KENWOOD

TK-D200/ TK-D200G/ TK-D300/ TK-D300G/ TK-D240/ TK-D340/ TK-D740/ TK-D840

Function Reference (FUNC)

Version:	2.30
Last Updated:	December 28, 2016
Language:	English
Type:	E

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About this Manual

This manual describes the functions of TK-D200/ TK-D200G/ TK-D300/ TK-D300G/ TK-D240/ TK-D340/ TK-D740/ TK-D840.

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

Item	Specifications	How to Verify
Market Code	E	Printed or labeled on the outside of carton and the model name plate on the transceiver.
Firmware Version of the Transceiver	1.15.00*1 1.30.00*2	Can be viewed in the **Transceiver Information** dialog box of KPG-166D. Turning the transceiver ON while pressing and holding the **Side 1** key on TK-Dx00 with LCD also displays the firmware version on the display.
KPG-166D version number	V 2.30	Can be viewed in the **About KPG-166D** dialog box of KPG-166D.

E: Designed for the European market.

*1 TK-D200/ TK-D200G/ TK-D300/ TK-D300G

*2 TK-D240/ TK-D340/ TK-D740/ TK-D840

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-166D or the display of the transceiver.

Bold Letters

The characters in bold letters indicate the name of the windows, tabs, checkboxes in KPG-166D and functions assigned to keys on the transceiver.

[ ] + [ ]

This notation is used for describing functions activated by pressing 2 keys on the PC keyboard at the same time. For example, the notation to enter a capitalized A on the PC is **[Shift]** + **[a]** for pressing the **[a]** key 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”.

Target Models

The target models of this manual are as follows.

TK-Dx00 series:

TK-D200/ TK-D200G/ TK-D300/ TK-D300G

TK-Dx40 series:

TK-D240/ TK-D340/ TK-D740/ TK-D840

Notations Used for the Target Models

In this manual, the target models are represented based on the following rules.

<table>
<tr><th>Model</th><th colspan="3">Notation</th></tr>
<tr><td>TK-D200</td><td rowspan="4">TK-Dx00</td><td rowspan="4">Portable</td><td rowspan="4">Display Type with LCD:
TK-Dx00 with LCD
Display Type without LCD:
TK-Dx00 without LCD</td></tr>
<tr><td>TK-D200G</td></tr>
<tr><td>TK-D300</td></tr>
<tr><td>TK-D300G</td></tr>
<tr><td>TK-D240</td><td rowspan="4">TK-Dx40</td><td rowspan="2">Portable</td><td>-</td></tr>
<tr><td>TK-D340</td><td>-</td></tr>
<tr><td>TK-D740</td><td rowspan="2">Mobile</td><td>-</td></tr>
<tr><td>TK-D840</td><td>-</td></tr>
</table>

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
CC	Color Code
CH	Channel
COM port	Communications port
DQT	Digital Quiet Talk
DTC	Data Transmission Control
EOT	End of Transmit
EXT	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
Mic	Microphone
PF	Programmable Function
PTT	Push-to-Talk
PTT ID	PTT (Push-to-talk) ID code
QT	Quiet Talk
RSSI	Received Signal Strength Indication
RX	Receive
STX	Start of Text
TA	Talk Around
TOT	Time-out Timer
TX	Transmit
UID	Unit ID
VOX	Voice-operated Transmission

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About the Programming Software

Various functions and parameters of the transceiver can be configured by using the KPG-166D software. Various functions can be enabled by connecting the transceiver to a PC using a programming cable and writing the data configured using KPG-166D to the transceiver. In this manual, the description of each function may have a corresponding reference in the help texts attached to KPG-166D. Therefore, you can configure the function by referring to the function also appearing in the KPG-166D help text.

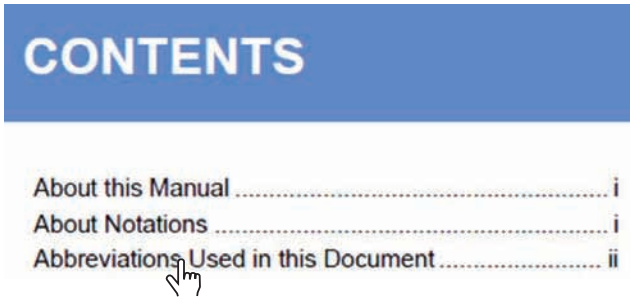
How to Search for Information

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 ( ).

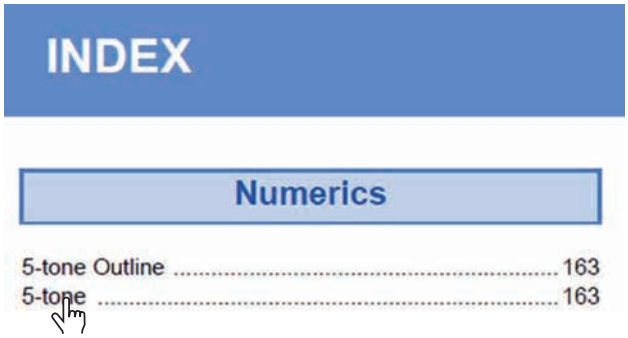
CONTENTS

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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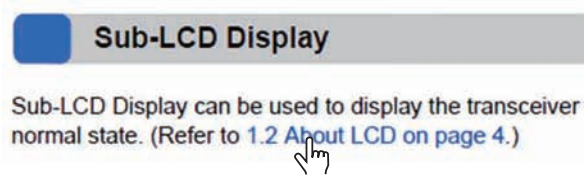

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The text in this document can be searched using the search function of your Adobe Acrobat or Acrobat Reader.

Outline of This Transceiver

TK-D200/ TK-D200G/ TK-D300/ TK-D300G/ TK-D240/ TK-D340/ TK-D740/ TK-D840 are VHF/ UHF transceivers for professional use. The transceiver is equipped with the digital communications system which complies with the DMR common air interface specifications, as well as the existing analog FM mode.

GENERAL FEATURES

TK-Dx00

- 512 Channels, 128 Zones
- 64 CH, 4 Zones (TK-Dx00 without LCD)

Models

- VHF Models (136 MHz to 174 MHz) (Low: 1 W, High: 5 W)
- UHF Models (400 MHz to 470 MHz) (Low: 1 W, High: 4 W)

Display Functions

- QVGA Color 2.0 inch TFT/ TRANSFLECTIVE LCD*1
- Function/ Status LCD Icons*1
- Transmit/ Busy/ Call Alert/ Warn LED

Specifications

- Backlight LCD & Keys*1
- On/ Off Volume Knob
- 6 Front PF Keys*1
- 4 Side PF Keys
- 12-Key Keypad*1
- 14 pin Universal connector
- 500 mW Speaker Audio
- Built-in Motion Sensor
- Built-in GPS Receiver*2

Others

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

TK-Dx40

Portable

- 2 Zones, 16 Channels per Zone

Models

- 1 W/ 5 W (136 MHz to 174 MHz) Model
- 1 W/ 4 W (400 MHz to 470 MHz) Model

Display Functions

- Transmit/ Busy/ Call Alert/ Warn LED
- Red/ Green/ Orange/ Blue LED

Specifications

- On/ Off Volume Knob
- 16-Position Mechanical Selector
- 2 Side PF Keys
- 2.5/ 3.5D connector

Others

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

Mobile

- 4 Zones, 32 Channels per Zone
- 4 Zones, 100 Channels per Zone (when expanded to 400 Channels)

Models

- 5 W/ 25 W (136 MHz to 174 MHz) Model
- 5 W/ 25 W (400 MHz to 470 MHz) Model

Display Functions

- 7-segment LED with 2-digit Display
- Red/ Green/ Orange/ Blue LED

Specifications

- 9 PF Keys
- 4 W/ 4 Audio Output Power
- DB15 Accessory Interface
- 8 Programmable I/O Ports

Others

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

DIGITAL MODES

GENERAL

- DMR Digital Air Interface
- AMBE+2 VOCODER
- 12.5 kHz (Narrow) Channel Spacing
- 16 Color Codes (0 to 15)
- Individual Call
- Paging Call
- Group Call
- Broadcast Group Call
- Emergency Call
- All Group Call
- Status Message*3
- Remote Stun/ Kill
- Remote Monitor
- Short Message*4
- Single Scan, Multi Scan

ANALOG MODES

GENERAL

- 12.5 kHz (Narrow)/ 20 kHz (Wide 4k)/ 25 kHz (Wide 5k) Channel Spacing
- 5-tone
- FleetSync
- DTMF*6
- 2-tone*6
- QT/DQT
- Single Scan, Multi Scan, Priority Scan *5

5-tone

- Selective/ Group Call
- Status Message
- Emergency Call

FleetSync*6

- PTT ID
- Selective/ Group Call
- Status Message
- Emergency Call

*1 Not available on TK-Dx00 without LCD.

*2 The KRA-43G or KRA-44G antenna is additionally required.

*3 To send messages or data with serial communications, the supported PC software and external devices need to be separately prepared for the transmitting transceiver. In addition, to send the received messages or data to external devices, the supported PC software and external devices need to be separately prepared for the receiving transceiver.

*4 TK-Dx00 with LCD only.

*5 TK-Dx40 (Mobile) only.

*6 TK-Dx40 only.

About Zones

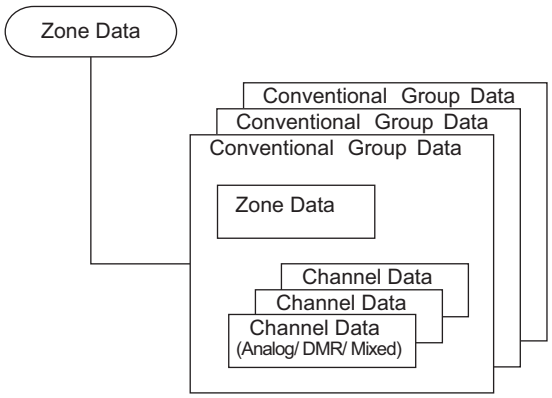


Figure 1-1 Zone Description

By using KPG-166D, zone data can be configured. Zone data consists of analog channels for communicating in an Analog Conventional system (analog mode) and DMR digital channels for communicating in a DMR Conventional system (digital mode). Channels in mixed mode, the mode to wait to receive both an analog signal and a DMR digital signal, can be also used.

The number of configurable zones and channels for each transceiver are shown below.

Model		Maximum No. of Zones Configurable for a Transceiver	Maximum No. of Channels Configurable for One Zone	Maximum No. of Channels Configurable for a Transceiver
TK-D200 TK-D200G TK-D300 TK-D300G	with LCD	128	250	512
	without LCD	4	16	64
TK-D240 TK-D340		2	16	32
TK-D740 TK-D840	**400 Ch and 128 Ch:** Uncheck	4	32	128
	400 Ch: Check	4	100	400

Note

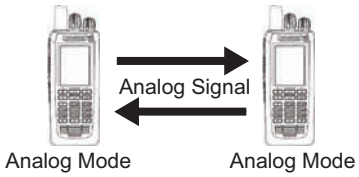
- The number of zones that can be configured varies depending on the number of channels.
- The number of channels that can be configured for each zone varies depending on the number of zones.

About Communications Systems

The transceiver can communicate in analog mode, the DMR digital mode, or mixed mode.

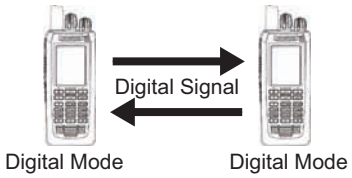
- **Analog Mode**

  Analog mode is the mode to transmit and receive an analog signal. To use this communication mode, “Analog” must be configured for Channel Type by using KPG-166D.



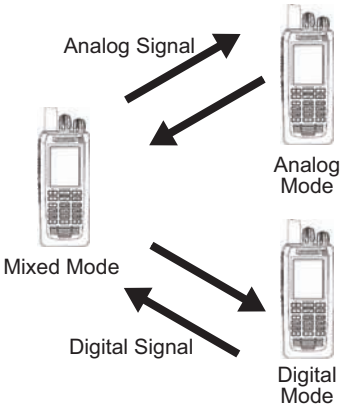
- **DMR Digital Mode**

  DMR digital mode is the mode to transmit and receive a DMR digital signal. To use this communication mode, “DMR” must be configured for Channel Type by using KPG-166D.



- **Mixed Mode**

  Mixed mode is the mode to receive both an analog signal and a DMR digital signal. To use this communication mode, “Mixed” must be configured for Channel Type by using KPG-166D.



  When transmitting in this mode, the transceiver transmits using the communication mode configured for Transmit Mode (Analog or DMR). However, the communication mode varies depending on the receiving status.

About Communication Methods

Following are the communication methods that the transceiver can use.

Communication Method	Description	Available System
Communications using a DMR ID	The transceiver can make the following communications by using a DMR ID. • Individual Call • Group Call • Broadcast Group Call • Status Call • Short Data Call	DMR Conventional system
Communications using a 5-tone	The transceiver can make the following communications by using a 5-tone. • Individual Call • Group Call • Status Call	Analog Conventional system
Making a Voice Call Using FleetSync ID (TK-Dx40 only)	The transceiver can make the following voice calls using a FleetSync ID. • Individual Call • Group Call • Fleet Call • Supervisor Call • Broadcast Call	Analog Conventional system
Data Communication Using FleetSync ID (TK-Dx40 only)	The transceiver can make a Status Message Call using a FleetSync ID.	Analog Conventional system
Direct communications between transceivers (Talk Around)	The transceiver can communicate directly with a target transceiver by using the Talk Around function when the transceiver is operated via a repeater.	DMR Conventional system Analog Conventional system
Direct communications between transceivers (DMR Direct Mode)	The transceiver can communicate directly with a target transceiver by using a DMR digital channel configured with the same frequency for the transmit frequency and receive frequency.	DMR Conventional system

Change History

Date	Description
2015.11.30	1) Added TK-D240/ TK-D340/ TK-D740/ TK-D840 to the list of compatible models. 2) Added description on “Notations Used for the Target Models”. 3) Added terms to “Abbreviations Used in This Document”. 4) Added descriptions on FleetSync to “About Communication Methods”. 5) Added reference sections for the following features to “Contents by Purpose”. • VOX • FleetSync • Ignition Sense • Horn Alert 6) Added information on TK-D240/ TK-D340/ TK-D740/ TK-D840 to the text descriptions for the respective sections. 7) Added the compatible models below the title in the main text. 8) Added KPG-36X and KPG-46X as compatible programming cables. 9) Added “Key Lock for Selector” to “3.10 Locking the Transceiver Keys (Key Lock)”. 10)Added “5.3 LED Display”. 11)Added “5.4 Lighting up the LED According to the Transceiver Status”. 12)Added “6.7 Using the Transceiver as a Loudspeaker (Public Address)”. 13)Added “6.8 Switching between the Built-in and External Speakers (External Speaker)”. 14)Added the following items to “8.10 Sending and Receiving a Status Message (Status Call)”. • AUX Input Status Message • AUX Output Status Message • Horn Alert Status 15)Added the following items to “9.2 Using the Signaling”. Using Optional Signaling (Analog) Unmuting the Speaker (Audio Control (Analog)) Unmuting in Tandem with the Microphone (Off-hook Decode) 16)Added “9.4 Using FleetSync to Initiate a Selective Call”. 17)Added “9.7 Disabling the Transceiver Capability by Remote Control (Stun/ Kill)”. 18)Added “9.8 Overlaying QT/DQT during Data Transmission (Data Transmit with QT/DQT)”. 19)Added “Receive Group Digits” to “10.3 Making a Selective Call”. 20)Added the following items to “10.6 Monitor Functions”. Pressing PTT/ Release PTT Monitor Operation Other than the PTT Switch Mute Monitor Tone Minimum Mute Tone Period

Date	Description
2015.11.30	21)Added “10.8 Encode Functions”. 22)Added “10.9 Decode Functions”. 23)Added the following chapters. 12 FleetSync 18 VOX 19 Function Port 20 Vehicle-interlinked Features 24)Added the following items to “14.1 Placing the Transceiver in Emergency Mode”. Manual Emergency Reset Suspended Power-off 25)Added the following items to “14.5 ID Sent when Emergency Mode is Activated (DMR Conventional System only)”. Emergency Call Fleet Emergency Call ID Emergency 5-tone 26)Added “17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan)”. 27)Added “Starting Scanning in Tandem with the Microphone (Off-hook Scan)” to “17.5 Common Functions for Scan”. 28)Changed the version number from 1.00 to 2.00.
2016.06.30	1) Corrected each version information in “About this Manual”. 2) Added “Zone Delete/Add” to “5.4 Lighting up the LED According to the Transceiver Status”. 3) Deleted TK-Dx00 from the compatible models in “6.6 Adjusting Audio Characteristics (DMR Conventional System Only)”. 4) Added the description of External Microphone Type (TK-Dx40) to “6.6 Adjusting Audio Characteristics (DMR Conventional System Only)”. 5) Added “External Speaker Type” to “6.6 Adjusting Audio Characteristics (DMR Conventional System Only)”. 6) Added the flashing LED colors to “8.1 Initiating Voice Communications (Basic Transmission and Reception)”. 7) Added the description of “Selective Call Alert LED” to “8.5 Making an Individual Call”. 8) Added the description of “Alert LED Color” to Table 8-7 Unit ID List in “8.5 Making an Individual Call”. 9) Added the description of “Selective Call Alert LED” to “8.7 Making a Group Call”. 10) Added the description of “Alert LED Color” to Table 8-8 Group ID List in “8.7 Making a Group Call”. 11) Deleted TK-Dx00 from the compatible models in “Group ID Scan” of “8.7 Making a Group Call”. 12) Corrected the names of compatible models in “8.8 Making an Informative Group Call (Broadcast Group Call)”. 13) Corrected the names of compatible models in “8.15 Sending GPS Data”. 14) Added the following items to “12.4 Making a Selective Call”: LED (Individual/ Group Call) LED (Other Selective Calls) 15) Added the following items to “12.5 Sending and Receiving a Status Message (Status Call)”: Power-on Status Message Power-off Status Message AUX Input Status Message (Mobile Only) AUX Output Status Message (Mobile Only) 16) Added the following sections to “12 FLEETSYNC”: Sending GPS Data Receiving GPS Data 17) Corrected “13 GPS POSITION DISPLAY” to “13 GPS”. 18) Added “13.1 GPS Functions” and “13.2 GPS Position Display”. 19) Corrected “13.1 Configuring the GPS Position Display” to “Configuring the GPS Position Display”. 20) Corrected “13.2 Location Information Display” to “Location Information Display”. 21) Changed the version number from 2.00 to 2.20.

Date	Description
2016.12.28	1) Added DTMF and 2-tone to “Outline of This Transceiver”. 2) Added the description of behaviors for when a password is configured to the description of TK-Dx40 (Mobile) in “3.1 Turning the Transceiver ON/ OFF”. 3) Added TK-Dx40 (Mobile) to the compatible models in “Keypad Operation”. 4) Added TK-Dx40 (Mobile) to the compatible models in “Specifying the Zone-channel Selected When the Transceiver Is Turned ON (Power-on Zone-Channel)”. 5) Added the description of the operation of TK-Dx40 to “Changing the Channel with a Single Touch (Home Channel)”. 6) Added “Priority 2 Zone-Channel” to “5.4 Lighting up the LED According to the Transceiver Status”. Changed “Priority Zone-Channel” to “Priority 1 Zone-Channel”. 7) Added the note to “Using Sound to Notify the Other Party that the Communication Ends (PTT Release Tone)”. 8) Added “Adjusting the Volume Level (Fine Volume Control)” to “6.4 Functions Related to the Volume Configuration”. 9) Added the description of behaviors of TK-Dx40 (Mobile) to “7 BATTERY”. 10) Added “7.3 Warning That the Battery Voltage of the Vehicle Battery Is Low (Battery Warning)”. 11) Added “Preamble Length” to “8.9 Common Functions for Data Communications”. 12) Added the descriptions of DTMF and 2-tone to “Using Optional Signaling (Analog)”. 13) Added the following items: 9.5 Using DTMF to Initiate a Selective Call 9.6 Using 2-tone to Initiate a Selective Call 14) Added “PTT ID Type” to “12.3 Sending a PTT ID”. 15) Added “DTMF” to Table 14-9. 16) Added “Emergency DTMF ID” to “14.5 ID Sent when Emergency Mode Is Activated”. 17) Deleted the description of the restriction of “Functions in Lone Worker Mode” for TK-Dx40 because Lone Worker Type is supported for TK-Dx40. 18) Added “15.1 Built-in Voice Scrambler (Analog)” to “15 COMMUNICATION SECURITY”. 19) Deleted the description of the restriction of “Transceiver’s Behavior upon Receipt of the Encrypted Audio Data” for TK-Dx40 because Scrambler Type is supported for TK-Dx40. 20) Added the retaining of the configuration status of a Multi-key to “Scrambler Status Memory” in “15.2 Scrambler (DMR Digital)”. Deleted the description of compatible models. 21) Corrected “17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan)” as follows: Corrected the description of “Fixed” in Table 17-1. Added “Operator Selectable” to Table 17-1. Added the note. Added “Configuring the Priority Channel”. 22) Added the following items to Table 17-3: Priority Priority + Talkback Priority 1 Priority 1 + Talkback Priority 2 Priority 2 + Talkback 23) Deleted the description of compatible models in “Selected Channel Scan”. 24) Deleted the description of compatible models in “Scan Stop Tone”. 25) Added TK-Dx40 to the compatible models in “21.1 Password for Transceiver Operation (Transceiver Password)”. 26) Added the following items to “21.1 Password for Transceiver Operation (Transceiver Password)”. Operating TK-Dx00 with LCD Operating TK-Dx40 27) Added the following items to Table A-2: Autodial Home Channel Home Channel Select Priority-channel Select 28) Changed “Available System” in the following items of Table A-2 to “ALL”: Scrambler Scrambler Key 29) Changed the version number from 2.20 to 2.30.

CONTENTS

About this Manual i
About Notations i
Target Models ii
Notations Used for the Target Models ii
Abbreviations Used in this Document iii
About Copyright iv
Software Copyrights iv
Firmware Copyrights iv
About Trademarks and Patent Rights iv
About the Programming Software v
How to Search for Information v
Outline of This Transceiver vi
GENERAL FEATURES vi
DIGITAL MODES viii
ANALOG MODES viii
About Zones ix
About Communications Systems x
About Communication Methods xi
Change History xii

CONTENTS BY PURPOSE xxv

1 FUNCTIONS AND PANEL LAYOUT 1

1.1 TK-D200/ TK-D200G/ TK-D300/ TK-D300G 1
1.2 TK-D240/ TK-D340 4
1.3 TK-D740/ TK-D840 5
1.4 About LCD 7
LCD 7
Icons 8
Key Guide 9

2 GETTING STARTED 11

2.1 Basic Workflows 11
2.2 Connecting the Transceiver to a PC 12
2.3 Writing the Configuration Data to the Transceiver 14
2.4 Reading the Configuration Data from the Transceiver 15
2.5 Embedding a Message in the Transceiver (Embedded Message) 16
Embedded Message 16
Embedded Message with Password 16

3 BASIC OPERATIONS 17

3.1 Turning the Transceiver ON/ OFF 17
Turning the Transceiver ON 17
Turning the Transceiver OFF 19
3.2 Adjusting the Volume Level 19
3.3 Using Function Keys 20
Mode Reset Timer 21
Keypad Operation 22
Manual Dialing (DMR Conventional System Only) 23
3.4 Using Menu Mode 24
3.5 Using the Contact List (DMR Conventional System Only) 26
Viewing the Configuration for Each ID 27
3.6 Changing the Zone-channel 29
Changing the Zone 29
Changing the Channel 31
Rollover/ End Stop 32
Notifying the Changed Zone- channel Number by Voice (Voice Announcement) 33
Specifying the Zone-channel Selected When the Transceiver Is Turned ON (Power-on Zone-Channel) 34
Changing the Channel by Specifying the Number (Channel Entry) 34
Changing the Channel with a Single Touch (Home Channel) 36
3.7 Transmitting/ Receiving 38
Input Sensitivity of the Microphone (Mic Sense) 38
3.8 Viewing the Receive History (Stack) 39
Stack Procedure of the Receive History (Latest Received Message Stack) (DMR Conventional System Only) 41
Call ID Stack (DMR Conventional System Only) 42
Status Message Stack (DMR Conventional System Only) 42
Queue Type (5-tone System Only) 43
Message Memory (5-tone System Only) 44
3.9 Operating the Transceiver in Each Mode (Common Operation) 45
Selecting or Clearing Data from a List 45
Entering or Deleting a Code 49
Entering or Deleting Characters 55
Character Entry 60
3.10 Locking the Transceiver Keys (Key Lock) 61
Key Lock for Selector 62

4 TRANSMISSION/ RECEPTION 63

4.1 Transmit/ Receive Frequencies 63
4.2 Transmission Power 63
4.3 Channel Spacing 65

4.4 Beat Shift 65
4.5 Displaying the Signal Strength Level (RSSI Level) (Maintenance Display) 66

5 INDICATION AND DISPLAY 67

5.1 Busy LED 67
5.2 Transmit LED 67
5.3 LED Display 68
Information in the LED Display 69
Adjusting the LED Display Brightness (LED Brightness) 73
5.4 Lighting up the LED According to the Transceiver Status 74
5.5 Lighting the Backlight (Backlight) 74
5.6 Changing the Brightness of the Backlight (LCD Brightness) 75
5.7 The Icons on the LCD 75
5.8 Displaying the Signal Strength (Signal Strength Indicator) 77
5.9 Indication Functions of the Display 78
Zone Name Display 78
Display Format 79
Power-on Text 79
Sub-LCD Display 80
5.10 Customizing a Displayed Text String (Display Customization) 81
5.11 Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen) 81

6 SOUND 82

6.1 Tones that Sound When a User Operates the Transceiver or When the Transceiver Status Is Changed 82
Power-on Tone 83
Control Tone 83
Warning Tone 84
Locator Tone 85
Sidetone 86
Volume Level Tone 86
Alert Tone 86
6.2 Tones that Sound When the Transceiver Receives a Call 87
Configuring the Alert Tone (Alert Tone Pattern) 88
6.3 Tones that Sound When the Communication Starts/ Ends 89
Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) 89
Using Sound to Notify the Other Party that the Communication Ends (PTT Release Tone) 90
6.4 Functions Related to the Volume Configuration 91
Configuring the Minimum Volume Level (Minimum Volume) 91
Configuring the Maximum Volume Level (Maximum Volume) 92
Configuring the Offset Value for Volume Level (Tone Volume Offset) 92
Configuring the Volume Level of Various Tones (Tone Volume) 92
Changing the Tone Volume Level with a Single Touch (Selectable Tone Level) 93
Temporarily Reducing the Volume Level of the Speaker Microphone (Speaker Attenuation) 94
Adjusting the Volume Level (Fine Volume Control) 94
6.5 Restricting Alert Tone When Consecutively Receiving a Call (Alert Tone Restriction from 2nd Call) (DMR Conventional System Only) 95
6.6 Adjusting Audio Characteristics (DMR Conventional System Only) 97
External Microphone Type 97
Auto Gain Control (RX Audio Response) 99
Audio Equalizer (RX Audio Response) 100
Noise Suppressor 101
Auto Gain Control (TX Audio Response) 101
Audio Equalizer (TX Audio Response) 102
External Speaker Type 102
6.7 Using the Transceiver as a Loudspeaker (Public Address) 103
6.8 Switching between the Built-in and External Speakers (External Speaker) 104

7 BATTERY 105

7.1 Displaying the Remaining Battery Power Level (Battery Indicator) 105
7.2 Warning that the Battery Voltage Is Low (Battery Warning) 107
7.3 Warning That the Battery Voltage of the Vehicle Battery Is Low (Battery Warning) 108
7.4 Reducing Battery Consumption (Battery Saver) 109

8 DMR CONVENTIONAL SYSTEM 110

8.1 Initiating Voice Communications (Basic Transmission and Reception) 110
- About Own ID 110
- Receiving 111
- Auto Reset Timer 111
- Selective Call Alert LED 112
- Searching Whether the Transceiver Receives a Call (Scan) 112
- Transmitting 113
- Restricting the Duration of Continuous Transmission (Time-out Timer) 113
- Avoiding Interference with Other Communications (Busy Channel Lockout (DMR)) 115
- Preferentially Using a Channel Being Used by Other Parties (BCL Override) 116
- Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode) 117
- Communicating via a Repeater (Repeater Mode) 119
- About the Slot Numbers (Slot Selection) 119

8.2 Using the Signaling 120
- Sharing the Same Channel (Frequency) by Several Groups (Color Code) 120

8.3 Waiting for Both Digital Signals and Analog Signals (Mixed Mode) 121

8.4 Using DMR ID to Initiate a Selective Call 122
- Available Calls 122

8.5 Making an Individual Call 122
- Initiating an Individual Call 123
- Initiating a Paging Call 125
- Receiving an Individual Call 125
- Unit ID List 127
- Editing the Contact List 128
- Displaying the ID of the Communicating Caller on the LCD (Caller ID Display) 131
- Restricting IDs for Which the Transceiver Can Initiate a Call (Unit ID Encode Block) 132

8.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) 133
- Initiating an Individual Call (Individual Call Acknowledge Request) 134
- Receiving an Individual Call (Individual Call Acknowledge Request) 137
- Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone) 138
- Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) 138

8.7 Making a Group Call 139
- Initiating a Group Call 139
- Receiving a Group Call 141
- Group ID List 142
- Display When the Transceiver Receives a Group Call (Group Call Display Type) 143
- Group ID Scan 144
- Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only)) 144

8.8 Making an Informative Group Call (Broadcast Group Call) 145
- Initiating a Broadcast Call 145
- Receiving a Broadcast Group Call 146

8.9 Common Functions for Data Communications 147
- Number of Retries 147
- Transmit Busy Wait Time 147
- Maximum ACK Wait Time 147
- Received Message Display Type (Message Display Type) 148
- Preamble Length 148

8.10 Sending and Receiving a Status Message (Status Call) 149
- Sending a Status Message in Contact List Mode 150
- Sending a Status Message in Status Mode 152
- Receiving a Status Message 155
- Status List 157
- Emergency Status 158
- Status Message on Data Zone-Channel 158
- Sending the Received Status Message from the Communication Port (Status Message Serial Output) 159
- Power-on Status Message 159
- Power-off Status Message 159
- Base ID 160
- Emergency Status Response 160
- AUX Input Status Message 161
- AUX Output Status Message 161
- Storing the Selected or Sent Status (Status Hold) 162
- Horn Alert Status 162

8.11 Sending and Receiving a Short Message (Short Data Call) 163
- Sending a Short Message in Contact List Mode 163
- Sending a Short Message in Message Mode 167
- Sending and Receiving a Short Message (Short Data Call) 167
- Viewing, Replying to, Forwarding, and Deleting the Received Short Message (Inbox) 168
- Sending a Short Message by Newly Entering a Message (Create New) 172

Sending a Short Message by Selecting a Message from a List (Predefined)..... 174
Viewing, Resending, Forwarding, and Deleting the Sent Short Message (Outbox) 176
Viewing, Sending, Editing, and Deleting the Stored Short Message (Draft)..... 180
Receiving a Short Message..... 184
Short Message on Data Zone-Channel 185
Sending the Received Short Message from the Communication Port (Short Message Serial Output) 185
8.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode) 186
8.13 Call All Transceivers of the Matching Color Code (Unaddressed Call) 187
8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) 188
8.15 Sending GPS Data 189
Transmission Method of GPS Data 189
ID of the Target Transceiver (Base ID)..... 189
Channel Used when Sending GPS Data (GPS Report Channel Type)..... 190
Sending GPS Data Automatically at Certain Intervals (GPS Report Mode) 190
Sending GPS Data According to the Request from the Base Station (GPS Report Mode)..... 191
Sending GPS Data Manually by Using a Key (Send the GPS Data)..... 191
GPS Report Interval Time..... 191
GPS Time Mark 192
GPS Message Type..... 192
GPS Report Back to Requested ID 192
8.16 Receiving GPS Data.....193
Map Header..... 193
GPS Position Display..... 194
8.17 Remote Operation by Radio Communication (Remote Control) 194
Sending Remote Control Messages by Remote Control Mode..... 195
Disabling the Transceiver Capability by Remote Control (Stun/ Kill) 197
Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor)..... 198
Checking Whether Another Transceiver is in Operation (Radio Check)..... 199

9 ANALOG CONVENTIONAL SYSTEM 200

9.1 Initiating Voice Communications (Basic Transmission and Reception) 200
Receiving 200
Temporarily Disabling the Squelch (Squelch Off).....200
Adjusting the Squelch Level (Squelch Level) 202
Searching Whether the Transceiver Receives a Call (Scan) 204
Transmitting 204
Restricting the Duration of Continuous Transmission (Time-out Timer).....204
Avoiding Interference with Other Communications (Busy Channel Lockout (Analog)) 206
Preferentially Using a Channel Being Used by Other Parties (BCL Override).....207
Communicating Without Using a Repeater (Talk Around) 208
9.2 Using the Signaling 209
Sharing the Same Channel (Frequency) by Several Groups (QT/DQT) 209
Using Optional Signaling (Analog) 210
Unmuting the Speaker (Audio Control (Analog)) 211
Temporarily Disabling the Signaling (Monitor).....211
Unmuting in Tandem with the Microphone (Off-hook Decode) 213
9.3 Using 5-tone to Communicate 214
9.4 Using FleetSync to Initiate a Selective Call 214
9.5 Using DTMF to Initiate a Selective Call 215
Sending a DTMF Code by Using the Autodial Key (Autodial) 216
Sending the DTMF Code While Transmitting (Manual Dialing).....217
Sending the DTMF Code by Pressing a Key on the Microphone Keypad without Using the PTT Switch (Keypad Auto PTT).....217
Sending a DTMF Code by Selecting from a List (Autodial Mode).....218
Redialing 219
Sending a PTT ID 220
Disabling the Transceiver Capability by Remote Control (Stun) 222
Functions Related to DTMF Code Encoding 223
Functions Related to DTMF Code Decoding 227
9.6 Using 2-tone to Initiate a Selective Call 231
Functions Related to 2-tone Code Encoding 231
Functions Related to 2-tone Code Decoding 232
9.7 Improving the Sound Quality for Transmitting and Receiving (Compander)..... 235

9.8 Disabling the Transceiver Capability by Remote Control (Stun) 235
9.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) 236
9.10 Multiplexing QT/DQT during Data Transmission (Data Transmit with QT/DQT) 236

10 5-TONE 237

10.1 5-tone Outline 237
Available Communication Functions 237
About 5-tone Code 239
About 5-tone Signaling Formats (5-tone Standard) 242
10.2 About Configuration Using KPG-166D 244
My ID 244
My ID Digits 245
Power-on My ID Edit 245
TX Address/ RX Address 247
Primary Address 247
Copy from Default TX/RX Address 248
Auto Reset Timer 249
Sidetone 250
Message Display Type 250
10.3 Making a Selective Call 251
Sending a Selective Call 252
Receiving a Selective Call 253
Changing the Selcall Code 254
Changing the Receive Code 258
Selectable Receive Digits 260
Selcall Digit Display 261
Changing the Selcall Code with the Digit Specified 262
Selectable Group Tone 265
Selcall List 266
Group Tone 267
Receive Group Digits 268
Digit Entry Method 269
Selectable Selcall Digits 270
10.4 Sending and Receiving a Status Message (Status Call) 271
Sending a Status Message 271
Receiving a Status Message 272
Changing the Status Code 273
Status List 276
Digit Entry Method 277
Selectable Status Digits 278
10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) 279
10.6 Monitor Functions 280
Monitor Function 281
Monitor Key Action 282
Automatic Close 283
Pressing PTT/ Release PTT 284
Monitor Operation Other than the PTT Switch 285
Mute Monitor Tone 286
Minimum Mute Tone Period 286
10.7 Conditions to Pause Scanning (Scan Configuration) 287
Scan Behavior 288
10.8 Encode Functions 291
10.9 Decode Functions 292

11 5-TONE ENCODE/ DECODE FORMAT 295

11.1 Encode Format 295
ALERT num 295
AUTR 295
BEEP num 296
BKTOF 296
BKTON 297
BLTOF 297
CLOSE 298
CTTP 298
DEL xtime 299
DELL ltime 299
DIFIX 300
DISPF 300
DISPS 301
DTAIL 301
EMGON 301
ENC enc 302
ENTTM ltime 302
ERRX0 303
ERRX1 303
IDLOF 303
IDLON vtime enc 304
KEYD 304
KEYE 305
KNOBD 305
KNOBE 305
LEDF 306
LEDS 306
LEN xtime 306
OPEN 307
PAUSE lwtime 307
RACK stime dec 308
REP rep 308
RIGN stime 309
RKILL1 309
RKILL2 310
RSML ltime 311

RSMS stime 311
RSTUN 312
RVIVE 313
RXF rf-freq 313
RXP 314
RX 314
SBUSY 314
SCHK 315
SCLOS 315
SCOFF 316
SCPH 316
SCR st-tone 316
SCRP 317
SCT st-tone 317
SCTP 317
SDIAL 318
SELC 318
SELCH channel 319
SELD 319
SELGR zone 320
SELM 320
SELMC 321
SELS 321
SEND #0 to SEND #F 322
SEND ^K1 to SEND ^K8 322
SEND ^M1 to SEND ^M8 322
SEND ^Q1 to SEND ^Q8 323
SEND ^RX1 to SEND ^RX8 323
SEND ^TX1 to SEND ^TX8 323
SEND ^U1 to SEND ^U8 324
SEND ^V1 to SEND ^V8 324
SENDC 325
SENDS 325
SLEN ofs 326
SOPEN 327
SPAUS 327
STOPS 327
STRTS 328
TEXT ‘text’ 328
TONE af-freq 328
TPD 329
TPE 329
TSET toneset 330
TXF rf-freq 330
TXM 330
TXP 331
TXS 331
TXT 331
TXTOF 332
XCARR 332
XCLOS 332
XCTCM 333
XCTCN 333
XCTCW 334
XOPEN 334
XSAT st-tone 335
XSCAN 335
XSENS 335
11.2 Decode Format 336
ALERT num 336
ALERTG num 336
ALERTI num 337
AUTR 337
BEEP num 337
BEEPG num 338
BEEPI num 338
BLTOF 338
BLTON 339
CKSAT 339
CMP #* 339
CMP #0 to CMP #F 340
CMP ^K1 to CMP ^K8 340
CMP ^M1 to CMP ^M8 341
CMP ^Q1 to CMP ^Q8 341
CMP ^RX1 to CMP ^RX8 342
CMP ^TONE 342
CMP ^TX1 to CMP ^TX8 342
CMP ^U1 to CMP ^U8 343
CMP ^V1 to CMP ^V8 343
DECA dec 344
DECAT time dec 344
DECF dec 345
DECG dec 345
DECGT time dec 346
DECI dec 346
DECIT time dec 347
DISPF 347
DISPM 348
DISPQ 348
DSPMT 349
DSPQT 349
EMGOF 350
ENCA enc 350
ENCG enc 351
ENCI enc 351
ERASE time 352
GRP0 352
GRP0A 353
GRPA 353
GRPN 354
GRPP 354
LEDF 354
MONC 355
MONF 355
MONO 355
QUEUE 356
REPOF 356
RKILL1 357

RKILL2 357
RSTUN 358
RVIVE 358
SELTXT 'text' 359
SENDPC 359
SSTO 1 to SSTO 8 360
STO 1 to 8 360
STTXT 'text' 361
XPASS 361

12 FLEETSYNC 362

12.1 Basic FleetSync Settings 362
About Own ID (Fleet (Own)/ ID (Own)) 362
FleetSync Baud Rate 362
12.2 Available Calls 363
12.3 Sending a PTT ID 363
PTT ID Type 363
Timing for Sending a PTT ID 364
Output of PTT ID Tone (PTT ID Sidetone) 365
Muting the PTT ID Tone (PTT ID Mute (Analog)) 365
Disabling Repeated Sending of PTT ID (PTT ID Pause (Analog)) 366
Output of the Received FleetSync ID from the Communication Port (Unit ID Serial Output) 366
12.4 Making a Selective Call 367
Initiating a Selective Call 368
Initiating a Paging Call 368
Receiving a Selective Call 369
ID List 369
Group ID 370
Selective Call Alert LED 370
LED (Individual/ Group Call) 370
LED (Other Selective Calls) 371
Restricting IDs that Support Talkback (Unit ID Encode Block) 371
Auto Reset Timer 371
12.5 Sending and Receiving a Status Message (Status Call) 372
Sending a Status Message 372
Receiving a Status Message 372
Power-on Status Message 374
Power-off Status Message 374
Status List 374
Target Fleet/ ID 375
Emergency Status Response 375
AUX Input Status Message (Mobile Only) 376
AUX Output Status Message (Mobile Only) 376
12.6 Data Communication Feature 377
GTC Count 377
Number of Retries 377
Transmit Busy Wait Time 378
Maximum ACK Wait Time 378
ACK Delay Time 378
Transmit Delay Time (Receive Capture) 379
Data Transmit Modulation Delay Time 379
Random Access (Contention) 380
Status Message on Data Zone-Channel 380
12.7 Sending GPS Data 381
Transmission Method of GPS Data 381
The ID of the Target Transceiver (Base Fleet/ Base ID) 381
Sending GPS Data Automatically at Certain Intervals (GPS Report Mode) 382
Sending GPS Data According to the Request from the Base Station (GPS Report Mode) 382
Sending GPS Data Manually by Using a Key (Send the GPS Data) 383
Sending GPS Data Together With Operation of the PTT Switch (GPS Combination) 383
Sending GPS Data Together With Status Call (GPS Combination) 384
Sending GPS Data Together With Emergency Call (GPS Combination) 384
Sending GPS Data Based On Travel Distance (GPS Distance Change) 385
GPS Functions 385
12.8 Receiving GPS Data 386
Map Header 386
12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) 387
12.10 Notifying Status Changes of the Transceiver by Sending PC Commands (J Command Serial Output) 387

13 GPS 388

13.1 GPS Functions 388
Number of Times 388
GPS Report Interval Time 389
GPS Time Mark 389
GPS Message Type 390
GPS Report on Data Zone-Channel 390
GPS Report Back to Requested ID 390
13.2 GPS Position Display 391
Configuring the GPS Position Display 391
Location Information Display 393

14 COMMUNICATIONS IN AN EMERGENCY.....394

14.1 Placing the transceiver in Emergency Mode.....394
- Interrupt Emergency CALL (DMR Conventional System Only).....396
- Emergency Alarm (DMR Conventional System Only).....396
- Manual Emergency Reset.....397
- Suspended Power-off.....397

14.2 Zone-channel Used for Emergency Mode.....398
- Emergency Channel Type.....398
- Emergency Zone-Channel.....400

14.3 Automatically Transmitting and Receiving in Emergency Mode.....401
- Emergency Cycle.....401
- Duration of Locator Tone 1.....402
- Duration of Locator Tone 2.....402
- Transmit Duration.....403
- Receive Duration.....403
- Emergency Mic Sense.....404
- Background Transmission.....404

14.4 Indication and Sound in Emergency Mode.....405
- Locator Tone.....405
- Emergency Display.....405
- Emergency Text.....405
- Emergency Mode Type.....406
- Emergency LED.....406

14.5 ID Sent when Emergency Mode Is Activated.....407
- Emergency ID.....407
- Emergency DMR ID Type.....408
- Emergency DMR ID.....408
- Emergency DTMF ID.....409
- Emergency Call Fleet.....409
- Emergency Call ID.....410
- Emergency 5-tone.....410
- Emergency Status.....410

14.6 5-tone Encode Format Executed When Emergency Mode Is Activated (Emergency Encode Format) (Analog System Only).....411

14.7 Placing the Transceiver in Emergency Mode Using Lone Worker.....412
- Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode.....412
- Functions in Lone Worker Mode.....414

14.8 Placing the Transceiver in Emergency Mode Using Activity Detection.....417
- Man-down Detection.....418
- Stationary Detection.....419
- Motion Detection.....419

15 COMMUNICATION SECURITY 420

15.1 Built-in Voice Scrambler (Analog)..... 420
- Enabling Voice Scrambler.....420
- Toggling the Voice Scrambler between Enabled and Disabled.....421
- Configuring Scrambler Code.....422
- Scrambler Status Memory.....423

15.2 Scrambler (DMR Digital)..... 423
- Toggling the Scrambler between Enabled and Disabled.....424
- Configuring the Encryption Key Data Used for Communications.....426
- Transceiver's Behavior upon Receipt of the Encrypted Audio Data.....427
- Multi-key List.....428
- Scrambler Status Memory.....428

16 FUNCTIONS RELEVANT TO COMMUNICATING WITH EXTERNAL DEVICES 429

16.1 Prioritizing Data Communications Using an External Device (Data Override)..... 429

16.2 Notifying Status Changes of the Transceiver by Sending PC Commands (J Command Serial Output)..... 430

17 SCAN..... 431

17.1 Starting the Scan..... 431

17.2 Scanning in One Zone (Single Scan)..... 431

17.3 Scanning All Target Zones for Scanning (Multi Scan)..... 433

17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan)..... 434
- Configuring the Priority Channel.....435
- Lookback.....436
- Priority-channel Stop Tone.....436

17.5 Transceiver Behavior during the Scan..... 437
- Conditions to Activate the Scan.....437
- Conditions to Resume the Scan.....437
- Transceiver Behavior in the Case that the Scan Cannot Be Resumed.....438
- Transceiver Behavior in the Case That a Zone Channel Is Changed during the Scan.....438
- Transceiver Behavior in the Case That a Zone Channel Is Changed Manually while the Scan Pauses to Receive.....438
- Reception during the Scan.....439

Conditions to Pause the Scan (Scan Configuration) (5-tone System Only) 439
17.6 Common Functions for Scan 440
Adding or Deleting a Channel to/from the Target Channels for Scanning (Scan Delete/Add) 440
Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add) 442
Revert Channel 443
Dropout Delay Time 444
Dwell Time 444
Revert Channel Display 444
Power-on Scan 445
Selected Channel Scan 445
Scan Stop Tone 445
Starting Scanning in Tandem with the Microphone (Off-hook Scan) 446

18 VOX 447

18.1 Enabling VOX 447
18.2 Configuring the Microphone Input Sensitivity Level (VOX Gain Level) 448
18.3 Maintaining the Transmission State after VOX Transmission (VOX Delay Time) 449
18.4 Disabling VOX Transmission during Voice Output (Transmit Inhibit while Receiving) 449
18.5 Canceling VOX Using PTT Switch (Cancel Operation) 450
18.6 Notifying the Start of VOX Transmission with a Tone (VOX Proceed Tone) 450

19 FUNCTION PORT 451

19.1 Functions Assignable to the AUX Input Port 451
Data Dwell Time 453
Emergency Delay Time 453
19.2 Functions Assignable to the AUX Output Port 454
Status Memory (AUX Output Status Message) 454
19.3 Switching the Zone-Channel Using a Connected External Device (Remote Zone-Channel) 455

20 VEHICLE-INTERLINKED FEATURES 456

20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) 456
How to Use the Ignition Sense Port 456
Time Interval before Transceiver Powers Off (Timed Power-off) 457
20.2 Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert) 458
Conditions for Activating Horn Alert 459
Horn Alert Logic Signal 459
Activating Horn Alert According to the Mic Hook Status (Off-hook Horn Alert) 460
Horn Alert Status when Power is On (Horn Alert Mode) 460

21 TRANSCEIVER DATA PROTECTION WITH PASSWORD 461

21.1 Password for Transceiver Operation (Transceiver Password) 461
Operating TK-Dx00 with LCD 461
Operating TK-Dx40 463
21.2 Password for Reading Configuration Data in a PC (Read Authorization Password) 465
21.3 Password for Writing Configuration Data (Overwrite Password) 465

22 MODE 466

22.1 Testing the Transmit and Receive Capabilities of the Transceiver (Panel Test Mode) 466
22.2 Adjusting the Transmit and Receive Capabilities of the Transceiver (Panel Tuning Mode) 467
22.3 Overwriting the Firmware (Firmware Programming Mode) 468
22.4 Checking the Firmware Version (Firmware Version Information Mode) 469
22.5 Testing or Adjusting the Transmit and Receive Capabilities of the Transceiver (PC Test Mode/ PC Tuning Mode) 470

A APPENDIX 471

A.1 Available Functions for the PF Keys 471
A.2 Available Functions for Menu Mode 481
A.3 Available Functions for the Selector 482

A.4 Available Functions for COM Port 483
COM Port Functions 484
Serial Protocol Types.....484
A.5 Functions Not Available for TK-Dx00 without LCD.....485
A.6 Key Operations for Each Mode.....488

INDEX 502

Basic Configurations for Using the Transceiver

Configuring Various Functions for the Transceiver

Frequencies and signaling for transmission and reception, channel data including the transmit power, and other functions required for various communications such as an Individual Call or a Group Call can be configured by using KPG-166D.

2 GETTING STARTED
Page 11

Assigning Functions to the Keys on the Transceiver

Various functions can be assigned to the PF keys on the transceiver.

A.1 Available Functions for the PF Keys
Page 471

Writing the Configuration Data to the Transceiver

The data configured by using KPG-166D can be written to the transceiver. Writing the data configured by using KPG-166D to the transceiver allows the transceiver to work according to the configuration data.

2.2 Connecting the Transceiver to a PC
Page 12
2.3 Writing the Configuration Data to the Transceiver
Page 14

Reading the Configuration Data from the Transceiver

The configuration data in the transceiver can be read into KPG-166D. By reading the configuration data written in the transceiver into KPG-166D, the configuration data can be changed or written to another transceiver.

2.2 Connecting the Transceiver to a PC
Page 12
2.4 Reading the Configuration Data from the Transceiver
Page 15

Transmission/ Reception

Changing Transmit Power

The transmission power of the transceiver can be changed to high power or low power.

4.2 Transmission Power
Page 63

Changing the Input Sensitivity of the Microphone

The input sensitivity of the microphone can be changed.

Input Sensitivity of the Microphone (Mic Sense)
Page 38

Restricting the Duration of Continuous Transmission

Setting the available duration of continuous transmission prevents the transceiver from occupying the frequency.

Restricting the Duration of Continuous Transmission (Time-out Timer)
DMR Conventional Page 113
Analog Conventional Page 204

Viewing the Receive History

Various received messages and callers who made calls can be viewed.

3.8 Viewing the Receive History (Stack)
Page 39

Searching Automatically Whether the Transceiver Receives a Signal on Multiple Channels

The transceiver can search automatically whether the transceiver receives a signal on multiple channels.

17 SCAN
Page 431

Using Function Keys

Pressing a key to which a function is assigned can activate the assigned function or place the transceiver in various Function Modes.

3.3 Using Function Keys
Page 20

Executing a Function by Selecting the Function from the Menu

Selecting functions in Menu Mode activates various functions or places the transceiver in various Function Modes.

3.4 Using Menu Mode
Page 24

Transmitting Only the Audio Sound to the Microphone

The VOX feature can be used to transmit only the audio input to the microphone without having to press the **PTT** switch.

18 VOX
Page 447

Indication and Display

Lighting the LED While Transmitting and Receiving

The transceiver can light or blink the LED while the transceiver is transmitting or receiving.

5.1 Busy LED Page 67
5.2 Transmit LED Page 67

Displaying the Transceiver Received Signal Strength

The received signal strength of the transceiver can be displayed on the transceiver display.

5.8 Displaying the Signal Strength (Signal Strength Indicator) Page 77

Displaying a Bitmap Image When the Transceiver is Turned ON

A desired bitmap image can be displayed on the transceiver display when the transceiver is turned ON.

5.11 Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen) Page 81

Displaying the Remaining Battery Power Level

A user can be notified on the level of the remaining battery power on the LCD and by LED.

7.1 Displaying the Remaining Battery Power Level (Battery Indicator) Page 105

Sound

Tones Used for the Transceiver

Various tones sound from the transceiver according to the operation of the transceiver.

6.1 Tones that Sound When a User Operates the Transceiver or When the Transceiver Status Is Changed Page 82

Changing the Calling Alert Tone

Tones that sound from the transceiver when the transceiver receives a call using optional signaling or a status message can be changed to the desired tone.

6.2 Tones that Sound When the Transceiver Receives a Call Page 87

Functions for DMR Conventional System

Making an Individual Call

A user can call an individual transceiver and initiate voice communication.

8.5 Making an Individual Call
Page 122

Making a Group Call

A user can call a group of transceivers registered as a call group, and initiate two-way voice communication.

8.7 Making a Group Call
Page 139

Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications

A user can initiate an Individual Call after distinguishing that the receiving transceiver is available for communications.

8.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)
Page 133

Sending and Receiving a Status Message

A user can send and receive a simple message called a status.

8.10 Sending and Receiving a Status Message (Status Call)
Page 149

Sending and Receiving a Short Message

A user can send and receive a message with a maximum of 376 characters.

8.11 Sending and Receiving a Short Message (Short Data Call)
Page 163

Sending GPS Data

By using the built-in GPS receiver unit or the microphone with a GPS receiver unit, the transceiver can send its own location information to the base station.

8.15 Sending GPS Data Page 189
8.16 Receiving GPS Data Page 193

Avoiding Interference with Other Communications

If a channel to be used for the transceiver to transmit is being used by other parties, the transmission of the transceiver on the channel is automatically restricted.

Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))
Page 115

Functions for Analog Conventional System

Making an Individual Call Using 5-tone Signaling

The transceiver can make voice communications to an individual transceiver or a group using 5-tone signaling.

10.3 Making a Selective Call
Page 251

Sending and Receiving a Status Message Using 5-tone Signaling

A user can send and receive a simple message called a status using 5-tone signaling.

10.4 Sending and Receiving a Status Message (Status Call)
Page 271

Avoiding Interference with Other Communications

If a channel to be used for the transceiver to transmit is being used by other parties, the transmission of the transceiver on the channel is automatically restricted.

Avoiding Interference with Other Communications (Busy Channel Lockout (Analog))
Page 206

Making a Selective Call Using Signaling

A user can initiate a selective call using signaling such as DTMF, 2-tone, and FleetSync. Message communications including a status message are also available by using FleetSync.

9.5 Using DTMF to Initiate a Selective Call
Page 215
9.6 Using 2-tone to Initiate a Selective Call
Page 231
12 FLEETSYNC
Page 362

Security

Enhancing Communication Security (DMR Conventional System only)

The transceiver is equipped with a scrambler function to enhance secrecy in communications on a DMR digital channel.

15 COMMUNICATION SECURITY
Page 420

Using a Password to Protect the Transceiver

A user can set a password to the transceiver so that the transceiver cannot be used by others without the user's permission.

21.1 Password for Transceiver Operation (Transceiver Password)
Page 461

Using a Password to Protect the Configuration Data of the Transceiver

To prevent the configuration data of the transceiver from being altered without the user's permission, or to prevent the configuration data written in the transceiver from being diverted, a password can be set for the configuration data.

21.2 Password for Reading Configuration Data in a PC (Read Authorization Password)
Page 465
21.3 Password for Writing Configuration Data (Overwrite Password)
Page 465

Functions Available on In-vehicle Models (TK-Dx40 (Mobile) only)

Powering On/Off the Transceiver in Tandem with the Vehicle Ignition

By using the ignition-interlinked feature, the power of the transceiver can be turned ON or OFF automatically in tandem with the status of the ignition-interlinked port of the vehicle.

20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense)
Page 456

Lighting the Headlight or Sounding the Horn of the Vehicle when a Call is Received

The Horn Alert feature can be used to turn on the headlight or sound the horn of the vehicle connected to the transceiver when a call is received.

20.2 Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert)
Page 458

Other Convenient Functions

Locking the Transceiver Keys

By locking the transceiver keys, a user can avoid erroneous operation of the transceiver caused by physically contacting the transceiver while carrying it around the waist, etc.

3.10 Locking the Transceiver Keys (Key Lock)
Page 61

Reducing Battery Consumption

The power consumption of the transceiver can be reduced by setting the transceiver receiving intermittently.

7.4 Reducing Battery Consumption (Battery Saver)
Page 109

Displaying the Transceiver Location Information

By using the built-in GPS receiver unit or the microphone of a GPS receiver unit, the transceiver can display its own location information on the display of the transceiver.

13 GPS
Page 388

1.1 TK-D200/ TK-D200G/ TK-D300/ TK-D300G

- **TK-Dx00 with LCD**

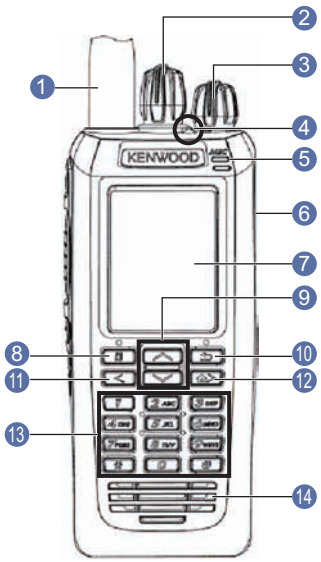


Figure 1-1 Front View of TK-Dx00 with LCD

1. **Antenna**

2. **Selector**
   The zone or channel can be changed.

3. **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.

4. **Transmit LED/ Busy LED**
   These LEDs light when the transceiver transmits or receives a signal.

5. **Microphone**
   Inputs audio sound.

6. **14-pin Universal Connector**
   External equipments such as a PC and an optional equipment can be connected to the 14-pin universal connector.

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

8. **[▢] (Menu) Key**
   The preassigned function will be activated or will be changed to the active state. The **[▢]** (Menu) key is described as the **Menu** (**[▢]**) key in this manual.
   The default of the **[▢]** (Menu) key is the Menu function. If the configuration is changed using KPG-166D, a newly configured function will be activated. Unless the Menu function is reassigned to the **[▢]** (Menu) key, Menu Mode cannot be activated even if the**[▢]** (Menu) key is pressed. Refer to A.6 Key Operations for Each Mode on page 488 for details on how the transceiver behaves when the **[▢]** (Menu) key is pressed in Menu Mode.

9. **[∧]/ [∨] (Up/ Down) Key**
   The zone or channel can be changed. The preassigned function will be activated or will be changed to the active state. The **[∧]** (Up) and **[∨]** (Down) keys are described as the **Up** and **Down** keys in this manual.

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

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

12. **[⌂>] (Right/Home) Key**
    The preassigned function will be activated or will be changed to the active state. The **[⌂>]** (Right/ Home) key is described as the **Right/ Home** key in this manual.

13. **Keypad**
    The transceiver can be operated by pressing a key.

14. **Speaker**
    The received audio and Alert Tone sound from the speaker.

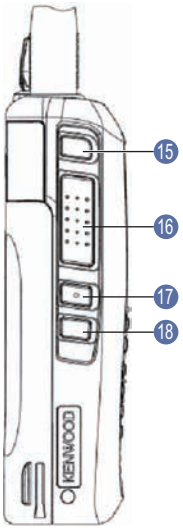


Figure 1-2 Side View of TK-Dx00 with LCD

⑮ **AUX Key**
The preassigned function will be activated or will be changed to the active state.

⑯ **PTT Switch**
Pressing the **PTT** switch allows a user to transmit.

⑰ **Side 1 Key**
The preassigned function will be activated or will be changed to the active state.

⑱ **Side 2 Key**
The preassigned function will be activated or will be changed to the active state.

● TK-Dx00 without LCD

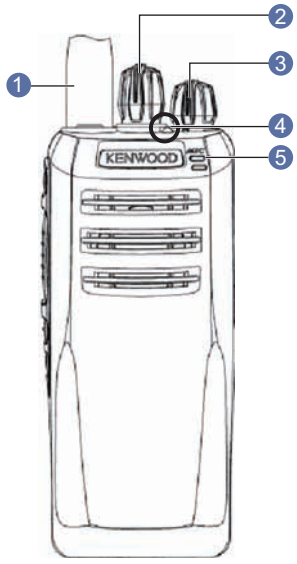


Figure 1-3 Front View of TK-Dx00 without LCD

1 Antenna

2 Selector
The zone or channel can be changed.

3 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.

4 Transmit LED/ Busy LED
These LEDs light when the transceiver transmits or receives a signal.

5 Microphone
Inputs audio sound.

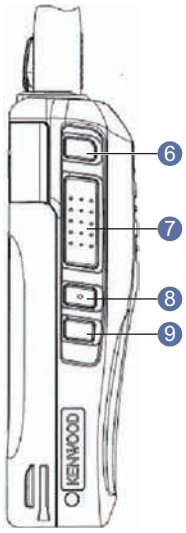


Figure 1-4 Side View of TK-Dx00 without LCD

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

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

8 Side 1 Key
The preassigned function will be activated or will be changed to the active state.

9 Side 2 Key
The preassigned function will be activated or will be changed to the active state.

1.2 TK-D240/ TK-D340

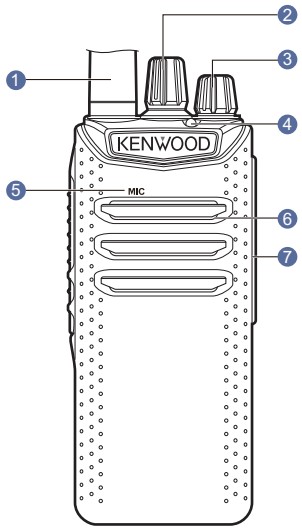


Figure 1-5 Front View of TK-D240/ TK-D340

1 Antenna

2 Selector
Changes the channel.

3 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.

4 Transmit LED/ Busy LED
These LEDs light when the transceiver transmits or receives a signal. Blinks in orange or blue color when the transceiver receives a call.

5 Microphone
Inputs audio sound.

6 Speaker
Outputs received audio sound or tones.

7 2.5/ 3.5D Connector
External devices such as PC and an optional device can be connected to the 2.5/ 3.5D connector.

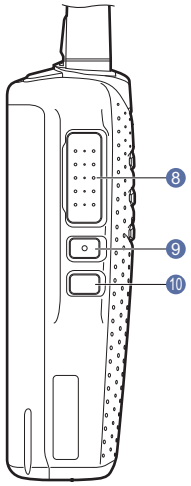


Figure 1-6 Side View of TK-D240/ TK-D340

8 PTT Switch
Press the **PTT** switch to transmit.

9 Side 1 Key
The preassigned function will be activated or will be changed to the active state.

10 Side 2 Key
The preassigned function will be activated or will be changed to the active state.

1.3 TK-D740/ TK-D840

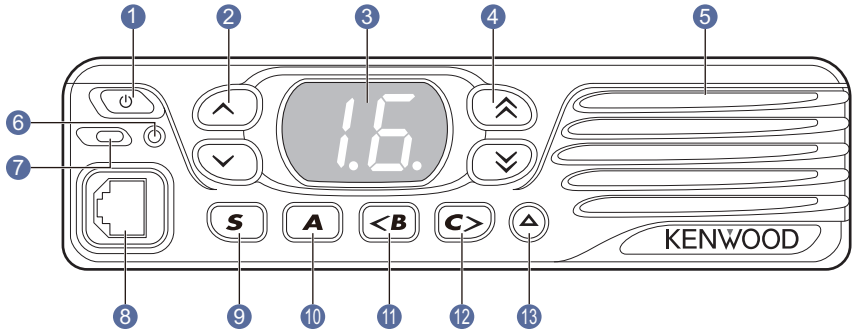


Figure 1-7 Front View of TK-D740/ TK-D840 (Front Panel)

1. **[⏻] (Power) Switch**
   Powers on when the switch is pressed once, and powers off when it is pressed again. **Power** switch is used to represent this **[⏻]** (Power) switch in the text of this manual.

2. **[∧]/ [∨] (Left Up/ Left Down) Key**
   The preassigned function will be activated or will be changed to the active state. “Volume Up” and “Volume Down” are assigned as the default values of these keys, which can be used to adjust the volume of the speaker. **Left Up** key and **Left Down** key are used to represent the **[∧]** (Left Up) and **[∨]** (Left Down) keys respectively in the text of this manual.

3. **LED Display**
   Indicates the channel number and status of the transceiver using the dot LED and 7-segment LED of the 2-digit display.

4. **[⩓]/ [⩔] (Right Up/ Right Down) Key**
   The preassigned function will be activated or will be changed to the active state. “Zone Up” and “Zone Down” are assigned as the default values of these keys, which can be used to alter the zone. **Right Up** key and **Right Down** key are used to represent the **[⩓]** (Right Up) and **[⩔]** (Right Down) keys respectively in the text of this manual.

5. **Speaker**
   The received audio and Alert Tone sound from the speaker.

6. **LED (Blue)**
   Lights up in blue when functions such as Talk Around and Horn Alert are enabled. (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

7. **Transmit LED/ Busy LED**
   These LEDs light when the transceiver transmits or receives a signal. Blinks in orange when the transceiver receives a call.

8. **Microphone Connector**
   For connecting a microphone.

9. **[S] Key**
   The preassigned function will be activated or will be changed to the active state.

10. **[A] Key**
    The preassigned function will be activated or will be changed to the active state.

11. **[<B] Key**
    The preassigned function will be activated or will be changed to the active state.

12. **[C>] Key**
    The preassigned function will be activated or will be changed to the active state.

13. **[△] (Triangle) Key**
    The preassigned function will be activated or will be changed to the active state. **Triangle** key is used to represent this **[△]** (Triangle) key in the text of this manual.

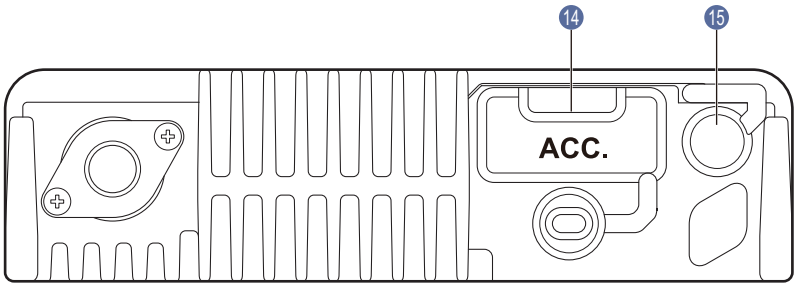


Figure 1-8 Rear View of TK-D740/ TK-D840 (Rear Panel)

14 D-sub 15-pin Connector

You can connect a PC or an external device to the D-sub 15-pin connector via cables such as KCT-60.

15 3.5D Jack Connector

You can connect an external speaker to the 3.5D jack connector. You can connect an external speaker such as KES-3 to the 3.5D jack connector. When you do so, output from the speaker inside the front panel switches to the external speaker connected to the 3.5D jack connector. In the descriptions of this manual, the external speaker connected to the 3.5D jack connector is regarded as a built-in speaker.

1.4 About LCD

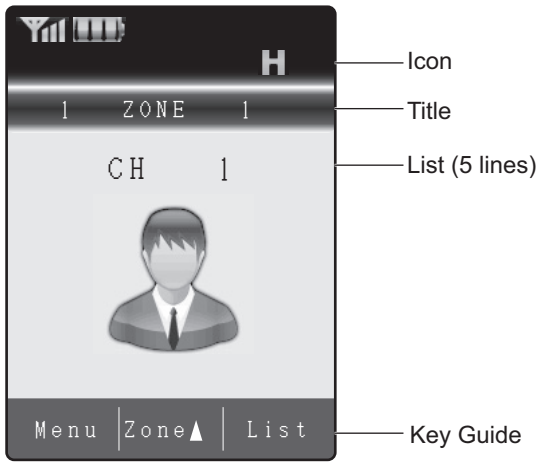
Compatible model: TK-Dx00 with LCD

LCD

The LCD of the transceiver is as follows. The contents that appear on the LCD varies depending on the transceiver's status.

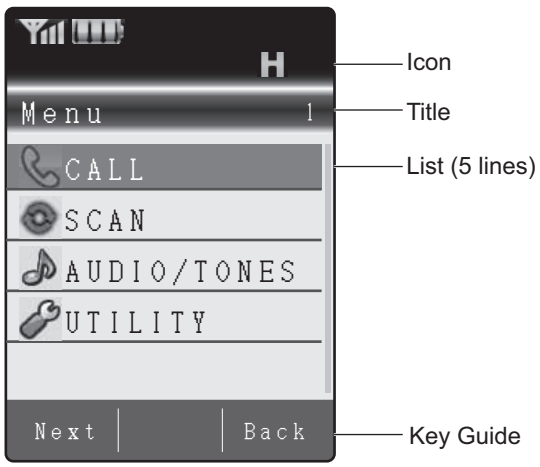
- **Basic Frame**

  This display is used while the transceiver is in the standby state.



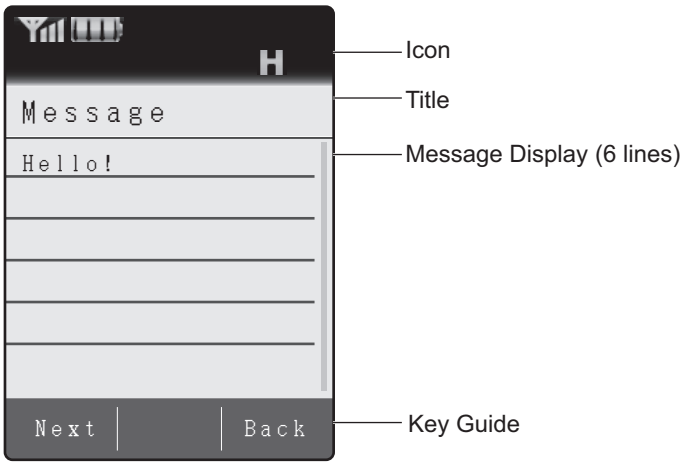
- **Function Mode Frame**

  This display is used while the transceiver is in Function Mode, such as Menu Mode and Stack Mode.



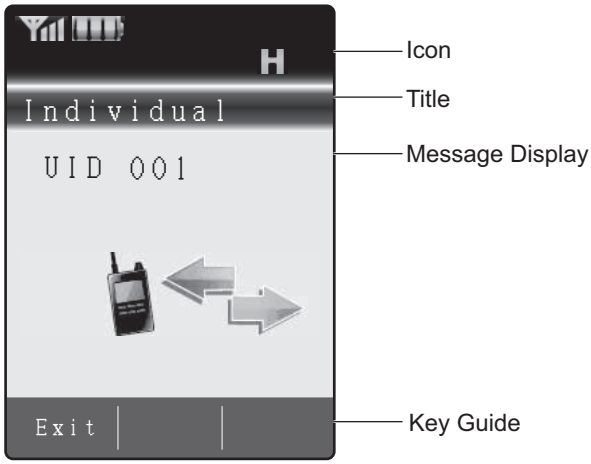
- **Message Frame**

  This display is used to indicate a short message.



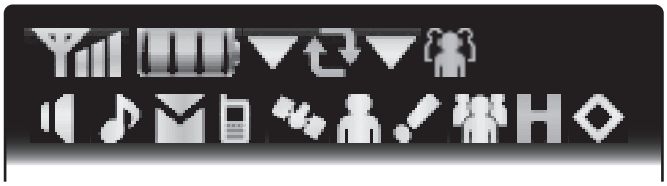
- **Communication Frame**

  This display is used while the transceiver is transmitting and receiving various types of calls.



Icons

Various icons indicating the transceiver's status appear in the icon display area. Refer to 5.7 The Icons on the LCD on page 75 for details of each icon.

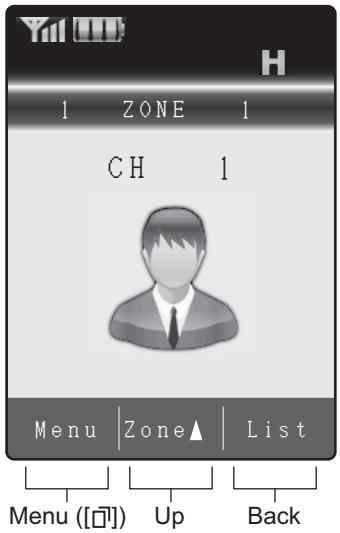


Key Guide

The function that will be activated by pressing the **Menu** (**[□]**), **Up**, or **Back** key is indicated on the lowest part of the LCD. The text that appears on the display varies depending on the transceiver's status.

- **PF Key**

  Functions assigned to each key appear while the transceiver is in the standby state. (Refer to A.1 Available Functions for the PF Keys on page 471.)



- **Function Mode**

  Functions that can be used in each mode appear while the transceiver is in Function Mode, such as Menu Mode and Stack Mode. However, the key guide for the **Up** key does not appear if the function which is used to select the list or code is assigned to the **Up** or **Down** key.

The following are key guides that appear while the transceiver is in Function Mode:

Table 1-1 Key Guide (Function Mode)

Key Guide	Description
OK	Confirms the data of the entered characters, code, or list.
Select	Confirms the data of the selected characters, code, or list.
Delete	Deletes the data of the selected characters, code, or list.
Confrm	Authenticates the entered password.
Exit	Aborts the Function Mode.
Next	Proceeds to the next step.
Back	Goes back to the previous step.

Note

- Key Guide for the **PF** keys always appears whether a function can be activated or not. The key guide which appears while the transceiver is in Function Mode is only for the functions that can be activated.
- Key Guide for a function assigned to and activated by pressing and holding a **PF** key appears only if no function is assigned to the same key.

  Example 1)“K_LOCK” appears as Key Guide in the following case: Function = None, Hold = Key Lock

  Example 2)“LIGHT” appears as Key Guide in the following case: Function = Backlight, Hold = Key Lock

When the transceiver is turned ON after the power source is attached to the transceiver, the transceiver starts up. To make the transceiver ready for use, the configuration data needs to be created using KPG-166D and written to the transceiver.

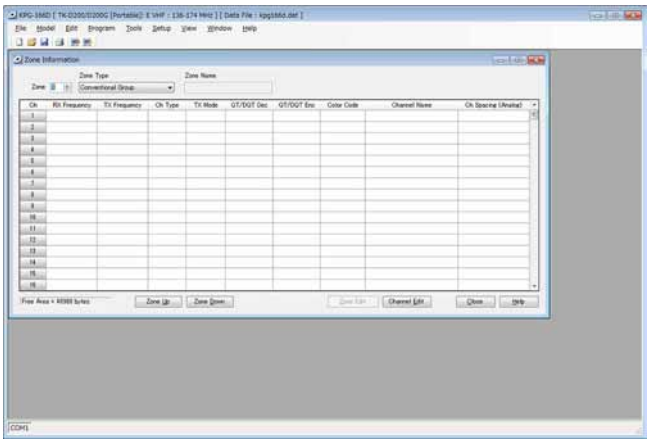
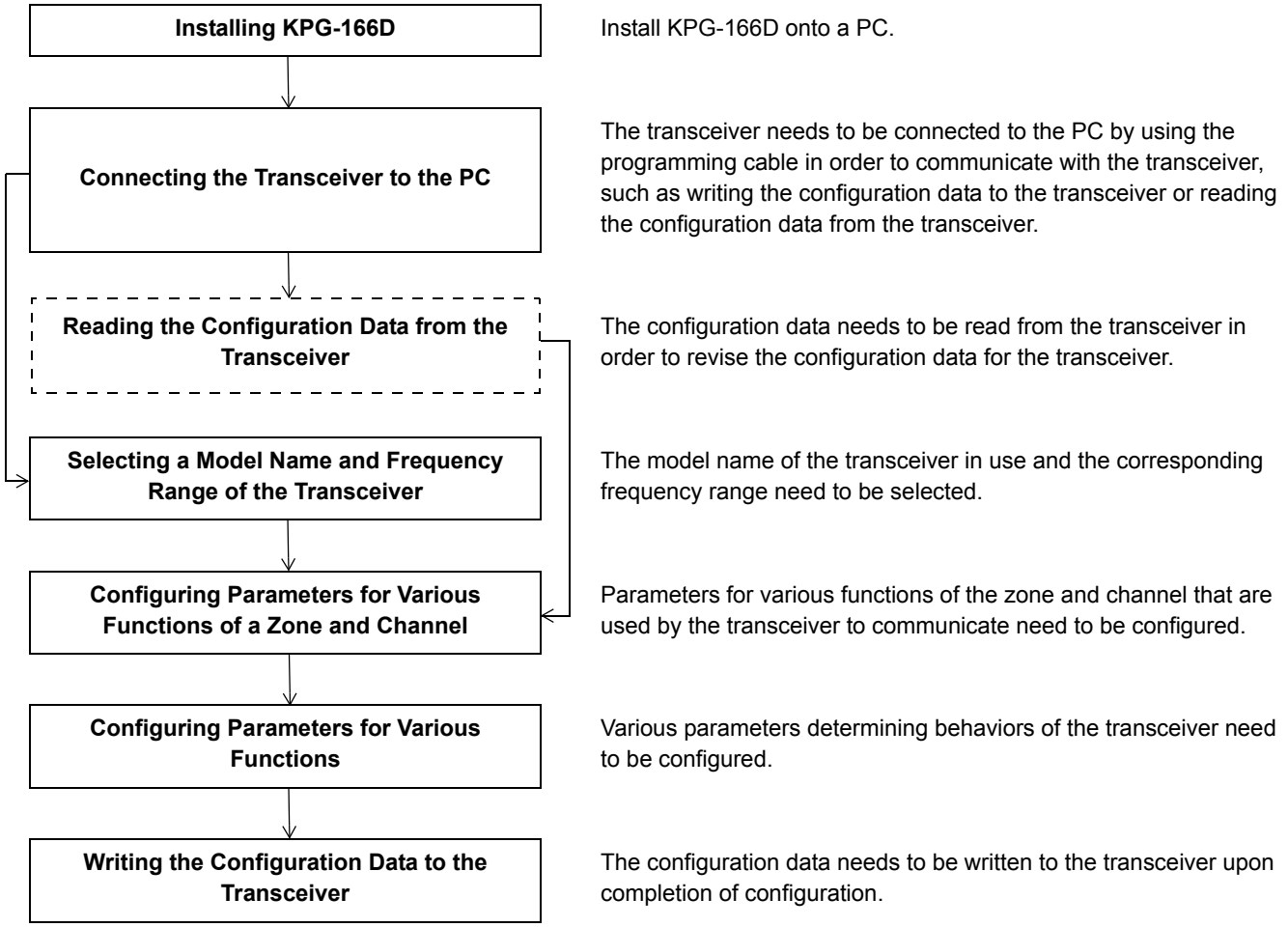


Figure 2-1 KPG-166D Main Window

By using KPG-166D, the zone and channel data needs to be configured and then the parameters for various functions can be configured. Refer to the help texts attached to KPG-166D for configuration methods.

2.1 Basic Workflows

The following is the basic workflow for configuring the transceiver by using KPG-166D:

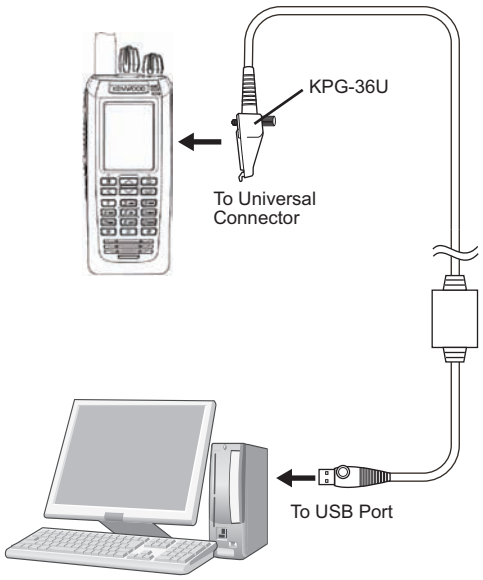


2.2 Connecting the Transceiver to a PC

To write the configuration data to or read the configuration data from the transceiver, it is necessary to connect the transceiver and a PC with KPG-166D installed using a programming cable.

TK-Dx00

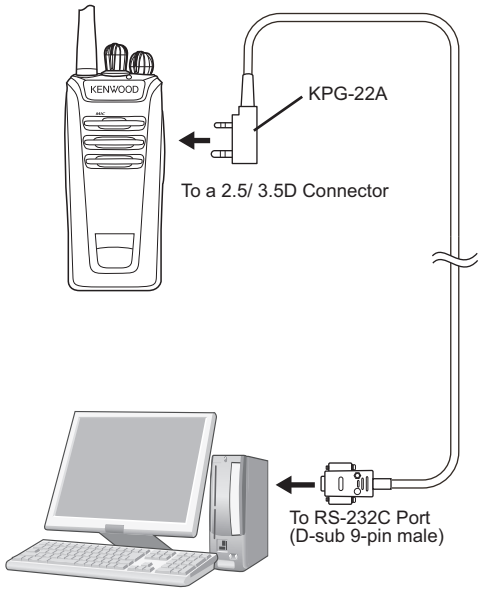
For connecting the transceiver to a PC via the KPG-36U programming cable.
Refer to the diagram below.



TK-Dx40 (Portable)

For connecting the transceiver to a PC via the KPG-22A or KPG-22U programming cable.
Refer to the diagram below.

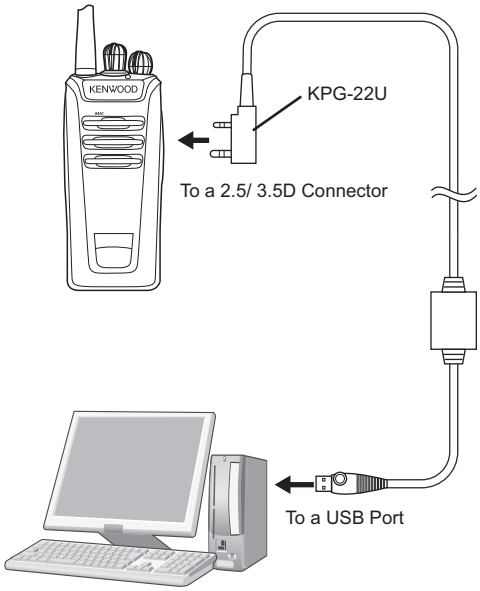
- **When using KPG-22A**



Note

When a RS-232C communication port is not available on the PC, connect KPG-22A after converting the USB port of the PC to DB 9-pin with KCT-53U.

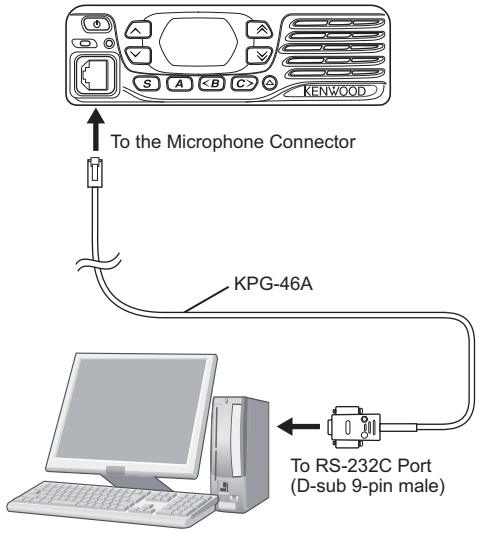
● **When using KPG-22U**



TK-Dx40 (Mobile)

For connecting the transceiver to a PC via the KPG-46A or KPG-46U programming cable.
Refer to the diagram below.

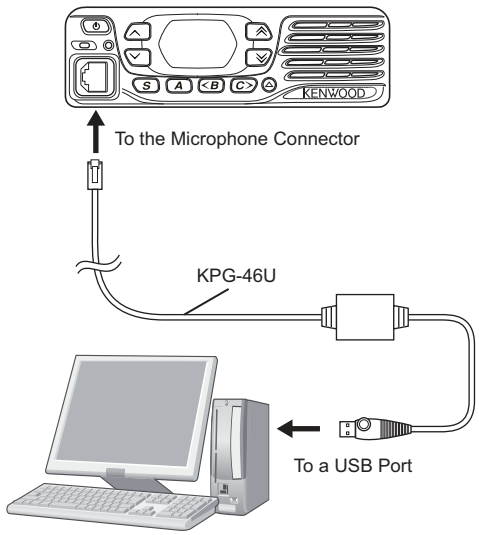
● **When using KPG-46A**



Note

When a RS-232C communication port is not available on the PC, connect KPG-46A after converting the USB port of the PC to DB 9-pin with KCT-53U.

● **When using KPG-46U**



2.3 Writing the Configuration Data to the Transceiver

Selecting “Write Data to the Transceiver” from the **Program** pulldown menu in the main window of KPG-166D opens the **Write Data to the Transceiver** dialog box. Clicking the “Write” button starts writing the configuration data to the transceiver.

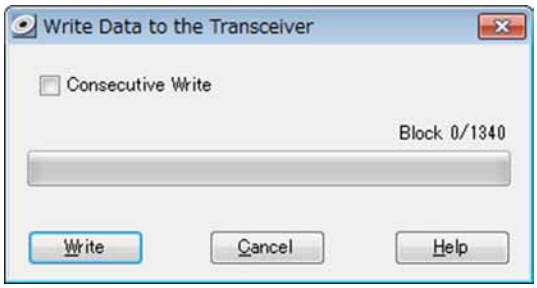


Figure 2-2 Write Data to the Transceiver Dialog Box

Configuration using KPG-166D

Writing the configuration data to the transceiver (See Program > Write Data to the Transceiver)

2.4 Reading the Configuration Data from the Transceiver

To change the data configured in the transceiver, read the configuration data from the transceiver to KPG-166D, and then write the configuration data to the transceiver after the configuration data has been changed.

Selecting “Read Data from the Transceiver” from the **Program** pulldown menu in the main window of KPG-166D opens the **Read Data from the Transceiver** dialog box. Clicking the “Read” button starts reading the configuration data from the transceiver.

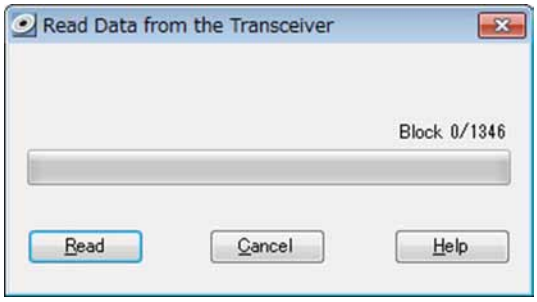


Figure 2-3 Read Data from the Transceiver Dialog Box

Configuration using KPG-166D

Reading the configuration data from the transceiver (See Program > Read Data from the Transceiver)

2.5 Embedding a Message in the Transceiver (Embedded Message)

The message can be written to the transceiver by using KPG-166D.

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-166D. 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-166D.

Configuration using KPG-166D

Configuring the Embedded Message (See Edit > Embedded Message)

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-166D. 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-166D.

Configuration using KPG-166D

Configuring the Embedded Message with Password (See Edit > Embedded Message with Password)

3.1 Turning the Transceiver ON/ OFF

Turning the Transceiver ON

Rotating the **Power** switch clockwise causes the transceiver to be turned ON.

TK-Dx00 without LCD

1 Turn the Transceiver ON.

A Power-on Tone A sounds from the transceiver. 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.

TK-Dx00 with LCD

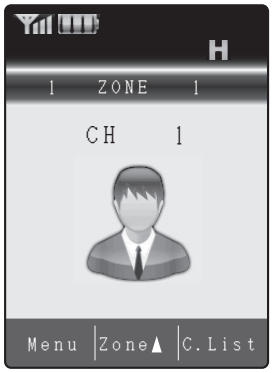
- **If the data is written to the transceiver and the password is not configured**

1 Turn the Transceiver ON.

The Power-on Tone A sounds from the transceiver and all segments on the LCD light for 500 ms. If Custom Start-up Screen is configured, the Power-on Tone A sounds from the transceiver when the transceiver is turned ON and the bitmapped image configured for the transceiver appears for 2 sec. (Refer to 5.11 Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen) on page 81.)

Power-on Text appears for 2 sec if the Power-on Text is configured. (Refer to Power-on Text on page 79.)

User Mode is activated.



● If the data is written to the transceiver and the transceiver's password is configured

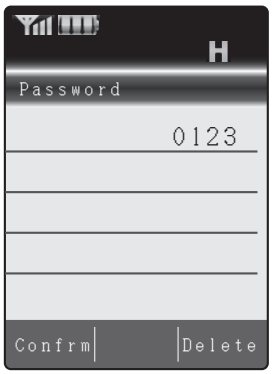
1 Turn the Transceiver ON.

The Power-on Tone A sounds from the transceiver and all segments on the LCD light for 500 ms.
If Custom Start-up Screen is configured, the Power-on Tone A sounds from the transceiver when the transceiver is turned ON and the bitmapped image configured for the transceiver appears for 2 sec. (Refer to 5.11 Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen) on page 81.)

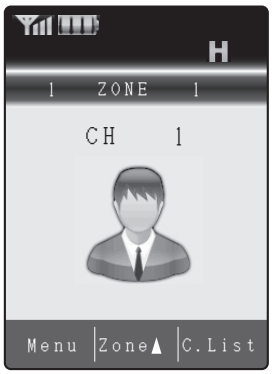
"PASSWORD" appears on the display. (Refer to 21.1 Password for Transceiver Operation (Transceiver Password) on page 461.)

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 sec if the Power-on Text is configured. (Refer to Power-on Text on page 79.)



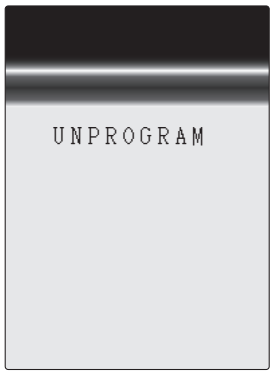
User Mode is activated.



● If the data is not written to the transceiver

1 Turn the Transceiver ON.

"UNPROGRAM" appears on the display.



Note

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

TK-Dx40

- **Portable**

  Turning the **Power** switch clockwise turns ON the power of the transceiver after outputting a Power-on Tone from the transceiver.

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

  - If a password is configured for the transceiver, the LED lights blue when the transceiver is turned ON, and then the transceiver enters the password entry mode. A Password Authorization Tone sounds from the transceiver and User Mode is activated after the correct password has been entered, and then the password protection of the transceiver will be disabled. (Refer to 21.1 Password for Transceiver Operation (Transceiver Password) on page 461.)

- **Mobile**

  Pressing and holding down the **Power** switch turns ON the power of the transceiver. You can also power on the transceiver according to the status of the vehicle's Ignition Sense port. (Refer to 20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) on page 456.)

  - If a password is configured for the transceiver, “PS” appears when the transceiver is turned ON, the LED lights blue, and then the transceiver enters the password entry mode. A Password Authorization Tone sounds from the transceiver and User Mode is activated after the correct password has been entered, and then the password protection of the transceiver will be disabled. (Refer to 21.1 Password for Transceiver Operation (Transceiver Password) on page 461.)
  - When the power of the transceiver is ON and no data is written to it, “--” is shown in the LED display.

