KENWOOD

NX-220/ NX-320/ NX-720HG/ NX-820HG

Function Reference (FUNC)

Version:	5.10
Last Updated:	October 31, 2016
Language:	English
Type:	K

About this Manual

This In-depth manual describes the functions of the NX-220/ NX-320/ NX-720HG/ NX-820HG transceiver and how to configure its various functions.

This document is created for the product having the following design specifications.

Item	Specifications	How to Verify
Market Code	K	Printed or labeled on the outside of carton and locations with model name.
Firmware Version of the Transceiver	5.10.00 or later	Can be viewed in the **Transceiver Information** dialog box of KPG-141D/ KPG-141DN. Or, for Mobile or Portable having an LCD, turning the transceiver ON while pressing the **[S]** key on the transceiver displays the transceiver firmware version on the main display.
Version of KPG-141D	V5.10 or later	Can be viewed in the **About KPG-141D** dialog box of KPG-141D.
Version of KPG-141DN	V5.10 or later	Can be viewed in the **About KPG-141DN** dialog box of KPG-141DN.

K: Designed for the North American markets.

How to Read the In-depth Manual

In-depth Manual has the following sections.

Function Reference (FUNC)

This section describes all functions of NX-220/ NX-320/ NX-720HG/ NX-820HG.

Customer Support Information (CSI)

This section describes how to adjust NX-220/ NX-320/ NX-720HG/ NX-820HG.

Also, this manual has references mentioned as “Configuration using KPG-141D/ KPG-141DN” for functions that can be configured using KPG-141D/ KPG-141DN.

About Notations

The following notations are used in this manual.

[ ]

The characters in [ ] indicate the name of the operating portion of the transceiver and the key of the PC.

“ ” (Double Quotation Mark)

The characters in “ ” indicate the name of the functions, buttons, and menus shown on the KPG-141D/ KPG-141DN or the LCD display of the transceiver.

Bold Letters

The characters in bold letters indicate the name of the windows, tabs, checkboxes in KPG-141D/ KPG-141DN and functions assigned to keys on the transceiver.

[ ] + [ ]

This notation is used for describing functions activated by pressing 2 keys on the keyboard at the same time. When the notation is **[Shift]** + **[a]**, a subscriber must press the **[a]** while pressing the **[Shift]** key.

PF (Programmable Function) Key

This function is used for describing the key that is assigned with any function. When the Reset function is assigned to the **[A]** key, the **[A]** key is described as “the **Reset** key”.

“Portable” and “Mobile” are designated in this manual as the generic name for a type of transceivers. Transceivers applicable to Portable and Mobile are as follows.

Portable:

NX-220/ NX-320

Mobile:

NX-720HG/ NX-820HG

Abbreviations Used in this Document

The following abbreviations are used in this in-depth manual. Refer to the abbreviation table below.

Abbreviation	Full Spelling or Meaning
ACK	Acknowledgment
AUX	Auxiliary
BCL	Busy Channel Lockout
BOT	Beginning of Transmit
CH	Channel
COM port	Communications port
COR	Carrier-operated Relay
CW	Continuous Wave
DFA	Direct Frequency Assignment
DQT	Digital Quiet Talk
DTC	Data Transmission Control
DTMF	Dual Tone Multi-frequency
EOT	End of Transmit
ETX	The end of Text
ESN	Electronic Serial Number
FEC	Forward Error Correction
FPU	Field Programming Unit
GPS	Global Positioning System
GTC	Go to channel
ID	Identification
LOK	Link OK (connected to the repeater)
LTR	Logic Trunked Radio
LTR ID	ID used in the LTR Trunked Radio System
MI2	Microphone Input II
Mic	Microphone
MSK	Minimum Shift Keying
OST	Operator Selectable Tone
PC	Personal Computer
PF	Programmable Function
PSTN	Public Switched Telephone Network
PTT	Push-to-Talk
PTT ID	PTT (Push-to-talk) ID code
QT	Quiet Talk
RAN	Radio Access Number
RSSI	Received Signal Strength Indication
RX	Receive
STX	Start of Text
TA	Talk Around
TEL	Telephone
TOR	Tone Operated Relay
TOT	Time-out Timer
TX	Transmit
UTC	Universal Time Coordinated
VOX	Voice-operated Transmission

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About NXDN

The digital communications system described in this document is realized with the KENWOOD proprietary technologies which comply with the NXDN common air interface specifications.

About NEXEDGE

NEXEDGE is a generic term to describe the KENWOOD proprietary digital communications system which complies with NXDN common air interface specifications.

About the Programming Software

Various functions and parameters of the transceiver can be configured by using the KPG-141D/ KPG-141DN software. Various functions can be enabled by connecting the transceiver to a PC by use of KPG-22A/ KPG-22U (Portable) or KPG-46A/ KPG-46U/ KPG-46X (Mobile) programing cables and writing the data configured using KPG-141D/ KPG-141DN to the transceiver. In this manual, the description of each function in the Function Reference may have a corresponding reference in the help texts attached to KPG-141D/ KPG-141DN. Therefore, you can configure the function by referring to the function also appearing in the help texts of KPG-141D/ KPG-141DN.

About KPG-141DN

KPG-141DN is the programming software to configure functions for a transceiver. KPG-141DN is compliant with the FCC Part 90 standard so that the specification does not allow to configure “Wide” (25 kHz) for Channel Spacing with VHF and UHF band transceivers. The specifications of KPG-141D and KPG-141DN are the same for the other functions.

Firmware Version of the Transceiver and Version of KPG-141D/ KPG-141DN

Firmware version of the transceiver supporting each function is described in the context of this document as needed. Following are versions of KPG-141D/ KPG-141DN that can be used for each firmware version.

Firmware Version of the Transceiver	Version of KPG-141D/ KPG-141DN
3.00.00 or later	V3.00 or later
5.10.00 or later	V5.10 or later
5.10.00 or later	V5.10 or later

About Transceivers

NX-720HG/ NX-820HG has a built-in GPS receiver unit. Also, specifications of NX-220/ NX-320 vary depending on the market code of the transceiver.

Model Name	Market Code	Frequency	LCD	4-key	DTMF keypad
NX-220	K	136 MHz to 174 MHz	Disabled	Disabled	Disabled
	K2	136 MHz to 174 MHz	Available	Available	Disabled
	K3	136 MHz to 174 MHz	Available	Available	Available
NX-320	K	450 MHz to 520 MHz	Disabled	Disabled	Disabled
	K2	450 MHz to 520 MHz	Available	Available	Disabled
	K3	450 MHz to 520 MHz	Available	Available	Available
	K4	400 MHz to 470 MHz	Disabled	Disabled	Disabled
	K5	400 MHz to 470 MHz	Available	Available	Disabled
	K6	400 MHz to 470 MHz	Available	Available	Available
	K7	350 MHz to 400 MHz	Disabled	Disabled	Disabled
	K8	350 MHz to 400 MHz	Available	Available	Disabled
	K9	350 MHz to 400 MHz	Available	Available	Available

The Portable transceiver is described as “Portable (with LCD/ with 16-key)”, “Portable (with LCD/ with 4-key)”, “Portable (without LCD/ without Key)” in this manual depending on the market code.

About Options to Use the Functions Described in This Document

To use the functions described in this document, the following KENWOOD optional accessories need to be prepared on your own as necessary.

Portable/ Mobile	Option
Portable	• Stationary/ Motion detection (Software Option) • KMC-48GPS (Speaker Microphone) • KMC-21 (Speaker Microphone) • KMC-45 (Speaker Microphone) • KHS-21 (Headset with Boom Microphone & PTT)
Mobile	• KMC-27A/B (Microphone) • KMC-30 (Microphone) • KMC-28B (Microphone with Keypad) • KMC-32 (Microphone with Keypad) • KMC-36 (Microphone with Keypad) • KMC-9C (Desktop Microphone) • KES-3 (External Speaker) • KES-5 (External Speaker) • KCT-60 (Connection Cable) • KCT-18 (Ignition Sense Cable) • KRA-40(G) (GPS Antenna)

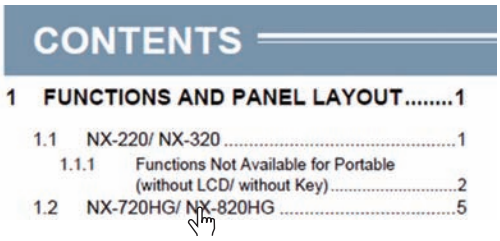
How to Search for Information

For your convenience of reading through this document using Adobe Acrobat or Adobe Reader, a link to a corresponding item is pasted in the Contents page, Index page, the lower part of each page and in the context. Clicking the portion where a link is pasted enables a jump to the corresponding page.

Placing a pointer over the portion where a link is pasted changes the shape of the pointer to a hand ( ).

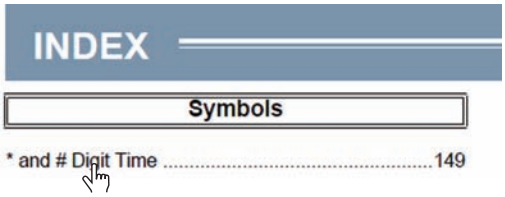
■ CONTENTS

Clicking a title in the Contents page allows a jump to the corresponding page.



■ INDEX

Clicking a function name, a title or a page number in the Index pages allows a jump to the corresponding page.



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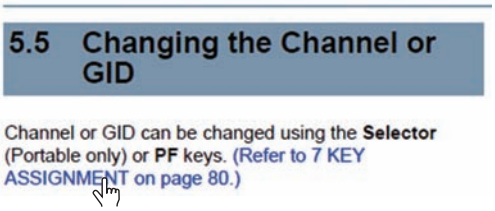

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Outline of Transceiver

NX-220/ NX-320/ NX-720HG/ NX-820HG are VHF/ UHF transceivers for the use of professionals. The transceiver is equipped with the existing analog FM mode and the digital communications system which complies with the NXDN common air interface specifications.

GENERAL FEATURES

Portable

- 260 CH/GID, 128 Zones
- 64 CH/GID, 4 Zones (Portable (without LCD/ without Key))

Models

- 1 W/ 5 W (136 MHz to 174 MHz) Models
- 1 W/ 5 W (400 MHz to 470 MHz, 450 MHz to 520 MHz) Models
- 12-Key Keypad Models

Display functions

- Function/ Status LCD Icons
- Transmit/ Busy/ Call Alert/ Warn LED
- 8 Character Alphanumeric Aliases

Specifications

- Backlit LCD & Keys
- Emergency/ AUX Key
- On/ Off Volume Knob
- 16-Position Mechanical Selector
- 4 Front PF Keys
- 3 Side PF Keys
- PC Serial Interface
- 500 mW Speaker Audio
- Built-in Motion Sensor

Main functions

- Zone/ CH# Voice Announcement
- Man-down detection
- SDM Manual Input*1
- Transparent Data Mode*2

Others

- Flash Firmware Upgrading
- MIL-STD-810 C/ D/ E/ F/ G
- IP54/ 55 Water & Dust Intrusion

Mobile

- 260 CH/GID, 128 Zones

Models

- 5 W/ 30 W / 50 W (136 MHz to 174 MHz) Model
- 5 W/ 30 W / 45 W (400 MHz to 470 MHz, 450 MHz to 520 MHz) Models

Display functions

- Function/ Status LCD Icons
- Transmit/ Busy/ Call Alert/ Warn LED
- Blue Function/ Status LED
- 10 Character Alphanumeric Aliases

Specifications

- Backlit LCD & Keys
- Emergency/ AUX Key
- 10 PF Keys
- Front Panel Speaker, 4 W Speaker Audio
- PC Serial Interface
- DB15 Accessory Interface
- 6 Programmable I/O Ports
- Microphone (KMC-35)

  Built-in GPS Receiver*3

Main functions

- Zone/ CH# Voice Announcement
- Timed Power-off
- Ignition Sense
- Public Address/ Horn Alert Output
- SDM Manual Input*1
- Transparent Data Mode*2

Others

- Flash Firmware Upgrading
- MIL-STD-810 C/ D/ E/ F/ G
- IP54 Water & Dust Intrusion

DIGITAL MODES

GENERAL

- NXDN Digital Air Interface
- AMBE+2 VOCODER
- 6.25 & 12.5 kHz Channels
- Over-the-Air Alias
- Over-the-Air Programming
- Paging Call
- Emergency Call
- All Group Call
- Status Message*1*4
- Remote Stun/ Kill*5
- Remote Monitor*5
- Short & Long Messages*1
- AUX Input Status Message (Mobile Only)*6
- AUX Output Status Message (Mobile Only)*7
- Ignition On/ Off GPS Reporting (Mobile Only)
- Data with Voice
- Single Scan, Multi Scan, List Scan
- NXDN Scrambler Included

CONVENTIONAL MODE

- 64 Radio Access Numbers (RAN)
- Individual Call & Group Call*8
- Mixed FM/ Digital Operation
- Site Roaming

TRUNKING MODE

- Single System (A single system can be used.)
- Multiple Systems (A maximum of 8 systems can be used by switching a system.)
- Individual Call
- Group Call & Broadcast Call
- Telephone Call
- Transmission Trunked Mode*9
- Message Trunked Mode*9
- Late Entry (UID & GID)*9
- 4 Priority Monitor ID's*9
- Remote Group Add*5
- Failsoft Mode

ANALOG MODES

GENERAL

- 12.5 & 25 kHz Channels[*10]
- FleetSync/ FleetSync II, MDC-1200, DTMF
- QT/ DQT/ 2-tone[*8] (Conventional Zones Only)
- Single Scan, Multi Scan, List Scan
- Priority Scan
- Voice Inversion Scrambler (16 Codes)

FleetSync/ FleetSync II

- PTT ID ANI/ Caller ID[*8]
- Selective/ Group Call[*8]
- Status Message[*1]
- Emergency, Short & Long Messages[*1]
- AUX Input Status Message (Mobile Only)[*6]
- AUX Output Status Message (Mobile Only)[*7]
- Ignition On/ Off GPS Reporting (Mobile Only)

MDC-1200

- PTT ID ANI/ Caller ID[*8]
- Emergency, Radio Check (Decode), Stun (Decode)

[*1] To use serial communications to send a message, a compatible PC software or external devices must be prepared for the transmitting transceiver. Also, to send a received message to the external devices, a compatible PC software or external devices must be prepared for the receiving transceiver.

[*2] A compatible PC software and external devices must be prepared for both the transmitting transceiver and the receiving transceiver.

[*3] An additional antenna of KRA-40(G) is required.

[*4] Portable (without LCD/ without Key) - Pre-programmed key operation.

[*5] A compatible PC software or external devices must be prepared for the transmitting transceiver.

[*6] The sensor to detect the status change of the port must be connected to the AUX Input port on the transmitting transceiver.

[*7] To control the external device remotely according to the status change of the port, the external device needs to be connected to the AUX Output port on the receiving transceiver.

[*8] Portable (without LCD/ without Key) - LCD dependent and some key-based functions not available.

[*9] These trunked features are primarily system programming and operational dependent. Priority Monitor also requires NX subscriber settings.

[*10] 25 kHz is not for sale in the USA and the US territories.

About 2nd Generation Trunking System

A transceiver having firmware version 5.10.00 or later supports the 2nd Generation NXDN Trunking system (a wide area system and the Direct Frequency Assignment (DFA) function).

The 2nd Generation NXDN Trunking system allows you to build a larger-scaled system than the existing NXDN Trunking system, and transceivers can be operated in a wide area system structured by connecting multiple single-site or multi-site systems. A system of a maximum of 1,152 sites can be built by connecting multiple systems of the same system code.

Also, in the 2nd Generation NXDN Trunking system, the Direct Frequency Assignment (DFA) function that directly notifies the transceiver of frequency information with the frequency information is supported. By using this function, the site can be expanded without overwriting the configuration data of the transceiver in operation because a broadcast message with the frequency information of a new site can be sent from the system such as when a site is added to the 2nd Generation NXDN Trunking system.

For the transceiver to use the functions of the 2nd Generation NXDN Trunking system, 2nd Generation Trunking System needs to be enabled.

“2nd Generation Trunking System” in Software Option needs to be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

Configuring the 2nd Generation Trunking System to be enabled or disabled (Refer to Model > Product Information > Enhanced Features.)

Revision History

Date	Description
2015.10.30	1)Corrected each version information in “About this Manual”. 2)Added “DFA” to “Abbreviations Used in this Document”. 3)Added each version information to “Firmware Version of the Transceiver and Version of KPG-141D/ KPG-141DN”. 4)Added “Single System” and “Multiple Systems” in “TRUNKING MODE” of “Outline of Transceiver”. 5)Added “About 2nd Generation Trunking System”. 6)Added “2.8.1 About the 4-digit Display of the Site Number”. 7)Added the description related to the 4-digit display of the site number in the following items: • 2.9 Maintenance Display • 25.21 Forced Search (NXDN Trunking System Only) • 25.22 Site Lock/ Site Select (NXDN Trunking System Only) 8)Added “System Select Tone” in “Table 3-4 Warning Tone”. 9)Added the description of the manual entry of the site number in “Site Select” (Portable and Mobile) of “5.17 Key Operations for Each Mode”. 10)Added “Single System”, “Multiple Systems”, and “Wide Area System” in the outline explanation of “25 NXDN”. 11)Added the explanations related to Call in Progress Tone and Disconnect Indication Tone in the following items: •25.5 Individual Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) •25.6 Group Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) •25.30 Telephone Call (NXDN Trunking System Only) 12) Added the description about the manual entry of the site number in “25.22 Site Lock/ Site Select (NXDN Trunking System Only)”. 13)Added “ ● Using Site Select Mode (manual entry)” in “25.22 Site Lock/ Site Select (NXDN Trunking System Only)”. 14)Added “25.31 Direct Frequency Assignment (NXDN Trunking System Only)”. 15)Added “25.32 System Auto Select (NXDN Trunking System Only)”. 16)Changed the version number from 3.00 to 5.10.

Date	Description
2016.10.31	1)Changed each version information in “About this Manual”. 2)Added the description related to Multi-System Roaming in “2.9 Maintenance Display”. 3)Added “Advanced GPS Report Error Tone” to Table 3-1 and Table 3-4. 4)Added “System Select Mode” in “5.17 Key Operations for Each Mode”. 5)Added the following items in “7.1 Available Functions for the Selector (Portable Only)”: System Select System Up/Down 6)Added the following items in “7.2 Available Functions for the PF Keys”: System Down System Down (Continuous) System Lock System Select System Up System Up (Continuous) 7)Added the description related to Multi-System Roaming in “■About Home System” of “25 NXDN”. 8)Added “25.18.17 GPS Report Channel”. 9)Added the description related to Multi-System Roaming in ““25.22 Site Lock/ Site Select (NXDN Trunking System Only)”. 10)Added the following items: 25.33 Multi-System Roaming (NXDN Trunking System Only) 25.34 System Lock/ System Select (NXDN Trunking System Only) 11)Changed the version number from 4.95 to 5.10.

CONTENTS

1.1 NX-220/ NX-320

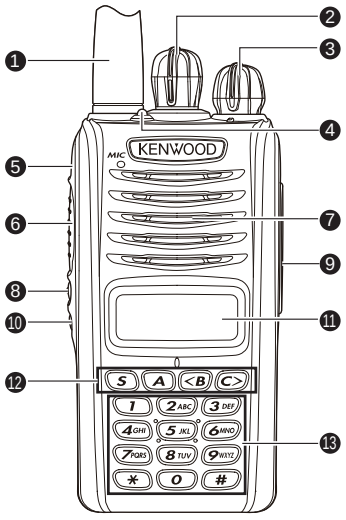


Figure 1-1 Front View of NX-220/ NX-320 (with LCD/ with 16-key)

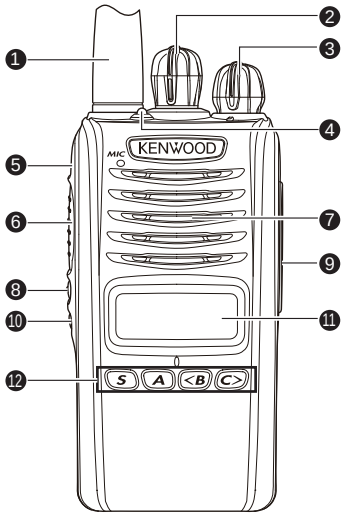


Figure 1-2 Front View of NX-220/ NX-320 (with LCD/ with 4-key)

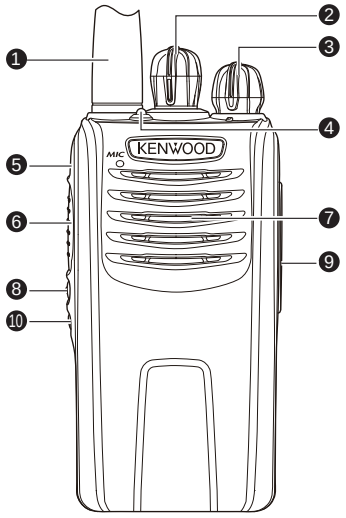


Figure 1-3 Front View of NX-220/ NX-320 (without LCD/ without Key)

❶ **Antenna**

❷ **Selector**

The zone, channel, or GID can be changed.

❸ **Power Switch/ Volume Control**

The transceiver can be turned ON by rotating the Power switch. The volume level of the speaker sound can be adjusted.

❹ **Transmit LED/ Busy LED**

These LEDs light when the transceiver transmits or receives a signal.

❺ **AUX Key**

The preassigned function will be activated or will be changed to the active state.

❻ **PTT Switch**

Pressing the **PTT** switch allows a user to transmit.

❼ **Speaker**

The received audio and alert tone sound from the speaker.

❽ **Side 1 Key**

The preassigned function will be activated or will be changed to the active state.

❾ **2.5 mm/ 3.5 mm Connector**

External equipments such as a PC and an optional equipment can be connected to the 2.5 mm/ 3.5 mm connector.

❿ **Side 2 Key**

The preassigned function will be activated or will be changed to the active state.

⓫ **LCD**

The channel number and the transceiver's status appear on this display.

⓬ **4-key ([S], [A], [<B], and [C>] keys)**

The preassigned function will be activated or will be changed to the active state.

⓭ **Keypad**

The transceiver can be operated by pressing a key.

1.1.1 Functions Not Available for Portable (without LCD/ without Key)

Following functions are unavailable for Portable (without LCD/ without Key).

Note: Functions available only for Mobile are not listed in the following list.

Table 1-1 Functions Not Available for Portable (without LCD/ without Key)

Item		Remarks
Basic Function		
	GPS Position Display	
	Transceiver Password	
	Keypad Operation	
	Key Assignment	Refer to Table 1-2 Functions Not Available for Portable (without LCD/ without Key).
Display Function		
	Display Format	
	Power-on Text	
	Backlight	
	Signal Strength Indicator	
	Call Indicator	
	Battery Indicator	For Portable (without LCD/ without Key), the Battery Indicator is the function that notifies by a lighting LED that the remaining battery level is low. Either Off or LED can be configured for Battery Indicator. If LED is configured for Battery Indicator, the LED notifies a user by lighting or blinking upon a press of the **Battery Indicator** key that the remaining battery level is low as follows. Lit green: Full Lit orange: Sufficient Lit red: Low Blinking red: Very Low
	Display Customization	
LTR		
	System Search	
DTMF		
	Autodial Programming	
	Encode	Autodial Mode, Manual Dial or Keypad Auto PTT are unavailable.
	Decode	Monitor of the Auto Reset Timer is always retained in the enabled state.
2-tone		
	Encode	• 2-tone Mode is unavailable. • 2-tone codes can be sent by using the **Call 1** to **Call 6** keys.
	Decode	Monitor of the Auto Reset Timer is always retained in the enabled state.
FleetSync		
	Selcall	• Selcall Mode (including Paging Call) is unavailable. • A Selective Call using the PTT ID is available.
	Status Message	• Status Mode is unavailable. • Status Messages can be sent by using the **Call 1** to **Call 6** keys.
	Short Message	Short Message Mode is unavailable.
	Interfleet Call	• Interfleet Calls cannot be initiated by selecting a FleetSync ID from the ID List or directly entering a FleetSync ID. • Interfleet Calls can be initiated by using the **Call 1** to **Call 6** keys or PTT ID.
	Status 80-99 (Special)	
	Manual Dialing	
	Auto Reset Timer	• The parameter of LCD is unavailable for Auto Reset Timer. • Monitor of the Auto Reset Timer is always retained in the enabled state.
	Caller ID Display	
	Message Display Type	
	Caller ID Stack	
	Status Message Stack	
	Short Message Stack	
	Latest Received Message Stack	
	Message Memory	
	Stack Mode	

Item		Remarks
Operator Selectable Tone		
NXDN		
	Individual Call	• Individual Call Mode is unavailable. • Individual Calls can be initiated by using Selcall on PTT. • Only Talkback for an Individual Call is available in an NXDN Trunking system.
	Individual Call (Individual Call Acknowledge Request)	• Individual Call Mode and Stack Mode are unavailable. • Individual Calls can be initiated by using the **Call 1** to **Call 6** keys or Selcall on PTT.
	Individual Call (Message Trunked (Enhanced))	
	Group Call	• Group Call Mode is unavailable. • A Group Call with Selcall on PTT is available in an NXDN Conventional system.
	Group Call Display	
	Caller ID Display	
	Paging Call	
	Status Call	• Status Mode is unavailable. • Status Messages can be sent by using the **Call 1** to **Call 6** keys.
	Short Data Call	Short Message Mode is unavailable.
	Clock Function	The clock function is unavailable.
	Special Status	Only available by using the PC command.
	Auto Reset Timer	The parameter of LCD is unavailable for Auto Reset Timer.
	Manual Dialing	
	Message Display Type	
	Caller ID Stack	
	Status Message Stack	
	Short Message Stack	
	Latest Received Message Stack	
	Message Memory	
	Maintenance Display	
Panel Test Mode		PC Test Mode is available.
Panel Tuning Mode		PC Tuning Mode is available.

Item	Remarks
Clone Mode	
Firmware Version Information Mode	

Table 1-2 Functions Not Available for Portable (without LCD/ without Key) (Key Function)

Key Function	Remarks
2-tone	
Autodial	
Autodial Programming	
Backlight	
Channel Entry	
Display Format	
Forced Search	• The available function is limited only to starting Forced Search. • The function of displaying the site number is unavailable.
GPS Position Display	
Group ID/Channel Entry	
Group (NXDN)	
Group + SDM (NXDN)	
Group + Status (NXDN)	
Individual (NXDN)	
Individual + SDM (NXDN)	
Individual + Status (NXDN)	
Maintenance	
Operator Selectable Tone	
OST List	
Priority-channel Select	
Scrambler/Encryption Code	
SDM (FleetSync/ NXDN)	
Selcall (FleetSync)	
Selcall + SDM (FleetSync)	
Selcall + Status (FleetSync)	

Key Function	Remarks
Site Lock	• The available function is limited only to configuring Site Lock to be enabled or disabled. • Site Select Mode is unavailable.
Squelch Level	
Stack	
Status	
Short Message	
Transceiver Password	
VOX	• The available function is limited only to configuring VOX to be enabled or disabled. • VOX Gain Level Mode is unavailable.

1.2 NX-720HG/ NX-820HG

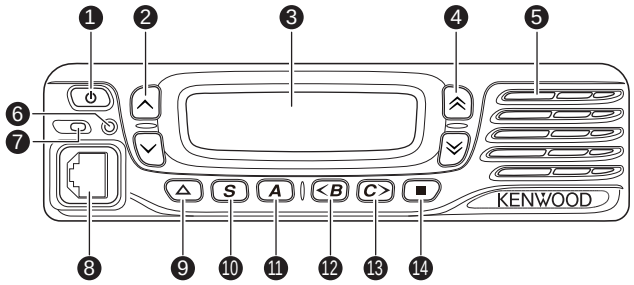


Figure 1-4 NX-720HG/ NX-820HG Front View

❶ [⏻] Power Switch

The transceiver is turned ON when this switch is pressed and the transceiver is turned OFF when this switch is pressed again. The **[⏻]** (Power) switch is described as the **Power** switch in this manual.

❷ [∧]/ [∨] (Left Up/ Left Down) Key

The volume level of the speaker sound can be adjusted. The preassigned function will be activated or will be changed to the active state. These **[∧]** (Left Up) and **[∨]** (Left Down) keys are described as **[∧]** and **[∨]** in this manual.

❸ LCD

The channel number and the transceiver's status appear on this display.

❹ [⩓]/ [⩔] (Right Up/ Right Down) Key

The zone, channel, or GID can be changed. The preassigned function will be activated or will be changed to the active state. These **[⩓]** (Right Up) and **[⩔]** (Right Down) keys are described as **[⩓]** and **[⩔]** in this manual.

❺ Speaker

The received audio and Alert Tone sound from the speaker.

❻ LED (blue)

If "Blue" is configured for Alert LED Color, the LED blinks blue when the transceiver receives various calls.

❼ Transmit LED/ Busy LED

These LEDs light when the transceiver transmits or receives a signal. These LEDs blink orange when the transceiver receives various calls.

❽ Microphone Connector

A microphone can be connected to this connector.

❾ [△] (Triangle) Key

The preassigned function will be activated or will be changed to the active state. The **[△]** (Triangle) key is described as the **Triangle** key in this manual.

❿ [S] Key

The preassigned function will be activated or will be changed to the active state.

⓫ [A] Key

The preassigned function will be activated or will be changed to the active state.

⓬ [<B] Key

The preassigned function will be activated or will be changed to the active state.

⓭ [C>] Key

The preassigned function will be activated or will be changed to the active state.

⓮ [■] (Square) Key

The preassigned function will be activated or will be changed to the active state. The **[■]** (Square) key is described as the **Square** key in this manual.

The transceiver has the following indicator and display.

- LED (TX/Busy)
- Selective Call Alert LED
- LCD Display

Note: The content regarding the LCD display in each description below is not applicable for Portable (without LCD/ without Key).

2.1 LED (TX/ Busy)

2.1.1 Busy LED

Busy LED is used to notify a user visually that the transceiver has received a signal.

The LED lights green while the transceiver is receiving a signal in a Conventional Group or LTR Trunking System.

The LED lights only when the transceiver is on a traffic channel in an NXDN Trunking system. The Busy LED does not light when the transceiver is on a control channel.

Also, whether the Busy LED will light while the transceiver receives in Emergency Mode can be configured. (Refer to: 19.1.13 Emergency LED on page 201)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to turn the Busy LED On (Edit > Optional Features > Optional Features 1 > Common Page 3 > LEDs)

2.1.2 Transmit LED

Transmit LED is used to notify a user visually that the transceiver is transmitting.

The Transmit LED lights red while the transceiver is transmitting.

Also, whether the Transmit LED will light while the transceiver transmits in Emergency Mode can be configured. (Refer to: 19.1.13 Emergency LED on page 201)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to turn the Transmit LED On (Edit > Optional Features > Optional Features 1 > Common Page 3 > LEDs)

2.2 Selective Call Alert LED

Selective Call Alert LED is used to notify a user visually that the transceiver has received various calls.

The LED blinks orange when the transceiver receives a call using such signaling as DTMF, 2-tone, FleetSync, or NXDN.

Selective Call Alert LED can be configured for each signaling. Refer to the following sections for details.

DTMF:

14.3.6 Selective Call Alert LED on page 130

2-tone:

15.3.5 Selective Call Alert LED on page 139

FleetSync:

16.8.20 Selective Call Alert LED on page 175

NXDN:

25.35.15 Selective Call Alert LED on page 331

Mobile is also equipped with the blue LED. The LED (blue) can blink blue when the transceiver receives various calls according to the configuration for Alert LED Color.

Alert LED Color can be configured per signaling. Refer to the following sections for details.

DTMF:

14.3.7 Alert LED Color (Mobile Only) on page 130

2-tone:

15.3.6 Alert LED Color (Mobile Only) on page 139

FleetSync:

16.8.27 Alert LED Color (Individual Call) (Mobile Only) on page 176
16.8.28 Alert LED Color (Other Selective Calls) (Mobile Only) on page 176
16.8.29 Alert LED Color (Paging Call) (Mobile Only) on page 177

NXDN:

25.35.24 Alert LED Color (Individual Call) (Mobile Only) on page 333
25.35.25 Alert LED Color (Group Call/ Conference Group Call) (Mobile Only) on page 333
25.35.26 Alert LED Color (Broadcast Group Call) (Mobile Only) on page 334
25.35.27 Alert LED Color (Paging Call) (Mobile Only) on page 334
25.35.28 Alert LED Color (Telephone Call) (Mobile Only) on page 334

2.3 LCD Display

The LCD displays of the transceiver are as follows.

■ Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key)

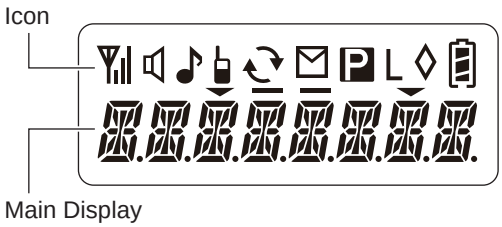


Figure 2-1 LCD (Portable)

■ Mobile

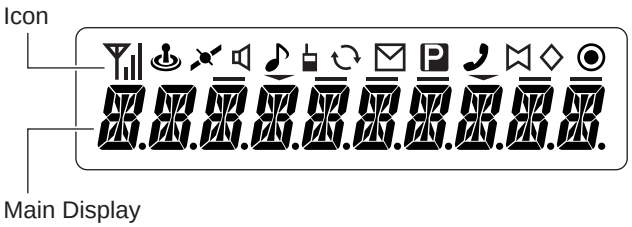


Figure 2-2 LCD (Mobile)

2.3.1 Backlight (Portable Only)

The backlight is located behind the LCD of the transceiver. By lighting the backlight, a user can view what appears on the LCD in dark places or at night.

Pressing the **Backlight** key toggles the backlight Between On and Off. If Auto Backlight is enabled, pressing any key other than the **PTT** switch turns the backlight On.

After the backlight is turned On, the backlight will automatically be turned Off upon the elapse of the time configured for Backlight Timer.

If any key other than the **PTT** switch is pressed before the time configured for Backlight Timer elapses, the lighting time of the backlight will be extended by the time configured for Backlight Timer.

Note: The **Backlight** key and Auto Backlight cannot be used at the same time.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Auto Backlight to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)

2.3.2 LCD Brightness (Mobile Only)

The transceiver can be used in dark places or at night by obscuring the brightness of the backlight.

Pressing the **LCD Brightness** key gradates the brightness of the backlight. The brightness level changes in the following order: High → Low → Off. Status of the backlight brightness that was changed by the **LCD Brightness** key is retained even after the transceiver is turned OFF.

The brightness of the backlight can be changed using KPG-141D/ KPG-141DN:

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the LCD Brightness Level (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Assigning functions to the PF keys (Edit > Key Assignment)

2.4 Icons

The following icons are available in the icon display area of the LCD.

■ Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key):

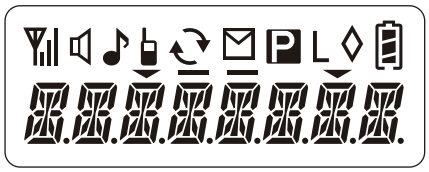


Figure 2-3 Icons (Portable)

Table 2-1 Icon List (Portable)

Icons	Description
	• RSSI Icon This icon indicates the signal strength.
	• Monitor Open/ Squelch Off Icon This icon appears when the transceiver unmutes the speaker, or deactivates the signaling.
	• Call Icon This icon indicates the status of the signaling. There are 2 states as follows: Lighted:The reset state of the optional signaling by pressing the **PTT** switch Blinking:The matched state of the optional signaling This icon is also used for Call Indicator in an LTR Trunking system. (Refer to: 13.14 Call Indicator on page 120)
	• Talk Around Icon This icon appears while Talk Around is enabled.
	• Scan Icon This icon indicates the status of the scanning. There are 2 states as follows: Lighted:Scanning. Blinking:Temporary pause in scanning
	• Message Stack Icon This icon appears if any received message is stored in the stack memory of the transceiver. There are 2 states as follows: Lighted:The status while a message is stored in the stack memory of the transceiver Blinking:The status while an unread message is stored in the stack memory of the transceiver.
	• Priority Channel Icon This icon appears when a Priority Channel is selected.
L	• Low Transmit Power Icon This icon appears when low power transmission is configured for the selected channel or GID.
	• Scrambler/Encryption Icon This icon appears while Voice Scrambler or Encryption is enabled.
	• Battery Status Icon This icon indicates the remaining battery capacity.
(Left)	• Zone Add Icon This icon appears when a target zone for scanning is selected.
(Right)	• CH/GID Add Icon This icon appears when a target channel or GID for scanning is selected.
(Left)	• VOX Icon This icon appears while VOX is active.

Note: The "▬" icon on the right side is unavailable.

■ Mobile

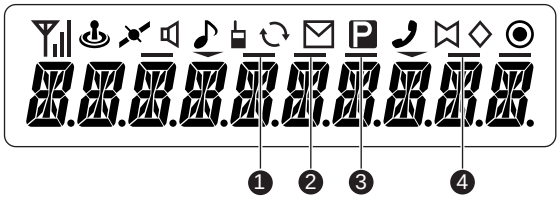


Figure 2-4 Icons (Mobile)

Table 2-2 Icon List (Mobile)

Icons	Description
	• RSSI Icon This icon indicates the signal strength.
	• Monitor Open/ Squelch Off Icon This icon appears when the transceiver unmutes the speaker, or deactivates the signaling.
	• Call Icon This icon indicates the status of the signaling. There are 2 states as follows: Lighted:The reset state of the optional signaling by pressing the **PTT** switch Blinking:The matched state of the optional signaling This icon is also used for Call Indicator in an LTR Trunking system. (Refer to: 13.14 Call Indicator on page 120)
	• Talk Around Icon This icon appears while Talk Around is enabled.
	• Scan Icon This icon indicates the status of the scanning. There are 2 states as follows: Lighted:Scanning. Blinking:Temporary pause in scanning

Icons	Description
	• Message Stack Icon This icon appears if any received message is stored in the stack memory of the transceiver. There are 2 states as follows: Lighted:The status while a message is stored in the stack memory of the transceiver Blinking:The status while an unread message is stored in the stack memory of the transceiver.
	• Priority Channel Icon This icon appears when a Priority Channel is selected.
	• Scrambler/Encryption Icon This icon appears while Voice Scrambler or Encryption is enabled.
(Left)	• Zone Add Icon This icon appears when a target zone for scanning is selected.
(Right)	• CH/GID Add Icon This icon appears when a target channel or GID for scanning is selected.
	• GPS Icon GPS positioning status appears. There are 2 states as follows: Lighted:Indicates that GPS positioning is enabled. Unlit: Indicates that GPS positioning is disabled.
	• Telephone ID Icon (LTR Trunking system) There are 2 states as follows: Lighted:Indicates that a GID with Telephone ID configured is being selected in an LTR Trunking system. Blinking:Indicates that Auto Telephone Search is being performed in an LTR Trunking system.
	• Horn Alert Icon This icon appears while Horn Alert is enabled.
	• Public Address Icon This icon appears while Public Address is enabled.
 (❶)	• External Speaker/ Internal Speaker Icon There are 2 states as follows: Lighted:Indicates that the external speaker is enabled. Blinking:Indicates that the internal speaker is enabled.
 (❷)	• AUX A Icon This icon appears while the AUX A port is active.
 (❸)	• AUX B Icon This icon appears while the AUX B port is active.
 (❹)	• Operator Selectable Tone Icon This icon appears while OST is enabled.

Note: The following icons are unavailable.
, "▬" (the rightmost), "▬" (the leftmost)

2.5 Signal Strength Indicator

Signal Strength Indicator can be used to display the signal strength of the received signal.

The RSSI icon indicating the signal strength appears in the following manner depending on the signal level of the received signal.

Table 2-3 Signal Strength Indicator

Icons	Status	Signal Strength
	High	Above -80 dBm
	Medium	-95 dBm to -80 dBm
	Low	-110 dBm to -95 dBm
	Very weak	With a carrier less than -110 dBm
Disabled	No signal	No carrier
	Blinking: Outside the communication area (NXDN Trunking System only)	-

Note: The signal strength references are as measured at room temperature.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Signal Strength Indicator to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)

2.6 Displays Relevant to the Battery (Portable Only)

Level of the remaining battery power can be notified to a user on the LCD and by LED.

2.6.1 Battery Indicator

■ Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key):

For Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key), Battery Indicator can be used to display a warning icon on the LCD and to warn using the LED when the remaining battery level is low.

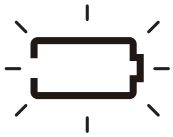
Conditions to activate the Battery Indicator vary depending on the configuration for Battery Warning. (Refer to: 2.6.2 Battery Warning on page 11)

Table 2-4 Battery Indicator

Configuration	Description
Off	The transceiver does not notify a user on the LCD and by LED that the battery level is low.
LCD	The transceiver notifies a user by displaying the “Battery Status” icon on the LCD that the remaining battery power is low. Depending on the remaining battery capacity, the “Battery Status” icon displays the remaining battery level in 4 stages: Full, Sufficient, Low, and Very Low. However, if “While Transmitting” is configured for Battery Warning, the “Battery Status” icon does not appear.
LED	The transceiver notifies a user by a blinking red LED that the remaining battery power is low.
LCD & LED	The transceiver notifies a user by displaying the “Battery Status” icon on the LCD and by a blinking red LED at the same time that the remaining battery power is low. However, if “While Transmitting” is configured for Battery Warning, the “Battery Status” icon does not appear.

If “LCD” or “LCD & LED” is configured for Battery Indicator, the remaining battery power appears in 4 stages depending on the remaining battery capacity.

Table 2-5 Battery Status Icon

Status	LED	Icons
Full	-	
Sufficient	-	
Low	-	
Very Low		

■ Portable (without LCD/ without Key)

For Portable (without LCD/ without Key), the Battery Indicator is the function that notifies by a lighting LED that the remaining battery level is low.

Conditions to activate the Battery Indicator vary depending on the configuration for Battery Warning. (参照: 2.6.2 Battery Warning on this page)

Table 2-6 Battery Indicator for Portable (without LCD/ without Key)

Configuration	Description
Off	The transceiver does not notify a user with the LED that the remaining battery power is low.
LED	The transceiver notifies a user by a lighting or blinking LED that the remaining battery power is low.

Upon pressing the **Battery Indicator** key, the lit or blinking LED notifies a user that the remaining battery level is low as follows.

Table 2-7 LED

LED		Status
Lit green		Full
Lit orange		Sufficient
Lit red		Low
Blinking red		Very Low

However, in the following cases, a Key-entry Error Tone sounds from the transceiver and the Battery Indicator does not work even if the **Battery Indicator** key is pressed.

If “Off” is configured for Battery Indicator.

If “LED” is configured for Battery Indicator and “While Transmitting” is configured for Battery Warning.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Battery Indicator (Edit > Optional Features > Optional Features 1 > Common Page 3 > Battery)

2.6.2 Battery Warning

Battery Warning can be used to notify a user by emitting a beep or blinking the LED when the remaining battery power is low.

The transceiver always monitors whether the battery voltage goes low and notifies a user that the remaining battery power is low according to the configuration of Battery Indicator when the battery voltage level goes lower than the warning voltage level. (Refer to: 2.6.1 Battery Indicator on page 10)

Table 2-8 Battery Warning

Configuration	Description
While Transmitting	The transceiver detects that the battery voltage is low while transmitting. When the battery voltage level goes lower than the warning voltage level (6.2 V), the transceiver notifies a user that the remaining battery power is low by a blinking red Transmit LED. The “Battery Status” icon does not appear even if “LCD” or “LCD & LED” has been configured for Battery Indicator; however, the transceiver notifies only by Transmit LED that the remaining battery power is low.
Always	The transceiver always detects whether the battery voltage goes low while the transceiver is in use. When the battery voltage goes below the warning voltage level (during transmission: 6.2 V, non-transmission: 7.0 V), the transceiver notifies a user that the remaining battery power is low according to the Battery Indicator configuration by changing the “Battery Status” icon, and by blinking a red Transmit LED.
Always - Late Warning	The transceiver always detects whether the battery voltage goes low while the transceiver is in use. When the battery voltage goes below the warning voltage level (during transmission: 6.2 V, non-transmission: 6.5 V), the transceiver notifies a user that the remaining battery power is low according to the Battery Indicator configuration by changing the “Battery Status” icon, and by blinking a red Transmit LED.

Also, if Battery Warning Tone is enabled, the transceiver notifies a user that the remaining battery capacity is low by making the Battery Warning Tone sound from the transceiver if the **PTT** switch is not pressed when the battery voltage level goes lower than the warning voltage level.

Note: This function is not activated if “Off” is configured for Battery Indicator.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Battery Warning (Edit > Optional Features > Optional Features 1 > Common Page 3 > Battery)
- Configuring the Battery Warning Tone to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 3 > Battery)

2.7 Main Display

The following functions are relevant to the main display.

- Zone Name
- Zone Name Text Length
- Zone Name display
- Channel Name
- GID Name
- Display Format
- Power-on Text

Note: Following are characters and symbols that can be entered.

Table 2-9 Available Characters and Symbols

(space) # $ % ( ) + - , / = @ \ _ * 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

2.7.1 Zone Name

Zone Name is the name that can be assigned to a zone.(Refer to: 4.1 Zone Description on page 27)

For Portable, a name of up to 8 characters can be configured for each zone. For Mobile, a name of up to 10 characters can be configured for each zone. If only a zone number appears on the transceiver main display, it may be difficult for a user to recognize on which zone the user is called or which zone can be used. If an identifiable name or common name appears on the transceiver main display, the user can easily recognize these with a glance.

The following 2 methods are available to display the Zone Name.

■ Zone Name Text Length

If Zone Name Text Length is used, both Zone Name and Channel Name (GID Name) can be displayed on the main display at the same time. Length of Zone Name is limited to the number of characters configured for Zone Name Text Length.

Table 2-10 Example of Zone Name Text Length Display

Item	Configuration
Zone Name Text Length	3
Zone Name	KENWOOD
GID Name	CHANNEL1
Displayed Characters	 Portable  Mobile

■ Zone Name Display

Zone Name Display can be used to display a Zone Name on the main display for 2 seconds when the zone is changed.

Portable

Mobile

Note:

- If no Zone Name is configured, the zone number and channel or GID number appear on the main display.
- If Zone Name Display is enabled, the Zone Name appears immediately after the transceiver is turned ON regardless of whether the zone is changed. If the Power-on Text is configured, Zone Name appears after the Power-on Text disappears.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Zone Name (Conventional Group) (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring the Zone Name (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Configuring the Zone Name (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit)
- Configuring the Zone-name Text Length (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Configuring the Zone Name Display to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)

2.7.2 Channel Name

Channel Name is a name assigned to a channel in a zone in a Conventional Group.

For Portable, a name of up to 8 characters can be configured for each channel.

For Mobile, a name of up to 10 characters can be configured for each channel.

If only a channel number appears on the transceiver main display, it may be difficult for a user to recognize on which channel the user is called or which channel can be used. If an identifiable name or common name appears on the transceiver main display, the user can easily recognize these with a glance.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Channel Name (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

2.7.3 GID Name

GID Name is a name assigned to a Group ID in a zone in an LTR Trunking system or NXDN Trunking system.

For Portable, a name of up to 8 characters can be configured for each GID.

For Mobile, a name of up to 10 characters can be configured for each GID.

If only a GID number appears on the transceiver main display, it may be difficult for a user to recognize who has been calling the user or which GID can be used. If an identifiable name or common name appears on the transceiver main display, the user can easily recognize these with a glance.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GID Name (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the GID Name (Edit > Zone Information (NXDN Trunking System) > GID Edit)

2.7.4 Display Format

Display Format can be used to display either Channel Name or GID Name on the main display, or both zone number and channel or GID number appear at the same time.

Table 2-11 Display Format

Configuration	Description
CH/GID Name	Channel Name or GID Name appears.
Zone-CH/GID Number	The zone number and channel or GID number appears.

Pressing the **Display Format** key changes the display. (Refer to: 7 KEY ASSIGNMENT on page 84)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Display Format (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Assigning functions to the PF keys (Edit > Key Assignment)

2.7.5 Power-on Text

Power-on Text can be used to display characters that appear during power-up.

If Power-on Text is configured, the configured characters appear for 2 seconds during power-up.

The configured text appears on the main display if “Text” is configured for Message Type.

Power-on Text = “ TRUCK 25”

Portable

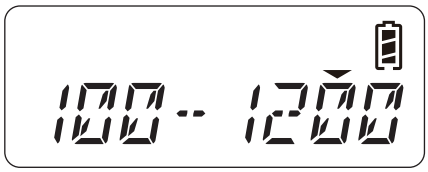
Mobile

If “FleetSync ID” is configured for Message Type, using “%” in a string of text causes text to appear by substitution of the Fleet (Own) and ID (Own) of FleetSync for “%”.

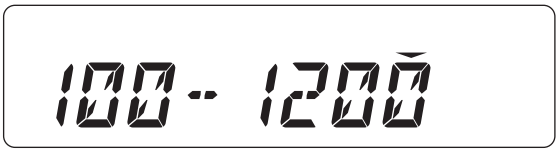
Fleet (Own) = 100

ID (Own) = 1200

Power-on Text = “%%%-%%%%”



Portable



Mobile

If “NXDN Unit ID” is configured for Message Type, using “%” in a string of text causes text to appear by substitution of the NXDN Unit ID (Own) for “%”.

Unit ID (Own)/ NXDN = 300

Power-on Text = “ID %%%%%”

Portable

Mobile

If “NXDN Unit ID Name” is configured for Message Type, the Unit ID name configured for the transceiver appears.

Unit ID Name (Own) = “ TRUCK 30”

Portable

Mobile

Note: Pressing a key while the Power-on Text appears causes the Power-on Text to disappear.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-on Text and Message Type (Edit > Optional Features > Optional Features 1 > Common Page 2 > Power-on)

2.8 Display Customization

Display Customization can be used to change by using KPG-141D/ KPG-141DN the character strings that appear on the LCD of the transceiver such as “SCAN” which appears while scanning and “SEND DAT” which appears while sending data.

The string of text which can be displayed on the LCD of the transceiver can be changed to languages other than English, such as Spanish or French, or to the function names used in other models.

2.8.1 About the 4-digit Display of the Site Number

The 4-digit display of the site number is shown as follows if the display of the site number is configured as 5 characters (Portable) or 7 characters (Mobile) in Display Customization.

Portable

The string of text configured in Display Customization: SITEA

The site number: 1152

The last character “A” disappears and the first digit of the site number appears.

Mobile

The string of text configured in Display Customization: SITEABC

The site number: 1152

The last character “C” disappears and the first digit of the site number appears.

■ Configuration Using KPG-141D/ KPG-141DN

- Changing the character strings that appear on the LCD of the transceiver (Edit > Display Customization)

2.9 Maintenance Display

Maintenance Display can be used to view the signal strength level (RSSI level) by displaying it on the LCD of the transceiver as a rough indication while constructing a system or doing maintenance of the system.

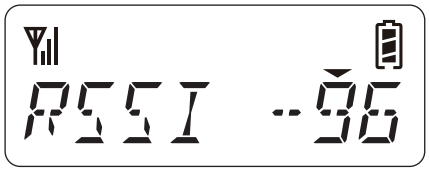
■ Operating the Transceiver

- **For a zone in any system other than an NXDN Trunking system:**

1. Press the **Maintenance** key.

   The transceiver enters Maintenance Display Mode and then the RSSI level appears. Display of the RSSI level is renewed every 500 ms.

   - **If the RSSI Level is -96 dBm**



Portable

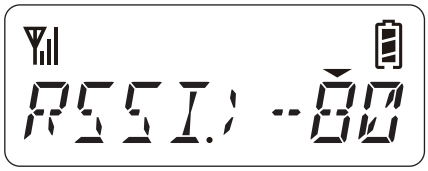
Mobile

   - **If the RSSI level is less than -120 dBm**

Portable

Mobile

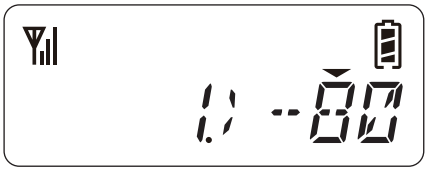
- **If the RSSI level is more than -80 dBm**



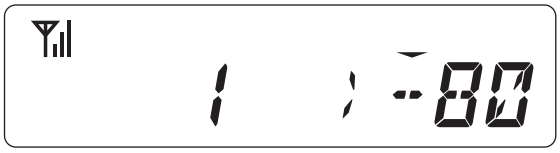
Portable

Mobile

- **If the RSSI level is more than -80 dBm**



Portable



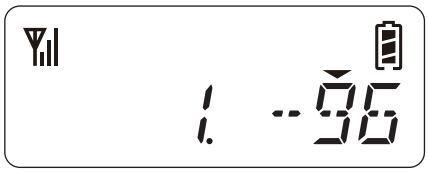
Mobile

● **For the zone in an NXDN Trunking system**

1. Press the **Maintenance** key.

The transceiver enters Maintenance Display Mode and then the channel number and RSSI level configured for Frequency Table appear.

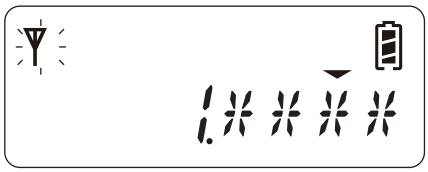
- **If the RSSI Level is -96 dBm**



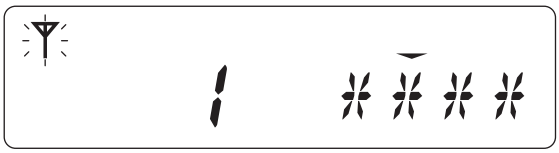
Portable

Mobile

- **If the RSSI level is less than -120 dBm**



Portable



Mobile

Note:

- ♦ If the transceiver is on a channel acquired by the frequency information acquired by DFA, “DFA” appears instead of the channel number.
- ♦ If the transceiver is in a Roaming System by using the SKF for roaming when the Multi-System Roaming function is used, “ROAM” appears instead of the channel number.

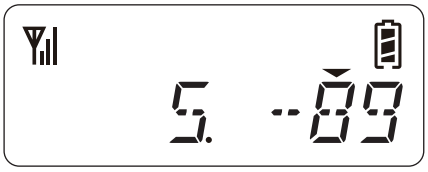
2. Change the channel number by using the transceiver keypad.

Portable:

[<B] key, **[C>]** key, or **Selector** (only if List Selection Key (Selector) is enabled)

Mobile:

[⩓] key or **[⩔]** key

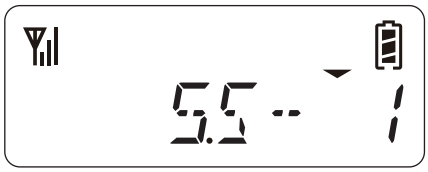


Portable

Mobile

3. Press the **[A]** key to change the display.

The channel number and the site number appear.



Portable

Mobile

Note:

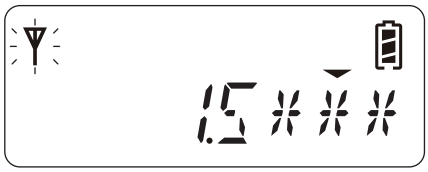
- If the site number is 4 digits, “S” disappears and the 4 digits appears.
- If a DFA channel is selected, the channel number display is replaced with “DFA”.

  Only the site name appears if Site Name is configured. However, if the transceiver is in a Roaming System by using the SKF for roaming, the site name does not appear even if the site name is configured, but the site number appears.

Portable

Mobile

If the selected channel number does not satisfy conditions to hunt for a control channel, the transceiver will be in the Out of Service state, and then the RSSI icon will blink. In this case, the channel number or site name does not appear.

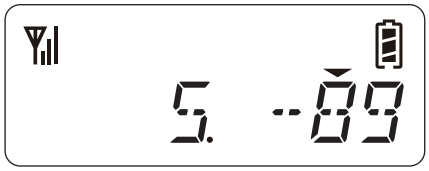


Portable

Mobile

4. Press the **[A]** key again.

The transceiver restores the previous RSSI level display.



Portable

Mobile

Note:

- In the zone of an NXDN Trunking system configured as the Home System of Multi-System Roaming, the system name appears by pressing the **[A]** key while the site number appears. The RSSI level reappears by pressing the **[A]** key again. (Refer to: 25.33 Multi-System Roaming (NXDN Trunking System Only) on page 314)
- The **PTT** switch can be used even if the transceiver is in Maintenance Display Mode. However, the **PTT** switch cannot be used if the transceiver is in Out of Service state in an NXDN Trunking system.
- While this function is in use, Battery Saver is disabled.
- In an NXDN Trunking system, the display is renewed at intervals of 1 frame.
- If the transceiver enters Maintenance Display Mode while Site Lock is enabled, Site Lock will temporarily be disabled. In this case, Site Lock will be enabled upon the end of Maintenance Display Mode.
- If the transceiver enters Maintenance Display Mode while the transceiver is outside of the communication area, the channel number retained in the transceiver appears.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

3.1 Tone Pattern

Following are tones that can be configured for the transceiver.

Table 3-1 Tone List

Tone	Description and Type
Power-on Tone	Power-on Tone A Power-on Tone B
Control Tone	Key Beep A Key Beep B Key Beep C Key-entry Error Tone Rollover Tone Stop Tone Password Authorization Tone Queue Tone Free System Ringback Mode Tone Ringer Tone Priority-channel Tone Scan Stop Tone Individual Call Tone Fleet Call Tone Group Call Tone Search Mode Tone Out of Range Tone Call Request Tone Zone 1 Select Tone Zone 2 Select Tone Zone 3 Select Tone Zone 4 Select Tone OTAP Reactivation Pre-alert Tone OTAP Reactivation Tone Call In Progress Tone Disconnect Indication Tone
Warning Tone	Warning Tone A Warning Tone B Warning Tone C Battery Warning Tone TOT Pre-alert Tone PLL Unlock Tone Busy Tone Busy Tone 2 Timed Power-off Pre-alert Tone A Timed Power-off Pre-alert Tone B Timed Power-off Pre-alert Tone C Delay Tone Intercept Tone Intercept Tone 2 Deny Tone System Search Tone System Search End Tone Call Queue Tone System Busy Tone Call Invalid Tone No Reply Tone Call Fail Tone Lone Worker Tone Group-registration Invalid Tone Call Processing Tone Network Failure Tone A Network Failure Tone B Man-down Pre-alert Stationary Pre-alert Tone Motion Pre-alert Tone System Select Tone Advanced GPS Report Error Tone
Locator Tone	Emergency Locator Tone
Sidetone	Proceed Tone VOX Proceed Tone PTT ID Sidetone
Volume Level Tone	Fixed Volume Key Tone Volume Key Tone
Alert Tone	Special Alert Tone

3.1.1 Power-on Tone

A Power-on Tone sounds from the transceiver when the transceiver is turned ON.

Table 3-2 Power-on Tone

Function	Description
Power-on Tone A	This tone sounds from the transceiver when the transceiver is turned ON.
Power-on Tone B (Mobile only)	This tone sounds when the transceiver is turned ON by pressing and holding the **Power** switch while “Ignition and Switch” is configured for Ignition Sense Type. In this case, Timed Power-off is not activated.

3.1.2 Control Tone

A Control Tone sounds when a function is activated by a user operating the transceiver.

Table 3-3 Control Tone

Function	Description
Key Beep A	This tone sounds from the transceiver when a function is enabled by pressing a key.
Key Beep B	This tone sounds from the transceiver when a function is disabled by pressing a key.
Key Beep C	This tone sounds from the transceiver when data, such as DTMF Memory or a Test Mode adjustment value, is written to the transceiver by pressing a key.
Key-entry Error Tone	This tone sounds from the transceiver when the operation activated by pressing a key is denied.
Rollover Tone	This tone sounds from the transceiver if “Rollover” is configured for Rollover/ End Stop. This tone sounds from the transceiver when the lowest zone number, the lowest channel, or GID number is selected. (Refer to: 5.6 Rollover/ End Stop on page 41)
Stop Tone	This tone sounds from the transceiver if “End Stop” is configured for Rollover/ End Stop. This tone sounds from the transceiver if a user attempts to decrease the zone, channel, or GID number while the zone, channel, or GID having the lowest number is selected. Also, this tone sounds from the transceiver if a user attempts to increase the zone, channel, or GID number while the zone, channel, or GID having the highest number is selected. (Refer to: 5.6 Rollover/ End Stop on page 41)
Password Authorization Tone	This tone sounds from the transceiver if the entered password matches the password preconfigured for the transceiver.
Queue Tone	This tone sounds from the transceiver while the transceiver is searching for an available RIC repeater to be connected to by using Auto Telephone in an LTR Trunking system. This tone sounds from the transceiver every 1 second until an available RIC repeater to be connected to is found or Auto Telephone is terminated if the transceiver cannot find an available RIC repeater within 60 seconds.
Free System Ringback Mode Tone	This tone sounds from the transceiver when the transceiver enters Free System Ringback Mode in an LTR Trunking system.
Ringer Tone	This tone sounds from the transceiver when a repeater is temporarily available on Free System Ringback Mode in an LTR Trunking system.
Priority-channel Tone	This tone sounds from the transceiver when the scan is paused on a Priority-channel.
Scan Stop Tone	Pressing the **Home CH/GID** or **Direct CH/GID** key during the scan causes the transceiver to migrate to the Home CH/ GID or Direct CH/GID. This tone sounds from the transceiver at 30-second intervals while the scan pauses.
Individual Call Tone	This tone sounds from the transceiver when the transceiver initiates an Individual Call of FleetSync.
Fleet Call Tone	This tone sounds from the transceiver when the transceiver initiates an Individual Call of FleetSync.
Group Call Tone	This tone sounds from the transceiver when the transceiver initiates an Individual Call of FleetSync.
Search Mode Tone	This tone sounds from the transceiver when the transceiver initiates Forced Search in an NXDN Trunking system.
Out of Range Tone	This tone sounds at intervals of 30 seconds from the transceiver if the transceiver is in the searching state even if 10 seconds elapse after the transceiver starts searching for a control channel in an NXDN Trunking system.
Call Request Tone	In an NXDN Trunking system or NXDN Conventional system, this tone sounds from the transceiver when the transceiver initiates Individual Call or Group Call by pressing the **PTT** switch
Zone 1 Select Tone Portable (without LCD/ without Key)	For Portable (without LCD/ without Key), this tone sounds from the transceiver if Zone 1 is selected.
Zone 2 Select Tone Portable (without LCD/ without Key)	For Portable (without LCD/ without Key), this tone sounds from the transceiver if Zone 2 is selected.
Zone 3 Select Tone Portable (without LCD/ without Key)	For Portable (without LCD/ without Key), this tone sounds from the transceiver if Zone 3 is selected.
Zone 4 Select Tone Portable (without LCD/ without Key)	For Portable (without LCD/ without Key), this tone sounds from the transceiver if Zone 4 is selected.
OTAP Reactivation Tone	Activation starts after an OTAP Reactivation Pre-alert Tone sounds from the transceiver for 5 times in OTAP Reactivation Mode. After completion of this Activation, an OTAP Reactivation Tone sounds from the transceiver, and the transceiver is activated in user mode.

Function	Description
OTAP Reactivation Pre-alert Tone	This tone sounds from the transceiver only if pressing a key on the transceiver allows the transceiver to be in OTAP Reactivation Mode. This tone sounds at 500-ms intervals from the transceiver while pressing and holding the **Side 2** key (Portable) or the **Square** key (Mobile) after the transceiver is turned ON and enters OTAP Reactivation Mode by pressing and holding the **Side 2** key (Portable) or **Square** key (Mobile). Activation starts after an OTAP Reactivation Pre-alert Tone sounds from the transceiver for 5 times. If the **Side 2** key (Portable) or the **Square** key (Mobile) is released before an OTAP Reactivation Pre-alert Tone sounds from the transceiver for 5 times, OTAP Reactivation Mode ends, and the transceiver is activated in User Mode.
Call In Progress Tone	This tone sounds from the transceiver if the transceiver becomes available for communications after the transceiver initiates the following calls. • Telephone Call • Individual Call (Message Trunked (Enhanced) • Individual Call Acknowledge Request • Group Call (Message Trunked (Enhanced)
Disconnect Indication Tone	This tone sounds from the transceiver if the transceiver terminates communications with the following calls. • Telephone Call • Individual Call (Message Trunked (Enhanced) • Individual Call Acknowledge Request • Group Call (Message Trunked (Enhanced)

3.1.3 Warning Tone

Warning Tone is a tone that sounds from the transceiver before or when the transceiver is disabled to transmit, when the transceiver becomes unable to transmit, or when the transceiver attempts to transmit while the transceiver is unable to transmit.

Table 3-4 Warning Tone

Function	Description
Warning Tone A	This tone sounds from the transceiver while an unprogrammed channel or GID is selected. This tone sounds from the transceiver until the **PTT** switch is released if the transmission is terminated by the Time-out Timer or the transceiver cannot transmit. This tone sounds from the transceiver until the **PTT** switch is released while Busy Channel Lockout is activated in a Conventional Group.
Warning Tone B	This tone sounds from the transceiver when the VOX transmission is terminated by Time-out Timer.
Warning Tone C	This tone sounds from the transceiver when the automatic transmission is terminated by Time-out Timer.
Battery Warning Tone (Portable only)	This tone sounds from the transceiver when the Battery voltage level drops to the adjusted reduced-voltage level.
TOT Pre-alert Tone	This tone sounds from the transceiver when the transmit inhibit period configured in the Time-out Timer is about to expire.
PLL Unlock Tone	This tone sounds from the transceiver when PLL is unlocked.
Busy Tone	This tone sounds from the transceiver if there is no available repeater in an LTR Trunking system.
Busy Tone 2	This tone sounds from the transceiver if the transceiver cannot send data to a Conventional Group since the channel is busy. In an NXDN Trunking system, this tone sounds from the transceiver when the transceiver receives a response message from the system to notify that the receiving transceiver is busy.
Timed Power-off Pre-alert Tone A (Mobile only)	This tone sounds from the transceiver 1 minute before the time preconfigured for Timed Power-off.
Timed Power-off Pre-alert Tone B (Mobile only)	This tone sounds from the transceiver 10 seconds before the time preconfigured for Timed Power-off.
Timed Power-off Pre-alert Tone C (Mobile only)	This tone sounds from the transceiver 2 seconds before the time preconfigured for Timed Power-off.
Delay Tone	This tone sounds from the transceiver between the 3rd and 6th attempts to access a repeater in order to notify a user that the connection to the repeater has been delayed if the transceiver attempts to access a repeater by a user pressing the **PTT** switch in an LTR Trunking system.
Intercept Tone	This tone sounds from the transceiver when the transceiver accesses a repeater by a user pressing the **PTT** switch and fails to connect to the repeater in an LTR Trunking system.
Intercept Tone 2	This tone sounds from the transceiver when the transceiver fails to connect to the repeater during an automatic transmission.
Deny Tone	This tone sounds from the transceiver if the transceiver cannot connect to an available RIC repeater within 60 seconds by using Auto Telephone in an LTR Trunking system.
System Search Tone	This tone sounds from the transceiver when the transceiver initiates System Search and changes the system in an LTR Trunking system.

Function	Description
System Search End Tone	This tone sounds from the transceiver if there is no repeater which can connect by using System Search in an LTR Trunking system.
Call Queue Tone	This tone sounds from the transceiver when the transceiver receives a response message from the system that indicates a queued state in an NXDN Trunking system.
System Busy Tone	This tone sounds from the transceiver when the transceiver receives a response message from the system that notifies of no traffic channel is available in an NXDN Trunking system.
Call Invalid Tone	This tone sounds from the transceiver when the transceiver receives from the system a response message, such as a service disabled state, in an NXDN Trunking system.
No Reply Tone	In an NXDN Trunking system, this tone sounds from the transceiver when the transceiver receives a message from the system to notify that the system has received no response from the receiving transceiver.
Call Fail Tone	This tone sounds from the transceiver when the transceiver receives no message from the system in an NXDN Trunking system.
Lone Worker Tone	This tone sounds from the transceiver when the amount of time configured for Lone Worker Interval elapses after the transceiver enters Lone Worker Mode.
Group-registration Invalid Tone	This tone sounds at intervals of 30 seconds from the transceiver upon receipt of a response message from the system indicating a failure in the Group ID registration.
Call Processing Tone	**NXDN Conventional system:** This tone sounds from the transceiver for the length of time from when the transceiver initiates an Individual Call Acknowledge Request by pressing the **PTT** switch until the call request is established. **NXDN Trunking system:** This tone sounds from the transceiver for the length of time from when the transceiver initiates an Individual Call or a Group Call by pressing the **PTT** switch until the call request is established.
Network Failure Tone A	In an NXDN Trunking system, this tone sounds at 5-s intervals from the transceiver while the transceiver is in Network Failure Mode.
Network Failure Tone B	In an NXDN Trunking system, this tone sounds from the transceiver when the transceiver exits Network Failure Mode.
Man Down Pre-alert (Portable only)	This tone sounds from the transceiver when the amount of time configured for Man-down Pre-alert elapses after the Man-down Detection function detects that the transceiver is tilted.
Stationary Pre-alert Tone (Portable only)	This tone sounds from the transceiver when the amount of time configured for Stationary Pre-alert elapses after the Stationary Detection function detects that the transceiver remains stationary.
Motion Pre-alert Tone (Portable only)	This tone sounds from the transceiver when the amount of time configured for Motion Pre-alert elapses after the Motion Detection function detects the vigorous movement of the transceiver.
System Select Tone	This tone sounds from the transceiver when an available system is found and registration succeeded.
Advanced GPS Report Error Tone	In an NXDN Trunking system, this tone sounds from the transceiver at 30 sec intervals when the channel for GPS data transmission cannot be used.

3.1.4 Locator Tone

Locator Tone sounds from the transceiver at the beginning and end of automatic transmissions in Emergency Mode.

Table 3-5 Locator Tone

Function	Description
Emergency Locator Tone	This tone sounds from the transceiver before and after automatic transmissions in Emergency Mode.

3.1.5 Sidetone

Sidetone sounds from the transceiver when the transceiver can communicate or the transceiver completes a transmission.

Table 3-6 Sidetone

Function	Description
Proceed Tone	This tone sounds from the transceiver when the transceiver completes a connection to a repeater by a user pressing the **PTT** switch in an LTR Trunking system or NXDN Trunking system. In a Conventional Group, this tone can be used to prevent missing the beginning of audio to be transmitted. This tone can be used coupled with Proceed Tone Delay Time.
VOX Proceed Tone (Portable only)	This tone sounds from the transceiver when the transceiver transmits while VOX is activated.
PTT ID Sidetone	This tone sounds from the transceiver when the transceiver transmits a FleetSync PTT ID.

3.1.6 Volume Level Tone

Volume Level Tone sounds from the transceiver when the volume level is changed.

Table 3-7 Volume Level Tone

Function	Description
Fixed Volume Key Tone	This tone sounds from the transceiver when the volume level is changed by using the **Fixed Volume** key.
Volume Key Tone (Mobile only)	This tone sounds from the transceiver when the volume level is changed by pressing the **Volume Up** or **Volume Down** key.

3.1.7 Alert Tone

Alert Tone sounds from the transceiver when the transceiver receives a call by the Optional Signaling or Status Message.

Table 3-8 Alert Tone

Function	Description
Special Alert Tone	This tone sounds from the transceiver when the transceiver receives a call by the Optional Signaling or Status Message. A maximum of 8 types of tones can be arbitrarily configured or changed.

3.2 Minimum Volume

■ Portable

For Portable, Minimum Volume can be used to retain the minimum volume level even if the Volume control is turned to its lowest level.

The remaining volume of audio prevents the user from failing to hear the received audio even if the Volume control has been fully turned down erroneously. The volume level remains at the same audio level at the fully turned down position as the Minimum Volume. If no Minimum Volume is configured, turning the volume level fully down will result in the audio volume being 0, hence received audio will not be audible.

■ Mobile

For Mobile, how the Minimum Volume will function varies depending on the configuration for Minimum Volume Type.

- **If “Preset” is configured for Minimum Volume Type:**

  Minimum Volume enables the volume level configured for Minimum Volume to be applied when the transceiver is turned ON again after the volume level was fully turned down and the transceiver was turned OFF.

- **If “Lowest Limit” is configured for Minimum Volume Type:**

  Minimum Volume can be used to maintain an audible volume level even if the volume level is turned down.

  The resulting audio volume prevents the user from failing to hear received audio even if the volume level is erroneously turned down fully. Turning up the volume causes the volume level to be increased from the audio level configured for Volume level. If no Minimum Volume is configured, turning the volume level fully down will result in the audio being inaudible.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Minimum Volume (Edit > Optional Features > Optional Features 1 > Common Page 2 > Audio Volume)
- Configuring the Minimum Volume Type (Edit > Optional Features > Optional Features 1 > Common Page 2 > Audio Volume)

3.3 Maximum Volume (Portable Only)

Maximum Volume can be used to limit the volume level from exceeding the configured volume level even if the Volume control is turned up.

This prevents a user from discomfort caused by an excessive volume level when wearing a headset.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Maximum Volume (Edit > Optional Features > Optional Features 1 > Common Page 2 > Audio Volume)

3.4 Tone Volume Offset

Tone Volume Offset can be used to adjust how much the standard tone volume level can be increased or decreased from the fixed volume position. This function can be used to adjust the volume level of a tone depending on the situation.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Tone Volume Offset (Edit > Optional Features > Optional Features 1 > Common Page 2 > Tone Volume)

3.5 Tone Volume

Tone Volume can be used to adjust the volume level of various tones.

This function can be used to maintain the volume level of the tones at a constant level depending on the situation or mute tones.

Tone Volume for the following tones can be configured by using KPG-141D/ KPG-141DN.

- Power-on Tone
- Control Tone
- Warning Tone
- Alert Tone
- Sidetone
- Locator Tone

Following are the types of tone volume that can be configured.

Table 3-9 Available Tone Volume

Tone Volume	Description
Current	The Tone Volume varies in conjunction with the current volume level.
1 to 31	The tone sounds from the transceiver with a fixed tone volume. Higher values result in greater volume.
Off	The tone does not sound from the transceiver.
Selectable	The tone volume varies in conjunction with the **Fixed Volume** key. (Refer to: 3.6 Selectable Tone Level on page 24)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Tone Volume of each tone (Edit > Optional Features > Optional Features 1 > Common Page 2 > Tone Volume)

3.6 Selectable Tone Level

Selectable Tone Level can be used to change the Tone Volume by using a **PF** key.

Pressing the **Fixed Volume** key causes the volume level of tones to be changed to Low Volume Level (Fixed Volume) or High Volume Level (Fixed Volume) configured using KPG-141D/ KPG-141DN. (Refer to: 7 KEY ASSIGNMENT on page 84)

■ Operating the Transceiver

1. Press the **Fixed Volume** key.

   The tone volume varies in the following order: Low Volume Level (Fixed Volume) → High Volume Level (Fixed Volume) → Off → Low Volume Level (Fixed Volume) ....

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Low Volume Level (Fixed Volume) and High Volume Level (Fixed Volume) (Edit > Optional Features > Optional Features 1 > Common Page 2 > Tone Volume)
- Assigning functions to the PF keys (Edit > Key Assignment)

3.7 Alert Tone Pattern

Alert Tone Pattern is the alert tone pattern when receiving a call with the optional signaling. An Alert Tone that is suitable for a user's environment can be selected.

Alert Tone Pattern can be used to select an Alert Tone from 8 patterns of Alert Tones. An Alert Tone pattern consists of 16 tones.

Alert Tone Pattern can be configured by using KPG-141D/ KPG-141DN. The following table shows the configuration items for the Autodial List.

Table 3-10 Alert Tone Pattern

Alert Tone Pattern	Description
Frequency	The tone frequency can be configured. A frequency between 400 Hz and 2500 Hz can be configured in steps of 10 Hz. Gap can be configured if "No Tone" is selected.
Length	The tone length can be configured. A tone length between 10 ms and 2500 ms can be configured in steps of 10 ms. No tone sounds if 0 ms is configured.
Cycle	This function can be used to configure the number of times for the Alert Tone that sounds from the transceiver. A number from 1 to 255 can be configured. The Alert Tone sounds from the transceiver until it is manually stopped if "Infinite" is configured. If it is intended for the Alert Tone to sound multiple times, the Alert Tone does not sound from the transceiver while the transceiver unmutes the speaker. Or, if the matching state of Optional Signaling is reset, Alert Tone will also be disabled.
Interval	This function can be used to configure the timing to repeat the Alert Tone that sounds from the transceiver. A time between 0 and 255 seconds can be configured in steps of 1 second.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone Pattern (Edit > Special Alert Tone)

3.8 PTT Release Tone

PTT Release Tone can be used to notify the receiving party by audible tone that the communication has completed by releasing the **PTT** switch. By using this function, the receiving party can know by an audible tone that the call has ended; therefore, the receiving party easily recognizes the timing for transmitting next.

The transceiver transmits the PTT Release Tone and then finishes the actual transmission when the call is ended by releasing the **PTT** switch.

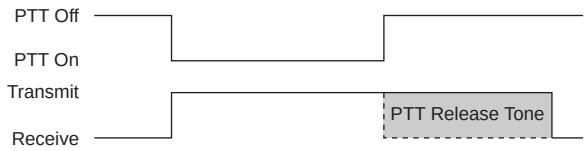


Figure 3-1 PTT Release Tone

- **Conventional Group/ NXDN Trunking System**

  This function can be enabled or disabled for each transceiver.

- **LTR Trunking System**

  This function can be enabled or disabled for each case when transmitting with the Dispatch ID or when transmitting with the Telephone ID. This can be configured individually in order to avoid double beeping when using a Telephone ID, since some repeaters have a similar function to Telephone IDs.

Note: In the case that EOT is configured for the DTMF, a PTT Release Tone is sent after sending the EOT. In the case that EOT is configured for FleetSync, a PTT Release Tone is sent after sending the EOT.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT Release Tone (Conventional Group) (Edit > Optional Features > Optional Features 2 > Conventional)
- Configuring the PTT Release Tone (Dispatch/ Telephone) (Edit > Optional Features > Optional Features 2 > LTR > PTT Release Tone)
- Configuring the PTT Release Tone (NXDN Trunking System) (Edit > NXDN > NXDN 1 > Trunking 1)

3.9 PTT Proceed Tone

PTT Proceed Tone is a tone that sounds from the transceiver when the transceiver becomes available by a user pressing the **PTT** switch.

In an LTR Trunking system and NXDN Trunking system, a user needs to start speaking when the repeater becomes available by a user pressing the **PTT** switch. Since this duration is not always the same, it is difficult for a user to know when to start speaking after pressing the **PTT** switch. If a user starts speaking at the time when the PTT Proceed Tone sounds from the transceiver in this situation, this allows communications to start without losing the first part of the call.

The PTT Proceed Tone sounds from the transceiver if the transceiver can modulate the audio signals after starting transmission, and the amount of time configured for Proceed Tone Delay Time elapses.

PTT Proceed Tone can be used in a Conventional Group.

Note:

- The transceiver does not transmit audio signals until the PTT Proceed Tone stops sounding even if the transceiver starts transmitting by a user pressing the **PTT** switch.
- If the PTT ID is configured for the channel while a DTMF, 2-tone, FleetSync, or MDC-1200 signaling is transmitted, the configuration for PTT Proceed Tone will be disabled. In this case, the configurations in Sidetone (DTMF/ 2-tone) and PTT ID Sidetone (FleetSync/ MDC-1200) is enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to sound a PTT Proceed Tone (Conventional Group) (Edit > Optional Features > Optional Features 2 > Conventional > PTT Proceed Tone (Conventional))
- Configuring whether to sound a PTT Proceed Tone (LTR Trunking System) (Edit > Optional Features > Optional Features 2 > LTR > PTT Proceed Tone (LTR))
- Configuring whether to sound a PTT Proceed Tone (NXDN Trunking System) (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Proceed Tone Delay Time (Conventional Group) (Edit > Optional Features > Optional Features 2 > Conventional > PTT Proceed Tone (Conventional))
- Configuring the Proceed Tone Delay Time (LTR Trunking System) (Edit > Optional Features > Optional Features 2 > LTR > PTT Proceed Tone (LTR))

3.10 Public Address (Mobile Only)

Public Address enables the transceiver to be used in place of a megaphone.

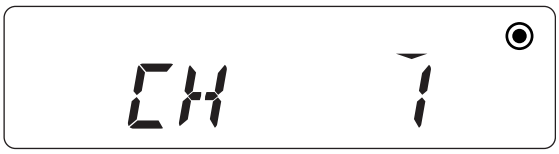
Pressing and holding the **PTT** switch while Public Address is enabled causes the audio spoken into the microphone to emit from the external speaker for Public Address that is connected to the rear panel of the transceiver.

■ Operating the Transceiver

● Enabling the Public Address

1. Press the **Public Address** key while Public Address is disabled.

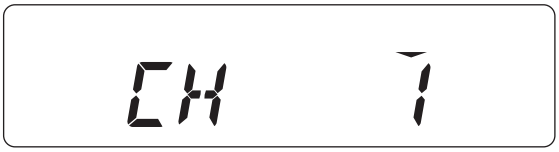
   The "◉" appears and then Public Address will be enabled.



● Disabling the Public Address

1. Press the **Public Address** key while Public Address is enabled.

   The "◉" disappears and then Public Address will be disabled.



Note:

- ♦ Public Address will automatically be disabled if the channel or GID is changed.
- ♦ To use Public Address, an external speaker for Public Address is required.
- ♦ In an NXDN Trunking system (Message Trunked (Enhanced)), Public Address will be disabled upon the reception of a call initiated by using a traffic channel such as an Individual Call, Group Call, and Broadcast Group Call. On the other hand, even if the transceiver receives a call initiated by using only a control channel such as a Status Call and Short Data Call, Public Address will not be disabled.
- ♦ Public Address and External Speaker cannot be used at the same time. If the **Public Address** key is pressed with External Speaker enabled, a Key-entry Error Tone sounds from the transceiver, and Public Address will not be activated. If the **External Speaker** key is pressed with Public Address enabled, a Key-entry Error Tone sounds from the transceiver, and External Speaker will not be activated.(Refer to: 4.14 External Speaker (Mobile Only) on page 36)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

4.1 Zone Description

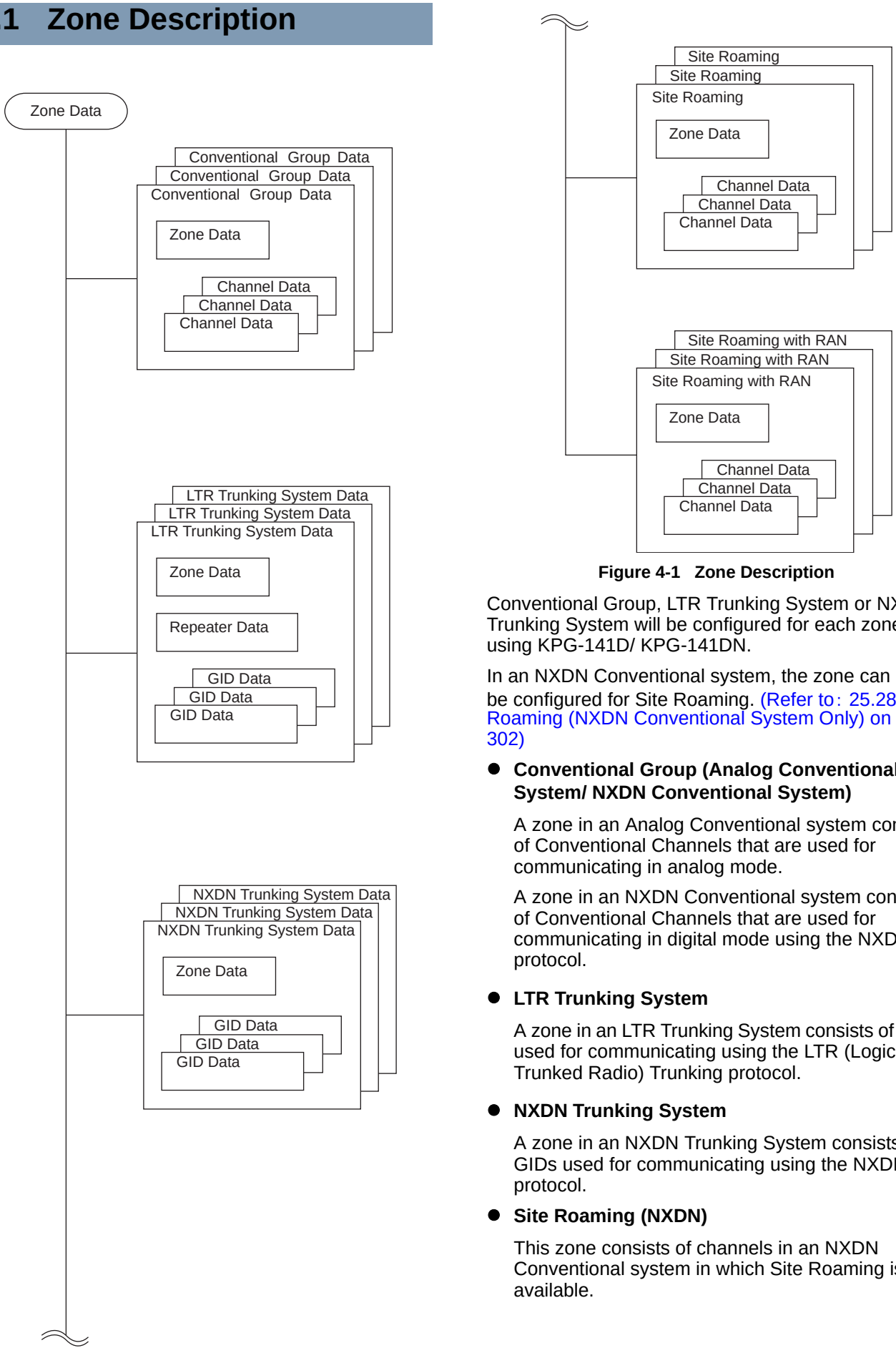


Figure 4-1 Zone Description

Conventional Group, LTR Trunking System or NXDN Trunking System will be configured for each zone using KPG-141D/ KPG-141DN.

In an NXDN Conventional system, the zone can also be configured for Site Roaming. (Refer to: 25.28 Site Roaming (NXDN Conventional System Only) on page 302)

- **Conventional Group (Analog Conventional System/ NXDN Conventional System)**

  A zone in an Analog Conventional system consists of Conventional Channels that are used for communicating in analog mode.

  A zone in an NXDN Conventional system consists of Conventional Channels that are used for communicating in digital mode using the NXDN protocol.

- **LTR Trunking System**

  A zone in an LTR Trunking System consists of GIDs used for communicating using the LTR (Logic Trunked Radio) Trunking protocol.

- **NXDN Trunking System**

  A zone in an NXDN Trunking System consists of GIDs used for communicating using the NXDN protocol.

- **Site Roaming (NXDN)**

  This zone consists of channels in an NXDN Conventional system in which Site Roaming is available.

- **Site Roaming with RAN (NXDN)**

  This zone consists of channels in an NXDN Conventional system in which Site Roaming is available.

For Portable (with LCD/ with 16-key), Portable (with LCD/ with 4-key), and Mobile, a maximum of 128 zone data for Conventional Group, LTR Trunking System, NXDN Trunking System, Site Roaming and Site Roaming with RAN in total can be configured for the transceiver. A maximum of 250 channels or GID data per zone can be configured for the transceiver. A maximum of 260 channels or GID data can be configured for a transceiver in total.

For Portable (without LCD/ without Key), a maximum of 4 zone data for Conventional Group, LTR Trunking System, NXDN Trunking System, Site Roaming and Site Roaming with RAN in total can be configured for the transceiver.
A maximum of 16 channels or GID data per zone can be configured for the transceiver. A maximum of 64 channels or GID data can be configured for a transceiver in total.

Note:

- The number of zones that can be configured varies depending on the number of channels or GIDs and repeaters.
- The number of channels or GIDs that can be configured for each zone varies depending on the number of zones and repeaters.

4.2 Transmit/ Receive Frequencies

Transmit/ Receive Frequencies is a pair of frequencies used for transmitting and receiving.

In a Conventional Group, transmit and receive frequencies can be configured for each channel.

In an LTR Trunking system, transmit and receive frequencies can be configured for each repeater consisting of an LTR Trunking system.

In an NXDN Trunking system, transmit and receive frequencies to be used for communication with a repeater consisting of an NXDN Trunking system can be configured for Frequency Table in NXDN Trunking system.

Table 4-1 Transmit/ Receive Frequency Range and Step Size

Model	Transmit/ Receive Frequencies	
	Range	Step
NX-220	136 MHz to 174 MHz	2.5 kHz, 3.125 kHz
NX-320	450 MHz to 520 MHz 400 MHz to 470 MHz	3.125 kHz, 5 kHz
NX-720HG	136 MHz to 174 MHz	2.5 kHz, 3.125 kHz
NX-820HG	450 MHz to 520 MHz 400 MHz to 470 MHz	3.125 kHz, 5 kHz

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the transmit and receive frequencies for a channel (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the transmit and receive frequencies for a Home Repeater (Edit > Zone Information (LTR Trunking System) > Repeater Information > Repeater Edit)
- Configuring the transmit and receive frequencies for Frequency Table in NXDN Trunking system (Edit > Network > Frequency Table)

4.3 Transmit Power

Transmit Power is the transmission power of the transceiver.

For Portable, a user can use the transceiver by setting the transmission power to high power or low power.

For Mobile, a user can use the transceiver by setting the transmission power to high power, mid power, or low power.

If the transceiver is located near repeaters or target party, a user can set the transmission power to be lower in order to avoid causing unnecessary radio interference to other transceivers. Also, for Portable, the battery operating time of the transceiver is extended by reducing power consumption.

Table 4-2 Transmit Power (Portable)

Model	Transmit Power	
	Low	High
NX-220	1 W	5 W
NX-320		

Table 4-3 Transmit Power (Mobile)

Model	Transmit Power		
	Low	Medium	High
NX-720HG	5 W	30 W	50 W
NX-820HG	5 W	30 W	45 W

■ Portable

In a Conventional Group and LTR Trunking system, either “High” or “Low” can be configured for Transmit Power for each channel or GID.

In an NXDN Trunking system, either “High” or “Low” can be configured for Transmit Power for each zone.

If “Low” is configured for Transmit Power of the selected channel or GID, the “L” icon appears in the icon display area of the transceiver.

If “High” is configured for Transmit Power of the selected channel or GID, the transmit power can be changed to low power by a press of the **Low Transmit Power** key. The transmit power of a channel or GID for which high power is preconfigured can be changed to low power according to the usage environment.

Note: The **Low Transmit Power** key cannot be used on a channel or GID where “Low” is configured for Transmit Power.

■ Mobile

In a Conventional Group and LTR Trunking system, either “High”, “Medium”, or “Low” can be configured for Transmit Power for each channel or GID.

In an NXDN Trunking system, either “High”, “Medium”, or “Low” can be configured for Transmit Power for each zone.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Power (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Transmit Power (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Transmit Power (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit)

4.4 Channel Spacing

Channel Spacing is the channel spacing used by the transceiver to transmit and receive.

Channel spacing is the spacing of frequencies between adjacent channels.

The channel spacing used by the transceiver to transmit and receive on an analog channel and on an NXDN digital channel are configured respectively.

■ Channel Spacing (Analog)

Following are the channel spacing to be used by a transceiver for transmission and reception on an analog channel.

Table 4-4 Channel Spacing (Analog)

Channel Spacing	Bandwidth
Wide	25 kHz
Narrow	12.5 kHz

The range differs as follows depending on the programming software type (KPG-141D or KPG-141DN).

Table 4-5 Channel Spacing (Analog) (Range)

FPU	Channel Spacing
KPG-141D	Wide, Narrow
KPG-141DN	Narrow

■ Channel Spacing (NXDN)

Following are the channel spacing to be used by a transceiver for transmission and reception on an NXDN digital channel.

Table 4-6 Channel Spacing (NXDN)

Channel Spacing	Bandwidth
Narrow	12.5 kHz
Very Narrow	6.25 kHz

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the channel spacing (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the channel spacing (Edit > Zone Information (LTR Trunking System) > Zone Edit)

4.5 Keypad Operation

The keypad operating method can be selected according to the user's purpose.

Functions can be assigned to the keypad by using KPG-141D/ KPG-141DN. Following is the list of the functions that can be assigned to the transceiver for Keypad Operation.

Table 4-7 Keypad Operation

Configuration	Description
None	Pressing a key on the keypad of the transceiver causes the Key-entry Error Tone to sound, but it has no effect to the transceiver.
Channel Entry	Pressing a key on the keypad can directly specify a channel. (Refer to: 5.7 Channel Entry on page 41)
Group ID/ Channel Entry	If a zone for any system other than NXDN Trunking system is selected, a channel number can be directly specified by using the [0] to [9] keys on the keypad. (Refer to: 5.7 Channel Entry on page 41) If a zone for NXDN Trunking system is selected, a Group ID for the NXDN Trunking system can be directly specified by using the [0] to [9] keys on the keypad. (Refer to: 5.8 Group ID Entry (NXDN Trunking System Only) on page 42)
OST	Pressing a key on the keypad can directly select the OST from the OST List 1 to OST List 40. (Refer to: 18 OPERATOR SELECTABLE TONE on page 194)
Autodial	Pressing a key on the keypad can select and send a DTMF code configured for the Autodial List. (Refer to: 14 DTMF on page 121)
Keypad Auto PTT	Every time a key on the keypad is pressed, the DTMF code is instantly sent. (Refer to: 14 DTMF on page 121)
Selcall (FleetSync)	Pressing the **[0]** to **[9]** keys on the keypad enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID registered in the ID List or directly entering a Fleet/ ID. (Refer to FUNC 16.2 Selective Call.) (Refer to: 16.2 Selective Call on page 143)
Status (FleetSync/ NXDN)	Pressing the **[0]** to **[9]** keys on the keypad enters Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured in the FleetSync Status List or NXDN Status List, or directly entering a Status number. (Refer to: 16.3 Status Message on page 148, 25.11 Status Call on page 263)

Configuration	Description
SDM (FleetSync/ NXDN)	Pressing the **[0]** to **[9]** keys on the keypad enters Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. (Refer to: 16.4 Short Message on page 158, 25.12 Short Data Call on page 271)
Selcall + Status (FleetSync)	Pressing the **[0]** to **[9]** keys on the keypad enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID registered in the ID List or directly entering a Fleet/ ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Selcall Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for Status List or directly entering a Status number. (Refer to: 16.2 Selective Call on page 143, 16.3 Status Message on page 148)
Selcall + SDM (FleetSync)	Pressing the **[0]** to **[9]** keys on the keypad enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID registered in the ID List or directly entering a Fleet/ ID. Then, pressing the **[S]** key or the [*] key while the transceiver is in Selcall Mode allows the transceiver to enter Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. (Refer to: 16.2 Selective Call on page 143, 16.4 Short Message on page 158)
Individual (NXDN)*1	Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Individual Call Mode in an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, a call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID.
Individual + Status (NXDN)*1	Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Individual Call Mode in an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, a call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Individual Call Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for NXDN Status List or directly entering a Status number.

Configuration	Description
Individual + SDM (NXDN)*1	Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Individual Call Mode in an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, a call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Individual Call Mode allows the transceiver to enter Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message.
Group (NXDN)*1	Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Group Call Mode in an NXDN Conventional system. In Group Call Mode, a Group Call can be initiated by a user selecting a Group ID registered in the Group ID List. **Note:** In an NXDN Trunking system, Group ID List can be viewed, but a Group Call cannot be initiated by selecting a Group ID.
Group + Status (NXDN)*1	**In an NXDN Conventional system:** Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Group Call Mode in an NXDN Conventional system. In Group Call Mode, a call can be initiated by a user selecting a Group ID registered in the Group ID List. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Group Call Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for NXDN Status List or directly entering a Status number. **In an NXDN Trunking system:** Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Status Mode in an NXDN Trunking system. In Status Mode, a Status Message can be sent by a user selecting a status configured for NXDN Status List or directly entering a Status number.
Group + SDM (NXDN)*1	**In an NXDN Conventional system:** Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Group Call Mode in an NXDN Conventional system. In Group Call Mode, a call can be initiated by a user selecting a Group ID registered in the Group ID List. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Group Call Mode allows the transceiver to enter Short Message. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. **In an NXDN Trunking system:** Pressing the **[0]** to **[9]** keys on the keypad allows the transceiver to enter Short Message Mode in an NXDN Trunking system. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message.

*1 Refer to the following sections for various calls for NXDN.

25.3 Individual Call (Transmission Trunked) (NXDN Trunking System Only) on page 230
25.4 Group Call (Transmission Trunked) (NXDN Trunking System Only) on page 236
25.5 Individual Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) on page 239
25.6 Group Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) on page 244
25.7 Individual Call (NXDN Conventional System) on page 246
25.8 Individual Call (Individual Call Acknowledge Request) (NXDN Conventional System Only) on page 252
25.9 Group Call (NXDN Conventional System) on page 257
25.11 Status Call on page 263
25.12 Short Data Call on page 271

Note:

- To directly enter a Fleet/ ID or status in an Analog Conventional system, Manual Dialing must be enabled using KPG-141D/ KPG-141DN. (Refer to: 16.8.7 Manual Dialing on page 172)
- To directly enter a Unit ID or status in an NXDN Conventional system or NXDN Trunking system, Manual Dialing must be enabled using KPG-141D/ KPG-141DN. (Refer to: 25.35.6 Manual Dialing on page 329)
- This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Keypad Operation (Edit > Key Assignment > General)

4.6 Battery Saver

Battery Saver allows the transceiver to reduce power consumption by receiving intermittently.

The transceiver receives intermittently in the following conditions.

- There is no carrier and no key is pressed for 5 seconds or more.
- There is a carrier but the QT tone frequency, DQT code, or RAN code does not match that preconfigured for the transceiver and no key is pressed for 5 seconds or more.

Extension of the intervals for intermittent reception may reduce the battery consumption; however, interruptions to introductory parts of received audio may occur. To use Battery Saver effectively, there are systemic issues to consider, for instance, the duration from when the transceiver starts transmitting until the transceiver starts sending audio.

Intervals for intermittent reception are as follows.

Table 4-8 Duration of the Battery Saver

Save	No Carrier	Inconsistent Status of QT tone frequency, DQT code or RAN code
Off	Off	Off
Short	200 ms	400 ms
Medium	400 ms	800 ms
Long	800 ms	1600 ms

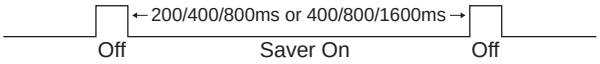


Figure 4-2 Battery Saver

Note:

- Battery Saver is activated only in an Analog Conventional system and NXDN Conventional system.
- Battery Saver is not activated while the transceiver is scanning.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Battery Saver (Edit > Optional Features > Optional Features 1 > Common Page 3 > Battery)

4.7 Mode Reset Timer

With the Mode Reset Timer, the length of time for the timer can be configured for canceling the standby status for further key entry in Function Mode or key function activation status for 2nd Function. By using this function, a user does not need to cancel the Function Mode manually. It also helps a user by canceling the Function Mode automatically so as not to remain in Function Mode for too long a time.

The transceiver has some special Function Modes. When the transceiver enters one of these modes, a preprogrammed display appears on the main display and sub-display and the Mode Reset Timer starts counting down the time. If no key is pressed before the Mode Reset Timer expires, the transceiver restores to the previous mode.

If a **Function** key is pressed, the transceiver waits for further entry of a key configured for 2nd Function and then Mode Reset Timer starts counting down. If no key is pressed before the Mode Reset Timer expires, the transceiver cancels waiting for the 2nd Function key entry and restores to the previous mode. Mode Reset Timer can be extended by key operation.

Mode Reset Timer is used for the following Function Modes.

Table 4-9 Objective Function Modes for Mode Reset Timer

2-tone Mode
Autodial Mode
Autodial Programming Mode
Channel Entry Mode
GPS Position Display Mode
Group Call Mode
Group ID Entry Mode
Individual Call Mode
Maintenance Display Mode
OST List Mode
Priority-channel Select Mode
Scrambler/Encryption Code Mode
Selcall Mode
Short Message Mode
Site Select Mode
Squelch Level Mode
Stack Mode
Status Mode
Transceiver Password Mode*1
VOX Gain Level Mode

*1 “PASSWORD” reappears on the main display when the duration configured for Mode Reset Timer elapses.

Note: For Portable (without LCD/ without Key), “Off” is always configured for Mode Reset Timer.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Mode Reset Timer (Edit > Optional Features > Optional Features 1 > Common Page 1)

4.8 Beat Shift

Beat Shift can be used to eliminate the influences of heterodyning in the transceiver caused by internal oscillators.

Due to the transceiver’s circuit configuration, the harmonics of the oscillators may interfere with reception depending on the receive frequency. The interference to reception can be avoided by slightly shifting the frequency of the oscillator.

For a Conventional Group, Site Roaming (NXDN), and Site Roaming with RAN (NXDN), Beat Shift can be configured for each channel.

In an LTR Trunking system, Beat Shift can be configured in each channel (frequency) of a repeater consisting of an LTR Trunking system.

For an NXDN Trunking system, Beat Shift can be configured for each channel used in an NXDN Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Beat Shift (Conventional Group, Site Roaming (NXDN), Site Roaming with RAN (NXDN)) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Beat Shift (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > Repeater Information > Repeater Edit)
- Configuring the Beat Shift (NXDN Trunking System) to be enabled or disabled (Edit > Network > Frequency Table > Frequency Edit)
- Configuring DFA Channel Beat Shift (Edit > Network > DFA Channel Beat Shift.)

4.9 Compander

Compander is a compound term made from “COMpressor” and “exPANDer”, and is a function designed to improve sound quality.

This function is used to improve the S/N ratio of voice communications by compressing the audio at the transmitting end of the communication path and expanding the audio at the receiving end of the path.

The transmitting party and the receiving party must have the same configuration to use this function.

Note: This function can be used only in an Analog Conventional system and LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Compander (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Compander (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)

4.10 Mic Sense

Mic Sense can be used to adjust the microphone sensitivity.

In Mic Sense, the microphone sensitivity can be configured within the following range.

6dB, 4dB, 2dB, 0dB, -2dB, -4dB, -6dB, -8dB, -10dB, -12dB, -14dB, -16dB, -18dB, -20dB

The appropriate level of microphone sensitivity for normal operation is 0 dB. Based on this level, the parameter of the microphone sensitivity can be configured.

Note:

- For Portable, microphone sensitivity for internal microphone and external microphone can be independently configured by using KPG-141D/ KPG-141DN.
- For Mobile, microphone sensitivity for MI2 line can be configured by using KPG-141D/ KPG-141DN when the transceiver transmits using External PTT (Voice), External PTT (Data), or Data PTT of the AUX Input port.
- If lower level than “0 dB” is configured for Mic Sense, the amplitude limit level is also lowered simultaneously; hence, Modulation Limiting (minimum) in Analog FM will be lowered.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Mic Sense (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Configuring the External Mic Sense (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Configuring the Mic Sense (AUX Input) (Edit > Extended Function > AUX > AUX Input)

4.11 Power Switch Status Memory (Mobile Only)

Power Switch Status Memory can be used to store the **Power** switch status (ON or OFF) when the power source is disconnected from the transceiver.

Whether to turn the transceiver ON when the power source is connected to the transceiver varies as below depending on the configuration for Power Switch Status Memory.

Table 4-10 Power Switch Status Memory

Configuration	Description
Enabled	Enables the capability to retain the ON- or OFF-state of the **Power** switch. Disconnecting the power source while the transceiver **Power** switch is in the ON state and then reconnecting the power source causes the transceiver to be connected to the power source and starts up. Disconnecting the power source while the transceiver **Power** switch if in the OFF state and then reconnecting the power source causes the transceiver to remain the power-OFF state. In this case, the transceiver does not start up unless the **Power** switch is pressed.
Disabled	Disables the capability to retain the ON- or OFF-state of the **Power** switch. Regardless of the previous ON- or OFF-state of the **Power** switch, the transceiver power is turned ON by connecting the power source to the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power Switch Status Memory (Edit > Optional Features > Optional Features 1 > Common Page 1)

4.12 Mic PTT (Mobile Only)

Mic PTT is the **PTT** switch on the microphone such as KMC-35/ KMC-36. This switch can be used for normal conversation.

The following functions relevant to Mic PTT can be configured using PG-141D/ KPG-141DN:

Table 4-11 Mic PTT

Configuration	Description
Modulation Line	This function can be used to configure which modulation line to be enabled for the **PTT** switch. The following modulation lines are available. • **Mic Line** Whether to enable the audio line of the microphone that is connected to the microphone connector when the transceiver transmits by a user pressing the **PTT** switch can be configured. • **MI2 Line** Whether to enable the audio modulation line of the D-sub 15-pin connector of the transceiver when the transceiver transmits by a user pressing the **PTT** switch can be configured. • **DI Line** Whether to enable the data modulation line of the D-sub 15-pin connector of the transceiver when the transceiver transmits by a user pressing the **PTT** switch can be configured. However, DI Line will be disabled if the transceiver transmits on the following channel or GID. • A channel with “Mixed” configured for Channel Type and “NXDN” configured for Transmit Mode • A channel in an NXDN Conventional system • A GID in an NXDN Trunking system
With QT/DQT	Whether to superimpose the QT tone frequency or DQT code configured for channels in the Conventional Group when the transceiver transmits by using the **PTT** switch can be configured. Normally, the QT tone frequency or DQT code is configured to be multiplexed.
With STE	Whether to send the STE (Squelch Tail Eliminator) after sending the QT tone frequency or DQT code configured for a channel in a Conventional Group when the transceiver transmits by using the **PTT** switch can be configured. Normally, the transceiver is configured to send the STE.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Mic PTT (Edit > Extended Function > Modulation Line)

4.13 Voice Announcement

Voice Announcement can be used to inform a user by voice which zone number and channel or GID number have been selected when a zone and a channel or a GID are changed.

This function allows a user to easily change a zone and channel or GID using the audio guidance even if the transceiver is operated under the circumstances where the user cannot see the LCD.

With this function enabled, the newly selected zone number and channel number or GID number are announced by voice as follows when the transceiver is turned ON, when the zone is changed, or when one of the Direct CH/GID 1 to Direct CH/GID 5 keys is operated.

Conventional Group:

“Zone xxx, Channel yyy” (xxx represents a zone number and yyy represents a channel number.)

LTR Trunking System/ NXDN Trunking System:

“Zone xxx, Group yyy” (xxx represents a zone number and yyy represents a GID number.)

However, if only one zone is configured for the transceiver, only channel or GID number is announced by voice, such as “yyy” (yyy represents a channel or GID number).

If a channel or GID is changed, or if the **Home CH/GID** key is operated, the newly selected channel or GID number is announced by voice, such as “yyy” (yyy represents a channel or GID number).

Note:

- The audio data used for Voice Announcement can be written into the transceiver by using KPG-141D/ KPG-141DN.
- Available languages for Voice Announcement are as follows:
  English, Spanish, Chinese, French, Russian, German, Italian, and Dutch
- The audio for Voice Announcement sounds from the speaker of the transceiver. However, if an external speaker is connected to the transceiver, the audio sounds from the external speaker. For Mobile, if the external speaker (KES-5) is connected to the transceiver through KCT-60, the audio sounds from the internal speaker or the external speaker depending on the configuration for External Speaker. (Refer to: 4.14 External Speaker (Mobile Only) on page 36)
- The configuration for Control Tone is applied to the volume for Voice Announcement. Voice Announcement is not activated if “Off” is configured for Control Tone. (Refer to: 3.5 Tone Volume on page 23)
- Voice Announcement is not activated while the transceiver is in Emergency Mode.
- If a zone or a channel is changed by the scan function, Voice Announcement will not be activated.
- The received audio does not sound while the audio for Voice Announcement is sounding.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Voice Announcement to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Writing the audio data used for Voice Announcement into the transceiver (Tools > Write Announcement Data to the Transceiver)

4.14 External Speaker (Mobile Only)

External Speaker can be used to switch between the external speaker being connected to the transceiver and the internal speaker being installed in the transceiver.

External Speaker will be enabled or disabled by pressing the **External Speaker** key.

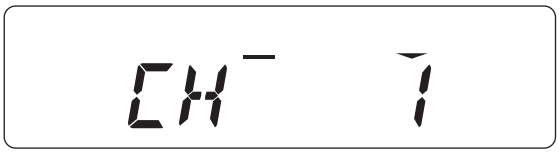
With External Speaker enabled, the audio sounds from the external speaker. With External Speaker disabled, the audio sounds from the internal speaker.

■ Operating the Transceiver

● **Enabling the external speaker**

1. Press the **External Speaker** key while External Speaker is disabled.

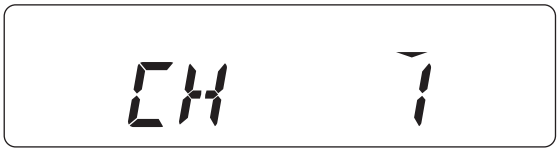
   External Speaker will be enabled, and a Key Beep A sounds from the external speaker. The "▬" icon appears at the same time.



● **Enabling the external speaker**

1. Press the **External Speaker** key while External Speaker is enabled.

   External Speaker will be disabled, and a Key Beep B sounds from the internal speaker. The "▬" icon disappears at the same time.



Note:

- The status of External Speaker, either enabled or disabled, is retained even after the transceiver is turned OFF.
- Switching between the external speaker and internal speaker is only available if the external speaker (KES-5) is connected to the transceiver through KCT-60.
- External Speaker and Public Address cannot be used at the same time. If the **External Speaker** key is pressed with Public Address enabled, a Key-entry Error Tone sounds from the transceiver, and External Speaker will not be activated. If the **Public Address** key is pressed with External Speaker enabled, a Key-entry Error Tone sounds from the transceiver, and Public Address will not be activated. (Refer to: 3.10 Public Address (Mobile Only) on page 26)
- If the transceiver enters Emergency Mode while External Speaker is enabled, a user cannot switch to the internal speaker.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

5.1 Turning the Transceiver ON/ OFF

5.1.1 Turning the Transceiver ON

For Portable, rotating the **Power** switch clockwise causes the transceiver to be turned ON.

For Mobile, pressing the **Power** switch causes the transceiver to be turned ON. Also, the transceiver can be turned ON by linking to the status of the Ignition Sense port of a vehicle. (Refer to: 30 IGNITION SENSE (MOBILE ONLY) on page 361)

■ Operating the Transceiver (Portable (without LCD/ without Key))

A Power-on Tone A sounds from the transceiver by rotating the **Power** switch clockwise and the transceiver will be turned ON.

If no data is written to the transceiver when the transceiver is turned ON, the LED lights orange and red alternately and a Warning Tone A continues to sound from the transceiver.

Note: If the firmware is not written to the transceiver properly, the LED lights orange, and then the transceiver will enter Firmware Programming Mode. In this case, write the firmware to the transceiver again.

■ Operating the Transceiver

- **If Data is written to the Transceiver and no Password is configured:**

1. Turn the transceiver ON.

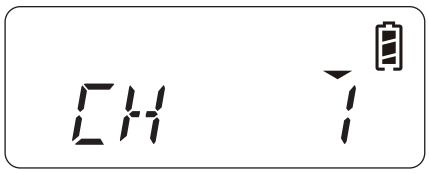
   A Power-on Tone A sounds from the transceiver and all segments on the LCD light for 500 ms.

   Power-on Text appears for 2 seconds if the Power-on Text is configured.(Refer to: 2.7.5 Power-on Text on page 14)

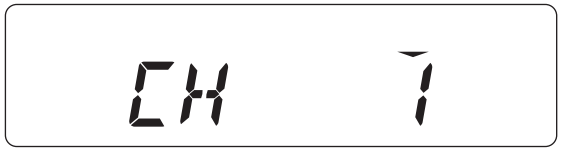
Portable

Mobile

Either the Channel Name, GID Name, Zone-channel Number or GID Number appears on the main display.(Refer to: 2.7.4 Display Format on page 13)



Portable



Mobile

- **If Data is written to the Transceiver and Password is configured:**

1. Turn the transceiver ON.

   A Power-on Tone A sounds from the transceiver and all segments on the LCD light for 500 ms.

   "PASSWORD" appears on the main display. (Refer to: 33.1 Transceiver Password on page 366)

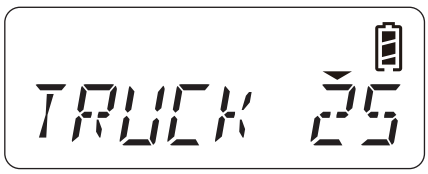
Portable

Mobile

2. Enter a password.

   A Password Authorization Tone sounds from the transceiver after the correct password has been entered, and then the password protection of the transceiver will be disabled.

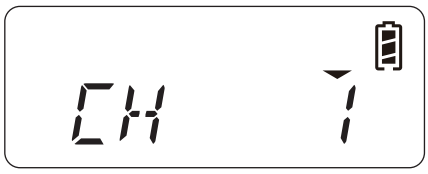
   Power-on Text appears for 2 seconds if the Power-on Text is configured. (Refer to: 2.7.5 Power-on Text on page 14)



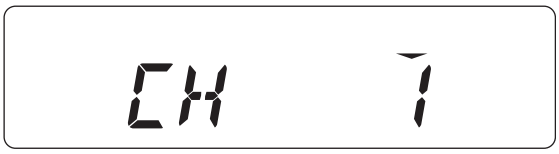
Portable

Mobile

Either the Channel Name, GID Name, Zone-channel Number or GID Number appears on the main display. (Refer to: 2.7.4 Display Format on page 13)



Portable

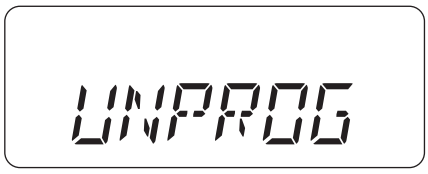


Mobile

- **If no Data is written to the Transceiver:**

  1. Turn the transceiver ON.

  The transceiver enters Unprogramming mode.



Portable

Mobile

Note: If the firmware is not written to the transceiver properly, the transceiver will enter Firmware Programming Mode. In this case, write the firmware to the transceiver again.

5.1.2 Turning the Transceiver OFF

For Portable, rotating the **Power** switch counterclockwise until it clicks turns the transceiver OFF.

For Mobile, pressing the **Power** switch while the transceiver is turned ON causes the transceiver to be turned OFF. Also, the transceiver can be turned OFF according to the status of the vehicle engine, either switched On or Off. (Refer to: 30 IGNITION SENSE (MOBILE ONLY) on page 361)

5.2 Adjusting the Volume Level

■ Portable

Rotating the **Volume** control clockwise increases the volume level from the speaker, and rotating the **Volume** control counterclockwise decreases the volume level from the speaker. (Refer to: 3 SOUND on page 18)

■ Mobile

Pressing the **Volume Up** key increases the volume level in steps of 1. Pressing the **Volume Down** key decreases the volume level in steps of 1.

If “Volume Up (Continuous)” or “Volume Down (Continuous)” is assigned to the **Volume Up** or **Volume Down** key, the volume level will be increased or decreased continuously every 100 ms by holding down the **Volume Up** or **Volume Down** key.

5.3 Using Function Keys

Pressing one of the function keys causes the function assigned to the corresponding function key to be activated. (Refer to: 7 KEY ASSIGNMENT on page 84)

5.4 Changing the Zone

Zone number can be changed by operating the **Selector** (Portable only) or **PF** keys. (Refer to: 7 KEY ASSIGNMENT on page 84)

■ Portable

- **If 16 Zone/Channel Selector is enabled and the Zone Select function is assigned to the Selector**

  The **Selector** can be used with the stopper installed. Rotating the **Selector** causes the transceiver to migrate to the zone having the same number specified by the **Selector**. Zones that can be selected are limited to zone 1 to zone 16.

  For Portable (without LCD/ without Key), zones that can be selected are limited to zone 1 to zone 4.

  If an unprogrammed zone is selected, "********" appears on the main display.

- **If 16 Zone/Channel Selector is disabled and the Zone Up/Down function is assigned to the Selector (Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key) only)**

  Rotating the **Selector** clockwise increases the zone number in steps of 1. Rotating the **Selector** counterclockwise decreases the zone number in steps of 1.

  If an unprogrammed zone is selected, the zone will be skipped.

- **Using the PF Keys**

  Pressing the **Zone Up** key increases the zone number in steps of 1. Pressing the **Zone Down** key decreases the zone number in steps of 1.

  If "Zone Up (Continuous)" or "Zone Down (Continuous)" is assigned to the **Zone Up** or **Zone Down** key, the zone number will be increased or decreased continuously every 200 ms by holding down the **Zone Up** or **Zone Down** key.

  If an unprogrammed zone is selected, the zone will be skipped.

Note:

- Operation for changing the zone varies depending on the configuration for Rollover/ End Stop. (Refer to: 5.6 Rollover/ End Stop on page 41)
- For Portable (without LCD/ without Key), zones that can be selected are limited to zone 1 to zone 4. When a zone is selected, the transceiver emits following tones according to the selected zone.

  Zone 1: Zone 1 Select Tone (A tone sounds once.)

  Zone 2: Zone 2 Select Tone (A tone sounds twice.)

  Zone 3: Zone 3 Select Tone (A tone sounds three times.)

  Zone 4: Zone 4 Select Tone (A tone sounds four times.)

  In this case, even if "Rollover" is configured for Rollover/ End Stop, no Rollover Tone sounds from the transceiver. (Refer to: 5.6 Rollover/ End Stop on page 41)
- For Portable (without LCD/ without Key), 16 Zone/Channel Selector is always enabled.

■ Mobile

Pressing the **Zone Up** key increases the zone number in steps of 1. Pressing the **Zone Down** key decreases the zone number in steps of 1.

If "Zone Up (Continuous)" or "Zone Down (Continuous)" is assigned to the **Zone Up** or **Zone Down** key, the zone number will be increased or decreased continuously every 200 ms by holding down the **Zone Up** or **Zone Down** key.