Turning the Transceiver OFF

Portable

Rotate the **Power** switch counterclockwise until it clicks to turn the transceiver OFF.

TK-Dx40 (Mobile)

Pressing the **Power** switch when the power of the transceiver is on turns OFF the power of the transceiver. You can also turn OFF the power of the transceiver according to whether the engine of the vehicle is started or stopped. (Refer to 20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) on page 456.)

3.2 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.

TK-Dx40 (Mobile)

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

If “Volume Up (Continuous)” or “Volume Down (Continuous)” is assigned to the **Volume Up** or **Volume Down** key, pressing and holding down the **Volume Up** or **Volume Down** key increases or reduces the volume continuously at an interval of 100 ms.

3.3 Using Function Keys

The following functions can be assigned to each key of the transceiver using KPG-166D. Pressing a key to which a function is assigned can activate the assigned function or place the transceiver in various Function Modes. (Refer to A.1 Available Functions for the PF Keys on page 471.)

The following are the configuration examples for each key of the transceiver:

Table 3-1 Configuration Examples for Keys

Key	Function	2nd Function	Hold	Hold Delay
Back	Home Channel	None	Home Channel Select	3.0
Left	Key Lock	Menu	None	1.0
Right/Home	Function	None	None	1.0

A function can be assigned to Function, 2nd Function and Hold of each key on the transceiver.

- **Function**

  The function is activated by pressing a key.

  In the configuration example above, pressing the **Home Channel**, **Key Lock**, or **Function** key activates the corresponding function.

  If the **Function** key is pressed, the transceiver waits for a function assigned to 2nd Function to be activated.

- **2nd Function**

  The function is activated by pressing a key to which the function is assigned to 2nd Function after the **Function** key is pressed.

  In the configuration example above, pressing the **Menu** key after the **Function** key is pressed activates the function.

- **Hold**

  The function is activated by pressing and holding a key for the length of time configured for Hold Delay.

  In the configuration example above, pressing and holding the **Home Channel Select** key for 3 sec activates the function.

Configuration using KPG-166D

Assigning functions to the PF keys (

Edit > Key Assignment)

Mode Reset Timer

Mode Reset Timer is the timer for canceling the standby status for further key entry in Function Mode or the 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 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 a function configured for 2nd Function to be activated, 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 function to be activated. Mode Reset Timer can be extended by key operation.

Mode Reset Timer is used for the following Function Modes:

Table 3-2 Objective Function Modes for Mode Reset Timer

Channel Entry Mode
Contact List Mode
GPS Position Display Mode
Group Call Mode
Individual Call Mode
Lone Worker Mode
Maintenance Display Mode
Message Mode
My ID Mode
Scrambler Code Mode
Selcall Mode
Send the GPS Mode
Squelch Level Mode
Stack Mode
Status Mode
Short Data Message Mode
Transceiver Password Mode
VOX Gain Level Mode

Note

In the case of TK-Dx00 without LCD and TK-Dx40 (Portable), Mode Reset Timer is fixed at “Off”.

Configuration using KPG-166D

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

Keypad Operation

Compatible model: TK-Dx00 with LCD/ TK-Dx40 (Mobile)

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

Functions can be assigned to the keypad by using KPG-166D. The following are the functions that can be assigned:

TK-Dx00 with LCD

Table 3-3 Functions Assigned via Keypad Operation (TK-Dx00 with LCD)

Configuration	Description
None	If a function for a **PF** key is assigned to the keypad, pressing a key on the keypad activate the function of the **PF** key. If no function for a **PF** key is assigned to the keypad, pressing a key on the keypad 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 Changing the Channel by Specifying the Number (Channel Entry) on page 34.)
Status	**DMR:** Pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Status Mode in DMR. In Status Mode, a status can be sent by selecting a status configured in the DMR Status List or directly entering a status. (Refer to 8.10 Sending and Receiving a Status Message (Status Call) on page 149.) **5-tone:** Pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Status Mode in 5-tone. In Status Mode, the Status code can be changed by selecting a Status code configured in the 5-tone Status List or directly entering a Status code. (Refer to Changing the Status Code on page 273.)
Selcall	Pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Selcall Mode in 5-tone. In Selcall Mode, the Selcall code can be changed by selecting a Selcall code configured in the Selcall List or directly entering a Selcall code. (Refer to Changing the Selcall Code on page 254.)
Selcall + Status	Pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Selcall Mode in 5-tone. In Selcall Mode, the Selcall code can be changed by selecting a Selcall code configured in the Selcall List or directly entering a Selcall code. Then, pressing and holding the **Menu** (**[⧉]**) or **[*]** key while the transceiver is in Selcall Mode allows the transceiver to enter Status Mode in 5-tone. In Status Mode, the Status code can be changed by selecting a Status code configured in the Status List or directly entering a Status code. (Refer to Changing the Selcall Code on page 254, Changing the Status Code on page 273.)
Free-dial Entry	Pressing the **[0]** to **[9]** keys on the keypad enters Free-dial Entry Mode. Free-dial Entry Mode, a 5-tone code can be sent by a user directly entering a 5-tone code.

Note

To directly enter a status in a DMR Conventional system, Manual Dialing must be enabled using KPG-166D. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)

TK-Dx40 (Mobile)

Table 3-4 Functions Assigned via Keypad Operation (TK-Dx40 (Mobile))

Configuration	Description
None	If a function for a **PF** key is assigned to the keypad, pressing a key on the keypad activate the function of the **PF** key. If no function for a **PF** key is assigned to the keypad, pressing a key on the keypad causes the Key-entry Error Tone to sound, but it has no effect to the transceiver.
Keypad Auto PTT	Every time a key on the microphone keypad is pressed, the DTMF code is directly sent. (Refer to 9.5 Using DTMF to Initiate a Selective Call on page 215.)

Configuration using KPG-166D

- Configuring the Keypad Operation (TK-Dx00 with LCD) (See Edit > Key Assignment > General)
- Configuring the Keypad Operation (TK-Dx40 (Mobile)) (See Edit > Key Assignment > Mic Key)

Manual Dialing (DMR Conventional System Only)

Compatible model: TK-Dx00 with LCD

Manual Dialing is the function to enter an ID, ID name, or status number in each Function Mode.

If Manual Dialing is enabled, an ID, ID name, or status number can be entered using the keypad or the **UP** or **Down** key in each Function Mode. (Refer to Entering or Deleting a Code on page 49, Entering or Deleting Characters on page 55.)

Configuration using KPG-166D

Configuring the Manual Dialing to be enabled or disabled (See Edit > DMR > General)

3.4 Using Menu Mode

Compatible model: TK-Dx00 with LCD

Menu Mode allows a user to select a function in the menu format and activate the function.

Since a maximum of 64 functions can be configured for a maximum of 8 categories, many functions can be used in Menu Mode.

Operating the Transceiver

The following procedure is an example of the user operation in Menu Mode:

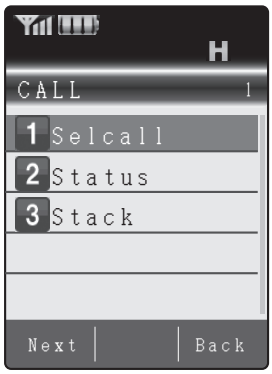
1 **Press the Menu key.**

The transceiver enters Menu Mode and then the Category List appears.

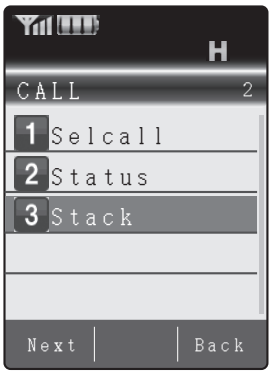
2 **Select the category from the Category List by pressing the Up or Down key.**

3 **Press the Menu ([▯]) or [*] key.**

The Function List for the selected category appears.



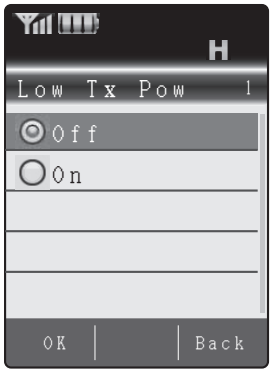
4 **Select the function to be activated from the Function List by pressing the Up or Down key.**



5 **Press the Menu ([ ]) or [*] key.**

The selected function is activated.

Options for a function, such as “ON” and “OFF”, can be selected by pressing the **Up** or **Down** key and then can be confirmed by pressing the **Menu** (**[ ]**) or **[*]** key.



Note

- Category List does not appear in Menu Mode only if configuring one Category. The Function List appears when the transceiver enters Menu Mode.
- The icon appearing on the left side of each category can be configured using KPG-166D.
- Refer to A.6 Key Operations for Each Mode on page 488 for operations of each key in Menu Mode.

Configuration using KPG-166D

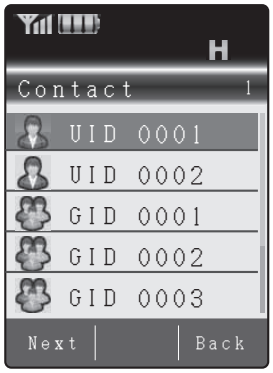
Configuring the Menu Mode (See Edit > Key Assignment > Menu)

3.5 Using the Contact List (DMR Conventional System Only)

Compatible model: TK-Dx00 with LCD

Contact List is the function like a phone book that allows the multiple contacts to be stored in the transceiver. The Unit ID or Group ID of the target transceiver can be selected from the preconfigured list. A maximum of 200 Unit IDs and Group IDs in total can be configured in the Contact List.

To use the Contact List, the transceiver needs to be placed in Contact List Mode. Pressing the **Contact List** key can place the transceiver in Contact List Mode. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then selecting the “Contact List” can place the transceiver in Contact List Mode.



Contact List can be configured by using KPG-166D.

Table 3-5 Contact List

Configuration	Description
ID Type	The type of ID (Individual or Group) can be configured.
ID	A Unit ID can be configured in the range between 1 and 16776415.
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 Contact List, the ID Name is displayed when the transceiver receives a call.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. The ID for which Transmit Inhibit is enabled does not appear on the ID selection display in Contact List Mode, and a user cannot select the ID in Contact List Mode. If the transceiver receives a call from an ID for which Transmit Inhibit is enabled, the caller’s ID Name appears on the display. In this case, a user cannot initiate a call to the caller even if the user attempts to respond by pressing the **PTT** switch.

In Contact List Mode, the following operations are available:

- **Viewing the configuration for each ID**
  → Viewing the Configuration for Each ID on page 27
- **Transmitting with the Unit ID specified**
  → 8.5 Making an Individual Call on page 122
  → 8.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) on page 133
- **Adding or deleting the target Unit ID to/from the Contact List**
  → Editing the Contact List on page 128

- **Transmitting with the Group ID specified**
  → 8.7 Making a Group Call on page 139
- **Sending a Status Message or Short Message with the Unit ID specified**
  → 8.10 Sending and Receiving a Status Message (Status Call) on page 149
  → 8.11 Sending and Receiving a Short Message (Short Data Call) on page 163

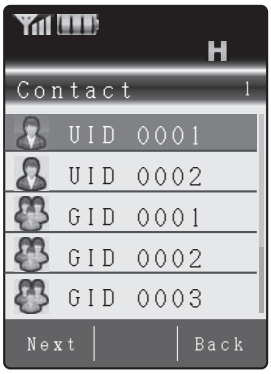
Viewing the Configuration for Each ID

The configuration for a Unit ID or Group ID configured in the Contact List can be viewed.

Operating the Transceiver

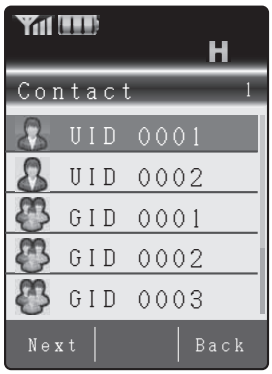
1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select the ID of the configuration to be viewed, and then press the Menu ([▯]) key.**



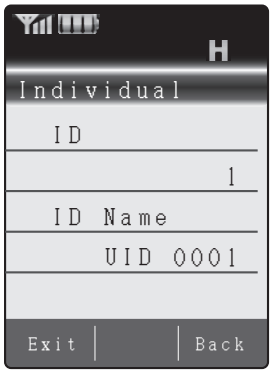
3 **Press the Up or Down key to select “View”, and then press the Menu ([▯]) key.**

If a Unit ID is selected:

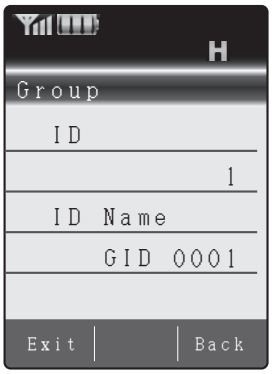
If a Group ID is selected:

4 The ID number and the ID name appear.

If a Unit ID is selected:



If a Group ID is selected:



5 Press the Menu ([ ]) key.

The transceiver reverts to the Contact List selection display.

3.6 Changing the Zone-channel

The Zone-channel can be changed using the **Selector** or **PF** keys.

Changing the Zone

Portable

The zone can be changed by operating the **Selector** or **PF** keys.

- **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 TK-Dx00 without LCD, the zones that can be selected are limited to zone 1 to zone 4.

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

- **If 16 Zone/Channel Selector is disabled and the Zone Up/Down function is assigned to the Selector (TK-Dx00 with LCD 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 Rollover/ End Stop on page 32.)
- For TK-Dx00 without LCD, the zones that can be selected are limited to zone 1 to zone 4. In the case of TK-Dx40 (Portable), the zones that can be selected are limited to zone 1 and zone 2. When a zone is selected, the transceiver emits the 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 Rollover/ End Stop on page 32.)
- For TK-Dx00 without LCD, 16 Zone/Channel Selector is always enabled.

TK-Dx40 (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, pressing and holding down the **Zone Up** or **Zone Down** key increases or decreases the zone number continuously at an interval of 200 ms.

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 Rollover/ End Stop on page 32.)

Configuration using KPG-166D

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

Changing the Channel

Portable

The channel can be changed by operating the **Selector** or **PF** keys.

- **If 16 Zone/Channel Selector is enabled and the Channel 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 having the same number specified by the **Selector**. Channels that can be selected are limited to channel number 1 to channel number 16.

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

- **If 16 Zone/Channel Selector is disabled and the Channel Up/Down function is assigned to the Selector (TK-Dx00 with LCD only)**

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

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

- **Using the PF keys**

  Pressing the **Channel Up** key increases the channel number in steps of 1. Pressing the **Channel Down** key decreases the channel number in steps of 1.

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

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

Note

- Operation for changing the channel varies depending on the configuration for Rollover/ End Stop. (Refer to Rollover/ End Stop on page 32.)
- For TK-Dx00 without LCD, 16 Zone/Channel Selector is always enabled.

TK-Dx40 (Mobile)

Pressing the **Channel Up** key increases the channel number in steps of 1. Pressing the **Channel Down** key decreases the channel number in steps of 1.

If "Channel Up (Continuous)" or "Channel Down (Continuous)" is assigned to the **Channel Up** or **Channel Down** key, pressing and holding down the **Channel Up** or **Channel Down** key increases or decreases the channel number continuously at an interval of 200 ms.

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

Note

Operation for changing the zone varies depending on the configuration for Rollover/ End Stop. (Refer to Rollover/ End Stop on page 32.)

Configuration using KPG-166D

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

Rollover/ End Stop

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

The zone or channel migrates as below depending on the configuration using KPG-166D when changing the zone or channel by using the **PF** keys or **Selector** on the transceiver:

Table 3-6 Rollover/ End Stop

Configuration	Description
Rollover	The Rollover Tone sounds from the transceiver and the transceiver will migrate to the zone or channel having the lowest number when a user attempts to increase the zone or channel number while the zone or channel having the highest number is selected. The transceiver will migrate to the zone or channel having the highest number when a user attempts to decrease the zone or channel number while the zone or channel having the lowest number is selected. Note If a zone is changed in TK-Dx00 without LCD or TK-Dx40 (portable), a Zone Select Tone is output from the transceiver, but a Rollover Tone is not output.
End Stop	Zones or channels in the range between the highest and lowest numbers can be selected. A zone or channel number is not looped. The Stop Tone sounds from the transceiver and the transceiver will not migrate to another zone or channel when a user attempts to increase the zone or channel number while the zone or channel having the highest number is selected. In addition, the Stop Tone sounds from the transceiver and the transceiver will not migrate to another zone or channel when a user attempts to decrease the zone or channel number while the zone or channel having the lowest number is selected.

Configuration using KPG-166D

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

Notifying the Changed Zone- channel Number by Voice (Voice Announcement)

Voice Announcement is the function to notify a user by voice of the selected zone number and channel number when a zone or channel is changed.

This function allows a user to easily change a zone or channel with a voice guidance even when a user operates the transceiver without seeing the LCD.

If this function is enabled, the changed zone number or channel number is notified by voice as follows when the transceiver is turned ON or the zone is changed:

"Zone xxx, Channel yyy" (xxx: zone number, yyy: channel number)

However, if only one zone is configured in the transceiver, only a channel number is notified by voice as "yyy" (yyy: channel number).

When the channel is changed, or the **Home Channel** key is operated, the new channel number is notified by voice as "yyy" (yyy: channel number).

Note

- The audio data used for Voice Announcement can be written into the transceiver by using KPG-166D.
- Available languages for Voice Announcement are as follows:
  English, Spanish, French, German, Dutch, Italian, Russian, and Chinese
- The audio for Voice Announcement sounds from the speaker of the transceiver. However, if the external speaker is connected to the transceiver, the audio sounds from the external speaker.
- The volume for Voice Announcement is set according to the configuration for Control Tone. Voice Announcement does not function if "Off" is configured for Control Tone. (Refer to Configuring the Volume Level of Various Tones (Tone Volume) on page 92.)
- Voice Announcement does not function while the transceiver is in Emergency Mode.
- Voice Announcement does not function if a zone or channel is changed by using the scan function.
- The received audio does not sound from the speaker if the audio for Voice Announcement sounds.

Configuration using KPG-166D

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

Specifying the Zone-channel Selected When the Transceiver Is Turned ON (Power-on Zone-Channel)

Compatible model: TK-Dx00/ TK-Dx40 (Mobile)

Power-on Zone-channel can be used to specify the Zone-channel of when the transceiver is turned ON.

Table 3-7 Power-on Zone-channel

Configuration	Description
Status Memory	The transceiver is turned ON with the Zone-channel selected just before the transceiver is turned OFF last time.
Fixed	The transceiver is turned ON with the Zone-channel configured for Zone-Channel (Power-on).

Configuration using KPG-166D

- Configuring the Zone-Channel Type (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Power-on)
- Configuring the Zone-Channel (Power-on) (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Power-on)

Changing the Channel by Specifying the Number (Channel Entry)

Compatible model: TK-Dx00 with LCD/ TK-Dx40 (Mobile)

Channel Entry is the function to directly migrate to the channel a user wishes to use.

For use of this function, press the **Channel Entry** key to place the transceiver in Channel Entry Mode.

The channel number in the current zone can be specified by directly entering numbers after pressing the **Channel Entry** key.

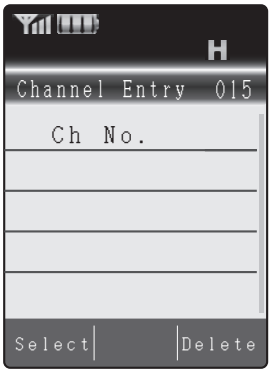
In the case of TK-Dx00 with LCD, if “Channel Entry” is configured for the Keypad Operation, the channel number can be specified by pressing the **[0]** to **[9]** keys on the keypad even if the **Channel Entry** key is not pressed.

The transceiver automatically recognizes the digits of the highest channel number configured for the transceiver. The channel number can be entered within this range of digits.

Operating the Transceiver

1 Press the Channel Entry key.

The transceiver enters Channel Entry Mode.
The following operations are identical even if the transceiver enters Channel Entry Mode by a user pressing the keypad.



2 Enter the channel number.

The following are examples for entering a channel number:

- If the maximum channel number has 3 digit:
  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 digit:
  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 digit:
  To make a call on channel 7, press the **[7]** key.

3 Confirm the channel number selected.

TK-Dx00 with LCD:
Press the **Menu** (**[ ]**) key.
TK-Dx40 (Mobile):
Press the **Triangle** key.
The transceiver migrates to the channel of the entered number after exiting Channel Entry Mode.

Note

- Refer to A.6 Key Operations for Each Mode on page 488 on key operations for entering the channel number in Channel Entry Mode for TK-Dx00 with LCD.
- The channel number selected before the transceiver enters the Channel Entry Mode appears as “[001]”. on the upper right side of the LCD of TK-Dx00 with LCD. Pressing the **Menu** (**[ ]**) or **[*]** key while no channel number is entered causes the transceiver to abort Channel Entry Mode and then revert to this channel number.
- If you exit the Channel Entry Mode on TK-Dx00 with LCD by pressing the **Right/Home** key, the transceiver reverts to the same channel that was selected before it entered the Channel Entry Mode.
- Pressing the **PTT** switch while in Channel Entry Mode causes the transceiver to transmit on the channel 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 selected before the transceiver entered Channel Entry Mode.

Configuration using KPG-166D

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

Changing the Channel with a Single Touch (Home Channel)

Home Channel is the function to migrate to a preconfigured channel by pressing the **Home Channel** key. The transceiver can move backward and forward between channels in the same zone.

Also, pressing the **Home Channel Select** key can change the Home Channel.

For TK-Dx00 with LCD, by pressing the **Menu** key to enter the Menu Mode, you can select “Home Channel Select” to change the Home Channel. (Refer to 3.4 Using Menu Mode on page 24.)

Note

If the **Home Channel** key is pressed during the scan, the transceiver pauses scanning while the transceiver is migrating to the Home Channel and a Scan Stop Tone will continue to sound at 30-sec intervals. (Refer to Scan Stop Tone on page 445.)

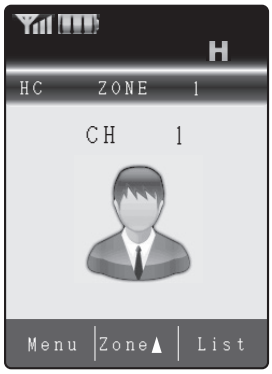
Operating the Transceiver

- **Migrating to the Home Channel**

1 **Press the Home Channel key.**

Key Beep A sounds from the transceiver, and then the transceiver can migrate to the Home Channel configured for the selected zone.

- For TK-Dx00 with LCD, “HC” appears on the sub-display.

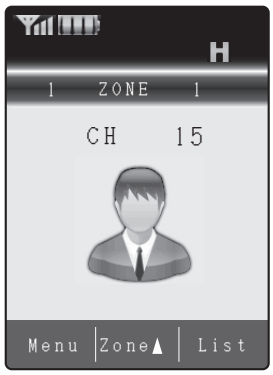


- For TK-Dx40 (Mobile), “Hc” appears.

2 **Press the Home Channel key again.**

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

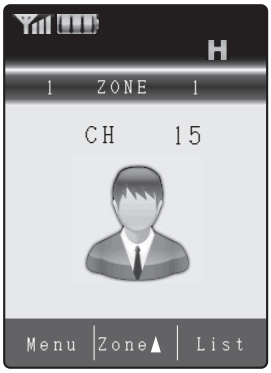
- For TK-Dx00 with LCD, “HC” on the sub-display disappears.



- For TK-Dx40 (Mobile), the transceiver restores the previous channel display.

● Changing the Home Channel

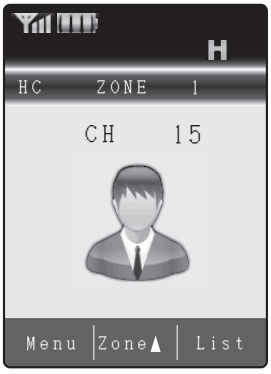
1 **Select the channel to be configured as the Home Channel.**



2 **Press the Home Channel Select key.**

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

- For TK-Dx00 with LCD, “HC” appears on the sub-display.



- For TK-Dx40 (Mobile), “Hc” appears.

Note

For TK-Dx00 without LCD/ TK-Dx40 (Portable), confirm the status of the transceiver by a tone sounded from the transceiver.

Configuration using KPG-166D

- Configuring the Home Channel (See Edit > Zone Information > Zone Edit)
- Assigning functions to the PF keys (See Edit > Key Assignment)

3.7 Transmitting/ Receiving

To transmit and receive, the **PTT** switch can be used.

Receiving

Received audio sounds from the speaker when the transceiver receives a signal and conditions to unmute the speaker are satisfied. To respond, speak into the microphone while pressing the **PTT** switch.

Transmitting

Transmitting can be initiated by selecting the desired Zone-channel and then pressing the **PTT** switch. Audio is transmitted by speaking into the microphone while pressing the **PTT** switch. Releasing the **PTT** switch terminates transmitting.

Conditions to unmute the speaker while receiving, the transceiver behavior while transmitting, or communication methods, such as an individual call or group call, vary according to the system in use. Refer to the following chapters for communication methods in each system:

8 DMR CONVENTIONAL SYSTEM on page 110
9 ANALOG CONVENTIONAL SYSTEM on page 200

Input Sensitivity of the Microphone (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:

6 dB, 4 dB (High), 2 dB, 0 dB (Normal), -2 dB, -4 dB, -6 dB, -8 dB, -10 dB (Low), -12 dB, -14 dB, -16 dB, -18 dB, -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

- Microphone sensitivity for internal microphone and external microphone can be independently configured by using KPG-166D.
- If a level lower than “0 dB” is configured for Mic Sense, the amplitude limit level is also lowered simultaneously; so Modulation Limiting (minimum) in Analog FM will be lowered.

Configuration using KPG-166D

- Configuring the Mic Sense (See Edit > Optional Features > Optional Features 1 > Common Page 1)
- Configuring the External Mic Sense (See Edit > Optional Features > Optional Features 1 > Common Page 1)

3.8 Viewing the Receive History (Stack)

Compatible model: TK-Dx00 with LCD

Stack is the function to store in the stack memory of the transceiver the record of the received calls or the received Status Messages.

A user can view or clear the various stack data stored in the stack memory of the transceiver if the transceiver is placed in Stack Mode.

In Stack Mode, incoming call records (Incoming), outgoing call records (Outgoing), missed calls (Missed), and the received Status Messages can be viewed.

A maximum of 200 records in total can be stored in the stack memory of the transceiver.

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. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then selecting "Stack" will cause the transceiver to enter Stack Mode. (Refer to 3.4 Using Menu Mode on page 24.)

If at least one piece of stack data exists, the transceiver enters Stack Mode and the stacked data appears. If no stack data exists, "<< EMPTY >>" appears on the display, and the transceiver does not enter Stack Mode.

The display switches as follows if the **Menu** (**[▯]**)key is pressed in Stack Mode:

Display of all stacked data in DMR
↓
Display of Incoming call data in DMR
↓
Display of Outgoing call data in DMR
↓
Display of Missed call data in DMR
↓
Display of all stacked data in 5-tone
↓
Display of Status Messages in DMR
↓
Display of all stacked data in DMR
↓
•••

If the channel in Mixed Mode is selected, the transceiver behaves as follows by pressing the **Stack** key or by executing "Stack" after the transceiver is placed in Menu Mode by pressing the **Menu** key:

Table 3-8 Transceiver Behavior in Stack Mode

Selected Channel	Behavior
Channel Type: Analog Channel Type: Mixed Transmit Mode: Analog	If at least one piece of stack data exists, the transceiver enters Stack Mode and the all stacked data in 5-tone appears.
Channel Type: DMR Channel Type: Mixed Transmit Mode: DMR	If at least one piece of stack data exists, the transceiver enters Stack Mode and the all stacked data in DMR appears.

Note

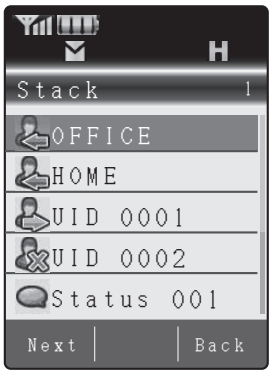
In order to store the record of the received calls or the received Status Messages in the stack memory of the transceiver, Call ID Stack or Status Message Stack must individually be enabled by using KPG-166D.

Operating the Transceiver

● Confirming the message

1 **Press the Stack key.**

The transceiver enters Stack Mode. The subsequent operations are identical even if the transceiver enters Stack Mode by a user pressing the **Menu** key.



The number of the stored message appears at the upper right of the display.
The display varies as follows depending on the message type:

Table 3-9 Stack Mode

Message Type		Icon Display
DMR	Incoming (Individual Call)	
	Status Message	
	Incoming (Group Call)	
	Outgoing	
	Missed	
5-tone	Selcall ID/ Status Message	

2 **Select a message to be confirmed by pressing the Up or Down key, and confirm the message.**

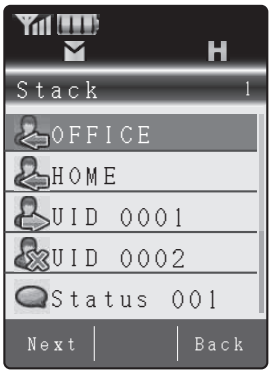
Refer to Selecting or Clearing Data from a List on page 45 for selection methods.

● Switching the message display

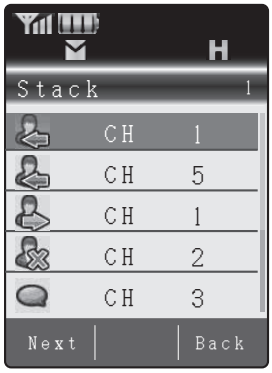
1 **Press and hold the Menu ([ ]) or [*] key while the message is displayed.**

The display switches as follows:
DMR:
For a display other than the display for Status Messages
ID Name → the channel where the message is received → ID Name ...
For the display for Status Messages
ID Name → Status Message → the channel where the message is received → ID Name ...
5-tone:
Selcall Name → Status Message → the channel where the message is received → Selcall Name ...

● ID Name display (a display example in DMR)
The ID name of the transceiver which was used for sending the message appears. If Call ID appears, a user can respond by pressing the **PTT** switch. (Only if the type of the stored message is Call ID)



● **Channel display (a display example in DMR)**
The channel name or the Zone-channel name of the transceiver which received the message appears.



Note

- Pressing the **Left** key can also switch the message display.
- Refer to Selecting or Clearing Data from a List on page 45 for instructions on how to clear a message.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Call ID Stack (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)
- Configuring the Status Message Stack (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

Stack Procedure of the Receive History (Latest Received Message Stack) (DMR Conventional System Only)

Latest Received Message Stack can be used to select a stack procedure to store the received Call ID and Status Message in the stack memory.

Table 3-10 Latest Received Message Stack

Configuration	Description
Enabled	The transceiver stores a maximum of 200 received Call IDs and Status Messages in the stack memory in the order of reception. If the transceiver receives the 201st call or Status Message, the transceiver clears the oldest Call ID or Status Message and stores the latest Call ID or Status Message.
Disabled	The transceiver stores a maximum of 200 received Call IDs and Status Messages in the stack memory in the order of reception. If the transceiver receives the 201st call or Status Message, the transceiver does not store the Call ID or Status Message.

Configuration using KPG-166D

Configuring the Latest Received Message Stack to be enabled or disabled (See Edit > Optional Features) Optional Features 1 > Common Page 4 > Stack)

Call ID Stack (DMR Conventional System Only)

Call ID Stack is the function to store in the stack memory of the transceiver the IDs from which the transceiver has received a call or the IDs to which the transceiver has made a call.

A maximum of 200 Call IDs and Status Messages in total can be stored.

If the **PTT** switch is pressed while a Call ID appears in Stack Mode, the transceiver can respond to the displayed Call ID.

The stack method varies depending on the configuration for Latest Received Message Stack.

Transceiver Behavior of When Responding to the Call ID Stored in the Stack Memory

A Call ID is cleared from the stack memory of the transceiver if the Call ID stored in the stack memory is selected and called. The Call ID will be cleared from the stack memory even if a call cannot be initiated because the channel is busy. If the transceiver receives a response from the called party while the Mode Reset Timer is counting down, the Call ID will not be stored in the stack memory.

In addition, the Call ID of the calling party is stored in the stack memory when the transceiver receives a call, but the Call ID will be cleared from the stack memory if a response is initiated while the Auto Reset Timer is counting down. Subsequently, the Call ID will not be stored in the stack memory even if a call from the same party is received while the Auto Reset Timer is counting down.

Configuration using KPG-166D

Configuring Call ID Stack (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

Status Message Stack (DMR Conventional System Only)

Status Message Stack is the function to store the received Status Messages in the stack memory of the transceiver.

A maximum of 200 Call IDs and Status Messages in total can be stored.

The stack method varies depending on the configuration for Latest Received Message Stack.

Configuration using KPG-166D

Configuring the Status Message Stack (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Stack)

Queue Type (5-tone System Only)

Queue Type can be used to select a stack procedure to store the received 5-tone codes in the stack memory of the transceiver. Queue Type can also be used to select how the transceiver displays in Stack Mode the stored 5-tone code in the stack memory of the transceiver.

A maximum of 15 received 5-tone codes can be stored in the Queue buffer of the stack memory of the transceiver.

The following can be configured by using KPG-166D: the order of storing the received 5-tone codes, the method of storing the received redundant 5-tone codes, and whether or not to display in Stack Mode the channel on which the code is received.

FIFO (First In First Out) and LIFO (Last In First Out) are available for the order of storing the received 5-tone codes in the Queue buffer.

- **FIFO**

  In FIFO, if the transceiver receives a 5-tone code, the received 5-tone code is always stored in Queue 1 in the Queue buffer. If the transceiver receives a 5-tone code, the 5-tone codes already stored in the Queue buffer are transferred to the next Queues, and the 5-tone code stored in Queue 15 is cleared.

- **LIFO**

  In LIFO, the transceiver stores the received 5-tone codes in the Queue buffer in order of Queue 1 to Queue 15. If the 5-tone codes are stored up to Queue 15, and the transceiver receives the next 5-tone code, the received 5-tone code is stored in Queue 15. The 5-tone codes stored in the Queue buffer are transferred to the preceding Queues, and the 5-tone code stored in Queue 1 is cleared.

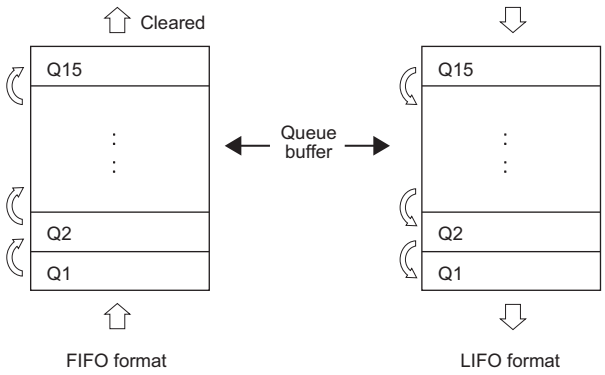


Figure 3-1 Queue Type

If a 5-tone code received is the same as the 5-tone code stored in the Queue buffer, the same 5-tone code can be redundantly stored if storing the same 5-tone codes redundantly is permitted. If storing the same 5-tone codes redundantly is prohibited, the 5-tone code stored in the Queue buffer is cleared. The 5-tone code received is stored in the Queue buffer according to the FIFO or LIFO method.

The transceiver behavior is as follows depending on the configuration for the Queue Type:

Table 3-11 Queue Type

Queue Type	Queue Behavior		
	Order of Storing (FIFO/ LIFO)	Redundant Storing (Inhibited/ Permitted)	Display of Channel on Which the Code Is Received (Inhibited/ Permitted)
Queue 1	FIFO	Permitted	Permitted
Queue 2	FIFO	Permitted	Inhibited
Queue 3	FIFO	Inhibited	Permitted
Queue 4	FIFO	Inhibited	Inhibited
Queue 5	LIFO	Permitted	Permitted
Queue 6	LIFO	Permitted	Inhibited
Queue 7	LIFO	Inhibited	Permitted
Queue 8	LIFO	Inhibited	Inhibited

Configuration using KPG-166D

Configuring Queue Type (See Edit > 5-tone > Encode/Decode > Decode > Stack)

Message Memory (5-tone System Only)

Message Memory is the function to retain in the transceiver the 5-tone codes stacked in the stack memory of the transceiver even after the transceiver is turned OFF.

Configuration using KPG-166D

Configuring Message Memory to be enabled or disabled (See Edit > 5-tone > Encode/Decode > Decode > Stack)

3.9 Operating the Transceiver in Each Mode (Common Operation)

Compatible model: TK-Dx00 with LCD/ TK-Dx40 (Mobile)

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

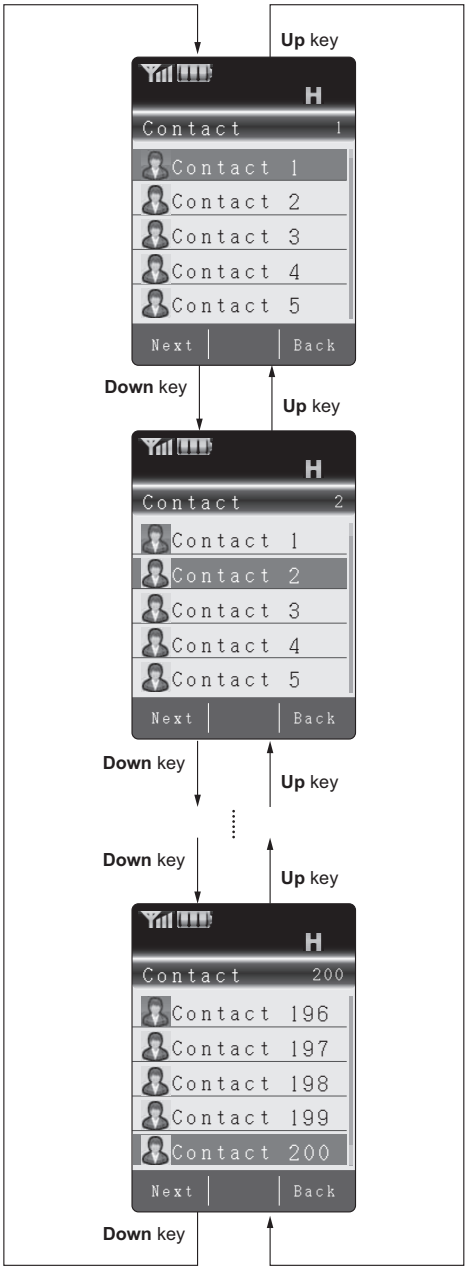
Selecting or Clearing Data from a List

This section explains operations using operating examples for Contact List Mode. (Refer to 3.5 Using the Contact List (DMR Conventional System Only) on page 26.)

Refer to A.6 Key Operations for Each Mode on page 488 for key operations in each mode.

TK-Dx00 with LCD

- **Selecting data from a list by using the Up and Down keys**



Note

The list number will automatically be scrolled up or down continuously while the **Up** or **Down** key is pressed and held.

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

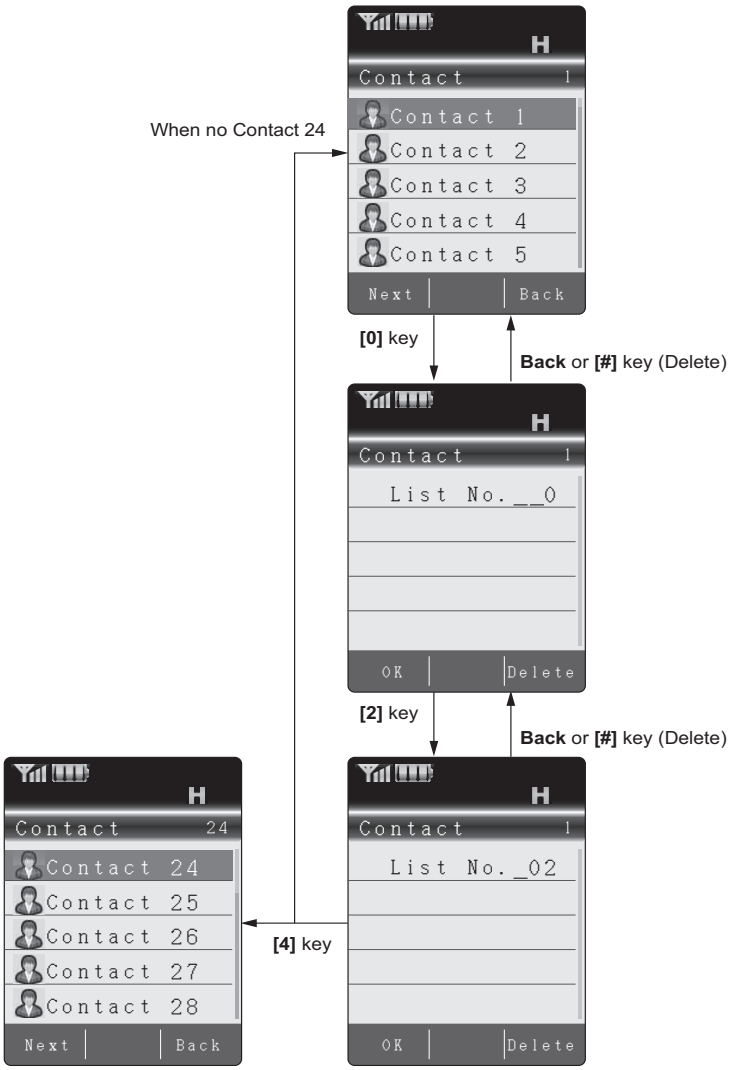
The following is the operation example for selecting “Contact 24” from an ID list in Contact List Mode:

1 Execute either of the following operations to display an ID list in Contact List:

- Press the **Contact List** key.
- Press the **Menu** ([▯]) key to enter Menu Mode, and then select “Contact List”.

2 Press the [0], [2], and [4] keys on the keypad in this order.

3 Press the Menu ([▯]) or [*] key (OK) to confirm.

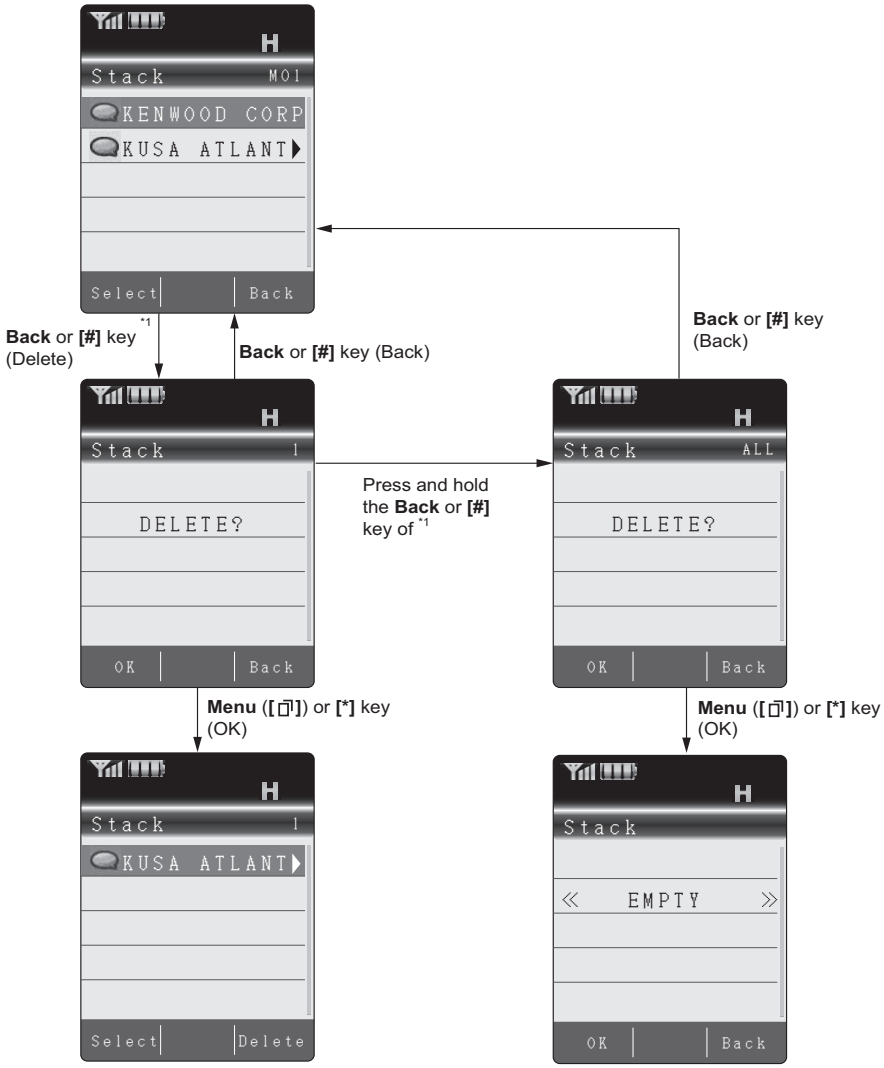


Note

- The following are the main keys to be used for this operation examples:
  To confirm: the **Menu** (**[▯]**) or **[*]** key
  To delete one character: the **Back** or **[#]** key
- The number of digits entered varies as follows depending on the highest list number configured in the transceiver:
  - If the highest list number is lower than 10: one digit
  - If the highest list number is 10 or higher and lower than 100: two digits
  - If the highest list number is 100 or higher and lower than 1000: three digits
  - If the highest list number is 1000 or higher: four digits
- If the entered number does not exist when it is confirmed, the transceiver restores the previous display prior to entering the number.

● Clearing data from a list

The following is the operation example for clearing “KENWOOD” from the history list in Stack Mode:

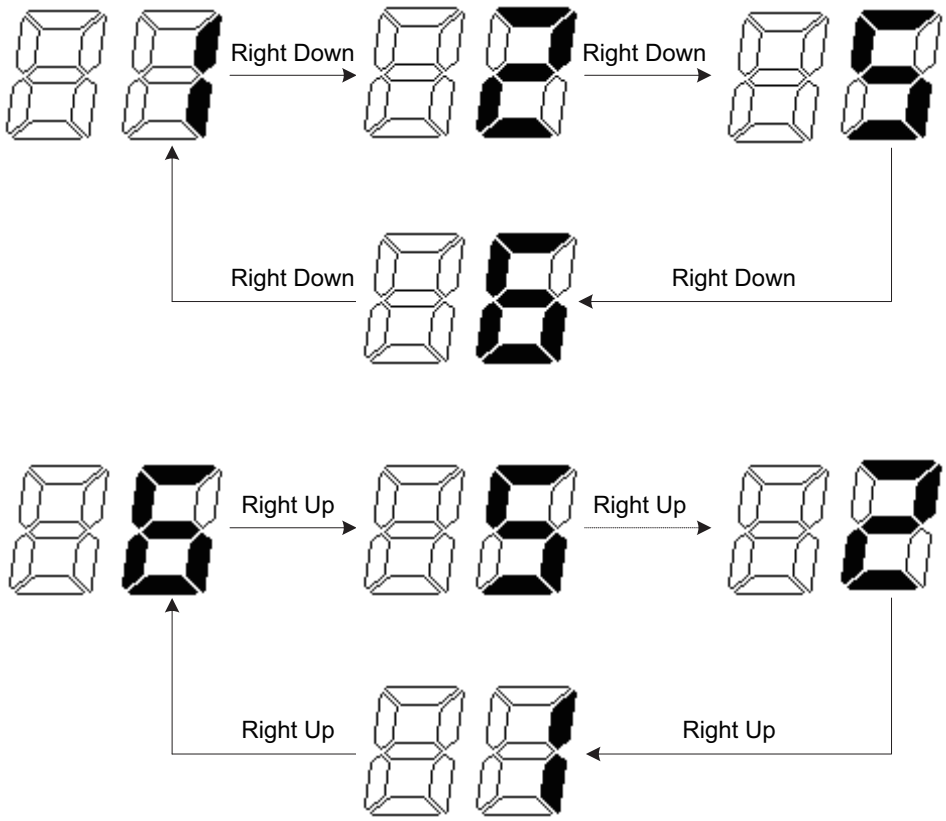


Note

The following are the main keys to be used for this operation examples:
To clear one piece of data: Press the **Back** or **[#]** key.
To clear all data: Press and hold the **Back** or **[#]** key.
To confirm: the **Menu** (**[▯]**) or **[*]** key

TK-Dx40 (Mobile)

- **Selecting data from a list by using the Right Up and Right Down keys**



Note

The list number will automatically be scrolled up or down continuously while the **Right Up** or **Right Down** key is pressed and held.

Entering or Deleting a Code

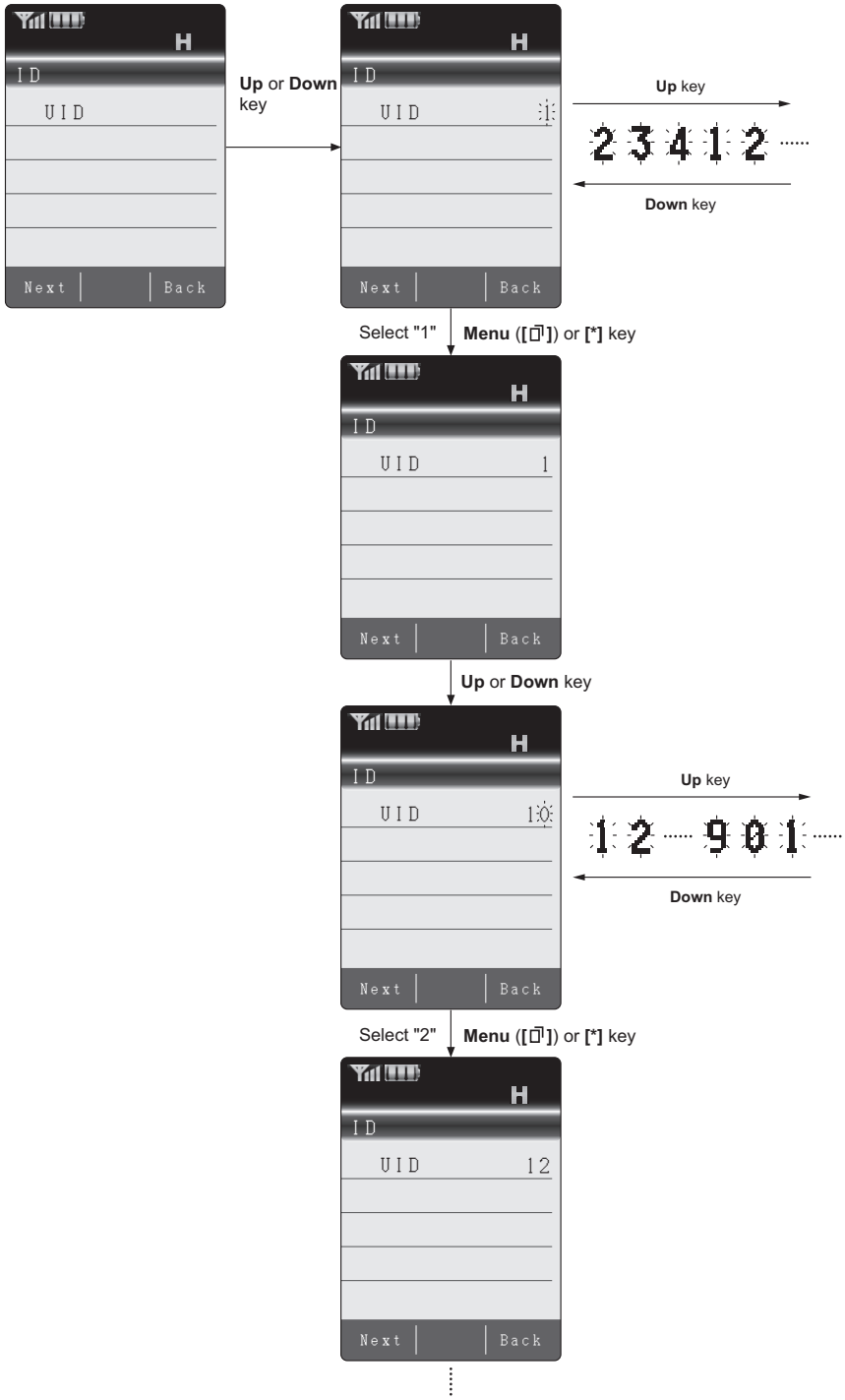
This section explains operations using operating examples for Contact List Mode. (Refer to 3.5 Using the Contact List (DMR Conventional System Only) on page 26.)

Refer to A.6 Key Operations for Each Mode on page 488 for key operations in each mode.

TK-Dx00 with LCD

- **Entering a code using the Up and Down keys**

  The following is the operation example to enter “ID 12” in Contact List Mode:

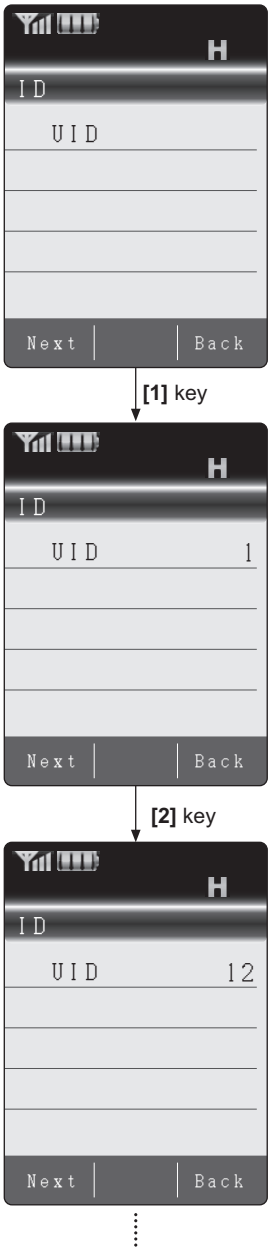


Note

- The following are the main keys to be used for this operation examples:
  To select a code: the **Up** or **Down** key
  To confirm: the **Menu** (**[ ]**) or **[*]** key
- Pressing and holding the **Up** or **Down** key causes the code to automatically be scrolled up or down continuously.
- The code that can be entered varies depending on the mode and the number of entered digits.

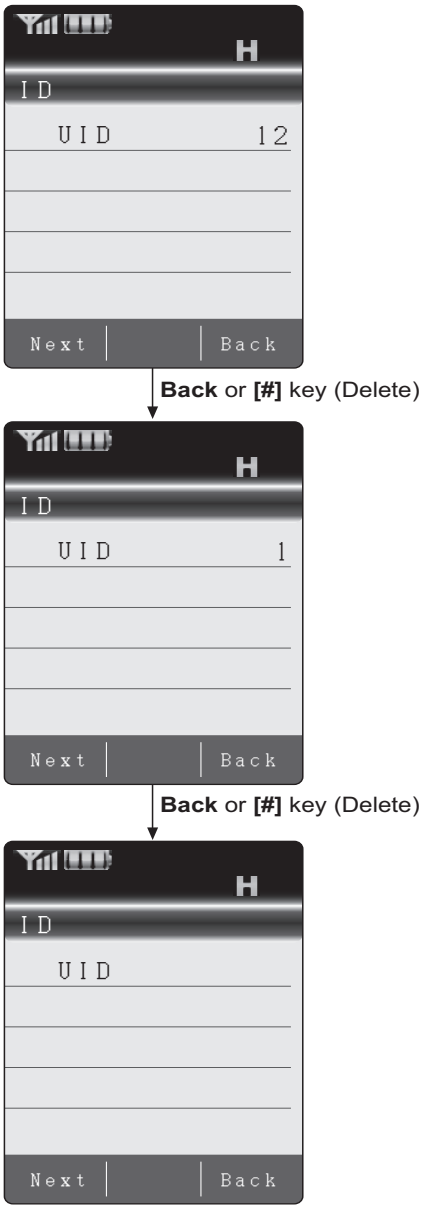
● Entering a code using the keypad

The following is the operation example to enter “ID 12” in Contact List Mode:



- **Deleting the entered code**

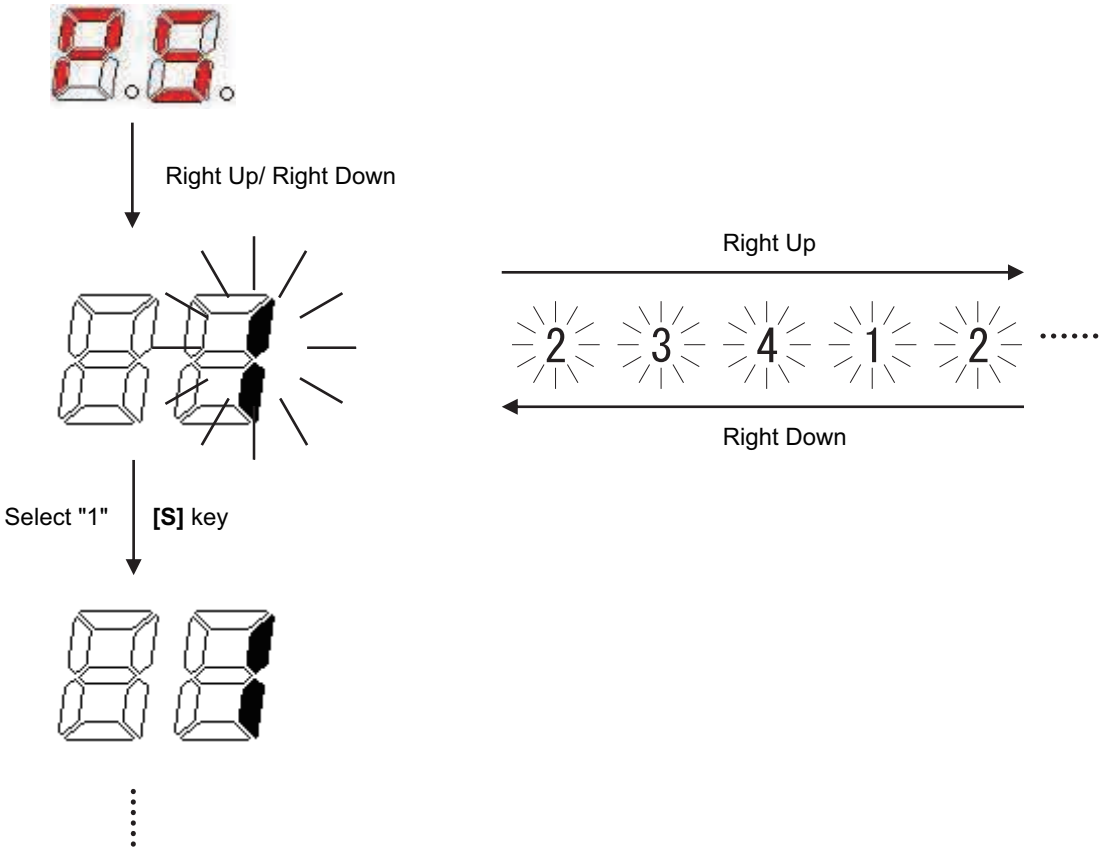
  Pressing the **Back** or **[#]** key causes one digit by the lowest digit to be cleared in the code. Furthermore, pressing and holding the **Back** or **[#]** key causes the entire code to be deleted.



TK-Dx40 (Mobile)

- **Entering a code using the Right Up and Right Down keys**

  The following is an example in the Transceiver Password Mode.

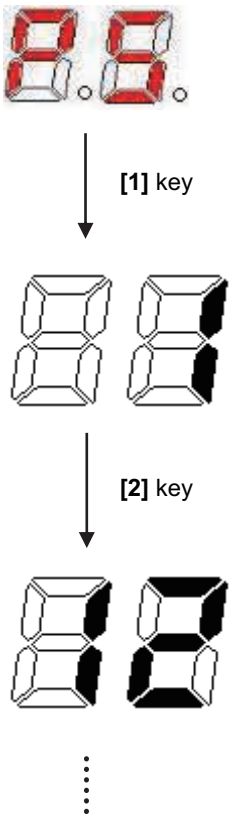


Note

- The code that can be entered varies depending on the mode and the number of entered digits.
- To enter the second and subsequent digits, the number you selected for the previous digit appears on the left, while the number for the digit you are currently entering appears on the right.

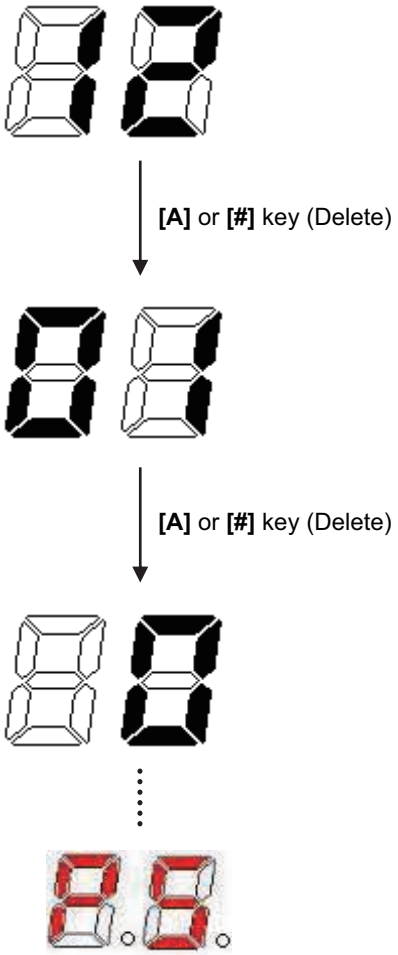
- **Entering a code using the keypad**

  The following is the operation example to enter “12” in Transceiver Password Mode:



- **Deleting the entered code**

  Pressing the **[A]** or **[#]** key once clears the last digit of the code. Pressing and holding down the **[A]** or **[#]** key clears the entire code.



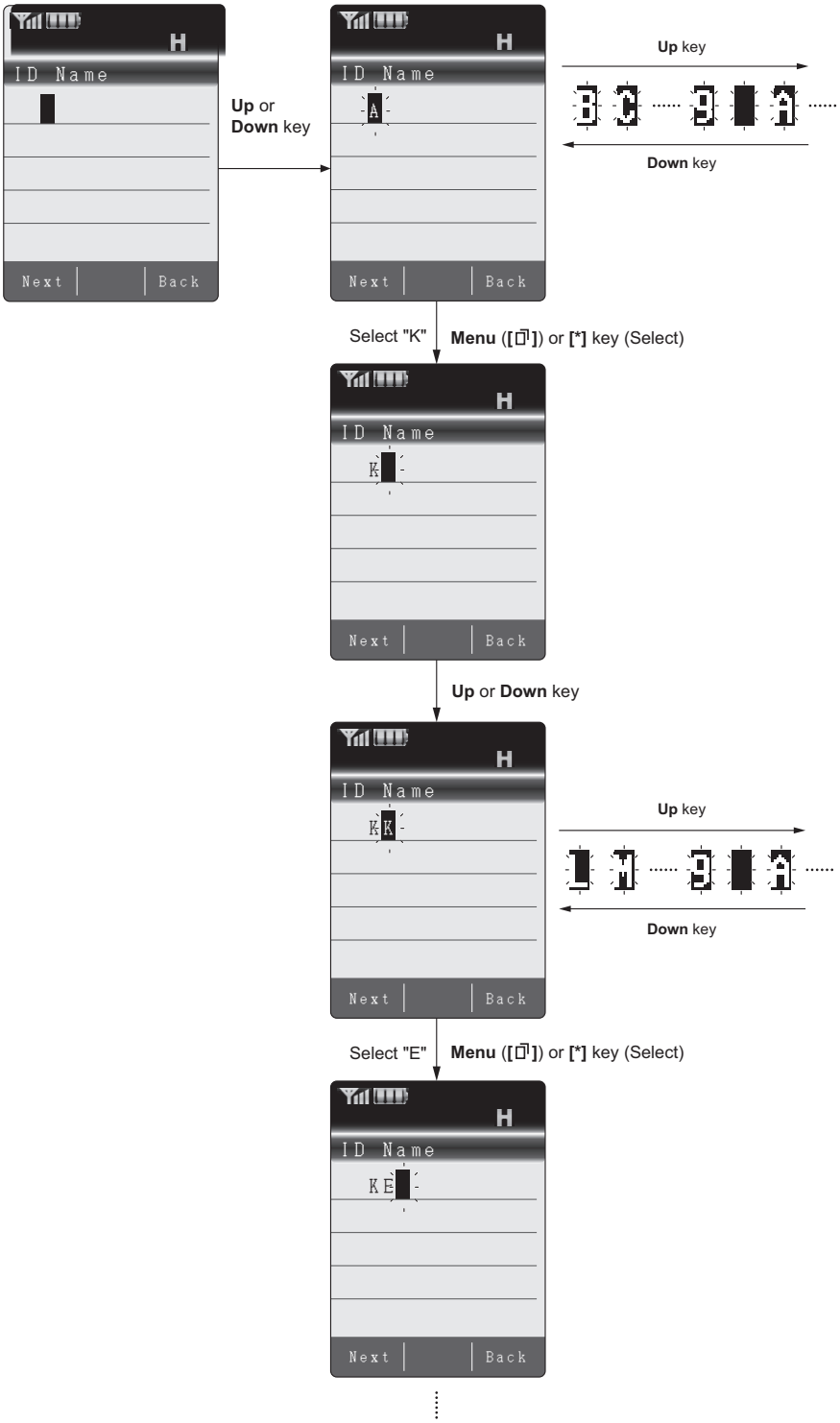
Entering or Deleting Characters

This section explains operations using operating examples for Contact List Mode. (Refer to 3.5 Using the Contact List (DMR Conventional System Only) on page 26.)

Refer to A.6 Key Operations for Each Mode on page 488 for key operations in each mode.

- **Entering characters using the Up and Down keys**

  The following is the operation example to enter “KENWOOD” in Contact List Mode:

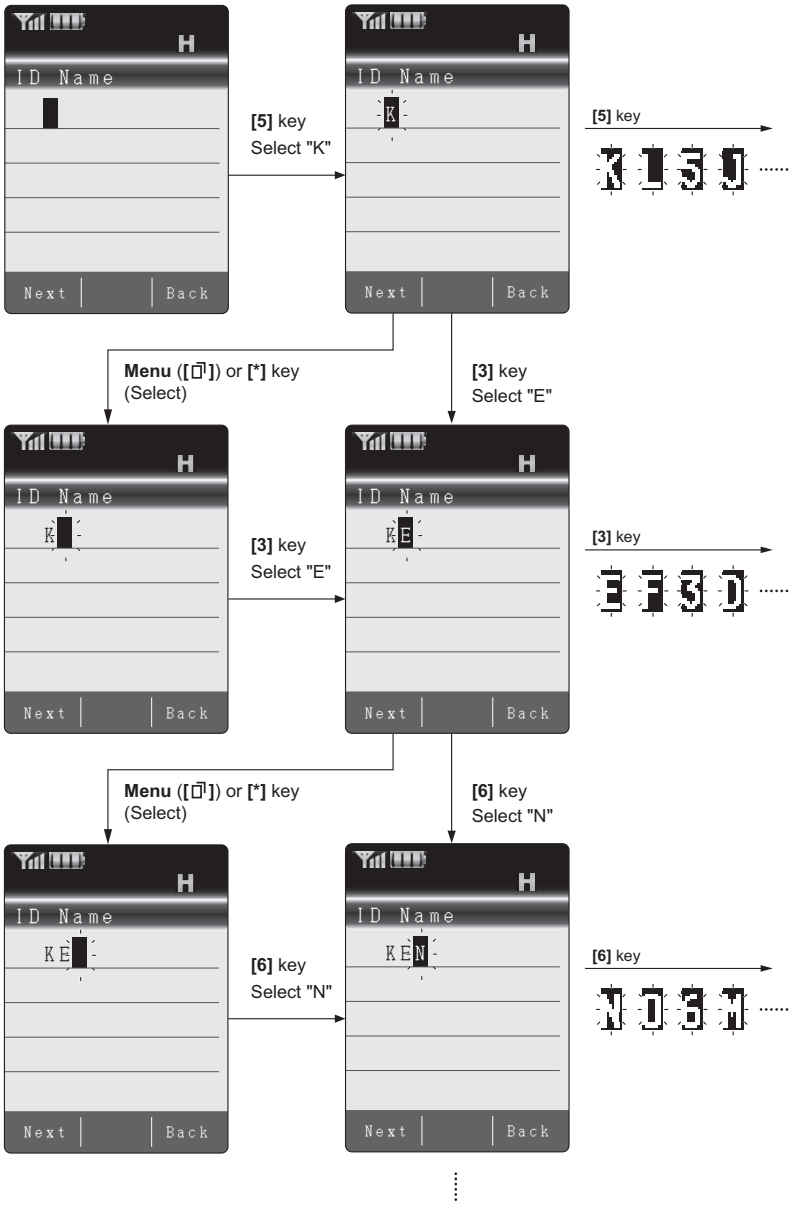


Note

- The following are the main keys to be used for this operation examples:
  To select a character: the **Up** or **Down** key
  To confirm: the **Menu** (**[▯]**) or **[*]** key
- Pressing and holding the **Up** or **Down** key causes the character to automatically be scrolled up or down continuously.
- Characters to be entered can be changed by configuring the Character Entry. (Refer to Character Entry on page 60.)

● Entering characters using the keypad

The following is the operation example to enter “KENWOOD” in Contact List Mode:

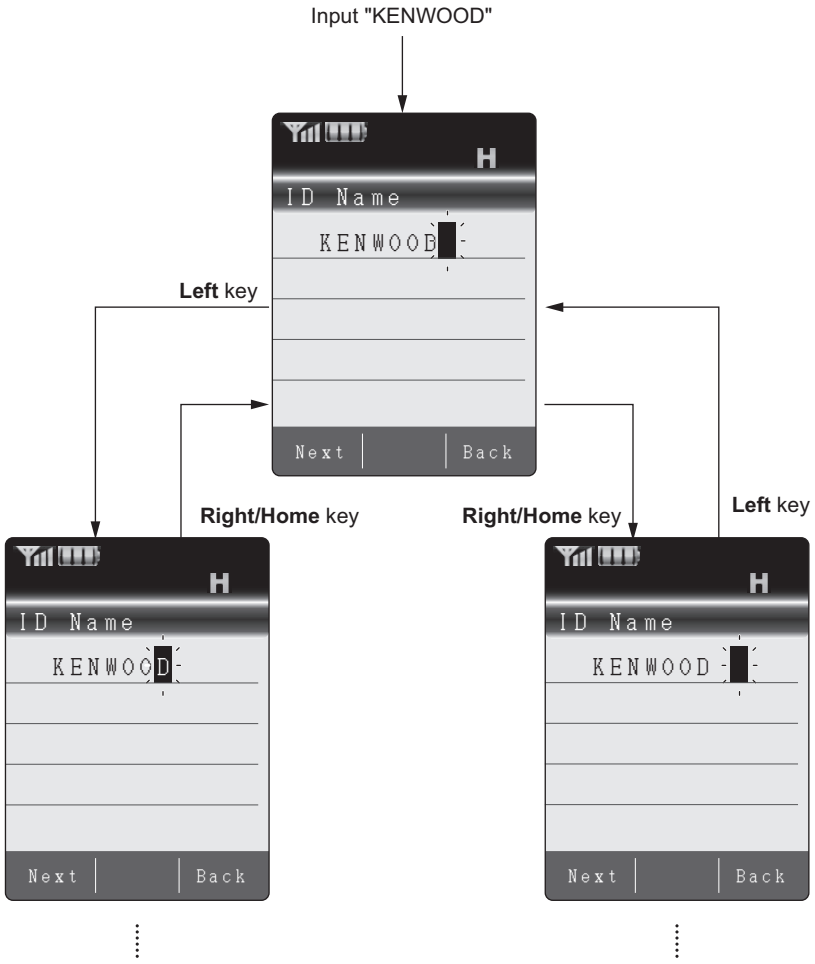


Note

- The following are the main keys to be used for this operation examples:
  To select a character: each key on the keypad
  To confirm: the **Menu** (**[▯]**) or **[*]** key
- Characters to be entered can be changed by configuring the Character Entry. (Refer to Character Entry on page 60.)

● Moving the cursor

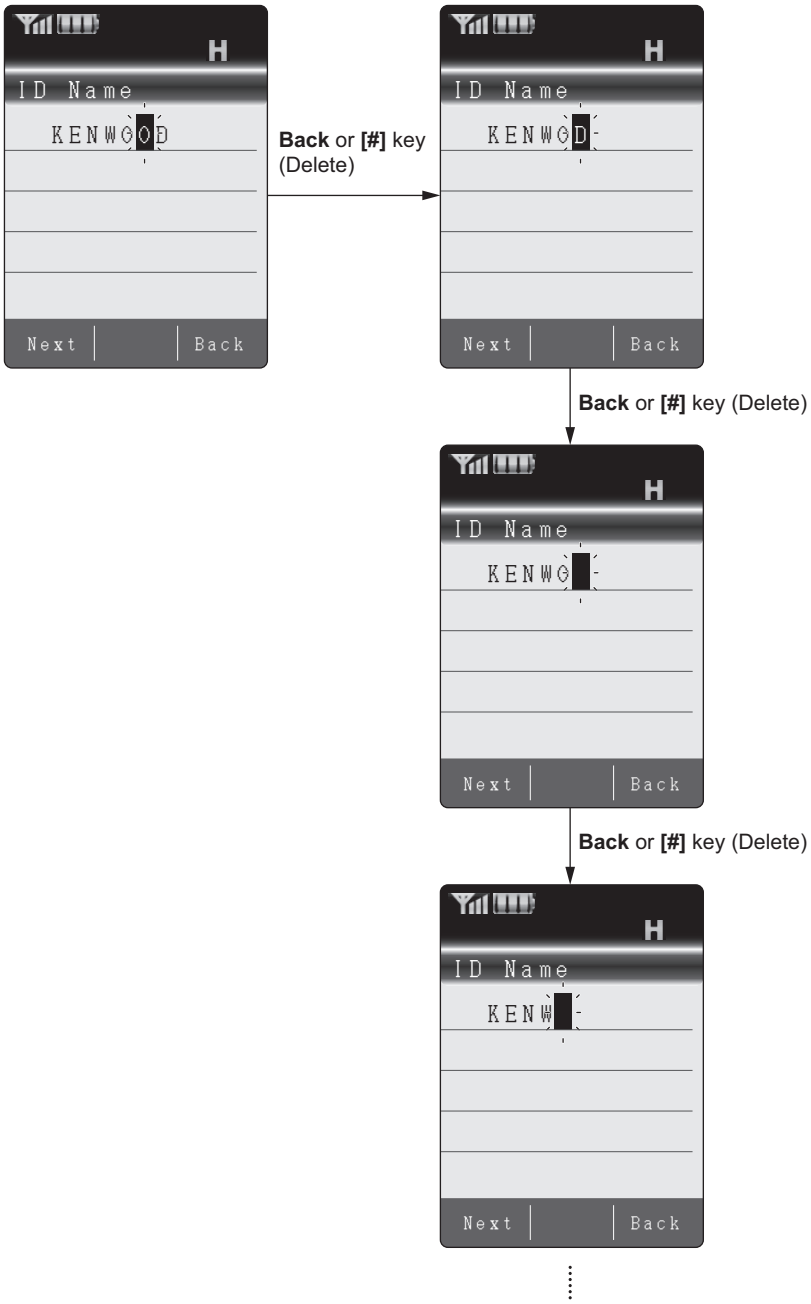
Pressing the **Left** or **Right/Home** key moves the cursor to left or right respectively. Pressing and holding the **Left** or **Right/Home** key will cause the cursor to continuously be moved.



If “Line Up/Down” is assigned to the **Up** or **Down** key by using KPG-166D, pressing the **Up** or **Down** key moves the cursor. Pressing the **Down** key moves the cursor down one line. Pressing the **Up** key moves the cursor up one line. (See Edit > Key Assignment > Character Entry > Up/Down)

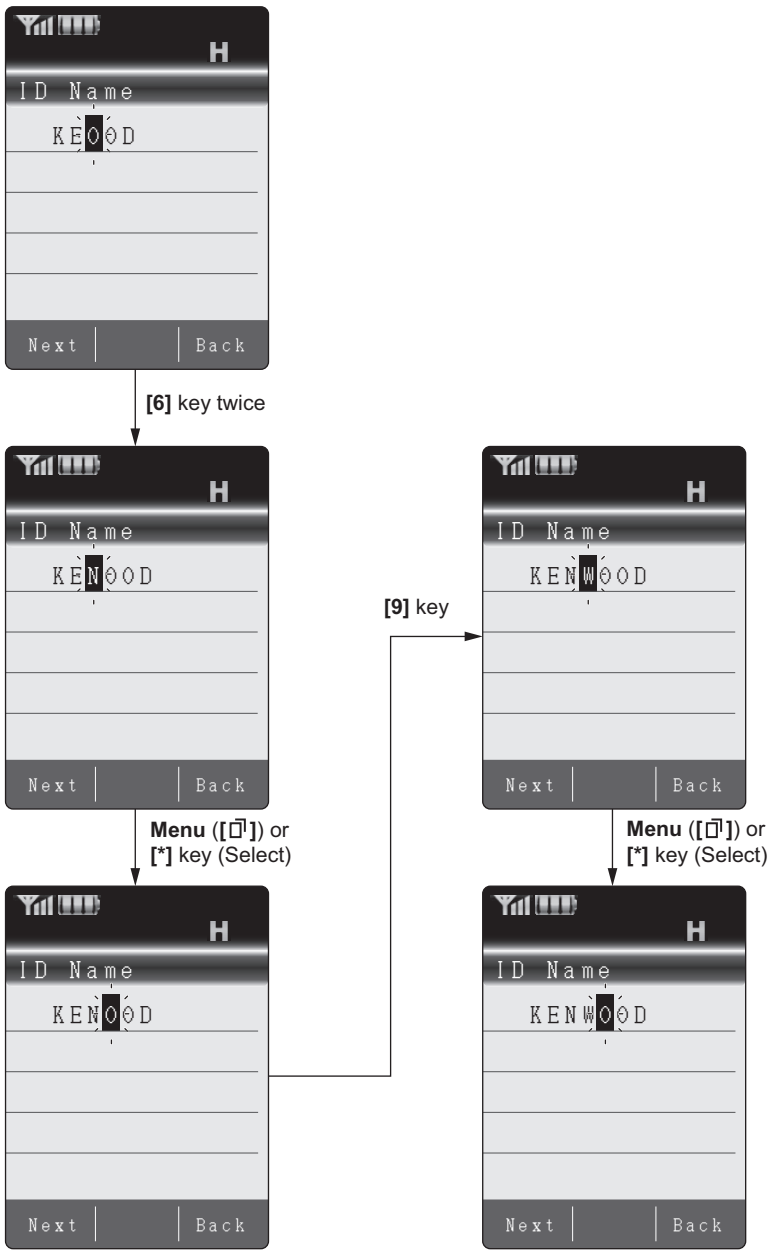
● Deleting characters

Pressing the **Back** or **[#]** key causes one character to be deleted. Furthermore, pressing and holding the **Back** or **[#]** key causes all characters to be deleted.



● Inserting characters

The following is the operation example to correct “KEOOD” to “KENWOOD” in Contact List Mode:



Note

- The following are the main keys to be used for this operation examples:
  To select a character: each key on the keypad
  To confirm: the **Menu** (**[ ]**) or **[*]** key
- Characters to be entered can be changed by configuring the Character Entry. (Refer to Character Entry on page 60.)

Character Entry

Compatible model: TK-Dx00 with LCD

Character Entry is the function to enter alphanumeric characters and symbols by using the **[0]** to **[9]**, **Up** and **Down** keys.

Symbols, lower case letters, etc. can be entered by using the **[0]** to **[9]**, **Up** and **Down** keys. The number of key operations for entering characters can be minimized by configuring only necessary characters.

A maximum of 8 alphanumeric characters (upper and lower case letters) and symbols can be configured for each key of **[0]** to **[9]** on the keypad.

A maximum of 80 alphanumeric characters and symbols can be configured for the **Up** and **Down** keys.

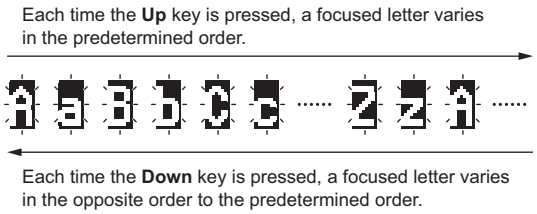
Character Entry is used to enter an ID Name in Contact List Mode or to enter a message in Message Mode, etc.

Note

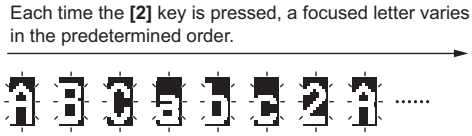
This feature is not available on TK-Dx00 without LCD.

Operating the Transceiver

- **If "AaBbCc...Zz" is configured for the Up and Down keys**



- **If "ABCabc2" is configured for the [2] key**



Note

- Pressing the **[*]** key switches the character entry mode in the following order: upper case letters → lower case letters → numbers → upper case letters → ...
- Refer to 3.9 Operating the Transceiver in Each Mode (Common Operation) on page 45 for operation methods.

Configuration using KPG-166D

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

3.10 Locking the Transceiver Keys (Key Lock)

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 the **Selector** can be used even if Key Lock is activated:

- Emergency
- Backlight
- Monitor
- Monitor Momentary
- Squelch Off
- Squelch Off Momentary
- Function
- Key Lock
- LCD Brightness
- Call

Note

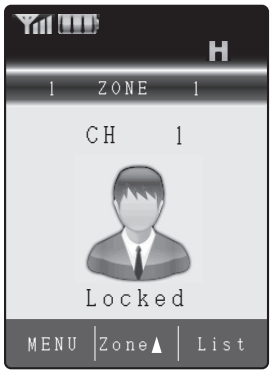
TK-Dx00 without LCD does not have any display features, but this feature can be used.

Operating the Transceiver

● Activating the Key Lock

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

"Locked" appears on the display, and then Key Lock will be activated.



● Deactivating the Key Lock

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

Key Lock will be deactivated.

Configuration using KPG-166D

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

Key Lock for Selector

Compatible model: TK-Dx40 (Portable)

Key Lock for Selector is used for setting whether to apply the Key Lock function to Selector.

When this feature is enabled, Key Lock is applied to Selector.

When this feature is disabled, Key Lock is not applied to Selector.

Configuration using KPG-166D

Enabling/Disabling the 16 Zone/Channel Selector (See Edit > Key Assignment > Top/Side)

4.1 Transmit/ Receive Frequencies

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

Transmit and receive frequencies can be configured for each channel.

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

Model	Transmit/ Receive Frequencies	
	Range	Step
TK-D200/ TK-D200G/ TK-D240/ TK-D740	136 MHz to 174 MHz	2.5 kHz, 3.125 kHz
TK-D300/ TK-D300G/ TK-D340/ TK-D840	400 MHz to 470 MHz	3.125 kHz, 5 kHz

Configuration using KPG-166D

Configuring the transmit and receive frequencies for a channel (See Edit > Zone Information > Channel Edit > Page 1)

4.2 Transmission Power

Transmit Power is the transmission power of the transceiver.

Portable

A portable transceiver can be used by switching the transmission power to high power or low power.

If the transceiver is located near repeaters or target party, a user can change the transmission power to low power 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 Transmission Power (Portable)

Model	Transmission Power	
	Low	High
TK-D200/ TK-D200G/ TK-D300/ TK-D300G	1 W	4 W
TK-D240	1 W	5 W
TK-D340	1 W	4 W

The “H” icon appears in the icon display area if a channel where “High” is configured for the transmission power is selected. Alternatively, the “L” icon appears in the icon display area if a channel where “Low” is configured for the transmission power is selected.

Either “High” or “Low” can be configured for the transmission power for each channel.

The transmission power can be changed between “High” and “Low” by selecting a channel where “High” is configured for the transmission power and doing one of the following operations:

- Press the **Low Transmit Power** key.
- Select “ON” (low power) or “OFF” (high power) after the transceiver enters Menu Mode by pressing the **Menu** key and “Low Transmit Power” is selected.

With one of the operations, the transmission power of the selected channel becomes “Low” by enabling Low Transmit Power, and the transmission power of the selected channel becomes “High” by disabling Low Transmit Power.

Note

The **Low Transmit Power** key cannot be used on a channel where “Low” is configured for the transmission power.

TK-Dx40 (Mobile)

On a Mobile model, a user can use the transceiver by switching the transmission power to high power or low power.

If the transceiver is located near a repeater or the target party, a user can lower the level of transmission power in order to avoid causing unnecessary radio interference to other transceivers.

Table 4-3 Transmission Power (Mobile)

Model	Transmission Power	
	Low	High
TK-D740	5 W	25 W
TK-D840	5 W	25 W

“High” or “Low” can be configured for the transmission power for each channel.

Configuration using KPG-166D

Configuring the transmission power for each channel (See Edit > Zone Information > Channel Edit > Page 1)

4.3 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.

Channel Spacing (Analog)

The following are the channel spacing to be used by a transceiver for transmission and reception on an analog channel. Channel spacing can be configured for each channel by using KPG-166D.

Table 4-4 Channel Spacing (Analog)

Channel Spacing	Bandwidth
Wide 5k	25 kHz
Wide 4k	20 kHz
Narrow	12.5 kHz

Channel Spacing (DMR)

The channel spacing to be used by the transceiver for transmission and reception on a DMR digital channel is Narrow (12.5 kHz).

Configuration using KPG-166D

Configuring the channel spacing (See Edit > Zone Information > Channel Edit > Page 1)

4.4 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.

The internal clock frequency of the transceiver is shifted on a channel on which Beat Shift is enabled.

Beat Shift can be configured for each channel.

Configuration using KPG-166D

Configuring the Beat Shift to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Beat Shift)

4.5 Displaying the Signal Strength Level (RSSI Level) (Maintenance Display)

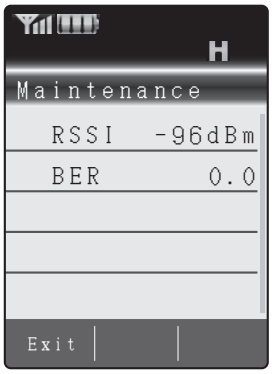
Compatible model: TK-Dx00 with LCD

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

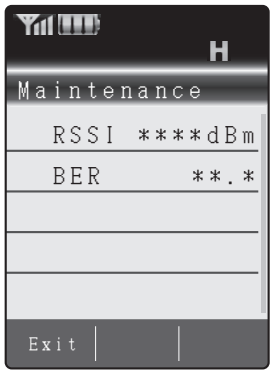
1 Press the Maintenance key.

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

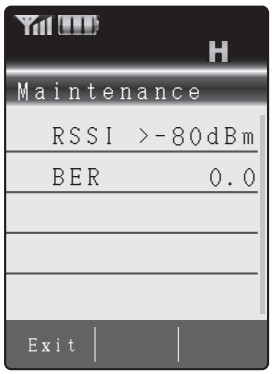
- If the RSSI level is -96 dBm:



- If the RSSI level is - 120 dBm or lower:



- If the RSSI level is -80 dBm or higher:



Note

- The **PTT** switch can be used even if the transceiver is in Maintenance Display Mode.
- The received ID or message does not appear even if the transceiver receives various calls in Maintenance Display Mode. However, "<<RECEIVE DATA>>" or "<<COMPLETE>>" etc. appears to indicate the data communication is in progress.
- Even if "Maintenance" is selected after the transceiver enters Menu Mode by pressing the **Menu** key, the operation above is enabled.

Configuration using KPG-166D

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

The transceiver has the following indicator and display:

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

Note

For TK-Dx00 without LCD, the content regarding the LCD display in the descriptions below is not applicable.

5.1 Busy LED

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

The Busy LED lights green while the transceiver is receiving a signal.

Also, whether the Busy LED will light while the transceiver receives in Emergency Mode can be configured. (Refer to Emergency LED on page 406.)

Configuration using KPG-166D

Configuring whether the Busy LED will light (See Edit > Optional Features > Optional Features 1) Common Page 3 > LEDs)

5.2 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 Emergency LED on page 406.)

Configuration using KPG-166D

Configuring whether the Transmit LED will light (See Edit > Optional Features > Optional Features 1 > Common Page 3 > LEDs)

5.3 LED Display

Compatible model: TK-Dx40 (Mobile)

TK-Dx40 (Mobile) is equipped with a 2-digit, 7-segment LED display. Information such as the channel number and transceiver status is shown in the LED display.

By illuminating the seven different bars and dots, the transceiver is able to indicate alphanumeric characters, symbols and the transceiver status.

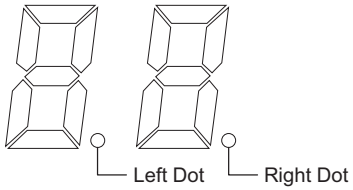


Figure 5-1 LED Display

Alphanumeric characters and symbols that can be shown in the LED display are as follows.

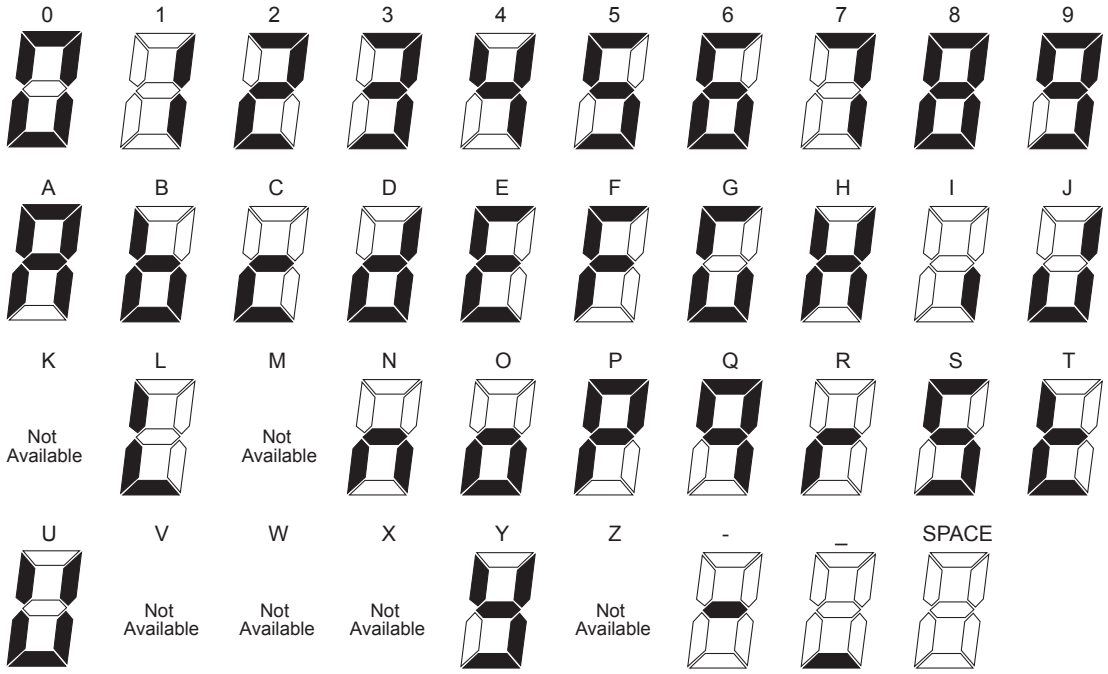
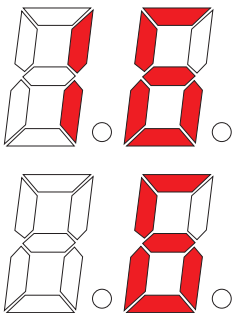
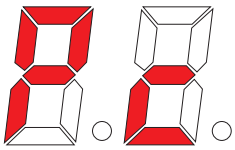
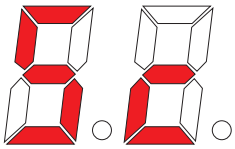
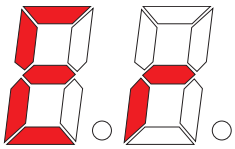
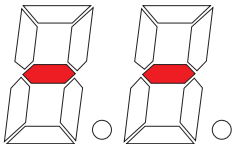
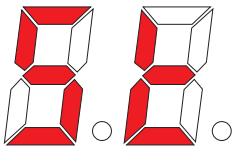


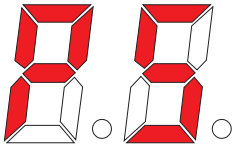
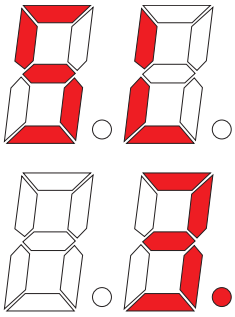
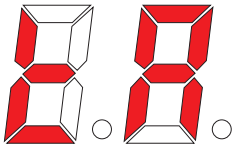
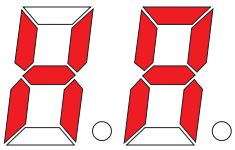
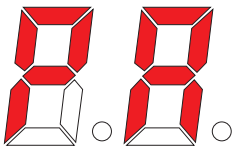
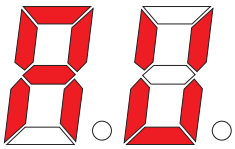
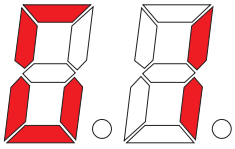
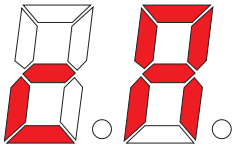
Figure 5-2 Alphanumeric Characters and Symbols that can be Displayed

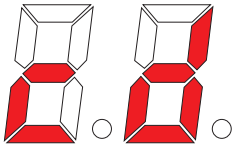
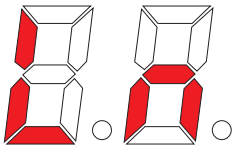
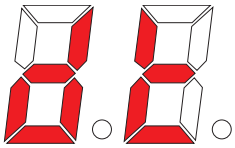
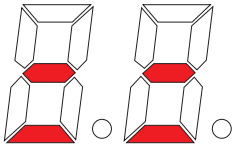
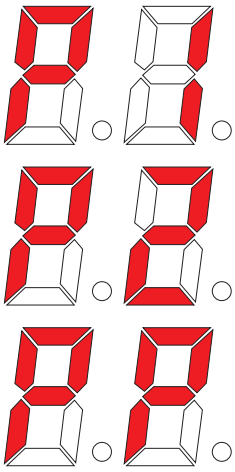
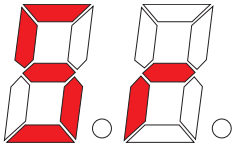
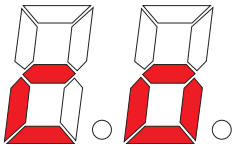
Information in the LED Display

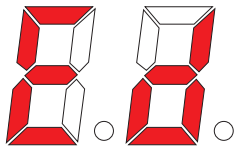
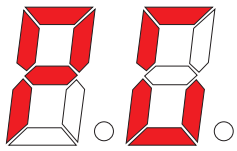
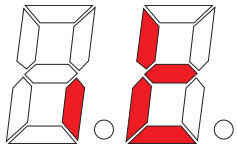
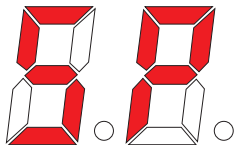
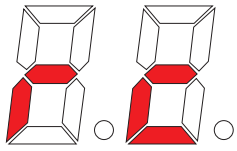
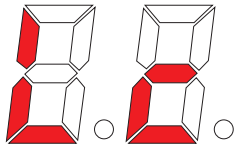
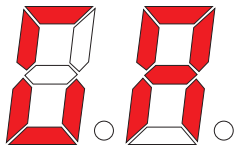
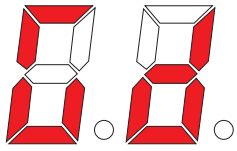
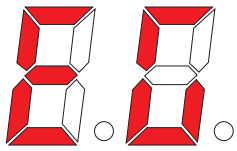
The LED display is able to show the following alphanumeric characters and symbols according to the status of the transceiver.

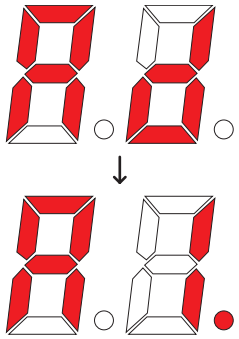
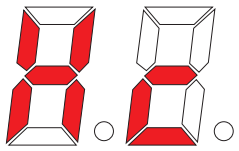
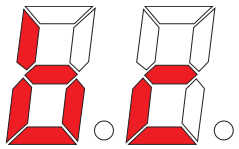
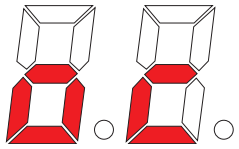
Table 5-1 Information in the LED Display

Status	Display	Remarks
Channel number display		Refer to 3.6 Changing the Zone-channel on page 29.
FPU Programming Mode Communicating with KPG-166D		Refer to 2 GETTING STARTED on page 11.
Scanning		Refer to 17 SCAN on page 431.
No response from the receiving transceiver or repeater during data transmission		
Data is not written to the transceiver		Refer to 3.1 Turning the Transceiver ON/ OFF on page 17.
In the Stun state		**DMR:** Refer to Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 197. **5-tone:** Refer to 9.8 Disabling the Transceiver Capability by Remote Control (Stun) on page 235. **FleetSync:** Refer to 12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 387.

Status	Display	Remarks
Transceiver Password Mode		Refer to 21.1 Password for Transceiver Operation (Transceiver Password) on page 461.
Squelch Level Mode		"SL" appears for 1 second upon entering the Squelch Level Mode. Next, the current squelch level is displayed, and the right dot starts blinking. Refer to Adjusting the Squelch Level (Squelch Level) on page 202.
Talk Around		Appears for 1 second when Talk Around is enabled. **DMR:** Refer to Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode) on page 117. **Analog:** Refer to Communicating Without Using a Repeater (Talk Around) on page 208.
Horn Alert		Appears for 1 second when Horn Alert is enabled. Refer to 20.2 Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert) on page 458.
Public Address		Appears for 1 second when Public Address is enabled. Refer to 6.7 Using the Transceiver as a Loudspeaker (Public Address) on page 103.
AUX		Appears for 1 second when AUX is enabled. Refer to 19.2 Functions Assignable to the AUX Output Port on page 454.
Zone display		Refer to 3.6 Changing the Zone-channel on page 29.
Scan Add channel		Refer to Adding or Deleting a Channel to/from the Target Channels for Scanning (Scan Delete/ Add) on page 440.

Status	Display	Remarks
Scan Delete channel		Refer to Adding or Deleting a Channel to/from the Target Channels for Scanning (Scan Delete/Add) on page 440.
Lone Worker Mode		Appears for 1 second upon entering the Lone Worker Mode. Refer to 14.7 Placing the Transceiver in Emergency Mode Using Lone Worker on page 412.
Currently receiving or sending Status Message		**DMR:** Refer to 8.10 Sending and Receiving a Status Message (Status Call) on page 149. **FleetSync:** Refer to 12.5 Sending and Receiving a Status Message (Status Call) on page 372.
Acknowledge Error Entered the busy state while data transmission is in progress		
Priority Channel		Appears for 1 second when Priority Channel is selected. Refer to 17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan) on page 434.
Scrambler		Appears for 1 second when Scrambler is enabled. Refer to 15 COMMUNICATION SECURITY on page 420.
Scrambler Code Mode		Refer to 15 COMMUNICATION SECURITY on page 420.

Status	Display	Remarks
Status Message transmission is complete		**DMR:** Refer to 8.10 Sending and Receiving a Status Message (Status Call) on page 149. **FleetSync:** Refer to 12.5 Sending and Receiving a Status Message (Status Call) on page 372.
Firmware Programming Mode		Refer to 22.3 Overwriting the Firmware (Firmware Programming Mode) on page 468.
Call Interrupt/ Call Interrupted		Refer to 8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) on page 188.
External Speaker		Refer to 6.8 Switching between the Built-in and External Speakers (External Speaker) on page 104.
Remote Control Mode		Refer to 8.17 Remote Operation by Radio Communication (Remote Control) on page 194.
Key Lock		Refer to 3.10 Locking the Transceiver Keys (Key Lock) on page 61.
Zone Add		Refer to Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/ Add) on page 442.
Zone Delete		Refer to Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/ Add) on page 442.
Emergency Status/ Lone Worker Status/ Man-down Status/ Stationary Status/ Motion Status		Refer to 14 COMMUNICATIONS IN AN EMERGENCY on page 394.

Status	Display	Remarks
Autodial Mode		Refer to Sending a DTMF Code by Selecting from a List (Autodial Mode) on page 218.
Home Channel		Refer to Changing the Channel with a Single Touch (Home Channel) on page 36.
Broadcast		Refer to 8.8 Making an Informative Group Call (Broadcast Group Call) on page 145.
OVCM		Refer to 8.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode) on page 186.

Adjusting the LED Display Brightness (LED Brightness)

LED Brightness is a feature for adjusting the brightness of the LED display. You can use the transceiver at dark places or at night by reducing the brightness of the LED display.

Pressing the **LED Brightness** key adjusts the brightness of the LED display to different levels. The brightness level changes in the following order: High → Low → Off. When the brightness level is set to “Off”, the LED light of the **PF** key goes off.

The brightness level of the backlight set using the **LED Brightness** key (High or Low) is maintained even after the power of the transceiver is turned OFF. When the brightness level of the backlight is set to “Off”, this state is maintained even after the power of the transceiver is turned OFF. Powering on the transceiver in this state starts up the transceiver in the Low state.

The brightness of the LED display can also be configured using KPG-166D.

Configuration using KPG-166D

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

5.4 Lighting up the LED According to the Transceiver Status

Compatible model: TK-Dx40 (Mobile)

The 2 dots in the LED display (left and right dots), when combined with the lighting operation of the LED (blue), can be used to indicate that the following functions are enabled.

- Talk Around
- Priority 1 Zone-Channel
- Priority 2 Zone-Channel
- Scan Delete/Add
- Zone Delete/Add
- Scrambler
- Horn Alert
- AUX
- Lone Worker
- Public Address
- External Speaker

When the functions are enabled using KPG-166D, you can configure which LED to illuminate for each function.

Configuration using KPG-166D

Configuring the LED Lighting Operation (See Edit > Optional Features > Optional Features 2 > LED)

5.5 Lighting the Backlight (Backlight)

Compatible model: TK-Dx00 with LCD

The backlight is equipped on the back side of the LCD on the transceiver. By lighting the backlight, the LCD can be viewed in dark places or at night.

Pressing the **Backlight** key toggles the backlight between On and Off. Also, the backlight will light when Auto Backlight is configured to be enabled.

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-166D

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

5.6 Changing the Brightness of the Backlight (LCD Brightness)

Compatible model: TK-Dx00 with LCD

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 → Medium → Low. Status of the backlight's brightness that was changed by the **LCD Brightness** key is retained even after the transceiver is turned OFF.

The brightness of the backlight can also be changed using KPG-166D.

Configuration using KPG-166D

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

5.7 The Icons on the LCD

Compatible model: TK-Dx00 with LCD

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

Table 5-2 Icon List

Icons	Description
	• Monitor Open/ Squelch Off Icon Appears when the transceiver is unmuted, or when signaling is disabled.
	• Call Icon Indicates the status of the signaling. There are 2 states as follows: Lighted: The state where the **PTT** switch is pressed and the signaling is disabled. Blinking: The state where the signaling matches.
 (Left)	• Zone Add Icon Appears when the zone to be scanned is selected.
 (Right)	• Channel Add Icon Appears when the channel to be scanned is selected.
	• Scan Icon The scan status appears. There are 2 states as follows: Lighted: Scanning. Blinking: Scan is paused.
	• Message Stack Icon Appears when the received message is stored in the transceiver stack memory. There are 2 states as follows: Lighted: The state when the message is stored in the transceiver stack memory. Blinking: The state when the unread message is stored in the transceiver stack memory.
	• Talk Around Icon Appears when the Talk Around is enabled.

Icons	Description
	• Scrambler Icon Appears when the Scrambler is enabled.
	• RSSI Icon Indicates the signal strength level.
	• Battery Status Icon Indicates the battery power level.
	• High Transmit Power Icon Appears when the channel configured to high power transmission is selected.
	• Low Transmit Power Icon Appears when the channel configured to low power transmission is selected. This icon appears in the same position as the High Transmit Power icon.
	• Lone Worker Icon Appears when the transceiver is in Lone Worker Mode.
	• GPS Icon GPS positioning status appears. There are 2 states as follows: Lighted: The state of when GPS positioning is being performed Unlighted: The state of when GPS positioning is not performed
	• Activity Detection Icon Appears when the Activity Detection is enabled.
	• Broadcast Call Icon Appears when the transceiver is in Broadcast Call Mode.
	• Keylock Icon Appears when the Keylock is enabled. This icon appears in the same position as the High Transmit Power icon.
	• Character Entry Icon : Upper case entry mode : Lower case entry mode : Number entry mode
	• OVCM Icon Appears when the transceiver is in OVCM Mode.

5.8 Displaying the Signal Strength (Signal Strength Indicator)

Compatible model: TK-Dx00 with LCD

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 5-3 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 of the communication area	-

Note

The signal strength references are rough indicators of room temperature.

Configuration using KPG-166D

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

5.9 Indication Functions of the Display

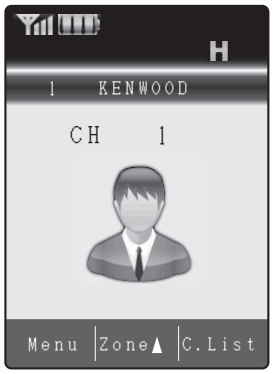
Compatible model: TK-Dx00 with LCD

The following functions are relevant to the display:

- Zone Name Display
- Display Format
- Power-on Text
- Sub-LCD Display

Zone Name Display

Zone Name Display is the function to display the zone name on the display.



Note

- If no Zone Name is configured, the zone number and the channel number appears on the 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, the zone name appears after the Power-on Text disappears.

Configuration using KPG-166D

Configuring the Zone Name Display to be enabled or disabled (See Edit > Optional Features > Optional Features 1 > Common Page 1)

Display Format

Display Format is the function to display on the transceiver display either only the channel name or both the zone number and channel number at the same time.

Table 5-4 Display Format

Configuration	Description
Channel Name	The channel name appears.
Zone-Channel Number	The zone number and channel number appear.

Pressing the **Display Format** key changes the display. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the display can be changed by selecting the “Display Format”. (Refer to 3.4 Using Menu Mode on page 24.)

Configuration using KPG-166D

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

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 sec during power-up.

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

Power-on Text = “TRUCK 0123”

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

Unit ID (Own)/ DMR = 6000

Power-on Text = “TAXI %%%%%%%%”

Note

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

Configuration using KPG-166D

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

Sub-LCD Display

Sub-LCD Display can be used to display the transceiver information on the sub-display while the transceiver is in the normal state. (Refer to 1.4 About LCD on page 7.)

Table 5-5 Sub-LCD Display

Configuration	Description
None	Nothing appears.
Zone Number	The zone number appears.
Channel Number	The channel number appears.

Configuration using KPG-166D

Configuring the Sub-LCD Display (See Edit > Optional Features > Optional Features 1 > Common Page 1)

5.10 Customizing a Displayed Text String (Display Customization)

Compatible model: TK-Dx00 with LCD

Using KPG-166D, this function can be used to change a string of text which appears on the LCD of the transceiver, such as Function Mode and Key Guide.

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.

Configuration using KPG-166D

Changing the text that appears on the LCD of the transceiver (See Edit > Display Customization)

5.11 Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen)

Compatible model: TK-Dx00 with LCD

Custom Start-up Screen can be used to display a bitmap image when the transceiver is turned ON. The image of a company name, logo, or simple message can be converted into bitmap image data and it can be displayed for 2 sec when the transceiver is turned ON. (Refer to Turning the Transceiver ON on page 17.)

The bitmap image in the following form can be used:

Size: 120 pixels (vertical) x 160 pixels (horizontal)

Colors: 65536 colors

Configuration using KPG-166D

Configuring the Custom Start-up Screen (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Power-on)

6.1 Tones that Sound When a User Operates the Transceiver or When the Transceiver Status Is Changed

Below is a list of the tones used for the transceiver:

Table 6-1 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 Priority-channel Tone Scan Stop Tone Call Request Tone Zone 1 Select Tone Zone 2 Select Tone Zone 3 Select Tone Zone 4 Select Tone Call In Progress Tone Disconnect Indication Tone Transaction Confirmed Tone Voice Stack Tone Confirm Tone Individual Call Tone Group Call 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 No Reply Tone Call Fail Tone Lone Worker Tone Call Processing Tone Man-down Pre-alert Stationary Pre-alert Motion Pre-alert
Locator Tone	Emergency Locator Tone
Sidetone	Proceed Tone VOX Proceed Tone PTT ID Sidetone
Volume Level Tone	Volume Key Tone Fixed Volume Key Tone
Alert Tone	Special Alert Tone

Power-on Tone

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

Table 6-2 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 (TK-Dx40 (Mobile) only)	When “Ignition and Switch” is configured in Ignition Sense Type, this tone is output from the transceiver when it is powered on by pressing and holding down the **Power** switch. Timed Power-off is not activated in this case.

Control Tone

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

Table 6-3 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 the Home Channel has been changed, or when data, such as 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 or the lowest channel number is selected. (Refer to Rollover/ End Stop on page 32.)
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 while the Zone-channel having the lowest number is selected. Also, this tone sounds from the transceiver if a user attempts to increase the Zone-channel while the Zone-channel having the highest number is selected. (Refer to Rollover/ End Stop on page 32.)
Password Authorization Tone	This tone sounds from the transceiver if the entered password matches the password preconfigured for the transceiver.
Priority-channel Tone (TK-Dx40 (Mobile) only)	This tone is output from the transceiver when scanning stops in the Priority Channel.
Scan Stop Tone	Pressing the **Home Channel** key during the scan causes the transceiver to pause scanning and migrate to the configured Home Channel. This tone sounds from the transceiver while the scan pauses.
Call Request Tone	In a DMR Conventional system, this tone sounds from the transceiver when the transceiver initiates an Individual Call (Individual Call Acknowledge Request) by pressing the **PTT** switch.
Zone 1 Select Tone (TK-Dx00 without LCD only)	For TK-Dx00 without LCD, this tone sounds from the transceiver if zone 1 is selected.
Zone 2 Select Tone (TK-Dx00 without LCD only)	For TK-Dx00 without LCD, this tone sounds from the transceiver if zone 2 is selected.

Function	Description
Zone 3 Select Tone (TK-Dx00 without LCD only)	For TK-Dx00 without LCD, this tone sounds from the transceiver if zone 3 is selected.
Zone 4 Select Tone (TK-Dx00 without LCD only)	For TK-Dx00 without LCD, this tone sounds from the transceiver if zone 4 is selected.
Call In Progress Tone	In a DMR Conventional system, this tone sounds from the transceiver if the transceiver initiates an Individual Call (Individual Call Acknowledge Request) and the transceiver is available for communications.
Disconnect Indication Tone	In a DMR Conventional system, this tone sounds from the transceiver if the transceiver terminates communications with an Individual Call (Individual Call Acknowledge Request).
Transaction Confirmed Tone	This tone sounds from the transceiver when the transceiver detects that no carrier is present after sending a Call Interrupt request message.
Voice Stack Tone	This tone sounds from the transceiver when a new Caller ID is stored in the stack memory of the transceiver.
Confirm Tone (TK-Dx40 (Portable) only)	This tone is output from the transceiver when VOX Gain Level is configured by pressing the **PTT** switch in the VOX Gain Level Mode.
Individual Call Tone	This tone sounds from the transceiver when the transceiver initiates an Individual Call.
Group Call Tone	This tone sounds from the transceiver when the transceiver initiates a Group Call.

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 6-4 Warning Tone

Function	Description
Warning Tone A	This tone sounds from the transceiver while an unprogrammed channel 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.
Warning Tone B (TK-Dx40 (Portable) only)	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	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 2	This tone sounds from the transceiver if the transceiver cannot send data since the channel is busy.
Timed Power-off Pre-alert Tone A (TK-Dx40 (Mobile) only)	This tone is output from the transceiver 1 minute before the time configured for Timed Power-off elapses.

Function	Description
Timed Power-off Pre-alert Tone B (TK-Dx40 (Mobile) only)	This tone is output from the transceiver 10 seconds before the time configured for Timed Power-off elapses.
Timed Power-off Pre-alert Tone C (TK-Dx40 (Mobile) only)	This tone is output from the transceiver 2 seconds before the time configured for Timed Power-off elapses.
No Reply Tone	This tone sounds from the transceiver when the transceiver cannot receive the acknowledgment from the receiving transceiver after sending a Status Message in a DMR Conventional system.
Call Fail Tone	In a DMR Conventional system, this tone sounds from the transceiver when the transceiver receives no effective response message from the repeater.
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.
Call Processing Tone	In a DMR Conventional system, this tone sounds from the transceiver when the transceiver initiates an Individual Call (Individual Call Acknowledge Request) by pressing the **PTT** switch. The tone from the transceiver continues to sound even if the **PTT** switch is released.
Man-down Pre-alert	This tone sounds from the transceiver when the transceiver detects being tilted by Man-down Detection and the time configured for Man-down Pre-alert elapses.
Stationary Pre-alert	This tone sounds from the transceiver when the transceiver detects being stationary by Stationary Detection and the time configured for Stationary Pre-alert elapses.
Motion Pre-alert	This tone sounds from the transceiver when the transceiver detects being heavily shaking by Motion Detection and the time configured for Motion Pre-alert elapses.

Locator Tone

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

Table 6-5 Locator Tone

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

Sidetone

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

Table 6-6 Sidetone

Function	Description
Proceed Tone	This tone sounds from the transceiver when the transceiver becomes available for communications after the **PTT** switch is pressed. (Refer to Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) on page 89.)
VOX Proceed Tone (TK-Dx40 (Portable) only)	This tone is output from the transceiver upon transmission when VOX is activated. (Refer to 18.6 Notifying the Start of VOX Transmission with a Tone (VOX Proceed Tone) on page 450.)
PTT ID Sidetone (TK-Dx40 only)	This tone is output from the transceiver when sending the FleetSync PTT ID. (Refer to Output of PTT ID Tone (PTT ID Sidetone) on page 365.)

Volume Level Tone

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

Table 6-7 Volume Level Tone

Function	Description
Volume Key Tone (TK-Dx40 (Mobile) only)	This tone sounds from the transceiver when the volume level is changed by pressing the **Volume Up** or **Volume Down** key.
Fixed Volume Key Tone	This tone sounds from the transceiver when the volume level is changed by using the **Fixed Volume** key.

Alert Tone

Alert Tone sounds from the transceiver when the transceiver receives various types of calls, Status Message, or Short Message. (Refer to 6.2 Tones that Sound When the Transceiver Receives a Call on page 87.)

Table 6-8 Alert Tone

Function	Description
Special Alert Tone	This tone sounds from the transceiver when the transceiver receives various types of calls, Status Message, or Short Message. A maximum of 8 types of tones can be arbitrarily configured or changed. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)

6.2 Tones that Sound When the Transceiver Receives a Call

An Alert Tone sounds from the transceiver such as when the transceiver receives a call using an Individual Call or a Group Call, a Status Message, or a Short Message and notifies the user of the reception.

The Alert Tone pattern can be configured by selecting from 8 types of tones configured for Special Alert Tone. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)

The following are the types of Alert Tone:

Table 6-9 Alert Tone

DMR	
Alert Tone (Individual Call)	This tone sounds from the transceiver when the transceiver receives an Individual Call.
Alert Tone (Group Call)	This tone sounds from the transceiver when the transceiver receives a Group Call.
Alert Tone (Broadcast Call)	This tone sounds from the transceiver when the transceiver receives a Broadcast Call.
Alert Tone (Status/Short Message Call)	This tone sounds from the transceiver when the transceiver receives a Status Message or a Short Message.
Alert Tone (Emergency Response)	This tone sounds from the transceiver when the transceiver receives an Emergency Call.
Alert Tone (Paging Call)	This tone sounds from the transceiver when the transceiver receives a Paging Call.
FleetSync	
Alert Tone (Individual Call)	This tone is output from the transceiver when it receives a FleetSync Individual Call.
Alert Tone (Other Selective Calls)	This tone is output from the transceiver when it receives a FleetSync Group Call, Fleet Call, Supervisor Call or Broadcast Call.
Alert Tone (Status/Short Message Call)	This tone sounds from the transceiver when the transceiver receives a FleetSync Status Call.
Alert Tone (Emergency Response)	This tone sounds from the transceiver when the transceiver receives a FleetSync Emergency Call.
Alert Tone (Paging Call)	This tone is output from the transceiver when it receives a FleetSync Paging Call.

Configuration using KPG-166D

- Configuring the DMR Alert Tones (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring the FleetSync Alert Tones (See Edit > FleetSync > General 2 > Alert Tone)

Configuring the Alert Tone (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-166D. The following table shows the configuration items for the Autodial List:

Table 6-10 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 s can be configured in steps of 1 s.

Configuration using KPG-166D

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

6.3 Tones that Sound When the Communication Starts/ Ends

These tones sound when the communication starts or ends and notifies the user of it.

Using Sound to Notify the Timing to Start Communications (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.

If a user starts speaking at the time when the PTT Proceed Tone sounds from the transceiver, 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.

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.
- When the transceiver is configured to output a different Sidetone, such as 5-tone or Background Transmission, PTT Proceed Tone is not output from the transceiver even when PTT Proceed Tone is enabled.
- The PTT Proceed Tone also sounds when audio is transmitted by a PC command.
- The PTT Proceed Tone does not sound from the transceiver if “External PTT (Data)” or “Data PTT” is assigned to the port.

Configuration using KPG-166D

- Configuring whether to emit the PTT Proceed Tone (See Edit > Optional Features > Optional Features 2 > Conventional > PTT Proceed Tone)
- Configuring the Proceed Tone Delay Time (See Edit > Optional Features > Optional Features 2 > Conventional > PTT Proceed Tone)

Using Sound to Notify the Other Party that the Communication Ends (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. With this function, knowing an audible tone marks the end of a call will allow the receiving party to easily recognize the timing to transmit next.

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

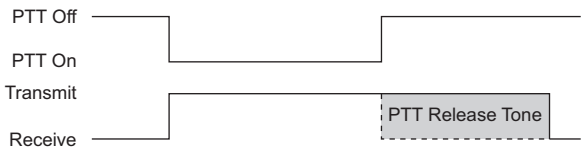


Figure 6-1 PTT Release Tone

You can also configure the volume level of PTT Release Tone (Transmit Tone Deviation) output from the target station on TK-Dx40.

Note

- The transceiver transmits the PTT Release Tone when the transceiver finishes transmitting even if the transceiver starts transmitting using anything other than the **PTT** switch. However, the transceiver does not transmit the PTT Release Tone when voice communications are interrupted by the Call Interruption function or while the transceiver is in Emergency Mode.
- The PTT Release Tone setting is disabled for channels using 5-tone. To transmit the PTT Release Tone on a channel using 5-tone, “Release Tone” needs to be configured for Encode Code (Releasing PTT). (Refer to Sending a Selective Call on page 252.)
- If the EOT of DTMF is configured, the PTT Release Tone is transmitted after the EOT is transmitted. If the EOT of FleetSync is configured, the EOT is transmitted after the PTT Release Tone is transmitted.

Configuration using KPG-166D

- Configuring the PTT Release Tone to be enabled or disabled (See Edit > Optional Features > Optional Features 2 > Conventional)
- Configuring the Transmit Tone Deviation (See Edit > Optional Features > Optional Features 2 > Conventional)

6.4 Functions Related to the Volume Configuration

The following functions are relevant to the volume configuration:

- Minimum Volume
- Maximum Volume
- Tone Volume Offset
- Tone Volume
- Selectable Tone Level
- Speaker Attenuation

Configuring the Minimum Volume Level (Minimum Volume)

TK-Dx00/ TK-Dx40 (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.

TK-Dx40 (Mobile)

For TK-Dx40 (Mobile), the Minimum Volume varies with the configuration of Minimum Volume Type.

- **When “Preset” is configured for Minimum Volume Type**

  This feature automatically adjusts the volume to the Minimum Volume level when the transceiver is powered on again even when the volume is lowered to the minimum before it is powered off.

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

  This feature prevents the audio sound from turning off completely even when the volume has been lowered to the minimum.

  The remaining volume of the audio prevents the user from missing out any received audio even when the volume has been turned down accidentally to the minimum. Raising the volume level in this case restores it to the configured Minimum Volume level. If “0” is configured for Minimum Volume, the received audio sound will not be audible when the volume level is turned down to the minimum.

Configuration using KPG-166D

- Configuring the Minimum Volume (TK-Dx00/ TK-Dx40 (Mobile)) (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Audio Volume)
- Configuring the Minimum Volume Type (TK-Dx40 (Mobile)) (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Audio Volume)
- Configuring the Minimum Volume (TK-Dx40 (Portable)) (See Edit > Optional Features > Optional Features 1 > Common Page 1)

Configuring the Maximum Volume Level (Maximum Volume)

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-166D

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

Configuring the Offset Value for Volume Level (Tone Volume Offset)

Compatible model: TK-Dx00

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-166D

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

Configuring the Volume Level of Various Tones (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 of the following tones can be configured using KPG-166D:

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

The following are the types of tone volume that can be configured:

Table 6-11 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 Changing the Tone Volume Level with a Single Touch (Selectable Tone Level) on page 93.)

Configuration using KPG-166D

Configuring the Tone Volume of various tones (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Tone Volume)

Changing the Tone Volume Level with a Single Touch (Selectable Tone Level)

Compatible model: TK-Dx00/ TK-Dx40 (Mobile)

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-166D.

In the case of TK-Dx00, by pressing the **Menu** key to enter the Menu Mode, you can select “Fixed Volume” to change the Tone Volume. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

1 **Press the Fixed Volume key.**

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

Configuration using KPG-166D

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

Temporarily Reducing the Volume Level of the Speaker Microphone (Speaker Attenuation)

Compatible model: TK-Dx00

Speaker Attenuation can be used to temporarily reduce the volume level of the speaker microphone.

This function can be used while the transceiver is in use in a quiet place. This function is normally activated and the transceiver can pause Speaker Attenuation only if making an important call, such as an emergency call.

Pressing the **Speaker Attenuation** key toggles Speaker Attenuation between activated and deactivated.

Operating the Transceiver

● Activating Speaker Attenuation

1 **Press the Speaker Attenuation key while the Speaker Attenuation is deactivated.**

Speaker Attenuation is activated and then the volume level will be decreased by approximately 10 dB.

● Deactivating Speaker Attenuation

1 **Press the Speaker Attenuation key while the Speaker Attenuation is activated.**

Speaker Attenuation is deactivated and then the volume level will restore to the previous level.

Note

- "Speaker Attenuation" can only be assigned to a **PF** key on the speaker microphone.
- Speaker Attenuation is deactivated if the speaker microphone is removed while Speaker Attenuation is activated.

Configuration using KPG-166D

Assigning functions to the PF keys on the Speaker Microphone (See Edit > Key Assignment > Mic Key)

Adjusting the Volume Level (Fine Volume Control)

Compatible model: TK-Dx40 (Portable)

Fine Volume Control is the function to make the change of the volume level gradual.

If this function is enabled, the maximum volume level can be lowered by 6 dB.

This function is used to adjust the volume level in detail at low volume levels.

Configuration using KPG-166D

Configuring the Fine Volume Control to be enabled or disabled (See Edit > Optional Features > Optional Features 1 > Common Page 1)

6.5 Restricting Alert Tone When Consecutively Receiving a Call (Alert Tone Restriction from 2nd Call) (DMR Conventional System Only)

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.
- **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.
- **Horn Alert (TK-Dx40 (Mobile) only)**
  The headlight of the vehicle connected to the Horn Alert port does not light up and the horn does not sound 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.

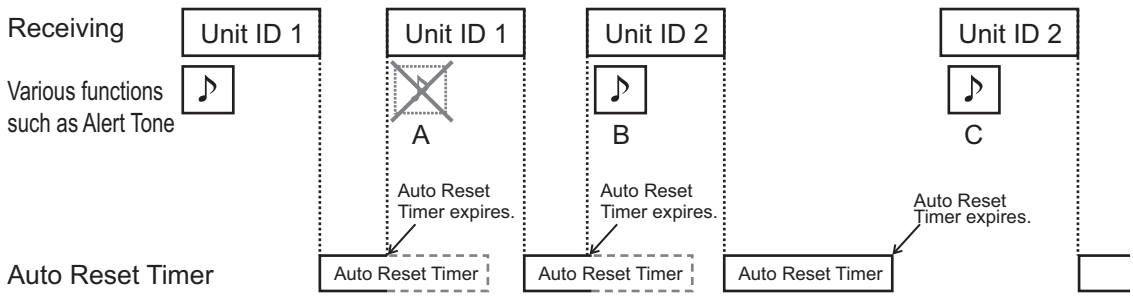


Figure 6-2 Alert Tone Restriction from 2nd Call (Individual Call)

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 if 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 if 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.

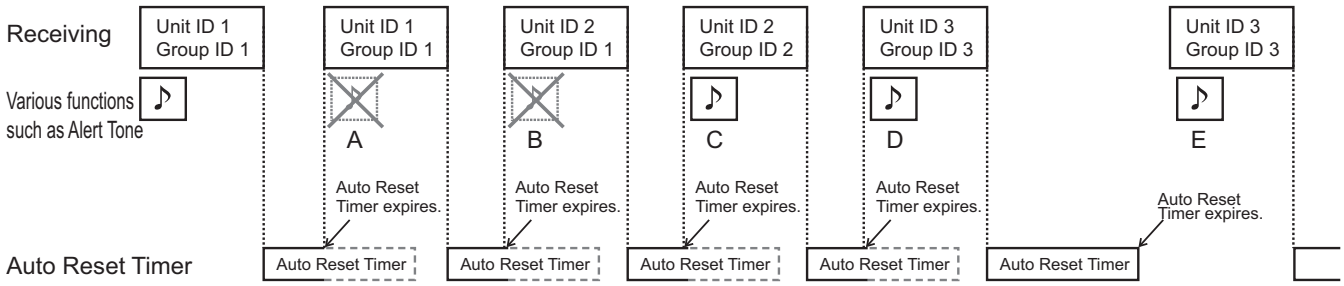


Figure 6-3 Alert Tone Restriction from 2nd Call (Group Call)

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 if 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 if 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 if 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 the 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-166D

Configuring the Alert Tone Restriction from 2nd Call to be enabled or disabled (See Edit > DMR > General)

6.6 Adjusting Audio Characteristics (DMR Conventional System Only)

Audio is the function to adjust audio characteristics according to the operating environment.

Depending on the configuration for Function Type, the audio function used for adjusting the audio quality varies as below.

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
- Auto Gain Control (RX Audio Response)
- Audio Equalizer (RX Audio Response)
- Auto Gain Control (TX Audio Response)
- Audio Equalizer (TX Audio Response)
- Noise Suppressor

Note

If the following functions are assigned to Menu Mode, the configuration for each function can be changed by pressing a key of the transceiver: (Refer to 3.4 Using Menu Mode on page 24.)

- External Microphone Type
- RX Audio Equalizer
- RX Auto Gain Control
- TX Audio Equalizer
- TX Auto Gain Control
- TX Noise Suppressor

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 6-12 External Microphone Type (TK-Dx00)

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: KMC-41, KMC-42W
Microphone 2	Enables the capability to adjust the audio characteristics of the following microphones: KMC-47GPS

Table 6-13 External Microphone Type (TK-Dx40)

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 and KMC-36
Microphone 2	Enables the capability to adjust the audio characteristics of the following microphones: Portable: KMC-48 Mobile: KMC-30 and 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 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	Enables the capability to adjust the audio characteristics of the following microphones: Portable: KHS-10
Microphone 7	Enables the capability to adjust the audio characteristics of the following microphones: Portable: EMC-11
Microphone 8	Enables the capability to adjust the audio characteristics of the following microphones: Portable: KHS-1
Microphone 9	Enables the capability to adjust the audio characteristics of the following microphones: Portable: KHS-29F
Microphone 10	Enables the capability to adjust the audio characteristics of the following microphones: Portable: KEP-2

Note

- To use an external microphone unlisted in the description of Table 6-12 and Table 6-13, configuring “None” in External Microphone Type is recommended.
- The transceiver enters External Microphone Type Mode by a user pressing the **Menu** key to enter Menu Mode, and then selecting “External Microphone Type”. In External Microphone Type Mode, the configuration for External Microphone Type can be changed.

Configuration using KPG-166D

- Configuring the External Microphone Type (See Edit > Optional Features > Optional Features 2 > Audio)
- Configuring External Microphone Type (See Edit > DMR > Conventional 2 > Audio > TX Audio Response)

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 6-14 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 the 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 an equal level.
- The transceiver enters Menu Mode by a user pressing the **Menu** key, and then the transceiver enters RX Auto Gain Control Mode by a user selecting “RX Auto Gain Control”. In RX Auto Gain Control Mode, the configuration for Auto Gain Control (RX Audio Response) can be changed.

Configuration using KPG-166D

- Configuring the Auto Gain Control (RX Audio Response) (See Edit > Optional Features > Optional Features 2 > Audio > RX Audio Response)
- Configuring Auto Gain Control (RX Audio Response) (See Edit > DMR > Conventional 2 > Audio > RX Audio Response)

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 6-15 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.

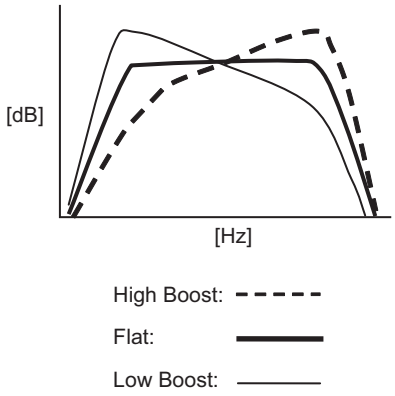


Figure 6-4 The Image of the Frequency Characteristic

Note

The transceiver enters RX Audio Equalizer Mode by a user pressing the **Menu** key to enter Menu Mode and then selecting “RX Audio Equalizer”. In RX Audio Equalizer Mode, the configuration for Audio Equalizer (RX Audio Response) can be changed.

Configuration using KPG-166D

- Configuring the Audio Equalizer (RX Audio Response) (See Edit > Optional Features > Optional Features 2 > Audio > RX Audio Response)
- Configuring Audio Equalizer (RX Audio Response) (See Edit > DMR > Conventional 2 > Audio > RX Audio Response)

Noise Suppressor

Noise Suppressor is the function to transmit a signal by reducing the background noise when the transceiver transmits a DMR 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.

Note

The transceiver enters TX Noise Suppressor Mode by a user pressing the **Menu** key to enter Menu Mode and then selecting "TX Noise Suppressor". In TX Noise Suppressor Mode, the configuration for Noise Suppressor can be changed.

Configuration using KPG-166D

- Configuring the Noise Suppressor to be enabled or disabled (See Edit > Optional Features > Optional Features 2 > Audio > TX Audio Response)
- Configuring Noise Suppressor to be enabled or disabled (See Edit > DMR > Conventional 2 > Audio > TX Audio Response)

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 6-16 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

- Mic Sense can be enabled even if "On" or "Off" is configured for the Auto Gain Control (TX Audio Response). However, configuring this function as "Off" allows Mic Sense to function more effectively.
- The transceiver enters Menu Mode by a user pressing the **Menu** key, and then the transceiver enters TX Auto Gain Control Mode by a user selecting "TX Auto Gain Control". In TX Auto Gain Control Mode, the configuration for Auto Gain Control (TX Audio Response) can be changed.

Configuration using KPG-166D

- Configuring the Auto Gain Control (TX Audio Response) (See Edit > Optional Features > Optional Features 2 > Audio > TX Audio Response)
- Configuring Auto Gain Control (TX Audio Response) (See Edit > DMR > Conventional 2 > Audio > TX Audio Response)

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 6-17 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.

Note

The transceiver enters TX Audio Equalizer Mode by a user pressing the **Menu** key to enter Menu Mode and then selecting “TX Audio Equalizer”. In TX Audio Equalizer Mode, the configuration for Audio Equalizer (TX Audio Response) can be changed.

Configuration using KPG-166D

- Configuring the Audio Equalizer (TX Audio Response) (See Edit > Optional Features > Optional Features 2 > Audio > TX Audio Response)
- Configuring Audio Equalizer (TX Audio Response) (See Edit > DMR > Conventional 2 > Audio > TX Audio Response)

External Speaker Type

Compatible model: TK-Dx40 (Mobile)

External Speaker Type is the function to configure the type of the external speaker to be connected to the transceiver and keep the audio in optimum condition.

Each optional external speaker to be connected to the transceiver has different audio characteristics. Use of this function equalizes audio characteristics and adjusts the condition appropriate for digitalization.

Table 6-18 Configuration of External Speaker Type

Configuration	Description
None	This needs to be configured to use the internal speaker. Disables the capability to adjust audio characteristics.
Speaker 1	Enables the capability to adjust the audio characteristics of the following speaker: KES-3
Speaker 2	Enables the capability to adjust the audio characteristics of the following speaker: KES-5
Speaker 3	Enables the capability to adjust the audio characteristics of the following speaker: When external speakers other than KES-3 and KES-5 are used

Configuration using KPG-166D

Configuring External Speaker Type (See Edit > DMR > Conventional 2 > Audio > RX Audio Response)

6.7 Using the Transceiver as a Loudspeaker (Public Address)

Compatible model: TK-Dx40 (Mobile)

Public Address is a feature that enables the use of the transceiver as a loudspeaker.

With Public Address enabled and the **PTT** switch pressed and held down, audio sound input through the microphone is output from the external speaker for Public Address that is connected to the D-sub 15-pin connector at the rear of the transceiver.

Operating the Transceiver

● Enabling Public Address

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

Doing so enables Public Address. “PA” appears in the LED display for 1 second.
When the two dots in the LED display (left dot and right dot) as well as the LED (blue) are configured to light up, each of the LEDs will remain lit while Public Address is enabled.

● Disabling Public Address

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

Doing so disables Public Address.

Note

- Transmission is disabled when Public Address is enabled.
- An external speaker for Public Address is needed when using the Public Address feature. For details on how to connect an external speaker for Public Address to the transceiver, please refer to the servicing manual.
- Changing the Zone Channel disables Public Address when it is enabled.
- When Public Address is enabled, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

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

6.8 Switching between the Built-in and External Speakers (External Speaker)

Compatible model: TK-Dx40 (Mobile)

External Speaker is a feature that switches between the external speaker connected to the D-sub connector of the transceiver and the built-in speaker of the transceiver.

Press the **External Speaker** key to enable or disable External Speaker.

When External Speaker is enabled, audio sound is output from the external speaker. When External Speaker is disabled, audio sound is output from the built-in speaker.

Operating the Transceiver

● Enabling the External Speaker

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

External Speaker is enabled and a Key Beep A tone is output from the built-in speaker. “SP” appears in the LED display for 1 second.
When the two dots in the LED display (left dot and right dot) as well as the LED (blue) are configured to light up, each of the LEDs will remain lit while External Speaker is enabled.

● Enabling the Built-in Speaker

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

External Speaker is disabled and a Key Beep B tone is output from the built-in speaker.

Note

- You can switch between the external speaker and the built-in speaker only when an external speaker is connected to the D-sub connector of the transceiver. For details on how to connect an external speaker to the D-sub connector of the transceiver, please refer to the servicing manual.
- When External Speaker is enabled, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)
- The External Speaker status (enabled or disabled) is retained even while the transceiver is turned OFF.

Configuration using KPG-166D

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

For Portable, a user can be notified on the level of the remaining battery power on the LCD and by LED. And, a user can also use the function to save the battery consumption.

For TK-Dx40 (Mobile), a user can be notified by a warning tone that the battery voltage of the vehicle battery is low.

7.1 Displaying the Remaining Battery Power Level (Battery Indicator)

TK-Dx00 with LCD

For TK-Dx00 with LCD, Battery Indicator shows a warning icon on the LCD and a warning message in the LED display when the remaining battery level is low.

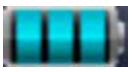
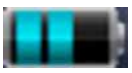
Conditions to activate the Battery Indicator vary depending on the configuration for Battery Warning. (Refer to 7.2 Warning that the Battery Voltage Is Low (Battery Warning) on page 107.)

Table 7-1 Battery Indicator (TK-Dx00 with LCD)

Configuration	Description
Off	The transceiver does not notify a user on the LCD and by LED when the remaining battery power 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, the “Battery Status” icon does not appear if “While Transmitting” is configured for Battery Warning.
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, the “Battery Status” icon does not appear if “While Transmitting” is configured for Battery Warning.

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 7-2 Battery Status Icon

Icons	Status
	Full
	Sufficient
	Low
	Very Low

TK-Dx00 without LCD/ TK-Dx40 (Portable)

For TK-Dx00 without LCD, Battery Indicator shows a warning message in the LED display when the remaining battery level is low.

Conditions to activate the Battery Indicator vary depending on the configuration for Battery Warning. (Refer to 7.2 Warning that the Battery Voltage Is Low (Battery Warning) on page 107.)

Table 7-3 Battery Indicator (TK-Dx00 without LCD)

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.

The transceiver notifies a user that the remaining battery level is low by lighting or blinking the LED as follows:

Table 7-4 LED

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

Configuration using KPG-166D

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

7.2 Warning that the Battery Voltage Is Low (Battery Warning)

Compatible model: Portable

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 for Battery Indicator when the battery voltage level goes lower than the warning voltage level. (Refer to 7.1 Displaying the Remaining Battery Power Level (Battery Indicator) on page 105.)

Table 7-5 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 power 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 cannot be activated if “Off” has been configured for Battery Indicator.

Configuration using KPG-166D

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

7.3 Warning That the Battery Voltage of the Vehicle Battery Is Low (Battery Warning)

Compatible model: TK-Dx40 (Mobile)

For TK-Dx40 (Mobile), Battery Warning is the function to notify a user by a warning tone that transmission is restricted because the battery voltage of the vehicle battery is low.

If the battery voltage of the vehicle battery goes lower than the threshold (9.0 V) when the transceiver is not transmitting, a Battery Warning Tone sounds from the transceiver. If the battery voltage of the vehicle battery recovers to the threshold (9.0 V), the Battery Warning Tone stops.

If the voltage of the vehicle battery is lower than the threshold (9.0 V) when transmitting, transmission cannot occur. In this case, while the **PTT** switch (including External PTT (Voice), External PTT (Data), and Data PTT) is being pressed, a Warning Tone A sounds from the transceiver. When the **PTT** switch is not pressed, a Warning Tone C sounds from the transceiver.

Note

- For Mobile, “Always” is configured in Battery Warning, and the function always works as above.
- The threshold (9.0 V) is not determined while transmitting.

Configuration using KPG-166D

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

7.4 Reducing Battery Consumption (Battery Saver)

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

The transceiver receives intermittently in the following conditions:

- When there is no carrier and no key is pressed for 5 sec or more
- When there is a carrier, but the QT tone, DQT code, or Color Code does not match that preconfigured for the transceiver and no key is pressed for 5 sec 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 7-6 Duration of the Battery Saver

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

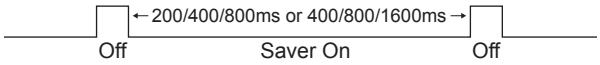


Figure 7-1 Battery Saver

Note

Battery Saver is not activated while the transceiver is scanning, or while the transceiver is in Emergency Mode or Maintenance Mode.

Configuration using KPG-166D

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

DMR is a generic name for a digital communication system protocol utilizing 4-level FSK. Using DMR, the transceiver can initiate an individual call or group call for voice calls, text data communications or GPS data communications. Also, connecting a transceiver to an external device (such as a PC) allows communication because the transceiver supports serial command communication.

In a DMR Conventional system, communications are realized by sending and receiving digital signals on a DMR digital channel. Using a DMR ID (Unit ID or Group ID) allows the various communications.

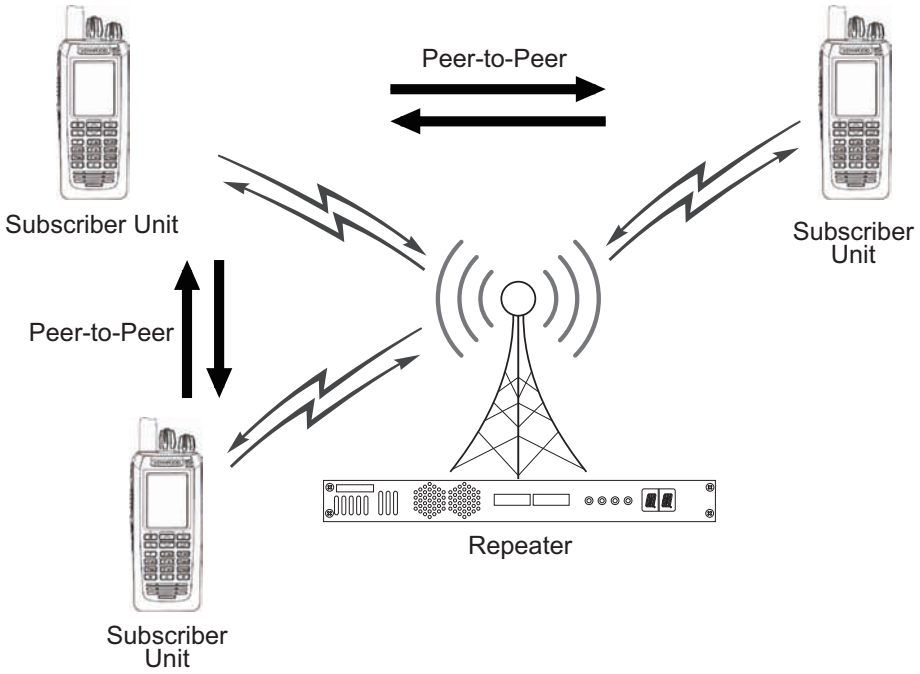


Figure 8-1 Image of Communications in a DMR Conventional System

Transceivers can communicate directly between transceivers without using a repeater. (Refer to Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode) on page 117.)

Or, the transceiver can communicate with another transceiver via a repeater. (Refer to Communicating via a Repeater (Repeater Mode) on page 119.)

8.1 Initiating Voice Communications (Basic Transmission and Reception)

This section describes the basic methods for transmission and reception in a DMR Conventional system and the relevant functions.

About Own ID

To initiate various communications using DMR, a Unit ID (Own), the identification code of a transceiver, needs to be configured for the transceiver.

One Unit ID (Own) can be configured for each transceiver.

Configuration using KPG-166D

Configuring the Unit ID (Own) (See Edit > DMR > Conventional 1)

Receiving

Received audio sounds from the speaker if the transceiver receives digital signals, and the frequency matches the frequency of the channel on which the transceiver has waited for or the DMR ID matches the DMR ID preconfigured for the transceiver. When a signaling (Color Code) is used, communications are possible if the received Color Code matches the Color Code which the transceiver waits for.

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.

Auto Reset Timer can be configured by using KPG-166D. Also, how the transceiver behaves after the amount of time configured for Auto Reset Timer elapses can be configured.

Table 8-1 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	If this function is enabled, the blinking orange BUSY LED for the Selective Call Alert LED turns Off when the time configured for the Auto Reset Timer elapses.
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 (TK-Dx00 with LCD only)	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 not available on TK-Dx00 without LCD.

Configuration using KPG-166D

Configuring the Auto Reset Timer (See Edit > DMR > Conventional 2 > Alert Reset)

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash when the transceiver receives a call using a DMR ID. A user can notice by the LED that the transceiver is receiving a call.

Table 8-2 Flashing LED Colors

Compatible Model	Flashing LED Color
TK-Dx00	Orange
TK-Dx40	Orange or blue

Note

For TK-Dx00 without LCD and TK-Dx40, the flashing LED indicates the following statuses of the transceiver when the transceiver receives a Selective Call:

(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, the LED flashes with the status (a) even 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. 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 DMR ID 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 Auto Reset Timer on page 111.)

Configuration using KPG-166D

Configuring the Selective Call Alert LED (See Edit > DMR > Conventional 3)

Searching Whether the Transceiver Receives a Call (Scan)

Using the Scan function, the transceiver can check each channel in turn whether the channel has a signal. If a channel has a signal, the transceiver receives the signal on the channel.

The following scan functions can be used in a DMR Conventional system.

- Single Scan
- Multi Scan

Refer to 17 SCAN on page 431 for details of Scan.

Transmitting

Transmitting can be initiated by pressing the **PTT** switch, or by selecting a DMR ID and then pressing the **PTT** switch. When a signaling (Color Code) is used, the transceiver sends the Color Code. In this case, if the transmitted Color Code matches the Color Code preconfigured for the receiving transceiver, the transceivers can communicate.

Restricting the Duration of Continuous Transmission (Time-out Timer)

Time-out Timer (TOT) is the function 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 transceiver automatically stops transmitting and releases the channel if it continuously transmits longer than the configured time.

Time-out Timer can be configured for each zone. Also, timers, such as TOT Pre-alert, TOT Rekey Time, and TOT Reset Time, relevant to Time-out Timer can be configured.

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 sec, TOT Pre-alert: 4 sec

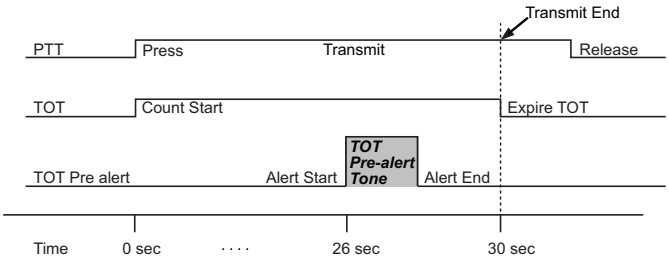


Figure 8-2 TOT Pre-alert

Note

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

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.
Example: Time-out Timer: 30 sec, TOT Rekey Time: 20 sec

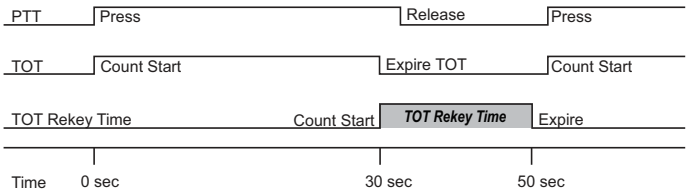


Figure 8-3 TOT Rekey Time

Note

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

TOT Reset Time

TOT Reset Time is the time required to reset the elapsed time for Time-out Timer.
Example 1: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

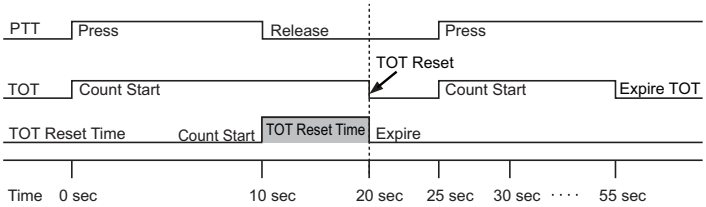


Figure 8-4 TOT Reset Time 1

The transceiver considers a retransmission within this configured length of time as a continuous transmission. In the following example, the counting of Time-out Timer continues because the transmission was started by a user pressing the **PTT** switch while the TOT Reset Time was counting down.
Example 2: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

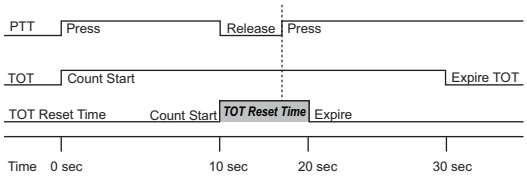


Figure 8-5 TOT Reset Time 2

Note

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

Configuration using KPG-166D

- Configuring the Time-out Time (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Pre-alert (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Rekey Time (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Reset Time (See Edit > Zone Information > Zone Edit)

Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))

Busy Channel Lockout is the function to automatically restrict 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, Warning Tone A is output from the transceiver, and transmission is disabled. In this case, “BUSY” appears on the display of TK-Dx00 with LCD. The Warning Tone A sounds from the transceiver until the **PTT** switch is released.

Following are conditions to disable transmission by Busy Channel Lockout (DMR):

Table 8-3 Busy Channel Lockout (DMR)

Configuration	Description
No	Busy Channel Lockout is disabled. Transmission is not restricted even if the channel on which the transceiver attempts to transmit is busy.
Carrier Only	The transceiver cannot transmit while the transceiver is receiving a carrier.
Correct CC	The transceiver cannot transmit if the transceiver receives a carrier and the received Color Code matches the Color Code preconfigured for the transceiver.
Interrupt CALL	The current incoming call can be interrupted by pressing the **PTT** switch to respond (Talkback) while receiving an Individual Call, Group Call, or Unaddress Call addressed to the own transceiver.

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 “DMR” is configured for Transmit Mode:**
  The transceiver transmits according to the configuration for Busy Channel Lockout (DMR).

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 DMR). If the transceiver receives an analog signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (Analog). If the transceiver receives a DMR signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (DMR).

Note

- Refer to Avoiding Interference with Other Communications (Busy Channel Lockout (Analog)) on page 206 for details on the transceiver behavior of the Busy Channel Lockout (Analog).
- Busy Channel Lockout cannot be activated in Emergency Mode.

Configuration using KPG-166D

Configuring the Busy Channel Lockout (DMR) (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Preferentially Using a Channel Being Used by Other Parties (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

- This feature is also activated during transmission using the VOX feature on TK-Dx40 (Portable). During VOX transmission, Busy Channel Lockout can be disabled temporarily to enable transmission if audio sound is input within 500 ms after the transceiver starts outputting Warning Tone B.
- This feature is also activated during transmission using the External PTT (Voice) or External PTT (Data) port on TK-Dx40 (Mobile). During External PTT transmission, Busy Channel Lockout can be disabled temporarily to enable transmission if audio sound is input within 500 ms after the transceiver starts outputting Warning Tone C.

Configuration using KPG-166D

Configuring the BCL Override to be enabled or disabled (See Edit > Zone Information > Zone Edit)

Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode)

Talk Around

Talk Around is the function allowing direct communication between transceivers 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.

The transceiver with Talk Around enabled transmits on the receive frequency and the Decode Signaling Color Code configured for the selected channel.

Pressing the **Talk Around** key toggles Talk Around between enabled and disabled.

In the case of TK-Dx00 with LCD, by pressing the **Menu** key for the transceiver to enter the Menu Mode, you can select “Talk Around” to enable or disable Talk Around. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

● Enabling the Talk Around

1 **Press the Talk Around key while Talk Around is disabled.**

Talk Around is enabled. In the case of TK-Dx00 with LCD, the “ ” icon lights up. If Talk Around is enabled on TK-Dx40 (Mobile), “ t A” appears for 1 second in the LED display before the previous display appears.

● Disabling the Talk Around

1 **Press the Talk Around key while Talk Around is enabled.**

Talk Around is disabled. In the case of TK-Dx00 with LCD, the “ ” icon disappears.

Note

- The enabled status of Talk Around is disabled by changing the zone or channel while Talk Around is enabled.
- If the transceiver starts scanning, the enabled status of Talk Around is disabled. Talk Around cannot be enabled while scanning. Talk Around can be enabled while the scan pauses, but the enabled status of Talk Around is disabled after the scan resumes.
- Talk Around is disabled in Emergency Mode.
- When Voice Scrambler is enabled on TK-Dx40 (Mobile), you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

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

DMR Direct Mode

DMR Direct Mode is the function allowing direct communication between transceivers without using a repeater.

If the transmit frequency and receive frequency are the same configuration on a DMR digital channel, the channel can be used in DMR Direct Mode. Also, the channel can be used in DMR Direct Mode even if the Talk Around function is enabled.

Simultaneous Communications by Dual Slot Direct Mode

The DMR Direct Mode communication methods have the new version (ETSI TS 102 361-1 V2.2.1 2013-02 or later) and old version (earlier than ETSI TS 102 361-1 V2.2.1 2013-02).

Which version is used to communicate can be configured by configuring Dual Slot Direct Mode using KPG-166D.

Table 8-4 Dual Slot Direct Mode

Configuration	Description
Enabled	The transceiver communicates using the new version of DMR Direct Mode. In the new version of DMR Direct Mode, if the slot numbers are different, communications of 2 parties can be realized separately without receiving interference even on the channel with the same frequency configured.
Disabled	The transceiver communicates using the old version of DMR Direct Mode. In the old version of DMR Direct Mode, if the slot numbers are different, communications of 2 parties cannot be realized separately without receiving interference even on the channel with the same frequency configured.

Note

Communication cannot be realized between the transceiver configured with the new version of DMR Direct Mode and the transceiver configured with the old version of DMR Direct Mode.

Configuration using KPG-166D

Configuring the Dual Slot Direct Mode to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Communicating via a Repeater (Repeater Mode)

Repeater Mode is the function to communicate with another transceiver via a repeater.

If the transmit frequency and receive frequency are different configurations on a DMR digital channel, the channel can be used in Repeater Mode.

In Repeater Mode, the transceiver can synchronize with a repeater if the transceiver receives a synchronization signal from the repeater.

If a synchronization signal from a repeater cannot be detected, the transceiver sends a Wakeup Message to prompt synchronization. If the transceiver does not receive any response from the repeater after the lapse of a specific time interval, the transceiver resends the Wakeup Message.

The wait time from sending the Wakeup Message to a repeater transmitting the synchronization signal (Sync Wakeup Wait Time) can be configured by using KPG-166D. Also, the number of times a Wakeup Message is resent (Number of Wakeup Message Retries) can be configured.

Note

- If a response from a repeater cannot be detected after a Wakeup Message is sent, “<<FAILED>>” appears on the display of TK-Dx00 with LCD. In the case of TK-Dx40 (Mobile), “Er” is displayed.
- If Talk Around is enabled, the transceiver does not behave in Repeater Mode, as the transceiver behaves in Direct Mode even if the transmit frequency and receive frequency are different configurations.

Configuration using KPG-166D

- Configuring the Sync Wakeup Wait Time (See Edit > DMR > Conventional 1 > Parameters)
- Configuring the Number of Wakeup Message Retries (See Edit > DMR > Conventional 1 > Parameters)

About the Slot Numbers (Slot Selection)

In DMR, the transceiver communicates using the predetermined slot according to the standard.

If communicating in Repeater Mode, the transceiver needs to communicate using the predetermined slot, as the information indicating slot 1 or slot 2 is in the synchronization signal transmitted from a repeater.

Also, for example in Repeater Mode, the signal being transmitted using slot 2 cannot be received when using slot 1, even if the receive frequencies are the same.

The slot number used for communication (1 or 2) can be configured by using KPG-166D.

Configuration using KPG-166D

Configuring the Slot Selection (See Edit > Zone Information > Channel Edit > Page 1)

8.2 Using the Signaling

Color Code is the signaling to be used for facilitating communication within a group if the same channel is shared by several groups.

Sharing the Same Channel (Frequency) by Several Groups (Color Code)

Color Code is a digital signaling type having the same function as analog QT tone 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 Color Code if a Color 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 is transmission and reception behavior of a Color Code:

Table 8-5 Transmission and Reception Behavior of a Color Code

Reception	If the transceiver receives a signal and the received Color Code matches the Color Code preconfigured for the transceiver, the transceiver unmutes the speaker and emits the received audio from the speaker.
Transmission	The transceiver sends the preconfigured Color Code while transmitting. Pressing the **PTT** switch causes the transceiver to send the Color Code.

Configuration using KPG-166D

Configuring the Color Code (See Edit > Zone Information > Channel Edit > Page 1)

8.3 Waiting for Both Digital Signals and Analog Signals (Mixed Mode)

Mixed Mode can be used to wait for a call in both digital and analog modes.

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.

Following is the transceiver behavior for transmission and reception on a channel where “Mixed” is configured for Channel Type.

Table 8-6 Mixed Mode 1

Reception	Mixed Mode can be used to wait for a call in both digital (Color Code) and analog (QT tone and DQT code) modes. The transceiver unmutes the speaker if the received signaling (QT tone, DQT code or Color Code) matches the signaling preconfigured for the transceiver (QT tone, DQT code or Color Code).
Transmission	The transceiver transmits in the mode (Analog or DMR) configured for Transmit Mode. In the case that the received signaling (QT tone, DQT code or Color Code) matches the signaling (QT tone, DQT code or Color 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). In the case that the received FleetSync ID (TK-Dx40 only) or DMR ID matches that 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 if the transceiver transmits before the time interval 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.

Following is the difference in operation for transmissions depending on transceiver configuration and received signal.

Table 8-7 Mixed Mode 2

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Disabled	Analog	Analog	The transceiver can transmit using the QT tone or DQT code preconfigured in the transceiver until the time configured for Signaling Reset Timer elapses.
Disabled	DMR	Analog	The transceiver can transmit using the QT tone 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 Color Code configured in the transceiver and specifying the received ID until the amount of time configured for Auto Reset Timer elapses.
Enabled	DMR	Digital	The transceiver can transmit using the Color Code configured in the transceiver and specifying the received ID until the amount of time configured for Auto Reset Timer elapses.
Enabled	DMR	Analog	For TK-Dx40, the transceiver can specify the received ID and transmit using the QT Tone or DQT Code configured in the transceiver until the time interval configured for Auto Reset Timer elapses. However, ID can be specified only when FleetSync signaling is received.

Note

- While the transceiver is in Emergency Mode, the transceiver transmits according to the configuration for Transmit Mode.
- The transceiver sends an acknowledgment in digital mode when DMR data is received. 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.
- If “0” is configured for Signaling Reset Timer, the transceiver transmits according to the configuration for Transmit Mode.
- To make a FleetSync data communication in mixed mode, enable **Data Transmit with QT/DQT** of the transmitting and receiving transceivers.

Configuration using KPG-166D

- Configuring the Channel Type and the Transmit Mode to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 1)
- Configuring the Signaling Reset Timer (See Edit > Optional Features > Optional Features 1 > Common Page 1)

8.4 Using DMR ID to Initiate a Selective Call

An individual call and group call are available by using DMR IDs. In addition, a message can be sent to a specified target ID in various types of message communications.

Available Calls

The following various types of calls can be used in a DMR Conventional system. For transceiver operations and behaviors, refer to the instructions of each call type.

- Individual Call/ Paging Call
- Individual Call (Individual Call Acknowledge Request)
- Group Call
- Broadcast Group Call
- Status Call
- Short Data Call (TK-Dx00 with LCD only)

8.5 Making an Individual Call

Individual Call can be used to initiate a call to a target transceiver individually to establish voice calls.

By specifying a Unit ID, the transceiver can initiate a call to the transceiver having the Unit ID.

The channel with Individual Call Acknowledge Request disabled needs to be used on both the transmitting transceiver and the receiving transceiver to initiate an Individual Call in a DMR Conventional system.

TK-Dx00 with LCD and TK-Dx40 also come with a Paging Call feature. The Paging Call feature is for calling a target transceiver. Use it when you want to call a target transceiver without communicating.

Configuration using KPG-166D

Configuring the Individual Call Acknowledge Request to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Individual Call Acknowledge Request)

Initiating an Individual Call

An Individual Call can be started by one of the following methods.

- **Contact List Mode**

  Selecting a Unit ID configured in Contact List in Contact List Mode initiates an Individual Call.

  Pressing the **Contact List** key places the transceiver in Contact List Mode.

  Or, the transceiver enters Contact List Mode when “Contact List” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to 3.4 Using Menu Mode on page 24.)

- **Stack Mode**

  Selecting a call record in Stack Mode and then pressing the **PTT** switch initiates an Individual Call.

  Pressing the **Stack** key places the transceiver in Stack Mode. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then selecting “Stack” will cause the transceiver to enter Stack Mode. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)

- **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. The Unit ID of the target transceiver can be configured by selecting one Unit ID from the Unit ID List by using KPG-166D. (Refer to Unit ID List on page 127.)

  TK-Dx00:

  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 the Stack Mode, and the transceiver can respond (Talkback) to the transceiver that made the Individual Call. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)

  TK-Dx40:

  When the **PTT** switch is pressed during counting of the Auto Reset Timer after an Individual Call has been received, you can respond (Talkback) to the transceiver at the other end of the Individual Call.

- **Call key**

  TK-Dx00:

  Pressing one of the **Call 1** key to the **Call 6** key initiates an Individual Call 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.

  TK-Dx40:

  Pressing the **Call 1** or **Call 2** key initiates an Individual Call to the Unit ID allocated to the key pressed. A Unit ID must be configured to the **Call 1** or **Call 2** key so as to initiate a call to the specified Unit ID each time the **Call 1** key or **Call 2** key is pressed.

- **PC Command**

  The transceiver starts an Individual Call upon the receipt of a PC command from the communication port.

Note

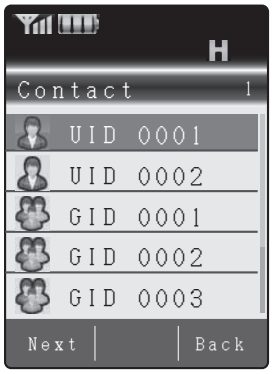
For TK-Dx00 without LCD and TK-Dx40, the transceiver cannot initiate an Individual Call using Contact List Mode or Stack Mode.

Operating the Transceiver

This section explains operations to initiate an Individual Call in Contact List Mode.

1 Press the Contact List key.

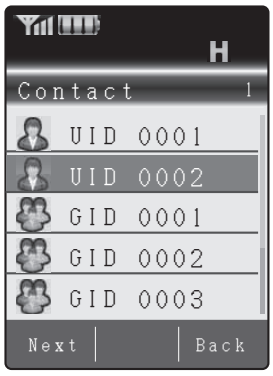
The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 Select a Unit ID from the Contact List by pressing the Up or Down key.

Refer to Selecting or Clearing Data from a List on page 45 for selection methods.



3 Press the PTT switch to initiate a Voice Call.

Press the **Side 2** key to initiate a Paging 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 Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) on page 89.)

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Selcall on PTT (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the ID List Number (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the Unit ID corresponding to the Call 1 to Call 6 keys (See Edit > Key Assignment > Call > Digital)

Initiating a Paging Call

Compatible model: TK-Dx00 with LCD/ TK-Dx40

The Paging Call feature is for calling a target transceiver. Use it when you want to call a target transceiver without communicating.

TK-Dx00 with LCD:

You can initiate a Paging Call by pressing the **Side 2** key after selecting a Unit ID specified in the Contact List in Contact List Mode.

TK-Dx40:

By pressing the **Paging Call** key, you can initiate a Paging Call for the Unit ID of the ID List Number configured for the channel.

Configuration using KPG-166D

- Assigning Functions to the PF Keys (See Edit > Key Assignment)
- Configuring the ID List Number of the Unit ID to be Sent (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

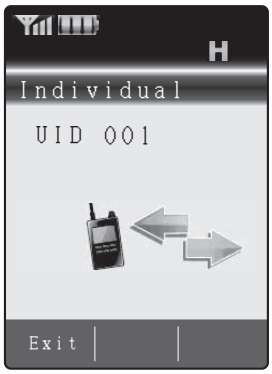
Receiving an Individual Call

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID preconfigured in the transceiver.

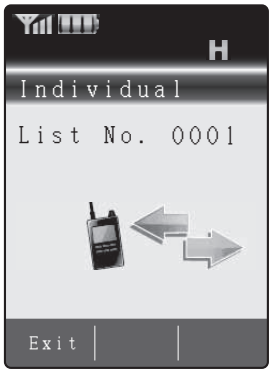
Transceiver Behavior

1 The transceiver receives an Individual Call.

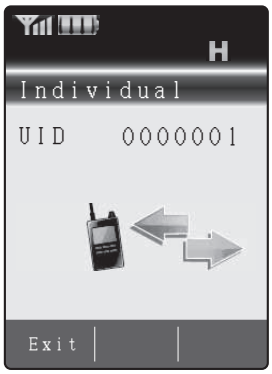
The Alert Tone (Individual Call) sounds from the transceiver and then the ID Name of the transmitting transceiver will appear.



If the ID Name is not configured in the Unit ID List, the Unit ID List number appears on the main display.



If the Unit ID is not configured in the Unit ID List, the Unit ID appears on the main display.



The transceiver can respond to the received Unit ID by a user pressing the **PTT** switch.

Note

- If Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call. (Refer to Selective Call Alert LED on page 112.)
- The Alert Tone sounds from the transceiver according to the Alert Tone (Paging Call) configuration if a Paging Call is received.

Transceiver Behavior when Receiving an Individual Call/ Paging Call

Compatible model: TK-Dx40

- **Alert Tone**

  If the Unit ID received is specified in the Unit ID List, an Alert Tone is output from the transceiver according to the Alert Tone (Individual) or Alert Tone (Paging) configuration of the corresponding Unit ID.

  However, if “Common” is configured for Alert Tone (Individual) or Alert Tone (Paging) in the Unit ID List and the Unit ID received is not specified in the Unit ID List, an Alert Tone is output from the transceiver according to the common DMR Conventional Alert Tone (Individual Call) or Alert Tone (Paging Call) configuration.

- **Selective Call Alert LED**

  If the received Unit ID is configured in the Individual ID List, the LED flashes according to the configuration of Alert LED Color (Individual) or Alert LED Color (Paging) for the corresponding Unit ID.

  However, if “Common” is configured for Alert LED Color (Individual) or Alert LED Color (Paging) in the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the LED flashes according to the configuration for Alert LED Color (Individual Call) or Alert LED Color (Paging Call) used in common in an DMR Conventional system.

Configuration using KPG-166D

- Configuring the Selective Call Alert LED (See Edit > DMR > Conventional 3)
- Configuring the Alert Tone (Individual Call) (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring the Alert Tone (Paging Call) (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring Alert LED Color (Individual Call) (See Edit > DMR > Conventional 3 > Alert LED Color)
- Configuring Alert LED Color (Paging Call) (See Edit > DMR > Conventional 3 > Alert LED Color)

Unit ID List

The Unit ID of the target transceiver must be preconfigured for the transceiver by using KPG-166D prior to initiating an Individual Call or Paging Call using Selcall on PTT and the **Call** key (TK-Dx00: **Call 1** to **Call 6** keys, TK-Dx40: **Call 1** or **Call 2** key). A maximum of 1000 Unit IDs can be configured for Unit ID List.

Table 8-8 Unit ID List

Configuration	Description
ID	A Unit ID can be configured in the range between 1 and 16776415.
ID Name (TK-Dx00 only)	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.
Transmit Inhibit	The permission or inhibition of transmission of the receiving party can be configured. The ID for which Transmit Inhibit is enabled cannot be configured as the target ID. If the transceiver receives a call from an ID for which Transmit Inhibit is enabled, the caller's ID Name appears on the 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) (TK-Dx40 only)	You can configure the tone type to be output from the transceiver when an Individual Call is received from a Unit ID specified in the Unit ID List.
Paging (Alert Tone) (TK-Dx40 only)	You can configure the tone type to be output from the transceiver when a Paging Call or Individual Call (Individual Call Acknowledge request) is received from a Unit ID specified in the Unit ID List. However, when receiving an Individual Call (Individual Call Acknowledge Request), the Paging configuration is applied if Automatic Response is disabled.
Individual (Alert LED Color) (TK-Dx40 only)	The flashing LED color of when an Individual Call is received from a Unit ID configured in the Unit ID List can be configured.
Paging (Alert LED Color) (TK-Dx40 only)	The flashing LED color of when a Paging Call is received from a Unit ID configured in the Unit ID List can be configured.

Configuration using KPG-166D

- Configuring the Unit ID List (See Edit > DMR > Unit ID List)
- Configuring Alert LED Color (See Edit > DMR > Unit ID List)
- Configuring Alert Tone (See Edit > DMR > Unit ID List)

Editing the Contact List

Compatible model: TK-Dx00 with LCD

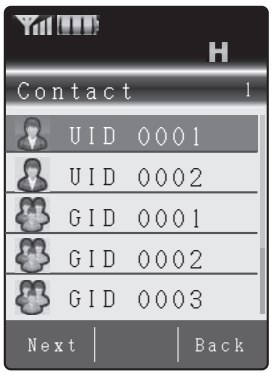
The configuration of a Unit ID configured in the Contact List can be changed or deleted, or a Unit ID can be newly added.

Operating the Transceiver

- **Changing the Configuration of a Unit ID**

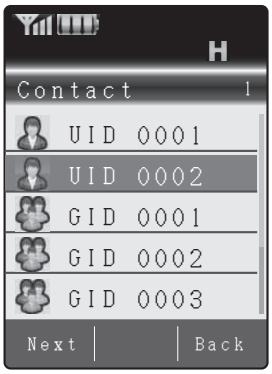
1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

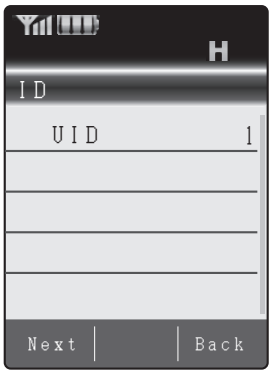
2 **Press the Up or Down key to select the Unit ID of the configuration to be changed, and then press the Menu ([ ]) key.**



3 **Press the Up or Down key to select “Edit”, and then press the Menu ([ ]) key.**

4 **Enter the ID, and then press the Menu ([ ]) key.**

Refer to Entering or Deleting a Code on page 49 for entry methods.

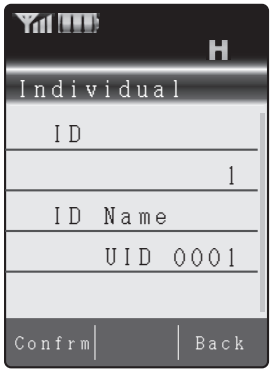


5 Enter the ID name, and then press the Menu ([ ]) key.

Refer to Entering or Deleting Characters on page 55 for entry methods.

6 Confirm the changed items, and then press the Menu ([ ]) key.

The configuration of the Unit ID is changed and then the transceiver reverts to the Contact List selection display.



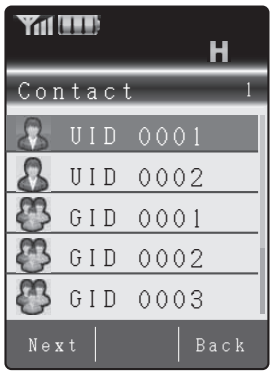
Note

- To correct the changed items, press the **Back** key to return to the ID name or ID entry display before pressing the **Menu** ([ ]) key of Step 5.
- The configuration of a Group ID cannot be changed.

● Deleting a Unit ID.

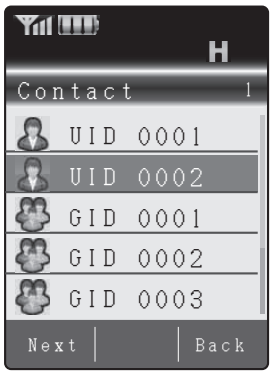
1 Press the Contact List key.

The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

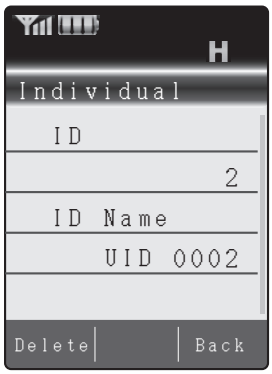
2 Press the Up or Down key to select the Unit ID which needs to be deleted, and then press the Menu ([ ]) key.



3 Press the Up or Down key to select "Delete", and then press the Menu ([ ]) key.

4 **Confirm the configuration of the Unit ID to be deleted, and then press the Menu ([ ]) key.**

The Unit ID is deleted and then the transceiver reverts to the Contact List selection display.



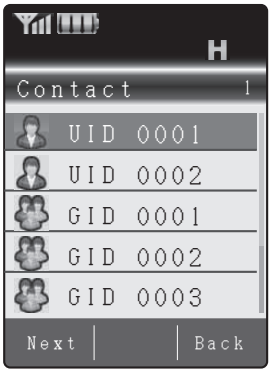
Note

A Group ID cannot be deleted.

● Adding a Unit ID.

1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.

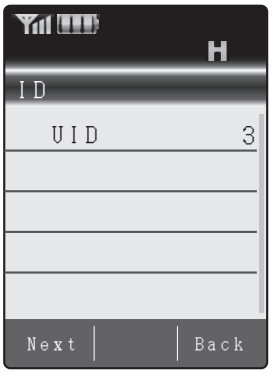


The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "New Contact", and then press the Menu ([ ]) key.**

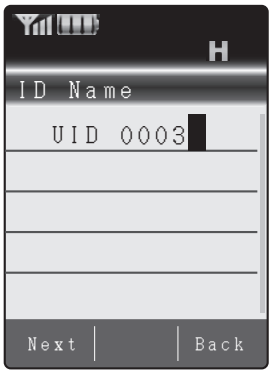
3 **Enter the ID, and then press the Menu ([ ]) key.**

Refer to Entering or Deleting a Code on page 49 for entry methods.



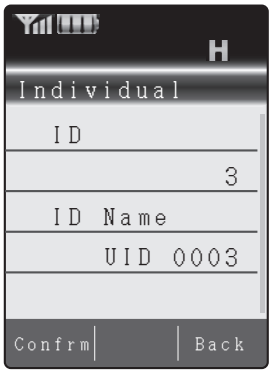
4 **Enter the ID name, and then press the Menu ([ ]) key.**

Refer to Entering or Deleting Characters on page 55 for entry methods.



5 **Confirm the configuration of the Unit ID to be added, and then press the Menu ([ ]) key.**

The Unit ID is added and then the transceiver reverts to the Contact List selection display.



Note

A Group ID cannot be added.

Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)

Compatible model: TK-Dx00 with LCD

Caller ID Display is the function to display the received ID on the display of the transceiver when an Unaddressed Call is received.

The ID appears according to the Group Call Display Type configuration. (Refer to Display When the Transceiver Receives a Group Call (Group Call Display Type) on page 143.)

A user can identify the caller not only by voice, but also through the display.

Note

- A user cannot reply to an ID on the transceiver while the ID appears on the main display.
- The transceiver can acquire the log data of operating time by sending information of the received Unit ID to a PC. In this case, a separate application program is required.
- This function can be used with the Individual Call (Individual Call Acknowledge Request).

Configuration using KPG-166D

Configuring the Caller ID Display (See Edit > DMR > Conventional 1)

Restricting IDs for Which the Transceiver Can Initiate a Call (Unit ID Encode Block)

Compatible model: TK-Dx00

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-166D. 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 an individual call. 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.

Note

This function can be used with the Individual Call (Individual Call Acknowledge Request).

Configuration using KPG-166D

Configuring the Unit ID Encode Block (See Edit > DMR > Conventional 1)

8.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)

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 a DMR Conventional system.

The Individual Call Acknowledge Request enables a call to the particular transceiver having the specified Unit ID, in the same way as a normal 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, Individual Call Acknowledge Request needs to be enabled and Busy Channel Lockout (DMR) needs to be configured to options other than “No” of the channel to be used by the transmitting transceiver by using KPG-166D. Also, using KPG-166D, the parameters of the following various functions to be used with Individual Call Acknowledge Request can be configured.

- Call Request Tone
- Call Processing Tone
- Delay Time

Note

- Individual Call Acknowledge Request cannot be used while the transceiver is placed in Emergency Mode. A normal Individual Call, which does not require the sending of a message requesting an acknowledgment, can only be used.
- For an Individual Call (Individual Call Acknowledge Request), the following functions used for a normal Individual Call are available. (Refer to 8.5 Making an Individual Call on page 122.)
  - Unit ID List
  - Caller ID Display (TK-Dx00 with LCD only)
  - Unit ID Encode Block (TK-Dx00 only)

Configuration using KPG-166D

- Configuring the Individual Call Acknowledge Request to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Individual Call Acknowledge Request)
- Configuring the Busy Channel Lockout (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Initiating an Individual Call (Individual Call Acknowledge Request)

An Individual Call (Individual Call Acknowledge Request) can be activated by one of the following methods.

- **Contact List Mode**

  In Contact List Mode, selecting a Unit ID configured in the Contact List and then pressing the **PTT** switch sends a message requesting an acknowledgment.

  Pressing the **Contact List** key places the transceiver in Contact List Mode.

  Or, the transceiver enters Contact List Mode when “Contact List” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to 3.4 Using Menu Mode on page 24.)

  Refer to Initiating an Individual Call on page 123 for operations to initiate an Individual Call in Contact List Mode.

- **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. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then selecting “Stack” will cause the transceiver to enter Stack Mode. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)

- **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. The Unit ID of the target transceiver can be configured by selecting one Unit ID from the Unit ID List by using KPG-166D.

- **Call key**

  TK-Dx00:

  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.

  TK-Dx40:

  Pressing the **Call 1** or **Call 2** 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** or **Call 2** key so as to initiate a call to the specified Unit ID each time the **Call 1** key or **Call 2** key is pressed.

Note

- An Individual Call (Individual Call Acknowledge Request) cannot be initiated by using a PC command. (TK-Dx00 only)
- For TK-Dx00 without LCD and TK-Dx40, the transceiver cannot initiate an Individual Call (Individual Call Acknowledge Request) using the Contact List Mode or Stack Mode.

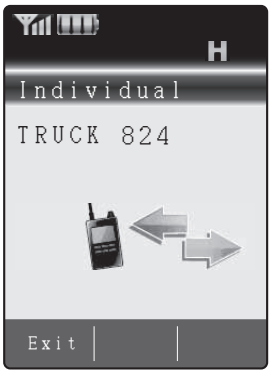
Operating the Transceiver

1 Follow one of the methods mentioned above to initiate an Individual Call (Individual Call Acknowledge Request).

A message requesting an acknowledgment is sent.

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 display, and the transceiver becomes enabled for the transmission by means of an Individual Call.



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

- Individual Call (Individual Call Acknowledge Request) is canceled by releasing the **PTT** switch prior to receiving a response message from the receiving transceiver.
- If the Call Request Tone is enabled, a Call Request Tone sounds from the transceiver when a call request for an Individual Call (Individual Call Acknowledge Request) is initiated. Also, if the 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 Acknowledge Request) is sent. (Refer to Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone) on page 138, Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) on page 138.)
- 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 Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) on page 89.)
- While the transceiver is on standby to receive an acknowledgment message from the receiving transceiver, canceling the call is possible by pressing the following keys.
  TK-Dx00:
  Side 1 key or **[#]** key
  TK-Dx40 (Portable):
  Side 1 key
  TK-Dx40 (Mobile):
  Triangle key
- The transmitting transceiver sends a message requesting another acknowledgment 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 Maximum ACK Wait Time on page 147, Number of Retries on page 147.)

- The transceiver cancels the call processing for the following. In this case, “<<No Reply>>” appears on the display of TK-Dx00 with LCD for 1 second. In the case of TK-Dx40 (Mobile), “Er” is displayed on the LED display for 1 sec.
    - If the transceiver cannot receive an acknowledgment message from the receiving transceiver even if a message requesting an acknowledgment has been sent for the number of times configured in the Number of Retries. (Refer to Number of Retries on page 147.)
    - If the receiving transceiver rejects the incoming call, and the transmitting transceiver receives the notification message for cancellation.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Selcall on PTT (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the ID List Number (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the Unit ID corresponding to the Call 1 to Call 6 keys (See Edit > Key Assignment > Call > Digital)

Receiving an Individual Call (Individual Call Acknowledge Request)

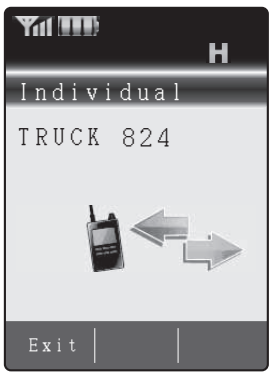
The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

To receive an Individual Call (Individual Call Acknowledge 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

1 Receive a message requesting an acknowledgment.

An acknowledgment message is automatically sent to the transmitting transceiver. An Alert Tone (Individual Call) sounds from the transceiver, and the ID for the transmitting transceiver appears on the display.



Note

- 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 Selective Call Alert LED is enabled, the LED blinks orange when the transceiver receives an Individual Call. (Refer to Selective Call Alert LED on page 112.)

Configuration using KPG-166D

- Configuring the Alert Tone (Individual Call) (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring the Alert Tone (Individual Call) (See Edit > DMR > Unit ID List > Individual > Alert Tone)

Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)

The Call Request Tone is the function to sound a Call Request Tone from the transceiver when a call request for an Individual Call (Individual Call Acknowledge Request) is initiated in a DMR Trunking system.

The Call Request Tone from the transceiver notifies the user that a call request for an Individual Call (Individual Call Acknowledge Request) has been initiated. The user can initiate the communication after the call request has been established.

Configuration using KPG-166D

Configuring the Call Request Tone to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Individual Call Acknowledge Request)

Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)

The Call Processing Tone is the function to sound 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 Acknowledge Request) is initiated in a DMR Conventional system.

The Call Processing Tone from the transceiver notifies a user that the call request for an Individual Call (Individual Call Acknowledge Request) is in progress. 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 Acknowledge Request) is initiated, a Call Processing Tone sounds from the transceiver upon the elapse of the time configured for Delay Time.

Configuration using KPG-166D

- Configuring the Call Processing Tone to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Individual Call Acknowledge Request > Call Processing Tone)
- Configuring the Delay Time to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Individual Call Acknowledge Request > Call Processing Tone)

8.7 Making a Group Call

Group Call can be used to engage in 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.