If an unprogrammed zone is selected, the zone will be skipped.

Note: Operation for changing the zone varies depending on the configuration for Rollover/ End Stop. (Refer to: 5.6 Rollover/ End Stop on page 41)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the 16 Zone/Channel Selector to be enabled or disabled (Edit > Key Assignment > General)

5.5 Changing the Channel or GID

Channel or GID can be changed using the **Selector** (Portable only) or **PF** keys. (Refer to: 7 KEY ASSIGNMENT on page 84)

■ Portable

- **If 16 Zone/Channel Selector is enabled and the CH/GID Select function is assigned to the Selector**

  The **Selector** can be used with the stopper installed. Rotating the **Selector** causes the transceiver to migrate to the channel or GID having the same number specified by the **Selector**. Channels or GIDs that can be selected are limited to channel or GID number 1 to Channel or GID number 16.

  If an unprogrammed channel or GID is selected, "********" appears on the main display.

- **If 16 Zone/Channel Selector is disabled and the CH/GID Up/Down function is assigned to the Selector (Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key) only)**

  Rotating the **Selector** clockwise increases the channel or GID number in steps of 1. Rotating the **Selector** counterclockwise decreases the channel or GID number in steps of 1.

  If an unprogrammed channel or GID is selected, the channel or GID will be skipped.

- **Using the PF Keys**

  Pressing the **CH/GID Up** key increases the channel or GID number in steps of 1. Pressing the **CH/GID Down** key decreases the channel or GID number in steps of 1.

  If "CH/GID Up (Continuous)" or "CH/GID Down (Continuous)" is assigned to the **CH/GID Up** or **CH/GID Down** key, the channel or GID number will be increased or decreased continuously every 200 ms by pressing and holding the **CH/GID Up** or **CH/GID Down** key.

  If an unprogrammed channel or GID is selected, the channel or GID will be skipped.

Note:

- Operation for changing the channel or GID varies depending on the configuration for Rollover/ End Stop. (Refer to: 5.6 Rollover/ End Stop on page 41)
- For Portable (without LCD/ without Key), 16 Zone/Channel Selector is always enabled.

■ Mobile

Pressing the **CH/GID Up** key increases the channel or GID number in steps of 1. Pressing the **CH/GID Down** key decreases the channel or GID number in steps of 1.

If "CH/GID Up (Continuous)" or "CH/GID Down (Continuous)" is assigned to the **CH/GID Up** or **CH/GID Down** key, the channel or GID number will be increased or decreased continuously every 200 ms by pressing and holding the **CH/GID Up** or **CH/GID Down** key.

If an unprogrammed channel or GID is selected, the channel or GID will be skipped.

Note: Operation for changing the channel or GID varies depending on the configuration for Rollover/ End Stop. (Refer to: 5.6 Rollover/ End Stop on page 41)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the 16 Zone/Channel Selector to be enabled or disabled (Edit > Key Assignment > General)

5.6 Rollover/ End Stop

Rollover/ End Stop allows you to configure how the zone, channel or GID migrates when changing the zone, channel or GID using the **PF** keys or **Selector** on the transceiver.

The zone, channel or GID migrates as below depending on the configuration using KPG-141D/ KPG-141DN when changing the zone, channel or GID using the **PF** keys or **Selector** on the transceiver.

Table 5-1 Rollover/ End Stop

Configuration	Description
Rollover	The Rollover Tone sounds from the transceiver and the transceiver will migrate to the zone or channel or GID having the lowest number when a user attempts to increase the zone, channel or GID number while the zone or channel or ID having the largest number is selected. The transceiver will migrate to the zone or channel or GID having the largest number when a user attempts to decrease the zone, channel or GID number while the zone or channel or GID having the lowest number is selected. **Note:** If a zone is changed with Portable (without LCD/ without Key), a Zone Select Tone sounds from the transceiver, but no Rollover Tone will sound.
End Stop	Zone, channel or GID in the range between the highest and lowest numbers can be selected. Zone, channel or GID number is not looped. The Stop Tone sounds from the transceiver and the transceiver will not migrate to another zone or channel or GID even if a user attempts to increase the zone, channel or GID number while the zone or channel or GID having the highest number is selected. The Stop Tone sounds from the transceiver and the transceiver will not migrate to another zone or channel or GID even if a user attempts to decrease the zone, channel or GID number while the zone or channel or GID having the lowest number is selected.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Rollover/ End Stop (Edit > Optional Features > Optional Features 1 > Common Page 1)

5.7 Channel Entry

Channel Entry can be used to directly migrate to the channel or GID a user wishes to use.

After pressing the **Channel Entry** key, a desired channel or GID number in the current zone can be specified by entering the number directly through one of the following operations

Portable:

- **Selector** (only if List Selection Key (Selector) is enabled)
- **[0]** to **[9]** keys

Mobile:

- **[⩓]** key or **[⩔]** key
- **[0]** to **[9]** keys

If “Channel Entry” is configured for Keypad Operation, the channel or GID number can be specified by pressing the **[0]** to **[9]** keys on the keypad without pressing the **Channel Entry** key.

If a zone for any system other than NXDN Trunking system is selected, the channel or GID number in the current zone can also be specified by entering numbers directly after pressing the **Group ID/Channel Entry** key.

If “Group ID/Channel Entry” is configured for Keypad Operation, the channel or GID can be specified by pressing keys from **[0]** to **[9]** on the keypad while a zone for any system other than NXDN Trunking system is being selected.

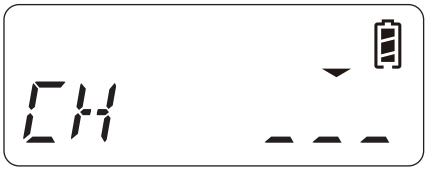
The transceiver automatically recognizes a maximum number of digits of the channel or GID number configured for the transceiver. A user can enter the channel or GID number within the range of the number of digits.

■ Operating the Transceiver

1. Press the **Channel Entry** key, or select a zone for any system other than NXDN Trunking system and press the **Group ID/Channel Entry** key.

   The transceiver enters Channel Entry Mode.

   The following operations are identical even if the transceiver enters Channel Entry Mode with keypad entry.



Portable

Mobile

2. Enter the channel or GID number by using the keys on the transceiver.

   Portable:

   Selector (only if List Selection Key (Selector) is enabled)

   Mobile:

   [⩓] key or **[⩔]** key

   The channel or GID number can also be entered by pressing keys from **[0]** to **[9]** on the keypad.

   The following are examples of how to enter the channel number by using the keypad.

   - **If the maximum channel number has 3 digits:**

     To make a call on channel 250, press the **[2]**, **[5]** and **[0]** keys in this order.

     To make a call on channel 90, press the **[0]**, **[9]** and **[0]** keys in this order.

     To make a call on channel 7, press the **[0]**, **[0]** and **[7]** keys in this order.

   - **If the maximum channel number has 2 digits:**

     To make a call on channel 90, press the **[9]** and **[0]** keys in this order.

     To make a call on channel 7, press the **[0]** and **[7]** keys in this order.

   - **If the maximum channel number has 1 digits:**

     To make a call on channel 7, press the **[7]** key.

Note:

- Refer to 5.17 Key Operations for each Mode on page 58 for key operations for entering the channel number in Channel Entry Mode.
- If Channel Entry Mode is ended by pressing the **[C>]** key, the transceiver will restore to the same channel or GID selected before the transceiver entered Channel Entry Mode.
- Pressing the **PTT** switch while in Channel Entry Mode causes the transceiver to transmit on the channel or GID selected before the transceiver enters Channel Entry Mode.
- If no key is pressed before the amount of time configured for Mode Reset Timer elapses while the transceiver is in Channel Entry Mode, the transceiver will exit Channel Entry Mode and return to the channel or GID selected before the transceiver entered Channel Entry Mode.
- For Portable (with LCD/ with 4-key), the channel or GID number can be entered only by using **Selector** (List Selection Key(Selector)).
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

5.8 Group ID Entry (NXDN Trunking System Only)

Group ID Entry can be used to directly select a Group ID a user wishes to use in an NXDN Trunking system.

If a zone for NXDN Trunking system is selected, after pressing the **Group ID/Channel Entry** key, the desired Group ID can be specified by one of the following operations to enter the Group ID number directly.

Portable:

- **Selector** (only if List Selection Key (Selector) is enabled)
- **[0]** to **[9]** keys

Mobile:

- **[⩓]** key or **[⩔]** key
- **[0]** to **[9]** keys

If “Group ID/Channel Entry” is configured for Keypad Operation, the Group ID can be specified by pressing keys from **[0]** to **[9]** on the keypad while a zone for NXDN Trunking system is being selected.

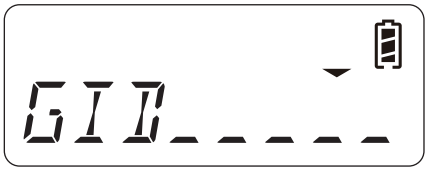
The transceiver automatically recognizes a maximum number of digits of the Group ID configured for the transceiver. A user can enter the Group ID within the range of the number of digits.

■ Operating the Transceiver

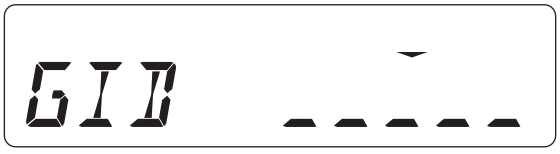
1. Select a zone for NXDN Trunking system and press the **Group ID/Channel Entry** key.

   The transceiver enters Group ID Entry Mode.

   The following operations are identical even if the transceiver enters Group ID Entry Mode with keypad entry.



Portable



Mobile

2. Enter the Group ID by using the keys on the transceiver.

   Portable:

   Selector (only if List Selection Key (Selector) is enabled)

   Mobile:

   [⩓] key or **[⩔]** key

   The Group ID can also be entered by pressing keys from **[0]** to **[9]** on the keypad.

   The following are examples of the entries by using the keypad.

   - **If the maximum Group ID has 5 digits:**

     To enter the Group ID 21250, press the **[2]**, **[1]**, **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 1250, press the **[0]**, **[1]**, **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 250, press the **[0]**, **[0]**, **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 90, press the **[0]**, **[0]**, **[0]**, **[9]**, and **[0]** keys in this order.

     To enter the Group ID 7, press the **[0]**, **[0]**, **[0]**, **[0]**, and **[7]** keys in this order.

   - **If the maximum Group ID has 4 digits:**

     To enter the Group ID 1250, press the **[1]**, **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 250, press the **[0]**, **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 90, press the **[0]**, **[0]**, **[9]**, and **[0]** keys in this order.

     To enter the Group ID 7, press the **[0]**, **[0]**, **[0]**, and **[7]** keys in this order.

   - **If the maximum Group ID has 3 digits:**

     To enter the Group ID 250, press the **[2]**, **[5]**, and **[0]** keys in this order.

     To enter the Group ID 90, press the **[0]**, **[9]**, and **[0]** keys in this order.

     To enter the Group ID 7, press the **[0]**, **[0]**, and **[7]** keys in this order.

   - **If the maximum Group ID has 2 digits:**

     To enter the Group ID 90, press the **[9]** and **[0]** keys in this order.

     To enter the Group ID 7, press the **[0]** and **[7]** keys in this order.

   - **If the maximum Group ID has 1 digits:**

     To enter the Group ID 7, press the **[7]** key.

Note:

- Refer to 5.17 Key Operations for each Mode on page 58 for key operations for entering the Group ID in Group ID Entry Mode.
- If the **PTT** switch is pressed in Group ID Entry Mode, the transmission starts using the selected Group ID.
- For Portable (with LCD/ with 4-key), the Group ID can be entered only by using **Selector** (List Selection Key(Selector)).
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

5.9 Home CH/GID

Home CH/GID can be used to migrate to a preconfigured channel or GID by pressing the **Home CH/GID** key. The transceiver can move backward and forward between channels or GIDs in the same zone.

Pressing the **Home CH/GID Select** key can change the Home Channel or GID. (Refer to: 7 KEY ASSIGNMENT on page 84)

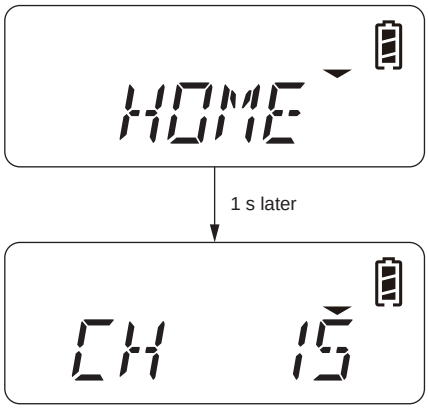
Note: Refer to 17 SCAN on page 179 for details on how the transceiver will respond by pressing the **Home CH/GID** key during the scan.

■ Operating the Transceiver

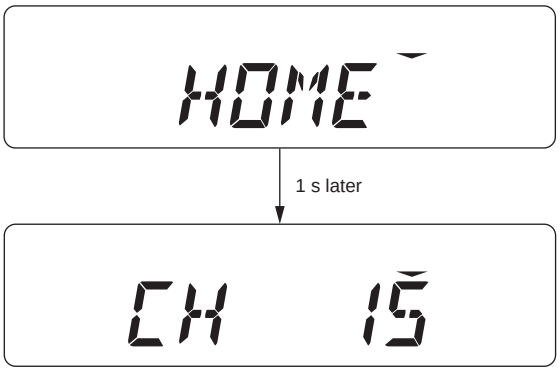
- **Migrating to a Home Channel or GID**

1. Press the **Home CH/GID** key.

   Key Beep A sounds from the transceiver, and then the transceiver can migrate to the Home Channel or GID configured for the selected zone. “HC” appears on the sub-display.



Portable



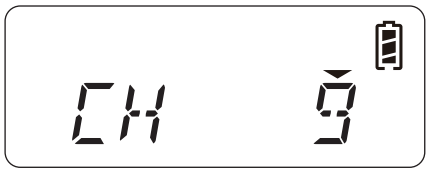
Mobile

2. Press the **Home CH/GID** key again.

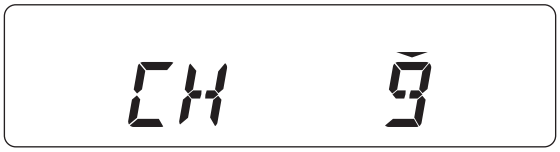
   A Key Beep B sounds from the transceiver, and then the transceiver reverts to the previous channel or GID.

- **Changing the Home Channel or GID**

1. Select the channel or GID to be configured as the Home Channel or GID.



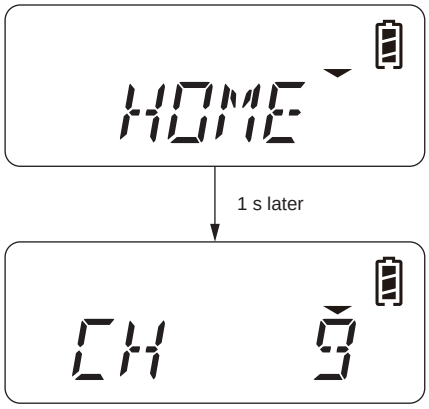
Portable



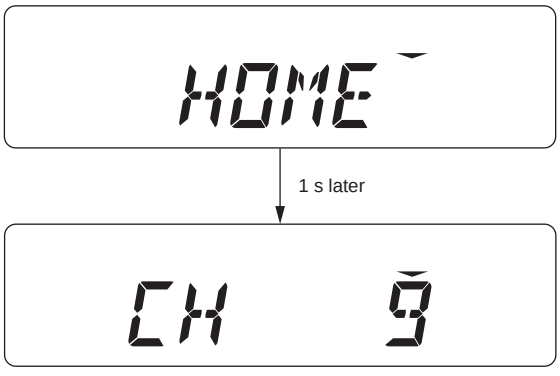
Mobile

2. Press the **Home CH/GID Select** key.

   Key Beep C sounds from the transceiver and the Home Channel or GID will be changed.



Portable



Mobile

Note: For Portable (without LCD/ without Key), the status of the transceiver can be confirmed by a tone sounded from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Home Channel (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring the Home GID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Configuring the Home GID (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit)
- Assigning functions to the PF keys (Edit > Key Assignment)

5.10 Direct CH/GID

Direct CH/GID can be used to migrate to a preconfigured channel or GID by pressing one of the Direct CH/GID 1 to Direct CH/GID 5 keys. The transceiver can move backward and forward between channels or GIDs in each zone.

Pressing one of the Direct CH/GID 1 Select to Direct CH/GID 5 Select keys can change the Direct Channel or GID. (Refer to: 7 KEY ASSIGNMENT on page 84)

Note: Refer to 17 SCAN on page 179 for details on how the transceiver will respond by pressing one of the Direct CH/GID 1 to Direct CH/GID 5 keys during the scan.

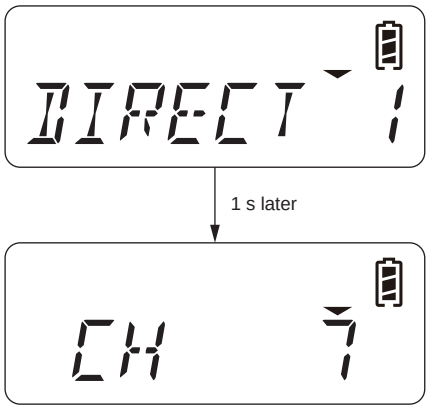
■ Operating the Transceiver

● Migrating to a Direct CH/GID

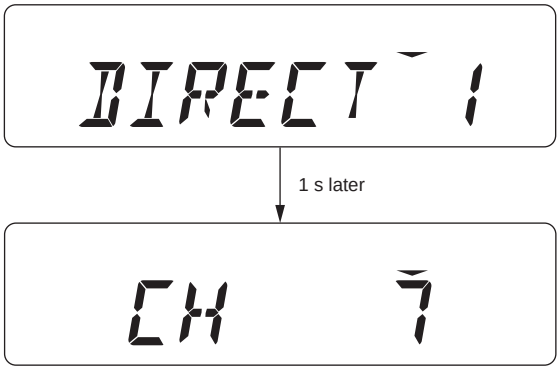
1. Press one of the Direct CH/GID 1 to Direct CH/GID 5 keys.

A Key Beep A sounds from the transceiver, and then the transceiver can migrate to the Direct Channel or GID regardless of the selected zone.

If the Return function is enabled, “DIRECT 1” (if the **Direct CH/GID 1** key is pressed) appears for 1 s, and then the transceiver migrates to the Direct CH/GID.



Portable

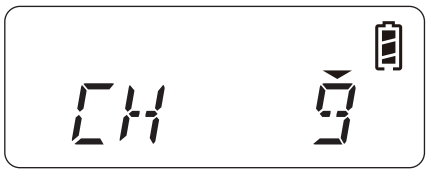


Mobile

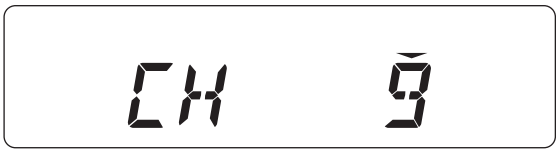
If any of the Direct CH/GID 1 to Direct CH/GID 5 keys is pressed again while Return is enabled, Key Beep B sounds from the transceiver, and then the transceiver will revert to the previous channel or GID.

- **Changing the Direct CH/GID**

1. Select the channel or GID intended to be configured as a Direct Channel or GID.



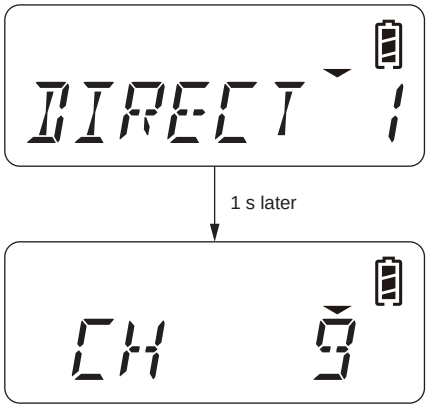
Portable



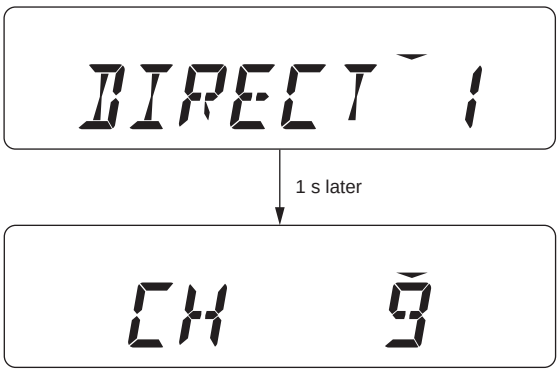
Mobile

2. Press one of the Direct CH/GID 1 Select to Direct CH/GID 5 Select keys.

   Key Beep C sounds from the transceiver and the Home Direct CH or GID will be changed.



Portable



Mobile

Note: For Portable (without LCD/ without Key), the status of the transceiver can be confirmed by a tone sounded from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Direct CH/GID (Edit > Key Assignment > Direct CH/GID)
- Configuring the Return to be enabled or disabled (Edit > Key Assignment > Direct CH/GID)
- Assigning functions to the PF keys (Edit > Key Assignment)

5.11 Key Lock (Portable Only)

Key Lock is used to disable the transceiver key operation.

This function can be used to avoid erroneous operation of the transceiver by physically contacting the transceiver while a user is carrying it around the waist, etc.

Pressing the **Key Lock** key toggles Key Lock between activated and deactivated.

Even if a key is pressed while Key Lock is activated, the Key-entry Error Tone sounds from the transceiver, but the action has no effect. However, keys assigned with the following functions, the **PTT** switch, and **Selector** (with a stopper) can be used even if Key Lock is enabled.

- Emergency
- Backlight
- Monitor
- Monitor Momentary
- Squelch Off
- Squelch Off Momentary
- Function
- Key Lock

Note: For Portable (without LCD/ without Key), the transceiver has no indicator and display, but this function is available.

■ Operating the Transceiver

- **Activating Key Lock**

1. Press the **Key Lock** key while Key Lock is deactivated.

   A Key Beep A sounds, and Key Lock will be activated.

- **Deactivating Key Lock**

1. Press the **Key Lock** key while Key Lock is activated.

   A Key Beep B sounds, and Key Lock will be deactivated.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

5.12 Receive

5.12.1 Conventional Group

Only if the received QT tone frequency, DQT code, or RAN code matches the QT tone frequency, DQT code, or RAN code preconfigured for the transceiver, the transceiver can communicate. Received audio sounds from the speaker while the received QT tone frequency, DQT code, or RAN code matches that preconfigured for the transceiver.

Receive Frequency and QT/DQT Decode or RAN Decode must be configured using KPG-141D/ KPG-141DN.

■ Operating the Transceiver

1. Select the zone or channel to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Adjust the volume when receiving a call as needed. (Refer to: 5.2 Adjusting the Volume Level on page 38)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the zone and channel data (Edit > Zone Information (Conventional Group))

5.12.2 LTR Trunking System

Transceivers can communicate only if the received LTR ID matches the LTR ID preconfigured for the receiving transceiver. Received audio sounds from the speaker while the received LTR ID matches the LTR ID preconfigured for the transceiver.

Receive Frequency and Decode ID must be configured using KPG-141D/ KPG-141DN.

■ Operating the Transceiver

1. Select the zone or GID to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Adjust the volume when receiving a call as needed. (Refer to: 5.2 Adjusting the Volume Level on page 38)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the zone and GID data (Edit > Zone Information (LTR Trunking System))

5.13 Transmit

5.13.1 Conventional Group

The transceiver sends the preconfigured QT tone frequency, DQT code, or RAN code when the transceiver starts transmitting by a user pressing the **PTT** switch. If the transmitted QT tone frequency, DQT code, or RAN code matches the QT tone frequency, DQT code, or RAN code preconfigured for the receiving transceiver, the transceivers can communicate.

Reverse Burst in QT tone and the Turn-off code in DQT code are transmitted when releasing the **PTT** switch to close the speaker of the receiving transceiver.

Transmit Frequency and QT/DQT Encode or RAN Encode must be configured using KPG-141D/ KPG-141DN.

■ Operating the Transceiver

1. Select the zone or channel to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Confirm that the channel is available.
3. Speak into the microphone while pressing the **PTT** switch.
4. Release the **PTT** switch to finish transmitting.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the zone and channel data (Edit > Zone Information (Conventional Group))

5.13.2 LTR Trunking System

The transceiver sends the preconfigured LTR ID when the transceiver starts transmitting by a user pressing the **PTT** switch. The transceiver links to the repeater and waits to receive the echo back data from the repeater. If the data is correct, the transceiver assumes that the link is properly established and re-transmits to call to the receiving transceiver.

If the transmitted LTR ID matches the LTR ID preconfigured for the receiving transceiver, the transceivers can communicate.

Releasing the **PTT** switch causes the transceiver to send the EOT data to close the speaker of the receiving transceiver.

Transmit Frequency and Encode ID must be configured using KPG-141D/ KPG-141DN.

■ Operating the Transceiver

1. Select the zone or GID to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Press the **PTT** switch.
3. Speak into the microphone.
4. Release the **PTT** switch.

   The transceiver will be in the standby state.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the zone and GID data (Edit > Zone Information (LTR Trunking System))

5.14 Transmitting with Talk Around

Talk Around is a function that allows transceivers to communicate directly without using a repeater. (Refer to: 10 TALK AROUND on page 99)

Each time the **Talk Around** key is pressed, Talk Around can be enabled or disabled. (Refer to: 7 KEY ASSIGNMENT on page 84)

5.14.1 Conventional Group

■ Operating the Transceiver

1. Select the zone or channel to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Press the **Talk Around** key.
3. Press the **PTT** switch.

   The transceiver initiates a call by using Receive Frequency and by sending the QT or DQT Decode code or RAN Decode code instead of Transmit Frequency and QT or DQT Encode code or RAN Encode code.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

5.14.2 LTR Trunking System

■ Operating the Transceiver

1. Select the zone or GID to be used. (Refer to: 5.4 Changing the Zone on page 39, 5.5 Changing the Channel or GID on page 40)
2. Press the **Talk Around** key.
3. Press the **PTT** switch.

   The transceiver initiates a call using the transmit frequency of the Home Repeater and Encode ID configured for the GID.

Note: The **Talk Around** key does not need to be pressed if a GID with Talk Around configured to be enabled is selected.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Talk Around to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Talk Around Key to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Assigning functions to the PF keys (Edit > Key Assignment)

5.15 Character Entry

Character Entry is a function to enter alphanumeric characters and symbols by pressing the **[0]** to **[9]** keys, **Selector** (Portable), or the **[ ]** and **[ ]** keys (Mobile).

Symbols, lower case letters, etc. can be entered by using the **[0]** to **[9]** keys on the keypad, **Selector** (Portable), or the **[ ]** and **[ ]** keys (Mobile). The number of key operations for entering characters can be minimized by configuring only necessary characters.

A maximum of 16 alphanumeric characters and symbols can be configured for the **[0]** to **[9]** keys on the keypad.

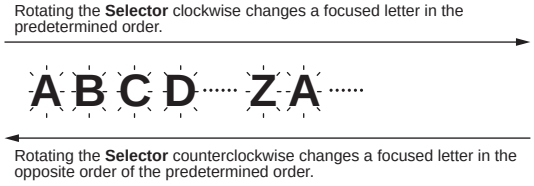
A maximum of 51 alphanumeric characters and symbols can be configured for **Selector** (Portable) or the **[ ]** and **[ ]** keys (Mobile).

Character Entry can be used to enter a DTMF Name in Autodial Programming Mode or to enter a message in Short Message Mode.

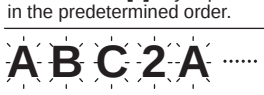
Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver (Operation Example of Portable)

- **If "ABCD...Z" is configured for Selector:**



- **If "ABC2" is configured for the [2] key:**



Note: Refer to 5.16 Common Operation on page 50 for operation methods.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Character Entry (Edit > Key Assignment > Character Entry)

5.16 Common Operation

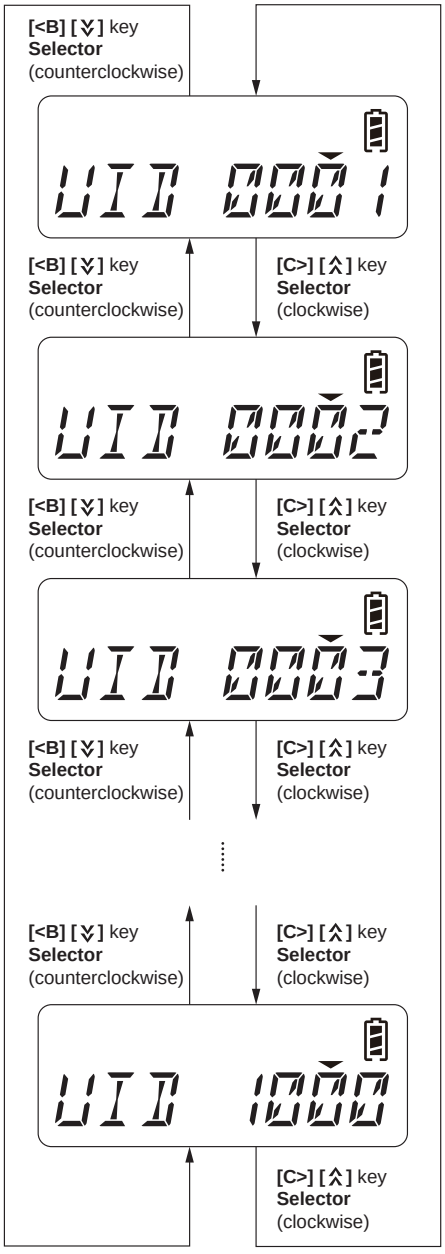
This section describes operations common to transceivers, such as list selection, character entry, etc.

Note:

- The operations described in this section are unavailable for Portable (without LCD/ without Key).
- This section uses display examples for Portable to describe the operations.

5.16.1 Selecting and Deleting Data from a List

- **Selecting data from a list by using the [<B]/ [C>] key, Selector (Portable), or the [ ]/ [ ] key (Mobile)**

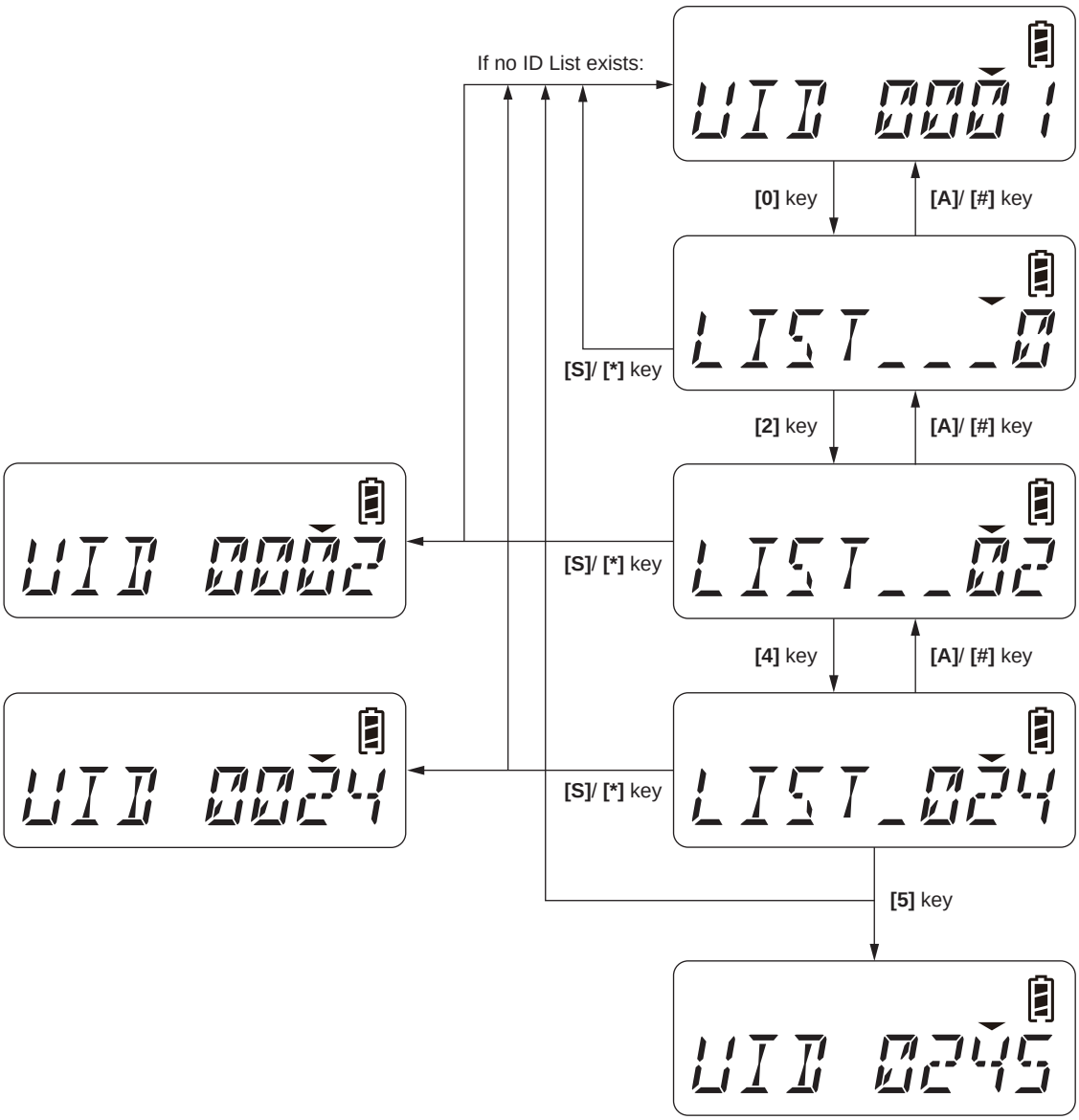


Note:

- The list number will automatically be scrolled up or down continuously while the **[<B]**/ **[C>]** key (Portable) or **[ ]**/ **[ ]** key (Mobile) is pressed and held.
- For Portable, the **Selector** is available only if List Selection Key (Selector) is enabled.

- **Selecting data from a list by using the keypad (Shortcut Entry)**

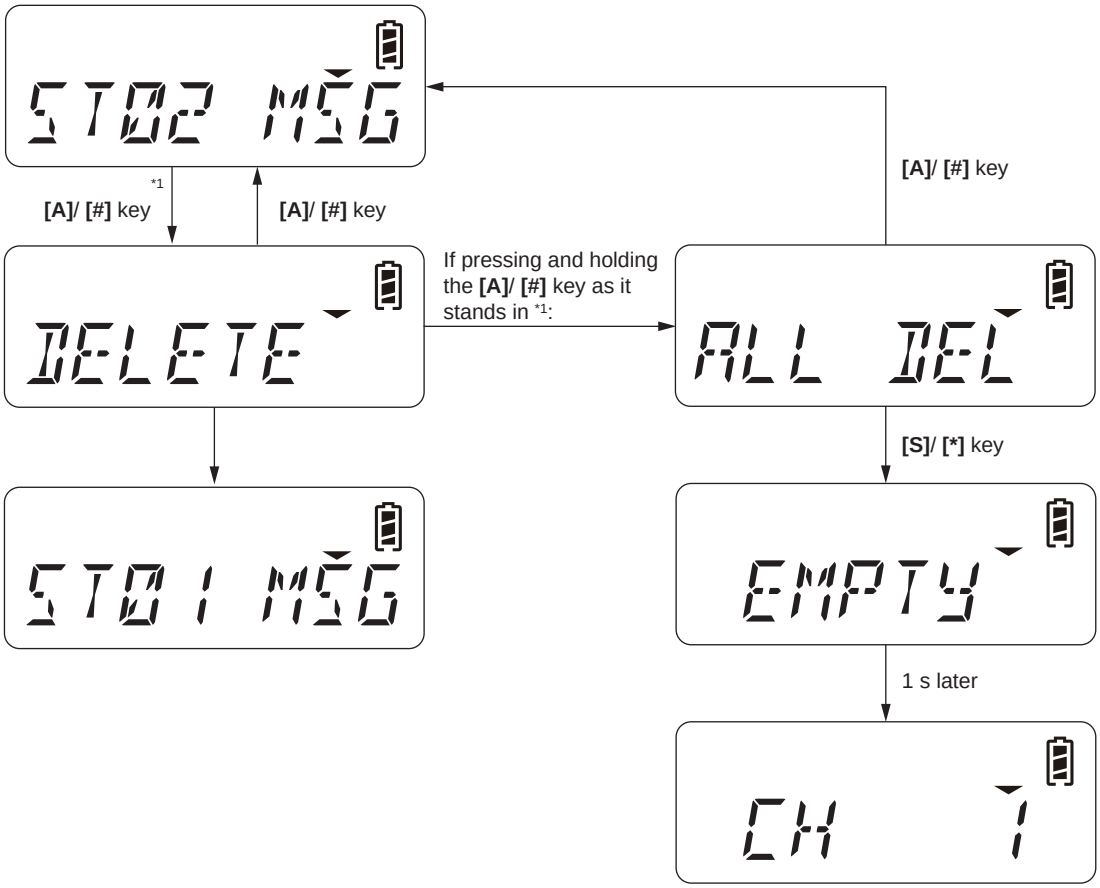
  This is an operating example for selecting “ID 0245”.



Note: The number of digits to be entered varies as follows depending on the highest list number configured in the transceiver:

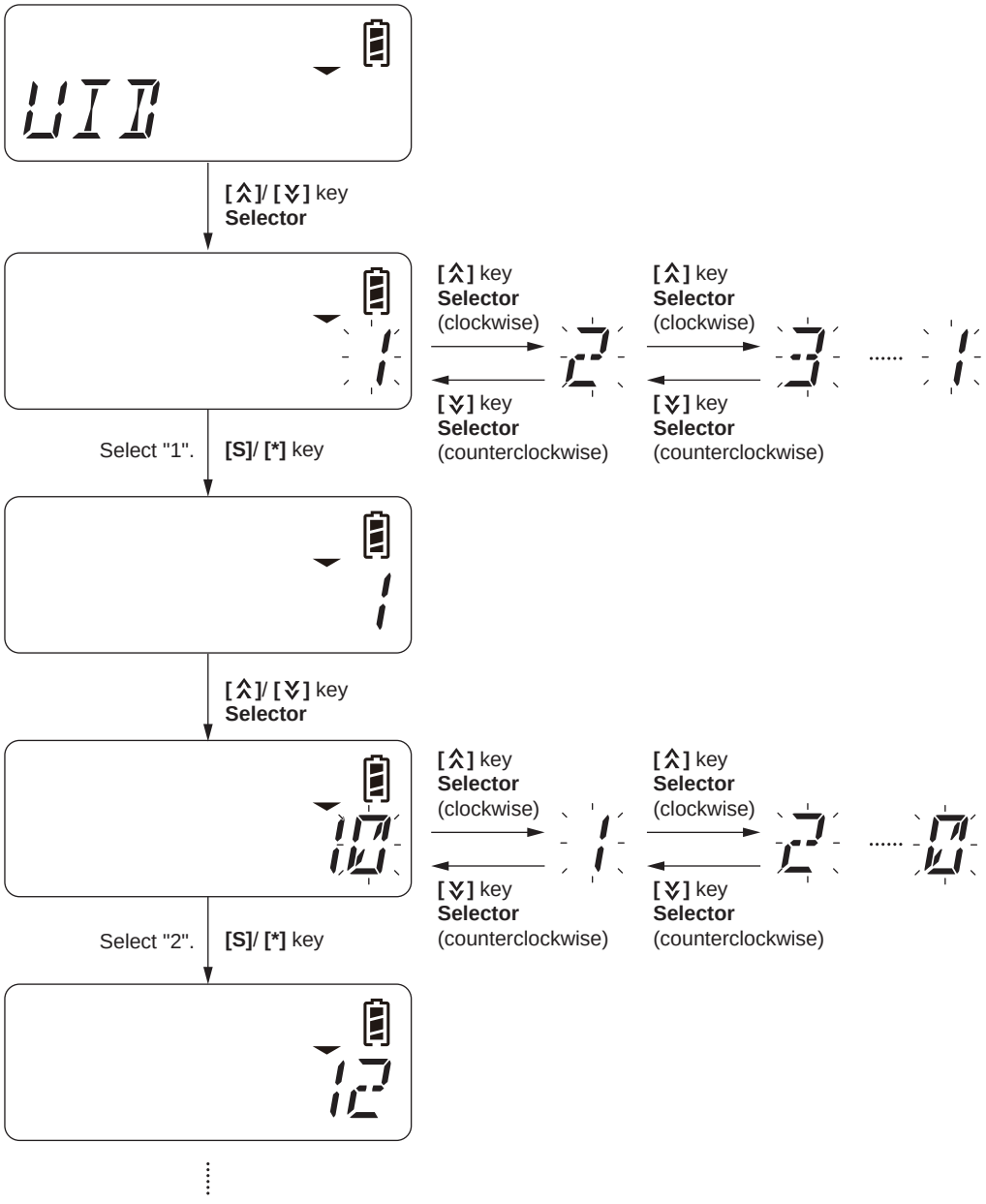
- If the highest list number is lower than 10: 1 digit
- If the highest list number is 10 or higher and lower than 100: 2 digits
- If the highest list number is 100 or higher and lower than 1000: 3 digits
- If the highest list number is 1000 or higher: 4 digits

- **Deleting data from a list**



5.16.2 Entering or Clearing a Code

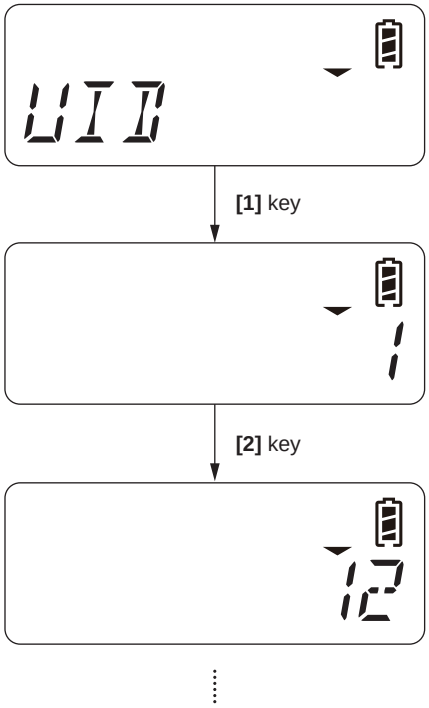
- **Entering a code using Selector (Portable) or the [ ]/ [ ] key (Mobile)**



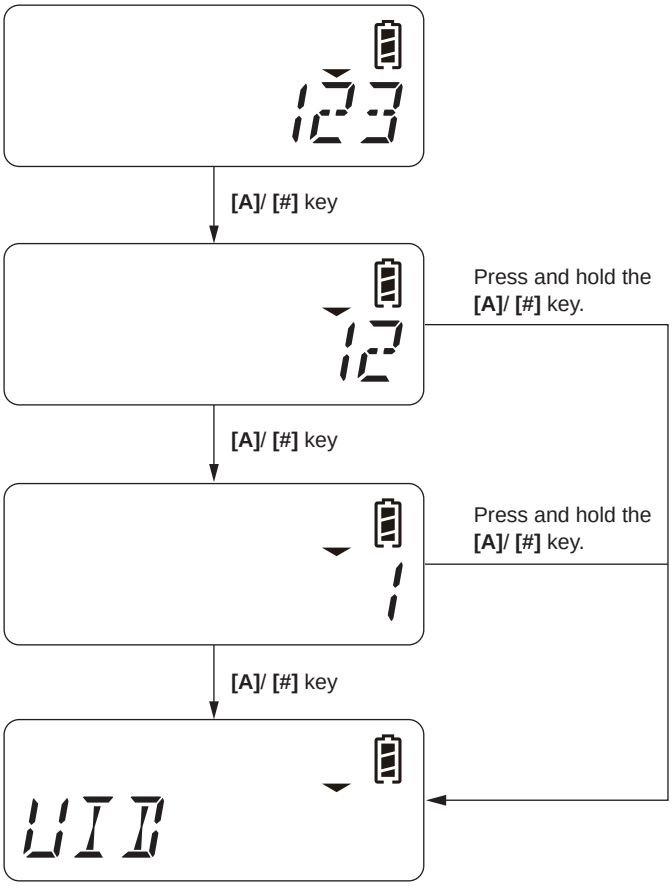
Note:

- Pressing and holding the **[ ]** or **[ ]** key (Mobile) will cause the code to automatically be scrolled up or down.
- The code that can be entered varies depending on the mode and the number of entered digits.
- For Portable, the **Selector** is available only if List Selection Key (Selector) is enabled.

- **Entering a code using the keypad**



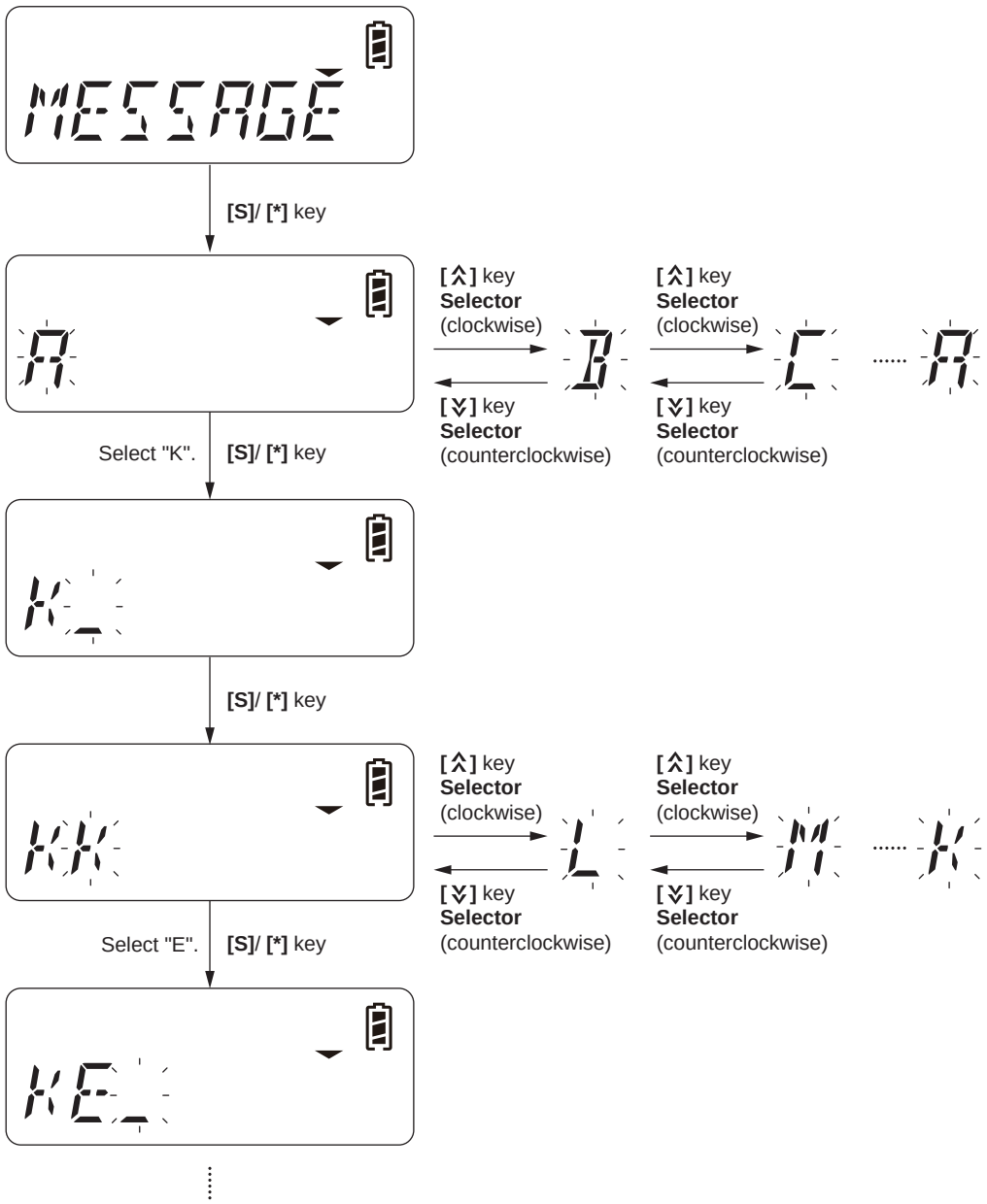
- **Clearing the entered code**



Note: Pressing the **[A]** or **[#]** key causes one digit of the code to be cleared. Furthermore, pressing and holding the **[A]** or **[#]** key causes the entire code to be cleared.

5.16.3 Entering or Clearing Characters

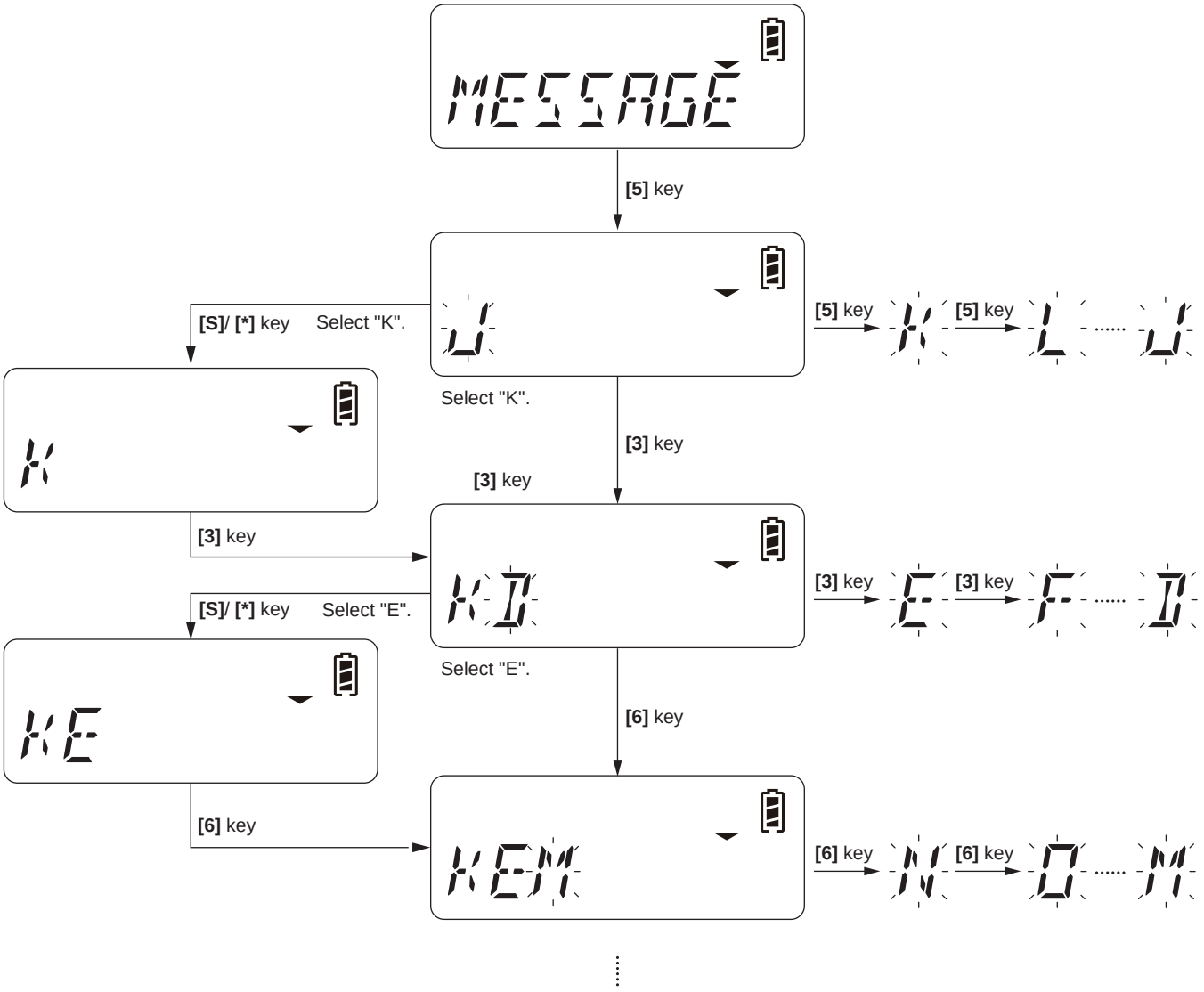
- **Entering characters using Selector (Portable) or the [ ]/ [ ] key (Mobile)**



Note:

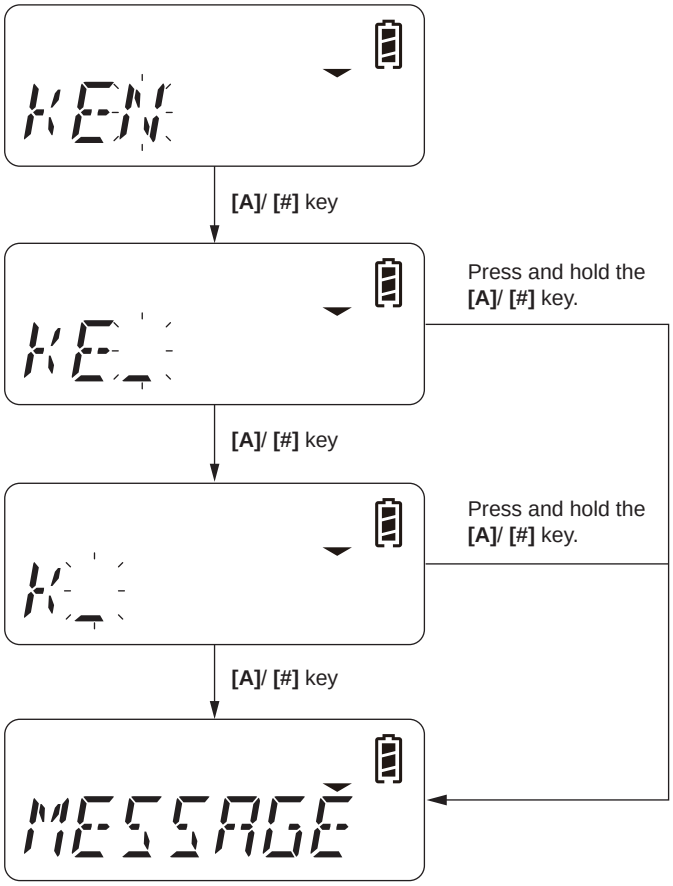
- Pressing and holding the **[ ]** or **[ ]** key (Mobile) will cause the character to automatically be scrolled up or down.
- Characters to be entered can be changed with the configuration for Character Entry. (Refer to: 5.15 Character Entry on page 49)
- For Portable, the **Selector** is available only if List Selection Key (Selector) is enabled.

- **Entering characters using the keypad**



Note: Characters to be entered can be changed with the configuration for Character Entry. (Refer to: 5.15 Character Entry on page 49)

- **Clearing characters**



Note: Pressing the **[A]** or **[#]** key causes one digit of the character to be cleared. Furthermore, pressing and holding the **[A]** or **[#]** key causes all characters to be cleared.

5.17 Key Operations for each Mode

Key operations for selecting a list or entering characters are described for each mode in this section. Refer to 5.16 Common Operation on page 50 for operation methods.

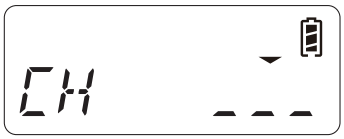
Note:

- The operations described in this section are unavailable for Portable (without LCD/ without Key).
- The operations using the **Selector** (Portable) describes the transceiver behavior while List Selection Key (Selector) is enabled. If List Selection Key (Selector) is disabled, the function assigned to **Selector** is activated.

■ Portable

Key	2-tone	Autodial
	Selecting a list 	Selecting a list 
Selector	Selects a list number from 2-tone List by changing the number one at a time.	Selects a list number from Autodial List by changing the number one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	**Press:** Transmits 2-tone after aborting the current mode.	**Press:** Sends the DTMF code after aborting the current mode.
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode. **Hold Down:** Enters Manual Entry Mode.
[A]	-	-
[<B]	**Press:** Selects a list number from 2-tone List by decreasing the number one at a time. **Hold Down:** Selects a list number from 2-tone List by continuously decreasing the number.	**Press:** Selects a list number from Autodial List by decreasing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously decreasing the number.
[C>]	**Press:** Selects a list number from 2-tone List by increasing the number one at a time. **Hold Down:** Selects a list number from 2-tone List by continuously increasing the number.	**Press:** Selects a list number from Autodial List by increasing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously increasing the number.
[0] to [9]	**Press:** Selects a list number from 2-tone List by directly entering the number.	**Press:** Selects a list number from Autodial List by directly entering the number.
[*]	**Press:** Aborts the current mode.	**Press:** Enters DTMF Code Entry Mode. Then, press one of the following keys: **[0]**: Redial **[*]**: BOT **[#]**: EOT
[#]	-	-
PTT Switch	**Press:** Transmits 2-tone after aborting the current mode.	**Press:** Sends the DTMF code after aborting the current mode.

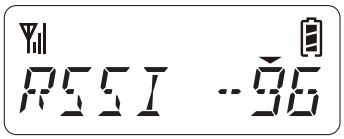
Key	Autodial	Autodial Programming
	Manual entry 	Selecting a list 
Selector	Selects a DTMF code by changing the code one at a time.	Selects a list number from Autodial List by changing the number one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-
[S]	**Press:** Exits the mode, or determines the DTMF code if it is selected. **Hold Down:** Enters List Selection Mode.	**Press:** Enters DTMF Name Entry Mode.
[A]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	**Press:** Deletes a piece of data from Autodial List. **Hold Down:** Deletes all data from Autodial List.
[<B]	-	**Press:** Selects a list number from Autodial List by decreasing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously decreasing the number.
[C>]	-	**Press:** Selects a list number from Autodial List by increasing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously increasing the number.
[0] to [9]	**Press:** Enters a DTMF code.	**Press:** Selects a list number from Autodial List by directly entering the number.
[*]	**If * and # key-entry Pattern is enabled:** **Press:** Enters DTMF Code Entry Mode. Then, press the **[*]** key or the **[#]** key to enter “*” or “#”. **Hold Down:** Enters DTMF Code Entry Mode. Then, pressing the **[2]**, **[5]**, **[8]** or **[0]** key enters “A”, “B”, “C”, or “D” respectively. **If * and # key-entry Pattern is disabled:** **Press:** Enters “*”.	**Press:** Enters DTMF Name Entry Mode.
[#]	**If * and # key-entry Pattern is enabled:** **Press:** Clears a digit. **Hold Down:** Clears all digits. **If * and # key-entry Pattern is disabled:** **Press:** Enters “#”.	**Press:** Deletes a piece of data from Autodial List. **Hold Down:** Deletes all data from Autodial List.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

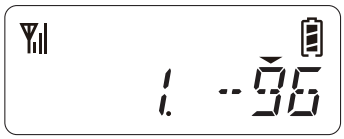
Key	Autodial Programming		Channel Entry[*1]
	Editing a DTMF Name 	Editing a DTMF code 	Entering a channel or GID number 
Selector	Selects a character by changing one character at a time.	Selects a DTMF code by changing the code one at a time.	Selects a channel or GID number by changing it one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-	-
[S]	**Press:** Determines the DTMF Name or a character while it is selected.	**Press:** Determines all DTMF codes or a DTMF code if it is selected.	**Press:** Determines the channel or GID number.
[A]	**Press:** Clears a character, or restores the list selection display if no character is entered. **Hold Down:** Clears all characters.	**Press:** Clears one digit, or restores the DTMF Name entry display if no DTMF code is entered. **Hold Down:** Clears all digits.	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	**Press:** Shifts the cursor to the left. **Hold Down:** Shifts the cursor to the left continuously.	-	-
[C>]	**Press:** Shifts the cursor to the right. **Hold Down:** Shifts the cursor to the right continuously.	-	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Enters characters.	**Press:** Enters a DTMF code.	**Press:** Enters the channel or GID number.
[*]	**Press:** Determines the DTMF Name or a character while it is selected.	**If * and # key-entry Pattern is enabled:** **Press:** Determines the DTMF code if it is selected. Or, transceiver enters DTMF Code Entry Mode, and then pressing the **[*]** or **[#]** key subsequently enters "*" or "#". **Hold Down:** Enters DTMF Code Entry Mode. Then, pressing the **[2]**, **[5]**, **[8]** or **[0]** key enters "A", "B", "C", or "D" respectively. **If * and # key-entry Pattern is disabled:** **Press:** Enters "*".	**Press:** Determines the channel or GID number.
[#]	**Press:** Clears a character, or restores the list selection display if no character is entered. **Hold Down:** Clears all characters.	**If * and # key-entry Pattern is enabled:** **Press:** Clears one digit, or restores the DTMF Name entry display if no DTMF code is entered. **Hold Down:** Clears all digits. **If * and # key-entry Pattern is disabled:** **Press:** Enters "#".	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

[*1] For Portable (with LCD/ with 4-key), List Selection Key (Selector) needs to be enabled to enter a channel or GID number in Channel Entry Mode.

Key	Group ID Entry[*1]	GPS Position Display	Group/ Group + Status/ Group + SDM
	Entering a Group ID 		Selecting a list (Conventional) 
Selector	Selects a Group ID by changing the number one at a time.	Selects display of latitude, longitude or altitude by changing each of them one at a time.	Selects a list number from Group ID List by changing the number one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-	-
[S]	**Press:** Determines the Group ID.	**Press:** Aborts the current mode. **Hold Down:** Pauses or resumes automatic switching of the displayed items (Latitude/ Longitude and Altitude).	**Press:** Aborts the current mode. Or, behaves as follows. **Group + Status:** Enters Status Mode. **Group + SDM:** Enters Short Message Mode.
[A]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-	-
[<B]	-	**Press:** Selects display of latitude, longitude or altitude by changing each of them one at a time. **Hold Down:** Selects display of latitude, longitude or altitude by changing each of them continuously.	**Press:** Selects a list number from Group ID List by decreasing the number one at a time. **Hold Down:** Selects a list number from Group ID List by continuously decreasing the number.
[C>]	**Press:** Aborts the current mode.	**Press:** Selects display of latitude, longitude or altitude by changing each of them one at a time. **Hold Down:** Selects display of latitude, longitude or altitude by changing each of them continuously.	**Press:** Selects a list number from Group ID List by increasing the number one at a time. **Hold Down:** Selects a list number from Group ID List by continuously increasing the number.
[0] to [9]	**Press:** Enters the Group ID.	-	**Press:** Selects a list number from Group ID List by directly entering the number.
[*]	**Press:** Determines the Group ID.	**Press:** Aborts the current mode. **Hold Down:** Pauses or resumes automatic switching of the displayed items (Latitude/ Longitude and Altitude).	Behaves the same way as when the **[S]** key is operated.
[#]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-	-
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits.	**Press:** Transmits.

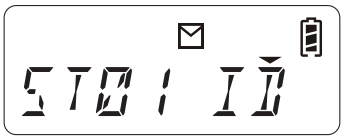
[*1] For Portable (with LCD/ with 4-key), List Selection Key (Selector) needs to be enabled to enter a Group ID in Group ID Entry Mode.

Key	Individual/ Individual + Status/ Individual + SDM		Maintenance Display
	Selecting a list 	Manual entry 	Other than NXDN Trunking system 
Selector	Selects a list number from Unit ID List by changing the number one at a time.	Selects an ID number by changing the number one at a time.	-
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	**Press:** Transmits the Paging Call If Individual Call Acknowledge Request is enabled, a message requesting an acknowledgment is sent.	**Press:** Transmits the Paging Call If Individual Call Acknowledge Request is enabled, a message requesting an acknowledgment is sent.	-
[S]	**Press:** Aborts the current mode. Or, behaves as follows. **Individual + Status:** Enters Status Mode. **Individual** + SDM: Enters Short Message Mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).	**Press:** Aborts the current mode. Determines the ID number if it is selected. Or, behaves as follows. **Individual + Status:** Enters Status Mode. **Individual + SDM:** Enters Short Message Mode. **Hold Down:** Enters List Selection Mode.	**Press:** Aborts the current mode.
[A]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-
[<B]	**Press:** Selects a list number from Unit ID List by decreasing the number one at a time. **Hold Down:** Selects a list number from Unit ID List by continuously decreasing the number.	-	-
[C>]	**Press:** Selects a list number from Unit ID List by increasing the number one at a time. **Hold Down:** Selects a list number from Unit ID List by continuously increasing the number.	-	-
[0] to [9]	**Press:** Selects a list number from Unit ID List by directly entering the number.	**Press:** Enters the ID number.	-
[*]	Behaves the same way as when the **[S]** key is operated.	Behaves the same way as when the **[S]** key is operated.	**Press:** Aborts the current mode.
[#]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-
PTT Switch	**Press:** Transmits. If Individual Call Ack Request is enabled, a message requesting an acknowledgment is sent.	**Press:** Transmits. If Individual Call Ack Request is enabled, a message requesting an acknowledgment is sent.	**Press:** Transmits.

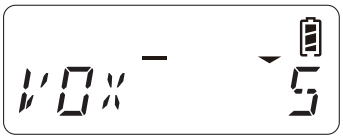
Key	Maintenance Display	OST List	Priority-channel Select
	NXDN Trunking system 	Selecting a list 	Selecting the Priority 
Selector	Selects a Frequency number from those registered in the Frequency Table by stepping through the numbers one at a time.	Selects a pair of QT/DQT Decode/ Encode from those in the OST List for selection by changing the pair one pair at a time.	Selects an option by changing the option one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-	-
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode after determination.
[A]	**Press:** Switches the display among the site number display, RSSI level display, and system name display.	-	-
[<B]	**Press:** Selects a Frequency number from those registered in the Frequency Table by decreasing the numbers one at a time. **Hold Down:** Selects a Frequency number from those registered in the Frequency Table by decreasing the numbers continuously.	**Press:** Selects a pair of QT/DQT Decode/ Encode from those in the OST List for selection by changing the pair one pair at a time. **Hold Down:** Selects a pair of QT/ DQT Decode/ Encode from those in the OST List for selection by changing from one pair to another continuously.	**Press:** Selects an option by changing the option one at a time. **Hold Down:** Selects an option by changing from one option to another continuously.
[C>]	**Press:** Selects a Frequency number from those registered in the Frequency Table by increasing the numbers one at a time. **Hold Down:** Selects a Frequency number from those registered in the Frequency Table by increasing the numbers continuously.	**Press:** Selects a pair of QT/DQT Decode/ Encode from those in the OST List for selection by changing the pair one pair at a time. **Hold Down:** Selects a pair of QT/ DQT Decode/ Encode from those in the OST List for selection by changing from one pair to another continuously.	**Press:** Selects an option by changing the option one at a time. **Hold Down:** Selects an option by changing from one option to another continuously.
[0] to [9]	-	**Press:** Selects a list number from OST List by directly entering the number.	**Press:** Selects from the list.
[*]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode after determination.
[#]	-	-	-
PTT Switch	**Press:** Transmits.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Scrambler/Encryption Code		Selcall/ Selcall + Status/ Selcall + SDM
	Analog 	NXDN 	Selecting a list 
Selector	Selects a Scrambler Code by changing the code one at a time.	Selects a list number from Multi-key List by changing the number one at a time.	Selects a list number from ID List by changing the number one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-	**Press:** Transmits the Paging Call
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode. Or, behaves as follows. **Selcall + Status:** Enters Status Mode. **Selcall + SDM:** Enters Short Message Mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).
[A]	-	-	-
[<B]	**Press:** Selects a Scrambler Code by decreasing the code one at a time. **Hold Down:** Selects a Scrambler Code by decreasing from one code to another continuously.	**Press:** Selects a list number from Multi-key List by decreasing the number one at a time. **Hold Down:** Selects a list number from Multi-key List by continuously decreasing the number.	**Press:** Selects a list number from ID List by decreasing the number one at a time. **Hold Down:** Selects a list number from ID List by continuously decreasing the number.
[C>]	**Press:** Selects a Scrambler Code by increasing the code one at a time. **Hold Down:** Selects a Scrambler Code by increasing from one code to another continuously.	**Press:** Selects a list number from Multi-key List by increasing the number one at a time. **Hold Down:** Selects a list number from Multi-key List by continuously increasing the number.	**Press:** Selects a list number from ID List by increasing the number one at a time. **Hold Down:** Selects a list number from ID List by continuously increasing the number.
[0] to [9]	-	**Press:** Selects a list number from Multi-key List by directly entering the number.	**Press:** Selects a list number from ID List by directly entering the number.
[*]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	Behaves the same way as when the **[S]** key is operated.
[#]	-	-	-
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits.

Key	Selcall/ Selcall + Status/ Selcall + SDM	Site Select	
	Manual entry 	Selecting a list 	Manual entry 
Selector	Selects an ID number by changing the number one at a time.	Selects a list number from Site List by changing the number one at a time.	Selects a site number by changing one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	**Press:** Transmits the Paging Call	-	-
[S]	**Press:** Aborts the current mode. Determines the ID number if it is selected. Or, behaves as follows. **Selcall + Status:** Enters Status Mode. **Selcall + SDM:** Enters Short Message Mode. **Hold Down:** Enters List Selection Mode.	**Press:** Aborts the current mode after determination. **Hold Down:** Migrates to the site number entry mode (only if Wide Area System is enabled).	**Press:** Aborts the current mode (with no site number entered). Determines the site number (while the site number is blinking). Aborts the current mode and enables Site Lock (after determining the site number). **Hold Down:** Migrates to the list selection mode.
[A]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	-	**Press:** Selects a list number from Site List by decreasing the number one at a time. **Hold Down:** Selects a list number from Site List by continuously decreasing the number.	-
[C>]	-	**Press:** Selects a list number from Site List by increasing the number one at a time. **Hold Down:** Selects a list number from Site List by continuously increasing the number.	-
[0] to [9]	**Press:** Enters the ID number.	**Press:** Selects a list number from Site List by directly entering the number.	**Press:** Enters a site number.
[*]	Behaves the same way as when the **[S]** key is operated.	**Press:** Aborts the current mode. **Hold Down:** Migrates to the site number entry mode (only if Wide Area System is enabled).	**Press:** Aborts the current mode (with no site number entered). Determines the site number (while the site number is blinking). Aborts the current mode and enables Site Lock (after determining the site number). **Hold Down:** Migrates to the list selection mode.
[#]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Squelch Level	Stack
	Selecting a list 	Selecting a list 
Selector	Selects a Squelch Level by changing the level one at a time.	Selects data stored in the transceiver stack memory by changing the data one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-
[S]	**Press:** Aborts the current mode after determination.	**Press:** Displays FleetSync stacked data and NXDN stacked data in this order, and then aborts the current mode. Or, displays NXDN stacked data and FleetSync stacked data in this order, and then aborts the current mode. **Hold Down:** Switches the displays. In the case of Caller ID Stack: ID Name → Received CH/GID → ID Name ••• In the case of Status/ Short Message Stack: ID Name → Status/ Short Message → Received CH/ GID → ID Name •••
[A]	-	**Press:** Deletes a piece of data stored in the transceiver stack memory. **Hold Down:** Deletes all data stored in the transceiver stack memory.
[<B]	**Press:** Selects a Squelch Level by decreasing the number one at a time. **Hold Down:** Selects a Squelch Level by decreasing from one number to another continuously.	**Press:** Selects data stored in the transceiver stack memory by changing the data one at a time. **Hold Down:** Selects data stored in the transceiver stack memory by changing one set of data to another continuously.
[C>]	**Press:** Selects a Squelch Level by increasing the number one at a time. **Hold Down:** Selects a Squelch Level by increasing from one number to another continuously.	**Press:** Selects data stored in the transceiver stack memory by changing the data one at a time. **Hold Down:** Selects data stored in the transceiver stack memory by changing one set of data to another continuously.
[0] to [9]	-	**Press:** Selects stacked data from the list.
[*]	**Press:** Aborts the current mode after determination.	Behaves the same way as when the **[S]** key is operated.
[#]	-	Behaves the same way as when the **[A]** key is operated.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits (Caller ID Stack display only).

Key	Status	
	Selecting a list (display example in NXDN) 	Manual entry 
Selector	Selects a list number from Status List by changing the number one at a time.	Selects a status number by changing the number one at a time.
Side 1	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	**Press:** Sends a Status Message.	**Press:** Sends a Status Message.
[S]	**Press:** Aborts the current mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).	**Press:** Exits the mode, or determines the status number if it is selected. **Hold Down:** Enters List Selection Mode.
[A]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	**Press:** Selects a list number from Status List by decreasing the number one at a time. **Hold Down:** Selects a list number from Status List by continuously decreasing the number.	-
[C>]	**Press:** Selects a list number from Status List by increasing the number one at a time. **Hold Down:** Selects a list number from Status List by continuously increasing the number.	-
[0] to [9]	**Press:** Selects a list number from Status List by directly entering the number.	**Press:** Enters a status number.
[*]	Behaves the same way as when the **[S]** key is operated.	**Press:** Exits the mode, or determines the status number if it is selected. **Hold Down:** Enters List Selection Mode.
[#]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Sends a Status Message.	**Press:** Sends a Status Message.

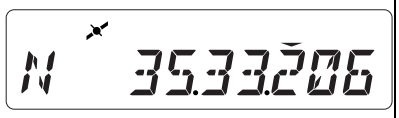
Key	Transceiver Password	VOX Gain Level	SDM (FleetSync/NXDN)/ Selcall + SDM (FleetSync)/ Group + SDM (NXDN)/ Individual + SDM (NXDN)
	Entering a code 	Configuring the level 	Short Message Entry 
Selector	Selects a code by changing the code one at a time.	Selects a VOX Gain Level by changing the level one step at a time.	Selects a character by changing one character at a time.
Side 1	**Press:** Deletes all codes.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Side 2	-	-	**Press:** Sends a Short Message.
[S]	**Press:** Verifies the password or determines the code.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode if no character is selected. Determines the selected character if a character is selected.
[A]	**Press:** Deletes a code. **Hold Down:** Deletes all codes.	-	**Press:** Deletes a character. **Hold Down:** Clears all characters.
[<B]	-	**Press:** Selects a VOX Gain Level by decreasing the level one step at a time. **Hold Down:** Selects a VOX Gain Level by decreasing from one level to another continuously.	**Press:** Shifts the cursor to the left. **Hold Down:** Shifts the cursor to the left continuously.
[C>]	-	**Press:** Selects a VOX Gain Level by increasing the level one step at a time. **Hold Down:** Selects a VOX Gain Level by increasing from one level to another continuously.	**Press:** Shifts the cursor to the right. **Hold Down:** Shifts the cursor to the right continuously.
[0] to [9]	**Press:** Enters a code.	-	**Press:** Enters characters.
[*]	**Press:** Verifies the password or determines the code.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode if no character is selected. Determines the selected character if a character is selected.
[#]	**Press:** Deletes a code. **Hold Down:** Deletes all codes.	-	**Press:** Deletes a character. **Hold Down:** Clears all characters.
PTT Switch	-	**Press:** Transmits after aborting the current mode.	**Press:** Sends a Short Message.

Key	System Select Mode
	
Selector	Selects a system by changing the system one at a time.
Side 1	**Press:** Aborts the current mode.
Side 2	-
[S]	**Press:** Confirms the configuration and then aborts the current mode.
[A]	-
[<B]	**Press:** Selects a system by decreasing the system one at a time. **Hold Down:** Selects a system by decreasing from one system to another continuously.
[C>]	**Press:** Selects a system by increasing the system one at a time. **Hold Down:** Selects a system by increasing from one system to another continuously.
[0] to [9]	**Press:** Selects from the list.
[*]	**Press:** Confirms the configuration and then aborts the current mode.
[#]	-
PTT Switch	**Press:** Transmits after aborting the current mode.

■ Mobile

Key	2-tone	Autodial	
	Selecting a list 	Selecting a list 	Manual entry 
[^]/ [v]	**Press:** Selects a list number from 2-tone List by changing the number one at a time. **Hold Down:** Selects a list number for 2-tone List by continuously changing the number.	**Press:** Selects a list number from Autodial List by changing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously changing the number.	**Press:** Selects a DTMF code by changing the code one at a time. **Hold Down:** Selects a DTMF code by changing from one code to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	**Press:** Transmits 2-tone after aborting the current mode.	**Press:** Sends the DTMF code after aborting the current mode.	-
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode. **Hold Down:** Enters Manual Entry Mode.	**Press:** Exits the mode, or determines the DTMF code if it is selected. **Hold Down:** Enters List Selection Mode.
[A]	-	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	-	**Press:** Enters Manual Entry Mode.	**Press:** Enters List Selection Mode.
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects a list number from 2-tone List by directly entering the number.	**Press:** Selects a list number from Autodial List by directly entering the number.	**Press:** Enters a DTMF code.
[A] to [D]	-	-	**Press:** Enters a DTMF code.
[*]	**Press:** Aborts the current mode.	**Press:** Enters DTMF Code Entry Mode. Then, press one of the following keys: **[0]**: Redial **[*]**: BOT **[#]**: EOT	**If * and # key-entry Pattern is enabled:** **Press:** Enters DTMF Code Entry Mode. Then, press the **[*]** key or the **[#]** key to enter "*" or "#". **Hold Down:** Enters DTMF Code Entry Mode. Then, pressing the **[2]**, **[5]**, **[8]** or **[0]** key enters "A", "B", "C", or "D" respectively. **If * and # key-entry Pattern is disabled:** **Press:** Enters "*".
[#]	-	-	**If * and # key-entry Pattern is enabled:** **Press:** Clears a digit. **Hold Down:** Clears all digits. **If * and # key-entry Pattern is disabled:** **Press:** Enters "#".
PTT Switch	**Press:** Transmits 2-tone after aborting the current mode.	**Press:** Sends the DTMF code after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Autodial Programming		
	Selecting a list 	Editing a DTMF Name 	Editing a DTMF code 
[⩓]/ [⩔]	**Press:** Selects a list number from Autodial List by changing the number one at a time. **Hold Down:** Selects a list number from Autodial List by continuously changing the number.	**Press:** Selects a character by changing one character at a time. **Hold Down:** Selects a character by changing from one character to another continuously.	**Press:** Selects a DTMF code by changing the code one at a time. **Hold Down:** Selects a DTMF code by changing from one code to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-	-
[S]	**Press:** Enters DTMF Name Entry Mode.	**Press:** Determines the DTMF Name or a character if it is selected.	**Press:** Determines all DTMF codes or a DTMF code if it is selected.
[A]	**Press:** Deletes a piece of data from Autodial List. **Hold Down:** Deletes all data from Autodial List.	**Press:** Clears a character, or restores the list selection display if no character is entered. **Hold Down:** Clears all characters.	**Press:** Clears one digit, or restores the DTMF Name entry display if no DTMF code is entered. **Hold Down:** Clears all digits.
[<B]	-	**Press:** Shifts the cursor to the left. **Hold Down:** Shifts the cursor to the left continuously.	-
[C>]	**Press:** Aborts the current mode.	**Press:** Shifts the cursor to the right. **Hold Down:** Shifts the cursor to the right continuously.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects a list number from Autodial List by directly entering the number.	**Press:** Enters characters.	**Press:** Enters a DTMF code.
[A] to [D]	-	-	**Press:** Enters a DTMF code.
[*]	**Press:** Enters DTMF Name Entry Mode.	**Press:** Determines the DTMF Name or a character if it is selected.	**If * and # key-entry Pattern is enabled:** **Press:** Determines a DTMF code if it is selected. Or, the transceiver migrates to DTMF Code Entry Mode, and then pressing the **[*]** or **[#]** key subsequently enters “*” or “#”. **Hold Down:** Enters DTMF Code Entry Mode. Then, pressing the **[2]**, **[5]**, **[8]** or **[0]** key enters “A”, “B”, “C”, or “D” respectively. **If * and # key-entry Pattern is disabled:** **Press:** Enters “*”.
[#]	**Press:** Deletes a piece of data from Autodial List. **Hold Down:** Deletes all data from Autodial List.	**Press:** Clears a character, or restores the list selection display if no character is entered. **Hold Down:** Clears all characters.	**If * and # key-entry Pattern is enabled:** **Press:** Clears one digit, or restores the DTMF Name entry display if no DTMF code is entered. **Hold Down:** Clears all digits. **If * and # key-entry Pattern is disabled:** **Press:** Enters “#”.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Channel Entry	Group ID Entry	GPS Position Display
	Entering a channel or GID number 	Entering a Group ID 	
[^]/ [v]	**Press:** Selects a channel or GID number by changing it one at a time. **Hold Down:** Selects a channel or GID number by changing it from one to another continuously.	**Press:** Selects a Group ID by changing the number one at a time. **Hold Down:** Selects a Group ID by changing from one number to another continuously.	**Press:** Selects display of latitude, longitude or altitude by changing each of them one at a time. **Hold Down:** Selects display of latitude, longitude or altitude by changing each of them continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-	-
[S]	**Press:** Determines the channel or GID number.	**Press:** Determines the Group ID.	**Press:** Aborts the current mode. **Hold Down:** Pauses or resumes automatic switching of the displayed items (Latitude/ Longitude and Altitude).
[A]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-
[<B]	-	-	**Press:** Pauses or resumes automatic switching of the displayed items (Latitude/ Longitude and Altitude).
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Enters the channel or GID number.	**Press:** Enters the Group ID.	-
[A] to [D]	-	-	-
[*]	**Press:** Determines the channel or GID number.	**Press:** Determines the Group ID.	**Press:** Aborts the current mode. **Hold Down:** Pauses or resumes automatic switching of the displayed items (Latitude/ Longitude and Altitude).
[#]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	**Press:** Clears a digit. **Hold Down:** Clears all digits.	-
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits.

Key	Group/ Group + Status/ Group + SDM	Individual/ Individual + Status/ Individual + SDM	
	Selecting a list (Conventional) 	Selecting a list 	Manual entry 
[⩓]/ [⩔]	**Press:** Selects a list number from Group ID List by changing the number one at a time. **Hold Down:** Selects a list number from Group ID List by continuously changing the number.	**Press:** Selects a list number from Unit ID List by changing the number one at a time. **Hold Down:** Selects a list number from Unit ID List by continuously changing the number.	**Press:** Selects an ID number by changing the number one at a time. **Hold Down:** Selects an ID number by changing from one number to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	**Press:** Transmits the Paging Call If Individual Call Acknowledge Request is enabled, a message requesting an acknowledgment is sent.	**Press:** Transmits the Paging Call If Individual Call Acknowledge Request is enabled, a message requesting an acknowledgment is sent.
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode. Or, behaves as follows. **Individual + Status:** Enters Status Mode. **Individual + SDM:** Enters Short Message Mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).	**Press:** Aborts the current mode. Determines the ID number if it is selected. Or, behaves as follows. **Individual + Status:** Enters Status Mode. **Individual + SDM:** Enters Short Message Mode. **Hold Down:** Enters List Selection Mode.
[A]	-	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	-	**Press:** Enters Manual Entry Mode.	**Press:** Enters List Selection Mode.
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects a list number from Group ID List by directly entering the number.	**Press:** Selects a list number from Unit ID List by directly entering the number.	**Press:** Enters the ID number.
[A] to [D]	-	-	-
[*]	**Press:** Aborts the current mode.	Behaves the same way as when the **[S]** key is operated.	Behaves the same way as when the **[S]** key is operated.
[#]	-	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Transmits.	**Press:** Transmits. If Individual Call Ack Request is enabled, a message requesting an acknowledgment is sent.	**Press:** Transmits. If Individual Call Ack Request is enabled, a message requesting an acknowledgment is sent.

Key	Maintenance Display		OST List
	Other than NXDN Trunking system 	NXDN Trunking system 	Selecting a list 
[⩓]/ [⩔]	-	**Press:** Selects a Frequency number from those registered in the Frequency Table by stepping through the numbers one at a time. **Hold Down:** Selects a Frequency Number configured in Frequency Table by changing from one number to another continuously.	**Press:** Selects a pair of QT/DQT Decode/ Encode from those in the OST List for selection by changing the pair one pair at a time. **Hold Down:** Selects a pair of QT/ DQT Decode/ Encode from those in the OST List for selection by changing from one pair to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-	-
[S]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[A]	-	**Press:** Switches the display among the site number display, RSSI level display, and system name display.	-
[<B]	-	-	-
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	-	-	**Press:** Selects a list number from OST List by directly entering the number.
[A] to [D]	-	-	-
[*]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[#]	-	-	-
PTT Switch	**Press:** Transmits.	**Press:** Transmits.	**Press:** Transmits after aborting the current mode.

Key	Priority-channel Select	Scrambler/Encryption Code	
	Selecting the Priority 	Analog 	NXDN 
[^]/ [v]	**Press:** Selects an option by changing the option one at a time. **Hold Down:** Selects an option by changing from one option to another continuously.	**Press:** Selects a Scrambler Code by changing the code one at a time. **Hold Down:** Selects a Scrambler Code by changing from one code to another continuously.	**Press:** Selects a list number from Multi-key List by changing the number one at a time. **Hold Down:** Selects a list number from Multi-key List by continuously changing the number.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-	-
[S]	**Press:** Aborts the current mode after determination.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[A]	-	-	-
[<B]	-	-	-
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects from the list.	-	**Press:** Selects a list number from Multi-key List by directly entering the number.
[A] to [D]	-	-	-
[*]	**Press:** Aborts the current mode after determination.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[#]	-	-	-
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Selcall/ Selcall + Status/ Selcall + SDM	
	Selecting a list 	Manual entry 
[⩓]/ [⩔]	**Press:** Selects a list number from ID List by changing the number one at a time. **Hold Down:** Selects a list number from ID List by continuously changing the number.	**Press:** Selects an ID number by changing the number one at a time. **Hold Down:** Selects an ID number by changing from one number to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	**Press:** Transmits the Paging Call	**Press:** Transmits the Paging Call
[S]	**Press:** Aborts the current mode. Or, behaves as follows. **Selcall + Status:** Enters Status Mode. **Selcall + SDM:** Enters Short Message Mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).	**Press:** Aborts the current mode. Determines the ID number if it is selected. Or, behaves as follows. **Selcall + Status:** Enters Status Mode. **Selcall + SDM:** Enters Short Message Mode. **Hold Down:** Enters List Selection Mode.
[A]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	**Press:** Enters Manual Entry Mode.	**Press:** Enters List Selection Mode.
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects a list number from ID List by directly entering the number.	**Press:** Enters the ID number.
[A] to [D]	-	-
[*]	Behaves the same way as when the **[S]** key is operated.	Behaves the same way as when the **[S]** key is operated.
[#]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Transmits.	**Press:** Transmits after aborting the current mode.

Key	Site Select	
	Selecting a list 	Manual entry 
[⩓]/ [⩔]	**Press:** Selects a list number from Site List by changing the number one at a time. **Hold Down:** Selects a list number from Site List by continuously changing the number.	**Press:** Selects a site number by changing one at a time. **Hold Down:** Selects a site number by changing from one number to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-
[S]	**Press:** Aborts the current mode after determination. **Hold Down:** Migrates to the site number entry mode (only if Wide Area System is enabled).	**Press:** Aborts the current mode (with no site number entered). Determines the site number (while the site number is blinking). Aborts the current mode and enables Site Lock (after determining the site number). **Hold Down:** Enters List Selection Mode.
[A]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
[<B]	-	**Press:** Enters List Selection Mode.
[C>]	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects a list number from Site List by directly entering the number.	**Press:** Enters a site number.
[A] to [D]	-	-
[*]	**Press:** Aborts the current mode after determination. **Hold Down:** Migrates to the site number entry mode (only if Wide Area System is enabled).	**Press:** Aborts the current mode (with no site number entered). Determines the site number (while the site number is blinking). Aborts the current mode and enables Site Lock (after determining the site number). **Hold Down:** Enters List Selection Mode.
[#]	-	**Press:** Clears a digit. **Hold Down:** Clears all digits.
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits after aborting the current mode.

Key	Squelch Level	Stack	Status
	Selecting a list 	Selecting a list 	Selecting a list (display example in NXDN) 
[∧]/ [∨]	**Press:** Selects a Squelch Level by changing the level one at a time. **Hold Down:** Selects a Squelch Level by changing from one level to another continuously.	**Press:** Selects data stored in the transceiver stack memory by changing the data one at a time. **Hold Down:** Selects data stored in the transceiver stack memory by changing one set of data to another continuously.	**Press:** Selects a list number from Status List by changing the number one at a time. **Hold Down:** Selects a list number from Status List by continuously changing the number.
Triangle	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
Square	-	-	**Press:** Sends a Status Message.
[S]	**Press:** Aborts the current mode.	**Press:** Displays FleetSync stacked data and NXDN stacked data in this order, and then aborts the current mode. Or, displays NXDN stacked data and FleetSync stacked data in this order, and then aborts the current mode. **Hold Down:** Switches the displays. In the case of Caller ID Stack: ID Name → Received CH/GID → ID Name ••• In the case of Status/ Short Message Stack: ID Name → Status/ Short Message → Received CH/GID → ID Name •••	**Press:** Aborts the current mode. **Hold Down:** Enters Manual Entry Mode (only if Manual Dialing is enabled).
[A]	-	**Press:** Deletes a piece of data stored in the transceiver stack memory. **Hold Down:** Deletes all data stored in the transceiver stack memory.	-
[<B]	-	**Press:** Behaves the same way as when the **[S]** key is operated (Hold Down).	**Press:** Enters Manual Entry Mode. (only if Manual Dialing is enabled)
[C>]	**Press:** Determines the Squelch Level and then aborts the current mode.	**Press:** Aborts the current mode.	**Press:** Aborts the current mode.
[0] to [9]	-	**Press:** Selects stacked data from the list.	**Press:** Selects a list number from Status List by directly entering the number.
[A] to [D]	-	-	-
[*]	**Press:** Aborts the current mode.	Behaves the same way as when the **[S]** key is operated.	Behaves the same way as when the **[S]** key is operated.
[#]	-	Behaves the same way as when the **[A]** key is operated.	-
PTT Switch	**Press:** Transmits after aborting the current mode.	**Press:** Transmits (Caller ID Stack display only).	**Press:** Sends a Status Message.

Key	Status	Transceiver Password	SDM (FleetSync/NXDN)/ Selcall + SDM (FleetSync)/ Group + SDM (NXDN)/ Individual + SDM (NXDN)
	Manual entry 	Entering a code 	Short Message Entry 
[⩓]/ [⩔]	**Press:** Selects a status number by changing the number one at a time. **Hold Down:** Selects a status number by changing from one number to another continuously.	**Press:** Selects a code by changing the code one at a time. **Hold Down:**: Selects a code by changing from one code to another continuously.	**Press:** Selects a character by changing one character at a time. **Hold Down:** Selects a character by changing from one character to another continuously.
Triangle	**Press:** Aborts the current mode.	**Press:** Deletes all codes.	**Press:** Aborts the current mode.
Square	**Press:** Sends a Status Message.	-	**Press:** Sends a Short Message.
[S]	**Press:** Exits the mode, or determines the status number if it is selected. **Hold Down:** Enters List Selection Mode.	**Press:** Verifies the password or determines the code.	**Press:** Aborts the current mode if no character is selected. Determines the selected character if a character is selected.
[A]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	**Press:** Deletes a code. **Hold Down:** Deletes all codes.	**Press:** Deletes a character. **Hold Down:** Clears all characters.
[<B]	**Press:** Enters List Selection Mode.	-	**Press:** Shifts the cursor to the left. **Hold Down:** Shifts the cursor to the left continuously.
[C>]	**Press:** Aborts the current mode.	**Press:** Deletes all codes.	**Press:** Shifts the cursor to the right. **Hold Down:** Shifts the cursor to the right continuously.
[0] to [9]	**Press:** Enters a status number.	**Press:** Enters a code.	**Press:** Enters characters.
[A] to [D]	-	-	-
[*]	**Press:** Exits the mode, or determines the status number if it is selected. **Hold Down:** Enters List Selection Mode.	**Press:** Verifies the password or determines the code.	**Press:** Aborts the current mode if no character is selected. Determines the selected character if a character is selected.
[#]	**Press:** Clears a digit. **Hold Down:** Clears all digits.	**Press:** Deletes a code. **Hold Down:** Deletes all codes.	**Press:** Deletes a character. **Hold Down:** Clears all characters.
PTT Switch	**Press:** Sends a Status Message.	-	**Press:** Sends a Short Message.

Key	System Select Mode
	
[^]/ [v]	**Press:** Selects a system by changing the system one at a time. **Hold Down:** Selects a system by changing from one system to another continuously.
Triangle	**Press:** Aborts the current mode.
Square	-
[S]	**Press:** Confirms the configuration and then aborts the current mode.
[A]	-
[<B]	-
[C>]	**Press:** Aborts the current mode.
[0] to [9]	**Press:** Selects from the list.
[A] to [D]	-
[*]	**Press:** Confirms the configuration and then aborts the current mode.
[#]	-
PTT Switch	**Press:** Transmits after aborting the current mode.

A function can be assigned to each COM port of the transceiver.

6.1 COM port

■ Portable

For Portable, the COM port 0 is assigned to the 2.5/ 3.5D connector.

The following functions can be assigned to communication ports using KPG-141D/ KPG-141DN.

Table 6-1 Available Functions for COM Ports

Range	Communication Ports
	COM port 0
None	The transceiver can communicate with KPG-141D/ KPG-141DN.
Data	The transceiver can remotely be controlled using PC Commands. The transceiver can communicate with KPG-141D/ KPG-141DN.
GPS	Position data can be acquired from the GPS receiver unit. Also, the transceiver can send the received GPS data when the transceiver receives the GPS data from another transceiver. The transceiver can communicate with KPG-141D/ KPG-141DN.
Data + GPS Data Output	The transceiver can remotely be controlled using PC Commands. The transceiver will send GPS data by adding STX and ETX when the transceiver receives GPS data from another transceiver. The transceiver can communicate with KPG-141D/ KPG-141DN.
Transparent	The port functions as the data communication port for the Transparent data communication using FleetSync protocol and NXDN protocol. The transceiver can communicate with KPG-141D/ KPG-141DN. However, on the COM port 0, the transceiver can communicate only for 10 s after the transceiver is turned ON.
Transparent 2 (NXDN)	The port functions as the data communication port for the Transparent data communication using NXDN protocol which the communication method is optimized. By using Transparent 2 (NXDN), data can be sent more efficiently than using Transparent. The transceiver can communicate with KPG-141D/ KPG-141DN. However, on the COM port 0, the transceiver can communicate only for 10 s after the transceiver is turned ON.

■ Mobile

Mobile has the following 2 communication ports:

- **COM port 0**

  The COM port 0 is assigned to the microphone jack on the front panel (TXD: Pin No. 4/ RXD: Pin No. 7).

- **COM port 1**

  The COM port 1 is assigned to the 15-pin connector on the rear panel (TXD: Pin No. 6/ RXD: Pin No. 7).

The following functions can be assigned to communication ports using KPG-141D/ KPG-141DN.

Table 6-2 Available Functions for COM Ports

Range	Communication Ports	
	COM port 0	COM port 1
None	The transceiver can communicate with KPG-141D/ KPG-141DN.	
Data	The transceiver can remotely be controlled using PC Commands. The transceiver can communicate with KPG-141D/ KPG-141DN.	
GPS	-	Position data can be acquired from the GPS receiver unit. Also, the transceiver can send the received GPS data when the transceiver receives the GPS data from another transceiver. The transceiver can communicate with KPG-141D/ KPG-141DN.
Data + GPS Data Output	The transceiver can remotely be controlled using PC Commands. The transceiver will send GPS data by adding STX and ETX when the transceiver receives GPS data from another transceiver. The transceiver can communicate with KPG-141D/ KPG-141DN.	
Transparent	-	The port functions as the data communication port for the Transparent data communication using FleetSync protocol and NXDN protocol.

Range	Communication Ports	
	COM port 0	COM port 1
Transparent 2 (NXDN)	-	The port functions as the data communication port for the Transparent data communication using NXDN protocol which the communication method is optimized. By using Transparent 2 (NXDN), data can be sent more efficiently than using Transparent.

Note:

- “Data” and “Data + GPS Data Output” cannot be assigned to the different communication ports at the same time.
- “GPS” and “Data + GPS Data Output” cannot be assigned to the different communication ports at the same time.
- “Transparent” and “Transparent 2 (NXDN)” cannot be assigned to the different communication ports at the same time.
- For Mobile, the PC command such as J Command which notifies a user that the transceiver status has been changed cannot be sent from the COM port 0.
- COM port 1 is also used for AUX port 1 and AUX port 2 for Extended Function; hence, if any function is assigned to COM port 1, AUX port 1 and AUX port 2 for Extended Function become disabled.
- If “Transparent” or “Transparent 2 (NXDN)” is assigned to COM port 1, the RTS/ CTS ports can function as the flow control port for Transparent. The RTS/ CTS ports are assigned to the 15-pin connector on the rear panel (RTS: Pin No. 8/ CTS: Pin No. 9). (参照 : 26 TRANSPARENT on page 340)
- RTS/ CTS is also used for AUX port 3 and AUX port 4 for Extended Function; hence, if RTS/ CTS is in use, AUX port 3 and AUX port 4 for Extended Function become disabled.
- For Mobile, if Built-in GPS Receiver is enabled, neither “GPS” nor “Data + GPS Data Output” can be assigned to the COM ports.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to COM ports (Edit > Optional Features > Optional Features 1 > Common Page 3)
- Configuring the RTS/CTS to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 3)

6.2 Polarity

Polarity is the logic of data lines for sending data using a communication port where “GPS” is assigned. However, the polarity of COM port 0 is fixed at Normal in order to communicate with KPG-141D/ KPG-141DN and the configuration cannot be changed.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Polarity (Edit > Optional Features > Optional Features 1 > Common Page 3)

6.3 Stop Bit

Polarity is the bit information for sending data using a communication port where “Data”, “GPS”, “Data + GPS Data Output”, “Transparent”, or “Transparent 2 (NXDN)” is assigned. “1” or “2” can be configured for Stop Bit.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Stop Bit (Edit > Optional Features > Optional Features 1 > Common Page 3)

6.4 Baud Rate

Baud Rate is the communication rate for sending data using a communication port where “Data”, “GPS”, “Data + GPS Data Output”, “Transparent”, or “Transparent 2 (NXDN)” is assigned.

Baud Rate can be configured by selecting from 1200 bps, 2400 bps, 4800 bps, 9600 bps or 19200 bps.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Baud Rate (Edit > Optional Features > Optional Features 1 > Common Page 3)

6.5 PC Interface Protocol

PC Interface Protocol is the communication system to be used to control the transceiver by using a PC command.

Table 6-3 PC Interface Protocol

PC Interface Protocol	Description
Version 1	This command starts with STX (Start of Text) and ends with ETX (End of Text). This command is compatible with transceivers that support the KENWOOD PC Interface Protocol.
Version 2	The command sequence is almost the same as the Version 1 data format, but it has the command sequence of Version 1 and a sequence number (SEQ).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PC Interface Protocol (Edit > Optional Features > Optional Features 1 > Common Page 3)

Various functions can be assigned to the **Selector** and **PF** keys.

7.1 Assigning Functions to the Selector (Portable Only)

The following functions can be assigned to the **Selector** using KPG-141D/ KPG-141DN. What function can be selected will vary depending on the configuration for 16 Zone/Channel Selector.

- **If the 16 Zone/Channel Selector is enabled:**

  A user can use the transceiver with the mechanical stopper installed in the **Selector**.

Table 7-1 Available Functions that can be Assigned to the Selector

Function Name	Description	Available System*1
None	No function is activated. Rotating the **Selector** causes the Key-entry Error Tone to sound.	ALL
CH/GID Select	Rotating the **Selector** causes the transceiver to migrate to the channel or GID indicated by the pointer of the **Selector**.	ALL
Zone Select	Rotating the **Selector** causes the transceiver to migrate to the zone indicated by the pointer of the **Selector**.	ALL
Site Select	Turning the **Selector** causes the transceiver to migrate to the site specified by the **Selector**. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
System Select	Rotating the **Selector** causes the transceiver to migrate to the system indicated by the pointer of the **Selector**. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System

*1 ALL indicates a function that can be used in all systems.

- **If 16 Zone/Channel Selector is disabled (Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key) only)**

  A user can use the transceiver without the mechanical stopper installed in the **Selector**.

Table 7-2 Available Functions that can be Assigned to the Selector

Function Name	Description	Available System*1
None	No function is activated. Rotating the **Selector** causes the Key-entry Error Tone to sound.	ALL
CH/GID Up/Down	Rotating the **Selector** causes the channel or GID number to be increased or decreased in steps of 1.	ALL
Zone Up/Down	Rotating the **Selector** causes the zone number to be increased or decreased in steps of 1.	ALL
Site Up/Down	Turning the **Selector** increases or decreases the site number in steps of 1. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
System Up/Down	Rotating the **Selector** increases or decreases the system number in steps of 1. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System

*1 ALL indicates a function that can be used in all systems.

Note:

- Refer to CSI “3 UNINSTALLING AND INSTALLING THE MECHANICAL STOPPER” for instructions on how to install and uninstall the mechanical stopper.
- Portable (without LCD/ without Key) is shipped with the mechanical stopper installed. No mechanical stopper is installed for Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key) as they were manufactured, and the stopper is supplied as an accessory with the transceiver.
- For Portable (without LCD/ without Key), 16 Zone/Channel Selector is always enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the Selector (Edit > Key Assignment > Top/Side)
- Configuring the 16 Zone/Channel Selector to be enabled or disabled (Edit > Key Assignment > General)

7.2 Assigning Functions to the PF Keys

The following functions can be assigned to the **PF** keys of the transceiver using KPG-141D/ KPG-141DN.

Table 7-3 Available Functions for the PF Keys

Function Name	Description	Available System*1
None	No function is activated.	-
2-tone	Enters the 2-tone Mode. In 2-tone Mode, a 2-tone code stored in the 2-tone Encode List can be selected and sent. (Refer to: 15 2-TONE on page 135) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System
Activity Detection (Portable only)	Toggles the Activity Detection between enabled and disabled. (Refer to: 19.3 Activity Detection (Portable Only) on page 208)	ALL
Activity Reset (Portable only)	Resets the count for Man-down Delay Time, Stationary Delay Time, or Motion Delay Time. (Refer to: 19.3 Activity Detection (Portable Only) on page 208)	ALL
Auto Telephone	Searches for and automatically connects to an available LTR Trunking system that can connect to a telephone line. (Refer to: 13.7.2 Auto Telephone Search on page 114)	LTR Trunking System
Autodial	Enters Autodial Mode. In Autodial Mode, the transceiver can transmit by a user selecting DTMF codes from the Autodial List or directly entering a DTMF code. (Refer to: 14 DTMF on page 121) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System LTR Trunking System NXDN Conventional System NXDN Trunking System
Autodial Programming	Enters Autodial Programming Mode. In Autodial Programming Mode, the data configured for Autodial List can be added, changed, or deleted.(Refer to: 14.4.2 Autodial Programming on page 131) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System LTR Trunking System NXDN Conventional System NXDN Trunking System
AUX A (Mobile only)	Alternates the status of the AUX A Output port. The AUX A Output port status is changed to inactive if the status is active; or, the AUX A Output port status is changed to active if the status is inactive. Status of the AUX A port can be changed by pressing the **AUX A** key, hence an external device connected to the AUX A port can be controlled.	ALL
AUX B (Mobile only)	Alternates the status of the AUX B Output port. The AUX B Output port status is changed to inactive if the status is active; or, the AUX B Output port status is changed to active if the status is inactive. Status of the AUX B port can be changed by pressing the **AUX B** key, hence an external device connected to the AUX B port can be controlled.	ALL
Backlight (Portable only)	The backlight of the transceiver lights. (Refer to: 2.3.1 Backlight (Portable Only) on page 7) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Broadcast	Alternates between Broadcast Call and Conference Call. This function can be used only for initiating a Group Call. (Refer to: 25 NXDN on page 225)	NXDN Trunking System
Battery Indicator (Portable (without LCD/ without Key) only)	The transceiver notifies a user by a lighting or blinking LED that the remaining battery power is low. (Refer to: 2.6.1 Battery Indicator on page 10)	ALL

Function Name	Description	Available System*1
Call 1 to Call 6	Sends the signaling (Autodial List, 2-tone Encode List, Status List, Unit ID List (NXDN)) configured for the transceiver.	ALL
CH/GID Down	Decreases the channel or GID number in steps of 1.	ALL
CH/GID Down (Continuous)	Pressing and holding the **CH/GID Down** key causes the channel or GID number to be decreased in steps of 1 every 200 ms.	ALL
CH/GID Recall	Pressing the **CH/GID Recall** key during the scan causes CH/GID Recall to be toggled between enabled and disabled. If CH/GID Recall is enabled, the transceiver will migrate to the channel or GID on which a signal was last received. (Refer to: 17.7.11 CH/GID Recall on page 191)	ALL
CH/GID Up	Increases the channel or GID number in steps of 1.	ALL
CH/GID Up (Continuous)	Pressing and holding the **CH/GID Up** key causes the channel or GID number to be increased in steps of 1 every 200 ms.	ALL
Channel Entry	Directly specify the channel number by pressing a key(s) on the keypad. (Refer to: 5.7 Channel Entry on page 41) **Note:** ♦ This function cannot be assigned for Portable (without LCD/ without Key). ♦ To use this function for Portable (with LCD/ with 4-key), List Selection Key (Selector) needs to be enabled.	ALL
CW Message	Sends the CW Message configured for the transceiver. (Refer to: 27 CW MESSAGE on page 345)	NXDN Conventional System
Direct CH/GID 1 to Direct CH/GID 5	Migrates to the channel or GID configured as Direct CH/GID. (Refer to: 5.10 Direct CH/GID on page 45)	ALL
Direct CH/GID 1 Select to Direct CH/GID 5 Select	Determines the displayed channel or GID as a Direct Channel or GID. (Refer to: 5.10 Direct CH/GID on page 45)	ALL
Display Format	Toggles the display between the channel or GID name and Zone-channel or GID number. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Emergency	Enters Emergency Mode. (Refer to: 19 EMERGENCY on page 197) **Note:** ♦ For Portable, this function can be assigned to the **AUX** key. ♦ For Mobile, this function can be assigned to the **Triangle** key. ♦ Emergency-key Delay Time will be applied to the key preprogrammed as “Emergency”.	ALL
External Speaker (Mobile only)	Switches between the external speaker being connected to the transceiver and the internal speaker being installed in the transceiver. (Refer to: 4.14 External Speaker (Mobile Only) on page 36)	ALL
Fixed Volume	Changes the tone level in the following order: Low → High → Off. (Refer to: 3 SOUND on page 18)	ALL
Forced Search	The selected site number appears for 2 seconds. Pressing and holding the **Forced Search** key causes the transceiver to start a Control Channel Hunt. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Trunking System
Forced Search Function	For transceivers other than Portable (without LCD/ without Key), pressing and holding the **Forced Search** key causes the transceiver to start a Control Channel Hunt. For Portable (without LCD/ without Key), pressing the **Forced Search Function** key causes the transceiver to start a Control Channel Hunt.	NXDN Trunking System

Function Name	Description	Available System*1
Function	Waits for activation of Key Function assigned to the 2nd Function and starts counting down the Mode Reset Timer. The Function status will be reset if no key is pressed before the amount of time configured for Mode Reset Timer elapses.	ALL
GPS Position Display	Enters GPS Position Display Mode. (Refer to: 22 GPS POSITION DISPLAY on page 215) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Group ID/Channel Entry	If a zone for any system other than NXDN Trunking system is selected, a channel number can be directly specified by using the keypad. (Refer to: 5.7 Channel Entry on page 41) If a zone for NXDN Trunking system is selected, a Group ID for NXDN Trunking system can be directly specified by using the keypad. (Refer to: 5.8 Group ID Entry (NXDN Trunking System Only) on page 42) **Note:** ♦ This function cannot be assigned for Portable (without LCD/ without Key). ♦ To use this function for Portable (with LCD/ with 4-key), List Selection Key (Selector) needs to be enabled.	ALL
Group (NXDN)	Enters Group Call Mode for an NXDN Conventional system. In Group Call Mode, a Group Call can be initiated by selecting a Group ID configured in the Group ID List. (Refer to: 25 NXDN on page 225) **Note:** ♦ In an NXDN Trunking system, Group ID List can be viewed, but a Group Call cannot be initiated by selecting a Group ID. ♦ This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System
Group + SDM (NXDN)	**In an NXDN Conventional system:** Enters Group Call Mode for an NXDN Conventional system. In Group Call Mode, a call can be initiated by a user selecting a Group ID registered in the Group ID List. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Group Call Mode allows the transceiver to enter Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. **In an NXDN Trunking system:** Enters Short Message Mode for an NXDN Trunking system. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. (Refer to: 25 NXDN on page 225) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System NXDN Trunking System
Group + Status (NXDN)	**In an NXDN Conventional system:** Enters Group Call Mode for an NXDN Conventional system. In Group Call Mode, a call can be initiated by a user selecting a Group ID registered in the Group ID List. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Group Call Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for NXDN Status List or directly entering a Status number. **In an NXDN Trunking system:** Enters Status Mode for an NXDN Trunking system. In Status Mode, a Status Message can be sent by a user selecting a status configured for NXDN Status List or directly entering a Status number. (Refer to: 25 NXDN on page 225) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System NXDN Trunking System

Function Name	Description	Available System*1
Home CH/GID	Migrates to the channel or GID configured as Direct CH/GID. (Refer to: 5.9 Home CH/GID on page 44)	ALL
Home CH/GID Select	Determines the selected channel or GID as a Home Channel or GID. (Refer to: 5.9 Home CH/GID on page 44)	ALL
Horn Alert (Mobile only)	Toggles the Horn Alert between enabled and disabled. (Refer to: 31 HORN ALERT (MOBILE ONLY) on page 362)	ALL
Individual (NXDN)	Enters Individual Call Mode for an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, an Individual Call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID. (Refer to: 25 NXDN on page 225) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System NXDN Trunking System
Individual + SDM (NXDN)	Enters Individual Call Mode for an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, a call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Individual Call Mode allows the transceiver to enter Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. (Refer to: 25 NXDN on page 225) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System NXDN Trunking System
Individual + Status (NXDN)	Enters Individual Call Mode for an NXDN Conventional system or NXDN Trunking system. In Individual Call Mode, an Individual Call can be initiated by a user selecting a Unit ID registered in the Unit ID List or directly entering a Unit ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Individual Call Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for Status List or directly entering a Status number. (Refer to: 25 NXDN on page 225) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Conventional System NXDN Trunking System
Key Lock (Portable only)	Toggles the Key Lock between enabled and disabled. (Refer to: 5.11 Key Lock (Portable Only) on page 47)	ALL
LCD Brightness (Mobile only)	Gradates the brightness of the backlight. (Refer to: 2.3.2 LCD Brightness (Mobile Only) on page 7)	ALL
Lone Worker	Toggles the Lone Worker between enabled and disabled. (Refer to: 19.2 Lone Worker on page 204)	ALL
Low Transmit Power (Portable only)	Toggles the transceiver transmit power between high power and low power. This function is available only on the channel where “High” is configured for Transmit Power in KPG-141D/ KPG-141DN.	ALL
Maintenance	Enters Maintenance Display Mode. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Monitor	In an Analog Conventional system, the transceiver resets the matching state of QT tone frequency or DQT code and Optional Signaling and resets muting upon detection of a carrier. In an NXDN Conventional system, the transceiver resets the matching state of RAN code and Optional Signaling and resets muting upon detection of an NXDN frame. (Refer to: 12.6 Monitor on page 108)	Analog Conventional System NXDN Conventional System LTR Trunking System
Monitor Momentary	In an Analog Conventional system, the transceiver resets the matching state of QT tone frequency or DQT code and Optional Signaling and resets muting upon detection of a carrier while the **Monitor Momentary** key is pressed and held. In an NXDN Conventional system, the transceiver resets the matching state of RAN code and Optional Signaling and deactivates muting upon detection of an NXDN frame while the **Monitor Momentary** key is pressed and held. (Refer to: 12.6 Monitor on page 108)	Analog Conventional System NXDN Conventional System LTR Trunking System

Function Name	Description	Available System*1
Operator Selectable Tone	Toggles the OST between enabled and disabled. (Refer to: 18 OPERATOR SELECTABLE TONE on page 194) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System
OST List	Enters OST Mode. In OST Mode, an OST List can be selected. (Refer to: 18 OPERATOR SELECTABLE TONE on page 194) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System
Priority-channel Select	Enters Priority-channel Select Mode. In Priority-channel Select Mode, the channel selected on the transceiver can be changed as a Priority-channel. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System NXDN Conventional System
Public Address (Mobile only)	Toggles the Public Address between enabled and disabled. (Refer to: 3.10 Public Address (Mobile Only) on page 26)	ALL
Scan	Starts or stops scanning. (Refer to: 17 SCAN on page 179)	ALL
Scan Delete/Add	Determines whether the selected channel or GID will be added to a Scan List. (Refer to: 17 SCAN on page 179)	ALL
Scrambler/Encryption	Toggles the Voice Scrambler/ Encryption between enabled and disabled. (Refer to: 20.1 Toggling the Voice Scrambler between Enabled and Disabled on page 211, 24.1 Toggling the Encryption between Enabled and Disabled on page 221)	**Voice Scrambler:** Analog Conventional System LTR Trunking System **Encryption:** NXDN Conventional System NXDN Trunking System
Scrambler/Encryption Code	Pressing and holding the **Scrambler/ Encryption** key causes the transceiver to enter Scrambler/ Encryption Code Mode. In Scrambler/ Encryption Code Mode, the Scrambler Code and Encryption Key data can be changed. (Refer to: 24.2 Configuring the Encryption Key Data used for Communications on page 222) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	**Voice Scrambler:** Analog Conventional System LTR Trunking System **Encryption:** NXDN Conventional System NXDN Trunking System
SDM (FleetSync/NXDN)	The transceiver enters Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. For an Analog Conventional system, a Short Message is addressed to a Target Fleet/ ID. For NXDN Conventional system and NXDN Trunking system, a Short Message is addressed to a Base ID. (Refer to: 16.4 Short Message on page 158, 25.12 Short Data Call on page 271) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Selcall (FleetSync)	Enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID from an ID List or directly entering a Fleet/ ID. (Refer to: 16.2 Selective Call on page 143) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System LTR Trunking System
Selcall + SDM (FleetSync)	Enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID registered in the ID List or directly entering a Fleet/ ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Selcall Mode allows the transceiver to enter Short Message Mode. In Short Message Mode, a Short Message can be sent by a user directly entering a Short Message. (Refer to: 16.4 Short Message on page 158) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System LTR Trunking System

Function Name	Description	Available System*1
Selcall + Status (FleetSync)	Enters Selcall Mode. In Selcall Mode, a call can be initiated by a user selecting a Fleet/ ID from an ID List or directly entering a Fleet/ ID. Then, pressing the **[S]** key or the **[*]** key while the transceiver is in Selcall Mode allows the transceiver to enter Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured for Status List or directly entering a Status number. (Refer to: 16.2 Selective Call on page 143) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System LTR Trunking System
Send the GPS Data	Manually sends the received GPS data over-the-air from the GPS receiver unit to the Base station via a communication port of the transceiver. (Refer to: 16.7 GPS on page 165)	ALL
Site Down	Decreases the site number in steps of 1. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
Site Down (Continuous)	Pressing and holding the **Site Down** key causes the site number to be decreased in steps of 1 every 100 ms. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
Site Lock	Toggles the Site Lock between enabled and disabled.	NXDN Trunking System
Site Select	Pressing and holding the **Site Lock** key causes the transceiver to enter Site Select Mode, and then the site to be stored can be selected. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Trunking System
Site Up	Increases the site number in steps of 1. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
Site Up (Continuous)	Pressing and holding the **Site Up** key causes the site number to be increased in steps of 1 every 100 ms. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)	NXDN Trunking System
Squelch Level	Enters Squelch Level Mode. In Squelch Level Mode, the Squelch level can be changed. (Refer to: 12.8 Squelch Level on page 110) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System
Squelch Off	In an Analog Conventional system, the transceiver opens squelch and unmutes the speaker. In an NXDN Conventional system, the transceiver resets the matching state of RAN code and Optional Signaling and resets muting upon detection of an NXDN frame. (Refer to: 12.7 Squelch Off on page 109)	Analog Conventional System NXDN Conventional System
Squelch Off Momentary	In an Analog Conventional system, the transceiver opens squelch and disables muting while the **Squelch Off Momentary** key is pressed down. In an NXDN Conventional system, the transceiver resets the matching state of RAN code and Optional Signaling and deactivates muting upon detection of an NXDN frame while the **Squelch Off Momentary** key is pressed and held.(Refer to: 12.7 Squelch Off on page 109)	Analog Conventional System NXDN Conventional System
Stack	Enters Stack Mode. While the transceiver is in Stack Mode, the data, such as call records, Status Messages, and Short Messages, stored in the stack memory of the transceiver can be viewed or cleared. **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Status (FleetSync/NXDN)	The transceiver enters Status Mode. In Status Mode, a Status Message can be sent by a user selecting a status configured in the FleetSync Status List or NXDN Status List, or directly entering a Status number. (Refer to: 16.3 Status Message on page 148, 25.11 Status Call on page 263) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL

Function Name	Description	Available System*1
System Down	Decreases the system number in steps of 1. The System Lock becomes enabled for the selected system. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System
System Down (Continuous)	Pressing and holding the **System Down** key causes the system number to be decreased in steps of 1 every 100 ms. The System Lock becomes enabled for the selected system. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System
System Lock	Toggles the System Lock between enabled and disabled. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System
System Select	Enters System Select Mode. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	NXDN Trunking System
System Up	Increases the system number in steps of 1. The System Lock becomes enabled for the selected system. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System
System Up (Continuous)	Pressing and holding the **System Up** key causes the system number to be increased in steps of 1 every 100 ms. The System Lock becomes enabled for the selected system. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)	NXDN Trunking System
Talk Around	Toggles the Talk Around between enabled and disabled.(Refer to: 10 TALK AROUND on page 99)	Analog Conventional System NXDN Conventional System LTR Trunking System
Telephone Disconnect	Sends the terminating signal (DTMF Code #) while the transceiver is connected to a telephone line of an LTR Trunking system.(Refer to: 13.7 Telephone Interconnect on page 113)	LTR Trunking System
Transceiver Password	Enters Transceiver Password Mode. In Transceiver Password Mode, the transceiver cannot be used until the correct password is entered. (Refer to: 33.1 Transceiver Password on page 366) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	ALL
Volume Down (Mobile only)	Decreases the volume level in steps of 1.(Refer to: 5.2 Adjusting the Volume Level on page 38)	ALL
Volume Down (Continuous) (Mobile only)	Pressing and holding the **Volume Down (Continuous)** key will decrease the volume level in steps of 1 every 100 ms. (Refer to: 5.2 Adjusting the Volume Level on page 38)	ALL
Volume Up (Mobile only)	Increases the volume level in steps of 1. (Refer to: 5.2 Adjusting the Volume Level on page 38)	ALL
Volume Up (Continuous) (Mobile only)	Pressing and holding the **Volume Up (Continuous)** key will increase the volume level in steps of 1 every 100 ms. (Refer to: 5.2 Adjusting the Volume Level on page 38)	ALL
VOX (PORTABLE ONLY)	Enters VOX Gain Level Mode. In VOX Gain Level Mode, the VOX microphone sensitivity can be adjusted. Pressing and holding the **VOX** key toggles the VOX function between enabled and disabled. (Refer to: 21 VOX (PORTABLE ONLY) on page 213) **Note:** This function cannot be assigned for Portable (without LCD/ without Key).	Analog Conventional System NXDN Conventional System
VOX Function (Potable only)	For Portable (with LCD/ with 16-key) or Portable (with LCD/ with 4-key), pressing and holding the **VOX** key toggles the VOX function between enabled and disabled. For Portable (without LCD/ without Key), pressing and holding the **VOX Function** key toggles the VOX function between enabled and disabled. (Refer to: 21 VOX (PORTABLE ONLY) on page 213)	Analog Conventional System NXDN Conventional System

Function Name	Description	Available System*1
Zone Delete/Add	Toggles the zone between deleted and added.	ALL
Zone Down	Decreases the zone number in steps of 1.	ALL
Zone Down (Continuous)	Pressing and holding the **Zone Down** key will decrease the zone number in steps of 1 every 200 ms.	ALL
Zone Up	Increases the zone number in steps of 1.	ALL
Zone Up (Continuous)	Pressing and holding the **Zone Up** key will increase the zone number in steps of 1 every 200 ms.	ALL

*1 ALL indicates that a function can be used in all systems.

Note:

♦ By pressing a key to which following functions are assigned, the transceiver migrates to the function's own mode. This mode is referred to as "Function Mode".

Key Function	Function Mode
2-tone	2-tone Mode
Autodial	Autodial Mode
Autodial Programming	Autodial Programming Mode
Channel Entry	Channel Entry Mode
GPS Position Display	GPS Position Display Mode
Group (NXDN) Group + SDM (NXDN) Group + Status (NXDN)	Group Call Mode
Individual (NXDN) Individual + SDM (NXDN) Individual + Status (NXDN)	Individual Call Mode
Maintenance	Maintenance Display Mode
OST List	OST List Mode
Priority-channel Select	Priority-channel Select Mode
Scrambler/ Encryption	Scrambler/ Encryption Code
Selcall (FleetSync) Selcall + SDM (FleetSync) Selcall + Status (FleetSync)	Selcall Mode
Group + SDM (NXDN) Individual + SDM (NXDN) SDM (FleetSync/NXDN) Selcall + SDM (FleetSync)	Short Message Mode
Site Select	Site Select Mode
Squelch Level	Squelch Level Mode
Stack	Stack Mode
Group + Status (NXDN) Individual + Status (NXDN) Selcall + Status (FleetSync) Status (FleetSync/NXDN)	Status Mode
Transceiver Password	Transceiver Password Mode
VOX	VOX Gain Level Mode

♦ If the transceiver migrates to the each Function Mode, by pressing the following keys, the assigned functions will not be activated, but the mode's own behavior will be executed.

Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key):

- **Selector** (if List Selection Key (Selector) is enabled)
- **Side 1** key
- **Side 2** key
- **[S]** key
- **[A]** key
- **[<B]** key
- **[C>]** key
- Keypad
- **PTT** switch

Mobile:

- **[⩓]** key
- **[⩔]** key
- **Triangle** key
- **Square** key
- **[S]** key
- **[A]** key
- **[<B]** key
- **[C>]** key
- Mic Keypad
- **PTT** switch

♦ To directly enter a Fleet/ ID or status in an Analog Conventional system, Manual Dialing must be enabled using KPG-141D/ KPG-141DN. (Refer to: 16.8.7 Manual Dialing on page 172)

♦ To directly enter a Unit ID or status in an NXDN Conventional system or NXDN Trunking system, Manual Dialing must be enabled using KPG-141D/ KPG-141DN. (Refer to: 25.35.6 Manual Dialing on page 329)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

Time-out Timer (TOT) is a function to be used to restrict the duration for the transceiver to continuously transmit.

This function is used to prevent a user from occupying a repeater or frequency which is shared with other users. The repeater automatically stops transmitting and releases the channel if it continuously transmits longer than the configured time.

Timers, such as TOT Pre-alert, TOT Rekey Time and TOT Reset Time, relevant to Time-out Timer can be configured.

Time-out Timer can be configured for each zone.

8.1 Conventional Group

In a Conventional Group, the following items relevant to Time-out Timer can be configured.

- Time-out Timer
- TOT Pre-alert
- TOT Rekey Time
- TOT Reset Time

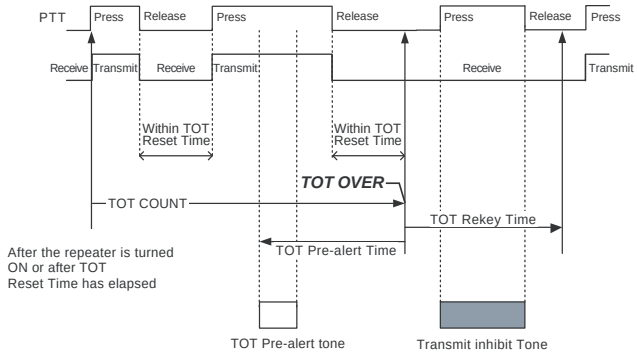


Figure 8-1 Timing to Activate the Time-out Timer and the Relevant Functions

8.1.1 Time-out Timer

Time-out Timer restricts the duration to continuously transmit.

Note: Time-out Timer cannot be activated in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Time-out Timer (Edit > Zone Information (Conventional Group) > Zone Edit)

8.1.2 TOT Pre-alert

TOT Pre-alert tone is used to notify a user that a continuous transmission is about to end by the Time-out Timer. The TOT Pre-alert Tone sounds from the transceiver before the transceiver stops the continuous transmission by the Time-out Timer.

Example: Time-out Timer: 30 s, TOT Pre-alert: 4 s

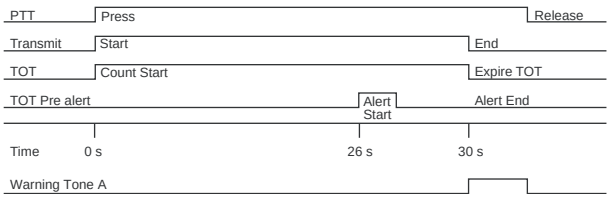


Figure 8-2 TOT Pre-alert

Note: If “Off” is configured for TOT Pre-alert, no TOT Pre-alert tone will sound from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the TOT Pre-alert (Edit > Zone Information (Conventional Group) > Zone Edit)

8.1.3 TOT Rekey Time

TOT Rekey Time is the amount of time from when the transceiver stops the transmission by the Time-out Timer until transmission becomes possible again.

This function is used to temporarily disable transmit capability when a user occupies a repeater or frequency for too long.

Example: Time-out Timer: 30 s, TOT Rekey Time: 20 s

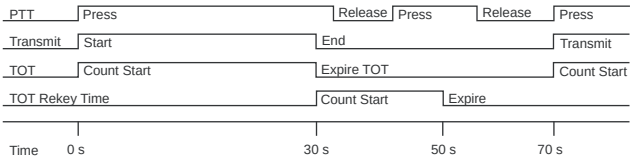


Figure 8-3 TOT Rekey Time

Note:

- ♦ If “Off” is configured for TOT Rekey Time, the repeater will immediately be ready to transmit.
- ♦ The timer will be reset if the zone or channel or GID is changed while the TOT Rekey Time is counting down.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the TOT Rekey Time (Edit > Zone Information (Conventional Group) > Zone Edit)

8.1.4 TOT Reset Time

TOT Reset Time is the time required to initialize and reset the elapsed time for Time-out Timer.

The transceiver considers a retransmission within this configured length of time as a continuous transmission. Therefore, the Time-out Timer keeps counting down.

Example: Time-out Timer: 30 s, TOT Reset Time: 10 s

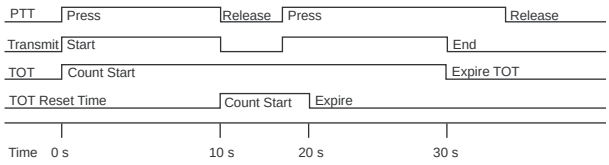


Figure 8-4 TOT Reset Time

Note:

- If “Off” is configured for TOT Reset Time, the Time-out Timer will be reset immediately after the repeater finishes transmitting.
- The timer will be reset if the zone or channel or GID is changed while the TOT Reset Time is counting down.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the TOT Reset Time (Edit > Zone Information (Conventional Group) > Zone Edit)

8.2 LTR Trunking System

In an LTR Trunking system, the following items relevant to Time-out Timer can be configured.

- Time-out Timer (Dispatch)
- Time-out Timer (Telephone)

8.2.1 Time-out Timer (Dispatch)

Time-out Timer (Dispatch) is the maximum length of time that the transceiver is allowed to transmit continuously while a user is talking using a Dispatch ID.

The transceiver stops transmitting and emits the Warning Tone A if transmission time exceeds the amount of time configured for Time-out Timer (Dispatch). The Warning Tone A sounds until the **PTT** switch is released.

Note:

- The transceiver will return to receive mode after sending the EOT if the transceiver is transmitting FleetSync, etc. when transmission is completed.
- Time-out Timer (Dispatch) does not activate in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Time-out Timer (Dispatch) (Edit > Zone Information (LTR Trunking System) > Zone Edit)

8.2.2 Time-out Timer (Telephone)

Time-out Timer (Telephone) is the maximum length of time for the transceiver to transmit continuously while a user is talking using a Telephone ID.

The transceiver stops transmitting and emits the Warning Tone A if transmission time exceeds the amount of time configured for Time-out Timer (Telephone). The Warning Tone A sounds until the **PTT** switch is released.

Note:

- The transceiver will return to receive mode after sending the EOT if the transceiver is transmitting FleetSync, etc. when transmission is completed.
- Time-out Timer (Telephone) does not activate in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Time-out Timer (Telephone) (Edit > Zone Information (LTR Trunking System) > Zone Edit)

8.3 NXDN Trunking System

In an NXDN Trunking system, the system controls the amount of time that the transceiver can continuously transmit on a traffic channel. If the amount of time that the transceiver can continuously transmit to the system is not specified, Time-out Timer configured for the transceiver is used.

The following items relevant to Time-out Timer can be configured.

- Time-out Timer
- TOT Pre-alert

Refer to 8.1.1 Time-out Timer on page 94 and 8.1.2 TOT Pre-alert on page 94 for details of each function.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Time-out Timer (Edit > Zone Information (NXDN Trunking System) > Zone Edit)
- Configuring the TOT Pre-alert (Edit > Zone Information (NXDN Trunking System) > Zone Edit)

Busy Channel Lockout automatically restricts the transmission so as not to interfere with other communications.

If an attempt is made to transmit on a channel that is already being used by other groups, the transceiver automatically restricts the transmission.

If the **PTT** switch is pressed while Busy Channel Lockout is enabled, the transceiver cannot transmit with “BUSY” appearing on the main display and a Warning Tone A sounding from the transceiver at the same time. The Warning Tone A sounds from the transceiver until the **PTT** switch is released.

Busy Channel Lockout in both analog and digital (NXDN) can be configured for each channel using KPG-141D/ KPG-141DN. The available options vary between analog and digital (NXDN) as below.

Table 9-1 Busy Channel Lockout

Configuration	Available Option
Busy Channel Lockout (Analog)	No, Carrier Only, Incorrect Tone, Optional Signaling
Busy Channel Lockout (NXDN)	No, Carrier Only, Incorrect RAN, Correct RAN, Any RAN

Following are conditions to disable transmission by Busy Channel Lockout.

Table 9-2 Conditions to disable Transmission with Busy Channel Lockout

Configuration	Description
No	Disables Busy Channel Lockout. Transmission is not restricted even if the analog channel on which the repeater attempts to transmit is busy.
Carrier Only	The transceiver cannot transmit while the transceiver is receiving a carrier.
Incorrect Tone	The transceiver cannot transmit if the transceiver receives a carrier and the received QT tone frequency or DQT code does not match the QT tone frequency or DQT code preconfigured for the transceiver. However, the transceiver can transmit if the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver.
Optional Signaling	The transceiver cannot transmit until the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver.
Incorrect RAN	The transceiver cannot transmit if the transceiver receives a carrier and the received RAN code does not match the RAN code preconfigured for the transceiver.
Correct RAN	The transceiver cannot transmit even if the transceiver receives a carrier and the received RAN code matches the RAN code preconfigured for the transceiver.
Any RAN	The transceiver cannot transmit while receiving a RAN code.

The transceiver is controlled in the following manner according to the configuration for Transmit Mode on a channel where “Mixed” is configured for Channel Type.

- **If “Analog” is configured for Transmit Mode:**

  The transceiver transmits according to the configuration for Busy Channel Lockout (Analog).

- **If “NXDN” is configured for Transmit Mode:**

  The transceiver transmits according to the configuration for Busy Channel Lockout (NXDN).

Also, while the Signaling Reset Timer or Auto Reset Timer is activated on a channel where “Mixed” is configured for Channel Type, the transceiver transmits according to the configuration for Busy Channel Lockout in the same mode as that of the received signal (Analog or NXDN). If the transceiver receives an analog signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (Analog). If the transceiver receives an NXDN signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (NXDN).

Note:

- Busy Channel Lockout is only available in the Conventional Group. Talk Around Busy Channel Lockout can be used in an LTR Trunking system. (Refer to: 10.2.1 Talk Around Busy Channel Lockout on page 100)
- Busy Channel Lockout cannot be activated in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Busy Channel Lockout (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

9.1 BCL Override

BCL Override can be used to transmit on a busy channel even if Busy Channel Lockout is activated and transmission is restricted. This function is used when a top priority transmission is required.

■ Operating the Transceiver

1. Press the **PTT** switch while transmission is restricted by Busy Channel Lockout.
2. Release the **PTT** switch, then press the **PTT** switch again within 500 ms.

   Busy Channel Lockout is temporarily disabled and the transceiver will start transmitting.

Note:

- BCL Override is only available in the Conventional Group.
- This function is also activated while the transceiver is transmitting using VOX. For a transmission using VOX, Busy Channel Lockout will temporarily be disabled and the transceiver can transmit if audio is input within 500 ms after the Warning Tone B starts sounding from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the BCL Override to be enabled or disabled (Edit > Zone Information (Conventional Group) > Zone Edit)

Talk Around is a function that allows transceivers to communicate directly without using a repeater.

If the transceiver cannot link to a repeater due to too great distance between the transceiver and the repeater, the transceiver can directly communicate with the target transceiver using Talk Around.

10.1 Conventional Group

The transceiver, with Talk Around enabled, transmits on the receive frequency and uses the Decode Signaling (QT tone frequency or DQT code or RAN code) configured for the selected channel.

Pressing the **Talk Around** key toggles Talk Around between enabled and disabled.

■ Operating the Transceiver

- **Enabling the Talk Around**

1. Press the **Talk Around** key if the function is disabled.

   The "🔒" icon lights and Talk Around will be enabled.

- **Disabling the Talk Around**

1. Press the **Talk Around** key if the function is enabled.

   The "🔒" icon disappears and Talk Around will be disabled.

Note:

- ♦ Talk Around is only available in the Conventional Group.
- ♦ Talk Around is disabled by changing the Zone-channel while Talk Around is enabled.
- ♦ If the transceiver migrates to a data channel by FleetSync GTC, Talk Around is disabled on the data channel. Talk Around will be enabled if the transceiver returns to the voice channel.
- ♦ Talk Around is disabled in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

10.2 LTR Trunking System

The transceiver with Talk Around enabled transmits using the transmit frequency and the Encode ID of the Home Repeater for the selected zone.

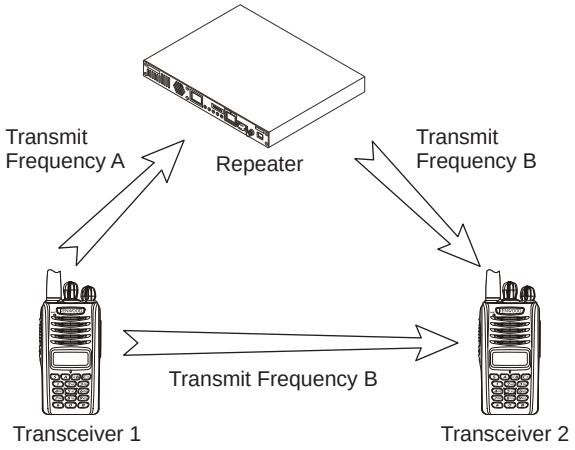


Figure 10-1 Talk Around

By using KPG-141D/ KPG-141DN, Talk Around can be configured for each Group ID to be enabled or disabled.

The "🔒" icon appears if a Group ID with Talk Around enabled is selected. Talk Around cannot be disabled by pressing a key of the transceiver such as the **Talk Around** key.

In a Group ID for which Talk Around is configured to be disabled, Talk Around can be toggled between enabled and disabled by pressing the **Talk Around** key.

Note: Availability of the **Talk Around** key operation can be configured for each zone. (Refer to: 10.2.2 Talk Around Key on page 100)

■ Operating the Transceiver

- **Using a GID with Talk Around enabled:**

1. Select a GID with Talk Around enabled.

   The "🔒" icon lights and Talk Around will be enabled.

- **Using a GID with Talk Around disabled:**

1. Press the **Talk Around** key.

   The "🔒" icon lights and Talk Around will be enabled.

2. Press the **Talk Around** key.

   The "🔒" icon disappears and Talk Around will be disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Talk Around (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Assigning functions to the PF keys (Edit > Key Assignment)

10.2.1 Talk Around Busy Channel Lockout

Talk Around Busy Channel Lockout automatically restricts a transmission so as not to interfere with other communications.

The transceiver directly communicates with the target transceiver using Talk Around if the distance to a home repeater is too great. If an attempt is made to use a channel already used by other groups at that time, the transceiver automatically restricts its own transmission.

If the **PTT** switch is pressed while Talk Around Busy Channel Lockout is enabled, the transceiver cannot transmit with “BUSY” appearing on the main display and a Busy Tone sounding from the transceiver at the same time. The Busy Tone sounds from the transceiver until the **PTT** switch is released.

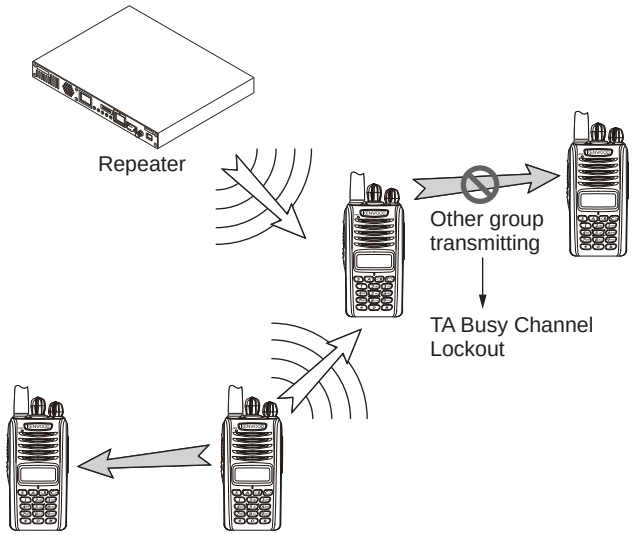


Figure 10-2 Talk Around Busy Channel Lockout

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Talk Around Busy Channel Lockout to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > Zone Edit)

10.2.2 Talk Around Key

Talk Around Key can be used to permit or inhibit the **Talk Around** key operation in an LTR Trunking system.

Talk Around Key can be disabled to prevent a user from using Talk Around.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Talk Around Key (Edit > Zone Information (LTR Trunking System) > Zone Edit)

PTT ID is a unique transceiver identification code transmitted by pressing or releasing the **PTT** switch.

Using the PTT ID enables the administrator or dispatcher to identify by PTT ID who is using a channel without asking by voice for the caller's name.

The following items relevant to PTT ID can be configured using KPG-141D/ KPG-141DN:

- PTT ID Type
- PTT ID (Analog) (Channel/GID Edit)
- Restricted ID in TA
- PTT ID Mute
- PTT ID Pause

Note: PTT ID is only available in the Conventional Group.

11.1 PTT ID Type

PTT ID Type is the type of PTT ID to be sent. There are 3 types of PTT ID formats: DTMF, FleetSync, and MDC-1200.

In order to send a DTMF code as the PTT ID, Beginning of Transmit and End of Transmit must be configured. (Refer to: 11.1.1 Beginning of Transmit on this page, 11.1.2 End of Transmit on this page)

In order to send a FleetSync ID code as the PTT ID, Fleet (Own) and ID (Own) must be configured. (Refer to: 16.8.1 Own Fleet/ID on page 170)

In order to send an ID (Own) code in the MDC-1200 format as the PTT ID, ID (Own) code in the MDC-1200 format must be configured. (Refer to: 28.1 PTT ID Encode/ Decode on page 346)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID Type (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

11.1.1 Beginning of Transmit

Beginning of Transmit is the DTMF code to be sent when the transceiver initiates transmitting if a DTMF code is sent as the PTT ID.

If Beginning of Transmit is not configured, no DTMF code will be sent when the transceiver initiates transmitting.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Beginning of Transmit (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

11.1.2 End of Transmit

End of Transmit is the DTMF code to be sent when the transceiver terminates transmitting if a DTMF code is sent as the PTT ID.

If End of Transmit is not configured, no DTMF code will be sent when the transceiver terminates transmitting.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the End of Transmit (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

11.2 Timing for Sending the PTT ID

The PTT ID is sent with the following timing.

- **BOT (Beginning of Transmit)**

  The PTT ID is added to a signal at the beginning of the transmission.

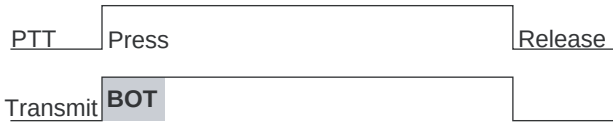


Figure 11-1 BOT

- **EOT (End of Transmit)**

  The PTT ID is added to a signal at the end of the transmission.

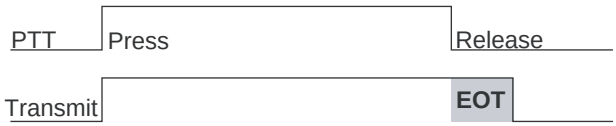


Figure 11-2 EOT

- **Both (BOT and EOT)**

  The PTT ID is added to a signal at the beginning and end of the transmission.

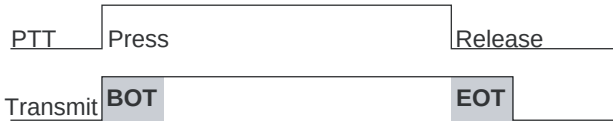


Figure 11-3 Both

The timing to send the PTT ID can be configured for each channel or GID using KPG-141D/ KPG-141DN.

Items to be configured vary depending on the configuration for PTT ID Type.

- **DTMF**

Table 11-1 DTMF

Configuration	Description
Off	No PTT ID is sent.
BOT	When the **PTT** switch on the transmitting transceiver is pressed, the DTMF code configured for Beginning of Transmit will be sent as the PTT ID.
EOT	When the **PTT** switch on the transmitting transceiver is released, the DTMF code configured for End of Transmit will be sent as the PTT ID.
Both	At both timing of BOT and EOT, the DTMF codes configured for Beginning of Transmit and End of Transmit will be sent as the PTT ID.

- **FleetSync**

Table 11-2 FleetSync

Configuration	Description
Off	No PTT ID is sent.
BOT	Own Fleet (Own) and ID (Own) are sent as the PTT ID when the **PTT** switch of the transmitting transceiver is pressed.
EOT	Own Fleet (Own) and ID (Own) are sent as the PTT ID when the **PTT** switch of the transmitting transceiver is released.
Both	The transceiver sends Fleet (Own) and ID (Own) as PTT ID at both BOT and EOT.
List	The transceiver initiates a Selcall using the FleetSync ID configured in the ID List by pressing the **PTT** switch on the transmitting transceiver. FleetSync ID can be selected from the ID List using KPG-141D/ KPG-141DN.

- **MDC-1200**

Table 11-3 MDC-1200

Configuration	Description
Off	No PTT ID is sent.
BOT	When the **PTT** switch on the transmitting transceiver is pressed, an ID (Own) code in the MDC-1200 format is sent as a PTT ID.
EOT	When the **PTT** switch on the transmitting transceiver is released, an ID (Own) code in the MDC-1200 format is sent as the PTT ID.
Both	At both timing of BOT and EOT, an ID (Own) code in the MDC-1200 format will be sent as the PTT ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the ID List Number of the FleetSync ID to be sent (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the PTT ID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the ID List Number of the FleetSync ID to be sent (Edit > Zone Information (LTR Trunking System) > GID Edit)

11.3 Restricted ID in Talk Around

Restricted ID in Talk Around is a function to disable the PTT ID transmission while Talk Around is enabled even if the **PTT** switch is pressed or released.

This function is available when PTT ID is not required such as when directly communicating with other transceivers.

Note: Restricted ID in Talk Around can be used only in a Conventional Group.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Restricted ID in Talk Around to be enabled or disabled (Edit > Optional Features > Optional Features 2 > Conventional)

11.4 PTT ID Mute

PTT ID Mute can be used to unmute after a certain amount of time elapses when the transceiver receives an analog signal. This function is used to mute data tones of the PTT ID (BOT) sent by the other party.

The transceiver resets mute if conditions to unmute are satisfied when amount of time configured for the Mute Hold Time elapses after the transceiver receives an analog signal being in the receive mode.

Even if QT tone frequency or DQT code or Optional Signaling is configured, the transceiver starts counting down the Mute Hold Time upon receipt of an analog signal. If the received signal disappears while the transceiver is counting down the Mute Hold Time, the timer will be reset. In this case, the timer restarts counting down from the beginning upon receipt of an analog signal again.

PTT ID Mute can be configured to be enabled or disabled and Mute Hold Time can be configured using KPG-141D/ KPG-141DN. These functions can be configured independently for a Conventional Group and LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID Mute (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the PTT ID Mute (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Mute Hold Time (Conventional Group) (Edit > Optional Features > Optional Features 2 > Conventional)
- Configuring the Mute Hold Time (LTR Trunking System) to be enabled or disabled (Edit > Optional Features > Optional Features 2 > LTR)

11.5 PTT ID Pause

PTT ID Pause can be used to keep the PTT ID from being sent when the transceiver alternates between transmit and receive in a certain period of time. This function can be used to prevent sending the PTT ID repeatedly to the receiving party.

The transceiver does not send PTT ID if the transceiver transmits again within the amount of time configured for PTT ID Pause Time after the transceiver transmits and restores the normal state. The transceiver sends PTT ID if the transceiver transmits after the amount of time configured for PTT ID Pause Time elapses.

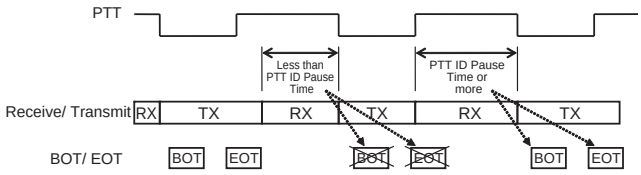


Figure 11-4 Timing to Activate PTT ID Pause

PTT ID Pause can be enabled or disabled and PTT ID Pause Time can be configured using KPG-141D/ KPG-141DN. PTT ID Pause can be configured independently for each Conventional Group and LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID Pause (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the PTT ID Pause (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the PTT ID Pause Time (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

QT tone frequency or DQT code and RAN code are the signaling to be used for facilitating communication within a group if the same channel is shared by several zones (groups). Also, DTMF, 2-tone, FleetSync and NXDN ID can be used as the Optional Signaling to initiate an individual call.

12.1 QT/DQT Decode/Encode

QT tone frequency or DQT code is the signaling used for facilitating communication within a group if the same channel is shared by several zones (groups).

QT tone frequency or DQT code has no effect on normal voice communication since QT tone frequency or DQT code uses a subaudible tone.

The transceiver mutes unwanted calls if QT tone frequency or DQT code is configured for each channel. Therefore, a user can communicate in a Group without listening to conversations from other groups.

This signaling does not affect voice communication since the signaling does not use the audible frequency spectrum above 300 Hz. Also, the transceiver can discriminate the signaling even if reception starts midway through a call since this signaling type has a continuous waveform.

- **QT (Quiet Talk):**

  QT is signaling using a continuous subaudible sine wave (67.0 Hz to 254.1 Hz). The frequency can be configured in steps of 0.1 Hz.

- **DQT (Digital Quiet Talk):**

  DQT is a signaling that uses “1” and “0” in 23-bit words. An octal code with a number between 000 and 777 can be configured. The DQT signal has a polarity and can be configured as Normal or Inverted, corresponding to the circuit configuration of repeater or the target transceiver.

Following are transmission and reception characteristics of QT tone frequency or DQT code.

Table 12-1 QT/ DQT Transmission/ Reception

Reception	If the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver, the transceiver resets muting the speaker, and received audio sounds from the speaker. The audio mutes when the transceiver receives a Reverse Burst (QT) or Turn-off Code (DQT).
Transmission	The transceiver sends the configured QT tone frequency or DQT code when the transceiver transmits. Pressing the **PTT** switch causes the transceiver to transmit the preconfigured QT tone frequency or DQT code. Also, QT tone frequency or DQT code cannot be transmitted or received in a Trunking system zone.

Note: QT/DQT Decode/ Encode is only available in the Analog Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the QT/DQT Decode/Encode (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

12.1.1 With STE (Squelch Tail Eliminator) (Mobile Only)

Squelch Tail Eliminator, which eliminates the noise that occurs in the receiving transceiver when transmission ends, is available with QT tone frequency or DQT code. This noise can be eliminated by sending a Squelch Tail Eliminator after sending the QT tone frequency or DQT code.

Refer to 4.12 Mic PTT (Mobile Only) on page 35 and 29.6 Function used for Sending by using the External PTT (Voice), External PTT (Data) and Data PTT Ports on page 359 for With STE.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the With STE (Edit > Extended Function > Modulation Line)

12.2 RAN Decode/ Encode

RAN (Radio Access Number) is a digital signaling type having the same function as analog QT tone frequency or DQT code. This signaling is used when the transceiver transmits or receives on a digital channel.

The transceiver mutes calls from a zone having a restricted RAN code if a RAN code is configured for each channel. Therefore, a user can communicate in a Group without listening to conversations from other groups.

The transceiver can distinguish the signaling even if the transceiver receives any signaling during a call since this signaling type has a continuous waveform.

Following are transmission and reception characteristics of a RAN code.

Table 12-2 RAN Transmission/ Reception

Reception	If the transceiver detects the preconfigured RAN code in a received signal, the transceiver unmutes the speaker and emits the received audio from the speaker.
Transmission	The transceiver sends the preconfigured RAN code while transmitting. Pressing the **PTT** switch causes the transceiver to send the RAN code. However, RAN code cannot be sent or received in a Trunking system zone.

Note: RAN Decode/ Encode is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the RAN Decode/Encode (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

12.3 Optional Signaling

Optional Signaling is signaling used to initiate an individual call. The types include DTMF, 2-tone, FleetSync and NXDN ID. (Refer to： 14 DTMF on page 121, 15 2-TONE on page 135, 16 FLEETSYNC on page 140, 25 NXDN on page 225)

The transceiver emits the Alert Tone and proceeds to Transpond when the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver.

- **Conventional Group**

  Items to be configured vary depending on the configuration for Channel Type.

Table 12-3 Optional Signaling

Configuration of Channel Type	Description
Analog	DTMF, 2-tone or FleetSync can be selected as the Optional Signaling (Analog). All signaling types use audible frequencies. The transceiver emits the Alert Tone and starts Transpond in the case that “QT/ DQT” is configured for Optional Signaling Decode Condition and the received Optional Signaling, QT tone frequency or DQT code matches that preconfigured for the transceiver. The transceiver emits the Alert Tone and starts Transpond in the case that “Carrier” is configured for Optional Signaling Decode Condition and the transceiver receives a carrier and the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver. In this case, the received QT tone frequency or DQT code does not need to match the QT tone frequency or DQT code preconfigured for the transceiver.
NXDN	DTMF or NXDN ID can be selected as the Optional Signaling (NXDN). DTMF is a signaling type using audible frequencies. The transceiver emits an Alert Tone and starts Transpond in the case that the received RAN code matches that preconfigured in the transceiver and the received DTMF code matches that preconfigured in the transceiver. NXDN ID is the signaling type using the Unit ID or Group ID stored in the NXDN data frame. The transceiver emits an Alert Tone in the case that the received RAN code matches that preconfigured in the transceiver and the received Unit ID or Group ID matches that preconfigured in the transceiver.

Configuration of Channel Type	Description
Mixed	DTMF, 2-tone or FleetSync can be selected as the Optional Signaling (Analog). DTMF or NXDN ID can be selected as the Optional Signaling (NXDN). • If the transceiver receives analog signals: The transceiver emits the Alert Tone and starts Transpond in the case that “QT/DQT” is configured for Optional Signaling Decode Condition and the received Optional Signaling, QT tone frequency or DQT code matches that preconfigured for the transceiver. The transceiver emits the Alert Tone and starts Transpond in the case that “Carrier” is configured for Optional Signaling Decode Condition and the transceiver receives a carrier and the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver. In this case, the received QT tone frequency or DQT code does not need to match the QT tone frequency or DQT code preconfigured for the transceiver. • **If the transceiver receives digital signals:** The transceiver emits an Alert Tone and starts Transpond in the case that the received RAN code matches that preconfigured in the transceiver and the received DTMF code matches that preconfigured in the transceiver. The transceiver emits an Alert Tone in the case that the received RAN code matches that preconfigured in the transceiver and the received Unit ID or Group ID matches that preconfigured in the transceiver.

- **LTR Trunking System**

  DTMF or FleetSync can be selected as the Optional Signaling. All signaling types use audible frequencies.

  The transceiver emits the Alert Tone and starts to Transpond if the received LTR ID matches the LTR ID preconfigured for the transceiver and the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Optional Signaling (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Optional Signaling (Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)

12.4 Audio Control

Audio Control is the condition which allows the transceiver to unmute the speaker by QT tone frequency, DQT code, RAN code, or LTR ID and Optional Signaling. The conditions on which the transceiver unmutes the speaker can be configured for each zone.

12.4.1 Conventional Group

The transceiver unmutes the speaker and emits received audio if the conditions configured for Audio Control are satisfied.

Conditions to unmute the speaker can be changed by a combination of QT tone frequency or DQT code and Optional Signaling.

If “NXDN” is configured for Channel Type, the conditions to unmute the speaker can be changed by a combination of RAN code and Optional Signaling.

The conditions on which the transceiver unmutes the speaker can be configured by using KPG-141D/ KPG-141DN. Items to be configured vary depending on the configuration for Channel Type.

- **If “Analog” is configured for Channel Type:**

Table 12-4 Audio Control (Analog)

Configuration	Description
QT/DQT	The transceiver unmutes the speaker if the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver. Conditions remain unchanged even if the transceiver transmits.
QT/DQT and Optional Signaling	The transceiver does not unmute the speaker unless the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver. While the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver, the transceiver unmutes the speaker if the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver. The matching status of the Optional Signaling will be reset after the Monitor function is enabled after transmission. Therefore, the transceiver unmutes the speaker by QT tone frequency or DQT code after the transmission.

Configuration	Description
QT/DQT or Optional Signaling	While the received Optional Signaling does not match the Optional Signaling preconfigured for the transceiver, the transceiver unmutes the speaker if the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver. The transceiver unmutes the speaker if the transceiver receives a carrier while the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver. The conditions for unmuting the speaker do not change even if the transceiver transmits.

- **If “NXDN” is configured for Channel Type:**

Table 12-5 Audio Control (NXDN)

Configuration	Description
RAN	The transceiver unmutes the speaker if the received RAN code matches the RAN code preconfigured for the transceiver. Conditions remain unchanged even if the transceiver transmits.
RAN and Optional Signaling	The transceiver does not unmute the speaker unless the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver.

- **If “Mixed” is configured for Channel Type:**

  “QT/DQT”, “QT/DQT or Optional Signaling”, or “QT/DQT and Optional Signaling” can be selected as Audio Control (Analog).

  “RAN” or “RAN and Optional Signaling” can be selected as Audio Control (NXDN).

  If the transceiver receives analog signals, 2-tone, DTMF and FleetSync signaling will be candidates for Optional Signaling.

  If the transceiver receives digital signals, DTMF and NXDN ID will be candidates for Optional Signaling.

  Refer to Table 12-4 and Table 12-5 for conditions to unmute the speaker.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Audio Control (Analog) (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring the Audio Control (NXDN) (Edit > Zone Information (Conventional Group) > Zone Edit)

12.4.2 LTR Trunking System

The transceiver unmutes the speaker and emits received audio if the conditions configured for Audio Control are satisfied.

The conditions on which the transceiver unmutes the speaker can be configured by using KPG-141D/ KPG-141DN.

Table 12-6 Audio Control (LTR Trunking System)

Configuration	Description
LTR ID	The transceiver unmutes the speaker if the received LTR ID matches the LTR ID preconfigured for the transceiver. The conditions for unmuting the speaker do not change even if the transceiver transmits.
LTR ID and Optional Signaling	Unmuting, Call Alert Beep, the Call Alert display and Transpond are activated if the received LTR ID matches the LTR ID preconfigured for the transceiver, and if the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver. Once Optional Signaling matches, the signaling status remains matched until it is reset. Once Optional Signaling matches, the transceiver unmutes if only LTR ID matches. When the transceiver transmits, Monitor will be activated and matching status of Optional Signaling will be reset. Therefore, the transceiver unmutes the speaker by LTR ID after the transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Audio Control (Edit > Zone Information (LTR Trunking System) > Zone Edit)

12.5 Optional Signaling Decode Condition

Optional Signaling Decode Condition is the conditions to decode Optional Signaling.

12.5.1 Conventional Group

Call Alert Beep, the Call Alert display and Transpond are activated if the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while the conditions configured for Optional Signaling Decode Condition are satisfied.

Once Optional Signaling matches, the signaling status remains matched until it is reset.

Conditions to decode the Optional Signaling can be configured using KPG-141D/ KPG-141DN.

Table 12-7 Optional Signaling Decode Condition

Configuration	Description
QT/DQT	The transceiver decodes the Optional Signaling only if the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the transceiver.
Carrier	The transceiver decodes Optional Signaling if a carrier is detected regardless of the status of QT tone frequency or DQT code.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Optional Signaling Decode Condition (Edit > Zone Information (Conventional Group) > Zone Edit)

12.5.2 LTR Trunking System

The LTR IDs must match in an LTR Trunking system. Hence, the conditions to decode Optional Signaling in an LTR Trunking system is LTR ID Decode only.

Call Alert Beep, the Call Alert display and Transpond are activated if the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver.

Once Optional Signaling matches, the signaling status remains matched until it is reset.

12.6 Monitor

Monitor can be used to unmute the speaker and place the transceiver into the standby state.

Monitor is used to check the availability of channels prior to transmitting in order to prevent from interfering with other parties.

To use this function, the **Monitor** key or the **Monitor Momentary** key must be used.

The transceiver responds according to the configuration for Channel Type.

Table 12-8 Monitor

Configuration of Channel Type	Description
Analog	While Monitor is enabled, the "🔊" icon appears, and the matching state of QT tone frequency or DQT code and Optional Signaling will be reset.
NXDN	While Monitor is enabled, the "🔊" icon appears, and the matching state of RAN code and Optional Signaling will be reset.
Mixed	While Monitor is enabled, the "🔊" icon appears, and the matching state of RAN code, QT tone frequency or DQT code, and Analog or NXDN Optional Signaling will be reset.

■ Operating the Transceiver

- **Monitor Key**

1. Press the **Monitor** key while Monitor is disabled.

   The "🔊" icon appears, and a Key Beep A sounds from the transceiver.

   On a channel where QT/DQT Decode is configured, the QT tone frequency or DQT code is deactivated and the received signal will be audible upon receipt of a carrier.
2. Press the **Monitor** key while the Monitor function is enabled.

   The "🔊" icon disappears, and a Key Beep B sounds from the transceiver.

   A channel where QT/DQT Decode is configured resumes Signaling Squelch.

- **Monitor Momentary Key**

1. Press and hold the **Monitor Momentary** key.

   The "🔊" icon appears. On a channel where QT/DQT Decode is configured, the QT tone frequency or DQT code is deactivated and the received signal will be audible upon receipt of a carrier.
2. Release the **Monitor Momentary** key.

   The "🔊" icon disappears. A channel where QT/DQT Decode is configured resumes Signaling Squelch.

Note:

- Pressing the **Monitor** or **Monitor Momentary** key while Optional Signaling is disabled resets Optional Signaling, and Optional Signaling will be activated.
- In an LTR Trunking system, the transceiver does not unmute until the ID matches even if the transceiver receives a carrier. If Optional Signaling is configured for the Group ID, the transceiver unmutes only with the Optional Signaling.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

12.6.1 Transceiver Operation during the Scan in a Conventional Group

In a Conventional Group, the transceiver resets the signaling and unmutes only with a carrier, and then remains in the standby state.

Pressing the **Monitor** key during the scan causes the "🔊" icon to appear and the scan to continue. While the "🔊" icon appears, the transceiver uses Carrier Squelch in the same manner as when the scan is deactivated.

Pressing and holding the **Monitor Momentary** key during the scan causes the transceiver to enable the Carrier Squelch in the same manner as when the scan is deactivated, and the scan continues. Pressing the **Monitor Momentary** key never causes the scan to be deactivated.

12.6.2 Transceiver Operation during the Scan in an LTR Trunking System

In an LTR Trunking system, the transceiver resets the Optional Signaling and unmutes only with an LTR ID, and then remains in the standby state.

Pressing the **Monitor** or **Monitor Momentary** key during the scan causes the "🔊" icon to appear. The transceiver continues scanning.

12.7 Squelch Off

Squelch Off is the function to allow the transceiver to open the squelch and unmute the speaker.

With this function, the transceiver can unmute the speaker without receiving a carrier. A user can use this function to monitor the availability of channels prior to transmitting in order to prevent from interfering with other parties.

To use this function, the **Squelch Off** or **Squelch Off Momentary** key must be assigned.

■ Operating the Transceiver

- **Squelch Off Key**

1. Press the **Squelch Off** key while Squelch Off is disabled.

   The "🔊" icon appears. For Portable (without LCD/ without Key), a Key Beep A sounds from the transceiver.

   The Busy LED lights green if Busy LED is enabled.

   The transceiver unmutes the speaker and opens squelch regardless of the configuration for QT/DQT Decode. White noise is audible if no carrier is received.

2. Press the **Squelch Off** key while Squelch Off is enabled.

   The "🔊" icon disappears. For Portable (without LCD/ without Key), a Key Beep B sounds from the transceiver.

   On a channel where QT tone frequency or DQT code is configured, the transceiver restores Signaling Squelch, and on a channel where no QT tone frequency or DQT code is configured, the transceiver restores Carrier Squelch.

- **Squelch Off Momentary Key**

1. Press and hold the **Squelch Off Momentary** key.

   The "🔊" icon appears.

   The Busy LED lights green if Busy LED is enabled.

   The transceiver unmutes the speaker and opens squelch regardless of the configuration for QT/DQT Decode. White noise is audible if no carrier is received.

2. Release the **Squelch Off Momentary** key.

   The "🔊" icon disappears.

   On a channel where QT tone frequency or DQT code is configured, the transceiver restores Signaling Squelch, and on a channel where no QT tone frequency or DQT code is configured, the transceiver restores Carrier Squelch.

Note:

- Pressing the **Squelch Off** or **Squelch Off Momentary** key while Optional Signaling is disabled resets Optional Signaling, and then Optional Signaling will be activated.
- The transceiver temporarily pauses scanning on a channel where the transceiver is scanning and then unmutes the speaker if Squelch Off is enabled during the scan. The transceiver does not resume scanning until Squelch Off is disabled.
- If Squelch Off is enabled on a channel where “Mixed” is configured for Channel Type, the transceiver will automatically unmute the speaker. White noise is audible if no carrier is present.
  In this case, QT tone frequency, DQT code, or RAM code will be disabled. If the transceiver receives an analog signal, the transceiver unmutes the speaker only with a carrier. The transceiver unmutes the speaker when the transceiver receives a digital signal even if the received RAN code does not match the RAN code preconfigured for the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

12.8 Squelch Level

Squelch Level is the threshold receive level by which the transceiver can determine that the received signal has a carrier.

If the received signal is weak, a low (decreased) Squelch Level value must be configured. If unwanted weak signals exist, raising (increasing) the Squelch Level improves the quality of communication.

Table 12-9 Squelch Level

Range	0	1 to 9
	Mute function completely disabled	Low ↔ High
Step	1	

Pressing the **Squelch Level** key changes the Squelch Level.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Squelch Level** key.

   The current Squelch Level appears on the main display.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select Squelch Level.

   Pressing the **[C>]** key (Portable), or pressing the **[⩓]** key (Mobile) increases Squelch Level.

   Pressing the **[<B]** key (Portable), or pressing the **[⩔]** key (Mobile) decreases Squelch Level.

Portable

Mobile

3. Press the **Side 1** key (Portable) or the **Triangle** key (Mobile).

   Squelch Level changes and then the display will restore to normal display.

Note:

- Squelch Level can be configured only in an Analog Conventional system. Configuration for Squelch Level 5 is applied to channels except for Analog Conventional system.
- Signaling is disabled while Squelch Level is being changed.
- Refer to 5.17 Key Operations for each Mode on page 58 for key operations for changing the Squelch Level.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Squelch Level (Edit > Optional Features > Optional Features 2 > Conventional)

12.9 Off-hook Decode (Mobile Only)

Off-hook Decode can be used to disable QT tone frequency or DQT code and Optional Signaling linked with a microphone on- or off-hook state, and unmute by a Carrier Squelch.

The transceiver responds according to the configuration for Off-hook Decode.

Table 12-10 Off-hook Decode

Configuration	Description
Enabled	The transceiver opens the squelch according to the configuration for Audio Control while the microphone is in either the on-hook state or off-hook state.
Disabled	**If Analog is configured for Channel Type:** • The transceiver unmutes the speaker upon receipt of a carrier while the microphone is in the off-hook state. • The transceiver opens the squelch according to the configuration for Audio Control while the microphone is in the on-hook state. **If NXDN is configured for Channel Type:** • The transceiver unmutes the speaker upon detection of a frame while the microphone is in the off-hook state. • The transceiver opens the squelch according to the configuration for Audio Control while the microphone is in the on-hook state.

Note:

- If “Mixed” is configured for Channel Type, the transceiver does one of the above operations according to the type of received signal (Analog or NXDN).
- Stun can be activated regardless of the status of Off-hook Decode and the microphone on- or off-hook state.
- The matching state of Optional Signaling will be reset by hooking the microphone on a hanger (on-hook state) after receiving a call by Optional Signaling.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Off-hook Decode to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)

LTR Trunking system is a communication system that utilizes the LTR Trunking protocol and consists of Group IDs.

In an LTR Trunking system, the transceiver can communicate with other parties via a repeater. The transceiver uses an available channel on a repeater to communicate.

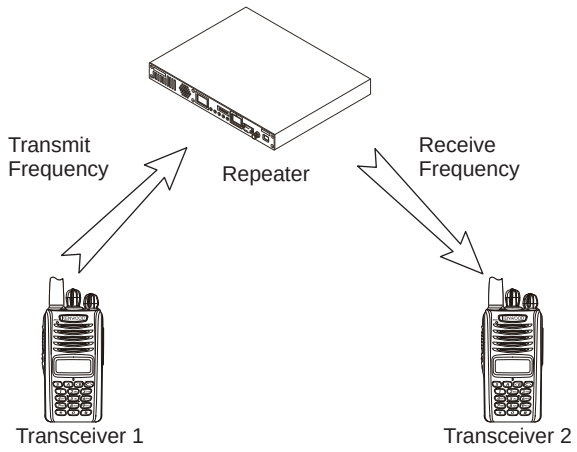


Figure 13-1 LTR Trunking System

The following data format is used to transmit and receive the LTR data between the repeater and the transceiver.

Table 13-1 LTR Data Format

Sync	Area	Go to Repeater No.	Home Repeater No.	ID	Free Repeater No.	Check bits
9	1	5	5	8	5	7
(40 bits @ 3.36 ms for 134.4 ms frame)						

The transceiver uses the LTR ID (Group ID) to initiate a call to the target transceiver. Communication will be established if Encode ID of the transmitting transceiver matches Decode ID of the receiving transceiver.

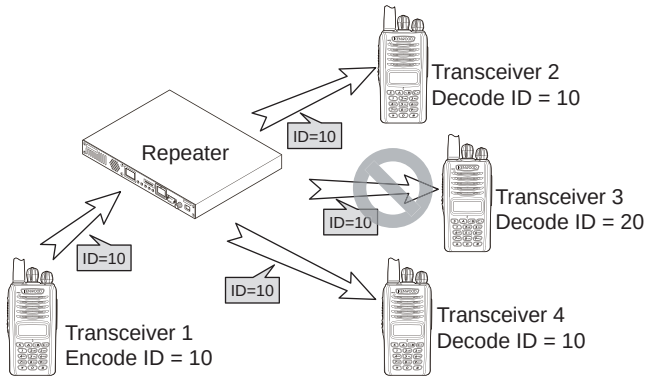


Figure 13-2 Communications in an LTR Trunking System

Following are descriptions of various functions in an LTR Trunking system.

13.1 Encode/ Decode ID

Encode ID is the LTR ID to be sent when the transceiver transmits.

Decode ID is the LTR ID used to unmute and to allow communications if the received LTR ID matches the LTR ID preconfigured for the transceiver.

Using the same LTR ID allows a user to communicate within a Group.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Encode ID (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Decode ID (Edit > Zone Information (LTR Trunking System) > GID Edit)

13.2 Area Code

Area Code is used to prevent from interfering with adjacent systems.

A value of “0” is normally configured for Area Code. However, if any interference is expected to occur, the value of “0” must be configured for the Area Code of one system and the value of “1” must be configured for the other system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Area Code (Edit > Zone Information (LTR Trunking System) > Repeater Information)

13.3 Home Repeater

The transceiver receives various information from its Home Repeater in an LTR Trunking system. The transceiver always transmits, receives and proceeds to Trunkout via a Home Repeater.

If a repeater is available, the transceiver can transmit or receive using this repeater.

An available repeater number is provided by the repeater to the transceiver enabling it to transmit using the available repeater if the repeater is used by other users. At the same time, the receiving transceiver receives the number of the repeater which is calling the receiving transceiver and then upon receipt of a call, migrates to the Trunkout Repeater and receives.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Home Repeater (Edit > Zone Information (LTR Trunking System) > Repeater Information)

13.4 Encode Data Type

Encode Data Type can be used to invert the logic of the LTR Message to be sent.

This configuration must be changed depending on the system type. Ask the system administrator of the system in use for the details of Encode Data Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Encode Data Type (Edit > Zone Information (LTR Trunking System) > Zone Edit)

13.5 Data Delay Time

Data Delay Time is the delay time from when the transceiver starts transmitting until the transceiver starts sending the LTR data. This function can be used when the transceiver is having a hard time linking with the repeater.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Delay Time (Edit > Zone Information (LTR Trunking System) > Zone Edit)

13.6 Scan Weight

Scan Weight is the length of time to decode the LTR ID sent from a repeater while the transceiver is scanning.

The transceiver receives its own LTR ID from a repeater, and then the transceiver will unmute or proceed to Trunkout. Frequent use of the same GID as own Home Repeater number in an LTR Trunking system indicates that those who have the same home repeater number are doing Trunkout. Therefore, it may take a long time to receive the LTR ID addressed to own transceiver. Therefore, Scan Weight must be configured longer so as not to miss LTR Data during the scan.

1 unit of weight is approximately 500 ms.

Note: If the duration configured for Scan Weight is too long, the speed of System Scan of the transceiver will slow down. The appropriate value for Scan Weight must be determined by checking the congestion of the system and noticing how frequently GIDs having the same home number are used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Scan Weight (Edit > Zone Information (LTR Trunking System) > Zone Edit)

13.7 Telephone Interconnect

In an LTR Trunking system, the transceiver can connect to the PSTN (Public Switched Telephone Network) via the RIC (Repeater Interconnect) which is a repeater connected to a telephone line.

RIC Repeater can be configured for a repeater used in an LTR Trunking system using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the RIC Repeater (Edit > Zone Information (LTR Trunking System) > Repeater Information > Repeater Edit)

13.7.1 Connecting to a Telephone Line

Pressing the **PTT** switch causes the transceiver to connect to a telephone line and initiate a call by manually or automatically specifying the phone number.

■ Operating the Transceiver

- **Automatically calling the Telephone Number**

1. Select the group for which a Telephone ID is configured.

Portable

Mobile

2. Configure the telephone number of the target transceiver using Autodial. (Refer to: 14 DTMF on page 121)

Portable

Mobile

3. Press the **PTT** switch.

   The transceiver automatically connects to a telephone line, and then the transceiver will call the telephone number.

- **Manually calling the Telephone Number**

1. Select a GID for which a Telephone ID is configured.

Portable

Mobile

2. Press the **PTT** switch.

   The transceiver receives dial tone after the transceiver connects to a telephone line, and then the transceiver will be in the phone off-hook state (dial standby state).

   The telephone number can be called by manual keypad operation using Manual Dialing or Keypad Auto PTT while receiving dial tone. (Refer to: 14 DTMF on page 121)

- **Disconnecting from the Telephone Line**

1. Press the **[#]** or **Telephone Disconnect** key during the call.

   The transceiver terminates the communication.

Note: If Optional Signaling is configured for GID with Telephone ID, Optional Signaling will be disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

13.7.2 Auto Telephone Search

Auto Telephone Search can be used to search for and connect to an available RIC repeater to link automatically.

The transceiver automatically searches for an available telephone line to be connected to, and then initiates a call. This function can be used like the memory dial of a cellular phone, allowing a user to easily and steadily initiate a call.

Zones satisfying all of the following conditions are targets to be searched. If there is no zone satisfying the following conditions, the Deny Tone sounds from the transceiver and the transceiver does not start the Auto Telephone Search:

- There must be a zone for which Auto Telephone Search is enabled.
- There must be a repeater for which RIC repeater is configured in the above zone.
- There must be a GID having an LTR ID configured as an Encode ID that can be connected to a telephone line in the above zone.

The transceiver starts the Auto Telephone Search using one of the following operations:

- **Auto Telephone Key**

  Pressing the **Auto Telephone** key causes the transceiver to start the Auto Telephone Search.

- **Autodial Key**

  Pressing the **Autodial** key causes the transceiver to enter Autodial Mode, and then the transceiver starts the Auto Telephone Search by a user pressing the **Side 2** key (Portable) or the **Square** key (Mobile). If the connection succeeds, the transceiver will transmit the telephone number selected from the Autodial List or entered by the DTMF codes.

  To use Auto Telephone Search in Autodial Mode, Auto Telephone must be enabled using KPG-141D/ KPG-141DN.

Note: The **Autodial** key cannot be assigned for Portable (without LCD/ without Key). Therefore, the transceiver cannot start Auto Telephone Search by using the **Autodial** key.

■ Operating the Transceiver

- **Auto Telephone Key**

1. Press the **Auto Telephone** key.

   “AUTO TEL” appears on the main display. For Mobile, the “ ” icon blinks.

   The transceiver starts the Auto Telephone Search.

Portable

Mobile

   The transceiver receives dial tone after the transceiver connects to a telephone line, and then the transceiver will be in the phone off-hook state (dial standby state).

Portable

Mobile

Note:

- If the transceiver cannot be connected to a telephone line within 60 seconds, the Deny Tone sounds from the transceiver and then Auto Telephone Search will end.
- Pressing the **Auto Telephone** key while the Auto Telephone Search is activated causes the Auto Telephone Search to be deactivated.

2. The transceiver can call the telephone number using Manual Dialing or Keypad Auto PTT while the transceiver is receiving dial tone. (Refer to: 14 DTMF on page 121)

Portable

Mobile

- **Autodial Key**

1. Configure the telephone number of the target transceiver using Autodial. (Refer to: 14 DTMF on page 121)

Portable

Mobile

2. Press the **Side 2** key (Portable) or the **Square** key (Mobile).

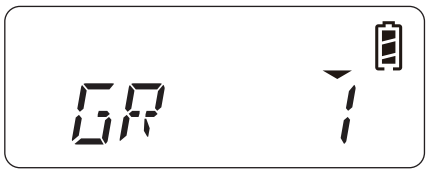
   “AUTO TEL” appears on the main display. For Mobile, the “ ” icon blinks.

   The transceiver starts the Auto Telephone Search.

Portable

Mobile

The transceiver automatically connects to a telephone line, and then the transceiver will call the telephone number.



Portable

Mobile

Note:

- If the transceiver cannot be connected to a telephone line within 60 seconds, the Deny Tone sounds from the transceiver and then Auto Telephone Search will end.
- Pressing the **Side 1** key (Portable) or the **Triangle** key (Mobile) while the Auto Telephone Search is activated causes the Auto Telephone Search to be deactivated.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Auto Telephone Search to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Configuring the Auto Telephone to be enabled or disabled (Edit > DTMF > Encode)

13.7.3 Free System Ringback

Free System Ringback is a function that allows the transceiver to notify a user by emitting a Ringer Tone from the transceiver that a repeater connected to a telephone line becomes available in the case that all repeaters connected to telephone lines are all busy.

■ Operating the Transceiver

1. Release the **PTT** switch while Busy Tone sounds.

   Free System Ringback Mode Tone sounds from the transceiver and the transceiver will enter Free System Ringback Mode.

   The Ringer Tone sounds from the transceiver when a repeater connected to a telephone line becomes available for communications.

Note:

- Free System Ringback can be used when the telephone is used. In the case of a Dispatch call, Free System Ringback cannot be used.
- The transceiver stops Free System Ringback when a user changes the zone or Group ID or when receiving a call.
- The transceiver pauses scanning if the transceiver enters Free System Ringback Mode during the scan. The transceiver will resume scanning when the transceiver aborts Free System Ringback Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Free System Ringback to be enabled or disabled (Edit > Optional Features > Optional Features 2 > LTR)

13.8 Fix ID

Fix ID is an ID having a higher priority level than that of Group ID.

Fix ID can be used to preferentially alternate to the Fix ID while the transceiver is receiving a call with another ID.

Following is the priority order of Fix IDs.

1st Fix ID → 2nd Fix ID → Displayed Group ID (Revert ID) → Selectable ID (Scan Add = Yes) → Decode ID

Call Indicator and Optional Signaling can be used when the transceiver receives a Fix ID. (Refer to: 13.14 Call Indicator on page 120, 12.3 Optional Signaling on page 105)

However, the transceiver cannot receive a Fix ID under the following conditions:

- If the transceiver receives a call from a Fix ID while the transceiver is communicating with a telephone.
- While the transceiver is receiving a call with Trunkout using a repeater except for Home Repeater.
- If the transceiver receives a call from a Fix ID in the data group.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Fix ID (Edit > Zone Information (LTR Trunking System) > Zone Edit > Fix ID)

13.9 Block ID

Block ID can be used to restrict use of IDs.

This function can be used to specify the range of the IDs used to communicate with a telephone, IDs that cannot be used immediately after the transceiver receives a call, and receive-only IDs.

13.9.1 Telephone ID

Telephone ID is an ID used to communicate with a telephone. A call can be initiated from the transceiver to a telephone, and from a telephone to the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Telephone ID (Edit > Zone Information (LTR Trunking System) > Zone Edit > Block ID)

13.9.2 Transmit Inhibit

Transmit Inhibit can be used to restrict a user from initiating a call using the received ID immediately after the transceiver receives a specific ID.

This can be used to restrict using an ID immediately after receiving the ID if Group ID is shared and used by multiple parties.

The transceiver cannot transmit until the length of time configured for Transmit Inhibit Time elapses after receiving the Transmit Inhibit ID.

Transmit Inhibit ID and Transmit Inhibit Time can be configured using KPG-141D/ KPG-141DN. This function can be configured for each user.

Note:

- If the zone or Group ID is changed, status of Transmit Inhibit is reset and a transmission can be started.
- If the transceiver receives a Transmit Inhibit ID during the scan, the transceiver cannot transmit until the amount of time configured for Transmit Inhibit Time elapses after receiving the call. Transmit Inhibit Time is reset and a transmission can be started when the transceiver resumes scanning.
- If the transceiver receives a Transmit Inhibit ID while linking to a repeater, the transmission remains restricted until the amount of time configured for Transmit Inhibit Time elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Inhibit ID (Edit > Zone Information (LTR Trunking System) > Zone Edit > Block ID)
- Configuring the Transmit Inhibit Time (Edit > Optional Features > Optional Features 2 > LTR)

13.9.3 Decode ID

Decode ID is an ID dedicated for reception by restricting a user from transmitting using the ID. The transceiver emits the received audio if the transceiver receives a call using the Decode ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Decode ID (Edit > Zone Information (LTR Trunking System) > Zone Edit > Block ID)

13.10 Transpond

Transpond allows the transceiver to send back an Acknowledgment upon receipt of a call. The transceiver transmits the Transpond Tone when the Acknowledge signal is transmitted.

Use of this function enables to verify whether the transceiver is within the communication area or not.

The transceiver sends back an Acknowledgment to the dispatcher after the transceiver is called using an LTR ID. The transceiver starts the transpond when the amount of time configured for Transpond Delay Time elapses. (参照: 13.10.1 Transpond Delay Time on this page)

Note:

- If the transceiver receives a target ID for transpond during the scan, the transceiver starts transpond after the time configured for Transpond Delay Time elapses. The transceiver resumes scanning after the amount of time configured for Dwell Time elapses. If the Dropout Delay Time is shorter than the Transpond Delay Time, the transceiver starts the transpond after the amount of time configured for Dropout Delay Time elapses.
- Transpond will be deactivated if a zone or GID is changed while the Transpond Delay Time is counting down.
- While Transmit Inhibit is activated, the transceiver does not start the transpond. (Refer to: 13.9.2 Transmit Inhibit on page 117)

13.10.1 Transpond Delay Time

Transpond Delay Time is the amount of time from when the transceiver receives a Group ID for which Transpond is configured until the transceiver transmits the Transpond.

If the Dropout Delay Time is shorter than the Transpond Delay Time, the transceiver starts the transpond after the amount of time configured for Dropout Delay Time elapses. (Refer to: 17.7.5 Dropout Delay Time on page 190)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transpond Delay Time (Edit > Optional Features > Optional Features 2 > LTR)

13.11 System Search

System Search can be used to automatically search for an available system with which to link.

If the transceiver cannot communicate by a user pressing the **PTT** switch, the transceiver is deemed to be outside of the system coverage area. In this case, System Search can be used to search for an available system with which to link.

If the transceiver cannot connect to the system while the transceiver is communicating using a Data GID, the transceiver can search for an available system with which to link using this function. In this case, the base station as a receiving transceiver must be in a state to receive signals transmitted by the transceiver, for instance by scanning.

There are two ways to initiate System Search: Manual and Auto.

Note: For Portable (without LCD/ without Key), the transceiver cannot initiate System Search by the Manual operation.

■ Operating the Transceiver

- **Manual**

1. Press the **[S]** key while Intercept Tone sounds from the transceiver.

   Intercept Tone stops sounding.
2. Release the **PTT** switch.

   System Search starts from the next system following the system to which the transceiver failed to connect.

   The transceiver stops searching if an available system is found.
3. Press the **PTT** switch.

   The transceiver connects to the repeater on the system on which the system search stops and then the transceiver can initiate a voice call.

- **Auto**

1. Release the **PTT** switch while Intercept Tone sounds from the transceiver.

   Intercept Tone stops sounding.

   System Search starts from the next system following the system to which the transceiver failed to connect.

   The transceiver stops searching if an available system is found.
2. Press the **PTT** switch.

   The transceiver connects to the repeater on the system on which the system search stops and then the transceiver can initiate a voice call.

Note:

- If the transceiver cannot connect to the system, the transceiver will migrate to the next system and then continue the System Search. In this case, System Search Tone will sound.
- If no system is found after searching all configured LTR zones, the System Search End Tone sounds and the search ends.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the System Search (Edit > Optional Features > Optional Features 2 > LTR)

13.12 Clear to Talk

Clear to Talk can be used to emit the Delay Tone when the transceiver accesses a repeater for the third time or more by pressing the **PTT** switch.

- **If Clear to Talk is disabled:**

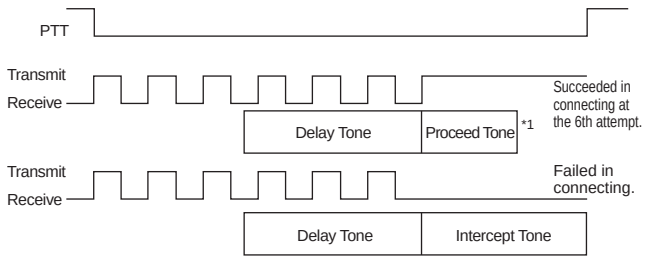
  After the **PTT** switch is pressed, a Delay Tone sounds from the transceiver if the transceiver attempts to connect to the repeater 3 times or more.

  If the repeater is busy when the **PTT** switch is pressed, a Busy Tone sounds from the transceiver.

- **If Clear to Talk is enabled:**

  After the **PTT** switch is pressed, no Delay Tone sounds from the transceiver if the transceiver attempts to connect to the repeater 3 times or more.

  Even if the repeater is busy when the **PTT** switch is pressed, no Busy Tone sounds from the transceiver.



*1 If Proceed Tone is enabled

Figure 13-3 Clear to Talk

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Clear to Talk (Edit > Optional Features > Optional Features 2 > LTR)

13.13 ARQ Mode

ARQ Mode can be used to terminate data communications in an LTR Trunking Radio system by a single link operation.

To send data in an LTR Trunking system, the transceiver is normally required to link to a repeater every time to send data. In this case, it may take a longer time to send data, or a data transmission may fail if the system is busy and there is no available channel on the repeater. ARQ Mode can avoid these problems and unfailingly complete data communications with a single link.

If ARQ Mode is used, the transceiver does not send the EOT until the transceiver finishes data communications once the transceiver establishes a link to the repeater. The transceiver will retain the linked state using the Hang Up Time configured for the repeater and then send or receive the acknowledgment during the Hang Up Time. ARQ Mode can be used to send data using FleetSync. For Mobile, ARQ Mode is also used for data communications by connecting to an external modem.

■ Transceiver Behavior

- **Data Transmitting Side**

  ARQ Mode is activated if data communications using FleetSync is started. The transceiver will not send the EOT when the transceiver finishes sending data. The transceiver sends the EOT and aborts ARQ Mode when all FleetSync data communications are completed.

- **Data Receiving Side**

  The state of the TOR port will go low level if the transceiver receives a Data GID signal. ARQ Mode is activated if the transceiver recognizes that data communications using FleetSync has received. The transceiver does not connect by sending back an acknowledgment, etc., but the transceiver sends data on the channel specified by a repeater. In this case, the transceiver does not send the EOT.

■ While the Transceiver is sending or receiving Data using an External Modem (Mobile only)

- **Data Transmitting Side**

  ARQ Mode is activated if the DTC port goes low level by an operation of an external modem. Then, the transceiver transmits and receives using the Data GID. Transmission and reception during the period are controlled by the External PTT (Data) port. The transceiver will not send the EOT (End of Transmit) when the transceiver finishes sending data. If the External PTT (Data) port goes high level after the DTC port goes high level, the transceiver sends the EOT and then the transceiver will abort ARQ Mode when the amount of time configured for Data Dwell Time elapses.

- **Data Receiving Side**

  The TOR port will go low level if the transceiver receives a Data GID (carrier + ID) signal. The DTC port goes low level and ARQ Mode is activated if the external modem recognizes that the transceiver has received data. If there are any signals to be applied to the External PTT (Data) port when sending back an acknowledgment, etc., the transceiver does not do the handshake, but sends data on a channel specified by the repeater. In this case, the transceiver does not send the LTR data and EOT.

Note: If no repeater is available when the External PTT (Voice), External PTT (Data) or Data PTT port is activated, the transceiver does not transmit. In this case, the System Busy port goes low level. Even if no External PTT (Voice), External PTT (Data) or Data PTT port is activated, the System Busy port goes low level if no repeater is available while the transceiver is receiving. With this function, the transceiver can notify external devices that there is no available repeater.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the ARQ Mode (Edit > Optional Features > Optional Features 2 > LTR)

13.14 Call Indicator

Call Indicator can be used to light or blink "♪" icon when the transceiver receives a call in an LTR Trunking system. This function can be used in noisy environments or while a user is away from the transceiver.

How the transceiver responds varies between the case when the transceiver receives a Group ID and the case when the transceiver receives a Fix ID.

Table 13-2 Call Indicator

Received ID	Description
Group ID	The transceiver notifies a user by blinking "♪" icon indicating that the transceiver received a call. The "♪" icon keeps blinking even if the call is finished. The blinking "♪" icon will light if the transceiver receives a call with a Fix ID having a high priority level. The "♪" icon disappears by pressing a key.
Fix ID	The transceiver notifies a user by lighting the "♪" icon indicating that the transceiver received a call. The "♪" icon keeps lighting even if the call is finished. The "♪" icon remains lit even if the transceiver receives a call having a Group ID. The "♪" icon disappears by pressing a key. However, the following keys are excluded: **Backlight** key **Function** key

Note: The "♪" icon does not disappear even if the transceiver receives another Group ID or a Group ID for which Call Indicator is configured after the "♪" icon has been lit or is blinking.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Call Indicator (Fix ID) (Edit > Zone Information (LTR Trunking System) > Zone Edit > Fix ID)
- Configuring the Call Indicator (Group ID) (Edit > Zone Information (LTR Trunking System) > GID Edit)

DTMF (Dual Tone Multi-frequency) is the signaling type that uses 2 different frequency tones simultaneously. DTMF code can be used as a PTT ID or for initiating an individual call, calling a telephone number while connected to a phone line, and remote control of the transceiver.

DTMF signaling uses 2 different frequencies combined (one lower and one higher frequency) and consists of the 0 to 9, A to D, * and # tones.

Table 14-1 DTMF Tone Frequency List

DTMF Code	Frequency	
	Low Frequency	High Frequency
0	941 Hz	1336 Hz
1	697 Hz	1209 Hz
2	697 Hz	1336 Hz
3	697 Hz	1477 Hz
4	770 Hz	1209 Hz
5	770 Hz	1336 Hz
6	770 Hz	1477 Hz
7	852 Hz	1209 Hz
8	852 Hz	1336 Hz
9	852 Hz	1477 Hz
A	697 Hz	1633 Hz
B	770 Hz	1633 Hz
C	852 Hz	1633 Hz
D	941 Hz	1633 Hz
*	941 Hz	1209 Hz
#	941 Hz	1477 Hz

14.1 Sending the DTMF Code

Following are methods available to send the DTMF code:

- Manual Dialing
- Keypad Auto PTT
- Store & Send
- Autodial List Selection
- Call Key
- Redial
- Beginning of Transmit (BOT)
- End of Transmit (EOT)

14.1.1 Manual Dialing

Manual Dialing can be used to send the DTMF code corresponding to a particular key by pressing a key(s) on the keypad while transmitting by pressing the **PTT** switch.

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **PTT** switch.
2. Press the key corresponding to the DTMF code to be sent.

   The transceiver sends the DTMF code.
3. Repeat step 2 as necessary.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Manual Dialing to be enabled or disabled (Edit > DTMF > Encode)

14.1.2 Keypad Auto PTT

For Keypad Auto PTT, pressing a key(s) on the keypad causes the transceiver to start immediately transmitting and send the DTMF code corresponding to the key. This function can be used to send the DTMF code by a press of a key(s) on the keypad without pressing the **PTT** switch.

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the key corresponding to the DTMF code to be sent.

   The transceiver sends the DTMF code.
2. Repeat step 1 as necessary.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions for Keypad Operation (Edit > Key Assignment > General)

14.1.3 Store & Send

Store & Send can be used to enter the DTMF code to be sent first, and then to send the entered DTMF codes all at once. A maximum of 30 digits can be transmitted in a single operation.

To use this function, Store & Send must be enabled using KPG-141D/ KPG-141DN.

The transceiver can enter Autodial Mode and the DTMF code can be entered using one of the following operations:

- **Autodial Key**

  Pressing the **Autodial** key causes the transceiver to enter Autodial Mode.

- **Keypad Entry**

  If “Autodial” is configured for Keypad Operation, pressing a key(s) on the keypad causes the transceiver to enter Autodial Mode. The transceiver will be on hold as the first digit of the DTMF code is entered. (Refer to 4.5 Keypad Operation on page 30)

Note: This function is unavailable for Portable (without LCD/ without Key).

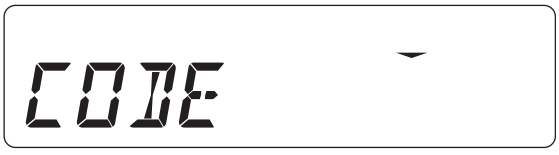
■ Operating the Transceiver

- **Using the Keypad**

1. Press the **Autodial** key.

The transceiver enters Autodial Mode and the DTMF code can be entered.

Portable



Mobile

The following operations are identical even if the transceiver enters Autodial Mode with keypad entry.

2. Enter using the keypad the DTMF code to be sent.

Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

Portable

Mobile

Note:

- To enter the DTMF “A” code, press and hold the **[*]** key and then press the **[2]** key.
- To enter the DTMF “B” code, press and hold the **[*]** key and then press the **[5]** key.
- To enter the DTMF “C” code, press and hold the **[*]** key and then press the **[8]** key.
- To enter the DTMF “D” code, press and hold the **[*]** key and then press the **[0]** key.
- To enter the DTMF “*” code, press the **[*]** key twice.
- To enter the DTMF “#” code, press the **[*]** key and then press the **[#]** key.
- If * and # key-entry Pattern is disabled, the tone for “*” or “#” can be directly entered by pressing the [*] key or [#] key. In this case, the above operations are unavailable.

3. Repeat step 2 if necessary.

Portable

Mobile

4.Select one of the following operations.

- In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
- In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

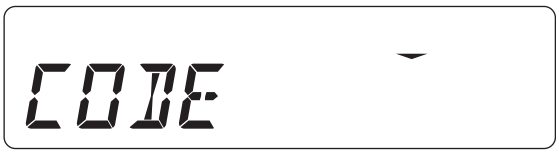
The transceiver sends the DTMF code.

● **Without using the Keypad**

1. Press the **Autodial** key.

The transceiver enters Autodial Mode and the DTMF code can be entered.

Portable

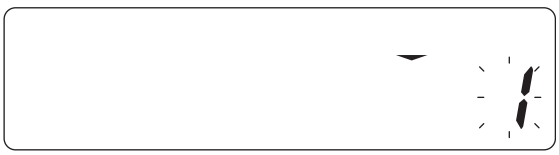


Mobile

2. Rotate the **Selector** (Portable), or press the **[▲]** or **[▼]** key (Mobile) to enter the DTMF code to be sent.

Characters are entered from the right end, and the character being entered blinks. Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

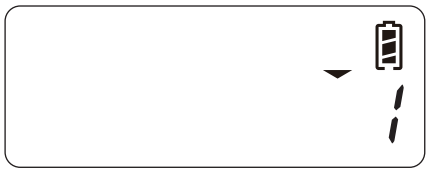
Portable



Mobile

3. Press the **[S]** key when the code is determined.

An entered digit stops blinking and remains lighted.



Portable

Mobile

4. Repeat steps 2 and 3 as necessary.

Portable

Mobile

5.Select one of the following operations.

- In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
- In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

The transceiver sends the DTMF code.

Note: To enter a DTMF code using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Store & Send to be enabled or disabled (Edit > DTMF > Encode)
- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions for Keypad Operation (Edit > Key Assignment > General)
- Configuring the * and # key-entry Pattern to be enabled or disabled (Edit > Key Assignment > General)

14.1.4 Autodial List Selection

Autodial List Selection allows a user to select the DTMF codes configured for the Autodial List to send the DTMF code.

To use this function, Store & Send must be disabled using KPG-141D/ KPG-141DN.

The transceiver can enter Autodial Mode and the DTMF codes can be selected using one of the following operations:

- **Autodial key**

  Pressing the **Autodial** key causes the transceiver to enter Autodial Mode.

- **Keypad Entry**

  If “Autodial” is configured for Keypad Operation, pressing a key(s) on the keypad causes the transceiver to enter Shortcut Entry Mode for Autodial Mode. (Refer to 4.5 Keypad Operation on page 30)

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Autodial** key.

   The transceiver enters Autodial Mode and then the Autodial List Selection display will appear.

Portable

Mobile

   The following operations are identical even if the transceiver enters Autodial Mode with keypad entry.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[ ]** or **[ ]** key (Mobile) to select the Autodial List to be sent.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Select one of the following operations.

   - In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
   - In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   The transceiver sends the DTMF code.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Store & Send to be enabled or disabled (Edit > DTMF > Encode)
- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions for Keypad Operation (Edit > Key Assignment > General)

14.1.5 Call Key

Pressing one of the Call 1 to Call 6 keys causes the transceiver to send the preconfigured DTMF code for the key.

Call 1 to Call 6 can be assigned to the **PF** keys using KPG-141D/ KPG-141DN and the DTMF code corresponding to each key can be selected from the Autodial List.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the DTMF Code corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)

14.1.6 Redial

Redial can be used to send previously sent DTMF code again.

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Autodial** key while the transceiver is in standby mode.

   The transceiver enters Autodial Mode.

2. Press the **[*]** key and then **[0]** key.

   The DTMF code last sent appears on the main display.

   In order to cancel the operation, the **Side 1** key (Portable) or the **Triangle** key (Mobile) needs to be pressed.

3. Select one of the following operations.

   - In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
   - In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   The transceiver sends the DTMF code.

Note: The DTMF code sent by Beginning of Transmit and End of Transmit cannot be sent again using this function.

14.1.7 Beginning of Transmit (BOT)

Beginning of Transmit allows the transceiver to send the DTMF code configured for Beginning of Transmit.

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Autodial** key while the transceiver is in standby mode.

   The transceiver enters Autodial Mode.

2. Press the **[*]** key and then press the **[#]** key.

   The DTMF code configured for Beginning of Transmit appears.

   In order to cancel the operation, the **Side 1** key (Portable) or the **Triangle** key (Mobile) needs to be pressed.

3. Select one of the following operations.

   - In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
   - In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   The transceiver sends the DTMF code.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Beginning of Transmit (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

14.1.8 End of Transmit (EOT)

End of Transmit allows the transceiver to send the DTMF code configured for End of Transmit.

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Autodial** key while the transceiver is in standby mode.

   The transceiver enters Autodial Mode.

2. Press the **[*]** key and then press the **[#]** key.

   The DTMF code configured for End of Transmit appears.

   In order to cancel the operation, the **Side 1** key (Portable) or the **Triangle** key (Mobile) needs to be pressed.

3. Select one of the following operations.

   - In order to send the DTMF code and initiate voice calls, the **PTT** switch needs to be pressed.
   - In order to send only the DTMF code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   The transceiver sends the DTMF code.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the End of Transmit (Edit > Optional Features > Optional Features 1 > Common Page 4 > PTT ID (Analog))

14.2 Encode

The following functions relevant to DTMF Encode can be configured using KPG-141D/ KPG-141DN:

- DTMF Speed
- First Digit Delay Time
- First Digit Time
- * and # Digit Time
- DTMF Hold Time
- D Code Assignment
- Sidetone
- Manual Dialing
- Store & Send
- Auto Telephone

14.2.1 DTMF Speed

DTMF Speed is the speed to send out the DTMF codes. Transmit speed of the DTMF code can be configured by entering the number of digits to be sent per second. The transceiver sends the DTMF code at the configured speed.

The transmission speed of the DTMF code can be selected from 6, 8, 10 or 15 digits/ second using KPG-141D/ KPG-141DN.

Following are durations for Digit Time (transmit time) and Gap Time (muted time) depending on the selected value.

Table 14-2 DTMF Speed

Range	Digit Time (Transmission Duration)	Gap Time (Silent Duration)
6 digits/s	84 ms	84 ms
8 digits/s	62 ms	62 ms
10 digits/s	50 ms	50 ms
15 digits/s	34 ms	34 ms

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the DTMF Speed (Edit > DTMF > Encode)

14.2.2 First Digit Delay Time

First Digit Delay Time is the amount of time from when the transceiver starts transmitting until the first digit of the DTMF code is sent out.

The transceiver transmits an unmodulated signal until the amount of time configured for First Digit Delay Time elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the First Digit Delay Time (Edit > DTMF > Encode)

14.2.3 First Digit Time

First Digit Time is used to extend the amount of time to send the first digit of the DTMF code when the transceiver starts transmitting the DTMF code.

Extending the transmission time for sending the first digit of the DTMF code will prevent the receiving transceiver from failing to receive the incoming DTMF code while the battery saver is active or the transceiver is scanning. This will enable the receiving transceiver to reliably decode the received DTMF code.

The time for sending the first digit of the DTMF code is the sum of the transmission time configured for DTMF Speed and First Digit Time.

Transmit Time for the 1st digit of DTMF = value configured for DTMF Speed (Digit Time) + value configured First Digit Time

Example: First Digit Time: 100 ms, Encode Code: 123

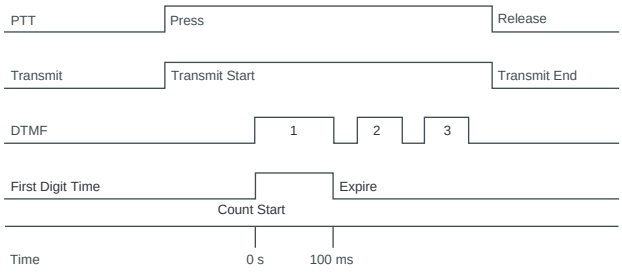


Figure 14-1 First Digit Time

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the First Digit Time (Edit > DTMF > Encode)

14.2.4 * and # Digit Time

* and # Digit Time is used to extend the transmit duration to send the * tone and # tone of the DTMF code.

* tone and # tone tend to be used for special functions. * and # Digit Time enables the receiving transceiver to reliably decode these tones.

The duration to send the * tone and # tone is the sum of the transmission time configured for DTMF Speed and the * and # Digit Time.

DTMF transmission time of the * and # tones = DTMF Speed (Digit Time) + * and # Digit Time

Example: * and # Digit Time: 100 ms, Encode Code: *01

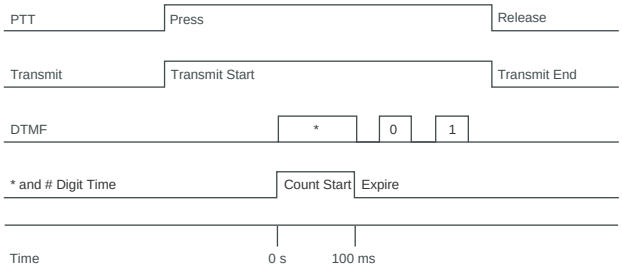


Figure 14-2 * and # Digit Time

Note: If the first digit of the DTMF code is the * tone or # tone, the transceiver compares the extension time to send the first digit configured for the First Digit Time with the * and # Digit Time and uses the longer extension time to send the first digit.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the * and # Digit Time (Edit > DTMF > Encode)

14.2.5 DTMF Hold Time

DTMF Hold Time is the amount of time from when the keypad is disabled until the transceiver restores the receive mode while sending the DTMF code using Keypad Auto PTT or Manual Dialing.

The DTMF signal received until its transmission is interrupted may be treated as one string of code depending on the devices on the receiving side. Therefore, the transceiver holds the transmission not to interrupt the digit sequence when sending a continuous DTMF signal.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the DTMF Hold Time (Edit > DTMF > Encode)

14.2.6 D Code Assignment

D Code Assignment can be used to configure whether the D Code is used for the D tone of DTMF or a dialing pause (unmodulated transmission).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the D Code Assignment (Edit > DTMF > Encode)

14.2.7 Sidetone

Sidetone is the function to emit the DTMF sidetone from the speaker while the transceiver sends the DTMF code.

Note:

- The transceiver does not emit the DTMF sidetone in Emergency Mode if “Silent” is configured for Emergency Mode Type. (Refer to 19.1.10 Emergency Mode Type on page 201)
- If the transceiver sends the DTMF code while PTT Proceed Tone is enabled, Proceed Tone will not sound. (Refer to 3.9 PTT Proceed Tone on page 25)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the DTMF Sidetone to be enabled or disabled (Edit > DTMF > Encode)

14.2.8 Manual Dialing

Manual Dialing can be used to send the corresponding DTMF code when a key(s) on the keypad is pressed while transmitting by pressing the **PTT** switch. (Refer to 14.1.1 Manual Dialing on page 121)

Note: This function is unavailable for Portable (with LCD/ with 4-key) and Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Manual Dialing to be enabled or disabled (Edit > DTMF > Encode)

14.2.9 Store & Send

Store & Send can be used to temporarily store the DTMF code entered using the keypad, then send the code all at once. A maximum of 30 digits can be transmitted in a single operation. (Refer to 14.1.3 Store & Send on page 122)

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Store & Send to be enabled or disabled (Edit > DTMF > Encode)

14.2.10 Auto Telephone

Auto Telephone is a function that allows the transceiver to interconnect to a telephone line in an LTR Trunking system.

After the transceiver enters Autodial Mode in an LTR Trunking system, pressing the **Side 2** key (Portable) or the **Square** key (Mobile) causes the transceiver to start searching for an available system that can connect to a telephone line. If the transceiver succeeds in connecting to a system that can be connected to a telephone line, the transceiver sends the DTMF code. (Refer to 13.7.2 Auto Telephone Search on page 114)

Note: Autodial Mode is unavailable for Portable (without LCD/ without Key). For Portable (without LCD/ without Key), the transceiver can search for an available system that can connect to a telephone line by pressing the **Auto Telephone** key.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Telephone to be enabled or disabled (Edit > DTMF > Encode)

14.3 Decode

The following functions relevant to DTMF Decode can be configured using KPG-141D/ KPG-141DN:

- Code
- Transpond/ Alert Tone
- Stun
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED
- Alert LED Color

14.3.1 Code

Code is the standby DTMF code preconfigured for the transceiver for receiving an individual call.

If the received DTMF code matches the standby DTMF code preconfigured for the transceiver, Alert Tone, Transpond and LED (Selective Call Alert LED) will be activated.

Note: “DTMF” must be configured for Optional Signaling used by the channel or GID. (Refer to 12.3 Optional Signaling on page 105)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Code (Edit > DTMF > Decode)

14.3.2 Transpond/ Alert Tone

Transpond and Alert Tone are the functions that allow the transceiver to transmit the multiplexed Transpond tone, or that allow an Alert tone to sound if the received DTMF code matches the standby DTMF code preconfigured for the channel or GID.

Table 14-3 Transpond/ Alert Tone

Configuration	Description
Transpond	The transceiver transmits the multiplexed Transpond Tone.
Alert Tone	The configured Alert Tone sounds from the transceiver.

Note:

- Alert Tone sounds from the transceiver after transponding if both Transpond and Alert Tone are configured at the same time.
- If Clear To Transpond is enabled, Alert Tone is suspended as well if Transpond is suspended since the channel is busy.
- The matching state of the DTMF codes will be reset on the following conditions. The status of Transpond is reset on the following conditions while Transpond is suspended. The Transpond will also be suspended if the transmission is disabled by Busy Channel Lockout.

Table 14-4 Conditions to Reset the Transpond Function

Transmission Operation	Conditions
Pressing a key	When the following keys or the **Selector** is pressed • **Monitor** key • **Monitor Momentary** key • **Squelch Off** key • **Squelch Off Momentary** key • **Zone Up** key • **Zone Down** key • **Zone Up/Down** (Selector)*1 • **CH/GID Up** key • **CH/GID Down** key • **CH/GID Up/Down** key (Selector)*1 • **Scan** key • **Home CH/GID** key • **Direct CH/GID 1** to **Direct CH/GID 5** keys
Hook*2	When the microphone is in the on-hook state
Expiration of the Auto Reset Timer	When the amount of time configured for Auto Reset Timer elapses (This condition is only applicable to DTMF.)
Receiving a Code	Receiving Code + # code
Transmission	Transmission is made using the following switch or one of the ports. (This condition is only applicable to Transpond.) • **PTT** switch • External PTT (Voice) port*2 • External PTT (Data) port*2

*1 Portable (with LCD/ with 16-key) or Portable (with LCD/ with 4-key) only

*2 Mobile only

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transpond and Alert Tone (Edit > DTMF > Decode)

14.3.3 Stun

Stun allows an administrator to remotely disable the transceiver using the DTMF code, for instance, if the transceiver is stolen.

When the transceiver receives the Stun Code, the transceiver multiplexes the Stun-on Tone and starts transponding. Then, the function configured in the Stun Code Response will be activated.

The function configured in the Stun Code Response is stored even if the transceiver is turned OFF. The state of Stun Code Response cannot be reset by Auto Reset Timer or by the user's operation. The transceiver transmits the Stun-off Tone and then will reset the state of Stun Code Response when the transceiver receives the Revive Code (Stun Code + "#").

Stun Code and Stun Code Response can be configured in the transceiver using KPG-141D/ KPG-141DN.

Table 14-5 Stun

Configuration	Description
Stun Code	Stun Code is the standby code for Stun preconfigured for the transceiver.
Stun Code Response	Stun Code Response can configure as below how the transceiver will respond when the Stun Code matches. • Transmit Inhibit: Transmit capability is disabled. User operations of the transceiver are also inhibited. Automatic transmission, such as Transpond, is still available. • Transceiver Inhibit: Transmit and receive capabilities are disabled. User operations of the transceiver are also inhibited.

Note: The transceiver cannot enter Emergency Mode while Stun is enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Stun Code (Edit > DTMF > Decode > Stun)
- Configuring the Stun Code Response (Edit > DTMF > Decode > Stun)

14.3.4 Auto Reset Timer

Auto Reset Timer allows you to configure the amount of time from when the received DTMF code matches the DTMF code preconfigured for the transceiver until the matching status is automatically reset.

By using KPG-141D/ KPG-141DN, Auto Reset Timer can be configured. Also, how the transceiver responds after the amount of time configured for Auto Reset Timer elapses can be configured.

Table 14-6 Auto Reset Timer

Configuration	Description
Off	Auto Reset Timer will not be activated.
1 s to 300 s	After the time configured for Auto Reset Timer elapses, the matching state of the DTMF code is automatically reset.
LED	While this function is enabled, if the time configured for Auto Reset Timer elapses, the BUSY LED blinking orange or blue (Mobile only) by Selective Call Alert LED is turned Off.
Alert	While this function is enabled, the intermittently emitted Alert Tone stops if the amount of time configured for Auto Reset Timer elapses.
Monitor	While this function is enabled, the matching state of the DTMF code is reset if the amount of time configured for Auto Reset Timer elapses.

Note: For Portable (without LCD/ without Key), the Monitor configuration explained above is always enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Reset Timer (Edit > DTMF > Decode > Auto Reset)

14.3.5 Clear to Transpond

Clear to Transpond allows the transceiver to wait to Transpond until the channel becomes available while other users are using the channel.

Note: This function can be used only in a Conventional Group.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Clear to Transpond to be enabled or disabled (Edit > DTMF > Decode)

14.3.6 Selective Call Alert LED

Selective Call Alert LED is used to make the LED blink orange when the received DTMF code matches the standby DTMF code preconfigured for the transceiver.

For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks.

A user can notice by the LED that the transceiver is receiving a call.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selective Call Alert LED to be enabled or disabled (Edit > DTMF > Decode)

14.3.7 Alert LED Color (Mobile Only)

Alert LED Color is used to blink the orange LED or the blue LED when the transceiver receives a call having a DTMF code.

The transceiver behaves as follows according to the configuration for Alert LED Color.

Table 14-7 Alert LED Color

Configuration	Description
Off	The LED does not blink even if the received DTMF code matches the standby DTMF code preconfigured for the transceiver.
Orange	The orange LED blinks when the received DTMF code matches the standby DTMF code preconfigured for the transceiver.
Blue	The blue LED blinks when the received DTMF code matches the standby DTMF code preconfigured for the transceiver.

Note: To use this function, Selective Call Alert LED (DTMF) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Edit > DTMF > Decode)

14.4 Autodial

The following functions relevant to Autodial can be configured using KPG-141D/ KPG-141DN:

- Autodial List
- Autodial Programming

14.4.1 Autodial List

Audio List is the list in which the DTMF code used for Autodial is configured.

Autodial List can be configured by using KPG-141D/ KPG-141DN.

Table 14-8 Autodial List Configuration

Autodial List	Description
DTMF Name	For Portable, a name of up to 8 characters can be configured for a DTMF code. For Mobile, a name of up to 10 characters can be configured for a DTMF code.
Code	The DTMF code to be sent can be configured. A maximum of 16 numeric digits can be configured.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Autodial List (Edit > DTMF > Autodial List)

14.4.2 Autodial Programming

Autodial Programming can be used to add, change, or delete the data configured for Autodial List by operating the transceiver.

Pressing the **Autodial Programming** key causes the transceiver to enter Autodial Programming Mode and then entries in the Autodial List can be added, changed or deleted.

Note:

- ♦ If * and # key-entry Pattern is disabled, the tone for "*" or "#" can be directly entered by pressing the **[*]** key or **[#]** key in Autodial Programming Mode. In this case, A to D tones cannot be entered by pressing the **[*]** key, and the characters entered by pressing the **[#]** key cannot be cleared.
- ♦ This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

- **Changing or Adding Data in the Autodial List**

1. Press the **Autodial Programming** key.

The transceiver enters Autodial Programming Mode.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⌃]** or **[⌄]** key (Mobile) to select the target data from Autodial List.

Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

If data is newly added to the Autodial List, "BLANK xx" ("xx" represents the list number) needs to be selected. Although the following procedure describes the operation with the displays that appear when changing data in the existing Autodial List, the operation is identical.

Portable

Mobile

3. Press the **[S]** or **[*]** key.

   The DTMF name edit display for the selected data appears.

Portable

Mobile

4. Enter the DTMF name.

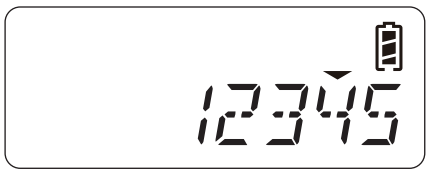
   Refer to 5.16.3 Entering or Clearing Characters on page 55 for entry methods.

Portable

Mobile

5. Press the **[S]** or **[*]** key after entering the DTMF Name.

   The DTMF Code edit display appears.



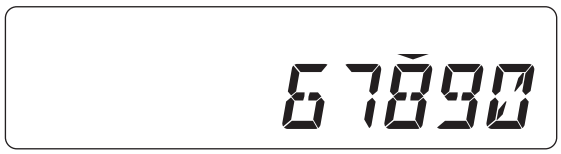
Portable

Mobile

6. Enter the DTMF code.

   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

Portable

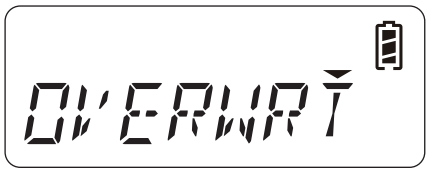


Mobile

7. Press the **[S]** or **[*]** key after entering the DTMF code.

   The writing completion message display appears.

   “OVERWRT” (Portable) or “OVER WRITE” (Mobile) appears if the data in the existing Autodial List is changed.



Portable

Mobile

"STORE" appears if new data is added in the Autodial List.

Portable

Mobile

8. Press the **[S]** or **[*]** key.

The data is written and the Autodial List selection display appears.

Portable

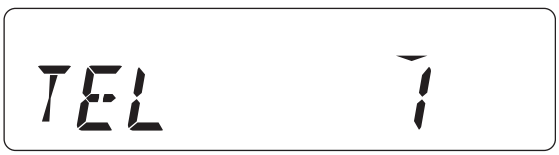
Mobile

- **Deleting data from Autodial List**

1. Press the **Autodial Programming** key.

The transceiver enters Autodial Programming Mode.

Portable



Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[ ]** or **[ ]** key (Mobile) to select the target data from Autodial List.

Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Press the **[A]** or **[#]** key.

"DELETE?" appears on the main display.

Portable

Mobile

4. Press the **[S]** or **[*]** key.

The selected data will be cleared.

Portable

Mobile

Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the * and # key-entry Pattern to be enabled or disabled (Edit > Key Assignment > General)

2-tone signaling uses a pair of 2 different tone frequencies in series. 2-tone is used to initiate an individual call on an analog channel in a Conventional Group.

A series of two different tone frequencies or single tone is used for 2-tone signaling. Tone frequencies between 288.5 Hz and 3106.0 Hz inclusive are used.

Note: This function is only available in the Analog Conventional system.

15.1 Sending the 2-tone Code

The transceiver can send a 2-tone code on an analog channel in a Conventional Group.

Following are methods available to send the 2-tone code:

- Selecting the 2-tone Encode Memory List
- Call Key

Note: Refer to 15.2 Encode on page 136 for each function of 2-tone Encode.

15.1.1 Selecting the 2-tone Encode Memory List

By selecting the 2-tone Encode Memory List, the 2-tone code configured in the 2-tone Encode Memory List can be selected and sent. (Refer to: 15.2.7 2-tone Encode Memory List on page 137)

An Encode Tone configured in Encode Memory List can be selected by pressing the **2-tone** key.

Note: This function is unavailable for Portable (without LCD/ without Key). For Portable (without LCD/ without Key), the 2-tone code can be sent by using the **Call 1** to **Call 6** keys.

■ Operating the Transceiver

1. Press the **2-tone** key.

   The 2-tone Encode Memory List appears.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⋀]** or **[⋁]** key (Mobile) to select the target data from 2-tone Encode List.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Select one of the following operations.
   - In order to send the 2-tone code and initiate voice calls, the **PTT** switch needs to be pressed.
   - In order to send only the 2-tone code, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   The transceiver sends the 2-tone code.

Note: If “QT/DQT and Optional Signaling” is configured for Audio Control, the transceiver will abort the standby mode for Optional Signaling after the transceiver transmits. The Transmit LED blinks orange when the transceiver finishes transmitting. (Refer to: 12.4 Audio Control on page 106)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

15.1.2 Call Key

Pressing one of the Call 1 to Call 6 keys causes the transceiver to transmit the preconfigured tone.

Call 1 to Call 6 can be assigned to the **PF** keys using KPG-141D/ KPG-141DN and the tone corresponding to each key can be selected from the 2-tone Encode Memory List.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the tones corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)

15.2 Encode

The following functions relevant to 2-tone Encode can be configured using KPG-141D/ KPG-141DN:

- Duration of 1st Tone
- Duration of 2nd Tone
- Duration of Single Tone
- Gap Time
- First Tone Delay Time
- Sidetone
- 2-tone Encode Memory List

15.2.1 Duration of 1st Tone

Duration of 1st Tone can be used to configure the 1st Tone Encode duration for transmitting the 2-tone code configured in the 2-tone Encode Memory List.

Duration of 1st Tone can be configured using KPG-141D/ KPG-141DN. Usually, 1 seconds is configured for this function.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of 1st Tone (Edit > 2-tone > Encode)

15.2.2 Duration of 2nd Tone

Duration of 2nd Tone can be used to configure the 2nd Tone Encode duration for transmitting the 2-tone code configured in the 2-tone Encode Memory List.

Duration of 2nd Tone can be configured using KPG-141D/ KPG-141DN. Usually, 3 seconds is configured for this function.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of 2nd Tone (Edit > 2-tone > Encode)

15.2.3 Duration of Single Tone

Duration of Single Tone is the Single Tone Encode duration for transmitting the Single Tone configured in the 2-tone Encode Memory List.

Duration of Single Tone can be configured using KPG-141D/ KPG-141DN. Usually, 5 seconds is configured for this function.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of Single Tone (Edit > 2-tone > Encode)

15.2.4 Gap Time

Gap Time is the unmodulated duration between the 1st Tone and 2nd Tone when sending the 2-tone code configured in the 2-tone Encode Memory List.

Gap Time can be configured using KPG-141D/ KPG-141DN. Normally, 0 ms is configured for Gap Time.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Gap Time (Edit > 2-tone > Encode)

15.2.5 First Tone Delay Time

First Tone Delay Time is delay time from when the transceiver starts transmitting until the transceiver actually starts transmitting the 2-tone code.

The transceiver transmits an unmodulated signal until the amount of time configured for First Tone Delay Time elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the First Tone Delay Time (Edit > 2-tone > Encode)

15.2.6 Sidetone

Sidetone is the function to emit the sidetone of the 2-tone code from the speaker while the transceiver transmits the 2-tone code.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Sidetone to be enabled or disabled (Edit > 2-tone > Encode)

15.2.7 2-tone Encode Memory List

2-tone Encode Memory List is the code list used for transmitting the 2-tone code. The transceiver transmits the 2-tone code when a code configured in the list is selected.

The following functions can be configured in the 2-tone Encode Memory List.

Table 15-1 Autodial List Configuration

Autodial List	Description
Single Tone	The code to be sent can be configured for each list number as a Single Tone. 2nd Tone cannot be configured if Single Tone is configured.
2-tone Name	For Portable, a name of up to 8 characters can be configured for a 2-tone code. For Mobile, a name of up to 10 characters can be configured for a 2-tone code.
1st Tone	The 1st Tone frequency can be configured. The frequency can be configured in the range between 288.5 Hz and 3106.0 Hz inclusive.
2nd Tone	The 2nd Tone frequency can be configured. The frequency can be configured in the range between 288.5 Hz and 3106.0 Hz inclusive. 2nd Tone cannot be configured if Single Tone is configured.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the 2-tone Encode Memory List (Edit > 2-tone > Encode)

15.3 Decode

There are 4 types of Optional Signaling available for each channel in Conventional Group. One of 2-tone 1, 2-tone 2, 2-tone 3, and 2-tone 4 can be configured for the Optional Signaling.

The following functions can be configured for 2-tone 1, 2-tone 2, 2-tone 3 and 2-tone 4:

- Decoder 1 to Decoder 4
- A Tone/ B Tone/ C Tone/ D Tone
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED
- Alert LED Color
- 2-tone Decode Frequency Tolerance

15.3.1 Decoder 1 to Decoder 4

Four types of Decoders can be configured for 2-tone 1, 2-tone 2, 2-tone 3 or 2-tone 4. The transceiver can be set to receive multiple 2-tone codes configured for Decoder 1 to Decoder 4 at the same time.

The following options can be configured for each Decoder.

■ Call Format

Call Format can be used to configure the A Tone, B Tone, C Tone and D Tone combinations for receiving a call. The following combinations are available.

Table 15-2 List of Call Format Combinations

Combination	Description
A and B	The transceiver waits to receive A tone and B tone.
A and C	The transceiver waits to receive A tone and C tone.
A and D	The transceiver waits to receive A tone and D tone.
B and A	The transceiver waits to receive B tone and A tone.
B and C	The transceiver waits to receive B tone and C tone.
B and D	The transceiver waits to receive B tone and D tone.
C and A	The transceiver waits to receive C tone and A tone.
C and B	The transceiver waits to receive C tone and B tone.
C and D	The transceiver waits to receive C tone and D tone.
D and A	The transceiver waits to receive D tone and A tone.
D and B	The transceiver waits to receive D tone and B tone.
D and C	The transceiver waits to receive D tone and C tone.
Long A	The transceiver waits to receive A tone.
Long B	The transceiver waits to receive B tone.

Combination	Description
Long C	The transceiver waits to receive C tone.
Long D	The transceiver waits to receive D tone.

Note: If anything other than “Long A”, “Long B”, “Long C”, or “Long D” is configured for Call Format, the transceiver stands by for the first tone for 1 second and the second tone for 3 seconds. If “Long A”, “Long B”, “Long C”, or “Long D” is configured for Call Format, the transceiver stands by for each tone for more than 5 seconds.

■ Transpond/ Alert Tone

Transpond and Alert Tone are functions that allow the transceiver to transmit the multiplexed Transpond tone, or that allow an Alert Tone to sound from the transceiver when the transceiver is called with 2-tone signaling.

Table 15-3 Transpond/ Alert

Transpond	Alert	Description
No	Off	No function is activated.
Yes	Off	The transceiver transmits the Transpond Tone.
No	Anything other than Off	An Alert Tone sounds from the transceiver.
Yes	Anything other than Off	An Alert Tone sounds from the transceiver after transmitting a Transpond Tone.

■ Alert Tone

Alert Tone is an alert tone to sound when the transceiver receives a call by 2-tone.

The tone can be selected from 8 tones configured in the Alert Tone Pattern. (Refer to: 3.7 Alert Tone Pattern on page 24)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Call Format, Transpond and Alert Tone (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.2 A Tone/ B Tone/ C Tone/ D Tone

This function can be used to select the tone frequency for A Tone, B Tone, C Tone and D Tone. The frequency can be configured between 288.5 Hz and 3106.0 Hz inclusive.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the A Tone/ B Tone/ C Tone/ D Tone (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.3 Auto Reset Timer

Auto Reset Timer allows you to configure the amount of time from when the received 2-tone code matches the 2-tone code preconfigured for the transceiver until the matching status is automatically reset.

Auto Reset Timer can be configured using KPG-141D/ KPG-141DN. Also, how the transceiver responds after the amount of time configured for Auto Reset Timer elapses can be configured.

Table 15-4 Auto Reset Timer

Configuration	Description
Off	Auto Reset Timer will not be activated.
1 s to 300 s	After the configured time elapses, the matching state of the 2-tone code is automatically reset.
LED	While this function is enabled, if the time configured for Auto Reset Timer elapses, the BUSY LED blinking orange or blue (Mobile only) by Selective Call Alert LED is turned Off.
Alert	While this function is enabled, the intermittently emitted Alert Tone stops if the amount of time configured for Auto Reset Timer elapses.
Monitor	While this function is enabled, the matching state of the 2-tone code is reset if the amount of time configured for Auto Reset Timer elapses.

Note: For Portable (without LCD/ without Key), the Monitor configuration explained above is always enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Reset Timer (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.4 Clear to Transpond

Clear to Transpond allows the transceiver to wait to Transpond until the channel becomes available while other users are using the channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Clear to Transpond to be enabled or disabled (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.5 Selective Call Alert LED

Selective Call Alert LED can be used to make the LED blink orange when the transceiver receives a 2-tone code.

For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks.

A user can notice by the LED that the transceiver is receiving a call.

Note: The matching state of 2-tone code will be reset on the following conditions. The status of Transpond is reset on the following conditions while Transpond is suspended. The Transpond will also be suspended if the transmission is disabled by Busy Channel Lockout.

Table 15-5 Conditions to Reset the Transpond Function

Transmission Operation	Conditions
Pressing a key	When the following keys or the **Selector** is pressed • **Monitor** key • **Monitor Momentary** key • **Squelch Off** key • **Squelch Off Momentary** key • **Zone Up** key • **Zone Down** key • **Zone Up/Down** (Selector)*1 • **CH/GID Up** key • **CH/GID Down** key • **CH/GID Up/Down** (Selector)*1 • **Scan** key • **Home CH/GID** key • **Direct CH/GID 1** to **Direct CH/GID 5** keys
Hook*2	When the microphone is in the on-hook state
Expiration of the Auto Reset Timer	When the amount of time configured for Auto Reset Timer elapses. (This condition is only applicable to 2-tone.)
Transmission	Transmission is made using the following switch or one of the ports. (This condition is only applicable to Transpond.) • **PTT** switch • External PTT (Voice) port*2 • External PTT (Data) port*2

*1 Portable (with LCD/ with 16-key) or Portable (with LCD/ with 4-key) only

*2 Mobile only

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selective Call Alert to be enabled or disabled (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.6 Alert LED Color (Mobile Only)

Alert LED Color is used to blink the orange LED or the blue LED when the transceiver receives a call having a 2-tone code.

The transceiver behaves as follows according to the configuration for Alert LED Color.

Table 15-6 Alert LED Color

Configuration	Description
Off	The LED does not blink even if the received 2-tone code matches the standby 2-tone code preconfigured for the transceiver.
Orange	The orange LED blinks when the received 2-tone code matches the standby 2-tone code preconfigured for the transceiver.
Blue	The blue LED blinks when the received 2-tone code matches the standby 2-tone code preconfigured for the transceiver.

Note: To use this function, Selective Call Alert LED (2-tone) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Edit > 2-tone > Decode (2-tone 1 to 4))

15.3.7 2-tone Decode Frequency Tolerance

2-tone Decode Frequency Tolerance can be used to change the 2-tone decode response bandwidth depending on the status of the system.

If the transceiver cannot decode a frequency, a larger value must be configured. If the transceiver decodes a different frequency erroneously, a smaller value must be configured.

The transceiver can decode the frequency if the received 2-tone frequency is within the range configured for 2-tone Decode Frequency Tolerance while the transceiver is waiting to receive A Tone, B Tone, C Tone, and D Tone frequency.

For instance, the transceiver determines that A Tone has matched if the received tone frequency does not exceed the range between 315.9094 Hz (321.7 Hz x 0.982) and 327.4906 Hz (321.7 Hz x 1.018) when 321.7 Hz is configured for the A Tone frequency and ±1.8 % is configured for 2-tone Decode Frequency Tolerance. However, this configuration can be used only as a guide, hence the Decode Response Bandwidth has a slight margin.

■ Configuration Using KPG-141D/ KPG-141DN

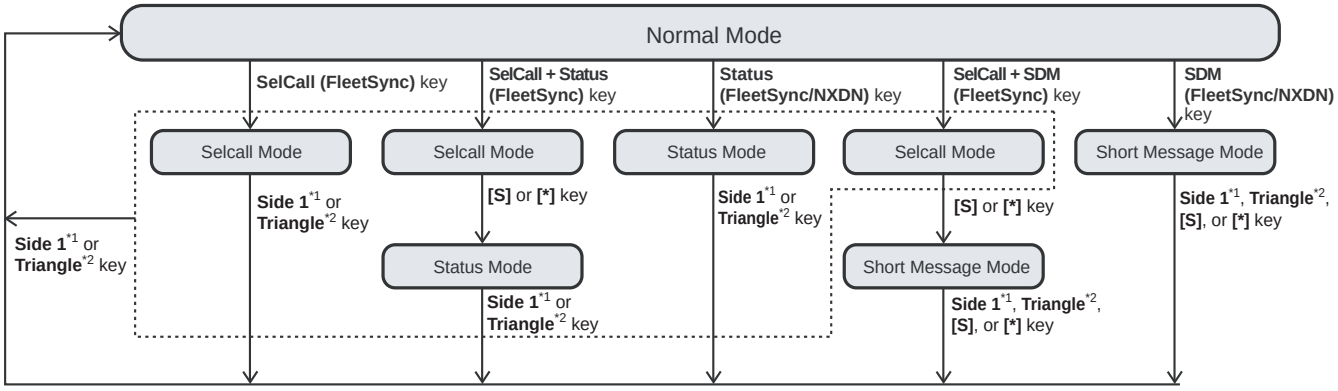
- Configuring the 2-tone Decode Frequency Tolerance (Edit > 2-tone > Decode)

FleetSync is a general term for the proprietary KENWOOD message communication system using MSK (Minimum Shift Keying) modulation. This function can be used in an Analog Conventional system and LTR Trunking system. The function identifies individual transceivers, and allows for text message and GPS data communications.

The transceiver can be connected to a PC or external devices since FleetSync also supports serial data communication.

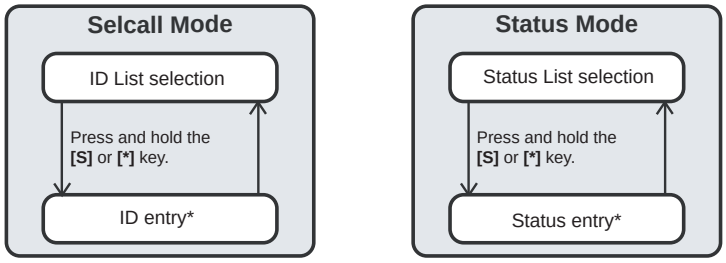
If a user wishes to send or receive a Selective Call, Status Message or Short Message using FleetSync, the user must operate the transceiver after selecting the desired mode. Following is the transition diagram of each mode.

■ Transmission

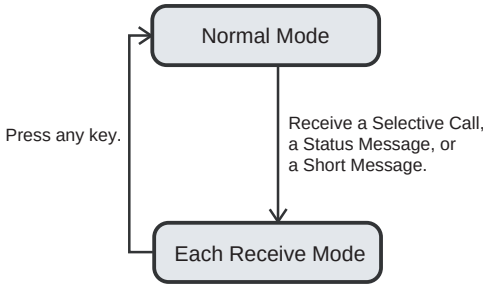


*1 Portable
*2 Mobile

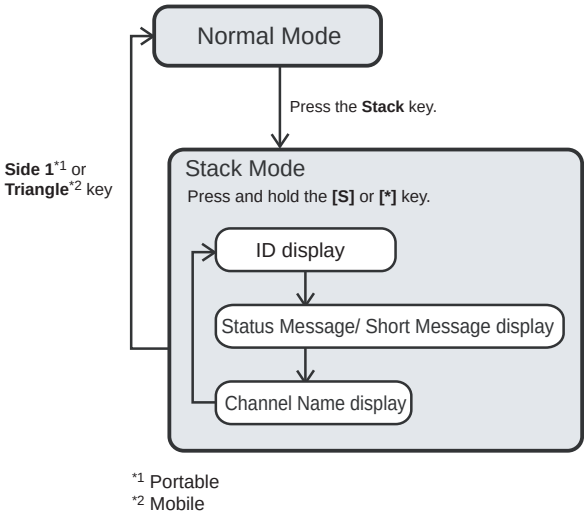
In Selcall Mode, a user can select the ID of the target transceiver from an ID List or directly enter an ID. Also, in Status Mode, a status to be sent can be selected from the Status List or the status can directly be entered. In either mode, the entry method can be changed by a user pressing and holding the **[S]** or **[*]** key. For Mobile, the entry method can also be changed by pressing the **[<B]** key.



■ Reception



■ Checking a Received Selective Call, Status Message or Short Message



[*1] Portable
[*2] Mobile

Note:

- Each mode for FleetSync is unavailable for Portable (without LCD/ without Key).
- This function can be used only for each channel or GID in the zone where “FleetSync” is configured for Signaling Type.

16.1 PTT ID Function

PTT ID is the function to send an identification code which is stored in the transceiver every time the **PTT** switch is pressed and/or released.

The caller's ID can be displayed on the main display using the received PTT ID while communicating with the caller. The user can confirm the caller not only by voice, but also through the display.

The PTT ID can be configured for each channel or GID. The PTT ID is sent with the following timing.
(Refer to: 11 PTT ID on page 101)

Table 16-1 Timing to Send the PTT ID

PTT ID	Timing to Send the PTT ID
Off	No PTT ID is sent.
BOT	The transceiver sends Fleet (Own) and ID (Own) as PTT ID by a user pressing the **PTT** switch at the transmitting transceiver.
EOT	The transceiver sends Fleet (Own) and ID (Own) as PTT ID by a user releasing the **PTT** switch at the transmitting transceiver.
Both	The transceiver sends Fleet (Own) and ID (Own) as PTT ID at both BOT and EOT.
List	The transceiver initiates a Selcall using the FleetSync ID configured in the ID List by a user pressing the **PTT** switch at the transmitting transceiver. FleetSync ID can be selected from the ID List using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the ID List Number of the FleetSync ID to be sent (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the PTT ID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the ID List Number of the FleetSync ID to be sent (Edit > Zone Information (LTR Trunking System) > GID Edit)

16.1.1 Caller ID Display

Caller ID Display is the function to display the received PTT ID on the main display.

A user can identify the caller not only by voice, but also through the display.

When the transceiver receives a PTT ID, the received ID, ID Name, or ID List number appears on the main display.

If the received ID is not configured for ID List in FleetSync, the ID will appear.

If the received ID is configured for ID List in FleetSync, the corresponding ID Name will appear. However, if the received ID is configured for ID List in FleetSync but the ID Name is not configured, the ID List number will appear.

Upon the elapse of the time configured for Auto Reset Timer or by a user pressing one of the keys of the transceiver, the main display reverts to the channel or GID display.

PTT ID appears with muting active when a PTT ID is received even if the conditions for unmuting are not satisfied.

Note:

- A user cannot reply to the ID appearing on the main display.
- PTT ID is displayed when the transceiver receives either BOT or EOT.
- In the case that the QT tone frequency and DQT code are preconfigured for the transceiver, Caller ID Display will be activated even if the received QT tone frequency or DQT code does not match the QT tone frequency or DQT code preconfigured for the transceiver.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Caller ID Display to be enabled or disabled (Edit > FleetSync > General 1)

16.1.2 PTT ID Sidetone

PTT ID Sidetone is the function to emit a PTT ID Sidetone when the transmitting transceiver sends the FleetSync ID. Use of this function can notify a user of the timing in which the transceiver initiates a call after the **PTT** switch is pressed.