Initiating a Group Call

Group Call can be started by one of the following methods.

- **Contact List Mode**

  While the transceiver is in Contact List Mode, the transceiver can initiate a Group Call by a user selecting a Group ID configured in the Contact List and then pressing the **PTT** switch.

  Pressing the **Contact List** key places the transceiver in Contact List Mode.

  Or, the transceiver enters Contact List Mode when “Contact List” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to 3.4 Using Menu Mode on page 24.)

- **Selcall on PTT**

  Selecting the channel where the target Group ID for Selcall on PTT is configured and then pressing the **PTT** switch initiates a Group Call. The Group ID of the target transceiver can be configured by selecting one Group ID from the Group ID List by using KPG-166D.

- **PC Command**

  The transceiver starts a Group Call upon the receipt of a PC command from the communication port.

Note

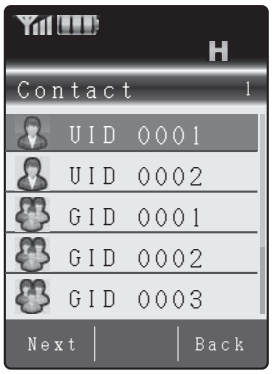
For TK-Dx00 without LCD and TK-Dx40, the transceiver cannot initiate a Group Call using Contact List Mode.

Operating the Transceiver

This section explains operations to initiate a Group Call in Contact List Mode.

1 Press the Contact List key.

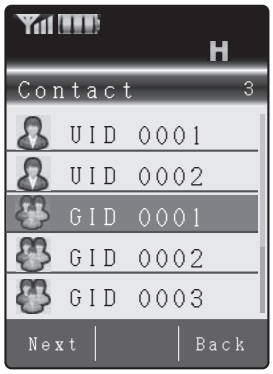
The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 Select a Group ID from the Contact List by pressing the Up or Down key.

Refer to Selecting or Clearing Data from a List on page 45 for selection methods.



3 Press the PTT switch.

The transceiver starts initiating a Group 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 Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) on page 89.)

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Selcall on PTT (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the ID List Number (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Receiving a Group Call

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.

Alert Tone (Group Call) sounds from the transceiver, and then the received Group ID, or the Unit ID of the transmitting transceiver, or both will appear. (Refer to Display When the Transceiver Receives a Group Call (Group Call Display Type) on page 143.)

The transceiver can respond to the received Group ID by a user pressing the **PTT** switch.

Note

- The transceiver can record the receipt of a Group Call. The record can be checked in Stack Mode. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)
- If Group ID Scan is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured for the Group ID List. (Refer to Group ID Scan on page 144.)
- If Selective Call Alert LED is enabled, the LED flashes when the transceiver receives a Group Call. (Refer to Selective Call Alert LED on page 112.)
- “Group GID 16777215” appears when the transceiver for which “ALL” is not configured in Group ID List receives an All Call.

Transceiver Behavior when Receiving a Group Call

Compatible model: TK-Dx40

- **Alert Tone**

  If the Group ID received is specified in the Group ID List, an Alert Tone is output from the transceiver according to the Alert Tone of the corresponding Group ID.

  However, if “Common” is configured for Alert Tone in the Group ID List and the Group ID received is not specified in the Group ID List, an Alert Tone is output from the transceiver according to the common DMR Conventional Alert Tone (Group Call) configuration.

- **Selective Call Alert LED**

  If the received Group ID is configured in the Group ID List, the LED blinks according to the configuration for Alert LED Color of 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 flashes according to the configuration for Alert LED Color (Group Call) used in common in a DMR Conventional system.

Configuration using KPG-166D

- Configuring the Alert Tone (Group Call) (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring the Alert Tone (Group Call) (See Edit > DMR > Group ID List > Alert Tone)
- Configuring Alert LED Color (Group Call) (See Edit > DMR > Conventional 3 > Alert LED Color)
- Configuring Alert LED Color (Group Call) (See Edit > DMR > Group ID List > Alert LED Color)

Group ID List

The target Group ID must be preconfigured for the transceiver by using KPG-166D prior to initiating a Group Call by using Selcall on PTT. A maximum of 1000 Group IDs can be configured for Group ID List.

Table 8-9 Group ID List

Configuration	Description
ID	A Group ID can be configured in the range between 1 and 16776415 inclusive and ALL. ALL allows initiation of a call to all IDs.
ID Name (TK-Dx00 only)	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 Transmit Inhibit is enabled cannot be configured as the target ID. If the transceiver receives a call from an ID for which Transmit Inhibit is enabled, the caller's ID Name appears on the 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 (TK-Dx40 only)	You can configure the tone type to be output from the transceiver when a Group Call is received from a Group ID specified in the Group ID List.
Alert LED Color (TK-Dx40 only)	The flashing LED color of when a Group Call is received from a Group ID configured in the Group ID List can be configured.

Configuration using KPG-166D

- Configuring the Group ID List (See Edit > DMR > Group ID List)
- Configuring Alert LED Color (See Edit > DMR > Group ID List)
- Configuring Alert Tone (See Edit > DMR > Group ID List)

Display When the Transceiver Receives a Group Call (Group Call Display Type)

Compatible model: TK-Dx00 with LCD

Group Call Display Type can be used to display the received information on the display when the transceiver receives a Group Call.

Table 8-10 Group Call Display Type

Configuration	Description
Group ID	The Group ID Name 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 and the Group ID of the received Group Call appears.
Calling Transceiver ID	If the Unit ID and Unit ID Name of the transmitting transceiver are configured in the Unit ID List, the Unit ID Name appears. If the Unit ID of the transmitting transceiver is configured in the Unit ID List but the Unit ID Name is not configured, the Unit ID List number appears. If the Unit ID of the transmitting transceiver is not configured in the Unit ID List, the received Unit ID appears. If the transceiver receives a Status Message with Group Call, the Status Name appears and the Group ID of the received Group Call appears.
Calling Transceiver ID + Group ID	According to the display methods of Group ID and Calling Transceiver ID, the both IDs are displayed simultaneously. If the transceiver receives a Status Message with Group Call, the Status Name appears for 3 sec, and the Group ID of the received Group Call and the Unit ID of the transmitting transceiver appear for 2 sec alternately.

Configuration using KPG-166D

Configuring the Group Call Display Type (See Edit > DMR > Conventional 1)

Group ID Scan

Group ID Scan is the function to standby to receive a Group Call from all Group IDs in a DMR Conventional system.

If this function is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured for Group ID List.

If this function is disabled, the transceiver is on standby to receive only the Group Calls from the Group IDs configured for Selcall on PTT, Persistent Group ID (DMR).

Note

- This function can be used only if “Group Call” is configured for Selcall on PTT.
- If “Group Call” is configured for Selcall on PTT and Group ID Scan is disabled, the transceiver can initiate a Group Call only to the Group ID configured for ID List Number.

Configuration using KPG-166D

- Configuring Group ID Scan to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring Selcall on PTT (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the Persistent Group ID (DMR) (See Edit > Zone Information > Zone Edit > Persistent Group ID (DMR))

Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))

Call Alert Inhibit (Group Calls only) is the function that disables the Alert Tone, Selective Call Alert LED, Caller ID Stack and Horn Alert 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**
  The following Alert Tones do not sound from the transceiver even if the transceiver receives a Group Call.
  Alert Tone (Group Call List)
  Group Call (Alert Tone) (Conventional)
- **Selective Call Alert LED**
  A Selective Call Alert LED does not blink even if the transceiver receives a Group Call.
- **Caller ID Stack (TK-Dx00 with LCD only)**
  The Caller ID will not be stored in the transceiver stack memory even if the transceiver receives a Group Call.
- **Horn Alert (TK-Dx40 (Mobile) only)**
  The headlight of the vehicle connected to Horn Alert does not light up and the horn is not sounded even when a Group Call is received.

Configuration using KPG-166D

Configuring the Call Alert Inhibit (Group Calls only) to be enabled or disabled (See Edit > DMR > General)

8.8 Making an Informative Group Call (Broadcast Group Call)

Broadcast Group Call can be used to engage in one-way informative 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.

Initiating a Broadcast Call

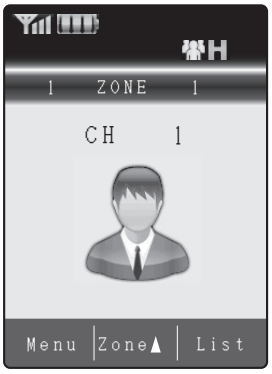
Group Call can be started by one of the following methods.

- **Broadcast key**
  Broadcast Call information is added to a Group Call and sent by the transceiver initiating a Group Call while Broadcast Group Call is enabled.
  Pressing the **Broadcast** key toggles the Broadcast Group Call between enabled and disabled.
  If the **Menu** key is pressed to enter Menu Mode and then “Broadcast” is selected, Broadcast Group Call can also be toggled between enabled and disabled. (Refer to 3.4 Using Menu Mode on page 24.)
- **PC Command**
  The transceiver starts a Broadcast Group Call upon the receipt of a PC command from the communication port.

Operating the Transceiver

1 **Press the Broadcast key.**

Broadcast Group Call will be enabled.



The following operations are identical even if Broadcast Group Call is enabled by pressing the **Menu** key.

2 **Initiating a Group Call.**

Refer to Initiating a Group Call on page 139 for methods to initiate a Group Call.
Pressing the **Broadcast** key after the transmission causes Broadcast Group Call to be disabled.

Note

If a valid response message cannot be received from a repeater when a Broadcast Group Call is initiated, a Call Fail Tone sounds from the transceiver and the Broadcast Group Call terminates.

Configuration using KPG-166D

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

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.

Operating the Transceiver

1 The transceiver receives a Broadcast Group Call.

For TK-Dx00 and TK-Dx40, an Alert Tone (Broadcast Call) sounds from the transceiver. Then, in the case of TK-Dx00 with LCD, the received Group ID, or the Unit ID of the transmitting transceiver, or both will appear. (Refer to Display When the Transceiver Receives a Group Call (Group Call Display Type) on page 143.)

Note

- If Selective Call Alert LED is enabled, the LED flashes when the transceiver receives a Broadcast Group Call. (Refer to Selective Call Alert LED on page 112.)
- A user cannot reply to the received Group ID. Pressing the **PTT** switch outputs Warning Tone A from the transceiver. In the case of TK-Dx00 with LCD, “Rx Only” appears on the transceiver display.

Configuration using KPG-166D

Configuring the Alert Tone (Broadcast Call) (See Edit > DMR > Conventional 3 > Alert Tone)

8.9 Common Functions for Data Communications

The following functions are used in common for data communications such as Status Call or Short Data Call, GPS data transmission:

- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- Message Display Type
- Preamble Length

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-166D

Configuring the Number of Retries (See Edit > DMR > General > Parameters)

Transmit Busy Wait Time

The transceiver confirms that the traffic 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 traffic 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-166D

Configuring the Transmit Busy Wait Time (See Edit > DMR > General > Parameters)

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.

Configuration using KPG-166D

Configuring the Maximum ACK Wait Time (See Edit > DMR > General > Parameters)

Received Message Display Type (Message Display Type)

Compatible model: TK-Dx00 with LCD

Message Display Type can be used to display a message on the display when the transceiver receives the Status Message or Short Message.

Table 8-11 Message Display Type

Configuration	Description
Message	Status Message or Short Message is displayed on the display of the transceiver. If a received message is longer than the displayable number of digits, it is displayed by scrolling the message repeatedly from right to left.
Message + ID	Status Message and ID or Short Message and ID are displayed on the display of the transceiver. The message and ID are displayed simultaneously. If the transceiver receives a Status Message or Short Message by an Individual Call, the ID (Caller ID) of the transmitting transceiver appears. If the transceiver receives a Status Message or Short Message by a Group Call, the ID Name appears according to the configuration for Group Call Display Type. (Refer to Display When the Transceiver Receives a Group Call (Group Call Display Type) on page 143.)

Note

The previous display appears again by pressing a key while the received message is displayed.

Configuration using KPG-166D

Configuring the Message Display Type (See Edit > DMR > General)

Preamble Length

Preamble Length is the function to extend time for sending a preamble when the DMR frame is sent.

Extending the time for sending a preamble at the beginning of transmission makes the receiving transceiver easier to receive a call and reduces missing of the beginning of the audio during the scan.

Configuration using KPG-166D

Configuring the Preamble Length (See Edit > DMR > General > Parameters)

8.10 Sending and Receiving a Status Message (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.

Following are the methods to send a Status Message:

Table 8-12 Sending Status Messages

Transmission Methods	Description
Contact List Mode	The transceiver sends a Status Message by a user selecting the ID of the target transceiver in Contact List Mode. (Refer to Sending a Status Message in Contact List Mode on page 150.)
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 Sending a Status Message in Status Mode on page 152.)
Call key	**TK-Dx00:** Pressing one of the **Call 1** to **Call 6** keys sends out the Status Message configured in the transceiver. **TK-Dx40:** Pressing the **Call 1** or **Call 2** key sends out the Status Message configured in the transceiver. **Call 1** to **Call 6** (TK-Dx00) or **Call 1**/ **Call 2** (TK-Dx40) can be assigned to the **PF** keys and the Status Message corresponding to each key can be configured by selecting from the **Status List** in DMR using KPG-166D. The Unit ID of the target transceiver can be configured by selecting from the **Unit ID List** in DMR. However, if “Base ID” is configured for **Unit ID**, the Unit ID of the target transceiver uses the Unit ID configured in **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 Power-on Status Message on page 159, Power-off Status Message on page 159.) In this case, a Status Message is always sent to the preconfigured Base ID.
AUX Input Status Message (TK-Dx40 (Mobile) only)	A specified Status Message is sent out when the AUX Input Status Message 1 port to AUX Input Status Message 1 port switches from high level to low level or from low level to high level. (Refer to AUX Input Status Message on page 161.)

Note

For TK-Dx00 without LCD and TK-Dx40, the transceiver cannot send a Status Message using Status Mode or Contact List Mode.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Status Message corresponding to the Call 1 to Call 6 keys (See Edit > Key Assignment > Call > Digital)

Sending a Status Message in Contact List Mode

Compatible model: TK-Dx00 with LCD

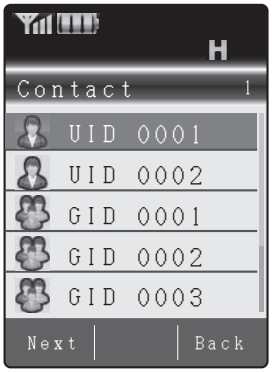
The transceiver can send a Status Message by a user selecting the ID of the target transceiver in Contact List Mode.

Pressing the **Contact List** key places the transceiver in Contact List Mode. In the case of TK-Dx00 with LCD, by pressing the **Menu** key to enter the Menu Mode, you can select “Contact List” for the transceiver to enter the Contact List Mode.

Operating the Transceiver

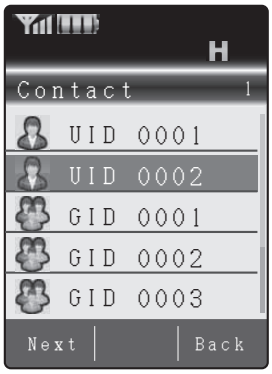
1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.



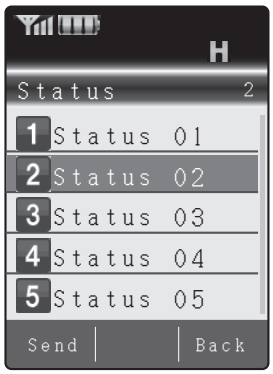
The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select the target Unit ID, and then press the Menu ([ ]) key.**



3 **Press the Up or Down key to select “Status”, and then press the Menu ([ ]) key.**

4 **Select a Status code by pressing the Up or Down key.**



5 **Press the Menu ([ ]) key.**

The transceiver sends the Status Message.

If the Status Message is properly sent to the target transceiver, “COMPLETE” appears.

Configuration using KPG-166D

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

Sending a Status Message in Status Mode

Compatible model: TK-Dx00 with LCD

In Status Mode, a Status Message can be sent by a user selecting a status from a list or directly entering a Status number.

The transceiver enters Status Mode with one of the following operations, and then the transceiver will send a Status Message. For sending a Status Message in Status Mode, the target ID is the ID configured for Base ID.

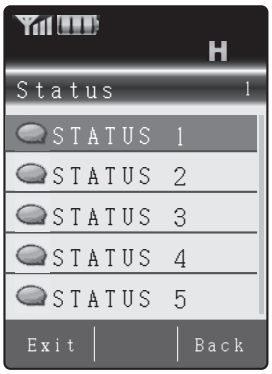
- **Status key**
  Pressing the **Status** key places the transceiver in Status Mode.
- **Menu key**
  Pressing the **Menu** key to place the transceiver in Menu Mode, and then selecting “Status” places the transceiver in Status Mode. (Refer to 3.4 Using Menu Mode on page 24.)
- **Keypad entry**
  If “Status” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the transceiver keypad causes the transceiver to enter Status Mode. (Refer to Keypad Operation on page 22.)

Operating the Transceiver

- **Sending a Status Message by list selection**

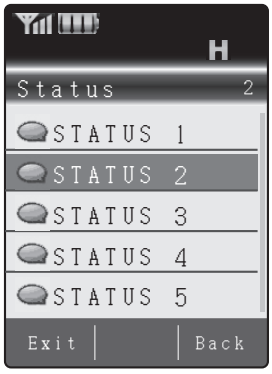
1 **Press the Status key.**

The transceiver enters Status Mode and then the Status List selection display appears.



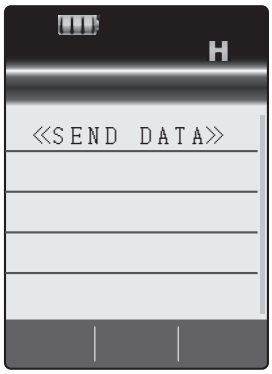
The following operations are identical even if the transceiver enters Status Mode by a user pressing the **Menu** key or with keypad entry.

2 **Select a Status code by pressing the Up or Down key.**



3 **Press the Side 2 key or PTT switch.**

The transceiver sends the Status Message.



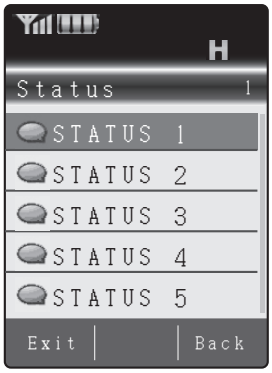
If the Status Message is properly sent to the target transceiver, “COMPLETE” appears.

● Sending a Status Message using Manual Dialing

To send a Status Message using Manual Dialing, Manual Dialing must be enabled using KPG-166D. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)

1 Press the Status key.

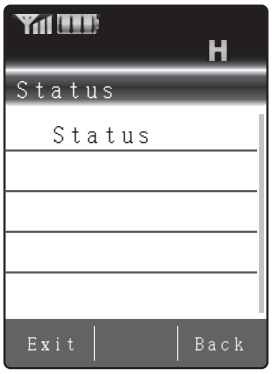
The transceiver enters Status Mode and then the Status List selection display appears.



The following operations are identical even if the transceiver enters Status Mode by a user pressing the **Menu** key or with keypad entry.

2 Press and hold the Menu ([▯]) or [*] key.

The status entry display appears.

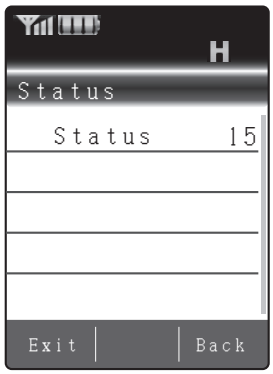


Pressing the **Left** key will also show the status entry display.

3 Enter a status.

Refer to Entering or Deleting a Code on page 49 for entry methods.

- **Using the PF keys**
  Select a character by pressing the **Up** or **Down** key, and then confirm the selected character by pressing the **Menu** (**[▯]**) or **[*]** key.
- **Using the keypad**
  A code can be entered by pressing the **[0]** to **[9]** keys.



4 **Press the Side 2 key or PTT switch.**

The transceiver sends the Status Message.

If the Status Message is properly sent to the target transceiver, “COMPLETE” appears.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Assigning functions to the Keypad Operation (See Edit > Key Assignment > General)
- Configuring the Manual Dialing to be enabled or disabled (See Edit > DMR > General)

Receiving a Status Message

Upon receiving a Status Message, the received Status Message appears on the display (TK-Dx00 with LCD only), and the transceiver can send the Status Message to an external device from the communication ports.

Note

- The received Color Code and the Color Code configured for the transceiver need to match to receive a Status Message.
- The transceiver can send the received Status Message using a serial command. The Status Message is sent to an external device that is connected to the transceiver, such as a PC. (Refer to Sending the Received Status Message from the Communication Port (Status Message Serial Output) on page 159.)
- To use serial communications, a user must prepare DMR compatible software or external devices.
- For TK-Dx00 with LCD, a received Status Message can be stored in the stack memory of the transceiver. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)

Transceiver Behavior

1 The transceiver starts receiving a Status Message.

"RECEIVE DATA" appears.

2 A Status Message is received.

"COMPLETE" appears.

The Alert Tone (Status/ Short Message Call) sounds from the transceiver and then the Status Message will appear. If a received message is longer than the displayable number of digits, it is displayed by scrolling the message repeatedly from right to left.
If "Message" is configured for Message Display Type, only Status Message appears.
If "Message + ID" is configured for Message Display Type, Status Message and ID appear simultaneously. If the transceiver receives a Status Message by an Individual Call, the ID (Caller ID) of the transmitting transceiver appears. If the transceiver receives a Status Message by a Group Call, the ID appears according to the configuration of Group Call Display Type. (Refer to Display When the Transceiver Receives a Group Call (Group Call Display Type) on page 143.)

If the status is not configured for Status List or the Status Name is not configured, the status number appears.

Note

- For TK-Dx00 with LCD, the following display appears when the transceiver receives an Emergency Status. (Refer to Emergency Status on page 158.)

Table 8-13 Display When Receiving Emergency Status

Types of Emergency Status	Display
Emergency Key	Emergency
Man-down	Man Down
Stationary	Stationary
Motion	Motion
Lone Worker	Lone Worker

- In the case of TK-Dx40 (Mobile), “dt” appears on the LED display when receiving of a Status Message starts. “Ed” appears on the LED display when receiving of a Status Message is complete.

Configuration using KPG-166D

- Configuring the Message Display Type (See Edit > DMR > General)
- Configuring the Alert Tone (Status/Short Message Call) (See Edit > DMR > Conventional 3 > Alert Tone)

Status List

Status Message must be preconfigured in the transceiver using KPG-166D prior to the transmission. A maximum of 1000 statuses can be configured in the Status List.

Table 8-14 Status List

Configuration	Description
Status	The Status number can be configured. The Status number can be configured by using a number between 0 and 1023.
Status Name (TK-Dx00 only)	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 Transmit Inhibit is enabled does not appear in the status selection display in Contact List Mode or Status Mode. In this case, a user cannot select a status for which Transmit Inhibit is enabled in Contact List Mode or Status Mode.

Configuration using KPG-166D

Configuring the Status List (See Edit > DMR > Status List)

Emergency Status

Emergency Status is the Status Message sent for various emergency behaviors.

There are various types of Emergency Status: a Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode, and a Status Message to exit Emergency Mode, etc.

Table 8-15 Types of Emergency Status

Types of Emergency Status	Description
Emergency Key	This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by pressing the **Emergency** key.
Man-down (TK-Dx00 only)	This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by the Man-down function.
Stationary (TK-Dx00 only)	This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by the Stationary function.
Motion (TK-Dx00 only)	This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by the Motion function.
Lone Worker	This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by the Lone Worker function.
Termination	This is the status for disabling Emergency Mode. The transceiver exits Emergency Mode if receiving a status configured for Termination while in Emergency Mode.

Configuration using KPG-166D

Configuring the Emergency Status (See Edit > Digital > Status > Emergency Status)

Status Message on Data Zone-Channel

Status Message on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send a Status Message in a DMR Conventional system.

The channel in a DMR Conventional system is automatically changed to the channel configured for Data Zone-Channel (DMR) to send the Status Message. The transceiver restores the last used zone-channel when the transmission ends. Status Message on Data Zone-Channel can be used to send data on a specific channel.

Configuration using KPG-166D

- Configuring the Status Message on Data Zone-Channel to be enabled or disabled (See Edit > DMR > Conventional 1)
- Configuring the Data Zone-Channel (DMR) (See Edit > Zone Information > Zone Edit)

Sending the Received Status Message from the Communication Port (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.

By using Status Message Serial Output, a base station user can monitor the received Status Message in real time.

Note

To use Status Message Serial Output, the "Data" or "Data + GPS Data Output" must be assigned to the communication port of the transceiver.

Configuration using KPG-166D

Configuring the Status Message Serial Output to be enabled or disabled (See Edit > Optional Features) Optional Features 1 > Common Page 4 > Serial Output)

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.

Configuration using KPG-166D

Configuring the Power-on Status Message (See Edit > DMR > Status)

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.

Configuration using KPG-166D

Configuring the Power-off Status Message (See Edit > DMR > Status)

Base ID

Base ID is the target transceiver ID for sending GPS data (TK-Dx00 only) or the following Status Messages.

- Power-on Status Message
- Power-off Status Message
- Status Message that is sent by selecting a status number or directly entering a status number after a user presses the **Status** key and the transceiver enters the Status Mode (TK-Dx00 with LCD only)
- Status Message that is sent by selecting a status number or directly entering a status number after a user selects “Status” in the Menu Mode and the transceiver enters the Status Mode (TK-Dx00 with LCD only)
- Status Message that is sent by pressing one of the **Call** key (TK-Dx00: **Call 1** to **Call 6** keys, TK-Dx40: **Call 1** or **Call 2** key)

Base ID can be configured using KPG-166D. 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-166D

Configuring the Base ID Type and the Base ID (See Edit > DMR > Conventional 1)

Emergency Status Response

Emergency Status Response is a feature for sounding the Alert Tone when the transceiver receives an Emergency Status.

For TK-Dx00 with LCD, if the Man-down tilt switch on the transmitting transceiver is switched on, which results in the transceiver entering the Emergency Mode, then “MAN DOWN” appears on the display of the receiving transceiver when it receives the signal. In the case that the transmitting transceiver enters Emergency Mode activated by the **Emergency** key or a foot switch, then “EMERGENCY” appears on the display of the receiving transceiver when it receives the signal.

Emergency Status Response can be configured by using KPG-166D.

Table 8-16 Emergency Status Response

Configuration	Description
None	The transceiver functions in the same manner as when receiving a normal status.
Alert	The Alert Tone configured for Alert Tone (Emergency Response) sounds from the transceiver when receiving an Emergency Status.
Horn (TK-Dx40 (Mobile) only)	Outputs the Alert Tone configured for Horn (Emergency Response) from the transceiver and activates the Horn Alert port when an Emergency Status is received.

Configuration using KPG-166D

- Configuring the Emergency Status Response (See Edit > DMR > General)
- Configuring the Alert Tone (Emergency Response) (See Edit > DMR > Conventional 3 > Alert Tone)
- Configuring the Alert Tone (Emergency Response) (See Edit > DMR > General > Emergency Response)

AUX Input Status Message

Compatible model: TK-Dx40 (Mobile)

AUX Input Status Message is a feature that sends out a specified Status Message when the AUX Input port switches from high level to low level or from low level to high level.

A Status Message can be sent out when there is a change in the AUX Input port status by attaching a sensor to the port. The target transceiver is the ID configured in Base ID. (Refer to Base ID on page 160.)

To make use of this feature, it is necessary to assign an AUX Input Status Message to one of the AUX Input ports.

Configuration using KPG-166D

- Configuring the AUX Input Status Message (See Edit > DMR > Status)
- Assigning Functions to the AUX Input (See Edit > Extended Function > AUX)

AUX Output Status Message

Compatible model: TK-Dx40 (Mobile)

AUX Output Status Message is a feature that switches the AUX Output port from high level to low level or from low level to high level when a specified Status Message is received. Use this feature when you want to turn on or turn off an external device via remote operation.

To make use of this feature, it is necessary to assign an AUX Output Status Message to one of the AUX Output ports.

Configuration using KPG-166D

- Configuring the AUX Output Status Message (See Edit > DMR > Status)
- Assigning Functions to the AUX Output (See Edit > Extended Function > AUX)

Storing the Selected or Sent Status (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 8-17 Status Hold

Configuration	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. • Status that is sent out when there is a change in the status of one of the ports from AUX Input Status Message 1 to AUX Input Status Message 3 (TK-Dx40 (Mobile) only) • The status transmitted when the transceiver is turned ON (Power-on Status) • Status that is sent out by pressing one of the **Call 1** to **Call 6** keys (TK-Dx00 only) • Status that is sent out by pressing the **Call 1** or **Call 2** key (TK-Dx40 only) • The status transmitted by using a PC command

Note

For TK-Dx00 without LCD and TK-Dx40, there is no function available for selecting a status from the Status List.

Configuration using KPG-166D

Configuring the Status Hold (See Edit > Optional Features > Optional Features 1 > Common Page 4)

Horn Alert Status

Compatible model: TK-Dx40 (Mobile)

Horn Alert Status is a feature that activates the Horn Alert port by receiving a status.

The Horn Alert port is activated when the transceiver receives the status configured in the Horn Alert Status.

Configuration using KPG-166D

Configuring the Horn Alert Status (See Edit > DMR > Status)

8.11 Sending and Receiving a Short Message (Short Data Call)

Compatible model: TK-Dx00 with LCD

Short Data Call can be used to send and receive a maximum of 368 characters (Short Message).

Using this function, a dispatcher can reliably send text messages to the target party.

Short Message can be sent by the following methods:

Table 8-18 Sending Short Messages

Transmission Methods	Description
Contact List Mode	In Contact List Mode, a Short Message is sent by selecting the target ID and directly entering a message or selecting a message from a list. (Refer to Sending a Short Message in Contact List Mode on page 163.)
Message Mode	In Message Mode, a Short Message is sent by directly entering a message or selecting a message from a list. Also, operations such as replying to and forwarding Short Messages, resending or forwarding Short Messages already sent, and sending Short Messages stored as drafts and not sent can be done. The target ID can be entered directly or selected from a Contact List. (Refer to Sending a Short Message in Message Mode on page 167.)

Sending a Short Message in Contact List Mode

In Contact List Mode, a Short Message can be sent by selecting the target ID and directly entering a message or selecting a message from a list.

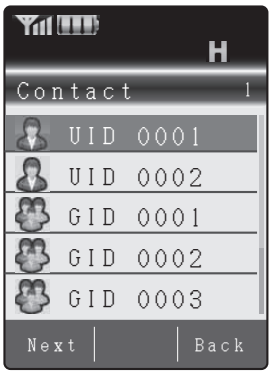
Pressing the **Contact List** key places the transceiver in Contact List Mode. Or, the transceiver enters Contact List Mode when “Contact List” is selected after entering Menu Mode by pressing the **Menu** key.

Operating the Transceiver

- **Sending a Short Message by Directly Entering a Message.**

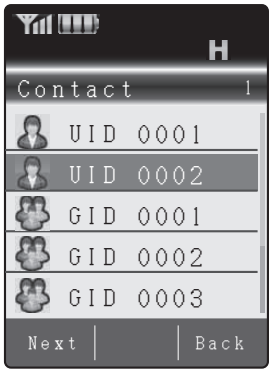
1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select the target ID, and then press the Menu ([ ]) key.**



3 Press the Up or Down key to select “Message”, and then press the Menu ([ ]) key.

If a Unit ID is selected:

If a Group ID is selected:

4 Press the Up or Down key to select “Create New”, and then press the Menu ([ ]) key.

5 Input a Message.

A maximum of 368 characters can be entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

6 Press the Menu ([ ]) key.

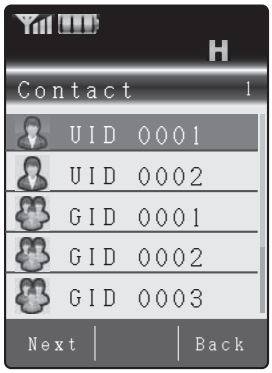
The transceiver sends the Short Message.

“COMPLETE” appears if the Short Message is properly sent to the target transceiver.

● Sending a Short Message by list selection

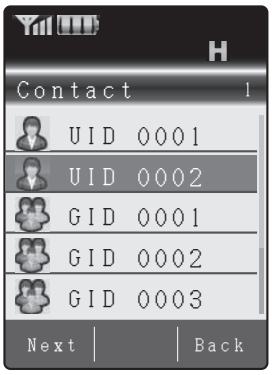
1 **Press the Contact List key.**

The transceiver enters Contact List Mode and then the Contact List selection display appears.



The following operations are identical if the transceiver enters Contact List Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select the target ID , and then press the Menu ([ ]) key.**

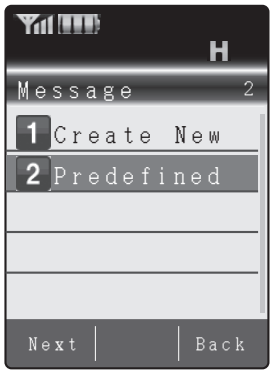


3 **Press the Up or Down key to select "Message", and then press the Menu ([ ]) key.**

If a Unit ID is selected:

If a Group ID is selected:

4 **Press the Up or Down key to select "Predefined", and then press the Menu ([ ]) key.**



5 **Select a message to be sent by pressing the Up or Down key.**

6 **Press the Menu ([ ]) key.**

The transcriber sends the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

Configuration using KPG-166D

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

Sending a Short Message in Message Mode

In Message Mode, a Short Message is sent by directly entering a message or selecting a message from a list.

Pressing the **Message** key places the transceiver in Message Mode. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then selecting “Message” will cause the transceiver to enter Message Mode.

The following menus are available in Message Mode: The operations such as sending, replying to and forwarding a message can be done by selecting a menu,

Table 8-19 Message Mode

Menu	Description
Inbox (nnn)	Received Short Messages are stored in Inbox. Received Short Messages can be viewed and messages can be replied to or forwarded by selecting this menu. Also, messages can be deleted. (Refer to Viewing, Replying to, Forwarding, and Deleting the Received Short Message (Inbox) on page 168.) “nnn” of “Inbox (nnn)” represents the number of stored messages.
Create New	By selecting this menu, a Short Message can be sent by newly entering a message. Also, the message entered can be stored as a draft. The stored messages are stored in Draft. (Refer to Sending a Short Message by Newly Entering a Message (Create New) on page 172.)
Predefined	By selecting this menu, a Short Message can be sent by selecting a message configured in the Short Message List. (Refer to Sending a Short Message by Selecting a Message from a List (Predefined) on page 174.)
Outbox (nnn)	Sent Short Messages are stored in Outbox. Sent Short Messages can be viewed and messages can be resent or forwarded by selecting this menu. Also, messages can be deleted. (Refer to Viewing, Resending, Forwarding, and Deleting the Sent Short Message (Outbox) on page 176.) “nnn” of “Outbox (nnn)” represents the number of stored messages.
Draft (nnn)	Messages stored as drafts in the Create New menu can be viewed and messages can be sent or edited by selecting this menu. Also, messages can be deleted. (Refer to Viewing, Sending, Editing, and Deleting the Stored Short Message (Draft) on page 180.) “nnn” of “Draft (nnn)” represents the number of stored messages.

Note

Inbox, Outbox and Draft together can store up to 200 messages or messages of an overall data size up to 20 KB. When storing a new message, the oldest message is deleted and the new message is stored.

Configuration using KPG-166D

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

Sending and Receiving a Short Message (Short Data Call)

Compatible model: TK-Dx40 (Mobile)

For Mobile, a Short Message can be sent by a PC command.

Viewing, Replying to, Forwarding, and Deleting the Received Short Message (Inbox)

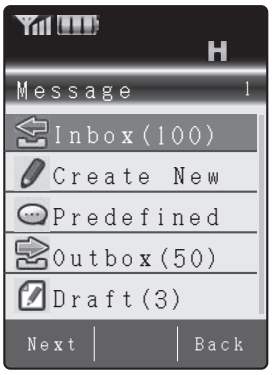
Received Short Messages can be viewed and messages can be replied to or forwarded in the Inbox menu. Also, messages can be deleted.

Operating the Transceiver

- **Viewing the received Short Message**

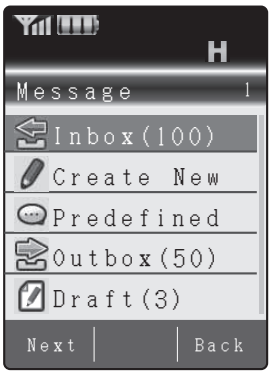
1 **Press the Message key.**

The transceiver enters Message Mode and then the menu selection display appears.

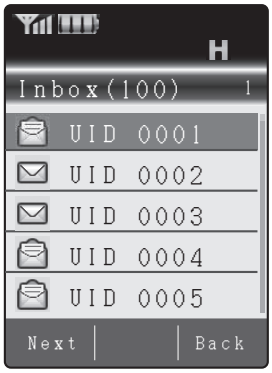


The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "Inbox", and then press the Menu ([ ]) key.**



The message list appears. The Unit ID of the transmitting transceiver appears on the message list. If the Unit ID of the transmitting transceiver is not configured in the Contact List or Unit ID List, "UID xxxxxxx" appears.
The " " icon appears for an unread message and the " " icon appears for a read message.



3 **Press the Up or Down key to select a message, and then press the Menu ([ ]) key.**

The message appears.
Pressing the **Up** or **Down** key can scroll the display up or down.

4 Press the Menu ([ ]) key.

The selection display of the options menu appears. The selection display of the options menu allows a user the various operations of replying to, forwarding, or deleting the message selected in Step 3. Refer to the following sections for details:

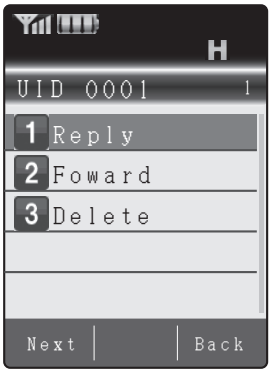
Reply: ● Replying to a Short Message on page 169

Forward: ● Forwarding a Short Message (Inbox) on page 170

Delete: ● Deleting a Short Message from a list (Outbox) on page 179

● Replying to a Short Message

1 In the selection display of the options menu, press the Up or Down key to select "Reply", and then press the Menu ([ ]) key.



2 Input a Message.

A maximum of 368 characters can be entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

3 Press the Menu ([ ]) key.

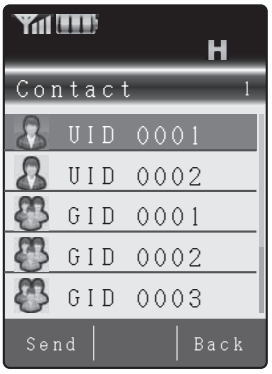
The transceiver sends the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

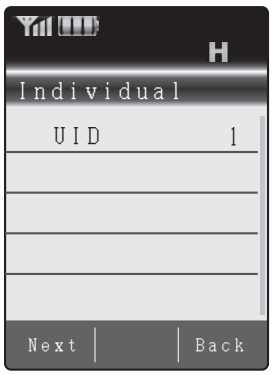
● Forwarding a Short Message (Inbox)

1 **In the selection display of the options menu, press the Up or Down key to select "Forward", and then press the Menu ([ ]) key.**

2 **Select the target ID by pressing the Up or Down key.**



For entering a Unit ID directly, press and hold the **Menu ([ ])** key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



3 **Press the Menu ([ ]) key.**

The transceiver forwards the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

● Deleting a Short Message from a list (Inbox)

1 **In the selection display of the options menu, press the Up or Down key to select "Delete", and then press the Menu ([ ]) key.**

2 **Press the Menu ([ ]) key.**

The selected Short Message is deleted from the list.

● Deleting all Short Messages from a list (Inbox)

1 **Select "Delete All" in Step 3 of "●Viewing the received Short Message", and then press the Menu ({ }) key.**

The warning message appears.

2 **Press the Menu ([ ]) key.**

All Short Messages are deleted from the list.

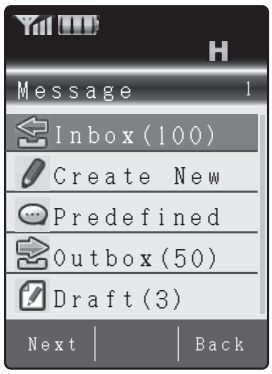
Sending a Short Message by Newly Entering a Message (Create New)

A Short Message can be sent by newly entering a message in the Create New menu. Also, the message entered can be stored as a draft.

Operating the Transceiver

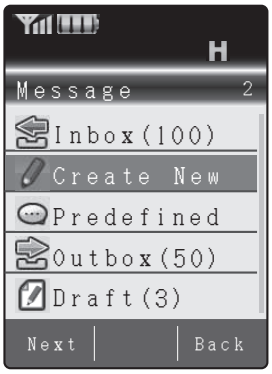
1 **Press the Message key.**

The transceiver enters Message Mode and then the menu selection display appears.



The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "Create New", and then press the Menu ([ ]) key.**



3 **Input a Message.**

A maximum of 368 characters can be entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

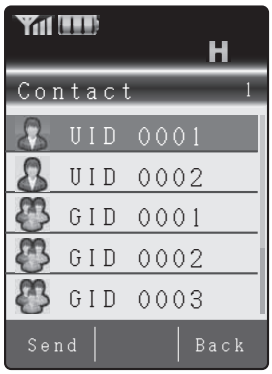
4 **Press the Menu ([ ]) key.**

The selection display of the options menu appears.

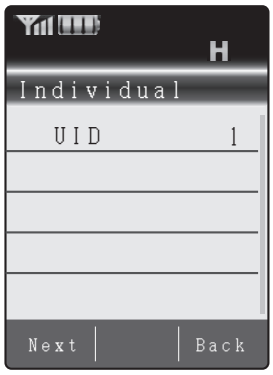
5 **Press the Up or Down key to select "Send" or "Save", and then press the Menu ([ ]) key.**

If "Send" is selected, proceed to the next step.
If "Save" is selected, the entered message is stored as a draft without being sent. The stored message can be viewed in the Draft menu. (Refer to Viewing, Sending, Editing, and Deleting the Stored Short Message (Draft) on page 180.)

6 **Select the target ID by pressing the Up or Down key.**



For entering a Unit ID directly, press and hold the **Menu** ([ ]) key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



7 **Press the Menu ([ ]) key.**

The transceiver sends the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

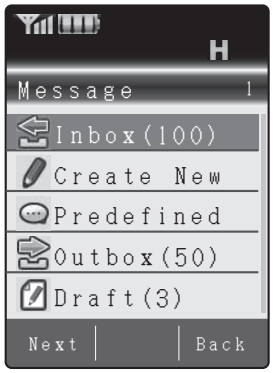
Sending a Short Message by Selecting a Message from a List (Predefined)

A Short Message can be sent by selecting a message configured in the Short Message List in the Predefined menu.

Operating the Transceiver

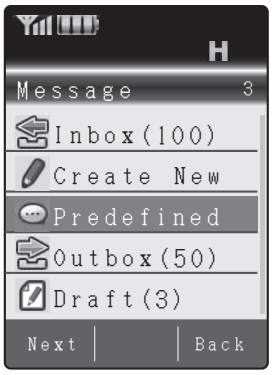
1 **Press the Message key.**

The transceiver enters Message Mode and then the menu selection display appears.



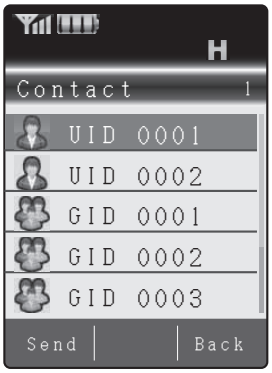
The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "Predefined", and then press the Menu ([□]) key.**

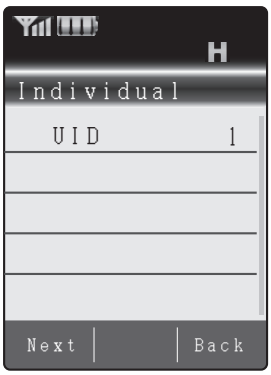


3 **Press the Up or Down key to select a message, and then press the Menu ([□]) key.**

4 **Select the target ID by pressing the Up or Down key.**



For entering a Unit ID directly, press and hold the **Menu** ([□]) key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



5 **Press the Menu ([ ]) key.**

The transceiver sends the Short Message.

“COMPLETE” appears if the Short Message is properly sent to the target transceiver.

Viewing, Resending, Forwarding, and Deleting the Sent Short Message (Outbox)

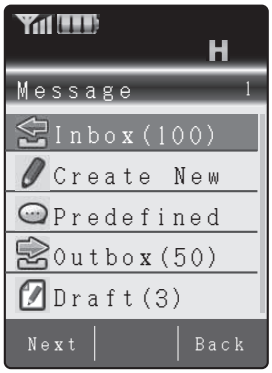
Sent Short Messages can be viewed and messages can be resent or forwarded in the Outbox menu. Also, messages can be deleted.

Operating the Transceiver

- **Viewing the sent Short Message**

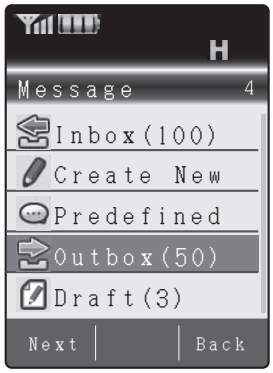
1 **Press the Message key.**

The transceiver enters Message Mode and then the menu selection display appears.

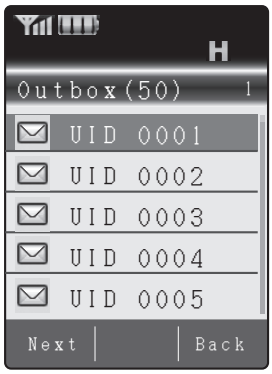


The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "Outbox", and then press the Menu ([ ]) key.**



The message list appears. The Unit ID of the target transceiver appears on the message list. If the Unit ID of the target transceiver is not configured in the Contact List or Unit ID List, "UID xxxxxxx" appears.



3 **Press the Up or Down key to select a message, and then press the Menu ([ ]) key.**

The message appears.
Pressing the **Up** or **Down** key can scroll the display up or down.

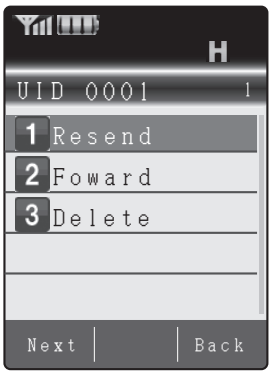
4 **Press the Menu ([▯]) key.**

The selection display of the options menu appears. The selection display of the options menu allows a user the various operations of resending, forwarding, or deleting the message selected in Step 3. Refer to the following sections for details:

Resend: ● Resending a Short Message on page 177

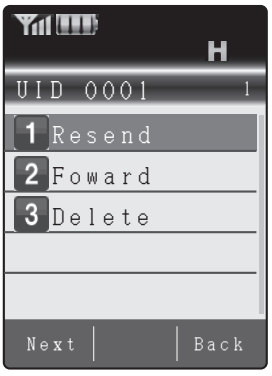
Forward: ● Forwarding a Short Message (Outbox) on page 178

Delete: ● Deleting a Short Message from a list (Outbox) on page 179



● Resending a Short Message

1 **In the selection display of the options menu, press the Up or Down key to select "Resend", and then press the Menu ([▯]) key.**



2 **Input a Message.**

A maximum of 368 characters can be entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

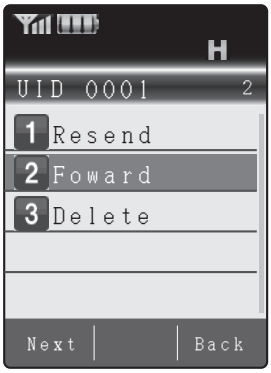
3 **Press the Menu ([▯]) key.**

The transceiver sends the Short Message.

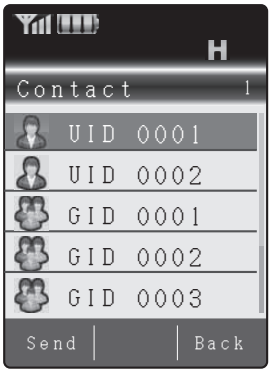
"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

● Forwarding a Short Message (Outbox)

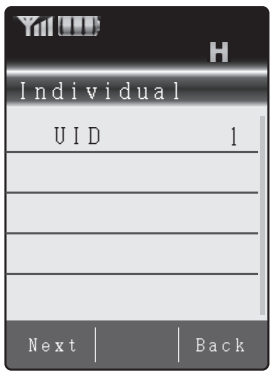
1 **In the selection display of the options menu, press the Up or Down key to select "Forward", and then press the Menu ([▯]) key.**



2 **Select the target ID by pressing the Up or Down key.**



For entering a Unit ID directly, press and hold the **Menu** (**[▯]**) key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



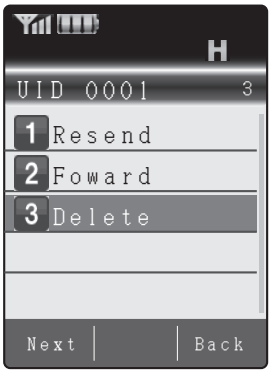
3 **Press the Menu ([▯]) key.**

The transceiver forwards the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

● Deleting a Short Message from a list (Outbox)

1 **In the selection display of the options menu, press the Up or Down key to select "Delete", and then press the Menu ([ ]) key.**



2 **Press the Menu ([ ]) key.**

The selected Short Message is deleted from the list.

● Deleting all Short Messages from a list (Outbox)

1 **Select "Delete All" in Step 3 of "●Viewing the sent Short Message", and then press the Menu ({ }) key.**

The warning message appears.

2 **Press the Menu ([ ]) key.**

All Short Messages are deleted from the list.

Viewing, Sending, Editing, and Deleting the Stored Short Message (Draft)

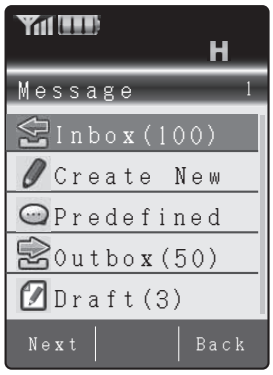
Messages stored as drafts in the Create New menu can be viewed and messages can be sent or edited in the Draft menu. Also, messages can be deleted.

Operating the Transceiver

- **Viewing the received Short Message**

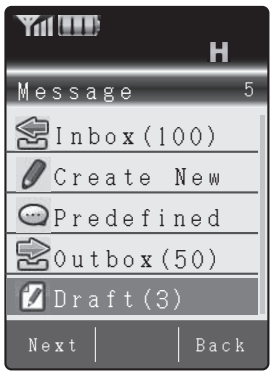
1 **Press the Message key.**

The transceiver enters Message Mode and then the menu selection display appears.

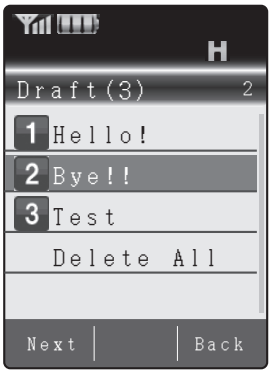


The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Press the Up or Down key to select "Draft", and then press the Menu ([ ]) key.**



3 **Select a message by pressing the Up or Down key.**



4 **Press the Menu ([ ]) key.**

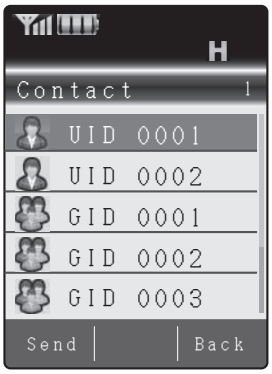
The selection display of the options menu appears. The selection display of the options menu allows a user the various operations of sending, editing, or deleting the message selected in Step 3. Refer to the following sections for details:

Send: ● Sending a Short Message on page 181
Edit: ● Editing a Short Message on page 182
Delete: ● Deleting a Short Message from a list (Inbox) on page 182

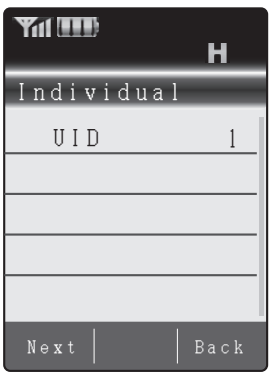
● Sending a Short Message

1 **In the selection display of the options menu, press the Up or Down key to select "Send", and then press the Menu ([ ]) key.**

2 **Select the target ID by pressing the Up or Down key.**



For entering a Unit ID directly, press and hold the **Menu** ([ ]) key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



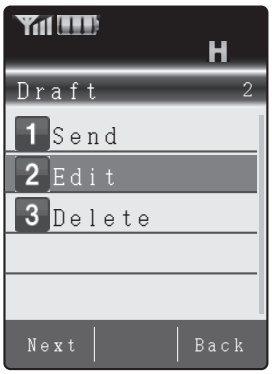
3 **Press the Menu ([ ]) key.**

The transceiver sends the Short Message.

"COMPLETE" appears if the Short Message is properly sent to the target transceiver.

● Editing a Short Message

1 **In the selection display of the options menu, press the Up or Down key to select “Edit”, and then press the Menu ([ ]) key.**



2 **Input a Message.**

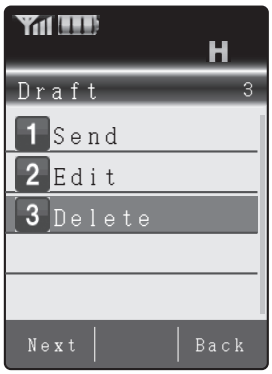
A maximum of 368 characters can be entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

3 **Select one of the following operations:**

- Press and hold the **Menu** ([ ]) key.
  The edited message is saved.
- Press the **Menu** ([ ]) key.
  The selection display of the target ID appears and the ID can be selected to send. Refer to Step 2 of ● Sending a Short Message on page 181 and later for the operation steps in this case.

● Deleting a Short Message from a list (Inbox)

1 **In the selection display of the options menu, press the Up or Down key to select “Delete”, and then press the Menu ([ ]) key.**



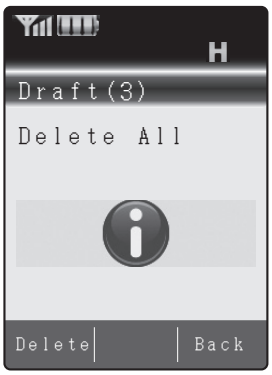
2 **Press the Menu ([ ]) key.**

The selected Short Message is deleted from the list.

● Deleting all Short Messages from a list (Draft)

1 **Select “Delete All” in Step 3 of “● Sending a Short Message”, and then press the Menu ({▢}) key.**

The warning message appears.



2 **Press the Menu ([▢]) key.**

All Short Messages are deleted from the list.

Receiving a Short Message

Upon receiving a Short Message, the received Short Message appears on the display, and the transceiver can send the Short Message to an external device from the communication ports.

Note

- The transceiver can send the received Short Message using a serial command. The Short Message is sent to an external device that is connected to the transceiver, such as a PC. (Refer to Sending the Received Short Message from the Communication Port (Short Message Serial Output) on page 185.)
- To use serial communications, a user must prepare DMR compatible software or external devices.

Transceiver Behavior

1 **The transceiver starts receiving a Short Message.**

"RECEIVE DATA" appears.

2 **The transceiver receives a Short Message.**

"COMPLETE" appears.

3 **Press the Menu ([▯]) key.**

The message appears.
Pressing the **Up** or **Down** key can scroll the display up or down.

Pressing the **Menu** (**[▯]**) key with the message in the displayed state, the selection display of the options menu appears. The selection display of the options menu allows a user the various operations of replying to, forwarding, or deleting the received message. Refer to Viewing, Replying to, Forwarding, and Deleting the Received Short Message (Inbox) on page 168 for operation methods.

Configuration using KPG-166D

Configuring the Message Display Type (See Edit > DMR > General)

Short Message on Data Zone-Channel

Short Message on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send a Short Message in a DMR Conventional system.

The channel in a DMR Conventional system is automatically changed to the channel configured for Data Zone-Channel (DMR) to send the Short Message. The transceiver restores the last used zone-channel when the transmission ends. Short Message on Data Zone-Channel is used to support data communications on a specific dedicated channel.

Configuration using KPG-166D

- Configuring the Short Message on Data Zone-Channel to be enabled or disabled (See Edit > DMR > Conventional 1)
- Configuring the Data Zone-Channel (DMR) (See Edit > Zone Information > Zone Edit)

Sending the Received Short Message from the Communication Port (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.

By using Short Message Serial Output, a base station user can monitor the received Short Message in real time.

Note

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-166D

Configuring the Short Message Serial Output to be enabled or disabled (See Edit > Optional Features) Optional Features 1 > Common Page 4 > Serial Output)

8.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)

Open Voice Channel Mode (OVCM) is the function to hear a conversation even if the received ID does not match when the transceiver receives various voice calls (Individual Call, Group Call, Broadcast Call).

When the use of OVCM is permitted for the transceiver receiving the various voice calls, the transceiver can hear the conversations even if the received ID does not match.

This function is used for transceivers other than the transceiver of the Specified ID to participate in a conversation.

To use this function, Open Voice Channel Mode must be enabled by using KPG-166D. Press the **OVCM** key to send out a signal that is applied with OVCM.

Alternatively, calls by OVCM can be enabled on TK-Dx00 with LCD by selecting “OVCM” in the Menu Mode. (Refer to 3.4 Using Menu Mode on page 24.)

If OVCM is enabled on TK-Dx00 with LCD, the “ ” icon lights up in the display of the transceiver.

Table 8-20 Open Voice Channel Mode

Configuration	Description
Enabled	**Transmit Operation:** Calls by OVCM can be enabled or disabled if the **OVCM** key is pressed, or “OVCM” is selected from Menu Mode. The transceiver can transmit a signal with OVCM applied while calls by OVCM are in the enabled status. **Receive Operation:** Conversations can be heard even if the ID does not match when the transceiver receives a call with OVCM applied.
Disabled	**Transmit Operation:** Calls by OVCM cannot be enabled or disabled even if the **OVCM** key is pressed, or “OVCM” is selected from Menu Mode. Therefore, the transceiver cannot transmit a signal with OVCM applied. **Receive Operation:** Conversations cannot be heard if the ID does not match even when the transceiver receives a call with OVCM applied.

For example, Transceiver A specifies the ID of Transceiver B, and initiates a call with OVCM applied (refer to the figure below).

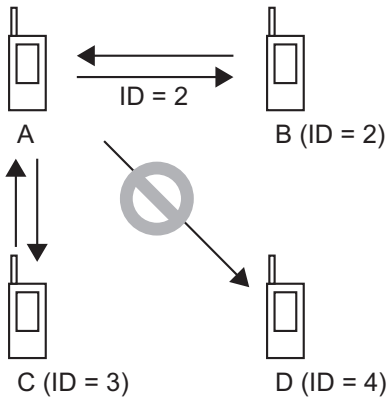


Figure 8-6 Operation Examples

Table 8-21 Configuration Examples

Transceivers	Open Voice Channel Mode	Call by OVCM
A	Enabled	Enabled
B	Disabled	Disabled
C	Enabled	Disabled
D	Disabled	Disabled

Because the ID matches, Transceiver B can communicate with Transceiver A even if Open Voice Channel Mode is disabled. Because Open Voice Channel Mode is enabled, Transceiver C can communicate with Transceiver A even if the ID does not match. Because Open Voice Channel Mode is disabled and the ID does not match , Transceiver D cannot communicate with Transceiver A even if the ID does not match.

Also, even if calls by OVCM are disabled, Transceiver B or C receiving a call with OVCM applied transmits a signal with OVCM applied when replying.

Note

- If the transceiver is turned OFF and turned back ON while calls by OVCM are enabled, calls by OVCM are disabled.
- If a signal with OVCM applied cannot be transmitted when replying.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Open Voice Channel Mode to be enabled or disabled (See Edit > DMR > Conventional 1)

8.13 Call All Transceivers of the Matching Color Code (Unaddressed Call)

Unaddressed Call is the function to initiate 2-way voice communication with multiple transceivers without specifying a group.

In a regular Group Call, the transceiver can communicate only with transceivers included in the Group ID specified. Unaddressed Call can initiate a call to all transceivers having the same Color Code on the same channel.

Using this function, such as during an emergency, the transceiver can initiate a call without distinguishing the group to share information with the users of multiple groups.

To use this function, the Selcall on PTT configuration of the channel to be used for an Unaddressed Call needs to be configured “Off” by using KPG-166D.

Configuration using KPG-166D

- Configuring the Color Code (See Edit > Zone Information > Channel Edit > Page 1)
- Configuring the Selcall on PTT (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)

Call Interruption is the function to enable a transceiver other than the transmitting transceiver to terminate voice communications by sending and receiving the Call Interruption request message. A transceiver receiving the Call Interruption request message on the channel where the transceiver is performing voice communication terminates voice communication.

By pressing the **Call Interruption** key, a Call Interruption request message can be sent.

Also, a Call Interruption request message can be sent by the following functions:

- **Busy Channel Lockout (Interrupt CALL)**
  The current incoming call can be interrupted by pressing the **PTT** switch to respond (Talkback) while receiving an Individual Call, Group Call, or Unaddress Call addressed to the own transceiver on a channel with “Interrupt CALL” configured in Busy Channel Lockout.
- **Interrupt ALL CALL**
  Call Interruption is executed and voice communication can be terminated when All Call is initiated during voice communication (including voice communication not addressed to the own transceiver) on the selected channel.
- **Interrupt Message CALL**
  Call Interruption is executed and voice communication can be terminated when transmission of a message is initiated during voice communication (including voice communication not addressed to the base station) on the selected channel.
- **Interrupt Emergency CALL**
  When the transceiver enters Emergency Mode, Call Interruption is executed and voice communication can be terminated if voice communication (including voice communication not addressed to the base station) is performed on the channel used for Emergency Mode.

To send a Call Interruption request message using these functions, Encode (Call Interruption) of the channel used needs to be enabled. To receive a Call Interruption request message, Decode (Call Interruption) of the channel used also needs to be enabled.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Decode (Call Interruption) to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 1 > DMR > Call Interruption)
- Configuring the Encode (Call Interruption) to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 1 > DMR > Call Interruption)
- Configuring the Busy Channel Lockout (DMR) (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the Interrupt ALL CALL to be enabled or disabled (See Edit > DMR > General)
- Configuring the Interrupt Message CALL to be enabled or disabled (See Edit > DMR > General)
- Configuring the Interrupt Emergency CALL to be enabled or disabled (See Edit > Emergency Information > Emergency 1)

8.15 Sending GPS Data

Compatible model: TK-Dx00/ TK-Dx40 (Mobile)

Global Positioning System (GPS) is the system to acquire the current location information of the own transceiver by receiving signals from the Global Positioning System satellites orbiting the earth.

The transceiver of the mobile station can send the acquired own location information (GPS data) to the base station. The base station can send received GPS data to the PC as serial commands.

A GPS receiver unit compatible with the NMEA-0183 standard is required and it must be connected to the communication port of the mobile station transceiver to send GPS data.

The GPS receiver unit is embedded in TK-D200G/ TK-D300G. In TK-D200/ TK-D300, the GPS receiver unit is not embedded. Therefore, the microphone with a GPS receiver unit needs to be connected.

Note

- For a transceiver sending the GPS data, “GPS” must be assigned to the communication port connected to the GPS receiver unit.
- For using the built-in GPS receiver unit by TK-D200G/ TK-D300G, Built-in GPS Receiver needs to be enabled when configuring data by using KPG-166D. In this case, the communication port does not need to be configured.

Transmission Method of GPS Data

Following are the methods to send GPS data.

- **Automatic GPS data transmission**
  - → Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)
  - → Sending GPS Data According to the Request from the Base Station (GPS Report Mode)
- **Manual GPS data transmission**
  - → Sending GPS Data Manually by Using a Key (Send the GPS Data)

ID of the Target Transceiver (Base ID)

Base ID is the ID of the target transceiver used for sending GPS data.

Either Unit ID or Group ID can be configured as Base ID by using KPG-166D. 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 of the **DMR** window > **GPS** tab in KPG-166D. If Base ID (GPS) is not configured, the GPS data is sent to the ID configured in the **Base ID** edit box in the **DMR** window > **General 1** tab.

Configuration using KPG-166D

- Configuring the Base ID Type and the Base ID (See Edit > DMR > Conventional 1)
- Configuring the Base ID Type (GPS) and the Base ID (GPS) (See Edit > DMR > GPS)

Channel Used when Sending GPS Data (GPS Report Channel Type)

GPS Report Channel Type can be configured to enable or disable the transmission of GPS data for each channel by using KPG-166D.

Table 8-22 GPS Report Channel Type

Configuration	Description
None	GPS data cannot be sent on the channel where “None” is configured for GPS Report Channel Type. (GPS Report Channel Type.
Selected Channel	GPS data can be sent on the channel where “Selected Channel” is configured for GPS Report Channel Type. If Base ID (GPS) is not configured, the GPS data is sent to the ID configured for Selcall on PTT on the channel.
Selected Zone Setting	On a channel where “Selected Zone Setting” is configured for GPS Report Channel Type, GPS data is sent after migrating to the Zone-channel configured by GPS Report Zone-Channel of the zone including the channel. The previous channel is restored after sending the GPS data. If Base ID (GPS) is not configured, GPS data is sent to the ID configured for Selcall on PTT on the channel configured in GPS Report Zone-Channel.

Configuration using KPG-166D

- Configuring the GPS Report Channel Type (See Edit > Zone Information > Channel Edit > Page 1 > DMR)
- Configuring the GPS Report Zone-Channel (See Edit > Zone Information > Zone Edit)

Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)

GPS data can be sent automatically at the intervals configured for GPS Report Interval Time.

This function is used for controlling or monitoring vehicles on a time basis by periodically transmitting location information to the base station.

To use this function, “Auto” must be configured for GPS Report Mode by using KPG-166D.

Note

- The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if “Auto” is configured for GPS Report Mode.
- If the transceiver is under the following conditions, the automatic transmission of GPS data at certain intervals will be canceled. Also, the Transmit Busy Wait Time will not suspend the transmission to avoid a collision with a GPS transmission from another transceiver while sending GPS data. (Refer to Transmit Busy Wait Time on page 147.)
  - While the transceiver is transmitting a call
  - While the transceiver unmutes the speaker
  - While Transmit Frequency is not configured
  - While transmission is disabled by the Time-out Timer
  - While the transceiver is sending or receiving DMR data
  - While the transceiver is waiting to send the Transpond tone
  - Transceiver Password Mode
  - Emergency Mode
  - While the transceiver is in busy state
  - While the Public Address function is used

Configuration using KPG-166D

Configuring the GPS Report Mode (See Edit > Optional Features > Optional Features 2 > GPS)

Sending GPS Data According to the Request from the Base Station (GPS Report Mode)

The transceiver can send GPS data when a GPS data transmission request is received from the base station.

This function is used when the base station controls the timing to require GPS data. This function is also used to avoid transmit collisions if there are many subscriber units.

To use this function, “Poll” must be configured for GPS Report Mode by using KPG-166D.

Note

The transceiver sends GPS data to the ID of the transceiver configured for Base ID (GPS) or Base ID, not to the ID that sent the data transmission request. However, the transceiver sends GPS data to the ID of the transceiver which sent a GPS Polling Request if GPS Report Back to Requested ID is enabled. (Refer to GPS Report Back to Requested ID on page 192.)

Configuration using KPG-166D

Configuring the GPS Report Mode (See Edit > Optional Features > Optional Features 2 > GPS)

Sending GPS Data Manually by Using a Key (Send the GPS Data)

GPS data can be sent manually by a user pressing the **Send the GPS Data** key. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the GPS data can be sent manually by selecting the “Send the GPS Data”. (Refer to 3.4 Using Menu Mode on page 24.)

Configuration using KPG-166D

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

GPS Report Interval Time

GPS Report Interval Time allows the transceiver to send GPS data if “Auto” is configured for GPS Report Mode.

GPS data is sent by the interval configured for GPS Report Interval Time if automatic transmission of GPS data is initiated by the GPS Report Mode function.

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-166D

Configuring the GPS Report Interval Time (See Edit > Optional Features > Optional Features 2 > GPS)

GPS 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-166D

Configuring the GPS Time Mark (See Edit > Optional Features > Optional Features 2 > GPS)

GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 8-23 GPS Message Type

Configuration	Operation
Full	The message to be sent is the GPS data corresponding to $GPRMC.
Short	The message to be sent is the GPS data corresponding to $GPGLL.

Configuration using KPG-166D

Configuring the GPS Message Type (See Edit > Optional Features > Optional Features 2 > GPS)

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 GPS Polling Requests.

Table 8-24 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 ID of the Target Transceiver (Base ID) on page 189.)

Configuration using KPG-166D

Configuring the GPS Report Back to Requested ID to be enabled or disabled (See Edit > Optional Features > Optional Features 2 > GPS)

8.16 Receiving GPS Data

The base station receiving GPS data from the transceiver of a mobile station can send the GPS data to the PC as serial commands. If a PC installed with a mapping application is connected to the communication port of the base station transceiver, the location information of mobile station transceivers appears on a map on the PC display. This function is convenient for dispatch control or a traffic control system.

Also, if a mobile station transceiver connecting to a GPS receiver unit receives location information (GPS data) from a GPS satellite, the current location information of the own transceiver can be displayed on the LCD.

Note

For a transceiver receiving GPS data, “Data + GPS Data Output” must be assigned to the communication port connected to a PC installed with the mapping application. (Refer to A.4 Available Functions for COM Port on page 483.)

Map Header

Whether to send data to the mapping application when the base station transceiver receives the GPS data from the mobile station transceiver can be configured.

Following are the type of data that can be sent to the mapping application.

Table 8-25 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. This sentence is used when sending GPS data in an Emergency Mode or by pressing the **PTT** switch.

Configuration using KPG-166D

Configuring the Map Header (See Edit > Optional Features > Optional Features 2 > GPS > Base Station Settings)

GPS Position Display

GPS Position Display can be used to show the current location information of the own transceiver on the LCD.

Refer to 13 GPS on page 388 for details about GPS Position Display.

8.17 Remote Operation by Radio Communication (Remote Control)

Remote Control is the function to remotely operate using radio communication the control of an individually specified transceiver.

You can control a transceiver by sending various Remote Control messages and making an individually specified transceiver receive the messages.

Remote Control has the following functions:

Table 8-26 Remote Control Functions

Function	Description
Remote Stun	This is the function to disable the use of an individually specified transceiver (Stun state) by making the transceiver receive a Remote Stun Message. If the transceiver receives the Remote Revive Message, the transceiver revives from the Stun state. (Refer to Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 197.)
Remote Kill	This is the function to inhibit the use of an individually specified transceiver and disable all operations by making the transceiver receive a Remote Kill Message. (Refer to Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 197.)
Remote Monitor	This is the function to make an individually specified transceiver transmit continuously by making the transceiver receive a Remote Monitor Message. (Refer to Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor) on page 198.)
Radio Check	This is the function to check whether or not an individually specified transceiver is being operated by making the transceiver receive a Radio Check Message. (Refer to Checking Whether Another Transceiver is in Operation (Radio Check) on page 199.)

TK-Dx00 with LCD:

By sending various Remote Control messages in Remote Control Mode and making an individually specified transceiver receive the messages, the transceiver can be controlled.

Pressing the **Remote Control** key places the transceiver in Remote Control Mode. In the case of TK-Dx00 with LCD, by pressing the **Menu** key to enter the Menu Mode, you can select “Remote Control” for the transceiver to enter the Remote Control Mode.

Various Remote Control messages can be sent by sending various Remote Control message transmission commands from the PC to the transceiver. To do so, “Data” or “Data + GPS Data Output” must be assigned to the communication port of the transceiver.

TK-Dx00 without LCD/ TK-Dx40:

You can control a transceiver by sending various transmission commands for the Remote Control messages from a PC to the transceiver and making an individually specified transceiver receive the messages. To do so, “Data” or “Data + GPS Data Output” must be assigned to the communication port of the transceiver.

Configuration using KPG-166D

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

Sending Remote Control Messages by Remote Control Mode

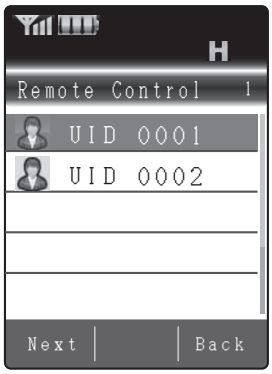
Compatible model: TK-Dx00 with LCD

Various Remote Control messages can be sent in Remote Control Mode

Operating the Transceiver

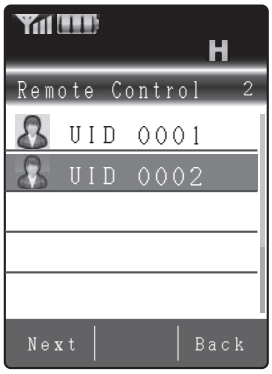
1 **Press the Remote Control key.**

The transceiver enters Remote Control Mode and then the Unit ID selection display will appear.

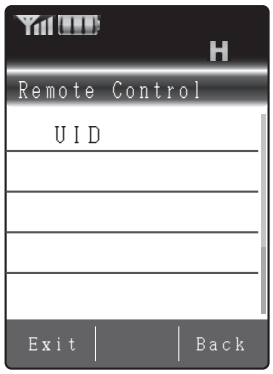


The subsequent operations are identical even if the transceiver enters Message Mode by a user pressing the **Menu** key.

2 **Select the target Unit ID by pressing the Up or Down key.**

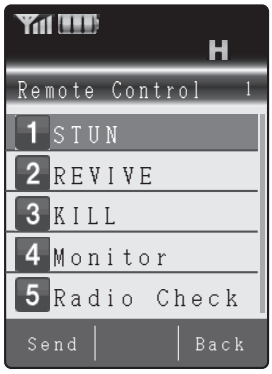


For entering a Unit ID directly, press and hold the **Menu** ([▯]) key to show the Unit ID entry display. However, Manual Dialing needs to be enabled for this operation. (Refer to Manual Dialing (DMR Conventional System Only) on page 23.)



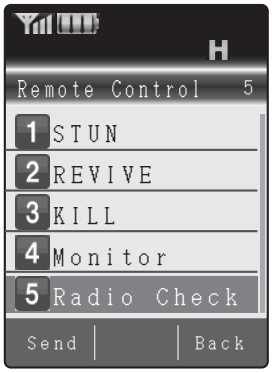
3 **Press the Menu ([▯]) key.**

The selection display of the options menu appears.



4 Select a Remote Control message to be sent by pressing the Up or Down key.

Stun: The transceiver sends the Remote Stun Message.
Revive: The transceiver sends the Remote Revive Message.
Kill: The transceiver sends the Remote Kill Message.
Monitor: The transceiver sends the Remote Monitor Message.
Radio Check: The transceiver sends the Radio Check Message.



5 Press the Menu ([ ]) key.

A Remote Control message is sent.

"COMPLETE" appears if the Remote Control message is properly sent to the target transceiver.

Disabling the Transceiver Capability by Remote Control (Stun/ Kill)

The transceiver capability can be disabled via remote control from an external device using radio communication. 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.

By sending a Remote Stun Message, Remote Control Message, or Remote Kill Message in Remote Control Mode and making an individually specified transceiver receive the message, the transceiver can be controlled. (Refer to Sending Remote Control Messages by Remote Control Mode on page 195.)

Following is the transceiver behavior when the transceiver receives a Remote Control message:

Table 8-27 Stun/ Kill

Remote Control Message	Description
Remote Stun	The transceiver is disabled if the transceiver receives the Remote Stun Message. Whether to accept a Remote Stun Message when the transceiver receives the Remote Stun Message can be configured using KPG-166D. 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-166D. Also, whether to accept a Remote Kill Message when the transceiver receives the Remote Kill Message can be configured using KPG-166D.

Note

- This function is applicable only when an individual call is initiated.
- The received Color Code and the Color Code configured for the transceiver need to match to receive the Remote Stun Message, Remote Revive Message, or Remote Kill Message.

Configuration using KPG-166D

Configuring the Remote Stun/Kill to be enabled or disabled (See Edit > DMR > Conventional 1)

Monitoring the Situation Around Another Transceiver by Remote Control (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.

By sending Remote Control Messages in Remote Control Mode and making an individually specified transceiver receive the messages, the transceiver can be controlled. (Refer to Sending Remote Control Messages by Remote Control Mode on page 195.)

The transceiver which has received the Remote Control Message sends an acknowledgment to the transmitting transceiver, and then unmutes the speaker and initiates a continuous transmission using Individual Call. The duration of continuous transmission can be configured via KPG-166D.

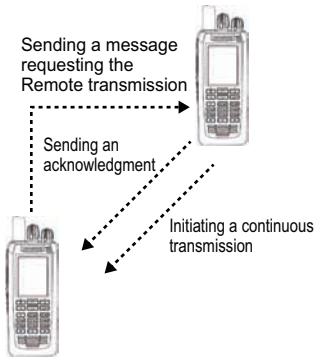


Figure 8-7 Remote Monitor

This function has a Normal Mode and a Silence Mode: the former is a mode notifying a user of the transceiver's status of continuous transmission by an indication on the LCD and by lighting the Transmit LED, and the latter is a mode not notifying a user of the transceiver's status of continuous transmission. The mode to use can be configured via KPG-166D.

If in Normal Mode

The transceiver which received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then displays "<<Remote TX >>" on the 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

- Whether to accept a Remote Control Message when the transceiver receives the Remote Control Message can be configured using KPG-166D.
- The transceiver initiates a continuous transmission only if the message requesting the Remote Control Message is received by an Individual Call. The transceiver does not initiate a continuous transmission even if the message requesting the Remote Control Message is received using anything other than Individual Call.
- While the transceiver is in the status of a continuous transmission because the Remote Monitor, Time-out Timer and Busy Channel Lockout are disabled.
- While the transceiver is in the state of a continuous transmission because of the Remote Monitor, the configuration of Emergency Mic Sense is applied to the microphone sensitivity.
- For TK-Dx00 without LCD and TK-Dx40, check the transceiver status via the LED in the Normal Mode.

Configuration using KPG-166D

- Configuring the Remote Monitor to be enabled or disabled (See Edit > DMR > Conventional 1)
- Configuring the Remote Monitor Timer (See Edit > DMR > Conventional 3 > Remote Monitor)
- Configuring the Remote Monitor Display (See Edit > DMR > Conventional 3 > Remote Monitor)
- Configuring the Emergency Mic Sense (See Edit > Emergency Information > Emergency 1)

Checking Whether Another Transceiver is in Operation (Radio Check)

Radio Check can be used to check whether an individually specified transceiver is operating in the system using radio communication.

By sending the Radio Check Messages in Remote Control Mode and making an individually specified transceiver receive the messages, the transceiver can be controlled. (Refer to Sending Remote Control Messages by Remote Control Mode on page 195.)

The transceiver receiving a Radio Check Message sends an acknowledgment to the transmitting transceiver.

Note

Whether to accept a Radio Check Message when the transceiver receives the Radio Check Message can be configured using KPG-166D.

Configuration using KPG-166D

Configuring the Radio Check to be enabled or disabled (See Edit > DMR > Conventional 1)

In an Analog Conventional system, communications are realized by sending and receiving analog signals on an analog channel. The transceiver can make an individual call or a group call using 5-tone signaling.

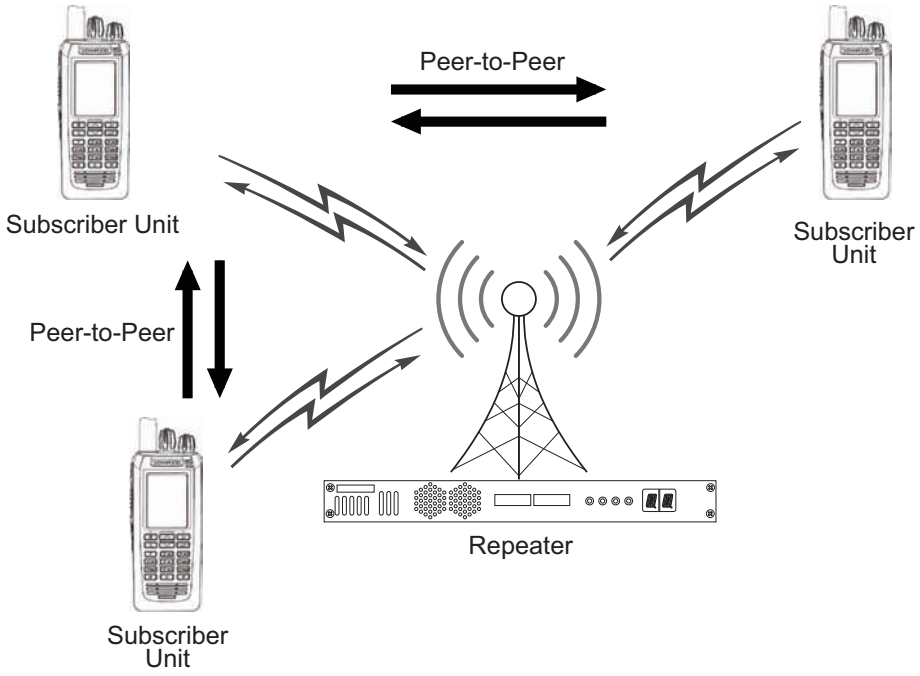


Figure 9-1 Image of Communications in an Analog Conventional System

9.1 Initiating Voice Communications (Basic Transmission and Reception)

This section describes the basic methods for transmission and reception in an Analog Conventional system and the relevant functions.

Receiving

Received audio sounds from the speaker if the transceiver receives analog signals, and the frequency matches the frequency of the channel on which the transceiver has waited for. When the signaling (QT/DQT) is used, communications are possible if the received QT tone or DQT code matches the QT tone or DQT code for which the transceiver waits.

Temporarily Disabling the Squelch (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.

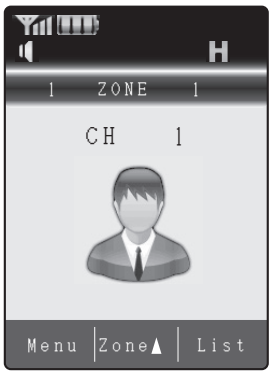
In the case of TK-Dx00 with LCD, by pressing the **Menu** key for the transceiver to enter the Menu Mode, you can select “Squelch Off” to enable or disable Squelch Off. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

● Squelch Off key

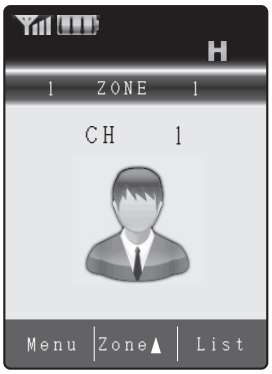
1 **Press the Squelch Off key while Squelch Off is disabled.**

A Key Beep A sounds from the transceiver. In the case of TK-Dx00 with LCD, the "" icon lights up. 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.**

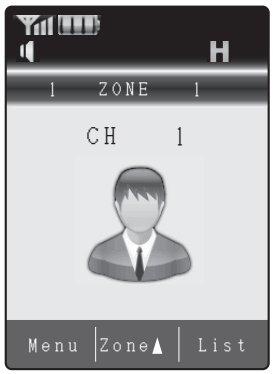
A Key Beep B sounds from the transceiver. In the case of TK-Dx00 with LCD, the "" icon disappears. On a channel where QT tone or DQT code is configured, the transceiver restores Signaling Squelch, and on a channel where no QT tone or DQT code is configured, the transceiver restores Carrier Squelch.



● Squelch Off Momentary key

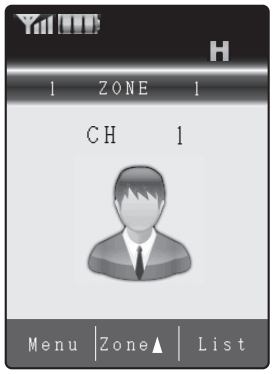
1 **Press and hold the Squelch Off Momentary key.**

In the case of TK-Dx00 with LCD, the "" icon lights up.
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.**

In the case of TK-Dx00 with LCD, the "" icon disappears.
On a channel where QT tone or DQT code is configured, the transceiver restores Signaling Squelch, and on a channel where no QT tone or DQT code is configured, the transceiver restores Carrier Squelch.



Note

- If Squelch Off becomes enabled during the scan, the transceiver pauses scanning on a channel where the transceiver is scanning, and then unmutes the speaker. 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 mandatory unmutes the speaker. White noise is audible if no carrier is present.

Configuration using KPG-166D

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

Adjusting the Squelch Level (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 9-1 Squelch Level

Range	0	1 to 9
	Mute function completely disabled	Low ⇔ High
Step	1	

TK-Dx00 with LCD/ TK-Dx40 (Mobile):

Pressing the **Squelch Level** key changes the Squelch Level.

In the case of TK-Dx00 with LCD, by pressing the **Menu** key to enter the Menu Mode, you can select “Squelch Level” to change the Squelch Level. (Refer to 3.4 Using Menu Mode on page 24.)

The Squelch Level can also be configured using KPG-166D.

TK-Dx00 without LCD/ TK-Dx40 (Portable):

The Squelch Level can be configured using KPG-166D.

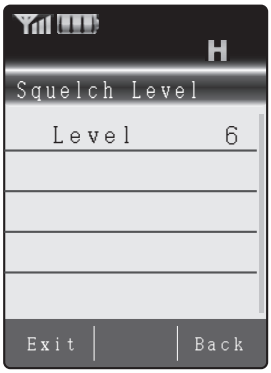
Operating the Transceiver

1 Press the Squelch Level key.

The current Squelch Level appears on the display.

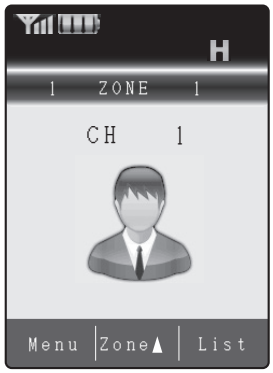
2 Change the Squelch Level by pressing the Up or Down key.

Pressing the **Up** key increases the Squelch Level. Pressing the **Down** key decreases the Squelch Level.



3 Press the Side 1 key.

Squelch Level changes and then the display will restore to normal display.



Note

- Squelch Level can be configured for a channel in an Analog Conventional system. Also, Squelch Level can be configured even for a channel where “Mixed” is configured for Channel Type. Squelch Level 5 is configured for other channels.
- Signaling is disabled while the Squelch Level is being changed.
- Refer to A.6 Key Operations for Each Mode on page 488 for key operations for changing the Squelch Level.

Configuration using KPG-166D

Configuring the Squelch Level (See Edit > Optional Features > Optional Features 2 > Conventional)

Searching Whether the Transceiver Receives a Call (Scan)

Using the Scan function, the transceiver can check each channel in turn whether the channel has a signal. If a channel has a signal, the transceiver receives the signal on the channel.

The following scan functions can be used in an Analog Conventional system.

- Single Scan
- Multi Scan

Refer to 17 SCAN on page 431 for details of Scan.

Transmitting

Pressing the **PTT** switch starts transmitting. When the signaling (QT/ DQT) is used, the transceiver sends the QT tone or DQT code. In this case, if the transmitted QT tone or DQT code matches the QT tone or DQT code preconfigured for the receiving transceiver, the transceivers can communicate.

Restricting the Duration of Continuous Transmission (Time-out Timer)

Time-out Timer (TOT) is the function 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 transceiver automatically stops transmitting and releases the channel if it continuously transmits longer than the configured time.

Time-out Timer can be configured for each zone. Also, timers, such as TOT Pre-alert, TOT Rekey Time, and TOT Reset Time, relevant to Time-out Timer can be configured.

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 sec, TOT Pre-alert: 4 sec

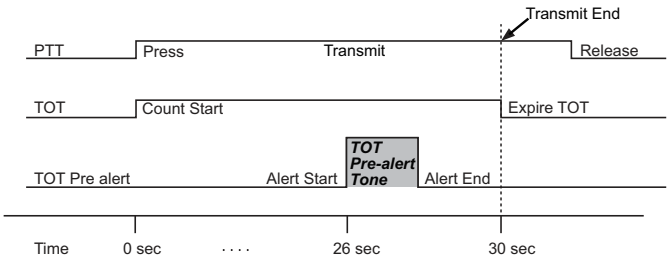


Figure 9-2 TOT Pre-alert

Note

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

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.
Example: Time-out Timer: 30 sec, TOT Rekey Time: 20 sec

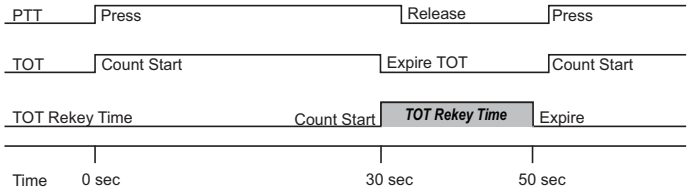


Figure 9-3 TOT Rekey Time

Note

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

TOT Reset Time

TOT Reset Time is the time required to reset the elapsed time for Time-out Timer.
Example 1: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

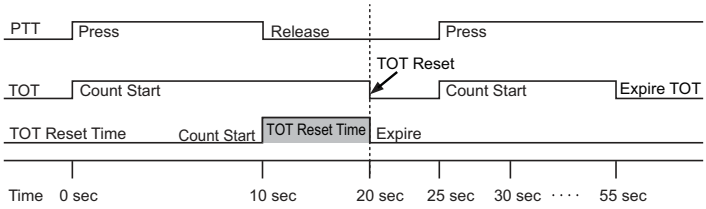


Figure 9-4 TOT Reset Time 1

The transceiver considers a retransmission within this configured length of time as a continuous transmission. In the following example, the counting of Time-out Timer continues because the transmission was started by a user pressing the **PTT** switch while the TOT Reset Time was counting down.
Example 2: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

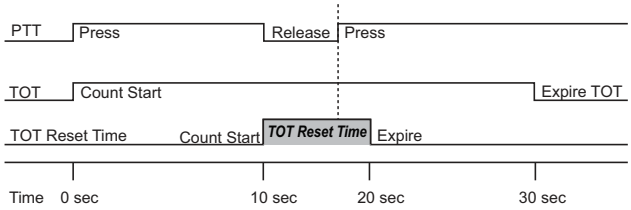


Figure 9-5 TOT Reset Time 2

Note

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

Configuration using KPG-166D

- Configuring the Time-out Time (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Pre-alert (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Rekey Time (See Edit > Zone Information > Zone Edit)
- Configuring the TOT Reset Time (See Edit > Zone Information > Zone Edit)

Avoiding Interference with Other Communications (Busy Channel Lockout (Analog))

Busy Channel Lockout is the function to automatically restrict 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, Warning Tone A is output from the transceiver, and transmission is disabled. In this case, “BUSY” appears on the display of TK-Dx00 with LCD. The Warning Tone A sounds from the transceiver until the **PTT** switch is released.