If a user starts speaking while the transceiver is sending the FleetSync ID, the audio may be sent to the receiving transceiver with the beginning of the audio missing. To prevent this phenomenon, this function needs to be used.

Note: On a channel where PTT ID is configured, PTT Proceed Tone will be disabled.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the PTT ID Sidetone to be enabled or disabled (Edit > FleetSync > General 1)

16.1.3 PTT ID Mute

PTT ID Mute is the function to unmute after a certain amount of time elapses when the transceiver receives an analog signal. This function is used to mute data tones of the PTT ID (BOT) sent by the other party.

Refer to 11.4 PTT ID Mute on page 103 for details.

16.1.4 PTT ID Pause

PTT ID Pause is the function to keep the PTT ID from being sent when the transceiver alternates between transmit and receive in a certain period of time. This function can be used to prevent sending the PTT ID repeatedly to the receiving party.

Refer to 11.5 PTT ID Pause on page 103 for details.

16.2 Selective Call

Selective Call is the function to initiate an individual call using FleetSync ID.

A user can initiate a call sending their own FleetSync ID and the target transceiver's ID by pressing the **PTT** switch after selecting the transceiver they wish to call. The transceiver unmutes the speaker and emits the received audio when the receiving transceiver receives the FleetSync ID.

The caller's ID appears on the receiving transceiver. The receiving transceiver can respond to the caller by pressing the **PTT** switch while the caller's ID appears.

The following Selective Call types are available.

Table 16-2 Selective Call Type

Call Type	Description
Individual Call	This function is used to initiate a call to the specified transceiver. The transceiver determines that the received call is an Individual Call when receiving a Selective Call having the Fleet and the ID matching its own ID.
Group Call	This function is used to initiate a call to several transceivers in the specified Fleet. The transceiver determines that the received call is a Group Call when receiving a Selective Call having the ID configured for Group ID and the same Fleet.
Fleet Call	This function is used to initiate a call to a party having a FleetSync ID in the specified Fleet. The transceiver determines that the received call is a Fleet Call when receiving a Selective Call having the ID configured as "0 (ALL)" and the same Fleet.
Supervisor Call	This function is used to initiate a call to a party having the same ID in each Fleet. The transceiver determines that the received call is a Supervisor Call when receiving a Selective Call having the Fleet configured as "0 (ALL)" and the same ID
Broadcast Call	This function is used to initiate a call to all transceivers having a FleetSync ID. The transceiver determines that the received call is a Broadcast Call when receiving a Selective Call having the ID configured as "0 (ALL)" and Fleet configured as "0 (ALL)".

16.2.1 Initiating a Selective Call

List Selection or Manual Dialing can be used to initiate a Selective Call.

To use List Selection, a user can initiate a Selective Call by selecting a FleetSync ID configured for ID List. (Refer to: 16.2.3 ID List on page 147)

To use Manual Dialing, a user can initiate a Selective Call by directly specifying the FleetSync ID. The call type is determined according to the number of entered digits.

Table 16-3 Call Type by Manual Dialing

Number of Digits	Range	Call Type
7 digits fffiiii	The transceiver recognizes the entered value as Fleet and ID. fff: Fleet: 100 to 349 iiii: ID: 1000 to 4999	Individual Call/ Group Call
4 digits iiii	The transceiver recognizes the entered value as the ID. iiii: ID: 1000 to 4999	Individual Call/ Group Call
3 digits fff	The transceiver recognizes the entered value as the Fleet. fff: Fleet: 100 to 349	Fleet Call

A user can also use a Paging Call to initiate a Selective Call. Paging Call is the function to initiate a call to a target party. This function can be used to initiate a call without using voice communication.

The transceiver enters Selcall Mode with one of the following options and then will initiate a Selective Call.

- **Selcall (FleetSync), Selcall + Status (FleetSync) or Selcall + SDM (FleetSync) key**

  Pressing the **Selcall (FleetSync)**, **Selcall + Status (FleetSync)**, or **Selcall + SDM (FleetSync)** key places the transceiver in Selcall Mode.

- **Keypad Entry**

  If “Selcall (FleetSync)”, “Selcall + Status (FleetSync)”, or “Selcall + SDM (FleetSync)” is configured for Keypad Operation, pressing one of the **[0]** to **[9]** keys on the transceiver keypad places the transceiver in Selcall Mode. The transceiver enters Selcall ID Shortcut Entry Mode or goes into the respective state as the first digit of the Selcall ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

Note:

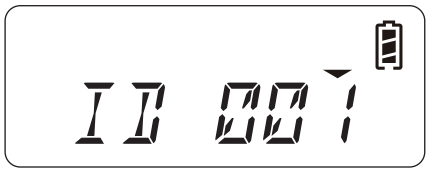
- The transceiver can initiate a Supervisor Call and Broadcast Call by selecting a FleetSync ID from the ID List. These calls cannot be initiated using Manual Dialing.
- For Portable (without LCD/ without Key), a Selective Call cannot be initiated using Selcall Mode. For Portable (without LCD/ without Key), a Selective Call can be initiated only by using PTT ID.

■ Operating the Transceiver

- **Initiating a Selective Call by List Selection**

1. Press the **Selcall (FleetSync)**, **Selcall + Status (FleetSync)**, or **Selcall + SDM (FleetSync)** key.

   The transceiver enters Selcall Mode and then the ID List selection display will appear.



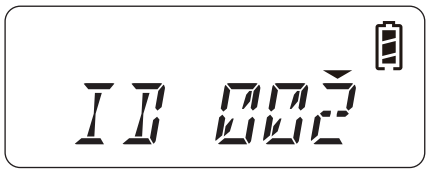
Portable

Mobile

   The following operations are identical even if the transceiver enters Selcall Mode with keypad entry.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the target data from ID List.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.



Portable

Mobile

3. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

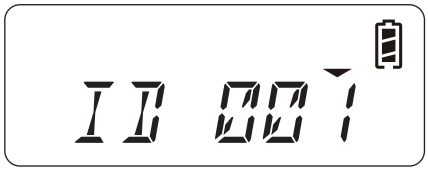
   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Selcall Mode by a user pressing the **Selcall + Status (FleetSync)** or **Selcall + SDM (FleetSync)** key) (Refer to: 16.3 Status Message on page 148)

- **Initiating a Selective Call using Manual Dialing**

To initiate a Selective Call using Manual Dialing, Manual Dialing must be enabled using KPG-141D/ KPG-141DN.

1. Press the **Selcall (FleetSync)**, **Selcall + Status (FleetSync)**, or **Selcall + SDM (FleetSync)** key.

   The transceiver enters Selcall Mode and then the ID List selection display will appear.



Portable

Mobile

   The following operations are identical even if the transceiver enters Selcall Mode with keypad entry.

2. Press and hold the **[S]** or **[*]** key.

   The Selcall ID entry display appears.

Portable

Mobile

   For Mobile, the Selcall ID entry display also appears by pressing the **[<B]** key.

3. Enter the ID.

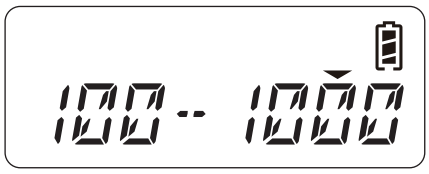
   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

   - **Using the Selector or the PF Keys**

     The characters can be selected by rotating the **Selector** (Portable), or pressing the **[⩓]** or **[⩔]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

   - **Using the Keypad**

     A code can be entered by pressing the **[0]** to **[9]** keys.



Portable

Mobile

4. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Selcall Mode by a user pressing the **Selcall + Status (FleetSync)** or **Selcall + SDM (FleetSync)** key) (Refer to: 16.3 Status Message on page 148)

Note: To enter an ID by using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions for Keypad Operation (Edit > Key Assignment > General)
- Configuring the Manual Dialing to be enabled or disabled (Edit > FleetSync > General 1)

16.2.2 Receiving a Selective Call

Conditions for the FleetSync ID to match are as follows:

Table 16-4 Conditions to Unmute the Speaker

Call Type	Conditions to Unmute the Speaker	
	Fleet fff: 100 to 349	ID iiii: 1000 to 4999
Individual Call	Match	Match
Group Call	Match	Group ID matches
Fleet Call	Match	ALL ID
Supervisor Call	ALL Fleet	Match
Broadcast Call	ALL Fleet	ALL ID

Note: To receive a Selective Call, “FleetSync” must be configured for the Optional Signaling used by the channel or GID.(Refer to: 12.3 Optional Signaling on page 105)

■ Transceiver Behavior

1. The transceiver receives a Selective Call.

   The Alert Tone (Individual Call or Other Selective Calls) sounds from the transceiver and then the ID Name of the transmitting transceiver will appear. (Refer to: 16.8.22 Alert Tone (Individual Call) on page 175, 16.8.23 Alert Tone (Other Selective Calls) on page 175)

Portable

Mobile

The transceiver can respond to the received ID by a user pressing the **PTT** switch. When a key other than the **PTT** switch is pressed, the configured function will be activated. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

- **If the ID is configured for ID List but the ID Name is not configured:**

  The list number appears.

Portable

Mobile

- **If the ID is not configured for ID List (when the transceiver receives an Individual Call or Group Call):**

  Fleet and ID appear.

Portable

Mobile

- **If the ID is not configured for ID List (when the transceiver receives a Fleet Call):**

  Fleet appears.

Portable

Mobile

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Selective Call. (Refer to: 16.8.20 Selective Call Alert LED on page 175)
- For Mobile, if “Blue” is configured for Alert LED Color (Individual Call or Other Selective Calls), the blue LED blinks when the transceiver receives a Selective Call. (Refer to: 16.8.27 Alert LED Color (Individual Call) (Mobile Only) on page 176, 16.8.28 Alert LED Color (Other Selective Calls) (Mobile Only) on page 176)

■ Individual Call/ Group Call

Pressing the **PTT** switch or the **Side 2** key (Portable), or the **Square** key (Mobile) causes the transceiver to initiate a call to the target transceiver shown on the main display.

The transceiver controls the mute only and does not enter Call Mode under the following conditions:

- The transceiver receives a call from a Fleet inhibited with the Interfleet configuration.
- The received ID is not registered in Unit ID Encode Block.
- The ID has Transmit Inhibit enabled by configuring Yes in the Selcall List.

When one of the keys on the transceiver is pressed, the LCD will restore to normal state. If Auto Reset Timer is configured, the LCD will restore to normal state after the time configured for Auto Reset Timer elapses.

■ Fleet Call

Pressing the **PTT** switch or the **Side 2** key (Portable), or the **Square** key (Mobile) causes the transceiver to initiate a call to the target transceiver.

The transceiver only controls the mute and does not enter Call Mode when receiving a call from a fleet which is not registered in the ID List.

When one of the keys on the transceiver is pressed, the LCD will restore to normal state. If Auto Reset Timer is configured, the LCD will restore to normal state after the time configured for Auto Reset Timer elapses.

■ Supervisor Call/ Broadcast Call

If the ID is configured for ID List, pressing the **PTT** switch or the **Side 2** key (Portable), or the **Square** key (Mobile) causes the transceiver to initiate a call to the target transceiver.

The transceiver only controls the mute and does not enter Call Mode when receiving a call from a party which is not registered in the ID List.

When one of the keys on the transceiver is pressed, the LCD will restore to normal state. If Auto Reset Timer is configured, the LCD will restore to normal state after the time configured for Auto Reset Timer elapses.

16.2.3 ID List

The transceiver uses an individual FleetSync ID to establish communication if FleetSync is enabled. The desired FleetSync IDs must be preconfigured in the transceiver using KPG-141D/ KPG-141DN prior to use of the transceiver. A maximum of 1000 FleetSync IDs can be configured for FleetSync ID List.

Table 16-5 ID List Configuration

ID List	Description
Fleet	Fleet of the FleetSync ID is configured. A user can select “ALL” or a number between 100 and 349. ALL allows initiation of a call to all Fleets.
ID	ID of the FleetSync ID can be configured. A user can register “ALL” or a number between 1000 and 4999. “ALL” allows initiation of a call to all IDs.
ID Name	The caller’s ID Name is configured. For Portable, a name of up to 8 characters can be configured for a FleetSync ID. For Mobile, a name of up to 10 characters can be configured for a FleetSync ID. If the caller’s ID Name is registered in the ID List, the ID Name appears on the main display when the transceiver receives a selective call.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. The ID for which “Yes” is configured for Transmit Inhibit does not appear on the ID selection display in Selcall Mode, and a user cannot select the ID in Selcall Mode. If the transceiver receives a call from an ID for which “Yes” is configured for Transmit Inhibit, the caller’s ID Name appears on the main display. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the **PTT** switch.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the ID List (Edit > FleetSync > ID List)

16.3 Status Message

Status Message is a simplified messaging system that allows a user to send or receive a status message (Statuses 10 to 99) by selecting numbers. With this function enabled, the dispatcher, etc. can send a message to the transceiver.

The following methods are available to send a Status Message.

Table 16-6 Sending Status Messages

Status Message	Description
Status Mode	The transceiver enters Status Mode by a user pressing a **PF** key or a key on the keypad, and then the transceiver will send a Status Message. (Refer to: 16.3.1 Sending a Status Message on this page)
Call Key	Pressing one of the Call 1 to Call 6 keys causes the transceiver to send the preconfigured Status Message. Call 1 to Call 6 can be assigned to the **PF** keys using KPG-141D/ KPG-141DN and the Status Message corresponding to each key can be selected from the Status List in FleetSync. In this case, the receiving party is fixed to the target party.
Turning the transceiver ON/ OFF	The transceiver sends the Status Message configured using KPG-141D/ KPG-141DN when the transceiver is turned ON or OFF. (Refer to: 16.3.7 Power-on Status Message on page 155, 16.3.8 Power-off Status Message on page 155) In this case, the receiving party is fixed to the target party.
AUX Input Status Message (Mobile only)	The transceiver sends the specified Status Message when the AUX Input port goes high level to low level or goes low level to high level. (Refer to: 16.3.13 AUX Input Status Message (Mobile Only) on page 157)
PC Command	The transceiver will send a Status Message when the transceiver receives a PC command from the communication port.

Note: For Portable (without LCD/ without Key), a Status Message cannot be sent by using Status Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Status Message corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)

16.3.1 Sending a Status Message

This section describes how to send a Status Message in Status Mode.

The transceiver enters Status Mode with one of the following operations, and then the transceiver will send a Status Message.

- **Status (FleetSync/NXDN) or Selcall + Status (FleetSync) key**

  Pressing the **Status (FleetSync/ NXDN)** key places the transceiver in Status Mode. In this case, a Status Message is addressed to a Target Fleet/ ID.

  Pressing the **Selcall + Status (FleetSync)** key causes the transceiver to enter Selcall Mode. The transceiver enters Status Mode by a user pressing the **[S]** or **[*]** key after selecting the target transceiver's Selcall ID. (Refer to: 16.2.1 Initiating a Selective Call on page 144)

- **Keypad Entry**

  If "Status (FleetSync/NXDN)" is configured for Keypad Operation, pressing a key(s) on the keypad causes the transceiver to enter Status Mode. In this case, a Status Message is addressed to a Target Fleet/ ID.

  If "Selcall + Status (FleetSync)" is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Selcall Mode. The transceiver enters Status Mode by a user pressing the **[S]** or **[*]** key after selecting the target transceiver's Selcall ID. (Refer to: 16.2.1 Initiating a Selective Call on page 144)

  The transceiver enters Selcall ID Shortcut Entry Mode or goes into the respective state as the first digit of the Selcall ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

■ Operating the Transceiver

- **Sending a Status Message by List Selection**

1. Select one of the following operations to place the transceiver in Status Mode.
   - **Pressing the Status (FleetSync/NXDN) key**

     The transceiver enters Status Mode. In this case, a Status Message is addressed to a Target Fleet/ ID.
   - **Pressing the Selcall + Status (FleetSync) key**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver's Selcall ID places the transceiver in Status Mode.

Portable

Mobile

Or, the transceiver enters Status Mode by a user using a keypad. In this case, the following operations are identical.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⋀]** or **[⋁]** key (Mobile) to select the target data from Status List.

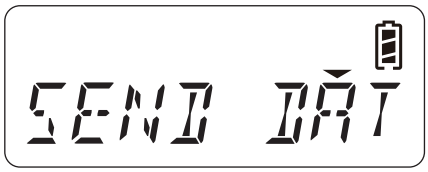
   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

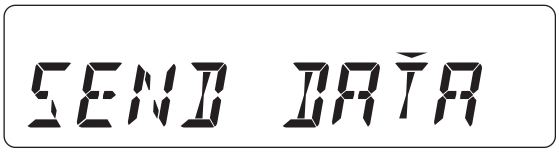
Mobile

3. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Status Message.



Portable



Mobile

- **If the Status Message is successfully sent to the target party:**

  “COMPLETE” appears on the main display.

Portable

Mobile

- **If the Status Message cannot be sent to the target party:**

  “NO REPLY” appears on the main display.

Portable

Mobile

- **If the Status Message cannot be sent since the target party is busy:**

  “BUSY” appears on the main display.

Portable

Mobile

- **If the transceiver cannot connect to the repeater (LTR Trunking System):**

  “OUT OF R” (Portable) or “OUT OF RNG” (Mobile) appears.

Portable

Mobile

- **If the transmission is canceled:**

  While sending a Status Message, pressing the **Side 1** key (Portable) or the **Triangle** key (Mobile) causes “CANCEL” to appear on the display, and the transmission is canceled.

Portable

Mobile

- **Sending a Status Message using Manual Dialing**

To send a Status Message using Manual Dialing, Manual Dialing must be enabled using KPG-141D/ KPG-141DN.

1. Select one of the following operations to place the transceiver in Status Mode.
   - **Pressing the Status (FleetSync/NXDN) key**

     The transceiver enters Status Mode. In this case, a Status Message is addressed to a Target Fleet/ ID.
   - **Pressing the Selcall + Status (FleetSync) key**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Selcall ID places the transceiver in Status Mode.

Portable

Mobile

Or, the transceiver enters Status Mode by a user pressing the **Menu** key or using a keypad. In this case, the following operations are identical.

2. Press and hold the **[S]** or **[*]** key.

   The status entry display appears.

Portable

Mobile

For Mobile, the status entry display also appears by pressing the **[<B]** key.

3. Enters a status.

   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

   - **Using the Selector or the PF Keys**

     The characters can be selected by rotating the **Selector** (Portable), or pressing the **[∧]** or **[∨]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

- **Using the Keypad**

  A code can be entered by pressing the **[0]** to **[9]** keys.

Portable

Mobile

4. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Status Message. Refer to step 3 of "●Sending a Status Message by List Selection" for the procedure on how to cancel displays and transmission while the transceiver is transmitting.

Note: To enter a status using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions for Keypad Operation (Edit > Key Assignment > General)
- Configuring the Manual Dialing to be enabled or disabled (Edit > FleetSync > General 1)

16.3.2 Receiving a Status Message

A received Status Message is transferred in the following way.

Table 16-7 Transferring a Status Message

Status Message	Description
Display	The received Status Message appears on the main display. If "Fixed" is configured for Message Display Type, only Status Message appears. The received Status Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if "Alternate" is configured for Message Display Type.
Alert Tone	Alert Tone sounds if the transceiver receives a Status Message.
PC Command	The transceiver sends the received Status Message using a serial command. This message is sent to an external device that is connected to the transceiver, such as a PC.

Note:

- To use serial communications, a user must prepare FleetSync compatible software or external devices.
- A maximum of 15 received Status Messages along with Short Messages can be stored in the stack memory of the transceiver. (Refer to: 16.6 Stack on page 163)
- Status Name appears on the main display when receiving the Status Message. "STATUS xx" appears on the main display if the transceiver receives a Status Message for which Status Name is not configured. (Refer to: 16.3.9 Status List on page 156)

■ Transceiver Behavior

1. The transceiver starts receiving a Status Message.

   "RECV DAT" (Portable) or "RECV DATA" (Mobile) appears.

Portable

Mobile

2. The transceiver receives a Status Message.
   “COMPLETE” appears on the main display.

Portable

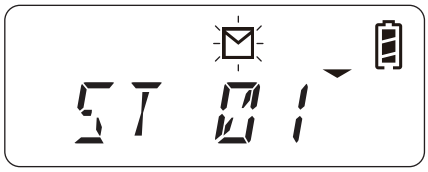
Mobile

The Alert Tone (Status/ Short Message Call) sounds from the transceiver and then the Status Message will appear.
(Refer to: 16.8.25 Alert Tone (Status/Short Message Call) on page 176)

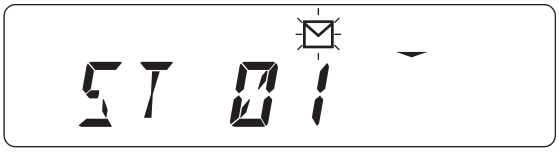
If the Status Message exceeds the number of displayable digits, the message text is displayed while being scrolled from right to left.

The received Status Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if “Alternate” is configured for Message Display Type.

Status Message Display (3 seconds)

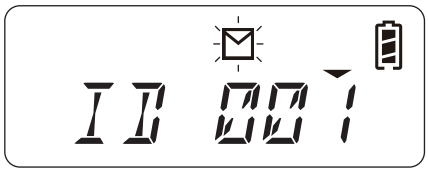


Portable



Mobile

ID Name Display (2 seconds)

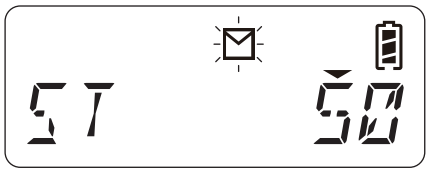


Portable

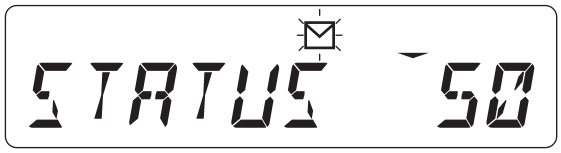
Mobile

- **If the status is not configured for Status List or the Status Name is not configured:**

  The status number appears.

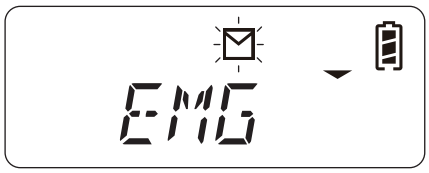


Portable

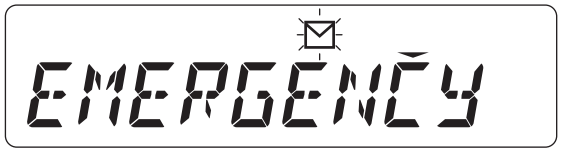


Mobile

- **If the transceiver receives Emergency Status:**

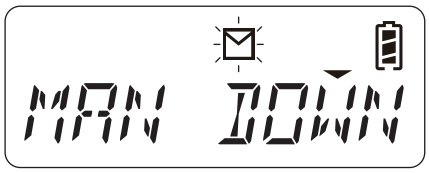


Portable

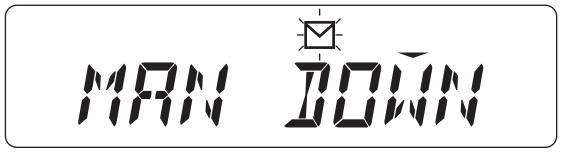


Mobile

- **If the transceiver receives Man-down Status:**

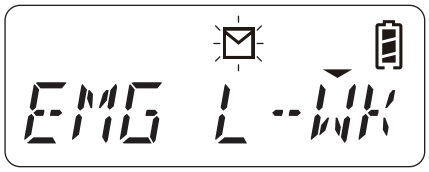


Portable



Mobile

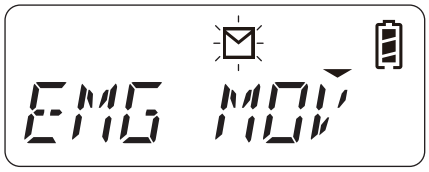
- **If the transceiver receives Lone Worker Status:**



Portable

Mobile

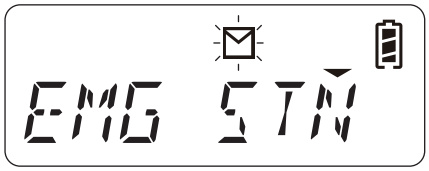
- **If the transceiver receives Motion Status:**



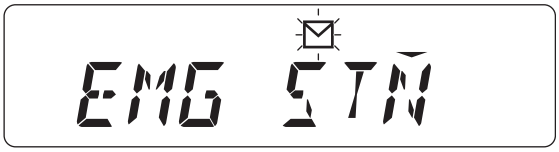
Portable

Mobile

- **If the transceiver receives Stationary Status:**

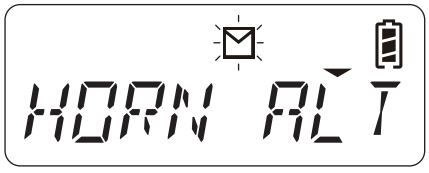


Portable

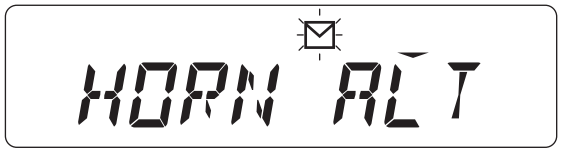


Mobile

- **If the transceiver receives Horn Alert Status:**



Portable



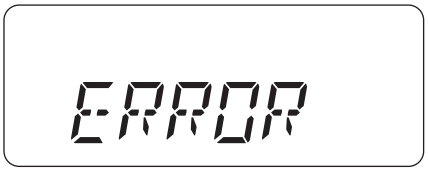
Mobile

- **If the transceiver receives Remote Stun Status:**

Portable

Mobile

- **If the transceiver receives Remote Kill Status:**



Portable

Mobile

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > FleetSync > General 1)

16.3.3 Reserved Status of the Status Message

There is a reserved status for Status Messages. Below is a list of the reserved statuses.

Table 16-8 Reserved Statuses

Status	Function	Operation on a Receiving transceiver	Availability of Status Entry based on the Entry Method	
			Manual Dialing	PC Control
10 to 79	Statuses intended for users	Reception of a normal Status	Yes	Yes
80	Default Status		Yes/ No*1	
81 - 86	Undefined			
87	Remote Kill Command	The transceiver sends an acknowledge. The receiving transceiver will be in the Kill state.		
88	Emergency Reset Command	This status resets Emergency.		
89	Horn Alert Activation Command	Activates the Horn Alert.*2		
90	Remote Stun Transmit Inhibit Command	The transceiver sends an acknowledge. Transmission is restricted. In this case, Current Status becomes "93".*3		
91	Remote Stun Transmit/Receive Inhibit Command	The transceiver sends an acknowledge. Transmission and reception are restricted. In this case, Current Status becomes "94".*3		
92	Remote Stun Reset Command	The transceiver sends an acknowledge. Disables the Stun. In this case, Current Status becomes "80".		
93	Remote Stun Transmit Inhibit Response	-		
94	Remote Stun Transmit/Receive Inhibit Response	-		
95 to 99	Reserved Statuses for Emergency (95: Lone Worker Status) (96: Motion Detection Status) (97: Stationary Detection Status) (98: Man-down Status) (99: Other Emergency Statuses)	The transceiver sends an acknowledge. Alert/ Horn/ None*4		

*1 Whether status numbers 80 to 99 can be entered for use with Manual Dialing can be enabled or disabled using KPG-141D/ KPG-141DN. (Refer to : 16.3.11 Status 80 - 99 (Special) on page 156)

*2 Horn Alert cannot be used for Portable.

*3 Stun Status will not be changed even if a user changes the status in Status Mode.

*4 How the transceiver receives reserved statuses for Emergency (status numbers 95 to 99) can be configured using KPG-141D/ KPG-141DN. (Refer to : 16.3.12 Emergency Status Response on page 156)

■ Emergency

If the transceiver receives a reserved status message, an Alert Tone sounds from the transceiver based on the Emergency Status Response configuration.

■ Remote Stun

This function disables almost all of the transceiver's functions as below. However, the Stun state will be reset upon receipt of Stun release status and the DTMF Stun release command.

Table 16-9 Transferring a Status Message

Status Message	Transmit Inhibit	Transmit/ Receive Inhibit
Normal Operation	Transmit Inhibit	Transmit/ Receive Inhibit
PC Control	The transceiver rejects the transmission request.	The transceiver rejects the transmission request.

Whether to accept the received Remote Stun Status can be configured using KPG-141D/ KPG-141DN. (Refer to: 16.8.31 Stun/Kill Status Validation on page 177)

■ Remote Kill

If the transceiver receives the Remote Kill Status (Reserved Status 87), the transceiver is disabled and no operations can be done. However, the configuration data can be written to the transceiver using KPG-141D/ KPG-141DN.

Whether to accept the received Remote Kill Status can be configured using KPG-141D/ KPG-141DN. (Refer to: 16.8.31 Stun/Kill Status Validation on page 177)

■ Status 90 - 92

These statuses are used to command or reset the Stun.

These statuses allow the transceiver to command or reset the Stun regardless of the Stun status of the receiving transceiver.

■ Status 93 - 94

These status numbers are used to respond to the Stun status of the transceiver when receiving the RSTM (Request Status).

16.3.4 Status Message Stack

Status Message Stack is the function to store a Status Message in the stack memory. A maximum of 15 Status Messages can be stored in the stack memory.

If a message is stored, the "✉" icon blinks. In this case, a user can read the stored Status Message if the transceiver enters Stack Mode. (Refer to: 16.6 Stack on page 163)

Note:

- A maximum of 15 messages (Status Message and Short Message) can be stored in the stack memory.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.3.5 Status Message on Data Zone-CH/GID

Status Message on Data Zone-CH/GID allows the transceiver to automatically change the channel to Data Zone-channel or GID to send the Status Message.

The transceiver automatically changes the channel to Data Zone-channel or GID to send the Status Message. The transceiver restores the last Zone-channel or GID when the transmission ends. Status Message on Data Zone-CH/GID can be used to send data on a specific channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message on Data Zone-CH/GID to be enabled or disabled (Edit > FleetSync > Parameter)

16.3.6 Status Message Serial Output

Status Message Serial Output allows the transceiver to send a Status, and the caller's Fleet and ID, from the transceiver's communication port when the transceiver receives a Status Message.

The dispatcher can retrieve the transceiver's status information using a PC.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message Serial Output to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

16.3.7 Power-on Status Message

Power-on Status Message allows the transceiver to send the selected Status Message when the transceiver is turned ON.

Using the Power-on Status Message, the base station can recognize that the transceiver has been turned ON. The transceiver sends the message to the FleetSync ID configured for Target Fleet/ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-on Status Message (Edit > FleetSync > Target)

16.3.8 Power-off Status Message

Power-off Status Message allows the transceiver to send the selected Status Message when the transceiver is turned OFF.

Using the Power-off Status Message, the base station can recognize that the transceiver has been turned OFF. The transceiver sends the message to the FleetSync ID configured for Target Fleet/ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-off Status Message (Edit > FleetSync > Target)

16.3.9 Status List

Status Message must be preconfigured in the transceiver using KPG-141D/ KPG-141DN prior to the transmission. A maximum of 90 statuses can be configured in the Status List.

Status List can be configured by using KPG-141D/ KPG-141DN.

Table 16-10 Status List

Call Type	Description
Status	The Status number can be configured. The Status Number can be configured by using a number between 10 and 99.
Status Name	The Status number can be configured. It is not easy to recognize the meaning of a status only by viewing a status number. In this case, a user can link the status number to a short message; hence, it can be easily understood. A maximum of 16 characters can be configured.
Transmit Inhibit	The transmission to the receiving party can be enabled or disabled. The status for which “Yes” is configured for Transmit Inhibit does not appear on the status selection display in Status Mode. In this case, a user cannot select a status for which “Yes” is configured for Transmit Inhibit in Status Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status List (Edit > FleetSync > Status List)

16.3.10 Target Fleet/ ID

Target Fleet/ ID is the target FleetSync ID used for sending the following Status Messages or Short Messages:

- AUX Input Status Message (Mobile only)
- Power-on Status Message
- Power-off Status Message
- A Status Message that is sent by selecting a status number or directly entering a status number after the transceiver enters Status Mode by a user pressing the **Status (FleetSync/NXDN)** key or the **[0]** to **[9]** keys on the microphone keypad
- A Status Message that is sent by a user pressing the **Call** key
- A Short Message that is sent by entering a text string after the transceiver enters Short Message Mode by a user pressing the **SDM (FleetSync/ NXDN)** key or the **[0]** to **[9]** keys on the microphone keypad

Target FleetSync ID can be configured using KPG-141D/ KPG-141DN. FleetSync ID of the base station which is responsible for operation and administration is normally configured for Target Fleet/ ID (Status Message).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Target Fleet/ID (Edit > FleetSync > Target)

16.3.11 Status 80 - 99 (Special)

Status 80 to 99 (reserved status) is a function used to prevent a user from sending the status numbers 80 to 99 erroneously.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status No.80 - 99 (Special) (Edit > FleetSync > General 1)

16.3.12 Emergency Status Response

Emergency Status Response is the function that is used to notify a user of that the transceiver has received an Emergency Status.

Emergency Status Response functions by the following Emergency Statuses.

Table 16-11 Emergency Status

Status	Factor That Activated Emergency
99	Emergency key Emergency port (AUX Input)
98	Man-down Detection
97	Stationary Detection
96	Motion Detection
95	Lone Worker

Emergency Status Response can be configured by using KPG-141D/ KPG-141DN.

Table 16-12 Emergency Status Response

Emergency Status Response	Description
None	The transceiver functions in the same manner as when receiving a normal status.
Alert	The Alert Tone configured for Emergency Response sounds from the transceiver when receiving an Emergency Status.
Horn[*1]	The Alert Tone configured for Emergency Response sounds and the Horn Alert port is activated upon receipt of an Emergency Status.

[*1] Mobile only

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Status Response (Edit > FleetSync > General 1)

16.3.13 AUX Input Status Message (Mobile Only)

AUX Input Status Message can be used to send the specified Status Message when the AUX Input port goes high to low or goes low to high.

The transceiver can send a Status Message when a sensor is attached to the AUX Input port and the status of the AUX Input port changes. The transceiver sends the message to the FleetSync ID configured for Target Fleet/ID. (Refer to: 16.3.10 Target Fleet/ ID on page 156)

To use this function, AUX Input Status Message must be assigned to one of AUX Input ports.

Note: State Hold Timer (Active Low) allows to configure the length of time that the AUX Output Status Message ports remain at the low level after these ports go low level. (Refer to: 29.4 State Hold Timer (Active Low) on page 358)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the AUX Input Status Message (Edit > FleetSync > Target)
- Assigning functions to the AUX Input port (Edit > Extended Function > AUX)

16.3.14 AUX Output Status Message (Mobile Only)

AUX Output Status Message is the function to switch the status of the AUX Output port from high to low or from low to high when the transceiver receives the specified Status Message. This function can be used to remotely turn the external device On or Off.

To use this function, AUX Output Status Message must be assigned to one of AUX Output ports.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the AUX Output Status Message (Edit > FleetSync > Target)
- Assigning functions to the AUX Output port (Edit > Extended Function > AUX)

16.4 Short Message

Short Message allows the transceiver to send and receive a maximum of 48 characters.

Using this function, a dispatcher can reliably send text messages to the target party.

Note: To use serial communications, a user must prepare FleetSync compatible software or external devices.

16.4.1 Sending a Short Message

This section describes how to send a Short Message.

The transceiver sends a Short Message by one of the following operations.

- **PC Command**

  “Data” or “Data + GPS Data Output” can be assigned to the communication port on the transceiver. The transceiver will send a Short Message when a PC sends a command to the transceiver communication port specifying to send a Short Message. (Refer to: 6 COMMUNICATION PORTS on page 81)

- **Short Message Mode**

  The transceiver enters Short Message Mode and sends a Short Message by one of the following operations.

  - **SDM (FleetSync/NXDN) or Selcall + SDM (FleetSync) Key**

    Pressing the **SDM (FleetSync/NXDN)** key places the transceiver in Short Message Mode. In this case, a Short Message is addressed to a Target Fleet/ ID.

    Pressing the **Selcall + SDM (FleetSync)** key places the transceiver in Selcall Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Selcall ID places the transceiver in Short Message Mode. (Refer to: 16.2.1 Initiating a Selective Call on page 144)

  - **Keypad Entry**

    If “SDM (FleetSync/NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the transceiver keypad causes the transceiver to enter Short Message Mode. The transceiver will be on hold as the first digit of the Short Message is entered. In this case, a Short Message is addressed to a Target Fleet/ ID.

    If “Selcall + SDM (FleetSync)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Selcall Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Selcall ID places the transceiver in Short Message Mode. (Refer to: 16.2.1 Initiating a Selective Call on page 144)

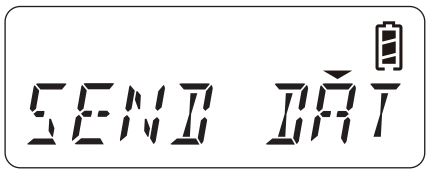
Note: For Portable (without LCD/ without Key), a Short Message cannot be sent by using Short Message Mode.

■ Operating the Transceiver

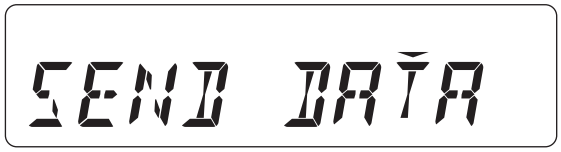
- **Sending a Short Message using a PC Command**

1. A PC sends the PC command to the transceiver to request transmission of a Short Message.

   The transceiver starts sending the Short Message.



Portable



Mobile

If the Short Message is properly sent to the receiving transceiver, “COMPLETE” appears.

Portable

Mobile

- **Sending a Short Message in Short Message Mode**

1. Select one of the following operations to place the transceiver in Short Message Mode.
   - **Pressing the SDM (FleetSync/NXDN) key**

     The transceiver enters Short Message Mode. In this case, a Short Message is addressed to a Target Fleet/ ID.
   - **Pressing the Selcall + SDM (FleetSync) key**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver's Selcall ID places the transceiver in Short Message Mode.

Portable

Mobile

Or, the transceiver enters Short Message Mode by a user using a keypad. In this case, the following operations are identical.

2. Enter a Short Message.

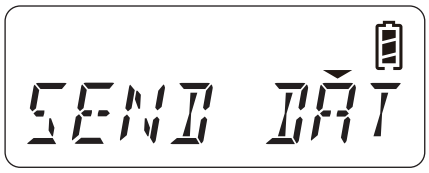
   A maximum of 48 characters can be entered. Refer to 5.16.3 Entering or Clearing Characters on page 55 for entry methods.

Portable

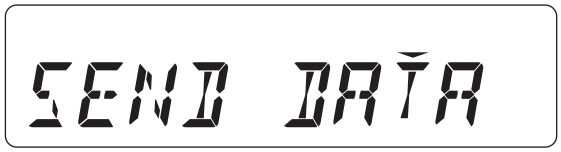
Mobile

3. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Short Message.



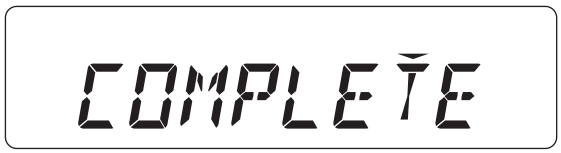
Portable



Mobile

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

Portable



Mobile

16.4.2 Receiving a Short Message

Upon the receipt of a Short Message, the received Short Message appears on the main display, and the transceiver can send the Short Message to an external device from the communication ports.

Table 16-13 Receiving a Short Message

Short Message	Description
Display	The received Short Message appears on the transceiver main display. If “Fixed” is configured for Message Display Type, only Short Message appears. The received Short Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if “Alternate” is configured for Message Display Type.
Alert Tone	Alert Tone sounds upon receipt of a Short Message.
PC Command	The transceiver sends the received Short Message using a serial command. This message is sent to an external device that is connected to the transceiver, such as a PC.

Note: A maximum of 15 received Short Message along with Short Messages can be stored in the stack memory of the transceiver. (Refer to: 16.6 Stack on page 163)

■ Transceiver Behavior

1. The transceiver starts receiving a Short Message.

   “RECV DAT” (Portable) or “RECV DATA” (Mobile) appears.

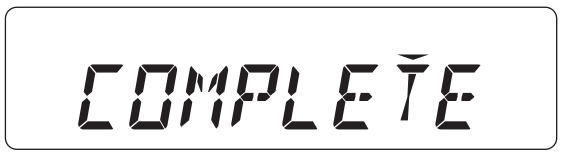
Portable

Mobile

2. The transceiver receives a Short Message.

   “COMPLETE” appears on the main display.

Portable



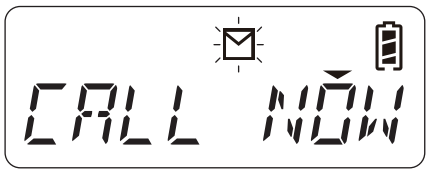
Mobile

The Alert Tone (Status/ Short Message Call) sounds from the transceiver and then the Short Message will appear.(Refer to: 16.8.25 Alert Tone (Status/Short Message Call) on page 176)

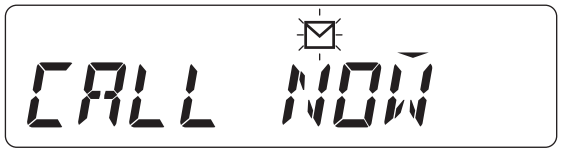
If the Short Message exceeds the number of displayable digits, the message text is displayed while being scrolled from right to left.

The received Short Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if “Alternate” is configured for Message Display Type.

Short Message Display (3 seconds)

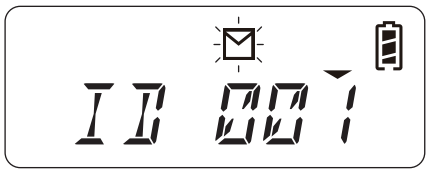


Portable



Mobile

ID Name Display (2 seconds)



Portable

Mobile

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > FleetSync > General 1)

16.4.3 Short Message Stack

Short Message Stack is used to store a Short Message in the stack memory. A maximum of 15 Short Messages can be stored in the stack memory.

If a message is stored, the "✉" icon blinks. In this case, a user can read the stored Short Message when the transceiver enters Stack Mode. (Refer to: 16.6 Stack on page 163)

Note:

- A maximum of 15 messages (Status Message and Short Message) can be stored in the stack memory.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.4.4 Short Message on Data Zone-CH/GID

Short Message on Data Zone-CH/GID allows the transceiver to automatically migrate to a Data Zone-channel or GID to send a Short Message.

The transceiver automatically migrates to a Data Zone-channel or GID to send a Short Message. The transceiver restores the last Zone-channel or GID when the transmission ends. Short Message on Data Zone-CH/GID is used to support data communications on a specific dedicated channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message on Data Zone-CH/GID to be enabled or disabled (Edit > FleetSync > Parameter)

16.4.5 Short Message Serial Output

Short Message Serial Output allows the transceiver to transfer the received Short Message and the caller's Fleet and ID from the transceiver's communication port.

The dispatcher can retrieve the transceiver's status information using a PC.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message Serial Output to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

16.5 Long Message

Long Message allows the transceiver to send and receive a maximum of 4,096 characters.

Using this function, information can reliably be sent to the target party.

Note:

- To send a Long Message, "Data" or "Data + GPS Data Output" must be configured for the communication port of the transceiver. (Refer to: 6 COMMUNICATION PORTS on page 81)
- To use serial communications, a user must prepare FleetSync compatible software or external devices.

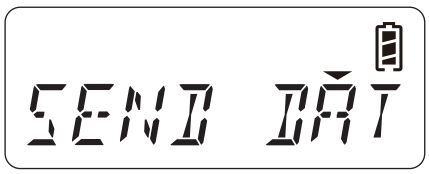
16.5.1 Sending a Long Message

A Long Message is sent via a PC. A Long Message cannot be sent from the transceiver.

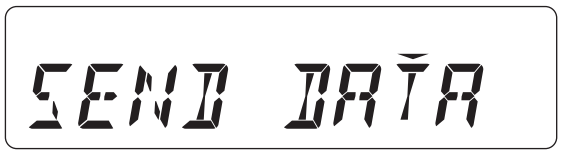
■ Transceiver Behavior

1. A PC sends the PC command to the transceiver to request transmission of a Long Message.

   The transceiver starts sending the Long Message.



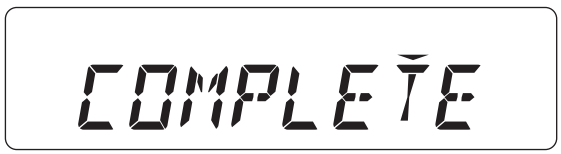
Portable



Mobile

If the Long Message is properly sent to the receiving transceiver, "COMPLETE" appears.

Portable



Mobile

16.5.2 Receiving a Long Message

The received Long Message data can be transferred via a PC or external device.

■ Transceiver Behavior

1. The transceiver starts receiving a Long Message.

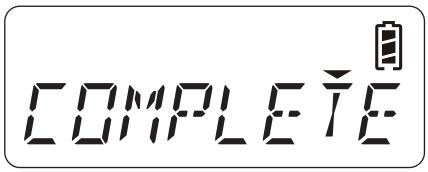
   “RECV DAT” (Portable) or “RECV DATA” (Mobile) appears.

Portable

Mobile

2. The transceiver receives a Long Message.

   “COMPLETE” appears on the main display.



Portable

Mobile

3. The transceiver restores the previous display.

   The received Long Message is transferred to the PC with the serial output.

16.5.3 Long Message on Data Zone-CH/GID

Long Message on Data Zone-CH/GID allows the transceiver to automatically migrate to a Data Zone-channel or GID to send a Long Message.

The transceiver automatically migrates to a Data Zone-channel or GID to send a Long Message. The transceiver restores the last Zone-channel or GID when the transmission ends. Long Message on Data Zone-CH/GID allows the transceiver to send data on a specific dedicated channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Long Message on Data Zone-CH/GID to be enabled or disabled (Edit > FleetSync > Parameter)

16.6 Stack

A received Selective Call, Status Message, or Short Message is stored in the Stack Memory. The message can be confirmed or deleted by operating the transceiver.

In order to store the received ID or various message in the stack memory of the transceiver, Caller ID Stack, Status Message Stack, or Short Message Stack must individually be enabled by using KPG-141D/ KPG-141DN.

The "✉" icon appears if messages are stored in the transceiver. If there is an unread message, the "✉" icon blinks.

Pressing the **Stack** key causes the transceiver to enter Stack Mode.

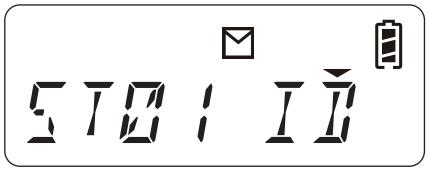
Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

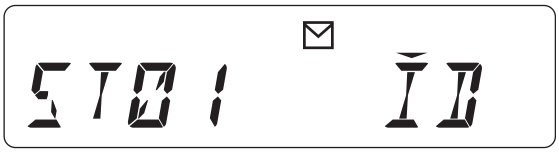
- **Confirming the Message**

1. Press the **Stack** key.

Enters Stack Mode.



Portable



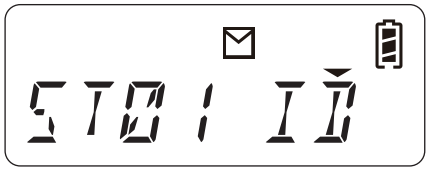
Mobile

The type and number of the stored message appear at the upper right of the display.

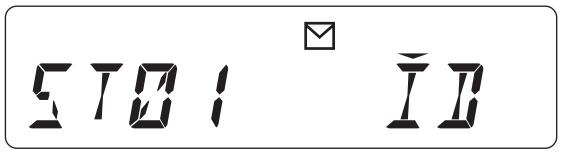
The display varies as follows depending on the message type.

The stored information (the message type, stored number, and displayed item) appears for 1 s and the stored data appears for 2 s alternately.

- **Displaying the Stored Information**

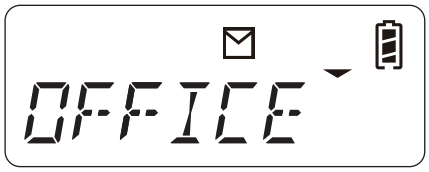


Portable



Mobile

- **Displaying the Stored Data**



Portable

Mobile

Table 16-14 Stored Information

Stored Information		Display
Message Type	Caller ID Stack	ID
	Status Message	ST
	Short Message	ME
Stored Number	1 to 15	01 to 15
Displayed Item	Caller ID	ID
	Status/ Short Message	MSG
	Received Channel or GID	CH

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the message and then confirm the message.

Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

The display, for which neither ID Name nor Status Name is configured, is the same display as appears while in Selcall Mode and Status Mode. (Refer to: 16.2.2 Receiving a Selective Call on page 146, 16.3.2 Receiving a Status Message on page 151)

- **Switching the Message Display**

1. Press and hold the **[S]** or **[*]** key while the message is appearing.

   The display switches as follows.

   In the case of Caller ID Stack:

   ID Name → Received Channel or GID → ID Name...

   In the case of Status/ Short Message Stack:

   ID Name → Status/Short Message → Received Channel or GID → ID Name...

   Note:

   - For Mobile, the message display can also be changed by pressing the **[<B]** key.
   - Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for instructions on how to clear a message.
   - If the **PTT** switch is pressed while a Caller ID appears, the transceiver can respond to the ID.
   - When the transceiver responds to the Caller ID, if "NXDN" is configured for Transmit Mode of the channel to be used for transmission, a Warning Tone A sounds from the transceiver by a user pressing the **PTT** switch, and the transceiver cannot respond.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Caller ID Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)
- Configuring the Status Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)
- Configuring the Short Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.6.1 Latest Received Message Stack

Latest Received Message Stack can be used to select a stack procedure to store the received Caller ID, Status Message or Short Message in the stack memory.

Table 16-15 Latest Received Message Stack

Configuration	Function
Enabled	**In the case of Caller ID:** The transceiver stores a maximum of 5 received Caller IDs in the stack memory in the order of reception. If the 6th Caller ID is received, the stored Caller IDs are deleted in chronological order and a new Caller ID will be stored in the stack memory. **In the case of Status Message or Short Message:** The transceiver stores a maximum of 15 received messages in the stack memory in the order of reception. If the 16th message is received, the stored and older messages are deleted in chronological order and the new message will be stored in the stack memory.
Disabled	**In the case of Caller ID:** The transceiver stores a maximum of 5 received Caller IDs in the stack memory in the order of reception. If the 6th Caller ID is received, this Caller ID will not be stored in the stack memory. **In the case of Status Message or Short Message:** The transceiver stores a maximum of 15 received messages in the stack memory in the order of reception. If the 16th message is received, this message will not be stored in the stack.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Latest Received Message Stack to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.6.2 Caller ID Stack

Caller ID Stack allows the transceiver to store the Caller ID of the target party in the stack memory.

The transceiver can store a maximum of 5 Caller IDs.

A user can respond to the displayed Caller ID by pressing the **PTT** switch while the transceiver is in Caller ID Stack Mode.

When the transceiver receives a call with FleetSync ID, the "✉" icon blinks to notify a user that the FleetSync ID is stored. The user can enter Stack Mode to check the stored FleetSync ID.

The stack method varies depending on the configuration for Latest Received Message Stack.
(Refer to: 16.6.1 Latest Received Message Stack on this page)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Caller ID Stack to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.6.3 Message Memory

Message Memory allows the transceiver to retain the stacked Caller ID, Status Message or Short Message in the stack memory even after the transceiver is turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Memory (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

16.7 GPS

GPS is a function for data communications which allows sending of location information of a mobile station to a base station or transferring of location information which is received by the base station to a PC as a serial command.

A GPS receiver unit compatible with the NMEA-0183 standard is required and it must be connected to the communication port of the transceiver (mobile station) to send GPS data. Mobile has a built-in GPS receiver unit.

A PC with the mapping application installed must be connected to the communication port of the transceiver (base station) to receive GPS data and translate the received GPS data for use on a map.

The location information of each transceiver appears on the PC display. This function is convenient for dispatch control or a traffic control system.

Refer to 22 GPS POSITION DISPLAY on page 215 for instructions for showing position information on the main display of the vehicle station's transceiver.

The following methods are available to send the GPS data.

■ Auto

The transceiver sends the GPS data at the intervals configured for GPS Report Interval.

■ Poll

The transceiver sends the GPS data when the transceiver receives a transmission request from the base station.

■ Manual

Pressing the **Send the GPS Data** key causes the transceiver to send GPS data.

■ PTT

The transceiver sends the GPS data linked with the **PTT** switch. The timing to send the GPS data can be selected from BOT, EOT and Both.

■ Status

The transceiver sends the GPS data linked with a Status Message.

■ Emergency

The transceiver sends the GPS data linked with a Emergency Call.

Note:

- For the transceiver sending the GPS data, "GPS" must be assigned to the communication port to which the GPS receiver unit is connected. (Refer to: 6 COMMUNICATION PORTS on page 81)
- To use the built-in GPS receiver unit in Mobile, Built-in GPS Receiver must be enabled when the data is configured by using KPG-141D/ KPG-141DN. In this case, the COM port setting is not required.
- For the transceiver receiving GPS data, "Data + GPS Data Output" must be assigned to the communication port to which a PC with the mapping application installed must be connected. (Refer to: 6 COMMUNICATION PORTS on page 81)

16.7.1 Base Fleet/ Base ID

Base Fleet and Base ID are the target FleetSync IDs to send GPS data.

FleetSync ID of the base station which is responsible for operation and administration of the system is normally configured for Base Fleet/ ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Base Fleet and Base ID (Edit > FleetSync > GPS)

16.7.2 GPS Combination

GPS Combination is the timing to send GPS data.

GPS data can be added to a signal when the transceiver is in PTT ID, Status, or Emergency Mode.

GPS Combination can be configured using KPG-141D/ KPG-141DN. Following are items that can be configured.

■ PTT ID

The transceiver sends the GPS data using the PTT ID (FleetSync) of the transmitting transceiver. The GPS data can be appended to the PTT ID transmission (BOT, EOT or Both) when it is sent.

Following are the IDs to be sent and the GPS data.

Table 16-16 IDs to be Sent and GPS Data

GPS Report Timing	PTT ID (Analog)			
	Off	BOT	EOT	Both
BOT	-	BOT + GPS	EOT	BOT + GPS EOT
EOT	-	BOT	EOT + GPS	BOT EOT + GPS

GPS Report Timing	PTT ID (Analog)			
	Off	BOT	EOT	Both
Both (BOT)	-	BOT + GPS	EOT + GPS	BOT + GPS EOT
Both (EOT)	-	BOT + GPS	EOT + GPS	BOT EOT + GPS
Both	-	BOT + GPS	EOT + GPS	BOT + GPS EOT + GPS

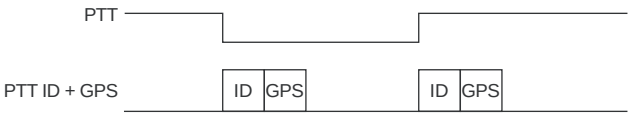


Figure 16-1 Timing for GPS Combination (PTT ID)

■ Status

The transceiver sends the GPS data using the FleetSync Status Message. The range of Status numbers to which GPS data is appended can also be configured.

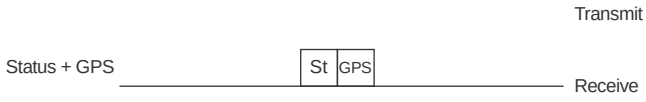


Figure 16-2 Timing to Send GPS Combination (Status)

■ Emergency

The transceiver sends the GPS data using the Emergency ID (FleetSync).

GPS data cannot be appended to the DTMF.

Following are the IDs to be sent and the GPS data.

Table 16-17 IDs to be Sent and GPS Data

Emergency	Emergency ID (Emergency Information)		
	Disabled	FleetSync	DTMF
Check (Enable)	-	FleetSync ID + GPS	DTMF ID
Uncheck (Disable)	-	FleetSync ID	DTMF ID

Figure 16-3 Timing to Send Combination (Emergency)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Combination (Edit > FleetSync > GPS > GPS Combination)

16.7.3 GPS Report Mode

GPS Report Mode can be used to send the GPS data automatically or send after receiving the command.

Table 16-18 GPS Report Mode

GPS Report Mode	Function
Poll	The transceiver sends the GPS data when receiving the GPS data transmission request from the base station. This function is used when the base station controls the timing to send the GPS data. This function is useful for avoiding transmit collisions if there are many subscriber units.
Auto	The transceiver sends the GPS data at the intervals configured for GPS Report Interval Time. This function is useful for controlling or monitoring vehicles on a time axis basis as the transceiver periodically sends the position data to the base station. The transceiver sends GPS data upon receipt of the GPS data transmission request from the base station even if Auto is configured.

Note: If the transceiver is under the following conditions, GPS data transmission using Auto will be canceled. To avoid a collision with a GPS transmission from other transceivers while sending GPS data, Transmit Busy Wait Time will not suspend the transmission. (Refer to: 16.8.11 Transmit Busy Wait Time on page 173)

- While the transceiver is transmitting
- While the transceiver is receiving
- While the Public Address function is used (Mobile only)
- If Transmit Frequency or Encode ID is not configured
- If transmission is disabled by the Time-out Timer
- While the transceiver is sending or receiving FleetSync data
- While Auto Telephone is active
- While System Search is active.
- While the transceiver is connected to the repeater
- While the transceiver is waiting to send the Transpond code
- Transceiver Password Mode
- Emergency Mode

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Mode (Edit > Optional Features > Optional Features 2 > GPS)

16.7.4 Number of Times

Number of Times allows the transceiver to automatically send GPS data for the configured number of times if “Poll” is configured for GPS Report Mode.

The transceiver sends GPS data for the number of configured times at the intervals configured for GPS Report Interval.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Number of Times (Edit > Optional Features > Optional Features 2 > GPS)

16.7.5 GPS Report Interval Time (Portable/Ignition On)

GPS Report Interval Time allows the transceiver to send GPS data at the regular intervals if “Auto” is configured for GPS Report Mode.

GPS Report Interval (Portable/Ignition On) is the interval to send the GPS data while the vehicle’s engine is running. In order to automatically transmit GPS data in Portable, this configuration is used.

Note: GPS Report Interval Time can be used to configure the trigger cycle to start transmitting GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the conditions at the transmitting transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- GPS Report Interval (Edit > Optional Features > Optional Features 2 > GPS > GPS Report Interval Time)

16.7.6 GPS Report Interval Time (Ignition Off) (Mobile Only)

GPS Report Interval Time allows the transceiver to send GPS data at the regular intervals if “Auto” is configured for GPS Report Mode.

GPS Report Interval (Ignition Off) is the interval to send GPS data while the vehicle is parked. Also, this configuration is used to transmit no GPS data linked with an ignition of a vehicle.

Note: GPS Report Interval Time can be used to configure the trigger cycle to start transmitting GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the conditions at the transmitting transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- GPS Report Interval (Ignition Off) (Edit > Optional Features > Optional Features 2 > GPS > GPS Report Interval Time)

16.7.7 GPS Time Mark

GPS Time Mark is the offset time from UTC (Coordinated Universal Time) to send the GPS data.

Configuring a different time for each transceiver allows the transceivers to send GPS data at different timings. This allows a user to avoid transmit collisions.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Time Mark (Edit > Optional Features > Optional Features 2 > GPS)

16.7.8 GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

If “Short” is configured, transmission time for GPS data can be reduced, compared with the TK-x80 and TK-x150-series transceivers.

Table 16-19 GPS Message Type

GPS Message Type	Description
Full	This message has the same format as the TK-x80 and TK-x150 series transceivers. The transmission period is approximately 500 ms. The transceiver sends GPS data corresponding to $GPGGA, $GPRMC and $GPGLL.
Short	The transmission period is approximately 320 ms. The transceiver sends GPS data corresponding to $GPGLL. When the base station receives this GPS data, a part of the data is sent as blank data even if $GPGGA and $GPRMC are configured for PC serial output at Base Station Settings.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Message Type (Edit > Optional Features > Optional Features 2 > GPS)]

16.7.9 GPS Report on Data Zone-CH/GID

GPS Report on Data Zone-CH/GID allows the transceiver to automatically change the channel to Data Zone-channel or GID to send the GPS data.

The transceiver automatically changes the channel to Data Zone-channel or GID to send GPS data. The transceiver will restore the last Zone-channel or GID when the transmission ends. GPS Report on Data Zone-CH/GID can be used to send data using a specific dedicated channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report on Data Zone-CH/GID to be enabled or disabled (Edit > Optional Features > Optional Features 2 > GPS)

16.7.10 Map Header

Whether to send data to the Mapping software when the transceiver receives the GPS data from a mobile station can be configured using KPG-141D/ KPG-141DN.

Following are the types of data that can be sent to the Mapping Software.

Table 16-20 Map Header

Data	Description
$GPGGA (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPGGA data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$GPGLL (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPGLL data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$GPRMC (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPRMC data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$PKLDS (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKLDS data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The $PKLDS data contains the $GPRMC data in the NMEA-0183 format, Fleet, ID, and the status information.
$PKLID (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKLID data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The transceiver at the base station extracts only Fleet, ID, and the status information from the received GPS data and sends the extracted data from the communication port. This sentence is recommended to be used along with $GPGGA (NMEA), $GPGLL (NMEA) or $GPRMC (NMEA). For example, if $GPGGA (NMEA) and $PKLID are used simultaneously, the transceiver at the base station sends from the communication port the $GPGGA data in addition to the Fleet, ID, and the status information extracted from the GPS data.
$PKLSH (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKLSH data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The $PKLSH data contains the $GPGLL data in the NMEA-0183 format, Fleet, and ID. In order to send GPS data in Emergency Mode or by pressing the **PTT** switch, this sentence is used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Map Header (Edit > Optional Features > Optional Features 2 > GPS > Base Station Settings)

16.7.11 GPS ACK Request

GPS ACK Request is the function that allows the base station transceiver to request a mobile station transceiver to send an acknowledgment message when a request message to send GPS data in the FleetSync format is sent by the base station transceiver.

Table 16-21 GPS ACK Request

Configuration	Description
Enabled	The base station transceiver requests the mobile station transceiver to send the acknowledgment message when a request message to send GPS data in the FleetSync format is placed by the base station transceiver. The mobile station transceiver sends an acknowledgment message and then GPS data upon receipt of a request message for transmitting the GPS data in the FleetSync format.

Configuration	Description
Disabled	The base station transceiver does not request the mobile station transceiver to send the acknowledgment message when a request message to send GPS data in the FleetSync format is placed by the base station transceiver. The mobile station transceiver sends the GPS data without sending an acknowledgment message upon receipt of a request message for sending the GPS data in the FleetSync format. Sending or receiving no acknowledgment messages results in less communication time and traffics.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS ACK Request to be enabled or disabled (Edit > FleetSync > GPS)

16.7.12 GPS Report CH/GID

GPS Report CH/GID is the function that allows the transceiver to determine whether to use analog mode or NXDN digital mode for automatic transmission of GPS data including polling on the data zone channel (or GID) in a Conventional Group.

For instance, along with the migration to a digital system, this function can be used when communicating by voice in digital mode; however, still automatic transmission of the GPS data including polling needs to be done in analog mode, etc.

The transceiver behaves as follows depending on the configuration for GPS Report Channel/GID.

Table 16-22 Configuration for GPS Report Channel/GID

Configuration	Description
Selected	If the transmission mode of the current channel is analog mode, GPS data including polling is automatically sent using the data zone channel (or GID) in analog mode. If the transmission mode for the current channel is NXDN digital mode, GPS data including polling is automatically sent using the data zone channel in the NXDN digital mode.
Analog	Regardless of the transmission mode for the current channel, GPS data including polling is automatically sent using the data zone channel (or GID) in analog mode.
NXDN	Regardless of the transmission mode for the current channel, GPS data including polling is automatically sent using the data zone channel in the NXDN digital mode.

Note:

- Configuration for GPS Report Channel/GID does not apply to the transmission of GPS data by means of Send the GPS Data or GPS Combination.
- If a parameter except for “Selected” is selected for GPS Report Channel/GID, GTC Count is automatically disabled even if GTC Count has been configured, and a GTC message cannot be sent.
- Even if any option other than “Selected” is configured for GPS Report CH/GID, when the transceiver receives a polling request, the GPS data is sent in the same behavior as with “Selected” configured, only for the first time. If the GPS data is sent consecutively for the second or later time, the GPS data is automatically sent according to the configuration for GPS Report Channel/GID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report CH/GID (Edit > Optional Features > Optional Features 2 > GPS)

16.7.13 GPS Report Back to Requested ID

GPS Report Back to Requested ID is the function that enables the receiving transceiver to send the GPS data to the ID of the transceiver, which sends a GPS Polling Request, upon receipt of the following GPS Polling Requests.

- GPS Data Single Polling Request
- GPS Data Multiple Polling Request
- GPS Data Query Request

Table 16-23 Configuring GPS Report Back to Requested ID

Configuration	Description
Enabled	Upon receipt of a GPS Polling Request, the transceiver sends the GPS data to the ID of the transceiver that sent the GPS Polling Request.
Disabled	Upon receipt of a GPS Polling Request, the transceiver sends the GPS data to the Fleet and the ID configured in the **Base Fleet** and **Base ID** edit boxes in the **FleetSync** window > **GPS** tab.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Back to Requested ID (Edit > Optional Features > Optional Features 2 > GPS)

16.8 FleetSync Functions

The following FleetSync functions can be configured using KPG-141D/ KPG-141DN:

- Own Fleet/ID
- Unit ID Encode Block
- Interfleet Call
- FleetSync Baud Rate
- Auto Reset Timer
- FleetSync II
- Manual Dialing
- Group ID
- GTC Count
- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- ACK Delay Time
- Transmit Delay Time (Receive Capture)
- Data Transmit Modulation Delay Time
- Data Preamble Extension Time
- Random Access (Contention)
- Unit ID Serial Output
- Data Override (Serial Input)
- Selective Call Alert LED
- Message Display Type
- Alert Tone (Individual Call)
- Alert Tone (Other Selective Calls)
- Alert Tone (Paging Call)
- Alert Tone (Status/Short Message Call)
- Alert Tone (Emergency Response)
- Alert LED Color (Individual Call)
- Alert LED Color (Other Selective Calls)
- Alert LED Color (Paging Call)
- PC Interface Protocol
- J Command Serial Output
- Stun/Kill Status Validation
- FleetSync Burst Noise Reduction
- Status Hold

16.8.1 Own Fleet/ID

FleetSync ID consists of a 3-digit (100 to 349) Fleet number and a 4-digit (1000 to 4999) ID number.

This ID is used for the PTT ID, initiating a call and FleetSync data communications.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Fleet (Own) and ID (Own) (Edit > FleetSync > General 1)

16.8.2 Unit ID Encode Block

Unit ID Encode Block is the FleetSync ID range used to initiate a call.

A FleetSync ID with which a user is allowed to initiate a call can be restricted using KPG-141D/ KPG-141DN. The user can use the FleetSync ID stored in the ID List even if it is outside the Unit ID Encode Block range.

The transceiver for which no Unit ID Encode Block is configured can initiate a call to all transceivers.

Following are available FleetSync IDs.

Table 16-24 Available FleetSync IDs

Unit ID Encode Block	Interfleet Call Configuration	
	On (Check)	Off (Uncheck)
Enabled	Unit ID Encode Block in all Fleets	Unit ID Encode Block in Own Fleet
Disabled	All Fleet IDs	All IDs in Own Fleet

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID Encode Block (Edit > FleetSync > General 1)

16.8.3 Interfleet Call

Interfleet Call can be used to initiate a call using a FleetSync ID having a different fleet number.

If Interfleet Call is disabled, a call to a FleetSync ID having a different fleet number can be inhibited. This function also prevents a user who does not use Interfleet IDs from initiating a call by selecting an Interfleet ID accidentally.

Note:

- A user can initiate an Interfleet Call regardless of the configuration of this function when initiating an Interfleet Call with the PC Command.
- For Portable (without LCD/ without Key), an Interfleet Call cannot be initiated by selecting a FleetSync ID from the ID List or directly entering a FleetSync ID; however, an Interfleet Call can be initiated by using the **Call 1** to **Call 6** keys and the PTT ID.
- Portable (without LCD/ without Key) cannot use this function to prohibit Interfleet Calls.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Interfleet Call to be enabled or disabled (Edit > FleetSync > General 1)

16.8.4 FleetSync Baud Rate

FleetSync Baud Rate is the data baud rate for the MSK modem used for FleetSync.

FleetSync Baud Rate configuration for the transmitting and receiving parties must be configured for the same baud rate.

Table 16-25 FleetSync Baud Rate

FleetSync Baud Rate	Description
1200 bps	This configuration is recommended for regular data communications.
2400 bps	With this configuration, a user can transmit more data in shorter time as compared with 1200 bps. However, errors are more likely to occur as communication proceeds at higher speeds. The optimum data communication area is smaller than that of 1200 bps.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the FleetSync Baud Rate (Edit > FleetSync > General 1)

16.8.5 Auto Reset Timer

Auto Reset Timer counts down the amount of time from when the received FleetSync ID matches the FleetSync ID (Own) preconfigured for the transceiver until the matching status is automatically reset. The matching state means that a user can communicate only using QT tone frequency or DQT code after the FleetSync ID is matched.

By using KPG-141D/ KPG-141DN, Auto Reset Timer can be configured. Also, how the transceiver responds after the amount of time configured for Auto Reset Timer elapses can be configured.

Table 16-26 Auto Reset Timer

Configuration	Description
Off	Auto Reset Timer will not be activated.
1 s to 300 s	After the time configured for Auto Reset Timer elapses, the matching state of the FleetSync ID is automatically reset.
LED	While this function is enabled, if the time configured for Auto Reset Timer elapses, the BUSY LED blinking orange or blue (Mobile only) by Selective Call Alert LED is turned Off.
Alert	While this function is enabled, the intermittently emitted Alert Tone stops if the amount of time configured for Auto Reset Timer elapses.
Monitor	While this function is enabled, the matching state of the Selective Call is reset if the amount of time configured for Auto Reset Timer elapses.
LCD	While this function is enabled, the transceiver restores the previous channel display if the amount of time configured for Auto Reset Timer elapses. **Note:** This function is unavailable for Portable (without LCD/ without Key).

Note: For Portable (without LCD/ without Key), the Monitor configuration explained above is always enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Reset Timer (Edit > FleetSync > General 2 > Auto Reset)

16.8.6 FleetSync II

FleetSync II is a new FleetSync format utilizing FEC (Forward Error Correction) technology. By using this error correction method, more reliable data communication can proceed compared with the original FleetSync format.

With FleetSync II, additional bits are added to handle error correction. Therefore, the data length is 4 times longer than that of the original format.

Note: The FleetSync II format has no compatibility with the original FleetSync format.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the FleetSync II (Edit > FleetSync > General 1)

16.8.7 Manual Dialing

Manual Dialing allows a user to directly enter the Fleet and the ID number.

If Manual Dialing is enabled, a Fleet or ID number can be directly entered using the keypad, the **Selector** (Portable), or keys on the transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Manual Dialing to be enabled or disabled (Edit > FleetSync > General 1)

16.8.8 Group ID

Group ID is an ID used to initiate a Group Call in FleetSync.

A Group Call can be initiated by using FleetSync assigning the same Group ID to transceivers that form a group. The call can be initiated on a smaller scale than a Fleet Call and Supervisor Call. It is usually used within the same fleet.

Table 16-27 Group ID Response

Call Type	Response	
	ID Configured in ID List	No ID Configured in ID List
Group Call	A user can respond with a Group Call.	A user can respond with a Group Call. However, a user may not be able to respond to a call, depending on the Interfleet configuration and the configuration for Unit Encode Block.

Whether to use Group IDs can be configured using KPG-141D/ KPG-141DN, and also the Divisional ID can be configured using KPG-141D/ KPG-141DN. A maximum of 10 Divisional IDs can be configured.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Group ID (Edit > FleetSync > General 1)
- Configuring the Group ID (1 to 10) (Edit > FleetSync > General 1)

16.8.9 GTC Count

GTC Count is the number of times to transmit the GTC using the transmitting transceiver.

GTC (Go To Channel) is a message that allows the transmitting transceiver to induce the receiving transceiver to the data channel.

The transmitting transceiver will migrate to the data channel after transmitting the GTC if the Status, Short or Long Message on Data Zone-CH/GID is configured. When the receiving transceiver receives the GTC, it automatically migrates to the data channel and stands by to receive the data.

Default value for the number of times is normally used.

Note:

- The receiving transceiver stands by to receive the Status, Short or Long Message after the transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time.
- The transmitting transceiver sends the Status, Short, or Long Message and stands by to receive the acknowledgment after the transmitting transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GTC Count (Edit > FleetSync > Parameter)

16.8.10 Number of Retries

If the transceiver does not receive the acknowledgment after the transceiver sends data and the time configured for Maximum ACK Wait Time elapses, the transceiver resends data. Number of Retries is the number of times for the transceiver to resend data. A smaller number can be configured if there is good communicating conditions, and a larger number can be configured if there are inferior communicating conditions.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Number of Retries (Edit > FleetSync > Parameter)

16.8.11 Transmit Busy Wait Time

The transceiver confirms that the communication channel is available before sending data and then starts sending data when the channel is available. Transmit Busy Wait Time is the duration to wait for the communication channel to become available.

A transmission is canceled when the channel is busy and the Transmit Busy Wait Time elapses.

The default configuration is normally used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Busy Wait Time (Edit > FleetSync > Parameter)

16.8.12 Maximum ACK Wait Time

Maximum ACK Wait Time is the length of time that the transceiver stands by to receive the acknowledgment after the transceiver sends data. If the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time, the transceiver resends data.

The default configuration is normally used.

Note:

- This period is applied to the wait time for receiving data after migrating to the data channel using GTC.
- A Long Data Message is sent several times. The receiving transceiver stands by to receive the next data for the time configured for Maximum ACK Wait Time after receiving the previous data. The transceiver exits Long Data Message Receive Mode if the transceiver does not receive any data during the period.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Maximum ACK Wait Time (Edit > FleetSync > Parameter)

16.8.13 ACK Delay Time

ACK Delay Time is the length of time from when the transceiver receives data until the transceiver sends the acknowledgment.

ACK Delay Time must be shorter than Maximum ACK Wait Time configured for the transmitting transceiver. In addition, ACK Delay Time must be shorter than Hold Time configured for the repeater if ARQ is used in an LTR Trunking system. (Refer to: 13.13 ARQ Mode on page 119)

The default configuration is normally used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the ACK Delay Time (Edit > FleetSync > Parameter)

16.8.14 Transmit Delay Time (Receive Capture)

Transmit Delay Time is a short period of time to transmit an unmodulated signal prior to transmitting the introductory part of data.

When the transmitting transceiver transmits an unmodulated signal, the receiving transceiver temporarily stops scanning to receive the data. Using this function, the data can reliably be sent even if the receiving transceiver is scanning or using the Battery Saver.

The default configuration is normally used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Delay Time (Edit > FleetSync > Parameter)

16.8.15 Data Transmit Modulation Delay Time

Data Transmit Modulation Delay Time is a period of time to transmit an unmodulated signal prior to starting to send data using MSK modulation.

It may be difficult to establish data communications when the transmit and receive frequencies are widely separated or the transceiver is always used in extremely cold areas. In such cases, Data Transmit Modulation Delay Time must be extended in order to improve the reliability of data communications.

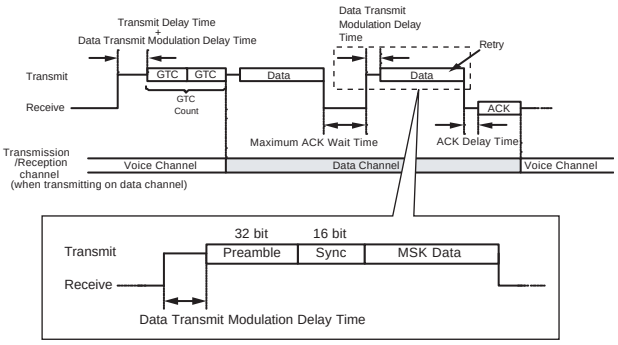


Figure 16-4 Timing to Activate the Transmit Delay Time and Data Transmit Modulation Delay Time

The default configuration is normally used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Transmit Modulation Delay Time (Edit > FleetSync > Parameter)

16.8.16 Data Preamble Extension Time

Refer to 26.2.1 Data Preamble Extension Time on page 344.

16.8.17 Random Access (Contention)

Random Access allows the transceiver to randomize the transmission start time for each transceiver to send data when the channel becomes available.

If a large number of transceivers begin transmitting immediately after the channel becomes available, transmission contention may occur. This function prevents this contention.

Note: Random Access period varies depending on the configuration of FleetSync Baud Rate. (Refer to: 16.8.4 FleetSync Baud Rate on page 171)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Random Access (Edit > FleetSync > Parameter)

16.8.18 Unit ID Serial Output

Unit ID Serial Output allows the transceiver to send the received Fleet and ID from the transceiver's communication port when the transceiver receives the PTT ID.

With the Unit ID Serial Output enabled, the dispatcher can monitor and control in real time transceivers that are transmitting.

Note: In order to use Unit ID Serial Output, "Data" or "Data + GPS Data Output" must be assigned to the communication port of the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID Serial Output (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

16.8.19 Data Override (Serial Input)

Data Override can be used to select the priority for voice communications or data communications using an external device.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Override (Serial Input) (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Input)

16.8.20 Selective Call Alert LED

Selective Call Alert LED can be used to make the LED blink orange when the transceiver receives a call.

For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks.

A user can notice by the LED that the transceiver is receiving a call.

Note: For Portable (without LCD/ without Key), the blinking LED (orange) upon the receipt of a Selective Call indicates the following status of the transceiver.

(a) The transceiver has received a Selective Call (as a status of an incoming call history).

(b) The transceiver can respond to the transmitting transceiver by pressing the **PTT** switch.

Therefore, if the transceiver receives a Selective Call while the transceiver cannot respond to the transmitting transceiver; for instance, the transceiver receives an ID inhibited to transmit, the LED blinks orange as the status (a). In this case, the transceiver cannot respond even if the **PTT** switch is pressed.

Also, if LED for Auto Reset Timer is disabled and the time configured for Auto Reset Timer has elapsed, the matching status of Optional Signaling will be reset. At this time, the LED indicating the status (a) continues blinking, so that the transceiver cannot respond to the transmitting transceiver.

If the LED indicates the status (a), the LED will be turned Off by pressing any key. If the LED indicates the status (b), the LED will be turned Off by pressing a key to which a specific functions is assigned. (Refer to: 4.7 Mode Reset Timer on page 33)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selective Call Alert LED (Edit > FleetSync > General 1)

16.8.21 Message Display Type

Message Display Type is the main display type when the transceiver receives a Status Message or Short Message.

Table 16-28 Message Display Type

Message Display Type	Description
Fixed	Only a message appears on the main display when the transceiver receives a Status Message or Short Message. If a message exceeds 8 characters (Portable) or 10 characters (Mobile), the message text is displayed repeatedly while being scrolled.
Alternate	A message appears for 3 seconds and Selcall ID appears for 2 seconds on the main display alternately upon reception of Status Message or Short Message.

Note:

- The previous display reappears if a key is pressed while the received message is displayed.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > FleetSync > General 1)

16.8.22 Alert Tone (Individual Call)

Alert Tone (Individual Call) sounds when the transceiver receives an individual call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Individual) (Edit > FleetSync > General 2 > Alert Tone)

16.8.23 Alert Tone (Other Selective Calls)

Alert Tone (Other Selective Calls) sounds when the transceiver receives a Selective Call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note:

- Alert Tone (Other Selective Calls) is used for Group Calls, Fleet Calls, Supervisor Calls and Broadcast Calls.
- If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Other Selective Calls) (Edit > FleetSync > General 2 > Alert Tone)

16.8.24 Alert Tone (Paging Call)

Alert Tone (Paging Call) sounds when the transceiver receives a Paging Call. One of 8 types of tones configured for Special Alert Tone can be selected.
(Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Paging Call) (Edit > FleetSync > General 2 > Alert Tone)

16.8.25 Alert Tone (Status/Short Message Call)

Alert Tone (Status/ Short Message Call) sounds when a Status Message or Short Message data is received. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Status/Short Message Call) (Edit > FleetSync > General 2 > Alert Tone)

16.8.26 Alert Tone (Emergency Response)

An Alert Tone (Emergency Response) sounds if “Alert Tone” is configured for Emergency Status Response.
(Refer to: 16.3.12 Emergency Status Response on page 156)

One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Emergency Response) (Edit > FleetSync > General 2 > Alert Tone)

16.8.27 Alert LED Color (Individual Call) (Mobile Only)

Alert LED Color (Individual Call) is used to blink the orange LED or the blue LED when the transceiver receives an Individual Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Individual Call).

Table 16-29 Alert LED Color (Individual Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives an Individual Call.
Orange	The orange LED blinks when the transceiver receives an Individual Call.
Blue	The blue LED blinks when the transceiver receives an Individual Call.

Note: To use this function, Selective Call Alert LED (FleetSync) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Individual Call) (Edit > FleetSync > General 2 > Alert LED Color)

16.8.28 Alert LED Color (Other Selective Calls) (Mobile Only)

Alert LED Color (Other Selective Calls) is used to blink the orange LED or the blue LED when the transceiver receives a Selective Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Other Selective Calls).

Table 16-30 Alert LED Color (Other Selective Calls)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Selective Call.
Orange	The orange LED blinks when the transceiver receives a Selective Call.
Blue	The blue LED blinks when the transceiver receives a Selective Call.

Note: To use this function, Selective Call Alert LED (FleetSync) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Other Selective Calls) (Edit > FleetSync > General 2 > Alert LED Color)

16.8.29 Alert LED Color (Paging Call) (Mobile Only)

Alert LED Color (Paging Call) is used to blink the orange LED or the blue LED when the transceiver receives a Paging Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Paging Call).

Table 16-31 Alert LED Color (Paging Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Paging Call.
Orange	The orange LED blinks when the transceiver receives a Paging Call.
Blue	The blue LED blinks when the transceiver receives a Paging Call.

Note: To use this function, Selective Call Alert LED (FleetSync) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Paging Call) (Edit > FleetSync > General 2 > Alert LED Color)

16.8.30 J Command Serial Output

J Command Serial Output is used to notify a user when the transceiver status is changed (information shown on the display is changed or a function is enabled or disabled and the volume level is changed, etc.) by sending a PC command.

Whether a PC command is automatically sent when the transceiver's status changes or a PC command is sent only if the transceiver receives a command from a PC can be configured by using KPG-141D/ KPG-141DN.

Note: For Mobile, the PC command such as J Command cannot be sent from the COM port 0. (Refer to: 6.1 COM port on page 81)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the J Command Serial Output (Edit > Optional Features > Optional Features 1 > Common Page 4)

16.8.31 Stun/Kill Status Validation

Stun/Kill Status Validation is used to permit or restrict reception of Stun Status and Kill Status codes.

Disabling the reception of Stun Status and Kill Status prevents the transceiver from being disabled by a Stun Status code or Kill Status code that was erroneously sent, for instance.

Note: If no Stun/Kill Status Validation is configured, the transceiver does not send back an acknowledgment even if the transceiver receives the Stun or Kill Status.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Stun/Kill Status Validation (Edit > FleetSync > General 1)

16.8.32 FleetSync Burst Noise Reduction

FleetSync Burst Noise Reduction mutes the incoming data burst tones when the transceiver receives FleetSync data.

When the transceiver receives an MSK data burst tone, the transceiver evaluates whether or not the tone is FleetSync data. If it is FleetSync data, the transceiver mutes until it completes receiving FleetSync data. However, since it takes a short period of time to recognize a tone as FleetSync data, the beginning of the tone may sound from the speaker for a moment.

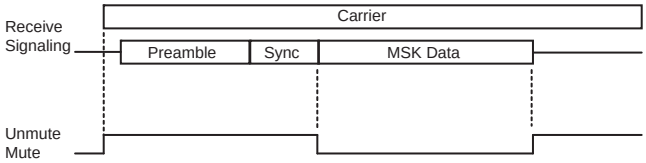


Figure 16-5 Timing to Activate the FleetSync Burst Noise Reduction

To receive the FleetSync data using BOT, the tone burst noise can be muted completely by configuring Mute Hold Time to function at the same time. However, since Mute Hold Time is valid for all communications, if the time is configured overly long, the beginning of the voice signal may also be muted on a channel that does not use the FleetSync functions. (Refer to: 11.4 PTT ID Mute on page 103)

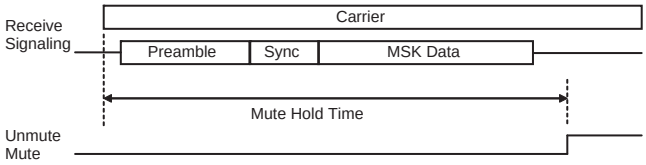


Figure 16-6 Timing to Activate Mute Hold Time

Note: This function is valid only for MSK data in FleetSync.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the FleetSync Burst Noise Reduction to be enabled or disabled (Edit > FleetSync > General 1)

16.8.33 Status Hold

Status Hold is the function to store in the transceiver the status selected from the Status List in Status Mode and the status transmitted.

When the transceiver receives a status request message, the status stored in the transceiver will automatically be transmitted. Also, the status stored in the transceiver will automatically be stored in GPS data and transmitted.

Table 16-32 Status Hold

Status Hold	Description
Selected	The transceiver stores the status selected from the Status List in Status Mode.
Selected + Transmit	The transceiver stores the status selected from the Status List in Status Mode and the status transmitted by one of the following method. • The status transmitted when the status for one of the AUX Input Status Message 1 to AUX Input Status Message 3 ports changes (Mobile only) • The status transmitted when the transceiver is turned ON. • The status transmitted by pressing one of the **Call 1** to **Call 6** keys. • The status transmitted by using a PC command.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Hold (Edit > Optional Features > Optional Features 1 > Common Page 4)

Scan is a function to check whether the transceiver receives a call from other transceivers.

The transceiver sequentially checks for availability of signal on each channel, and the transceiver receives on the channel where the signal is detected in a Conventional Group.

The transceiver sequentially checks for calls using a Group ID in an LTR Trunking system, and the transceiver receives the signal using the Group ID when the transceiver receives a call using a Group ID that can be decoded.

The transceiver sequentially checks for a call initiated using a Group ID or Unit ID in an NXDN Trunking system, and the transceiver receives the signal from the ID when the transceiver receives a call from a Group ID or Unit ID that can be decoded.

Note: Refer to 25.28 Site Roaming (NXDN Conventional System Only) on page 302 for instructions on the scan using Site Roaming in an NXDN Conventional system.

There are two types of Scan: Manual Scan and Automatic Scan.

The transceiver can do Single Scan, Multi Scan, and List Scan in all systems. However, the transceiver cannot scan while zones in an NXDN Trunking system and zones in a Conventional Group and LTR Trunking system are combined.

■ Manual Scan

Pressing the **Scan** key causes the transceiver to start the scan according to the configuration for Scan Type.

- **Single Scan**

  The transceiver scans the channels or GID to be scanned in the zone selected when the scanning starts. Even if a Priority Channel is located in a zone for another Conventional Group, this Priority Channel will be scanned while the transceiver scans in a Conventional Group or an LTR Trunking system.

- **Multi Scan**

  While the transceiver is scanning in a Conventional Group or an LTR Trunking system, the transceiver scans all channels or GIDs to be scanned in the zones where the transceiver scans. Also, a Priority Channel in all zones except for a zone in an NXDN Trunking system is scanned.

  While the transceiver is scanning in an NXDN Trunking system, the transceiver scans all GIDs to be scanned in the zones where the transceiver scans. However, zones in a Conventional Group and an LTR Trunking system are exempted.

  Pressing the **Scan** key causes the transceiver to start the Multi Scan. If a zone in another system is selected during the Multi Scan, the transceiver starts the scan according to the configuration for Scan Type in the selected zone.

- **List Scan**

  While the transceiver is scanning in a Conventional Group or an LTR Trunking system, the transceiver scans all channels or GIDs to be scanned in the zones configured in a Scan List Table. Also, even if a Priority Channel is located in a zone for another Conventional Group which is not configured in the Scan List Table, this Priority Channel is scanned while the transceiver scans in a Conventional Group or an LTR Trunking system.

  The transceiver scans all GIDs to be scanned in the zone configured in the Scan List Table while scanning in an NXDN Trunking system. However, zones in a Conventional Group and an LTR Trunking system are exempted.

  Pressing the **Scan** key causes the transceiver to start the List Scan. If a zone in another system is selected during the List Scan, the transceiver starts the scan according to the configuration for Scan Type in the selected zone.

■ Auto Scan

- **Group Scan**

  If a zone is selected in an LTR Trunking system, the transceiver automatically scans the Group IDs to be scanned in the selected zone.

  Whether the transceiver automatically scans can be configured using KPG-141D/ KPG-141DN. (Refer to: 17.6 LTR Group Scan on page 188)

17.1 Scan Behavior

Note: The amount of time from when the transceiver pauses scanning for transmission or reception until the transceiver resumes scanning can be configured using Dropout Delay Time and Dwell Time. (Refer to: 17.7.5 Dropout Delay Time on page 190, 17.7.6 Dwell Time on page 190)

17.1.1 Conditions to Activate the Scan

If the **Scan** key is pressed while the transceiver is not scanning, the transceiver starts one of Single Scan, Multi Scan, or List Scan according to the configuration for Scan Type.

One of the following conditions must be met to activate the scan. An Error Tone sounds when the conditions do not meet the requirements to activate scan.

- **If the transceiver starts scanning in a zone in an NXDN Trunking system**

  Two or more GID to be scanned must coexist in the zone where the transceiver scans.

- **If the transceiver starts scanning in a zone other than a zone in an NXDN Trunking system**
  - Two or more channels or GID to be scanned must coexist in the zone where the transceiver scans.
  - One channel or GID to be scanned must exist in the zone to be scanned, and a Priority Channel must exist in the same zone or other zones.
  - In the case that there is no channel or GID to be scanned in the zone to be scanned, a Priority Channel must exist in the same zone or other zones.

The above zone to be scanned stands for the following zones.

- **If "Single" is configured for the Scan Type:**

  The selected zone

- **If "Multi" or "List" is configured for the Scan Type:**
  - Zones in an NXDN Trunking system (if the scan starts from zones in an NXDN Trunking system)
  - Zones in a Conventional Group or an LTR Trunking system (if the scan starts from zones except for a zone in an NXDN Trunking system)

17.1.2 Conditions to Resume the Scan

One of the following conditions must be met to resume scanning while the transceiver pauses scanning. If the transceiver does not meet the conditions to resume scanning, the "" icon blinks and scanning pauses.

- **For the zone in an NXDN Trunking system**

  Two or more GID to be scanned must exist in the zone where the transceiver scans.

- **For the zone other than a zone in an NXDN Trunking system**
  - One channel or GID to be scanned must exist in the zone to be scanned, and a Priority Channel must exist in the same zone or other zones.
  - In the case that there is no channel or GID to be scanned in the zone to be scanned, a Priority Channel must exist in the same zone or other zones.

The above zone to be scanned stands for the following zones.

- **If "Single" is configured for the Scan Type:**

  The selected zone

- **If "Multi" or "List" is configured for the Scan Type:**
  - Zones in an NXDN Trunking system (if the scan starts from zones in an NXDN Trunking system)
  - Zones in a Conventional Group or an LTR Trunking system (if the scan starts from zones except for a zone in an NXDN Trunking system)

Pressing the **Scan Delete/Add** key while scan pauses deletes or adds the current channel temporarily. This state is retained until the scan stops by pressing the **Scan** key. A Priority Channel is always scanned regardless of the Delete/Add display.

17.1.3 Transceiver Behavior in the Case that the Scan cannot be Resumed

During the scan, the selected channel or GID appears and the "" icon blinks when the channel is changed manually to a zone that does not meet the requirements to resume scanning. In this case, the scan does not resume.

The transceiver transmits using the Revert Channel or GID when the **PTT** switch is pressed while the "" icon is blinking. Upon elapse of the time configured for Dwell Time after completion of the transmission, the transceiver reverts to the selected channel or GID; however, the scan does not resume.

17.1.4 Transceiver Behavior in the Case That a Zone Channel (or GID) Is Changed during the Scan

The transceiver scans as follows when the zone channel (or GID) is changed while the following appears on the main display.

Table 17-1 Transceiver Behavior after the Zone Channel (or GID) Is Changed

Display	Description
SCAN	The transceiver pauses scanning on the selected channel or GID. The transceiver resumes scanning after the Key Delay Time elapses (1 s).
Revert CH/GID	The transceiver pauses scanning on the selected channel or GID if the Revert Channel or GID is different from the selected channel or GID.

- If the **Home CH/GID** key is pressed during the scan, the transceiver pauses scanning while the transceiver is migrating to the Home Channel or GID and a Scan Stop Tone will continue to sound at 30-s intervals. (Refer to: 17.7.16 Scan Stop Tone on page 193)
- If one of the **Direct CH/GID 1** to **Direct CH/GID 5** keys is pressed during the scan, the transceiver pauses scanning while the transceiver is migrating to the Direct Channel or GID and also a Scan Stop Tone will continue to sound at 30-s intervals. (Refer to: 17.7.16 Scan Stop Tone on page 193)

17.1.5 Transceiver Behavior in the Case That a Zone Channel (or GID) Is Changed Manually while the Scan Pauses to Receive

The transceiver scans as below when a user manually changes the Zone-channel or GID while the scan pauses to receive.

- The transceiver continues to pause scanning on the selected channel or GID if the channel or GID where the transceiver pauses scanning is different from the selected channel or GID.

17.1.6 Reception during the Scan in a Conventional Group

The transceiver receives according to the configuration for Audio Control.

■ Behavior after Receiving QT/DQT/RAN

If the received QT tone frequency, DQT code, or RAN code on each channel matches the QT tone frequency, DQT code, or RAN code preconfigured for the receiving transceiver, the transceivers pauses scanning. Dropout Delay Time is activated if the QT tone frequency, DQT code, or RAN code matching state is reset. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan.

Pressing the **PTT** switch causes the transceiver to transmit on a Revert CH/GID. The transceiver starts counting down the Dwell Time when the transmission ends, and then resumes scanning after the Dwell Time elapses.

■ QT/DQT/RAN - Optional Signaling AND Transceiver Behavior

If the received QT tone frequency, DQT code, or RAN code matches the QT tone frequency, DQT code, or RAN code preconfigured for the receiving transceiver, the transceivers pauses scanning. The transceiver does not emit the received audio and then waits to receive an Optional Signaling (2-tone, DTMF, FleetSync, NXDN ID).

The transceiver resumes scanning after the amount of time configured for Dropout Delay Time elapses if the QT tone frequency, DQT code, or RAN code matching state is reset while waiting to receive the Optional Signaling.

The transceiver emits the received audio and Alert Tone or starts transponding when the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while waiting to receive the Optional Signaling. The transceiver stands by on the channel when the Optional Signaling matches.

■ QT/DQT - Optional Signaling OR Transceiver Behavior

If the received QT tone frequency or DQT code matches the QT tone frequency or DQT code preconfigured for the receiving transceiver, the transceivers pauses scanning. The transceiver emits the received audio and then waits to receive an Optional Signaling.

The transceiver resumes scanning after the amount of time configured for Dropout Delay Time elapses if the QT tone frequency or DQT code matching state is reset while waiting to receive the Optional Signaling.

If the transceiver pauses scanning when the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver, the transceiver does not resume scanning even if the Optional Signaling is reset.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Audio Control (Edit > Zone Information (Conventional Group) > Zone Edit)

17.1.7 Reception during the Scan in an LTR Trunking System

The transceiver receives as below according to the configuration for Audio Control.

■ Transceiver Behavior by Group ID

The transceiver pauses scanning when the decoded Group ID matches the Group ID to be scanned. Dropout Delay Time is activated if the decoded Group ID does not match the Group ID preconfigured for the transceiver. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan.

Pressing the **PTT** switch causes the transceiver to transmit on a Revert CH/GID. The transceiver starts counting down the Dwell Time when the transmission ends, and then resumes scanning after the Dwell Time elapses.

■ LTR ID - Optional Signaling AND Transceiver Behavior

The transceiver pauses scanning if the decoded LTR ID matches the LTR ID to be scanned. The transceiver does not emit the received audio and then waits to receive an Optional Signaling.

The transceiver resumes scanning after the amount of time configured for Dropout Delay Time elapses if the decoded LTR ID matching state is reset while waiting to receive the Optional Signaling.

The transceiver emits the received audio and Alert Tone or starts transponding when the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while waiting to receive the Optional Signaling. The transceiver stands by for the LTR ID after the Optional Signaling matches.

Note: The transceiver will migrate to the LTR ID having the higher priority level when the transceiver receives an LTR ID having a higher priority level than the current LTR ID in an LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Audio Control (Edit > Zone Information (LTR Trunking System) > Zone Edit)

17.1.8 Reception during the Scan in an NXDN Trunking System

While the transceiver is scanning in an NXDN Trunking system, the transceiver will receive as below.

- The transceiver pauses scanning when the decoded Group ID matches the Group ID to be scanned.
- The transceiver pauses scanning when the decoded Unit ID matches the Unit ID preconfigured for the transceiver.
- After the transceiver migrates from a traffic channel to a control channel, the transceiver resumes scanning when the amount of time configured for Dropout Delay Time elapses after Dropout Delay Time is activated.

Note: A Group ID for which “ALL” is configured or a Group ID which is configured for Priority Monitor ID is always scanned regardless of the configuration for Delete or Add. If a scan pauses on a Group ID for which “ALL” is configured or a Group ID which is configured for Priority Monitor ID, pressing the **Scan Delete/Add** key has no effect but the Key-entry Error Tone sounds from the transceiver, and the Group ID cannot be deleted from the Scan List.

17.2 Single Scan

The transceiver scans using Single Scan all the channels or GID to be scanned in the zone where the transceiver starts scanning.

Channels or GIDs to be scanned are channels or GIDs where Scan Add is enabled using KPG-141D/ KPG-141DN.

If a zone in a Conventional Group or an LTR Trunking system is selected, Priority Channel is scanned even if no Priority Channel is configured in the zone to be scanned.

To use Single Scan, “Single” must be configured using KPG-141D/ KPG-141DN for Scan Type in a Conventional Group or an LTR Trunking system, and “Single” must be configured for Scan Type (NXDN Trunking) in an NXDN Trunking system.

Note:

- If Selected CH/GID Scan is enabled, the selected channel or GID can be scanned even if the channel or GID is excluded from the target channels or GIDs for scanning. (Refer to: 17.7.14 Selected CH/GID Scan on page 192)
- A Group ID for which “ALL” is configured or a Group ID which is configured for Priority Monitor ID is always scanned regardless of the configuration for Delete or Add in an NXDN Trunking system.
- The transceiver pauses scanning if the zone which is not configured is changed using **Selector** for which “Zone Select” is configured during the Single Scan.
- During the Single Scan in an NXDN Trunking system, only the Priority Monitor ID configured for the selected zone is used as a Priority Monitor ID.

■ Operating the Transceiver

1. Press the **Scan** key.

   The transceiver starts scanning.

   “SCAN” appears on the main display and the “” icon appears.

   For Portable (without LCD/ without Key), the LED blinks green.

Portable

Mobile

Note: If a channel or GID is fixed and the transceiver cannot resume scanning, such as when the transceiver is migrating to the Home Channel or GID, etc., the “” icon blinks and a Scan Stop Tone continues to sound from the transceiver.

2. Press the **Scan** key during the scan.

   The “” icon disappears and the scan ends.

   For Portable (without LCD/ without Key), the LED turns Off and the scan ends.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring Scan Add to be enabled or disabled for each channel (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring Scan Add to be enabled or disabled for each GID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring Scan Add to be enabled or disabled for each GID (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring Scan Type for a Conventional Group and an LTR Trunking system (Edit > Scan Information > Scan)
- Configuring Scan Type for an NXDN Trunking system (Edit > Scan Information > Scan)
- Assigning functions to the PF keys (Edit > Key Assignment)

17.3 Multi Scan

The transceiver scans using Multi Scan all the channels or GID to be scanned in the zone to be scanned.

The transceiver scans all channels or GIDs to be scanned in the zones to be scanned.

If the scan starts from a zone in a Conventional Group or an LTR Trunking system, the transceiver scans all channels or GIDs to be scanned in the zones where the transceiver scans, except for zones in an NXDN Trunking system.

If the scan starts from a zone in an NXDN Trunking system, the transceiver scans all GIDs to be scanned in the zones where the transceiver scans, except for zones in a Conventional Group or an LTR Trunking system.

If another zone is selected during the Multi Scan, the transceiver starts the scan according to the configuration for Scan Type in the selected zone.

Following are the zone channel (or GID) to be scanned:

- The zone which is configured to be scanned using KPG-141D/ KPG-141DN or the **Zone Delete/Add** key
- The channel or GID which is configured to be scanned using KPG-141D/ KPG-141DN or the **Zone Delete/Add** key
- Priority Channels in all zones except for a zone in an NXDN Trunking system (only for a Conventional Group and an LTR Trunking system)

To use Multi Scan, “Multi” must be configured using KPG-141D/ KPG-141DN for Scan Type in a Conventional Group or an LTR Trunking system, and “Multi” must be configured for Scan Type (NXDN Trunking) in an NXDN Trunking system.

Note:

- If Selected CH/GID Scan is enabled, the selected channel or GID can be scanned even if it is deleted from the Scan List. (Refer to: 17.7.14 Selected CH/GID Scan on page 192)
- A Group ID for which “ALL” is configured or a Group ID which is configured for Priority Monitor ID is always scanned regardless of the configuration to be scanned in an NXDN Trunking system.
- The transceiver pauses scanning if the zone which is not configured is changed using **Selector** for which “Zone Select” is configured during the Multi Scan.
- During the Multi Scan in an NXDN Trunking system, only the Priority Monitor ID configured for the selected zone is used as a Priority Monitor ID.(Refer to: 25.17 Priority Monitor ID on page 279)

■ Operating the Transceiver

1. Press the **Scan** key.

   The transceiver starts scanning.

   “SCAN” appears on the main display and the “ ” icon appears.

   For Portable (without LCD/ without Key), the LED blinks green.

Portable

Mobile

Note: If a channel or GID is fixed and the transceiver cannot resume scanning, such as when the transceiver is migrating to the Home Channel or GID, etc., the “ ” icon blinks and a Scan Stop Tone continues to sound from the transceiver.

2. Press the **Scan** key during the scan.

   The “ ” icon disappears and the scan ends.

   For Portable (without LCD/ without Key), the LED turns Off and the scan ends.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring Zone Add to be enabled or disabled for each zone (Conventional Group) (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring Zone Add to be enabled or disabled for each zone (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit
- Configuring Zone Add to be enabled or disabled for each zone (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit
- Configuring Scan Add to be enabled or disabled for each channel (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring Scan Add to be enabled or disabled for each GID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring Scan Add to be enabled or disabled for each GID (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)

- Configuring Scan Type for a Conventional Group and an LTR Trunking system (Edit > Scan Information > Scan)
- Configuring Scan Type for an NXDN Trunking system (Edit > Scan Information > Scan)
- Assigning functions to the PF keys (Edit > Key Assignment)

17.4 List Scan

The transceiver scans using List Scan all the channels or GID to be scanned in the zone configured in a Scan List Table.

The transceiver scans all channels or GIDs to be scanned in the zones configured in a Scan List Table.

If the scan starts from a zone in a Conventional Group or an LTR Trunking system, the transceiver scans all channels or GIDs to be scanned in the zones selected from a Scan List Table, except for a zone in an NXDN Trunking system.

If the scan starts from a zone in an NXDN Trunking system, the transceiver scans all channels or GIDs to be scanned in the zones selected from a Scan List Table, except for a zone in a Conventional Group or an LTR Trunking system.

If a zone in another zone is selected during the List Scan, the transceiver starts the scan according to the configuration for Scan Type in the selected zone.

Following are the zone channel (or GID) to be scanned:

- Zones configured in a Scan List Table using KPG-141D/ KPG-141DN
- The channel or GID which is configured to be scanned using KPG-141D/ KPG-141DN or the **Zone Delete/Add** key
- Priority Channels in all zones except for a zone in an NXDN Trunking system (only for a Conventional Group and an LTR Trunking system)

To use List Scan, “List” must be configured using KPG-141D/ KPG-141DN for Scan Type in a Conventional Group or an LTR Trunking system, and “List” must be configured for Scan Type (NXDN Trunking) in an NXDN Trunking system.

Note:

- If Selected CH/GID Scan is enabled, the selected channel or GID can be scanned even if it is deleted from the Scan List. (Refer to: 17.7.14 Selected CH/GID Scan on page 192)
- A Group ID for which “ALL” is configured or a Group ID which is configured for Priority Monitor ID is always scanned regardless of the configuration to be scanned in an NXDN Trunking system.
- The transceiver pauses scanning if the zone which is not configured is changed using **Selector** for which “Zone Select” is configured during the List Scan.
- If a zone is changed during the List Scan, the Scan List is changed to the Scan List configured for the zone.

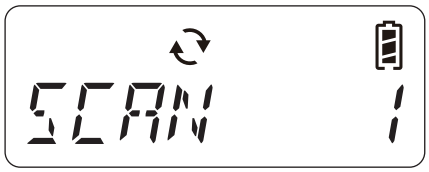
■ Operating the Transceiver

1. Press the **Scan** key.

   The transceiver starts scanning.

   “SCAN n” appears on the main display and the “” icon appears. The zone number configured for the Scan List can be entered for “n”.

   For Portable (without LCD/ without Key), the LED blinks green.



Portable

Mobile

Note: If a channel or GID is fixed and the transceiver cannot resume scanning, such as when the transceiver is migrating to the Home Channel or GID, etc., the “” icon blinks and a Scan Stop Tone continues to sound from the transceiver.

2. Press the **Scan** key during the scan.

   The “” icon disappears and the scan ends.

   For Portable (without LCD/ without Key), the LED turns Off and the scan ends.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Scan List Table (Conventional Group) (Edit > Zone Information (Conventional Group) > Zone Edit > Scan List Table)
- Configuring the Scan List Table (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit > Scan List Table)
- Configuring the Scan List Table (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit > Scan List Table)
- Configuring Scan Add to be enabled or disabled for each channel (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring Scan Add to be enabled or disabled for each GID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring Scan Add to be enabled or disabled for each GID (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring Scan Type for a Conventional Group and an LTR Trunking system (Edit > Scan Information > Scan)
- Configuring Scan Type for an NXDN Trunking system (Edit > Scan Information > Scan)
- Assigning functions to the PF keys (Edit > Key Assignment)

17.5 Priority Scan

Priority Scan can be used to scan the high priority channels of a Conventional Group regardless of the scan configuration for each channel or GID.

The transceiver monitors a Priority Channel using Lookback even if the transceiver is receiving on a Normal Channel using Single Scan, Multi Scan, or List Scan if Priority Channel is configured.

The transceiver scans the Priority Channel in the following cases:

- If there is no Priority Channel in the selected zone during the Single Scan.
- If Priority Channel is in a different zone from the scanning zone-channels during the Multi Scan.
- If no Priority Channel is included in the zone configured in the Scan List Table during the List Scan.

The transceiver scans Priority Channels at the timing configured for Lookback Time A or Lookback Time B when the transceiver proceeds to a Single Scan, Multi Scan, or List Scan. (Refer to: 17.7.7 Lookback on page 191)

Priority Channel can be configured using KPG-141D/ KPG-141DN. Also, Priority Scan type can be configured for a Priority Channel as below.

Table 17-2 Priority Scan

Priority Scan	Description
Fixed	The channel configured using KPG-141D/ KPG-141DN is used as a Priority Channel.
Selected	The selected channel is used as a Priority Channel.
Operator Selectable	The channel selected by a user is used as a Priority Channel. Pressing the **Priority-channel Select** key causes the transceiver to enter Priority-channel Select Mode.

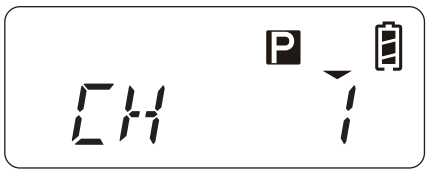
Note:

- Group IDs in an LTR Trunking system and NXDN Trunking system cannot be configured for Priority Channel.
- The transceiver does not monitor the Priority Channel using Lookback while the transceiver pauses scanning in an LTR Trunking system and NXDN Trunking system. (Refer to: 17.7.7 Lookback on page 191)

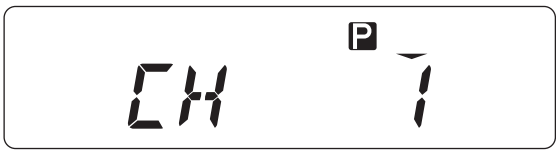
■ Operating the Transceiver

- **Selecting the Priority Channel**

  The "P" icon appears.



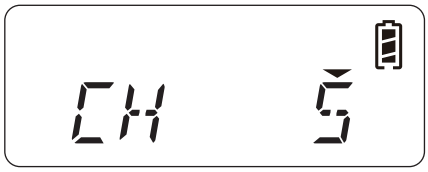
Portable



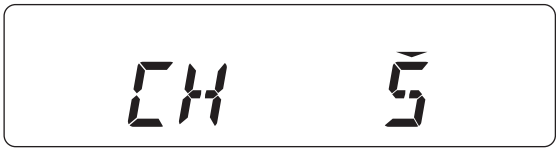
Mobile

- **Configuring the Priority Channel**

  1. Select the channel of a Conventional Group to be configured as a Priority Channel.



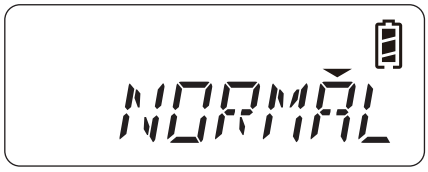
Portable



Mobile

  2. Press the **Priority-channel Select** key.

  The transceiver enters Priority-channel Select Mode.



Portable

Mobile 216

Note: If "Operator Selectable" is not configured for Priority by using KPG-141D/ KPG-141DN, the transceiver cannot enter this mode.

  3. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the priority for the channel.

  Either "NORMAL" or "PRIORITY" needs to be selected.

Portable

Mobile

  4. Press the **[S]** or **[*]** key.

  The selected channel is configured as a Priority Channel and then the transceiver restores the previous channel display.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Priority Channel (Edit > Scan Information > Scan)
- Assigning functions to the PF keys (Edit > Key Assignment)

17.6 LTR Group Scan

A Group ID to be scanned for the selected LTR Trunking system is automatically scanned if LTR Background Scan is enabled using KPG-141D/ KPG-141DN. Pressing the **Scan** key is not required to start the Group Scan.

To use this function, LTR Background Scan must be enabled using KPG-141D/ KPG-141DN.

The following Group IDs is scanned:

- The Group ID which is configured to be scanned using KPG-141D/ KPG-141DN
- A Group ID added by the **Scan Delete/Add** key

The transceiver can activate the Group Scan even if the transceiver is proceeding to a Single Scan, Multi Scan or List Scan by a user pressing the **Scan** key.

Following are differences between the cases when scanning automatically starts and when scanning is activated by pressing the **Scan** key.

- If the **Scan** key is not pressed, all Group IDs in the selected zone for LTR Trunking system is scanned. Priority Channel configured in other zones is not scanned.
- If the scan is activated by pressing the **Scan** key, Priority Channel is scanned.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the LTR Background Scan to be enabled or disabled (Edit > Scan Information > Scan)

17.7 Scan Function

The following scan functions can be configured using KPG-141D/ KPG-141DN:

- Scan Delete/Add
- Zone Delete/Add
- Scan List
- Revert CH/GID
- Dropout Delay Time
- Dwell Time
- Lookback
- AC Control
- Priority Temporary Delete/ Add
- Revert CH/GID Display
- CH/GID Recall
- Priority-channel Stop Tone
- Power-on Scan
- Selected CH/GID Scan
- Off-hook Scan
- Scan Stop Tone

17.7.1 Scan Delete/Add

Scan Delete/Add can be used to add a channel or GID to be scanned to the Scan List or delete a channel or GID to be scanned from the Scan List.

With this function, a user can reliably receive a call from a primary channel or GID by deleting unnecessary channels or GIDs to increase the scan speed.

Following are the transceiver's behavior.

(a) Pressing the **Scan Delete/Add** key while the transceiver turns Off the scanning adds the channel or GID to be scanned to the Scan List or deletes the channel or GID to be scanned from the Scan List.

(b) Pressing the **Scan Delete/Add** key while the transceiver temporarily pauses scanning temporarily adds the channel or GID to be scanned to the Scan List or deletes the channel or GID to be scanned from the Scan List. This status is retained until the scanning is terminated by pressing the **Scan** key and will be cleared when the scan completes.

(c) The Key-error Entry Tone sounds from the transceiver by pressing the **Scan Delete/Add** key while the transceiver is scanning and this operation has no effect to the transceiver.

However, for Portable (without LCD/ without Key), only the above operation (b) which is to temporarily delete the channel or GID to be scanned from the Scan List is available. For Portable (without LCD/ without Key), the operation (a) and the operation which is to temporarily add the channel or GID to be scanned to the Scan List is unavailable.

■ Operating the Transceiver

- **Portable (without LCD/ without Key)**

1. Press the **Scan Delete/Add** key.

   If the selected channel or GID is configured in the Scan List, the channel or GID is deleted from the Scan List.

   If the selected channel or GID is not configured in the Scan List, Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all.

- **Other Than Portable (without LCD/ without Key)**

1. Press the **Scan Delete/Add** key.

   If the selected channel or GID is configured in the Scan List, the channel or GID is deleted from the Scan List. The " ▬ " icon (right) disappears.

   The selected channel or GID is added to the Scan List if the selected channel or GID is not configured in the Scan List. The " ▬ " icon (right) appears.

Note: Pressing the **Scan Delete/Add** key while the scan temporarily pauses causes the status of Delete or Add to be retained in the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

17.7.2 Zone Delete/Add

Zone Delete/Add can be used to add a zone to be scanned to the Scan List or delete a zone to be scanned from the Scan List.

With this function, a user can reliably receive a call from a primary zone by deleting unnecessary zones to increase the scan speed.

Pressing the **Zone Delete/Add** key adds the zone to be scanned to the Scan List or deletes the zone to be scanned from the Scan List.

■ Operating the Transceiver

- **Portable (without LCD/ without Key)**

1. Press the **Zone Delete/Add** key.

   If the selected zone is configured in the Scan List, the zone is deleted from the Scan List.

   If the selected zone is not configured in the Scan List, the zone is added to the Scan List.

- **Other Than Portable (without LCD/ without Key)**

1. Press the **Zone Delete/Add** key.

   If the selected zone is configured in the Scan List, the zone is deleted from the Scan List. The " ▬ " icon (left) disappears.

   If the selected zone is not configured in the Scan List, the zone is added to the Scan List. The " ▬ " icon (left) appears.

Note:

- This function cannot be used if "Single" is configured for Scan Type.
- A Key-error Entry Tone sounds from the transceiver by pressing the **Zone Delete/Add** key during the scan and this operation has no effect to the transceiver.
- By pressing the **Zone Delete/Add** key while a scan is temporarily paused, the zone is temporarily deleted from or added to the target zones for scanning. This status is retained until the scanning is terminated by pressing the **Scan** key and will be cleared when the scan completes.
- By pressing the **Zone Delete/Add** key while a scan is temporarily paused, the status information for adding or deleting the zone to or from the target zones for scanning is retained in the transceiver.
- If "List" is configured for Scan Type, a zone can be added to or deleted from the target zones for scanning only while the scan is temporarily paused.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

17.7.3 Scan List

Scan List is the list for which a target zone of the List Scan is configured.

Scan List can be configured using KPG-141D/ KPG-141DN for Conventional Group, LTR Trunking System, or NXDN Trunking System.

Note: Scan List can be used only if "List" is configured for Scan Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Scan List (Conventional Group) (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring the Scan List (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Configuring the Scan List (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit)

17.7.4 Revert CH/GID

Revert CH/GID is the zone channel (or GID) which is used when the transceiver transmits by a user pressing the **PTT** switch during the scan.

Table 17-3 Revert CH/GID

Configuration	Description
Last Called + Selected	The transceiver transmits on the last-called zone-channel or GID by a user pressing the **PTT** switch during the scan. The transceiver transmits on the zone-channel or GID where the transceiver pauses scanning by a user pressing the **PTT** switch during the scan. If the zone-channel or GID is changed, the transceiver transmits using the new channel or GID after the zone-channel or GID is changed until the transceiver receives another call.
Selected	The transceiver transmits on the new channel or GID after the zone-channel or GID is changed regardless of the scanning status.
Selected + Talkback	The transceiver transmits on the new zone-channel or GID after the zone-channel or GID is changed during the scan. The transceiver transmits on the zone-channel or GID where the transceiver pauses scanning while the scan pauses.
Priority	The transceiver transmits on a Priority Channel regardless of the scanning status.
Priority + Talkback	The transceiver transmits on a Priority Channel during the scan. The transceiver transmits on the zone-channel or GID where the transceiver pauses scanning while the scan pauses.

Note:

- If Revert CH/GID Display is enabled, Revert Channel or GID can appear on the main display during the scan. (Refer to: 17.7.10 Revert CH/GID Display on page 191)
- If the Home CH/GID function is activated, the transceiver transmits on the Home Channel or GID regardless of the configuration of Revert CH/GID.
- If the Direct CH/GID function is activated (Return is checked), the transceiver transmits on the Direct Zone-CH/GID regardless of the configuration of Revert CH/GID.
- Talkback is an operation to transmit on the Zone-channel or GID on which the transceiver pauses scanning while the scan pauses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Revert CH/GID (Edit > Scan Information > Scan)

17.7.5 Dropout Delay Time

Dropout Delay Time is the time from when the transceiver finishes receiving signals until the transceiver resumes scanning.