Following are conditions to disable transmission by Busy Channel Lockout (Analog).

Table 9-2 Busy Channel Lockout (Analog)

Configuration	Description
No	Busy Channel Lockout is disabled. Transmission is not restricted even if the channel on which the transceiver 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 or DQT code does not match the QT tone or DQT code preconfigured for the transceiver. The transceiver can transmit if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver.
Optional Signaling (TK-Dx40 only)	Transmission by the transceiver is not allowed until the Optional Signaling received matches the Optional Signaling configured for the transceiver.
Correct Tone (TK-Dx40 only)	The transceiver cannot transmit if the transceiver receives a carrier and the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver. The transceiver can transmit if the received **QT** tone or **DQT** code does not match the **QT** tone or **DQT** code preconfigured for the transceiver.

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 “DMR” is configured for Transmit Mode:**
  The transceiver transmits according to the configuration for Busy Channel Lockout (DMR).

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 DMR). If the transceiver receives an analog signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (Analog). If the transceiver receives a DMR signal, the transceiver will transmit according to the configuration for Busy Channel Lockout (DMR).

Note

- Refer to Avoiding Interference with Other Communications (Busy Channel Lockout (DMR)) on page 115 for details on the transceiver behavior of the Busy Channel Lockout (DMR).
- Busy Channel Lockout cannot be activated in Emergency Mode.

Configuration using KPG-166D

Configuring the Busy Channel Lockout (Analog) (See Edit > Zone Information > Channel Edit > Page 1 > Analog)

Preferentially Using a Channel Being Used by Other Parties (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

- This feature is also activated during transmission using the VOX feature on TK-Dx40 (Portable). During VOX transmission, Busy Channel Lockout can be disabled temporarily to enable transmission if audio sound is input within 500 ms after the transceiver starts outputting Warning Tone B.
- This feature is also activated during transmission using the External PTT (Voice) or External PTT (Data) port on TK-Dx40 (Mobile). During VOX transmission, Busy Channel Lockout can be disabled temporarily to enable transmission if audio sound is input within 500 ms after the transceiver starts outputting Warning Tone C.

Configuration using KPG-166D

Configuring the BCL Override to be enabled or disabled (See Edit > Zone Information > Zone Edit)

Communicating Without Using a Repeater (Talk Around)

Talk Around is the function allowing direct communication between transceivers 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.

The transceiver, with Talk Around enabled, transmits on the receive frequency and uses the Decode Signaling (QT tone or DQT code) configured for the selected channel.

Pressing the **Talk Around** key toggles Talk Around between enabled and disabled.

Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then Talk Around can be toggled between enabled and disabled by selecting “Talk Around”. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

- **Enabling the Talk Around**

1 **Press the Talk Around key while Talk Around is disabled.**

Talk Around is enabled. In the case of TK-Dx00 with LCD, the “ ” icon lights up. In the case of TK-Dx40 (Mobile), “TA” is displayed for 1 sec.

- **Disabling the Talk Around**

1 **Press the Talk Around key while Talk Around is enabled.**

Talk Around is disabled. In the case of TK-Dx00 with LCD, the “ ” icon disappears.

Note

- The enabled status of Talk Around is disabled by changing the zone or channel while Talk Around is enabled.
- If the transceiver starts scanning, the enabled status of Talk Around is disabled. Talk Around cannot be enabled while scanning. Talk Around can be enabled while the scan pauses, but the enabled status of Talk Around is disabled after the scan resumes.
- Talk Around is disabled in Emergency Mode.

Configuration using KPG-166D

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

9.2 Using the Signaling

QT/ DQT is the signaling to be used for facilitating communication within a group if the same channel is shared by several groups.

Sharing the Same Channel (Frequency) by Several Groups (QT/DQT)

QT/ DQT is the signaling to be used for facilitating communication within a group if the same channel is shared by several groups.

QT tone or DQT code has no effect on normal voice communication since QT tone or DQT code uses a subaudible tone.

The transceiver mutes unwanted calls if QT tone 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 octadecimal 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 or DQT code.

Table 9-3 QT/ DQT Transmission/ Reception

Reception	If the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver, the transceiver unmutes 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 or DQT code when the transceiver transmits. Pressing the **PTT** switch causes the transceiver to transmit the preconfigured QT tone or DQT code.

Configuration using KPG-166D

Configuring the QT/DQT Decode/Encode (See Edit > Zone Information > Channel Edit > Page 1)

Using Optional Signaling (Analog)

Compatible model: TK-Dx40

Optional Signaling is used for making selective calls. Optional Signaling that is usable in an Analog Conventional system is FleetSync, DTMF, and 2-tone.

All theses types of signaling make use of audio bandwidths. (Refer to 12 FLEETSYNC on page 362, 9.5 Using DTMF to Initiate a Selective Call on page 215, 9.6 Using 2-tone to Initiate a Selective Call on page 231.)

Behavior of the transceiver varies as follows according to the configuration of Optional Signaling Decode Condition.

When Optional Signaling Decode Condition is configured to “QT/DQT”:

When the QT tone or DQT code matches, and the Optional Signaling on standby matches with that received, the transceiver outputs an Alert Tone and starts Transpond.

When Optional Signaling Decode Condition is configured to “Carrier”:

When the transceiver receives a carrier and the Optional Signaling on standby matches with that received, the transceiver outputs an Alert Tone and starts Transpond. In this case, matching of the QT tone or DQT code is not required.

For channels where “Mixed” is configured for Channel Type, behavior of the transceiver varies as follows according to the type of signal received.

- **When an Analog Signal is Received**

  The transceiver behaves according to the configuration for Optional Signaling (Analog).

- **When a Digital Signal is Received**

  The transceiver outputs an Alert Tone when the Color Code and the Unit ID/ Group ID received match with those configured for the transceiver respectively.

Configuration using KPG-166D

- Configuring Optional Signaling (Analog) (See Edit > Zone Information > Channel Edit > Page 1 > Analog)
- Configuring the Optional Signaling Decode Condition (See Edit > Zone Information > Zone Edit)

Unmuting the Speaker (Audio Control (Analog))

Compatible model: TK-Dx40

Audio Control is a set of conditions to be satisfied for the transceiver to unmute the speaker. Conditions for the transceiver to unmute the speaker can be configured for each channel.

When the conditions specified in Audio Control are satisfied, the transceiver unmutes the speaker and outputs the received sound.

QT tone or DQT code can be combined with Optional Signaling to alter the conditions for the transceiver to unmute the speaker.

Alternatively, the carrier can also be combined with Optional Signaling to alter the conditions for the transceiver to unmute the speaker.

The conditions for the transceiver to unmute the speaker using the QT tone or DQT code are as follows.

Table 9-4 Audio Control (Analog)

Configuration	Description
QT/DQT	The transceiver unmutes the speaker if it receives a carrier and the received QT tone or DQT code matches the QT tone or DQT code configured for the channel.
QT/DQT and Optional Signaling	The transceiver unmutes the speaker when it receives a carrier and the following conditions are satisfied. • The QT tone or DQT code received matches the QT tone or DQT code configured for the channel. • The Optional Signaling received matches the Optional Signaling configured for the channel.
QT/DQT or Optional Signaling	The transceiver unmutes the speaker when it receives a carrier and any of the following conditions is satisfied. • The QT tone or DQT code received matches the QT tone or DQT code configured for the channel. • The Optional Signaling received matches the Optional Signaling configured for the channel.

Configuration using KPG-166D

Configuring the Audio Control (Analog) (See Edit > Zone Information > Zone Edit)

Temporarily Disabling the Signaling (Monitor)

Monitor is the function that temporarily disables the QT/DQT that are configured for a channel on which the transceiver waits.

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.

In the case of TK-Dx00 with LCD, by pressing the **Menu** key for the transceiver to enter the Menu Mode, you can select “Monitor” to enable or disable Monitor. (Refer to 3.4 Using Menu Mode on page 24.)

While Monitor is enabled, the QT tone or DQT code will be disabled.

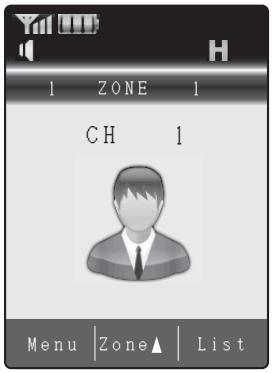
On a channel where “Mixed” is configured for Channel Type, while Monitor is enabled, the QT tone or DQT code will be disabled.

Operating the Transceiver

● Monitor key

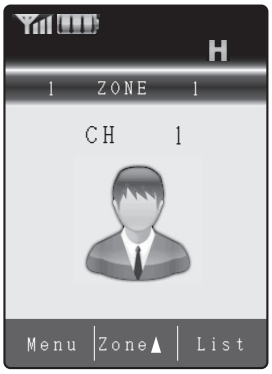
1 **Press the Monitor key while Monitor is disabled.**

A Key Beep A sounds from the transceiver. In the case of TK-Dx00 with LCD, the "" icon lights up. On a channel where QT/DQT Decode is configured, the QT tone or DQT code is deactivated and the received signal will be audible upon receipt of a carrier.



2 **Press the Monitor key while Monitor is enabled.**

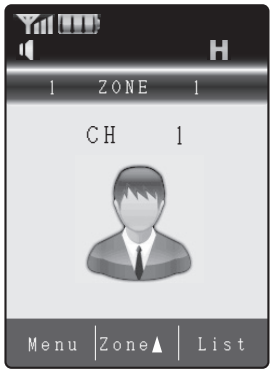
A Key Beep B sounds from the transceiver. In the case of TK-Dx00 with LCD, the "" icon disappears.
A channel where QT/DQT Decode is configured resumes Signaling Squelch.



● Monitor Momentary key

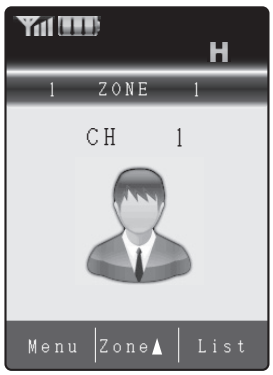
1 **Press and hold the Monitor Momentary key.**

In the case of TK-Dx00 with LCD, the "" icon lights up. On a channel where QT/DQT Decode is configured, the QT tone or DQT code is deactivated and the received signal will be audible upon receipt of a carrier.



2 **Release the Monitor Momentary key.**

In the case of TK-Dx00 with LCD, the "" icon disappears. A channel where QT/DQT Decode is configured resumes Signaling Squelch.



Configuration using KPG-166D

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

Transceiver Behavior during the Scan

The transceiver resets the signaling and unmutes only with a carrier, and then remains in the standby state.

Scanning continues when the **Monitor** key is pressed while scanning is in progress. As with the state when scanning is not in progress, the transceiver switches to Carrier Squelch.

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.

Unmuting in Tandem with the Microphone (Off-hook Decode)

Compatible model: TK-Dx40 (Mobile)

Off-hook Decode is a feature that enables decoding of QT/DQT and Optional Signaling even when the microphone is in the off-hook state.

The transceiver behaves as follows according to the configuration for Off-hook Decode.

Table 9-5 Off-hook Decode

Configuration	Description
Enabled	Regardless of whether the microphone is in the on-hook or off-hook state, behavior of the transceiver is controlled by Signaling Squelch using QT/DQT, while Optional Signaling behaves according to the Audio Control configuration.
Disabled	Behavior of the transceiver is controlled by Carrier Squelch when the microphone is in the off-hook state. When the microphone is in the on-hook state, behavior of the transceiver is controlled by Signaling Squelch using QT/DQT, while Optional Signaling behaves according to the Audio Control configuration.

Note

- Stun can be activated regardless of the status of Off-hook Decode and whether the microphone is in the on-hook or off-hook state.
- When the microphone switches to the on-hook state after receiving a call via Optional Signaling, the matching state of Optional Signaling is reset.
- The hook status of the microphone can be switched using the AUX Input port that is assigned to “External Hook”. (Refer to 19.1 Functions Assignable to the AUX Input Port on page 451.)

Configuration using KPG-166D

Enabling/Disabling Off-hook Decode (See Edit > Optional Features > Optional Features 1 > Common Page 1)

9.3 Using 5-tone to Communicate

The communication using 5-tone is available in an Analog Conventional system.

Refer to 10 5-TONE on page 237 for details about 5-tone.

9.4 Using FleetSync to Initiate a Selective Call

On an Analog Conventional system, individual calls and group calls can be made using FleetSync and different types of messages can be transmitted.

Refer to 12 FLEETSYNC on page 362 for details on FleetSync.

9.5 Using DTMF to Initiate a Selective Call

Compatible model: TK-Dx40

DTMF (Dual Tone Multi-frequency) is the signaling type that uses 2 different frequency signals simultaneously. DTMF is used such as when an individual call is made and when a repeater is controlled by remote control.

DTMF signaling uses 2 different frequencies combined (one lower frequency and one higher frequency) and consists of the 0 to 9, A to D, * and # tones.

Table 9-6 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

The following are methods available to send the DTMF code:

- Autodial (TK-Dx40 (Portable) only)
- Manual Dialing (TK-Dx40 (Mobile) only)
- Keypad Auto PTT (TK-Dx40 (Mobile) only)
- Autodial Mode (TK-Dx40 (Mobile) only)
- Redial (TK-Dx40 (Mobile) only)
- PTT ID Communication
- PC Command

Sending a DTMF Code by Using the Autodial Key (Autodial)

Compatible model: TK-Dx40 (Portable)

Pressing the Autodial key sends a DTMF code. By using KPG-166D, the DTMF code to be sent can be configured for each channel by selecting one of the DTMF codes from the Autodial List.

Configuration using KPG-166D

- Assigning Functions to the PF Keys (See Edit > Key Assignment)
- Configuring the DTMF code to be sent by selecting from the Autodial List (See Edit > Zone Information > Channel Edit > Page 2)

Autodial List (TK-Dx40 (Portable))

Autodial List is the list in which the DTMF code to be sent by pressing the **Autodial** key is configured. A list number in the Autodial List can be configured for each channel by using KPG-166D.

When the **Autodial** key is pressed, the DTMF code corresponding to the list number in the Autodial List configured for the selected channel is sent.

A maximum of 9 DTMF codes can be configured in the Autodial List by using KPG-166D.

Note

The DTMF code configured for No.1 in the Autodial List is also used as a code for Transpond when receiving an individual call. (Refer to Transceiver Behavior When Receiving a Selective Call on page 228.)

Configuration using KPG-166D

- Configuring the Autodial List (See Edit > DTMF > Autodial List)
- Configuring the DTMF code to be sent by selecting from the Autodial List (See Edit > Zone Information > Channel Edit > Page 2)

Sending the DTMF Code While Transmitting (Manual Dialing)

Compatible model: TK-Dx40 (Mobile)

If Manual Dialing is enabled, the DTMF code corresponding to a key on the microphone keypad can be sent when pressing the key while transmitting by pressing the **PTT** switch.

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-166D

Configuring the Manual Dialing to be enabled or disabled (See Edit > DTMF > Encode)

Sending the DTMF Code by Pressing a Key on the Microphone Keypad without Using the PTT Switch (Keypad Auto PTT)

Compatible model: TK-Dx40 (Mobile)

If “Keypad Auto PTT” is configured for Keypad Operation, the transceiver can immediately initiate transmission by pressing a key on the microphone keypad and send the DTMF code corresponding to the key. This function can be used to send the DTMF code by pressing keys on the microphone keypad without pressing the **PTT** switch.

Operating the Transceiver

1 **Press the key corresponding to the DTMF code to be sent.**

2 **Repeat Step 1 as necessary.**

Configuration using KPG-166D

Configuring the Keypad Operation (See Edit > Key Assignment > Mic Key)

Sending a DTMF Code by Selecting from a List (Autodial Mode)

Compatible model: TK-Dx40 (Mobile)

A DTMF code configured in the Autodial List can be selected and sent after the transceiver enters Autodial Mode by pressing the **Autodial** key.

Operating the Transceiver

1 **Press the Autodial key.**

The transceiver enters Autodial Mode. After “Ad” appears on the LED display for 1 sec, the Autodial List number, such as “A1”, appears and the right dot blinks.

2 **Enter the Autodial List number to be sent by pressing the [1] to [9] keys.**

For example, to select the number 7, press the **[7]** key. On the LED display, the entered number appears after “AR” as “A7”.

Note

An Autodial List number can also be selected by pressing the **Right Up** or **Right Down** key.

3 **Press the PTT switch.**

The DTMF code configured for the selected Autodial List number is sent.

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Autodial List (TK-Dx40 (Mobile))

Audio List is the list in which the DTMF code is configured. A DTMF code can be sent by selecting a list number in Autodial Mode.
A maximum of 9 DTMF codes can be configured in the Autodial List by using KPG-166D.

Configuration using KPG-166D

Configuring the Autodial List (See Edit > DTMF > Autodial List)

Redialing

Compatible model: TK-Dx40 (Mobile)

A previously sent DTMF code can be sent again.

Operating the Transceiver

1 **Press the Autodial key.**

The transceiver enters Autodial Mode. After “Ad” appears on the LED display for 1 sec, the Autodial List number, such as “A1”, appears and the right dot blinks.

2 **Press the [0] key.**

“rd” appears on the LED display and the previously sent DTMF code is selected.

3 **Press the PTT switch.**

The DTMF code last sent is sent.

Note

A DTMF code sent by using the following functions is not registered as a redial code.

- BOT
- EOT
- Emergency DTMF ID (Key)
- Emergency DTMF ID (Lone Worker)

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Sending a PTT ID

A PTT ID is an unique identification code of the transceiver transmitted by pressing or releasing the **PTT** switch. The administrator can identify by a PTT ID who is using a channel without asking by voice for the caller's name.

PTT ID Type

PTT ID Type is the type of PTT ID to be sent.

To send a DTMF code as the PTT ID, "DTMF" needs to be configured for PTT ID Type by using KPG-166D. Also, the DTMF code to be sent needs to be configured in accordance with the configuration of the timing for sending the PTT ID.

Timing for Sending a PTT ID

A PTT ID is sent out at the following timings:

- **BOT (Beginning of Transmit)**
  A PTT ID is added to the signal at the beginning of the transmission.

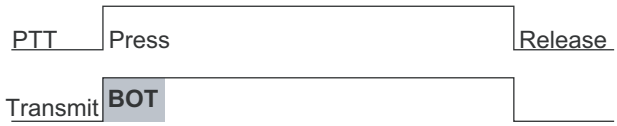


Figure 9-6 BOT

- **EOT (End of Transmit)**
  A PTT ID is added to the signal at the end of the transmission.

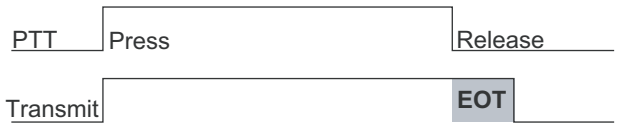


Figure 9-7 EOT

- **Both (BOT and EOT)**
  A PTT ID is added to the signal at both the beginning and the end of the transmission.

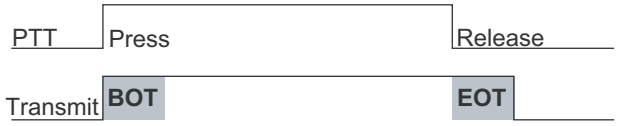


Figure 9-8 Both

The timing for sending a PTT ID can be configured for each channel by using KPG-166D.

Table 9-7 Timing for Sending a PTT ID

Configuration	Description
Off	Does not send out a PTT ID.
BOT	When the **PTT** switch on the transmitting transceiver is pressed, the DTMF code configured in Beginning of Transmit is sent as the PTT ID.
EOT	When the **PTT** switch on the transmitting transceiver is released, the DTMF code configured in End of Transmit is sent as the PTT ID.
Both	At both timing of BOT and EOT, the DTMF codes configured in Beginning of Transmit and End of Transmit are sent as the PTT IDs.

Configuration using KPG-166D

- Configuring the PTT ID Type (See Edit > Zone Information > Channel Edit > Page 2 > PTT ID (Analog))
- Configuring the PTT ID (See Edit > Zone Information > Channel Edit > Page 1 > Analog)
- Configuring the Beginning of Transmit (See Edit > Zone Information > Channel Edit > Page 2 > PTT ID (Analog))
- Configuring the End of Transmit (See Edit > Zone Information > Channel Edit > Page 2 > PTT ID (Analog))

Muting the PTT ID Tone (PTT ID Mute (Analog))

PTT ID Mute (Analog) 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 Muting the PTT ID Tone (PTT ID Mute (Analog)) on page 365 for details.

Disabling Repeated Sending of PTT ID (PTT ID Pause (Analog))

PTT ID Pause (Analog) is the function that stops sending of the PTT ID when the transceiver repeats transmission and reception within a specific time interval.

This function is used to stop sending of the PTT ID repeatedly to the other party.

Refer to Disabling Repeated Sending of PTT ID (PTT ID Pause (Analog)) on page 366 for details.

Disabling the Transceiver Capability by Remote Control (Stun)

The transceiver capability can be disabled via remote control from an external device using radio communication. This function allows a 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 via remote control from an external device using radio communication.

When the transceiver receives the Stun Code, the transceiver multiplexes the Stun-on Tone and starts transponding. After that, the transceiver enters the Stun state according to the configuration in Stun Code Response.

The transceiver memorizes the Stun state even if the transceiver is turned OFF. The Stun state cannot be reset by the Auto Reset Timer or by the transceiver operation. The transceiver transmits the Stun-off Tone and then resets the Stun state when the transceiver receives the Revive Code (Stun Code + “#”).

Stun Code and Stun Code Response can be configured by using KPG-166D.

Table 9-8 Stun

Configuration	Description
Stun Code	Stun Code is the standby code for Stun.
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. Automatic transmission, such as Transpond, is still available.

Note

- For TK-Dx40 (Mobile), “St” appears on the LED display during the Stun state.
- The transceiver cannot be placed in Emergency Mode while the transceiver is in the Stun state.
- Automatic GPS data transmission can be executed even while the transceiver is in the Stun state.

Configuration using KPG-166D

- Configuring the Stun Code (See Edit > DTMF > Decode > Stun)
- Configuring the Stun Code Response (See Edit > DTMF > Decode > Stun)

Functions Related to DTMF Code Encoding

Functions related to DTMF code encoding are shown below:

- DTMF Speed
- First Digit Delay Time
- First Digit Time
- * and # Digit Time
- D Code Assignment
- DTMF Hold Time
- Sidetone
- PTT ID with QT/DQT

DTMF Speed

DTMF Speed is the speed to send out the DTMF codes. Transmit speed of the DTMF code can be configured by the number of digits to be sent per second. The transceiver sends the DTMF code at the configured speed.

The number of digits of DTMF code to be sent per second is configured by selecting the number from 6, 8, 10, or 15 by using KPG-166D.

The following are durations for Digit Time (transmit time) and Gap Time (muted time) depending on the selected value:

Table 9-9 DTMF Speed

Range	Digit Time (Transmit Time)	Gap Time (Muted Time)
6 digits/s	83.3 ms	83.3 ms
8 digits/s	62.5 ms	62.5 ms
10 digits/s	50.0 ms	50.0 ms
15 digits/s	33.3 ms	33.3 ms

Note

If “15 digits/s” is configured for DTMF Speed, some transceivers may fail to correctly decode due to the DTMF decoding capability of the transceiver. In that case, configure the lower transmission speed to use the transceiver.

Configuration using KPG-166D

Configuring the DTMF Speed (See Edit > DTMF > Encode)

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-166D

Configuring the First Digit Delay Time (See Edit > DTMF > Encode)

First Digit Time

First Digit Time is the function to extend the length of time to send the first digit of the DTMF code when the transceiver starts transmitting the DTMF code.

Extending the transmission time of the first digit of the DTMF code allows the receiving transceiver to easily recognize the incoming DTMF code in order to avoid failure in receiving the DTMF code while the receiving transceiver is in the battery saver mode or scanning.

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.

Transmission Time for the 1st digit of DTMF = value configured for DTMF Speed (Digit Time) + value configured for First Digit Time

Example: First Digit Time: 100 ms, Encode Code: 123

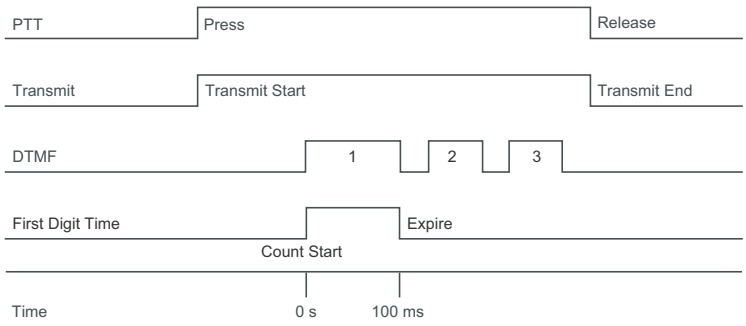


Figure 9-9 First Digit Time

Configuration using KPG-166D

Configuring the First Digit Time (See Edit > DTMF > Encode)

* and # Digit Time

* and # Digit Time is the function to extend the transmission time for the * tone and # tone when the DTMF code is sent.

Since * tone and # tone are more frequently used for special tasks than 0 to 9 tones, this function is used for the receiving transceiver to easily recognize these tones.

The time for sending 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 = value configured for DTMF Speed (Digit Time) + value configured for * and # Digit Time

Example: * and # Digit Time: 100 ms, Encode Code: *01

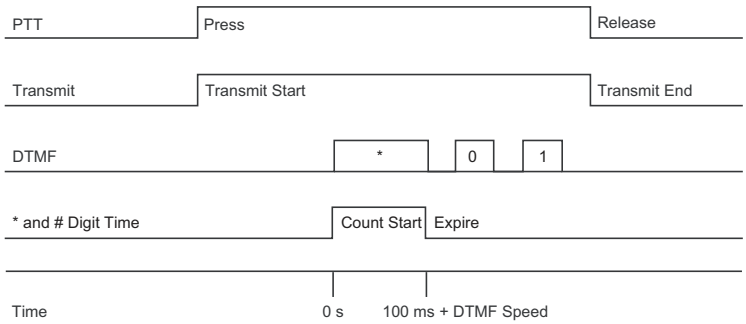


Figure 9-10 * and # Digit Time

Note

If the first digit of the DTMF code to be sent is the * tone or # tone, the transceiver compares the extension time configured in First Digit Time with the extension time configured in * and # Digit Time, and uses the longer extension time to send the first digit.

Configuration using KPG-166D

Configuring the * and # Digit Time (See Edit > DTMF > Encode)

D Code Assignment

D Code Assignment is the function to select whether the D Code is used for the D tone of DTMF or a dialing pause (unmodulated transmission).

Configuration using KPG-166D

Configuring the D Code Assignment (See Edit > DTMF > Encode)

DTMF Hold Time

Compatible model: TK-Dx40 (Mobile)

DTMF Hold Time is the amount of time from when the microphone keypad is disabled until the transceiver restores the receive mode while sending the DTMF code by 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-166D

Configuring the DTMF Hold Time (See Edit > DTMF > Encode)

Emitting the DTMF Code Tone (Sidetone)

Sidetone is the function to emit the tone of the DTMF code from the speaker while the transceiver transmits the DTMF code.

Note

If “Silent” is configured for Emergency Mode Type, the DTMF Sidetone does not sound while the transceiver sends the DTMF code (Emergency ID) in Emergency Mode. (Refer to Emergency Mode Type on page 406.)

Configuration using KPG-166D

Configuring the DTMF Sidetone to be enabled or disabled (See Edit > DTMF > Encode)

Reducing the DTMF Data Burst Tones (PTT ID with QT/DQT)

PTT ID with QT/DQT is the function to send a QT tone or a DQT code when the transceiver sends a DTMF code on the channel where QT/DQT is used.

If PTT ID with QT/DQT is enabled, a QT tone or a DQT code is sent when the transceiver sends a DTMF code on the channel where QT/DQT is used. If PTT ID with QT/DQT is disabled, the DTMF data burst tones can be reduced.

“Carrier” needs to be configured in Optional Signaling Decode Condition for the receiving transceiver when PTT ID with QT/DQT is disabled.

Configuration using KPG-166D

Configuring the PTT ID with QT/DQT to be enabled or disabled (See Edit > DTMF > Encode)

Functions Related to DTMF Code Decoding

For the transceiver to decode a DTMF code, “DTMF” needs to be configured as the Optional Signaling to be used on the channel. (Refer to Using Optional Signaling (Analog) on page 210.)

Functions related to DTMF code decoding are shown below:

- ID Code
- Group Code
- Transpond
- Alert Tone
- LED
- Selective Call Alert LED
- Auto Reset Timer
- Clear to Transpond

Standby Code (ID Code)

ID 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) function.

Configuration using KPG-166D

Configuring the ID Code (See Edit > DTMF > Decode)

Code Used for Receiving a Group Call (Group Code)

Group Code is a code used for receiving a group call.

If the received DTMF code includes a Group Code of one or more digits, the receiving transceiver recognizes the Group Code as a wildcard and receives the Group Call by replacing the Group Code with a DTMF code from 0 to 9.

The table below shows an example when Transceiver V to Transceiver Y wait to receive a call from the base station with the following configurations:

Table 9-10 Transceiver Configuration

Transceivers	Standby Code (ID Code)	Group Code
V	123	A
W	223	A
X	235	A
Y	355	A

If the base station initiates a call by using the DTMF code “A23”:

Only Transceiver V and Transceiver W can receive the call.

If the base station initiates a call by using the DTMF code “AA5”:

Only Transceiver X and Transceiver Y can receive the call.

If the base station initiates a call by using the DTMF code “AAA”:

All the transceivers from Transceiver V to Transceiver Y can receive the call.

Configuration using KPG-166D

Configuring the Group Code (See Edit > DTMF > Decode)

Transceiver Behavior When Receiving a Selective Call

If the received DTMF code matches the standby DTMF code preconfigured for the transceiver, the transceiver can transmit the multiplexed Transpond tone, emit an Alert Tone, or flash the LED orange or blue.

- **Transpond**

  Upon receipt of an individual call, the transceiver behaves as follows according to the configuration for Transpond:

Table 9-11 Transpond Behavior

Configuration	Description
Off	Transpond is not activated.
Alert	The transceiver sends an Alert Tone to the transmitting transceiver.
ID Code	The transceiver sends an ID Code to the transmitting transceiver.
Transpond Code	The transceiver sends the DTMF code configured for No.1 in the Autodial List to the transmitting transceiver.

- **Alert Tone**

  Upon receipt of an individual call, the transceiver emits an Alert Tone according to the configuration for Individual Call (Alert Tone).

  Upon receipt of a group call, the transceiver emits an Alert Tone according to the configuration for Group Call (Alert Tone).

- **Selective Call Alert LED**

  When the transceiver receives an individual call, the LED flashes orange or blue according to the configuration for Individual Call (LED).

  When the transceiver receives a group call, the LED flashes orange or blue according to the configuration for Group Call (LED).

Note

- Transpond is not activated when the transceiver receives a group call.
- The matching state of the DTMF codes is reset in the following conditions. Also, Transpond is reset in the following conditions:

Table 9-12 Conditions to Reset the DTMF Code

Configuration	Description
Pressing a key	When the following keys are operated • Monitor • Monitor Momentary • Squelch Off • Squelch Off Momentary • Zone Up • Zone Down • Channel Up • Channel Down • Scan • Emergency • Channel Select • Zone Select • Home Channel • Home Channel Select
Hook (TK-Dx40 (Mobile) only)	When the microphone is placed in the on-hook state
Expiration of the Auto Reset Timer	When the length of time configured in Auto Reset Timer elapses (the condition to reset the DTMF code)
Transmission	When transmitting by using the following (the condition to reset Transpond) • **PTT** switch • External PTT (Voice) port (TK-Dx40 (Mobile) only) • External PTT (Data) port (TK-Dx40 (Mobile) only)

Configuration using KPG-166D

- Configuring the Transpond (See Edit > DTMF > Decode)
- Configuring the Individual Call (Alert Tone) (See Edit > DTMF > Decode > Alert Tone)
- Configuring the Group Call (Alert Tone) (See Edit > DTMF > Decode > Alert Tone)
- Configuring the Selective Call Alert LED to be enabled or disabled (See Edit > DTMF > Decode)
- Configuring the Individual Call (LED) (See Edit > DTMF > Decode > LED)
- Configuring the Group Call (LED) (See Edit > DTMF > Decode > LED)

Auto Reset Timer

Auto Reset Timer is the amount of time from when the received DTMF code matches the DTMF code preconfigured for the transceiver until the matching state is automatically reset.

By using KPG-166D, Auto Reset Timer can be configured.

Table 9-13 Auto Reset Timer

Configuration		Description
Auto Reset Timer	Off	Auto Reset Timer does not function.
	1 s to 300 s	After the configured time elapses, the matching state of the DTMF code is automatically reset.
LED		If this function is enabled, the LED flashed by Selective Call Alert LED turns off when the length of time configured in Auto Reset Timer elapses.
Alert		If this function is enabled, the intermittently emitted Alert Tone stops when the length of time configured in Auto Reset Timer elapses.

Configuration using KPG-166D

Configuring the Auto Reset Timer (See Edit > DTMF > Decode > Auto Reset)

Clear to Transpond

Clear to Transpond is the function that allows the transceiver to wait to initiate the Transpond until the channel becomes available while other users are using the channel when the transceiver attempts to initiate the Transpond.

Configuration using KPG-166D

Configuring the Clear to Transpond to be enabled or disabled (See Edit > DTMF > Decode)

9.6 Using 2-tone to Initiate a Selective Call

2-tone signaling uses a pair of 2 different tone frequencies in series. 2-tone is used for an individual call initiated in an Analog Conventional system.

2-tone consists of 2 tone signals in series with 2 different frequencies or a single tone signal within the frequency range between 288.5 Hz and 3106.0 Hz.

Pressing the **Call 1** or **Call 2** key causes the transceiver to send the 2-tone code preconfigured for the transceiver.

By using KPG-166D, the function of Call 1 or Call 2 needs to be assigned to a **PF** key, and each key needs to be configured as a key to send a 2-tone code.

Configuration using KPG-166D

- Assigning Call 1 or Call 2 to the PF keys (See Edit > Key Assignment)
- Configuring the Call key as a key to send a 2-tone code (See Edit > Key Assignment > Call > Analog)

Functions Related to 2-tone Code Encoding

Functions related to 2-tone code encoding are shown below:

Table 9-14 2-tone Encode

Configuration	Description
Duration of 1st Tone	Duration of 1st Tone is the duration of time for 1st Tone Encode when the transceiver sends a 2-tone code.
Duration of 2nd Tone	Duration of 2nd Tone is the duration of time for 2nd Tone Encode when the transceiver sends a 2-tone code.
Duration of Single Tone	Duration of Single Tone is the duration of time for Single Tone Encode when the transceiver sends a Single Tone.
Single Tone	Single Tone is the function to send the 1st Tone as a Single Tone. If “Yes” is configured for Single Tone, the 1st Tone is sent for the duration of time configured for Duration of Single Tone. In this case, the 2nd Tone is not sent.
1st Tone	1st Tone is one of the tone frequencies of a 2-tone code, which is sent first. 1st Tone is sent for the duration of time configured for Duration of 1st Tone. 1st Tone can be configured in the range between 288.5 Hz and 3106.0 Hz.
2nd Tone	2nd Tone is one of the tone frequencies of a 2-tone code, which is sent after the 1st Tone. 2nd Tone is sent for the duration of time configured for Duration of 2nd Tone. 2nd Tone can be configured in the range between 288.5 Hz and 3106.0 Hz. If “Yes” is configured for Single Tone, the 2nd Tone is not sent.
Gap Time	Gap Time is the unmodulated duration between the 1st Tone and 2nd Tone when sending the 2-tone code.
First Tone Delay Time	First Tone Delay Time is the length of time from when the transceiver starts transmitting until the transceiver starts transmitting a tone when sending the 2-tone code. The transceiver transmits an unmodulated signal until the amount of time configured for First Tone Delay Time elapses.
Sidetone	Sidetone is the function to emit the tone of the 2-tone code from the speaker while the transceiver transmits the 2-tone code.

Configuration using KPG-166D

Configuring various functions associated with the 2-tone code encoding (See Edit > 2-tone > Encode)

Functions Related to 2-tone Code Decoding

For the transceiver to decode a 2-tone code, “2-tone 1”, “2-tone 2”, or “2-tone 3” needs to be configured as the Optional Signaling to be used on the channel. (Refer to Using Optional Signaling (Analog) on page 210.)

The following functions associated with 2-tone Decode can be configured for each of 2-tone 1, 2-tone 2, and 2-tone 3:

- Decoder 1 to Decoder 2
- A Tone/ B Tone/ C Tone/ D Tone
- Auto Reset Timer
- Clear to Transpond
- Short Decode
- Selective Call Alert LED

Standby Code (Decoder 1 and Decoder 2)

Two types of Decoders can be configured for each of 2-tone 1, 2-tone 2, and 2-tone 3. The transceiver can wait to receive the 2-tone codes configured in Decoder 1 and Decoder 2 at the same time.

The following items can be configured for each Decoder:

- **Call Format**

  Call Format is the combination of A Tone, B Tone, C Tone, and D Tone for which the transceiver waits. The following combinations are available:

Table 9-15 List of Call Format Combinations

Combination	Description	Call Type
A and B	The transceiver waits to receive A Tone and B Tone.	Individual call
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.	Individual call
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. (Single Tone)	Group call
Long B	The transceiver waits to receive B Tone. (Single Tone)	
Long C	The transceiver waits to receive C Tone. (Single Tone)	
Long D	The transceiver waits to receive D Tone. (Single Tone)	

Note

If anything other than “Long A”, “Long B”, “Long C”, and “Long D” is configured in Call Format, the transceiver waits to receive the 1st tone for 1 sec and the 2nd tone for 3 sec. If “Long A”, “Long B”, “Long C”, or “Long D” is configured in Call Format, the transceiver waits to receive the target tone for 4 sec or more.

- **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 9-16 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 the transceiver transmits a Transpond tone.

- **Alert Tone**

  Alert Tone is an Alert Tone that sounds when the transceiver is called with 2-tone signaling.

  The tone can be selected from 8 tones configured in the Alert Tone Pattern. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)

- **Decode LED**

  Decode LED is the function to make the LED flash orange or blue when the transceiver receives a call using a 2-tone code.

  To use this function, Selective Call Alert LED must be enabled.

Configuration using KPG-166D

- Configuring the Call Format (See Edit > 2-tone > Decode (2-tone 1 to 3))
- Configuring the Transpond (See Edit > 2-tone > Decode (2-tone 1 to 3))
- Configuring the Decode LED (See Edit > 2-tone > Decode (2-tone 1 to 3))
- Configuring the Alert Tone (See Edit > 2-tone > Decode (2-tone 1 to 3))

Frequencies for Standby Code (A Tone/ B Tone/ C Tone/ D Tone)

A Tone/ B Tone/ C Tone/ D Tone is the frequency of the tone signal which the receiving transceiver waits to receive. The frequency can be configured in the range between 288.5 Hz and 3106.0 Hz inclusive.

Configuration using KPG-166D

Configuring the A Tone/ B Tone/ C Tone/ D Tone (See Edit > 2-tone > Decode (2-tone 1 to 3))

Auto Reset Timer

Auto Reset Timer is the length of time from when the received 2-tone code matches the 2-tone code preconfigured for the transceiver until the matching state is automatically reset.

Auto Reset Timer can be configured using KPG-166D.

Table 9-17 Auto Reset Timer

Configuration		Description
Auto Reset Timer	Off	Auto Reset Timer does not function.
	1 s to 300 s	After the configured time elapses, the matching state of the 2-tone code is automatically reset.
LED		If this function is enabled, the LED flashed by Selective Call Alert LED turns off when the length of time configured in Auto Reset Timer elapses.
Alert		If this function is enabled, the intermittently emitted Alert Tone stops when the length of time configured in Auto Reset Timer elapses.

Configuration using KPG-166D

Configuring the Auto Reset Timer (See Edit > 2-tone > Decode (2-tone 1 to 3))

Clear to Transpond

Clear to Transpond is the function that allows the transceiver to wait to initiate the Transpond until the channel becomes available while other users are using the channel when the transceiver attempts to initiate the Transpond.

Configuration using KPG-166D

Configuring the Clear to Transpond to be enabled or disabled (See Edit > 2-tone > Decode (2-tone 1 to 3))

Short Decode

Short Decode is the function that the transceiver identifies the call type before the transceiver completes receiving the 2-tone code.

The transceiver determines whether the received 2-tone code matches the tone preconfigured for the transceiver. If the tone matches, the transceiver immediately receives the tone.

Configuration using KPG-166D

Configuring the Short Decode to be enabled or disabled (See Edit > 2-tone > Decode (2-tone 1 to 3))

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash orange or blue when the transceiver receives a 2-tone code.

Whether to make the LED flash orange or blue can be configured in Decode LED.

A user can notice by the LED that the transceiver is receiving a call.

Configuration using KPG-166D

- Configuring the Selective Call Alert LED to be enabled or disabled (See Edit > 2-tone > Decode (2-tone 1 to 3))
- Configuring the Decode LED (See Edit > 2-tone > Decode (2-tone 1 to 3))

9.7 Improving the Sound Quality for Transmitting and Receiving (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.

Configuration using KPG-166D

Configuring the Compander to be enabled or disabled for each channel (See Edit > Zone Information > Channel Edit > Page 2)

9.8 Disabling the Transceiver Capability by Remote Control (Stun)

By using the RSTUN command for the 5-tone Encode/ Decode Format, the transceiver can be disabled via remote control from an external device. This function allows a system administrator to remotely disable the transceiver, for instance, if the transceiver is lost.

By using the RVIVE command for the 5-tone Encode/ Decode Format, the transceiver that has been disabled by this function can be enabled for use again via remote control from an external device using radio communication.

Refer to 11 5-TONE ENCODE/ DECODE FORMAT on page 295 for details about 5-tone Encode/ Decode Format.

9.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill)

By using the Remote Stun/ Kill status of FleetSync, the transceiver can be disabled via remote control from an external device. This function allows a system administrator to remotely disable the transceiver, for instance, if the transceiver is lost.

Refer to 12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 387 for details on the Remote Stun/ Kill status of FleetSync.

9.10 Multiplexing QT/DQT during Data Transmission (Data Transmit with QT/DQT)

Compatible model: TK-Dx40

Data Transmit with QT/DQT is a feature for multiplexing the QT tone or DQT code configured for the channel during data transmission.

This feature is used on a data channel. It is also used during data transmission using an external device.

When a QT tone or DQT code is used, such as on a repeater, enabling this feature makes it possible to transmit data by multiplexing the QT tone or DQT code.

When voice and data communications are carried out concurrently on the same channel, you can disable this feature to transmit data without multiplexing the QT tone or DQT code to make the audio sound transmitted inaudible during data communication.

Configuration using KPG-166D

Configuring Data Transmit with QT/DQT (See Edit > Optional Features > Optional Features 1 > Common Page 1)

The transceiver can initiate various communications using 5-tone signaling.

10.1 5-tone Outline

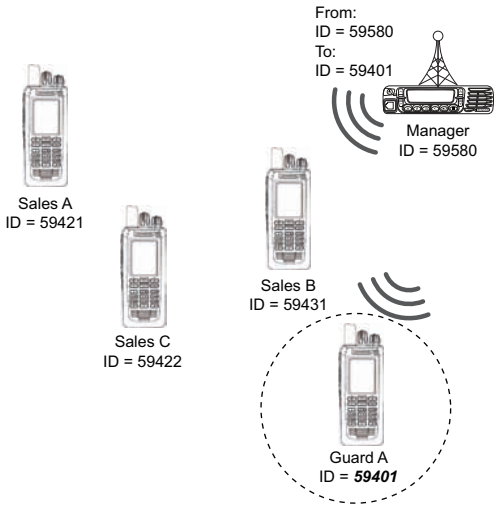
5-tone is the signaling mainly used in Europe. The transceiver can make a Selcall, Group Call, and Status Call by using the consecutive 5 Single Tones.

Available Communication Functions

The transceiver can make the following types of communication using 5-tone signaling:

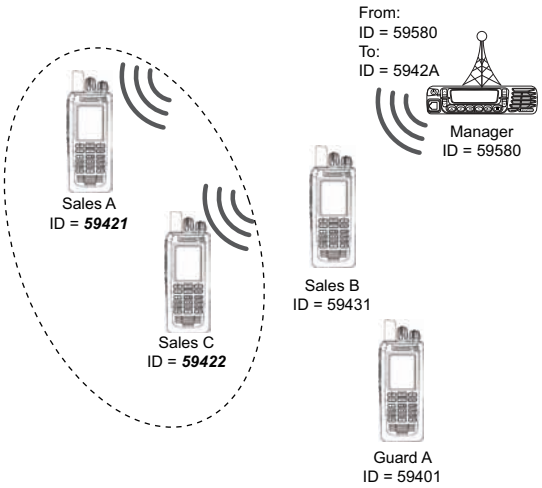
Individual Call

Individual Call is used to initiate a call to the specified transceiver. When a transceiver receives a 5-tone code that matches the 5-tone code configured for the transceiver, it is deemed to have received an Individual Call.



Group Call

Group Call is used to initiate a call to several transceivers in a group at the same time. Group Call is used to initiate a call to several transceivers in a group at the same time. In Group Call, the transceiver can initiate a Group Call by including a Group Tone in the 5-tone code. When a transceiver receives a 5-tone code containing a Group Tone that matches the 5-tone code configured for the transceiver, it is deemed to have received a Group Call.



Status Message

By sending and receiving a status number using 5-tone signaling, TK-Dx00 can send and receive the message corresponding to the status number.

Others

- By receiving a command sent from the base station transceiver, the transceiver executes the operation corresponding to the command.
- By receiving the Remote Stun or Remote Kill command, the transceiver can be prevented from being used. Besides, the transceiver in an unusable state can be usable by receiving the Remote Revive command.

About 5-tone Code

5-tone signaling uses Single Tones from 300 Hz to 3000 Hz. 5 consecutive Single Tones are stored as a 5-tone code in a frame and sent and received as a frame. When carrying out various types of communication via a repeater, a maximum of 3 frames can be used to send and receive 5-tone codes. A 5-tone code can be represented using numbers and alphabets from A to E.

Example 1:

The 5-tone code is sent and received in order of 0 to 4.

Frame: 01234

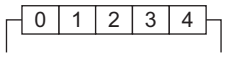


Figure 10-1 5-tone Code

Example 2:

The 5-tone codes are sent and received in order of Frame 1 to Frame 2. The sending and receiving order of the 5-tone code of each frame is the same as Example 1.

Frame 1: 01234

Frame 2: 56789

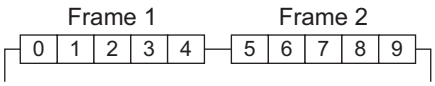


Figure 10-2 5-tone Code

Example 3:

The 5-tone codes are sent and received in order of Frame 1 to Frame 3. The sending and receiving order of the 5-tone code of each frame is the same as Example 1.

Frame 1: 01234

Frame 2: 56789

Frame 3: 98765

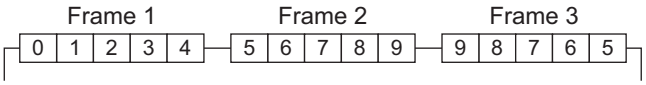


Figure 10-3 5-tone Code

Generally, tones from 0 to 9 are used as a code representing a transceiver individual number. Tones from A to E are used as a code with which the transceiver can behaves in a particular way, such as a Group Tone or Repeat Tone.

Tone Period

Tone Period is the length of each Single Tone from 0 to 9 and from A to E.

For example, each Single Tone is sent with the 70-ms tone length if the transceiver is configured as follows:

5-tone Standard: EEA

Tone Period: 70 ms

Single Tone: 1 (1124 Hz), 2 (1197 Hz), 3 (1275 Hz), 4 (1358 Hz), 5 (1446 Hz)

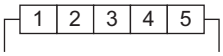


Figure 10-4 Tone Period

Configuration using KPG-166D

Configuring Tone Period (See Edit > 5-tone > System Parameter > General)

Receive Gap Period

Receive Gap Period is the length of time for the transceiver to detect a received 5-tone code as consecutive codes in one frame.

If the transceiver receives a subsequent 5-tone code after the time configured for Receive Gap Period elapses, the 5-tone code is recognized as the 5-tone code of the next frame. The 5-tone codes received before the time configured for Receive Gap Period elapses are recognized as consecutive 5-tone codes.

The recommended value for Receive Gap Period is 1.5 times the value of Tone Period.

Configuration using KPG-166D

Configuring Receive Gap Period (See Edit > 5-tone > System Parameter > General)

Repeat Tone

Repeat Tone is a feature that substitutes a tone with a different tone if a 5-tone code to be sent contains a series of the same tone.

For example, when the transceiver sends a 5-tone code 12335, the series of the same tone “33” is substituted by “3E” and sent if the Repeat Tone is E. In other words, 123E5 is actually sent in this case.

If the receiving transceiver receives the 5-tone code 123E5, the transceiver recognizes that the tone in the digit preceding “E” is consecutively received. In other words, the transceiver recognizes that 12335 is received in this case.

Table 10-1 Usage Example of Repeat Tone

Encode Code	Decode Code	Code Recognized by the Receiving Transceiver
12335	123E5	12335
12333	123E3	12333
11111	1E1E1	11111
E2345	E2345	E2345

Note

- Generally, E is used as the Repeat Tone.
- Tones from A to E are usually used as special tones and they are not used for a transceiver individual ID. Therefore, the Repeat Tone is not generally sent as the first tone in a frame. If E2345 is sent as in the example above, “E” is not recognized as the Repeat Tone.

Configuration using KPG-166D

Configuring Repeat Tone (See Edit > 5-tone > System Parameter > General)

Decode Single Tone Frequency

Compatible model: TK-Dx00

Decode Single Tone Frequency is the frequency of the Single Tone which the transceiver waits to receive.

If the transceiver receives a tone on the frequency configured for Decode Single Tone Frequency consecutively for the time configured for Decode Single Tone Duration, the transceiver can receive the tone as a Single Tone.

The transceiver can react similar to the behavior of when the transceiver receives a 5-tone code, such as opening or closing the monitor, turning the LED On or Off, or blinking the LED. Generally, this function is used for closing the monitor by receiving a Single Tone. (Refer to CMP ^TX1 to CMP ^TX8 on page 342.)

Configuration using KPG-166D

Configuring Decode Single Tone Frequency (See Edit > 5-tone > System Parameter > General)

Decode Single Tone Duration

Compatible model: TK-Dx00

Decode Single Tone Duration is the length of time for the transceiver to receive a Single Tone consecutively.

If the transceiver receives a tone on the frequency configured for Decode Single Tone Frequency consecutively for the time configured for Decode Single Tone Duration, the transceiver can receive the tone as a Single Tone.

The transceiver can react similar to the behavior of when the transceiver receives a 5-tone code, such as opening or closing the monitor, turning the LED On or Off, or blinking the LED. (Refer to CMP ^TONE on page 342.)

Configuration using KPG-166D

Configuring Decode Single Tone Duration (See Edit > 5-tone > System Parameter > General)

About 5-tone Signaling Formats (5-tone Standard)

There are 12 types of signaling formats for a Single Tone used for 5-tone signaling. The 5-tone signaling format is determined by country and region. More than one signaling format may be used for a region, such as CCIR and ZVEI.

In the 12 types of signaling formats, the frequency for each Single Tone from 0 to 9 and A to E is determined. One of the signaling formats can be used according to the system in use. If the system in use has no proper signaling format, Kenwood Tone can be used. For Kenwood Tone, the frequency of each Single Tone from 0 to 9 and A to E can be configured as desired.

The signaling format to be used can be configured for 5-tone Standard by using KPG-166D.

Table 10-2 5-tone Signaling Format 1

Tone	5-tone Signaling Format			
	ZVEI	CCIR	EEA	PZVEI
0	2400 Hz	1981 Hz	1981 Hz	2400 Hz
1	1060 Hz	1124 Hz	1124 Hz	1060 Hz
2	1160 Hz	1197 Hz	1197 Hz	1160 Hz
3	1270 Hz	1275 Hz	1275 Hz	1270 Hz
4	1400 Hz	1358 Hz	1358 Hz	1400 Hz
5	1530 Hz	1446 Hz	1446 Hz	1530 Hz
6	1670 Hz	1540 Hz	1540 Hz	1670 Hz
7	1830 Hz	1640 Hz	1640 Hz	1830 Hz
8	2000 Hz	1747 Hz	1747 Hz	2000 Hz
9	2200 Hz	1860 Hz	1860 Hz	2200 Hz
A	2800 Hz	2400 Hz	1055 Hz	970 Hz
B	810 Hz	930 Hz	930 Hz	810 Hz
C	970 Hz	2247 Hz	2247 Hz	2800 Hz
D	886 Hz	991 Hz	991 Hz	886 Hz
E	2600 Hz	2110 Hz	2110 Hz	2600 Hz
Tone Period	70 ms	100 ms	40 ms	70 ms

Table 10-3 5-tone Signaling Format 2

Tone	5-tone Signaling Format			
	DZVEI	PCCIR	PDZVEI	ZVEI-2
0	2200 Hz	1981 Hz	2200 Hz	2400 Hz
1	970 Hz	1124 Hz	970 Hz	1060 Hz
2	1060 Hz	1197 Hz	1060 Hz	1160 Hz
3	1160 Hz	1275 Hz	1160 Hz	1270 Hz
4	1270 Hz	1358 Hz	1270 Hz	1400 Hz
5	1400 Hz	1446 Hz	1400 Hz	1530 Hz
6	1530 Hz	1540 Hz	1530 Hz	1670 Hz

Tone	5-tone Signaling Format			
	DZVEI	PCCIR	PDZVEI	ZVEI-2
7	1670 Hz	1640 Hz	1670 Hz	1830 Hz
8	1830 Hz	1747 Hz	1830 Hz	2000 Hz
9	2000 Hz	1860 Hz	2000 Hz	2200 Hz
A	2600 Hz	1055 Hz	825 Hz	886 Hz
B	2800 Hz	930 Hz	886 Hz	810 Hz
C	886 Hz	2400 Hz	2600 Hz	2600 Hz
D	810 Hz	991 Hz	2800 Hz	2800 Hz
E	2400 Hz	2110 Hz	2400 Hz	970 Hz
Tone Period	70 ms	100 ms	70 ms	70 ms

Table 10-4 5-tone Signaling Format 3

Tone	5-tone Signaling Format			
	EIA	Natel	AP-369	Kenwood
0	600 Hz	1633 Hz	980 Hz	815 Hz
1	741 Hz	631 Hz	1190 Hz	882 Hz
2	882 Hz	697 Hz	1380 Hz	954 Hz
3	1023 Hz	770 Hz	1600 Hz	1032 Hz
4	1164 Hz	852 Hz	1800 Hz	1117 Hz
5	1305 Hz	941 Hz	2010 Hz	1209 Hz
6	1446 Hz	1040 Hz	2220 Hz	1308 Hz
7	1587 Hz	1209 Hz	2410 Hz	1415 Hz
8	1728 Hz	1336 Hz	2590 Hz	1531 Hz
9	1869 Hz	1477 Hz	2820 Hz	1657 Hz
A	2151 Hz	1633 Hz	770 Hz	1939 Hz
B	2433 Hz	600 Hz	740 Hz	2270 Hz
C	2010 Hz	1995 Hz	-	2098 Hz
D	2292 Hz	2205 Hz	-	2457 Hz
E	459 Hz	1805 Hz	2960 Hz	1792 Hz
Tone Period	33 ms	70 ms	70 ms	70 ms

Configuration using KPG-166D

- Configuring 5-tone Standard (See Edit > 5-tone > System Parameter > General)
- Configuring Kenwood Tone (See Edit > 5-tone > Kenwood Tone)

10.2 About Configuration Using KPG-166D

The following configurations using KPG-166D are required to initiate various communications using 5-tone signaling.

- **Configuring a zone and channel for 5-tone signaling**
  A zone and channel must be configured for transmission and reception using 5-tone signaling.
- **Configuring the My ID**
  A transceiver ID must be configured for transmission and reception using 5-tone signaling. My ID is the transceiver unique code. All transceivers operating in a system using 5-tone signaling require a different ID.
- **Configuring the System Parameter**
  The parameters for various functions to determine the transceiver behavior for transmission and reception using 5-tone signaling must be configured. A maximum of 16 System Parameters can be configured and one of the System Parameters can be assigned to each channel. The transceiver can send and receive a 5-tone code according to the configuration for System Parameter.
- **Configuring the Encode Format and Decode Format**
  For TK-Dx00, Encode Format and Decode Format are scripts used to send and receive a 5-tone code. The script that determines the timing to send or receive a 5-tone code or the transceiver behavior when a 5-tone code is sent or received must be created using various commands and configured for the transceiver.
- **Configuring the sending and receiving of a 5-tone code**
  To send a 5-tone code, an Encode Format must be assigned to each function to act as a trigger (Pressing the PTT and **Call** key, etc.). In addition, to receive a 5-tone code, a Decode Format must be assigned to each System Parameter.

My ID

My ID is a code unique to the transceiver. It is used to send and receive a 5-tone code. My ID consists of a maximum of 8 alphanumeric characters.

My ID can be configured for each transceiver by using KPG-166D. In addition, the following functions relevant to My ID can be configured using KPG-166D:

- My ID Digits
- Power-on My ID Edit

Configuration using KPG-166D

Configuring the My ID (See Edit > Optional Features > Optional Features 1 > Common Page 4 > My ID)

My ID Digits

My ID Digits is the function to specify the number of digits for My ID which can be configured for the transceiver.

My ID can be configured with the number of digits specified by My ID Digits when configuring My ID for the transceiver by using KPG-166D or changing the My ID configured for the transceiver by using a transceiver key.

Note

Compatible model: TK-Dx40

It is necessary to select the checkboxes on the right as shown in the diagram below using KPG-166D.

If My ID Digits are configured as shown above and the Encode Code is configured as “MMMMM”, a “12343” code is sent out.

Configuration using KPG-166D

Configuring the My ID Digits (See Edit > Optional Features > Optional Features 1 > Common Page 4 > My ID)

Power-on My ID Edit

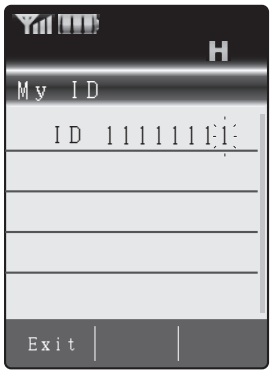
Compatible model: TK-Dx00 with LCD

Power-on My ID Edit is the function to allow a user to change the My ID configured for the transceiver by using a transceiver key when the transceiver is turned ON.

Operating the Transceiver

1 **Turn the transceiver ON.**

The transceiver enters My ID Mode and the My ID configured for the transceiver appears on the display.

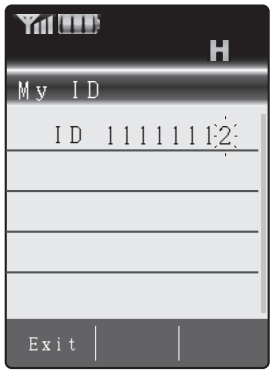


The above is the example when the number of digits specified by My ID Digits is 8.

2 **Enter a 5-tone code.**

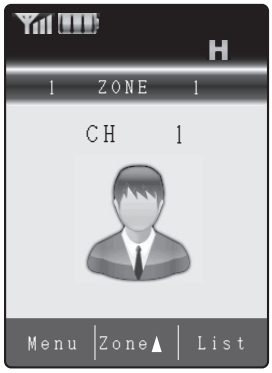
Refer to Entering or Deleting a Code on page 49 for entry methods.

- **Using the PF keys**
  A code can be selected by using the **Up** or **Down** key.
- **Using the keypad**
  A code can be entered by using the **[0]** to **[9]** keys.



3 **Press the Menu ([ ]) or [*] key after entering all the codes.**

The entered code is confirmed and the transceiver exits My ID Mode.



Note

- The changed My ID will be retained even after the transceiver is turned OFF.
- The transceiver cannot receive a signal during My ID Mode.
- The Group Tone cannot be entered in My ID Mode.
- If Custom Start-up Screen and Transceiver Password are configured, a bitmap image appears for 2 sec when the transceiver is turned ON, and the transceiver enters Transceiver Password Mode. The transceiver enters My ID Mode if the correct password is entered and the transceiver password protection is disabled.
- If Power-on Text is configured, the Power-on Text appears for 2 sec after the transceiver exits My ID Mode.

Configuration using KPG-166D

Configuring the Power-on My ID Edit to be enabled or disabled (See Edit > Optional Features > Optional Features 1 > Common Page 4 > My ID)

TX Address/ RX Address

Compatible model: TK-Dx00

TX Address is the address of the target transceiver for sending a 5-tone code. RX Address is the own address of the transceiver for receiving a 5-tone code.

TX Address and RX Address can be configured for each channel by using KPG-166D.

- **TX Address**

  TX Address is generally used as the target transceiver's ID to which a call is initiated.

  TX Address is described as "^TX" in an Encode/ Decode Format. (Refer to CMP ^TX1 to CMP ^TX8 on page 342, SEND ^TX1 to SEND ^TX8 on page 323.)

- **RX Address**

  RX Address is generally used as the own ID which the transceiver waits to receive on a channel. RX Address is used when sending or receiving a 5-tone code. RX Address is used to use different own ID on each channel.

  RX Address is described as "^RX" in an Encode/ Decode Format. (Refer to CMP ^RX1 to CMP ^RX8 on page 342, SEND ^RX1 to SEND ^RX8 on page 323.)

Configuration using KPG-166D

Configuring the TX Address/ RX Address (See Edit > Zone Information > Channel Edit > Page 1 > Analog)

Primary Address

Compatible model: TK-Dx40

Primary Address is the own address of the transceiver for sending a 5-tone code.

TX Address and RX Address can be configured for each channel using KPG-166D.

When Encode Code is configured as "P", "P" is substituted by the Primary Address before it is being sent.

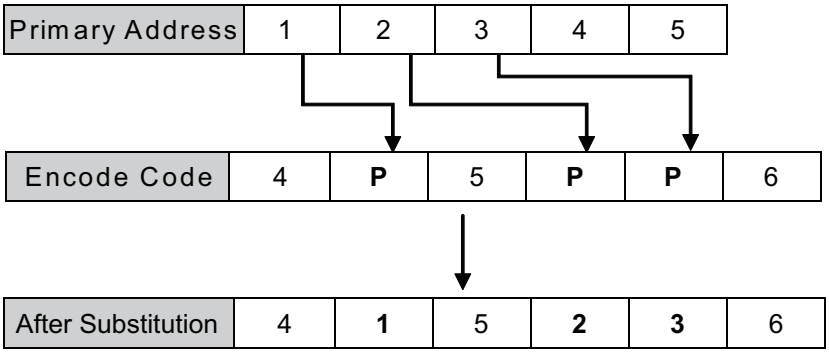


Figure 10-5 Substitution Example

Configuration using KPG-166D

Configuring the Primary Address (See Edit > Zone Information > Channel Edit > Page 1 > Analog)

Copy from Default TX/RX Address

Compatible model: TK-Dx00

Copy from Default TX/RX Address is the function to substitute the TX Address configured for the selected channel for the Selcall code or Status code retained in the transceiver when a zone or channel is changed. It is also the function to substitute the RX Address configured for the selected channel for the Receive code retained in the transceiver when a zone or channel is changed.

Example:

TX Address: 59400

Selectable Status Digits: 1, 2, 3, 4, 5, 6, 7, 8

In this case, 59400111 is substituted for the Selcall code or Status code retained in the transceiver.

Note

If Overwrite is configured for Digit Entry Method and if Copy from Default TX/RX Address is enabled, the configuration for Digit Entry Method is applied if the zone or channel is not changed. The configuration for Copy from Default TX/RX Address is applied if the zone or channel is changed. (Refer to Digit Entry Method on page 269.)

Configuration using KPG-166D

Configuring Copy from Default TX/RX Address to be enabled or disabled (See Edit > 5-tone > System Parameter > General)

Auto Reset Timer

Auto Reset Timer is the time interval starting from the point when the received 5-tone code matches with the 5-tone code configured for the transceiver up to the point when the matching status is automatically reset. A matching status means that a user can communicate using only QT/DQT after the 5-tone code matches.

By using KPG-166D, 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 10-5 Auto Reset Timer

Configuration	Description
Off	Auto Reset Timer will not be activated.
LCD	The transceiver restores the previous channel display when the amount of time configured for Auto Reset Timer elapses. Note This function is not available on TK-Dx00 without LCD and TK-Dx40.
LED	The LED is turned Off when the amount of time configured for Auto Reset Timer elapses.
Alert Tone	The Alert Tone stops sounding when the amount of time configured for Auto Reset Timer elapses.
Monitor	The matching status of 5-tone is reset when the amount of time configured for Auto Reset Timer elapses. Note For TK-Dx00 without LCD, this function is always enabled.

Note

Auto Reset Timer does not activate while the Transpond is suspended by the CTTP command.

Configuration using KPG-166D

- Configuring Auto Reset Timer (See Edit > 5-tone > System Parameter > General)
- Configuring Auto Reset Timer (See Edit > 5-tone > Encode/Decode)

Sidetone

Sidetone is a feature to emit the tone of the 5-tone code from the speaker when the transceiver is sending a 5-tone code.

Note

If Silent is configured for Emergency Mode Type, the tone of the 5-tone code in Emergency Mode does not sound from the speaker of the transceiver.

Configuration using KPG-166D

Configuring Sidetone to be enabled or disabled (See Edit > 5-tone > Encode/Decode > Encode)

Message Display Type

Compatible model: TK-Dx00 with LCD

Message Display Type is a feature to display the received Selcall code or Status code on the display when the transceiver receives a call using 5-tone signaling.

Table 10-6 Message Display Type

Configuration	Description
Fixed	The received Status code appears on the display when the transceiver receives a call using 5-tone signaling. The Status Name is scrolled on the main display if the Status Name is 15 characters or longer. If the transceiver receives only a Selcall code, only the Selcall code appears.
Alternate	The received Status code appears for 3 sec and the received Selcall code appears for 2 sec alternately when the transceiver receives a call using 5-tone signaling. If the transceiver receives either a Selcall code or Status code, only the received code appears.

Configuration using KPG-166D

Configuring Message Display Type to be enabled or disabled (See Edit > 5-tone > Encode/Decode > Decode)

10.3 Making a Selective Call

Selective Call is a feature to initiate an individual call using 5-tone signaling.

Selective Call initiated by 5-tone signaling is generally used as a function to recognize the unique number of a transceiver or repeater. A 5-tone code to be sent in a Selective Call can be configured using KPG-166D. In the case of TK-Dx00 with LCD, the 5-tone code to be sent in a Selective Call can be changed using the transceiver keys.

The 5-tone code to be sent in Selective Call is referred to as “Selcall code”. A received 5-tone code is referred to as “Receive code”.

TK-Dx00:

To initiate a Selective Call using 5-tone signaling, a script for Selective Call must be created in the Encode Format and Decode Format in advance and configured for the transceiver.

When the transceiver sends a 5-tone code in Selective Call, the transceiver sends the Selcall code according to the script created in Encode Format. When the transceiver receives a 5-tone code in Selective Call, the transceiver receives the Selcall code according to the script created in the Decode Format. (Refer to 11 5-TONE ENCODE/ DECODE FORMAT on page 295.)

TK-Dx40:

To initiate a Selective Call using 5-tone signaling, the Encode Format and Decode Format must be configured for the transceiver.

When the transceiver sends a 5-tone code in Selective Call, the transceiver sends the Selcall code configured for the Encode Code. When the transceiver receives a 5-tone code in Selective Call, the transceiver receives the Selcall code configured for the Decode Code.

Sending a Selective Call

TK-Dx00:

A Selcall code can be sent using one of the following functions. However, an Encode Format to send a Selcall code needs to be configured for each function.

Table 10-7 Encode Function (TK-Dx00)

Function	Behavior
Pressing PTT	The Encode Format is executed when the **PTT** switch is pressed.
Releasing PTT	The Encode Format is executed when the **PTT** switch is released.
Call 1 to Call 6	The Encode Format is executed when the **Call 1** to **Call 6** key is pressed.
Channel Select	The Encode Format is executed when the channel is changed.
Power-on/ Power-off	The Encode Format is executed when the transceiver is turned ON or OFF.
Auto Transmit	The Encode Format is executed when GPS data is automatically sent.

TK-Dx40:

A Selcall code can be sent using one of the following functions. However, an Encode Code for sending a Selcall code must be configured for each function.

Table 10-8 Encode Function (TK-Dx40)

Function	Behavior
Pressing PTT	Pressing the **PTT** switch sends out the Selcall code configured in Encode Code (Pressing PTT). (Refer to Pressing PTT/ Release PTT on page 284.)
Releasing PTT	Releasing the **PTT** switch sends out the Selcall code configured in Encode Code (Releasing PTT). (Refer to Pressing PTT/ Release PTT on page 284.)
Call 1/ Call 2	Pressing the **Call 1** or **Call 2** key sends out the Selcall code configured in Encode Code (Other).
Power-on/ Power-off	Powering on or off the transceiver sends out the Selcall code configured in Encode Code (Other).

Note

If Sidetone is enabled, a tone of Selcall code can sound from the transceiver speaker when the transceiver sends a Selcall code. (Refer to Sidetone on page 250.)

Configuration using KPG-166D

- Configuring Encode Format (See Edit > 5-tone > System Parameter > Others)
- Configuring Encode Code (See Edit > 5-tone > System Parameter > Others)

Receiving a Selective Call

TK-Dx00:

The transceiver behavior varies depending on whether the transceiver stores the received Selcall code or not.

Transceiver Behavior

- **If the transceiver does not store the received Selcall code:**

  This is the example of when the Decode Format to display the received Selcall code on the display is configured.

  The transceiver executes the Decode Format when the transceiver receives a Selcall code.

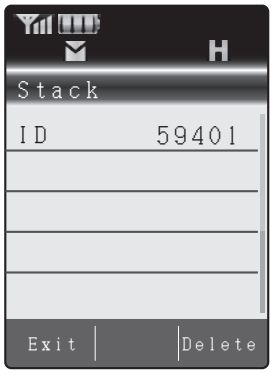
Note

- The code configured as the Group Tone appears as “G”.
- The statuses of transceiver display, LED, and Alert Tone revert to the former statuses if any transceiver key is pressed or the time configured for Auto Reset Timer elapses.
- If the received Selcall code matches the Selcall code configured in the Selcall List of the transceiver, the corresponding Selcall Name appears on the display.

- **If the transceiver stores the received Selcall code:**

  This is the example of when the Decode Format to store the received Selcall code in the transceiver stack memory and display it on the display is configured.

  The transceiver executes the Decode Format when the transceiver receives a Selcall code. The transceiver enters Stack Mode. (Refer to 3.8 Viewing the Receive History (Stack).)



Note

The code configured as the Group Tone appears as “G”.

TK-Dx40:

The transceiver receives the Selcall code configured in Decode Code according to the Decode Configuration. The transceiver can wait to receive up to 8 types of Selcall codes at the same time. (Refer to 10.9Decode Functions on page 292.)

Configuration using KPG-166D

Configuring the Encode/ Decode Format (Refer to the following:)

Edit > 5-tone > System Parameter > Decode
Edit > 5-tone > System Parameter > PTT
Edit > 5-tone > System Parameter > Others
Edit > 5-tone > Encode/Decode

Changing the Selcall Code

Compatible model: TK-Dx00 with LCD

In Selcall Mode, the Selcall code can be changed by selecting a Selcall code configured in the Selcall List or directly entering a Selcall code. (Refer to Selcall List on page 266.)

The transceiver can enter Selcall Mode and the Selcall code can be changed using one of the following operations:

- **Selcall or Selcall + Status key**

  Pressing the **Selcall** or **Selcall + Status** key places the transceiver in Selcall Mode.

- **Menu key**

  Pressing the **Menu** key to place the transceiver in Menu Mode, and then selecting “Selcall” or “Selcall + Status” places the transceiver in Selcall Mode. (Refer to 3.4 Using Menu Mode on page 24.)

- **Keypad entry**

  If “Selcall” or “Selcall + Status” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Selcall Mode. The transceiver enters the Selcall code shortcut entry mode or goes into the respective state as the first digit of the Selcall code is entered. (Refer to Keypad Operation on page 22.)

- **SELC (Encode Format Command)**

  The transceiver enters Selcall Mode by executing the SELC command for the Encode Format. The transceiver behavior in Selcall Mode is the same as when the **Selcall** key is pressed. (Refer to SELC on page 318.)

- **SELMC (Encode Format Command)**

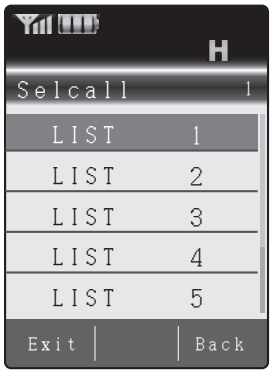
  The transceiver enters Selcall Mode by executing the SELMC command for the Encode Format. The transceiver behavior in Selcall Mode is the same as when the **Selcall + Status** key is pressed. (Refer to SELMC on page 321.)

Operating the Transceiver

● Changing the Selcall code by selecting from the Selcall List

1 **Press the Selcall or Selcall + Status key.**

The transceiver enters Selcall Mode and then the Selcall List appears.
Selcall Names corresponding to the Selcall codes having the same number of digits as the number of digits specified for Selectable Selcall Digits. The following displays are the Selcall Name display examples. (Refer to Selectable Selcall Digits on page 270.)



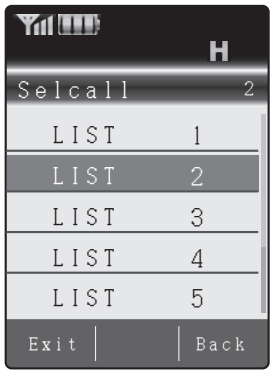
The following operations are identical even if the transceiver enters Selcall Mode by a user pressing the **Menu** key, with keypad entry, or with command operation.

Note

No name corresponding to a Selcall code is configured in the Selcall List, the Selcall code appears.

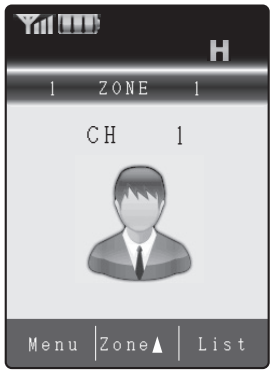
2 **Select a Selcall code from the Selcall List by pressing the Up or Down key.**

Refer to Selecting or Clearing Data from a List on page 45 for the selection method.



3 **Press the Menu ([▯]) or [*] key.**

The selected Selcall code is confirmed and the transceiver exits Selcall Mode.



● Changing the Selcall code by directly entering a Selcall code

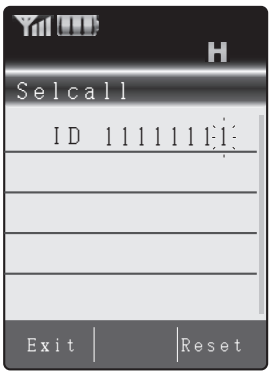
1 **Press the Selcall or Selcall + Status key.**

The transceiver enters Selcall Mode and then the Selcall List appears.
Selcall Names corresponding to the Selcall codes having the same number of digits as the number of digits specified for Selectable Selcall Digits. The following displays are the Selcall Name display examples. (Refer to Selectable Selcall Digits on page 270.)

The following operations are identical even if the transceiver enters Selcall Mode by a user pressing the **Menu** key, with keypad entry, or with command operation.

2 Press and hold the Menu ([▯]) or [*] key, or press the Left key.

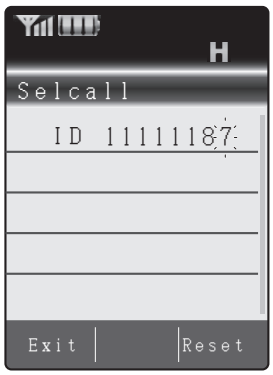
A Selcall code can be entered.



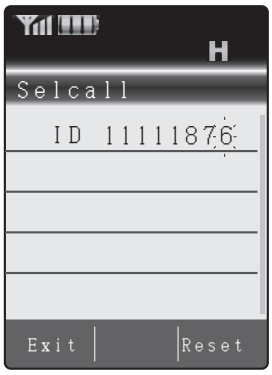
3 Enter a Selcall code.

- **Entering a Selcall code using the keypad**
  A Selcall code can be entered by pressing a key on the keypad. The entered Selcall code appears in the rightmost digit as below:
  Press the **[8]** key.

Press the **[7]** key.



Press the **[6]** key.

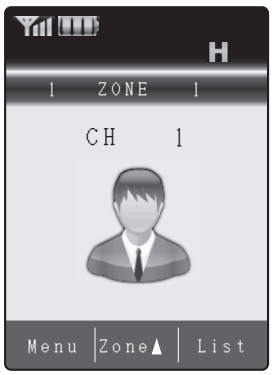


If Replace is configured for Digit Entry Method, a Selcall code can be entered after the TX Address configured for the selected channel substitutes for the Selcall code. If no TX Address is configured for the selected channel, a Selcall code can be entered after the “11111111” substitutes for the Selcall code. (Refer to Digit Entry Method on page 269.)

- **Entering a Selcall code after specifying the digit**
  A Receive code can be entered by using the **Up** or **Down** key.
  Pressing the **Left** key shifts the cursor to the left.
  Pressing the **Right/Home** key shifts the cursor to the right.

4 Press the Menu ([▯]) or [*] key.

The entered Selcall code is confirmed and the transceiver exits Selcall Mode.



Note

- If Selectable Group Tone is enabled, pressing and holding the **[0]** key enters the Group Tone. (Refer to Selectable Group Tone on page 265.)
- If the Group Tone is entered, “G” appears on the display; however, the tone configured for Group Tone will actually be transmitted. (Refer to Group Tone on page 267.)
- If no digit is specified as a changeable digit for Selectable Selcall Digits, the transceiver cannot enter Selcall Mode.
- Pressing the **Back** or **[#]** key restores the value of the Selcall code before the change.
- Refer to A.6 Key Operations for Each Mode on page 488 for operations of each key in Selcall Mode.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Assigning functions that is activated when a key on the keypad is pressed (See Edit > Key Assignment > General)
- Configuring Encode Format (See Edit > 5-tone > Encode/Decode > Encode)

Changing the Receive Code

Compatible model: TK-Dx00 with LCD

In Receive Entry Mode, the Receive code can be changed by directly entering a Receive code.

The transceiver can enter Receive Entry Mode and the Receive code can be changed using one of the following operations:

- **Receive Entry key**
  Pressing the **Receive Entry** key places the transceiver in Receive Entry Mode.
- **Menu key**
  Pressing the **Menu** key places the transceiver in Menu Mode, and then selecting “Receive Entry” places the transceiver in Receive Entry Mode. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

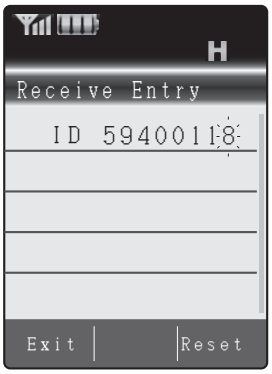
1 Press the Receive Entry key.

The transceiver enters Receive Entry Mode and the Receive code retained in the transceiver appears.
If no Receive code is retained in the transceiver, “11111111” appears. However, if the zone or channel is changed before the transceiver enters Receive Entry Mode, the displayed Receive code varies according to the configuration for Copy from Default TX/RX Address. (Refer to Copy from Default TX/RX Address on page 248.)

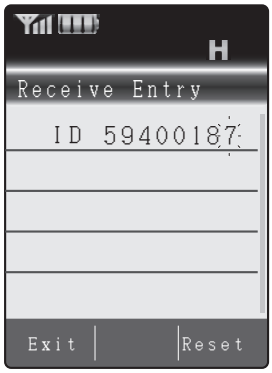
The following operations are identical if the transceiver enters Receive Entry Mode by a user pressing the **Menu** key.

2 Enter a Receive code.

- **Entering a Receive code using the keypad**
  A Receive code can be entered by pressing a key on the keypad. The entered Receive code appears in the rightmost digit as below:
  Press the **[8]** key.



Press the **[7]** key.



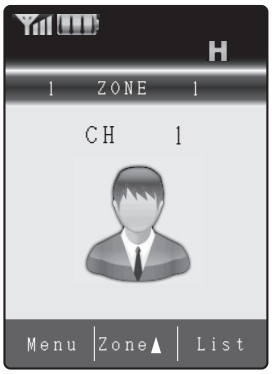
Press the **[6]** key.

If Replace is configured for Digit Entry Method, a Receive code can be entered after the RX Address configured for the selected channel substitutes for the Receive code. If no RX Address is configured for the selected channel, a Receive code can be entered after the "11111111" substitutes for the Receive code. (Refer to Digit Entry Method on page 269.)

- **Entering a Receive code after specifying the digit**
  A Receive code can be entered using the **Up** or **Down** key.
  Pressing the **Left** key shifts the cursor to the left.
  Pressing the **Right/Home** key shifts the cursor to the right.

3 Press the Menu ([ ]) or [*] key.

The entered Receive code is confirmed and the transceiver exits Receive Entry Mode.



Note

- If no digit is specified as a changeable digit for Selectable Receive Digits, the transceiver cannot enter Receive Entry Mode.
- Pressing the **Back** or **[#]** key restores the value of the Receive code before the change.
- Refer to A.6 Key Operations for Each Mode on page 488 for operations of each key in Receive Entry Mode.

Configuration using KPG-166D

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

Selectable Receive Digits

Compatible model: TK-Dx00 with LCD

Selectable Receive Digits is the number of digits for a Receive code that can be changed by directly entering a code in Receive Entry Mode. The Receive code having the number of digits (from 1 to 8) specified for Selectable Receive Digits can be changed.

Example:

Receive code: 59400593

Selectable Receive Digits: 1, 3, 7

The code in the 1st, 3rd, and 7th digits “549” can be changed. (Refer to Changing the Receive Code on page 258.)

Note

If ^V12345678 is defined in Encode Format, the number of digits for a Receive code that can be changed in Receive Entry Mode can be specified as the same way as Selectable Receive Digits. (Refer to CMP ^V1 to CMP ^V8 on page 343, SEND ^V1 to SEND ^V8 on page 324.)

Configuration using KPG-166D

Configuring Selectable Receive Digits (See Edit > 5-tone > System Parameter > General)

Selcall Digit Display

Compatible model: TK-Dx00 with LCD

Selcall Digit Display is the function to display the Selcall code instead of the channel name on the display when the transceiver is in the standby state.

If this function is enabled, the Selcall code can be displayed on the display when the transceiver is in the standby state.

Operating the Transceiver

The following is the operation example of when the transceiver is configured as below:

TX Address of channel 1: 59401

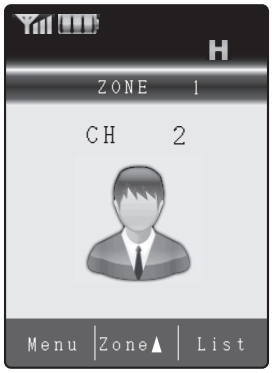
TX Address of channel 2: 59402

Copy from Default TX/RX Address: Check

Selectable Selcall Digits: 1, 2, 3, 4, 5

The Selcall code (TX Address) of channel 1 is displayed.

If channel 1 is changed to channel 2, the channel name of channel 2 is displayed.



The Selcall code (TX Address) of channel 2 is displayed if 2 sec elapses after the channel name is displayed or if any key is pressed.

Configuration using KPG-166D

Configuring Selcall Digit Display to be enabled or disabled (See Edit > 5-tone > System Parameter > General)

Changing the Selcall Code with the Digit Specified

Compatible model: TK-Dx00 with LCD

Pressing the **Digit 1x Up**, **Digit 1x Down**, **Digit 10x Up**, or **Digit 10x Down** key changes the Selcall code with the digit specified.

Table 10-9 Digit Up/ Digit Down

Key	Description
Digit 1x Up	Pressing the **Digit 1x Up** key increases the code in the last digit of the Selcall code by one.
Digit 1x Down	Pressing the **Digit 1x Down** key decreases the code in the last digit of the Selcall code by one.
Digit 10x Up	Pressing the **Digit 10x Up** key increases the code in the 2nd digit from the last digit of the Selcall code by one.
Digit 10x Down	Pressing the **Digit 10x Down** key decreases the code in the 2nd digit from the last digit of the Selcall code by one.

Operating the Transceiver

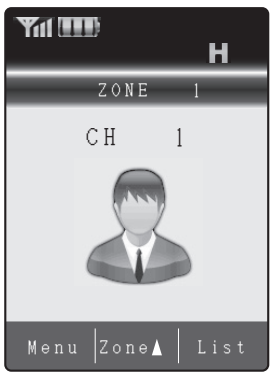
- **Digit 1x Up/ Digit 1x Down**

  The following is the operation example of when the transceiver is configured as below:

  TX Address: 59401

  Selectable Selcall Digits: 1, 2, 3, 4, 5

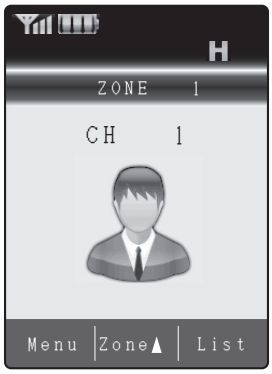
  The channel name is displayed.



Pressing the **Digit 1x Up** key displays the Selcall code (TX Address) and changes the Selcall code from “59401” to “59402”.

Pressing the **Digit 1x Down** key changes the Selcall code from “59402” to “59401”.

The transceiver restores the channel name display when the amount of time configured for Mode Reset Timer elapses.



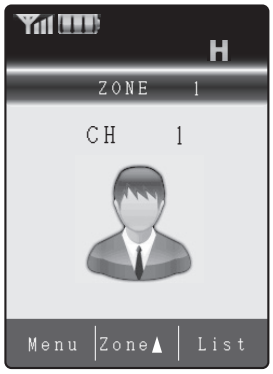
- **Digit 10x Up/ Digit 10x Down**

  The following is the operation example of when the transceiver is configured as below:

  TX Address: 59401

  Selectable Selcall Digits: 1, 2, 3, 4, 5

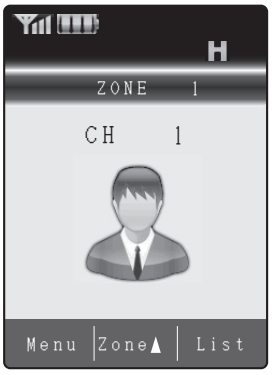
The channel name is displayed.



Pressing the **Digit 10x Up** key displays the Selcall code (TX Address) and changes the Selcall code from “59401” to “59411”.

Pressing the **Digit 10x Down** key changes the Selcall code from “59411” to “59401”.

The transceiver restores the channel name display when the amount of time configured for Mode Reset Timer elapses.



Note

- If no digit is specified as a changeable digit for Selectable Selcall Digits, a Selcall code cannot be changed even by pressing the **Digit 1x Up**, **Digit 1x Down**, **Digit 10x Up**, or **Digit 10x Down** key.
- If only one digit is specified as a changeable digit for Selectable Selcall Digits, a Selcall code cannot be changed even by pressing the **Digit 10x Up** or **Digit 10x Down** key.

Configuration using KPG-166D

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

Selectable Group Tone

Compatible model: TK-Dx00 with LCD

Selectable Group Tone is the function that allows a user to enter the Group Tone to a digit specified by Selectable Selcall Digits.

The operation varies as below depending on the configuration for Group Tone (0 to 9 or A to E).

- **If the Group Tone is from A to E:**

  Example 1:

  Selectable Group Tone: Check

  Group Tone: A

  The Group Tone can be entered if the **[0]** key is pressed and held. “G” appears on the display.

  Pressing the **Up** or **Down** key changes the digit as below:

  → 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → G → 0 → 1...

  ← 1 ← 2 ← 3 ← 4 ← 5 ← 6 ← 7 ← 8 ← 9 ← G ← 0 ← 1...

  If “G” appears between 9 and 0, the Group Tone cannot be entered.

  Example 2:

  Selectable Group Tone: Uncheck

  Group Tone: A

  The Group Tone cannot be entered even if the **[0]** key is pressed and held. “0” is entered when the **[0]** key is pressed.

  Pressing the **Up** or **Down** key changes the digit as below:

  0 → 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 0 → 1...

  0 ← 1 ← 2 ← 3 ← 4 ← 5 ← 6 ← 7 ← 8 ← 9 ← 0 ← 1…

  “G” does not appear between 9 and 0.

- **If the Group Tone is from 0 to 9:**

  Example 1:

  Selectable Group Tone: Check

  Group Tone: 3

  The Group Tone can be entered if the **[0]** key is pressed and held or if the **[3]** key is pressed. “G” appears on the display.

  Pressing the **Up** or **Down** key changes the digit as below:

  → 1 → 2 → G → 4 → 5 → 6 → 7 → 8 → 9 → 0 → 1...

  ← 1 ← 2 ← G ← 4 ← 5 ← 6 ← 7 ← 8 ← 9 ← 0 ← 1...

  If “G” appears between 2 and 4, the Group Tone cannot be entered.

Example 2:

Selectable Group Tone: Uncheck

Group Tone: 3

The Group Tone cannot be entered even if the **[0]** key is pressed and held. “0” is entered when the **[0]** key is pressed.

Pressing the **[3]** key emits a Key-entry Error Tone from the transceiver.

Pressing the **Up** or **Down** key changes the digit as below:

→ 1 → 2 → 4 → 5 → 6 → 7 → 8 → 9 → 0 → 1...

← 1 ← 2 ← 4 ← 5 ← 6 ← 7 ← 8 ← 9 ← 0 ← 1...

“G” does not appear between 2 and 4.

Note

The configuration for Selectable Group Tone is applied only to the operation to enter a 5-tone code in Selcall Mode.

Configuration using KPG-166D

Configuring Selectable Group Tone (See Edit > 5-tone > System Parameter > General)

Selcall List

Compatible model: TK-Dx00

Selcall List is the list where a Selcall code used for making an individual call with 5-tone signaling is configured. A maximum of 1000 Selcall codes can be configured in the Selcall List.

Configuration using KPG-166D

Configuring Selcall List (See Edit > 5-tone > Selcall/Status List > Selcall)

Group Tone

Group Tone is the tone used for the transceiver to make a Group Call. The transceiver can initiate a call to several transceivers at the same time by sending and receiving a 5-tone code containing a Group Tone.

For example, if the Group Tone is A, the transceiver can initiate a call to transceivers from 12340 to 12349 and 1234A to 1234E by sending 5-tone code 1234A.

Table 10-10 Usage Example of Group Tone

Encode Code	Decode Code
1234A	12340
	12341
	12342
	12343
	12344
	12345
	12346
	12347
	12348
	12349
	1234A
	1234B
	1234C
	1234D
	1234E

Note

- Generally, A is used as the Group Tone.
- Tones from A to E are usually used as special tones and they are not used for a transceiver individual ID. Therefore, in the above example, transceiver can actually initiate a call to transceivers from 12340 to 12349.

Configuration using KPG-166D

Configuring Group Tone (See Edit > 5-tone > System Parameter > General)

Receive Group Digits

Compatible model: TK-Dx40

Receive Group Digits is a feature that waits to receive a Group Tone for the specified digit place with respect to the 5-tone code received.

The following is an example of configuration using KPG-166D as well as the receive operation of the transceiver.

- **Configuration Example using KPG-166D**

Decode Code	Group Tone
59401	A

Receive Group Digits	1	2	3	4	5	6	7	8
				V	**V**			

- **(Example) Receive Operation:**

Encode Code								Calling Type
1	2	3	4	5	6	7	8	
5	9	4	**0**	**1**				Individual Call
5	9	4	**A**	**1**				Group Call
5	9	4	**0**	**A**				Group Call
5	9	4	**A**	**A**				Group Call
5	9	A	**0**	**1**				Ignored
5	A	4	**0**	**1**				Ignored
A	9	4	**0**	**1**				Ignored

Configuration using KPG-166D

Configuring Receive Group Digits (See Edit > 5-tone > System Parameter > General)

Digit Entry Method

Compatible model: TK-Dx00 with LCD

Digit Entry Method is the method to enter a 5-tone code in Selcall Mode, Status Mode, or Receive Entry Mode.

Table 10-11 Digit Entry Method

Configuration	Description
Replace[*1]	If a 5-tone code is entered by pressing a key on the keypad in Selcall Mode, Status Mode, or Receive Entry Mode, the following appears on the display according to the type of the 5-tone code: **Selcall code:** TX Address configured for the selected channel appears. **Status code:** TX Address configured for the selected channel appears. **Receive code:** RX Address configured for the selected channel appears. A 5-tone code can be entered by overwriting the displayed 5-tone code.
Overwrite	If the transceiver enters Selcall Mode, Status Mode, or Receive Entry Mode, the last entered 5-tone code appears on the display. A 5-tone code can be entered by overwriting the displayed 5-tone code.

[*1] The 5-tone code cannot be substituted when the 5-tone code is entered using the **Up** or **Down** key, or using the **Digit 1x Up**, **Digit 1x Down**, **Digit 10x Up**, or **Digit 10x Down** key.

Note

- In My ID Mode, the last entered 5-tone code appears regardless of the configuration for Digit Entry Method. My ID is retained in the transceiver even after the transceiver is turned OFF. (Refer to My ID on page 244.)
- The Selcall code, Status code, and Receive code are retained in the transceiver even after the transceiver is turned OFF.

Configuration using KPG-166D

Configuring Digit Entry Method (See Edit > 5-tone > System Parameter > General)

Selectable Selcall Digits

Compatible model: TK-Dx00 with LCD

Selectable Selcall Digits is the number of digits for a Selcall code that can be changed by selecting a Selcall code from the Selcall List or directly entering a code in Selcall Mode. The Selcall code having the number of digits (from 1 to 8) specified by Selectable Selcall Digits can be changed.

Example:

Selcall code: 59400511

Selectable Selcall Digits: 4, 5, 6

If the Selcall code is changed by directly entering a code, the code in the 4th to 6th digits “005” can be changed. If selecting a Selcall code from the Selcall List, the Selcall code can be changed by selecting from Selcall codes having the same number of digits as the number of digits specified by Selectable Selcall Digits (3 digits). (Refer to Changing the Selcall Code on page 254.)

Note

If ^K12345678 is described in Encode Format, the number of digits for a Selcall code that can be changed in Selcall Mode can be specified as the same way as Selectable Selcall Digits. (Refer to CMP ^K1 to CMP ^K8 on page 340, SEND ^K1 to SEND ^K8 on page 322.)

Configuration using KPG-166D

Configuring Selectable Selcall Digits (See Edit > 5-tone > System Parameter > General)

10.4 Sending and Receiving a Status Message (Status Call)

Compatible model: TK-Dx00

Status Message is a simplified messaging system to inform the base station or others of various types of information by sending and receiving a status number with 5-tone signaling. Using the Status Message, the transceiver can inform the base station of the transceiver status with a message, or the base station can provide instructions to mobile stations with a message.

To use Status Message, a message corresponding to a status number needs to be determined in advance. A status number and a message corresponding the status number can be configured using KPG-166D. In addition, the 5-tone code to be sent in Status Message can be changed using the transceiver key.

The 5-tone code to be sent in Status Message is referred to as “Status code”.

To send and receive a Status Message using 5-tone signaling, a script for Status Message must be created in the Encode Format and Decode Format in advance and configured for the transceiver.

When the transceiver sends a 5-tone code in Status Message, the transceiver sends the Status code according to the script created in the Encode Format. When the transceiver receives a 5-tone code in Status Message, the transceiver receives the Status code according to the script created in the Decode Format. (Refer to 11 5-TONE ENCODE/ DECODE FORMAT on page 295.)

Sending a Status Message

A Status code can be sent using one of the following functions. However, an Encode Format to send a Status code needs to be configured for each function.

Table 10-12 Encode Function

Function	Behavior
Pressing PTT	The Encode Format is executed when the **PTT** switch is pressed.
Releasing PTT	The Encode Format is executed when the **PTT** switch is released.
Call 1 to Call 6	The Encode Format is executed when the **Call 1** to **Call 6** key is pressed.
Channel Select*1	The Encode Format is executed when the channel is changed.
Power-on/ Power-off*1	The Encode Format is executed when the transceiver is turned ON or OFF.
Auto Transmit	The Encode Format is executed when GPS data is automatically sent.

*1 This function is not available for the transceiver having firmware version 1.00.00. This function is planned to be supported by the transceiver having firmware version 1.10.00 or later.

Note

If Sidetone is enabled, a tone of Status code can sound from the transceiver speaker when the transceiver sends a Status code. (Refer to Sidetone on page 250.)

Receiving a Status Message

The transceiver behavior varies depending on whether the transceiver stores the received Status code or not.

Transceiver Behavior

- **If the transceiver does not store the received Status code:**

  This is the example of when the Decode Format to display the received Status code on the display is configured.

  The transceiver executes the Decode Format when the transceiver receives a Status code.

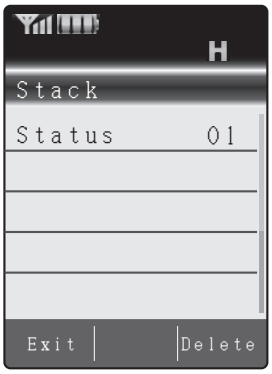
Note

- If a Status Message is longer than the displayable number of digits, it is displayed by scrolling the message from right to left.
- The statuses of transceiver display, LED, and Alert Tone revert to the former statuses if any transceiver key is pressed or the time configured for Auto Reset Timer elapses.

- **If the transceiver stores the received Status code:**

  This is the example of when the Decode Format to store the received Status code in the transceiver stack memory and display it on the display is configured.

  The transceiver executes the Decode Format when the transceiver receives a Status code. The transceiver enters Stack Mode. (Refer to 3.8 Viewing the Receive History (Stack) on page 39.)



Configuration using KPG-166D

Configuring the Encode/ Decode Format (Refer to the following:)

Edit > 5-tone > System Parameter > Decode
Edit > 5-tone > System Parameter > PTT
Edit > 5-tone > System Parameter > Others
Edit > 5-tone > Encode/Decode

Changing the Status Code

In Status Mode, the Status code can be changed by selecting a Status code configured in the Status List or directly entering a Status code.

The transceiver can enter Status Mode and the Status code can be changed using one of the following operations:

- **Status or Selcall + Status key**

  Pressing the **Status** key places the transceiver in Status Mode.

  Or, pressing the **Selcall + Status** key places the transceiver in Selcall Mode. Pressing the **Menu** (**[⧉]**) or **[*]** key subsequently places the transceiver in Status Mode.

- **Menu key**

  Pressing the **Menu** key to place the transceiver in Menu Mode, and then selecting “Status” places the transceiver in Status Mode.

  Or, pressing the **Menu** key to place the transceiver in Menu Mode, and then selecting “Selcall + Status” places the transceiver in Selcall Mode. Pressing the **Menu** (**[⧉]**) or **[*]** key subsequently places the transceiver in Status Mode. (Refer to 3.4 Using Menu Mode on page 24.)

- **Keypad entry**

  If “Status” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Status Mode.

  Or, if “Selcall + Status” is configured for Keypad Operation, pressing the **[0]** to **[9]** keys on the keypad places the transceiver in Selcall Mode. Pressing the **Menu** (**[⧉]**) or **[*]** key subsequently places the transceiver in Status Mode.

  The transceiver enters the Status code shortcut entry mode or goes into the respective state as the first digit of the Status code is entered. (Refer to Keypad Operation on page 22.)

- **SELM (Encode Format Command)**

  The transceiver enters Status Mode by executing the SELM command for the Encode Format. The transceiver behavior in Status Mode is the same as when the **Status** key is pressed. (Refer to SELM on page 320.)

- **SELS (Encode Format Command)**

  The transceiver enters Status Mode by executing the SELS command in the Encode Format. The transceiver behavior in Status Mode is the same as when the **Status** key is pressed. (Refer to SELS on page 321.)

Note

This function is not available on TK-Dx00 without LCD.

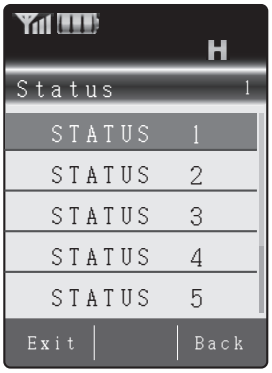
Operating the Transceiver

● Changing the Status code by selecting from the Status List

1 Select one of the following operations to place the transceiver in Status Mode.

- **Press the Status key.**
- **Press the Selcall + Status key, and then press the Menu ([ ]) or [*] key.**

The transceiver enters Status Mode and then the Status List appears.
Status Names corresponding to the Status codes having the same number of digits as the number of digits specified by Selectable Status Digits. The following displays are the Status Name display examples. (Refer to Selectable Status Digits on page 278.)



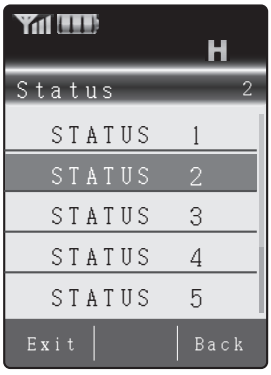
The following operations are identical even if the transceiver enters Status Mode by a user pressing the **Menu** key, with keypad entry, or with command operation.

Note

No name corresponding to a Status code is configured in the Status List, the Status code appears.

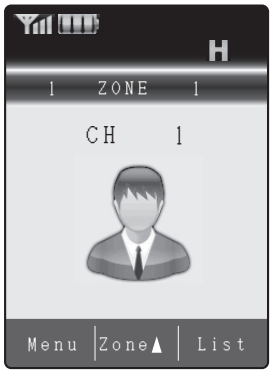
2 Select a Status code from the Status List by pressing the Up or Down key.

Refer to Selecting or Clearing Data from a List on page 45 for the selection method.



3 Press the Menu ([ ]) or [*] key.

The selected Status code is confirmed and the transceiver exits Status Mode.

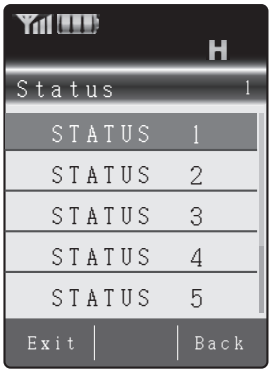


● Changing the Status code by directly entering a Status code

1 Select one of the following operations to place the transceiver in Status Mode.

- **Press the Status key.**
- **Press the Selcall + Status key, and then press the Menu ([ ]) or [*] key.**

The transceiver enters Status Mode and then the Status List appears.
Status Names corresponding to the Status codes having the same number of digits as the number of digits specified by Selectable Status Digits. The following displays are the Status Name display examples. (Refer to Selectable Status Digits on page 278.)



The following operations are identical even if the transceiver enters Status Mode by a user pressing the **Menu** key, with keypad entry, or with command operation.

2 Press and hold the Menu ([▯]) or [*] key, or press the Left key.

A Status code can be entered.

3 Enter a Status code.

- **Entering a Status code using the keypad**
  A Status code can be entered by pressing a key on the keypad. The entered Status code appears in the rightmost digit as below:
  Press the **[8]** key.

Press the **[7]** key.

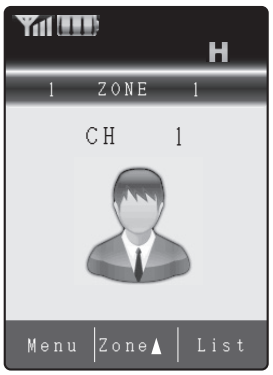
Press the **[6]** key.

If Replace is configured for Digit Entry Method, a Status code can be entered after the TX Address configured for the selected channel substitutes for the Status code. If no TX Address is configured for the selected channel, a Status code can be entered after the “11111111” substitutes for the Status code. (Refer to Digit Entry Method on page 269.)

- **Entering a Status code after specifying the digit**
  A Status code can be entered by using the **Up** or **Down** key.
  Pressing the **Left** key shifts the cursor to the left.
  Pressing the **Right/Home** key shifts the cursor to the right.

4 Press the Menu ([▯]) or [*] key.

The entered Status code is confirmed and the transceiver exits Status Mode.



Note

- If no digit is specified as a changeable digit for Selectable Status Digits, the transceiver cannot enter Status Mode.
- Pressing the **Back** or **[#]** key restores the value of the Status code before the change.
- Refer to A.6 Key Operations for Each Mode on page 488 for operations of each key in Status Mode.

Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Assigning functions that is activated when a key on the keypad is pressed (See Edit > Key Assignment > General)
- Configuring Encode Format (See Edit > 5-tone > Encode/Decode > Encode)

Status List

Status List is the list where a Status code used for sending and receiving a Status Message with 5-tone signaling is configured. A maximum of 1000 Status codes can be configured in the Status List.

Configuration using KPG-166D

Configuring Status List (See Edit > 5-tone > Selcall/Status List > Status)

Digit Entry Method

Digit Entry Method is the method to enter a 5-tone code in Selcall Mode, Status Mode, or Receive Entry Mode.

Table 10-13 Digit Entry Method

Configuration	Description
Replace*1	If a 5-tone code is entered by pressing a key on the keypad in Selcall Mode, Status Mode, or Receive Entry Mode, the following appears on the display according to the type of the 5-tone code: **Selcall code:** TX Address configured for the selected channel appears. **Status code:** TX Address configured for the selected channel appears. **Receive code:** RX Address configured for the selected channel appears. A 5-tone code can be entered by overwriting the displayed 5-tone code.
Overwrite	If the transceiver enters Selcall Mode, Status Mode, or Receive Entry Mode, the last entered 5-tone code appears on the display. A 5-tone code can be entered by overwriting the displayed 5-tone code.

*1 The 5-tone code cannot be substituted when the 5-tone code is entered using the **Up** or **Down** key, or using the **Digit 1x Up**, **Digit 1x Down**, **Digit 10x Up**, or **Digit 10x Down** key.

Note

- In My ID Mode, the last entered 5-tone code appears regardless of the configuration for Digit Entry Method. My ID is retained in the transceiver even after the transceiver is turned OFF. (Refer to My ID on page 244.)
- The Selcall code, Status code, and Receive code are retained in the transceiver even after the transceiver is turned OFF.
- This function is not available on TK-Dx00 without LCD.

Configuration using KPG-166D

Configuring Digit Entry Method (See Edit > 5-tone > System Parameter > General)

Selectable Status Digits

Selectable Status Digits is the number of digits for a Status code that can be changed by selecting a Status code from the Status List or directly entering a code in Status Mode. The Status code having the number of digits (from 1 to 8) specified by Selectable Status Digits can be changed.

Example:

Status code: 59400503

Selectable Status Digits: 6, 7

If the Status code is changed by directly entering a code, the code in the 6th and 7th digits “50” can be changed. If selecting a Status code from the Status List, the Status code can be changed by selecting from Status codes having the same number of digits as the number of digits specified by Selectable Status Digits (2 digits). (Refer to Changing the Status Code on page 273.)

Note

- If ^U12345678 is defined in Encode Format, the number of digits for a Status code that can be changed in Status Mode can be specified as the same way as Selectable Status Digits. (Refer to CMP ^U1 to CMP ^U8 on page 343, SEND ^U1 to SEND ^U8 on page 324.)
- This function is not available on TK-Dx00 without LCD.

Configuration using KPG-166D

Configuring Selectable Status Digits (See Edit > 5-tone > System Parameter > General)

10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry)

Compatible model: TK-Dx00

Free-dial Entry is the function to allow a user to enter a 5-tone code directly using the keypad and send the entered code by using the SDIAL command for the Encode Format.

The transceiver can enter Free-dial Entry Mode and a 5-tone code with a maximum of 30 digits can be entered by using one of the following operations:

- **Keypad entry**

  If “Free-dial Entry” is configured for Keypad Operation, pressing the **[0]** to **[9]**, **[A]** to **[D]**, **[*]**, or **[#]** key on the keypad places the transceiver in Free-dial Entry Mode. The transceiver will be on hold as the first digit of the 5-tone code is entered. (Refer to Keypad Operation on page 22.)

- **SELD (Encode Format Command)**

  The transceiver enters Free-dial Entry Mode by executing the SELD command for the Encode Format. (Refer to SELD on page 319.)

Operating the Transceiver

1 **Press the [0] to [9], [A] to [D], [*], or [#] key on the keypad.**

If the **[0]** key is pressed, the transceiver enters Free-dial Entry Mode and “0” is entered. Refer to Entering or Deleting Characters on page 55 for entry methods.

The entered 5-tone code can be sent by using the SDIAL command for the Encode Format. (Refer to SDIAL on page 318.)

Configuration using KPG-166D

- Assigning functions that is activated when a key on the keypad is pressed (See Edit > Key Assignment > General)
- Configuring Encode Format (See Edit > 5-tone > Encode/Decode > Encode)

10.6 Monitor Functions

“Monitor is opened (Monitor Open)” means that the received 5-tone code matches the 5-tone code preconfigured for the transceiver and the speaker is unmuted. “Monitor is closed (Monitor Close)” means that the received 5-tone code no longer matches the 5-tone code preconfigured for the transceiver and the speaker is muted.

The opening or closing operation of the monitor using 5-tone signaling can be used for various purposes.

To use this function, scripts opening the monitor and closing the monitor need to be created in Encode Format or Decode Format in advance and configured for the transceiver. (Refer to 11 5-TONE ENCODE/ DECODE FORMAT on page 295.)

The monitor opens and the “” icon appears if the received 5-tone code matches the 5-tone code preconfigured for the transceiver. The transceiver behavior when the monitor is opened or closed can be configured in Encode Format or Decode Format according to the usage environment of the transceiver. For example, if the transceiver is configured to blink the “” icon when the monitor is opened, a user can more surely notice receiving a call.

In addition, the monitor can be opened by using the **Monitor** or **Monitor Momentary** key.

The following functions are relevant to opening or closing the monitor:

- Monitor Function
- Monitor Key Action (TK-Dx00 only)
- Automatic Close
- Pressing PTT/ Release PTT (TK-Dx40 only)
- Mute Monitor Tone (TK-Dx40 only)
- Minimum Mute Tone Period (TK-Dx40 only)

Note

- When the channel is changed while the monitor is open, the monitor is still open only if the channel is an analog channel and the same System Parameter is configured. When the channel is changed to a channel where a different System Parameter is configured or to a DMR digital channel, the monitor is closed. Even if the channel is changed to a channel where the same System Parameter is configured, the monitor is closed if the channel is a mixed channel.
- If the **Monitor** key is pressed on a mixed channel, the monitor status does not change even if the time configured for Auto Reset Timer elapses.

Monitor Function

Monitor Function is the function to determine the transceiver behavior when the monitor is opened or closed.

Table 10-14 Monitor Function

Configuration	Description
QT/DQT	Opening the monitor disables QT/DQT signaling, and the transceiver is able to unmute the speaker simply by receiving a carrier. In the case of TK-Dx00, the "▯▌" icon lights up. When the monitor is closed, the QT/DQT signaling is enabled. In the case of TK-Dx00, the "▯▌" icon disappears. Note When the transceiver is in Squelch Level Mode, the transceiver can unmute the speaker just by receiving a carrier.
5-tone	Opening the monitor disables 5-tone signaling, and the transceiver is able to unmute the speaker simply by receiving a QT/DQT Signaling. If a QT tone or DQT code is not configured for the transceiver, the transceiver can unmute the speaker just by receiving a carrier. In the case of TK-Dx00, the "▯▌" icon lights up. When the monitor is closed, the 5-tone signaling is enabled. In the case of TK-Dx00, the "▯▌" icon disappears. Note When the transceiver is in Squelch Level Mode, the transceiver unmutes the speaker if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver.

Configuration using KPG-166D

Configuring Monitor Function (See Edit > 5-tone > System Parameter > General)

Monitor Key Action

Compatible model: TK-Dx00

Monitor Key Action is the function to determine the transceiver behavior of when the **Monitor** key is pressed.

Table 10-15 Monitor Key Action

Configuration	Description
Open	The monitor is opened and the "" icon appears when the **Monitor** key is pressed. The transceiver behaves according to the configuration for Monitor Function while the monitor is open. (Refer to Monitor Function on page 281.) The transceiver does not respond at all if the **Monitor** key is pressed while the monitor is open.
Close	The monitor is closed and the "" icon disappears when the **Monitor** key is pressed. The transceiver does not respond at all if the **Monitor** key is pressed while the monitor is closed.
Both	The monitor is opened or closed every time the **Monitor** key is pressed.
Disable	The transceiver does not respond at all even if the **Monitor** key is pressed.

The following beeps sound from the transceiver if the monitor status is changed by the transceiver status or by the **Monitor** key operation:

Table 10-16 Change of Monitor Status

Signaling Type	Optional Signaling Status	Monitor Key Action	Change of Monitor Status	Beep
5-tone	Matched or Unmatched	Disable	Unrelated to the monitor status	Key-entry Error Tone
		Open		Key Beep A
		Close		Key Beep B
		Both	Close → Open	Key Beep A
			Open → Close	Key Beep B

Note

- Pressing the **Monitor** key while the 5-tone code is matching resets the matching state of the 5-tone code without changing the monitor status. Then, the monitor status will be changed according to the configuration for Monitor Key Action.
- For the transceiver using 5-tone signaling, the statuses of Monitor and Squelch Off (enabled or disabled) are not retained in the transceiver.
- The configuration for Monitor Key Action does not apply to the **Monitor Momentary** key.

Configuration using KPG-166D

Configuring Monitor Key Action (See Edit > 5-tone > System Parameter > General)

Automatic Close

Automatic Close is a feature that closes the monitor automatically if the specified digit place of the received 5-tone code matches that of the RX Address (TK-Dx00) or Primary Address (TK-Dx40).

By using this function, the monitor for transceivers other than the target transceiver can automatically be closed.

Example:

The following is an example when the first, second and third digits are specified as the target digits for comparison in Automatic Close on TK-Dx00.

- **When the transceiver waiting to receive the 5-tone code (RX Address) 59405 receives the 5-tone code 59405:**

  The monitor is closed if the monitor is open when the first “594” match. If the transceiver receives “05” subsequently, the monitor is opened because the all codes match.

- **When the transceiver waiting to receive the 5-tone code (RX Address) 59402 receives the 5-tone code 59405:**

  The monitor is closed if the monitor is open when the first “594” match. If the transceiver receives “05” subsequently, the monitor is closed because the codes do not match.

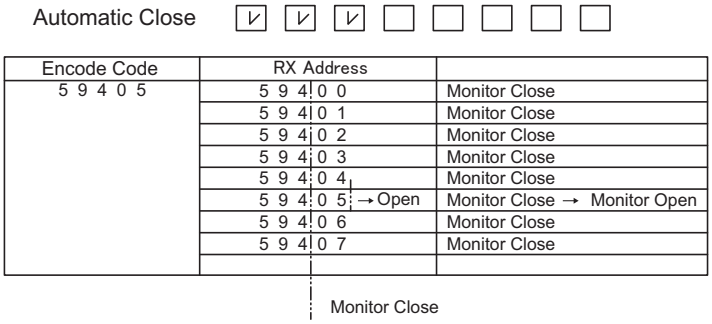


Figure 10-6 Automatic Close

Configuration using KPG-166D

Configuring Automatic Close (See Edit > 5-tone > System Parameter > General)

Pressing PTT/ Release PTT

Compatible model: TK-Dx40

The monitor can be opened after sending a 5-tone code by pressing the **PTT** switch.

Monitor (Pressing PTT)

Monitor (Pressing PTT) is a feature for opening the monitor after sending a 5-tone code by pressing the **PTT** switch.

When this feature is configured to “Open”, the monitor opens after sending a 5-tone code by pressing the **PTT** switch. The monitor is closed when the time configured for Auto Reset Timer elapses.

Note

The monitor opens once the **PTT** switch is released.

Encode Off when Monitor Open (Pressing PTT)

Encode Off when Monitor Open (Pressing PTT) is a feature that does not send out a 5-tone code if the monitor is open when the **PTT** switch is pressed.

When this feature is enabled, a 5-tone code is not sent out if the monitor is open when the **PTT** switch is pressed.

When this feature is disabled, a 5-tone code configured in Encode Code (Pressing PTT) is sent out regardless of whether the monitor is open or closed when the **PTT** switch is pressed.

Encode Off when Monitor Open (Releasing PTT)

Encode Off when Monitor Open (Releasing PTT) is a feature that does not send out a 5-tone code if the monitor is open when the **PTT** switch is released.

When this feature is enabled, a 5-tone code is not sent out if the monitor is open when the **PTT** switch is pressed.

When this feature is disabled, a 5-tone code configured in Encode Code (Releasing PTT) is sent out regardless of whether the monitor is open or closed when the **PTT** switch is released.

Encode Pause Time

Encode Pause Time is a feature that does not send out a 5-tone code when resending is carried out within a certain time interval after a 5-tone code is sent out by pressing the **PTT** switch.

Pressing the **PTT** switch sends out a 5-tone code when Encode Code (Pressing PTT) is configured. Releasing the **PTT** switch sends out a 5-tone code when Encode Code (Releasing PTT) is configured.

Countdown of Encode Pause Time starts if the **PTT** switch is released and reception by the transceiver resumes. The 5-tone code configured in Encode Code (Pressing PTT) or Encode Code (Releasing PTT) is not sent out even when the **PTT** switch is pressed again within the time interval configured in Encode Pause Time.

Configuration using KPG-166D

- Configuring Monitor (Pressing PTT) (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)
- Configuring Encode Code (Pressing PTT) (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)
- Enabling/Disabling Encode Off when Monitor Open (Pressing PTT) (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)
- Configuring Encode Code (Releasing PTT) (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)
- Enabling/Disabling Encode Off when Monitor Open (Releasing PTT) (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)
- Configuring Encode Pause Time (See Edit > 5-tone > System Parameter > PTT > Pressing PTT)

Monitor Operation Other than the PTT Switch

Compatible model: TK-Dx40

The monitor can be opened or closed according to changes in the status of the transceiver, such as when the **Call 1** or **Call 2** key is pressed or when the channel is changed. In this case, monitor operation (Open or Close) needs to be configured for the respective function.

Table 10-17 Encode Function (TK-Dx40)

Function	Behavior
Call 1/ Call 2	Monitor operation can only be configured to “Open” for **Call 1**/ **Call 2**. The monitor opens after the 5-tone code configured in Encode Code is sent out by pressing the **Call 1** or **Call 2** key.
On-hook/ Off-hook (Mobile only)	The monitor opens or closes when the microphone switches to the on-hook or off-hook state.
Channel Select	The monitor opens or closes when the channel changes.
Power-on	Powers on the transceiver and opens or closes the monitor after sending out the 5-tone code configured in Encode Code.

Configuration using KPG-166D

Configuring Monitor Operation (Monitor) (See Edit > 5-tone > System Parameter > Others)

Mute Monitor Tone

Compatible model: TK-Dx40

Mute Monitor Tone is a feature for disabling the monitor feature of the receiving transceiver.

The transmitting transceiver adds a Mute Monitor Tone to the end of the frame when sending out the 5-tone code.

The receiving transceiver disables the monitor feature when it receives a Mute Monitor Tone longer than the time configured for Minimum Mute Tone Period.

Tones from B to E that are not configured for Group Tone or Repeat Tone can be configured as the Mute Monitor Tone.

Configuration using KPG-166D

Configuring Mute Monitor Tone (See Edit > 5-tone > System Parameter > General)

Minimum Mute Tone Period

Compatible model: TK-Dx40

Minimum Mute Tone Period is the duration for continuously receiving the Mute Monitor Tone that is used to disable the monitor feature of the receiving transceiver.

The transmitting transceiver adds a Mute Monitor Tone to the end of the frame when sending out the 5-tone code.

The receiving transceiver disables the monitor feature when it receives a Mute Monitor Tone longer than the time configured for Minimum Mute Tone Period.

Configuration using KPG-166D

Configuring Minimum Mute Tone Period (See Edit > 5-tone > System Parameter > General)

10.7 Conditions to Pause Scanning (Scan Configuration)

Scan Condition is the condition to pause scanning.
The condition to pause scanning can be configured for each System Parameter by using KPG-166D.

Table 10-18 Scan Configuration

Configuration	Description
Carrier	The transceiver pauses scanning if the transceiver receives a carrier during the scan. Dropout Delay Time is activated if the carrier disappears. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan. If the transceiver has finished transmission, the transceiver resumes the scan after the time configured for Dwell Time elapses.
QT/DQT	The transceiver pauses scanning if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver during the scan. The time measurement of Dropout Delay Time starts if the carrier disappears or the QT/DQT becomes unmatched. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan. Or, if the transceiver has finished transmission, the transceiver resumes the scan after the time configured for Dwell Time elapses.
5-tone	If the first digit of the received 5-tone code matches the first digit of the RX Address (TK-Dx00) or Primary Address (TK-Dx40) configured for the transceiver during the scan, the transceiver waits to receive the 5-tone code. The subsequent digits are compared in the way. The transceiver pauses scanning if all digits of the 5-tone code are found to be matching. The time measurement of Dropout Delay Time starts if the carrier disappears. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan. Or, if the transceiver has finished transmission, the transceiver resumes the scan after the time configured for Dwell Time elapses.
QT/DQT + 5-tone	If the first digit of the received 5-tone code matches the first digit of the RX Address (TK-Dx00) or Primary Address (TK-Dx40) configured for the transceiver, and if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver during the scan, the transceiver waits to receive the 5-tone code. The subsequent digits are compared in the way. The transceiver pauses scanning if all digits of the 5-tone code are found to be matching. The time measurement of Dropout Delay Time starts if the carrier disappears or the QT/DQT becomes unmatched. After the time configured for Dropout Delay Time elapses, the transceiver resumes the scan. Or, if the transceiver has finished transmission, the transceiver resumes the scan after the time configured for Dwell Time elapses.
5-tone with Monitor	If the first digit of the received 5-tone code matches the first digit of the RX Address (TK-Dx00) or Primary Address (TK-Dx40) configured for the transceiver during the scan, the transceiver waits to receive the 5-tone code. The transceiver pauses scanning while the time measurement of Dropout Delay Time is carried out if all the subsequent 5-tone codes are found to be matching. The transceiver resumes the scan if the monitor is not opened while the transceiver is pausing scanning. Dropout Delay Time is activated if the carrier disappears. The transceiver pauses scanning while the monitor is open. The transceiver resumes the scan if the monitor is closed.
QT/DQT + 5-tone with Monitor	If the first digit of the received 5-tone code matches the first digit of the RX Address (TK-Dx00) or Primary Address (TK-Dx40) configured for the transceiver, and if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver during the scan, the transceiver waits to receive the 5-tone code. The subsequent digits are compared in the way. The transceiver pauses scanning while the time measurement of Dropout Delay Time is carried out if all digits of the 5-tone code are found to be matching. The transceiver resumes the scan if the monitor is not opened while the transceiver is pausing scanning. The transceiver pauses scanning while the monitor is open. The transceiver resumes the scan if the monitor is closed.

Note

- If anything other than “5-tone with Monitor” or “QT/DQT + 5-tone with Monitor” is configured for Scan Configuration, the transceiver resumes the scan with the 5-tone code matched after the time configured for Dropout Delay Time or Dwell Time elapses even while the time measurement of Auto Reset Timer is carried out.
- If “5-tone with Monitor” or “QT/DQT + 5-tone with Monitor” is configured for Scan Configuration, the transceiver pauses scanning while the monitor is open regardless of the presence of a busy signal or the matching state of QT/DQT or 5-tone code.

Configuration using KPG-166D

Configuring Scan Configuration (See Edit > 5-tone > System Parameter > General)

Scan Behavior

The scan behavior and transceiver behavior vary as below according to the monitor status or the Auto Reset Timer status while the transceiver is scanning.

- If the channel is changed with the monitor opened during the scan and if a different System Parameter is configured for the channel, the monitor is closed.

  Example: Channel 3: System Parameter 2, Channels other than Channel 3: System Parameter 1

Channel	→	1	→	2	→	3	→	4	→	1
System Parameter	→	1	→	1	→	2	→	1	→	1
Monitor State	Open	Open	Open	Open	Open	Close	Close	Close	Close	Close

- If the channel is changed to a channel using anything other than 5-tone signaling during the scan, the monitor is closed. If Auto Reset Timer is activated, the matching state of 5-tone code is reset if the time configured for Auto Reset Timer has elapsed. If Auto Reset Timer is not activated, the matching state of 5-tone code is retained.

Note

The matching state of 5-tone code means the behavior to change the LED, LCD, and Monitor statuses, which is executed by receiving a 5-tone code (Decode).

- If the **Monitor** key is pressed while the transceiver is scanning and the monitor status is changed from closed to opened, Auto Reset Timer is activated according to the configuration for System Parameter of the Revert Channel, and then the monitor is closed after the time configured for Auto Reset Timer elapses. Except when the transceiver is scanning, Auto Reset Timer is automatically set according to the configuration for System Parameter of the selected channel.
- If the scan is resumed while the timer for Auto Reset Timer is counting down and then the scan is paused, Auto Reset Timer is reactivated according to the configuration for System Parameter of the channel where the scan is paused. If the transceiver detects a busy signal or the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver (if QT/DQT is configured), Auto Reset Timer is automatically extended.

  Example:

  Channel 1:

  Scan Configuration: 5-tone

  Auto Reset Timer: 10 sec

  Channel 3:

  Scan Configuration: Carrier

  Auto Reset Timer: 5 sec

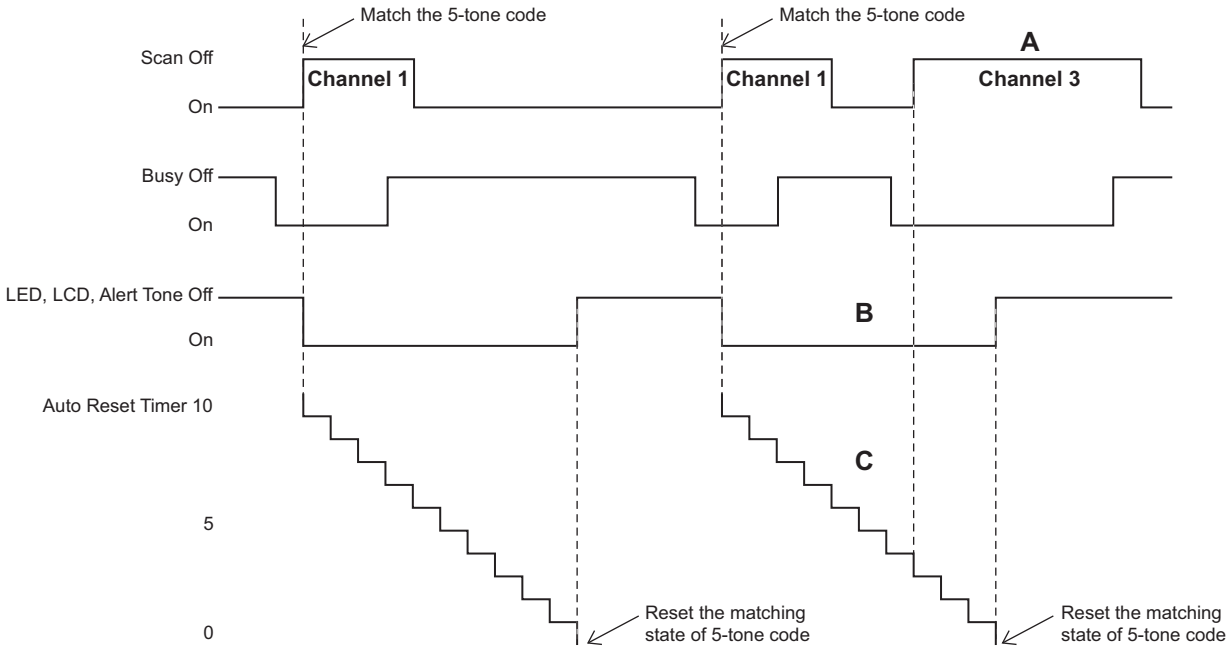


Figure 10-7 Scan Behavior 1

A: The transceiver pauses scanning upon detection of a busy signal because “Carrier” is configured for Scan Configuration.

B: The matching state of 5-tone code (LED, LCD, Alert Tone) continues on Channel 1 because the 5-tone code does not match on Channel 3.

C: Auto Reset Timer is reactivated because the scan resumes on Channel 1 while the timer for Auto Reset Timer is counting down and then the scan is paused on Channel 1 again. If the scan is paused again on Channel 3, Auto Reset Timer is not reactivated because the System Parameter is different.

- The following is the scan behavior when “5-tone with Monitor” or “QT/DQT + 5-tone with Monitor” is configured for Scan Configuration. If the received 5-tone code matches the 5-tone code preconfigured for the transceiver and if the scan is paused while the monitor is open, when the status of monitor is changed from opened to closed after the time configured for Auto Reset Timer elapses, the transceiver immediately resumes the scan if the time configured for Dropout Delay Time or Dwell Time has elapsed.

  Example:

  Monitor (Auto Reset Timer): Check

  Auto Reset Timer: The value larger than the configuration value for Dropout Delay Time

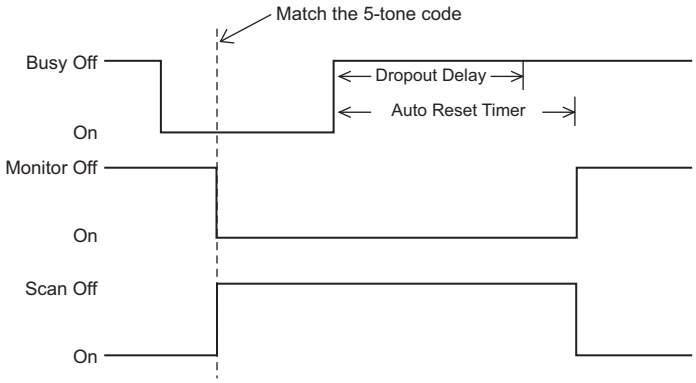


Figure 10-8 Scan Behavior 2

- The transceiver pauses scanning if an Encode Format is executed during the scan. Usually, if the time configured for Dwell Time elapses after the Encode Format is executed, the transceiver resumes the scan.

10.8 Encode Functions

Compatible model: TK-Dx40

This section explains the Encode functions of the 5-tone code on TK-Dx40.

The Encode Code, which is transmitted when the **PTT** switch or **Call 1**/ **Call 2** key is pressed, can be configured for each System Parameter of the 5-tone using KPG-166D.

Up to 32 Encode Codes can be configured for each transceiver, while 3 frames can be configured for each Encode Code.

When a 5-tone code is not configured for Frame 2 or Frame 3, the time measurement of Delay 2 or Delay 3 is not carried out respectively, and the transceiver ends the transmission after the time configured for End Delay has elapsed.

When First Digit Extended is configured, the length of the tone at the beginning of the frame to be sent is the sum of the First Digit Length and the Tone Period setting values.

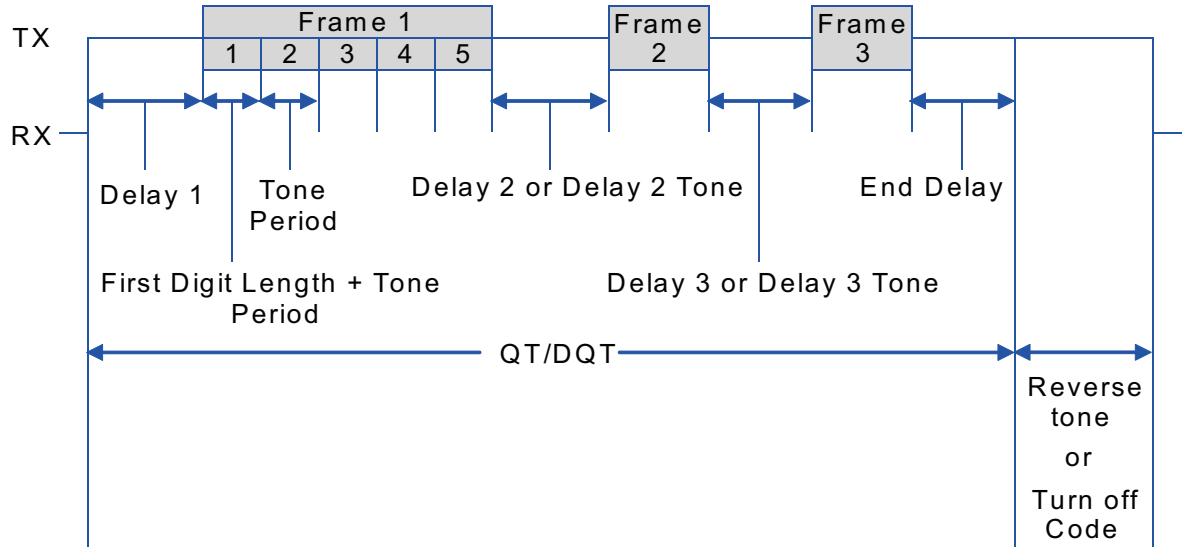


Figure 10-9 Encode

Table 10-19 Encode Functions

Function	Behavior
Delay 1	Delay 1 is the duration from the time when the transceiver starts transmission to the time when transmission of Frame 1 starts. When a 5-tone code is not configured for Frame 1, Frame 2 and Frame 3 also become blank, and a 5-tone code is not sent.
Delay 2	Delay 2 is the duration from the time when the 5-tone code for Frame 1 is sent to the time when transmission of the 5-tone code for Frame 2 starts. When a 5-tone code is not configured for Frame 2, Delay 2 does not count down and the time measurement configured for End Delay is initiated.
Delay 3	Delay 3 is the duration from the time when the 5-tone code for Frame 2 is sent to the time when transmission of the 5-tone code for Frame 3 starts. When a 5-tone code is not configured for Frame 3, Delay 3 does not count down and the time measurement configured for End Delay is initiated.
End Delay	End Delay is the period during which transmission continues after all the 5-tone codes are sent. Reverse tone and Turn off Code are sent after the time configured for End Delay has elapsed.
Transpond Delay	Transpond Delay is the duration from the time the transceiver receives the Transpond request to the time the Transpond code is returned.
First Digit Length	First Digit Length is a feature for extending the transmission time of the first code of each frame. Transmission time for the first code of each frame can be extended according to the duration configured for First Digit Length.

Function	Behavior

Configuration using KPG-166D

Configuring Encode Feature of the 5-tone Code (See Edit > 5-tone > Encode/Decode)

Decode Code	1	2	3	4	5	6	7	8
	✓	✓	✓					

Function		Description
Auto Reset Timer	Off	Auto Reset Timer will not be activated.
	1 s to 300 s	The transceiver behaves as follows when the time configured for Auto Reset Timer elapses. **LED:** If this function is enabled, the blinking orange LED for the Selective Call Alert LED turns Off when the time configured for the Auto Reset Timer elapses. **Alert Tone:** If this function is enabled, the intermittently emitted Alert Tone stops after the preset time interval of Auto Reset Timer has elapsed. **Monitor:** After the time configured for Auto Reset Timer elapses, the matching state of the 5-tone code is automatically reset.
Next Decode Wait Time		Next Decode Wait Time is the waiting time from the point the 5-tone code for Frame 1 or Frame 2 is received up to the point the 5-tone code for the next frame is received. When the 5-tone code for the next frame is received within the interval configured in Next Decode Wait Time, the transceiver regards it as a 5-tone code for Frame 2 or Frame 3. When the 5-tone code for the next frame is not received within the interval configured in Next Decode Wait Time, the transceiver regards the 5-tone code it receives next as the 5-tone code for Frame 1.
Clear to Transpond		Clear to Transpond is a feature that does not send out the Transpond code while a carrier is present in the channel after receipt by the transceiver, and waits to transmit the Transpond code until the carrier disappears.

Function	Description
Alert Tone	Alert Tone is a tone that is output from the transceiver when it receives a 5-tone code via an Individual Call or a Group Call. Each of Individual and Group can be configured to one of the tone patterns from 1 to 8. When Individual or Group is configured to “Stop”, Alert Tone output from the transceiver stops when the transceiver receives a 5-tone code via an Individual Call or a Group Call This function cannot be used if “Stun” or “Kill” is configured for Remote.
Monitor	Monitor is a feature for opening or closing the monitor when the transceiver receives a 5-tone code. When Monitor is configured to “Open”, the monitor opens when the transceiver receives a 5-tone code. When Monitor is configured to “Close”, the monitor closes when the transceiver receives a 5-tone code. This function cannot be used if “Stun” or “Kill” is configured for Remote.
LED	LED is a feature for blinking or turning off the LED light when the transceiver receives a 5-tone code. When LED is configured to “Blink”, the LED blinks in orange color when the transceiver receives a 5-tone code. When LED is configured to “Clear”, the LED light turns off when the transceiver receives a 5-tone code. This function cannot be used if “Stun” or “Kill” is configured for Remote.

Function	Description
Transpond	Transpond is a feature for returning a Transpond code when the transceiver receives a 5-tone code. Automatically returns the Transpond code (Encode Code) configured in Transpond when the transceiver receives a 5-tone code via an Individual Call.
Emergency	Emergency is a feature for exiting the Emergency Mode when the transceiver receives this 5-tone code in this mode.
Remote	Remote is a feature for disabling the transceiver via wireless remote control using an external device. This function allows an system administrator to remotely disable the transceiver, for instance, if the transceiver is lost. **Stun:** Disables the transceiver (enters the Stun state) when it receives the 5-tone code for which Remote is configured to “Stun”. The Stun state can be canceled by the receiving a Revive Code or writing the configuration data with KPG-166D. The 5-tone codes below can be transmitted automatically even while the transceiver is in the Stun state. • Power-on Encode • Power-off Encode **Revive:** The Stun state is canceled when the transceiver in the Stun state receives a 5-tone code for which Remote is configured to “Revive”. **Kill:** Use of the transceiver is prohibited and all operations are disabled upon receiving a 5-tone code for which Remote is configured to “Kill”. Note If a Decode Code for which Remote is configured to “Stun”, “Revive” or “Kill” is included in a Group Tone, no action is initiated even when the 5-tone code is received.
Horn Alert (Mobile only)	Horn Alert is a feature for activating the Horn Alert Port of the transceiver when the transceiver receives a 5-tone code.

Configuration using KPG-166D

- Configuring 5-tone Codes on Standby Concurrently for Reception (System Parameter) (See Edit > 5-tone > System Parameter > Decode)
- Configuring Decode Feature of the 5-tone Code (See Edit > 5-tone > Encode/Decode > Decode)

Compatible model: TK-Dx00

Encode/ Decode Format is the script used to send and receive a 5-tone code. A script can be created by using various types of commands for encoding and decoding.

This chapter explains the description of each command, the usage example, and the transceiver behavior. In addition, configuration range is also described for commands having a limit in its configuration range.

11.1 Encode Format

Encode Format is the script used to send a 5-tone code. The script that determines the timing to send a 5-tone code or the transceiver behavior when a 5-tone code is sent can be created using the following commands:

ALERT num

Description	Upon execution of the ALERT num command, the transceiver emits the Alert Tone configured for “num”. The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)
Range	num: 1 to 8
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX ALERT 2
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and an Alert Tone 2 sounds.

AUTR

Description	Upon execution of the AUTR command, Auto Reset Timer is activated and then the timer for Auto Reset Timer starts counting down. Upon lapse of the time configured for Auto Reset Timer, the transceiver restores the display in receive mode, turns the LED Off, or disables the Alert Tone or Monitor function according to the configuration for Auto Reset Timer. (Refer to Auto Reset Timer on page 249.)
Usage Example	**Sample Script**
	Encode Format: OPEN TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX AUTR
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver opens the monitor and starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and the timer for Auto Reset Timer starts counting down.

BEEP num

Description	Upon execution of the BEEP num command, the transceiver emits the beep configured for “num”. The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX BEEP 2
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and a Beep 2 sounds from the transceiver.

BKTOF

Description	Upon execution of BKTOF while the transceiver is transmitting the Background Tone (1630 Hz) after executing the BKTON command, the transceiver stops transmitting the Background Tone.
Usage Example	**Sample Script**
	Encode Format: EMGON REP 5 TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 100 BKTON TXM DELL 5 BKTOF RX RSML 5
	Transceiver Behavior
	After a lapse of 200 ms from the point the transceiver enters Emergency Mode and starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 100 ms after transmitting all tones, the transceiver activates the Background Tone. The transceiver unmutes the microphone and continues transmitting for the subsequent 5 sec, and then reverts to receive mode. The transceiver stops transmitting the Background Tone when reverting to receive mode, and then starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 5 times.

BKTON

Description	Upon execution of the BKTON command, the transceiver transmits the Background Tone (1630 Hz). The BKTON command is used together with the BKTOF command.
Usage Example	**Sample Script**
	Encode Format: EMGON REP 5 TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 100 BKTON TXM DELL 5 BKTOF RX RSML 5
	Transceiver Behavior
	After a lapse of 200 ms from the point the transceiver enters Emergency Mode and starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 100 ms after transmitting all tones, the transceiver activates the Background Tone. The transceiver unmutes the microphone and continues transmitting for the subsequent 5 sec, and then reverts to receive mode. The transceiver stops transmitting the Background Tone when reverting to receive mode, and then starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 5 times.

BLTOF

Description	Upon execution of the BLTOF command, the display backlight is turned Off. The BLTOF command is used for the transceiver to behave as if the transceiver is turned OFF when the transceiver is in Emergency Mode.
Usage Example	**Sample Script**
	Encode Format: EMGON BLTOF LEN 0 TEXT ‘ ’ DIFIX REP 5 TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 50 TXM DELL 5 RX RSML 5 **Decode Format:** CMP ^RX12345 EMGOF REPOF BLTON MONO BEEP 3 ENCI ENC_textof **Encode Format (ENC_textof):** TXTOF
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) When the transceiver enters Emergency Mode, the display backlight is turned Off. After a lapse of 200 ms from the point the transceiver enters Emergency Mode and starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver unmutes the microphone and continues transmitting for the subsequent 5 sec, and then reverts to receive mode. The transceiver starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 5 times. If the transceiver receives a 5-tone code #59401 when the transceiver reverts to receive mode, the transceiver exits Emergency Mode. The backlight lights, the monitor is opened, and a Beep 3 sounds from the transceiver.

CLOSE

Description	Upon execution of the CLOSE command, the transceiver closes the monitor.
Usage Example	**Sample Script**
	Encode Format: CLOSE TXM SCTP
	Transceiver Behavior
	The transceiver transmits after the monitor is closed. At this time, the QT tone or DQT code is also transmitted. Note The XCLOS and XOPEN commands are used to detect the monitor status when the Encode Format is started. After the monitor status is detected by each command, the transceiver behaves as below according to the monitor status. (Refer to XCLOS on page 332, OPEN on page 307.) XCLOS: If the monitor is closed, the commands subsequent to XCLOS are not executed. XOPEN: If the monitor is open, the commands subsequent to XOPEN are not executed.

CTTP

Description	Upon execution of the CTTP command, the transceiver activates Clear to Transpond. Clear to Transpond is the function that the transceiver does not send an acknowledgment while a carrier is present on the channel after reception; the transceiver waits to send an acknowledgment until the carrier disappears.
Usage Example	**Sample Script**
	Decode Format: CMP #54321 BEEP 16 MONF ENCI encAck **Encode Format (encAck):** CTTP TXS DEL 100 TSET EEA LEN 40 SEND #59480 DEL 50 RX
	Transceiver Behavior
	Upon receipt of a 5-tone code #54321, a Beep 16 sounds from the transceiver. The transceiver opens the monitor and the “ ” icon blinks at this time. The transceiver starts transmitting if no carrier is present on the channel. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59480 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode. The transceiver does not transmit while a carrier is present on the channel; the transceiver waits to transmit until the carrier disappears.

DEL xtime

Description	Upon execution of the DEL xtime command, the transceiver waits to execute the next command for the length of time configured for “xtime”. DEL stands for Delay. The DEL xtime command can be used when a wait time until the transceiver enters transmit or receive mode is required or when an unmodulated signal needs to be transmitted for sending or receiving 5-tone codes in 2 frames.
Range	xtime: 0 ms to 7000 ms (in steps of 1 ms)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

DELL ltime

Description	Upon execution of the DELL ltime command, the transceiver waits to execute the next command for the length of time configured for “ltime”. DELL stands for Delay Long. The DELL ltime command can be used when a wait time until the transceiver enters transmit or receive mode is required or when a long transmission time is required during Emergency Mode.
Range	ltime: 0 sec to 255 sec (in steps of 1 sec)
Usage Example	**Sample Script**
	Encode Format: REP 30 TXS DEL 200 TSET EEA LEN 40 SEND #12345678 DEL 50 TXM DELL 10 RX RSML 5
	Transceiver Behavior
	After a lapse of 200 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345678 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver unmutes the microphone and continues transmitting for the subsequent 10 sec, and then reverts to receive mode. The transceiver starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 30 times.

DIFIX

Description	Upon execution of the DIFIX command, the transceiver current display remains unchanged.
Usage Example	**Sample Script**
	Encode Format: DIFIX EMGON TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 50 TXM DELL 10 REP 5 RX RSML 5
	Transceiver Behavior
	The transceiver enters Emergency Mode with the current display unchanged. After a lapse of 200 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver unmutes the microphone and continues transmitting for the subsequent 10 sec, and then reverts to receive mode. The transceiver starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 5 times.

DISPF

Description	Upon execution of the DISPF command, the current display blinks. When the display is Basic Frame, the current display blinks. When the display is Function Mode Frame 1, the contents in Line 1 blink. (Refer to LCD on page 7.)
Usage Example	**Sample Script**
	Encode Format: TXT SCPH DEL 180 RX OPEN DISPF
	Transceiver Behavior
	The transceiver transmits the QT Reverse Burst tone for 180 ms and then reverts to receive mode. At this time, the transceiver opens the monitor and the current display blinks.

DISPS

Description	Upon execution of the DISPS command, the display blinking by the DISPF command stops blinking, and the transceiver reverts to the normal display.
Usage Example	**Sample Script**
	Decode Format: STO 12345 QUEUE DISPQ DISPF LEDF MONO ENCI transpond **Encode Format (transpond):** TXS DEL 500 TSET EEA LEN 40 SEND #54321 DEL 20 RX DEL 2000 DISPS LEDS
	Transceiver Behavior
	The received 5-tone code blinks on the display, and the LED blinks orange. The transceiver opens the monitor and proceeds to Transpond at this time. After a lapse of 500 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #54321 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 20 ms after transmitting all tones, the transceiver reverts to receive mode. After 2 sec elapse, the display and LED stop blinking.

DTAIL

Description	Upon execution of the DTAIL command, the transceiver sends the Turn off code.
Usage Example	**Sample Script**
	Encode Format: TXT DTAIL DEL 180 RX
	Transceiver Behavior
	The transceiver sends the DQT turn-off code for 180 ms and then reverts to receive mode.

EMGON

Description	Upon execution of the EMGON command, the transceiver enters Emergency Mode. To exit Emergency Mode, pressing the **Emergency** key, turning the transceiver OFF, or executing the EMGOF command for the Decode Format is required. (Refer to EMGOF on page 350.)
Usage Example	**Sample Script**
	Encode Format: EMGON TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 50 TXM DELL 10 REP 5 RX RSML 5
	Transceiver Behavior
	After a lapse of 200 ms from the point the transceiver enters Emergency Mode and starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver unmutes the microphone and continues transmitting for the subsequent 10 sec, and then reverts to receive mode. The transceiver starts transmitting again after 5 sec elapse. The transceiver repeats the above behavior 5 times. Note Even if the EMGON command is executed, the display does not remain unchanged unlike the DIFIX command execution.

ENC enc

Description	Upon execution of the ENC enc command, the transceiver executes the Encode Format configured for “enc”. The ENC enc command is used to encode the 5-tone codes in the 2nd and 3rd frames. An Encode Format name needs to be configured for “enc”.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #594^K45 DEL 50 RX ENC 2nd_frame **Encode Format (2nd_frame):** TXS DEL 200 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to #594^K45 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode temporarily and then starts transmitting again. After a lapse of 200 ms from the point the transceiver resumes transmission, the transceiver sends a 5-tone code corresponding to ^RX12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

ENTTM ltime

Description	Upon execution of the ENTTM ltime command, the transceiver exits each Function Mode, such as Selcall Mode, Status Mode, or Stack Mode, if the time configured for “ltime” elapses.
Range	ltime: 0 sec to 255 sec (in steps of 1 sec)
Usage Example	**Sample Script**
	Decode Format: STO 12345 QUEUE DISPQ BEEP 1 ENCI test_ENTTM **Encode Format (test_ENTTM):** ENTTM 10
	Transceiver Behavior
	The transceiver enters Stack Mode and the Queue Number of the 5-tone code stored in the transceiver appears on the display. A Beep 1 sounds from the transceiver. The timer to exit Function Mode is set to 10 sec. The transceiver exits Stack Mode and reverts to the normal display after 10 sec elapse. Note If the ENTTM ltime command is used, the time configured for Mode Reset Timer is disabled. (Refer to Mode Reset Timer on page 21.)

ERRX0

Description	The transceiver aborts the execution of Encode Format without emitting an error tone if the command beginning with letter X (such as the XCARR or XCLOS command) is executed after executing the ERRX0 command.
Usage Example	**Sample Script**
	Encode Format: ERRX1 OPEN XCLOS ERRX0 XCARR TXM
	Transceiver Behavior
	If the monitor is closed, the transceiver opens the monitor, emits an error tone, and then aborts the execution of Encode Format. If the monitor is open and if the transceiver does not detect any carrier, the transceiver unmutes the microphone and starts transmitting. If the transceiver detects a carrier, the transceiver aborts the execution of Encode Format without emitting an error tone.

ERRX1

Description	The transceiver emits an error tone and aborts the execution of Encode Format if the command beginning with letter X (such as the XCARR or XCLOS command) is executed after executing the ERRX1 command.
Usage Example	**Sample Script**
	Encode Format: ERRX1 XCARR TXM SCTP
	Transceiver Behavior
	If the transceiver does not detect any carrier, the transceiver unmutes the microphone and transmits the QT tone or DQT code configured for the channel. If the transceiver detects a carrier, the transceiver emits an error tone and aborts the execution of Encode Format.

IDLOF

Description	Upon execution of the IDOLF command, the transceiver aborts the execution of the IDLON vtime enc command. The IDLOF command is used to stop sending the ID at regular time intervals.
Usage Example	**Sample Script**
	Encode Format (ENC_IDLOF): IDLOF **Encode Format (ENC_IDLON):** IDLON 5 ENCIDL **Encode Format (ENCIDL):** TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX
	Transceiver Behavior
	The transceiver aborts the execution of the IDLON vtime enc command and executes the Encode Format (ENCIDL). After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

IDLON vtime enc

Description	Upon execution of the IDLON vtime enc command, the transceiver executes the Encode Format configured for “enc” at the intervals configured for “vtime”. The IDLON vtime enc command is used to send the ID at regular time intervals after the transceiver is turned ON.
Range	vtime (Very Long Time): 0 min to 255 min (in steps of 1 min) enc: Encode Format Name
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX IDLON 5 ENCIDL **Encode Format (ENCIDL):** TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode. If the transceiver does not transmit within 5 minutes or does not open the monitor within 5 minutes after the transceiver finishes the transmission, the transceiver resends 5-tone code #59499. The transceiver repeats this behavior until the transceiver is turned OFF. If the transceiver carries out transmission within 5 minutes after the transceiver finishes the transmission, it returns to the standby state after transmission is complete. The standby time is 5 minutes. If the monitor is opened within 5 minutes after the transceiver completes the transmission, the transceiver returns to the standby state when the monitor is closed. The standby time is 5 minutes.

KEYD

Description	Upon execution of the KEYD command, the transceiver locks all keys, and any key operation becomes disabled. Using this command in combination with the Decode Format prevents the receiving transceiver from being operated. In addition, the Encode Format containing this command can be assigned to a key to use like the **Key Lock** key.
Usage Example	**Sample Script**
	Decode Format: CMP #12300 MONC ENCI lock **Encode Format (lock):** KEYD
	Transceiver Behavior
	Upon receipt of a 5-tone code #12300, the transceiver closes the monitor and locks all the keys to prevent any operation.

KEYE

Description	Upon execution of the KEYE command, the transceiver unlocks all keys. Using this command in combination with the Decode Format unlocks the key lock state of the receiving transceiver. In addition, the Encode Format containing this command can be assigned to a key to use like the **Key Lock** key.
Usage Example	**Sample Script**
	Decode Format: CMP #12301 MONO ENCI Unlock **Encode Format (Unlock):** KEYE
	Transceiver Behavior
	Upon receipt of a 5-tone code #12301, the transceiver opens the monitor and unlocks all the keys.

KNOBD

Description	Upon execution of the KNOBD command, the transceiver locks the **Selector**, and any operation of the **Selector** becomes disabled. The KNOBD command can be used only if 16 Zone/Channel Selector is disabled by using KPG-166D.
Usage Example	**Sample Script**
	Decode Format: CMP #12300 MONC ENCI lock_K **Encode Format (lock_K):** KNOBD
	Transceiver Behavior
	Upon receipt of a 5-tone code #12300, the transceiver closes the monitor and locks the **Selector**.

KNOBE

Description	Upon execution of the KNOBE command, the transceiver unlocks the lock state of the **Selector**.
Usage Example	**Sample Script**
	Decode Format: CMP #12301 MONO ENCI Unlock_K **Encode Format (Unlock_K):** KNOBE
	Transceiver Behavior
	Upon receipt of a 5-tone code #12301, the transceiver opens the monitor and releases the lock state of the **Selector**.

LEDF

Description	Upon execution of the LEDF command, the LED blinks orange.
Usage Example	**Sample Script**
	Decode Format: CMP #12300 ENCI transpond **Encode Format (transpond):** TXS DEL 500 TSET EEA LEN 40 SEND #12301 DEL 20 RX LEDF
	Transceiver Behavior
	Upon receipt of a 5-tone code #12300, the transceiver starts transmitting. After a lapse of 500 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12301 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 20 ms after transmitting all tones, the transceiver reverts to receive mode and blinks the LED orange.

LEDS

Description	Upon execution of the LEDS command, the LED blinking orange is turned Off.
Usage Example	**Sample Script**
	Decode Format: STO 12345 QUEUE DISPQ DISPF LEDF MONO ENCI transpond **Encode Format (transpond):** TXS DEL 500 TSET EEA LEN 40 SEND #54321 DEL 20 RX DEL 2000 DISPS LEDS
	Transceiver Behavior
	The received 5-tone code blinks on the display, and the LED blinks orange. The transceiver opens the monitor and proceeds to Transpond at this time. After a lapse of 500 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #54321 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 20 ms after transmitting all tones, the transceiver reverts to receive mode. After 2 sec elapse, the display and LED stop blinking.

LEN xtime

Description	Upon execution of the LEN xtime command, the transceiver transmits each tone of the 5-tone code or Single Tone for the length of time configured for “xtime”.
Range	xtime: 0 ms to 7000 ms (in steps of 1 ms)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #59401 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59401 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

OPEN

Description	Upon execution of the OPEN command, the transceiver opens the monitor. The transceiver behaves according to the configuration for Monitor Function after the monitor is opened. (Refer to Monitor Function on page 281.)
Usage Example	**Sample Script**
	Encode Format (PTT Release): TXT DTAIL DEL 180 RX OPEN
	Transceiver Behavior
	After the transceiver sends the DQT turn-off code for 180 ms, the transceiver reverts to receive mode and opens the monitor.

PAUSE lwtime

Description	Upon execution of the PAUSE lwtime command, the transceiver starts the timer for Encode Pause Time to count down. The time for Encode Pause Time is configured for “lwtime”.
Range	lwtime: 0 sec to 300 sec (in steps of 1 sec)
Usage Example	**Sample Script**
	Encode Format (PTT Press): TXS DEL 100 TSET EEA LEN 40 SPAUS SEND #594^K45 TXM **Encode Format (PTT Release):** RX PAUSE 5
	Transceiver Behavior
	Pressing the **PTT** switch causes the transceiver to start transmission. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to #594^K45 in the EEA signaling format. Each tone length is 40 ms. After transmitting all tones, the transceiver unmutes the microphone and continues to transmit. However, while the timer for Encode Pause Time is counting down, the transceiver unmutes the microphone and continues to transmit without sending the 5-tone code corresponding to #594^K45. Upon release of the **PTT** switch, the transceiver reverts to receive mode and the timer for Encode Pause Time counts down 5 sec.

RACK stime dec

Description	Upon execution of the RACK stime dec command, the transceiver enters the standby state with the Decode Format configured for “dec” for the length of time configured for “stime”. The RACK stime dec command is used when an acknowledgment from the receiving transceiver is required after the transceiver transmits.
Range	stime (Standard Time): 0 ms to 2550 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	**Sample Script**
	Encode Format: REP 10 TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX RACK 2500 DecAck RSML 5 **Decode Format (DecAck):** CMP #54321 REPOF BEEP 16 MONF
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and waits to receive an acknowledgment. If the transceiver does not receive the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver resends a 5-tone code #59499 after a lapse of 5 sec. The transceiver repeats the above behavior 10 times. If the transceiver receives the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver stops repeating the above behavior, and then emits a Beep 16 and opens the monitor.

REP rep

Description	Upon execution of the REP rep command, the transceiver repeats executing the Encode Format for the number of times configured for “rep”.
Range	rep: 0 (infinite) or 1 time to 255 times (in steps of 1)
Usage Example	**Sample Script**
	Encode Format: REP 10 TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX RACK 2500 DecAck RSML 5 **Decode Format (DecAck):** CMP #54321 REPOF BEEP 16 MONF
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and waits to receive an acknowledgment. If the transceiver does not receive the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver resends a 5-tone code #59499 after a lapse of 5 sec. The transceiver repeats the above behavior 10 times. If the transceiver receives the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver stops repeating the above behavior, and then emits a Beep 16 and opens the monitor.

RIGN stime

Description	Upon execution of the RIGN stime command, the transceiver disables Automatic Close for the length of time configured for “stime”. The RIGN stime command is used to prevent the monitor from being closed by Automatic Close if the transceiver receives a call from another transceiver while the transceiver waits to receive an acknowledgment. (Refer to Automatic Close on page 283.)
Range	stime (Standard Time): 0 ms to 2550 ms (in steps of 10 ms)
Usage Example	**Sample Script**
	Encode Format: OPEN TXS DEL 100 TSET EEA LEN 40 SEND #123^K45 DEL 50 RIGN 2000 RX
	Transceiver Behavior
	The transceiver opens the monitor and starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to #123^K45 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and disables Automatic Close for 2000 ms.

RKILL1

Description	Upon execution of the RKILL1 command, “ERROR” appears on the display, the transceiver enters the Kill state, and all operations become disabled. To revive the transceiver from the Kill state, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP #98790 ENCI enc_kill CMP #98795 ENCI enc_stun CMP #98796 ENCI enc_rvive **Encode Format (enc_kill):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#90 DEL 50 RKILL1 **Encode Format (enc_stun):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#95 DEL 50 RSTUN Encode Format (enc_rvive): TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#96 DEL 50 RVIVE
	Transceiver Behavior
	The transceiver starts transmitting upon receipt of the 5-tone code #98790, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#90 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “ERROR” appears on the display and all operations become disabled. The transceiver starts transmitting upon receipt of the 5-tone code #98795, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#95 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “STUN” appears on the display and all operations are prohibit. The transceiver starts transmitting upon receipt of the 5-tone code #98796, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#96 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver revives from the Stun state and the transceiver operation becomes enabled. Note • Using the RKILL1 command for the Decode Format also places the transceiver in the Kill state. (Refer to RKILL1 on page 357.) • The RKILL1 command for the Encode Format is effective to place the transceiver in the Kill state after sending an acknowledgment.

RKILL2

Description	Upon execution of the RKILL2 command, “ERROR” appears on the display, the transceiver enters the Kill state, and all operations become disabled. All the configuration data configured for the transceiver is deleted. To revive the transceiver from the Kill state, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP #98790 ENCI enc_kill CMP #98795 ENCI enc_stun CMP #98796 ENCI enc_rvive **Encode Format (enc_kill):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#90 DEL 50 RKILL2 **Encode Format (enc_stun):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#95 DEL 50 RSTUN **Encode Format (enc_rvive):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#96 DEL 50 RVIVE
	Transceiver Behavior
	The transceiver starts transmitting upon receipt of the 5-tone code #98790, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#90 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “ERROR” appears on the display and all operations become disabled. All the configuration data configured for the transceiver is deleted. The transceiver starts transmitting upon receipt of the 5-tone code #98795, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#95 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “STUN” appears on the display and all operations are prohibit. The transceiver starts transmitting upon receipt of the 5-tone code #98796, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#96 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver revives from the Stun state and the transceiver operation becomes enabled. Note • Using the RKILL2 command for the Decode Format also places the transceiver in the Kill state. (Refer to RKILL2 on page 357.) • The RKILL2 command for the Encode Format is effective to place the transceiver in the Kill state after sending an acknowledgment.

RSML ltime

Description	Upon execution of the RSML ltime command, the transceiver executes the Encode Format repeatedly by the REP rep command at the intervals configured for “ltime”. (Refer to REP rep on page 308.) The RSML ltime command is used for the transceiver to wait to receive an acknowledgment.
Range	ltime: 0 sec to 255 sec (in steps of 1 sec)
Usage Example	**Sample Script**
	Encode Format: REP 10 TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX RACK 2500 DecAck RSML 5 **Decode Format (DecAck):** CMP #54321 REPOF BEEP 16 MONF
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and waits to receive an acknowledgment. If the transceiver does not receive the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver resends a 5-tone code #59499 after a lapse of 5 sec. The transceiver repeats the above behavior 10 times. If the transceiver receives the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver stops repeating the above behavior, and then emits a Beep 16 and opens the monitor.

RSMS stime

Description	Upon execution of the RSMS stime command, the transceiver executes the Encode Format repeatedly by the REP rep command at the intervals configured for “stime”. (Refer to REP rep on page 308.)
Range	stime (Standard Time): 0 ms to 2550 ms (in steps of 10 ms)
Usage Example	**Sample Script**
	Encode Format: REP 10 TXS DEL 100 TSET EIA LEN 33 SEND #59499 DEL 20 RX RSMS 800 **Decode Format:** CMP #54321 REPOF BEEP 16 MONF
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EIA signaling format. Each tone length is 33 ms. Upon lapse of 20 ms after transmitting all tones, the transceiver reverts to receive mode. After a lapse of 800 ms, the transceiver resends a 5-tone code #59499. The transceiver repeats the above behavior 10 times. While the transceiver is in receive mode, the transceiver waits to receive with the Decode Format configured for the selected channel. If the transceiver receives a 5-tone code #54321, the transceiver stops repeating the above behavior, and then emits a Beep 16 and opens the monitor.

RSTUN

Description	Upon execution of the RSTUN command, “STUN” appears on the display, the transceiver enters the Remote Stun state, and all operations become disabled. To revive the transceiver from the Remote Stun state, the transceiver in the Remote Stun state must receive the 5-tone code to execute the RVIVE command, and then the RVIVE command must be executed. Or, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP #98790 ENCI enc_kill CMP #98795 ENCI enc_stun CMP #98796 ENCI enc_rvive **Encode Format (enc_kill):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#90 DEL 50 RKILL1 **Encode Format (enc_stun):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#95 DEL 50 RSTUN **Encode Format (enc_rvive):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#96 DEL 50 RVIVE
	Transceiver Behavior
	The transceiver starts transmitting upon receipt of the 5-tone code #98790, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#90 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “ERROR” appears on the display and all operations become disabled. The transceiver starts transmitting upon receipt of the 5-tone code #98795, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#95 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “STUN” appears on the display and all operations are prohibit. The transceiver starts transmitting upon receipt of the 5-tone code #98796, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#96 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver revives from the Remote Stun state and the transceiver operation becomes enabled. Note • Using the RSTUN command for the Decode Format also places the transceiver in the Remote Stun state. (Refer to RSTUN on page 358.) • The RSTUN command for the Encode Format is effective to place the transceiver in the Remote Stun state after sending an acknowledgment.

RVIVE

Description	Upon execution of the RVIVE command, the transceiver revives from the Remote Stun state and all the transceiver operation becomes enabled.
Usage Example	**Sample Script**
	Decode Format: CMP #98790 ENCI enc_kill CMP #98795 ENCI enc_stun CMP #98796 ENCI enc_rvive **Encode Format (enc_kill):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#90 DEL 50 RKILL1 **Encode Format (enc_stun):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#95 DEL 50 RSTUN **Encode Format (enc_rvive):** TXS DEL 100 TSET CCIR LEN 100 SEND ^RX123#96 DEL 50 RVIVE
	Transceiver Behavior
	The transceiver starts transmitting upon receipt of the 5-tone code #98790, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#90 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “ERROR” appears on the display and all operations become disabled. The transceiver starts transmitting upon receipt of the 5-tone code #98795, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#95 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after all tones are transmitted, “STUN” appears on the display and all operations are prohibit. The transceiver starts transmitting upon receipt of the 5-tone code #98796, and after a lapse of 100 ms, the transceiver sends a 5-tone code corresponding to ^RX123#96 in the CCIR signaling format. Each tone length is 100 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver revives from the Remote Stun state and the transceiver operation becomes enabled. Note • Using the RVIVE command for the Decode Format also revives the transceiver from the Remote Stun state. (Refer to RVIVE on page 358.) • The RVIVE command for the Encode Format is effective to revive the transceiver from the Remote Stun state after sending an acknowledgment.

RXF rf-freq

Description	Upon execution of the RXF rf-freq command, the transceiver waits to receive on the frequency configured for “rf-freq”. The frequency supported by the transceiver in use must be configured for “rf-freq”.
Range	rf-freq: Receive frequency
Usage Example	**Sample Script**
	Encode Format: TXT DTAIL DEL 180 RXF 451.01250 DEL 5000 RXP
	Transceiver Behavior
	The transceiver sends the DQT turn-off code for 180 ms and then waits to receive on the receive frequency of 451.01250 MHz. After 5 sec elapse, the transceiver waits to receive on the receive frequency configured for the current channel.

RXP

Description	Upon execution of the RXP command, the transceiver waits to receive on the receive frequency configured for the current channel.
Usage Example	**Sample Script**
	Encode Format: TXT DTAIL DEL 180 RXF 451.01250 DEL 5000 RXP
	Transceiver Behavior
	The transceiver sends the DQT turn-off code for 180 ms and then waits to receive on the receive frequency of 451.01250 MHz. After 5 sec elapse, the transceiver waits to receive on the receive frequency configured for the current channel.

RX

Description	Upon execution of the RX command, the transceiver reverts to receive mode.
Usage Example	**Sample Script**
	Encode Format: TXT DTAIL DEL 180 RX
	Transceiver Behavior
	The transceiver sends the DQT turn-off code for 180 ms and then reverts to receive mode.

SBUSY

Description	If the transceiver detects a signal or if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver when executing the SBUSY command, the transceiver does not execute the SEND command which is subsequent to the SBUSY command.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SBUSY SEND #59402 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, if the transceiver detects a signal or if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver, the transceiver reverts to receive mode without sending the 5-tone code #59402. If the transceiver does not detect any signal, the transceiver sends the 5-tone code #59402 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SCHK

Description	Upon execution of the SCHK command, the transceiver sends the least significant digit of checksum data by adding the digit to the code to be sent. The SCHK command is used in combination with the SLEN ofs command. (Refer to SLEN ofs on page 326.)
Usage Example	**Sample Script**
	Encode Format: SELD TXS DEL 50 LEN 150 SDIAL DEL 150 SLEN 1 DEL 150 SCHK DEL 50 RX
	Transceiver Behavior
	The transceiver enters Free-dial Entry Mode. The following is the example of when 5-tone code 1234 is entered. The transceiver sends the 5-tone code as below: 1) The entered 5-tone code 1234 is sent as the Encode Code. Each tone length is 150 ms. 2) After 150 ms elapse, the value 5, obtained by adding the value configured for “ofs” of the SLEN ofs command (1) to the number of digits of entered 5-tone code (4), is added to the 5-tone code 1234 and sent. 3) After 150 ms elapse, the value 5 in the least significant digit of checksum data is added to the 5-tone code 1234 and sent. Checksum data can be calculated by adding each tone number of the sent 5-tone code 1234 and the value 5 calculated in 2). (1 + 2 + 3 + 4 + 5 = 15) Upon lapse of 50 ms after sending the 5-tone code, the transceiver reverts to receive mode. The 5-tone code which is sent in the above example is 123455.

SCLOS

Description	If the monitor is closed when executing the SCLOS command, the transceiver does not execute the SEND command which is subsequent to the SCLOS command.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SCLOS SEND #59402 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver reverts to receive mode without sending the 5-tone code #59402 if the monitor is closed. If the monitor is open, the transceiver sends the 5-tone code #59402 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SCOFF

Description	Upon execution of the SCOFF command, the transceiver stops transmitting the QT tone or DQT code. The SCOFF command is used as the Encode Format which is executed when the **PTT** switch is released. (Refer to Table 10-7 Encode Function (TK-Dx00) on page 252.) Continuing the transmission for more several hundred ms after executing the SCOFF command reduces the Squelch Tail Noise on the receiving transceiver.
Usage Example	**Sample Script**
	Encode Format: TXT SCOFF DEL 200 RX
	Transceiver Behavior
	The transceiver stops transmitting the QT tone or DQT code. The transceiver continues transmitting for 200 ms, and then reverts to receive mode.

SCPH

Description	Upon execution of the SCPH command, the transceiver transmits the QT Reverse Burst tone.
Usage Example	**Sample Script**
	Encode Format: TXT SCPH DEL 180 RX
	Transceiver Behavior
	The transceiver transmits the QT Reverse Burst tone for 180 ms and then reverts to receive mode.

SCR st-tone

Description	Upon execution of the SCR st-tone command, the transceiver waits to receive with the QT tone or DQT code configured for “st-tone”.
Range	st-tone: QT tone (67.0 Hz to 254.1 Hz) or DQT code (D000N to D777N or D000I to D777I)
Usage Example	**Sample Script**
	Encode Format: TXT DTAIL DEL 200 RX SCR 151.4 DEL 5000 SCRP
	Transceiver Behavior
	The transceiver sends the DQT turn-off code for 200 ms and then waits to receive with the QT tone of 151.4 Hz. After 5 sec elapse, the transceiver waits to receive with the QT tone or DQT code for receiving configured for the current channel.

SCRP

Description	Upon execution of the SCRP command, the transceiver waits to receive with the QT tone or DQT code for receiving configured for the current channel.
Usage Example	**Sample Script**
	Encode Format: TXT SCPH DEL 200 RX SCR 151.4 DEL 5000 SCRP
	Transceiver Behavior
	The transceiver sends the QT Reverse Burst tone for 200 ms and then waits to receive with the QT tone of 151.4 Hz. After 5 sec elapse, the transceiver waits to receive with the QT tone or DQT code for receiving configured for the current channel.

SCT st-tone

Description	Upon execution of the SCT st-tone command, the transceiver transmits using the QT tone or DQT code configured for “st-tone”.
Range	st-tone: QT tone (67.0 Hz to 254.1 Hz) or DQT code (D000N to D777N or D000I to D777I)
Usage Example	**Sample Script**
	Encode Format: TXS SCTP DEL 250 TSET ZVEI LEN 70 SEND #59402 DEL 50 SCT 151.4 DEL 250 SEND ^K12345 SCOFF DEL 250 RX
	Transceiver Behavior
	The transceiver starts transmitting using the QT tone or DQT code for transmitting configured for the current channel. After a lapse of 250 ms, the transceiver sends a 5-tone code #59402 in the ZVEI signaling format. Each tone length is 70 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver changes the QT tone to the tone of 151.4 Hz. After a lapse of 250 ms, the transceiver sends a 5-tone code corresponding to ^K12345. The transceiver stops transmitting the QT tone or DQT code. After 250 ms elapse, the transceiver reverts to receive mode.

SCTP

Description	Upon execution of the SCTP command, the transceiver transmits using the QT tone or DQT code for transmitting configured for the current channel.
Usage Example	**Sample Script**
	Encode Format: TXM DEL 100 SCTP
	Transceiver Behavior
	The transceiver transmits using the QT tone or DQT code for transmitting configured for the current channel.

SDIAL

Description	Upon executing the SDIAL command, the transceiver sends all codes entered as dial numbers. A maximum of 30 digits of dial numbers can be entered using the keypad. The SDIAL command is recommended to be used together with the SLEN and SCHK commands in order to reduce failures that may occur due to poor signal conditions.
Usage Example	**Sample Script**
	Encode Format: SELD TXS DEL 100 LEN 150 SDIAL DEL 50 RX
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Free-dial Entry Mode, and a 5-tone code can be entered. (Refer to 10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) on page 279.) Note If the TXS command is used, the code "*" is sent as "E" tone and the code "#" is sent as "F" tone (unmodulated).

SELC

Description	Upon execution of the SELC command, the transceiver enters Selcall Mode. In Selcall Mode, a Selcall code can be selected from the Selcall List to send. The transceiver behavior in Selcall Mode is the same as when the **Selcall** key is pressed. (Refer to Changing the Selcall Code on page 254.)
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 QUEUE DISPM MONO BEEP 12
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Selcall Mode, and a Selcall code can be selected from the Selcall List. (Refer to Changing the Selcall Code on page 254.) If the **Menu** (**[□]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Selcall code from the Selcall List, the transceiver sends the selected Selcall code by using the EEA signaling format after 100 ms elapse. Each tone length is 40 ms. The transceiver sends the Selcall code for 100 ms, and then reverts to receive mode. The receiving transceiver stores the received Selcall code to the Queue buffer. The transceiver displays the Selcall code stored in the Queue buffer on the display and opens the monitor. A Beep 12 sounds from the transceiver.

SELCH channel

Description	Upon execution of the SELCH channel command, the transceiver migrates to the channel configured for “channel”. If UP is configured for “channel”, executing the SELCH channel command increases the channel number by one. If DOWN is configured for “channel”, executing the SELCH channel command decreases the channel number by one.
Range	channel: Channel number 1 to Channel number 250, UP or DOWN
Usage Example	**Sample Script**
	Encode Format: SELCH 2 TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	The transceiver migrates to channel 2 and starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SELD

Description	Upon execution of the SELD command, the transceiver enters Free-dial Entry Mode. In Free-dial Entry Mode, a maximum of 30 digits of 5-tone code can be entered using the keypad. (Refer to 10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) on page 279.)
Usage Example	**Sample Script**
	Encode Format: SELD TXS DEL 100 LEN 150 SDIAL DEL 50 RX
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Free-dial Entry Mode, and a 5-tone code can be entered. (Refer to 10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) on page 279.) Note If the TXS command is used, the code “*” is sent as “E” tone and the code “#” is sent as “F” tone (unmodulated).

SELGR zone

Description	Upon execution of the SELGR zone command, the transceiver migrates to the zone configured for “zone”. If UP is configured for “zone”, executing the SELGR zone command increases the zone number by one. If DOWN is configured for “zone”, executing the SELGR zone command decreases the zone number by one.
Range	zone: Zone number 1 to Zone number 128, UP or DOWN
Usage Example	**Sample Script**
	Encode Format: SELGR 3 SELCH 2 TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	The transceiver migrates to channel 2 in zone 3 and starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SELM

Description	Upon execution of the SELM command, the transceiver enters Status Mode. In Status Mode, a Status code can be selected from the Status List to send. The transceiver behavior in Status Mode is the same as when the **Status** key is pressed. (Refer to Changing the Status Code on page 273.)
Usage Example	**Sample Script**
	Encode Format: SELM TXS DEL 100 TSET EEA LEN 40 SENDS DEL 100 RX **Decode Format:** SSTO 12345 QUEUE DISPM MONO BEEP 1
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Status Mode, and a Status code can be selected from the Status List. (Refer to Changing the Status Code on page 273.) If the **Menu** (**[□]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Status code from the Status List, the transceiver sends the selected Status code by using the EEA signaling format after 100 ms elapse. Each tone length is 40 ms. The transceiver sends the Status code for 100 ms, and then reverts to receive mode. The receiving transceiver stores the received Status code in the Queue buffer. The transceiver displays the Status code stored in the Queue buffer on the display and opens the monitor. A Beep 1 sounds from the transceiver.

SELMC

Description	Upon execution of the SELMC command, the transceiver enters Selcall Mode and Status Mode. The transceiver behavior of when the SELMC command is executed is the same as when the **Selcall + Status** key is pressed.
Usage Example	**Sample Script**
	Encode Format: SELMC TXS DEL 100 TSET EEA LEN 40 SENDC SENDS DEL 100 RX **Decode Format:** STO 123 SSTO 45 QUEUE DISPM BEEP 8 MONF
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Selcall Mode, and a Selcall code can be selected from the Selcall List. (Refer to Changing the Selcall Code on page 254.) If the **Menu** (**[▢]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Selcall code from the Selcall List, the transceiver enters Status Mode, and a Status code can be selected from the Status List. (Refer to Changing the Status Code on page 273.) If the **Menu** (**[▢]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Status code from the Status List, the transceiver sends the selected Selcall and Status codes by using the EEA signaling format after 100 ms elapse. Each tone length is 40 ms. The transceiver sends the Selcall and Status codes for 100 ms, and then reverts to receive mode. The receiving transceiver stores the received Selcall and Status codes in the Queue buffer. The transceiver displays the Selcall and Status codes stored in the Queue buffer on the display and opens the monitor. A Beep 8 sounds from the transceiver.

SELS

Description	Upon execution of the SELS command, “STATUS” appears on the display and the transceiver enters Status Mode. In Status Mode, a Status code can be entered with the numbers from 0 to 9 and sent. The transceiver behavior in Status Mode is the same as when the **Status** key is pressed. (Refer to Changing the Status Code on page 273.)
Usage Example	**Sample Script**
	Encode Format: SELS TXS DEL 50 TSET EEA LEN 40 SEND ^RX12345^U45 DEL 50 RX
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Status Mode, and a Status code can be entered. (Refer to Changing the Status Code on page 273.) If the **Menu** (**[▢]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after entering a Status code, the transceiver sends a 5-tone code corresponding to ^RX12345 in the EEA signaling format after a lapse of 50 ms. In this case, the codes in the 1st to 5th digits of the 5-tone code configured as the RX Address are sent. Subsequently, the transceiver sends the Status code corresponding to ^U45 by using the EEA signaling format. In this case, the codes in the 4th and 5th digits of entered Status code are sent. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND #0 to SEND #F

Description	Upon execution of the SEND #n command (n: 0 to 9, A to F), the transceiver sends the Selcall code configured for “#n”. A Selcall code can be configured for “#n” like “#12345” and sent.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^K1 to SEND ^K8

Description	Upon execution of the SEND ^Kn command (n: 1 to 8), the transceiver sends the Selcall code corresponding to the digit configured for “^Kn”.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^K12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of the 5-tone code stored in the Selcall buffer in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^M1 to SEND ^M8

Description	Upon execution of the SEND ^Mn command (n: 1 to 8), the transceiver sends My ID corresponding to the digit configured for “^Mn”. (Refer to My ID on page 244.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^M12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of the 5-tone code configured for the transceiver as My ID in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^Q1 to SEND ^Q8

Description	Upon execution of the SEND ^Qn command (n: 1 to 8), the transceiver sends the Queue code corresponding to the digit configured for "^Qn". The Queue code is the 5-tone code stored in the transceiver Queue buffer. (Refer to Queue Type (5-tone System Only) on page 43.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^Q12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of the 5-tone code stored in the transceiver Queue buffer in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^RX1 to SEND ^RX8

Description	Upon execution of the SEND ^RXn command (n: 1 to 8), the transceiver sends the RX Address corresponding to the digit configured for "^RXn". RX Address can be configured for each channel. (Refer to TX Address/ RX Address on page 247.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of the 5-tone code configured for the transceiver as the RX Address in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^TX1 to SEND ^TX8

Description	Upon execution of the SEND ^TXn command (n: 1 to 8), the transceiver sends the TX Address corresponding to the digit configured for "^TXn". TX Address can be configured for each channel. (Refer to TX Address/ RX Address on page 247.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^TX12345 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of the 5-tone code configured for the transceiver as the TX Address in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^U1 to SEND ^U8

Description	Upon execution of the SEND ^Un command (n: 1 to 8), the transceiver sends the Status code corresponding to the digit configured for "^Un". The Status code to be sent can be selected from the Status List in Status Mode or specified by directly entering the Status code. (Refer to Changing the Status Code on page 273.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^U12345 DEL 50 RX
	Transceiver Behavior
	Upon lapse of 100 ms after the transceiver starts transmitting, the transceiver sends the codes in the 1st to 5th digits of Status code stored in the transceiver by using the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SEND ^V1 to SEND ^V8

Description	Upon execution of the SEND ^Vn command (n: 1 to 8), the transceiver sends the Receive code corresponding to the digit configured for "^Vn". The Receive code to be sent can be selected in Receive Entry Mode. (Refer to Changing the Receive Code on page 258.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^RX123^V45 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 3rd digits of the 5-tone code configured for the transceiver as the RX Address in the EEA signaling format. Subsequently, the transceiver sends the codes in the 4th and 5th digits of the selected Receive code by using the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SENDC

Description	Upon execution of the SENDC command, the transceiver sends the Selcall code selected by using the SELC or SELMC command. (Refer to SELC on page 318, SELMC on page 321.)
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 QUEUE DISPM MONO BEEP 12
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Selcall Mode, and a Selcall code can be selected from the Selcall List. (Refer to Changing the Selcall Code on page 254.) If the **Menu** (**[▢]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Selcall code from the Selcall List, the transceiver sends the selected Selcall code by using the EEA signaling format after 100 ms elapse. Each tone length is 40 ms. The transceiver sends the Selcall code for 100 ms, and then reverts to receive mode. The receiving transceiver stores the received Selcall code to the Queue buffer. The transceiver displays the Selcall code stored in the Queue buffer on the display and opens the monitor. A Beep 12 sounds from the transceiver.