The transceiver pauses scanning when the transceiver receives a call during the scan. The transceiver resumes scanning after the transceiver finishes receiving and then the time configured for Dropout Delay Time elapses.

The following are conditions to resume scanning:

- There is no signal to receive.
- The QT tone, DQT code, or RAN code matching state is reset.
- The Group ID matching state is reset (LTR Trunking System).

The transceiver activates Talkback depending on the configuration for Revert CH/GID while the amount of time configured for Dropout Delay Time is counting down.

If the transceiver pauses scanning while the amount time configured for Dropout Delay Time is counting down, the transceiver monitors Priority Channel by using Lookback if the paused channel is not Priority Channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Dropout Delay Time (Edit > Scan Information > Scan)

17.7.6 Dwell Time

The scan pauses when the **PTT** switch is pressed during the scan. Dwell Time is the time from when the transceiver completes scanning until the transceiver resumes scanning.

The transceiver activates Talkback depending on the configuration for Revert CH/GID while the amount of time configured for Dwell Time is counting down.

If the transceiver pauses scanning while the amount time configured for Dwell Time is counting down, the transceiver monitors Priority Channel by using Lookback if the paused channel is not Priority Channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Dwell Time (Edit > Scan Information > Scan)

17.7.7 Lookback

Lookback is used to check a Priority Channel at a constant interval while the transceiver is receiving on a normal channel (Channels other than Priority Channel) and also a Priority Channel is configured for the transceiver.

The transceiver selects the interval time to check the Priority Channel (Lookback Time A or Lookback Time B) based on the receiving status of the Priority Channel.

■ Lookback Time A

Lookback Time A is the interval time to check for a signal on a Priority Channel while the transceiver is receiving a signal on a normal channel which is different from the Priority Channel.

The Lookback Time A must be shorter than Lookback Time B since the transceiver may receive a call on the Priority Scan.

■ Lookback Time B

Lookback Time B is the interval time to check for a signal that has unmatched QT tone frequency, DQT code, or RAN code on a Priority Channel while the transceiver is receiving a signal on a normal channel during the Priority Scan.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Lookback Time A (Edit > Scan Information > Scan)
- Configuring the Lookback Time B (Edit > Scan Information > Scan)

17.7.8 AC Control

AC Control is a function to activate the carrier squelch by deactivating the QT tone frequency or DQT code on a Priority Channel during the Priority Scan.

If this function is activated, the transceiver can quickly migrate to a Priority Channel since the transceiver does not need to check the QT tone frequency or DQT code. A user can monitor conversations on all Priority Channels when another group having a different priority channel is using this function during the Priority Scan.

Note: This function is only available in the Analog Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the AC Control to be enabled or disabled (Edit > Scan Information > Scan)

17.7.9 Priority Temporary Delete/ Add

A Priority Channel is always scanned regardless of the Scan Delete/Add configuration. If this function is enabled, pressing the **Scan Delete/Add** key temporarily deletes a Priority Channel from the Scan List when the scan pauses on the Priority Channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Priority Temporary Delete/Add (Edit > Scan Information > Scan)

17.7.10 Revert CH/GID Display

Revert CH/GID Display is a function to display the Revert Zone-channel or GID on the main display during the scan.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Revert CH/GID Display to be enabled or disabled (Edit > Scan Information > Scan)

17.7.11 CH/GID Recall

CH/GID Recall is a function to migrate to the last called Zone-channel or GID by pressing the **CH/GID Recall** key during the scan.

Note:

- If the **CH/GID Recall** key is pressed while no signal is received after scan starts, the transceiver migrates to the channel or GID from which the transceiver started scanning.
- If CH/GID Recall is enabled, the transceiver does not resume scanning even if the amount of time configured for Dropout Delay Time or Dwell Time elapses.
- CH/GID Recall is disabled if the channel or GID is changed while CH/GID Recall is enabled. The transceiver resumes scanning after the Key Delay Time elapses (1 s).
- If CH/GID Recall is enabled, the transceiver does not initiate Lookback.
- If CH/GID Recall is enabled, a Scan Stop Tone sounds from the transceiver at 30-sec intervals. The Scan Stop Tone does not sound from the transceiver while the transceiver receives a call, unmutes the speaker and emits the received audio. This tone does not sound from the transceiver while the transceiver is transmitting. After the transmission ends, the tone starts to sound from the transceiver at 30-s intervals.

■ Operating the Transceiver

1. Press the **CH/GID Recall** key during the scan.

   The transceiver pauses scanning after migrating to the last received Zone-channel or GID.

2. Press the **CH/GID Recall** key while the transceiver is migrating to the last called Zone-channel or GID.

   The transceiver resumes scanning.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

17.7.12 Priority-channel Stop Tone

Priority-channel Stop Tone is a function to emit the Priority-channel tone from the transceiver when the transceiver receives during the scan on a Priority Channel and then pauses scanning.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Priority-channel Stop Tone to be enabled or disabled (Edit > Scan Information > Scan)

17.7.13 Power-on Scan

Power-on Scan is a function to be used to automatically start scanning when the transceiver is turned ON.

- **Portable**

  If “Zone Select” is configured for the Selector, the transceiver starts the scan according to the configuration for Scan Type for the zone number indicated by the pointer of **Selector** when the transceiver is turned ON. If the zone number indicated by the pointer of the **Selector** is not configured for the transceiver, the scan pauses.

  If anything other than “Zone Select” is configured for Selector, the transceiver starts the scan according to the configuration for Scan Type for the zone selected when the transceiver is turned ON.

- **Mobile**

  The transceiver starts the scan according to the configuration for Scan Type for the zone selected when the transceiver is turned ON.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-on Scan to be enabled or disabled (Edit > Scan Information > Scan)

17.7.14 Selected CH/GID Scan

Selected CH/GID Scan is a function that is used to add the selected channel or GID to the Scan List even if it is deleted from the Scan List.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selected CH/GID Scan to be enabled or disabled (Edit > Scan Information > Scan)

17.7.15 Off-hook Scan (Mobile Only)

Off-hook Scan is a function to start the scan regardless of the status of microphone, either on-hook or off-hook.

The transceiver scans according to the configuration for Off-hook Scan.

Table 17-4 Off-hook Scan

Configuration	Description
Enabled	Pressing the **Scan** key causes the transceiver to start scanning regardless of the microphone On- or Off-hook state.
Disabled	If the microphone is in the On-hook state, pressing the **Scan** key causes the transceiver to start scanning; however if the microphone is in the Off-hook state, the transceiver cannot start scanning. If the microphone changes from the On-hook state to Off-hook state in Scan Mode, the scan pauses on the Revert Channel or GID. When the microphone goes to On-hook state, the transceiver resumes scanning.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Off-hook Scan to be enabled or disabled (Edit > Scan Information > Scan)

17.7.16 Scan Stop Tone

Scan Stop Tone is a function to emit a Scan Stop Tone from the transceiver while the scan pauses, for example, while the transceiver is on a Home Channel or GID or Direct Channel or GID.

The transceiver pauses scanning if the conditions to start the scan are not satisfied, for instance while the transceiver is on a Home Channel or GID, or Direct Channel or GID, and then the Scan Stop Tone sounds at 30-s intervals.

Also, whether to emit the Scan Stop Tone can be configured using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Scan Stop Tone to be enabled or disabled (Edit > Scan Information > Scan)

Operator Selectable Tone (OST) can be used to change the Decode/ Encode combination of the QT/ DQT signaling without changing the transmit and receive frequencies.

If there are multiple Groups using the same frequency but a different QT tone frequency or DQT code, this function can be used to allow a dispatcher to specify the target group to command.

A maximum of 40 pairs of QT tone frequencies or DQT codes for Decode/ Encode signaling for OST can be configured in the OST Table using KPG-141D/ KPG-141DN. (Refer to: 18.6 OST Table on page 196)

Note:

- OST is disabled when the zone or channel is changed. OST is enabled again when the transceiver restores the previous channel while OST Status Memory is enabled. (Refer to: 18.4 OST Status Memory on page 196)
- If Talk Around and Operator Selectable Tone (OST) are both activated, the OST has priority.
- This function is unavailable for Portable (without LCD/ without Key).

18.1 Configuring the OST to be Enabled or Disabled

Pressing the **Operator Selectable Tone** key causes OST to be enabled or disabled.

■ Operating the Transceiver

- **Enabling the OST**

1. Press the **Operator Selectable Tone** key while OST is disabled.

   OST will be enabled. The OST Name appears on the main display for 2 s.

- **Disabling the OST**

1. Press the **Operator Selectable Tone** key while OST is enabled.

   OST will be disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

18.2 Selecting the OST List

The OST List (QT/DQT Decode/ Encode pair) to be used can be selected in OST List Mode.

Pressing and holding the **Operator Selectable Tone** key causes the transceiver to enter OST List Mode.

■ Operating the Transceiver

1. Press and hold the **Operator Selectable Tone** key.

   The transceiver enters OST List Mode.

   The following operations are identical even if the transceiver enters OST List Mode with keypad entry.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the OST code from Status List.

   The selected OST code will be enabled.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

   Note: QT/DQT Encode and QT/DQT Decode can be disabled if “TONE OFF” is selected. (Refer to: 18.5 Tone Off on page 196)

3. Press the **Side 1** key (Portable) or the **Triangle** key (Mobile).

   OST List Mode is exited.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

18.3 Direct OST

Direct OST is the function that is used to select an OST code by using the keypad.

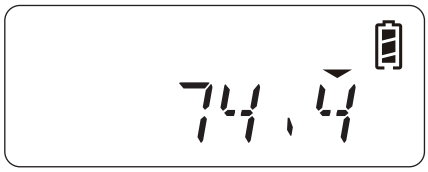
If “OST” is configured for Keypad Operation, an OST code can be selected using the keypad. (Refer to: 4.5 Keypad Operation on page 30)

■ Operating the Transceiver

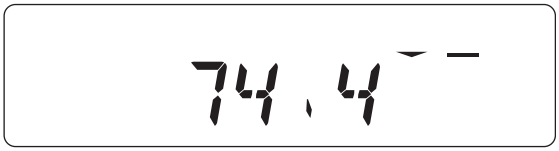
- **If selecting an OST code from the OST List having List Number 9 or lower:**

1. Press and hold one of the **[1]** to **[9]** keys.

   The OST List corresponding to the pressed key is enabled. The corresponding OST Name appears for 2 s.



Portable



Mobile

   The previous channel name or number appears on the main display when the OST Name display disappears.

   Note: “TONE OFF” can be selected by pressing and holding the **[0]** key. (Refer to: 18.5 Tone Off on page 196)

- **If selecting an OST code from the OST List having List Number 10 or higher:**

1. Press and hold the **[*]** key.

   The transceiver enters OST List Number Entry Mode.

Portable

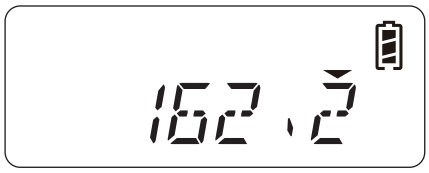
Mobile

2. Enter the OST List number by using the keypad.

Portable

Mobile

   The corresponding OST Name appears for 2 s.



Portable

Mobile

   The previous channel name or number appears on the main display when the OST Name display disappears.

   Note: Pressing and holding the **[#]** key disables OST while the channel where OST is enabled is selected.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions for Keypad Operation (Edit > Key Assignment > General)

18.4 OST Status Memory

OST Status Memory is the function that is used to retain the OST code configured for each channel even if the transceiver is turned OFF or the channel is changed.

If this function is enabled, the OST code configured for each channel can be retained even if the channel is changed or the transceiver is turned OFF.

If this function is disabled, the OST code configured for each channel cannot be retained even if the channel is changed or the transceiver is turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the OST Status Memory to be enabled or disabled (Edit > Optional Features > Optional Features 2 > Conventional)

18.5 Tone Off

Tone Off allows a user to select “TONE OFF” on a main display by using the keys on the transceiver.

If this function is enabled, “TONE OFF” can be selected from the OST List.

If “TONE OFF” is selected, QT/DQT Encode and QT/DQT Decode can be disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Tone Off to be enabled or disabled (Edit > Optional Features > Optional Features 2 > Conventional)

18.6 OST Table

OST Table can be used to configure an encode and decode pair for QT tone frequency or DQT code signaling used for OST. A maximum of 40 pairs can be configured. The following functions can be configured in the OST Table.

Table 18-1 OST Table

OST Table	Description
OST Name	For Portable, a name of up to 8 characters can be configured for an Encode/ Decode pair. For Mobile, a name of up to 10 characters can be configured for an Encode/ Decode pair. “TONE 1” to “TONE 40” appears on the main display if no OST Name is configured.
QT/DQT Decode	The QT tone frequency or DQT code to be used to receive a call can be configured. The following QT/DQT Decode range is available: QT: 67.0 Hz to 254.1 Hz (in steps of 0.1 Hz) DQT: 000N to 777N, 000I to 777I
QT/DQT Encode	The QT tone frequency or DQT code to be used to make a call can be configured. The following QT/DQT Encode range is available: QT: 67.0 Hz to 254.1 Hz (in steps of 0.1 Hz) DQT: 000N to 777N, 000I to 777I

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the OST Table (Edit > Optional Features > Optional Features 2 > Conventional)

Emergency is the function to be used for the transceiver to transmit and receive for emergency purposes. This function is used for a user to immediately contact the base station in emergency situations.

The transceiver behaves according to the configurations in Emergency Mode when the transceiver is placed in Emergency Mode. The base station transceiver can notice an occurrence of an emergency situation in the transmitting transceiver upon receipt of a call by use of Emergency.

Pressing and holding the **Emergency** key for longer than the time configured for Emergency-key Delay Time causes the transceiver to enter Emergency Mode.

If the Lone Worker function is enabled, the transceiver enters Emergency Mode when the time configured for Lone Worker Interval elapses in Lone Worker Mode and then the time configured for Duration of Lone Worker Tone elapses. (Refer to: 19.2 Lone Worker on page 204)

Also, for Portable, when the transceiver detects that the transceiver is tilted, remains stationary, or moves vigorously for a certain period of time due to an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status. (Refer to: 19.3 Activity Detection (Portable Only) on page 208)

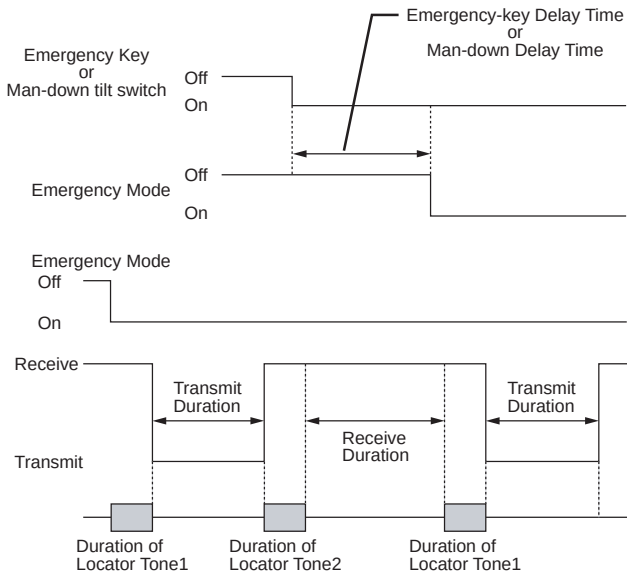


Figure 19-1 Emergency Mode

While the transceiver is under the following conditions, the transceiver does not enter Emergency Mode:

- While the transceiver is in the Stun state
- If in Transceiver Password entry mode
- If no transmit channel or GID is registered for the Emergency CH/ GID

Note:

- The **PTT** switch can be used even if the transceiver is in Emergency Mode. The transceiver reverts to automatic receive mode when the transceiver completes transmitting by releasing the **PTT** switch.
- The configuration for Emergency Mic Sense applies to the microphone sensitivity in Emergency Mode. (Refer to: 19.1.12 Emergency Mic Sense on page 201)
- For Portable, “Emergency” can be assigned to the **AUX** key.
- For Mobile, “Emergency” can be assigned to the **Triangle** key. Or “Emergency” can also be assigned to the AUX Input port of the D-sub 15 pin on the rear panel. (Refer to: 29.1 Available Functions for the AUX Input Port on page 352)
- Busy Channel Lockout configured for a channel is disabled in Emergency Mode.
- The transceiver does not decode the Stun Code and Optional Signaling in Emergency Mode.

Operating the Transceiver

Placing the Transceiver in Emergency Mode

1.Press and hold the **Emergency** key for longer than the time configured for Emergency-key Delay Time.

The transceiver enters Emergency Mode.

Exiting Emergency Mode

1.Select one of the following operations.

- Press and hold the **Emergency** key for longer than the time configured for Emergency-key Delay Time while the transceiver is in Emergency Mode.
- Turn the transceiver OFF.

Note: The transceiver exits Emergency Mode upon receipt of the Emergency Termination Status (FleetSync: 88, NXDN: 226) while in Emergency Mode.

Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

19.1 Emergency Mode Function

The transceiver behaves according to the configurations for the various functions listed below in Emergency Mode.

- Emergency CH/GID Type
- Emergency Zone-CH/GID
- Emergency Cycle
- Duration of Locator Tone 1
- Transmit Duration
- Duration of Locator Tone 2
- Receive Duration
- Emergency Display
- Emergency Text
- Emergency Mode Type
- Emergency-key Delay Time
- Emergency Mic Sense
- Emergency LED
- Background Transmission
- Emergency ID
- Emergency DTMF ID
- Emergency Call Fleet
- Emergency Call ID
- Emergency NXDN ID Type
- Emergency NXDN ID
- Emergency Alarm

19.1.1 Emergency CH/GID Type

Emergency CH/GID Type is the type of a channel or GID used when the transceiver is placed in Emergency Mode.

Emergency CH/GID Type can be configured using KPG-141D/ KPG-141DN.

Table 19-1 Emergency CH/GID Type

Emergency CH/GID Type	Description
Selected	When the transceiver enters Emergency Mode, the transceiver resets the migration state of channels, such as Home CH/GID, and then the transceiver executes the Emergency behavior on the previously selected channel or GID.
Fixed	When the transceiver enters Emergency Mode, the transceiver migrates to the Zone-CH/GID configured for Emergency Zone-CH/GID, and then the transceiver executes the Emergency behavior.

The transceiver behaves as below according to the configuration for Emergency CH/GID Type.

- **Selected**
- **If a channel in an Analog Conventional system or a GID in an LTR Trunking system is selected:**
  The transceiver behaves according to the configuration for Emergency ID (Analog).

Table 19-2 Emergency ID (Analog)

Emergency ID	Description
None	The transceiver transmits using either QT/ DQT (Conventional) or LTR ID (LTR).
DTMF, FleetSync	The transceiver transmits according to the configuration for DTMF or FleetSync.

- **If a channel in an NXDN Conventional system is selected:**
  The transceiver behaves according to the configuration for Emergency ID (NXDN Conventional).

Table 19-3 Emergency ID (NXDN Conventional)

Emergency ID	Description
None	The transceiver transmits only using the RAN code.
NXDN	If “Group ID” is configured for Emergency NXDN ID Type, the transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID. If “Unit ID” is configured for Emergency NXDN ID Type, the transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID.

- **If a GID for NXDN Trunking system is selected:**
  The transceiver behaves according to the configuration for Emergency ID (NXDN Trunking).

Table 19-4 Emergency ID (NXDN Trunking)

Emergency NXDN ID Type	Description
Group ID	The transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID. When receiving a Group Call, the transceiver also uses the Group ID configured for Emergency NXDN ID.
Unit ID	The transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID. When receiving a Group Call, the transceiver uses the currently selected Group ID.

- **Fixed**

- **If a channel in an Analog Conventional system or a GID in an LTR Trunking system is configured for Emergency Zone-CH/GID:**

  The transceiver behaves according to the configuration for Emergency ID (Analog).

Table 19-5 Emergency ID (Analog)

Emergency ID	Description
None	The transceiver transmits using either QT/DQT (Conventional) or LTR ID (LTR).
DTMF, FleetSync	The transceiver transmits according to the configuration for DTMF or FleetSync.

- **If a channel in an NXDN Conventional system is configured for Emergency Zone-CH/GID:**

  The transceiver behaves according to the configuration for Emergency ID (NXDN Conventional).

Table 19-6 Emergency ID (NXDN Conventional)

Emergency ID	Description
None	The transceiver transmits only using the RAN code.
NXDN	If “Group ID” is configured for Emergency NXDN ID Type, the transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID. If “Unit ID” is configured for Emergency NXDN ID Type, the transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID.

- **If a GID for NXDN Trunking system is configured for Emergency Zone-CH/GID:**

  The transceiver behaves according to the configuration for Emergency ID (NXDN Trunking).

Table 19-7 Emergency ID (NXDN Trunking)

Emergency NXDN ID Type	Description
Group ID	The transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID. When receiving a Group Call, the transceiver also uses the Group ID configured for Emergency NXDN ID.
Unit ID	The transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID. When receiving a Group Call, the transceiver uses the Group ID configured for Emergency Zone-CH/GID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency CH/GID Type (Edit > Emergency Information > Emergency 1)
- Configuring the Emergency ID (Analog) (Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))
- Configuring the Emergency ID (NXDN Conventional) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Conventional))
- Configuring the Emergency ID (NXDN Trunking) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Trunking))

19.1.2 Emergency Zone-CH/GID

Emergency Zone-CH/GID is the zone-channel or GID used in Emergency Mode if “Fixed” is configured for Emergency CH/GID Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Zone-CH/GID (Edit > Emergency Information > Emergency 1)

19.1.3 Emergency Cycle

Emergency Cycle is the number of times for which the transceiver toggles between transmission and reception in Emergency Mode.

Table 19-8 Emergency Cycle

Emergency Cycle	Description
1 to 200	The transceiver repeats automatic transmission and automatic reception for the configured number of times, and then the transceiver exits Emergency Mode.
Infinite	The transceiver continues to alternate between automatic transmission and reception until the **Emergency** key is pressed again or the transceiver is turned OFF.
Off	The transceiver does not automatically transmit and receive in Emergency Mode.

Note: If “Off” is configured for Emergency Cycle and if “Selected” is configured for Emergency CH/GID Type, a zone-channel or GID can be changed even while the transceiver is placed in Emergency Mode. However, a zone-channel or GID cannot be changed while Emergency Alarm in an MDC-1200 format is activated.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Cycle (Edit > Emergency Information > Emergency 1)

19.1.4 Duration of Locator Tone 1

Duration of Locator Tone 1 is the duration to emit an Alert Tone which notifies that the transceiver will start a transmission before the transceiver starts automatic transmission in Emergency Mode.

The transceiver automatically repeat transmitting and receiving in Emergency Mode. When the transceiver switches reception to transmission, a Locator Tone 1 sounds from the transceiver for the length of time configured for Duration of Locator Tone 1.

When the tone sounds, a user can easily recognize without viewing the transceiver that the transceiver is about to automatically transmit in Emergency Mode. This tone can also be used to locate a user who is in emergency situations.

Note: This function is enabled if “Audible” is configured for Emergency Mode Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of Locator Tone 1 (Edit > Emergency Information > Emergency 1)

19.1.5 Transmit Duration

Transmit Duration is the duration for a single session of automatic transmission in Emergency Mode.

The transceiver switches to automatic reception in Emergency Mode when the time configured for Transmit Duration elapses after the transceiver starts automatic transmission in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Duration (Edit > Emergency Information > Emergency 1)

19.1.6 Duration of Locator Tone 2

Duration of Locator Tone 2 is the duration to emit an Alert Tone which notifies that the transceiver has completed an automatic transmission in Emergency Mode, and starts receiving.

The transceiver automatically repeat transmitting and receiving in Emergency Mode. When the transceiver switches transmission to reception, a Locator Tone 2 sounds from the transceiver for the length of time configured for Duration of Locator Tone 2.

When the tone sounds, a user can easily recognize without viewing the transceiver that the transceiver ends to automatically transmit in Emergency Mode. This tone can also be used to locate a user who is in emergency situations.

Note: This function is enabled if “Audible” is configured for Emergency Mode Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of Locator Tone 2 (Edit > Emergency Information > Emergency 1)

19.1.7 Receive Duration

Receive Duration is the duration for a single session of automatic reception in Emergency Mode.

The transceiver switches to automatic transmission in Emergency Mode when the time configured for Receive Duration elapses after the transceiver starts automatic reception in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Receive Duration (Edit > Emergency Information > Emergency 1)

19.1.8 Emergency Display

Emergency Display is the function to display the preconfigured text message on the transceiver main display or retain the display appearance before the transceiver enters Emergency Mode.

Table 19-9 Emergency Display

Emergency Display	Description
Selected	The previously selected channel or GID is retained on the main display even if the transceiver enters Emergency Mode.
Text	A preconfigured text message for the Emergency Text appears on the main display when the transceiver enters Emergency Mode.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Display (Edit > Emergency Information > Emergency 1)

19.1.9 Emergency Text

Emergency Text is a text message that appears on the main display if Text is configured for Emergency Display.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Text (Edit > Emergency Information > Emergency 1)

19.1.10 Emergency Mode Type

Emergency Mode Type is the function to determine whether the received audio or various tones are muted while the transceiver is in Emergency Mode.

Table 19-10 Emergency Mode Type

Emergency Mode Type	Description
Silent	The transceiver mutes the received audio and various tones while in Emergency Mode.
Audible	The transceiver emits the received audio and various tones in the same manner as in normal mode even while in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Mode Type (Edit > Emergency Information > Emergency 1)

19.1.11 Emergency-key Delay Time

Emergency-key Delay Time is the duration from when the **Emergency** key is pressed until the transceiver enters Emergency Mode. Pressing and holding the **Emergency** key for the duration configured for Emergency-key Delay Time causes the transceiver to enter Emergency Mode. This function can be used to prevent the transceiver from erroneously entering Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency-key Delay Time (Edit > Emergency Information > Emergency 1)

19.1.12 Emergency Mic Sense

Emergency Mic Sense is the function used to adjust the microphone input sensitivity in Emergency Mode.

In Emergency Mic Sense, the microphone sensitivity can be configured within the following range.

6dB, 4dB, 2dB, 0dB, -2dB, -4dB, -6dB, -8dB, -10dB, -12dB, -14dB, -16dB, -18dB, -20dB

The appropriate level of microphone sensitivity for normal operation is 0 dB. Based on this level, the parameter of the microphone sensitivity can be configured.

Note: If the value lower than “0 dB” is configured for Emergency Mic Sense, the amplitude limit level is also lowered simultaneously; hence, Modulation Limiting (minimum) in Analog FM will be lowered.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Mic Sense (Edit > Emergency Information > Emergency 1)

19.1.13 Emergency LED

Emergency LED is the function to make the Transmit LED light when the transceiver transmits in Emergency Mode and the Busy LED light when the transceiver receives in Emergency Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency LED (Edit > Emergency Information > Emergency 1)

19.1.14 Background Transmission

Background Transmission is the function to multiplex a Background Tone on the transmitted audio when the transceiver transmits in Emergency Mode. Background Tone is multiplexed every 1 second while the transceiver is transmitting audio data.

The audio signal is not muted since the Background Tone is transmitted with lower deviation than normal. The receiving transceiver can easily recognize that the transmitting transceiver is in Emergency Mode if the tone is multiplexed while initiating a voice call.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Background Transmission (Edit > Emergency Information > Emergency 1)

19.1.15 Emergency Alarm

Emergency Alarm is a function to send an Emergency Alarm Request message before the transceiver enters Emergency Mode to notify the base station that the transceiver is in an emergency situation.

Using this function can reliably notify the base station that the transceiver is in an emergency situation.

If the **Emergency** key is pressed and held for longer than the time configured in Emergency-key Delay Time on an analog channel or GID where MDC-1200 is used as the signaling type, the transceiver sends the Emergency Alarm Request message using the emergency packet in the MDC-1200 format. Upon receipt of an acknowledgment, the transceiver enters Emergency Mode.

If the transceiver receives no acknowledgment until the time configured for Maximum ACK Wait Time elapses after sending the Emergency Alarm Request message, the transceiver resends the Emergency Alarm Request message. If the transceiver still cannot receive an acknowledgment after sending the message 5 times, the transceiver enters Emergency Mode.

Note:

- To use this function, Emergency Alarm needs to be enabled, and "FleetSync/MDC-1200" needs to be configured for Emergency ID.
- The transceiver that received the Emergency Alarm Request message notifies a user of the receipt of the Emergency Call according to the configuration for Emergency Response.
- If the zone, channel or GID is changed while the transceiver is in Emergency Mode, the transceiver resends the Emergency Alarm Request message on a channel or GID which the transceiver has migrated to.
- The transceiver sends an Emergency Alarm Request message; however the transceiver cannot send an acknowledgment even if an Emergency Alarm Request message has been received.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Alarm (Edit > Emergency Information > Emergency 1)
- Configuring the Maximum ACK Wait Time (Edit > MDC-1200 > Parameter)

19.1.16 Emergency ID

Emergency ID is the code to be sent or the control type each time the transceiver starts automatic transmission and reception in Emergency Mode.

Each Emergency ID can be configured for an Analog Conventional system or an NXDN Conventional system using KPG-141D/ KPG-141DN.

Table 19-11 Emergency ID (Analog)

Emergency ID	Description
None	The transceiver transmits and receives according to the configuration using KPG-141D/ KPG-141DN.
DTMF	The transceiver first sends the DTMF code configured for the following functions when transmitting in Emergency Mode. • Emergency DTMF ID (Key) • Emergency DTMF ID (Man-down) (Portable Only) • Emergency DTMF ID (Stationary) (Portable Only) • Emergency DTMF ID (Motion) (Portable Only) • Emergency DTMF ID (Lone Worker) (Portable Only)
FleetSync/ MDC-1200	The transceiver behavior varies depending on the configuration in Signaling Type (either FleetSync or MDC-1200). **FleetSync:** The transceiver first sends the FleetSync SelCall ID configured for Emergency Call Fleet and Emergency Call ID when transmitting in Emergency Mode. **MDC-1200:** The transceiver first sends the MDC-1200 packet when transmitting in Emergency Mode.

Table 19-12 Emergency ID (NXDN Conventional)

Emergency ID	Description
None	The transceiver transmits and receives according to the configuration using KPG-141D/ KPG-141DN.
NXDN	When transmitting in Emergency Mode, the transceiver initiates a Group Call or an Individual Call according to the configurations for Emergency NXDN ID Type and Emergency NXDN ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency ID (Analog) (Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))
- Configuring the Emergency ID (NXDN Conventional) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Conventional))

19.1.17 Emergency DTMF ID

Emergency DTMF ID is the DTMF code to be sent first in Emergency Mode if “DTMF” is configured for Emergency ID (Analog).

The DTMF code to be sent varies as below depending on what caused the transceiver to enter Emergency Mode.

- **Emergency DTMF ID (Key)**

  This is the DTMF ID code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by pressing the **Emergency** key.

- **Emergency DTMF ID (Man-down) (Portable Only)**

  This is the DTMF ID code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by Man-down Detection.

- **Emergency DTMF ID (Stationary) (Portable Only)**

  This is the DTMF ID code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by Stationary Detection.

- **Emergency DTMF ID (Motion) (Portable Only)**

  This is the DTMF ID code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by Motion Detection.

- **Emergency DTMF ID (Lone Worker) (Portable Only)**

  This is the DTMF ID code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by Lone Worker.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency DTMF ID (Analog) (Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

19.1.18 Emergency Call Fleet

Emergency Call Fleet is the Call Fleet to be sent first in Emergency Mode if “FleetSync” is configured for Emergency ID (Analog).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Call Fleet (Analog) (Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

19.1.19 Emergency Call ID

Emergency Call ID is the Call ID to be sent first in Emergency Mode if “FleetSync” is configured for Emergency ID (Analog).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Call ID (Analog) (Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

19.1.20 Emergency NXDN ID Type

Emergency NXDN ID Type is the type of NXDN ID used for automatic transmissions while the transceiver is in Emergency Mode in an NXDN Conventional system or NXDN Trunking system.

Either Group ID or Unit ID can be configured for Emergency NXDN ID Type using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency NXDN ID Type (NXDN Conventional) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Conventional))
- Configuring the Emergency NXDN ID Type (NXDN Trunking) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Trunking))

19.1.21 Emergency NXDN ID

Emergency NXDN ID is the NXDN ID used for transmissions and receptions while the transceiver is in Emergency Mode in an NXDN Conventional system or NXDN Trunking system.

If “Unit ID” is configured for Emergency NXDN ID Type, the Unit ID used for initiating an Individual Call in Emergency Mode can be configured.

If “Group ID” is configured for Emergency NXDN ID Type, the Group ID used for initiating a Group Call in Emergency Mode can be configured.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency NXDN ID (NXDN Conventional) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Conventional))
- Configuring the Emergency NXDN ID (NXDN Trunking) (Edit > Emergency Information > Emergency 2 > Emergency ID (NXDN Trunking))

19.2 Lone Worker

Lone Worker is the function that automatically places the transceiver in Emergency Mode if the transceiver is not operated for a certain period of time.

If the transceiver is placed in Lone Worker Mode while the user has a task at a dangerous place, for instance, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status because a user cannot operate the transceiver due to an accident.

Since the Lone Worker Tone sounds from the transceiver prior to entering Emergency Mode if the transceiver is in the Lone Worker Mode, the Lone Worker function can also be used to warn a user.

19.2.1 Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode

Pressing the **Lone Worker** key, while the transceiver is in a mode other than Lone Worker Mode, places the transceiver in Lone Worker Mode. Pressing the **Lone Worker** key while the transceiver is in Lone Worker Mode, the transceiver exits Lone Worker Mode.

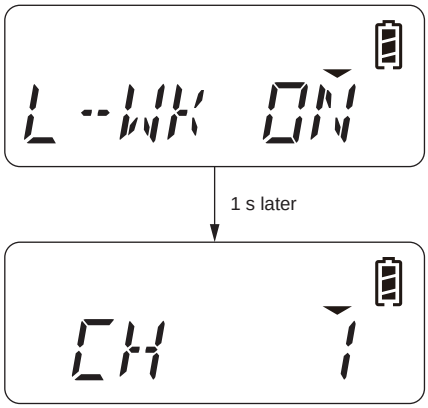
If the transceiver is in a mode other than Lone Worker Mode, the transceiver also enters Lone Worker Mode when a channel or GID where Lone Worker is enabled using KPG-141D/ KPG-141DN is selected. If the transceiver is in Lone Worker Mode, the transceiver exits Lone Worker Mode when a channel or GID where Lone Worker is disabled using KPG-141D/ KPG-141DN is selected.

■ Operating the Transceiver

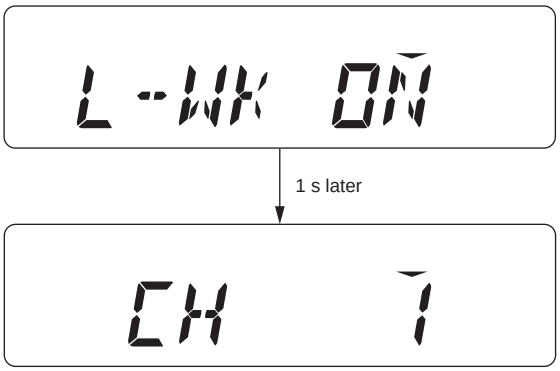
- **Enabling the Transceiver in Lone Worker Mode**

1.Press the **Lone Worker** key or select a channel or GID where Lone Worker is enabled while the transceiver is in a mode other than Lone Worker Mode.

The transceiver enters Lone Worker Mode, and then the timer for Lone Worker Interval starts counting down. If the **Lone Worker** key is pressed, “L-WK ON” appears on the main display for 1 s and a Key Beep A sounds from the transceiver.



Portable



Mobile

If no key is pressed after the timer for Lone Worker Interval starts counting down, the Lone Worker Tone sounds from the transceiver when the time configured for Lone Worker Interval elapses. The Lone Worker Tone sounds for the time configured for Duration of Lone Worker Tone. If no key is pressed while the Lone Worker Tone continues to sound from the transceiver, and if the time configured for Duration of Lone Worker Tone elapses, the transceiver enters Emergency Mode.

The transceiver behaves according to the configuration of Emergency after the transceiver enters Emergency Mode. (Refer to: 19 EMERGENCY on page 197)

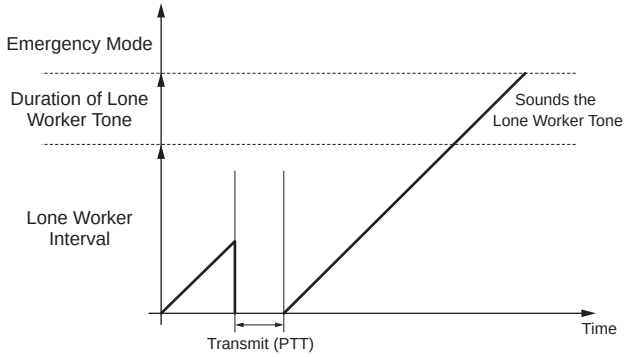


Figure 19-2 Lone Worker Mode (Portable)

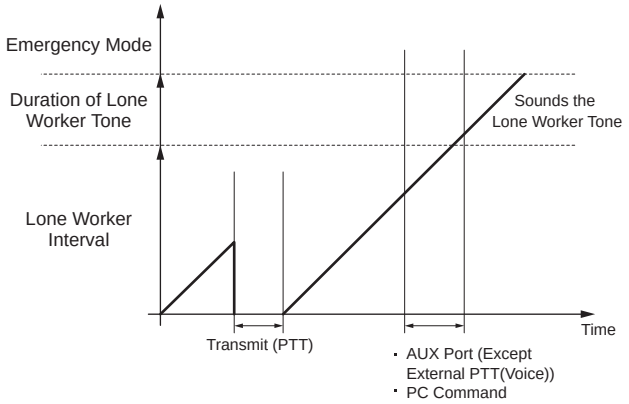
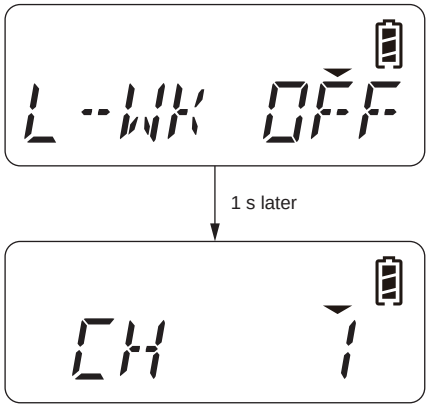


Figure 19-3 Lone Worker Mode (Mobile)

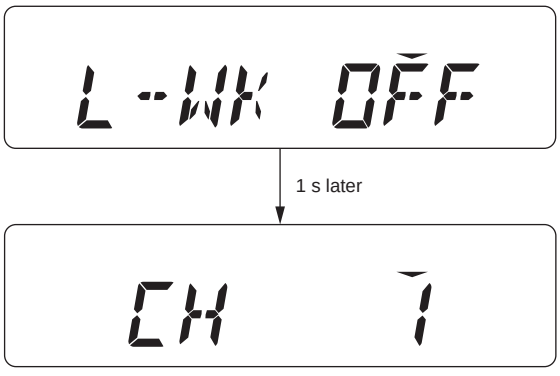
- **Disabling Lone Worker Mode**

1. Press the **Lone Worker** key or select a channel or GID where Lone Worker is disabled while the transceiver is in Lone Worker Mode.

Aborts the Lone Worker Mode. If the **Lone Worker** key is pressed, “L-WK OFF” appears on the main display for 1 s and a Key Beep B sounds from the transceiver.



Portable



Mobile

Note:

- If a **PF** key is pressed or the transceiver transmits by a user pressing the **PTT** switch while the timer for Lone Worker Interval is counting down, the timer for Lone Worker Interval is reset and then restarts counting down from the beginning. However, if the communication using a PC Command takes place, the timer for Lone Worker Interval continues counting down without being reset.
- Lone Worker cannot be activated while the transceiver is in the Stun state or while in Transceiver Password Mode.
- Lone Worker can be activated even if the Key Lock state is activated while the transceiver is in Lone Worker Mode.
- The transceiver exits Emergency Mode by pressing the **Emergency** key for longer than the time configured for Emergency-key Delay Time after the transceiver migrates from Lone Worker Mode to Emergency Mode.
- If the scan starts while the transceiver is in Lone Worker Mode, the scan starts with Lone Worker Mode enabled. If the scan starts while the transceiver is in a mode other than Lone Worker mode, the scan starts with Lone Worker Mode disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Lone Worker (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Lone Worker (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Lone Worker (NXDN Trunking System) to be enabled or disabled (Edit > Zone Information (NXDN Trunking System) > GID Edit)

19.2.2 Functions in Lone Worker Mode

The following Lone Worker Mode functions can be configured using KPG-141D/ KPG-141DN:

- Lone Worker Type
- Lone Worker Interval
- Duration of Lone Worker Tone

■ Lone Worker Type

Lone Worker Type can be used to configure how the transceiver behaves in Lone Worker Mode. The transceiver behaves as below while in Lone Worker Mode according to the configuration for Lone Worker Type.

Table 19-13 Lone Worker Type

Configuration	Description
Normal	Lone Worker Mode can be enabled or disabled by a user pressing the **Lone Worker** key. A user can transmit and receive using the transceiver in the same manner as normal even if the transceiver enters Lone Worker Mode and while the time configured for Lone Worker Interval is counting down. The status of Lone Worker Mode, either enabled or disabled by a user pressing the **Lone Worker** key, is retained in the transceiver. The status of Lone Worker Mode, either enabled or disabled, is also retained in the transceiver even if the channel or GID is changed or the transceiver is turned ON or OFF.
Transmit/ Receive Inhibit	Lone Worker Mode can be enabled or disabled by a user pressing the **Lone Worker** key. A user cannot transmit and receive using the transceiver while a timer for Lone Worker Interval is counting down after the transceiver enters Lone Worker Mode. Only the following **PF** keys can be used while the transceiver is in Lone Worker Mode: • **Lone Worker** key • **Emergency** key • **Function** key • **Backlight** key (Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key)) • **LCD Brightness** key (Mobile) The status of Lone Worker Mode, either enabled or disabled by a user pressing the **Lone Worker** key, is retained in the transceiver. The status of Lone Worker Mode, either enabled or disabled, is also retained in the transceiver even if the channel or GID is changed or the transceiver is turned ON or OFF.
Preset	If a channel or GID is selected, Lone Worker Mode is enabled or disabled depending on the configuration for Lone Worker Mode for the selected channel or GID. Lone Worker Mode can also be enabled or disabled by a user pressing the **Lone Worker** key. A user can transmit and receive using the transceiver in the same manner as normal even if the transceiver enters Lone Worker Mode and while the time configured for Lone Worker Interval is counting down. The status of Lone Worker Mode, either enabled or disabled by a user pressing the **Lone Worker** key, is not retained in the transceiver.

Lone Worker Type can be configured using KPG-141D/ KPG-141DN depending on the usage of the transceiver. The transceiver's behavior varies as below depending on the configuration for Lone Worker Type.

Table 19-14 Lone Worker Type

Transceiver Behavior	Configuration for Lone Worker Type		
	Normal	Transmit/ Receive Inhibit	Preset
Toggling the Lone Worker Mode between enabled and disabled when a channel or GID is changed	No	No	Yes
Toggling the Lone Worker Mode between enabled and disabled by a user pressing the **Lone Worker** key	Yes	Yes	Yes
Retaining the status of Lone Worker Mode, either enabled or disabled, in the transceiver	Yes	Yes	No
Transmitting and receiving by operating the transceiver in the same manner as normal mode	Yes	No	Yes

Yes: Available
No: Not available

Note: The transceiver does not transmit by a user pressing the **PTT** switch while the Lone Worker Tone continues to sound from the transceiver even if “Normal” or “Preset” is configured for Lone Worker Type. Also, this function cannot be activated even if a **PF** key is pressed. In this case, a timer for Lone Worker Interval is reset and then restarts counting down from the beginning. However, pressing and holding the **Emergency** key for longer than the time configured for Emergency-key Delay Time results in the transceiver entering Emergency Mode.

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Lone Worker Type (Edit > Emergency Information > Emergency 1 > Lone Worker)
- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Lone Worker (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Lone Worker (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Lone Worker (NXDN Trunking System) to be enabled or disabled (Edit > Zone Information (NXDN Trunking System) > GID Edit)

Lone Worker Interval

Lone Worker Interval is the interval time from when the transceiver enters Lone Worker Mode until the Lone Worker Tone sounds from the transceiver.

If no key is pressed after the transceiver enters Lone Worker Mode and then a timer for Lone Worker Interval starts counting down, and if the time configured for Lone Worker Interval elapses, the Lone Worker Tone sounds from the transceiver. The Lone Worker Tone sounds from the transceiver for the time configured for Duration of Lone Worker Tone.

If any key is pressed before the time configured for Lone Worker Interval elapses, the timer for Lone Worker Interval is reset and restarts counting down from the beginning. Also, if the **Lone Worker** key is pressed before the time configured for Lone Worker Interval elapses, Lone Worker Mode becomes disabled and then the transceiver reverts to the normal mode.

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Lone Worker Interval (Edit > Emergency Information > Emergency 1 > Lone Worker)

Duration of Lone Worker Tone

Duration of Lone Worker Tone is the length of time that the Lone Worker Tone sounds from the transceiver.

If no key is pressed after the transceiver enters Lone Worker Mode and then a timer for Lone Worker Interval starts counting down, and if the time configured for Lone Worker Interval elapses, the Lone Worker Tone sounds from the transceiver. The Lone Worker Tone sounds from the transceiver for the time configured for Duration of Lone Worker Tone. If no key is pressed while the Lone Worker Tone continues to sound from the transceiver, and if the time configured for Duration of Lone Worker Tone elapses, the transceiver enters Emergency Mode.

If any key is pressed while the Lone Worker Tone continues to sound from the transceiver, the Lone Worker Tone stops sounding, and the timer for Lone Worker Interval is reset and then restarts counting down from the beginning.

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Duration of Lone Worker Tone (Edit > Emergency Information > Emergency 1 > Lone Worker)

19.3 Activity Detection (Portable Only)

Activity Detection is the function to detect the status of the transceiver by analyzing the behavior of the transceiver using the acceleration sensor and tilt sensor embedded in the transceiver, and to automatically place the transceiver in Emergency Mode.

Using this function, if the transceiver detects that the transceiver is tilted, remains stationary, or moves vigorously for a certain period of time due to an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status.

To use this function, Activity Detection must be enabled.

Activity Detection becomes enabled by pressing the **Activity Detection** key while the Activity Detection is disabled, or selecting a channel or GID where Activity Detection is enabled.

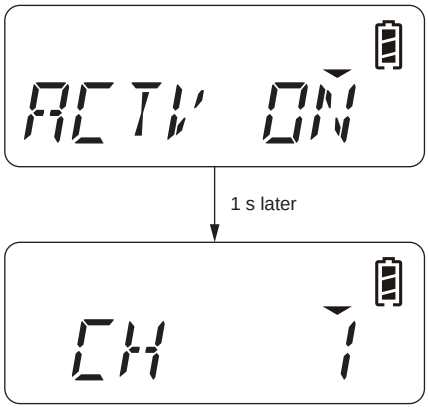
Activity Detection becomes enabled by pressing the **Activity Detection** key while the Activity Detection is enabled, or selecting a channel or GID where Activity Detection is disabled.

■ Operating the Transceiver

- **Enabling Activity Detection**

1. Press the **Activity Detection** key while the Activity Detection is disabled or select a channel or GID where Activity Detection is enabled.

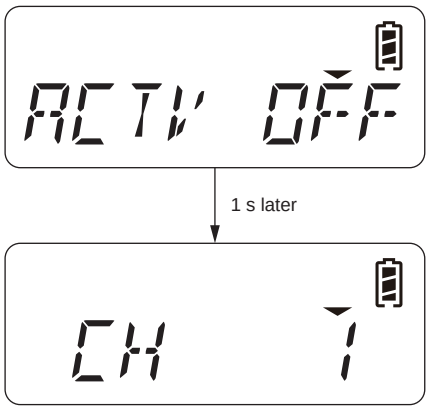
   Activity Detection becomes enabled. If the **Activity Detection** key is pressed, “ACTV ON” appears on the main display for 1 s and a Key Beep A sounds from the transceiver.



- **Disabling Activity Detection**

1. Press the **Activity Detection** key while the Activity Detection is enabled or select a channel or GID where Activity Detection is disabled.

   Activity Detection becomes disabled. If the **Activity Detection** key is pressed, “ACTV OFF” appears on the main display for 1 s and a Key Beep B sounds from the transceiver.



■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Activity Detection (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Activity Detection (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Activity Detection (NXDN Trunking System) to be enabled or disabled (Edit > Zone Information (NXDN Trunking System) > GID Edit)

19.3.1 Man-down Detection

Man-down Detection is the function to automatically place the transceiver in Emergency Mode if the transceiver becomes tilted and keeps the state for more than the length of time configured for Man-down Delay Time.

Using this function, when the user is in emergency situations due to an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status.

If Man-down Pre-alert is configured, a Man-down Pre-alert sounds from the transceiver before the transceiver enters Emergency Mode. The transceiver does not enter Emergency Mode if the tilted state of the transceiver is reset before the time configured for Man-down Delay Time elapses.

The threshold value of the tilt angle (Man-down Angle) to be used to detect that the transceiver is tilted can be configured to 45 °, 60 °, or 75 °.

Note:

- If the **PTT** switch is pressed while the time configured for Man-down Delay Time is elapsing, the counting down of Man-down Delay Time will be paused. Releasing the **PTT** switch restarts counting down.
- Pressing the **Activity Reset** key resets the timer for Man-down Delay Time and then restarts counting down from the beginning.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Man-down Detection to be enabled or disabled (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Delay Time (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Pre-alert (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Angle (Edit > Emergency Information > Emergency 1 > Activity Detection)

19.3.2 Stationary Detection

Stationary Detection is the function to automatically place the transceiver in Emergency Mode if the transceiver remains stationary and keeps the state for more than the length of time configured for Stationary Delay Time.

Using this function, when a user cannot operate the transceiver due to an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status.

If Stationary Pre-alert is configured, a Stationary Pre-alert sounds from the transceiver before the transceiver enters Emergency Mode. The transceiver does not enter Emergency Mode if the stationary state of the transceiver is reset before the time configured for Stationary Delay Time elapses.

Note:

- If the **PTT** switch is pressed while the time configured for Stationary Delay Time is elapsing, the counting down of Stationary Delay Time will be paused. Releasing the **PTT** switch restarts counting down.
- Pressing the **Activity Reset** key resets the timer for Stationary Delay Time and then restarts counting down from the beginning.
- Stationary Detection is a software option. It must be purchased separately.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Stationary Detection to be enabled or disabled (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Stationary Delay Time (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Stationary Pre-alert (Edit > Emergency Information > Emergency 1 > Activity Detection)

19.3.3 Motion Detection

Motion Detection is the function to automatically place the transceiver in Emergency Mode if an excessive impact is applied to the transceiver by its exposure to a vigorous vibration, and so on, and if the transceiver keeps the state for more than the length of time configured for Motion Delay Time.

Using this function, if an excessive impact is constantly applied to the transceiver by an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status.

If Motion Pre-alert is configured, a Motion Pre-alert sounds from the transceiver before the transceiver enters Emergency Mode. The transceiver does not enter Emergency Mode if the vigorous movement of the transceiver stops before the time configured for Motion Delay Time elapses.

Note:

- If the **PTT** switch is pressed while the time configured for Motion Delay Time is elapsing, the counting down of Motion Delay Time will be paused. Releasing the **PTT** switch restarts counting down.
- Pressing the **Activity Reset** key resets the timer for Motion Delay Time and then restarts counting down from the beginning.
- Motion Detection is a software option. It must be purchased separately.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Motion Detection to be enabled or disabled (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Motion Delay Time (Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Motion Pre-alert (Edit > Emergency Information > Emergency 1 > Activity Detection)

Voice Scrambler is the function to scramble the audio signal so that the contents of communications can be prevented from being intercepted.

The transceiver is equipped with an entry-level speech inversion scrambler.

Note: This function can be used only in an Analog Conventional system and LTR Trunking system.

20.1 Toggling the Voice Scrambler between Enabled and Disabled

Pressing the **Scrambler/ Encryption** key toggles the Voice Scrambler between enabled and disabled.

Note:

- The Voice Scrambler can also be enabled or disabled using KPG-141D/ KPG-141DN. The status of Voice Scrambler configured using KPG-141D/ KPG-141DN can be changed by a transceiver operation.
- Audio signals modulated by the Voice Scrambler can properly be demodulated only by the same type of scrambler.

■ Operating the Transceiver

- **Enabling the Voice Scrambler**

1. Press the **Scrambler/ Encryption** key while the built-in Scrambler is disabled.

The "◊" icon appears, and the Voice Scrambler is enabled.

- **Disabling the Voice Scrambler**

1. Press the **Scrambler/ Encryption** key while the built-in Scrambler is enabled.

The "◊" icon disappears, and the Voice Scrambler is disabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Voice Scrambler (Conventional Group) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2 > Scrambler Setting)
- Configuring the Voice Scrambler (LTR Trunking System) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > GID Edit > Scrambler Setting)

20.2 Configuring the Scrambler Code

Pressing and holding the **Scrambler/ Encryption** key causes the transceiver to enter Scrambler/ Encryption Code Mode. In Scrambler/ Encryption Code Mode, the Scrambler Code, which is used for when the transceiver scrambles and sends the audio signal and when the transceiver receives the scrambled audio signal, can be configured for each channel.

Only if the received Scramble Code matches the Scrambler Code preconfigured for the transceiver, the scrambled signal can be descrambled and the received audio sounds normally from the transceiver.

The inversion frequency that corresponds to each Scrambler Code from 1 to 16 can be configured using KPG-141D/ KPG-141DN.

Note:

- The Scrambler Code can be configured using KPG-141D/ KPG-141DN. The Scrambler Code configured using KPG-141D/ KPG-141DN can also be changed by a transceiver operation. For Portable (without LCD/ without Key); however, the Scrambler Code cannot be changed by operating the transceiver.
- When the status of Voice Scrambler (enabled or disabled) is switched on the channel where "Mixed" is configured for Channel Type, the status of Voice Scrambler (enabled or disabled) applies for the channel according to the mode of the channel (either Analog or NXDN) configured using Transmit Mode.
- The Scrambler Code with "Kenwood" configured for the inversion frequency has compatibility with the AQUA scrambler installed in the TK-x180 series and TK-x170 series transceiver.

■ Operating the Transceiver

1.Press and hold the **Scrambler/ Encryption** key.

The transceiver enters Scrambler/Encryption Code Mode and the Scrambler Code configured for the selected channel appears.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select Scrambler Code.

   The selected value of Scrambler Code will be enabled.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Press the **Side 1** key (Portable) or the **Triangle** key (Mobile).

   Scrambler/ Encryption Code Mode is exited.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Scrambler Code (Conventional Group) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2 > Scrambler Setting)
- Configuring the Scrambler Code (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit > Scrambler Setting)
- Configuring the Inversion Frequency for Scrambler Code (Edit > Optional Features > Optional Features 2 > Scrambler)
- Configuring the Inversion Frequency (Edit > Optional Features > Optional Features 2 > Scrambler)

20.3 Scrambler/Encryption Status Memory

Scrambler/Encryption Status Memory is the function to retain in the transceiver the Voice Scrambler status of each channel, either enabled or disabled.

If Scrambler/Encryption Status Memory is enabled, the Voice Scrambler status, either enabled or disabled retained in the transceiver are read and applied to the parameters for each channel when the data is read from the transceiver using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Scrambler/Encryption Status Memory to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1)

21 VOX (PORTABLE ONLY)

VOX is the function to start transmitting by speaking into a microphone without pressing the **PTT** switch.

This function can be used when a user cannot press the **PTT** switch, for instance, when a user is using both hands for other tasks.

VOX can be used only when a user wears the headset and when the transceiver is operated in a Conventional Group.

If VOX Function is enabled using KPG-141D/ KPG-141DN, VOX is activated when the transceiver is turned ON.

For Portable (with LCD/ with 16-key) or Portable (with LCD/ with 4-key), pressing and holding the **VOX** key toggles VOX between activated and deactivated.

For Portable (without LCD/ without Key), pressing and holding the **VOX Function** key toggles VOX between activated and deactivated.

Note:

- VOX cannot be used when the transmission is restricted, such as when the transceiver is in the Stun state.
- If the transceiver stops the VOX transmission due to the Time-out Timer, the transceiver cannot transmit until both audio input and the **PTT** switch are disabled.
- A user cannot use VOX only with the transceiver itself. Although VOX is activated if the speaker microphone is connected to the transceiver, proper operation of the function cannot be guaranteed. Normally, VOX can be used by a user wearing a headset.

■ Operating the Transceiver

● Activating the VOX

1. Do the following operation while VOX is inactive.

Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key):

Press and hold the **VOX** key.

Portable (without LCD/ without Key):

Press the **VOX Function** key.

The "▬" (left) icon appears and then VOX is activated.

● Deactivating the VOX

1. Do the following operation while VOX is active.

Portable (with LCD/ with 16-key) and Portable (with LCD/ with 4-key):

Press and hold the **VOX** key.

Portable (without LCD/ without Key):

Press the **VOX Function** key.

The "▬" (left) icon disappears and then VOX is deactivated.

Note: The status of VOX is retained in the transceiver even if the transceiver is turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

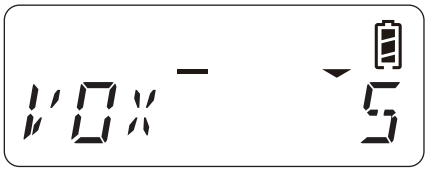
21.1 VOX Gain Level

VOX Gain Level is the input sensitivity of the microphone.
VOX Gain Level can be configured using KPG-141D/ KPG-141DN. VOX Gain Level can also be adjusted by user operation.
Pressing the **VOX** key causes the transceiver to enter VOX Gain Level Mode.

■ Operating the Transceiver

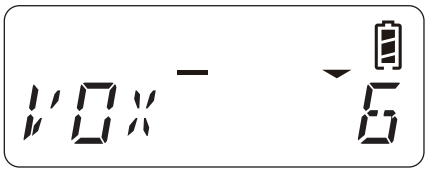
1. Press the **VOX** key.

The transceiver enters VOX Gain Level Mode and then the current VOX Gain Level appears. VOX is activated at the same time, and the "▬" (left) icon appears.



2. Adjust the VOX Gain Level by pressing the **[<B]** or **[C>]** key.

VOX Gain Level can be adjusted in the range between 1 and 10. Larger value results in higher sensitivity.



3. Speak into the microphone of the headset to check whether the sensitivity is configured properly.

The LED lights orange when the audio input level reaches the reference value for transmission. In this case, the transceiver does not transmit.

Note: The status of VOX Gain Level is retained in the transceiver even if the transceiver is turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the VOX Gain Level (Edit > Optional Features > Optional Features 2 > Conventional > VOX)
- Assigning functions to the PF keys (Edit > Key Assignment)

21.2 VOX Delay Time

VOX Delay Time is the duration in which the transceiver remains in transmit mode after a VOX transmission has finished. If the transceiver reverts to receive mode too quickly after a user pauses speaking, the end portion of the speech may not be transmitted. To avoid this, an appropriate VOX Delay Time must be configured allowing all words to be transmitted without an overly long delay after the user stops speaking.

Upon the elapse of the time configured for VOX Delay Time after no audio is inputted to the microphone, the transceiver terminates VOX transmission.

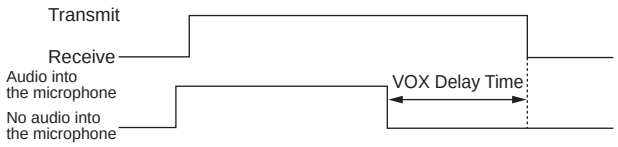


Figure 21-1 VOX Delay Time

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the VOX Delay Time (Edit > Optional Features > Optional Features 2 > Conventional > VOX)

21.3 Transmit Inhibit while Receiving

Transmit Inhibit while Receiving is the function to restrict a VOX transmission while the speaker is unmuted.

This function can be used to prevent the VOX function from being activated by audio emitted from the speaker.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Inhibit while Receiving (Edit > Optional Features > Optional Features 2 > Conventional > VOX)

21.4 Cancel Operation

Cancel Operation is the function to deactivate the VOX if the **PTT** switch is pressed while the VOX is active.

Even if VOX is deactivated by pressing the **PTT** switch, VOX is activated if the **VOX** key is pressed and held. If no key is assigned as the **VOX** key, turning the transceiver ON again enables VOX to be activated.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Cancel Operation (Edit > Optional Features > Optional Features 2 > Conventional > VOX)

21.5 VOX Proceed Tone

VOX Proceed Tone is the tone notifying a user that a transmission using the VOX has been started.

If this function is enabled, a VOX Proceed Tone sounds from the transceiver to notify the start of transmission when the transmission using the VOX starts.

Note: If other tones, such as a Sidetone or a PTT ID Sidetone, are configured to be emitted, a VOX Proceed Tone does not sound.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the VOX Proceed Tone (Edit > Optional Features > Optional Features 2 > Conventional > VOX)

Global Positioning System (GPS) is the system that allows a user to check the current location of latitude and longitude by receiving signals from the Global Positioning System satellites orbiting the earth. GPS Position Display can be used to show one's current position on the transceiver display.

For example, a forest ranger or forest firefighter can use this function to monitor the current location and report the location to the base station in order to perform their tasks smoothly.

GPS Position Display has the following functions:

- Displays the current location (latitude and longitude) on the transceiver main display.
- Displays the altitude of the current location on the transceiver main display.
- Automatically switches the main display between the current location (latitude and longitude) display and the altitude display.
- Displays on the sub-display the strength of signals sent from the GPS satellites.

To use GPS Position Display, the GPS receiver unit needs to be enabled in the transceiver.

Portable:

Data must be configured using KPG-141D/ KPG-141DN, and the configuration data must be written to the transceiver, and then the GPS microphone (KMC-48GPS) must be connected to the transceiver.

Mobile:

Mobile has a built-in GPS receiver unit. Built-in GPS Receiver must be enabled when configuring data by using KPG-141D/ KPG-141DN.

Note:

- This function is unavailable for Portable (without LCD/ without Key).
- To use the built-in GPS receiver unit in Mobile, an additional antenna of KRA-40 (G) is required.

22.1 Configuring the GPS Position Display

The functions below relevant to GPS Position Display can be configured using KPG-141D/ KPG-141DN. The functions must be configured in the following order.

1) Communication Ports

"GPS" needs to be assigned to the communication port of the transceiver. Stop Bit and Baud Rate must be configured if needed. For Portable, Stop Bit and Baud Rate need to be configured as follows. (Refer to: 6 COMMUNICATION PORTS on page 81)

Stop Bit: 1

Baud Rate: 9600 bps

If the built-in GPS receiver unit in Mobile is used, no configuration is required for COM ports.

2) PF key

GPS Position Display needs to be assigned to a key on the transceiver. (Refer to: 7 KEY ASSIGNMENT on page 84)

Pressing the **GPS Position Display** key causes the transceiver to enter GPS Position Display Mode.

3) Configuring Displays in GPS Position Display Mode

- **Latitude and Longitude**

  This function can be used to configure whether the latitudinal and longitudinal values appear on the transceiver main display. If this function is enabled, latitudinal and longitudinal values appear on the transceiver main display in GPS Position Display Mode. The latitude and longitude display format can be selected from "Degrees, Minutes" and "Degrees, Minutes, Seconds" for user convenience.

  If this function is disabled, the latitudinal and longitudinal values do not appear in GPS Position Display Mode.

- **Altitude**

  This function can be used to configure whether the altitudinal value will appear on the transceiver main display. If this function is enabled, the altitudinal value appears on the transceiver main display in GPS Position Display Mode. Either "Meters" or "Feet" can be configured for the format to display an altitudinal value for user convenience.

  If this function is disabled, no altitudinal value appears in GPS Position Display Mode.

■ Configuration Using KPG-141D/ KPG-141DN

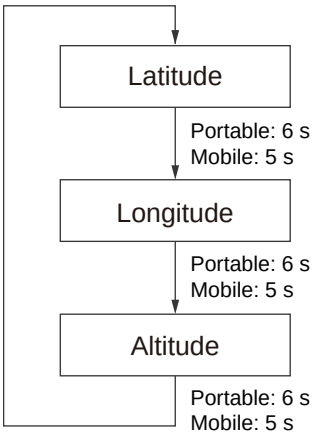
- Configuring the COM port (Edit > Optional Features > Optional Features 1 > Common Page 3 > COM port)
- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Latitude and Longitude (Edit > Optional Features > Optional Features 2 > GPS > GPS Position Display)
- Configuring the Altitude (Edit > Optional Features > Optional Features 2 > GPS > GPS Position Display)

22.2 Displaying Positioning Information

The transceiver enters GPS Position Display Mode if the **GPS Position Display** key is pressed while the transceiver is in standby mode.

For Portable, the transceiver automatically switches between the latitude and longitude display and the altitude display approximately every 6 seconds while in GPS Position Display Mode.

For Mobile, the transceiver automatically switches between the latitude and longitude display and the altitude display approximately every 5 seconds while in GPS Position Display Mode.



Note:

- The transceiver cannot enter GPS Position Display Mode if the display that appears in GPS Position Display Mode is not configured.
- Pressing and holding the **[S]** or **[*]** key pauses alternation of the automatic display. Pressing and holding the **[S]** or **[*]** key again resumes alternation of the automatic display. For Mobile, pressing the **[<B]** key also pauses or resumes alternation of the automatic display.

■ Operating the Transceiver

1. Press the **GPS Position Display** key.

The transceiver enters GPS Position Display Mode.

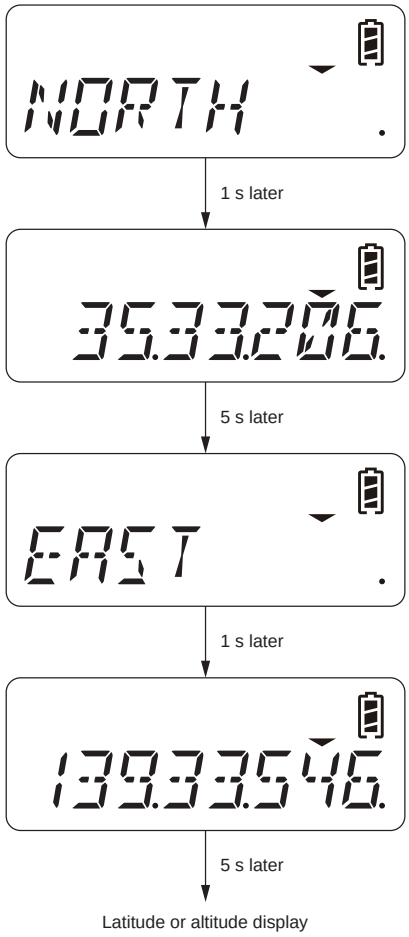
For Portable, the dot icon appears on the rightmost area on the display.

For Mobile, the "✕" icon appears.

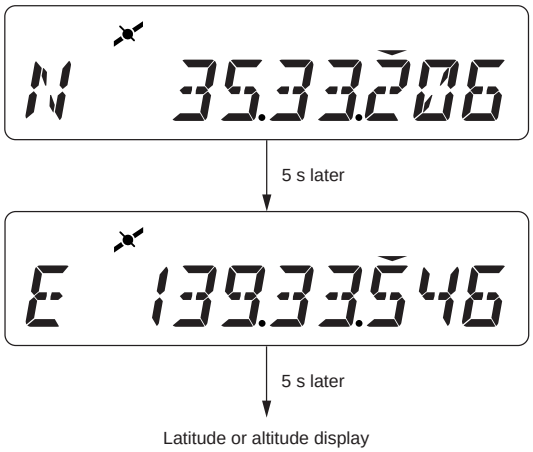
The following displays appear.

- **Latitude and Longitude Display**

"Degrees, Minutes" display

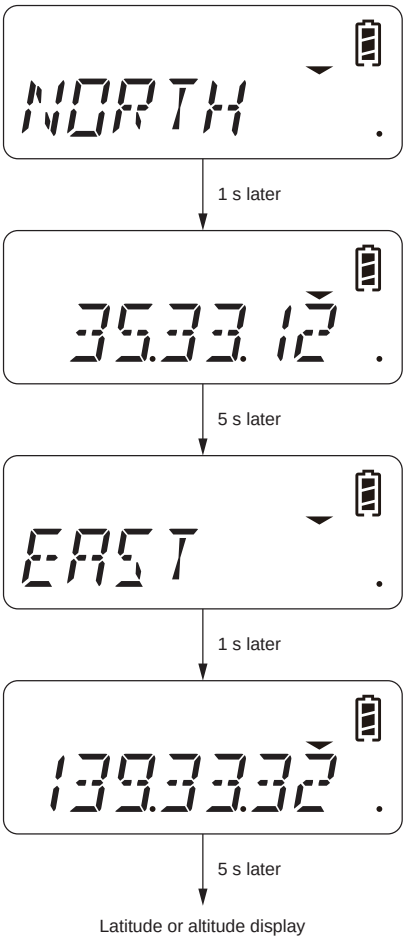


Portable

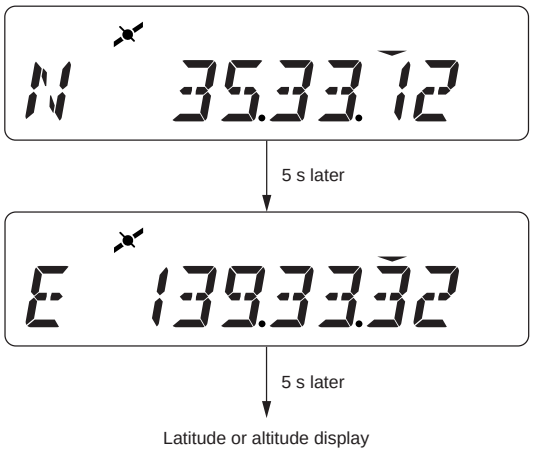


Mobile

“Degrees, Minutes, Seconds” display



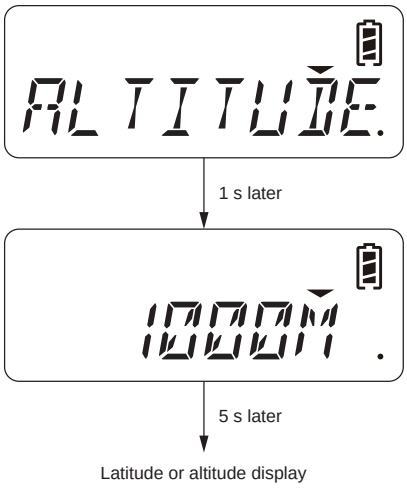
Portable



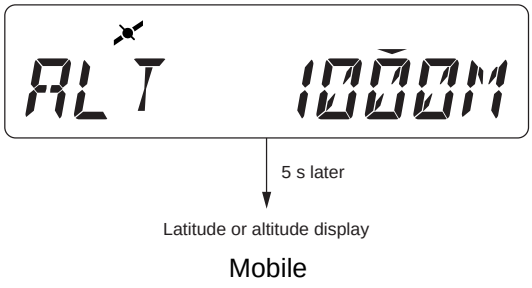
Mobile

- **Altitude Display**

Meters display

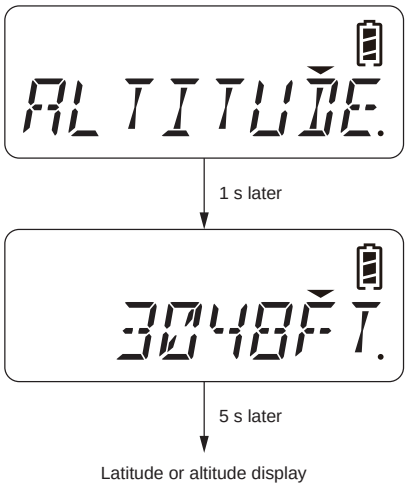


Portable



Mobile

Feet display



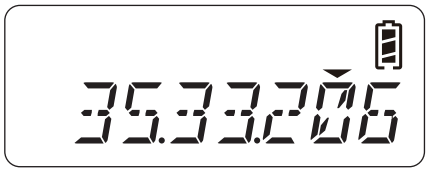
Portable

Mobile

- **GPS Non-positioning Status Display**

  For Portable, the dot icon disappears from the rightmost area on the display. For Mobile, the “ ” icon disappears.

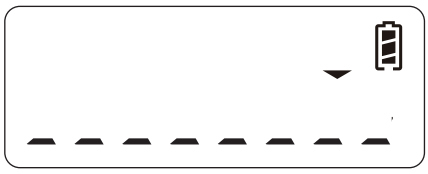
  If 5 s elapse since the transceiver received non-positioning data from a GPS receiver unit or the transceiver became unable to receive serial GPS data, the transceiver will be determined that the GPS positioning is disabled.



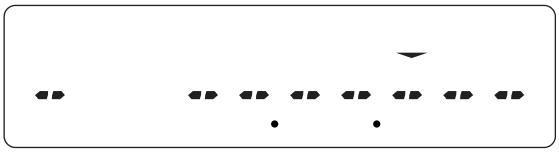
Portable

Mobile

If the transceiver is receiving no location data from a GPS receiver unit yet, after the transceiver is just turned ON, “-” appears for all digits on the display.



Portable



Mobile

2. Press the **[S]** or **[*]** key.

The transceiver exits GPS Position Display Mode and then restores the previous display.

Note: For Mobile, latitude and longitude display appears as below:
North Latitude: N
South Latitude: S
East Longitude: E
West Longitude: W

Data communications are available for the transceiver by using the various functions of FleetSync or NXDN, or using an external device connected to the transceiver.

23.1 Data Communication Functions

The following functions relevant to data communication can be configured using KPG-141D/ KPG-141DN:

- Data
- Data Zone-CH/GID
- Data Transmit with QT/DQT
- Data Override
- Data Dwell Time

23.1.1 Data

Data is the function to enable a channel to be dedicated for data communications in an Analog Conventional system. By using the channel dedicated for data communications, the audio emitted from the speaker is muted.

Note: This function can be used only in an Analog Conventional system and LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data for a channel (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the Data for a Group ID (Edit > Zone Information (LTR Trunking System) > GID Edit)

23.1.2 Data Zone-CH/GID

Data Zone-CH/GID is the data channel or GID having the highest priority when the transceiver migrates to a data channel or GID.

If Data Zone-CH/GID is not configured, the transceiver migrates to the data channel or GID having the highest channel number or GID number in the zone.

If the following functions are enabled, the transceiver sends the message or data after migrating to the Data Zone-channel or GID configured in the selected zone when the transceiver sends a Status Message, Short Message, Long Message, GPS data or Transparent data:

- Status Message on Data Zone-CH/GID
- Short Message on Data Zone-CH/GID
- Long Message on Data Zone-CH/GID
- GPS Report on Data Zone-CH/GID
- Transparent on Data Zone-CH/GID

When the transceiver stops transmitting, the transceiver reverts to the previous Zone-channel or GID upon a lapse of time configured for Data Dwell Time.

Note: This function can be used only in a Conventional Group and LTR Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Zone-CH/GID (Conventional Group) (Edit > Zone Information (Conventional Group) > Zone Edit)
- Configuring the Data Zone-CH/GID (LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > Zone Edit)
- Configuring the Data Zone-CH/GID (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > Zone Edit)

23.1.3 Data Transmit with QT/ DQT

Data Transmit with QT/DQT is the function to be used to multiplex the QT tone frequency or DQT code configured for channels during data transmission.

This function is available on the channels in the Conventional Group that send a Status Message, Short Message or Long Message. This function is also used for data communications by use of an external device.

If QT tone frequency or DQT code is used by repeaters, enabling this function allows the data communications with the QT tone frequency or DQT code multiplexed.

If data communication and a voice call are established on the same channel, the data transmission sound can be muted during data communication without multiplexing the QT tone frequency or DQT code by disabling this function.

Note: This function is only available in the Analog Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Transmit with QT/DQT (Edit > FleetSync > Parameter)

23.1.4 Data Override

Data Override is the function that allows prioritization of data communication using an external device even if the communication is made by a user operating the transceiver.

The transceiver behaves as follows according to the configuration for Data Override.

Table 23-1 Data Override

Configuration	Description
Enabled	Data communications using an external device has a high priority level. Data Override is activated when the AUX Input port is activated and when the transceiver receives a PC command from the serial port. • External PTT (Data) • Data PTT • DTC • CH/GID Select A to CH/GID Select D When Data Override is activated, the transceiver automatically exits the following statuses: • Auto Telephone Search Mode • Function Mode • Public Address Mode (Mobile Only) • The state when the transceiver temporarily migrates to a channel or GID by pressing one of the **Direct CH/ GID 1** to **Direct CH/GID 5** keys or **Home CH/GID** or **CH/GID Recall** key
Disabled	The transceiver key control has the priority. The transceiver suspends the transmission even if the transceiver receives the above data transmission request from an external device.

Note: While the transceiver is under the following conditions, Data Override is not activated:

- While the transceiver is transmitting (including while a link is established in an LTR Trunking System)
- While the Public Address function is used (Mobile only)
- While the transceiver is proceeding System Search
- While the transceiver is in Emergency Mode
- While the transceiver is in Transceiver Password Mode
- While the transceiver is in the Stun state

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Override (Serial Input) to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Input)
- Configuring the Data Override (AUX Input) to be enabled or disabled (Edit > Extended Function > AUX > AUX Input)

23.1.5 Data Dwell Time (Mobile Only)

Data Dwell Time is the delay time to revert to the voice channel or GID when the state of the DTC port or Data PTT port on AUX Input port changes from active to inactive. This function can be used when an external device waits to receive an acknowledgment from the receiving transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Dwell Time (Edit > Extended Function > AUX > AUX Input)

Encryption is the function that enhances secrecy in communications on the NXDN digital channels by encrypting voice data or user data such as a Short Message and a Long Message.

The Encryption function can provide bit scramble encryption using the encryption module embedded in a transceiver.

To transmit or receive a signal, the communication data can be encrypted or decrypted using the encryption key data configured in the transceiver.

■ Transmission

If Encryption is enabled, the transceiver encrypts and then sends voice data or user data such as a Short Message or a Long Message. If Encryption is disabled, the transceiver transmits communication data without encryption.

■ Reception

Upon receipt of the encrypted communication data, the transceiver decrypts the received data using the encryption key data configured in the transceiver. If the data is properly decrypted, the received audio sounds from the speaker. The receive behavior of the transceiver, however, differs depending on the Encryption status (enabled or disabled) and the configuration for Encryption Type. Refer to 24.3 Transceiver's Behavior upon Receipt of the Encrypted Communication Data on page 223 for details.

The encryption key data that is used for the Encryption function can be configured up to 16 entries in the Multi-key List by the use of KPG-141D/ KPG-141DN. Status of encryption, either enabled or disabled, and the Multi-key List Number having the encryption key data can be configured for each channel. (Refer to: 24.4 Multi-key List on page 224)

Also, the Encryption status (enabled or disabled) and the encryption key data used for communications can be changed by the transceiver operation.

Note: Encryption is only available in an NXDN Conventional system and an NXDN Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Encryption Key Data (Edit > Encryption)
- Configuring the Encryption (NXDN Trunking System/ GID) to be enabled or disabled (Edit > Zone Information (NXDN Trunking System) > GID Edit > Encryption Settings)
- Configuring the Encryption (NXDN Trunking System/ Transceiver) to be enabled or disabled (Edit > Encryption > NXDN Trunking)
- Configuring the Multi-key List Number (NXDN Trunking System/ GID) (Edit > Zone Information (NXDN Trunking System) > GID Edit > Encryption Settings)
- Configuring the Multi-key List Number (NXDN Trunking System/ Transceiver) (Edit > Encryption > NXDN Trunking)
- Configuring the Encryption (NXDN Conventional System) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2 > Encryption Settings)
- Configuring the Multi-key List Number (NXDN Conventional System) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2 > Encryption Settings)

24.1 Toggling the Encryption between Enabled and Disabled

Pressing the **Scrambler/ Encryption** key toggles the status of Encryption between enabled and disabled.

If Encryption is enabled, the transceiver encrypts and then sends voice data or user data such as a Short Message or a Long Message. If Encryption is disabled, the transceiver transmits communication data without encryption.

The receiving behavior of the transceiver differs depending on the Encryption status, either to be enabled or disabled, and the configuration for Encryption Type. Refer to 24.3 Transceiver's Behavior upon Receipt of the Encrypted Communication Data on page 223 for details.

Note:

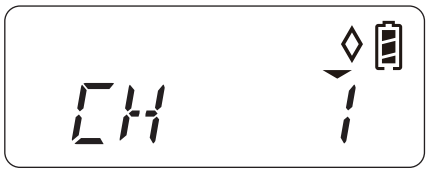
- When the status of Encryption (enabled or disabled) is switched on the channel where "Mixed" is configured for Channel Type, the status of Encryption (enabled or disabled) applies for the channel according to the mode of the channel (either Analog or NXDN) configured using Transmit Mode.
- For a transceiver operated in an NXDN Conventional system, the Encryption status, either to be enabled or disabled, can be configured for each channel; thus the configured Encryption status applies only for the selected channels or GIDs.
- For a transceiver operated in an NXDN Trunking system, whether the Encryption status, either to be enabled or disabled, is configured for the transceiver or for each GID can be selected.

■ Operating the Transceiver

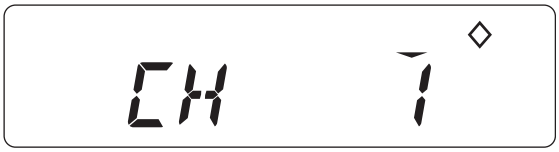
- **Enabling the Encryption**

1.Press the **Scrambler/ Encryption** key while Encryption is disabled.

The "◊" icon appears and then Encryption will be enabled.



Portable

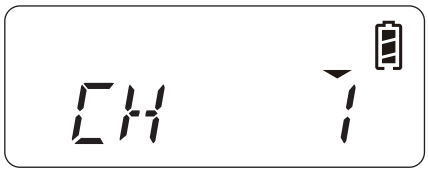


Mobile

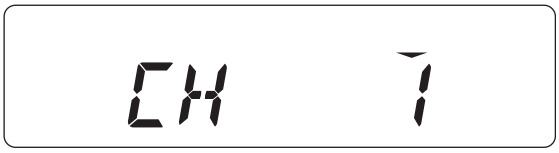
- **Disabling the Encryption**

1.Press the **Scrambler/ Encryption** key while Encryption is enabled.

The "◊" icon disappears and Encryption will be disabled.



Portable



Mobile

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

24.2 Configuring the Encryption Key Data used for Communications

The transceiver enters the Scrambler/ Encryption Code Mode by pressing and holding the **Scrambler/ Encryption** key for which the Scrambler/ Encryption Code is assigned. In the Scrambler/ Encryption Code Mode, the encryption key data used for communications can be configured by selecting the key data from the Multi-key List. (Refer to: 24.4 Multi-key List on page 224)

Note:

- For a transceiver operated in an NXDN Conventional system, a Multi-key List Number having the encryption key data can be configured for each channel.
- For a transceiver operated in an NXDN Trunking system, whether a Multi-key List Number having the encryption key data is configured for the transceiver or for each GID can be selected.
- This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1.Press and hold the **Scrambler/ Encryption** key.

The transceiver enters Scrambler/ Encryption Code Mode and the configured Key Data appears.

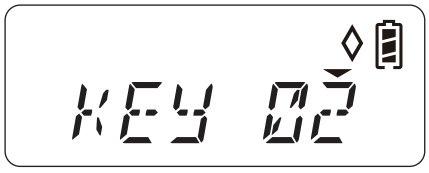
Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select Key Data.

The selected value of Key Data will be enabled.

Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.



Portable

Mobile

3. Press the **Side 1** key (Portable) or the **Triangle** key (Mobile).

   Scrambler/ Encryption Code Mode is exited.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

24.3 Transceiver's Behavior upon Receipt of the Encrypted Communication Data

Upon receipt of the encrypted communication data, the transceiver behaves as follows according to the Encryption status (enabled or disabled) and the configuration for Encryption Type.

■ If Encryption Is Enabled:

The transceiver's behavior varies as follows depending on whether 0 is configured for only one Key ID, or for more than one Key ID in the Multi-key List.

- **If 0 is configured for only one Key ID in the Multi-key List:**

  The transceiver searches the encryption key data configured in the Multi-key List. If the Key ID included in the encryption key data, which was used for encryption of the received communication data, matches the Key ID included in the encryption key data which is configured for the transceiver, the transceiver can use the encryption key data to decrypt the data. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker. The transceiver mutes the speaker if the Key IDs do not match.

- **If 0 is configured for more than one Key ID in the Multi-key List:**

  The transceiver's behavior varies as follows depending on the value for Key ID contained in the encryption key data which has been utilized for encryption of the received communication data, either 0 or a value other than 0.

  Key ID: 0

  Without searching the encryption key data, the transceiver decrypts the data using the encryption key data corresponding to the Multi-key List Number configured for the channel where the transceiver has been on standby to receive the encrypted signal. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds from the speaker without being decrypted.

  Key ID: Any value other than 0

  The transceiver searches the encryption key data configured in the Multi-key List. If the Key ID included in the encryption key data, which was used for encryption of the received communication data, matches the Key ID included in the encryption key data which is configured for the transceiver, the transceiver can use the encryption key data to decrypt the data. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker. The transceiver mutes the speaker if the Key IDs do not match.

■ If Encryption Is Disabled:

Following are the transceiver behaviors that may vary depending on the configuration for Encryption Type (Type 1 or Type 2):

- **Type 1**

  The transceiver behaves in the same manner as with Encryption enabled.

- **Type 2**

  The received audio does not sound from the speaker.

Note: Upon receipt of unencrypted communication data, the transceiver emits the received audio from the speaker according to the audio control conditions regardless of the Encryption status (enabled or disabled) or configuration for Encryption Type.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Encryption Type (Edit > Encryption)

24.4 Multi-key List

Multi-key List is the list to configure the encryption key data and the encryption key information, that are used for encryption and decryption of communication data. A maximum of 16 sets of encryption key data and encryption key information can be configured in the Multi-key List using KPG-141D/ KPG-141DN.

The following parameters need to be configured for Multi-key List.

- **Key Data**

  Key Data allows you to configure the encryption key data in the range of 1 to 32767.

- **Key ID**

  Key ID allows you to configure an ID code to identify the encryption key data in the range of 0 to 63. 0 can redundantly be configured for more than one Key ID. The transceiver's behavior upon receipt of the encrypted communication data varies depending on the configuration for Key ID. (Refer to: 24.3 Transceiver's Behavior upon Receipt of the Encrypted Communication Data on page 223)

- **Key Name**

  For Portable, a name of up to 8 characters can be configured for the encryption key data. For Mobile, a name of up to 10 characters can be configured for the encryption key data.

The encryption key data configured in the Multi-key List can be allocated to the transceiver by specifying the corresponding Multi-key List Number.

NXDN Conventional system:

Each channel can be assigned a Multi-key List Number.

NXDN Trunking system:

If "GID" is configured for Encryption (NXDN Trunking), each GID can be assigned a Multi-key List Number.

If "Transceiver" is configured for Encryption (NXDN Trunking), the transceiver can be assigned only one Multi-key List Number.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Encryption Key Data (Edit > Encryption)
- Configuring the Encryption (NXDN Trunking) (Edit > Encryption)

24.5 Scrambler/Encryption Status Memory

Scrambler/Encryption Status Memory is the function to retain the Encryption status, either enabled or disabled, in the transceiver.

If Scrambler/Encryption Status Memory is enabled, the stored configuration for Encryption, either enabled or disabled, is read as default when data is read from a transceiver using KPG-141D/ KPG-141DN.

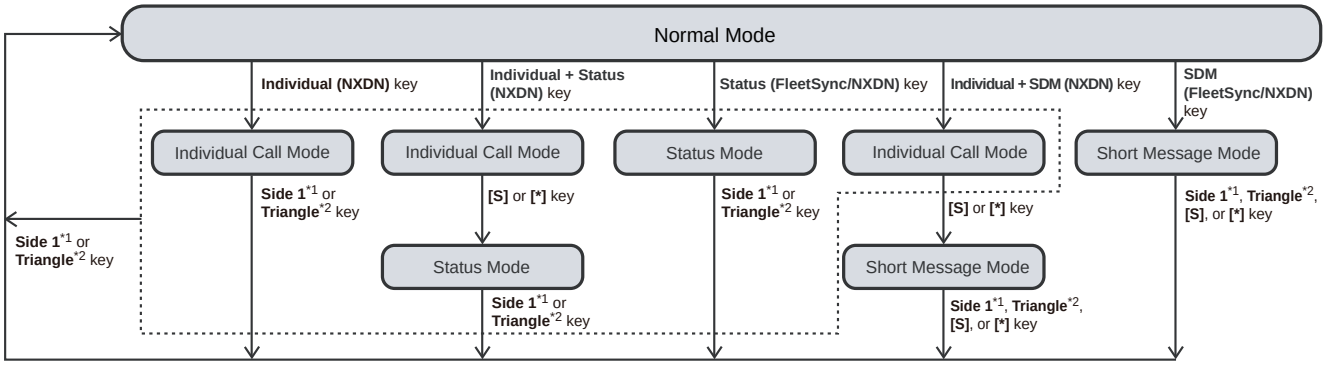
■ Configuration Using KPG-141D/ KPG-141DN

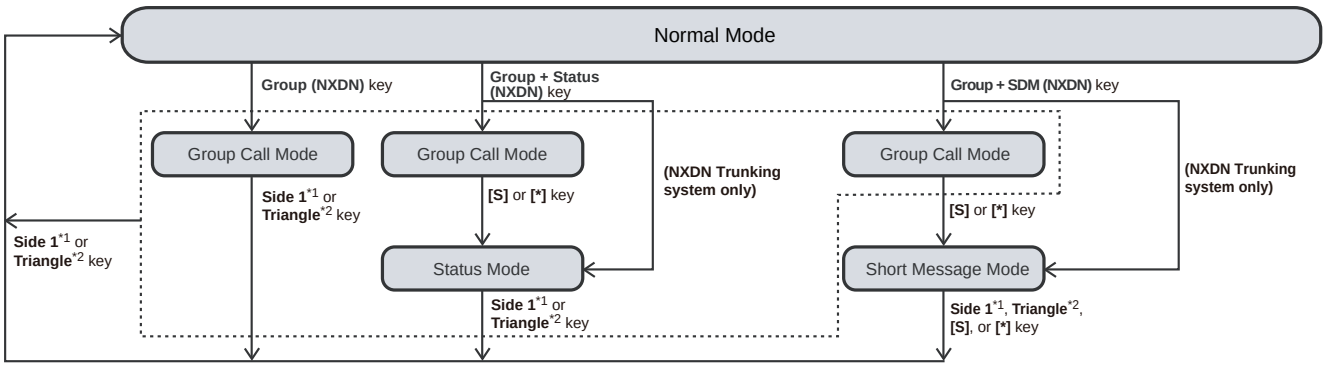
- Configuring the Scrambler/Encryption Status Memory (Edit > Optional Features > Optional Features 1 > Common Page 1)

NXDN is a generic name for a digital communication system protocol utilizing 4-level FSK. Using NXDN, the transceiver can initiate an Individual Call or Group Call for voice calls. Since the NEXEDGE transceiver corresponds to serial command communication, connecting a transceiver to an external device, such as a PC, allows communications to take place.

In the case that an Individual Call or Group Call is initiated or received or a Status Message or Short Message is sent or received using the NXDN protocol, the transceiver can be operated after selecting the corresponding mode. The following is the transition diagram of each mode:

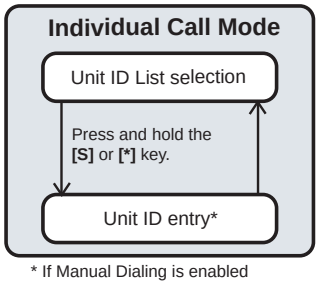
■ Transmission



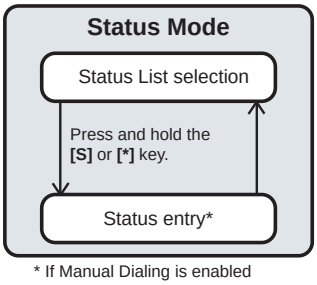


*1 Portable
*2 Mobile

In Individual Call Mode, a Unit ID of the target transceiver can be selected from the Unit ID List or a Unit ID can directly be entered. Also, in Status Mode, a status to be sent can be selected from the Status List or the status can directly be entered. In either mode, the entry method can be changed by a user pressing and holding the **[S]** or **[*]** key. For Mobile, the entry method can also be changed by pressing the **[<B]** key.

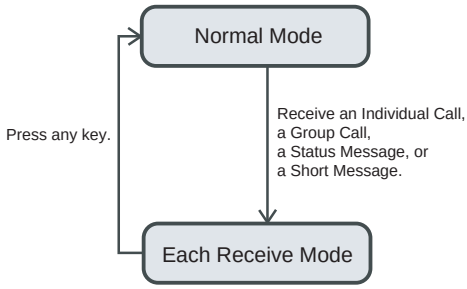


* If Manual Dialing is enabled

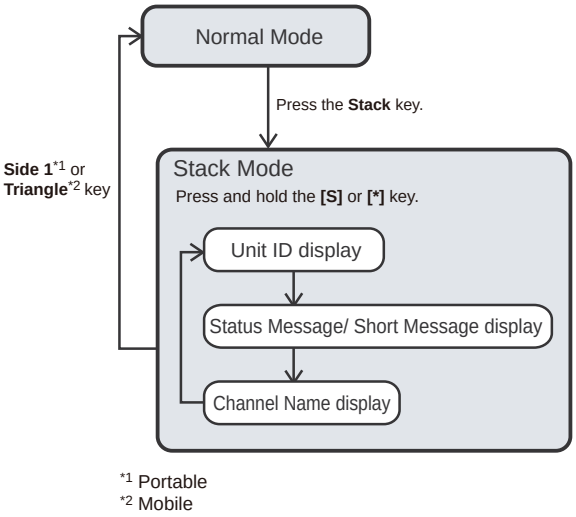


* If Manual Dialing is enabled

■ Reception



■ In the case of Confirming the Received Individual Call, Status Message or Short Message



In addition, the transceiver can be operated either in a single system or in multiple systems in an NXDN Trunking system: the former uses only one system and the latter uses 1 to 8 systems.

■ Single System

In a single system, the transceiver can use only one system.

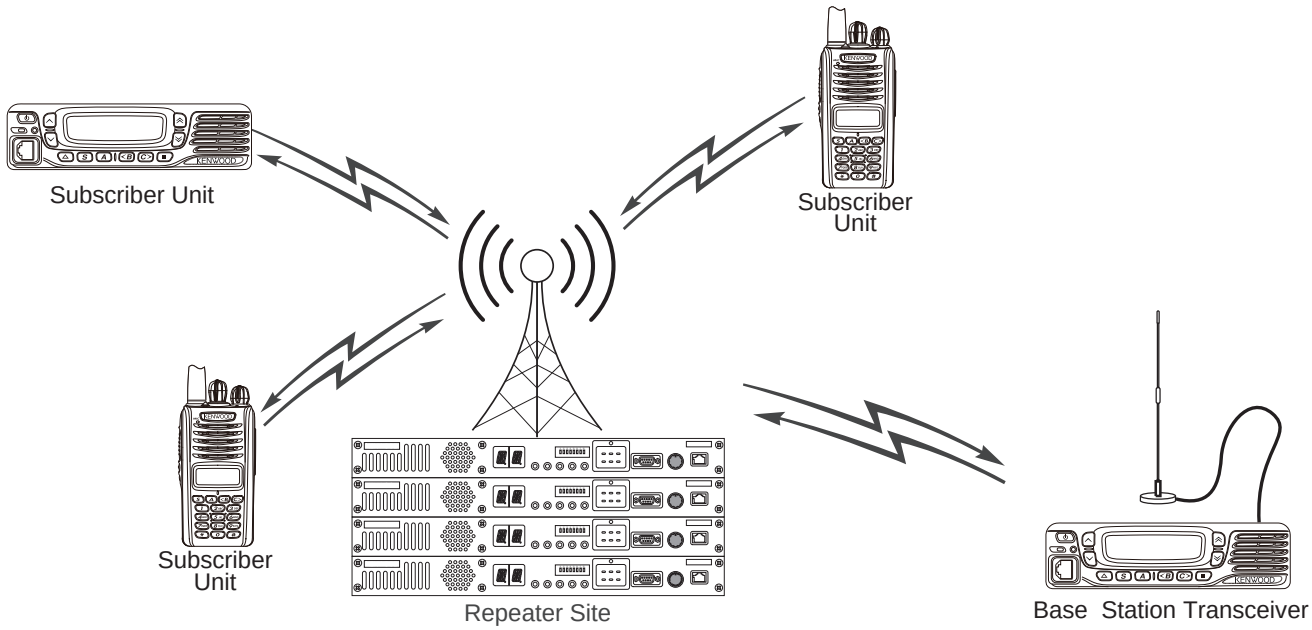


Figure 25-1 Image of Communications in a Single System

■ Multiple Systems

In multiple systems, a system number (1 to 8) to be used can be configured for each zone. This allows a user to switch a system to use just by changing a zone.

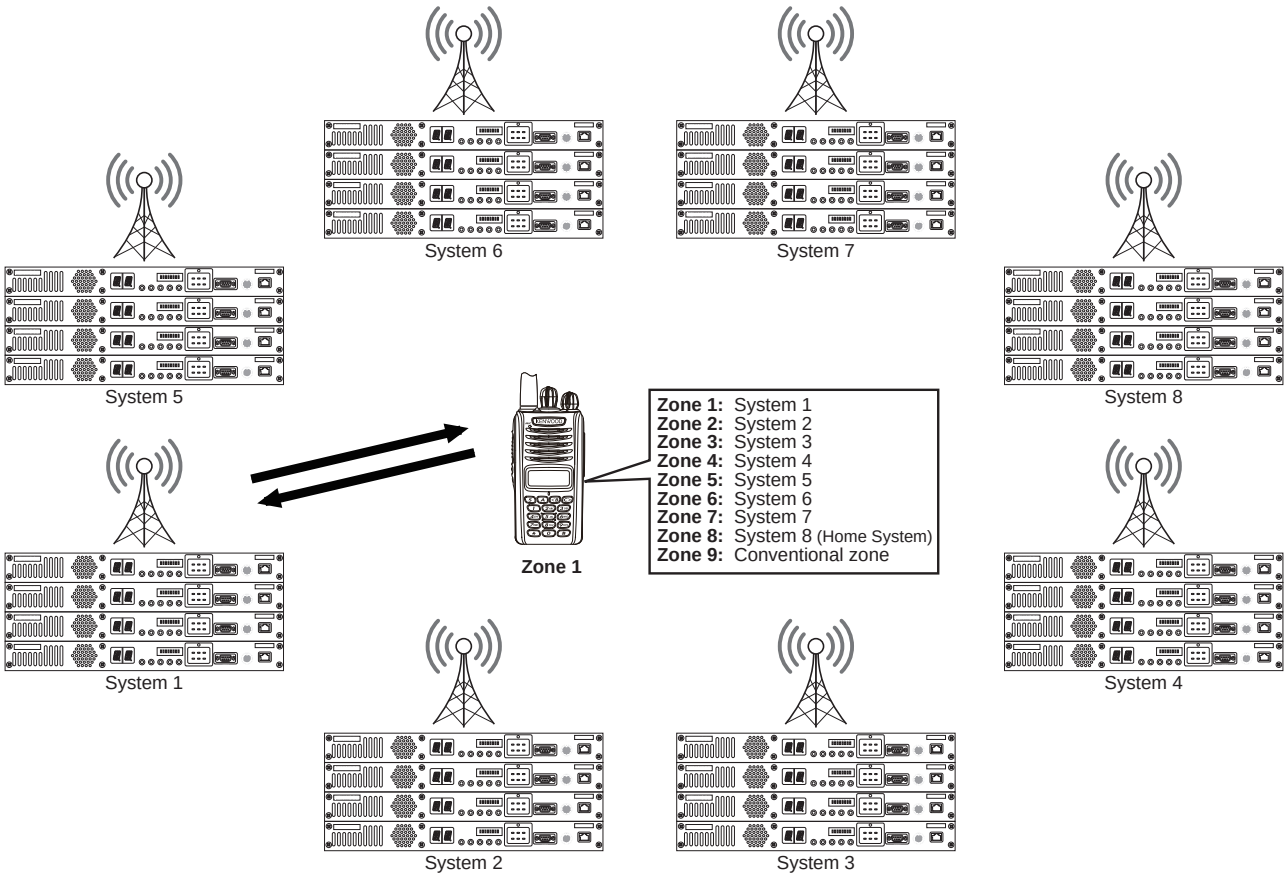


Figure 25-2 Image of Communications in Multiple Systems

Each system is associated with network information including site information, a control channel hunt, and a frequency table. A maximum of 8 pieces of network information can be configured and any one of the pieces of network information can be associated with each system.

■ About Home System

In multiple systems, one of the systems is configured as the Home System. In a zone of an NXDN Conventional system used in multiple systems, the parameters configured in the Home System are used for the following parameters.

- Unit ID (Own)
- Base ID Type
- Base ID
- Unit ID Encode Block (Start - End)
- Base ID Type (GPS)
- Base ID (GPS)
- Unit ID List

In the image of Figure 9-2, system 8 is configured as the Home System. In this case, the parameters configured in system 8 are used for the above functions in zone 9 of an NXDN Conventional system.

Also, the system that is configured as the Home System is used as the Home System of the Multi-System Roaming function. (Refer to: 25.33 Multi-System Roaming (NXDN Trunking System Only) on page 314)

■ Wide Area System

In a wide area system, the transceiver can be operated by using a maximum of 1,152 sites.

A wide area system is a structure that can construct a system exceeding 48 sites by connecting multiple systems of the same system code. A maximum of 1,152 sites can be constructed.

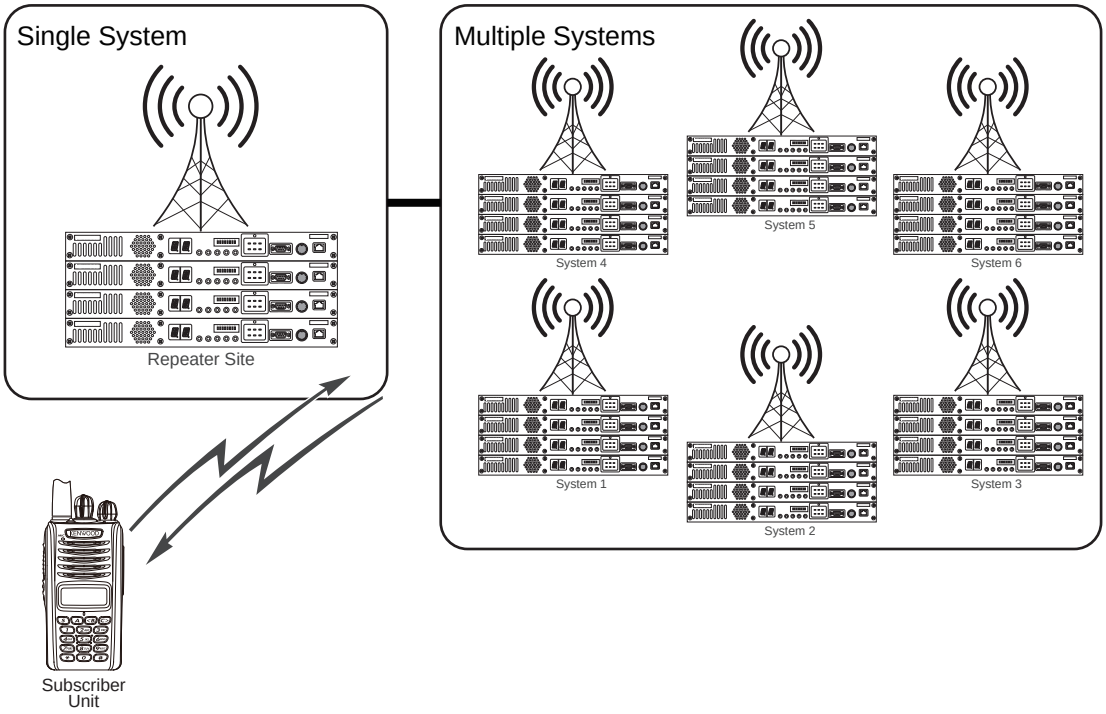


Figure 25-3 Image of Communications in a Wide Area System

Note:

- A wide area system can be used in a 2nd Generation NXDN Trunking system. (Refer to About 2nd Generation Trunking System on page x.)
- A wide area system can be used only for a transceiver having firmware version 5.10.00 or later. Also, to use a wide area system, Wide Area System needs to be enabled.
- For the transceiver to use the functions of a wide area system, 2nd Generation Trunking System needs to be enabled.
- Refer to NEXEDGE 2nd Generation Function Reference (FUNC) for details on a wide area system.

25.1 Available Calls

25.1.1 Available Calls in an NXDN Trunking System

The following calls are available in an NXDN Trunking system. Refer to the instruction for each call for the transceiver operation and behavior.

- Individual Call (Transmission Trunked)
- Group Call (Transmission Trunked)
- Individual Call (Message Trunked (Enhanced))
- Group Call (Message Trunked (Enhanced))
- Broadcast Group Call
- Status Call
- Short Data Call
- Long Data Call

For Individual Call and Group Call, the transceiver behavior varies depending on the configuration for Trunking Type (“Transmission Trunked” or “Message Trunked (Enhanced)”). (Refer to: 25.2 Trunking Type (NXDN Trunking System Only) on this page)

25.1.2 Available Calls in an NXDN Conventional System

The following calls are available in an NXDN Conventional system. Refer to the instruction for each call for the transceiver operation and behavior.

- Individual Call
- Individual Call (Individual Call Acknowledge Request)
- Group Call
- Status Call
- Short Data Call
- Long Data Call

25.2 Trunking Type (NXDN Trunking System Only)

For Individual Call and Group Call in an NXDN Trunking system, the method for releasing a traffic channel varies as below depending on the configuration for Trunking Type. The configuration for Trunking Type must be changed following the configuration for the system.

Table 25-1 Trunking Type

Configuration	Description
Transmission Trunked	The system releases a traffic channel after the communication ends on the traffic channel by a user of the transmitting transceiver releasing the **PTT** switch. This parameter can be used for calls such as an Individual Call and Group Call which do not determine whether or not the receiving transceiver is available for communications before initiating a call. (Refer to: 25.3 Individual Call (Transmission Trunked) (NXDN Trunking System Only) on page 230 25.4 Group Call (Transmission Trunked) (NXDN Trunking System Only) on page 236)
Message Trunked (Enhanced)	The link to a traffic channel is maintained after the communication ends by a user of the transmitting transceiver releasing the **PTT** switch on a traffic channel until a certain period of time elapses. To release the traffic channel before a certain period of time elapses, an additional operation is required on the transceiver. While the link to a traffic channel is being maintained, the transceiver can communicate again by pressing the **PTT** switch, without reestablishing a link. This parameter can be used for calls such as an Individual Call and Group Call which determine whether or not the receiving transceiver is available for communications before initiating a call. (Refer to: 25.5 Individual Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) on page 239 25.6 Group Call (Message Trunked (Enhanced)) (NXDN Trunking System Only) on page 244)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Trunking Type (Edit > NXDN > NXDN 1 > Trunking 1)

25.3 Individual Call (Transmission Trunked) (NXDN Trunking System Only)

Individual Call can be used to initiate a call to a target transceiver individually to establish voice calls.

The transceiver can initiate a call to a transceiver having the same Unit ID.

To make an Individual Call in an NXDN Trunking system, “Transmission Trunked” needs to be configured for Trunking Type in both the transmitting transceiver and the receiving transceiver. “Transmission Trunked” or “Message Trunked” also needs to be configured for Trunking Type on the system. (Refer to: 25.2 Trunking Type (NXDN Trunking System Only) on page 229)

25.3.1 Initiating an Individual Call (Transmission Trunked)

Individual Call can be started by one of the following methods.

- **Individual Call Mode**

  In Individual Call Mode, an Individual Call is initiated by selecting a Unit ID configured in the Unit ID List or directly entering a Unit ID. (Refer to: 25.3.3 Unit ID List on page 234)

  Pressing the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key places the transceiver in Individual Call Mode.

  If “Individual (NXDN)”, “Individual + Status (NXDN)”, or “Individual + SDM (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or goes into the respective state as the first digit of the Unit ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

- **Selcall on PTT**

  The transceiver initiates an Individual Call when the **PTT** switch is pressed on a GID where “Individual Call” is configured for Selcall on PTT. A Unit ID of the target transceiver can be configured by selecting one Unit ID from the Unit ID List by using KPG-141D/ KPG-141DN.

The Unit ID Name or Unit ID of the transmitting transceiver appears on the receiving transceiver display. The receiving transceiver can respond to the caller by pressing the **PTT** switch while the caller’s ID appears.

The transceiver can record the reception of the Individual Call in the transaction log. The record can be viewed in Stack Mode and the transceiver can initiate an Individual Call to the target transceiver. (Refer to: 25.14 Stack on page 277)

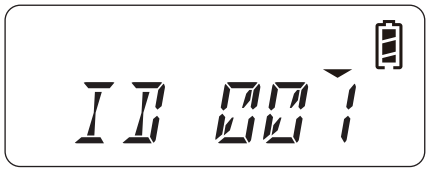
Note: For Portable (without LCD/ without Key), an Individual Call cannot be initiated using Individual Call Mode. Also, for Portable (without LCD/ without Key), an Individual Call cannot be initiated by using Selcall on PTT, but the transceiver can only respond to the received Unit ID.

■ Operating the Transceiver

- **Initiating an Individual Call by List Selection**

1. Press the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key.

   The transceiver enters Individual Call Mode and then the Unit ID List selection display will appear.



Portable

Mobile

   The following operations are identical even if the transceiver enters Individual Call Mode with keypad entry.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select a Unit ID from the Unit ID List.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

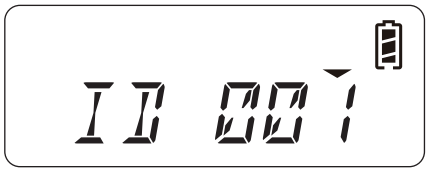
   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Individual Call Mode by a user pressing the **Individual + Status (NXDN)** or **Individual + SDM (NXDN)** key) (Refer to: 25.11 Status Call on page 263)

- **Initiating an Individual Call using Manual Dialing**

  To initiate an Individual Call using Manual Dialing, Manual Dialing must be enabled using KPG-141D/ KPG-141DN.

1. Press the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key.

   The transceiver enters Individual Call Mode and then the Unit ID List selection display will appear.



Portable

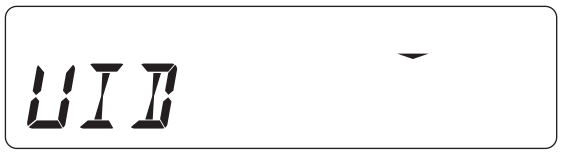
Mobile

The following operations are identical even if the transceiver enters Individual Call Mode with keypad entry.

2. Press and hold the **[S]** or **[*]** key.

   The Unit ID entry display appears.

Portable



Mobile

For Mobile, the Unit ID entry display also appears by pressing the **[<B]** key.

3. Enter a Unit ID.

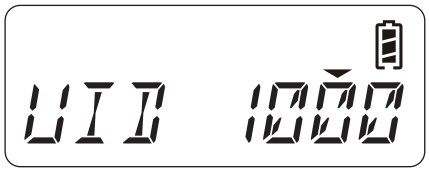
   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

   - **Using the Selector or the PF Keys**

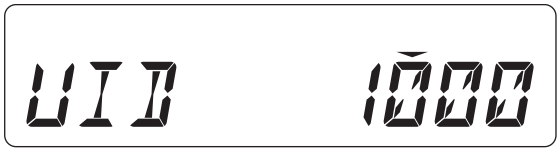
     The characters can be selected by rotating the **Selector** (Portable), or pressing the **[⩓]** or **[⩔]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

   - **Using the Keypad**

     A Unit ID can be entered by pressing the **[0]** to **[9]** keys.



Portable



Mobile

4. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Individual Call Mode by a user pressing the **Individual + Status (NXDN)** or **Individual + SDM (NXDN)** key) (Refer to: 25.11 Status Call on page 263)

- **Display during a Transmission**

  “CALLING” appears on the main display of the transceiver from when the transceiver initiates various call requests until the call requests are determined.

Portable

Mobile

The following display appears depending on the response message from the system after initiating various calls while in an NXDN Trunking system.

- **If the transceiver receives a response message indicating the queue state from the system:**

  If the transceiver receives a response message indicating the queue state from the system, the Call Queue Tone sounds from the transceiver and then the transceiver will enter the standby state.

  However, it does not appear during a Status Call, Short Data Call and a Long Data Call.

Portable

Mobile

- **If the transceiver receives a response message from the system indicating a busy state of the receiving transceiver:**

  The Busy Tone 2 sounds from the transceiver and then the transceiver will terminate the transmission.

Portable

Mobile

- **If the transceiver receives a response message from the system, indicating that no traffic channel is available:**

  The System Busy Tone sounds from the transceiver and then the transceiver will terminate the transmission.

Portable

Mobile

- **If the transceiver receives a response message from the system indicating no response from the receiving transceiver:**

  The No Reply Tone sounds from the transceiver and then the transceiver will terminate the transmission.

Portable

Mobile

- **If the transceiver receives a message, such as a service invalid message, from the system:**
  The Call Invalid Tone sounds from the transceiver and then the transceiver will terminate the transmission.

Portable

Mobile

- **If the transceiver does not receive any message from the system:**
  The Call Fail Tone sounds from the transceiver and then the transceiver will terminate the transmission.

Portable

Mobile

Note:

- If Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when the **PTT** switch is pressed to initiate a call request. If the Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver while the **PTT** switch is pressed and held after a call request is initiated by pressing the **PTT** switch. (Refer to: 25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only) on page 301)
- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- To enter an ID using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Manual Dialing to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Selcall on PTT (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)

25.3.2 Receiving an Individual Call (Transmission Trunked)

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID preconfigured in the transceiver.

Note: When the transceiver receives an Individual Call in an NXDN Trunking system, the transceiver will automatically send the response message notifying the acceptance of incoming calls.

■ Transceiver Behavior

1. The transceiver receives an Individual Call.
   The "♪" icon blinks, and an Alert Tone (Individual Call) sounds from the transceiver. The ID Name of the transmitting transceiver appears on the main display.

Portable

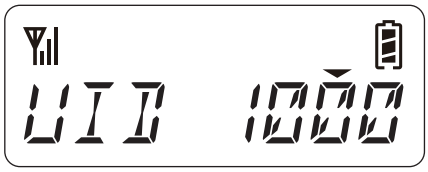
Mobile

If the ID Name is not configured in the Unit ID List, the Unit ID List number appears on the main display.

Portable

Mobile

If the Unit ID is not configured in the Unit ID List, the Unit ID appears on the main display.



Portable

Mobile

The transceiver can respond to the received Unit ID by a user pressing the **PTT** switch. Pressing a key other than the **PTT** switch activates the assigned function. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call or a Paging Call. For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call or a Paging Call. For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Individual Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Individual Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Trunking) used in common in the system. When the transceiver receives a Paging Call, the LED blinks in the same way as an Individual Call according to the configuration of Alert LED Color (Paging Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Paging Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Trunking) used in common in the system.
- If the transceiver receives the Unit ID Name by Over-the Air Alias, the received Unit ID Name will appear.
- If Unit ID Name received using Over-the-Air Alias is stored in the stack memory of the transceiver, the stored Unit ID Name will appear.
- If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Individual Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Individual Call) used in common in the system. When the transceiver receives a Paging Call, an Alert Tone sounds from the transceiver in the same way as an Individual Call according to the configuration of Alert Tone (Paging Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Paging Call) used in common in the system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert Tone (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert LED Color (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Alert LED Color (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)

25.3.3 Unit ID List

The transceiver uses an individual Unit ID to establish communication if using the NXDN function. The desired Unit IDs must be preconfigured in the transceiver using KPG-141D/ KPG-141DN prior to use of the transceiver. A maximum of 1000 Unit IDs can be configured for Unit ID List.

Table 25-2 Unit ID List

Configuration	Operation
ID	A Unit ID can be configured in the range between 1 and 65519. However, an ID having the number of 60001 or larger cannot be used in an NEXEDGE Trunking system.

Configuration	Operation
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the transmitting transceiver is registered in the ID List, the ID Name appears on the main display when the transceiver receives a call. After that, the received Unit ID Name appears upon receipt of the Unit ID Name by Over-the-Air Alias while receiving a call. If the transceiver cannot receive the Unit ID Name, the stored ID Name appears if the ID Name is stored for the Unit ID stored in the transceiver. The Unit ID number appears if the above conditions are not satisfied.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. An ID for which "Yes" is configured for Transmit Inhibit does not appear on the ID selection display in Individual Call Mode, and a user cannot select the ID in Individual Call Mode. If the transceiver receives a call from an ID for which "Yes" is configured for Transmit Inhibit, the caller's ID Name appears on the main display. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the **PTT** switch.
Individual (Alert Tone)	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives an Individual Call from the Unit ID which is configured in the Unit ID List.
Paging (Alert Tone)	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives a Paging Call or an Individual Call (Message Trunked (Enhanced)) from the Unit ID which is configured in the Unit ID List. However, the configuration for Paging is applied to an Individual Call (Message Trunked (Enhanced)) only when the call is received with Automatic Response disabled.
Alert LED Color (Individual Call) (Mobile Only)*1	A user can configure whether to blink the orange LED or the blue LED when the transceiver receives an Individual Call from the Unit ID which is configured in the Unit ID List. If "Common" is configured, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Trunking) used in common in the system. If "Off" is configured, the LED does not blink when the transceiver receives an Individual Call from the corresponding Unit ID.
Alert LED Color (Paging Call) (Mobile Only)*1	A user can configure whether to blink the orange LED or the blue LED when the transceiver receives a Paging Call or an Individual Call (Message Trunked (Enhanced)) from the Unit ID which is configured in the Unit ID List. If "Common" is configured, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Trunking) used in common in the system. If "Off" is configured, the LED does not blink when the transceiver receives a Paging Call or an Individual Call (Message Trunked (Enhanced)) from the corresponding Unit ID. However, the configuration for Paging is applied to an Individual Call (Message Trunked (Enhanced)) only when the call is received with Automatic Response disabled.