SENDS

Description	Upon execution of the SENDS command, the transceiver sends the Status code selected by using the SELM or SELMC command. (Refer to SELM on page 320, SELMC on page 321.)
Usage Example	**Sample Script**
	Encode Format: SELM TXS DEL 100 TSET EEA LEN 40 SENDS DEL 100 RX **Decode Format:** SSTO 12345 QUEUE DISPM MONO BEEP 1
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Status Mode, and a Status code can be selected from the Status List. (Refer to Changing the Status Code on page 273.) If the **Menu** (**[▢]**) or **[*]** key, or the **Call 1** to **Call 6** key is pressed after selecting a Status code from the Status List, the transceiver sends the selected Status code by using the EEA signaling format after 100 ms elapse. Each tone length is 40 ms. The transceiver sends the Status code for 100 ms, and then reverts to receive mode. The receiving transceiver stores the received Status code in the Queue buffer. The transceiver displays the Status code stored in the Queue buffer on the display and opens the monitor. A Beep 1 sounds from the transceiver.

SLEN ofs

Description	Upon execution of the SLEN ofs command, the transceiver sends as the Selcall code the remainder of when a value, obtained by adding the number configured for “ofs” to the number of digits of Selcall code to be sent, is divided by 10. The SLEN ofs command can be used in combination with the SCHK command to calculate a checksum. (Refer to SCHK on page 315.)
Range	ofs (Off Set): 0 to 9 (in steps of 1)
Usage Example	**Sample Script** **Encode Format:** SELD TXS DEL 50 LEN 150 SDIAL DEL 150 SLEN 1 DEL 150 SCHK DEL 50 RX **Transceiver Behavior** The transceiver enters Free-dial Entry Mode. The following is the example of when 5-tone code 1234 is entered. The transceiver sends the 5-tone code as below: 1) The entered 5-tone code 1234 is sent as the Encode Code. Each tone length is 150 ms. 2) After 150 ms elapse, the value 5, obtained by adding the value configured for “ofs” of the SLEN ofs command (1) to the number of digits of entered 5-tone code 1234 (4), is added to the 5-tone code 1234 and sent. 3) After 150 ms elapse, the value 5 in the least significant digit of checksum data is added to the 5-tone code 1234 and sent. Checksum data can be calculated by adding each tone number of the sent 5-tone code 1234 and the value 5 calculated in 2). (1 + 2 + 3 + 4 + 5 = 15) Upon lapse of 50 ms after sending the 5-tone code, the transceiver reverts to receive mode. The 5-tone code which is sent in the above example is 123455. Note The value 5, calculated in 2), is the remainder of when the value 5, obtained by adding the value configured for “ofs” of the SLEN ofs command (1) to the number of digits of code 1234 (4), is divided by 10. The following are the examples to calculate the value. • A dialed number string 1234567 (7 digits long) coupled with the SLEN 3 command (7 + 3) divided by Modulus 10 = a remainder of 0 • A dialed number string 456376247623 (12 digits long) coupled with the SLEN 9 command (12 + 9) divided by Modulus 10 = a remainder of 1 • No dialed number (without any digits) coupled with the SLEN 5 command (0 + 5) divided by Modulus 10 = a remainder of 5

SOPEN

Description	If the monitor is open when executing the SOPEN command, the transceiver does not execute the SEND command which is subsequent to the SOPEN command.
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SOPEN SEND #59402 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver reverts to receive mode without sending the 5-tone code #59402 if the monitor is opened. If the monitor is closed, the transceiver sends the 5-tone code #59402 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

SPAUS

Description	If the timer for Encode Pause Time is counting down when executing the SPAUS command, the transceiver does not execute the SEND command which is subsequent to the SPAUS command.
Usage Example	**Sample Script**
	Encode Format (PTT Press): TXS DEL 100 TSET EEA LEN 40 SPAUS SEND #594^K45 TXM **Encode Format (PTT Release):** RX PAUSE 5
	Transceiver Behavior
	Pressing the **PTT** switch causes the transceiver to start transmission. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to #594^K45 in the EEA signaling format. Each tone length is 40 ms. After transmitting all tones, the transceiver unmutes the microphone and continues to transmit. However, while the timer for Encode Pause Time is counting down, the transceiver unmutes the microphone and continues to transmit without sending the 5-tone code corresponding to #594^K45. Upon release of the **PTT** switch, the transceiver reverts to receive mode and the timer for Encode Pause Time counts down 5 sec.

STOPS

Description	Upon execution of the STOPS command, the transceiver stops scanning.
Usage Example	**Sample Script**
	Encode Format: ERRX1 STOPS XSCAN TXM
	Transceiver Behavior
	If the scan has started, an error tone sounds from the transceiver and the scan stops. If the scan stops, the transceiver starts transmitting.

STRTS

Description	Upon execution of the STRTS command, the transceiver starts scanning.
Usage Example	**Sample Script**
	Encode Format: STRTS
	Transceiver Behavior
	The transceiver starts scanning.

TEXT ‘text’

Description	Upon execution of the TEXT ‘text’ command, the transceiver displays the text string configured for “text” on the display. The text string is displayed and scrolled from right to left. The time interval to scroll the text string can be configured for the LEN xtime command. In addition, execution of the TXTOF command restores the previous display. (Refer to LEN xtime on page 306, TXTOF on page 332.)
Usage Example	**Sample Script**
	Encode Format: LEN 250 TEXT ‘Kenwood Corporation Radio ID 1001’ DELL 5 TXTOF
	Transceiver Behavior
	The text string “Kenwood Corporation Radio ID 1001” is displayed and scrolled from right to left at 250-ms intervals. Upon lapse of 5 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

TONE af-freq

Description	Upon execution of the TONE af-freq command, the transceiver transmits the Single Tone configured for “af-freq”. The length of the Single Tone to be sent can be configured for the LEN xtime command. (Refer to LEN xtime on page 306.) If the transceiver receives a signal from the repeater, Group Call, or Selective Call, the transceiver opens the monitor. Transmitting a Single Tone can close the opened monitor.
Range	af-freq: 300 Hz to 3000 Hz (in steps of 1 Hz)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 250 LEN 6000 TONE 2135 DEL 150 RX
	Transceiver Behavior
	Upon lapse of 250 ms after the transceiver starts transmitting, the transceiver transmits the Single Tone of 2135 Hz for 6 sec. Upon lapse of 150 ms after transmitting the Single Tone, the transceiver reverts to receive mode.

TPD

Description	Upon execution of the TPD command, the transceiver exits Transparency Mode. Upon execution of the TPE command, the transceiver enters Transparency Mode. (Refer to TPE on page 329.)
Usage Example	**Sample Script**
	Encode Format: SELD TXS DEL 50 LEN 150 DEL 80 TPE SDIAL DEL 50 TPD TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Free-dial Entry Mode, and a 5-tone code can be entered. (Refer to 10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) on page 279.) If the **Menu** (**[⊡]**) key or the **Call 1** to **Call 6** key is pressed after the 5-tone code 123456 is entered, the transceiver sends the 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

TPE

Description	Upon execution of the TPE command, the transceiver enters Transparency Mode. In Transparency Mode, the transceiver can send a large packet size of data by means of a Selcall tone. “D” is inserted every 4 digits of the 5-tone code to be sent so as not to call a transceiver other than the target transceiver.
Usage Example	**Sample Script**
	Encode Format: SELD TXS DEL 50 LEN 150 DEL 80 TPE SDIAL DEL 50 TPD TXS DEL 100 TSET EEA LEN 40 SEND #12345 DEL 50 RX
	Transceiver Behavior
	Pressing the key to which the above Encode Format is assigned places the transceiver in Free-dial Entry Mode, and a 5-tone code can be entered. (Refer to 10.5 Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) on page 279.) If the **Menu** (**[⊡]**) key or the **Call 1** to **Call 6** key is pressed after the 5-tone code 123456 is entered, the transceiver sends the 5-tone code #12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

TSET toneset

Description	Upon execution of the TSET toneset command, the transceiver sends a 5-tone code in the signaling format configured for “toneset”. If a signaling format is configured with TSET toneset command, the tone length for each signaling format needs to be configured with the LEN xtime command. (Refer to LEN xtime on page 306.)
Range	toneset: ZVEI, CCIR, EEA, PZVEI, DZVEI, PCCIR, PDZVEI, ZVEI-2, EIA, Natel, AP-369, Kenwood
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET Kenwood LEN 70 SEND #98765 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #98765 in the Kenwood signaling format. Each tone length is 70 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

TXF rf-freq

Description	Upon execution of the TXF rf-freq command, the transceiver transmits using the frequency configured for “rf-freq”. The transceiver mutes the microphone and speaker during the transmission. The frequency supported by the transceiver in use must be configured for “rf-freq”.
Range	rf-freq: Transmit frequency
Usage Example	**Sample Script**
	Encode Format: TXF 451.25500 TXS DEL 50 LEN 6000 TONE 2135 DEL 2000 RX TXP TXS DEL 50 LEN 1000 TONE 1000 DEL 50 RX
	Transceiver Behavior
	The transceiver transmits the Single Tone of 2135 Hz for 6 sec on the receive frequency of 451.25500 MHz. Upon lapse of 2 sec after transmitting the Single Tone, the transceiver transmits the Single Tone of 1000 Hz for 1 sec on the transmit frequency configured for the current channel. Upon lapse of 50 ms after transmitting the Single Tone, the transceiver reverts to receive mode.

TXM

Description	Upon execution of the TXM command, the transceiver unmutes the microphone and starts transmitting. The transceiver mutes the speaker during the transmission. The TXM command can normally be configured for the transceiver behavior upon a press of the **PTT** switch.
Usage Example	**Sample Script**
	Encode Format: TXM SCTP
	Transceiver Behavior
	The transceiver transmits using the QT tone or DQT code configured for the current channel. Subsequently, the transceiver unmutes the microphone and continues to transmit.

TXP

Description	Upon execution of the TXP command, the transceiver transmits using the transmit frequency configured for the current channel. The transceiver mutes the microphone and speaker during the transmission.
Usage Example	**Sample Script**
	Encode Format: TXF 451.25500 TXS DEL 50 LEN 6000 TONE 2135 DEL 2000 RX TXP TXS DEL 50 LEN 1000 TONE 1000 DEL 50 RX
	Transceiver Behavior
	The transceiver transmits the Single Tone of 2135 Hz for 6 sec on the receive frequency of 451.25500 MHz. Upon lapse of 2 sec after transmitting the Single Tone, the transceiver transmits the Single Tone of 1000 Hz for 1 sec on the transmit frequency configured for the current channel. Upon lapse of 50 ms after transmitting the Single Tone, the transceiver reverts to receive mode.

TXS

Description	Upon execution of the TXS command, the transceiver sends a 5-tone code or a Single Tone. The transceiver mutes the microphone during the transmission. If Sidetone is enabled, a tone of the 5-tone code or Single Tone sounds from the transceiver speaker. (Refer to Sidetone on page 250.)
Usage Example	**Sample Script**
	Encode Format: TXS DEL 100 TSET EEA LEN 40 SEND ^RX123^V45 DEL 50 RX
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends the codes in the 1st to 3rd digits of the 5-tone code configured for the transceiver as the RX Address in the EEA signaling format. Subsequently, the transceiver sends the codes in the 4th and 5th digits of the selected Receive code by using the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode.

TXT

Description	Upon execution of the TXT command, the transceiver transmits the QT Reverse Burst tone or DQT turn-off code. The transceiver mutes the microphone and speaker during the transmission.
Usage Example	**Sample Script**
	Encode Format (PTT Release): TXT SCPH DEL 180 DTAIL DEL 180 RX
	Transceiver Behavior
	If a QT tone is configured for the current channel, the transceiver transmits the Reverse Burst tone for 180 ms. If a DQT code is configured for the current channel, the transceiver sends the DQT turn-off code for 180 ms.

TXTOF

Description	Upon execution of the TXTOF command when a text string appears on the display by executing the TEXT command, the display reverts to the previous display.
Usage Example	**Sample Script**
	Encode Format: TEXT 'Hello Kenwood' DELL 3 TXTOF
	Transceiver Behavior
	The text string "Hello Kenwood" appears on the display. The display reverts to the previous display upon lapse of 3 sec.

XCARR

Description	If the transceiver detects a carrier when executing the XCARR command, the transceiver does not execute commands subsequent to the XCARR command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: ERRX1 XCARR TXM
	Transceiver Behavior
	If the transceiver detects a carrier on the current channel, the transceiver emits an error tone and does not start transmission. If the transceiver does not detect any carrier on the current channel, the transceiver unmutes the microphone and starts transmitting.

XCLOS

Description	If the monitor is closed when executing the XCLOS command, the transceiver does not execute commands subsequent to the XCLOS command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: OPEN XCLOS TXS DEL 100 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX CLOSE
	Transceiver Behavior
	The transceiver verifies whether or not the monitor is open, and if the monitor is closed, the transceiver opens the monitor and aborts the execution of Encode Format. If the monitor is open, the transceiver starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to ^RX12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and closes the monitor.

XCTCM

Description	Upon execution of the XCTCM command, transmission is restricted by Busy Channel Lockout depending on the status of QT/DQT signaling. The transceiver behavior upon execution of the XCTCM command varies as below according to the status of QT/DQT signaling: ● **If QT/DQT signaling is disabled by pressing the Monitor key:** The transceiver executes commands subsequent to the XCTCM command. ● **If QT/DQT signaling is not disabled:** If the transceiver does not detect any carrier, the transceiver can transmit if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver. If the received QT tone or DQT code does not match the QT tone or DQT code preconfigured for the transceiver, or if the transceiver detects only a carrier, the transceiver does not executes commands subsequent to the XCTCM command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: XCTCM TXM SCTP
	Transceiver Behavior
	If the transceiver does not detect any carrier, or if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver, the transceiver starts transmitting. If the received QT tone or DQT code does not match the QT tone or DQT code preconfigured for the transceiver, the transceiver does not start transmission and aborts the execution of Encode Format.

XCTCN

Description	Upon execution of the XCTCN command, if the transceiver detects only a carrier or if the received QT tone or DQT code does not match the QT tone or DQT code preconfigured for the transceiver, the transceiver does not executes commands subsequent to the XCTCN command and aborts the execution of Encode Format. The XCTCN command is used so as not to interfere with the use of repeater by other user groups when operating the transceiver via a repeater.
Usage Example	**Sample Script**
	Encode Format: ERRX1 XCTCN TXM
	Transceiver Behavior
	If the transceiver detects only a carrier, or if the received QT tone or DQT code does not match the QT tone or DQT code preconfigured for the transceiver, the transceiver emits an error tone and does not start transmission.

XCTCW

Description	Upon execution of the XCTCW command, the transceiver aborts the execution of Encode Format if the transceiver does not detect any carrier or if the received signaling does not match the signaling preconfigured for the transceiver. The transceiver can transmit only if the received signaling matches the signaling preconfigured for the transceiver.
Usage Example	**Sample Script**
	Encode Format: ERRX1 XCTCW TXM
	Transceiver Behavior
	If the transceiver does not detect any carrier, or if the received signaling does not match the signaling preconfigured for the transceiver, the transceiver emits an error tone and does not start transmission.

XOPEN

Description	If the monitor is open when executing the XOPEN command, the transceiver does not execute commands subsequent to the XOPEN command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: CLOSE XOPEN TXS DEL 100 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX OPEN
	Transceiver Behavior
	The transceiver verifies whether or not the monitor is open, and if the monitor is open, the transceiver closes the monitor and aborts the execution of Encode Format. If the monitor is closed, the transceiver starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code corresponding to ^RX12345 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and opens the monitor.

XSAT st-tone

Description	If the transceiver is receiving the QT tone or DQT code configured for “st-tone” when executing the XSAT st-tone command, the transceiver does not execute commands subsequent to the XSAT st-tone command and aborts the execution of Encode Format.
Range	QT tone (67.0 Hz to 254.1 Hz) or DQT code (D000N to D777N or D000I to D777I)
Usage Example	**Sample Script**
	Encode Format: XSAT 88.5 TXS DEL 100 TSET EEA LEN 40 SEND #59402 DEL 50 RX
	Transceiver Behavior
	If the transceiver is not receiving the QT tone of 88.5 Hz, the transceiver starts transmitting. After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59402 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode. If the transceiver is receiving the QT tone of 88.5 Hz, the transceiver does not execute commands subsequent to the XSAT st-tone command and aborts the execution of Encode Format.

XSCAN

Description	If the transceiver is scanning or pauses scanning when executing the XSCAN command, the transceiver does not execute commands subsequent to the XSCAN command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: ERRX1 STOPS XSCAN TXM
	Transceiver Behavior
	If the transceiver is scanning or pauses scanning, the transceiver stops scanning and emits an error tone. The transceiver does not start transmission. If the scan has stopped, the transceiver unmutes the microphone and starts transmitting.

XSENS

Description	If the transceiver is scanning when executing the XSENS command, the transceiver does not execute commands subsequent to the XSENS command and aborts the execution of Encode Format.
Usage Example	**Sample Script**
	Encode Format: XSENS TXM
	Transceiver Behavior
	If the transceiver is scanning, the transceiver does not execute commands subsequent to the XSENS command and aborts the execution of Encode Format. If the scan has stopped, the transceiver unmutes the microphone and starts transmitting.

11.2 Decode Format

Decode Format is the script used to receive a 5-tone code. The script that determines the timing to receive a 5-tone code or the transceiver behavior when a 5-tone code is received can be created using the following commands.

Basically, in the Decode Format, each command in the Decode Format can be executed to control the transceiver behavior if a 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver.

Whether or not a 5-tone matches is determined by comparing the received 5-tone code with the 5-tone code preconfigured for the transceiver using the CMP command.

ALERT num

Description	If the 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ALERT num command, and emits the Alert Tone configured for “num”. The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)
Range	num: 1 to 8
Usage Example	**Sample Script**
	Decode Format: CMP #12345 MONO ALERT 8
	Transceiver Behavior
	Upon receipt of a 5-tone code #12345, the transceiver opens the monitor, the “ ” icon appears, and an Alert Tone 8 sounds from the transceiver.

ALERTG num

Description	If the 5-tone code received in a Group Call containing the Group Tone matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ALERTG num command, and emits the Alert Tone configured for “num”. (Refer to Group Tone on page 267.) The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)
Range	num: 1 to 8
Usage Example	**Sample Script**
	Decode Format: CMP ^TX12345 MONF ALERTI 4 ALERTG 2
	Transceiver Behavior
	^TX12345: 59401 (TX stands for TX Address), Group Tone: A Upon receipt of a 5-tone code #59401, the transceiver opens the monitor, the “ ” icon blinks, and an Alert Tone 4 sounds from the transceiver. (Individual Call) Upon receipt of a 5-tone code #5940A, the transceiver opens the monitor, the “ ” icon blinks, and an Alert Tone 2 sounds from the transceiver. (Group Call)

ALERTI num

Description	If the 5-tone code received in an Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ALERTI num command, and emits the Alert Tone configured for “num”. The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Configuring the Alert Tone (Alert Tone Pattern) on page 88.)
Range	num: 1 to 8
Usage Example	**Sample Script**
	Decode Format: CMP ^TX12345 MONF ALERTI 4 ALERTG 2
	Transceiver Behavior
	^TX12345: 59401 (TX stands for TX Address), Group Tone: A Upon receipt of a 5-tone code #59401, the transceiver opens the monitor, the “” icon blinks, and an Alert Tone 4 sounds from the transceiver. (Individual Call) Upon receipt of a 5-tone code #5940A, the transceiver opens the monitor, the “” icon blinks, and an Alert Tone 2 sounds from the transceiver. (Group Call)

AUTR

Description	Upon execution of the AUTR command, Auto Reset Timer is activated and then the timer for Auto Reset Timer starts counting down. Upon lapse of the time configured for Auto Reset Timer, the transceiver restores the display in receive mode, turns the LED Off, or disables the Alert Tone or Monitor function according to the configuration for Auto Reset Timer. (Refer to Auto Reset Timer on page 249.)
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 MONO AUTR
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, the transceiver opens the monitor, and the timer for Auto Reset Timer starts counting down.

BEEP num

Description	If the 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the BEEP num command, and emits the beep configured for “num”. The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	**Sample Script**
	Decode Format: CMP #12345 BEEP 12
	Transceiver Behavior
	Upon receipt of a 5-tone code #12345, a Beep 12 sounds from the transceiver.

BEEPG num

Description	If the 5-tone code received in a Group Call containing the Group Tone matches the 5-tone code preconfigured for the transceiver, the transceiver executes the BEEPG num command, and emits the beep configured for “num”. (Refer to Group Tone on page 267.) The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	**Sample Script**
	Decode Format: CMP ^TX12345 BEEPI 15 BEEPG 16
	Transceiver Behavior
	^TX12345: 12301 (TX stands for TX Address), Group Tone: A Upon receipt of a 5-tone code #12301, a Beep 15 sounds from the transceiver. (Individual Call) Upon receipt of a 5-tone code #1230A, a Beep 16 sounds from the transceiver. (Group Call)

BEEPI num

Description	If the 5-tone code received in an Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the BEEPI num command, and emits the beep configured for “num”. The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	**Sample Script**
	Decode Format: CMP ^TX12345 BEEPI 15 BEEPG 16
	Transceiver Behavior
	^TX12345: 12301 (TX stands for TX Address), Group Tone: A Upon receipt of a 5-tone code #12301, a Beep 15 sounds from the transceiver. (Individual Call) Upon receipt of a 5-tone code #1230A, a Beep 16 sounds from the transceiver. (Group Call)

BLTOF

Description	Upon execution of the BLTOF command, the display backlight is turned Off.
Usage Example	**Sample Script**
	Decode Format: CMP #12345 MONC BEEP 8 BLTOF
	Transceiver Behavior
	Upon receipt of a 5-tone code #12345, the transceiver closes the monitor, a Beep 8 sounds from the transceiver, and the display backlight is turned Off.

BLTON

Description	Upon execution of the BLTON command, the display backlight lights.
Usage Example	**Sample Script**
	Encode Format: EMGON BLTOF REP 5 TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 50 TXM DEL 5000 RX RSML 5 **Decode Format:** CMP ^RX12345 EMGOF REPOF BLTON MONO BEEP 3
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401 in Emergency Mode, the transceiver exits Emergency Mode, and the display backlight lights up. Then, the transceiver opens the monitor and a Beep 3 sounds from the transceiver.

CKSAT

Description	Upon execution of the CKSAT command, the transceiver determines whether the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver. The transceiver executes the commands subsequent to the CKSAT command if the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver.
Usage Example	**Sample Script**
	Decode Format: CKSAT CMP ^RX12345 MONO BEEP 15
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) The transceiver determines whether the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver. If the received QT tone or DQT code matches the QT tone or DQT code preconfigured for the transceiver, the transceiver opens the monitor and a Beep 15 sounds from the transceiver upon receipt of a 5-tone code #59401.

CMP #*

Description	Upon execution of the CMP #* command, the transceiver compares the received 5-tone code with the 5-tone code preconfigured for the transceiver. The transceiver executes the commands following the CMP #* command if the received 5-tone code matches the 5-tone code configured for “#*”. The 5-tone code to be compared is configured for “#*”. If any code from 0 to 9 and A to E is received for *, the transceiver determines the 5-tone code matches.
Usage Example	**Sample Script**
	Decode Format: CMP #12* STO 45 QUEUE BEEP 13
	Transceiver Behavior
	The following assumes that the transceiver receives a 5-tone code #12345. The 1st and 2nd digits of received 5-tone code (#12) matches; therefore, the transceiver determines that the 5-tone code matches even if any code from 0 to 9 and A to E is received for * in the subsequent 3rd digit. The transceiver executes the next command, and stores the code 45 in the 4th and 5th digits of received 5-tone code in the Queue buffer. Then, a Beep 13 sounds from the transceiver.

CMP #0 to CMP #F

Description	Upon execution of the CMP #n command (n: 0 to 9, A to F), the transceiver compares the received 5-tone code with the 5-tone code preconfigured for the transceiver. The transceiver executes the commands following the CMP #n command if the received 5-tone code matches the 5-tone code configured for “#n”. The 5-tone code to be compared can be configured for “#n” like “#12345”.
Usage Example	**Sample Script**
	Decode Format: CMP #12345 MONF BEEP 12
	Transceiver Behavior
	Upon receipt of a 5-tone code #12345, the transceiver opens the monitor, the “ ” icon blinks, and an Alert Tone 12 sounds from the transceiver.

CMP ^K1 to CMP ^K8

Description	Upon execution of the CMP ^Kn command (n: 1 to 8), the transceiver compares the received 5-tone code with the Selcall code stored in the Selcall buffer. The Selcall code to be compared is only the code corresponding to the digit configured for “^Kn”. The transceiver executes the commands subsequent to the CMP ^Kn command if the received 5-tone code matches the Selcall code stored in the Selcall buffer. Pressing the **Selcall** or **Selcall + Status** key to place the transceiver in Selcall Mode stores the Selcall code in the Selcall buffer. (Refer to Changing the Selcall Code on page 254.)
Usage Example	**Sample Script**
	Decode Format: CMP ^K12345 MONO BEEP 11 ENCI K_add Encode Format (K_add):TEXT 'Key-Disp’ DELL 1 TXTOF
	Transceiver Behavior
	The transceiver compares the received 5-tone code with the code in the 1st to 5th digits of the Selcall code stored in the Selcall buffer. The transceiver opens the monitor and emits a Beep 11 if the received 5-tone code matches the Selcall code stored in the Selcall buffer. Then, the transceiver executes the Encode Format (K_add). The text string “Key-Disp” appears on the display, and the display reverts to the previous display upon lapse of 1 sec after the transceiver starts displaying the text string.

CMP ^M1 to CMP ^M8

Description	Upon execution of the CMP ^Mn command (n: 1 to 8), the transceiver compares the received 5-tone code with the My ID code stored in the My ID buffer. The My ID code to be compared is only the code corresponding to the digit configured for "^Mn". The transceiver executes the commands following the CMP ^Mn command if the received 5-tone code matches the My ID code stored in the My ID buffer. My ID can be configured using KPG-166D. In addition, My ID can be changed in My ID Mode when the transceiver is turned ON. (Refer to My ID on page 244.)
Usage Example	**Sample Script**
	Decode Format: CMP ^M12345 MONO BEEP 11
	Transceiver Behavior
	The transceiver compares the received 5-tone code with the code in the 1st to 5th digits of the My ID code stored in the My ID buffer. The transceiver opens the monitor and emits a Beep 11 if the received 5-tone code matches the My ID code stored in the My ID buffer.

CMP ^Q1 to CMP ^Q8

Description	Upon execution of the CMP ^Qn command (n: 1 to 8), the transceiver compares the received 5-tone code with the Queue code stored in the Queue buffer. The Queue code to be compared is only the code corresponding to the digit configured for "^Qn". The transceiver executes the commands following the CMP ^Qn command if the received 5-tone code matches the Queue code stored in the Queue buffer. The Queue code is stored in the Queue buffer in the following ways. (Refer to Queue Type (5-tone System Only) on page 43.) ● Pressing the **Stack** key to place the transceiver in Stack Mode stores the Queue code in the Queue buffer. ● Executing the QUEUE command after executing the STO command in a Decode Format stores the Queue code in the Queue buffer.
Usage Example	**Sample Script**
	Decode Format: CMP ^Q12345 MONO BEEP 12 XPASS STO 12345 QUEUE BEEP 1
	Transceiver Behavior
	The transceiver compares the received 5-tone code with the code in the 1st to 5th digits of the Queue code stored in the Queue buffer. The transceiver opens the monitor and emits a Beep 12 if the received 5-tone code matches the Queue code stored in the Queue buffer. If the received 5-tone code does not match the Queue code stored in the Queue buffer, the transceiver stores the received 5-tone code in the Queue buffer after storing it in the temporary buffer. Then, a Beep 1 sounds from the transceiver.

CMP ^RX1 to CMP ^RX8

Description	Upon execution of the CMP ^RXn command (n: 1 to 8), the transceiver compares the received 5-tone code with the RX Address preconfigured for the transceiver. The RX Address to be compared is only the code corresponding to the digit configured for "^RXn". The transceiver executes the commands following the CMP ^RXn command if the received 5-tone code matches the RX Address preconfigured for the transceiver. (Refer to TX Address/ RX Address on page 247.)
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 BEEPI 15 BEEPG 16
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address), Group Tone: A Upon receipt of a 5-tone code #59401, a Beep 15 sounds from the transceiver. (Individual Call) Upon receipt of a 5-tone code #5940A, a Beep 16 sounds from the transceiver. (Group Call)

CMP ^TONE

Description	Upon execution of the CMP ^TONE command, the transceiver compares the received Single Tone with the Single Tone preconfigured for the transceiver. The following parameters are compared: • Decode Single Tone Frequency (Refer to Decode Single Tone Frequency on page 241.) • Decode Single Tone Duration (Refer to Decode Single Tone Duration on page 241.) The transceiver executes the commands subsequent to the CMP ^TONE command if the received Single Tone matches the Single Tone preconfigured for the transceiver.
Usage Example	Sample Script
	Decode Format: CMP ^TONE BEEP 17
	Transceiver Behavior
	A Beep 17 sounds from the transceiver if the transceiver receives the Single Tone of 2500 Hz for 5000 ms when the transceiver is configured as below: Decode Single Tone Frequency: 2500 Hz Decode Single Tone Duration: 5000 ms

CMP ^TX1 to CMP ^TX8

Description	Upon execution of the CMP ^TXn command (n: 1 to 8), the transceiver compares the received 5-tone code with the TX Address preconfigured for the transceiver. The TX Address to be compared is only the code corresponding to the digit configured for "^TXn". The transceiver executes the commands following the CMP ^TXn command if the received 5-tone code matches the TX Address preconfigured for the transceiver. (Refer to TX Address/ RX Address on page 247.)
Usage Example	**Sample Script**
	Decode Format: CMP ^TX12345 BEEP 46
	Transceiver Behavior
	^TX12345: 59401 (TX stands for TX Address) Upon receipt of a 5-tone code #59401, a Beep 46 sounds from the transceiver.

CMP ^U1 to CMP ^U8

Description	Upon execution of the CMP ^Un command (n: 1 to 8), the transceiver compares the received 5-tone code with the Status code stored in the Status buffer. The Status code to be compared is only the code corresponding to the digit configured for "^Un". The transceiver executes the commands following the CMP ^Un command if the received 5-tone code matches the Status code stored in the Status buffer. Pressing the **Status** or **Selcall + Status** key to place the transceiver in Status Mode stores the Status code in the Status buffer. (Refer to Changing the Status Code on page 273.)
Usage Example	**Sample Script**
	Decode Format: CMP ^U12345 MONO BEEP 13 ENCI U_add **Encode Format (U_add):** TEXT 'U-Disp' DELL 1 TXTOF
	Transceiver Behavior
	The transceiver compares the received 5-tone code with the code in the 1st to 5th digits of the Status code stored in the Status buffer. The transceiver opens the monitor and emits a Beep 13 if the received 5-tone code matches the Status code stored in the Status buffer. Then, the transceiver executes the Encode Format (U_add). The text string "U-Disp" appears on the display, and the display reverts to the previous display upon lapse of 1 sec after the transceiver starts displaying the text string.

CMP ^V1 to CMP ^V8

Description	Upon execution of the CMP ^Vn command (n: 1 to 8), the transceiver compares the received 5-tone code with the Receive code stored in the Selectable Receive buffer. The Receive code to be compared is only the code corresponding to the digit configured for "^Vn". The transceiver executes the commands subsequent to the CMP ^Vn command if the received 5-tone code matches the Receive code stored in the Selectable Receive buffer. Pressing the **Receive Entry** key to place the transceiver in Receive Entry Mode stores the selected Receive code in the Selectable Receive buffer. (Refer to Changing the Receive Code on page 258.)
Usage Example	**Sample Script**
	Decode Format: CMP ^V12345 MONO BEEP 13 ENCI V_add **Encode Format (V_add):** TEXT 'V-Disp' DELL 1 TXTOF
	Transceiver Behavior
	The transceiver compares the received 5-tone code with the code in the 1st to 5th digits of the Receive code stored in the Selectable Receive buffer. The transceiver opens the monitor and emits a Beep 13 if the received 5-tone code matches the Receive code stored in the Selectable Receive buffer. Then, the transceiver executes the Encode Format (V_add). The text string "V-Disp" appears on the display, and the display reverts to the previous display upon lapse of 1 sec after the transceiver starts displaying the text string.

DECA dec

Description	If the 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECA dec command, and executes the Decode Format configured for “dec”.
Range	dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECA deca **Decode Format (deca):** CMP ^RX12345 ENCA text_a **Encode Format (text_a):** TEXT ‘Called’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address), Group Tone: A If the 1st to 3rd digits of the received 5-tone code are #123, #A23, #1A3, #12A, #AA3, #A2A, #1AA, or #AAA, the transceiver executes the Decode Format (deca). Upon receipt of a 5-tone code #12301, the transceiver executes the Encode Format (text_a). Upon execution of the Encode Format (text_a), “Called” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

DECAT time dec

Description	If the 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECAT time dec command, and executes the Decode Format configured for “dec” for the length of time configured for “time”. The DECAT time dec command is used to wait for a certain period of time to decode the 5-tone codes in the 2nd and 3rd frames.
Range	time: 0 ms to 2550 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 DECAT 1500 DecNextFive **Decode Format (DecNextFive):** STO 12345 CMP #F MONO QUEUE DISPQ BEEP 3
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of 5-tone code #59401, the transceiver executes the Decode Format (DecNextFive) for 1500 ms. If the transceiver receives the subsequent 5-tone code before 1500 ms elapse, the transceiver stores the received 5-tone code in the temporary buffer and opens the monitor. Next, the transceiver stores the received 5-tone code in the Queue buffer and display the code on the display. Then, a Beep 3 sounds from the transceiver.

DECF dec

Description	If the received 5-tone code does not match the 5-tone code preconfigured for the transceiver, the transceiver executes the DECF dec command, and executes the Decode Format configured for “dec”. The DECF dec command is normally used when the script to be executed in Decode Format is insufficient in size.
Range	dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 BEEP 0 DECF beep_1 **Decode Format (beep_1):** CMP ^RX12346 BEEP 1
	Transceiver Behavior
	^RX12345: 59400, ^RX12346: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59400, a Beep 0 sounds from the transceiver. Upon receipt of a 5-tone code other than #59400, the transceiver executes the Decode Format (beep_1). Upon receipt of a 5-tone code #59401, a Beep 1 sounds from the transceiver.

DECG dec

Description	If the 5-tone code received in a Group Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECG dec command, and executes the Decode Format configured for “dec”.
Range	dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECG decg **Decode Format (decg):** CMP ^RX12345 ENCG text_g **Encode Format (text_g):** TEXT ‘Group’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address), Group Tone: A If the 1st to 3rd digits of the received 5-tone code are #A23, #1A3, #12A, #AA3, #A2A, #1AA, or #AAA, the transceiver executes the Decode Format (decg). If the 5-tone code received in a Group Call containing the Group Tone A matches the 5-tone code preconfigured for the transceiver, “Group” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

DECGT time dec

Description	If the 5-tone code received in a Group Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECGT time dec command, and executes the Decode Format configured for “dec” for the length of time configured for “time”. The DECGT time dec command is used to wait for a certain period of time to decode the 5-tone codes in the 2nd and 3rd frames.
Range	time: 0 ms to 2550 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 DECGT 1500 DecNextFive **Decode Format (DecNextFive):** STO 12345 CMP #F MONO QUEUE DISPQ BEEP 3
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of 5-tone code #59401, the transceiver executes the Decode Format (DecNextFive) for 1500 ms. If the transceiver receives the subsequent 5-tone code before 1500 ms elapse, the transceiver stores the received 5-tone code in the temporary buffer and opens the monitor. Next, the transceiver stores the received 5-tone code in the Queue buffer and display the code on the display. Then, a Beep 3 sounds from the transceiver.

DECI dec

Description	If the 5-tone code received in an Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECI dec command, and executes the Decode Format configured for “dec”.
Range	dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECI deci **Decode Format (deci):** CMP ^RX12345 ENCI text_I **Encode Format (text_I):** TEXT ‘Individual’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) Only if the 1st to 3rd digits of the received 5-tone code are #123, the transceiver executes the Decode Format (deci). Upon receipt of a 5-tone code #12301, the transceiver executes the Encode Format (text_I). Upon execution of the Encode Format (text_I), “Individual” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

DECIT time dec

Description	If the 5-tone code received in an Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the DECIT time dec command, and executes the Decode Format configured for “dec” for the length of time configured for “time”. The DECIT time dec command is used to wait for a certain period of time to decode the 5-tone codes in the 2nd and 3rd frames.
Range	time: 0 ms to 2550 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 DECIT 1500 DecNextFive **Decode Format (DecNextFive):** STO 12345 CMP #F MONO QUEUE DISPQ BEEP 3
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) Upon receipt of 5-tone code #12301, the transceiver executes the Decode Format (DecNextFive) for 1500 ms. If the transceiver receives the subsequent 5-tone code before 1500 ms elapse, the transceiver stores the received 5-tone code in the temporary buffer and opens the monitor. Next, the transceiver stores the received 5-tone code in the Queue buffer and display the code on the display. Then, a Beep 3 sounds from the transceiver.

DISPF

Description	Upon execution of the DISPF command, the current display blinks. When the display is Basic Frame, the current display blinks. When the display is Function Mode Frame 1 or Function Mode Frame 2, the contents in Line 1 blink. (Refer to LCD on page 7.)
Usage Example	**Sample Script**
	Decode Format: STO 12345 QUEUE DISPQ DISPF MONO BEEP 9
	Transceiver Behavior
	The transceiver stores the received 5-tone code in the Queue buffer after storing it in the temporary buffer. Next, the transceiver displays the received 5-tone code on the display and opens the monitor, and the contents displayed on the display blink. Then, a Beep 9 sounds from the transceiver.

DISPM

Description	Upon execution of the DISPM command, the transceiver enters Stack Mode. If the Selcall code or Status code stored in the Queue buffer matches the Selcall code or Status code configured in the Selcall List or Status List, the transceiver displays the corresponding Selcall Name or Status Name on the display. The DISPM command is used as the subsequent command after the QUEUE command is executed. The code having the same number of digits as the number of digits configured for the STO or SSTO command is compared.
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 QUEUE DISPM MONO BEEP 12
	Transceiver Behavior
	The transmitting transceiver can send the Selcall code upon execution of the above Encode Format. (Refer to SELC on page 318.) The receiving transceiver stores the received Selcall code in the temporary buffer and then stores the code in the Queue buffer. Next, the transceiver enters Stack Mode, and then displays the Selcall Name corresponding to the Selcall code stored in the Queue buffer on the display and opens the monitor. Then, a Beep 12 sounds from the transceiver. Note If no name corresponding to the Selcall code or Status code is configured in the Selcall List or Status List, the Selcall code or Status code appears.

DISPQ

Description	Upon execution of the DISPQ command, the transceiver enters Stack Mode and displays the Selcall code or Status code stored in the Queue buffer on the display. The DISPQ command is used as the subsequent command after the QUEUE command is executed.
Usage Example	**Sample Script**
	Encode Format: SELM TXS DEL 100 TSET EEA LEN 40 SENDS DEL 100 RX **Decode format:** SSTO 12345 QUEUE DISPQ MONO BEEP 1
	Transceiver Behavior
	The transmitting transceiver can send the Status code upon execution of the above Encode Format. (Refer to SELM on page 320.) The receiving transceiver stores the received Status code in the temporary buffer and then stores the code in the Queue buffer. Next, the transceiver enters Stack Mode, and then displays the Status code stored in the Queue buffer on the display and opens the monitor. Then, a Beep 1 sounds from the transceiver.

DSPMT

Description	Upon execution of the DSPMT command, if the Selcall code or Status code stored in the temporary buffer matches the Selcall code or Status code configured in the Selcall List or Status List, the transceiver displays the corresponding Selcall Name or Status Name on the display. The DSPMT command is used when not storing the 5-tone code received by executing the QUEUE command in the Queue buffer, or used to display the received 5-tone code as it is.
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 DSPMT MONO BEEP 8
	Transceiver Behavior
	The transmitting transceiver can send the Selcall code upon execution of the above Encode Format. (Refer to SELC on page 318.) The receiving transceiver stores the received Selcall code in the temporary buffer. Next, the transceiver displays the Selcall Name corresponding to the Selcall code stored in the temporary buffer on the display and opens the monitor. Then, a Beep 8 sounds from the transceiver. Note If no name corresponding to the Selcall code or Status code is configured in the Selcall List or Status List, the Selcall code or Status code appears.

DSPQT

Description	Upon execution of the DSPQT command, the transceiver displays the Selcall code or Status code stored in the temporary buffer on the display. The DSPQT command is used when not storing the 5-tone code received by executing the QUEUE command in the Queue buffer, or used to display the received 5-tone code as it is.
Usage Example	**Sample Script**
	Encode Format: SELM TXS DEL 100 TSET EEA LEN 40 SENDS DEL 100 RX **Decode Format:** STO 12345 DSPQT MONO BEEP 8
	Transceiver Behavior
	The transmitting transceiver can send the Status code upon execution of the above Encode Format. (Refer to SELM on page 320.) The receiving transceiver stores the received Status code in the temporary buffer. Next, the transceiver displays the Status code stored in the temporary buffer on the display and opens the monitor. Then, a Beep 8 sounds from the transceiver.

EMGOF

Description	If the received 5-tone code matches the 5-tone code preconfigured for the transceiver while the transceiver is in Emergency Mode by the EMGON command, the transceiver executes the EMGOF command and exits Emergency Mode.
Usage Example	**Sample Script**
	Encode Format: EMGON REP 5 TXS DEL 200 TSET EEA LEN 40 SEND #59499 DEL 50 TXM DEL 5000 RX RSML 5 **Decode Format:** CMP ^RX12345 EMGOF REPOF MONO BEEP 3
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401 while the transceiver is in Emergency Mode by the EMGON command, the transceiver exits Emergency Mode and opens the monitor. Then, a Beep 3 sounds from the transceiver.

ENCA enc

Description	If the 5-tone code received in a Group Call or Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ENCA enc command, and executes the Encode Format configured for “enc”.
Range	enc: Encode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECA deca **Decode Format (deca):** CMP ^RX12345 ENCA text_a **Encode Format (text_a):** TEXT ‘Called’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address), Group Tone: A If the 1st to 3rd digits of the received 5-tone code are #123, #A23, #1A3, #12A, #AA3, #A2A, #1AA, or #AAA, the transceiver executes the Decode Format (deca). Upon receipt of a 5-tone code #12301, the transceiver executes the Encode Format (text_a). Upon execution of the Encode Format (text_a), “Called” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

ENCG enc

Description	If the 5-tone code received in a Group Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ENCG enc command, and executes the Encode Format configured for “enc”.
Range	enc: Encode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECG decg **Decode Format (decg):** CMP ^RX12345 ENCG text_g **Encode Format (text_g):** TEXT ‘Group’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address), Group Tone: A If the 1st to 3rd digits of the received 5-tone code are #A23, #1A3, #12A, #AA3, #A2A, #1AA, or #AAA, the transceiver executes the Decode Format (decg). If the 5-tone code received in a Group Call containing the Group Tone A matches the 5-tone code preconfigured for the transceiver, “Group” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

ENCI enc

Description	If the 5-tone code received in an Individual Call matches the 5-tone code preconfigured for the transceiver, the transceiver executes the ENCI enc command, and executes the Encode Format configured for “enc”.
Range	enc: Encode Format Name
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 DECI deci **Decode Format (deci):** CMP ^RX12345 ENCI text_I **Encode Format (text_I):** TEXT ‘Individual’ DELL 1 TXTOF
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) Only if the 1st to 3rd digits of the received 5-tone code are #123, the transceiver executes the Decode Format (deci). Upon receipt of a 5-tone code #12301, the transceiver executes the Encode Format (text_I). Upon execution of the Encode Format (text_I), “Individual” appears on the display. Upon lapse of 1 sec after the transceiver starts displaying the text string, the display reverts to the previous display.

ERASE time

Description	Upon execution of the ERASE time command, the transceiver deletes all codes stored in the temporary buffer upon lapse of time configured for “time”. The ERASE time command is normally used to send and receive the 5-tone codes in 2 frames.
Range	time: 0 ms to 2550 ms (in steps of 10 ms)
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 QUEUE DISPQ MONF BEEP 9 XPASS STO 12345 ERASE 800 **Encode Format:** TXS DEL 100 TSET EEA LEN 40 SEND ^K12345 DEL 200 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) If the transceiver receives a 5-tone code other than #12301 in the 1st frame, the transceiver stores the received 5-tone code in the temporary buffer. Next, the transceiver starts counting down the timer for deleting codes stored in the temporary buffer. Upon lapse of 800 ms, all codes stored in the temporary buffer are deleted. If the transceiver receives 5-tone code #12301 in the 2nd frame before 800 ms elapse, the transceiver stores the received 5-tone code in the Queue buffer and displays the code on the display. Next, the transceiver opens the monitor, the “ ” icon blinks, and a Beep 9 sounds from the transceiver. If the received 5-tone code matches the 5-tone code preconfigured for the transceiver, the transceiver executes the Decode Format up to the XPASS command. In this case, the commands subsequent to the XPASS command are not executed. Therefore, the 5-tone code #12301 received in the 2nd frame is not stored in the temporary buffer.

GRP0

Description	The transceiver recognizes tone 0 as the Group Tone when executing the CMP command subsequent to the GRP0 command.
Usage Example	**Sample Script**
	Decode Format: GRP0 CMP ^RX123 GRP0A CMP ^RX45 MONO BEEP 3
	Transceiver Behavior
	^RX12345: 301A1 (RX stands for RX Address) The transceiver recognizes tone 0 as the Group Tone in all digits. The transceiver recognizes tone A as the Group Tone in the 4th and 5th digits. Upon receipt of a 5-tone code #301A1, the transceiver opens the monitor, and a Beep 3 sounds from the transceiver. The transceiver recognizes tone 0 in the 2nd digit and tone A in the 4th digit as the Group Tone.

GRP0A

Description	The transceiver recognizes tone A and tone 0 as the Group Tone when executing the CMP command subsequent to the GRP0A command.
Usage Example	**Sample Script**
	Decode Format: GRP0 CMP ^RX123 GRP0A CMP ^RX45 MONO BEEP 3
	Transceiver Behavior
	^RX12345: 301A1 (RX stands for RX Address) The transceiver recognizes tone 0 as the Group Tone in all digits. The transceiver recognizes tone A as the Group Tone in the 4th and 5th digits. Upon receipt of a 5-tone code #301A1, the transceiver opens the monitor, and a Beep 3 sounds from the transceiver. The transceiver recognizes tone 0 in the 2nd digit and tone A in the 4th digit as the Group Tone.

GRPA

Description	The transceiver recognizes tone A as the Group Tone when executing the CMP command subsequent to the GRPA command.
Usage Example	**Sample Script**
	Decode Format: GRPN CMP ^RX123 GRPA CMP ^RX45 MONO BEEP 3
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) The transceiver does not recognize any Group Tone in the 1st to 3rd digits. The transceiver recognizes tone A as the Group Tone in the 4th and 5th digits. Upon receipt of a 5-tone code #12301, #1230A, #123A1, or #123AA, the transceiver opens the monitor, and a Beep 3 sounds from the transceiver. The transceiver recognizes tone A as the Group Tone if tone A is placed in the 4th or 5th digit.

GRPN

Description	The transceiver does not recognize any Group Tone when executing the CMP command subsequent to the GRPN command.
Usage Example	**Sample Script**
	Decode Format: GRPN CMP ^RX123 GRPA CMP ^RX45 MONO BEEP 3
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) The transceiver does not recognize any Group Tone in the 1st to 3rd digits. The transceiver recognizes tone A as the Group Tone in the 4th and 5th digits. Upon receipt of a 5-tone code #12301, #1230A, #123A1, or #123AA, the transceiver opens the monitor, and a Beep 3 sounds from the transceiver. The transceiver recognizes tone A as the Group Tone if tone A is placed in the 4th or 5th digit.

GRPP

Description	The transceiver recognizes the tone configured for Group Tone of the System Parameter in current use as the Group Tone when executing the CMP command subsequent to the GRPP command.
Usage Example	**Sample Script**
	Decode Format: GRP0 CMP ^RX123 GRPP CMP ^RX45 MONO BEEP 3
	Transceiver Behavior
	^RX12345: 301A1 (RX stands for RX Address), Group Tone: A The transceiver recognizes tone 0 as the Group Tone in the 1st to 3rd digits. The transceiver recognizes tone A as the Group Tone in the 4th and 5th digits. Upon receipt of a 5-tone code #301A1, the transceiver opens the monitor, and a Beep 3 sounds from the transceiver. The transceiver recognizes tone 0 in the 2nd digit and tone A in the 4th digit as the Group Tone.

LEDF

Description	The transceiver executes the LEDF command and the LED blinks orange if the received 5-tone code matches the 5-tone code preconfigured for the transceiver.
Usage Example	**Sample Script**
	Decode Format: CMP #59480 MONO LEDF BEEP 12
	Transceiver Behavior
	Upon receipt of a 5-tone code #59480, the transceiver opens the monitor, the LED blinks orange, and a Beep 12 sounds from the transceiver.

MONC

Description	The transceiver executes the MONC command and then closes the monitor and the "" icon is turned Off if the received 5-tone code matches the 5-tone code preconfigured for the transceiver.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 MONC BEEP 15
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, the transceiver closes the monitor, and a Beep 15 sounds from the transceiver.

MONF

Description	The transceiver executes the MONF command and then opens the monitor and the "" icon blinks if the received 5-tone code matches the 5-tone code preconfigured for the transceiver.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 MONF LEDF BEEP 12
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, the transceiver opens the monitor. The "" icon blinks, the LED blinks orange, and a Beep 12 sounds from the transceiver.

MONO

Description	The transceiver executes the MONO command and then opens the monitor and the "" icon appears if the received 5-tone code matches the 5-tone code preconfigured for the transceiver.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 MONO LEDF BEEP 12
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, the transceiver opens the monitor. The "" icon lights, the LED blinks orange, and a Beep 12 sounds from the transceiver.

QUEUE

Description	Upon execution of the QUEUE command, the transceiver stores the 5-tone code stored by the STO or SSTO command in the temporary buffer to the Queue buffer.
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 QUEUE DISPM MONO BEEP 12
	Transceiver Behavior
	The transmitting transceiver can send the Selcall code upon execution of the above Encode Format. (Refer to SELC on page 318.) The receiving transceiver stores the received Selcall code in the temporary buffer and then stores the code in the Queue buffer. Next, the transceiver enters Stack Mode, and then displays the Selcall Name corresponding to the Selcall code stored in the Queue buffer on the display and opens the monitor. Then, a Beep 12 sounds from the transceiver. (Refer to DISPM on page 348.)

REPOF

Description	The transceiver executes the REPOF command and stops repeating the execution of Encode Format by the REP rep command for the Encode Format if the received 5-tone code matches the 5-tone code preconfigured for the transceiver. (Refer to REP rep on page 308.) The REPOF command is used when an acknowledgment from the receiving transceiver is required after the transceiver transmits.
Usage Example	**Sample Script**
	Encode Format: REP 10 TXS DEL 100 TSET EEA LEN 40 SEND #59499 DEL 50 RX RACK 2500 DecAck RSML 5 **Decode Format (DecAck):** CMP #54321 REPOF BEEP 16 MONF
	Transceiver Behavior
	After a lapse of 100 ms from the point the transceiver starts transmitting, the transceiver sends a 5-tone code #59499 in the EEA signaling format. Each tone length is 40 ms. Upon lapse of 50 ms after transmitting all tones, the transceiver reverts to receive mode and waits to receive an acknowledgment. If the transceiver does not receive the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver resends a 5-tone code #59499 after a lapse of 5 sec. The transceiver repeats the above behavior 10 times. If the transceiver receives the 5-tone code #54321 within 2500 ms after the transceiver finishes the transmission, the transceiver stops repeating the above behavior, and then emits a Beep 16 and opens the monitor.

RKILL1

Description	Upon execution of the RKILL1 command, “ERROR” appears on the display, the transceiver enters the Kill state, and all operations become disabled. To revive the transceiver from the Kill state, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 BEEP 10 MONF CMP #59490 RKILL1
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, a Beep 10 sounds from the transceiver, the transceiver opens the monitor, and the “ ” icon blinks. Upon receipt of a 5-tone code #59490, “ERROR” appears on the display and all operations become disabled. Note Using the RKILL1 command for the Encode Format also places the transceiver in the Kill state. (Refer to RKILL1 on page 309.)

RKILL2

Description	Upon execution of the RKILL2 command, “ERROR” appears on the display, the transceiver enters the Kill state, and all operations become disabled. All the configuration data configured for the transceiver is deleted. To revive the transceiver from the Kill state, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 BEEP 10 MONF CMP #59490 RKILL2
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) Upon receipt of a 5-tone code #59401, a Beep 10 sounds from the transceiver, the transceiver opens the monitor, and the “ ” icon blinks. Upon receipt of a 5-tone code #59490, “ERROR” appears on the display and all operations become disabled. All the configuration data configured for the transceiver is deleted. Note Using the RKILL2 command for the Encode Format also places the transceiver in the Kill state. (Refer to RKILL2 on page 310.)

RSTUN

Description	Upon execution of the RSTUN command, “STUN” appears on the display, the transceiver enters the Remote Stun state, and all operations become disabled. To revive the transceiver from the Remote Stun state, the transceiver in the Remote Stun state must receive the 5-tone code to execute the RVIVE command, and then the RVIVE command must be executed. Or, configuration data needs to be written to the transceiver by using KPG-166D. This function is used to prevent an unauthorized person from using the transceiver; for example, when the transceiver is stolen.
Usage Example	**Sample Script**
	Decode Format: CMP #59495 RSTUN CMP #59496 RVIVE BEEP 2
	Transceiver Behavior
	Upon receipt of a 5-tone code #59495, “STUN” appears on the display and all operations become disabled. Upon receipt of a 5-tone code #59496, the transceiver revives from the Remote Stun state, and a Beep 2 sounds from the transceiver. Note Using the RSTUN command for the Encode Format also places the transceiver in the Stun state. (Refer to RSTUN on page 312.)

RVIVE

Description	Upon execution of the RVIVE command, the transceiver revives from the Remote Stun state and all the transceiver operation becomes enabled.
Usage Example	**Sample Script**
	Decode Format: CMP #59495 RSTUN CMP #59496 RVIVE BEEP 2
	Transceiver Behavior
	Upon receipt of a 5-tone code #59495, “STUN” appears on the display and all operations become disabled. Upon receipt of a 5-tone code #59496, the transceiver revives from the Remote Stun state, and a Beep 2 sounds from the transceiver. Note Using the RSTUN command for the Encode Format also places the transceiver in the Stun state. (Refer to RVIVE on page 313.)

SELTXT ‘text’

Description	Upon execution of the SELTXT ‘text’ command, the transceiver displays the text string configured for “text” and the Selcall code stored in the temporary buffer on the display. The text string appears in Line 1 on the display. The Selcall code appears in Line 2 on the display. (Refer to LCD on page 7.)
Range	text: A maximum of 14 alphanumeric characters
Usage Example	Sample Script
	Decode Format: STO 12345 SELTXT ‘CALL’ MONO BEEP 8
	Transceiver Behavior
	The transceiver stores the received Selcall code in the temporary buffer. Next, the transceiver displays “CALL” in Line 1 and the Selcall code in Line 2 on the display and opens the monitor. Then, a Beep 8 sounds from the transceiver.

SENDPC

Description	Upon execution of the SENDPC command, the transceiver can transfer the received 5-tone code to a PC via the COM port on the transceiver. A maximum of 28 digits of 5-tone code can be transferred to a PC.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX123 STO 45 SENDPC
	Transceiver Behavior
	^RX12345: 59401 (RX stands for RX Address) If the transceiver receives a 5-tone code #59401, the transceiver stores the received 5-tone code in the temporary buffer. Next, the received 5-tone code #59401 is transferred via the COM port on the transceiver. In order to use this function, “Data” or “Data + GPS Data Output” must be configured for the COM port on the transceiver. (Refer to A.4 Available Functions for COM Port on page 483.)

SSTO 1 to SSTO 8

Description	Upon execution of the SSTO n command (n: 1 to 8), the transceiver stores the received Status code in the temporary buffer. The configured number subsequent to SSTO determines the digit of temporary buffer at which the received code is stored. A Status code with a maximum of 8 digits can be stored in the temporary buffer.
Usage Example	**Sample Script**
	Encode Format: SELM TXS DEL 100 TSET EEA LEN 40 SENDS DEL 100 RX **Decode Format:** SSTO 45 QUEUE DISPM MONO BEEP 1
	Transceiver Behavior
	The transmitting transceiver can send the Status code upon execution of the above Encode Format. (Refer to SELM on page 320.) If the receiving transceiver receives the Status code, the receiving transceiver stores the received Status code at the 4th and 5th digits of temporary buffer and then stores the code in the Queue buffer. Next, the transceiver displays the Status Name corresponding to the received Status code on the display and opens the monitor. Then, a Beep 1 sounds from the transceiver.

STO 1 to 8

Description	Upon execution of the STO n command (n: 1 to 8), the transceiver stores the received Selcall code in the temporary buffer. The configured number subsequent to STO determines the digit of temporary buffer at which the received code is stored. A Selcall code with a maximum of 8 digits can be stored in the temporary buffer.
Usage Example	**Sample Script**
	Encode Format: SELC TXS DEL 100 TSET EEA LEN 40 SENDC DEL 100 RX **Decode Format:** STO 12345 QUEUE DISPM MONO BEEP 12
	Transceiver Behavior
	The transmitting transceiver can send the Selcall code upon execution of the above Encode Format. (Refer to SELC on page 318.) If the receiving transceiver receives the Selcall code, the receiving transceiver stores the received Selcall code at the 1st to 5th digits of temporary buffer and then stores the code in the Queue buffer. Next, the transceiver displays the Selcall Name corresponding to the received Selcall code on the display and opens the monitor. Then, a Beep 12 sounds from the transceiver.

STTXT ‘text’

Description	Upon execution of the STTXT ‘text’ command, the transceiver displays the text string configured for “text” and the Status code stored in the temporary buffer on the display. The text string appears in Line 1 on the display. The Status code appears in Line 2 on the display. (Refer to LCD on page 7.)
Range	text: A maximum of 14 alphanumeric characters
Usage Example	**Sample Script**
	Decode Format: SSTO 45 STTXT ‘STATUS’ MONO BEEP 8
	Transceiver Behavior
	The transceiver stores the received Status code in the temporary buffer. Next, the transceiver displays “STATUS” in Line 1 and the Status code in Line 2 on the display and opens the monitor. Then, a Beep 8 sounds from the transceiver.

XPASS

Description	If the received 5-tone code matches the 5-tone code preconfigured for the transceiver when executing the XPASS command, the transceiver suspends the execution of the Decode Format. If the received 5-tone code does not match the 5-tone code preconfigured for the transceiver when executing XPASS, the transceiver executes the commands following the XPASS command.
Usage Example	**Sample Script**
	Decode Format: CMP ^RX12345 QUEUE DISPQ MONF BEEP 9 XPASS STO 12345 ERASE 800 **Encode Format:** TXS DEL 100 TSET EEA LEN 40 SEND ^K12345 DEL 200 TSET EEA LEN 40 SEND ^RX12345 DEL 50 RX
	Transceiver Behavior
	^RX12345: 12301 (RX stands for RX Address) If the transceiver receives a 5-tone code other than #12301 in the 1st frame, the transceiver stores the received 5-tone code in the temporary buffer. Next, the transceiver starts counting down the timer for deleting codes stored in the temporary buffer. Upon lapse of 800 ms, all codes stored in the temporary buffer are deleted. If the transceiver receives 5-tone code #12301 in the 2nd frame before 800 ms elapse, the transceiver stores the received 5-tone code in the Queue buffer and displays the code on the display. Next, the transceiver opens the monitor, the “ ” icon blinks, and a Beep 9 sounds from the transceiver. If the received 5-tone code matches the 5-tone code preconfigured for the transceiver, the transceiver executes the Decode Format up to the XPASS command. In this case, the commands subsequent to the XPASS command are not executed. Therefore, the 5-tone code #12301 received in the 2nd frame is not stored in the temporary buffer.

Compatible model: TK-Dx40

FleetSync is a term that refers collectively to a message communication system that makes use of the MSK transmission system. It is a unique system proposed by KENWOOD. By using FleetSync, the transceiver is able to support individual identification and text message communication.

FleetSync is also compatible with serial communication, and enables PCs or an optional external device to be connected to the transceiver.

12.1 Basic FleetSync Settings

This section explains the basic parameters required for the different types of communication using FleetSync.

About Own ID (Fleet (Own)/ ID (Own))

FleetSync communication uses a 7-digit identification code (FleetSync ID) that is made up of a 3-digit Fleet (100 to 349) and a 4-digit ID (1000 to 4999).

Each transceiver is identified by its FleetSync ID. To initiate various communications using FleetSync, an own FleetSync ID (Fleet (Own)/ ID (Own)) needs to be configured for the transceiver. One Fleet (Own)/ ID (Own) can be configured for each transceiver.

Configuration using KPG-166D

Configuring Fleet (Own) and ID (Own) (See Edit > FleetSync > General 1)

FleetSync Baud Rate

FleetSync Baud Rate is the data transmission speed of the MSK Modem used by FleetSync.

It is necessary to set the FleetSync Baud Rate on the transceivers at both the transmitting and receiving ends to the same speed.

Table 12-1 FleetSync Baud Rate

Configuration	Description
1200 bps	This is the recommended setting.
2400 bps	Enables more data to be transmitted within a shorter time interval compared to 1200 bps. However, errors are more likely to occur due to communication at high speed. The area for which data communication is supported is also relatively narrower compared to 1200 bps.

Configuration using KPG-166D

Configuring the FleetSync Baud Rate (See Edit > FleetSync > General 1)

12.2 Available Calls

The following calls can be made using a FleetSync ID. For transceiver operations and behaviors, refer to the instructions of each call type.

- PTT ID Communication
- Selective Call
- Individual Call
- Group Call
- Fleet Call
- Supervisor Call
- Broadcast Call
- Status Call

Note

The type of selective call is determined by the Fleet and ID match pattern. (Refer to 12.4 Making a Selective Call on page 367.)

12.3 Sending a PTT ID

PTT ID is an identification code unique to the transceiver. It is sent out when the **PTT** switch is operated.

Upon selecting the channel using the PTT ID and operating the **PTT** switch, the transceiver sends out the FleetSync ID (Fleet ID/ Group ID).

PTT ID Type

PTT ID Type is the type of PTT ID to be sent.

In order to send a FleetSync ID as the PTT ID, “FleetSync” must be configured for PTT ID Type by using KPG-166D. In addition, Fleet (Own) and ID (Own) must be configured. (Refer to About Own ID (Fleet (Own)/ ID (Own)) on page 362.)

Configuration using KPG-166D

Configuring the PTT ID Type (See Edit > Zone Information > Channel Edit > Page 2 > PTT ID (Analog))

Timing for Sending a PTT ID

A PTT ID is sent out at the following timings.

- **BOT (Beginning of Transmit)**
  A PTT ID is added to the signal at the beginning of the transmission.

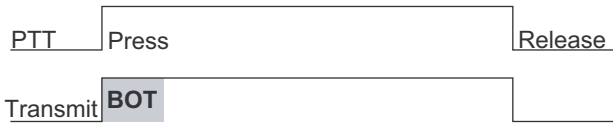


Figure 12-1 BOT

- **EOT (End of Transmit)**
  A PTT ID is added to the signal at the end of the transmission.

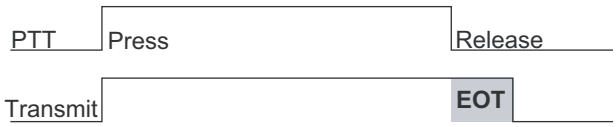


Figure 12-2 EOT

- **Both (BOT and EOT)**
  A PTT ID is added to the signal at both the beginning and the end of the transmission.

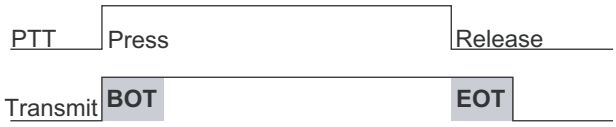


Figure 12-3 Both

The timing for sending a PTT ID can be configured for each channel using KPG-166D.

Table 12-2 Timing for Sending a PTT ID

Configuration	Description
Off	Does not send out a PTT ID.
BOT	Sends out the transceiver's Fleet (Own) and ID (Own) as a PTT ID when the **PTT** switch on the transceiver at the transmitting end is pressed.
EOT	Sends out the transceiver's Fleet (Own) and ID (Own) as a PTT ID when the **PTT** switch on the transceiver at the transmitting end is released.
Both	Sends out the transceiver's Fleet (Own) and ID (Own) as a PTT ID at both BOT and EOT.
List	Initiates a Selcall at the timing of both BOT and EOT by using a FleetSync ID configured in the FleetSync ID List. You can specify the FleetSync ID to send from the ID List using KPG-166D.

Configuration using KPG-166D

- Configuring the PTT ID (See Edit > Zone Information > Channel Edit > Page 1 > Analog)
- Configuring the ID List Number of the FleetSync ID to be Sent (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Output of PTT ID Tone (PTT ID Sidetone)

PTT ID Sidetone is a feature for sounding a PTT ID Sidetone from the transceiver after the transceiver at the transmitting end has sent out a FleetSync ID.

It is used to notify the user at the transmitting end the timing to start communicating in a call.

If the user at the transmitting end starts communicating without being aware of whether the FleetSync ID has been sent out, the beginning part of the voice output from the transceiver at the receiving end may be interrupted. The PTT ID Sidetone is used to prevent this problem from occurring.

Note

- The PTT Proceed Tone setting is disabled for channels configured with the PTT ID.
- When “Silent” is configured in Emergency Mode Type, a PTT ID Sidetone does not sound in Emergency Mode.

Configuration using KPG-166D

Enabling/Disabling the PTT ID Sidetone (See Edit > FleetSync > General 1)

Muting the PTT ID Tone (PTT ID Mute (Analog))

PTT ID Mute (Analog) is a feature for unmuting the speaker when a specific time interval has elapsed after the transceiver receives the analog signal. This feature is to mute the data tones of the PTT ID (BOT) sent out by the party at the other end of the call.

Upon receiving the analog signal and after the preset Mute Hold Time has elapsed while in the receiving mode, the transceiver unmutes the speaker if the condition to do so is satisfied.

Even when QT/DQT or Optional Signaling is configured, the Mute Hold Time timer starts counting once the transceiver receives the analog signal. If the reception signal is lost while Mute Hold Time is counting, the timer will be reset. In this case, counting starts again from scratch when the next analog signal is received.

You can enable/disable PTT ID Mute (Analog) or configure the Mute Hold Time using KPG-166D.

Configuration using KPG-166D

- Enabling/Disabling PTT ID Mute (Analog) (See Edit > Zone Information > Channel Edit > Page 2)
- Configuring Mute Hold Time (See Edit > Optional Features > Optional Features 1 > Common Page 1)

Disabling Repeated Sending of PTT ID (PTT ID Pause (Analog))

PTT ID Pause (Analog) is the function that stops sending of the PTT ID when the transceiver repeats transmission and reception within a specific time interval. This function is used to stop sending of the PTT ID repeatedly to the other party.

After transceiver has completed transmission and switches to the receiving mode, PTT ID will not be sent out when there is transmission within the time interval configured in PTT ID Pause Time. After the time interval specified in PTT ID Pause Time has elapsed, the transceiver will send out the PTT ID during a transmission.

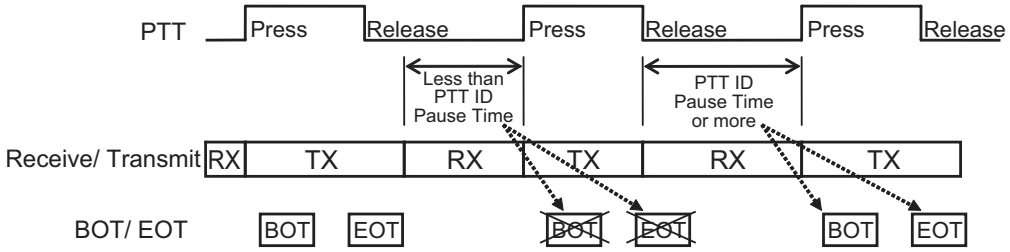


Figure 12-4 Timing for Starting PTT ID Pause

You can enable/disable PTT ID Pause (Analog) or configure the PTT ID Pause Time using KPG-166D.

Configuration using KPG-166D

- Enabling/Disabling PTT ID Pause (Analog) (See Edit > Zone Information > Channel Edit > Page 2)
- Configuring the PTT ID Pause Time (See Edit > Optional Features > Optional Features 1 > Common Page 1)

Output of the Received FleetSync ID from the Communication Port (Unit ID Serial Output)

Unit ID Serial Output allows the transceiver to output the Fleet and ID received from the communication port of the transceiver when a PTT ID has been received.

By using Unit ID Serial Output, the base station user is able to monitor the transceiver that is currently communicating in real time.

Note

To use Unit ID Serial Output, “Data” or “Data + GPS Data Output” must be assigned in the function setting of the transceiver's communication port.

Configuration using KPG-166D

Configuring the Unit ID Serial Output (See Edit > Optional Features > Optional Features 1 > Common Page 3 > Serial Output)

12.4 Making a Selective Call

Different types of calls can be made using a FleetSync ID.

Upon selecting the target transceiver to call and pressing the **PTT** switch, you can add your own FleetSync ID and the ID of the target transceiver to the signal and send it out. After the target transceiver has received the FleetSync ID, the transceiver unmutes the speaker and outputs the receiving tone.

The receiving transceiver can respond to the caller by pressing the **PTT** switch while the Auto Reset Timer is counting.

The different types of Selective Calls are as follows.

Table 12-3 Types of Selective Calls

Call Type	Description
Individual Call	Individual Call is used to initiate a call to a specific transceiver. When a transceiver receives a Selective Call with a Fleet and ID that matches its own ID, it is deemed to have received an Individual Call.
Group Call	Group Call is used to initiate a call to multiple transceivers within a specific Fleet. When a transceiver receives a Selective Call with a matching Fleet and an ID that is configured as the Group ID , it is deemed to have received a Group Call.
Fleet Call	For calling all transceivers with a FleetSync ID in the same Fleet as one's own. When a transceiver receives a Selective Call with a matching Fleet and an ID that is configured as “0 (ALL)” , it is deemed to have received a Fleet Call.
Supervisor Call	Supervisor Call is used to initiate a call to the transceiver having the same ID in the respective Fleets. When a transceiver receives a Selective Call with a matching ID and Fleet that is configured as the “0 (ALL)”, it is deemed to have received a Supervisor Call.
Broadcast Call	Broadcast Call is used to initiate a call to all transceivers with a FleetSync ID. When a transceiver receives a Selective Call with the ID configured as “0 (ALL)” and Fleet as “0 (ALL)”, it is deemed to have received a Broadcast Call.

Selective Call also comes with a Paging Call feature. Use Paging Call when you want to call a radio station without communicating.

Initiating a Selective Call

Selective Call can be started via any of the following operations.

- **PTT ID**
  Configure the ID List in PTT ID of Channel Edit. Pressing the **PTT** switch on the channel with the ID List configured initiates a Selcall.
- **Talkback**
  When the **PTT** switch is pressed during counting of the Auto Reset Timer after a Selective Call has been received, you can respond (Talkback) to the transceiver at the other end of the Selective Call.

Configuration using KPG-166D

- Configuring the PTT ID of the FleetSync ID to be Sent (See Edit > Zone Information > Channel Edit > Page 1 > Analog)
- Configuring the ID List Number of the FleetSync ID to be Sent (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Initiating a Paging Call

Use Paging Call when you want to call a target transceiver without communicating.

By pressing the **Paging Call** key, you can initiate a Paging Call for the FleetSync ID of the ID List Number configured for the channel.

Configuration using KPG-166D

- Assigning Functions to the PF Keys (See Edit > Key Assignment)
- Configuring the ID List Number of the FleetSync ID to be Sent (See Edit > Zone Information > Channel Edit > Page 1 > DMR)

Receiving a Selective Call

The transceiver emits an Alert Tone (Individual Call, Other Selective Calls or Paging Call) upon receiving a Selective Call. If Selective Call Alert LED is enabled, the LED blinks in orange when the transceiver receives a Selective Call. (Refer to Selective Call Alert LED on page 370.)

Below are the matching conditions for the FleetSync ID that the transceiver is waiting for.

Table 12-4 Conditions for Unmuting the Speaker

Call Type	Conditions for Unmuting the Speaker	
	Fleet fff: 100 to 349	ID iiii: 1000 to 4999
Individual Call	Matching	Matching
Group Call	Matching	Group ID matches
Fleet Call	Matching	ALL ID
Supervisor Call	ALL Fleet	Matching
Broadcast Call	ALL Fleet	ALL ID

Note

- To receive a Selective Call, “FleetSync” must be configured for Optional Signaling used by the channel. (Refer to Using Optional Signaling (Analog) on page 210.)
- The FleetSync ID received can be output from the communication port of the transceiver. (Refer to Output of the Received FleetSync ID from the Communication Port (Unit ID Serial Output) on page 366.)

Configuration using KPG-166D

Configuring the Alert Tone (See Edit > FleetSync > General 2 > Alert Tone)

ID List

When using the FleetSync feature, the transceiver uses individual FleetSync IDs for communication. The Fleet Sync ID of the target party needs to be configured in advance on the transceiver using KPG-166D. A maximum of 1000 FleetSync IDs can be configured for FleetSync ID List.

Table 12-5 ID List Configuration Items

Configuration	Description
Fleet	For configuring the Fleet of the FleetSync ID. Fleet can be set to “ALL” or a value between 100 and 349. “ALL” allows initiation of a call to all Fleets.
ID	For configuring the ID of the FleetSync ID. ID can be set to “ALL” or a value between 1000 and 4999. “ALL” allows initiation of a call to all IDs.

Configuration using KPG-166D

Configuring the ID List (See Edit > FleetSync > ID List)

Group ID

Group ID is used when making a Group Call using FleetSync.

By assigning the same Group ID as the transceiver for which a group is formed, you can make a Group Call using FleetSync. It is also possible to make calls to smaller units such as a Fleet Call or a Supervisor Call. In general, it is used only within the same Fleet.

You can use KPG-166D to select whether to use the Group ID and also to configure the Group ID. A maximum of 10 Group IDs can be configured.

Configuration using KPG-166D

- Enabling/Disabling the Group ID (See Edit > FleetSync > General 1)
- Configuring the Group ID (1 to 10) (See Edit > FleetSync > General 1)

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash orange or blue when the transceiver receives a call.

A user can notice by the LED that the transceiver is receiving a call.

Note

The flashing LED (orange or blue) indicates the following statuses of the transceiver when the transceiver receives a Selective Call:

(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, the LED flashes with the status (a) even 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. In this case, the transceiver cannot respond even if the **PTT** switch is pressed.

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 Auto Reset Timer on page 371.)

Configuration using KPG-166D

Configuring the Selective Call Alert LED (See Edit > FleetSync > General 1)

LED (Individual/ Group Call)

LED (Individual/Group Call) is the function to make the LED flash when a Selective Call (Individual/Group Call) is received.

A user can notice by the LED that the transceiver is receiving a call.

Orange and blue can be selected for the flashing LED color.

Configuration using KPG-166D

Configuring LED (Individual/Group Call) (See Edit > FleetSync > General 2 > LED)

LED (Other Selective Calls)

LED (Other Selective Calls) is the function to make the LED flash when a Selective Call (a call other than Individual/ Group Calls) is received.
A user can notice by the LED that the transceiver is receiving a call.
Orange and blue can be selected for the flashing LED color.
Fleet Calls, Supervisor Calls, and Broadcast Calls apply as Other Selective Calls.

Configuration using KPG-166D

Configuring LED (Other Selective Calls) (See Edit > FleetSync > General 2 > LED)

Restricting IDs that Support Talkback (Unit ID Encode Block)

Unit ID Encode Block is the FleetSync ID range that can be used by the transceiver for responding (Talkback).
You can restrict the FleetSync ID with which a user is allowed to respond (Talkback) using the KPG-166D setting.
After receiving a FleetSync ID that satisfies the reception conditions, the transceiver unmutes the speaker and outputs the receiving tone. The receiving transceiver can respond (Talkback) to the transmitting transceiver by pressing the **PTT** switch. However, response (Talkback) by the receiving transceiver is not allowed if response (Talkback) to the FleetSync ID of the transmitting transceiver is prohibited.

Note

- A user can respond (Talkback) using a FleetSync ID 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 is able to respond (Talkback) to all transceivers.

Configuration using KPG-166D

Configuring the Unit ID Encode Block (See Edit > FleetSync > General 1)

Auto Reset Timer

Auto Reset Timer is the time interval starting from the point when the received FleetSync ID matches with the own FleetSync ID configured for the transceiver up to the point when the matching status is automatically reset. A matching status means that a user can communicate using only a QT tone or DQT code after the FleetSync ID matches.
By using KPG-166D, Auto Reset Timer can be configured. Also, you can configure how the transceiver behaves after the preset time interval of the Auto Reset Timer has elapsed.

Table 12-6 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 FleetSync ID is automatically reset.
LED	If this function is enabled, the blinking orange LED for the Selective Call Alert LED turns off when the preset time interval of the Auto Reset Timer has elapsed.
Alert	While this function is enabled, the intermittently emitted Alert Tone stops after the preset time interval of Auto Reset Timer has elapsed.

Configuration using KPG-166D

Configuring the Auto Reset Timer (See Edit > FleetSync > General 2 > Auto Reset)

12.5 Sending and Receiving a Status Message (Status Call)

Status Message is a simple messaging function for transmitting and receiving the status indicated using a number between 10 and 99. By using Status Message, it is possible to send instructions such as from the base station using messages instead of audio sound.

Sending a Status Message

Upon pressing the “Call 1” or “Call 2” key assigned to the **PF** key of the transceiver, a Status Message configured in advance on the transceiver is sent out.
The Status Message to send can be configured by making a selection from the Status List.
The FleetSync ID of the target transceiver can be configured by selecting from the Target Fleet/ID or ID List.

Configuration using KPG-166D

- Assigning Functions to the PF Keys (See Edit > Key Assignment)
- Configuring the Status Message to Send And the FleetSync ID of the Target Transceiver (See Edit > Key Assignment > Call > Analog)

Receiving a Status Message

Each of the Status Messages has a pre-assigned status. The table below shows the behavior of the transceiver when it receives a pre-assigned status.

Table 12-7 Pre-assigned Statuses

Status	Function	Behavior of Receiving Transceiver
10 to 79	User-defined statuses	Receives statuses as usual.
80	Default status	
81 to 86	Undefined	
87	Remote Kill command	Sends out receipt confirmation. Switches the receiving transceiver to the Kill state.
88	Cancel Emergency command	Cancels the Emergency mode.
89	Enable Horn Alert command	Activates Horn Alert. *1
90	Prohibit Remote Stun transmission command	Sends out receipt confirmation. Switches to the transmission prohibited state. Sets Current Status to “93”.
91	Prohibit Remote Stun transmission/reception command	Sends out receipt confirmation. Switches to the transmission/reception prohibited state. Sets Current Status to “94”.
92	Cancel Remote Stun command	Sends out receipt confirmation. Cancels Stun. Sets Current Status to “80”.
93	Response to Remote Stun transmission prohibition	-
94	Response to Remote Stun transmission/ reception prohibition	-
95 to 99	Pre-assigned Emergency Statuses 95: Lone Worker Status 99: Other Emergency Status	Sends out receipt confirmation. Alert/ Horn/ None *2

*1 Horn Alert cannot be used on Portable.

*2 You can determine how to receive the pre-assigned Emergency status (Status 95 to 99) using the KPG-166D setting. (Refer to Emergency Status Response on page 375.)

Emergency

Upon receiving a pre-assigned Emergency status (Status 95 to 99), an Alert Tone is sounded from the transceiver according to the Emergency Status Response setting. (Refer to Emergency Status Response on page 375.)

Note

In the case of Mobile, “EG” appears on the 7-segment LED display when an Emergency Status is received.

Remote Stun

The use of the transceiver is restricted as follows when a Remote Stun status (Status 90 or 91) is received. Stun is canceled when a Remote Revive status is received.

Table 12-8 Remote Stun

Item	Transmission prohibited (Status 90)	Transmission/reception prohibited (Status 91)
Normal behavior	Transmission prohibited	Transmission/reception prohibited
PC control	Does not accept transmission request.	Does not accept transmission request.

You can configure whether to accept a received Remote Stun status using Stun Status Validation of KPG-166D. (Refer to 12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 387.)

Note

If TK-Dx40 (Mobile) receives the Remote Stun status, “dt” appears in the 7-segment LED display. After the reception is complete, the transceiver sends ACK and enters the Stun state. When the transceiver enters the Stun state, “St” appears in the 7-segment LED display.

Remote Kill

Upon receiving the Remote Kill status (Status 87), use of the transceiver is prohibited and all operations will be disabled. However, the configuration data can be written from KPG-166D.

You can configure whether to accept a received Remote Kill status using Kill Status Validation of KPG-166D. (Refer to 12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill) on page 387.)

Note

If Mobile receives the Remote Kill Status, “--” appears in the 7-segment LED display.

Status 90 - 92

Sends or cancels a Stun command.

Sends out or cancels a Stun command regardless of the current Stun status of the receiving transceiver.

Status 93 - 94

This is a status number for responding the Stun status of the transceiver when a RSTM (Request Status) is received.

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-166D

Configuring Power-on Status Message (See Edit > FleetSync > Target)

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-166D

Configuring Power-on Status Message (See Edit > FleetSync > Target)

Status List

Status Message must be preconfigured in the transceiver using KPG-166D prior to the transmission. A maximum of 90 statuses can be configured in the Status List.

A status number within the range from 10 to 99 in the Status List can be configured using KPG-166D.

Configuration using KPG-166D

Configuring the Status List (See Edit > FleetSync > Status List)

Target Fleet/ ID

Target Fleet/ID is the FleetSync ID of the target transceiver when sending a Status Message.

When Fleet/ID of Key Assignment > Call > Analog is configured as “Target” using KPG-166D, a Status Message is transmitted to the FleetSync ID configured in Target Fleet/ID.

Target FleetSync ID can be configured using KPG-166D. ID of the base station that manages operations is normally configured for FleetSync ID.

Configuration using KPG-166D

- Configuring the Fleet/ ID (See Edit > Key Assignment > Call > Analog)
- Configuring the Target Fleet/ ID (See Edit > FleetSync > Target)

Emergency Status Response

Emergency Status Response is a function that outputs an Alert Tone and activates the Horn Alert port when the transceiver receives an Emergency Status.

Table 12-9 Emergency Status Response

Configuration	Description
None	The transceiver functions in the same manner as when receiving a normal status.
Alert Tone	Outputs the Alert Tone configured for Emergency Response from the transceiver when an Emergency Status is received.
Horn (Mobile only)	Outputs the Alert Tone configured for Emergency Response from the transceiver and activates the Horn Alert port when an Emergency Status is received.

Note

In the case of Mobile, “EG” appears on the 7-segment LED display when an Emergency Status is received.

Configuration using KPG-166D

- Configuring the Emergency Status Response (See Edit > FleetSync > General 1)
- Configuring the Emergency Response (See Edit > FleetSync > General 2 > Alert Tone)

AUX Input Status Message (Mobile Only)

AUX Input Status Message is a feature that sends out a specified Status Message when the AUX Input port switches from high level to low level or from low level to high level.

A Status Message can be sent out when there is a change in the AUX Input port status by attaching a sensor to the port. The transceiver sends the message to the FleetSync ID configured for Target Fleet/ID. (Refer to Target Fleet/ID on page 375.)

To make use of this feature, it is necessary to assign an AUX Input Status Message to one of the AUX Input ports.

Configuration using KPG-166D

- Configuring AUX Input Status Message (See Edit > FleetSync > Target > AUX Input Status Message)
- Assigning functions to the PF keys on the transceiver (See Edit > Key Assignment)

AUX Output Status Message (Mobile Only)

AUX Output Status Message is a feature that switches the AUX Output port from high level to low level or from low level to high level when a specified Status Message is received. Use this feature when you want to turn on or turn off an external device via remote operation.

To make use of this feature, it is necessary to assign an AUX Output Status Message to one of the AUX Output ports.

Configuration using KPG-166D

- Configuring AUX Output Status Message (See Edit > FleetSync > Target > AUX Output Status Message)
- Assigning functions to the PF keys on the transceiver (See Edit > Key Assignment)

12.6 Data Communication Feature

Data communication (Status Call) makes use of the following features.

- 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)
- Status Message on Data Zone-Channel

GTC Count

GTC Count is the number of times for transmitting GTC by the transmitting transceiver.

GTC (Go to Channel) refers to a message sent through the voice channel for the transmitting transceiver to guide the receiving transceiver to the data channel.

The transmitting transceiver moves to the data channel after transmitting GTC when a Status Message on Data Zone-Channel is configured. Upon receiving GTC, the receiving transceiver moves automatically to the data channel and waits for the data.

The default configuration is normally used.

Note

- After the receiving transceiver has moved to the data channel, it will wait for the Status Message data. The receiving transceiver returns to the voice channel if no Status Message is received within the time interval configured in Maximum ACK Wait Time.
- After the transmitting transceiver has moved to the data channel, it will send out the Status Message and wait for confirmation of its receipt. The transmitting transceiver returns to the voice channel if no receipt confirmation is received within the time interval configured in Maximum ACK Wait Time.

Configuration using KPG-166D

Configuring the GTC Count (See Edit > FleetSync > Parameter)

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-166D

Configuring the Number of Retries (See Edit > FleetSync > Parameter)

Transmit Busy Wait Time

The transceiver confirms that the traffic 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 traffic 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-166D

Configuring the Transmit Busy Wait Time (See Edit > FleetSync > Parameter)

Maximum ACK Wait Time

Maximum ACK Wait Time is the length of time that the transceiver stands by to receive the receipt confirmation after the transceiver sends out the data.

If the transceiver does not receive the confirmation within the time configured for Maximum ACK Wait Time, the transceiver will resend the data.

The default configuration is normally used.

Note

It is also used for the standby time interval in the data channel upon moving to the data channel using GTC.

Configuration using KPG-166D

Configuring the Maximum ACK Wait Time (See Edit > FleetSync > Parameter)

ACK Delay Time

ACK Delay Time is the time interval from data receipt by the transceiver up to return of the receipt confirmation.

ACK Delay Time needs to be configured to a duration shorter than the Maximum ACK Wait Time on the transmitting transceiver.

The default configuration is normally used.

Configuration using KPG-166D

Configuring the ACK Delay Time (See Edit > FleetSync > Parameter)

Transmit Delay Time (Receive Capture)

Transmit Delay Time (Receive Capture) is the time for transmitting the unmodulated signal when the transceiver sends out the first data.

When the transmitting transceiver has sent out the unmodulated signal, the receiving transceiver pauses scanning and shifts to a state to ensure receipt of the data. It is used to ensure that the receiving party receives the data in such cases when Scan or Battery Saver is currently in use by the receiving transceiver.

The default configuration is normally used.

Configuration using KPG-166D

Configuring the Transmit Delay Time (Receive Capture) (See Edit > FleetSync > Parameter)

Data Transmit Modulation Delay Time

Data Transmit Modulation Delay Time is the time interval from the point when transmission starts up to the point when modulation of the MSK data starts during data transmission by the transceiver.

Data communication may not be successful if the transmitting and receiving frequencies are extremely different or when the product is used in a cold region. In such cases, you can improve data communication by extending the Data Transmit Modulation Delay Time.