*1 To use this function, Selective Call Alert LED must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID List (Edit > NXDN > NXDN 2 > Unit ID List)

25.3.4 Unit ID Encode Block

Unit ID Encode Block is the Unit ID range used to initiate a call.

A Unit ID with which a user is allowed to initiate a call can be restricted using KPG-141D/ KPG-141DN. A user can use the Unit ID stored in the Unit ID List even if it is outside the Unit ID Encode Block range.

The transceiver for which no Unit ID Encode Block is configured can initiate a call to all transceivers.

The transceiver disables the squelch and emits received audio when the transceiver receives the Unit ID satisfying the receiving conditions. In this case, the Unit ID of the transmitting transceiver appears on the receiving transceiver. The receiving transceiver can respond to the transmitting transceiver by pressing the **PTT** switch. However, the transceiver cannot respond if initiating a call to the Unit ID of the transmitting transceiver is restricted.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID Encode Block (Edit > NXDN > NXDN 1 > General 1)

25.4 Group Call (Transmission Trunked) (NXDN Trunking System Only)

Group Call can be used to engage in 2-way group voice calls by initiating a call to a group.

The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the Group ID for which “ALL” is configured.

To make a Group Call in an NXDN Trunking system, “Transmission Trunked” needs to be configured for Trunking Type in both the transmitting transceiver and the receiving transceiver. “Transmission Trunked” or “Message Trunked” also needs to be configured for Trunking Type on the system. (Refer to: 25.2 Trunking Type (NXDN Trunking System Only) on page 229)

25.4.1 Initiating a Group Call (Transmission Trunked)

Group Call can be started by one of the following methods. Transmission method varies depending on the system used for the transceiver.

- **CH/GID Up and CH/GID Down keys**

  The transceiver initiates a Group Call when the **PTT** switch is pressed after selecting a Group ID by pressing the **CH/GID Up** or **CH/GID Down** key.

- **Selcall on PTT**

  The transceiver initiates a Group Call using Group ID configured for GID when the **PTT** switch is pressed on GID where “Group Call” is configured for Selcall on PTT.

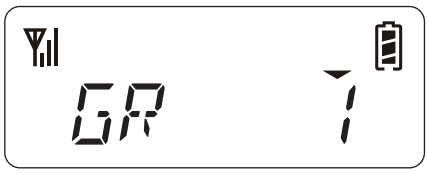
- **PC Command**

  The transceiver initiates a Group Call upon the receipt of a PC command from the communication port.

Note: For Portable (without LCD/ without Key), a Group Call cannot be initiated using Group Call Mode.

■ Operating the Transceiver

1. Select the target Group ID by using the **CH/GID Up** or **CH/GID Down** key to initiate a Group Call.



Portable

Mobile

2. Press the **PTT** switch.

   The transceiver starts initiating a call.

Note:

- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- The transceiver initiates a Group Call only by a user pressing the **PTT** switch when the transceiver transmits on a channel that “Group Call” is configured for Selcall on PTT. In this case, a Group ID does not need to be selected by operating the transceiver. (NXDN Conventional System Only)
- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Selcall on PTT (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)

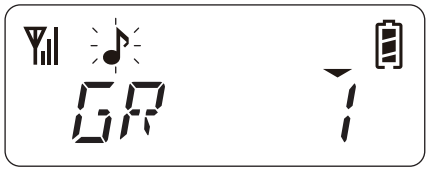
25.4.2 Receiving a Group Call (Transmission Trunked)

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

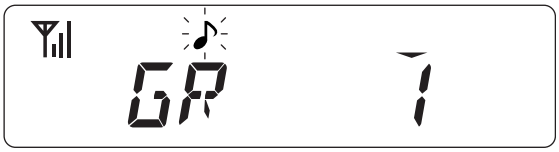
■ Transceiver Behavior

1. Receive a Group Call.

   The “♪” icon blinks, and an Alert Tone (Conference Group Call) sounds from the transceiver. The received Group ID, or the Unit ID of the transmitting transceiver, or both will appear on the main display.(Refer to: 25.4.3 Group Call Display Type on page 237)



Portable



Mobile

The transceiver can respond to the received Group ID by a user pressing the **PTT** switch. Pressing a key other than the **PTT** switch activates the assigned function. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Group Call. For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives a Group Call. For Mobile, the LED blinks according to the configuration for Alert LED Color (Zone Information) corresponding to the received Group ID. However, if “Common” is configured for Alert LED Color (Zone Information), the LED blinks according to the configuration for Alert LED Color (Conference Group Call) (Trunking) used in common in the system.
- The transceiver can record the reception of a Group Call. The record can be checked in Stack Mode. (Refer to: 25.14 Stack on page 277)
- When the transceiver receives the Group ID for which “ALL” is configured, the transceiver can respond using the Group ID if the received Group ID is configured in the GID list for the received zone. If no Group ID is configured in the ID List, the receiving transceiver can receive a call but the receiving transceiver cannot respond to the call. In this case, the ID Name of the transmitting transceiver does not appear even if Over-the-Air Alias is enabled. (Refer to: 25.35.2 Over-the-Air Alias on page 327)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call.
- An Alert Tone sounds from the transceiver according to the configuration of the GID corresponding to the received Group ID.
- The Encryption function becomes disabled when the transceiver receives a Group Call from a telephone.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Zone Information) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Alert Tone (Conference Group Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert LED Color (Zone Information) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Alert LED Color (Conference Group Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)

25.4.3 Group Call Display Type

Group Call Display Type can be used to display the received information on the main display when the transceiver receives a Group Call.

Table 25-3 Group Call Display Type

Configuration	Description
Group ID	The Group ID of the received Group Call appears. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 seconds and the Group ID of the received Group Call appears for 2 seconds alternately.
Calling Transceiver ID	The Unit ID of the transmitting transceiver appears. The stacked ID Name appears if the ID Name is stored for the Unit ID stacked in the transceiver. If the received Unit ID is not in the stack memory, the ID Name configured for the Unit ID List appears if the ID Name of the received Unit ID is configured in the Unit ID List. The Unit ID number appears if the above conditions are not satisfied. If the transceiver receives a Unit ID Name, the received Unit ID Name will appear after 500 ms elapses upon appearance of the Unit ID. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 seconds and the Unit ID of the transmitting transceiver appears for 2 seconds alternately. If the transceiver receives a Group Call from a telephone, “PHONE” (Portable) or “PHONE CALL” (Mobile) appears.
Calling Transceiver ID/ Group ID	The Group ID of the received Group Call and the Unit ID of the transmitting transceiver appear alternately. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 s, and the Group ID of the received Group Call appears for 3 s, and the Unit ID of the transmitting transceiver appears for 2 s alternately. For Portable, if the transceiver receives a Group Call from a telephone, the Group ID of the received Group Call and “PHONE” appear alternately. For Mobile, the Group ID of the received Group Call and “PHONE CALL” appear alternately.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Group Call Display Type (Edit > NXDN > NXDN 1 > General 1)

25.4.4 Call Alert Inhibit (Group Calls Only)

Call Alert Inhibit (Group Calls only) is the function that disables the Alert Tone, Selective Call Alert LED, Horn Alert, and Caller ID Stack functions when the transceiver receives a Group Call.

Use of this function prevents specific functions from activating as follows even if these functions are enabled or configured to be enabled when the transceiver receives a Group Call.

- **Alert Tone**

  An Alert Tone does not sound from the transceiver even if the transceiver receives a Group Call.

- **Selective Call Alert LED**

  A Selective Call Alert LED does not blink even if the transceiver receives a Group Call.

- **Horn Alert (Mobile only)**

  The headlights or the horn of a vehicle being connected to the Horn Alert port does not light or sound even if the transceiver receives a Group Call.

- **Caller ID Stack**

  The Caller ID will not be stored in the transceiver stack memory even if the transceiver receives a Group Call.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Call Alert Inhibit (Group Calls only) to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.4.5 Ignore Group Call during Individual Call

Ignore Group Call during Individual Call is the function that prevents reception of Group Calls while the transceiver is receiving an Individual Call.

This function can be used when a user wishes to prioritize the currently receiving Individual Call.

If the transceiver receives an Individual Call with this function enabled, the transceiver cannot receive a Group Call (including data communications) while Auto Reset Timer is counting down.

Note: The following Group Calls can be received even if this function is enabled.

- A Group Call using the Group ID configured for Priority Monitor ID
- A Group Call using All Group ID
- A Group Call for Emergency

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Ignore Group Call during Individual Call to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.4.6 PTT Hold Inhibit

PTT Hold Inhibit is the function that inhibits the transceiver from holding the transmit operation and immediately ends the transmission if the transmission is prohibited on the traffic channel when the transceiver initiated a Group Call in an NXDN Trunking system.

While a transceiver is transmitting using Group Call, the other transceivers cannot initiate a Group Call. With this function enabled, a user can be notified that the transmission is prohibited when the transceiver tries to transmit by a user pressing the **PTT** switch while another transceiver is transmitting using Group Call.

Use of this function enables transceivers to avoid the collision of calls that occurs if the transceivers that hold their transmit operation start the transmissions all at once when the transmission becomes available.

Table 25-4 PTT Hold Inhibit

Configuration	Description
Enabled	The transceiver does not hold the transmit operation and immediately ends the transmission if transmission is prohibited on the traffic channel when the transceiver initiated a Group Call in an NXDN Trunking system. A Warning Tone A sounds from the transceiver while the **PTT** switch is pressed, and the transceiver cannot start transmission.
Disabled	The transceiver holds the transmit operation until transmission becomes available if transmission is prohibited on the traffic channel when the transceiver initiated a Group Call in an NXDN Trunking system. The transceiver holds the transmit operation while the **PTT** switch is pressed. The transmission starts if the **PTT** switch is still pressed when transmission becomes available.

Note: While in Emergency Mode, the transceiver holds the transmit operation regardless of the configuration for PTT Hold Inhibit.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT Hold Inhibit to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.5 Individual Call (Message Trunked (Enhanced)) (NXDN Trunking System Only)

Individual Call (Message Trunked (Enhanced)) is the function that allows a user to distinguish whether or not the receiving transceiver is available to communicate so as to initiate an Individual Call in an NXDN Trunking system.

Using the Individual Call (Message Trunked (Enhanced)) function, communications can be started without reestablishing a link between the transceiver and a traffic channel to respond to a call, as the link to the traffic channel has been maintained. This enables the occupation of a traffic channel assuring the continuity of communications without facing the busy channel to respond to a call. The traffic channel can be released by the transceiver operation.

The transmitting transceiver sends a message requesting an Individual Call to a system when initiating an Individual Call. After receiving the message requesting an Individual Call, the system sends a message requesting an acknowledgment to the receiving transceiver to confirm the availability of the receiving transceiver. The receiving transceiver sends an acknowledgment for the message requesting the acknowledgment to the system. Subsequently, upon receipt of a message requesting the connection from the receiving transceiver, the system assigns a traffic channel. The transmitting transceiver and the receiving transceiver can communicate after receiving from the system a message assigning a traffic channel.

To use this function, “Message Trunked (Enhanced)” needs to be configured for Trunking Type on both the transmitting transceiver and the receiving transceiver using KPG-141D/ KPG-141DN. “Message Trunked (Enhanced)” also needs to be configured for Trunking Type on the system. (Refer to: 25.2 Trunking Type (NXDN Trunking System Only) on page 229)

Note: For Individual Call (Message Trunked (Enhanced)), the following functions used for initiating an Individual Call normally are available. (Refer to: 25.3 Individual Call (Transmission Trunked) (NXDN Trunking System Only) on page 230)

- Unit ID List
- Unit ID Encode Block

25.5.1 Initiating an Individual Call (Message Trunked (Enhanced))

An Individual Call (Message Trunked (Enhanced)) can be initiated by doing any one of the following operations.

- **Individual Call Mode**

  A message requesting an Individual Call is sent to a system by pressing the **PTT** switch after selecting a Unit ID configured in the Unit ID List, or directly specifying a Unit ID in Individual Call Mode.

  Pressing the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key places the transceiver in Individual Call Mode.

  If “Individual (NXDN)”, “Individual + Status (NXDN)”, or “Individual + SDM (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or goes into the respective state as the first digit of the Unit ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

- **Stack Mode**

  A message requesting an Individual Call is sent to a system by selecting an incoming call history in Stack Mode and then pressing the **PTT** switch.

  Pressing the **Stack** key places the transceiver in Stack Mode.

- **Selcall on PTT**

  A message requesting an Individual Call is sent to a system by selecting the GID for which the target Unit ID for Selcall on PTT has been configured and then by pressing the **PTT** switch. A Unit ID of the target transceiver can be configured by selecting one from the Unit ID List using KPG-141D/ KPG-141DN.

- **Call Key**

  A message requesting an Individual Call is sent to a system by pressing one of the **Call 1** key to **Call 6** key. The Unit ID configured for the key pressed can be called. A Unit ID must be configured to the **Call 1** key to the **Call 6** key so as to initiate a call to the specified Unit ID when one of the **Call 1** key to the **Call 6** key is pressed.

Note:

- An Individual Call (Message Trunked (Enhanced)) cannot be initiated by using a PC command.
- For Portable (without LCD/ without Key), an Individual Call (Message Trunked (Enhanced)) cannot be initiated using Individual Call Mode or Stack Mode.

■ Operating the Transceiver

1. Initiate an Individual Call (Message Trunked (Enhanced)) by following one of the methods mentioned above.

   A message requesting an Individual Call is sent to a system.

Portable

Mobile

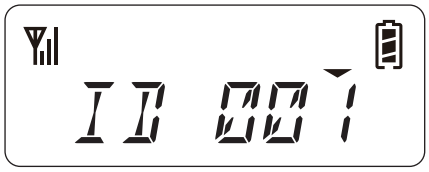
   "HOLDING" appears on the main display, and the transceiver waits to receive the response from the receiving transceiver.

Portable

Mobile

2. Receive from the system a message for traffic channel assignment.

   If Call in Progress Tone is enabled, a Call in Progress Tone sounds from the transceiver. The ID of the receiving transceiver appears on the main display, and the transceiver becomes available for transmission by an Individual Call.



Portable

Mobile

   Receiving a message for traffic channel assignment while the **PTT** switch is being pressed and held starts transmission by an Individual Call. If PTT Proceed Tone is configured to be enabled, a PTT Proceed Tone sounds from the transceiver at this time.

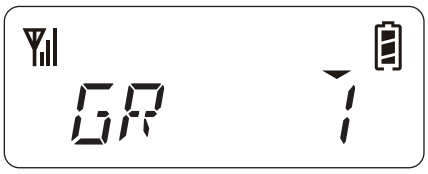
3. Press the **PTT** switch.

   The Individual Call is initiated.

   Even after the **PTT** switch is released to end the transmission, the link between the transceiver and the traffic channel is maintained.

4. Press the **Side 1** key (Portable), the **Triangle** key (Mobile), or the **[#]** key.

   The Individual Call ends. If Disconnect Indication Tone is enabled, a Disconnect Indication Tone sounds from the transceiver. The link to the traffic channel is disconnected, and the transceiver display reverts to the GID display.



Portable

Mobile

Note:

- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.
- The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key while pressing and holding the **PTT** switch.
- If Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when a call requesting an Individual Call (Message Trunked (Enhanced)) is initiated. If Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver until the transceiver receives from the system a message for traffic channel assignment after the call requesting an Individual Call (Message Trunked (Enhanced)) is initiated. (Refer to: 25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only) on page 301)
- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- For Mobile, if Microphone On-hook Disconnect is enabled, an Individual Call ends by placing the microphone in the on-hook state.
- The transceiver cancels the call if the transceiver receives a message from the system to notify that the system has received no response from the receiving transceiver. In this case, "NO REPLY" appears on the main display for 1 second.
- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Selcall on PTT (NXDN Trunking System) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Unit ID corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)
- Configuring the Call in Progress Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Disconnect Indication Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.5.2 Receiving an Individual Call (Message Trunked (Enhanced))

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

To receive an Individual Call (Message Trunked (Enhanced)), the transceiver must receive from the system a message requesting an acknowledgment for the Individual Call, and send to the system a message requesting the connection. The transceivers can initiate the communication after receiving the message for traffic channel assignment from the system.

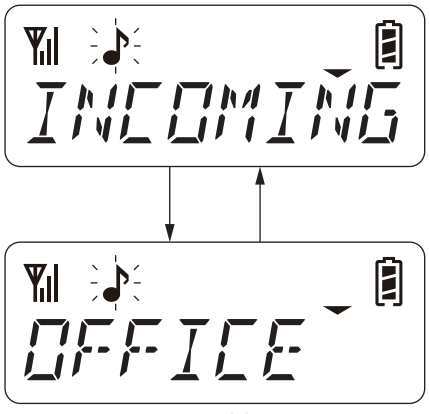
■ Operating the Transceiver

The transceiver's behavior differs depending on the configuration for Automatic Response.

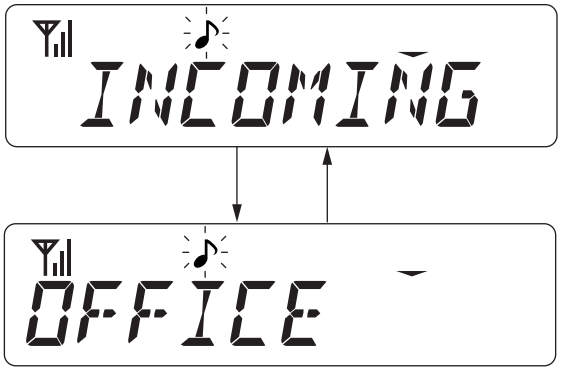
- **If Automatic Response is disabled:**

1. Receive from the system a message requesting reception of an Individual Call.

The "♪" icon blinks, and an Alert Tone (Paging) sounds from the transceiver. "INCOMING" or the ID of the transmitting transceiver alternately appears on the main display every 1 second.



Portable



Mobile

2. Press the **PTT** switch, **Side 2** key (Portable), or the **Square** key (Mobile).

A message requesting the connection is sent to the system.

Portable

Mobile

3. Receive from the system a message for traffic channel assignment.

If Call in Progress Tone is enabled, a Call in Progress Tone sounds from the transceiver. The ID of the transmitting transceiver appears on the main display, and the transceiver becomes ready for communications.

Portable

Mobile

Receiving a message for traffic channel assignment while the **PTT** switch is being pressed and held starts transmission by an Individual Call. If PTT Proceed Tone is configured to be enabled, a PTT Proceed Tone sounds from the transceiver at this time.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call (Message Trunked (Enhanced)). For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call (Message Trunked (Enhanced)). For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Paging Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Paging Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Trunking) used in common in the system.
- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.
- The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key while pressing and holding the **PTT** switch.
- If Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when a message requesting the connection is transmitted. If Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver while the transceiver waits to receive from the system a message for traffic channel assignment. (Refer to: 25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only) on page 301)
- For Mobile, if Microphone Off-hook Connect is enabled, a message requesting the connection is sent by placing the microphone in the off-hook state.
- During step 1, the transceiver can reject an incoming call by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key.
- The Individual Call ends by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key. For Mobile, if Microphone On-hook Disconnect is enabled, an Individual Call ends by placing the microphone in the on-hook state.
- If the transceiver receives an Emergency Call, the transceiver automatically sends a message requesting the connection regardless of the configuration for Automatic Response.
- By pressing the **PTT** switch, the transmitting transceiver can be called.
- If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Paging Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Paging Call) used in common in the system.

- **If Automatic Response is enabled:**

1. Receive from the system a message requesting reception of an Individual Call.

   A message requesting the connection is automatically sent to the system.

Portable

Mobile

2. Receive from the system a message for traffic channel assignment.

   The “♪” icon blinks, and an Alert Tone (Individual Call) sounds from the transceiver. The ID of the transmitting transceiver appears on the main display, and the transceiver becomes ready for communications.

Portable

Mobile

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call (Message Trunked (Enhanced)). For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call (Message Trunked (Enhanced)). For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Individual Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Individual Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Trunking) used in common in the system.
- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.

- ♦ The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key while pressing and holding the **PTT** switch.
- ♦ The Individual Call ends by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key. For Mobile, if Microphone On-hook Disconnect is enabled, an Individual Call ends by placing the microphone in the on-hook state.
- ♦ If the transceiver receives an Emergency Call, the transceiver automatically sends a message requesting the connection regardless of the configuration for Automatic Response.
- ♦ By pressing the **PTT** switch, the transmitting transceiver can be called.
- ♦ If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Individual) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Individual) used in common in the system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert Tone (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert LED Color (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Alert LED Color (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Call in Progress Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.5.3 Automatic Response

Automatic Response is the function to automatically send a message requesting the connection upon receipt of a message requesting an acknowledgment for an Individual Call.

If this function is enabled, the transceiver automatically sends a message requesting the connection upon receipt of a message requesting an acknowledgment for an Individual Call.

If this function is disabled, the transceiver automatically sends no message requesting the connection even if the transceiver has received message requesting an acknowledgment for an Individual Call. In this case, a message requesting the connection can be sent manually by a user operating the transceiver. Refer to "■ If Automatic Response is Disabled:" in 25.5.2 Receiving an Individual Call (Message Trunked (Enhanced)) on page 241 for instruction.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Automatic Response to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.6 Group Call (Message Trunked (Enhanced)) (NXDN Trunking System Only)

Group Call (Message Trunked (Enhanced)) is the function that allows you to establish two-way group voice communications by initiating a call to a group. Using the Group Call (Message Trunked (Enhanced)) function, communications can be started without reestablishing a link between the transceiver and a traffic channel to respond to a call, as the link to the traffic channel has been maintained. This enables the occupation of a traffic channel assuring the continuity of communications without facing the busy channel to respond to a call. The traffic channel can be released by the transceiver operation.

To use this function, “Message Trunked (Enhanced)” needs to be configured for Trunking Type on both the transmitting transceiver and the receiving transceiver using KPG-141D/ KPG-141DN. “Message Trunked (Enhanced)” also needs to be configured for Trunking Type on the system. (Refer to: 25.2 Trunking Type (NXDN Trunking System Only) on page 229)

Note: For Group Call (Message Trunked (Enhanced)), the following functions used for initiating a Group Call normally are available. (Refer to: 25.4 Group Call (Transmission Trunked) (NXDN Trunking System Only) on page 236)

- Group Call Display Type
- Call Alert Inhibit (Group Calls only)
- Ignore Group Call during Individual Call
- PTT Hold Inhibit

25.6.1 Initiating a Group Call (Message Trunked (Enhanced))

Group Call (Message Trunked (Enhanced)) can be initiated by pressing the **CH/GID Up** key or the **CH/GID Down** key to select a Group ID, and then pressing the **PTT** switch.

■ Operating the Transceiver

1. Press the **CH/GID Up** key or the **CH/GID Down** key to select a Group ID, and then press the **PTT** switch.

   A message requesting a Group Call is sent to the system.

Portable

Mobile

2. Receive from the system a message for traffic channel assignment.

   If Call in Progress Tone is enabled, a Call in Progress Tone sounds from the transceiver.

Portable

Mobile

3. Press the **PTT** switch.

   The Group Call is initiated.

   Even after the **PTT** switch is released to end the transmission, the link between the transceiver and the traffic channel is maintained.

4. Press the **Side 1** key (Portable), the **Triangle** key (Mobile), or the **[#]** key.

   The Group Call ends. If Disconnect Indication Tone is enabled, a Disconnect Indication Tone sounds from the transceiver. The link to the traffic channel is disconnected, and the transceiver display reverts to the GID display.

Note:

- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.
- The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key while pressing and holding the **PTT** switch.
- If Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when a call requesting a Group Call (Message Trunked (Enhanced)) is initiated. If Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver until the transceiver receives from the system a message for traffic channel assignment after the call requesting a Group Call (Message Trunked (Enhanced)) is initiated. (Refer to: 25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only) on page 301)
- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- For Mobile, if Microphone On-hook Disconnect is enabled, a Group Call ends by placing the microphone in the on-hook state.
- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

25.6.2 Receiving a Group Call (Message Trunked (Enhanced))

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

■ Transceiver Behavior

1. The transceiver receives a Group Call.

   If a traffic channel has been assigned, the transceiver emits an Alert Tone (Conference Group Call), and either the received Group ID or the Unit ID for the transmitting transceiver, or both IDs, appear on the main display. For a Broadcast Group Call, the transceiver emits an Alert Tone (Broadcast Group Call).

Portable

Mobile

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Group Call (Message Trunked (Enhanced)). For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives a Group Call (Message Trunked (Enhanced)). For Mobile, the LED blinks according to the configuration for Alert LED Color (Zone Information) corresponding to the received Group ID. However, if “Common” is configured for Alert LED Color (Zone Information), the LED blinks according to the configuration for Alert LED Color (Conference Group Call) (Trunking) used in common in the system.
- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.
- The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key while pressing and holding the **PTT** switch.
- The Group Call ends by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key. For Mobile, if Microphone On-hook Disconnect is enabled, a Group Call ends by placing the microphone in the on-hook state.
- An Alert Tone sounds from the transceiver according to the configuration of the GID corresponding to the received Group ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Zone Information) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Alert Tone (Conference Group Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert LED Color (Zone Information) (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Alert LED Color (Conference Group Call) used in common in the system (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Call in Progress Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Disconnect Indication Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.7 Individual Call (NXDN Conventional System)

Individual Call can be used to initiate a call to a target transceiver individually to establish voice calls.

The transceiver can initiate a call to a transceiver having the same Unit ID.

To make an Individual Call in an NXDN Conventional system, Individual Call Acknowledge Request must be disabled in both the transmitting transceiver and the receiving transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Individual Call Acknowledge Request to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request)

25.7.1 Initiating an Individual Call

Individual Call can be started by one of the following methods.

- **Individual Call Mode**

  In Individual Call Mode, an Individual Call is initiated by selecting a Unit ID configured in the Unit ID List or directly entering a Unit ID. (Refer to: 25.7.3 Unit ID List on page 249)

  Pressing the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key places the transceiver in Individual Call Mode.

  If “Individual (NXDN)”, “Individual + Status (NXDN)”, or “Individual + SDM (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or goes into the respective state as the first digit of the Unit ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

- **Selcall on PTT**

  The transceiver initiates an Individual Call when the **PTT** switch is pressed on a channel where “Individual Call” is configured for Selcall on PTT. A Unit ID of the target transceiver can be configured by selecting one Unit ID from the Unit ID List by using KPG-141D/ KPG-141DN.

The Unit ID Name or Unit ID of the transmitting transceiver appears on the receiving transceiver display. The receiving transceiver can respond to the caller by pressing the **PTT** switch while the caller’s ID appears.

The transceiver can record the reception of the Individual Call in the transaction log. The record can be viewed in Stack Mode and the transceiver can initiate an Individual Call to the target transceiver. (Refer to: 25.14 Stack on page 277)

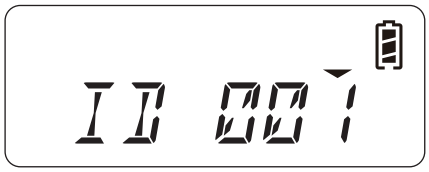
Note: For Portable (without LCD/ without Key), an Individual Call cannot be initiated using Individual Call Mode.

■ Operating the Transceiver

- **Initiating an Individual Call by List Selection**

1. Press the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key.

   The transceiver enters Individual Call Mode and then the Unit ID List selection display will appear.



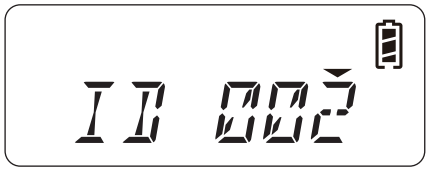
Portable

Mobile

The following operations are identical even if the transceiver enters Individual Call Mode with keypad entry.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⋀]** or **[⋁]** key (Mobile) to select a Unit ID from the Unit ID List.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.



Portable

Mobile

3. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

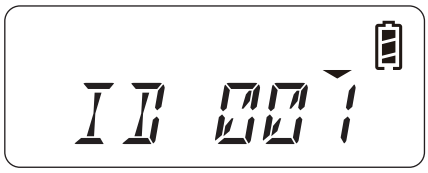
   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Individual Call Mode by a user pressing the **Individual + Status (NXDN)** or **Individual + SDM (NXDN)** key) (Refer to: 25.11 Status Call on page 263)

- **Initiating an Individual Call using Manual Dialing**

  To initiate an Individual Call using Manual Dialing, Manual Dialing must be enabled using KPG-141D/ KPG-141DN.

1. Press the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key.

   The transceiver enters Individual Call Mode and then the Unit ID List selection display will appear.



Portable

Mobile

   The following operations are identical even if the transceiver enters Individual Call Mode with keypad entry.

2. Press and hold the **[S]** or **[*]** key.

   The Unit ID entry display appears.

Portable

Mobile

   For Mobile, the Unit ID entry display also appears by pressing the **[<B]** key.

3. Enter a Unit ID.

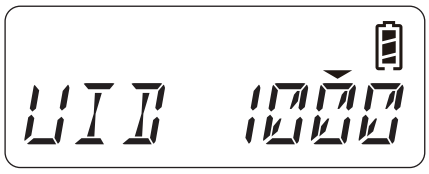
   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

- **Using the Selector or the PF Keys**

  The characters can be selected by rotating the **Selector** (Portable), or pressing the **[⩓]** or **[⩔]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

- **Using the Keypad**

  A Unit ID can be entered by pressing the **[0]** to **[9]** keys.



Portable

Mobile

4. Press the **PTT** switch to initiate a Voice Call.

   In order to initiate a Paging Call, the **Side 2** key (Portable) or the **Square** key (Mobile) needs to be pressed.

   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Individual Call Mode by a user pressing the **Individual + Status (NXDN)** or **Individual + SDM (NXDN)** key) (Refer to: 25.11 Status Call on page 263)

Note:

- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- To enter an ID using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Manual Dialing to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Selcall on PTT (NXDN Conventional System) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

25.7.2 Receiving an Individual Call

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID preconfigured in the transceiver.

Note: To receive an Individual Call in an NXDN Conventional system, “NXDN ID” must be configured for Optional Signaling used on the channel. (Refer to: 12.3 Optional Signaling on page 105)

■ Transceiver Behavior

1. The transceiver receives an Individual Call.

   The “♪” icon blinks, and an Alert Tone (Individual Call) sounds from the transceiver. The ID Name of the transmitting transceiver appears on the main display.

Portable

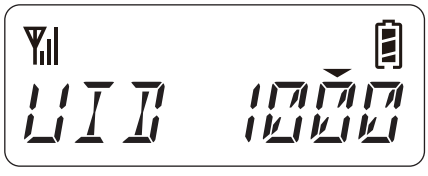
Mobile

   If the ID Name is not configured in the Unit ID List, the Unit ID List number appears on the main display.

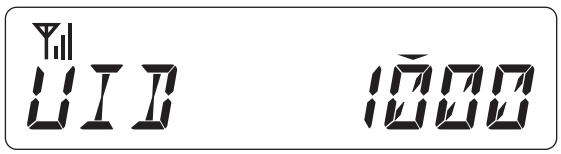
Portable

Mobile

   If the Unit ID is not configured in the Unit ID List, the Unit ID appears on the main display.



Portable



Mobile

   The transceiver can respond to the received Unit ID by a user pressing the **PTT** switch. Pressing a key other than the **PTT** switch activates the assigned function. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call or a Paging Call. For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call or a Paging Call. For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Individual Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Individual Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Conventional) used in common in the system. When the transceiver receives a Paging Call, the LED blinks in the same way as an Individual Call according to the configuration of Alert LED Color (Paging Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Paging Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Conventional) used in common in the system.
- If the transceiver receives the Unit ID Name by Over-the Air Alias, the received Unit ID Name will appear.
- If Unit ID Name received using Over-the-Air Alias is stored in the stack memory of the transceiver, the stored Unit ID Name will appear.
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving an Individual Call. (Conventional only) (Refer to: 25.7.6 Unit ID Serial Output on page 251)
- If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Individual Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Individual Call) used in common in the system. When the transceiver receives a Paging Call, an Alert Tone sounds from the transceiver in the same way as an Individual Call according to the configuration of Alert Tone (Paging Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Paging Call) used in common in the system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)

- Configuring the Alert Tone (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)
- Configuring the Alert Tone (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)
- Configuring the Alert LED Color (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)
- Configuring the Alert LED Color (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)

25.7.3 Unit ID List

The transceiver uses an individual Unit ID to establish communication if using the NXDN function. The desired Unit IDs must be preconfigured in the transceiver using KPG-141D/ KPG-141DN prior to use of the transceiver. A maximum of 1000 Unit IDs can be configured for Unit ID List.

Table 25-5 Unit ID List

Configuration	Operation
ID	A Unit ID can be configured in the range between 1 and 65519.
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the transmitting transceiver is registered in the ID List, the ID Name appears on the main display when the transceiver receives a call. After that, the received Unit ID Name appears upon receipt of the Unit ID Name by Over-the-Air Alias while receiving a call. If the transceiver cannot receive the Unit ID Name, the stored ID Name appears if the ID Name is stored for the Unit ID stored in the transceiver. The Unit ID number appears if the above conditions are not satisfied.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. An ID for which "Yes" is configured for Transmit Inhibit does not appear on the ID selection display in Individual Call Mode, and a user cannot select the ID in Individual Call Mode. If the transceiver receives a call from an ID for which "Yes" is configured for Transmit Inhibit, the caller's ID Name appears on the main display. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the **PTT** switch.
Individual (Alert Tone)	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives an Individual Call from the Unit ID which is configured in the Unit ID List.
Paging (Alert Tone)	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives a Paging Call or an Individual Call (Individual Call Acknowledge Request) from the Unit ID which is configured in the Unit ID List. However, the configuration for Paging is applied to an Individual Call (Individual Call Acknowledge Request) only when the call is received with Automatic Response disabled.
Alert LED Color (Individual Call) (Mobile Only)*1	A user can configure whether to blink the orange LED or the blue LED when the transceiver receives an Individual Call from the Unit ID which is configured in the Unit ID List. If "Common" is configured, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Trunking) used in common in the system. If "Off" is configured, the LED does not blink when the transceiver receives an Individual Call from the corresponding Unit ID.
Alert LED Color (Paging Call) (Mobile Only)*1	A user can configure whether to blink the orange LED or the blue LED when the transceiver receives a Paging Call or an Individual Call (Individual Call Acknowledge Request) from the Unit ID which is configured in the Unit ID List. If "Common" is configured, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Trunking) used in common in the system. If "Off" is configured, the LED does not blink when the transceiver receives a Paging Call or an Individual Call (Individual Call Acknowledge Request) from the corresponding Unit ID. However, the configuration for Paging is applied to an Individual Call (Individual Call Acknowledge Request) only when the call is received with Automatic Response disabled.

*1 To use this function, Selective Call Alert LED must be enabled.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the Unit ID List (Edit > NXDN > NXDN 2 > Unit ID List)

25.7.4 Caller ID Display

Caller ID Display can be used to display the caller's Unit ID Name or Unit ID on the main display when the transceiver receives a call in an NXDN Conventional system.

The received Unit ID or Group ID can be displayed on the main display upon receipt of the signals transmitted by the transceiver using Group Call.

A user can identify the caller not only by voice, but also through the display.

The behavior of when the transceiver receives a call in an NXDN Conventional system varies as follows depending on the configuration of Caller ID Display (Off, RAN, or RAN and Selcall).

- **Off**

  When the transceiver receives an NXDN digital signal in an NXDN Conventional system, the received ID does not appear on the main display.

- **RAN**

  When the transceiver receives a signal transmitted only using the RAN code, the received Unit ID Name or Unit ID appears on the main display if the received RAN code matches that preconfigured in the transceiver regardless of the Optional Signaling (NXDN) configuration.

  If the transceiver receives a Group Call, Caller ID Display will not be activated.

- **RAN and Selcall**

  When the transceiver receives a signal transmitted only using the RAN code, the received Unit ID Name or Unit ID appears on the main display if the received RAN code matches that preconfigured in the transceiver regardless of the Optional Signaling (NXDN) configuration.

  If the transceiver stands by on the channel where "None" or "DTMF" is configured for Optional Signaling (NXDN) when the transceiver receives a Group Call, and if the received RAN code matches that preconfigured in the transceiver, the received Unit ID Name or Unit ID, and Group ID appear on the main display according to the Group Call Display Type configuration.

  If the transceiver receives a Group ID which is not registered in the Group ID List, Group ID No. will appear. If the Group ID is not registered in the Group ID List upon the receipt of a Group ID for which "ALL" is configured, Caller ID Display will not be activated. Also, if the transceiver stands by on the channel where "NXDN ID" is configured for Optional Signaling (NXDN), Caller ID Display will not be activated.

Note:

- If the transceiver receives an individual call using NXDN ID, the caller's ID appears. If the transceiver receives a group call using NXDN ID, a message configured for Group Call Display Type appears. (Refer to: 25.9.4 Group Call Display Type on page 260)
- A user cannot reply to the ID appearing on the main display.
- By sending information of the received Unit ID to a PC, the transceiver can acquire log data of operating time. In this case, a separate application program is required.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Caller ID Display (Edit > NXDN > NXDN 1 > Conventional)

25.7.5 Unit ID Encode Block

Unit ID Encode Block is the Unit ID range used to initiate a call.

A Unit ID with which a user is allowed to initiate a call can be restricted using KPG-141D/ KPG-141DN. A user can use the Unit ID stored in the Unit ID List even if it is outside the Unit ID Encode Block range.

The transceiver for which no Unit ID Encode Block is configured can initiate a call to all transceivers.

The transceiver disables the squelch and emits received audio when the transceiver receives the Unit ID satisfying the receiving conditions. In this case, the Unit ID of the transmitting transceiver appears on the receiving transceiver. The receiving transceiver can respond to the transmitting transceiver by pressing the **PTT** switch. However, the transceiver cannot respond if initiating a call to the Unit ID of the transmitting transceiver is restricted.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID Encode Block (Edit > NXDN > NXDN 1 > General 1)

25.7.6 Unit ID Serial Output

Unit ID Serial Output can be used to send the received Unit ID from the transceiver's communication port.

With the Unit ID Serial Output enabled, the dispatcher can monitor and control in real time transceivers that are transmitting. The Unit ID sent from the communication port can also be used for management of the call log.

Note:

- In order to use Unit ID Serial Output, "Data" or "Data + GPS Data Output" must be assigned to the communication port of the transceiver.
- In the case of an NXDN system, the same Unit ID may be sent multiple times depending on the reception conditions of the receiving party.
- When the transceiver receives a Group Call from a telephone, the specific ID for telephone (U65521 (0xFFF1)) is output via the COM port on the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID Serial Output (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

25.8 Individual Call (Individual Call Acknowledge Request) (NXDN Conventional System Only)

Individual Call Acknowledge Request is the function that allows a user to distinguish whether or not the receiving transceiver is available to communicate so as to initiate an Individual Call in an NXDN Conventional system.

The Individual Call Acknowledge Request enables a call to the particular transceiver having the specified Unit ID, in the same way as an ordinary Individual Call does; however, an acknowledgment message must be received from the receiving transceiver before the communication starts (or receiving an Individual Call from the receiving transceiver also allows the communication to start).

The transmitting transceiver sends a message requesting an acknowledgment when initiating an Individual Call. Upon receipt of the message requesting an acknowledgment, the receiving transceiver sends to the transmitting transceiver an acknowledgment message to notify that the receiving transceiver is available for the call. The transmitting transceiver becomes enabled for the communication upon receipt of the acknowledgment message from the receiving transceiver.

To use this function, the Individual Call Acknowledgment Request must be enabled on the transmitting transceiver using KPG-141D/ KPG-141DN. Also, using KPG-141D/ KPG-141DN, the following are various functions to be used with Individual Call Acknowledgment Request for which parameters can be configured:

- Call Request Tone
- Call Processing Tone
- Call Processing Tone Delay Time
- Automatic Response
- Initiating/Incoming Reset Time

Note:

- Individual Call Acknowledge Request cannot be used while the transceiver is placed in Emergency Mode. An ordinary Individual Call, which does not require the sending of a message requesting an acknowledgment, can only be used.
- For Individual Call (Individual Call Acknowledge Request), the following functions used for initiating an Individual Call normally are available: (Refer to: 25.7 Individual Call (NXDN Conventional System) on page 246)
  - Unit ID List
  - Caller ID Display
  - Unit ID Encode Block
  - Unit ID Serial Output

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Individual Call Acknowledge Request to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request)

25.8.1 Initiating an Individual Call (Individual Call Acknowledgment Request)

An Individual Call (Individual Call Acknowledgment Request) can be activated by one of the following methods.

- **Individual Call Mode**

  Selecting a Unit ID configured in the Unit ID List or directly entering a Unit ID while the transceiver is in Individual Call Mode, and then pressing the **PTT** switch or the **Side 2** key (Portable) or the **Square** key (Mobile) sends a message requesting an acknowledgment.

  Pressing the **Individual (NXDN)**, **Individual + Status (NXDN)**, or **Individual + SDM (NXDN)** key places the transceiver in Individual Call Mode.

  If “Individual (NXDN)”, “Individual + Status (NXDN)”, or “Individual + SDM (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or goes into the respective state as the first digit of the Unit ID is entered. (Refer to: 4.5 Keypad Operation on page 30)

- **Stack Mode**

  Selecting a call record in Stack Mode and then pressing the **PTT** switch sends a message requesting an acknowledgment.

  Pressing the **Stack** key places the transceiver in Stack Mode.

- **Selcall on PTT**

  Selecting the channel where the target Unit ID for Selcall on PTT is configured and then pressing the **PTT** switch sends a message requesting an acknowledgment. A Unit ID of the target transceiver can be configured by selecting one from the Unit ID List using KPG-141D/ KPG-141DN.

- **Call Key**

  Pressing one of the **Call 1** key to the **Call 6** key sends a message requesting an acknowledgment to the Unit ID allocated to the key pressed. A Unit ID must be configured to the **Call 1** key to the **Call 6** key so as to initiate a call to the specified Unit ID when one of the **Call 1** key to the **Call 6** key is pressed.

Note:

- An Individual Call (Individual Call Acknowledge Request) cannot be initiated by using a PC command.
- For Portable (without LCD/ without Key), an Individual Call (Individual Call Acknowledge Request) cannot be initiated using Individual Call Mode or Stack Mode.

Operating the Transceiver

1. Follow one of the methods mentioned above to initiate an Individual Call (Individual Call Acknowledgment Request).

   A message requesting an acknowledgment is sent.

Portable

Mobile

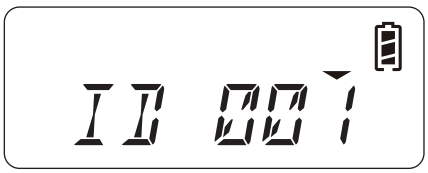
“<<HOLDING>>” appears on the main display, and the transceiver waits to receive an acknowledgment message from the receiving transceiver.

Portable

Mobile

2. Receive an acknowledgment message from the receiving transceiver.

   The Call In Progress Tone sounds from the transceiver, the ID for the receiving transceiver appears on the main display, and the transceiver becomes enabled for the transmission by means of an Individual Call.



Portable

Mobile

Receiving an acknowledgment message while the **PTT** switch is being pressed initiates an Individual Call. If PTT Proceed Tone is configured to be enabled, a PTT Proceed Tone sounds from the transceiver at this time.

3. Press the **PTT** switch.

   The Individual Call is initiated.

Note:

- For Portable (without LCD/ without Key), if Selective Call Alert LED is enabled, the LED blinks orange when the transceiver is ready for communication.
- If Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when a call request for an Individual Call (Individual Call Acknowledgment Request) is sent. If Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver until the transceiver receives an acknowledgment message from the receiving transceiver after the call request for an Individual Call (Individual Call Acknowledgment Request) is sent. (Refer to: 25.8.3 Call Request Tone on page 256 25.8.4 Call Processing Tone on page 256)
- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- While the transceiver waits to receive an acknowledgment message from the receiving transceiver, it is possible to cancel the call by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key.
- The transmitting transceiver sends a message requesting an acknowledgment again if the time configured for Maximum Acknowledgment Wait Time elapses before receiving a response message from the receiving transceiver. The transmitting transceiver can send a message requesting an acknowledgment up to the number of times configured for Number of Retries until the transceiver receives a response message. (Refer to: 25.35.10 Maximum ACK Wait Time on page 330 25.35.8 Number of Retries on page 330)
- The transceiver cancels the call processing for the following. In this case, “NO REPLY” appears on the main display for 1 second.
  - If the transceiver cannot receive an acknowledgment message from the receiving transceiver even though a message requesting an acknowledgment has been sent the number of times configured for Number of Retries. (Refer to: 25.35.8 Number of Retries on page 330)
  - If the receiving transceiver rejects the incoming call, and the transmitting transceiver receives the notification message for cancellation.
  - If the time configured for Initiating/Incoming Reset Time elapses before the transceiver receives an acknowledgment message from the receiving transceiver. (Refer to: 25.8.6 Initiating/Incoming Reset Time on page 257)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Selcall on PTT (NXDN Conventional System) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Unit ID corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)

25.8.2 Receiving an Individual Call (Individual Call Acknowledgment Request)

The transceiver being operated in an NXDN Conventional system can wait to receive an Individual Call on the channel where “NXDN ID (Unit ID)” has been configured as the receivable type of Optional Signaling.

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

To receive an Individual Call (Individual Call Acknowledgment Request), the receiving transceiver must receive a message requesting an acknowledgment from the transmitting transceiver. The transceiver becomes enabled for the communication after the transmitting transceiver receives an acknowledgment message.

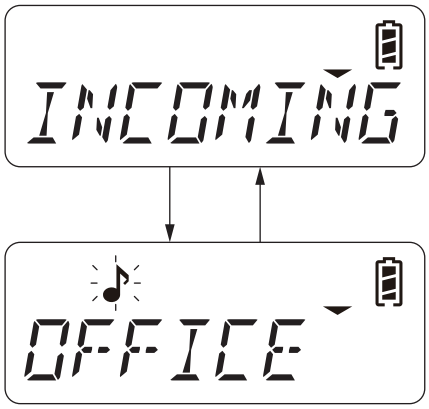
■ Operating the Transceiver

The transceiver’s behavior differs depending on the configuration for Automatic Response.

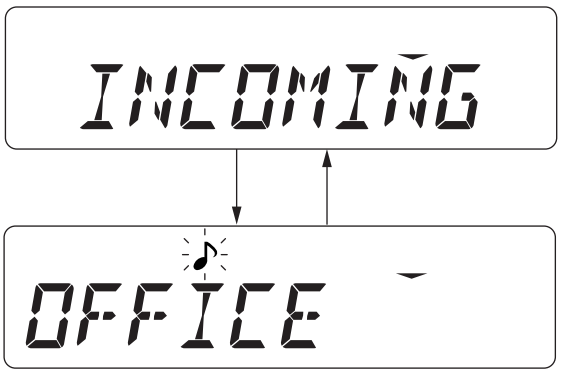
● **If Automatic Response is disabled:**

1. Receive a message requesting an acknowledgment.

   The transceiver sends an automatic response message to the transmitting transceiver to notify that the transceiver has received the message requesting an acknowledgment. The “♪” icon blinks, and an Alert Tone (Paging) sounds from the transceiver. “INCOMING” or the ID of the transmitting transceiver alternately appears on the main display every 1 second.



Portable



Mobile

2. Press the **Side 2** key (Portable) or the **Square** key (Mobile).

   An acknowledgment message is sent.

Portable

Mobile

After sending the acknowledgment message, by receiving an Individual Call from the transmitting transceiver which has been enabled for the communication, an Alert Tone (Individual Call) sounds from the transceiver and an ID for the transmitting transceiver appears.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call (Individual Call Acknowledge Request). For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call (Individual Call Acknowledge Request). For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Paging Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Paging Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Paging Call) (Conventional) used in common in the system.
- If the time configured for Initiating/Incoming Reset Time elapses while the transceiver is placed in the state mentioned at Step 1, the transceiver resets the standby state, and the display reverts to the channel display. (Refer to: 25.8.6 Initiating/Incoming Reset Time on page 257)
- During step 1, the transceiver can reject an incoming call by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key.
- Pressing the **PTT** switch at step 2 initiates an Individual Call to the transmitting transceiver. Not only receiving an acknowledgment message, but also receiving an Individual Call makes the transmitting transceiver available for the communication.
- If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Paging Call) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Paging Call) used in common in the system.

- **If Automatic Response is enabled:**

1. Receive a message requesting an acknowledgment.

   An acknowledgment message is automatically sent to the transmitting transceiver. The “♪” icon blinks, and an Alert Tone (Individual Call) sounds from the transceiver. The ID for the transmitting transceiver appears on the main display.

Portable

Mobile

After sending the acknowledgment message, by receiving an Individual Call from the transmitting transceiver which has been enabled for the communication, an Alert Tone (Individual Call) sounds from the transceiver and an ID for the transmitting transceiver appears.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call (Individual Call Acknowledge Request). For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks when the transceiver receives an Individual Call (Individual Call Acknowledge Request). For Mobile, if the received Unit ID is configured in the Unit ID List, the LED blinks according to the configuration of Alert LED Color (Individual Call) for the corresponding Unit ID. However, if “Common” is configured for Alert LED Color (Individual Call) in the Unit ID List, or if the received Unit ID is not configured in the Unit ID List, the LED blinks according to the configuration for Alert LED Color (Individual Call) (Conventional) used in common in the system.
- Pressing the **PTT** switch initiates an Individual Call to the transmitting transceiver. Not only receiving an acknowledgment message, but also receiving an Individual Call makes the transmitting transceiver available for the communication.
- If the received Unit ID is configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration of Alert Tone (Individual) for the corresponding Unit ID. If the received Unit ID is not configured in the Unit ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Individual) used in common in the system.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the Alert Tone (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert Tone (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)
- Configuring the Alert Tone (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)
- Configuring the Alert LED Color (Individual Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Paging Call) (Unit ID List) (Edit > NXDN > NXDN 2 > Unit ID List)
- Configuring the Alert LED Color (Individual Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)
- Configuring the Alert LED Color (Paging Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)

25.8.3 Call Request Tone

Call Request Tone is the function to emit a Call Request Tone from the transceiver when a call request for an Individual Call (Individual Call Acknowledgment Request) is initiated in an NXDN Conventional system.

The Call Request Tone from the transceiver notifies the user that a call request for an Individual Call (Individual Call Acknowledgment Request) has been initiated. The user can initiate the communication after the call request has been established.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the Call Request Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request)

25.8.4 Call Processing Tone

Call Processing Tone is the function to emit a Call Processing Tone from the transceiver until the transceiver receives an acknowledgment message from the receiving transceiver after the call request for an Individual Call (Individual Call Acknowledgment Request) is initiated in an NXDN Conventional system.

A Call Processing Tone from the transceiver notifies a user that the call request for an Individual Call (Individual Call Acknowledgment Request) is in process. A Call Processing Tone stops when the call request is established, and the user can initiate the communication.

After the call request for an Individual Call (Individual Call Acknowledgment Request) is initiated, a Call Processing Tone sounds from the transceiver upon the elapse of the time configured for Call Processing Tone Delay Time.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the Call Processing Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request > Call Processing Tone)
- Configuring the Call Processing Tone Delay Time (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request > Call Processing Tone)

25.8.5 Automatic Response

Automatic Response is the function to automatically send an acknowledgment message upon receipt of a message requesting an acknowledgment of an Individual Call.

If this function is enabled, the transceiver automatically sends an acknowledgment message upon receipt of a message requesting an acknowledgment of an Individual Call.

If this function is disabled, the transceiver automatically sends no acknowledgment message even if the transceiver has received a message requesting an acknowledgment of an Individual Call. In this case, an acknowledgment message can be sent manually by operating the transceiver. Refer to "■ If Automatic Response is disabled:" in 25.8.2 Receiving an Individual Call (Individual Call Acknowledgment Request) on page 254 for instruction.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the Automatic Response to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request)

25.8.6 Initiating/Incoming Reset Time

Initiating/Incoming Reset Time is the maximum length of time for which the transmitting transceiver can wait to receive an acknowledgment message from the receiving transceiver after sending a message requesting an acknowledgment of an Individual Call.

If Automatic Response is disabled, Initiating/Incoming Reset Time can also be used as the maximum length of time that allows the transceiver to send an acknowledgment message by operating the transceiver after receiving a message requesting an acknowledgment of an Individual Call. If the time configured for Initiating/Incoming Reset Time elapses, the transceiver resets the standby state, and the display reverts to the channel display.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Initiating/Incoming Reset Time (Edit > NXDN > NXDN 1 > Conventional > Individual Call Acknowledge Request)

25.9 Group Call (NXDN Conventional System)

Group Call can be used to engage in 2-way group voice calls by initiating a call to a group.

The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the Group ID for which “ALL” is configured.

25.9.1 Initiating a Group Call

Group Call can be started by one of the following methods. Transmission method varies depending on the system used for the transceiver.

- **Group Call Mode**

  While the transceiver is in Group Call Mode, the transceiver can initiate a Group Call by a user selecting a Group ID configured in the Group ID List and then pressing the **PTT** switch. (Refer to: 25.9.3 Group ID List on page 259)

  Pressing the **Group (NXDN)**, **Group + Status (NXDN)** or **Group + SDM (NXDN)** key places the transceiver in Group Call Mode.

- **Selcall on PTT**

  The transceiver initiates an Group Call when the **PTT** switch is pressed on a GID where “Group Call” is configured for Selcall on PTT. A Group ID of the target transceiver can be configured by selecting one Group ID from the Group ID List by using KPG-141D/ KPG-141DN.

- **PC Command**

  The transceiver initiates a Group Call upon the receipt of a PC command from the communication port.

Note: For Portable (without LCD/ without Key), a Group Call cannot be initiated using Group Call Mode.

■ Operating the Transceiver

1. Press the **Group (NXDN)**, **Group + Status (NXDN)**, or **Group + SDM (NXDN)** key.

   The transceiver enters Group Call Mode and the Group ID List selection display appears.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[^]** or **[v]** key (Mobile) to select a Group ID from the Group ID List.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Press the **PTT** switch.

   Press the **[S]** or **[*]** key to enter the Status Message or Short Message. (only if the transceiver enters Group Call Mode by a user pressing the **Group + Status (NXDN)** or **Group + SDM (NXDN)** key) (Refer to: 25.11 Status Call on page 263)

Note:

- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- The transceiver initiates a Group Call only by a user pressing the **PTT** switch when the transceiver transmits on a channel that "Group Call" is configured for Selcall on PTT. In this case, a Group ID does not need to be selected by operating the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Selcall on PTT (NXDN Conventional System) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)

25.9.2 Receiving a Group Call

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

Note: To receive a Group Call in an NXDN Conventional system, "NXDN ID" must be configured for Optional Signaling used on the channel. (Refer to: 12.3 Optional Signaling on page 105)

■ Transceiver Behavior

1. Receive a Group Call.

   The "♪" icon blinks, and an Alert Tone (Group Call) sounds from the transceiver. The received Group ID, or the Unit ID of the transmitting transceiver, or both will appear on the main display. (Refer to: 25.9.4 Group Call Display Type on page 260)

Portable

Mobile

   The transceiver can respond to the received Group ID by a user pressing the **PTT** switch. Pressing a key other than the **PTT** switch activates the assigned function. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Group Call. For Mobile, if "Blue" is configured for Alert LED Color, the blue LED blinks when the transceiver receives a Group Call. For Mobile, if the received Group ID is configured in the Group ID List, the LED blinks according to the configuration of Alert LED Color for the corresponding Group ID. However, if "Common" is configured for Alert LED Color in the Group ID List, or if the received Group ID is not configured in the Group ID List, the LED blinks according to the configuration for Alert LED Color (Group Call) (Conventional) used in common in the system.
- The transceiver can record the reception of a Group Call. The record can be checked in Stack Mode. (Refer to: 25.14 Stack on page 277)

- When the transceiver receives the Group ID for which “ALL” is configured, the transceiver can respond using the Group ID if the received Group ID is configured in the Group ID List. If no Group ID is configured in the ID List, the receiving transceiver can receive a call but the receiving transceiver cannot respond to the call. In this case, the ID Name of the transmitting transceiver does not appear even if Over-the-Air Alias is enabled. (Refer to: 25.35.2 Over-the-Air Alias on page 327)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call.
- If GID Scan (NXDN) is enabled, the transceiver can wait to receive a Group Call from all Group IDs configured for Group ID List in an NXDN Conventional system. (Refer to: 25.9.5 GID Scan (NXDN) on page 260)
- If the received Group ID is configured in the Group ID List, an Alert Tone sounds from the transceiver according to the configuration for the corresponding Group ID. If the received Group ID is not configured in the Group ID List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Group Call) used in common in the system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Group ID List) (Edit > NXDN > NXDN 2 > Group ID List)
- Configuring the Alert Tone (Group Call) used in common in the system (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)

25.9.3 Group ID List

The transceiver uses an Group ID configured in the Group ID List to initiate a Group Call in an NXDN Conventional system. The desired Group IDs must be preconfigured using KPG-141D/ KPG-141DN for the transceiver to initiate a Group Call. A maximum of 1000 Group IDs can be configured for Group ID List.

Table 25-6 Group ID List

Configuration	Description
ID	A Group ID can be configured in the range between 1 and 65519 inclusive and ALL. ALL allows initiation of a call to all IDs.
ID Name	The caller’s ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the group is configured in the Group ID List, the ID Name appears on the main display when the transceiver receives a call. If the ID Name is not configured in the Group ID List, the Group ID List number appears on the main display.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. The ID for which “Yes” is configured for Transmit Inhibit does not appear on the ID selection display in Group Call Mode, and a user cannot select the ID in Group Call Mode. If the transceiver receives a call from an ID for which “Yes” is configured for Transmit Inhibit, the caller’s ID Name appears on the main display. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the **PTT** switch.
Alert Tone	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives a Group Call from the Group ID which is configured in the Group ID List.
Alert LED Color (Mobile Only)*1	A user can configure whether to blink the orange LED or the blue LED when the transceiver receives a Group Call from the Group ID which is configured in the Group ID List. If “Common” is configured, the LED blinks according to the configuration for Alert LED Color (Group Call) (Conventional) used in common in the system. If “Off” is configured, the LED does not blink when the transceiver receives a Group Call from the corresponding Group ID.

*1 To use this function, Selective Call Alert LED must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Group ID List (Edit > NXDN > NXDN 2 > Group ID List)

25.9.4 Group Call Display Type

Group Call Display Type can be used to display the received information on the main display when the transceiver receives a Group Call.

Table 25-7 Group Call Display Type

Configuration	Description
Group ID	The Group ID of the received Group Call appears. If the ID Name is not configured in the Group ID List, the Group ID List number appears on the main display. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 seconds and the Group ID of the received Group Call appears for 2 seconds alternately.
Calling Transceiver ID	The Unit ID of the transmitting transceiver appears. The stacked ID Name appears if the ID Name is stored for the Unit ID stacked in the transceiver. If the received Unit ID is not in the stack memory, the ID Name configured for the Unit ID List appears if the ID Name of the received Unit ID is configured in the Unit ID List. The Unit ID number appears if the above conditions are not satisfied. If the transceiver receives a Unit ID Name, the received Unit ID Name will appear after 500 ms elapses upon appearance of the Unit ID. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 seconds and the Unit ID of the transmitting transceiver appears for 2 seconds alternately. If the transceiver receives a Group Call from a telephone, “PHONE” (Portable) or “PHONE CALL” (Mobile) appears.
Calling Transceiver ID/ Group ID	The Group ID of the received Group Call and the Unit ID of the transmitting transceiver appear alternately. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 s, and the Group ID of the received Group Call appears for 3 s, and the Unit ID of the transmitting transceiver appears for 2 s alternately. For Portable, if the transceiver receives a Group Call from a telephone, the Group ID of the received Group Call and “PHONE” appear alternately. For Mobile, the Group ID of the received Group Call and “PHONE CALL” appear alternately.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Group Call Display Type (Edit > NXDN > NXDN 1 > General 1)

25.9.5 GID Scan (NXDN)

GID Scan (NXDN) is the function to wait to receive a Group Call from all Group IDs in an NXDN Conventional system.

If this function is enabled, the transceiver can wait to receive a Group Call from all Group IDs configured for Group ID List.

If this function is disabled, the transceiver can wait to receive only the Group Calls from the Group IDs configured for Selcall on PTT (NXDN), Persistent GID (NXDN).

Note:

- This function can be used only if “Group Call” is configured for Selcall on PTT (NXDN).
- If “Group Call” is configured for Selcall on PTT (NXDN) and GID Scan (NXDN) is disabled, the transceiver can initiate a Group Call only to the Group ID configured for ID List Number (NXDN).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GID Scan (NXDN) to be enabled or disabled (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Selcall on PTT (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Persistent GID (NXDN) (Edit > Zone Information (Conventional Group) > Zone Edit > Persistent GID (NXDN))

25.9.6 Call Alert Inhibit (Group Calls Only)

Call Alert Inhibit (Group Calls only) is the function that disables the Alert Tone, Selective Call Alert LED, Horn Alert, and Caller ID Stack functions when the transceiver receives a Group Call.

Use of this function prevents specific functions from activating as follows even if these functions are enabled or configured to be enabled when the transceiver receives a Group Call.

- **Alert Tone**

  An Alert Tone does not sound from the transceiver even if the transceiver receives a Group Call.

- **Selective Call Alert LED**

  A Selective Call Alert LED does not blink even if the transceiver receives a Group Call.

- **Horn Alert (Mobile only)**

  The headlights or the horn of a vehicle being connected to the Horn Alert port does not light or sound even if the transceiver receives a Group Call.

- **Caller ID Stack**

  The Caller ID will not be stored in the transceiver stack memory even if the transceiver receives a Group Call.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Call Alert Inhibit (Group Calls only) to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.9.7 Ignore Group Call during Individual Call

Ignore Group Call during Individual Call is the function that prevents reception of Group Calls while the transceiver is receiving an Individual Call.

This function can be used when a user wishes to prioritize the currently receiving Individual Call.

If the transceiver receives an Individual Call with this function enabled, the transceiver cannot receive a Group Call (including data communications) while Auto Reset Timer is counting down.

Note: The following Group Calls can be received even if this function is enabled.
- A Group Call using All Group ID
- A Group Call for Emergency

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Ignore Group Call during Individual Call to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.10 Broadcast Group Call (NXDN Trunking System Only)

Broadcast Group Call can be used to engage in one-way informative group voice calls by initiating a call to a group in an NXDN Trunking system.

The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the Group ID for which “ALL” is configured.

The transceiver initiates a Broadcast Call upon the receipt of a PC command from the communication port.

25.10.1 Initiating a Broadcast Call

The transceiver can initiate a Broadcast Group Call by a user pressing the **PTT** switch while Broadcast Group Call is enabled.

Pressing the **Broadcast** key toggles the Broadcast Group Call between enabled and disabled.

■ Operating the Transceiver

1. Select the target GID using the **CH/GID Up** and **CH/GID Down** keys to initiate a Broadcast Call.

Portable

Mobile

2. Press the **Broadcast** key.

   Broadcast Group Call will be enabled.

Portable

Mobile

3. Press the **PTT** switch.

   The transceiver starts initiating a call.

   Pressing the **Broadcast** key after the transmission causes Broadcast Group Call to be disabled.

Note:

- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

25.10.2 Receiving a Broadcast Group Call

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Broadcast Group Call.

Note: The transceiver can receive the Broadcast Group Call initiated using the Group ID for which “ALL” is configured even if no Group ID is configured for the transceiver.

■ Transceiver Behavior

1. Receive a Broadcast Group Call.

   The “♪” icon blinks, and an Alert Tone (Broadcast Group Call) sounds from the transceiver. The received Group ID, or the Unit ID of the transmitting transceiver, or both will appear on the main display. (Refer to: 25.4.3 Group Call Display Type on page 237)

Portable

Mobile

Note:

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Broadcast Group Call. For Mobile, if “Blue” is configured for Alert LED Color (Broadcast Group Call), the blue LED blinks when the transceiver receives a Broadcast Group Call.
- A user cannot reply to the received Group ID. Pressing the **PTT** switch causes “RX ONLY” to appear on the transceiver main display.

25.11 Status Call

Status Call is a simple messaging system that allows a user to send and receive a status (Status Message). Since the message is replaced by status, communications can take place quickly and communication traffic can be reduced.

The following methods are available to send a Status Message.

Table 25-8 Sending Status Messages

Status Message	Description
Status Mode	The transceiver enters Status Mode by a user pressing a **PF** key or a key on the keypad, and then the transceiver will send a Status Message. (Refer to: 25.11.1 Sending a Status Message on this page)
Call Key	Pressing one of the **Call 1** to **Call 6** keys causes the transceiver to send the preconfigured Status Message. Call 1 to Call 6 can be assigned to the **PF** keys using KPG-141D/ KPG-141DN and the Status Message corresponding to each key can be selected from the Status List in NXDN. In this case, a Status Message is always sent to the preconfigured Base ID.
Turning the transceiver ON/ OFF	The transceiver sends the Status Message configured in the transceiver when the transceiver is turned ON or OFF. (Refer to: 25.11.8 Power-on Status Message on page 269 25.11.9 Power-off Status Message on page 270) In this case, a Status Message is always sent to the preconfigured Base ID.
AUX Input Status Message (Mobile only)	The transceiver sends the specified Status Message when the AUX Input port goes high level to low level or goes low level to high level. (Refer to: 25.11.12 AUX Input Status Message (Mobile Only) on page 271)
PC Command	The transceiver will send a Status Message when the transceiver receives a PC command from the communication port.

Note: For Portable (without LCD/ without Key), a Status Message cannot be sent by using Status Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the Status Message corresponding to Call 1 to Call 6 keys (Edit > Key Assignment > Call)

25.11.1 Sending a Status Message

This section describes how to send a Status Message in Status Mode.

The transceiver enters Status Mode with one of the following operations, and then the transceiver will send a Status Message.

- **Status (FleetSync/ NXDN), Individual + Status (NXDN) or Group + Status (NXDN) Key**

  Pressing the **Status (FleetSync/NXDN)** key places the transceiver in Status Mode. In this case, a Status Message is addressed to a Base ID.

  Or, pressing the **Individual + Status (NXDN)** or **Group + Status (NXDN)** key places the transceiver in Individual Call Mode or Group Call Mode. The transceiver enters Status Mode by pressing the **[S]** or **[*]** key after selecting the target Unit ID or Group ID.

- **Keypad Entry**

  If “Status (FleetSync/NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the transceiver keypad causes the transceiver to enter Status Mode. In this case, a Status Message is addressed to a Base ID.

  If “Individual + Status (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Individual Call Mode. The transceiver enters Status Mode by a user pressing the **[S]** or **[*]** key after selecting the target transceiver’s Unit ID.

Note: Refer to the instruction for each call in NXDN for operation in Individual Call Mode or Group Call Mode.

■ Operating the Transceiver

- **Sending a Status Message by List Selection**

1. Select one of the following operations to place the transceiver in Status Mode.
   - **Pressing the Status (FleetSync/NXDN) key**

     The transceiver enters Status Mode. In this case, a Status Message is addressed to a Base ID.
   - **Pressing the Individual + Status (NXDN) key**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Unit ID places the transceiver in Status Mode.
   - **Pressing the Group + Status (NXDN) key (NXDN Conventional System)**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Group ID places the transceiver in Status Mode.

- **Pressing the Group + Status (NXDN) key after selecting the target transceiver's Group ID (NXDN Trunking System)**

  The transceiver enters Status Mode.

Portable

Mobile

Or, the transceiver enters Status Mode by a user using a keypad. In this case, the following operations are identical.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the target data from Status List.

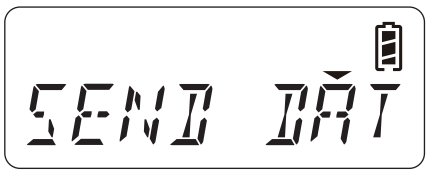
   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

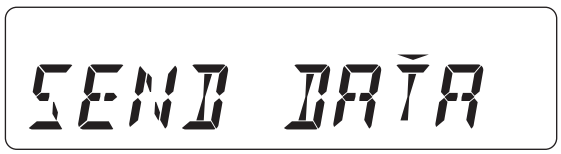
Mobile

3. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Status Message.

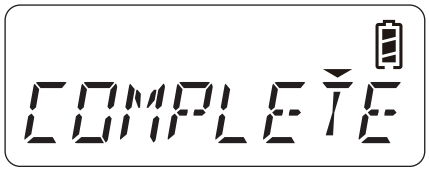


Portable



Mobile

If the Status Message is properly sent to the target transceiver, "COMPLETE" appears.



Portable

Mobile

- **Sending a Status Message using Manual Dialing**

  To send a Status Message using Manual Dialing, Manual Dialing must be enabled using KPG-141D/ KPG-141DN.

1. Select one of the following operations to put the transceiver into Status Mode.

   - **Pressing the Status (FleetSync/NXDN) key**

     The transceiver enters Status Mode. In this case, a Status Message is addressed to a Base ID.

   - **Pressing the Individual + Status (NXDN) key**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver's Unit ID places the transceiver in Status Mode.

   - **Pressing the Group + Status (NXDN) key (NXDN Conventional System)**

     Pressing the **[S]** or **[*]** key after a user selects the target transceiver's Group ID places the transceiver in Status Mode.

- **Pressing the Group + Status (NXDN) key after selecting the target transceiver's Group ID (NXDN Trunking System)**

  The transceiver enters Status Mode.

Portable

Mobile

Or, the transceiver enters Status Mode by a user using a keypad. In this case, the following operations are identical.

2. Press and hold the **[S]** or **[*]** key.

   The status entry display appears.

Portable

Mobile

For Mobile, the status entry display also appears by pressing the **[<B]** key.

3. Enters a status.

   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

   - **Using the Selector or the PF Keys**

     The characters can be selected by rotating the **Selector** (Portable), or pressing the **[∧]** or **[∨]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

   - **Using the Keypad**

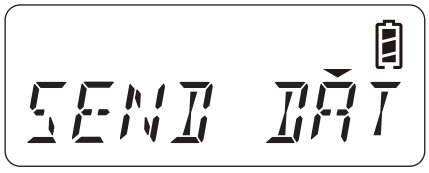
     A code can be entered by pressing the **[0]** to **[9]** keys.

Portable

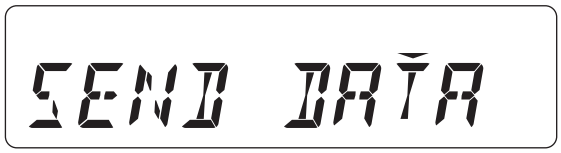
Mobile

4. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Status Message.



Portable



Mobile

If the Status Message is properly sent to the target transceiver, "COMPLETE" appears.

Portable

Mobile

Note:

- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.
- To enter a status using the **Selector** (Portable), List Selection Key (Selector) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions for Keypad Operation (Edit > Key Assignment > General)
- Configuring the Manual Dialing to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.11.2 Receiving a Status Message

A received Status Message is transferred in the following way.

Table 25-9 Transferring a Status Message

Status Message	Description
Display	The received Status Message appears on the main display. If “Fixed” is configured for Message Display Type, only Status Message appears. The received Status Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if “Alternate” is configured for Message Display Type.
Alert Tone	Alert Tone sounds if the transceiver receives a Status Message.
PC Command	The transceiver sends the received Status Message using a serial command. This message is sent to an external device that is connected to the transceiver, such as a PC. (Refer to: 25.11.7 Status Message Serial Output on page 269)

Note:

- To use serial communications, a user must prepare NXDN compatible software or external devices.
- A maximum of 15 received Status Messages along with Short Messages can be stored in the stack memory of the transceiver. (Refer to: 25.14 Stack on page 277)
- Status Name appears on the main display when receiving the Status Message. “STATUS xx” appears on the main display if the transceiver receives a Status Message for which Status Name is not configured. (Refer to: 25.11.3 Status List on page 268)

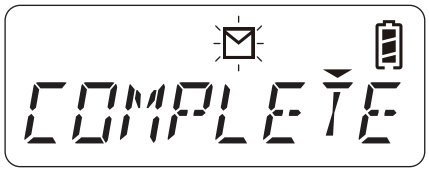
■ Transceiver Behavior

1. The transceiver starts receiving a Status Message.
   “RECV DAT” (Portable) or “RECV DATA” (Mobile) appears.

Portable

Mobile

2. The transceiver receives a Status Message.
   “COMPLETE” appears on the main display.



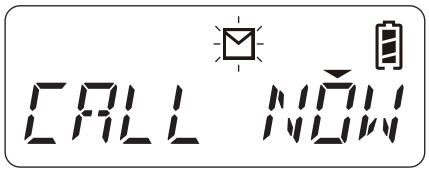
Portable

Mobile

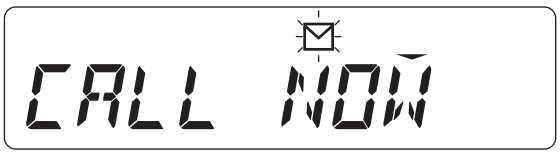
The Alert Tone (Status/ Short Message Call) sounds from the transceiver and then the Status Message will appear. If the Status Message exceeds the number of displayable digits, the message text is displayed while being scrolled from right to left.

The received Status Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if “Alternate” is configured for Message Display Type.

Status Message Display (3 seconds)



Portable



Mobile

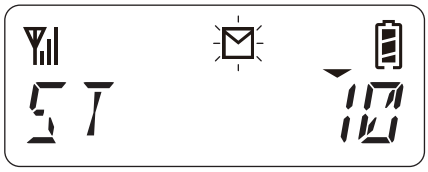
ID Name Display (2 seconds)

Portable

Mobile

- **If the status is not configured for Status List or the Status Name is not configured:**

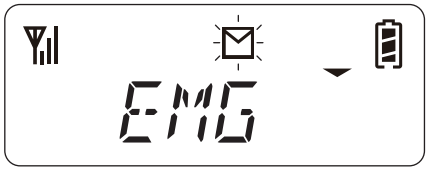
  The status number appears.



Portable

Mobile

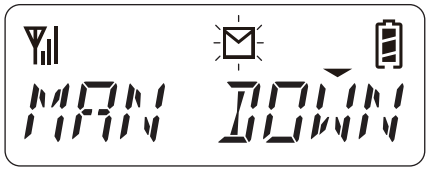
- **If the transceiver receives Emergency Status:**



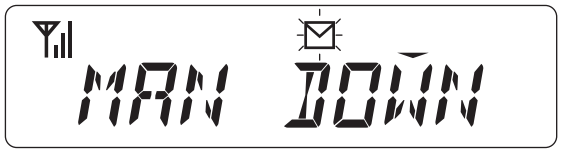
Portable

Mobile

- **If the transceiver receives Man-down Status:**

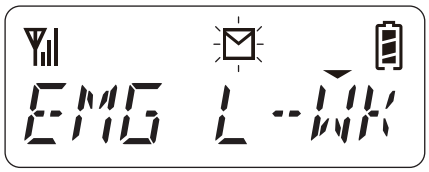


Portable



Mobile

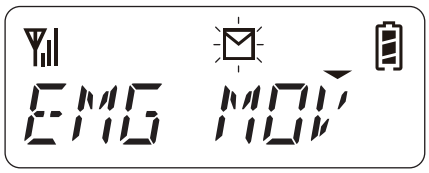
- **If the transceiver receives Lone Worker Status:**



Portable

Mobile

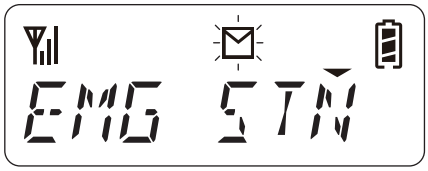
- **If the transceiver receives Motion Status:**



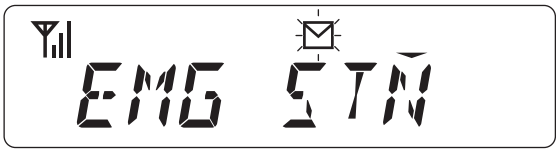
Portable

Mobile

- **If the transceiver receives Stationary Status:**

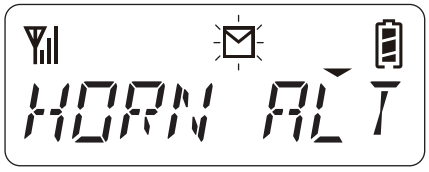


Portable



Mobile

- **If the transceiver receives Horn Alert Status:**



Portable

Mobile

Note:

- If the transceiver receives a Status Message by a Group Call, the ID Name appears according to the configuration for Group Call Display Type. (Refer to: 25.4.3 Group Call Display Type on page 237 25.9.4 Group Call Display Type on page 260)
- If the received status ID is configured in the Status List, an Alert Tone sounds from the transceiver according to the corresponding configuration in the Status List. If the received status number is not configured in the Status List, an Alert Tone sounds from the transceiver according to the configuration for Alert Tone (Status/Short Message Call) used in common in the system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Alert Tone (Status List) (Edit > NXDN > NXDN 2 > Status List)
- Configuring the Alert Tone (Status/Short Message Call) used in common in the system (Edit > NXDN > NXDN 1 > General 2 > Alert Tone)

25.11.3 Status List

Status Message must be preconfigured in the transceiver using KPG-141D/ KPG-141DN prior to the transmission. A maximum of 207 statuses can be configured in the Status List.

Table 25-10 Status List

Configuration	Description
Status	The Status number can be configured. The Status Number can be configured by using a number between 1 and 207.
Status Name	The Status number can be configured. It is not easy to recognize the meaning of a status only by viewing a status number. In this case, a user can link the status number to a short message; hence, it can be easily understood. A maximum of 16 characters can be configured. If the status number is configured in the Status List, the Status Name appears when the transceiver receives a Status Message. If the transceiver receives a status that is not configured in the Status List, the status number appears on the transceiver display.
Transmit Inhibit	The transmission to the receiving party can be enabled or disabled. The status for which “Yes” is configured for Transmit Inhibit does not appear on the Status selection display in Status Mode. In this case, a user cannot select a status for which “Yes” is configured for Transmit Inhibit in Status Mode.
Alert Tone	A user can configure the type of the tone that sounds from the transceiver when the transceiver receives a status number which is configured in the Status List.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status List (Edit > NXDN > NXDN 2 > Status List)

25.11.4 Special Status

Special Status is a function used to prevent a user from sending the status number 226 erroneously.

Status 226 is a status to disable Emergency Mode.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Special Status (Edit > NXDN > NXDN 1 > General 1)

25.11.5 Status Message Stack

Status Message Stack is the function to store a Status Message in the stack memory. A maximum of 15 Status Messages can be stored in the stack memory.

If a message is stored, the " " icon blinks. In this case, a user can read the stored Status Message if the transceiver enters Stack Mode. (Refer to: 25.14 Stack on page 277)

Note:

- A maximum of 15 messages (Status Message and Short Message) can be stored in the stack memory.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

25.11.6 Status Message on Data Zone-CH/GID

Status Message on Data Zone-CH/GID is a function that allows the transceiver to automatically change the channel to Data Zone-channel or GID to send a Status Message in an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for Data Zone-CH/GID (NXDN) to send the Status Message. The transceiver restores the last used Zone-channel or GID when the transmission ends. Status Message on Data Zone-CH/GID can be used to send data on a specific channel.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message on Data Zone-CH/GID to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional)
- Configuring the Data Zone-CH/GID (NXDN) (Edit > Zone Information (Conventional Group) > Zone Edit)

25.11.7 Status Message Serial Output

Status Message Serial Output allows the transceiver to send the Status and the Unit ID of the transmitting transceiver from the transceiver's communication port when the transceiver receives a Status Message.

Using Status Message Serial Output, the dispatcher can monitor the received Status Message in real time.

Note: Data must be assigned to the communication port of the transceiver if using Status Message Serial Output.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Message Serial Output to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

25.11.8 Power-on Status Message

Power-on Status Message allows the transceiver to send the selected Status Message when the transceiver is turned ON.

Using the Power-on Status Message, the base station can recognize that the transceiver has been turned ON. The transceiver sends the message to the ID configured for Base ID.

Note: In an NXDN Trunking system, the transceiver aborts the transmission without retransmitting Power-on Status if the transceiver fails to transmit Power-on Status.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-on Status Message (Edit > NXDN > NXDN 2 > Status)

25.11.9 Power-off Status Message

Power-off Status Message allows the transceiver to send the selected Status Message when the transceiver is turned OFF.

Using the Power-off Status Message, the base station can recognize that the transceiver has been turned OFF. The transceiver sends the message to the ID configured for Base ID.

Note:

- In an NXDN Trunking system, the transceiver aborts the transmission without retransmitting Power-off Status if the transceiver fails to transmit Power-off Status.
- In an NXDN Trunking system, the transceiver does not transmit Power-off Status if the transceiver cannot acquire the control channel when the transceiver is turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Power-off Status Message (Edit > NXDN > NXDN 2 > Status)

25.11.10 Base ID

Base ID is the target transceiver's ID used to send GPS data or Transparent data and the following Status Messages and Short Messages.

- AUX Input Status Message (Mobile only)
- Power-on Status Message
- Power-off Status Message
- A Status Message that is sent by selecting a status number or directly entering a status number after the transceiver enters Status Mode by a user pressing the **Status (FleetSync/NXDN)** key or the **[0]** to **[9]** keys on the microphone keypad
- A Status Message that is sent by a user pressing the **Call** key
- A Short Message that is sent by entering a text string after the transceiver enters Short Message Mode by a user pressing the **SDM (FleetSync/ NXDN)** key or the **[0]** to **[9]** keys on the microphone keypad

Base ID can be configured using KPG-141D/ KPG-141DN. Either Unit ID or Group ID can be configured. ID of the base station that manages operations is normally configured for Base ID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Base ID Type (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Base ID (Edit > NXDN > NXDN 1 > General 1)

25.11.11 Emergency Status Response

Emergency Status Response is the function that is used to notify a user of that the transceiver has received an Emergency Status.

Emergency Status Response functions by the following Emergency Statuses.

Table 25-11 Emergency Status

Status	Factor That Activated Emergency
224	Emergency key
Emergency port (AUX Input)	
225	Man-down Detection
227	Stationary Detection
228	Motion Detection
229	Lone Worker

Emergency Status Response can be configured by using KPG-141D/ KPG-141DN.

Table 25-12 Emergency Status Response

Emergency Status Response	Description
None	The transceiver functions in the same manner as when receiving a normal status.
Alert	The Alert Tone configured for Emergency Response sounds from the transceiver when receiving an Emergency Status.
Horn*1	The Alert Tone configured for Emergency Response sounds and the Horn Alert port is activated upon receipt of an Emergency Status.

*1 Mobile only

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Status Response (Edit > NXDN > NXDN 1 > General 1)

25.11.12 AUX Input Status Message (Mobile Only)

AUX Input Status Message can be used to send the specified Status Message when the AUX Input port goes high level to low level or goes low level to high level.

The transceiver can send a Status Message when a sensor is attached to the AUX Input port and the status of the AUX Input port changes. The target ID is the ID configured for the Base ID. (Refer to: 25.11.10 Base ID on page 270)

To use this function, AUX Input Status Message must be assigned to one of AUX Input ports.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the AUX Input Status Message (Edit > NXDN > NXDN 2 > Status)
- Assigning functions to the AUX Input port (Edit > Extended Function > AUX)

25.11.13 AUX Output Status Message (Mobile Only)

AUX Output Status Message is the function to switch the status of the AUX Output port from high to low or from low to high when the transceiver receives the specified Status Message. This function can be used to remotely turn the external device On or Off.

To use this function, AUX Output Status Message must be assigned to one of AUX Output ports.

Note: State Hold Timer (Active Low) allows to configure the length of time that the AUX Output Status Message ports remain at the low level after these ports go low level. (Refer to: 29.4 State Hold Timer (Active Low) on page 358)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the AUX Output Status Message (Edit > NXDN > NXDN 2 > Status)
- Assigning functions to the AUX Output port (Edit > Extended Function > AUX)

25.12 Short Data Call

Short Data Call can be used to send and receive a maximum of 100 characters (Short Message).

Using this function, a dispatcher can reliably send text messages to the target party.

25.12.1 Sending a Short Message

This section describes how to send a Short Message.

The transceiver sends a Short Message by one of the following operations.

- **PC Command**

  “Data” or “Data + GPS Data Output” can be assigned to the communication port on the transceiver. The transceiver will send a Short Message when a PC sends a command to the transceiver communication port specifying to send a Short Message. (Refer to: 6 COMMUNICATION PORTS on page 81)

- **Short Message Mode**

  The transceiver enters Short Message Mode and sends a Short Message by one of the following operations.

  - **SDM (FleetSync/NXDN), Individual + SDM (NXDN) or Group + SDM (NXDN) Key**

    Pressing the **SDM (FleetSync/NXDN)** key places the transceiver in Short Message Mode. In this case, a Short Message is addressed to a Base ID.

    Pressing the **Individual + SDM (NXDN)** key places the transceiver in Individual Call Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Unit ID places the transceiver in Short Message Mode.

    The transceiver’s behavior when the **Group + SDM (NXDN)** key is pressed varies depending on the system.

    In an NXDN Conventional system:

    The transceiver enters Group Call Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Group ID places the transceiver in Short Message Mode.

    In an NXDN Trunking system:

    The transceiver enters Short Message Mode. The target transceiver’s Group ID must be selected before entering Short Message Mode.

- **Keypad Entry**

  If “SDM (FleetSync/NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the transceiver keypad causes the transceiver to enter Short Message Mode. The transceiver will be on hold as the first digit of the Short Message is entered. In this case, a Short Message is addressed to a Base ID.

  If “Individual + SDM (NXDN)” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad causes the transceiver to enter Individual Call Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Unit ID places the transceiver in Short Message Mode.

  The transceiver’s behavior varies depending on the system while “Group + SDM (NXDN)” is configured for Keypad Operation.

  In an NXDN Conventional system:

  Pressing the **[0]** to **[9]** keys on the transceiver keypad places the transceiver in Group Call Mode. Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Group ID places the transceiver in Short Message Mode.

  In an NXDN Trunking system:

  Pressing the **[0]** to **[9]** keys on the transceiver keypad places the transceiver in Short Message Mode. The target transceiver’s Group ID must be selected before entering Short Message Mode.

Note:

- For Portable (without LCD/ without Key), a Short Message cannot be sent by using Short Message Mode.
- Refer to the instruction for each call in NXDN for operation in Individual Call Mode or Group Call Mode.

■ Operating the Transceiver

1. Select one of the following operations to place the transceiver in Short Message Mode.

   - **Pressing the SDM (FleetSync/NXDN) key**
     The transceiver enters Short Message Mode. In this case, a Short Message is addressed to a Base ID.
   - **Pressing the Individual + SDM (NXDN) key**
     Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Unit ID places the transceiver in Short Message Mode.
   - **Pressing the Group + SDM (NXDN) key (NXDN Conventional System)**
     Pressing the **[S]** or **[*]** key after a user selects the target transceiver’s Group ID places the transceiver in Short Message Mode.
   - **Pressing the Group + SDM (NXDN) key after a user selects the target transceiver’s Group ID (NXDN Trunking System)**
     The transceiver enters Short Message Mode.

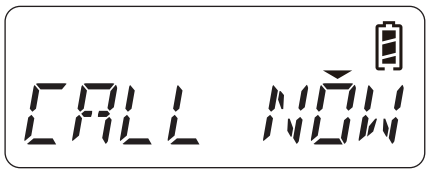
Portable

Mobile

Or, the transceiver enters Short Message Mode by a user using a keypad. In this case, the following operations are identical.

2. Enter a Short Message.

   A maximum of 100 characters can be entered. Refer to 5.16.3 Entering or Clearing Characters on page 55 for entry methods.

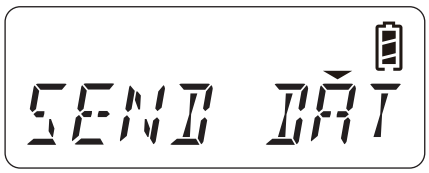


Portable

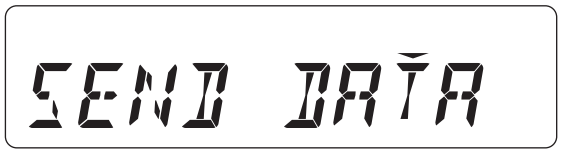
Mobile

3. Press the **Side 2** key (Portable), the **Square** key (Mobile), or the **PTT** switch.

   The transceiver sends the Short Message.

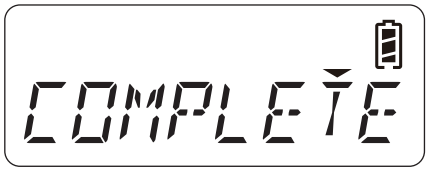


Portable



Mobile

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.



Portable

Mobile

Note: Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

25.12.2 Receiving a Short Message

Upon the receipt of a Short Message, the received Short Message appears on the main display, and the transceiver can send the Short Message to an external device from the communication ports.

Table 25-13 Receiving a Short Message

Short Message	Description
Display	The received Short Message appears on the transceiver main display. If "Fixed" is configured for Message Display Type, only Short Message appears. The received Short Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if "Alternate" is configured for Message Display Type.
Alert Tone	Alert Tone sounds upon receipt of a Short Message.
PC Command	The transceiver sends the received Short Message using a serial command. This message is sent to an external device that is connected to the transceiver, such as a PC. (Refer to: 25.12.5 Short Message Serial Output on page 275)

Note:

- To use serial communications, a user must prepare NXDN compatible software or external devices.
- A maximum of 15 received Short Message along with Short Messages can be stored in the stack memory of the transceiver. (Refer to: 25.14 Stack on page 277)

■ Transceiver Behavior

1. The transceiver starts receiving a Short Message.

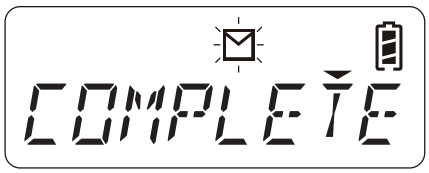
   "RECV DAT" (Portable) or "RECV DATA" (Mobile) appears.

Portable

Mobile

2. The transceiver receives a Short Message.

   "COMPLETE" appears on the main display.



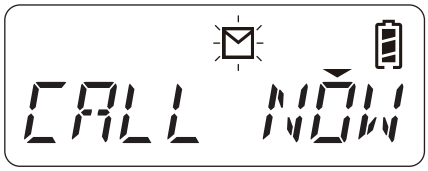
Portable

Mobile

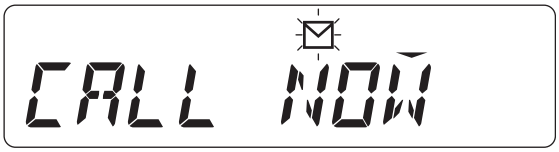
The Alert Tone (Status/ Short Message Call) sounds from the transceiver and then the Short Message will appear. If the Short Message exceeds the number of displayable digits, the message text is displayed while being scrolled from right to left.

The received Short Message appears on the main display for 3 seconds and ID Name appears for 2 seconds alternately if "Alternate" is configured for Message Display Type.

Short Message Display (3 seconds)

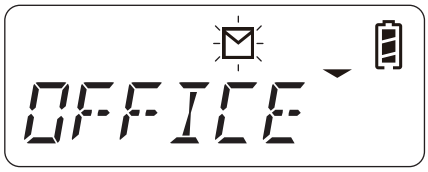


Portable



Mobile

ID Name Display (2 seconds)



Portable

Mobile

Note: If the transceiver receives a Short Message by a Group Call, the ID Name appears according to the configuration for Group Call Display Type configuration.
(Refer to: 25.4.3 Group Call Display Type on page 237
25.9.4 Group Call Display Type on page 260)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > NXDN > NXDN 1 > General 1)

25.12.3 Short Message Stack

Short Message Stack is used to store a Short Message in the stack memory. A maximum of 15 Short Messages can be stored in the stack memory.

If a message is stored, the " " icon blinks. In this case, a user can read the stored Short Message when the transceiver enters Stack Mode. (Refer to: 25.14 Stack on page 277)

Note:

- A maximum of 15 messages (Status Message and Short Message) can be stored in the stack memory.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message Stack (Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

25.12.4 Short Message on Data Zone-CH/GID

Short Message on Data Zone-CH/GID is a function that allows the transceiver to automatically change the channel to Data Zone-channel or GID to send a Short Message in an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for Data Zone-CH/GID (NXDN) to send the Short Message. The transceiver restores the last Zone-channel or GID when the transmission ends. Short Message on Data Zone-CH/GID is used to support data communications on a specific dedicated channel.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message on Data Zone-CH/GID to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional)
- Configuring the Data Zone-CH/GID (NXDN) (Edit > Zone Information (Conventional Group) > Zone Edit)

25.12.5 Short Message Serial Output

Short Message Serial Output allows the transceiver to send a Short Message and the Unit ID of the transmitting transceiver from the transceiver's communication port when the transceiver receives a Short Message.

Using Short Message Serial Output, the dispatcher can monitor received Short Messages in real time.

Note: In order to use Short Message Serial Output, "Data" or "Data + GPS Data Output" must be assigned to the communication port of the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Short Message Serial Output to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

25.13 Long Data Call

Long Data Call can be used to send and receive a maximum of 4,096 characters (Long Message).

Using this function, information can reliably be sent to the target party.

Note: To send a Long Message, "Data" or "Data + GPS Data Output" must be configured for the communication port of the transceiver. (Refer to: 6 COMMUNICATION PORTS on page 81)

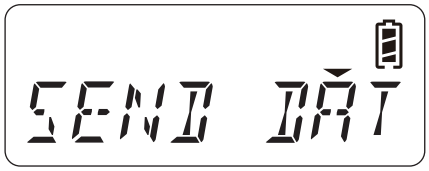
25.13.1 Sending a Long Message

A Long Message is sent via a PC. A Long Message cannot be sent from the transceiver.

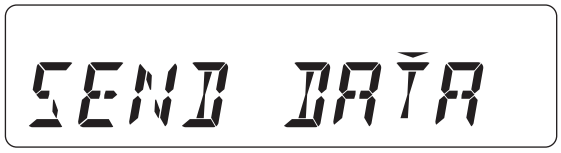
■ Transceiver Behavior

1. A PC sends the PC command to the transceiver to request transmission of a Long Message.

   The transceiver starts sending the Long Message.

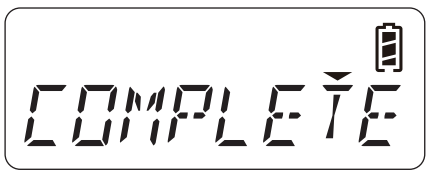


Portable



Mobile

If the Long Message is properly sent to the receiving transceiver, "COMPLETE" appears.



Portable

Mobile

Note: Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

25.13.2 Receiving a Long Message

The received Long Message data can be transferred via a PC or external device.

Note: To use serial communications, a user must prepare NXDN compatible software or external devices.

■ Transceiver Behavior

1. The transceiver starts receiving a Long Message.

   "RECV DAT" (Portable) or "RECV DATA" (Mobile) appears.

Portable

Mobile

2. The transceiver receives a Long Message.

   "COMPLETE" appears on the main display.

Portable

Mobile

3. The transceiver restores the previous display.

   The received Long Message is transferred to the PC with the serial output.

25.13.3 Long Message on Data Zone-CH/GID

Long Message on Data Zone-CH/GID is a function that allows the transceiver to automatically change the channel to Data Zone-channel or GID to send a Long Message in an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for Data Zone-CH/GID (NXDN) to send the Long Message. The transceiver restores the last Zone-channel or GID when the transmission ends. Long Message on Data Zone-CH/GID allows the transceiver to send data on a specific dedicated channel.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Long Message on Data Zone-CH/GID to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional)
- Configuring the Data Zone-CH/GID (NXDN) (Edit > Zone Information (Conventional Group) > Zone Edit)

25.14 Stack

The received Caller ID, Status Message, and Short Message can be stored in the stack memory. The stored Caller ID or message can be confirmed or deleted by placing the transceiver in Stack Mode.

The "✉" icon appears if messages are stored in the transceiver. If there is an unread message, the "✉" icon blinks.

Pressing the **Stack** key causes the transceiver to enter Stack Mode.

Refer to 16.6 Stack on page 163 for transceiver operation and Stack functions.

Note:

- If the **PTT** switch is pressed while a Caller ID appears, the transceiver can respond to the Caller ID. If "Analog" is configured for Transmit Mode of the channel to be used for transmission, a Warning Tone A sounds from the transceiver by a user pressing the **PTT** switch, and the transceiver cannot respond.
- If the transceiver receives a Group Call from a telephone, "PHONE" (Portable) or "PHONE CALL" (Mobile) appears on the main display, and the received Caller ID will be stored in the stack memory of the transceiver.
- The transceiver cannot call to the Caller ID that is stored upon receipt of a Group Call from a telephone.

25.14.1 Clear Caller ID Stack on Reply

Clear Caller ID Stack on Reply is the function to clear a Caller ID stored in the stack memory of the transceiver at the same time as when the transceiver initiates a call by selecting the Caller ID in the stack memory.

This function can be used when a user does not wish to keep a Caller ID in the stack memory of the transceiver after the user uses the Caller ID.

With this function enabled, a Caller ID can be cleared from the stack memory of the transceiver when the transceiver initiates a call by selecting the Caller ID stored in the stack memory. If the transceiver receives a response from the called party, the Caller ID will not be stored in the stack memory while Mode Reset Timer is counting down.

Although the other party's Caller ID will be stored in the stack memory upon receipt of a call, if the transceiver responds while Auto Reset Timer is counting down, the Caller ID will be cleared from the stack memory at that point. After that, if the transceiver receives a call from the same party while Auto Reset Timer is counting down, the Caller ID will not be stored in the stack memory.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Clear Caller ID Stack on Reply to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.15 Mixed Mode

Mixed Mode can be used to wait for a call in both digital and analog modes in a Conventional Group.

The channel used in analog mode can also be used in digital mode, hence the transceiver can easily migrate from analog mode to digital mode.

The following is the transceiver behavior for transmission and reception on a channel where "Mixed" is configured for Channel Type:

Table 25-14 Mixed Mode 1

Reception	Mixed Mode can be used to wait for a call in both digital (RAN code) and analog (QT tone frequency and DQT code) modes. The transceiver unmutes the speaker if the received signaling (QT tone frequency, DQT code or RAN code) matches the signaling preconfigured for the transceiver (QT tone frequency, DQT code or RAN code).
Transmission	The transceiver transmits in the mode (Analog or NXDN) configured for Transmit Mode. In the case that the received signaling (QT tone frequency, DQT code or RAN code) matches the signaling (QT tone frequency, DQT code or RAN code) configured for the transceiver, the transceiver can transmit in the same mode that the transceiver received the signal regardless of the configuration for Transmit Mode before the amount of time configured for Signaling Reset Timer elapses (except if the transceiver is doing data communications). If the received Optional Signaling (DTMF, 2-tone, FleetSync, or NXDN ID) matches the Optional Signaling preconfigured for the transceiver, the transceiver can transmit in the same mode as the mode of the received signal regardless of the configuration for Transmit Mode before the amount of time configured for Auto Reset Timer elapses. The transceiver can also transmit in the same mode that the transceiver received the signal regardless of the configuration for Transmit Mode while doing data communications as well.

The following is the difference in operation for transmissions depending on transceiver configuration and received signal.

Table 25-15 Mixed Mode 2

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Disabled	Analog	Digital	The transceiver can transmit using the RAN code configured in the transceiver until the amount of time configured for Signaling Reset Timer elapses.
Disabled	Analog	Analog	The transceiver can transmit using the QT tone frequency or DQT code configured in the transceiver.

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Disabled	NXDN	Digital	The transceiver can transmit using the RAN code configured for the transceiver.
Disabled	NXDN	Analog	The transceiver can transmit using the QT tone frequency or DQT code preconfigured in the transceiver until the time configured for Signaling Reset Timer elapses.
Enabled	Analog	Digital	The transceiver can transmit using the RAN code configured in the transceiver and specifying the received ID until the amount of time configured for Auto Reset Timer elapses.
Enabled	Analog	Analog	The transceiver can transmit using the QT tone frequency or DQT code configured in the transceiver and specifying the received ID. However, ID can be specified only if the transceiver receives the FleetSync signaling. The transceiver can transmit using only QT tone frequency or DQT code configured in the transceiver if the transceiver receives DTMF or 2-tone.
Enabled	NXDN	Digital	The transceiver can transmit using the RAN code configured in the transceiver and specifying the received ID.
Enabled	NXDN	Analog	The transceiver can transmit using the QT tone frequency or DQT code configured in the transceiver and specifying the received ID until the amount of time configured for Auto Reset Timer elapses. However, ID can be specified only if the transceiver receives the FleetSync signaling. The transceiver can transmit using only QT tone frequency or DQT code configured for the transceiver if the transceiver receives DTMF or 2-tone code.

Note:

- Conditions to unmute the speaker vary depending on the configuration for Audio Control. (Refer to: 12.4 Audio Control on page 106)
- The transceiver transmits according to the configuration for Transmit Mode while the transceiver is in Emergency Mode.
- If the transceiver receives the FleetSync data, the transceiver will send the acknowledgment in analog mode. If the transceiver receives the NXDN data, the transceiver will send the acknowledgment in digital mode. The transceiver transmits according to the configuration for Transmit Mode after the transceiver completes data communications regardless of the configuration for Signaling Reset Timer or Auto Reset Timer.
- In FleetSync data communications, if the transceiver receives data by means of a call other than Individual Call, namely Fleet Call, Group Call, Supervisor Call, or Broadcast Call, the transceiver transmits in analog mode while the speaker opens during the length of time from when the transceiver receives data until the time configured for Signaling Reset Timer elapses regardless of the configuration for Transmit Mode.
- If “OFF” is configured for Signaling Reset Timer, the transceiver retains the status of transmitting in the same mode as the received signal. This status will be reset by an operation such as changing a channel.
- If “0” is configured for Signaling Reset Timer, the transceiver transmits in the mode configured for the Transmit Mode regardless of the received signal.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Channel Type and Transmit Mode (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the Signaling Reset Timer (Edit > Optional Features > Optional Features 1 > Common Page 1)

25.16 Late Entry

Late Entry allows the transceiver to participate in on-going voice calls using Group Call even if the transceiver receives a voice call midway through the call.

Operations vary as below depending on the system operating the transceiver.

■ NXDN Conventional System

In an NXDN Conventional system, a transceiver can participate in on-going voice calls by decoding control data that is always sent along with audio data even if the transceiver receives a voice call midway through the call.

Late Entry functions all the time in an NXDN Conventional system.

■ NXDN Trunking System

In an NXDN Trunking system, the transmitting transceiver sends a communication request on the control channel, and the transceiver will migrate to the specified traffic channel to communicate. A transceiver that is turned ON after the traffic channel assignment is completed or a transceiver that migrated from another site cannot participate in the on-going communications because they have not received the traffic channel assignment message. In this case, the transceiver can participate in on-going communications by receiving the traffic channel assignment message that is periodically sent from the system on the control channel.

In an NXDN Trunking system, whether or not Late Entry functions depends on the configuration on the system. If Late Entry is permitted on the system, the transceiver can participate in on-going voice calls midway through the calls by receiving the traffic channel assignment message. If Late Entry is not permitted on the system, the transceiver cannot participate in on-going voice calls midway through the calls.

25.17 Priority Monitor ID

Priority Monitor ID is the ID that the transceiver preferentially receives when the transceiver is making voice calls using Group Call on a radio communication channel in an NXDN Trunking system. When the transceiver receives the Priority Monitor ID, the transceiver will change the mode to that of the call.

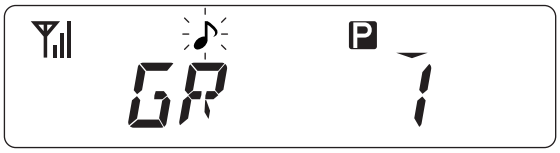
4 Priority Monitor IDs can be configured in a zone using KPG-141D/ KPG-141DN.

■ Transceiver Behavior

1. The transceiver receives the Priority Monitor ID while the transceiver is making voice calls using Group Call on the radio control channel.

   The "P" icon appears, and an Alert Tone (Conference Group Call or Broadcast Group Call) sounds from the transceiver. The transceiver will start communicating using Priority Monitor ID.

Portable



Mobile

   The transceiver can respond to the received Group ID by a user pressing the **PTT** switch. Pressing a key other than the **PTT** switch activates the assigned function. However, functions that can be used are limited. When an invalid key is pressed, the Key Beep B sounds, and then the display will restore to normal state. Refer to 4.7 Mode Reset Timer on page 33 for available functions.

Note:

- This function is applicable only if the transceiver is making voice calls using a Group Call. This function is not applicable to data communications.
- While a Group Call is being received using a Group ID except for the Group ID configured for Priority Monitor ID, a Group Call can be received only with a Priority Monitor ID. While receiving a Group Call using a Priority Monitor ID, only a Group Call with Priority Monitor ID having higher priority can be received.
- Therefore, the transceiver cannot migrate to another traffic channel even though the communication starts on another radio communication channel.

- If a Group ID is configured for Priority Monitor ID, the transceiver can receive while scan temporarily pauses.
- During the scan, only the Priority Monitor ID configured for the selected zone is used as a Priority Monitor ID.

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Priority Monitor ID (Edit > Zone Information (NXDN Trunking System) > Zone Edit > Priority Monitor ID)

25.18 GPS

GPS is a function for data communications which allows sending of location data of a mobile station to a base station or transferring of location data which is received by the base station to a PC as a serial command.

A GPS receiver unit compatible with the NMEA-0183 standard is required and it must be connected to the communication port of the transceiver (mobile station) to send GPS data. Mobile has a built-in GPS receiver unit.

A PC with the mapping application installed must be connected to the communication port of the transceiver (base station) to receive GPS data and translate the received GPS data for use on a map.

The position of each transceiver appears on the PC display. This function is convenient for dispatch control or a traffic control system.

Refer to 22 GPS POSITION DISPLAY on page 215 for instructions for showing position information on the main display of the vehicle station's transceiver.

The following are methods available to send the GPS data:

Auto

The transceiver sends the GPS data at the intervals configured for GPS Report Interval.

Poll

The transceiver sends the GPS data when the transceiver receives a transmission request from the base station.

Manual

Pressing the **Send the GPS Data** key causes the transceiver to send GPS data.

Voice Call

The transceiver sends the GPS data linked with voice calls.

Status

The transceiver sends the GPS data linked with a Status Message.

Emergency

The transceiver sends the GPS data linked with an Emergency Call.

Note:

- For the transceiver sending the GPS data, “GPS” must be assigned to the communication port to which the GPS receiver unit is connected. (Refer to: 6 COMMUNICATION PORTS on page 81)
- To use the built-in GPS receiver unit in Mobile, Built-in GPS Receiver must be enabled when the data is configured by using KPG-141D/ KPG-141DN. In this case, the COM port setting is not required.
- For the transceiver receiving GPS data, “Data + GPS Data Output” must be assigned to the communication port to which a PC with the mapping application installed must be connected. (Refer to: 6 COMMUNICATION PORTS on page 81)

25.18.1 Base ID

Base ID is the ID of the target transceiver used for sending GPS data.

By using KPG-141D/ KPG-141DN, ether Unit ID or Group ID can be configured as Base ID. The ID of the base station which is responsible for operation and administration of system is normally configured for Base ID.

GPS data will be sent to the ID configured in the **Base ID (GPS)** edit box in the **NXDN** window > **GPS** tab. If no Base ID (GPS) is configured, the GPS data is sent to the ID configured in the **Base ID** edit box in the **NXDN** window > **General 1** tab.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Base ID (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Base ID Type (Edit > NXDN > NXDN 1 > General 1)
- Configuring the Base ID (GPS) (Edit > NXDN > NXDN 2 > GPS)
- Configuring the Base ID Type (GPS) (Edit > NXDN > NXDN 2 > GPS)

25.18.2 GPS Combination

GPS Combination is the timing to send GPS data.

GPS data can be added to a signal when the transceiver is in Voice Call, Status, or Emergency Mode.

GPS Combination can be configured using KPG-141D/ KPG-141DN.

- **Voice Call**

  The transceiver sends GPS data by adding the GPS data to a signal while making voice calls.

- **Status**

  The transceiver adds GPS data on the NXDN Status Message and sends it. The range of status numbers to which GPS data will be added can be configured.

- **Emergency**

  The transceiver adds GPS data on the Emergency Status (Status 224 and Status 225) and sends it.

Note: The GPS data added to a signal is sent to the ID configured for Base ID Type and Base ID. To allow the receiving transceiver to receive GPS combination data, the receiving transceiver must receive a call from the transmitting transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Combination (Edit > NXDN > NXDN 2 > GPS > GPS Combination)

25.18.3 GPS Report Mode

GPS Report Mode can be used to transmit the GPS data automatically or transmit after receiving the request command.

Table 25-16 GPS Report Mode

GPS Report Mode	Function
Poll	The transceiver sends the GPS data when the GPS data transmission request is received from the base station. This function is used when the base station controls the timing to send the GPS data. This function is useful for avoiding transmit collisions if there are many subscriber units. The transceiver sends the GPS data to the ID configured for Base ID, not to the ID that sent the data transmission request.
Auto	The transceiver sends the GPS data at the intervals configured for GPS Report Interval Time. This function is useful for controlling or monitoring vehicles on a time axis basis as the transceiver periodically sends the position data to the base station. The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if Auto is configured.

Note: If the transceiver is under the following conditions, GPS data transmission using Auto will be canceled. To avoid a collision with a GPS transmission from other transceivers while sending GPS data, Transmit Busy Wait Time will not suspend the transmission. (Refer to: 25.35.9 Transmit Busy Wait Time on page 330)

- While the transceiver is transmitting.[*1]
- While the transceiver is in busy state
- While the transceiver unmutes the speaker
- While the Public Address function is used (Mobile only)
- If Transmit Frequency or Encode ID is not configured
- If transmission is disabled by the Time-out Timer
- While the transceiver is sending or receiving the NXDN data
- While the transceiver is doing the handshake

- Auto Telephone Mode
- System Search Mode
- Transceiver Password Mode
- Emergency Mode
- Failsoft Mode
- While the transceiver is waiting to send the Transpond code
- Control channel for Mixed Mode
- While the transceiver is outside of the communication area (Out Of Range)

*1 However, since Data with Voice is activated while the voice data is sent, the transmission of GPS data will not be canceled. (Mobile only)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Mode (Edit > Optional Features > Optional Features 2 > GPS)

25.18.4 Number of Times

Number of Times allows the transceiver to automatically send GPS data for the configured number of times if “Poll” is configured for GPS Report Mode.

The transceiver sends GPS data for the number of configured times at the intervals configured for GPS Report Interval.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Number of Times (Edit > Optional Features > Optional Features 2 > GPS)

25.18.5 GPS Report Interval Time (Portable/Ignition On)

GPS Report Interval Time allows the transceiver to send GPS data at the regular intervals if “Auto” is configured for GPS Report Mode.

GPS Report Interval (Portable/Ignition On) is the interval to send the GPS data while the vehicle’s engine is running. In order to automatically transmit GPS data in Portable, this configuration is used.

Note:

- GPS Report Interval Time can be used to configure the trigger cycle to start transmitting GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the conditions at the transmitting transceiver.
- The GPS data is multiplexed into audio data and sends both data without pausing voice communications even if the transceiver automatically sends GPS data during the voice communications. However, if the amount of time configured using GPS Report Interval Time (Portable/Ignition On) is short (less than 10 seconds), note that sound quality may be degraded.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Interval (Portable/ Ignition On) (Edit > Optional Features > Optional Features 2 > GPS > GPS Report Interval Time)

25.18.6 GPS Report Interval Time (Ignition Off) (Mobile Only)

GPS Report Interval Time allows the transceiver to send GPS data at the regular intervals if “Auto” is configured for GPS Report Mode.

GPS Report Interval (Ignition Off) is the interval to send GPS data while the vehicle is parked. Also, this configuration is used even if an ignition of a vehicle is not used.

Note:

- GPS Report Interval Time can be used to configure the trigger cycle to start transmitting GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the conditions at the transmitting transceiver.
- The GPS data is multiplexed into audio data and sends both data without pausing voice communications even if the transceiver automatically sends GPS data during the voice communications. However, if the amount of time configured using GPS Report Interval Time (Portable/Ignition On or Ignition Off) is short (less than 10 seconds), note that sound quality may be degraded.

■ Configuration Using KPG-141D/ KPG-141DN

- GPS Report Interval (Ignition Off) (Edit > Optional Features > Optional Features 2 > GPS > GPS Report Interval Time)

25.18.7GPS Time Mark

GPS Time Mark is the offset time from UTC (Coordinated Universal Time) to send the GPS data.

This function is useful for avoiding transmit collisions if there are many transceivers that send GPS data.

Configuring a different timing for each transceiver allows each transceiver to send GPS data with different timing. This allows a user to avoid transmit collisions.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Time Mark (Edit > Optional Features > Optional Features 2 > GPS)

25.18.8 GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 25-17 GPS Message Type

GPS Message Type	Operation
Full	The message to be sent is the GPS data corresponding to $GPGGA, $GPRMC and $GPGLL.
Short	The message to be sent is the GPS data corresponding to $GPGLL. When the base station receives this GPS data, a part of the data is sent as blank data even if $GPGGA and $GPRMC are configured for PC serial output at Base Station Setting.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Message Type (Edit > Optional Features > Optional Features 2 > GPS)

25.18.9 GPS Report on Data Zone-CH/GID

GPS Report on Data Zone-CH/GID allows the transceiver to automatically change the channel to a Data Zone-channel or GID to send the GPS data.

The transceiver automatically changes the channel to Data Zone-channel or GID to send the GPS data. The transceiver will restore the last Zone-channel or GID when the transmission ends. GPS Report on Data Zone-CH/GID can be used to send data using a specific dedicated channel.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report on Data Zone-CH/GID to be enabled or disabled (Edit > Optional Features > Optional Features 2 > GPS)

25.18.10 Map Header

Whether to send data to the mapping application when the transceiver receives the GPS data from the mobile station can be configured.

The following are the type of data that can be sent to the mapping application:

Table 25-18 Map Header

Data	Description
$GPGGA (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPGGA data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$GPGLL (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPGLL data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$GPRMC (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the $GPRMC data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
$PKNDS (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKNDS data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The $PKNDS data contains the $GPRMC data in the NMEA-0183 format, Unit ID, and the status information.
$PKNID (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKNID data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The transceiver at the base station extracts only Unit ID and the status information from the received GPS data and sends the extracted data from the communication port of the repeater. This sentence is recommended to be used along with $GPGGA (NMEA), $GPGLL (NMEA) or $GPRMC (NMEA). For example, if $GPGGA (NMEA) and $PKNID are used simultaneously, the transceiver at the base station sends from the communication port of the repeater the $GPGGA data in addition to the Unit ID and the status information extracted from the GPS data.
$PKNSH (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the $PKNSH data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The $PKNSH data contains the $GPGLL data in the NMEA-0183 format and the Unit ID. In order to send GPS data in Emergency Mode or by pressing the **PTT** switch, this sentence is used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Map Header (Edit > Optional Features > Optional Features 2 > GPS > Base Station Settings)

25.18.11 Data with Voice

Data with Voice can be used to multiplex GPS data on audio data while the transceiver is being used for voice communications.

If the timing of automatic audio data transmission coincides that of GPS data configured for GPS Report Internal Time, the transceiver multiplex GPS data on audio data while the transceiver is sending audio data.

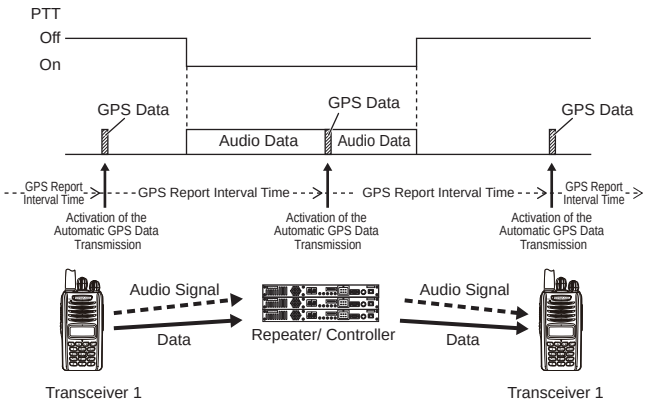


Figure 25-4 Data with Voice

Note:

- If the transceiver is being used for voice communications and receives GPS data, LCD, LED and Alert Tone will function according to the configurations for voice calls.
- On a channel for which “Very Narrow” is configured for Channel Spacing, remind that the sound quality may be degraded if amount of time configured for GPS Report Interval Time is too short.

25.18.12 GPS Data Zone-Channel (NXDN Trunking System Only)

GPS Data Zone-Channel is the zone and channel in a Conventional Group that is used for sending GPS data in an NXDN Trunking system. To use the GPS Data Zone-Channel, “Conventional Channel” needs to be configured for GPS Report Channel Type.

If “Conventional Channel” has been configured for GPS Report Channel Type, the transceiver automatically migrates to the GPS Data Zone-Channel corresponding to the current site so as to send the GPS data at the time of sending GPS data. After sending the GPS data, the transceiver reverts to the previous GID in an NXDN Trunking system.

Also, only a channel on an NXDN Conventional system can be configured for GPS Data Zone-Channel.

■ GPS Report CH Type

GPS Report Channel Type is the channel type that is used by the transceiver to automatically send the GPS data including polling in an NXDN Trunking system.

The transceiver can use a control channel, a traffic channel, or a channel in an NXDN Conventional system to automatically send the GPS data including polling.

The transceiver behaves as follows depending on the configuration for GPS Report Channel Type.

Table 25-19 Configuration for GPS Report Channel Type

Configuration	Description
Control Channel	The GPS data is automatically is sent on a control channel in the current site including polling.
Traffic Channel	The GPS data is automatically sent on a traffic channel in the current site as a Long Data Message including polling.
Conventional Channel	The GPS data including polling is automatically sent on the zone and channel configured for GPS Data Zone-Channel. The zone and channel corresponding to the current site number are applied. The transceiver automatically migrates to a GPS Data Zone-Channel corresponding to the current site to send the GPS data at the time of sending GPS data.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Data Zone-Channel (Edit > Zone Information (NXDN Trunking System) > Zone Edit > GPS Data Zone-Channel)
- Configuring the GPS Report CH Type (Edit > NXDN > NXDN 1 > Trunking 1)

25.18.13 GPS Report CH/GID

GPS Report CH/GID is the function that allows the transceiver to determine whether to use analog mode or NXDN digital mode for automatic transmission of GPS data including polling on the data zone channel (or GID) in a Conventional Group.

For instance, along with the migration to a digital system, this function can be used when communicating by voice in digital mode; however, still automatic transmission of the GPS data including polling needs to be done in analog mode, etc.

The transceiver behaves as follows depending on the configuration for GPS Report Channel/GID.

Table 25-20 Configuration for GPS Report Channel/GID

Configuration	Description
Selected	If the transmission mode of the current channel is analog mode, GPS data including polling is automatically sent using the data zone channel (or GID) in analog mode. If the transmission mode for the current channel is NXDN digital mode, GPS data including polling is automatically sent using the data zone channel in the NXDN digital mode.
Analog	Regardless of the transmission mode for the current channel, GPS data including polling is automatically sent using the data zone channel (or GID) in analog mode.
NXDN	Regardless of the transmission mode for the current channel, GPS data including polling is automatically sent using the data zone channel in the NXDN digital mode.

Note:

- Configuration for GPS Report Channel/GID does not apply to the transmission of GPS data by means of Send the GPS Data or GPS Combination.
- If a parameter except for “Selected” is selected for GPS Report Channel/GID, GTC Count is automatically disabled even if GTC Count has been configured, and a GTC message cannot be sent.
- Even if any option other than “Selected” is configured for GPS Report CH/GID, when the transceiver receives a polling request, the GPS data is sent in the same behavior as with “Selected” configured, only for the first time. If the GPS data is sent consecutively for the second or later time, the GPS data is automatically sent according to the configuration for GPS Report Channel/GID.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report CH/GID (Edit > Optional Features > Optional Features 2 > GPS)

25.18.14 GPS Report Back to Requested ID

GPS Report Back to Requested ID is the function that enables the receiving transceiver to send the GPS data to the ID of the transceiver, which sends a GPS Polling Request, upon receipt of the following GPS Polling Requests.

- GPS Data Single Polling Request
- GPS Data Multiple Polling Request
- GPS Data Query Request

Table 25-21 Configuring GPS Report Back to Requested ID

Configuration	Description
Enabled	Upon receipt of a GPS Polling Request, the transceiver sends the GPS data to the ID of the transceiver that sent the GPS Polling Request.
Disabled	Upon receipt of a GPS Polling Request, the transceiver sends the GPS data to the ID configured for Base ID (GPS). If no Base ID (GPS) is configured, the GPS data is sent to the ID configured for Base ID.(Refer to: 25.18.1 Base ID on page 281)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Back to Requested ID to be enabled or disabled (Edit > Optional Features > Optional Features 2 > GPS)

25.18.15 GPS ACK Request

GPS ACK Request is the function that allows the base station transceiver to request a mobile station transceiver to send an acknowledgment message when a request message to send GPS data in the NXDN format is sent by the base station transceiver.

Table 25-22 GPS ACK Request

Configuration	Description
Enabled	The base station transceiver requests the mobile station transceiver to send the acknowledgment message when a request message to send GPS data in the NXDN format is placed by the base station transceiver. The mobile station transceiver sends an acknowledgment message and then GPS data upon receipt of a request message for transmitting the GPS data in the NXDN format.
Disabled	The base station transceiver does not request the mobile station transceiver to send the acknowledgment message when a request message to send GPS data in the NXDN format is placed by the base station transceiver. The mobile station transceiver sends the GPS data without sending an acknowledgment message upon receipt of a request message for sending the GPS data in the NXDN format. Sending or receiving no acknowledgment messages results in less communication time and traffics.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the GPS ACK Request to be enabled or disabled (Edit > NXDN > NXDN 2 > GPS)

25.18.16 GPS Report Priority (Over Group Call) (NXDN Trunking System Only)

GPS Report Priority (Over Group Call) is the function that causes the transceiver to stop receiving a Group Call (Transmission Trunked) and to prioritize sending GPS data at the time of automatic transmission of GPS data including polling.

If the transceiver is receiving a Group Call (Transmission Trunked) with this function enabled, the transceiver starts sending the GPS data at the time of automatic transmission of GPS data including polling.

This function can be used to avoid that frequent receipts of a Group Call (Transmission Trunked) prevent the transceiver from performing automatic transmission of GPS data.

Note: This function can be used only if “Transmission Trunked” is configured for Trunking Type. With “Message Trunked (Enhanced)” configured for Trunking Type, the transceiver does not start sending GPS data at the time of automatic transmission of GPS data including polling if the transceiver is receiving a Group Call (Message Trunked (Enhanced)). Also, if the system is being operated using the control channel for Mixed Mode, the transceiver does not start sending GPS data either.

■ **Configuration Using KPG-141D/ KPG-141DN**

- Configuring the GPS Report Priority (Over Group Call) to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.18.17 GPS Report Channel

GPS Report Channel is the function that allows the transceiver to send GPS data by using a GPS data transmission channel.

By using GPS Report Channel, the transceiver can send GPS data without using a control channel at the timing specified in a NEXEDGE system. In this case, the transceiver sends GPS data by using the slot assigned by the GPS Report Channel.

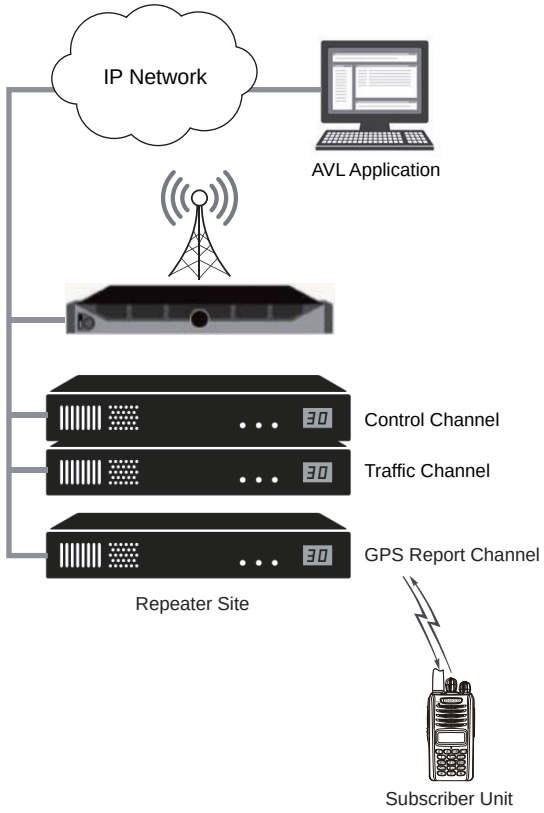


Figure 25-5 Advanced GPS Report Mode

If the transceiver sends GPS data by using the GPS Report Channel, the traffic to the control channel can be reduced.

Also, a transmission interval of the transceiver GPS data can be configured for each UID in the NEXEDGE system. The transceiver used for a purpose of high update rates of GPS data (such as police or emergency services) can be configured and operated with a short GPS data transmission interval and the number of transceivers that can be added can be expanded.

Refer to NEXEDGE 2nd Generation Function Reference “ABOUT GPS” for details.

Note:

- The transceiver behavior of when the transceiver sends GPS data by using the channel for GPS data transmission depends on the system configuration. However, using KPG-141D/ KPG-141DN, the warning display (Advanced GPS Report Error Indicator) and warning tone (Advanced GPS Report Error Tone) of when the channel for GPS data transmission cannot be used because of a problem in the system can be configured for the transceiver.
- The GPS data is sent to the ID configured in Base ID or Base ID (GPS).
- To send the GPS data, Base ID Type or Base ID Type (GPS) needs to be configured for a Unit ID.
- If the transceiver is operated in a system using the channel for GPS data transmission, the transceiver cannot use the following functions even if the functions are configured:
  - GPS Report Mode
  - Number of Times
  - GPS Time Mark
  - GPS Message Type
  - GPS Report Channel Type
  - GPS Report Interval Time
- These functions are disabled while the transceiver is in Emergency Mode.

■ Advanced GPS Report Error Indicator

Advanced GPS Report Error Indicator is the function to display a warning message on the display when the channel for GPS data transmission cannot be used because of a problem in the system, even if GPS Report Channel is enabled.

If this function is enabled, “GPS REPORT ERR” appears on the display of the transceiver for 1 sec when the channel for GPS data transmission cannot be used.

■ Advanced GPS Report Error Tone

Advanced GPS Report Error Tone is the function to emit a warning tone from the transceiver when the channel for GPS data transmission cannot be used because of a problem in the system, even if GPS Report Channel is enabled.

If this function is enabled, a warning tone sounds from the transceiver at 30 sec intervals when the channel for GPS data transmission cannot be used.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GPS Report Channel to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > Advanced GPS Report Mode)
- Configuring the Advanced GPS Report Error Indicator to be enabled or disabled (Edit > Network > Hunt Options)
- Configuring the Advanced GPS Report Error Tone to be enabled or disabled (Edit > Network > Hunt Options)

25.19 Last Control Channel (NXDN Trunking System Only)

Last Control Channel can be used to retain the information for the last-used site when the transceiver is turned OFF while the transceiver is operated in an NXDN Trunking system.

There are two types of operation for the system. Whether the transceiver starts searching for a control channel from the last-used site or from the preferred channel when the transceiver searches for a control channel can be configured depending on the operation mode of the system.

- **If giving preference to always using the site having good signal strength:**

  Since the last-used site normally has high signal strength, it is effective to start searching for a control channel from the last-used site.

- **If giving preference to always using the preconfigured site:**

  The transceiver may register at a site having poor signal strength every time. To avoid this problem, it is effective to always start searching for a preferred channel.

If this function is enabled, the information for the last-used site is retained even if the transceiver is turned OFF. When the transceiver is turned ON again, the transceiver starts searching for a control channel from a control channel in the retained site.

If this function is disabled, the information for the last-used site is not retained after the transceiver is turned OFF. When the transceiver is turned ON again, the transceiver starts searching for a control channel from the control channel configured as a Preferential Hunt Control Channel. Preferential Hunt Control Channel is the channel having the highest priority when searching for a control channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Last Control Channel to be enabled or disabled (Edit > Network > Hunt Options)
- Configuring the Preferential Hunt Control Channel (Edit > Zone Information (NXDN Trunking System) > Zone Edit > Preferential Hunt Control Channel)

25.20 System Search Policy (NXDN Trunking System Only)

System Search Policy is the policy used when the transceiver searches for a system.

Using this function, the transceiver can be configured to start roaming easily in order for a user to select the system having good signal strength. The transceiver can also be configured not to start roaming in order to keep using the system in use as much as possible around the system critical point.

Table 25-23 System Search Policy

System Search Policy	Description
Normal	This is normal configuration considering both roaming and coverage. This configuration is used for normal communications.
Roaming Preferential	This configuration gives higher priority for roaming to maintain communication quality and allows the transceiver to start the system search easily. This configuration is used to install many multiple sites having relatively small communication area.
Site Preferential	This configuration prioritizes the coverage of the current site, and the transceiver is less likely to start a system. This configuration is used when the transceiver is operated with a single site, or the transceiver is used to widen the operation area of the transceiver by installing a small number of sites having wide coverage.

Note:

- For the signal strength level while the transceiver acquires a control channel, Roaming Preferential is the strongest level followed by Normal and Site Preferential.
- For the frequency of the transceiver to migrate from the current site to another site, Roaming Preferential is the highest frequency rate followed by Normal and Site Preferential.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the System Search Policy (Edit > Network > Hunt Options)

25.21 Forced Search (NXDN Trunking System Only)

Forced Search allows a user to manually start the test to acquire another control channel providing better conditions while the transceiver is in the idle state after acquiring a control channel.

The following are hunt sequences to be used by Forced Search:

- **Preferential Hunt Sequence**

  Two channels configured as Preferential Hunt Control Channel are searched. Preferential Hunt Control Channel is the channel having the highest priority when searching for a control channel.

- **Normal Hunt Sequence**

  A channel configured as Normal Hunt Control Channel is searched. Normal Hunt Control Channel is a channel that can be used as a control channel in each site.

- **System Add Channel Sequence**

  Eight channels that are additionally registered by a broadcast message sent from the system will be searched.

- **Site Hunt Sequence**

  A channel configured as Site Hunt Control Channel in each site is searched. Site Hunt Control Channel is a channel that can be used as a control channel in each site.

- **Comprehensive Hunt Sequence**

  All channels that can be used as a control channel are searched based on all frequencies configured in a Network Frequency Table.

■ Operating the Transceiver

- **Portable (without LCD/ without Key)**

1. Press and hold the **Forced Search** key.
   Search Mode Tone sounds from the transceiver, and then the transceiver will start the Forced Search.

   The transceiver leaves the acquired control channel and starts the hunt sequence, and then the transceiver proceeds to search for another control channel using the Preferential Hunt Sequence. If a control channel is found, the transceiver migrates to that control channel. In such a case, the transceiver is in the standby state after processing an acquisition of control channel. If no control channel is found, the transceiver continues the hunt sequence.

- **Other Than Portable (without LCD/ without Key)**

1. Press the **Forced Search** key.

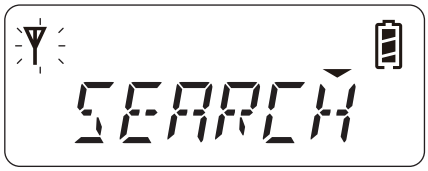
   The site number of the current control channel appears for 2 seconds.

Portable

Mobile

2. Press and hold the **Forced Search** key.

   Search Mode Tone sounds from the transceiver, and then the transceiver will start the Forced Search.



Portable

Mobile

   The transceiver leaves the acquired control channel and starts the hunt sequence, and then the transceiver proceeds to search for another control channel using the Preferential Hunt Sequence. If a control channel is found, the transceiver migrates to that control channel. In such a case, the transceiver is in the standby state after processing an acquisition of control channel. If no control channel is found, the transceiver continues the hunt sequence.

Note:

- The transceiver cannot receive any call while the transceiver is doing the Forced Search.
- Forced Search cannot be used if the transceiver is locked on a site. However, the site number can be displayed.
- Refer to "2.8.1 About the 4-digit Display of the Site Number on page 15" for the 4-digit display of the site number if the display of the site number is configured as 5 characters (Portable) or 7 characters (Mobile) in Display Customization.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

25.22 Site Lock/ Site Select (NXDN Trunking System Only)

Site Lock can be used to lock the site to be used as the current site and prevent the transceiver from roaming to other sites by a user operating transceiver keys when the transceiver is used around the border of the site coverage area. If this function is enabled, the transceiver is locked on the current site and cannot roam.

If a site is selected in Site Select Mode, or if the transceiver is operated in a wide area system, the transceiver can be locked on the selected site by directly entering a site number. Or, selecting a site by using the **Selector** or **PF** keys can lock the transceiver on the selected site. To select a site, site information must be configured using KPG-141D/ KPG-141DN. Or, the following functions must be assigned to the **Selector** and **PF** keys in order to select a site using the **Selector** or **PF** keys.

Table 25-24 Site Select

Key	Function	Reference
Selector *1	Site Up/Down Site Select	(Refer to: 7.1 Assigning Functions to the Selector (Portable Only) on page 84)
PF key	Site Up Site Up (Continuous) Site Down Site Down (Continuous)	(Refer to: 7.2 Assigning Functions to the PF Keys on page 85)

*1 Portable only

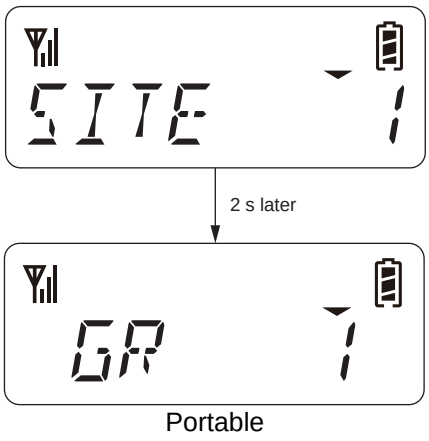
Note: Site Select Mode is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

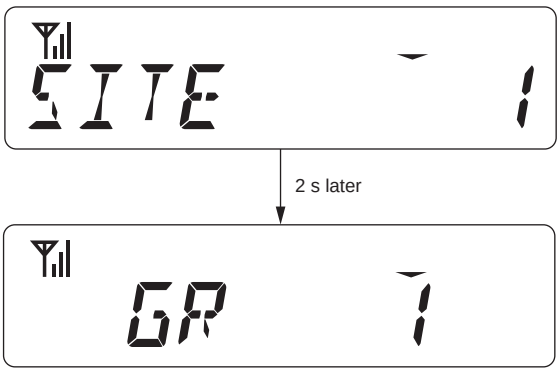
● Enabling or Disabling the Site Lock

1. Press the Site Lock key while **Site Lock** is disabled.

   Site Lock becomes enabled, and the site number or the site name of the current site appears on the main display for 2 s.



Portable



Mobile

2. Press the **Site Lock** key while Site Lock is enabled.

   Site Lock will be disabled.

Note:

- The Site Lock can be enabled for the current site only if the transceiver has acquired a control channel.
- Refer to "2.8.1 About the 4-digit Display of the Site Number on page 15" for the 4-digit display of the site number if the display of the site number is configured as 5 characters (Portable) or 7 characters (Mobile) in Display Customization.

● Using Site Select Mode (list selection)

1. Press and hold the **Site Lock** key.

   The transceiver enters Site Select Mode, and then the list will appear.

Portable

Mobile

Note:

- If the zone of the system that is configured as the Home System of Multi-System Roaming is selected and the transceiver is outside the communication area, selecting a system in System Select Mode places the transceiver in Site Select Mode of the system. (Refer to: 25.34 System Lock/ System Select (NXDN Trunking System Only) on page 323)
- If the transceiver is in a Roaming System by using the SKF for roaming when the Multi-System Roaming function is used, the site name does not appear even if the site name is configured, but the site number appears.

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select the target site for Site Lock.

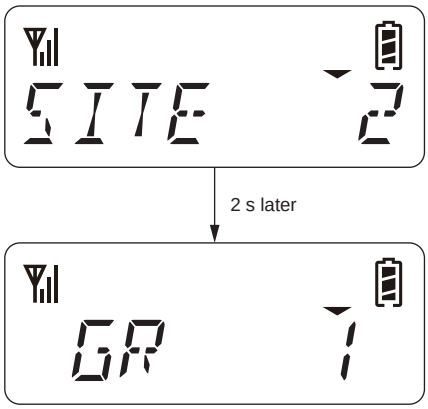
   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

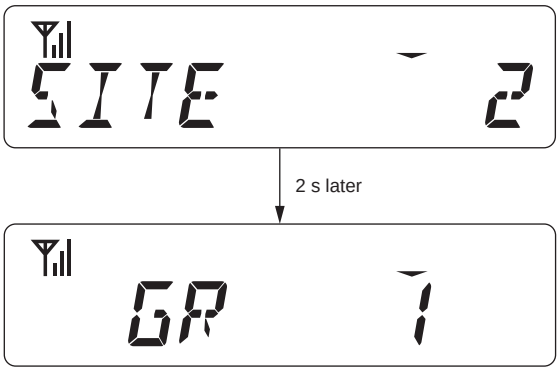
Mobile

3. Press the **[S]** or **[*]** key.

   Site Lock is enabled for the selected site number.



Portable



Mobile

- **Using Site Select Mode (manual entry)**

1. Press and hold the **Site Lock** key.

   The transceiver enters Site Select Mode, and then the list will appear.

Portable

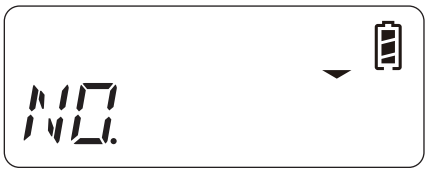
Mobile

Note:

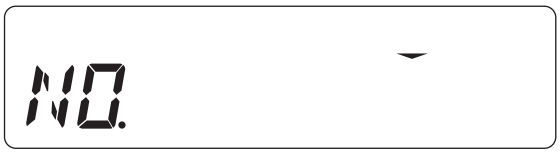
- If no Site Name is configured, the site number entry display appears. In this case, proceed to step 3.
- To manually enter a site number in Site Select Mode, Wide Area System needs to be enabled.

2. Press and hold the **[S]** or **[*]** key.

   The site number entry display appears. The transceiver can migrate to the site number entry display only if Wide Area System of the FPU is enabled.



Portable



Mobile

3. Enter a site number.

   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.

   - **Using the Selector or the PF Keys**

     The characters can be selected by rotating the **Selector** (Portable), or pressing the **[⩓]** or **[⩔]** key (Mobile), and the selected characters can be determined by pressing the **[S]** or **[*]** key.

   - **Using the Keypad**

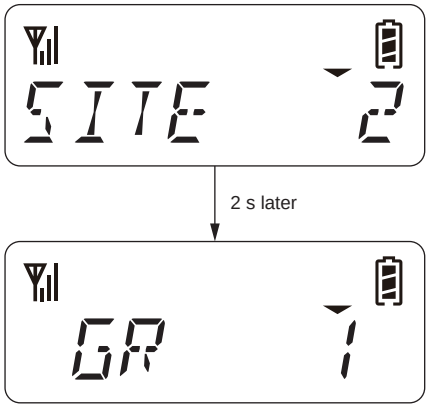
     A code can be entered by pressing the **[0]** to **[9]** keys.

Portable

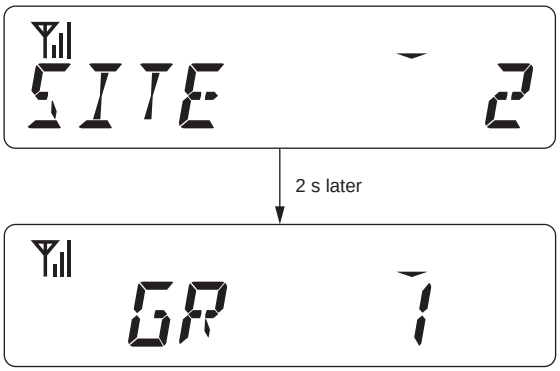
Mobile

4. Press the **[S]** or **[*]** key.

   Site Lock is enabled for the entered site number.



Portable



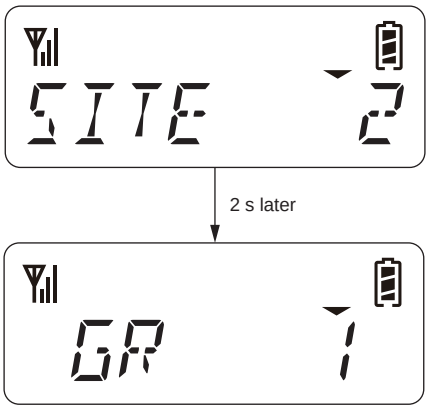
Mobile

- **Using the Selector (Portable only) or the PF key**

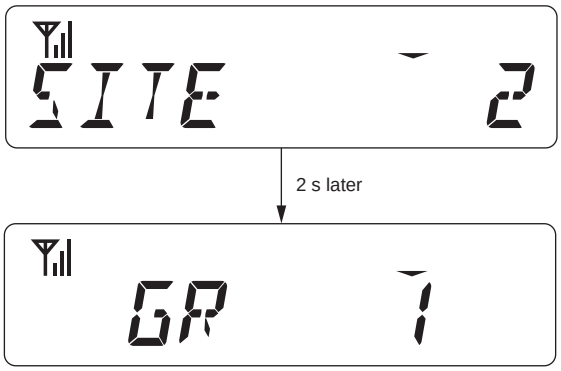
1.Select one of the following operations.

- Select the site to be locked by using the **Side Up** or **Side Down** key.
- Select the site to be locked by turning the **Selector** (Site Up/Down).
- Select the site to be locked by turning the **Selector** (Site Select).

Site Lock is enabled for the selected site number. The site number or the site name of the selected site appears on the main display for 2 s.



Portable



Mobile

Note:

- The status of Site Lock, either enabled or disabled, is retained in the transceiver. The site number of the site is also retained while Site Lock is enabled.
- Site Lock is not disabled even if the transceiver cannot receive signals from a control channel while Site Lock is enabled.
- If no Site Name is configured, the transceiver cannot enter Site Select Mode. If no Site Name is configured, the site cannot be selected using the **Site Up** or **Site Down** key or **Selector** (Site Up/Down). However, rotating the **Selector** (Site Select) selects a Site Number from 1 to 16 even if no Site Name is configured.
- To manually enter a site number in Site Select Mode, Wide Area System needs to be enabled.
- Manual entry in Site Select Mode can be used only for a transceiver having firmware version 5.10.00 or later.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Configuring the site information (Edit > Network > Site Information)

25.23 Failsoft (NXDN Trunking System Only)

Failsoft is a function that provides the minimal communication capability for the transceivers in the site coverage area in the case that the system fails to provide the Trunking control service among the sites, for instance, in a case when a cable connecting repeaters is cut or an error occurs in communication between controllers.

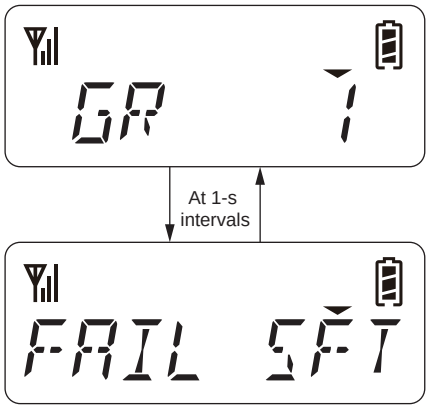
If the system fails to provide the trunking control service for the site, the system migrates the channel to the Failsoft channel and then the system will send a broadcast message to the transceivers indicating that the system is in Failsoft state. When a transceiver searches using the hunt sequence for a channel configured as a Failsoft Channel and then receives the broadcast message from the system indicating the Failsoft state of the system, the transceiver will enter Failsoft Mode.

On the Failsoft Channel, signals are simply repeated within the site and only Group voice communications (Conference Group Call, Broadcast Group Call, All Group Call) can be done for the selected Group ID. While the transceiver searches for a control channel in adjacent sites at intervals configured for Search Interval Time, and then acquires a channel operating as a control channel, the transceiver will exit Failsoft Mode.

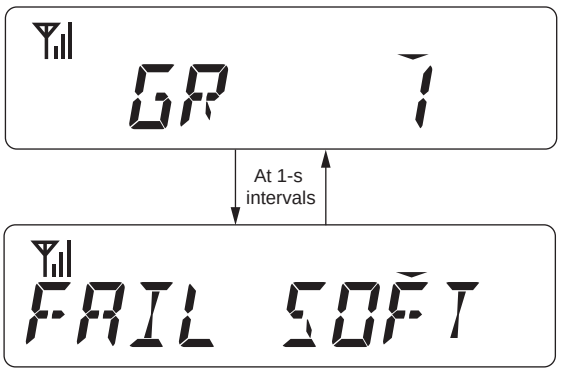
■ Transceiver Behavior

1. The transceiver receives the broadcast message from the system indicating the Failsoft state of the system.

   The transceiver enters Failsoft Mode. “FAILSOFT” appears on the transceiver main display at 1-second intervals. The LED lights green while the transceiver is in Failsoft Mode.



Portable



Mobile

Note:

- While the system is in the Failsoft state, various functions that are provided on a control channel, such as location registration, etc., will not be available.
- If the transceiver acquires a control channel in Failsoft Mode, the transceiver exits Failsoft Mode and then the transceiver will begin to do location registration. The transceiver also begins to do location registration if the transceiver acquires a control channel in the site where its location has already been registered or the transceiver acquires a control channel in another site.
- If the transceiver fails to acquire a Failsoft Channel, the transceiver will not enter Failsoft Mode.
- The transceiver cannot migrate from the Failsoft Channel to another channel since the transceiver cannot acquire a control channel even if the transceiver migrates to another NXDN Trunking Zone while the transceiver is in Failsoft Mode.
- The transceiver temporarily pauses scanning if the transceiver enters Failsoft Mode during the scan. The scanning remains paused temporarily even if the transceiver exits Failsoft Mode.
- For Portable (without LCD/ without Key), the status of the transceiver can be confirmed by the LED.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Failsoft Channel (Edit > Zone Information (NXDN Trunking System) > Zone Edit > Failsoft Channel)
- Configuring the Search Interval Time (Edit > Network > Hunt Options)

25.24 Remote Group Add (NXDN Trunking System Only)

Remote Group Add is a function that allows the transceiver, which receives a message requesting to change the remote group, to add a Group ID to the transceiver by making another transceiver receive the message requesting to change the remote group sent from the transceiver connected to a PC.

This function allows the system to establish communications by making target transceivers temporarily participate in a group or temporarily configuring a new group by gathering mobile stations in different parties.

Note: For Portable (without LCD/ without Key), few available **PF** keys and no LCD may cause operational confusion. Therefore, we recommend not to change the Group ID for system operation in Portable (without LCD/ without Key).

25.24.1 Sending the Message Requesting to Change the Remote Group or Reset the Change of the Remote Group

The transceiver connected to a PC sends the message requesting to change the remote group or reset the change of the remote group.

■ Operating the Transceiver

- **Sending the Message requesting to change the Remote Group**

1. A PC sends the command requesting to change the remote group.

   The transceiver sends the message requesting to change the remote group to the specified transceiver using an Individual Call.

- **Sending the Message requesting to reset the Change of the Remote Group**

1. A PC sends the command requesting to reset the change of the remote group.

   The transceiver sends the message requesting to reset the change of the remote group to the specified transceiver using an Individual Call.

Note:

- To send the message requesting to change the remote group or reset the change of the remote group, “Data” or “Data + GPS Data Output” must be assigned to the communication port of the transceiver. (Refer to: 6 COMMUNICATION PORTS on page 81)
- The message requesting to change the remote group or reset the change of the remote group can only be sent using an Individual Call.

25.24.2 Receiving the Message Requesting to Change the Remote Group or Reset the Change of the Remote Group

The transceiver that received the message requesting to change the remote group adds the specified Group ID as GID No. 0 to the zone in the NXDN Trunking system where the transceiver received the message. Or, the transceiver that received the message requesting to reset the change of the remote group clears the Group ID added as GID No. 0 from the zone in the NXDN Trunking system where the transceiver received the message.

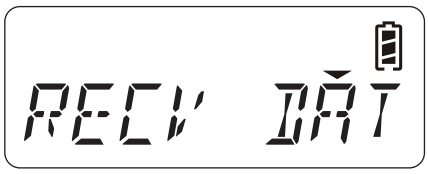
(Hereinafter, the Group ID that is added using this function is referred to as the Regroup ID.)

■ Operating the Transceiver

- **Receiving the Message requesting to change the Remote Group**

1. The transceiver starts receiving the message requesting to change the remote group.

   “RECV DAT” (Portable) or “RECV DATA” (Mobile) appears.



Portable

Mobile

2. The transceiver completes receiving the message requesting to change the remote group.

   “COMPLETE” appears on the main display.

Portable

Mobile

The transceiver adds the Regroup ID to the zone in an NXDN Trunking system where the transceiver received the message.

If the change of the Group ID is permitted by the information in the received message, “GR ADD-D” appears on the transceiver main display. In this case, the transceiver can transmit and receive with a Regroup ID. The transceiver can also transmit and receive by selecting a Group ID other than the Regroup ID by a user operating transceiver keys.

Portable

Mobile

If the change of the Group ID is not allowed by the information in the received message, “GR ADD-F” appears on the transceiver main display. In this case, the transceiver can transmit and receive only with the Regroup ID. Another zone or GID cannot be selected by a user operating transceiver keys.

Portable

Mobile

- **Receiving the Message requesting to reset the Change of the Remote Group**

1. The transceiver starts receiving the message requesting to reset the change of the remote group.

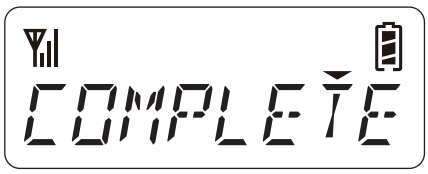
   “RECV DAT” (Portable) or “RECV DATA” (Mobile) appears.

Portable

Mobile

2. The transceiver completes receiving the message requesting to reset the change of the remote group.

   “COMPLETE” appears on the main display.



Portable

Mobile

   The Regroup ID which is added to the zone in the NXDN Trunking system where the transceiver receives the message is cleared, and then the lowest GID No. will be selected.

Note:

- Multiple Regroup IDs cannot be added. Therefore, the Regroup ID will be overwritten if the transceiver to which the Regroup ID has already been added receives the message requesting to change the remote group.
- The Regroup ID will be cleared if the configuration data is written to the transceiver by using KPG-141D/ KPG-141DN.

25.24.3 Transceiver’s Behavior when Using the Regroup ID

The following are the transceiver’s behavior when using the added Regroup ID:

- The added Regroup ID will be retained even after the transceiver is turned OFF.
- The added Regroup ID can be used even if the transceiver migrates to another site.
- A Rollover Tone sounds from the transceiver if the transceiver migrates to the Regroup ID by a user operating the **Selector** (Portable only) or **PF** key where “CH/GID Up/Down” is assigned.
- Entering a value of “0” for GID No. in Channel Entry Mode enables a GID to be changed to a Regroup ID. (Refer to: 5.7 Channel Entry on page 41)
- Regroup ID cannot be configured as a Direct GID by a user pressing the **Direct CH/GID Select** key. (Refer to: 5.10 Direct CH/GID on page 45)
- The Regroup ID cannot be applied as a Home GID by a user pressing the **Home CH/GID Select** key. (Refer to: 5.9 Home CH/GID on page 44)
- A Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all even by a user pressing the **Scan Delete/Add** key while the Regroup ID is selected.
- If the Regroup ID is configured for Revert CH/GID while “Selected” is configured for Revert CH/GID, the Revert CH/GID will be changed to the lowest GID configured in an NXDN Trunking Zone when the transceiver receives the message requesting to reset the change of the remote group. (Refer to: 17.7.4 Revert CH/GID on page 190)
- For Portable, if a GID other than the Regroup ID is selected by a user rotating the **Selector** while “CH/GID Select” is assigned to the **Selector**, the Regroup ID cannot be selected using the **Selector** later. However, the Regroup ID can be selected by a user using the **CH/GID Up** and **CH/GID Down** keys.
- During the scan, if the transceiver receives the message requesting to change the Group ID of the Remote Group where the change of Group ID is enabled, the scan will continue. During the scan, if the transceiver receives the message requesting to change the Group ID of the remote group where no change of the Group ID is allowed, the scan will pause. The transceiver transmits using the Regroup ID when the transceiver transmits in the above conditions. Also, the transceiver resumes the scan when the transceiver receives the message requesting to reset the change of the remote group in this state.

- If the transceiver receives the message requesting to change the remote group where the change of the Group ID is enabled, the conditions to resume the scan are satisfied, and then the transceiver will resume the scan while the scan pauses since the conditions to resume the scan are not satisfied due to lack of GIDs to be scanned. If the transceiver receives the message requesting to reset the change of the Remote Group in this state, the conditions to resume the scan are not satisfied again; hence the scan will pause.
- In the Emergency mode, the transceiver cannot send and receive a message requesting to change the remote group or reset the change of the remote group.

25.25 Registration/ Group-registration/ Registration Clear (NXDN Trunking System Only)

Registration is a function that enables registration with the system the location data of the transceiver at the time the transceiver searches for or acquires a control channel, for instance by turning the transceiver ON. By registering the location of the transceiver, the system can recognize which site the transceiver belongs to and specifies the site where the communication can be established. Therefore, in the case of Individual Call, a request for an incoming call can immediately be placed with a site where the called transceiver resides; hence, the system can effectively be operated.

Group-registration is a function that enables the transceiver to register with the system groups to be used. By registering groups, the system can recognize in which site the transceiver waiting for a Group Call resides. Therefore, in the case that a Group Call is made in a multi-site system, the system can limit the registered sites as coverage for the call; hence, the system can effectively handle a Group Call.

Registration Clear is a function that enables clearing from the system of the transceiver registration information, for instance by turning the transceiver OFF. This function can be used on the system side to recognize a transceiver that does not reside in the site.

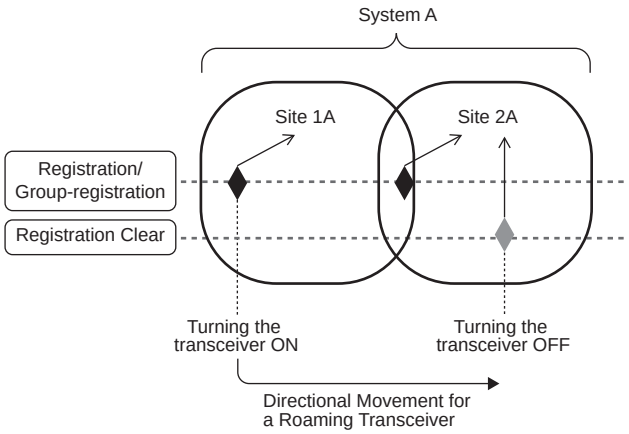


Figure 25-6 Registration/ Group-registration/ Registration Clear

25.25.1 Registration

The transceiver can register its own Unit ID in the system.

■ Conditions for the Transceiver to begin Registration

The transceiver begins Registration under the following conditions:

- **In the case that the transceiver is turned ON:**

  The transceiver begins Registration upon acquisition of a control channel after the transceiver is turned ON.

- **In the case of roaming to different sites:**

  The transceiver begins Registration when the transceiver roams to different sites regardless of single-site system or multi-site system.

- **When the zone is changed to a zone in an NXDN Trunking system**

  Upon change of a zone in an Analog Conventional system or LTR Trunking system to a zone in an NXDN Trunking system by a user operating the transceiver and acquisition of a control channel, the transceiver will begin Registration.

■ Transceiver's Behavior in the case of Registration

The following is the transceiver's behavior during Registration:

- If the location of your own station is successfully registered, the transceiver will remain on a control channel. Otherwise, the transceiver attempts to acquire another control channel again.
- If the transceiver receives the response message indicating failure in Registration when the transceiver begins Registration, the transceiver retains the information (a maximum of 48 messages) and then the transceiver will attempt to acquire a control channel again. Since the information is not cleared even if the zone is changed and the zone is retained until the transceiver is turned OFF, the transceiver will not begin Registration if the acquired channel has the same Site No. as the Site No. that was previously determined as a Registration failure. Also, if the transceiver does not receive any response from the system when the transceiver begins Registration or if a timer for Random Access expires, the transceiver will attempt to acquire a new control channel again. In this case, incompletion of Registration prevents the transceiver from being used in the system. Upon acquisition of a new control channel, the transceiver begins Registration according to the conditions.
- Registration is a mandatory condition to communicate using a system; hence, the transceiver cannot initiate a call until location registration is completed. However, in a system that does not require location registration, the transceiver can initiate a call even if location registration is not completed. This depends on the system configuration.
- If the transceiver information registered in the system has already been cleared when the transceiver initiates a call, the transceiver begins Registration and then terminates the call upon receipt of a response message from the system indicating non-registration.

25.25.2 Group-registration

The transceiver can register its own Group ID in the system.

■ Conditions for the Transceiver to begin Group-registration

The transceiver begins Group-registration under the following conditions:

- **In the case of Registration**

  The transceiver registers both the Unit ID of your own station (location registration) and Group ID (group registration) when the transceiver begins Registration, such as a case when the transceiver is turned ON or when the transceiver roams to a different site.

- **When changing to another Group ID without Group Registration**

  The transceiver begins Group-registration 2 seconds after changing the Group ID by a user operating the transceiver.

- **When attempting to initiate a call using a Group ID without Group Registration**

  If the transceiver attempts to transmit using a new Group ID that is different from the registered Group ID in the system, the transceiver will continue to initiate a Group Call after beginning Group Registration for the new Group ID.

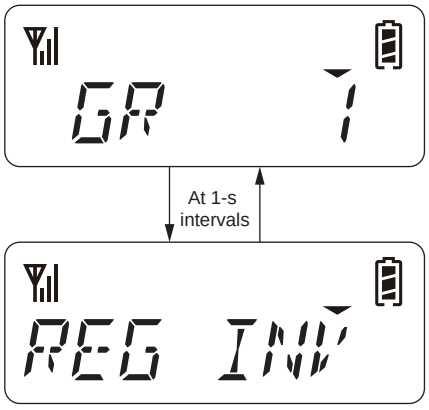
Note:

- The transceiver does not begin Group-registration while the transceiver is on a traffic channel. If a Group ID waiting on a control channel is different from the Group ID registered in the system at the time when a call on a traffic channel ends, the transceiver will begin Group-registration again.
- The transceiver's behavior is similar to the behavior when the transceiver sends data using a Group Call or initiates a Group Call using a PC command. If the Group ID for a group that has not been registered in the system is changed after a transmission ends, the transceiver will begin Group-registration 2 seconds after changing the Group ID.
- If the transceiver receives a response message from the system indicating a group registration failure when the transceiver begins Group-registration prior to a user pressing the **PTT** switch to initiate a Group Call, the transceiver will terminate the Group Call.

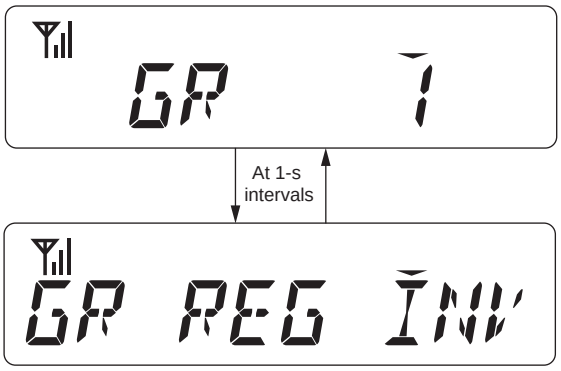
■ Transceiver's Behavior in the case that the Transceiver begins Location Registration and Group Registration

The following is the transceiver's behavior in the case that the transceiver begins location registration and group registration:

- If both location registration and group registration are successful, the transceiver will remain on the acquired control channel.
- If the transceiver receives a response message from the system indicating rejection of group registration even if location registration is successful, the transceiver will attempt to acquire a control channel again.
- If the transceiver receives a response message from the system indicating failure in Group Registration even though location registration is successful, the transceiver will remain on the acquired control channel without registering the group. If Group-registration Invalid Tone is enabled, the Group-registration Invalid Tone sounds from the transceiver at 30-second intervals. Also, if Group-registration Invalid Indicator is enabled, "REG INV" (Portable) or "GR REG INV" (Mobile), and the GID name alternately appear on the transceiver main display at 1-second intervals.



Portable

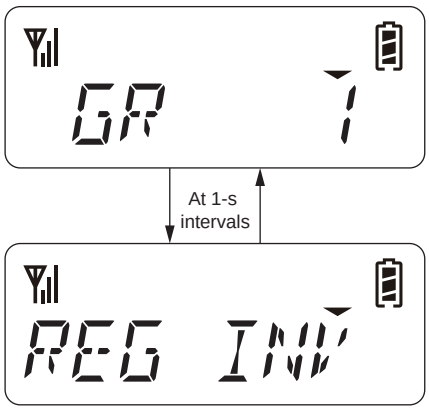


Mobile

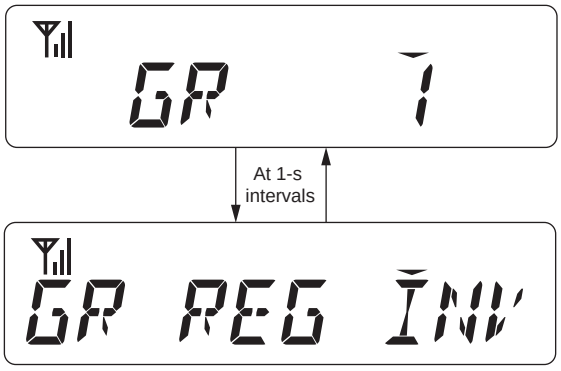
■ Transceiver's Behavior in the case that the Transceiver begins Group-registration

In the case of a change to the Group ID without a group registration or if the transceiver attempts to transmit using the Group ID for the group without group registration, the transceiver will begin Group-registration. The following is the transceiver's behavior during Group-registration:

- If the transceiver receives a response message from the system indicating permission for group registration, the transceiver will remain on the acquired control channel.
- If the transceiver receives a response message from the system indicating rejection of group registration or the transceiver does not receive any response from the system, or the timer for random access expires, the transceiver will attempt to acquire a control channel again.
- If the transceiver receives the response message indicating failure in group registration from the system, the transceiver will remain on the acquired control channel without registering the group. If Group-registration Invalid Tone is enabled, the Group-registration Invalid Tone sounds from the transceiver at 30-second intervals. Also, if Group-registration Invalid Indicator is enabled, "REG INV" (Portable) or "GR REG INV" (Mobile), and the GID name alternately appear on the transceiver main display at 1-second intervals.



Portable



Mobile

- If the transceiver information registered in the system is already cleared when the transceiver initiates a Group Call, the transceiver begins Group-registration and then the transceiver will terminate the Group Call upon receipt of a response message from the system indicating non-registration of the group in the system.

Note:

- The transceiver may not be able to receive a Group Call using the Group ID without Group Registration in the system. This depends on the system configuration.
- If a Group ID which is different from the Group ID for the group registered in the system is received, the transceiver will not begin Group-registration yet at the time of receiving the call.
- If a Group ID is added to the transceiver by receiving a request for changing the remote group, the transceiver will begin Group-registration 2 seconds after changing to the added Group ID. If the transceiver restores to the previous GID upon receipt of a message requesting to reset the change of the remote group, the transceiver will begin Group-registration 2 seconds after changing to that Group ID of the GID. (Refer to: 25.24 Remote Group Add (NXDN Trunking System Only) on page 294)
- For Portable (without LCD/ without Key), the status of the transceiver can be confirmed by a tone sounded from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Group-registration Invalid Indicator (Edit > Network > Hunt Options)
- Configuring the Group-registration Invalid Tone (Edit > Network > Hunt Options)

25.25.3 Registration Clear

The transceiver can clear from the system the information about the transceiver location registration.

■ Conditions for the Transceiver to clear from the System the Transceiver Location Registration Information

The transceiver clears from the system the information about the transceiver location registration under the following conditions:

- **In the case that the transceiver is turned OFF:**

  The transceiver will be turned OFF after clearing from the system the information about the location registration. If Power-off Status Message is configured, the transceiver will clear from the system the information about location registration after sending the Power-off Status Message.

  In Portable, if the transceiver is turned OFF by a user removing the battery pack, the transceiver will not clear from the system the information about the location registration.

- **In the case that the zone is changed to a zone in a system other than an NXDN Trunking system**

  The transceiver will migrate to the changed zone after clearing from the system the information about location registration.

■ Transceiver's Behavior in the case of Clearance from the System the Information about Location Registration

If the transceiver receives from the system a response message (indicating permission, rejection or failure), the transceiver does not receive any response from the system, or the timer for random access expires, the transceiver will refresh the information about the site from where the information of the location registration has cleared.

25.26 Remote Monitor

Remote Monitor is the function to remotely operate using radio communication an individually specified transceiver to transmit continuously. Use of this function allows the base station to monitor the situation around the transceiver.

If a PC sends the Remote transmission command to the transceiver, the transceiver will send a message requesting the Remote transmission using Individual Call. The target ID of the Individual Call will be specified by the Remote transmission command. The transceiver which has received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then unmutes the speaker and initiates a continuous transmission using Individual Call. The length of time for a continuous transmission will be specified by the Remote transmission command.

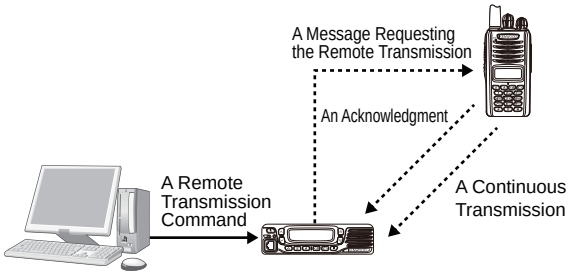


Figure 25-7 Remote Monitor

This function has Normal Mode and Silence Mode: the former notifies a user of the transceiver by an indication on the LCD or lighting the Transmit LED of that the transceiver is in the status of a continuous transmission, and the other does not notify a user of the transceiver in contrast. The mode will be specified by the Remote transmission command.

■ If in Normal Mode

The transceiver which received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then displays "RMT TX" (Portable) or "REMOTE TX" (Mobile) on the main display and transmits with the Transmit LED lighting.

■ If in Silence Mode

The transceiver which received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then transmits without changing the indication of LCD and without lighting the Transmit LED.

Note:

- The transceiver initiates a continuous transmission only if the message requesting the Remote transmission is received by an Individual Call. The transceiver does not initiate a continuous transmission even if the message requesting the Remote transmission is received using anything other than Individual Call.
- While the transceiver is in the status of a continuous transmission due to Remote Monitor, Time-out Timer and Busy Channel Lockout are disabled. However, in an NXDN Trunking system, Time-out Timer behaves depending on the system configuration.
- In order to receive a message requesting the Remote transmission in an NXDN Conventional system, the received RAN code needs to match the RAN code preconfigured in the transceiver.
- For Portable (without LCD/ without Key), the status of the transceiver in Normal Mode can be confirmed by the LED.

25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only)

Call Request Tone is the function to emit a Call Request Tone from the transceiver when a call request for an Individual Call or Group Call is initiated by pressing the **PTT** switch in an NXDN Trunking system.

Also, Call Processing Tone is the function to emit a Call Processing Tone from the transceiver while the **PTT** switch is pressed and held after a call request for an Individual Call or Group Call is initiated by pressing the **PTT** switch in an NXDN Trunking system.

Depending on the system condition, it may take few seconds to determine the call request upon the initiation of a call request using Individual Call or Group Call. Use of this function notifies a user by emitting a tone from the transceiver of the condition from when the transceiver initiates a call request using Individual Call or Group Call until the call request is determined.

When the transceiver initiates an Individual Call or Group Call using this function, the transceiver behaves as follows.

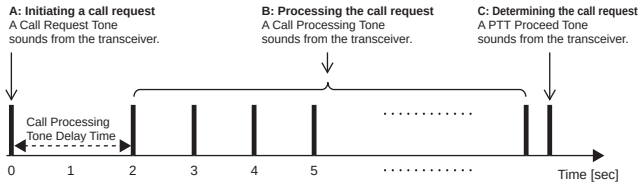


Figure 25-8 Call Request Tone/ Call Processing Tone

A: A Call Request Tone sounds from the transceiver when a call request has been initiated by pressing the **PTT** switch.

B: A Call Processing Tone sounds from the transceiver while the **PTT** switch is pressed and held after initiating a call request by pressing the **PTT** switch. The length of time from when a call request is initiated by pressing the **PTT** switch until the Call Processing Tone sounds from the transceiver can be configured for Call Processing Tone Delay Time.

C: If PTT Proceed Tone is enabled, the PTT Proceed Tone sounds from the transceiver when a call request is determined. A user can start conversations. (Refer to: 3.9 PTT Proceed Tone on page 25)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Call Request Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Call Processing Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1 > Call Processing Tone)

25.28 Site Roaming (NXDN Conventional System Only)

Site Roaming is the function to migrate automatically to the site (channel) providing better radio environment if a transceiver is operated in the NXDN Conventional system.

The transceiver receives a synchronization signal transmitted from the repeaters in multiple sites at regular time intervals, and detects the RSSI level. Therefore, the transceiver migrates automatically to the channel providing better radio environment.

This function can be used by configuring channels for each zone in Site Roaming or Site Roaming with RAN (a maximum of 250 channels) by using KPG-141D/ KPG-141DN.

25.28.1 Site Roaming Behaviors

If the zone configured as Site Roaming or Site Roaming with RAN is selected, the transceiver automatically initiates Site Roaming on the channels configured for the zone.

For Portable (without LCD/ without Key), the LED blinks green upon the initiation of Site Roaming.

Portable

Mobile 503

When the transceiver transmits, the RAN code configured for Revert Channel is multiplexed on a signal.

The channel the transceiver received last time is retained even if the transceiver is turned OFF. When the transceiver is turned ON and transmits again, this channel is used as the Revert Channel. If there is no Revert Channel, the channel of the lowest number configured for the zone will be used as the Revert Channel. While the transceiver is receiving, or if the transceiver transmits while the length of time configured for Dropout Delay Time or Dwell Time is elapsing, the transceiver transmits using the Revert Channel.

When the transceiver receives a synchronization signal from the repeater, the transceiver basically behaves as follows.

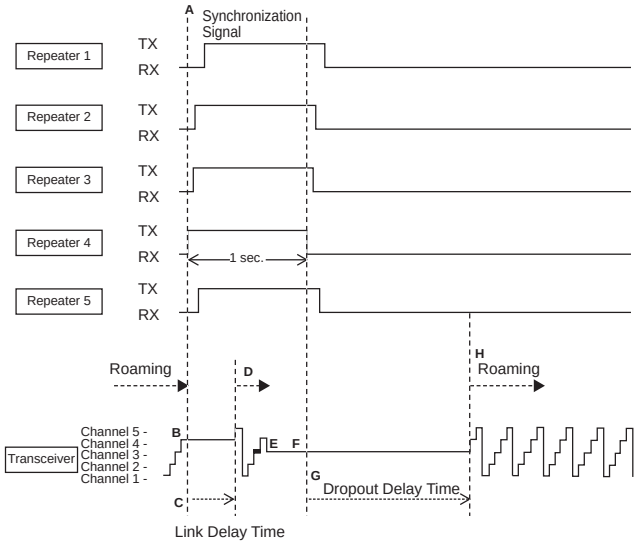


Figure 25-9 Site Roaming

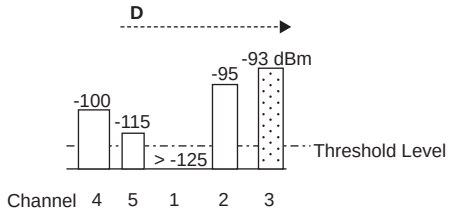


Figure 25-10 Threshold Level

A: The repeater in an NXDN Conventional system transmits a synchronization signal at regular time intervals. Or, the repeater in an NXDN Conventional system transmits a call signal according to a transmission request from other transceivers.

B: For example, the transceiver in the zone configured as Site Roaming or Site Roaming with RAN detects adequate RSSI level on Channel 4.

C: The transceiver activates Site Roaming Link Delay Time.

D: Upon the elapse of the length of time configured for Site Roaming Link Delay Time, the transceiver goes around all the channels and searches for the channel having the strongest RSSI level.

E: After going around all the channel, the transceiver migrates to the channel having the strongest RSSI level (for example, Channel 3) and examines whether the received RAN code matches that preconfigured for the channel.

- If “Site Roaming” is configured for Zone Type:

  If the received RAN code matches that preconfigured for the channel, the transceiver unmutes the speaker and the channel will be the Revert Channel.

  If the received RAN code does not match that preconfigured for the channel, the transceiver continues to mute the speaker but the channel will be Revert Channel. Then the transceiver migrates to the channel having the second strongest RSSI level (for example, Channel 2) and examines whether the received RAN code matches that preconfigured for the channel. If the received RAN code matches that preconfigured for the channel, the transceiver unmutes the speaker and the channel will be the Revert Channel.

- If “Site Roaming with RAN” is configured for Zone Type:

  If the received RAN code matches that preconfigured for the channel, the transceiver unmutes the speaker and the channel will be the Revert Channel.

  If the received RAN code does not match that preconfigured for the channel, the transceiver migrates to the channel having the second strongest RSSI level (for example, Channel 2) and examines whether the received RAN code matches that preconfigured for the channel. If the received RAN code matches that preconfigured for the channel, the transceiver unmutes the speaker and the channel will be the Revert Channel.

F: While the received RAN code matches that preconfigured for the channel, the transceiver will remain on the channel and will not resume Site Roaming.

G: If the received signal disappears or the received RAN code does not match that preconfigured for the channel, Dropout Delay Time will be activated.

H: After the time configured for Dropout Delay Time elapses, the transceiver resumes Site Roaming.

Note:

- The following functions cannot be used on a channel in the zone configured as Site Roaming or Site Roaming with RAN:
  - Scan Add
  - Data
- The following functions cannot be used in a zone configured as Site Roaming or Site Roaming with RAN:
  - Home CH/GID
  - Data Zone-CH/GID (Analog)
  - Data Zone-CH/GID (NXDN)
  - Zone Add
  - Scan List
  - **Home CH/GID** key
  - **Home CH/GID Select** key
  - **Direct CH/GID 1** to **Direct CH/GID 5** keys
  - **Direct CH/GID 1 Select** to **Direct CH/GID 5 Select** keys
  - **Scan** key
- The zone number configured as Site Roaming or Site Roaming with RAN cannot be configured for the following functions:
  - Direct CH/GID 1 to Direct CH/GID 5
  - Priority 1 Zone-Channel
  - Priority 2 Zone-Channel
  - Emergency Zone-CH/GID
- In the zone configured as anything other than Site Roaming and Site Roaming with RAN, a zone number configured as Site Roaming or Site Roaming with RAN cannot be configured for the following functions:
  - Data Zone-CH/GID (Analog)
  - Data Zone-CH/GID (NXDN)
  - Scan List Table
- If the transceiver initiates an Emergency Call in the zone configured as Site Roaming or Site Roaming with RAN, the transceiver transmits on the Revert Channel regardless of the configuration for Emergency CH/GID Type (Selected or Fixed).
- The Revert Channel used for Site Roaming is not retained when the zone is changed.
- If the zone configured as Site Roaming or Site Roaming with RAN is selected while the transceiver is scanning, the transceiver resumes Site Roaming.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Zone Type (Edit > Zone Information)

25.28.2 Site Roaming Link Delay Time

The length of time until the repeater in each site is activated may vary depending on the site. Site Roaming Link Delay Time is a function to configure the length of time to tolerate, by delaying the time to start searching for a signal on other channel, a variation in time of when each repeater is activated.

If the transceiver detects a signal on a channel after Site Roaming is initiated, Site Roaming Link Delay Time will be activated. Upon the elapse of the time configured for Site Roaming Link Delay Time after detecting the signal, the transceiver goes around other channels in the same zone to search for a signal. After going around all the channel, the transceiver migrates to the channel having the strongest RSSI level and examines whether the received RAN code matches that preconfigured for the channel. If the received RAN code does not match that preconfigured for the channel or if no RAN code is configured for the channel, the transceiver migrates to the channel having the second strongest RSSI level and examines whether the received RAN code matches that preconfigured for the channel.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Site Roaming Link Delay Time (Edit > Scan Information > Site Roaming (NXDN))

25.28.3 Dropout Delay Time (Site Roaming)

If the transceiver receives a synchronization signal or call from the repeater during Site Roaming, Site Roaming temporarily pauses.

Dropout Delay Time is the time from when the transceiver finishes receiving signals until the transceiver resumes Site Roaming.

If the received signal disappear or the received RAN code does not match that preconfigured for the channel, Dropout Delay Time will be activated. After the time configured for Dropout Delay Time elapses, the transceiver resumes Site Roaming.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Dropout Delay Time (Edit > Scan Information > Site Roaming (NXDN))

25.28.4 Dwell Time

When the transceiver starts transmitting by a user pressing the **PTT** switch during Site Roaming, Site Roaming temporarily pauses.

Dwell Time is the length of time from when the transceiver completes transmitting until the transceiver resumes Site Roaming.

After the transceiver completes transmitting, Dwell Time will be activated. After the time configured for Dwell Time elapses, the transceiver resumes Site Roaming.

If “Off” is configured for Dwell Time, Site Roaming will restart immediately after the transceiver has terminated the transmission. Even if the transceiver receives a signal after the transceiver has terminated the transmission, Site Roaming will promptly restart. However, Site Roaming will not restart if the transceiver responds to the received signal and the transceiver terminates the transmission. The transceiver behaves in this manner since the channel in use provides the better radio environment and the transceiver remains on the channel even after the transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Dwell Time (Edit > Scan Information > Site Roaming (NXDN))

25.28.5 Quick Site Roaming Level

Quick Site Roaming Level is the function to allow Site Roaming to behave faster when the transceiver is in an area with a strong signal.

If the transceiver receives a signal of which level is higher than that configured for Quick Site Roaming Level during Site Roaming, the channel will be the Revert Channel. In this case, Site Roaming Link Delay Time is disabled and the transceiver unmutes the speaker if the received RAN code matches that preconfigured for the channel.

However, if “Off” is configured for Quick Site Roaming Level and Standard Site Roaming Level, the transceiver initiates Site Roaming using the threshold value preconfigured in the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Quick Site Roaming Level (Edit > Scan Information > Site Roaming (NXDN))

25.28.6 Standard Site Roaming Level

Standard Site Roaming Level is the function to allow Site Roaming to behave faster when the transceiver is in an area with a strong signal.

The transceiver searches a signal of which level is higher than that configured for Standard Site Roaming Level during Site Roaming.

Since a channel having a signal of which level is lower than that configured for Standard Site Roaming Level is excluded from Site Roaming, the transceiver does not search the channel. If the transceiver receives a signal of which level is higher than that configured for Standard Site Roaming Level during Site Roaming, Site Roaming will temporarily pause and then Site Roaming Link Delay Time will be activated. If the received RAN code matches the RAN code preconfigured for the channel, the transceiver unmutes the speaker.

However, if “Off” is configured for Quick Site Roaming Level and Standard Site Roaming Level, the transceiver initiates Site Roaming using the threshold value preconfigured in the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Standard Site Roaming Level (Edit > Scan Information > Site Roaming (NXDN))

25.28.7 Site Roaming Resume Level

Site Roaming Resume Level is the threshold value of the RSSI level used for determining whether to resume Site Roaming according to the rise and fall of the RSSI level for the signal received by the transceiver.

If the RSSI level of the received signal is lower than the level preconfigured for Site Roaming Resume Level while the transceiver remains on the channel synchronized by Site Roaming, Dropout Delay Time will be activated. After the time configured for Dropout Delay Time elapses, the transceiver resumes Site Roaming. If the RSSI level of the received signal is higher than the level preconfigured for Site Roaming Resume Level while the Dropout Delay Time is counting down, the Dropout Delay Time will be extended and the transceiver will not resume Site Roaming.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Site Roaming Resume Level (Edit > Scan Information > Site Roaming (NXDN))

25.28.8 Off-hook Site Roaming (Mobile Only)

Off-hook Site Roaming is the function to start the Site Roaming depending on the status of microphone, either on-hook or off-hook.

The transceiver behaves as follows according to the configuration for Off-hook Site Roaming.

Table 25-25 Off-hook Site Roaming

Configuration	Description
Enabled	The transceiver can start Site Roaming while the microphone is in either the on-hook state or off-hook state. Even if the microphone changes from the On-hook state to Off-hook state during Site Roaming, Site Roaming will not pause.
Disabled	The transceiver can start Site Roaming if the microphone is in the on-hook state. The transceiver cannot start Site Roaming if the microphone is in the off-hook state. If the microphone changes from the On-hook state to Off-hook state during Site Roaming, Site Roaming will temporarily pause on the Revert Channel. Even if the microphone changes from the On-hook state to Off-hook state while Site Roaming pauses, the channel will not be changed. When the microphone goes to On-hook state, the transceiver resumes Site Roaming.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Off-hook Site Roaming to be enabled or disabled (Edit > Scan Information > Site Roaming (NXDN))

25.28.9 Revert Channel Display

Revert Channel Display is the function to display the selected Revert Channel on the main display during Site Roaming.

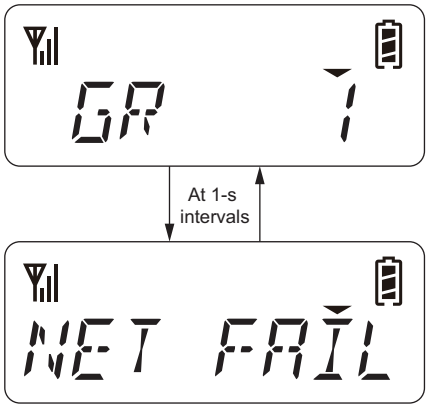
■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Revert Channel Display to be enabled or disabled (Edit > Scan Information > Site Roaming (NXDN))

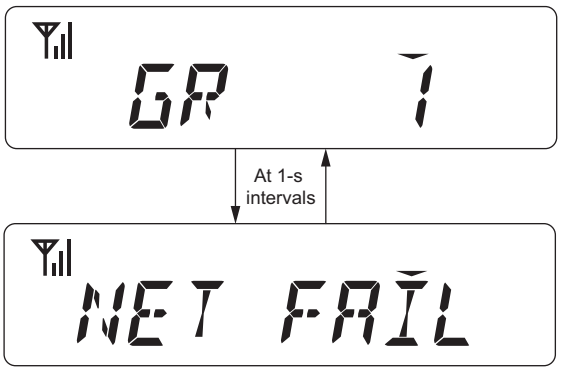
25.29 Network Failure (NXDN Trunking System Only)

Network Failure is the function to provide a communication capability as a single site within a site if the site fails to connect to the network in a multi-site system due to a system failure. Use of this function allows the transceiver to communicate within the site even if the system is in the state of Network Failure.

Upon the receipt of the broadcast message notifying that the system is in the state of Network Failure, the transceiver enters Network Failure Mode. If Network Failure Indicator is enabled, “NET FAIL” and the GID name alternately appear on the main display of the transceiver at 1-second intervals while the transceiver is operated in Network Failure Mode.



Portable



Mobile

Also, If Network Failure Tone is enabled, a Network Failure Tone A sounds at 5-second intervals from the transceiver while the transceiver is operated in Network Failure Mode, and a Network Failure Tone B sounds from the transceiver when the transceiver exits Network Failure Mode.

Note:

- The transceiver cannot transmit using Site Roaming while the system is in the state of Network Failure.
- Even if the transceiver is operated in Network Failure Mode, Background Hunt will be initiated as usual.
- Pressing any key on the transceiver stops a Network Failure Tone A from sounding.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Network Failure Indicator (Edit > Network > Hunt Options)
- Configuring the Network Failure Tone (Edit > Network > Hunt Options)

25.30 Telephone Call (NXDN Trunking System Only)

Telephone Call is the function to initiate voice communications using a telephone by connecting to a telephone line such as PSTN and PABX.

A call can be initiated from the transceiver to a telephone, and from a telephone to the transceiver.

25.30.1 Initiating a Telephone Call

Telephone Call can be started by one of the following methods.

- **Autodial Mode**

  A Telephone Call can be initiated by selecting the DTMF code configured in the Autodial List, or directly entering a DTMF code and pressing the **PTT** switch, the **Side 2** key (Portable), or the **Square** key (Mobile) in Autodial Mode. (Refer to: 14.1.4 Autodial List Selection on page 124)

  Pressing the **Autodial** key causes the transceiver to enter Autodial Mode.

- **Keypad Entry**

  If “Autodial” is configured for Keypad Operation, pressing a key(s) on the keypad causes the transceiver to enter Autodial Mode. The transceiver will be on hold as the first digit of the DTMF code is entered. A Telephone Call can be initiated by entering a DTMF code and pressing the **PTT** switch, the **Side 2** key (Portable), or the **Square** key (Mobile). (Refer to: 14.1.3 Store & Send on page 122)

- **Call Key**

  A Telephone Call can be initiated by pressing one of the **Call 1** to **Call 6** keys. A DTMF code of the target transceiver can be configured for the **Call 1** to **Call 6** keys by selecting one DTMF code from the Autodial List by using KPG-141D/ KPG-141DN. (Refer to: 14.1.5 Call Key on page 124)

- **Selcall on PTT**

  The transceiver initiates a Telephone Call when the **PTT** switch is pressed on a GID where “Telephone Call” is configured for Selcall on PTT. A DTMF code of the target transceiver can be configured by selecting one DTMF code from the Autodial List by using KPG-141D/ KPG-141DN.

- **Response to Incoming Calls**

  When the transceiver receives a Telephone Call, the transceiver can respond to the transmitting transceiver by pressing the **PTT** switch, the **Side 2** key (Portable), or the **Square** key (Mobile) while “PHONE CALL” appears on the main display.

Note: For Portable (without LCD/ without Key), a Telephone Call cannot be initiated with keypad entry or by using Autodial Mode.

■ Operating the Transceiver

1. Initiate a Telephone Call by one of the method above.

Portable

Mobile

If Call in Progress Tone is enabled, a Call In Progress Tone sounds from the transceiver and “PHONE” (Portable) or “PHONE CALL” (Mobile) appears on the main display when the transceiver is available for communications.

The Busy LED lights green.

Portable

Mobile

2. Press the **PTT** switch.

   A user can start conversations.

Portable

Mobile

3. Press the **Side 1** key (Portable), the **Triangle** key (Mobile), or the **[#]** key.

   If Disconnect Indication Tone is enabled, a Disconnect Indication Tone sounds from the transceiver and the communication ends.

Portable

Mobile

Note:

- The DTMF code can be sent during the call by pressing one of the **[0]** key to **[9]** key, the **[*]** key or the **[#]** key.
- If Call Request Tone is enabled, the Call Request Tone sounds from the transceiver when the **PTT** switch is pressed to initiate a call request. If the Call Processing Tone is enabled, a Call Processing Tone sounds from the transceiver while the **PTT** switch is pressed and held after a call request is initiated by pressing the **PTT** switch. (Refer to: 25.27 Call Request Tone/ Call Processing Tone (NXDN Trunking System Only) on page 301)
- If PTT Proceed Tone is enabled, a Proceed Tone sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to: 3.9 PTT Proceed Tone on page 25)
- For Mobile, if Microphone On-hook Disconnect is enabled, a conversation ends by placing the microphone in the on-hook state.
- Refer to ● Display during a Transmission on page 232 for information about the contents displayed on the main display during transmission.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selcall on PTT (Edit > Zone Information (NXDN Trunking System) > GID Edit)
- Configuring the Call in Progress Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Disconnect Indication Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)

25.30.2 Receiving a Telephone Call

When the transceiver receives a Telephone Call, an Alert Tone (Telephone Call) sounds from the transceiver and “PHONE” (Portable) or “PHONE CALL” (Mobile) appears on the main display.

Portable

Mobile

Note:

- If Telephone Call Alert LED is enabled, the LED blinks orange when the transceiver receives a Telephone Call.
- For Mobile, if “Blue” is configured for Alert LED Color (Telephone Call), the blue LED blinks when the transceiver receives a Telephone Call.
- If Telephone Call (Alert Tone) is enabled, a tone sounds from the speaker of the transceiver when the transceiver receives a Telephone Call.
- The transceiver can respond to the transmitting transceiver by pressing the **PTT** switch, the **Side 2** key (Portable), or the **Square** key (Mobile) when the transceiver receives a Telephone Call. For Mobile, when Mic Off-hook Connect is enabled, the transceiver can respond to the transmitting transceiver even if the microphone is in the Off-hook state.
- When the transceiver receives a Telephone Call, the transceiver can reject an incoming call by pressing the **Side 1** key (Portable), the **Triangle** key (Mobile) or the **[#]** key.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Telephone Call Alert LED to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Telephone Call (Alert Tone) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert LED Color (Telephone Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)

25.31 Direct Frequency Assignment (NXDN Trunking System Only)

Direct Frequency Assignment (DFA) is the function where a 2nd Generation NXDN Trunking system directly notifies the transceiver of frequency information with the frequency information.

The transceiver which received from the system a broadcast message with the frequency information of a new site added, such as when the site is added to a 2nd Generation NXDN Trunking system, can immediately use the site. The site can be expanded without overwriting the configuration data of the transceiver in operation.

When receiving a broadcast message with frequency information from a 2nd Generation NXDN Trunking system, the following frequency information is stored in the internal memory of the transceiver. In addition to the configuration data of KPG-141D/ KPG-141DN, a new Hunt Table is structured and becomes a search target of a control channel. This information is not cleared even if turning the transceiver OFF, and is stored in the internal memory of the transceiver.

Table 25-26 Parameters of Direct Frequency Assignment

Frequency Information	Broadcast Message Including Frequency Information	Amount That Can Be Stored	Timing of Storage
Base frequency	SITE_INFO message	A maximum of 8 pairs (available for managed in each network)	When a SITE_INFO message is received
Step			
Uplink and downlink frequency numbers on a control channel	CCH_INFO message	A maximum of 414 pairs (available for managed in each network)	When a CCH_INFO message is received
Bandwidth (or Bit Rate)			

The transceiver calculates the frequency of a newly added repeater as follows:

Frequency = base frequency + (frequency number) × (step)

Note:

- To use this function, Direct Frequency Assignment needs to be configured in Channel Announcement in the system for the frequency notification method in a 2nd Generation NXDN Trunking system. Also, 2nd Generation Trunking System of the transceiver needs to be enabled.
- This function can be used only for a transceiver having firmware version 5.10.00 or later.

25.31.1 Confirming the Stored Frequency Information (DFA Information)

The frequency information stored in the internal memory of the transceiver can be confirmed in the **DFA Information** dialog box of KPG-141D/ KPG-141DN. By reading the frequency information from the transceiver in the **DFA Information** dialog box, the various information of each network can be viewed. Refer to the help texts of KPG-141D/ KPG-141DN for instructions on how to operate by the **DFA Information** dialog box.

■ Configuration Using KPG-141D/ KPG-141DN

- Confirming the Stored Frequency Information (Refer to Tools > DFA Information.)

25.31.2 Deleting the Stored Frequency Information (DFA Data Erase)

The frequency information stored in the internal memory of the transceiver can be deleted when writing the configuration data to the transceiver. Refer to the help texts of KPG-141D/ KPG-141DN (DFA Data Erase) for instructions on how to operate.

■ Configuration Using KPG-141D/ KPG-141DN

- Deleting the Stored Frequency Information (Program > Write Data to the Transceiver > DFA Data Erase)

25.31.3 Using Beat Shift for Direct Frequency Assignment (DFA Channel Beat Shift)

DFA Channel Beat Shift is the Beat Shift function applied to a channel that becomes available after acquiring the frequency information by using Direct Frequency Assignment. (Refer to 4.8 Beat Shift on page 33.)

If the frequency information acquired from a 2nd Generation NXDN Trunking system matches within the range of frequencies configured by KPG-141D/ KPG-141DN, Beat Shift behaves according to the configuration of Transceiver (Beat Shift).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring DFA Channel Beat Shift (Refer to Edit > Network > DFA Channel Beat Shift.)

25.31.4 Example of System Operation Using Direct Frequency Assignment

This section describes the operation example of an NXDN Trunking system using Direct Frequency Assignment.

■ Adding a New Site

1) The transceiver acquires the base frequency and step information from a SITE_INFO message in an existing site and stores them in the internal memory of the transceiver.

2) After acquiring the frequency number (downlink only) of a control channel in a new adjacent site from an ADJ_SITE_INFO message in the existing site, the transceiver calculates the frequency and migrates to the new site by using Background Hunt.

3) After acquiring the uplink and downlink frequency numbers from a CCH_INFO message in the new site, the transceiver stores the uplink and downlink frequency numbers in the internal memory of the transceiver, calculates the frequency, and executes location registration.

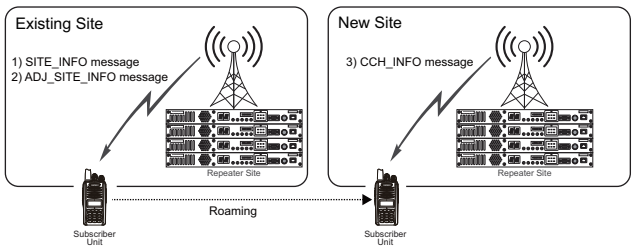


Figure 25-11 Adding a New Site

■ Acquiring a Traffic Channel in a New Site

1) The transceiver sends a VCALL_REQ message to a newly added site.

2) If the transceiver receives a VCALL_ASSGN message with the frequency number of a traffic channel added, the transceiver calculates the frequency of the traffic channel and migrates to this traffic channel.

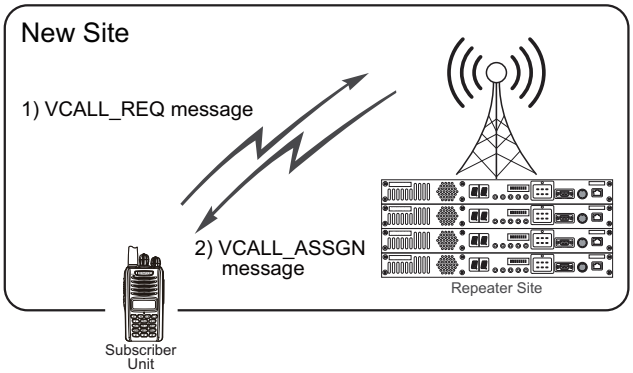


Figure 25-12 Acquiring a Traffic Channel in a New Site

■ Adding a Control Channel to an Existing Site

1) The transceiver acquires the base frequency and step information from a SITE_INFO message and stores them in the internal memory of the transceiver.

2) The transceiver acquires the frequency number of a newly added control channel and stores the frequency number in the internal memory of the transceiver. Then, the transceiver calculates the frequency of the control channel and migrates to this control channel.

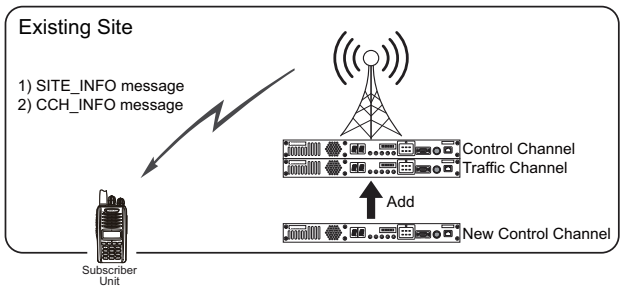


Figure 25-13 Adding a Control Channel to an Existing Site

■ Adding a Traffic Channel to an Existing Site

1) The transceiver sends a VCALL_REQ message to the existing site.

2) If the transceiver receives a VCALL_ASSGN message with the frequency number of a newly added traffic channel, the transceiver calculates the frequency of the traffic channel and migrates to this traffic channel.

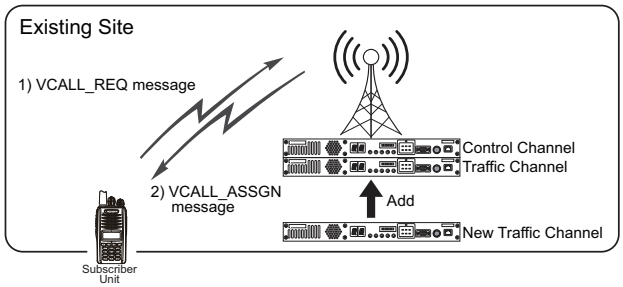


Figure 25-14 Adding a Traffic Channel to an Existing Site

25.32 System Auto Select (NXDN Trunking System Only)

System Auto Select is the function to automatically switch the system without manually changing the zone if the transceiver is being operated in multiple systems.

If the transceiver becomes outside the communication area in an NXDN Trunking system, System Selection Wait Time is activated. The transceiver remains in the current system while System Selection Wait Time is counting down. If the length of time configured in System Selection Wait Time elapses, the zone is automatically switched to the zone of a zone number greater by one. The switching of zones repeats until a control channel is acquired.

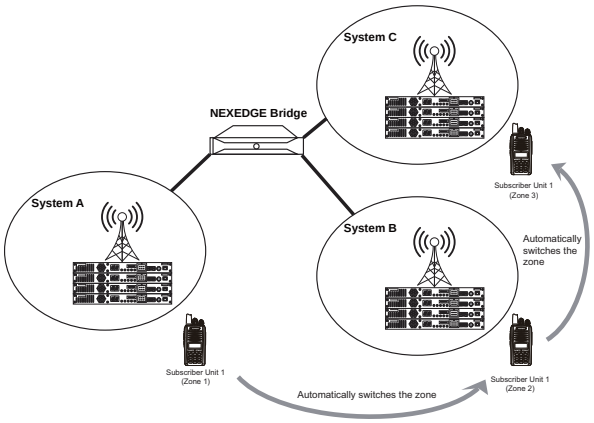


Figure 25-15 System Auto Select

However, the following zones are excluded from switching and skipped:

- A zone in the same system as the previous zone
- A zone in a system other than an NXDN Trunking system

Note:

♦ If the following keys are operated while System Auto Select is activated, System Auto Select ends. Then, the transceiver returns to the zone channel selected when starting System Auto Select.

Channel Up/Down key

Zone Up/Down key

Channel Down key

Channel Up key

Zone Down key

Zone Up key

Site Up key

Site Down key

♦ If the following keys are operated or the status of the AUX Input port changes while System Auto Select is activated, System Auto Select ends. Then, the transceiver returns to the zone channel selected when starting System Auto Select, and the function behaves. The behavior is the same even if the channel is changed in Channel Entry Mode or Group ID Entry Mode.

Channel Select key

Zone Select key

Site Select key

Scan key

Direct Channel 1 to Direct Channel 5 key

Direct Channel 1 Select to Direct Channel 5 Select key

Home Channel key

Home Channel Select key

Emergency key

Transceiver Password key

Maintenance key

Lone Worker key

Activity Detection key

Channel Recall key

CH/GID Select A to CH/GID Select D (AUX Input) (Mobile only)

Emergency (AUX Input) (Mobile only)

DTC (AUX Input) (Mobile only)

Data PTT (AUX Input) (Mobile only)

♦ Even if the following keys are operated while System Auto Select is behaving, a Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all. The behavior of System Auto Select continues.

Low Transmit Power key

High Transmit Power key

Scrambler/Encryption key

Scrambler/Encryption Code key

♦ This function can be used only for a transceiver having firmware version 5.10.00 or later.

■ Transceiver Behavior

1. The transceiver becomes outside the communication area in an NXDN Trunking system.

System Selection Wait Time is activated.

Portable

Mobile

2. The length of time configured in System Selection Wait Time elapses.

Zones are automatically switched sequentially.

Portable

Mobile

Note: If Auto Select Indication is enabled, “AUTO SEL” appears on the transceiver display while System Auto Select is behaving.

3. An available system is found, and registration succeeds.

If System Select Tone is enabled, a System Select Tone sounds from the transceiver, and System Auto Select ends.

Portable

Mobile

Note:

- If an available system is not found, the transceiver returns to the zone selected when starting System Select Tone, and System Select Tone ends.
- If Comprehensive Hunt is enabled and many channels are configured in Frequency Table, the migration to the next zone may take time because the number of channels to be searched is large.
- If the transceiver is turned OFF and then turned ON again while System Auto Select is activated, the transceiver is turned ON in the zone where System Auto Select is started.
- In a zone where “Auto” is configured in Home Group Revert, the transceiver migrates to a GID other than the Home GID, and System Selection Wait Time is not activated even if the transceiver becomes outside the communication area in the destination GID while the Home Group Revert Timer is counting down. If the transceiver is outside the communication area when the countdown of the Home Group Revert Timer ends and the transceiver returns to the Home GID, System Selection Wait Time is activated. (Refer to 25.35.32 Home Group Revert on page 339.)
- When the transceiver is in the following states, System Auto Select is not activated:
  - “Off” is configured in System Selection Wait Time
  - Lone Worker Mode
  - Activity Detection is enabled (Portable only)
  - Emergency Mode
  - Maintenance Mode
  - OTAP Mode
  - Transceiver Password Mode
  - Error Zone-CH/GID
  - Remote Group Add (GID change prohibition)
  - When the GID is changed by using Direct CH/GID 1 to Direct CH/GID 5 (Return is enabled)
  - When the GID is changed by using Home GID (only if “Manual” is configured in Home Group Revert)
  - When the channel or GID is changed by using CH/GID Recall
  - When the channel or GID is changed by using CH/GID Select A to CH/GID Select D (AUX Input) (Mobile only)
  - Stun state
  - When executing Forced Search
  - Failsoft Mode
  - When the Zone-channel or GID is changed

25.32.1 System Selection Wait Time

System Selection Wait Time is the length of time from when the transceiver becomes outside the communication area in the currently selected system until the transceiver starts the System Auto Select behavior.

Configuring System Selection Wait Time can prevent System Auto Select from being activated accidentally even if the transceiver temporarily enters a coverage area with weak signals and becomes outside the communication area.

If the transceiver becomes outside the communication area, System Selection Wait Time is activated. If no available control channel is found and the length of time configured in System Selection Wait Time elapses, the transceiver starts the System Auto Select behavior. If an available control channel is found while the System Selection Wait Time is counting down, the transceiver stops the countdown of the System Selection Wait Time and does not start the System Auto Select behavior.

Note: If “Off” is configured in System Selection Wait Time, System Auto Select does not behave and the transceiver remains in the selected system even if the transceiver becomes outside the communication area.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the System Selection Wait Time (Edit > NXDN > NXDN 1 > Trunking 2 > System Auto Select)

25.32.2 Selected Channel Hold

Selected Channel Hold is the function to retain the GID number selected in the zone where the transceiver became outside of the communication area when the zone switched by System Auto Select.

Table 25-27 Selected Channel Hold

Configuration	Description
Enabled	When the zone is switched by System Auto Select, the transceiver migrates to the same GID number as the GID number selected in the zone where the transceiver became outside of the communication area, and the transceiver starts the control channel hunt. If the same GID number as the GID number selected in the zone where the transceiver became outside of the communication area does not exist in the destination zone, the transceiver migrates to the backup GID number in the destination zone and starts the control channel hunt. If no backup GID number exists, the transceiver migrates to the lowest GID number in the zone and starts the control channel hunt.
Disabled	When the zone is switched by System Auto Select, the GID number selected in the zone where the transceiver became outside of the communication area is not retained. The transceiver migrates to the backup GID number in the destination zone and starts the control channel hunt. If no backup GID number exists, the transceiver migrates to the lowest GID number in the zone and starts the control channel hunt.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selected Channel Hold to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > System Auto Select)

25.32.3 Auto Select Indication

Auto Select Indication is the function to display “AUTO SEL” on the transceiver display while System Auto Select is behaving.

If this function is enabled, “AUTO SEL” appears on the transceiver display while System Auto Select is behaving.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Select Indication to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > System Auto Select)

25.32.4 System Select Tone

System Select Tone is the function to emit a System Select Tone from the transceiver when an available system is found by System Auto Select and registration succeeded.

If this function is enabled, a System Select Tone sounds from the transceiver when an available system is found by System Auto Select and registration succeeded.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the System Select Tone to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > System Auto Select)

25.33 Multi-System Roaming (NXDN Trunking System Only)

Multi-System Roaming is the function that enables the transceiver to roam into a system other than the system to which the transceiver belongs in a multi-system where multiple systems of different System Codes are connected by using the Roaming Gateway (KPG-1005RG).

If this function is used, the communication area expands because the transceiver can communicate using multiple systems.

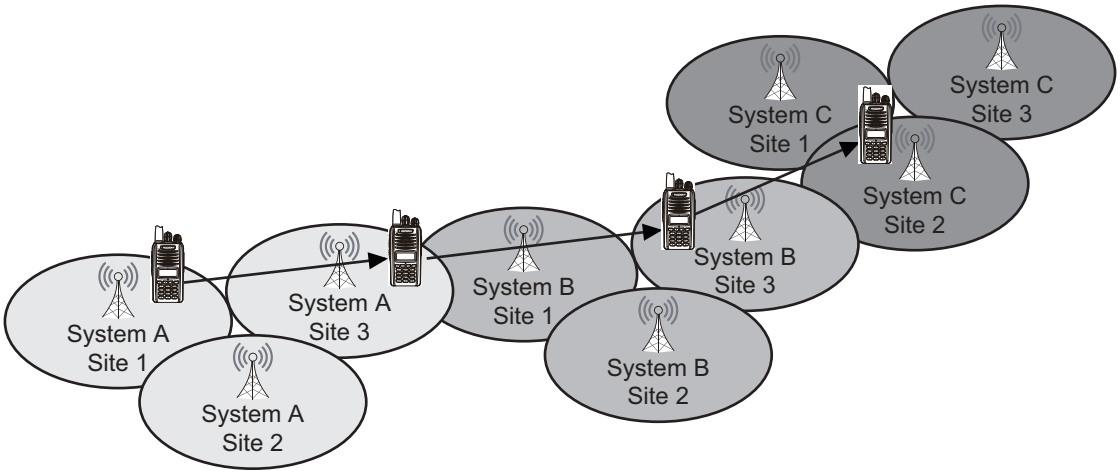


Figure 25-16 Multi-System Roaming

The transceivers that belong to the same system (hereinafter referred to as “Home System”) can communicate with each other. For a system other than the system to which the transceiver belongs (hereinafter referred to as “Roaming System”), the transceiver is basically operated in the Home System configuration just by using the system temporarily. However, the number of network configurations and the number of System Keys each need to be the same as the number of systems to be roamed to enter a Roaming System.

The Home System has a single NXDN Trunking system configuration, which includes the network and System Key configurations of the Home System and the network and System Key configurations of a Roaming System. The Home System can have a maximum of 7 Roaming Systems.

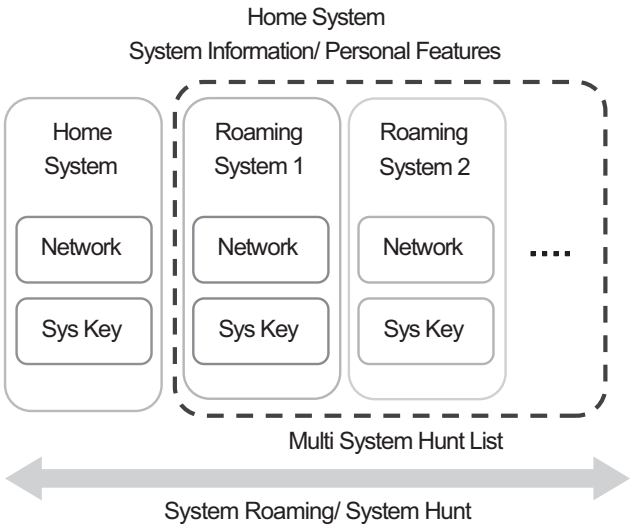


Figure 25-17 System Roaming/ System Hunt

Note: In a Roaming System, Failsoft and the GPS data transmission functions other than the following functions do not function:

- GPS data transmission in Advanced GPS Report Mode
- GPS data transmission by Send the GPS Data
- GPS data transmission by the receipt of a GPS Data Single Polling Request

25.33.1 Multi-System Hunt

Multi-System Hunt is the function to roam among the systems configured in Multi-System Hunt List.

If this function is enabled, the Multi-System Hunt is started according to the configuration in Multi-System Hunt Trigger.

Table 25-28 Multi-System Hunt Trigger

Configuration	Description
After Standard Hunt	If the transceiver becomes outside the communication area and the hunt sequence ends in the current system, the Multi-System Hunt is started in the order of systems configured in Multi-System Hunt List.
Time	If the transceiver becomes outside the communication area and the length of time configured in Time elapses, the Multi-System Hunt is started in the order of systems configured in Multi-System Hunt List. This configuration is used to prevent the transceiver from being migrated to a different system erroneously even if the transceiver temporarily enters an area with a weak signal and becomes outside the communication area. **Note:** The length of time configured in Time counts down from when the transceiver becomes outside the communication area until the Multi-System Hunt is started.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Multi-System Hunt to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming)
- Configuring the Multi-System Hunt Trigger (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming)
- Configuring the Time (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming)

25.33.2 Multi-System Hunt List

Multi-System Hunt List is the list in which systems targeted for roaming are configured.

If the transceiver is outside the communication area, the systems configured in Multi-System Hunt List are the targets for roaming by the Multi-System Background Hunt function. (Refer to: 25.33.5 Executing the Background Hunt in Different Systems (Multi-System Background Hunt) on page 320)

If the transceiver is outside the communication area, the Multi-System Hunt is executed by switching systems in the order configured in Multi-System Hunt List.

In a multi-system, the systems are automatically switched. In the switched system, the same hunt sequence as the hunt sequence of a single system is executed.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Multi-System Hunt List (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming > Multi-System Hunt List)
- Configuring the Home System (Edit > NXDN > NXDN 1 > General 1 > Home System)

25.33.3 Transceiver Behavior When Executing the Multi-System Hunt

■ Transceiver behavior immediately after turning the transceiver ON

If the transceiver is turned ON, the transceiver starts the Multi-System Hunt on the control channel of the system last used when the transceiver was last turned OFF.

If the transceiver executes the Multi-System Hunt and all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

The transceiver behavior varies as follows depending on the configuration in Last Control Channel. (Refer to: 25.19 Last Control Channel (NXDN Trunking System Only) on page 287)

- **If Last Control Channel is enabled:**

  If the system last used when the transceiver was last turned OFF is the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

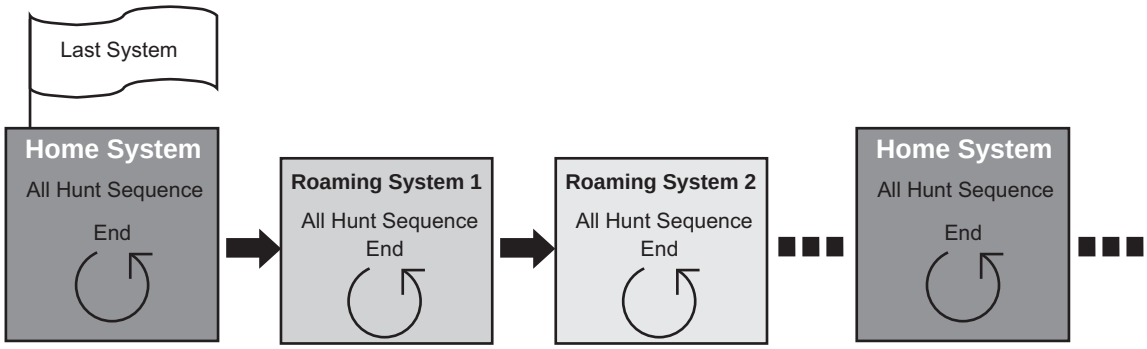


Figure 25-18 Multi-System Hunt 1

  If the system last used when the transceiver was last turned OFF is a system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of the system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

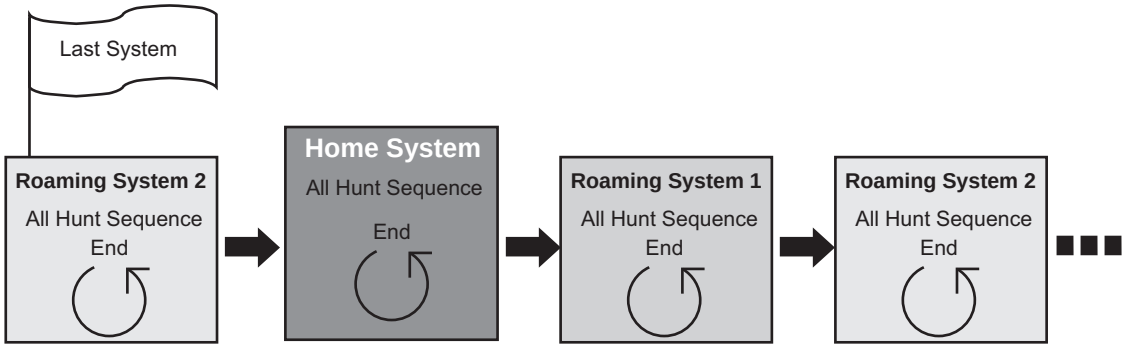


Figure 25-19 Multi-System Hunt 2

- **If Last Control Channel is disabled:**

  The transceiver always starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

■ Transceiver behavior when the transceiver becomes outside the communication area

If the transceiver becomes outside the communication area, the transceiver starts the Multi-System Hunt in the current system.

If the transceiver executes the Multi-System Hunt and all hunt sequences end without acquiring a control channel, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

The transceiver behavior varies as follows depending on the configuration in Multi-System Hunt Trigger. (Refer to: 25.33.1 Multi-System Hunt on page 315)

- **If "After Standard Hunt" is configured in Multi-System Hunt Trigger:**

  If the transceiver becomes outside the communication area in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

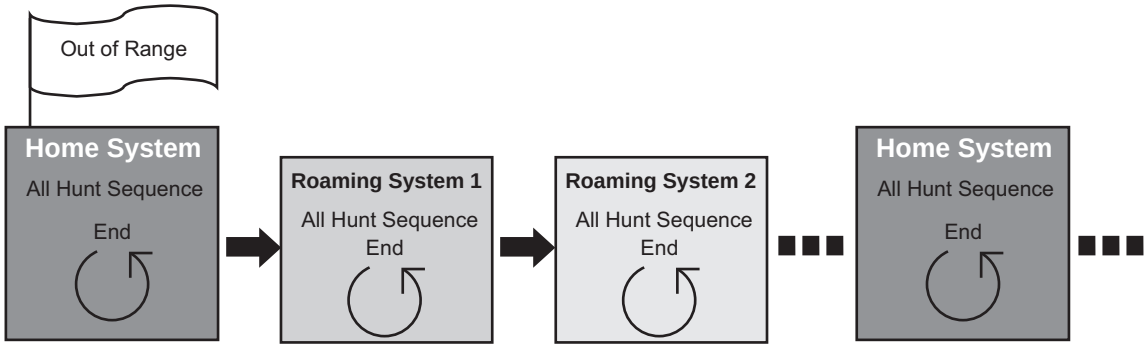


Figure 25-20 Multi-System Hunt 3

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

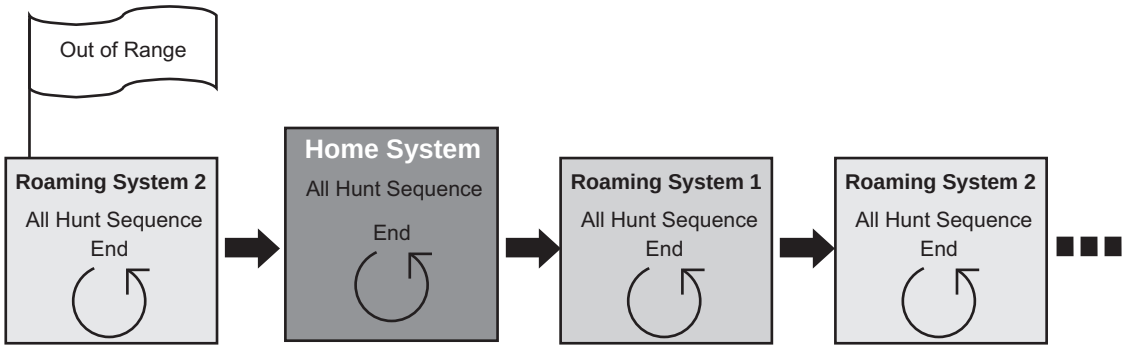


Figure 25-21 Multi-System Hunt 4

- **If “Time” is configured in Multi-System Hunt Trigger:**

  If the transceiver becomes outside the communication area in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When the length of time configured in Time elapses, the transceiver starts the Multi-System Hunt by forcibly switching systems in the order configured in Multi-System Hunt List.

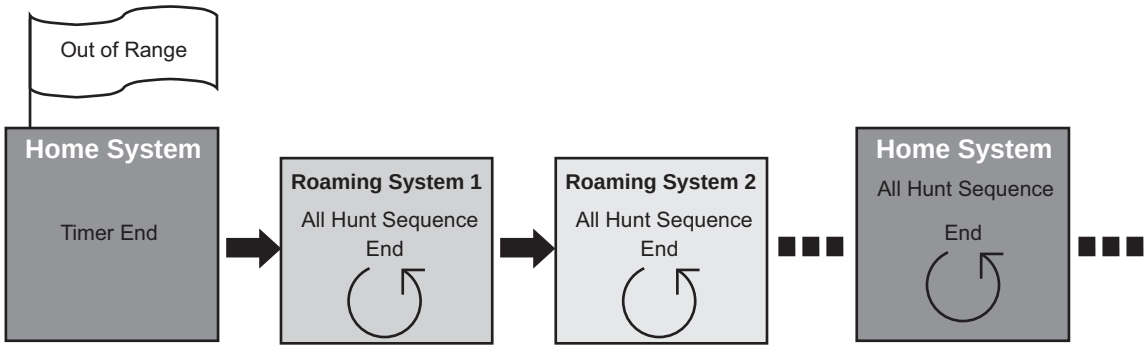


Figure 25-22 Multi-System Hunt 5

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. If the length of time configured in Time elapses, the transceiver forcibly migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

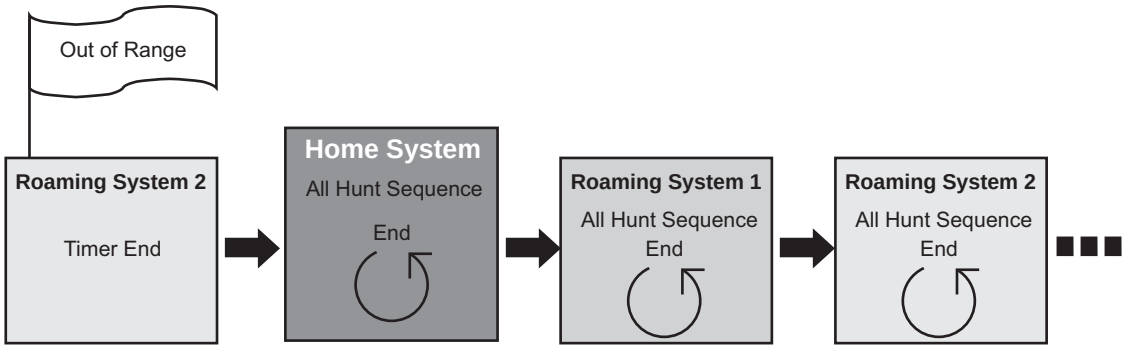


Figure 25-23 Multi-System Hunt 6

■ Transceiver behavior when Forced Search is executed

If Forced Search is executed in an NXDN Trunking system with Multi-System Hunt enabled, the Multi-System Hunt is executed for each system configured in Multi-System Hunt List. (Refer to: 25.21 Forced Search (NXDN Trunking System Only) on page 288)

When all hunt sequences end without acquiring a control channel in a system, the transceiver starts the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List. If all hunt sequences end without acquiring a control channel in the Roaming System registered last in Multi-System Hunt List, the transceiver returns to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver repeats this behavior until the transceiver acquires a control channel.

If Forced Search is executed in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

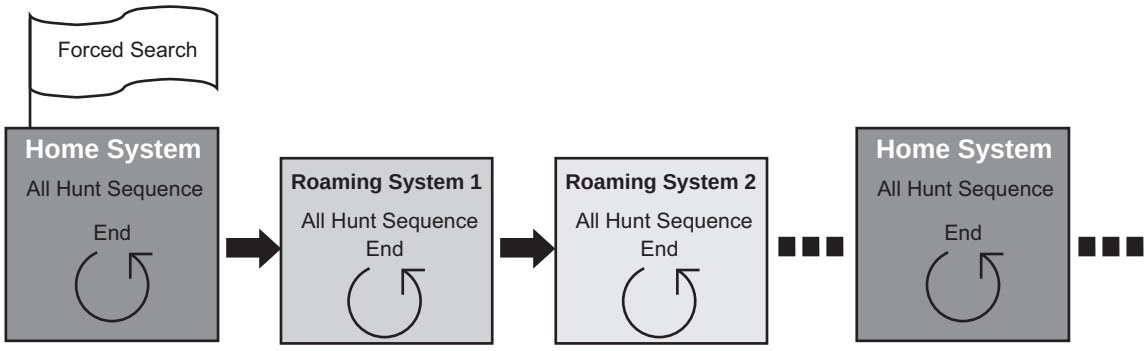


Figure 25-24 Multi-System Hunt 7

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in Multi-System Hunt List.

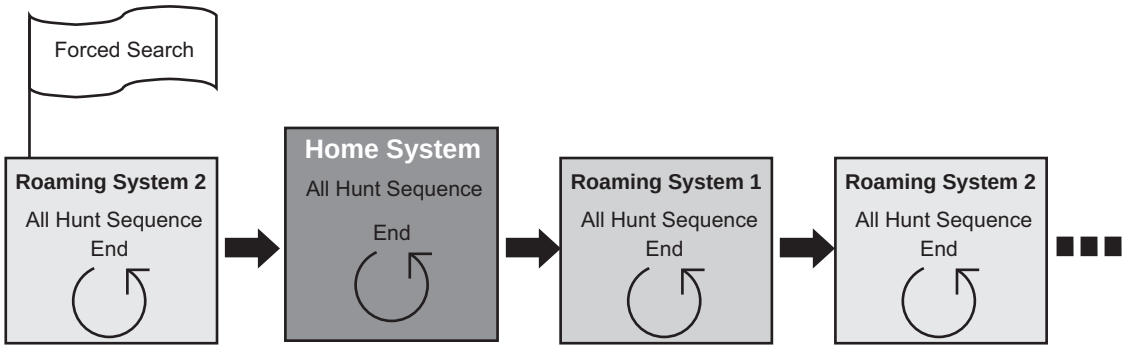


Figure 25-25 Multi-System Hunt 8

25.33.4 Using the System Auto Select Function (System Auto Select)

System Auto Select functions after the length of time configured in System Selection Wait Time elapses if the System Auto Select function is configured in the Home System. (Refer to: 25.32 System Auto Select (NXDN Trunking System Only) on page 311)

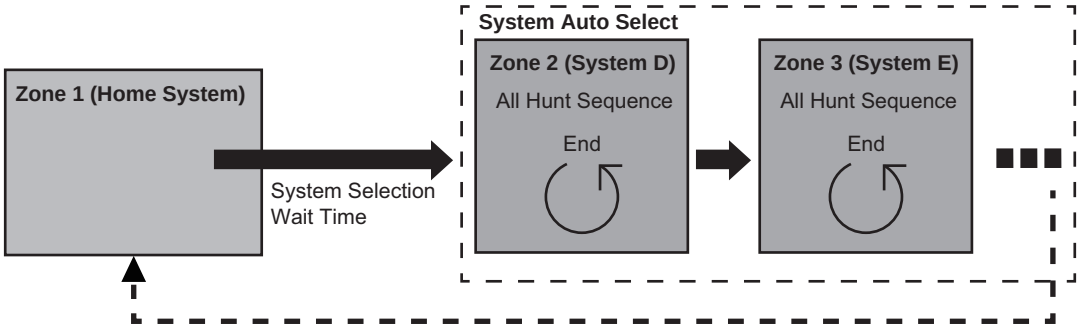


Figure 25-26 System Auto Select

25.33.5 Executing the Background Hunt in Different Systems (Multi-System Background Hunt)

Multi-System Background Hunt is the function to execute the Background Hunt in systems configured in Multi-System Hunt List.

By using this function, the transceiver can automatically acquire a control channel providing better conditions than the currently acquired control channel by expanding the range to other systems as well as the same system, while the transceiver is in the standby state after acquiring a control channel. The target system of Multi-System Background Hunt is a system configured in Multi-System Hunt List. To use this function, the target system of Multi-System Background Hunt needs to be specified in the channel information of an adjacent site (Adjacent Site Information) in the system.

Also, for Multi-System Background Hunt, the Home System can have the most preferentially searched channel (Preferential Hunt Control Channel).

Note:

- In Multi-System Background Hunt, the following configurations of each system are commonly used:
  - Search Interval Time (Refer to: 25.23 Failsoft (NXDN Trunking System Only) on page 293)
  - System Search Policy (Refer to: 25.20 System Search Policy (NXDN Trunking System Only) on page 288)
- By using Direct Frequency Assignment (DFA), the transceiver can roam by Multi-System Background Hunt even for a newly added system. The transceiver can roam even if a frequency is not configured in the transceiver to operate in the newly added system. However, the newly added system needs to be registered as the Roaming System in Multi-System Hunt List beforehand. (Refer to: 25.31 Direct Frequency Assignment (NXDN Trunking System Only) on page 309)

■ Signal strength level for a new control channel acquisition by Multi-System Background Hunt

The signal strength level to acquire a control channel providing better conditions than the current control channel by Multi-System Background Hunt can be configured on a control channel in the Home System or Roaming System.

Table 25-29 Level Margin

Configuration	Description
Roaming System Level Margin	The signal strength level to acquire a control channel in the Roaming System providing better conditions than the current control channel by Multi-System Background Hunt is configured. The conditions to acquire a new control channel by Multi-System Background Hunt in the Roaming System are as follows: a) The signal strength of the control channel to be newly acquired in the Roaming System is stronger than the signal strength of the currently acquired control channel in the Home System or Roaming System. b) The difference of the signal strength of a) is equal to or higher than the level configured in Roaming System Level Margin.
Home System Level Margin	The signal strength level to acquire a control channel in the Home System providing better conditions than the current control channel by Multi-System Background Hunt is configured. The conditions to acquire a new control channel by Multi-System Background Hunt in the Home System are as follows: a) The signal strength of the control channel to be newly acquired in the Home System is stronger than the signal strength of the currently acquired control channel in the Roaming System. b) The difference of the signal strength of a) is equal to or higher than the level configured in Home System Level Margin.

■ Conditions for Multi-System Background Hunt to function

The conditions for Multi-System Background Hunt to function are as follows:

Table 25-30 Conditions for Multi-System Background Hunt to Function

Channel Information of the Adjacent Site (Candidate as the Control Channel to Be Newly Acquired)		Currently Acquired Control Channel		
		Home System		Roaming System
		Priority 1/ Priority 2	Other Than Priority 1/ Priority 2	Other Than Priority 1/ Priority 2
Home System	**Priority 1/ Priority 2**	Multi-System Background Hunt does not function because the system is the same.	Multi-System Background Hunt does not function because the system is the same.	Because the control channel to be newly acquired has a higher priority level than the currently acquired control channel, the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel, regardless of the configuration in Home System Level Margin.
	Other Than Priority 1/ Priority 2	Multi-System Background Hunt does not function because the system is the same.	Multi-System Background Hunt does not function because the system is the same.	If the following 2 conditions are satisfied, the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel. a) The signal strength of the control channel to be newly acquired is stronger than the signal strength of the currently acquired control channel. b) The difference of the signal strength of a) is equal to or higher than the level configured in Home System Level Margin.

Channel Information of the Adjacent Site (Candidate as the Control Channel to Be Newly Acquired)		Currently Acquired Control Channel		
		Home System		Roaming System
		Priority 1/ Priority 2	Other Than Priority 1/ Priority 2	Other Than Priority 1/ Priority 2
Roaming System	**Other Than Priority 1/ Priority 2**	The Roaming System cannot have the most preferentially searched channel. (Preferential Hunt Control Channel). Also, Multi-System Background Hunt does not function because a control channel with higher priority than the currently acquired control channel does not exist.	If the following 2 conditions are satisfied, the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel. a) The signal strength of the control channel to be newly acquired is stronger than the signal strength of the currently acquired control channel. b) The difference of the signal strength of a) is equal to or higher than the level configured in Roaming System Level Margin.	**If the system is the same:** Multi-System Background Hunt does not function. **If the system is different:** If the following 2 conditions are satisfied, the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel. a) The signal strength of the control channel to be newly acquired is stronger than the signal strength of the currently acquired control channel. b) The difference of the signal strength of a) is equal to or higher than the level configured in Roaming System Level Margin.

Note: If the System Lock or Site Lock is enabled, Multi-System Background Hunt does not function. (Refer to: 25.22 Site Lock/ Site Select (NXDN Trunking System Only) on page 289)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring **Multi-System Background Hunt** to be enabled or disabled (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming > Multi-System Background Hunt)
- Configuring **Roaming System Level Margin** (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming > Multi-System Background Hunt > System Background Hunt Level Margin)
- Configuring **Home System Level Margin** (Edit > NXDN > NXDN 1 > Trunking 2 > Multi-System Roaming > Multi-System Background Hunt > System Background Hunt Level Margin)

25.34 System Lock/ System Select (NXDN Trunking System Only)

System Lock is the function to lock the system to be used as the current system and prevent the transceiver from roaming to other systems by operating the transceiver keys in a system that uses Multi-System Roaming. If this function is enabled, the transceiver is locked in the current system and cannot roam.

Pressing the **System Lock** key causes the System Lock to become enabled for the selected system.

The System Lock can also be enabled by selecting a system in System Select Mode. Also, selecting a system by using the **Selector** or **PF** keys can enable the System Lock.

The following functions need to be assigned to the **Selector** and **PF** keys in order to select the system to enable the System Lock by using the **Selector** or **PF** keys:

Table 25-31 System Lock/ System Select

Key	Function	Reference
Selector[*1]	System Up/Down System Select	7.1 Assigning Functions to the Selector (Portable Only) on page 84
PF key	System Up System Up (Continuous) System Down System Down (Continuous)	7.2 Assigning Functions to the PF Keys on page 85

[*1] Portable only

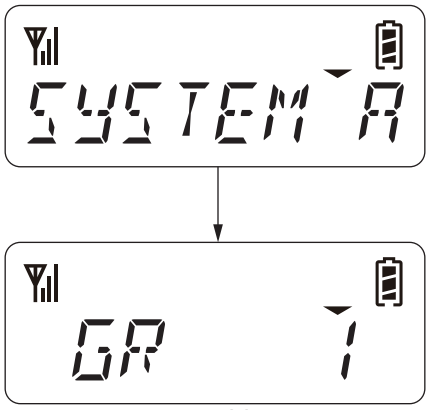
Note: This function functions only if a Zone-channel in an NXDN Trunking system configured as the Home System with Multi-System Hunt enabled is selected. (Refer to: 25.33.1 Multi-System Hunt on page 315)

■ Operating the Transceiver

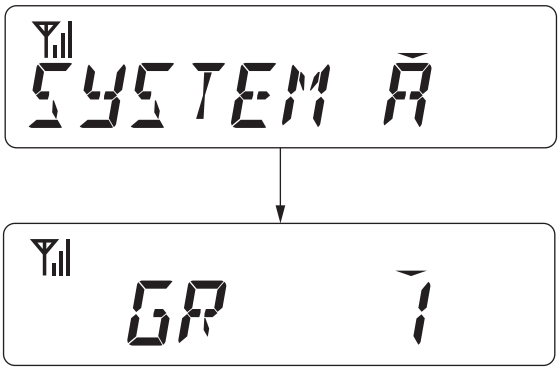
- **Enabling or disabling the System Lock**

1. Press the **System Lock** key while the System Lock is disabled.

A Key Beep A sounds from the transceiver and the system name of the system in use appears on the display for 2 sec. After 2 sec elapse, the System Lock becomes enabled.



Portable



Mobile

2. Press the **System Lock** key while the System Lock is enabled.

The System Lock becomes disabled.

- **Using System Select Mode**

1. Press and hold the **System Lock** key.

   The transceiver enters System Select Mode, and then the system list appears.

Portable

Mobile

2. Press the **[<B]** or **[C>]** key (Portable), or press the **[⩓]** or **[⩔]** key (Mobile) to select a system for which the System Lock is to be enabled.

   Refer to 5.16.1 Selecting and Deleting Data from a List on page 50 for selection methods.

Portable

Mobile

3. Press the **[S]** key or **[*]** key.

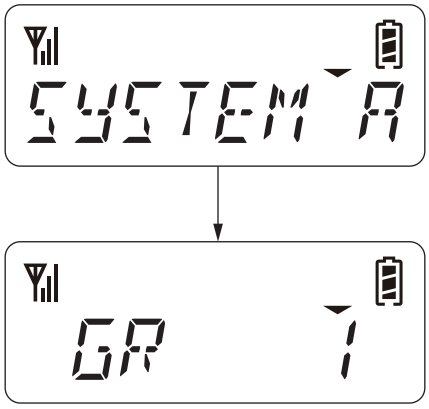
   The System Lock becomes enabled for the selected system.

- **Using the Selector (Portable only) or the PF key**

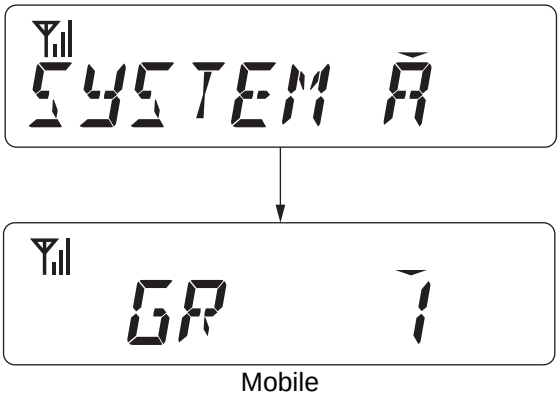
1.Select one of the following operations.

- Press the **System Up** or **System Down** key to select a system for which the System Lock is to be enabled.
- Turn the **Selector** (System Up/Down) to select a system for which the System Lock is to be enabled.
- Turn the **Selector** (System Select) to select a system for which the System Lock is to be enabled.

A Key Beep A sounds from the transceiver and the system name of the system in use appears on the display for 2 sec. After 2 sec elapse, the System Lock becomes enabled.



Portable



Mobile

Note:

- The System Lock can be enabled only if the transceiver has acquired a control channel.
- If the Site Lock is disabled, the transceiver can roam between sites in the system even if the System Lock is enabled for the system in use.
- Because the site is fixed even if the System Lock is disabled if the Site Lock is enabled, the transceiver becomes unable to roam to other systems.
- For System Select, Multi-System Hunt List in an NXDN Trunking system is referenced. If a system name is configured in Multi-System Hunt List, the system name appears. If a system name is not configured in Multi-System Hunt List, “SYSTEM n” (“n” is the system number) appears.
- The status of the System Lock, either enabled or disabled, is retained in the transceiver.
- If the System Lock is enabled, Multi-System Background Hunt does not function. 25.33.5 Executing the Background Hunt in Different Systems (Multi-System Background Hunt) on page 320
- The System Lock does not become disabled even if the transceiver cannot receive signals from a control channel while the System Lock is enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)
- Assigning functions to the Selector (Edit > Key Assignment > Top/Side)

25.35 NXDN Functions

The following NXDN functions can be configured using KPG-141D/ KPG-141DN:

- Unit ID (Own)
- Over-the-Air Alias
- Radio Check
- Remote Control
- Auto Reset Timer
- Manual Dialing
- GTC Count
- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- ACK Delay Time
- Transmit Delay Time (Receive Capture)
- Data Transmit Modulation Delay Time
- Random Access (Contention)
- Selective Call Alert LED
- Message Display Type
- Alert Tone (Individual Call)
- Alert Tone (Group Call)
- Alert Tone (Broadcast Group Call)
- Alert Tone (Paging Call)
- Alert Tone (Telephone Call)
- Alert Tone (Status/Short Message Call)
- Alert Tone (Emergency Response)
- Alert LED Color (Individual Call)
- Alert LED Color (Group Call/ Conference Group Call)
- Alert LED Color (Broadcast Group Call)
- Alert LED Color (Paging Call)
- Alert LED Color (Telephone Call)
- Audio Response
- Noise Suppressor
- Alert Tone Restriction from 2nd Call
- Status Hold
- Home Group Revert

25.35.1 Unit ID (Own)

Unit ID (Own) is an identification code required for various types of communication using NXDN.

A name specific to the transceiver can be configured for Unit ID (Own).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Unit ID (Own) and Unit ID Name (Own) (Edit > NXDN > NXDN 1 > General 1)

25.35.2 Over-the-Air Alias

Over-the-Air Alias allows the receiving transceiver to display the ID Name of the transmitting transceiver when receiving a call even if the ID Name of the transmitting transceiver is not configured for the receiving transceiver.

Using this function, Unit ID Name of the added unit does not need to be configured such as when a unit is added to the system in service.

The transmitting transceiver sends Unit ID Name when making voice calls. If the receiving transceiver receives a call such as an Individual Call, the Unit ID Name stored in the reception frame will appear on the main display.

Note: The received Unit ID Name appears after a display which is different from that for the received Unit ID Name in the following cases:

- The Unit ID of the transmitting transceiver is not configured in the Unit ID List.
- The Unit ID of the transmitting transceiver is not stored as Caller ID.
- The received Unit ID Name is different from the ID configured in the Unit ID List or the ID Name stored in the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Over-the-Air Alias to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.35.3 Radio Check

Radio Check can be used to check whether an individually specified transceiver is operating in the system using radio communication.

In order to use this function, “Data” or “Data + GPS Data Output” must be configured for the communication port of the transceiver. (Refer to: 6 COMMUNICATION PORTS on page 81)

- The transceiver will send the Status Inquiry Message using Individual Call when a PC sends the Radio Check transmission command (Status Request Transmission command) to the transceiver.
- The transceiver that receives the Status Inquiry Message sends a Status Message. (Refer to: 25.11.1 Sending a Status Message on page 263)

  The transceiver sends the status configured for Default Status if no status is selected yet when the transceiver is turned ON, for instance.

  If status is selected in Status Mode, the transceiver sends the selected status.

  The transceiver will send the status retained in the transceiver if the transceiver migrates to normal mode after selecting the status.

  The transceiver sends the status configured for Stun Response Status while Stun is enabled (Transmit Inhibit or Transceiver Inhibit). If no Stun Response Status is configured, the transceiver transmits the Status in the same manner as when the transceiver is in the normal state.
- If the transceiver that sent the Status Inquiry Message receives the transmitted Status, the transceiver will receive the Status in the same manner as when the transceiver receives status. (Refer to: 25.11.2 Receiving a Status Message on page 266)

Note: In an NXDN Conventional system, the transceiver can receive the Status Inquiry Message if the received RAN code matches the RAN code preconfigured for the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Default Status (Edit > NXDN > NXDN 2 > Status > Option)
- Configuring the Stun Response Status (Edit > NXDN > NXDN 2 > Status > Option)

25.35.4 Remote Control

Radio Control can be used to remotely control an individually specified transceiver using radio communication.

In order to use this function, “Data” must be assigned to the communication port of the transceiver. (Refer to: 6 COMMUNICATION PORTS on page 81)

The transceiver will send the Remote Control Message using Individual Call if a PC sends the Remote Control transmission command to the transceiver.

The following are the Remote Control Messages:

Table 25-32 Remote Control

Remote Control Message	Description
Remote Stun	The transceiver is disabled if the transceiver receives the Remote Stun Message. Whether to accept the Remote Stun Message can be configured using KPG-141D/ KPG-141DN. If the transceiver receives the Remote Revive Message, the Stun state will be reset.
Remote Revive	If the transceiver receives the Remote Revive Message, the Stun state will be reset.
Remote Kill	If the transceiver receives the Remote Kill Message, the transceiver is disabled and all operations will be prohibited. All configuration data of the transceiver is cleared, hence Stun state will not be reset even if the transceiver receives the Remote Revive Message. However, the configuration data can be written to the transceiver using KPG-141D/ KPG-141DN. Whether to accept the Remote Kill Message can be configured using KPG-141D/ KPG-141DN.

Note:

- This function is applicable only when an individual call is initiated.
- The Stun state is identical to Stun (Transceiver Inhibit) for DTMF and FleetSync. (Refer to: 14.3.3 Stun on page 129 16.3.3 Reserved Status of the Status Message on page 153)
- The Stun state will be reset by Remote Revive even if the transceiver enters the Stun state by receiving DTMF or FleetSync signaling.
- The Stun state is also reset by using DTMF (Stun Code + #) and FleetSync (Status number 92).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Remote Stun/Kill to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.35.5 Auto Reset Timer

Auto Reset Timer is the amount of time from when the received Unit ID or Group ID matches the Unit ID or Group ID preconfigured for the transceiver until the LCD, blinking of LED and emission of Alert Tone will automatically be reset.

By using KPG-141D/ KPG-141DN, Auto Reset Timer can be configured. Also, how the transceiver responds after the amount of time configured for Auto Reset Timer elapses can be configured.

Table 25-33 Auto Reset Timer

Configuration	Description
Off	Auto Reset Timer will not be activated.
1 s to 300 s	After the configured time elapses, the matching state of the Unit ID or Group ID is automatically reset.
LED	While this function is enabled, if the time configured for Auto Reset Timer elapses, the BUSY LED blinking orange or blue (Mobile only) by Selective Call Alert LED is turned Off.
Alert Tone	While this function is enabled, the intermittently emitted Alert Tone stops if the amount of time configured for Auto Reset Timer elapses.
LCD	While this function is enabled, the display will change from one of the following displays to the previous channel display if the amount of time configured for Auto Reset Timer elapses. • ID display after receiving an Individual Call or Group Call • Status Message display after receiving a Status Message • Short Message display after receiving a Short Message **Note:** This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Auto Reset Timer (Edit > NXDN > NXDN 1 > General 2 > Auto Reset)

25.35.6 Manual Dialing

Manual Dialing is the function to directly enter the Unit ID and status.

If Manual Dialing is enabled, a Unit ID or a status can be directly entered using the keypad, the **Selector** (Portable), or keys on the transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Manual Dialing to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.35.7 GTC Count

GTC Count is the number of times to transmit the GTC using the transmitting transceiver.

GTC (Go To Channel) is a message that allows the transmitting transceiver to induce the receiving transceiver to the data channel.

The transmitting transceiver will migrate to the data channel after transmitting the GTC if the Status, Short or Long Message on Data Zone-CH/GID is configured. When the receiving transceiver receives the GTC, it automatically migrates to the data channel and stands by to receive the data.

Default value for the number of times is normally used.

Note:

- The receiving transceiver stands by to receive the Status, Short or Long Message after the transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time.
- The transmitting transceiver sends the Status, Short, or Long Message and stands by to receive the acknowledgment after the transmitting transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time.
- This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the GTC Count (Edit > NXDN > NXDN 1 > Conventional > Parameter)

25.35.8 Number of Retries

If the transceiver does not receive the acknowledgment after the transceiver sends data and the time configured for Maximum ACK Wait Time elapses, the transceiver resends data. Number of Retries is the number of times for the transceiver to resend data. A smaller number can be configured if there is good communicating conditions, and a larger number can be configured if there are inferior communicating conditions.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Number of Retries (Edit > NXDN > NXDN 1 > General 1 > Parameter)

25.35.9 Transmit Busy Wait Time

The transceiver confirms that the communication channel is available before sending data and then starts sending data when the channel is available. Transmit Busy Wait Time is the duration to wait for the communication channel to become available.

A transmission is canceled when the channel is busy and the Transmit Busy Wait Time elapses.

The default configuration is normally used.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Busy Wait Time (Edit > NXDN > NXDN 1 > General 1 > Parameter)

25.35.10 Maximum ACK Wait Time

Maximum ACK Wait Time is the length of time that the transceiver stands by to receive the acknowledgment after the transceiver sends data. If the transceiver does not receive the acknowledgment within the time configured for Maximum ACK Wait Time, the transceiver resends data.

The default configuration is normally used.

Note:

- This period is applied to the wait time for receiving data after migrating to the data channel using GTC.
- A Long Data Message is sent several times. The receiving transceiver stands by to receive the next data for the time configured for Maximum ACK Wait Time after receiving the previous data. The transceiver exits Long Data Message Receive Mode if the transceiver does not receive any data during the period.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Maximum ACK Wait Time (Edit > NXDN > NXDN 1 > General 1 > Parameter)

25.35.11 ACK Delay Time

ACK Delay Time is the length of time from when the transceiver receives data until the transceiver sends the acknowledgment.

ACK Delay Time must be shorter than Maximum ACK Wait Time configured for the transmitting transceiver.

The default configuration is normally used.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the ACK Delay Time (Edit > NXDN > NXDN 1 > Conventional > Parameter)

25.35.12 Transmit Delay Time (Receive Capture)

Transmit Delay Time is the period of time to transmit the IDLE frame prior to the first data transmission.

The transmitting transceiver transmits the IDLE frame and the receiving transceiver temporarily pauses scanning to receive the data. Using this function, the data can reliably be sent even if the receiving transceiver is scanning or using the Battery Saver.

The default configuration is normally used.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transmit Delay Time (Edit > NXDN > NXDN 1 > Conventional > Parameter)

25.35.13 Data Transmit Modulation Delay Time

Data Transmit Modulation Delay Time is the duration from when the transceiver starts transmitting until the transceiver starts being modulated by the data frame.

Data Transmit Modulation Delay Time is used to allow the transmitted radio signal to stabilize before applying data. However, it may be difficult to establish data communications when the transmit and receive frequencies are widely separated or the transceiver is always used in extremely cold areas. In such cases, Data Transmit Modulation Delay Time must be extended in order to improve the reliability of data communications.

The default configuration is normally used.

Note: This function is only available in the NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Transmit Modulation Delay Time (Edit > NXDN > NXDN 1 > Conventional > Parameter)

25.35.14 Random Access (Contention)

Random Access allows the transceiver to randomize the transmission start time for each transceiver to send data when the channel becomes available.

If a large number of transceivers begin transmitting immediately after the channel becomes available, transmission contention may occur. This function prevents this contention.

Note:

- The length of time for Random Access varies depending on the configuration for the Channel Spacing (Narrow or Very Narrow). (Refer to: 4.4 Channel Spacing on page 30)
- This function can be only used in an NXDN Conventional system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Random Access (Edit > NXDN > NXDN 1 > Conventional)

25.35.15 Selective Call Alert LED

Selective Call Alert LED can be used to make the LED blink orange when the transceiver receives a call.

For Mobile, if “Blue” is configured for Alert LED Color, the blue LED blinks.

A user can notice by the LED that the transceiver is receiving a call.

Note: For Portable (without LCD/ without Key), the blinking LED (orange) upon the receipt of a Selective Call indicates the following status of the transceiver.

(a) The transceiver has received a Selective Call (as a status of an incoming call history).

(b) The transceiver can respond to the transmitting transceiver by pressing the **PTT** switch.

Therefore, if the transceiver receives a Selective Call while the transceiver cannot respond to the transmitting transceiver; for instance, the transceiver receives an ID inhibited to transmit, the LED blinks orange as the status (a). In this case, the transceiver cannot respond even if the **PTT** switch is pressed.

Also, if LED for Auto Reset Timer is disabled and the time configured for Auto Reset Timer has elapsed, the matching status of Optional Signaling will be reset. At this time, the LED indicating the status (a) continues blinking, so that the transceiver cannot respond to the transmitting transceiver. If the LED indicates the status (a), the LED will be turned Off by pressing any key. If the LED indicates the status (b), the LED will be turned Off by pressing a key to which a specific functions is assigned. (Refer to: 4.7 Mode Reset Timer on page 33)

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Selective Call Alert LED (Trunking) (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Selective Call Alert LED (Conventional) (Edit > NXDN > NXDN 1 > Conventional)

25.35.16 Message Display Type

Message Display Type can be used to display a message on the main display type when the transceiver receives the Status Message or Short Message.

Table 25-34 Message Display Type

Message Display Type	Description
Fixed	“STM/SDM” appears on the main display when the transceiver receives a Status Message or Short Message. If a message exceeds 8 characters (Portable) or 10 characters (Mobile), the message text is displayed repeatedly while being scrolled.
Alternate	“STM/SDM” appears for 3 seconds and Unit ID appears for 2 seconds on the main display alternately upon receipt of a Status Message or Short Message.

Note:

- The previous display reappears if a key is pressed while the received message is displayed.
- This function is unavailable for Portable (without LCD/ without Key).

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Message Display Type (Edit > NXDN > NXDN 1 > General 1)

25.35.17 Alert Tone (Individual Call)

Alert Tone (Individual Call) sounds when the transceiver receives an individual call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Individual) (Trunking) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert Tone (Individual) (Conventional) (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)

25.35.18 Alert Tone (Group Call/ Conference Group Call)

Alert Tone (Group Call/ Conference Group Call) sounds when the transceiver receives a Group Call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Conference Group Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert Tone (Group Call) (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)

25.35.19 Alert Tone (Broadcast Group Call)

Alert Tone (Broadcast Group Call) sounds when the transceiver receives a Broadcast Group Call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Broadcast Group Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)

25.35.20 Alert Tone (Paging Call)

Alert Tone (Paging Call) sounds when the transceiver receives a Paging Call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Paging Call) (Trunking) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)
- Configuring the Alert Tone (Paging Call) (Conventional) (Edit > NXDN > NXDN 1 > Conventional > Alert Tone)

25.35.21 Alert Tone (Telephone Call)

Alert Tone (Telephone Call) sounds when the transceiver receives a Telephone call. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Telephone Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert Tone)

25.35.22 Alert Tone (Status/ Short Message Call)

Alert Tone (Status/ Short Message Call) sounds when a Status Message or Short Message data is received. One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Status/Short Message Call) (Edit > NXDN > NXDN 1 > General 2 > Alert Tone)

25.35.23 Alert Tone (Emergency Response)

An Alert Tone (Emergency Response) sounds if “Alert Tone” is configured for Emergency Status Response. (Refer to: 25.11.11 Emergency Status Response on page 270)

One of 8 types of tones configured for Special Alert Tone can be selected. (Refer to: 3.7 Alert Tone Pattern on page 24)

Note: If “Infinite” is configured for Cycle for Special Alert Tone, the transceiver stops emitting this tone after the time configured for Auto Reset Timer elapses.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone (Emergency Response) (Edit > NXDN > NXDN 1 > General 2 > Alert Tone)

25.35.24 Alert LED Color (Individual Call) (Mobile Only)

Alert LED Color (Individual Call) is used to blink the orange LED or the blue LED when the transceiver receives an Individual Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Individual Call).

Table 25-35 Alert LED Color (Individual Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives an Individual Call.
Orange	The orange LED blinks when the transceiver receives an Individual Call.
Blue	The blue LED blinks when the transceiver receives an Individual Call.

Note: To use this function, Selective Call Alert LED (NXDN Trunking or NXDN Conventional) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Individual Call) (Trunking) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Alert LED Color (Individual Call) (Conventional) (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)

25.35.25 Alert LED Color (Group Call/ Conference Group Call) (Mobile Only)

Alert LED Color (Group Call/ Conference Group Call) is used to blink the orange LED or the blue LED when the transceiver receives a Group Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Group Call/ Conference Group Call).

Table 25-36 Alert LED Color (Group Call/ Conference Group Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Group Call.
Orange	The orange LED blinks when the transceiver receives a Group Call.
Blue	The blue LED blinks when the transceiver receives a Group Call.

Note: To use this function, Selective Call Alert LED (NXDN Trunking or NXDN Conventional) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Conference Group Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Alert LED Color (Group Call) (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)

25.35.26 Alert LED Color (Broadcast Group Call) (Mobile Only)

Alert LED Color (Broadcast Group Call) is used to blink the orange LED or the blue LED when the transceiver receives a Broadcast Group Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Broadcast Group Call).

Table 25-37 Alert LED Color (Broadcast Group Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Broadcast Group Call.
Orange	The orange LED blinks when the transceiver receives a Broadcast Group Call.
Blue	The blue LED blinks when the transceiver receives a Broadcast Group Call.

Note: To use this function, Selective Call Alert LED (NXDN Trunking) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Broadcast Group Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)

25.35.27 Alert LED Color (Paging Call) (Mobile Only)

Alert LED Color (Paging Call) is used to blink the orange LED or the blue LED when the transceiver receives a Paging Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Paging Call).

Table 25-38 Alert LED Color (Paging Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Paging Call.
Orange	The orange LED blinks when the transceiver receives a Paging Call.
Blue	The blue LED blinks when the transceiver receives a Paging Call.

Note: To use this function, Selective Call Alert LED (NXDN Trunking or NXDN Conventional) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Paging Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)
- Configuring the Alert LED Color (Paging Call) (Edit > NXDN > NXDN 1 > Conventional > Alert LED Color)

25.35.28 Alert LED Color (Telephone Call) (Mobile Only)

Alert LED Color (Telephone Call) is used to blink the orange LED or the blue LED when the transceiver receives a Telephone Call.

The transceiver behaves as follows according to the configuration for Alert LED Color (Telephone Call).

Table 25-39 Alert LED Color (Telephone Call)

Configuration	Description
Off	The LED does not blink when the transceiver receives a Telephone Call.
Orange	The orange LED blinks when the transceiver receives a Telephone Call.
Blue	The blue LED blinks when the transceiver receives a Telephone Call.

Note: To use this function, Selective Call Alert LED (NXDN Trunking) must be enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert LED Color (Telephone Call) (Edit > NXDN > NXDN 1 > Trunking 1 > Alert LED Color)

25.35.29 Audio

Audio can be used to adjust the audio quality for digital communication according to the operating environment of the transceiver.

The combination of configurations for each function can customize the audio characteristic according to a user's operating environment and adjust the audio characteristic of the external microphone connected to the transceiver so that the audio characteristic can be optimal.

- External Microphone Type
- Low Cut
- Auto Gain Control (RX Audio Response)
- Audio Equalizer (RX Audio Response)
- Noise Suppressor
- Auto Gain Control (TX Audio Response)
- Audio Equalizer (TX Audio Response)

■ External Microphone Type

External Microphone Type is the function to configure the type of the external microphone to be connected to the transceiver and keep the audio in optimum condition.

The external microphones to be connected to the transceiver have different audio characteristics. Use of this function equalizes audio characteristics and adjusts the condition appropriate for digitalization.

Table 25-40 External Microphone Type

External Microphone Type	Description
None	Disables the capability to adjust audio characteristics. This needs to be configured if an external microphone is not connected or if other external devices are connected to the transceiver.
Microphone 1	Enables the capability to adjust the audio characteristics of the following microphones. **Portable:** KMC-45 **Mobile:** KMC-35, KMC-36
Microphone 2	Enables the capability to adjust the audio characteristics of the following microphones. **Portable:** KMC-48GPS **Mobile:** KMC-30, KMC-32
Microphone 3	Enables the capability to adjust the audio characteristics of the following microphones. **Portable:** KMC-21 **Mobile:** KMC-9C
Microphone 4	Enables the capability to adjust the audio characteristics of the following microphones. **Portable:** KHS-7, KHS-8, KHS-9, KHS-21, KHS-22, KHS-25, KHS-26, and KHS-27 **Mobile:** KMC-27
Microphone 5	Enables the capability to adjust the audio characteristics of the following microphones. **Portable:** KHS-23 **Mobile:** KMC-28
Microphone 6 (Portable only)	Enables the capability to adjust the audio characteristics of the following microphones. KHS-10

Note:

- In order to use the external microphone unlisted in the description of Table 25-34, we recommend to configure External Microphone Type as "None".
- For Mobile, "Microphone 6" is unavailable.

■ Low Cut

Low Cut can be used to cut off the frequencies outside of the audible frequency band when the transceiver receives a signal in Digital Mode.

The received audio may not be clearly audible in Digital Mode when a user communicates using an earphone or while communicating in noisy environments.

In this case, frequencies of 300 Hz and lower can be cut off in the receiving transceiver using Low Cut. By this, the sound of the received audio in Digital Mode will be similar to the received audio in Analog Mode; hence, the received audio may be understood easily.

Table 25-41 Audio Response

Audio Response	Description
Enabled	While the transceiver receives in Digital Mode, audio frequencies of 300 Hz and lower will be cut off.
Disabled	Audio frequencies of 300 Hz and lower will not be cut off even if the transceiver receives in Digital Mode.

■ Auto Gain Control (RX Audio Response)

Auto Gain Control is the function to adjust the volume level of the received audio. The received audio sounds better by amplifying or attenuating the received audio.

The volume level of the received audio may vary depending on the voice level of a user talking to the transmitting transceiver and the distance between the microphone and the mouth. In this case, this function allows a user to hear the received audio clearly since the received audio is automatically adjusted to a certain volume level according to the configuration for the volume level.

Table 25-42 Auto Gain Control (RX Audio Response)

Auto Gain Control	Description
Off	Auto Gain Control (RX Audio Response) is disabled and the volume level of the received audio cannot automatically be adjusted.
High	Auto Gain Control (RX Audio Response) is enabled and the volume level of the received audio can automatically be adjusted to a certain level according to the configuration for the volume level. However, a background noise of the received audio may be played back loudly, or a howl may occur.
Low	Auto Gain Control (RX Audio Response) is enabled and the volume level of the received audio can automatically be adjusted to a certain level according to the configuration for the volume level. However, the volume level to be controlled will be lower than that of when “High” is configured. Therefore, the range of the volume level to be automatically adjusted will be narrow, but the less effect on the background noise and howl will occur.

Note: If Auto Gain Control (RX Audio Response) is disabled in the receiving transceiver but Auto Gain Control (TX Audio Response) is enabled in the transmitting transceiver, the volume level of the received audio will automatically be adjusted to a certain level.

■ Audio Equalizer (RX Audio Response)

Audio Equalizer is the function to adjust audio characteristics to be applied to play the received audio.

The received audio may sound differently depending on an usage environment of the transceiver and whether to use a speaker or headphones to play the received audio. Also, the received audio may sound differently depending on the effect of a microphone equipped with the transmitting transceiver and external connector devices. Use of this function allows a user to select according to user convenience or preference an audio characteristic of the received audio sounding from the speaker.

Table 25-43 Audio Equalizer (RX Audio Response)

Audio Equalizer	Description
Flat	This is a standard audio characteristic.
High Boost	This audio characteristic emphasizes the received audio range which is higher than Flat. The quality of the received audio will be clear with the focus on hearing conversations for certain.
Low Boost	This audio characteristic minimizes the received audio range which is higher than Flat and emphasizes the low range. The quality of the received audio will be natural.

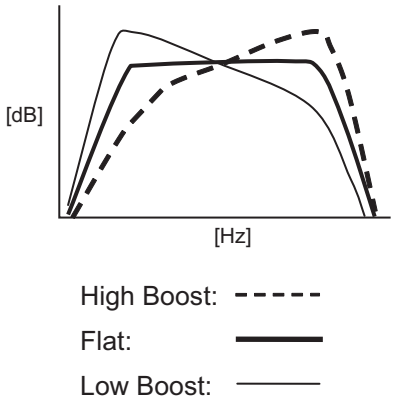


Figure 25-27 The Image of the Frequency Characteristic

■ Noise Suppressor

Noise Suppressor is the function to transmit a signal by reducing the background noise when the transceiver transmits an NXDN digital signal.

If this function is enabled, the transceiver transmits a signal by reducing the background noise so that the noise of the received audio will be less in the receiving transceiver. However, a part of audio component may be omitted, so that an inward received audio will sound. In this case, configuring this function disabled allows the transceiver to transmit an audio signal which is similar to an analog signal; therefore the received audio may be heard clearly in the receiving transceiver.

■ Auto Gain Control (TX Audio Response)

Auto Gain Control is the function to adjust the volume level of the transmitted audio. When the volume level of the transmitted audio is adjusted by automatically increasing or decreasing the microphone sensitivity, the transmitted audio can be heard clearly in the receiving transceiver.

The volume level of the transmitted audio may vary depending on the voice level of a user talking to the transmitting transceiver and the distance between the microphone and the mouth. In this case, the use of this function automatically adjusts the microphone sensitivity, so that the transmitted audio can be heard clearly in the receiving transceiver.

If the background noise is loud, the microphone sensitivity may not be properly adjusted. In this case, a user needs to hold the microphone closer and speaks loudly.

Table 25-44 Auto Gain Control (TX Audio Response)

Auto Gain Control	Description
On	Auto Gain Control (TX Audio Response) is enabled and the volume level of the transmitted audio can automatically be adjusted to the proper volume level.
Off	Auto Gain Control (TX Audio Response) is disabled and the volume level of the transmitted audio cannot automatically be adjusted.

Note: Even if either “On” or “Off” is configured for Auto Gain Control (TX Audio Response), Mic Sense can be enabled. However, configuring this function as “Off” allows Mic Sense to function more effectively.

■ Audio Equalizer (TX Audio Response)

Audio Equalizer is the function to adjust audio characteristics to be applied to play the transmitted audio. Audio Equalizer (TX Audio Response) is applied to a transmitted audio played back by the receiving transceiver.

Also, the received audio may sound differently depending on an usage environment of the transceiver, and effects of a microphone equipped with the transceiver and external connector devices. Use of this function allows a user to select according to user convenience or preference an audio characteristic of the transmitted audio inputted to a microphone.

Table 25-45 Audio Equalizer (TX Audio Response)

Audio Equalizer	Description
Flat	This is a standard audio characteristic.
High Boost	This audio characteristic emphasizes the transmitted audio range which is higher than Flat. The quality of the transmitted audio will be clear with the focus on hearing conversations for certain.
Low Boost	This audio characteristic minimizes the transmitted audio range which is higher than Flat and emphasizes the low range. The quality of the transmitted audio will be natural.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the External Microphone Type (Edit > NXDN > NXDN 1 > General 2 > Audio)
- Configuring the Low Cut to be enabled or disabled (Edit > NXDN > NXDN 1 > General 2 > Audio > Audio > RX Audio Response)
- Configuring the Auto Gain Control (RX Audio Response) (Edit > NXDN > NXDN 1 > General 2 > Audio > Audio > RX Audio Response)
- Configuring the Audio Equalizer (RX Audio Response) (Edit > NXDN > NXDN 1 > General 2 > Audio > Audio > RX Audio Response)
- Configuring the Noise Suppressor to be enabled or disabled (Edit > NXDN > NXDN 1 > General 2 > Audio > TX Audio Response)
- Configuring the Auto Gain Control (TX Audio Response) (Edit > NXDN > NXDN 1 > General 2 > Audio > TX Audio Response)
- Configuring the Audio Equalizer (TX Audio Response) (Edit > NXDN > NXDN 1 > General 2 > Audio > TX Audio Response)

25.35.30 Alert Tone Restriction from 2nd Call

Alert Tone Restriction from 2nd Call is the function that disables the functions such as the storing of a Caller ID in the transceiver stack memory and the activation of various alerts, if the transceiver consecutively receives an Individual Call from the transceiver having the same Unit ID, or receives a Group Call with the same Group ID after the transceiver receives an Individual Call or a Group Call.

For instance, emitting an Alert Tone from the transceiver every time the transceiver repeatedly and frequently receives a call from the same party may be annoying. In that case, this function can be used to disable the Alert Tone for sounding from the transceiver even if the transceiver receives a call from the same party in succession.

This function prevents these functions from activating as follows even if these functions are enabled or configured to be enabled when the transceiver receives a call from the same party in succession.

- **Alert Tone**
  An Alert Tone does not sound from the transceiver even if the transceiver receives a call from the same party in succession.
- **Selective Call Alert LED**
  A Selective Call Alert LED does not blink even if the transceiver receives a call from the same party in succession.
- **Horn Alert (Mobile only)**
  The headlights or the horn of a vehicle being connected to the Horn Alert port does not light or sound even if the transceiver receives a call from the same party in succession.
- **Caller ID Stack**
  The Caller ID cannot be stored in the transceiver stack memory even if the transceiver receives a call from the same party in succession.

When the transceiver receives an Individual Call or Group Call using this function, the transceiver behaves as follows.

- **Behavior examples of when the transceiver receives an Individual Call**

  If the transceiver receives an Individual Call, an Alert Tone does not sound from the transceiver when the transceiver receives an Individual Call again from the transceiver having the same Unit ID before the time configured for Auto Reset Timer elapses.

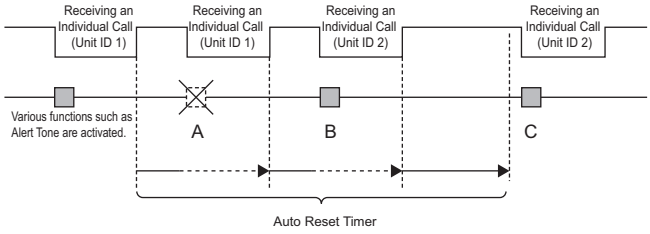


Figure 25-28 Alert Tone Restriction from 2nd Call (Individual Call)

A: The transceiver receives an Individual Call from the transceiver (Unit ID 1) having the same Unit ID before the time configured for Auto Reset Timer elapses, so that various functions such as Alert Tone will not be activated.

B: Even though the time configured for Auto Reset Timer has not elapsed yet, the transceiver receives an Individual Call from the transceiver (Unit ID 2) having a different Unit ID, so that various functions such as Alert Tone will be activated.

C: Even though the transceiver receives an Individual Call from the transceiver (Unit ID 2) again, the time configured for Auto Reset Timer has already elapsed, so that various functions such as Alert Tone will be activated.

- **Behavior examples of when the transceiver receives a Group Call**

  If the transceiver receives a Group Call, various functions such as Alert Tone are not activated when the transceiver receives a Group Call again using the same Group ID before the time configured for Auto Reset Timer elapses. In this case, even if the Unit ID of the transmitting transceiver is either the same or different, various functions such as Alert Tone will not be activated when the Group ID for the Group Call received second time or later is the same as the Group ID for the Group Call received first time.

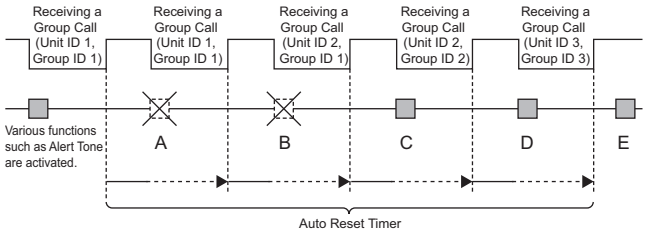


Figure 25-29 Alert Tone Restriction from 2nd Call (Group Call)

A: The transceiver receives a Group Call using the same Group ID from the transceiver (Unit ID 1) having the same Unit ID before the time configured for Auto Reset Timer elapses, so that various functions such as Alert Tone will not be activated.

B: Even though the transmitting transceiver has the different Unit ID, the transceiver receives a Group Call using the same Group ID before the time configured for Auto Reset Timer elapses, so that various functions such as Alert Tone will not be activated.

C: Even though the transmitting transceiver has the same Unit ID, the transceiver receives a Group Call using the different Group ID before the time configured for Auto Reset Timer elapses, so that various functions such as Alert Tone will be activated.

D: The transceiver receives a Group Call using the different Group ID from the transceiver having the different Unit ID before the time configured for Auto Reset Timer elapses, so that various functions such as Alert Tone will be activated.

E: Even though the transceiver receives a Group Call using the same Group ID, the time configured for Auto Reset Timer has already elapsed, so that various functions such as Alert Tone will be activated.

Note: If Alert Tone Restriction from 2nd Call is enabled, various functions such as Alert Tone will not be activated upon the reception of the second and subsequent calls from the same transceiver even if “Off” is configured for Auto Reset Timer.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Alert Tone Restriction from 2nd Call to be enabled or disabled (Edit > NXDN > NXDN 1 > General 1)

25.35.31 Status Hold

Status Hold is the function to store in the transceiver the status selected from the Status List in Status Mode and the status transmitted.

When the transceiver receives a status request message, the status stored in the transceiver will automatically be transmitted. Also, the status stored in the transceiver will automatically be stored in GPS data and transmitted.

Table 25-46 Status Hold

Status Hold	Description
Selected	The transceiver stores the status selected from the Status List in Status Mode.
Selected + Transmit	The transceiver stores a status selected from the Status List in Status Mode and a status transmitted by one of the following method. • The status transmitted when the status for one of the AUX Input Status Message 1 to AUX Input Status Message 3 ports changes (Mobile only) • The status transmitted when the transceiver is turned ON (Power-on Status). • The status transmitted by pressing one of the **Call 1** to **Call 6** keys. • The status transmitted by using a PC command.

Note: Portable (without LCD/ without Key) does not have the feature to select a status from the Status List.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Status Hold (Edit > Optional Features > Optional Features 1 > Common Page 4)

25.35.32 Home Group Revert

Home Group Revert is the function to make the transceiver migrate to the Home GID by pressing the key or automatically in an NXDN Trunking system.
(Refer to: 5.9 Home CH/GID on page 44)

Table 25-47 Home Group Revert

Home Group Revert	Description
Manual	The transceiver migrates to the Home GID configured in the selected zone by pressing the **Home CH/GID** key after a zone in an NXDN Trunking system is selected. The transceiver migrates to the GID which is selected before the migration by pressing the **Home CH/GID** key again.
Auto	If the transceiver is turned ON while a zone in an NXDN Trunking system is selected, the transceiver automatically migrates to the Home GID configured in the selected zone. The transceiver automatically migrates to the Home GID configured in the selected zone when a zone in an NXDN Trunking system is changed to another zone in an NXDN Trunking system, or a zone in another system is changed to a zone in an NXDN Trunking system. Also, if the GID is changed to a GID except the Home GID by pressing a key on the transceiver after the transceiver migrates to the Home GID, the transceiver automatically migrates to the Home GID upon the elapse of the time configured for Home Group Revert Timer.

This function is convenient; for example, when a call needs to be initiated by using other Group ID while “Auto” is configured for this function though the specific Group ID is usually used for transmission, the transceiver can automatically migrate to the Group ID in ordinary use without operating the transceiver after the call has been initiated by using the other Group ID.

Note:

- ♦ This function can be only used in an NXDN Trunking system.
- ♦ In a system in which Group Registration is used, Group Registration will start upon the elapse of 2 s after a GID has changed. If this function is configured as “Auto”, the transceiver starts counting down the Home Group Revert Timer after the transceiver terminates Group Registration. At this time, if Home Group Revert Timer is configured as less than 2 s, the transceiver migrates to the Home GID before Group Registration starts so that Home Group Revert Timer needs to be configured cautiously.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Home Group Revert (Edit > NXDN > NXDN 1 > Trunking 1)
- Configuring the Home Group Revert Timer (Edit > NXDN > NXDN 1 > Trunking 1)

Transparent is the function that allows the data communications using FleetSync or the NXDN protocol. This function can be used by connecting a PC, card reader or telemetry devices to the transceiver. Using this function, the transceiver can send or receive data without limiting the data type. This function can be used without operating the transceiver. All operations are controlled by data from other devices.

Using this function, a PC connected to the receiving transceiver can decode the transmitted bar-code data, for instance, while the bar-code reader is connected to a PC on the transmitting transceiver to transmit the bar-code data.

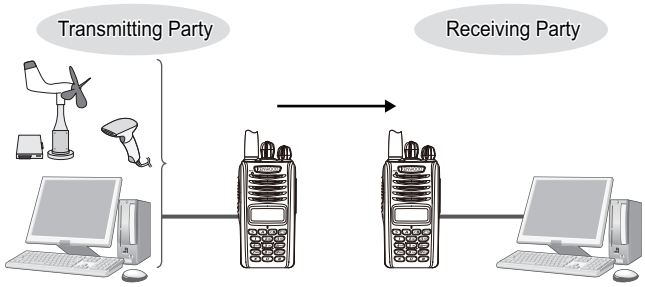


Figure 26-1 Transparent 1

Data communications using Transparent can be used to send or receive the ASCII characters of 0x00 to 0xFF without any restriction.

The connection between an external device and the transceiver is specified by the PC Interface. The transceivers at the transmitting end and receiving end are specified by the Air Interface.

Note:

- For the transceiver, either “Transparent” or “Transparent 2 (NXDN)” can be assigned to its communication port.
- If “Transparent 2 (NXDN)” is assigned to a communication port of the transceiver, data communications on Transparent using the FleetSync protocol are unavailable. In addition, data communications using Transparent between the transceiver for which “Transparent” is assigned to its communication port and that for which “Transparent 2 (NXDN)” is assigned to its communication port because Transparent and Transparent 2 (NXDN) are incompatible.

26.1 PC Interface

This section describes the PC Interface that defines data communications established between the transceiver and an external device connected to the transceiver.

To use this function, “Transparent” or “Transparent 2 (NXDN)” must be assigned by using KPG-141D/ KPG-141DN to the communication port which connects the transceiver and an external device. PC Interface supports baud rates of 1200 bps, 2400 bps, 4800 bps, 9600 bps and 19200 bps. (Refer to: 6.1 COM port on page 81, 6.4 Baud Rate on page 82)

Note: If “Transparent” or “Transparent 2 (NXDN)” is assigned to a communication port of the transceiver, the following functions of FleetSync and NXDN are unavailable.

- Long Message transmission/ reception
- Transmission using a PC command
- Short Message (PC Command)
- Long Message on Data Zone-CH/GID

26.1.1 Transmitting Transceiver

The ASCII characters from 0x00 to 0xFF can be sent or received.

The transceiver for which “Transparent” is assigned to its communication port sends the received data automatically using the FleetSync protocol or NXDN protocol if the received data size exceeds 80 bytes upon the receipt of data from an external device.

The transceiver for which “Transparent 2 (NXDN)” is assigned to its communication port sends the received data automatically using the NXDN protocol if the received data size exceeds 314 bytes upon the receipt of data from an external device. By using Transparent 2 (NXDN), data can be sent faster and more efficiently than by using Transparent.

The transceiver automatically sends the received data if the transceiver does not receive any data for a duration sufficient to receive 16 characters after receiving the last data.

The transmitting transceiver transmits over the Air when the data time elapses in the following way:

- **Baud Rate 19200 bps and 1 Stop Bit are Configured for the PC and Transmitting Transceiver:**

  When a duration equal to or more than 1/19200 x 10 x 16 = 8.3 ms elapses

- **Baud Rate 9600 bps and 2 Stop Bit are Configured for the PC and Transmitting Transceiver:**

  When a duration equal to or more than 1/9600 x 11 x 16 = 18.3 ms elapses

In an NXDN Conventional system and NXDN Trunking system, data is sent to the ID configured for Base ID Type and Base ID. In an NXDN Trunking system, data which is equal to or less than 80 bytes is sent on a control channel, and data which is more than 80 bytes is sent on a traffic channel.

The maximum data capacity for the receive buffer of the transmitting transceiver in order to receive data from a PC is limited to 1024 bytes. If transmit speed and reception from a PC is unbalanced and the overflowing received data exceeds 1024 bytes, the excessive data will be ignored.

For Mobile, if the transceiver receives the 1024 bytes of data while the transceiver is configured for which the RTS and CTS ports are available, the transceiver starts the flow control to an external device. (Refer to: 6.1 COM port on page 81)

The transceiver can control not to overflow from the buffer the data sent from the external device as soon as the transceiver has started the flow control, so that the transceiver can receive the 1024 bytes of data. In the RTS and CTS ports, the data communications with an external device are controlled as follows.

RTS:

When the buffer of the transceiver for serial communications becomes full, the status of the RTS port will be low level <8 V).

CTS:

When the status of the CTS port becomes low level <8 V), the serial data will not be sent from the transceiver.

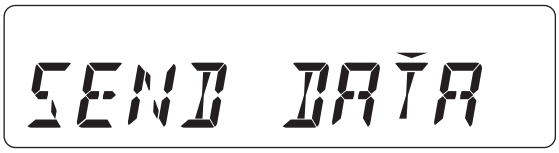
■ Transceiver Behavior

1. A device sends data to the transceiver.

   The transceiver for which “Transparent” is assigned to its communication port automatically starts transmitting when the received data size reaches 80 bytes.

   The transceiver for which “Transparent 2 (NXDN)” is assigned to its communication port automatically starts transmitting when the received data size reaches 314 bytes.

Portable



Mobile

“COMPLETE” appears on the transceiver main display for 1 s when the transmission completes, and the transceiver restores the previous display.

Portable

Mobile

26.1.2 Receiving Transceiver

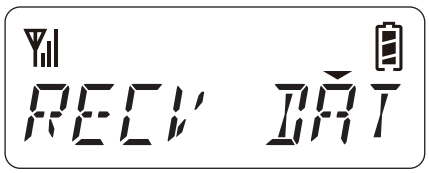
The transceiver which receives the Transparent data from the transceiver for which “Transparent” is assigned to its communication port sends the data received from the communication port to which “Transparent” is assigned.

In addition, the transceiver which receives the Transparent data from the transceiver for which “Transparent 2 (NXDN)” is assigned to its communication port sends the data received from the communication port to which “Transparent 2 (NXDN)” is assigned.

If Header is enabled using KPG-141D/ KPG-141DN, the transmitting transceiver’s ID information is automatically added to the beginning of the transmission data. When another transceiver receives the data, the ID information can easily be identified. (Refer to: 26.2.2 Transparent Header on page 344)

■ Transceiver Behavior

1. The transceiver receives data.



Portable

Mobile

“COMPLETE” appears on the transceiver main display for 1 s when the reception completes, and then the transceiver restores the previous display.

Portable

Mobile

26.2 Transparent

This section describes various functions to be used for data communications using Transparent.

The following items relevant to Transparent can be configured using KPG-141D/ KPG-141DN:

- Data Preamble Extension Time
- Transparent Header
- COM port Priority
- Transparent on Data Zone-CH/GID

- **Example in an Analog Conventional system:**

  The following assumes that 250 bytes of Transparent Data are sent from a PC to the transmitting transceiver. Following is the block diagram if the parameters are configured as below.

  Transmit Delay Time: 100 ms

  Data Transmit Modulation Delay Time: 400 ms

  Data Preamble Extension Time: 50 ms

  Transparent Header: Enable

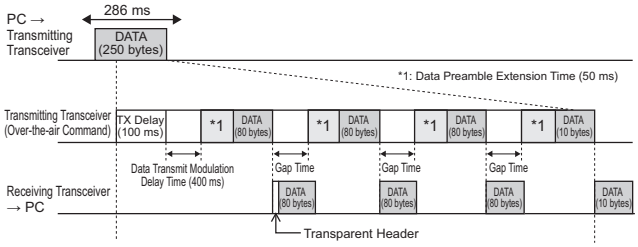


Figure 26-2 Transparent 2

The amount of time configured for Data Transmit Modulation Delay Time is applied to Gap Time in an Analog Conventional system. However, if the time configured for Data Transmit Modulation Time is equal to or less than 10 ms, the Gap Time is a fixed value (10 ms).

- **Example in an NXDN Conventional system:**

  Example 1: If “Transparent” is assigned to a communication port

  The following assumes that 250 bytes of Transparent Data are sent from a PC to the transmitting transceiver. Following is the block diagram if the parameters are configured as below.

  Transmit Delay Time: 100 ms

  Data Transmit Modulation Delay Time: 400 ms

  Transparent Header: Enable

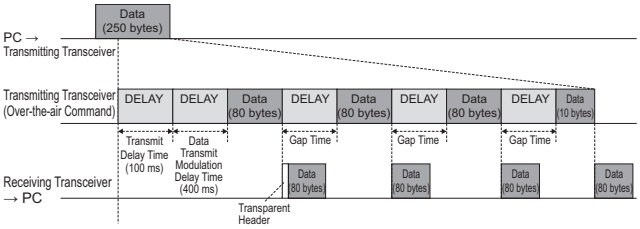


Figure 26-3 Transparent 3

The DELAY frame is placed for the amount of time configured for Transmit Delay Time and Data Transmit Modulation Delay Time before the transceiver begins transmitting, and it is also placed between blocks of data to be send (Gap Time). The amount of time configured for Data Transmit Modulation Delay Time is applied to Gap Time in an NXDN Conventional system. However, if the time configured for Data Transmit Modulation Time is equal to or less than 80 ms, the Gap Time is a fixed value (80 ms).

Example 2: If “Transparent 2 (NXDN)” is assigned to a communication port

The following assumes that 950 bytes of Transparent Data are sent from a PC to the transmitting transceiver. Following is the block diagram if the parameters are configured as below.

Transmit Delay Time: 100 ms

Data Transmit Modulation Delay Time: 400 ms

Transparent Header: Enable

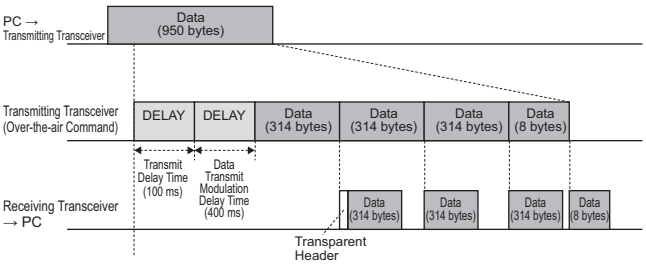


Figure 26-4 Transparent 4

The DELAY frame is placed for the amount of the time configured for Transmit Delay Time and Data Transmit Modulation Delay Time, and then the data is sent. There is no Gap Time between data blocks to be sent.

- **•Example in an NXDN Trunking system**

  Example 1: If “Transparent” is assigned to a communication port

  The following assumes that 250 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The data is sent on a communication channel as shown in the block diagram below.

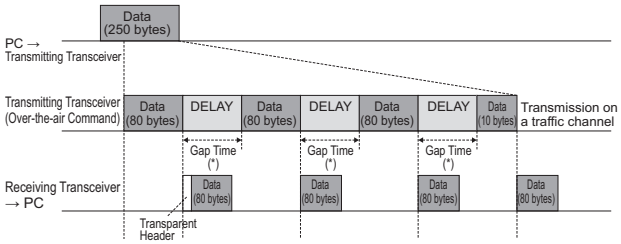


Figure 26-5 Transparent 5

The DELAY frame is placed between blocks of data to be sent (Gap Time) and the data is sent. In an NXDN Trunking system, the Gap Time is a fixed value (80 ms).

Example 2: If “Transparent 2 (NXDN)” is assigned to a communication port

The following assumes that 950 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The data is sent on a control channel as shown in the block diagram below. There is no Gap Time between data blocks to be sent.

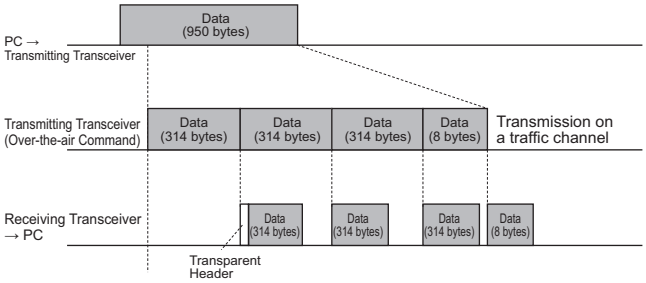


Figure 26-6 Transparent 6

Example 3:

The following assumes that 80 bytes of Transparent Data are transferred from a PC to the transmitting transceiver. The data is sent on a control channel as shown in the block diagram below.

In this example, there is no difference in sending data even if either “Transparent” or “Transparent 2 (NXDN)” is assigned to a communication port.

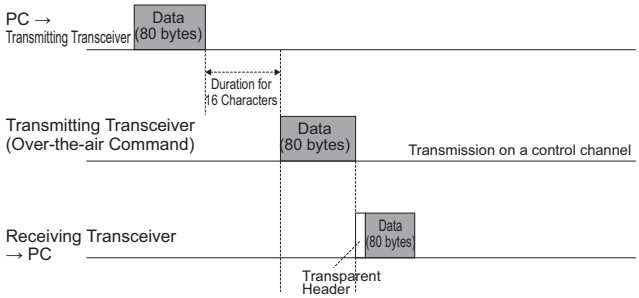


Figure 26-7 Transparent 7

Note: Refer to 16.8.14 Transmit Delay Time (Receive Capture) on page 173 for details of Transmit Delay Time. Refer to 16.8.15 Data Transmit Modulation Delay Time on page 174 for details of Data Transmit Modulation Delay Time.

26.2.1 Data Preamble Extension Time

The data exceeding 80 bytes can be divided into 80-byte Data Blocks and the blocks can be sent over the Air in data communications using Transparent.

In this case, Preamble, such as 0xAA, 0xAA, ... can be entered between Data Blocks. This extended time is called Data Preamble Extension Time.

Preamble (0xAA, 0xAA, ...) is sent out for the amount of time configured for Data Preamble Extension Time.

The transceiver occupies the channel to transmit over the Air once the transceiver starts sending data in data communications using Transparent. This parameter can be used to reliably and quickly send data without receiving an acknowledgment sent over the Air.

Note:

- This function is applicable only if the transceiver is using FleetSync data communications.
- The configuration value for Maximum ACK Wait Time needs to be configured to be larger than the total configuration value for Data Preamble Extension Time and Data Transmit Modulation Delay Time.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Data Preamble Extension Time (Edit > FleetSync > Parameter)

26.2.2 Transparent Header

Transparent Header is the function to send the KENWOOD proprietary sentence to an application which is used during data communications using Transparent.

The Header is sent for data sent first. Transparent Data is sent after sending the Header.

The application software may be able to recognize from where the data is sent by analyzing this Header information.

■ Configuration Using KPG-141D/ KPG-141DN

- Transparent Header (Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

26.2.3 COM port Priority

The transceiver can make data communications if “Data”, “Data + GPS Data Output”, “Transparent”, or “Transparent 2 (NXDN)” is assigned to its communication port. COM port Priority can be used to improve the reliability of the communication between a PC and the transceiver.

Table 26-1 COM port Priority

Configuration	Description
Serial Data	Transparent Data sent from a PC has the higher priority level. If the PC that is connected using a serial port sends Transparent data while the transceiver is receiving data over the Air, the transceiver stops receiving data over the Air and then immediately start sending Transparent data.
Receiving Data	Receiving over the Air has the higher priority level. If the PC that is connected using a serial port sends Transparent data while the transceiver is receiving data over the Air, the transceiver does not send Transparent data until the transceiver completes receiving data over the Air.

Note: Serial Data cannot be prioritized in a zone in an NXDN Trunking system. In a zone in an NXDN Trunking system, the transceiver functions in the same manner as if “Receiving Data” is configured for COM port Priority even if “Serial Data” is configured for COM port Priority.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the COM port Priority (Edit > Optional Features > Optional Features 1 > Common Page 3)

26.2.4 Transparent on Data Zone-CH/GID

Transparent on Data Zone-CH/GID is the function that allows the transceiver to automatically change the channel to Data Zone-channel or GID to send Transparent data.

The transceiver automatically changes the channel to Data Zone-channel or GID to send Transparent data. The transceiver restores the last Zone-channel or GID before completing transmitting the Transparent data. Transparent on Data Zone-CH/GID is used to send the data on a specific dedicated channel.

Note: This function is not available in the NXDN Trunking system.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transparent on Data Zone-CH/GID (FleetSync) to be enabled or disabled (Edit > FleetSync > Parameter)
- Configuring the Transparent on Data Zone-CH/GID (NXDN) to be enabled or disabled (Edit > NXDN > NXDN 1 > Conventional)

Continuous Wave (CW) is a radio emission type that is used to send and receive Morse code messages over the air.

CW Message is used to send Morse code messages preconfigured in the transceiver by using the **PF** keys.

Pressing the **CW Message** key causes the transceiver to send the CW Message.

The transceiver can send a CW Message only on a Very Narrow channel where “NXDN” is configured for Channel Type in the Conventional Group. The transceiver will switch to Analog modulation mode when the transceiver sends a CW Message.

A maximum of 32 alphanumeric characters and symbols can be configured and sent.

Note: CW specifications are compliant with articles in FCC 90.425 Station Identification and International Morse Code.

■ Configuration Using KPG-141D/ KPG-141DN

- CW Message Memory (Edit > Optional Features > Optional Features 1 > Common Page 3 > CW ID)
- Assigning functions to the PF keys (Edit > Key Assignment)

27.1 CW Message Function

The following CW Message functions can be configured using KPG-141D/ KPG-141DN.

- CW Speed
- CW Modulation Delay Time
- Audio Frequency
- CW Sidetone

27.1.1 CW Speed

CW Speed refers to how fast the CW Message is sent by using Morse code.

■ Configuration Using KPG-141D/ KPG-141DN

- CW Speed (Edit > Optional Features > Optional Features 1 > Common Page 3 > CW ID)

27.1.2 CW Modulation Delay Time

CW Modulation Delay Time is the amount of time from when the transceiver starts transmitting until the transceiver starts sending the CW Message.

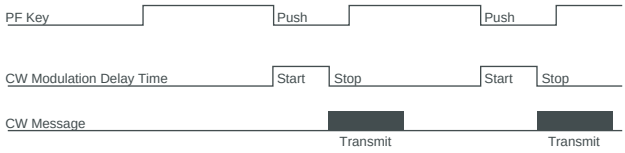


Figure 27-1 CW Modulation Delay Time

Note: If “Off” is configured for CW Modulation Delay Time, the transceiver sends a CW Message immediately after the transceiver starts transmitting.

■ Configuration Using KPG-141D/ KPG-141DN

- CW Modulation Delay Time (Edit > Optional Features > Optional Features 1 > Common Page 3 > CW ID)

27.1.3 Audio Frequency

Audio Frequency is the frequency used to send the CW Message.

■ Configuration Using KPG-141D/ KPG-141DN

- Audio Frequency (Edit > Optional Features > Optional Features 1 > Common Page 3 > CW ID)

27.1.4 CW Sidetone

CW Sidetone is the function to emit tones from the speaker while the transceiver sends a CW Message.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the CW Sidetone Stack to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 3 > CW ID)

MDC-1200 is the data system using Audio Frequency Shift Keying (AFSK). In this data system, the transceivers communicate at a 1200 baud data rate using 1200 Hz and 1800 Hz tones.

Using this data system allows a user to recognize who has been calling when making a voice communication. In addition, a dispatcher can determine whether or not the transceiver is available, or disable the transceiver to be operated by sending a message to the transceiver.

In this data system, each function, such as PTT ID Encode/ Decode, Emergency Encode/ Decode, Radio Check Decode, and Radio Inhibit Decode, can be used.

Note: This function can be used only for each channel or GID in the zone where “MDC-1200” is configured for Signaling Type.

28.1 PTT ID Encode/ Decode

A PTT ID is an unique identification code of the transceiver transmitted by pressing or releasing the **PTT** switch. Using the PTT ID enables the administrator or dispatcher to identify by PTT ID who is using a channel without asking by voice for the caller’s name.

In order to use the PTT ID in the MDC-1200 format, the following configurations must be configured by using KPG-141D/ KPG-141DN.

- PTT ID Type

  “FleetSync/MDC-1200” needs to be configured for PTT ID Type.

- PTT ID

  The timing to send a PTT ID in the MDC-1200 format can be configured. The timing to send a PTT ID can be configured if “MDC-1200” is configured for PTT ID Type.

- ID (Own)

  An unique ID number of the transceiver can be configured. In the MDC-1200 format, an ID (Own) code (an unique ID number of the transceiver) is sent as the PTT ID.

28.1.1 Sending a PTT ID

The transceiver sends an ID (Own) code in the MDC-1200 format by pressing the **PTT** switch according to the conditions configured for each channel or GID.

■ Timing to Send the PTT ID

The timing to send an PTT ID can be configured for each channel or GID.

Following are the timings to send an PTT ID.

Table 28-1 Timing to Send the PTT ID

Configuration	Description
Off	No PTT ID is sent.
BOT	When the **PTT** switch on the transmitting transceiver is pressed, an ID (Own) code in the MDC-1200 format is sent as a PTT ID.
EOT	When the **PTT** switch on the transmitting transceiver is released, an ID (Own) code in the MDC-1200 format is sent as the PTT ID.
Both	At both timing of BOT and EOT, an ID (Own) code in the MDC-1200 format will be sent as the PTT ID.

■ PTT ID Sidetone

PTT ID Sidetone is the function to emit a sidetone of the ID (Own) code from the speaker while the transceiver is sending an ID (Own) code in the MDC-1200 format.

The calling user can notice the timing to start speaking by the PTT ID Sidetone.

If the calling user starts speaking without noticing that the ID (Own) code in the MDC-1200 format is still being sent, the beginning of the transmitted audio may not be emitted from the speaker of the receiving transceiver. To prevent this problem, this function needs to be used.

■ PTT ID Pause

PTT ID Pause is the function to keep the PTT ID from being sent when the transceiver alternates between transmit and receive in a certain period of time. This function can be used to prevent sending the PTT ID repeatedly to the receiving party.

Refer to 11.5 PTT ID Pause on page 103 for details.

■ Data Transmit Modulation Delay Time

If Data Transmit Modulation Delay Time is configured, the transceiver sends an ID (Own) code in the MDC-1200 format when the amount of time configured for Data Transmit Modulation Delay Time elapses after the transceiver starts transmitting.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the PTT ID (Analog) (Conventional) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the PTT ID (Analog)(LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring PTT ID Sidetone (MDC-1200) (Edit > MDC-1200 > General)
- Configuring the PTT ID Pause (Analog) (Conventional) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 2)
- Configuring the PTT ID Pause (Analog)(LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Data Transmit Modulation Delay Time (Edit > MDC--1200 > Parameter)

28.1.2 Receiving a PTT ID

When the transceiver receives a PTT ID, the received ID, ID Name, or ID List number appears on the main display.

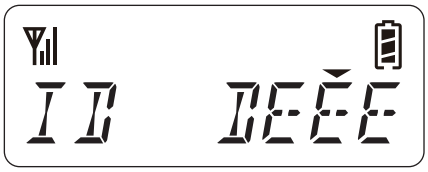
■ Caller ID Display

If Caller ID Display is enabled, the received ID, ID Name, or ID List number appears on the main display when the transceiver receives a PTT ID.

If no received ID is configured for ID List in MDC-1200, the ID appears.

If the received ID is configured for ID List in MDC-1200, the corresponding ID Name appears. However, if the received ID is configured for ID List in MDC-1200 but no ID Name is configured, ID List number appears.

- **ID Display Example**



Portable

Mobile

- **ID Name Display Example**

Portable

Mobile

- **ID List Number Display Example**

Portable

Mobile

Upon the elapse of the time configured for Auto Reset Timer or by a user pressing one of the keys of the transceiver, the main display reverts to the channel or GID display.

■ PTT ID Mute

PTT ID Mute is the function to unmute after a certain amount of time elapses when the transceiver receives an analog signal. This function is used to mute data tones of the PTT ID (BOT) sent by the other party.

Refer to 11.4 PTT ID Mute on page 103 for details.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Caller ID Display (Edit > MDC-1200 > General)
- Configuring the PTT ID Mute (Analog) (Conventional) (Edit > Zone Information (Conventional Group) > Channel Edit > Page 1)
- Configuring the PTT ID Mute (Analog)(LTR Trunking System) (Edit > Zone Information (LTR Trunking System) > GID Edit)

28.2 Emergency Encode/ Decode

Emergency Mode can be used to transmit and receive with the transceiver in emergencies. In such emergency situations, a user can immediately contact the base station by using this function. The transceiver can notify the base station of an occurrence of an emergency situation by sending an Emergency Alarm Request message or an Emergency ID in the MDC-1200 format.

■ Emergency Alarm

The transceiver can notify the base station of an occurrence of an emergency situation by sending an Emergency Alarm Request message. (Refer to: 19.1.15 Emergency Alarm on page 202)

■ Emergency ID (MDC-1200)

The transceiver can notify the base station of an occurrence of an emergency situation by sending an Emergency ID in the MDC-1200 format when the transceiver starts transmission in Emergency Mode. (Refer to: 19.1.16 Emergency ID on page 202)

28.2.1 Placing the Transceiver in Emergency Mode

The transceiver enters Emergency Mode according to the configuration for Emergency Alarm by pressing and holding the **Emergency** key longer than the amount of time configured for Emergency-key Delay Time. (Refer to: 19.1.15 Emergency Alarm on page 202)

28.2.2 Emergency Response

Emergency Response is the function to notify a user of that the transceiver has received either an Emergency Alarm Request message or an Emergency ID in the MDC-1200 format.

When the transceiver receives an Emergency Alarm Request message or an Emergency ID in the MDC-1200 format, the receiving transceiver notifies a user of that an Emergency Call is received according to the configuration in Emergency Response, for example, by displaying the received ID or ID Name in the MDC-1200 format on the LCD or emitting an Alert Tone.

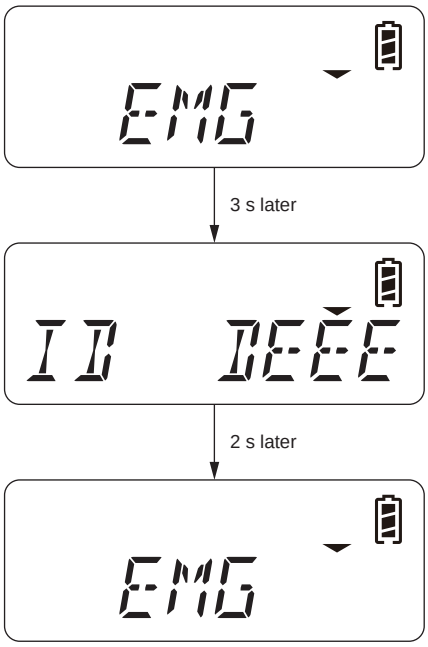
Following is the transceiver behavior while each function of Emergency Response is enabled.

LCD

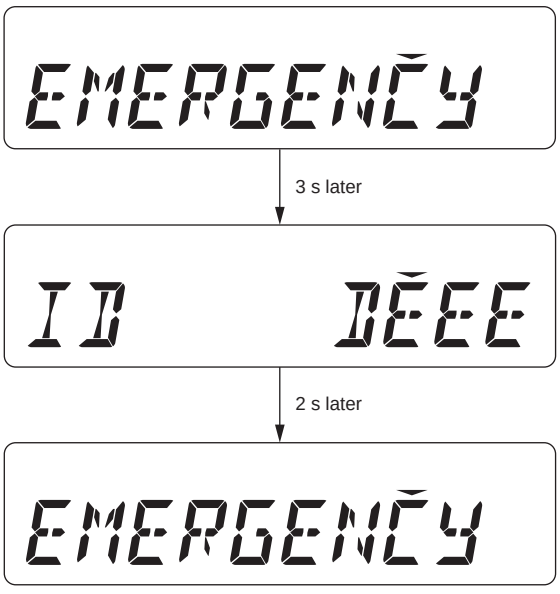
“EMG” (Portable) or “EMERGENCY” (Mobile) and the received ID (or ID Name or ID List number) appear on the main display alternately if the transceiver receives an Emergency Alarm Request message or an Emergency ID in the MDC-1200 format.

If no received ID is configured for ID List in MDC-1200, the ID appears.

If the received ID is configured for ID List in MDC-1200, the corresponding ID Name appears. However, if the received ID is configured for ID List in MDC-1200 but no ID Name is configured, ID List number appears.



Portable



Mobile

Upon the elapse of the time configured for Auto Reset Timer or by a user pressing one of the keys of the transceiver, the main display reverts to the channel or GID display.

Alert Tone

An Alert Tone sounds from the transceiver only if the transceiver receives an Emergency Alarm Request message.

Upon the elapse of the time configured for Auto Reset Timer or by a user pressing one of the keys of the transceiver, an Alert Tone stops sounding.

An Alert Tone does not sound from the transceiver even if the transceiver receives an Emergency ID in the MDC-1200 format.

Horn Alert (Mobile only)

The Horn Alert port is activated only if the transceiver receives an Emergency Alarm Request message. The transceiver behaves according to the configuration for Horn Alert by using KPG-141D/ KPG-141DN. (Refer to: 31 HORN ALERT (MOBILE ONLY) on page 362)

The Horn Alert port is not activated even if the transceiver receives an Emergency ID in the MDC-1200 format.

Configuration Using KPG-141D/ KPG-141DN

- Configuring the Emergency Response (Edit > MDC-1200 > General)

28.3 Radio Check

Radio Check is the function that is used to confirm whether the transceiver is available for communications.

The transceiver sends an acknowledgment to the system if the transceiver receives a Radio Check command in the MDC-1200 format sent from the system and the received ID matches the ID preconfigured for the transceiver. The system can determine whether or not the transceiver is available for communications by receiving this acknowledgment.

■ Transceiver Behavior

1. Receives a Radio Check command.

Portable

Mobile

The transceiver sends an acknowledgment if the received ID matches the ID preconfigured for the transceiver.

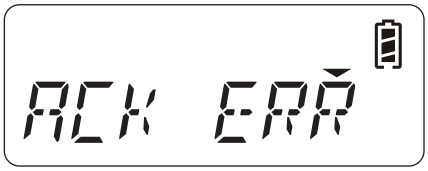
2. Completes sending an acknowledgment.

Portable

Mobile

- **If an acknowledgment cannot be sent in an LTR Trunking system:**

  Following indication appears after the transceiver has sent an acknowledgment if the transceiver cannot receive Echoback from the repeater and cannot send the acknowledgment.



Portable

Mobile

Note:

- Upon elapse of the time configured for ACK Delay Time after the transceiver receives a Radio Check command in the MDC-1200 format, the transceiver sends an acknowledgment.
- The transceiver does not send an acknowledgment if the received ID does not match the ID preconfigured for the transceiver.
- If this function is disabled, the transceiver does not send an acknowledgment.
- A Radio Check command in the MDC-1200 format cannot be sent from the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Radio Check to be enabled or disabled (Edit > MDC-1200 > General)
- Configuring the ACK Delay Time (Edit > MDC-1200 > Parameter)

28.4 Stun

Stun is the function that is used to disable the transceiver capability by remote control. This function allows an system administrator to remotely disable the transceiver, for instance, if the transceiver is lost.

The transceiver which has been disabled by this function can be enabled to be usable again by remote control from an external device using radio communication.

■ Placing the Transceiver in the Stun State

The transceiver sends an acknowledgment to the system if the transceiver receives a Stun Request message in the MDC-1200 format sent from the system and the received ID matches the ID preconfigured for the transceiver. Then, the transceiver enters the Stun state and cannot be used.

If the transceiver enters the Stun state, the transceiver is in the status as same as that when the transceiver is turned OFF: all LCD and LED are turned Off and no key is usable.

■ Resetting the Stun State of the Transceiver

While the transceiver is in the Stun state, the transceiver sends an acknowledgment to the system if the transceiver receives a Stun Revive Request message in the MDC-1200 format sent from the system and the received ID matches the ID preconfigured for the transceiver. Then, the Stun state is reset and the transceiver can be used again.

Note:

- Whether the Stun function is enabled or disabled can be configured in Stun Validation. If Stun Validation is disabled, the state of the transceiver does not change even if the transceiver receives a Stun or a Stun Revive command in the MDC-1200 format.
- Upon elapse of the time configured in ACK Delay Time after the transceiver receives a Stun Request or a Stun Revive Request message in the MDC-1200 format, the transceiver sends an acknowledgment.
- The transceiver does not send an acknowledgment if the received ID does not match the ID preconfigured for the transceiver.
- If this function is disabled, the transceiver does not perform any operation even if it received a Stun Request or a Stun Revive Request message.
- A Stun Request or a Stun Revive Request message in the MDC-1200 format cannot be sent from the transceiver.
- Even if the transceiver which has been placed in the Stun state by using the DTMF, FleetSync, or NXDN format, its Stun state can be reset by receiving a Stun Revive Request message in the MDC-1200 format. Also, the transceiver which has been placed in the Stun state by receiving a Stun Request message in the MDC-1200 format, its Stun state can be reset by receiving a Stun Revive signal in the DTMF, FleetSync, or NXDN format.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Stun Validation to be enabled or disabled (Edit > MDC-1200 > General)

The transceiver is equipped with Function Ports (AUX Input/ AUX Output) that can be programmed depending on the customer's requirement.

The input/ output ports are assigned to the D-sub 15-pin connector on the rear panel.

29.1 Available Functions for the AUX Input Port

This section describes each function that can be assigned to AUX Input ports.

Depending on a function assigned to an AUX input port, the function will immediately be activated if the AUX input port is active when the transceiver is turned ON. In addition, depending on a function assigned to an AUX input port, the function will not be activated when the transceiver is in the Stun state. Refer to the following table for how the function behaves depending on the transceiver status.

Table 29-1 Behavior of Each Function Depending on the Transceiver Status

Function	Transceiver Status	
	When the transceiver is turned ON	While the transceiver is in the Stun state
External PTT (Voice)	x	x
External PTT (Data)	x	x
Data PTT	x	x
CH/GID Select A to CH/GID Select D	O	*1
DTC	O	*1
Speaker Mute	O	O
Mic Mute	O	O
External Monitor	O	O
External Hook	O	O
Emergency	O	x
AUX Input Status Message 1 to AUX Input Status Message 3	x	x

*1 The function is activated when the Stun state is reset.

O: The function is activated. x: The function remains inactive.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the AUX Input port (Edit > Extended Function > AUX)

29.1.1 External PTT (Voice)

External PTT (Voice) is the transmission request PTT port for voice channels. This port can be used for a transmission request from a headset or external microphone.

The transceiver starts transmitting if the External PTT (Voice) port goes low level. The transceiver ends transmitting if the External PTT (Voice) port goes high level. If the transceiver is on a data channel or GID, the transceiver migrates to the lowest numbered voice channel in the current zone to transmit.

Also, functions that are used for transmitting by using the External PTT (Voice) port can be configured using KPG-141D/ KPG-141DN. (Refer to: 29.6 Function used for Sending by using the External PTT (Voice), External PTT (Data) and Data PTT Ports on page 359)

Note: Data PTT, External PTT (Voice) and External PTT (Data) ports cannot be used at the same time.

29.1.2 External PTT (Data)

External PTT (Data) is the transmission request port for data communications.

There are 2 types of usage of the External PTT (Data) port as below.

■ Using with the DTC Port

This port is used as the transmission request port in ARQ Mode. The transceiver transmits by activating the External PTT (Data) port after activating the DTC port.

■ Using the External PTT (Data) Port with CH/GID Select A to CH/GID Select D

This port functions as the transmit request port for external devices used for data communications. However, the transceiver transmits on the currently selected channel or GID without migrating to the Data Zone-channel or GID in the same manner as the Data PTT port.

The transceiver responds as below depending on the channel or GID which has its External PTT (Data) port activated.

Table 29-2 External PTT (Data)

Current Channel or GID	Response of the Transceiver
Conventional Zone-channel (Analog)	The transceiver transmits.
Conventional Zone-channel (NXDN)	The Key-entry Error Tone sounds from the transceiver and the transceiver does not transmit.
LTR Trunking Zone-GID	The transceiver transmits.
NXDN Trunking Zone-GID	The Key-entry Error Tone sounds from the transceiver and the transceiver does not transmit.

Also, functions that are used for transmitting by using the External PTT (Data) port can be configured using KPG-141D/ KPG-141DN. (Refer to: 29.6 Function used for Sending by using the External PTT (Voice), External PTT (Data) and Data PTT Ports on page 359)

Note:

- Data PTT, External PTT (Voice) and External PTT (Data) ports cannot be used at the same time.
- The transceiver mutes the speaker on a data channel or data GID. The transceiver does not send the PTT ID even if the PTT ID is configured.

29.1.3 Data PTT

Data PTT is the transmission request port for data communications.

The transceiver migrates to a Data Zone-channel or GID to start the transmission when the Data PTT port goes low level. The transceiver ends transmitting if the Data PTT port goes high level. The transceiver remains on the data channel for the amount of time configured for the Data Dwell Time after the Data PTT port goes high level. The transceiver restores to the voice channel after the amount of time configured for Data Dwell Time elapses.

The relationship between the channel or GID which has its Data PTT port activated and the Data Zone-channel or GID is shown as below.

Table 29-3 Data PTT

Current Channel or GID	Data Zone-CH/GID
Conventional Zone-channel (Analog)	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the Conventional Zone to start transmitting. If no Data Zone-channel or GID (Analog) is configured, the transceiver will migrate to the data channel (Channel Type = Analog only) configured for the highest channel number in the zone to start transmitting.
Conventional Zone-channel (NXDN)	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the Conventional Zone to start transmitting. If no Data Zone-channel or GID (Analog) is configured, the Key-entry Error Tone sounds from the transceiver and the transceiver does not start transmitting.
LTR Trunking Zone-GID	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the LTR Trunking Zone to start transmitting. If no Data Zone-channel or GID (Analog) is configured, the transceiver will migrate to the data GID configured for the highest GID number in the zone to start transmitting.
NXDN Trunking Zone-GID	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the NXDN Trunking Zone to start transmitting. If no Data Zone-channel or GID (Analog) is configured, the Key-entry Error Tone sounds from the transceiver and the transceiver does not start transmitting.

Also, functions that are used for transmitting by using the Data PTT port can be configured using KPG-141D/ KPG-141DN. (Refer to: 29.6 Function used for Sending by using the External PTT (Voice), External PTT (Data) and Data PTT Ports on page 359)

Note:

- Data PTT, External PTT (Voice) and External PTT (Data) ports cannot be used at the same time.
- The transceiver mutes the speaker on a data channel or data GID. The transceiver does not send the PTT ID even if the PTT ID is configured.

29.1.4 CH/GID Select A to CH/GID Select D

CH/GID Select is the CH/GID Select port to be used with the Remote CH/GID List.

The Zone-channel or GID of the transceiver can be changed using the external device that is connected to the transceiver. (Refer to: 29.7 Remote Zone-CH/GID on page 360)

29.1.5 DTC

DTC is the port that controls the transceiver to migrate to the Data Zone-channel or GID used for data communications and then activate ARQ Mode.

To send data in an LTR Trunking System, the transceiver is normally required to link to a repeater every time to send data. However, it may take a longer time to send data, or a data transmission may fail if the system is busy and there is no available channel on the repeater. ARQ Mode can be used to avoid these problems and unfailingly complete data communications with a single link.

If ARQ Mode is used, the transceiver does not send the EOT until the transceiver finishes data communications once the transceiver establishes a link to the repeater. The transceiver retains the linked state using the Hung Up Time configured for the repeater and then send or receive the acknowledgment during the Hung Up Time. With this function, the transceiver is not required to link to a repeater every time to send data, hence Air Time can effectively be utilized.

The relationship between the channel or GID where the DTC port is activated and the Data Zone-channel or GID is shown as below.

Table 29-4 DTC

Current Channel or GID	Data Zone-CH/GID
Conventional Zone-channel (Analog)	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the Conventional Zone. If no Data Zone-channel or GID (Analog) is configured, the transceiver will migrate to the data channel (Channel Type = Analog only) configured for the highest channel number in the zone.
Conventional Zone-channel (NXDN)	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the Conventional Zone. If no Data Zone-channel or GID (Analog) is configured, the Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all.
LTR Trunking Zone-GID	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the LTR Trunking Zone to start transmitting. If no data Zone-channel or GID (Analog) is configured, the transceiver will migrate to the data GID configured for the highest GID number in the zone.
NXDN Trunking Zone-GID	The transceiver migrates to an analog channel or GID configured for Data Zone-CH/GID (Analog) in the NXDN Trunking Zone. If no Data Zone-channel or GID (Analog) is configured, the Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all.

Note:

- The data channel is not reverted by Revert CH/GID.
- When the DTC port goes low level during the scan, the transceiver migrates to the Data Zone-channel or GID in the Revert Zone.
- If “Data PTT” is assigned to another port, “DTC” cannot be assigned.
- If “External PTT (Data)” is not assigned to another port, “DTC” cannot be assigned.

29.1.6 Speaker Mute

Speaker Mute is the port that is used to mute the speaker audio output line.

The transceiver mutes the speaker when the Speaker Mute port goes low level. The transceiver unmutes the speaker when the Speaker Mute port goes high level.

29.1.7 Mic Mute

Mic Mute is the port that is used to mute the microphone modulation line.

The Mic Line (Front Mic and MI2) is muted when the Mic Mute port goes low level. The Mic Line (Front Mic and MI2) is unmuted when the Mic Mute port goes high level.

29.1.8 External Monitor

External Monitor is the port that is used to activate the Monitor.

Monitor is enabled when the External Monitor port goes low level. Monitor is disabled when the External Monitor port goes high level.

Note:

- If the External Monitor port is activated while Monitor is enabled by pressing the **Monitor** key, Monitor for the External Monitor port is enabled.
- The enabled state of Monitor is not retained in the transceiver.

29.1.9 External Hook

External Hook is the port that is used to switch the state of the microphone hook in the same way as Local Mic Hook.

The microphone goes to the On-hook state when the External Hook port goes low level. The microphone goes to the Off-hook state when the External Hook port goes high level.

Off-hook Decode, Off-hook Horn Alert, Off-hook Scan and Optional Signaling are reset in the same manner as Local Mic Hook.

If both Local Mic Hook and External Hook ports are in the Off-hook state, the microphone goes to the Off-hook state. If either port is in the On-hook state, the microphone goes to the On-hook state.

29.1.10 Emergency

Emergency is the port that is used to activate the Emergency function.

The transceiver enters Emergency Mode when the Emergency port goes low level.

The transceiver behaves according to the configuration using KPG-141D/ KPG-141DN in Emergency Mode. Emergency Key Delay Time must be configured for this port and used to avoid erroneously placing the transceiver in Emergency Mode unintentionally. (Refer to: 19 EMERGENCY on page 197)

29.1.11 AUX Input Status Message 1 to AUX Input Status Message 3

AUX Input Status Message is the trigger port that is used to send a FleetSync or NXDN Status Message.

The transceiver sends a Status Message configured for each port to FleetSync ID configured for Target Fleet/ ID (FleetSync) or Base ID (NXDN) when the port goes high level to low level or goes low level to high level.

Two statuses (High → Low, Low → High) can be configured for each port of AUX Input Status Message 1 to AUX Input Status Message 3 by using KPG-141D/ KPG-141DN. These ports are normally used as the sensor ports for telemetry purposes. (Refer to: 16.3.13 AUX Input Status Message (Mobile Only) on page 157, 25.11.12 AUX Input Status Message (Mobile Only) on page 271)

The transceiver sends a Status Message as below depending on the channel or GID where the AUX Input Status Message 1 to AUX Input Status Message 3 ports are activated.

Table 29-5 AUX Input Status Message

Current Channel or GID	Response of the Transceiver
Conventional Zone-channel (Analog)	The transceiver sends a Status Message using the FleetSync protocol. The destination is the ID configured for Target Fleet/ ID (FleetSync).
Conventional Zone-channel (NXDN)	The transceiver sends a Status Message using the NXDN protocol. The destination is the ID configured for Base ID (NXDN).
LTR Trunking Zone-GID	The transceiver sends a Status Message using the FleetSync protocol. The destination is the ID configured for Target Fleet/ ID (FleetSync).
NXDN Trunking Zone-GID	The transceiver sends a Status Message using the NXDN protocol. The destination is the ID configured for Base ID (NXDN).

Note:

- The transceiver does not send a status message immediately after the transceiver is turned ON since the transceiver does not recognize that the AUX Input port to which “AUX Input Status Message” is assigned has changed.
- If the logic of the port is not changed, the transceiver does not send a Status Message when the analog channel or GID is changed to NXDN channel or GID. However, the transceiver sends a Status Message if conditions to send the Status Message are satisfied.

29.2 Available Functions for AUX Output Ports

Following functions can be assigned to AUX Output ports.

Table 29-6 Available Functions for AUX Output Ports

Function Name	Description
None	No function is assigned.
LOK	**In the case of Conventional Group:** The output port is active while the transceiver is transmitting. Otherwise, the output port is inactive. **In an LTR Trunking system:** The output port is activated when the transceiver is linked with a repeater while transmitting. Otherwise, the output port is inactive. **In an NXDN Trunking system:** The output port is active while the transceiver is transmitting on a traffic channel. Otherwise, the output port is inactive. The output signal of LOK can be configured using KPG-141D/ KPG-141DN. There are 2 types of LOK Logic Signals: “Continuous” and “Pulse”. The port is always at low level while the LOK port is active if “Continuous” is selected. The port is active for the first 30 ms, and then the port returns to open level while “Pulse” is selected.
COR	**In the case of Conventional Group and LTR Trunking System:** The output port is active while the transceiver is receiving a carrier. Otherwise, the output port is inactive. **In an NXDN Trunking system:** The output port is active while the transceiver is receiving a carrier. Otherwise, the output port is inactive.
COR or Channel Busy	The output port for COR or Channel Busy status is active while the conditions to activate the COR or the conditions to activate the Channel Busy are satisfied. While conditions to activate the COR and Channel Busy are not satisfied, the output port for COR or Channel Busy status is inactive.
TOR	**In the case of Conventional Group:** The output port is active while the received QT tone frequency, DQT code (Analog), or RAN code (NXDN) matches the QT tone frequency, DQT code (Analog), or RAN code (NXDN) preconfigured for the transceiver. If QT/ DQT Decode is not configured, the output port is active while the transceiver is receiving a carrier. If RAN Decode is not configured, the output port is active while the transceiver is receiving a RAN code. Otherwise, the output port is inactive. **In an LTR Trunking system:** The output port is active while the transceiver is receiving the GID. Otherwise, the output port is inactive. **In an NXDN Trunking system:** The output port is active while the transceiver is unmuting the speaker on a traffic channel. Otherwise, the output port is inactive.
TOR or Channel Busy	The output port for TOR or Channel Busy status is active while the conditions to activate the TOR or the conditions to activate the Channel Busy are satisfied. If conditions to activate the TOR and Channel Busy are not satisfied, the output port for TOR or Channel Busy status is inactive.

Function Name	Description
Channel Busy	The output port is active while the transceiver does not accept a remote control request from an external device. The output port is active while the transceiver is in the following situations. ■ The output port is active regardless of the configuration for Data Override while the transceiver is in the following situations: (Refer to: 23.1.4 Data Override on page 220) • While the transceiver is transmitting (including while a link is established in an LTR Trunking System) • While Public Address is used • While the transceiver is proceeding System Search • While the transceiver is in Emergency Mode • While the transceiver is in Transceiver Password Mode • While the transceiver is in the Stun state • While the transceiver is on an NXDN channel or GID ■ If Data Override is disabled, the output port is active while the transceiver is in the following situations: (Refer to: 23.1.4 Data Override on page 220) • While the transceiver is proceeding the Auto Telephone Search • While the transceiver is in Function Mode • While Public Address is used • While the transceiver temporarily migrates to a channel or GID by a user pressing one of the **Direct CH/ GID 1** to **Direct CH/GID 5** keys or **Home CH/GID** or **CH/GID Recall** key
System Busy	The output port is active if there is no available channel on the repeater in an LTR Trunking System. Otherwise, this port is inactive.
AUX A	The port output is changed with the state of the **AUX A** key. An external device connected to the AUX A port can be controlled.
AUX B	The port output is changed with the state of the **AUX B** key. An external device connected to the AUX B port can be controlled.
PTT Output	The output port is active while the **PTT** switch is being pressed. Otherwise, this port is inactive.
TXS	The output port is active while the transceiver is transmitting. Otherwise, this port is inactive.

Function Name	Description
AUX Output Status Message 1 to AUX Output Status Message 3	The status of these ports are changed when the transceiver receives a FleetSync or NXDN Status Message. The transceiver alternates the status of the AUX Output port (High to Low or Low to High) when the received Status Message matches the Status number preconfigured for the port. Two statuses (High ⮑⏲⮑⏲⮑⏲ Low, Low ⮑⏲⮑⏲⮑⏲ High) can be configured for each port of AUX Output Status Message 1 to AUX Output Status Message 3 by using KPG-141D/ KPG-141DN. These ports are usually used to remotely control the transceiver by connecting an external device to the AUX Output port. (Refer to: 16.3.13 AUX Input Status Message (Mobile Only) on page 157, 25.11.12 AUX Input Status Message (Mobile Only) on page 271) Also, the port status can be retained even if the transceiver is turned OFF. (Refer to: 29.5 Status Memory (AUX Output Status Message) on page 358)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the AUX Output port (Edit > Extended Function > AUX)
- Configuring the LOK Logic Signal (Edit > Extended Function > AUX > AUX Output)

29.3 Debounce Time

Debounce Time is the amount of time to eliminate the noise and chattering that may occur at the AUX Input port.

If noise or chattering does not occur while the amount of time configured for Debounce Time is counting down, the AUX Input Port where Debounce is enabled is activated. Using this function prevents the state of the AUX Input port from being erroneously changed by noise and chattering.

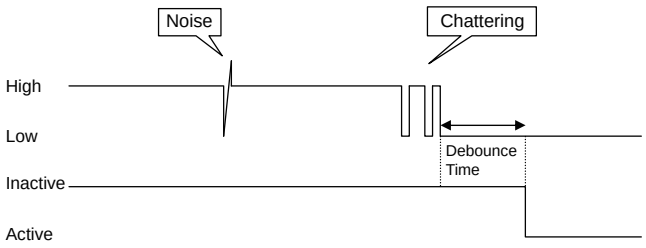


Figure 29-1 Debounce Time

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Debounce Time (Edit > Extended Function > AUX > AUX Input)

29.4 State Hold Timer (Active Low)

State Hold Timer (Active Low) is the length of time that the AUX Output Status Message ports remain at the low level after these ports go low level.

The AUX Output Status Message ports go high level after the time configured for State Hold Timer (Active Low) elapses.

If “Off” is configured for State Hold Timer (Active Low), the timer is not activated. In this case, the AUX Output Status Message ports remain at low level from when AUX Output Status Message ports go low level until the transceiver receives the status message which changes the AUX Output Status Message ports to high level.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the State Hold Timer (Active Low) (Edit > Extended Function > AUX > AUX Output > AUX Output Status Message)

29.5 Status Memory (AUX Output Status Message)

Status Memory (AUX Output Status Message) can be used to retain the output status of AUX Output Status Message 1 to AUX Output Status Message 3.

If this function is enabled, the output status of each of AUX Output Status Message 1 to AUX Output Status Message 3 is retained. When the transceiver is turned ON, the transceiver restores the last status prior to the transceiver being turned OFF (high level or low level).

If this function is disabled, the output status of each of AUX Output Status Message 1 to AUX Output Status Message 3 is not retained and the port always goes high level when the transceiver is turned ON.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the State Hold Timer (Active Low) (Edit > Extended Function > AUX > AUX Output > AUX Output Status Message)

29.6 Function used for Sending by using the External PTT (Voice), External PTT (Data) and Data PTT Ports

Functions used for sending by using the External PTT (Voice), External PTT (Data) and Data PTT ports can be configured using KPG-141D/ KPG-141DN.

Table 29-7 External PTT (Voice), External PTT (Data), Data PTT

Configuration	Operation
Modulation Line	Which modulation line will be enabled can be configured for the External PTT (Voice), External PTT (Data) and Data PTT ports. The following modulation lines are available. • **Mic Line** Whether to enable the audio line of the microphone that is connected to the microphone connector of the transceiver when transmitting by using the Mic PTT, External PTT (Voice), External PTT (Data) and Data PTT ports can be configured. • **MI2 Line** Whether to enable the audio modulation line of the D-sub 15-pin connector of the transceiver when transmitting by using the Mic PTT, External PTT (Voice), External PTT (Data) and Data PTT ports can be configured. If the transceiver transmits by using the External PTT (Voice) port, the transceiver is often configured to be modulated only by the MI2 Line. • **DI Line** Whether to enable the data modulation line of the D-sub 15-pin connector of the transceiver when transmitting by using the Mic PTT, External PTT (Voice), External PTT (Data) and Data PTT ports can be configured. If the transceiver transmits by using the External PTT (Voice) or Data PTT port, the transceiver is often configured to be modulated only by the DI Line. However, DI Line will be disabled if the transceiver transmits on the following channel or GID. • A channel with “Mixed” configured for Channel Type and “NXDN” configured for Transmit Mode • A channel in an NXDN Conventional system • A GID in an NXDN Trunking system **Note:** The same port (Pin No. 5) in D-sub 15 Pin is used for MI2 Line and DI Line. By default, the port is used for the DI Line. To use the port for the MI2 Line, this port setting must be changed. Refer to the service manual on how to change the port setting.
With QT/DQT	Whether to multiplex the QT tone frequency or DQT code configured for a channel in the Conventional Group when transmitting by using the Mic PTT, External PTT (Voice), External PTT (Data), and Data PTT ports can be configured. Normally, QT tone frequency or DQT code is configured to be multiplexed.
With STE	Whether to send the STE (Squelch Tail Eliminator) after sending the QT tone frequency or DQT code configured for a channel in the Conventional Group by using the Mic PTT, External PTT (Voice), External PTT (Data), and Data PTT ports can be configured. Normally, the transceiver is configured to send the STE.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring functions used for sending by using the External PTT (Voice), External PTT (Data) and Data PTT ports (Edit > Extended Function > Modulation Line)

29.7 Remote Zone-CH/GID

Remote Zone-CH/GID can be used to migrate to one of 15 zones and channels or GIDs by using the CH/GID Select A to CH/GID Select D ports.

29.7.1 Migrating to a Specific Zone and Channel or GID by Using an External Device That Is Connected to the Transceiver

The transceiver migrates to the zone and channel or GID registered in the Remote Zone-CH/GID List if one of the CH/GID Select A to CH/GID Select D ports goes low level.

Table 29-8 Remote Zone-CH/GID List Number Corresponding to each CH/GID Select Port

Remote Zone-CH/GID	AUX Input port			
	CH/GID Select D	CH/GID Select C	CH/GID Select B	CH/GID Select A
No.1	High	High	High	Low
No.2	High	High	Low	High
No.3	High	High	Low	Low
No.4	High	Low	High	High
No.5	High	Low	High	Low
No.6	High	Low	Low	High
No.7	High	Low	Low	Low
No.8	Low	High	High	High
No.9	Low	High	High	Low
No.10	Low	High	Low	High
No.11	Low	High	Low	Low
No.12	Low	Low	High	High
No.13	Low	Low	High	Low
No.14	Low	Low	Low	High
No.15	Low	Low	Low	Low
Not Configured*1	High	High	High	High

*1 If no Remote Zone-CH/GID is configured, the transceiver cannot migrate to another zone and channel or GID.

Note: A zone and channel or GID for which no channel or GID data is configured cannot be configured in the Remote Zone-CH/GID List.

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the AUX Input port (Edit > Extended Function > AUX)
- Configuring Remote Zone-CH/GID List (Edit > Extended Function > Remote Zone-CH/GID)

Ignition Sense can be used to automatically turn the transceiver ON or OFF linked with the status of the Ignition Sense terminal of a vehicle. While the vehicle engine is running, the Ignition Sense terminal should be in the high state and when the vehicle engine is not running, the Ignition Sense terminal should be in the low state.

Ignition Sense can be enabled or disabled using KPG-141D/ KPG-141DN.

Note: To use the Ignition Sense function, the Ignition Sense cable (KCT-18) and the Ignition Line of the vehicle must be connected using KCT-60.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Ignition Sense to be enabled or disabled (Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

30.1 Usage of the Ignition Sense Port

The method for turning the transceiver ON or OFF using the Ignition Sense terminal varies depending on the configuration for Ignition Sense Type.

- **Turning the Transceiver ON or OFF according to the State of the Ignition Sense Terminal**

  The transceiver can be turned ON or OFF according to the state of the Ignition Sense terminal if “Ignition Only” is configured for Ignition Sense Type.

  The transceiver is automatically turned ON when the Ignition Sense terminal goes high and is automatically turned OFF when the terminal goes low. The transceiver cannot be turned ON or OFF by pressing the **Power** switch.

- **Turning the Transceiver ON or OFF using both the Ignition Sense Terminal and Power Switch**

  The transceiver can be turned ON or OFF using both the **Power** switch and the Ignition Sense terminal if “Ignition and Switch” is configured for Ignition Sense Type.

  The transceiver can be turned OFF by pressing the **Power** switch even if the vehicle engine is running (the state of the Ignition Sense terminal is High). However, the state of the **Power** switch is not retained.

  Also, the transceiver is turned ON when the state of the Ignition Sense terminal switches from low to high.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Ignition Sense Type (Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

30.2 Timed Power-off

Timed Power-off is the amount of time from when the vehicle stops running (the state of the Ignition Sense terminal is low) until the transceiver is automatically turned OFF.

If the amount of time configured for Timed Power-off elapses after the vehicle’s engine stops running, the transceiver is automatically turned OFF. This function is convenient for continuing communications even if the vehicle engine is not running.

The Timed Power-off Pre-alert Tone sounds from the transceiver in the following way if anything other than “Off” is configured for Warning Tone:

- One minute before the transceiver is turned OFF: The transceiver beeps twice. (Timed Power-off Pre-alert Tone A)
- Ten seconds before the transceiver is turned OFF: The transceiver beeps 4 times. (Timed Power-off Pre-alert Tone B)
- Two seconds before the transceiver is turned OFF: The transceiver beeps continuously. (Timed Power-off Pre-alert Tone C)

Note:

- The Timed Power-off is reset if the Ignition Sense terminal goes high.
- If “Ignition and Switch” is configured for Ignition Sense Type, Timed Power-off timer is not activated if the transceiver is turned ON by pressing and holding the **Power** switch.
- If “Ignition and Switch” is configured for Ignition Sense Type while Timed Power-off is activated, Timed Power-off timer is reset when the **Power** switch is pressed. Pressing and holding the **Power** switch causes the transceiver to be turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Timed Power-off (Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

Horn Alert can be used to activate the Horn Alert port for a certain amount of time when the transceiver receives a call.

This function turns headlights On of the vehicle connected to the Horn Alert port and makes the horn sound. Therefore, a user can recognize that the transceiver has received a call with lighting of headlights of the vehicle and the horn even if the user is away from the transceiver.

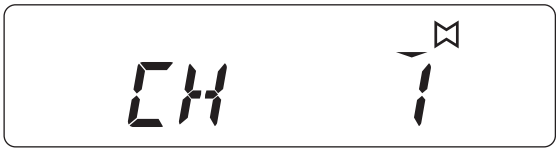
Pressing the **Horn Alert** key causes the Horn Alert to be enabled or disabled.

■ Operating the Transceiver

- **Enabling the Horn Alert**

1. Press the **Horn Alert** key while Horn Alert is disabled.

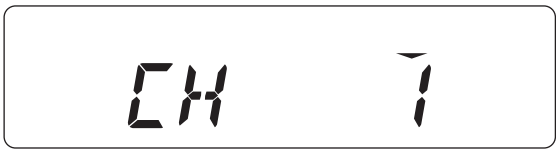
   The "⋈" appears and then Horn Alert will be enabled.



- **Disabling the Horn Alert**

1. Press the **Horn Alert** key while Horn Alert is enabled.

   The "⋈" disappears and then Horn Alert will be disabled.



Note:

- The Horn Alert port functions according to the configuration for Horn Alert Logic Signal. (参照 : 31.2 Horn Alert Logic Signal on page 364)
- While the state of the Ignition Sense port is High, the Horn Alert port is not be activated even if the transceiver receives a call. (参照 : 30 IGNITION SENSE (MOBILE ONLY) on page 361)

■ Configuration Using KPG-141D/ KPG-141DN

- Assigning functions to the PF keys (Edit > Key Assignment)

31.1 Conditions to Activate the Horn Alert

The conditions to activate the Horn Alert vary depending on Conventional Group, LTR Trunking system and NXDN Trunking system.

31.1.1 Conventional Group

The conditions to activate the Horn Alert in a Conventional Group are as follows. The conditions vary between analog and digital (NXDN) as below.

Table 31-1 Conditions to Activate the Horn Alert (Conventional Group)

Zone Type	Conditions
Conventional Group (Analog)	• When the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while Horn Alert is enabled • When the transceiver receives a Paging Call while Horn Alert is enabled • When the transceiver receives FleetSync Status 89 regardless of the configuration for Horn Alert
Conventional Group (NXDN)	• When the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while Horn Alert is enabled • When the transceiver receives a Paging Call while Horn Alert is enabled • When the transceiver receives Horn Alert Status regardless of the configuration for Horn Alert **Note:** Horn Alert Status can be configured using KPG-141D/ KPG-141DN. (Edit > NXDN > NXDN 2 > Status > Option)

31.1.2 LTR Trunking System

LTR Trunking system can be configured using KPG-141D/ KPG-141DN to enable or disable the Horn Alert for each Group ID.

- **If Horn Alert key is configured:**

  One of the following conditions must be satisfied to activate the Horn Alert:

  - In the case that Horn Alert is enabled by pressing the **Horn Alert** key
  - In the case that “Start Up” is configured for Horn Alert Mode

  If one of the above conditions is satisfied, Horn Alert is activated under the following conditions:

  - If the received Group ID matches the Group ID preconfigured for the transceiver while “None” is configured for Optional Signaling of the preconfigured Group ID and Horn Alert is enabled as well
  - If the received Group ID and Optional Signaling match the Group ID and Optional Signaling preconfigured for the transceiver while “DTMF” or “FleetSync” is configured for Optional Signaling of the preconfigured Group ID and Horn Alert is enabled as well However, in the case of a Paging Call, “FleetSync” must be configured for Optional Signaling.
  - If the Fix ID with Horn Alert enabled matches the received Group ID

  Also, the Horn Alert port is activated according to the Horn Alert Logic Signal configuration when the transceiver receives Status No. 89 regardless of the above conditions, Optional Signaling configuration, and other configurations relevant to Horn Alert.

- **If no Horn Alert key is configured:**

  Horn Alert is activated under the following conditions:

  - If the received Group ID matches the Group ID preconfigured for the transceiver while “None” is configured for Optional Signaling of the preconfigured Group ID and Horn Alert is enabled as well
  - If the received Group ID and Optional Signaling match the Group ID and Optional Signaling preconfigured for the transceiver while “DTMF” or “FleetSync” is configured for Optional Signaling of the preconfigured Group ID and Horn Alert is enabled as well However, in the case of a Paging Call, “FleetSync” must be configured for Optional Signaling.
  - If the Fix ID with Horn Alert enabled matches the received Group ID

  Also, the Horn Alert port is activated according to the Horn Alert Logic Signal configuration when the transceiver receives Status No. 89 regardless of the above conditions, Optional Signaling configuration, and other configurations relevant to Horn Alert.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Horn Alert to be enabled or disabled for each Group ID (Edit > Zone Information (LTR Trunking System) > GID Edit)
- Configuring the Horn Alert (Fix ID) to be enabled or disabled (Edit > Zone Information (LTR Trunking System) > Zone Edit > Fix ID)

31.1.3 NXDN Trunking System

One of the following conditions must be satisfied to activate the Horn Alert in an NXDN Trunking system:

- In the case that Horn Alert is enabled by pressing the **Horn Alert** key
- In the case that “Start Up” is configured for Horn Alert Mode

If one of these conditions is satisfied, Horn Alert is activated when the transceiver receives the following calls.

- Individual Call (Transmission Trunked)
- Group Call (Transmission Trunked)
- Individual Call (Message Trunked (Enhanced))
- Group Call (Message Trunked (Enhanced))
- Paging Call
- Telephone Call

Also, the Horn Alert port will be activated according to the configuration for Horn Alert Logic Signal when the transceiver receives Horn Alert Status regardless of the above conditions and other configurations relevant to Horn Alert.

Note: Horn Alert Status can be configured using KPG-141D/ KPG-141DN. (Edit > NXDN > NXDN 2 > Status > Option)

31.2 Horn Alert Logic Signal

Horn Alert Logic Signal is a function to activate Horn Alert port, depending on the configuration, upon activation of Horn Alert.

How the Horn Alert port is activated when Horn Alert is activated can be configured using KPG-141D/ KPG-141DN.

Table 31-2 Horn Alert Logic Signal

Configuration	Description
Until Reset	The Horn Alert port remains active until the matching status of Optional Signaling is reset.
1 s to 30 s	The Horn Alert port remains active for configured amount of time.
Pulse	The Horn Alert port is activated 3 times at 500 ms intervals. (参照: Figure 31-1 Pulse 1 on this page) Only if the transceiver receives Fix ID, the Horn Alert port is activated for 1 second and deactivated for 500 ms, and then it is activated for 1 second again. (参照: Figure 31-2 Pulse 2 on this page)

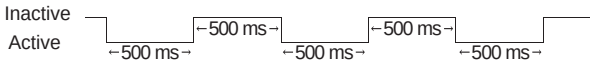


Figure 31-1 Pulse 1

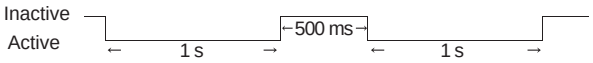


Figure 31-2 Pulse 2

Note:

- The Horn Alert port is not deactivated even if the matching status of DTMF and 2-tone is reset while the amount of time configured for Horn Alert Logic Signal is longer than the amount of time configured for Auto Reset Timer for DTMF or 2-tone. The Horn Alert port is deactivated when the amount of time configured for Horn Alert Logic Signal elapses.
- The Horn Alert port is deactivated if one of the following operations is done while Horn Alert is activated:
  - The **Horn Alert** key is enabled (Horn Alert will be disabled).
  - The state of the microphone hook is changed.
  - A key is pressed.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Horn Alert Logic Signal (Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

31.3 Off-hook Horn Alert

Off-hook Horn Alert can be used to activate the Horn Alert function linked with the microphone hook status.

Refer to 31.1 Conditions to Activate the Horn Alert on page 362 for conditions to activate the Horn Alert.

Table 31-3 Off-hook Horn Alert

Configuration	Description
Enabled	Horn Alert is activated regardless of the microphone On- or Off-hook state.
Disabled	Horn Alert is activated only if the microphone is On-hook.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Off-hook Horn Alert (Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

31.4 Horn Alert Mode

Horn Alert Mode is a function to enable or disable Horn Alert, depending on the configuration, when the transceiver is turned ON.

The Horn Alert state when the transceiver is turned ON can be configured using KPG-141D/ KPG-141DN.

Table 31-4 Horn Alert Mode

Configuration	Description
Current	When the transceiver is turned ON, the transceiver always starts up with Horn Alert disabled.
Status Memory	If Horn Alert is enabled or disabled by pressing the **Horn Alert** key, the status of Horn Alert, either enabled or disabled, can be retained in the transceiver. When the transceiver is turned ON, the transceiver starts up in the same Horn Alert state as was retained in the transceiver (enabled or disabled).
Startup	When the transceiver is turned ON, the transceiver always starts up with Horn Alert enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Horn Alert Mode (Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

32 OVER-THE-AIR PROGRAMMING

Over-the-air Programming is the function to write configuration data to the transceiver using wireless communications. This function enables configuration data for the transceiver to be updated by remotely controlling from the base station.

To use this function, the PC application software, Over-the-air Programming Manager (Model name: KPG-150AP) is required to manage data configured using KPG-141D/ KPG-141DN, and transmit the configuration data to each subscriber unit via the base station transceiver.

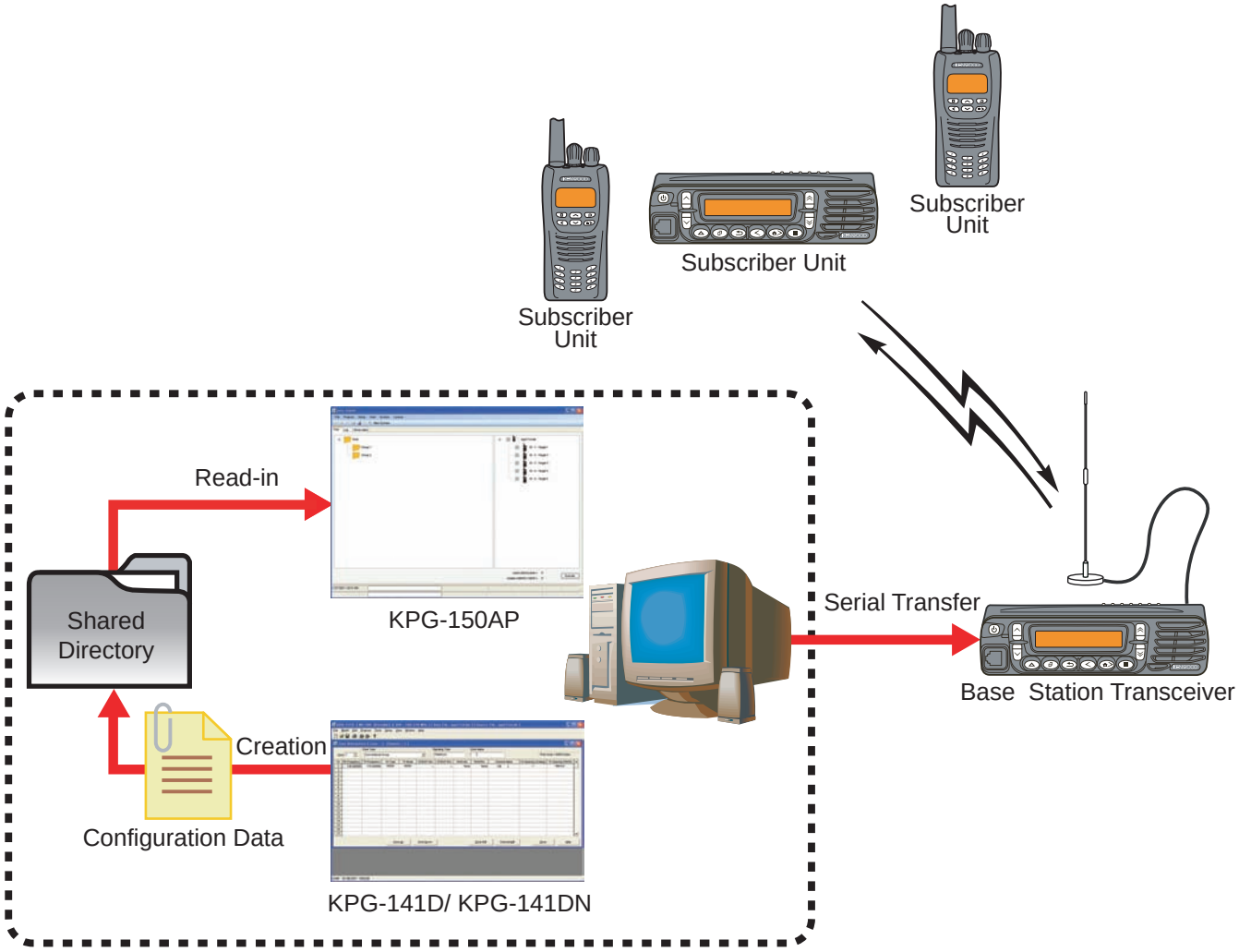


Figure 32-1 An Example of the System Structure

The transceiver for which Over-the-air Programming is enabled can be used in a system where Over-the-air Programming is incorporated. The subscriber unit can write the received configuration data into the unit and enable it. The base station transceiver can transmit the configuration data to the subscriber unit according to the request from Over-the-air Programming Manager.

Refer to Over-the-air Programming Manager Basic Operations supplied with KPG-150AP for the details of this function.

■ Configuration Using KPG-141D/ KPG-141DN

Configuring Over-the-air Programming to be enabled or disabled (Model > Product Information)

The transceiver has a password function for operating the transceiver and protecting the security of the configuration data.

33.1 Transceiver Password

Transceiver Password protects the transceiver from unauthorized usage. The transceiver will be ready to be used when the correct password is entered after turning the transceiver ON.

A password can be configured for the transceiver using KPG-141D/ KPG-141DN. The password can be configured using any numbers between 0 and 999999 inclusive.

Pressing the **Transceiver Password** key places the transceiver in Transceiver Password Mode.

Note:

- If Transceiver Password is configured but the **Transceiver Password** key is not assigned, the transceiver automatically enters Transceiver Password Mode when the transceiver is turned ON.
- This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Press the **Transceiver Password** key.

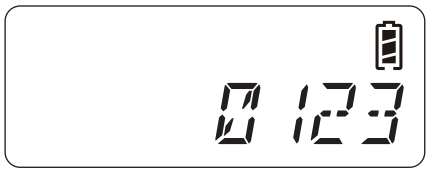
   The transceiver enters Transceiver Password Mode.

Portable

Mobile

2. Enter a password.

   Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods.



Portable

Mobile

3. Press the **Menu [S]** or [*] key after entering the password.

   If the password matches, a Password Authorization Tone sounds from the transceiver and the transceiver enters User Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Transceiver Password (Edit > Optional Features > Optional Features 1 > Common Page 1)
- Assigning functions to the PF keys (Edit > Key Assignment)

33.2 Read Authorization Password

Read Authorization Password protects the configuration data, such as the operating frequencies, from being read by unauthorized persons if the transceiver should ever be stolen.

To read the configuration data using KPG-141D/ KPG-141DN from a transceiver having a Read Authorization Password, the Read Authorization Password must be entered at a PC. The configuration data in the transceiver cannot be read unless the correct Password is entered.

Cloning the configuration data would not start unless the correct password is entered when the Read Authorization Password is configured for the master transceiver. Refer to 5.16.2 Entering or Clearing a Code on page 53 for entry methods of Read Authorization Password.

Read Authorization Password can be configured for the transceiver using KPG-141D/ KPG-141DN. Read Authorization Password can be configured using any numbers between 0 and 999999 inclusive.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Read Authorization Password (Edit > Optional Features > Optional Features 1 > Common Page 1 > Data Password)

33.3 Overwrite Password

Overwrite Password protects the configuration data from being overwritten by unauthorized persons if the transceiver should ever be stolen.

To write data using KPG-141D/ KPG-141DN to a transceiver for which the Overwrite Password is configured, the password must be entered at a PC.

Overwrite Password can be configured for the transceiver using KPG-141D/ KPG-141DN. Overwrite Password can be configured using any numbers between 0 and 999999 inclusive.

Note: Cloning data from another transceiver cannot be done if the Overwrite Password is configured for the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Overwrite Password (Edit > Optional Features > Optional Features 1 > Common Page 1 > Data Password)

Embedded Message can be used to embed a text message in the transceiver.

34.1 Embedded Message

Embedded Message can be used to store a maximum of 64 characters in the transceiver. The transceiver profile information, such as the control number and the file name of the configuration data written in the transceiver, can be embedded.

The message can be written to the transceiver by using KPG-141D/ KPG-141DN. The message written in the transceiver is stored as a part of the configuration data.

The embedded messages can be read from the transceiver by using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Embedded Message (Edit > Embedded Message)

34.2 Embedded Message with Password

Embedded Message with Password can be used to store with a password a maximum of 64 alphanumeric characters and symbols in the transceiver.

The transceiver profile information, such as the control number and the file name of configuration data written in the transceiver, can be embedded with a password.

The message and the password can be written to the transceiver by using KPG-141D/ KPG-141DN. The Embedded Message with Password is stored in the transceiver as independent data from the configuration data.

The password must be entered to write a message. The message cannot be written to the transceiver unless the correct password is entered.

The embedded messages can be read from the transceiver by using KPG-141D/ KPG-141DN.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring the Embedded Message with Password (Edit > Embedded Message with Password)

The transceiver has the following modes: the mode for adjusting the transceiver, the mode for copying the configuration data to another transceiver, and the mode for updating the firmware and confirming the version number of the firmware.

- Panel Test Mode
- Panel Tuning Mode
- Clone Mode
- Firmware Programming Mode
- Firmware Version Information Mode

The transceiver can enter each mode by pressing keys on the transceiver. Whether to permit the use of these modes can be configured using KPG-141D/ KPG-141DN.

35.1 Panel Test Mode

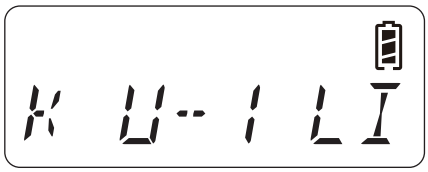
Panel Test Mode can be used to test transmit and receive capabilities of the transceiver using the operation panel of the transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Turn the transceiver ON while pressing and holding the **[A]** key.

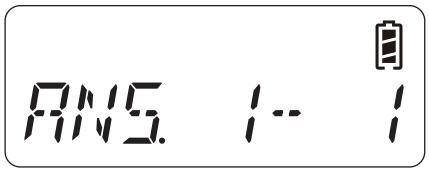
   A Power-on Tone A sounds from the transceiver, and then the market code and the frequency range of the transceiver and the battery type (Portable only) appear for 2 sec.



Portable

Mobile

The transceiver enters Panel Test Mode after a lapse of 2 sec.



Portable

Mobile

Note:

- Refer to the service manual for operating the transceiver in Panel Test Mode and for instructions on how to test transmit and receive capabilities.
- To end Panel Test Mode, the transceiver must be turned OFF.
- The transceiver cannot enter Panel Test Mode while Stun is enabled.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to permit the use of Panel Test Mode (Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

35.2 Panel Tuning Mode

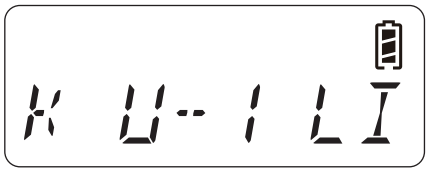
Panel Tuning Mode can be used to adjust transmit and receive capabilities of the transceiver by using the operation panel of the transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Turn the transceiver ON while pressing and holding the **[A]** key.

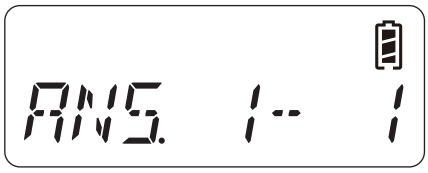
   A Power-on Tone A sounds from the transceiver, and then the market code and the frequency range of the transceiver and the battery type appear for 2 sec.



Portable

Mobile

   The transceiver enters Panel Test Mode after a lapse of 2 sec.

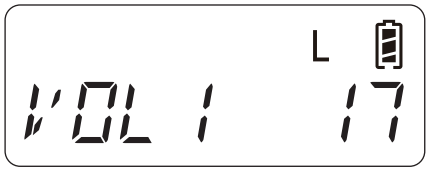


Portable

Mobile

2. Press the **[S]** key.

   The transceiver enters Panel Tuning Mode.



Portable

Mobile

Note:

- ♦ Refer to the service manual for operating the transceiver in Panel Tuning Mode and instructions on how to adjust transmit and receive capabilities.
- ♦ To end Panel Tuning Mode, the transceiver must be turned OFF.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to permit the use of Panel Tuning Mode (Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

35.3 Clone Mode

Clone Mode can be used to copy the data configured for the transceiver to another transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Turn the transceiver ON while pressing and holding the **[<B]** key.

   The transceiver enters Clone Mode.

Portable

Mobile

Note:

- ♦ Refer to the service manual for operating the transceiver in Clone Mode and details of the Clone function.
- ♦ To end Clone Mode, the transceiver must be turned OFF.
- ♦ The following data cannot be copied in Clone Mode:
  - Tuning Data
  - Embedded Message with Password
  - KENWOOD ESN Data
  - MPT ESN Data
  - NXDN ESN Data
- ♦ The data to be copied to a transceiver must be created with firmware of the same version number. If the data is copied to a transceiver having a different firmware version number, this may result in an error or a failure of the transceiver to function correctly. We strongly recommend that you confirm the data created by comparing the data in a transceiver having the same firmware version number.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to permit the use of Clone Mode (Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

35.4 Firmware Programming Mode

Firmware Programming Mode can be used to write the firmware to the transceiver.

■ Operating the Transceiver

1. Press and hold the **Side 1** key (Portable) or the **Triangle** key (Mobile) to turn the transceiver ON.

   The LED lights orange, and then the transceiver enters Firmware Programming Mode.

Portable

Mobile

Note:

- ♦ Refer to the service manual for operating the transceiver in Firmware Programming Mode and instructions on how to write the firmware to the transceiver.
- ♦ To end Firmware Programming Mode, the transceiver must be turned OFF.
- ♦ Turning the transceiver ON places the transceiver in Firmware Programming Mode if no firmware has been written in the transceiver.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to permit the use of Firmware Programming Mode (Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

35.5 Firmware Version Information Mode

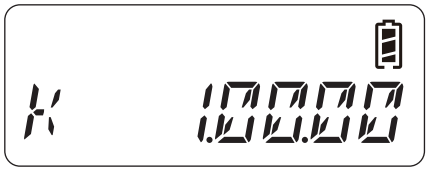
Firmware Version Information Mode can be used to confirm the version number of the firmware written to the transceiver.

Note: This function is unavailable for Portable (without LCD/ without Key).

■ Operating the Transceiver

1. Turn the transceiver ON while pressing and holding the**[S]** key.

   The transceiver enters Firmware Version Information Mode. The version number of the transceiver written to the transceiver appears.



Portable

Mobile

2. Release the **[S]** key.

   The transceiver exits Firmware Version Information Mode, and then the transceiver enters User Mode.

■ Configuration Using KPG-141D/ KPG-141DN

- Configuring whether to permit the use of Firmware Version Information Mode (Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

Symbols

Numerics

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

Z