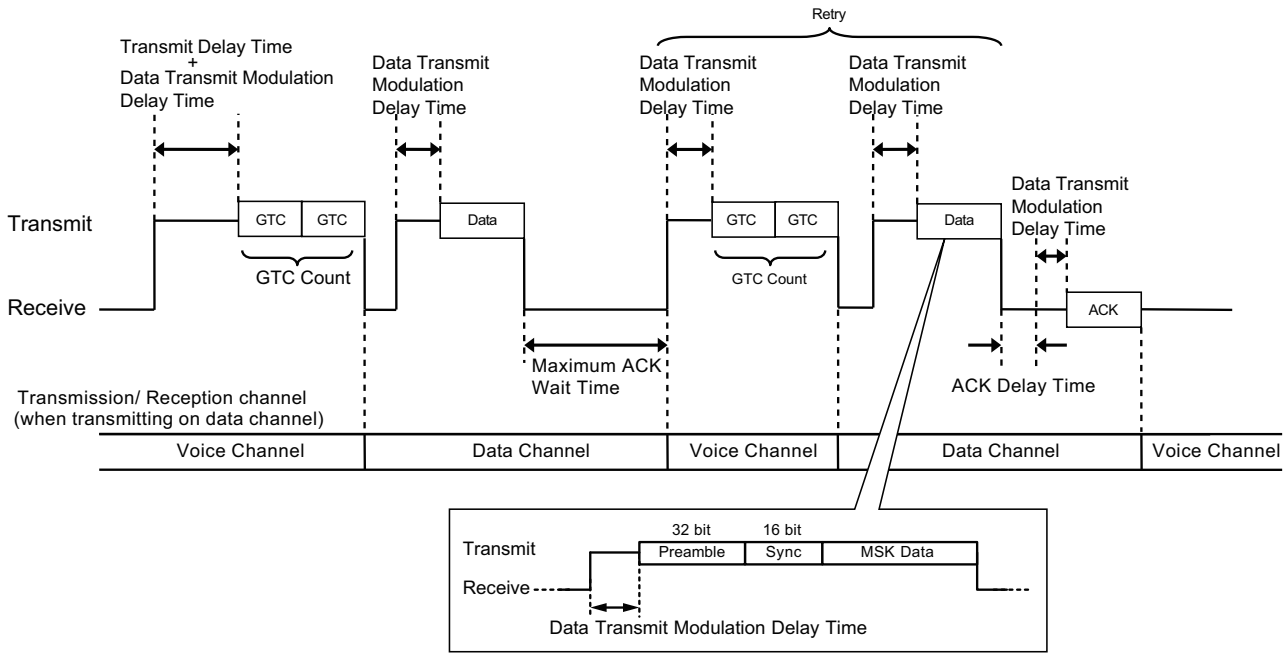


Figure 12-5 Timing for Activating Transmit Delay Time and Data Transmit Modulation Delay Time

The default configuration is normally used.

Configuration using KPG-166D

Configuring the Data Transmit Modulation Delay Time (See Edit > FleetSync > Parameter)

Random Access (Contention)

Random Access is a feature to randomly displace the timing for starting transmission by each transceiver when they are waiting to start transmission after the channel switches from the busy to the ready state.
This is used to prevent any conflict in transmission when all the transceivers start transmission at the same time after the channel switches from the busy to the ready state.

Note

Random Access time varies according to the FleetSync Baud Rate setting. (Refer to FleetSync Baud Rate on page 362.)

Configuration using KPG-166D

Configuring the Random Access (Contention) (See Edit > FleetSync > Parameter)

Status Message on Data Zone-Channel

Status Message on Data Zone-Channel is a feature that automatically switches to the Data Zone-Channel when sending a Status Message.
It switches automatically to the Data Zone-Channel when the transceiver is sending a Status Message. After transmission has ended, the transceiver returns to the last Zone-Channel that was received prior to sending the Status Message. Status Message on Data Zone-Channel can be used for data communication on a specific channel.

Configuration using KPG-166D

Enabling/Disabling the Status Message on Data Zone-Channel (See Edit > FleetSync > Parameter)

12.7 Sending GPS Data

Compatible model: TK-Dx40 (Mobile)

Global Positioning System (GPS) is the system to acquire the current location information of the own transceiver by receiving signals from the Global Positioning System satellites orbiting the earth.

The transceiver of the mobile station can send the acquired own location information (GPS data) to the base station. The base station can send received GPS data to the PC as serial commands.
A GPS receiver unit compatible with the NMEA-0183 standard is required and it must be connected to the communication port of the mobile station transceiver to send GPS data. In the transceiver, the GPS receiver unit is not embedded. Therefore, the microphone with a GPS receiver unit needs to be connected. To send GPS data, an optional third-party GPS receiver unit must be attached to the transceiver.

Note

For a transceiver sending the GPS data, “GPS” must be assigned to the communication port connected to the GPS receiver unit.

Transmission Method of GPS Data

Following are the methods to send GPS data.

- Automatic **GPS** data transmission
  - → Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)
  - → Sending GPS Data According to the Request from the Base Station (GPS Report Mode)
- Manual **GPS** data transmission
  - → Sending GPS Data Manually by Using a Key (Send the GPS Data)
- **GPS** data transmission together with operation of the **PTT** switch
  - → Sending GPS Data Together With Operation of the PTT Switch (GPS Combination)
- **GPS** data transmission together with **Status Message**
  - → Sending GPS Data Together With Status Call (GPS Combination)
- **GPS** data transmission together with **Emergency Call**
  - → Sending GPS Data Together With Emergency Call (GPS Combination)
- **GPS** data transmission linked with travel distance
  - → Sending GPS Data Based On Travel Distance (GPS Distance Change)

The ID of the Target Transceiver (Base Fleet/ Base ID)

Base Fleet and Base ID are the target FleetSync ID to send GPS data.
The FleetSync ID of the base station which is responsible for operation and administration of system is normally configured for Base ID.

Configuration using KPG-166D

Configuring Base Fleet and Base ID (See Edit > FleetSync > GPS)

Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)

GPS data can be sent automatically at the intervals configured for GPS Report Interval.

This function is used for controlling or monitoring vehicles on a time basis by periodically transmitting location information to the base station. To use this function, “Auto” must be configured for GPS Report Mode by using KPG-166D.

Note

- The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if “Auto” is configured for GPS Report Mode.
- If the transceiver is under the following conditions, the automatic transmission of GPS data at certain intervals will be canceled. Also, the Transmit Busy Wait Time will not suspend the transmission to avoid a collision with a GPS transmission from another transceiver while sending GPS data. (Refer to Transmit Busy Wait Time on page 378.)
  - While the transceiver is transmitting
  - While the transceiver is receiving
  - While the transceiver is in busy state
  - While the transceiver unmutes the speaker
  - While the Public Address function is used
  - While Transmit Frequency is not configured
  - While transmission is disabled by the Time-out Timer
  - While the transceiver is sending or receiving FleetSync data
  - Transceiver Password Mode
  - Emergency Mode

Configuration using KPG-166D

Configuring GPS Report Mode (See Edit > Optional Features > Optional Features 1 > GPS)

Sending GPS Data According to the Request from the Base Station (GPS Report Mode)

The transceiver can send GPS data when a GPS data transmission request is received from the base station.

This function is used when the base station controls the timing to require GPS data. This function is also used to avoid transmit collisions if there are many subscriber units. To use this function, “Poll” must be configured for GPS Report Mode by using KPG-166D.

Note

The transceiver sends the GPS data to the ID configured for Base Fleet/ Base ID, not to the ID that sent the data transmission request.

Configuration using KPG-166D

Configuring GPS Report Mode (See Edit > Optional Features > Optional Features 1 > GPS)

Sending GPS Data Manually by Using a Key (Send the GPS Data)

GPS data can be sent manually by a user pressing the **Send the GPS Data** key.

Configuration using KPG-166D

Assigning functions to the PF keys on the transceiver (See Edit > Key Assignment)

Sending GPS Data Together With Operation of the PTT Switch (GPS Combination)

The transceiver can send GPS data by adding the GPS data to the PTT ID (FleetSync) of the transmitting transceiver.

To use this function, PTT ID for GPS Combination must be enabled by using KPG-166D. GPS data is added to the PTT ID as follows according to the configurations for PTT ID (Analog) and GPS Report Timing. (Refer to Timing for Sending a PTT ID on page 364.)

Table 12-10 Timing for Adding GPS Data

GPS Report Timing	PTTID (Analog)			
	Off	BOT	EOT	Both
BOT	-	BOT + GPS	EOT	BOT + GPS EOT
EOT	-	BOT	EOT + GPS	BOT EOT + GPS
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

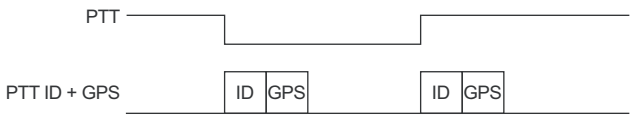


Figure 12-6 Timing for GPS Combination (PTT ID)

Configuration using KPG-166D

- Configuring GPS Combination (PTT ID) (See Edit > Optional Features > Optional Features 1 > GPS > GPS Combination)
- Configuring GPS Report Timing (See Edit > Optional Features > Optional Features 1 > GPS > GPS Combination)

Sending GPS Data Together With Status Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to a Status Message using FleetSync. To use this function, Status for GPS Combination must be enabled by using KPG-166D. The range of status numbers to which GPS data can be added can be configured.

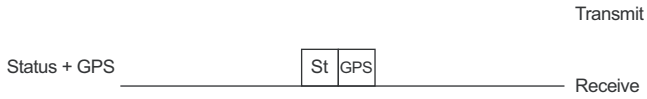


Figure 12-7 Timing to Send GPS Combination (Status)

Configuration using KPG-166D

- Configuring GPS Combination (Status) (See Edit > Optional Features > Optional Features 1 > GPS > GPS Combination)
- Configuring GPS Report Status Number Block (See Edit > Optional Features > Optional Features 1 > GPS > GPS Combination)

Sending GPS Data Together With Emergency Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to the Emergency ID (FleetSync). To use this function, Emergency for GPS Combination must be enabled by using KPG-166D.

Figure 12-8 Timing to Send Combination (Emergency)

Configuration using KPG-166D

Configuring GPS Combination (Emergency) (See Edit > Optional Features > Optional Features 1 > GPS > GPS Combination)

Sending GPS Data Based On Travel Distance (GPS Distance Change)

GPS data can be sent when the distance between the location of the previous GPS data transmission and the current location exceeds the value configured in **Distance Value**.

The transceiver calculates the distance between the position where the GPS data was sent and the current position at regular time intervals (3 sec) after the transceiver sent GPS data. The GPS data is sent if the calculated distance exceeds the value configured for Distance Value. If no GPS data is sent after the transceiver is turned ON, the transceiver regards the location information first received from the GPS unit as the previous transmission position and calculates the distance to the current position. The distance is calculated from the latitudinal and longitudinal values. To use this function, GPS Distance Change must be enabled by using KPG-166D.

Configuration using KPG-166D

- Configuring **GPS Distance Change** to be enabled or disabled (See Edit > Optional Features > Optional Features 1 > GPS > GPS Distance Change)
- Configuring **Distance Unit** (See Edit > Optional Features > Optional Features 1 > GPS > GPS Distance Change)
- Configuring **Distance Value** (See Edit > Optional Features > Optional Features 1 > GPS > GPS Distance Change)

GPS Functions

The following functions are relevant to GPS data transmission.

Number of Times

- GPS Report Interval Time
- GPS Time Mark
- GPS Message Type
- GPS Report on Data Zone-Channel
- GPS Report Back to Requested ID

Refer to 13.1 GPS Functions on page 388 for details of each function.

12.8 Receiving GPS Data

Compatible model: TK-Dx40 (Mobile)

The base station receiving GPS data from the transceiver of a mobile station can send the GPS data to the PC as serial commands. If a PC installed with a mapping application is connected to the communication port of the base station transceiver, the location information of mobile station transceivers appears on a map on the PC display. This function is convenient for dispatch control or a traffic control system. Also, if a mobile station transceiver connecting to a GPS receiver unit receives location information (GPS data) from a GPS satellite, the current location information of the own transceiver can be displayed on the LCD.

Note

For a transceiver receiving GPS data, “Data + GPS Data Output” must be assigned to the communication port connected to a PC installed with the mapping application. (Refer to A.4 Available Functions for COM Port on page 483.)

Map Header

Whether to send data to the mapping application when the base station transceiver receives the GPS data from the mobile station transceiver can be configured.

Following are the type of data that can be sent to the mapping application.

Table 12-11 Map Header

Data	Description
$GPGGA (NMEA1)	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 (NMEA2)	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 (NMEA3)	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 (KW1)	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 (KW2)	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 1), $GPGLL (NMEA 2) or $GPRMC (NMEA 3). For example, if $GPGGA (NMEA 1) and $PKLID are used simultaneously, the transceiver at the base station sends from the communication port of the repeater the $GPGGA data in addition to the Fleet ID and the status information extracted from the GPS data.
$PKLSH (KW3)	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 and the Fleet ID. This sentence is used when sending GPS data in an Emergency Mode or by pressing the **PTT** switch.

Configuration using KPG-166D

Configuring Map Header (See Edit > Optional Features > Optional Features 2 > GPS > Base Station Settings)

12.9 Disabling the Transceiver Capability by Remote Control (Stun/ Kill)

With the Stun/Kill feature, the administrator can disable the use of a transceiver using the Stun/Kill status such as when it has been stolen.

The table below shows the transceiver behavior when it receives a Remote Stun/Kill status.

Table 12-12 Remote Stun/Kill Statuses

Status	Description
Remote Stun	The transceiver is unable to transmit data upon receiving the Remote Stun status (Status 90). The transceiver is unable to transmit or receive data upon receiving the Remote Stun status (Status 91). The Stun state is reset when the transceiver receives the Remote Revive status (Status 92). You can configure whether to accept a Remote Stun status using KPG-166D.
Remote Revive	The Stun state is reset when the transceiver receives the Remote Revive status (Status 92).
Remote Kill	Use of the transceiver is prohibited and all operations will be disabled upon receiving the Remote Kill status (Status 87). All configuration data of the transceiver is cleared, hence Stun state will not be reset even if the transceiver has received the Remote Revive status (Status 92). However, the configuration data can be written using KPG-166D. You can configure whether to accept a Remote Kill status using KPG-166D.

Configuration using KPG-166D

- Configuring the Stun Status Validation (See Edit > FleetSync > General 1)
- Configuring the Kill Status Validation (See Edit > FleetSync > General 1)

12.10 Notifying Status Changes of the Transceiver by Sending PC Commands (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, a function is enabled or disabled, the volume level is changed, etc.) by sending a PC command.

You can use KPG-166D to configure whether to send a PC command automatically when the transceiver status changes, or to send it only when the transceiver receives a command from the PC.

Note

In the case of Mobile, PC commands such as J Command cannot be output from COM Port 0. (Refer to A.4 Available Functions for COM Port on page 483.)

Configuration using KPG-166D

Configuring the J Command Serial Output (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Output)

Global Positioning System (GPS) is the system to acquire the current location information of the own transceiver by receiving signals from the Global Positioning System satellites orbiting the earth.

GPS data can be communicated by using the DMR or FleetSync protocol.

Refer to the following for information on the transmission behavior for each protocol and behavior sending received GPS data to a PC as serial commands.

- **DMR**
  8.15 Sending GPS Data on page 189, 8.16 Receiving GPS Data on page 193 in “8 DMR CONVENTIONAL SYSTEM”
- **FleetSync**
  12.7 Sending GPS Data on page 381, 12.8 Receiving GPS Data on page 386 in “12 FLEETSYNC” This chapter describes common functions relevant to sending GPS data and the GPS Position Display function used to show the current location information of the own transceiver on the LCD.

13.1 GPS Functions

The following functions are relevant to GPS data transmission.

- Number of Times
- GPS Report Interval Time
- GPS Time Mark
- GPS Message Type
- GPS Report on Data Zone-Channel
- GPS Report Back to Requested ID

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 times configured for Number of Times at the intervals configured for GPS Report Interval.

Configuration using KPG-166D

Configuring Number of Times (See Edit > Optional Features > Optional Features 2 > GPS)

GPS Report Interval Time

GPS Report Interval Time allows the transceiver to send GPS data at the configured intervals if “Auto” is configured for GPS Report Mode.

GPS Report Interval Time (Ignition On)

GPS Report Interval (Ignition On) is the interval to send the GPS data while the vehicle’s engine is running.

GPS Report Interval Time (Ignition Off)

GPS Report Interval (Ignition Off) is the interval to send GPS data while the vehicle is parked. Also, if Ignition Sense function is not used (nothing is entered in the Ignition Sense port), GPS data will be sent according to the configuration for Ignition Off. (Refer to 20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) on page 456.)

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-166D

- Configuring GPS Report Interval (Ignition On) (See Edit > Optional Features > Optional Features 2 > GPS Report Interval Time)
- Configuring GPS Report Interval (Ignition Off) (See Edit > Optional Features > Optional Features 2 > GPS Report Interval Time)

GPS 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-166D

Configuring GPS Time Mark (See Edit > Optional Features > Optional Features 2 > GPS)

GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 13-1 GPS Message Type

Configuration	Operation
Full	The transmission period is approximately 500 ms. The message to be sent is the GPS data corresponding to $GPGGA, $GPRMC and $GPGLL.
Short	The transmission period is approximately 320 ms. 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. If “Short” is configured, transmission time for GPS data can be reduced.

Configuration using KPG-166D

Configuring GPS Message Type (See Edit > Optional Features > Optional Features 2 > GPS)

GPS Report on Data Zone-Channel

GPS Report on Data Zone-Channel 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-Channel can be used to send data using a specific dedicated channel.

Configuration using KPG-166D

Configuring GPS Report on Data Zone-Channel to be enabled or disabled (See Edit > FleetSync > GPS)

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

Table 13-2 Configuring GPS Report Back to Requested ID

Configuration	Operation
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 FleetSync ID configured for Base Fleet and Base ID. (Refer to The ID of the Target Transceiver (Base Fleet/ Base ID) on page 381.)

Configuration using KPG-166D

Configuring GPS Report Back to Requested ID to be enabled or disabled (See Edit > Optional Features > Optional Features 2 > GPS)

13.2 GPS Position Display

Compatible model: TK-Dx00 with LCD

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 display of the transceiver.
- Displays the altitude of the current location on the display of the transceiver.

The GPS receiver unit is embedded in TK-D200G/ TK-D300G. In TK-D200/ TK-D300, the GPS receiver unit is not embedded. Therefore, the microphone with a GPS receiver unit needs to be connected.

Configuring the GPS Position Display

The functions below relevant to GPS Position Display can be configured using KPG-166D. The functions must be configured in the following order.

1) Built-in GPS Receiver/ Communication Port

For using the built-in GPS receiver unit, Built-in GPS Receiver needs to be enabled.

For using an external GPS receiver unit, "GPS" needs to be assigned to the communication port connecting the GPS receiver unit. (Refer to A.4 Available Functions for COM Port on page 483.)

2) PF key

GPS Position Display needs to be assigned to a key on the transceiver. (Refer to A.1 Available Functions for the PF Keys on page 471.)

Pressing the **GPS Position Display** key causes the transceiver to enter GPS Position Display Mode.

The transceiver also enters GPS Position Display Mode if "GPS Position Display" is selected after entering Menu Mode by pressing the **Menu** key. (Refer to 3.4 Using Menu Mode on page 24.)

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 display in GPS Position Display Mode. If this function is enabled, latitudinal and longitudinal values appear on the transceiver 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 display in GPS Position Display Mode. If this function is enabled, the altitudinal value appears on the transceiver 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-166D

- Configuring the Built-in GPS Receiver to be enabled or disabled (See Model > Product Information)
- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Latitude and Longitude (See Edit > Optional Features > Optional Features 2 > GPS > GPS Position Display)
- Configuring the Altitude (See Edit > Optional Features > Optional Features 2 > GPS > GPS Position Display)

Location Information Display

The latest location information (latitude, longitude, altitude) appears when the transceiver is placed in GPS Position Display Mode.

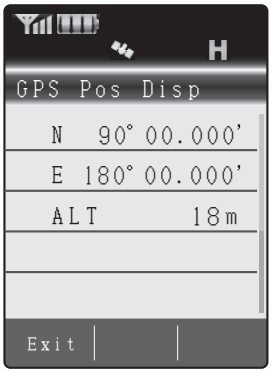
The transceiver enters GPS Position Display Mode if the **GPS Position Display** key is pressed or “GPS Position Display” is selected by pressing the **Menu** key while the transceiver is in standby mode.

Operating the Transceiver

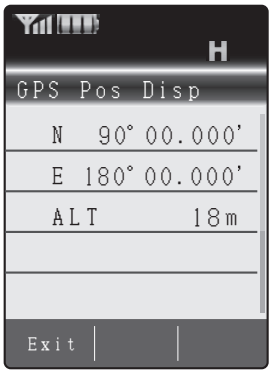
1 Press the GPS Position Display key.

The transceiver enters GPS Position Display Mode, and the latest latitude, longitude, and altitude appear.
The following operations are identical even if the transceiver enters GPS Position Display Mode by a user pressing the **Menu** key.
The following displays appear.

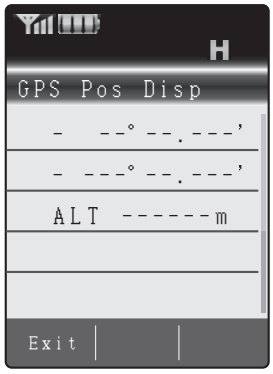
- **Latitude, Longitude and Altitude Display**
  The “ ” icon appears when continuously receiving positioning data from the GPS receiver unit at intervals within 5 sec.



- **GPS Non-positioning Status Display**
  The “ ” icon disappears if 5 sec elapse after the transceiver receives any non-positioning data from the GPS units and the transceiver becomes unable to receive serial data.



“-” appears for all digits on the display if the transceiver receives no location data from the GPS units, such as immediately after the transceiver is turned ON.



2 Press the Menu ([ ]), Right/Home or [*] key.

The transceiver exits GPS Position Display Mode and then restores the previous display.

Note

- Latitude and longitude appears as follows:
  North Latitude: N
  South Latitude: S
  East Longitude: E
  West Longitude: W
- The transceiver cannot enter GPS Position Display Mode if the display that appears in GPS Position Display Mode is not configured.

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.

14.1 Placing the transceiver in Emergency Mode

Selecting one of the following operations can place the transceiver in Emergency Mode.

- **Emergency key**

  Pressing and holding the **Emergency** key for longer than the time configured for Hold Delay causes the transceiver to enter Emergency Mode.

  TK-Dx00:

  "Emergency" can be assigned for the **AUX** key or the **PF 1** key of the speaker microphone only as the function when the key is held.

  TK-Dx40:

  For Portable, "Emergency" can only be assigned as a function when the **Side 1** key is held.

  For Mobile, "Emergency" can only be assigned as a function when the **Triangle** key is held.

  The following figure shows a configuration example when "Emergency" is assigned for Hold of the **AUX** key by using KPG-166D. In this case, the transceiver enters Emergency Mode if the **AUX** key is pressed and held for 1 s or more.

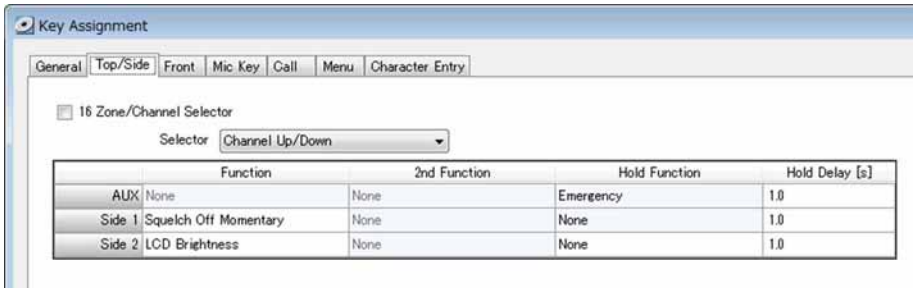


Figure 14-1 Configuration Example using KPG-166D

- **Lone Worker**

  Using Lone Worker, 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 14.7 Placing the Transceiver in Emergency Mode Using Lone Worker on page 412.)

- **Activity Detection (TK-Dx00 only)**

  Using Activity Detection, the transceiver can automatically enter Emergency Mode and notify the base station of the transceiver status when the transceiver detects being tilted, stationary or heavily shaking due to an accident for a certain period of time. (Refer to 14.8 Placing the Transceiver in Emergency Mode Using Activity Detection on page 417.)

- **5-tone Encode Format (TK-Dx00 only)**

  The transceiver enters Emergency Mode by executing the EMGON command for the 5-tone Encode Format. (Refer to EMGON on page 301.)

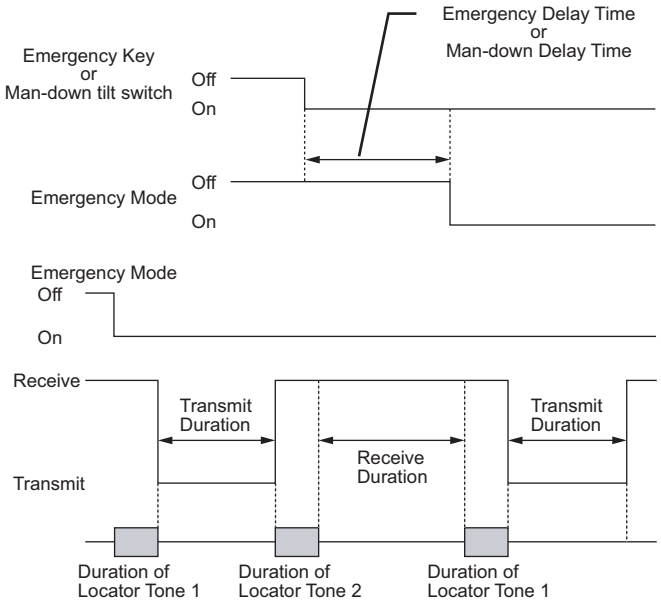


Figure 14-2 Emergency Mode

Pressing and holding the **Emergency** key for longer than the time configured for Hold Delay or turning the transceiver OFF exits Emergency Mode.

While the transceiver is under the following conditions, the transceiver does not enter Emergency Mode:

- If in the Stun status
- If in Transceiver Password entry mode
- If no transmit channel is registered for the Emergency Zone-Channel

Note

- If the transceiver receives the status configured for Termination (Emergency Status) in Emergency Mode, the transceiver exits Emergency Mode. (Refer to Emergency Status on page 410.)
- 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 Emergency Mic Sense on page 404.)
- The Stun/ Kill Code (excluding DMR communication) and Optional Signaling are not decoded in Emergency Mode.

Configuration using KPG-166D

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

Interrupt Emergency CALL (DMR Conventional System Only)

Interrupt Emergency CALL is the function to execute Call Interruption if voice communication (including voice communication not addressed to the own transceiver) is made on a channel used in Emergency Mode when the transceiver enters Emergency Mode.

Call Interruption is the function to enable a transceiver other than the transmitting transceiver to terminate voice communications by sending and receiving the Call Interruption request message. A transceiver receiving the Call Interruption request message on the channel where the transceiver is performing voice communication terminates voice communication. (Refer to 8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) on page 188.)

Configuration using KPG-166D

Configuring the Interrupt Emergency CALL to be enabled or disabled (See Edit > Emergency Information > Emergency 1)

Emergency Alarm (DMR Conventional System Only)

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.

The transceiver sends an Emergency Alarm Request message when the **Emergency** key is pressed and when Lone Worker or various Activity Detection functions are activated on a DMR digital channel. 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 “DMR” needs to be configured for Emergency ID.
- The transceiver receiving an Emergency Alarm Request message notifies a user of the receipt of the Emergency Call according to the configuration for Emergency Response.
- If a zone or channel is changed while the transceiver is in Emergency Mode, the transceiver resends the Emergency Alarm Request message on the channel which the transceiver has migrated to.
- Whether to send an acknowledgment when the transceiver receives an Emergency Alarm Request message can be configured using KPG-166D.

Configuration using KPG-166D

- Configuring the Emergency Alarm to be enabled or disabled (See Edit > Emergency Information > Emergency 1)
- Configuring the Maximum ACK Wait Time (See Edit > DMR > General > Parameters)
- Configuring the Emergency Response (See Edit > DMR > General > Emergency Response)
- Configuring the Emergency Alarm Ack (See Edit > Zone Information > Channel Edit > Page 2)

Manual Emergency Reset

Compatible model: TK-Dx40 (Mobile)

Manual Emergency Reset is a feature for exiting the Emergency Mode when the **Emergency** key is pressed for a duration longer than that configured in Hold Delay while the transceiver is in the Emergency Mode.

Note

- Even when this feature is disabled, the transceiver exits the Emergency Mode when you turn OFF its power.
- When Suspended Power-off is enabled, the Emergency Mode cannot be canceled even when the **Power** switch is pressed. In this case, it is recommended to enable Manual Emergency Reset.

Configuration using KPG-166D

Enabling/Disabling the Manual Emergency Reset (See Edit > Emergency Information > Emergency 1)

Suspended Power-off

Compatible model: TK-Dx40 (Mobile)

Suspended Power-off is a feature that maintains the Emergency Mode by stopping the power of the transceiver from turning OFF even when the **Power** switch is pressed in this mode.

If Ignition Sense is enabled and the transceiver is in the Emergency Mode, the transceiver does not power off and the Emergency Mode continues even when the status of the Ignition Sense port changes from high level to low level. (Refer to 20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) on page 456.)

The light of the LED display goes off when the Emergency Mode is maintained by the Suspended Power-off feature.

Note

When Suspended Power-off is enabled, the power of the transceiver cannot be turned OFF until the Emergency Mode is canceled.

Configuration using KPG-166D

Enabling/Disabling Suspended Power-off (See Edit > Emergency Information > Emergency 1)

14.2 Zone-channel Used for Emergency Mode

The channel to be used when the transceiver enters Emergency Mode can be configured.

Emergency Channel Type

Emergency Channel Type is the type of a channel used when the transceiver is placed in Emergency Mode.
Emergency Channel Type can be configured using KPG-166D.

Table 14-1 Emergency Channel Type

Configuration	Description
Selected	When the transceiver enters Emergency Mode, the transceiver resets the migration state of channels, such as Home Channel, and then the transceiver executes the Emergency behavior on the previously selected channel.
Fixed	When the transceiver enters Emergency Mode, the transceiver migrates to the Zone-channel configured for Emergency Zone-Channel, and then the transceiver initiates the Emergency operation.

The transceiver behaves as below according to the configuration for Emergency Channel Type:

- **Selected**
  - **If a channel in an Analog Conventional system is selected:**

    TK-Dx00:

    The transceiver transmits only using a QT tone or a DQT code.

    The channel's behavior is the same as the channel where "Mixed" is configured for Channel Type and "Analog" is configured for Transmit Mode.

    TK-Dx40:

    The transceiver behaves according to the configuration for Emergency ID (Analog).

    The channel's behavior is the same as the channel where "Mixed" is configured for Channel Type and "Analog" is configured for Transmit Mode.

Table 14-2 Emergency ID (Analog)

Configuration	Description
None	The transceiver transmits only using a QT tone or a DQT code.
FleetSync, 5-tone	The transceiver transmits according to the configuration of FleetSync or 5-tone.

- **If a channel in a DMR Conventional system is selected:**
  The transceiver behaves according to the configuration for Emergency ID (DMR Conventional).
  The channel behavior is the same for channels where “Mixed” is configured for Channel Type and “DMR” is configured for Transmit Mode.

Table 14-3 Emergency ID (DMR Conventional)

Configuration	Description
None	The transceiver transmits only using the Color Code.
DMR	If “Group ID” is configured for Emergency DMR ID Type, the transceiver initiates a Group Call using the Group ID configured for Emergency DMR ID. If “Unit ID” is configured for Emergency DMR ID Type, the transceiver initiates an Individual Call using the Unit ID configured for Emergency DMR ID.

Fixed

- **If a channel in an Analog Conventional system is configured for Emergency Zone-Channel:**
  TK-Dx00:
  The transceiver transmits only using a QT tone or a DQT code.
  The channel’s behavior is the same as the channel where “Mixed” is configured for Channel Type and “Analog” is configured for Transmit Mode.
  TK-Dx40:
  The transceiver behaves according to the configuration for Emergency ID (Analog).
  The channel’s behavior is the same as the channel where “Mixed” is configured for Channel Type and “Analog” is configured for Transmit Mode.

Table 14-4 Emergency ID (Analog)

Configuration	Description
None	The transceiver transmits only using a QT tone or a DQT code.
FleetSync, 5-tone	The transceiver transmits according to the configuration of FleetSync or 5-tone.

- **If a channel in a DMR Conventional system is configured for Emergency Zone-Channel:**
  The transceiver behaves according to the configuration for Emergency ID (DMR Conventional).
  The channel behavior is the same for channels where “Mixed” is configured for Channel Type and “DMR” is configured for Transmit Mode.

Table 14-5 Emergency ID (DMR Conventional)

Configuration	Description
None	The transceiver transmits only using the Color Code.
DMR	If “Group ID” is configured for Emergency DMR ID Type, the transceiver initiates a Group Call using the Group ID configured for Emergency DMR ID. If “Unit ID” is configured for Emergency DMR ID Type, the transceiver initiates an Individual Call using the Unit ID configured for Emergency DMR ID.

Configuration using KPG-166D

- Configuring the Emergency Channel Type (See Edit > Emergency Information > Emergency 1)
- Configuring the Emergency ID (DMR Conventional) (See Edit > Emergency Information > Emergency 2 > Emergency ID (DMR Conventional))

Emergency Zone-Channel

Emergency Zone-Channel is the Zone-channel used in Emergency Mode if “Fixed” is configured for Emergency Channel Type.

Configuration using KPG-166D

Configuring the Emergency Zone-Channel (See Edit > Emergency Information > Emergency 1)

14.3 Automatically Transmitting and Receiving in Emergency Mode

The number of times for which the transceiver toggles between transmission and reception, or the duration for a single session of automatic transmission or reception in Emergency Mode can be configured. It is also available to change the microphone sensitivity for Emergency Mode or to multiplex the Background Tone on the audio to be transmitted.

Emergency Cycle

Emergency Cycle is the number of times for which the transceiver toggles between transmission and reception in Emergency Mode.

Table 14-6 Emergency Cycle

Configuration	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 Channel Type, a zone-channel can be changed even while the transceiver is placed in Emergency Mode. However, a zone-channel cannot be changed while Emergency Alarm is transmitted.
- If TK-Dx40 is configured to send out a 5-tone code, a 5-tone code is sent out only once when the transceiver enters the Emergency Mode.

Configuration using KPG-166D

Configuring the Emergency Cycle (See Edit > Emergency Information > Emergency 1)

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.
- A Locator Tone sounds from the speaker of the transceiver regardless of whether an external speaker is connected or not. In addition, a received audio will sound from the external speaker if the external speaker is connected.

Configuration using KPG-166D

Configuring the Duration of Locator Tone 1 (See Edit > Emergency Information > Emergency 1)

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.
- A Locator Tone sounds from the speaker of the transceiver regardless of whether an external speaker is connected or not. However, a received audio will sound from the external speaker if the external speaker is connected.

Configuration using KPG-166D

Configuring the Duration of Locator Tone 2 (See Edit > Emergency Information > Emergency 1)

Transmit Duration

Transmit Duration is the duration for a single session of automatic transmission in Emergency Mode.

The transceiver switches to automatic reception when the time configured for Transmit Duration elapses after the transceiver starts automatic transmission.

Note

If 0 sec is configured for Transmit Duration, the transceiver does not automatically transmit on a DMR digital channel. However, a corresponding Emergency Status is sent if the Emergency Status is configured. Also, even if 0 sec is configured for Transmit Duration, the transceiver automatically transmits for a minimum 1 sec on an analog channel. (Refer to Emergency Status on page 158.)

Configuration using KPG-166D

Configuring the Transmit Duration (See Edit > Emergency Information > Emergency 1)

Receive Duration

Receive Duration is the duration for a single session of automatic reception in Emergency Mode.

The transceiver switches to automatic transmission when the time configured for Transmit Duration elapses after the transceiver starts automatic reception.

Configuration using KPG-166D

Configuring the Receive Duration (See Edit > Emergency Information > Emergency 1)

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.

6 dB, 4 dB (High), 2 dB, 0 dB (Normal), -2 dB, -4 dB, -6 dB, -8 dB, -10 dB (Low), -12 dB, -14 dB, -16 dB, -18 dB, -20 dB

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 a level lower than “0 dB” is configured for Emergency Mic Sense, the amplitude limit level is also lowered simultaneously; so Modulation Limiting (minimum) in Analog FM will be lowered.

Configuration using KPG-166D

Configuring the Emergency Mic Sense (See Edit > Emergency Information > Emergency 1)

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 sec 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 when a tone is multiplexed over the audio signal.

Configuration using KPG-166D

Configuring the Background Transmission (See Edit > Emergency Information > Emergency 1)

14.4 Indication and Sound in Emergency Mode

Functions related to the tone that sounds from the transceiver when the automatic transmission starts or ends in Emergency Mode, and display and the LED notification in Emergency Mode can be configured.

Locator Tone

A Locator Tone sounds from the transceiver before the automatic transmission in Emergency Mode starts and when the automatic transmission ends.

A Locator Tone 1 sounds from the transceiver before the automatic transmission in Emergency Mode starts. A Locator Tone 2 sounds from the transceiver when the automatic transmission in Emergency Mode ends. The transceiver automatically repeat the transmission and reception in Emergency Mode for the number of times specified for Emergency Cycle. (Refer to 14.3 Automatically Transmitting and Receiving in Emergency Mode on page 401.)

Emergency Display

Compatible model: TK-Dx00 with LCD

Emergency Display is the function to display the preconfigured text message on the transceiver display or retain the display appearance before the transceiver enters Emergency Mode.

Table 14-7 Emergency Display

Configuration	Description
Selected	The previously selected channel is retained on the 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.

Configuration using KPG-166D

Configuring the Emergency Display (See Edit > Emergency Information > Emergency 1)

Emergency Text

Compatible model: TK-Dx00 with LCD

Emergency Text is a text message that appears on the display if Text is configured for Emergency Display.

Configuration using KPG-166D

Configuring the Emergency Text (See Edit > Emergency Information > Emergency 1)

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 14-8 Emergency Mode Type

Configuration	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-166D

Configuring the Emergency Mode Type (See Edit > Emergency Information > Emergency 1)

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-166D

Configuring the Emergency LED (See Edit > Emergency Information > Emergency 1)

14.5 ID Sent when Emergency Mode Is Activated

Emergency ID can be sent each time the transceiver starts automatic emergency transmission and reception in Emergency Mode.

Emergency ID

Emergency ID refers to the category and control type of the code that is sent out each time automatic emergency transmission/reception starts in the Emergency Mode.

KPG-166D can be used to configure the Emergency ID for the Analog Conventional and DMR Conventional systems respectively. Emergency ID for the Analog Conventional system can only be configured for TK-Dx40.

Table 14-9 Emergency ID (Analog)

Configuration	Description
None	The transceiver transmits and receives according to the configuration of Zone-channel used for Emergency Mode.
DTMF	The transceiver first sends the DTMF code configured for Emergency DTMF ID (Key) or Emergency DTMF ID (Lone Worker) when transmitting in Emergency Mode.
FleetSync	In the Emergency Mode, the transceiver first sends out the FleetSync ID configured in Emergency Call Fleet and Emergency Call ID.
5-tone	In the Emergency Mode, the transceiver first sends out the 5-tone code configured in Emergency 5-tone.

Table 14-10 Emergency ID (DMR Conventional)

Configuration	Description
None	The transceiver transmits and receives according to the configuration for Color Code of the Zone-channel used for Emergency Mode.
DMR	When transmitting in Emergency Mode, the transceiver initiates a Group Call or an Individual Call according to the configurations for Emergency DMR ID Type and Emergency DMR ID.

Configuration using KPG-166D

- Configuring the Emergency ID (DMR Conventional) (See Edit > Emergency Information > Emergency 2 > Emergency ID (DMR Conventional))
- Configuring the Emergency ID (Analog) (See Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

Emergency DMR ID Type

Emergency DMR ID Type is the type of Emergency DMR ID used for automatic transmissions while the transceiver is in Emergency Mode.

Either Group ID or Unit ID can be configured for Emergency DMR ID Type using KPG-166D.

Configuration using KPG-166D

Configuring the Emergency DMR ID Type (See Edit > Emergency Information > Emergency 2 > Emergency ID (DMR Conventional))

Emergency DMR ID

Emergency DMR ID is the DMR ID used to transmit and receive while the transceiver is in Emergency Mode.

If “Unit ID” is configured for Emergency DMR ID Type, the Unit ID used for initiating an Individual Call in Emergency Mode can be configured.

If “Group ID” is configured for Emergency DMR ID Type, the Group ID used for initiating a Group Call in Emergency Mode can be configured.

Configuration using KPG-166D

Configuring the Emergency DMR ID (See Edit > Emergency Information > Emergency 2 > Emergency ID (DMR Conventional))

Emergency DTMF ID

Compatible model: TK-Dx40

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 code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by pressing the **Emergency** key.
- **Emergency DTMF ID (Lone Worker)**
  This is the DTMF code to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode by Lone Worker.

Configuration using KPG-166D

Configuring the Emergency DTMF ID (See Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

Emergency Call Fleet

Compatible model: TK-Dx40

Emergency Call Fleet is the Call Fleet that is sent out first in the Emergency Mode when “FleetSync” is configured for Emergency ID (Analog).

Configuration using KPG-166D

Configuring the Emergency Call Fleet (See Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

Emergency Call ID

Compatible model: TK-Dx40

Emergency Call ID is the Call ID that is sent out first in the Emergency Mode when “FleetSync” is configured for Emergency ID (Analog).

Configuration using KPG-166D

Configuring the Emergency Call ID (See Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

Emergency 5-tone

Compatible model: TK-Dx40

Emergency 5-tone is the 5-tone code that is sent out first in the Emergency Mode when “5-tone” is configured for Emergency ID (Analog).

Configuration using KPG-166D

Configuring Emergency 5-tone (See Edit > Emergency Information > Emergency 2 > Emergency ID (Analog))

Emergency Status

This is the Status Message to be sent first when the transceiver starts transmitting after the transceiver enters Emergency Mode. Refer to Emergency Status on page 158 for Emergency Status.

14.6 5-tone Encode Format Executed When Emergency Mode Is Activated (Emergency Encode Format) (Analog System Only)

Compatible model: TK-Dx00

Emergency Encode Format is the function to execute the Encode Format of 5-tone when the transceiver enters Emergency Mode on an analog channel. (Refer to 11.1 Encode Format on page 295.)

The Encode Format to be executed varies as below depending on what caused the transceiver to enter Emergency Mode.

- **Emergency Key**
  This is the Encode Format to be executed when the transceiver starts transmitting after the transceiver enters Emergency Mode by pressing the **Emergency** key.
- **Man-down**
  This is the Encode Format to be executed when the transceiver starts transmitting after the transceiver enters Emergency Mode by Man-down Detection.
- **Stationary**
  This is the Encode Format to be executed when the transceiver starts transmitting after the transceiver enters Emergency Mode by Stationary Detection.
- **Motion**
  This is the Encode Format to be executed when the transceiver starts transmitting after the transceiver enters Emergency Mode by Motion Detection.
- **Lone Worker**
  This is the Encode Format to be executed when the transceiver starts transmitting after the transceiver enters Emergency Mode by Lone Worker.

Configuration using KPG-166D

Configuring Emergency Encode Format (5-tone) (See Edit > Emergency Information > Emergency 2 > Emergency Encode Format (5-tone))

14.7 Placing the Transceiver in Emergency Mode Using 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 a 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.

Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode

The transceiver enters or exits Lone Worker Mode by a user operating the keys on the transceiver.

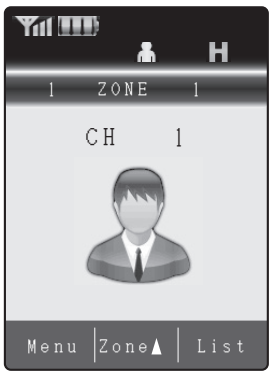
Operating the Transceiver

- **Placing the transceiver in Lone Worker Mode**

1 **Do either of the following operations while the transceiver is not in Lone Worker Mode.**

- Press the **Lone Worker** key.
- Select a channel where Lone Worker is enabled.
- Press the **Menu** key to enter Menu Mode, and select “Lone Worker” and then select “ON”. (TK-Dx00 with LCD only)

The transceiver enters the Lone Worker Mode and activates the Lone Worker Interval. The Key Beep A sounds from the transceiver by pressing the **Lone Worker** key.
In the case of TK-Dx00 with LCD, the “ ” icon lights up.
In the case of TK-Dx40 (Mobile), “Ln” is displayed.



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 14.1 Placing the transceiver in Emergency Mode on page 394.)

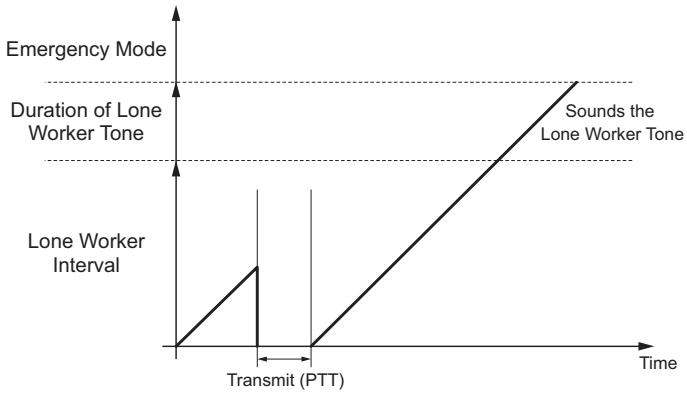


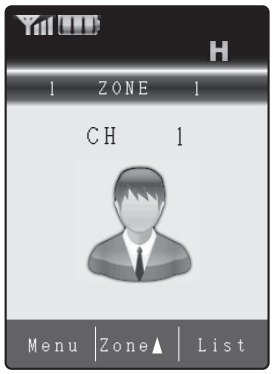
Figure 14-3 Lone Worker Mode

● Exiting Lone Worker Mode

1 Do either of the following operations while the transceiver is in Lone Worker Mode.

- Press the **Lone Worker** key.
- Select a channel where Lone Worker is disabled.
- Press the **Menu** key to enter Menu Mode, and select “Lone Worker” and then select “OFF”. (TK-Dx00 with LCD only)

Exits the Lone Worker Mode. The Key Beep B sounds from the transceiver by pressing the **Lone Worker** key.
In the case of TK-Dx00 with LCD, the “ ” icon disappears.
In the case of TK-Dx40 (Mobile), the number of the channel selected is displayed.



Note

- For TK-Dx00, if “Transmit/Receive Inhibit” is configured for the Lone Worker Type, Lone Worker cannot be turned On or Off in the Menu Mode. (Refer to Lone Worker Type on page 414.)
- If a **PF** key is pressed or the transceiver transmits by the pressing the **PTT** switch while the time configured for Lone Worker Interval elapses, the timer for Lone Worker Interval is reset and starts counting down from the beginning. However, in the case of communication via PC Command, 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.
- If the transceiver migrates from Lone Worker Mode to Emergency Mode, the transceiver exits Emergency Mode by a user pressing the **Emergency** key for a length of time greater than the length of time configured for the Hold Delay.
- If a scan initiates while the transceiver is in Lone Worker Mode, the scan initiates 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-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Lone Worker to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2)

Functions in Lone Worker Mode

The following functions are relevant to Lone Worker Mode.

- 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 14-11 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 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 (TK-Dx00 only) • **Backlight** key (TK-Dx00 only) • **LED Brightness** key (TK-Dx00 only) • **LED Brightness** key (TK-Dx40 (Mobile only)) 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 is changed or the transceiver is turned ON or OFF.
Preset	If a channel is selected, Lone Worker Mode is enabled or disabled depending on the configuration for Lone Worker Mode for the selected channel. 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-166D depending on the usage of the transceiver. The transceiver's behavior varies as below depending on the configuration for Lone Worker Type.

Table 14-12 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 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: Unavailable

Note

If "Normal" or "Preset" is configured for Lone Worker Type, the transceiver cannot transmit even by pressing the **PTT** switch when it is sounding the Lone Worker Tone. Also, this function cannot be activated even if a **PF** key is pressed. In this case, the timer for Lone Worker Interval is reset and starts counting down from the beginning. However, pressing and holding the **Emergency** key for longer than the time configured for Hold Delay results in the transceiver entering Emergency Mode.

Configuration using KPG-166D

- Configuring the Lone Worker Type (See Edit > Emergency Information > Emergency 1 > Lone Worker)
- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Lone Worker to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2)

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-166D

Configuring the Lone Worker Interval (See 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.

Pressing any key while the Lone Worker Tone continues to sound from the transceiver stops the Lone Worker Tone. The timer for Lone Worker Interval is reset and starts counting down from the beginning.

Configuration using KPG-166D

Configuring the Duration of Lone Worker Tone (See Edit > Emergency Information > Emergency 1 > Lone Worker)

14.8 Placing the Transceiver in Emergency Mode Using Activity Detection

Compatible model: TK-Dx00

Activity Detection is the function to automatically place the transceiver in Emergency Mode after detecting the state of the transceiver by analyzing the movement using the acceleration sensor and inclination sensor embedded in the transceiver.

Using this function, the transceiver can automatically enter Emergency Mode and notify the base station of the transceiver status when the transceiver detects being tilted, stationary or heavily shaking due to an accident for a certain period of time.

To use this function, Activity Detection needs to be enabled.

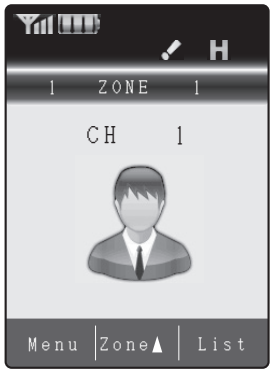
Operating the Transceiver

● Enabling the Activity Detection

1 Do one of the following operations while Activity Detection is disabled.

- Press the **Activity Detection** key.
- Select a channel where Activity Detection is enabled.
- Press the **Menu** key to enter Menu Mode, and select “Activity Detection” and then select “On”. (TK-Dx00 with LCD only)

Activity Detection is enabled. In the case of TK-Dx00 with LCD, the “ ” icon lights up.
If Activity Detection is enabled by the **Activity Detection** key or **Menu** key, the Key Beep A sounds from the transceiver.

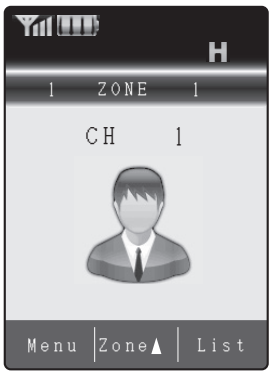


● Disabling the Activity Detection

1 Do one of the following operations while Activity Detection is enabled.

- Press the **Activity Detection** key.
- Select a channel where Activity Detection is disabled.
- Press the **Menu** key to enter Menu Mode, and select “Activity Detection” and then select “Off”. (TK-Dx00 with LCD only)

Activity Detection is disabled. In the case of TK-Dx00 with LCD, the “ ” icon disappears.
If Activity Detection is disabled by the **Activity Detection** key or **Menu** key, the Key Beep B sounds from the transceiver.



Configuration using KPG-166D

- Assigning functions to the PF keys (See Edit > Key Assignment)
- Configuring the Activity Detection to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2)

Man-down Detection

Man-down Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver becomes tilted and continues this position for longer than the time configured for Man-down Delay Time.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status when a user falls due to an accident.

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 transceiver returns from the tilted position before the time configured for Man-down Delay Time elapses.

Also, the threshold of the tilt angle for detecting the transceiver in the tilted state (Man-down Angle) can be configured to one of 45 degrees, 60 degrees and 75 degrees.

Note

- While the time configured for Man-down Delay Time elapses, pressing the **PTT** switch pauses the countdown of Man-down Delay Time. Releasing the **PTT** switch resumes the countdown.
- Pressing the **Activity Reset** key resets the Man-down Delay Time timer and start the countdown from the beginning.

Configuration using KPG-166D

- Configuring the Man-down Detection to be enabled or disabled (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Delay Time (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Pre-alert (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Man-down Angle (See Edit > Emergency Information > Emergency 1 > Activity Detection)

Stationary Detection

Stationary Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver becomes stationary and continues this state for longer than the time configured for Stationary Delay Time.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status because a user cannot operate the transceiver due to an accident.

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 transceiver returns from the stationary position before the time configured for Stationary Delay Time elapses.

Note

- While the time configured for Stationary Delay Time elapses, pressing the **PTT** switch pauses the countdown of Stationary Delay Time. Releasing the **PTT** switch resumes the countdown.
- Pressing the **Activity Reset** key resets the Stationary Delay Time timer and start the countdown from the beginning.

Configuration using KPG-166D

- Configuring the Stationary Detection to be enabled or disabled (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Stationary Delay Time (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Stationary Pre-alert (See Edit > Emergency Information > Emergency 1 > Activity Detection)

Motion Detection

Motion Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver becomes strongly shaken, such as an acute vibration, and continues this state for longer than the time configured for Motion Delay Time.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status because the strong shaking continues due to an accident.

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 transceiver returns from the acute movement state before the time configured for Motion Delay Time elapses.

Note

- While the time configured for Motion Delay Time elapses, pressing the **PTT** switch pauses the countdown of Motion Delay Time. Releasing the **PTT** switch resumes the countdown.
- Pressing the **Activity Reset** key resets the Motion Delay Time timer and start the countdown from the beginning.

Configuration using KPG-166D

- Configuring the Motion Detection to be enabled or disabled (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Motion Delay Time (See Edit > Emergency Information > Emergency 1 > Activity Detection)
- Configuring the Motion Pre-alert (See Edit > Emergency Information > Emergency 1 > Activity Detection)

The transceiver is equipped with functions to enhance secrecy in communications variously on an analog channel and on a DMR digital channel.

15.1 Built-in Voice Scrambler (Analog)

Compatible model: TK-Dx40

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

Voice Scrambler can be used only in an Analog Conventional system.

Enabling Voice Scrambler

Voice Scrambler is enabled by a user selecting an analog channel where Voice Scrambler is enabled. For Mobile, “Sr” is displayed for 1 sec.

Voice Scrambler can be enabled or disabled for each channel by using KPG-166D.

A Scrambler Code from 1 to 16, which is used for when the transceiver scrambles and sends the audio signal and when the transceiver receives the scrambled audio signal, can also be configured for each channel.

Note

- The inversion frequency of each Scrambler Code from 1 to 16 can be configured in the range from 2000 Hz to 4096 Hz by using KPG-166D.
- For Mobile, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue) when Voice Scrambler is enabled. (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

- Configuring the Voice Scrambler to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Scrambler Settings (Analog))
- Configuring the Scrambler Code (See Edit > Zone Information > Channel Edit > Page 2 > Scrambler Settings (Analog))
- Configuring the inversion frequency of a Scrambler Code (See Edit > Optional Features > Optional Features 2 > Scrambler)

Toggling the Voice Scrambler between Enabled and Disabled

The configuration status of Voice Scrambler for each channel can be toggled between enabled and disabled by using the **Scrambler** key.

Pressing the **Scrambler** key toggles the Voice Scrambler between enabled and disabled.

Note

- If the status of Voice Scrambler (to be enabled or disabled) is toggled on the channel where “Mixed” is configured for Channel Type, the status of Voice Scrambler (to be enabled or disabled) applies to the mode configured for Transmit Mode (Analog or DMR).
- The Voice Scrambler status (to be enabled or disabled) can be configured for each channel, so the configured Voice Scrambler status applies only to the selected channel.

Operating the Transceiver

● Enabling Voice Scrambler

1 **Press the Scrambler key while Voice Scrambler is disabled.**

Voice Scrambler is enabled.
For Mobile, “Sr” is displayed for 1 sec. For Mobile, when the two dots in the LED display (left dot and right dot) and the LED (blue) are configured to light up, each of the LEDs also remains lit while Voice Scrambler is enabled.

● Disabling Voice Scrambler

1 **Press the Scrambler key while Voice Scrambler is enabled.**

Voice Scrambler is disabled.

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Configuring Scrambler Code

Supported Models: Mobile

Pressing and holding the **Scrambler** key causes the transceiver to enter Scrambler Code Mode.

In Scrambler Code Mode, a 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 also 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.

Note

The Scrambler Code can also be configured for each channel by using KPG-166D. In addition, the Scrambler Code configured for each channel by using KPG-166D can be changed by the operation of the transceiver.

Operating the Transceiver

1 **Press and hold the Scrambler key.**

The transceiver enters Scrambler Code Mode. “co” appears on the LED display for 1 sec and then the Scrambler Code configured for the selected channel appears. The right dot blinks at this time.

2 **Select a Scrambler Code by pressing the [<B] or [C>] key.**

3 **Press the [S] key.**

The transceiver exits Scrambler Code Mode and the selected Scrambler Code is configured for the transceiver.

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Scrambler Status Memory

Scrambler Status Memory is the function to retain the Voice Scrambler function status, either enabled or disabled, in the transceiver.

If Scrambler Status Memory is enabled, the stored configuration for the Voice Scrambler function status, either enabled or disabled, is read as default when data is read from the transceiver by using KPG-166D.

Configuration using KPG-166D

Configuring the Scrambler Status Memory (See Edit > Optional Features > Optional Features 1 > Common Page 1)

15.2 Scrambler (DMR Digital)

Scrambler is the function that enhances secrecy in communications on the DMR digital channels by encrypting audio data.

The Scrambler 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 Scrambler is enabled, the transceiver encrypts and then sends audio data. If Scrambler is disabled, the transceiver transmits audio data without encryption.

Reception

Upon receipt of the encrypted audio 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 Scrambler status (enabled or disabled) and the configuration for Scrambler Type. Refer to Transceiver's Behavior upon Receipt of the Encrypted Audio Data on page 427 for details.

The encryption key data that is used for the Scrambler function can be configured up to 16 entries in the Multi-key List by the use of KPG-166D. Status of Scrambler, either enabled or disabled, and the Multi-key List Number having the encryption key data can be configured for each channel. (Refer to Multi-key List on page 428.)

For TK-Dx00 with LCD and TK-Dx40 (Mobile), the Scrambler status (enabled or disabled) and the encryption key data used for communication can be changed by the transceiver operation.

Configuration using KPG-166D

- Configuring the encryption key data (See Edit > Scrambler)
- Configuring Scrambler to be enabled or disabled (See Edit > Zone Information > Channel Edit > Page 2 > Scrambler Settings)
- Configuring the Multi-key List Number (See Edit > Zone Information > Channel Edit > Page 2 > Scrambler Settings)

Toggling the Scrambler between Enabled and Disabled

Pressing the **Scrambler** key toggles the Scrambler between enabled and disabled.

In the case of TK-Dx00 with LCD, by pressing the **Menu** key for the transceiver to enter the Menu Mode, you can select “Scrambler” to enable or disable Scrambler. (Refer to 3.4 Using Menu Mode on page 24.)

If Scrambler is enabled, the transceiver encrypts and then sends audio data. If Scrambler is disabled, the transceiver transmits audio data without encryption.

The receiving behavior of the transceiver differs depending on the Scrambler status, either to be enabled or disabled, and the configuration for Scrambler Type. Refer to Transceiver’s Behavior upon Receipt of the Encrypted Audio Data on page 427 for details.

Note

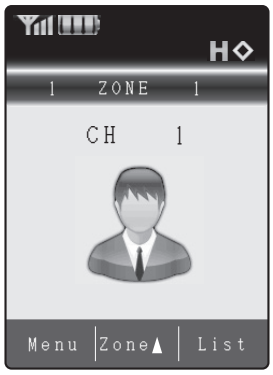
- If the status of Scrambler (to be enabled or disabled) is switched on the channel where “Mixed” is configured for Channel Type, the status of Scrambler (to be enabled or disabled) applies for the Receive Mode (DMR) and Transmit Mode (DMR).
- The Scrambler status (to be enabled or disabled) can be configured for each channel, so the configured Scrambler status applies only for the selected channel.

Operating the Transceiver

- **Enabling Scrambler**

1 **Press the Scrambler key while Scrambler is disabled.**

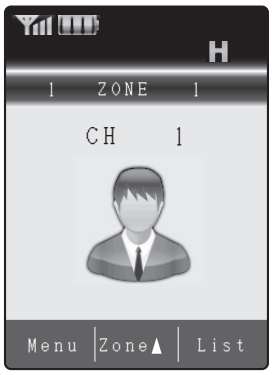
Scrambler is enabled.
In the case of TK-Dx00 with LCD, the “ ◇ ” icon lights up.
In the case of TK-Dx40 (Mobile), “Sr” is displayed for 1 sec.



● Disabling Scrambler

1 Press the Scrambler key while Scrambler is enabled.

Scrambler is disabled.
In the case of TK-Dx00 with LCD, the " " icon disappears.
In the case of TK-Dx40 (Mobile), the number of the channel selected is displayed.



Note

For TK-Dx40 (Mobile), when Voice Scrambler is enabled, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

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

Configuring the Encryption Key Data Used for Communications

Compatible model: TK-Dx00 with LCD/ TK-Dx40 (Mobile)

Pressing and holding the **Scrambler** key causes the transceiver to enter Scrambler Code Mode. In Scrambler Code Mode, the encryption key data used for communications can be configured by selecting the key data from the Multi-key List. (Refer to Multi-key List on page 428.)

In the case of TK-Dx00 with LCD, by pressing the **Menu** key for the transceiver to enter the Menu Mode, you can select “Scrambler” for the transceiver to enter Scrambler Code Mode so as to configure the encryption key data to be used for communication. (Refer to 3.4 Using Menu Mode on page 24.)

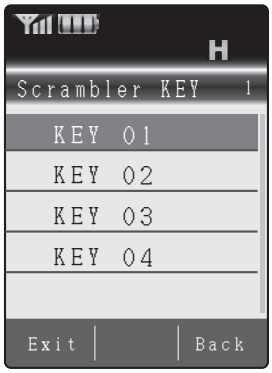
Note

The Multi-key List Number having the encryption key data can be configured for each channel.

Operating the Transceiver

1 **Press and hold the Scrambler key.**

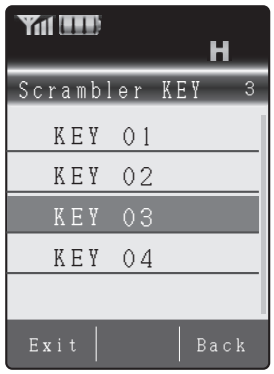
The transceiver enters Scrambler Code Mode.
In the case of TK-Dx00 with LCD, the Key Data configured is displayed.
In the case of TK-Dx40 (Mobile), “CO” is displayed for 1 sec.
For TK-Dx40 (Mobile), Scrambler is enabled.



The following operations are identical if the transceiver enters Scrambler Code Mode by pressing the **Menu** key.

2 **Select Key Data.**

TK-Dx00 with LCD:
Select by pressing the **Up** or **Down** key.
TK-Dx40 (Mobile):
Select by pressing the **Right Up** or **Right Down** key.
Refer to Selecting or Clearing Data from a List on page 45 for selection methods.



3 Confirm the Key Data selected.

TK-Dx00:
Press the **Side 1** key.
TK-Dx40 (Mobile):
Press the **[S]** key.
The selected value of Key Data is configured.

Configuration using KPG-166D

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

Transceiver's Behavior upon Receipt of the Encrypted Audio Data

Upon receipt of the encrypted communication data, the transceiver behaves as follows according to the Scrambler status (enabled or disabled) and the configuration for Scrambler Type.

If Scrambler Is Enabled:

Regardless of the configuration for Scrambler Type, the received audio outputs from the speaker according to the audio control conditions and the configuration in the Multi-key List.

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.

If Scrambler Is Disabled:

Following are the transceiver behaviors that may vary depending on the configuration for Scrambler Type (Type 1 or Type 2):

- **Type 1**
  The received audio outputs from the speaker according to the audio control conditions and the configuration in the Multi-key List.
  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.
- **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 Scrambler status (enabled or disabled) or configuration for Scrambler Type.

Configuration using KPG-166D

Configuring the Scan Type (See Edit > Scrambler)

Multi-key List

Multi-key List is the list to configure the encryption key data, that is used for encryption and decryption of communication data. A maximum of 16 sets of encryption key data can be configured in the Multi-key List by using KPG-166D.

The following parameters can be configured:

- **Key Data**
  Key Data allows you to configure the encryption key data in the range of 1 to 32767.
- **Key Name (TK-Dx00 only)**
  Key Name allows you to configure using a maximum of 14 alphanumeric characters and symbols a name corresponding to the encryption key data.

Configuration using KPG-166D

Configuring the encryption key data (See Edit > Scrambler)

Scrambler Status Memory

Scrambler Status Memory is the function to retain the status of the Scrambler function, either enabled or disabled, and the configuration of a Multi-key.

If the Scrambler Status Memory function is enabled, the stored status of the Scrambler function, either enabled or disabled, and the configuration of a Multi-key are read as default when data is read from the transceiver by using KPG-166D.

Configuration using KPG-166D

Configuring the Scrambler Status Memory (See Edit > Optional Features > Optional Features 1 > Common Page 1)

16.1 Prioritizing Data Communications Using an External Device (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 16-1 Data Override

Configuration	Description
Enabled	Data communications using an external device has a high priority level. Data Override is activated for receiving PC commands from a serial port. For TK-Dx40 (Mobile), Data Override is also activated when the following AUX Input ports are at low level. • 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: • Function Mode • While the Public Address function is used (AUX Input Only) • Pressing the **Home Channel** key to temporarily migrate the channel (TK-Dx00 only) • While the Selcall matches
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 in Emergency Mode
  - While the transceiver is in the Stun state
  - While the Public Address function is used (TK-Dx40 (Mobile) only)
- Data Override ends automatically when the transceiver is under the following statuses:
  - In Transceiver Password Mode
  - VOX Gain Level Mode

Configuration using KPG-166D

- Configuring the Data Override (Serial Input) (TK-Dx00 only) (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Input)
- Configuring the Data Override (TK-Dx40 (Mobile)) (See Edit > Extended Function > AUX > AUX Input)

16.2 Notifying Status Changes of the Transceiver by Sending PC Commands (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 using KPG-166D.

The PC command that indicates the status is not sent from the COM Port 0 of TK-Dx40 (Mobile).

Configuration using KPG-166D

Configuring the J Command Serial Output (See Edit > Optional Features > Optional Features 1 > Common Page 4 > Serial Input)

Scan is the function to search automatically whether the transceiver receives a signal on multiple channels.

The transceiver sequentially checks for availability of a signal on each channel, and the transceiver receives a signal on the channel where the signal is detected.

17.1 Starting the Scan

Pressing the **Scan** key or pressing the **Menu** key to enter Menu Mode and selecting the “Scan” causes the transceiver to start the scan as configured for Scan Type. (Refer to 3.4 Using Menu Mode on page 24.)

- **Single Scan**
  The transceiver scans the channels to be scanned in the zone selected when the scanning starts.
- **Multi Scan**
  The transceiver scans all target channels in the target zones.

17.2 Scanning in One Zone (Single Scan)

The transceiver scans using Single Scan all the channels to be scanned in the zone where the transceiver starts scanning.

Channels to be scanned are configured as the target channels for scanning using the **Scan Delete/Add** key or KPG-166D.

To use Single Scan, “Single” is configured for Scan Type using KPG-166D.

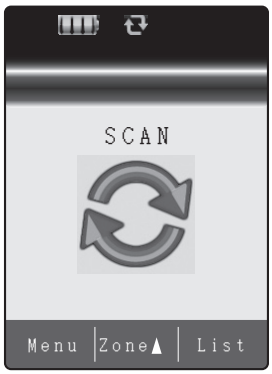
Note

- In the case of TK-Dx00, if Selected Channel Scan is enabled, the selected channel can be scanned even if the channel is excluded from the target channels for scanning. (Refer to Selected Channel Scan on page 445.)
- During Single Scan on Portable, the transceiver pauses scanning when the zone is changed to one that is not configured using the **Selector** for which “Zone Select” is configured.

Operating the Transceiver

1 Press the Scan key.

The transceiver starts scanning.
For TK-Dx00 with LCD, “SCAN” appears on the display and the “ ” icon lights up.
For TK-Dx40 (Mobile), “Sc” appears on the LED display.
For TK-Dx00 without LCD and TK-Dx40 (Portable), the LED blinks green.



Note

For TK-Dx00, if a channel is fixed and the transceiver cannot resume scanning, such as when the transceiver is migrating to the Home Channel, etc., the “ ” icon blinks (TK-Dx00 with LCD only) and a Scan Stop Tone continues to sound from the transceiver.

2 Press the Scan key during the scan.

Scanning ends.
For TK-Dx00, “ ” disappears.
For TK-Dx40 (Mobile), the number of the channel selected is displayed.
For TK-Dx00 without LCD and TK-Dx40 (Portable), the LED turns off and the scan ends.

Configuration using KPG-166D

- Configuring the Scan Add to be enabled or disabled for each channel (See Edit > Zone Information > Channel Edit > Page 1)
- Configuring the Scan Type (See Edit > Scan Information)
- Assigning functions to the PF keys (See Edit > Key Assignment)

17.3 Scanning All Target Zones for Scanning (Multi Scan)

The transceiver scans using Multi Scan all the channels to be scanned in the zones to be scanned.

Following are the zone channels to be scanned:

- The zone configured to be scanned using KPG-166D or the **Zone Delete/Add** key
- The channel configured to be scanned using KPG-166D or the **Scan Delete/Add** key

To use Multi Scan, “Multi” is configured for Scan Type using KPG-166D.

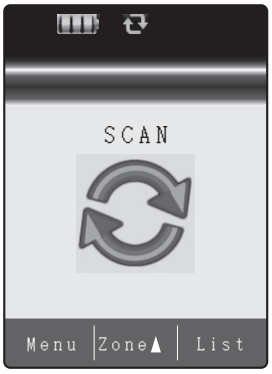
Note

- In the case of TK-Dx00, if Selected Channel Scan is enabled, the selected channel can be scanned even if the channel is excluded from the target channels for scanning. (Refer to Selected Channel Scan on page 445.)
- During Multi Scan on Portable, the transceiver pauses scanning when the zone is changed to one that is not configured using the **Selector** for which “Zone Select” is configured.

Operating the Transceiver

1 Press the Scan key.

The transceiver starts scanning.
For TK-Dx00 with LCD, “SCAN” appears on the display and the “ ” icon lights up.
For TK-Dx40 (Mobile), “Sc” appears on the LED display.
For TK-Dx00 without LCD and TK-Dx40 (Portable), the LED blinks green.



Note

For TK-Dx00, if a channel is fixed and the transceiver cannot resume scanning, such as when the transceiver is migrating to the Home Channel, etc., the “ ” icon blinks (TK-Dx00 with LCD only) and a Scan Stop Tone continues to sound from the transceiver.

2 Press the Scan key during the scan.

Scanning ends.
For TK-Dx00, “ ” disappears.
For TK-Dx40 (Mobile), the number of the channel selected is displayed.
For TK-Dx00 without LCD and TK-Dx40 (Portable), the LED turns off and the scan ends.

Configuration using KPG-166D

- Configuring the Zone Add to be enabled or disabled for each zone (See Edit > Zone Information > Zone Edit)
- Configuring the Scan Add to be enabled or disabled for each channel (See Edit > Zone Information > Channel Edit > Page 1)
- Configuring the Scan Type (See Edit > Scan Information)
- Assigning functions to the PF keys (See Edit > Key Assignment)

17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan)

Compatible model: TK-Dx40

By using Priority Scan, the transceiver is able to scan a channel with a higher priority level regardless of the scan configuration of the respective channels.

When Priority Channel is configured, the Priority Channel is monitored by Lookback even when scan is paused in the Normal Channel (channel that is not a Priority Channel).

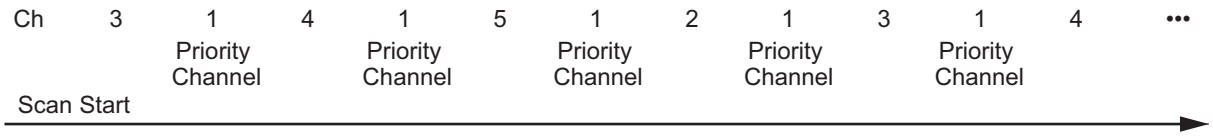


Figure 17-1 Priority Scan

The transceiver scans the Priority Channel according to the interval configured in Lookback Time A and Lookback Time B. (Refer to Lookback on page 436.)

For TK-Dx40 (Portable), one Priority Channel can be configured for each transceiver. For TK-Dx40 (Mobile), two Priority Channels can be configured for each transceiver. The type of Priority Channel can be selected from “None”, “Fixed”, “Selected” and “Operator Selectable”.

Table 17-1 Priority

Configuration	Description
None	Priority Channel is not configured.
Fixed	**TK-Dx40 (Portable):** Uses the channel configured in Priority Zone-Channel as the Priority Channel. **TK-Dx40 (Mobile):** Uses the channels configured in Priority 1 Zone-Channel and Priority 2 Zone-Channel as the Priority Channels.
Selected	Uses the selected channel as the Priority Channel.
Operator Selectable	Uses the channel configured by a user as the Priority Channel. **TK-Dx40 (Portable):** By pressing the **Priority-channel Select** key after selecting the channel to be configured as the Priority Channel, a Tone A sounds from the transceiver and the selected channel becomes the Priority Channel. **TK-Dx40 (Mobile):** By pressing the **Priority-channel Select** key after selecting the channel to be configured as the Priority Channel, the transceiver enters Priority-channel Select Mode. The Priority Channel can be configured in Priority-channel Select Mode. (Refer to Configuring the Priority Channel on page 435.)

Note

- If Priority-channel Stop Tone is enabled, a Priority-channel Tone sounds from the transceiver when the scan is paused on the Priority Channel.
- The Priority Channel is scanned even if the Priority Channel is excluded from the target channels for scan.
- Priority Channel is not monitored by Lookback while scan is paused in the Priority Channel.
- When the channel configured as the Priority Channel is selected, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

- Configuring the Priority (Portable) (See Edit > Scan Information)
- Configuring the Priority Zone-Channel (Portable) (See Edit > Scan Information)
- Configuring Priority 1/ Priority 2 (Mobile) (See Edit > Scan Information)
- Configuring Priority 1 Zone-Channel/ Priority 2 Zone-Channel (Mobile) (See Edit > Scan Information)
- Assigning functions to the PF keys (See Edit > Key Assignment)

Configuring the Priority Channel

Compatible model: TK-Dx40 (Mobile)

The Priority Channel can be configured in Priority-channel Select Mode by operating the transceiver.

By pressing the **Priority-channel Select** key, the transceiver enters Priority-channel Select Mode.

The transceiver can enter Priority-channel Select Mode only if “Operator Selectable” is configured for Priority 1 or Priority 2.

Operating the Transceiver

1 **Press the Priority-channel Select key after selecting the channel to be configured as the Priority Channel.**

“Pr” appears for 1 sec and then the transceiver enters Priority-channel Select Mode.

2 **Select the priority of the channel by pressing the Right Up or Right Down key.**

The options are as follows:
nr: Normal Channel
P1: Priority 1 Channel
P2: Priority 2 Channel
PP: Priority 1 & Priority 2 Channels

3 **Press the [S] or [*] key.**

Priority is configured for the selected channel and the transceiver exits Priority-channel Select Mode.

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Lookback

Lookback is a feature for checking the Priority Channel at periodic intervals during reception by the Normal Channel (channel that is not a Priority Channel) when a Priority Channel is configured for the transceiver.

Lookback Time A or Lookback Time B is applied as the interval for checking the Priority Channel depending on the reception status of the Priority Channel.

Lookback Time A

Lookback Time A refers to the time interval for checking the Priority Channel during Priority Scan when a carrier is not present in the Priority Channel while the transceiver uses a Normal Channel with a carrier different from that of the Priority Channel for reception.

As calls might be constantly received from the Priority Channel, it is recommended that Lookback Time A be configured to an interval that is shorter than that of Lookback Time B.

Lookback Time B

Lookback Time B refers to the time interval for checking the Priority Channel during Priority Scan when a carrier is present in the Priority Channel but the QT tone, DQT code or Color Code does not match with that of the transceiver while the transceiver uses a Normal Channel with a carrier different from that of the Priority Channel for reception.

Configuration using KPG-166D

- Configuring the Lookback Time A (See Edit > Scan Information)
- Configuring the Lookback Time B (See Edit > Scan Information)

Priority-channel Stop Tone

Priority-channel Stop Tone is a feature for sounding the Priority-channel Tone from the transceiver when reception is carried out by the Priority Channel during the scan and scan is paused.

Configuration using KPG-166D

Enabling/Disabling the Priority-channel Stop Tone (See Edit > Scan Information)

17.5 Transceiver Behavior during the Scan

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 Dropout Delay Time on page 444, Dwell Time on page 444.)

Conditions to Activate the Scan

If the **Scan** key is pressed while the transceiver is not scanning or the “Scan” is selected after entering Menu Mode by pressing the **Menu** key, the transceiver starts one of Single Scan or Multi Scan according to the configuration for Scan Type.

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.

- **Single Scan**
  - Two or more channels to be scanned must coexist in the zone targeted to be scanned.
  - There is one channel to be scanned in the selected zone, and a Priority Channel exists in that zone or a different zone (TK-Dx40 (Mobile) only).
- **Multi Scan**
  - Two or more channels to be scanned must coexist in the zone targeted to be scanned.
  - There is one channel to be scanned in the zone to be scanned, and a Priority Channel exists in that zone or a different zone (TK-Dx40 (Mobile) only).

Conditions to Resume the Scan

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. (TK-Dx00 with LCD only)

- **Single Scan**
  - Two or more channels to be scanned must coexist in the zone targeted to be scanned.
  - There is one channel to be scanned in the selected zone, and a Priority Channel exists in that zone or a different zone (TK-Dx40 (Mobile) only).
- **Multi Scan**
  - Two or more channels to be scanned must coexist in the zone targeted to be scanned.
  - There is one channel to be scanned in the zone to be scanned, and a Priority Channel exists in that zone or a different zone (TK-Dx40 (Mobile) only).

Pressing the **Scan Delete/Add** key while scan pauses deletes or adds the current channel temporarily. Maintains the current state until scanning is stopped by pressing the **Scan** key or, in the case of TK-Dx00 with LCD, by pressing the **Menu** key and selecting “Scan” in the Menu Mode.

Note

If Off-hook Scan is disabled on TK-Dx40 (Mobile), scan resumes when the microphone switches from the off-hook to the on-hook state. Scan does not resume if the above condition is not satisfied. (Refer to Starting Scanning in Tandem with the Microphone (Off-hook Scan) on page 446.)

Transceiver Behavior in the Case that the Scan Cannot Be Resumed

Scanning remains in the paused state in the selected channel if the zone is switched manually to one that does not meet the requirements to resume scanning. In this case, the " " icon starts to blink on TK-Dx00 with LCD.

The transceiver transmits using the Revert Channel when the **PTT** switch is pressed in this state. Upon elapse of the time configured for Dwell Time after completion of the transmission, the transceiver reverts to the selected channel; however, the scan does not resume.

Note

If Off-hook Scan is disabled on Mobile, scan does not resume if the microphone remains in the off-hook state. (Refer to Starting Scanning in Tandem with the Microphone (Off-hook Scan) on page 446.)

Transceiver Behavior in the Case That a Zone Channel Is Changed during the Scan

The transceiver scans as follows when the zone channel is changed while the following appears on the display.

Table 17-2 Transceiver Behavior after the Zone Channel Is Changed

Display	Description
SCAN (TK-Dx00 with LCD) SC (TK-Dx40 (Mobile))	The transceiver pauses scanning on the selected channel. The transceiver resumes scanning after the Key Delay Time elapses (1 sec).
Revert Channel	The transceiver pauses scanning on the selected channel if the Revert Channel is different from the selected channel.

- In the case of TK-Dx00, if the **Home Channel** key is pressed during the scan, the transceiver pauses the scanning while the transceiver is migrating to the Home Channel and a Scan Stop Tone will continue to sound. (Refer to Scan Stop Tone on page 445.)

Transceiver Behavior in the Case That a Zone Channel Is Changed Manually while the Scan Pauses to Receive

The transceiver scans as below when a user manually changes the Zone-channel while the scan pauses to receive.

- The transceiver continues to pause scanning on the selected channel if the channel where the transceiver pauses scanning differs from the selected channel.

Reception during the Scan

While the transceiver scans, the transceiver will receive as follows:

QT/DQT/Color Code Behavior

If the received QT tone, DQT code, or Color Code on each channel matches the QT tone, DQT code, or Color Code preconfigured for the transceiver, the transceiver pauses scanning. Dropout Delay Time is activated if the QT tone, DQT code, or Color 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 Channel. The transceiver starts counting down the Dwell Time when the transmission ends, and then resumes scanning after the Dwell Time elapses.

QT/ DQT/ Color Code - Optional Signaling: AND Behavior

If the received QT tone, DQT code, or Color Code matches the QT tone, DQT code, or Color Code preconfigured for the transceiver, the transceiver pauses scanning. The transceiver does not emit the received audio and then waits to receive an Optional Signaling (DMR ID).

The transceiver resumes scanning after the length of time configured for Dropout Delay Time elapses, if the QT tone, DQT code or Color Code matching state is reset while waiting to receive the Optional Signaling.

The transceiver activates Alert LED and Alert Tone and outputs the received audio 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 (FleetSync): OR Behavior

Compatible model: TK-Dx40

The transceiver receives the QT tone or DQT code, and if it matches the QT tone or DQT code preconfigured for the transceiver, the transceiver pauses scanning. The transceiver outputs the received audio from the speaker and waits to receive an Optional Signaling.

If the QT tone or DQT code does not match with that of the transceiver while waiting to receive the Optional Signaling, the transceiver stops output of the received audio and resumes scanning after the length of time configured for Dropout Delay Time has elapsed.

If scan is paused when the Optional Signaling received matches with that configured for the transceiver, the paused state continues until the Optional Signaling is reset.

Conditions to Pause the Scan (Scan Configuration) (5-tone System Only)

Refer to 10.7 Conditions to Pause Scanning (Scan Configuration) on page 287 for details about Scan Configuration.

17.6 Common Functions for Scan

The following functions are relevant to the scan.

- Scan Delete/Add
- Zone Delete/Add
- Revert Channel
- Dropout Delay Time
- Dwell Time
- Revert Channel Display
- Power-on Scan
- Selected Channel Scan
- Scan Stop Tone

Adding or Deleting a Channel to/from the Target Channels for Scanning (Scan Delete/Add)

Scan Delete/Add is the function to add a channel to the target channels for scanning or delete a channel from the target channels for scanning.

With this function, a user can reliably receive a call from a primary channel by deleting unnecessary channels 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 or deletes a channel to/from the target channels for scanning.

(b) Pressing the **Scan Delete/Add** key while the transceiver temporarily pauses scanning temporarily adds or deletes a channel to/from the target channels for scanning. This status is retained until the scan is stopped by pressing the **Scan** key, and the status will be cleared when the scan is complete.

(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, TK-Dx00 without LCD and TK-Dx40 (Portable) only allow the operation to temporarily delete a channel for scanning in (b) above. Also, TK-Dx00 without LCD and TK-Dx40 (Portable) do not allow (a) and the operation to temporarily add a channel for scanning.

In the case of TK-Dx00 with LCD, the same operations as above can also be performed by pressing the **Menu** key to enter the Menu Mode and selecting "Scan Delete/Add". (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

- **TK-Dx00 without LCD/ TK-Dx40 (Portable)**

1 **Press the Scan Delete/Add key.**

If the selected channel is configured to be scanned, the channel is deleted from the target channels for scanning.
If the selected channel is not configured to be scanned, a Key-entry Error Tone sounds from the transceiver and the transceiver does not respond at all.

- **TK-Dx00 with LCD/ TK-Dx40 (Mobile)**

1 **Press the Scan Delete/Add key.**

If the selected channel is configured to be scanned, the channel is deleted from the target channels for scanning.
TK-Dx00 with LCD:
The " " icon (right) disappears.
TK-Dx40 (Mobile):
"cd" appears for 1 sec.
If the selected channel is not configured to be scanned, the channel is added to the target channels for scanning.
TK-Dx00 with LCD:
The " " icon (right) lights up.
TK-Dx40 (Mobile):
"cA" appears for 1 sec.
For TK-Dx00 with LCD, if "Scan Delete/Add" is selected after entering the Menu Mode by pressing the **Menu** key, "Delete" or "Add" must be selected. (Refer to 3.4 Using Menu Mode on page 24.)

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-166D

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

Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add)

Zone Delete/Add is the function to add a zone to the target zones for scanning or delete a zone from the target zones for scanning.

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 or deletes a zone to or from the target zones for scanning.

For TK-Dx00 with LCD, a zone can be added to or deleted from the target zones for scanning by selecting “Zone Delete/Add” after entering the Menu Mode by pressing the **Menu** key. (Refer to 3.4 Using Menu Mode on page 24.)

Operating the Transceiver

- **TK-Dx00 without LCD/ TK-Dx40 (Portable)**

1 Press the **Zone Delete/Add** key.

If the selected zone is configured to be scanned, the zone is deleted from the target zones for scanning.
If the selected zone is not configured to be scanned, the zone is added to the target zones for scanning.

- **TK-Dx00 with LCD/ TK-Dx40 (Mobile)**

1 **Press the Zone Delete/Add key.**

If the selected zone is configured to be scanned, the zone is deleted from the target zones for scanning. In the case of TK-Dx00 with LCD, the “ ” icon (left) disappears. For TK-Dx40 (Mobile), “Sc” appears in the LED display.
If the selected zone is not configured to be scanned, the zone is added to the target zones for scanning. In the case of TK-Dx00 with LCD, the “ ” icon (left) lights up. For TK-Dx40 (Mobile), “GA” appears in the LED display.
For TK-Dx00 with LCD, if “Zone Delete/Add” is selected after entering the Menu Mode by pressing the **Menu** key, “Delete” or “Add” must be selected. (Refer to 3.4 Using Menu Mode on page 24.)

Note

- This function cannot be used if “Single” is configured for the Scan Type.
- By pressing the **Zone Delete/Add** key during a scan, the Key-error Entry Tone sounds from the transceiver, and this operation has no effect to the transceiver.
- By pressing the **Zone Delete/Add** key while a scan is a temporarily paused, the zone will be temporarily deleted from or added to the target zones for scanning. This status is retained until the scan is stopped by pressing the **Scan** key, and the status will be cleared when the scan is complete.
- Pressing the **Scan 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.

Configuration using KPG-166D

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

Revert Channel

Revert Channel is the Zone-channel which is used when the transceiver transmits by a user pressing the **PTT** switch during the scan.

Table 17-3 Revert Channel

Configuration	Description
Last Called + Selected	The transceiver transmits on the last-called Zone-channel by a user pressing the **PTT** switch during the scan. The transceiver transmits on the Zone-channel where the transceiver pauses scanning by a user pressing the **PTT** switch while the scan pauses. If the Zone-channel is changed, the transceiver transmits using the new channel after the Zone-channel is changed until the transceiver receives another call.
Selected	The transceiver transmits on the new channel after the Zone-channel is changed regardless of the scanning status.
Selected + Talkback	The transceiver transmits on the new Zone-channel after the Zone-channel is changed during the scan. The transceiver transmits on the Zone-channel where the transceiver pauses scanning while the scan pauses.
Priority (TK-Dx40 (Portable) only)	The transceiver carries out transmission on the Priority Channel regardless of the scan status.
Priority + Talkback (TK-Dx40 (Portable) only)	The transceiver carries out transmission on the Priority Channel while scanning is in progress. The transceiver carries out transmission on the Zone Channel where the transceiver pauses scanning while the scan pauses.
Priority 1 (TK-Dx40 (Mobile) only)	The transceiver carries out transmission on the Priority 1 Channel regardless of the scan status.
Priority 1 + Talkback (TK-Dx40 (Mobile) only)	The transceiver carries out transmission on the Priority 1 Channel while scanning is in progress. The transceiver carries out transmission on the Zone Channel where the transceiver pauses scanning while the scan pauses.
Priority 2 (TK-Dx40 (Mobile) only)	The transceiver carries out transmission on the Priority 2 Channel regardless of the scan status.
Priority 2 + Talkback (TK-Dx40 (Mobile) only)	The transceiver carries out transmission on the Priority 2 Channel while scanning is in progress. The transceiver carries out transmission on the Zone Channel where the transceiver pauses scanning while the scan pauses.

Note

- If Revert Channel Display is enabled on TK-Dx00 with LCD, Revert Channel can be displayed during the scan. (Refer to Revert Channel Display on page 444.)
- If the Home Channel feature is activated on TK-Dx00, the transceiver carries out transmission on the Home Channel regardless of the configuration of the Revert Channel.
- Talkback is an operation to transmit on the Zone-channel on which the transceiver pauses scanning while the scan pauses.

Configuration using KPG-166D

Configuring the Revert Channel (See Edit > Scan Information)

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 Color Code matching state is reset.

The transceiver activates Talkback depending on the configuration for Revert Channel while the amount of time configured for Dropout Delay Time is counting down.

Configuration using KPG-166D

Configuring the Dropout Delay Time (See Edit > Scan Information)

Dwell Time

The scan pauses when the **PTT** switch is pressed to transmit during the scan. Dwell Time is the time from when the transceiver completes transmitting until the transceiver resumes scanning.

The transceiver activates Talkback depending on the configuration for Revert Channel while the amount of time configured for Dwell Time is counting down.

Configuration using KPG-166D

Configuring the Dwell Time (See Edit > Scan Information)

Revert Channel Display

Compatible model: TK-Dx00 with LCD

Revert Channel Display is a function to display the Revert Zone-Channel on the display during the scan.

Configuration using KPG-166D

Configuring the Revert Channel Display to be enabled or disabled (See Edit > Scan Information)

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-166D

Configuring the Power-on Scan to be enabled or disabled (See Edit > Scan Information)

Selected Channel Scan

Selected Channel Scan is a function that is used to add the selected channel to the target channels for scanning even if it is not configured to be scanned.

Configuration using KPG-166D

Configuring the Selected Channel Scan to be enabled or disabled (See Edit > Scan Information)

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.

The transceiver pauses scanning if the conditions to start the scan are not satisfied, for instance while the transceiver is on a Home Channel, and then the Scan Stop Tone sounds.

Also, whether to emit the Scan Stop Tone can be configured using KPG-166D.

Configuration using KPG-166D

Configuring the Scan Stop Tone to be enabled or disabled (See Edit > Scan Information)

Starting Scanning in Tandem with the Microphone (Off-hook Scan)

Compatible model: TK-Dx40 (Mobile)

Off-hook Scan is a feature for starting the scan regardless of the hook status of the microphone.

The transceiver scans as follows according to the configuration for Off-hook Scan.

Table 17-4 Off-hook Scan

Configuration	Description
Enabled	Regardless of whether the microphone is in the on-hook or off-hook state, the transceiver starts scanning when the **Scan** key is pressed.
Disabled	The transceiver starts scanning when the **Scan** key is pressed while the microphone is in the on-hook state, and scanning does not start if it is in the off-hook state. If the microphone switches from the on-hook to off-hook state in the Scan Mode, scanning pauses in the Revert Channel. The transceiver resumes scanning when the microphone switches to the on-hook state.

Note

The hook status of the microphone can be switched using the AUX Input port that is assigned to “External Hook”. (Refer to 19.1 Functions Assignable to the AUX Input Port on page 451.)

Configuration using KPG-166D

Enabling/Disabling the Off-hook Scan (See Edit > Scan Information)

Compatible model: TK-Dx40 (Portable)

VOX is a feature that transmits only the voice input to the microphone without having to press the **PTT** switch.

This feature comes in handy such as when both your hands are occupied and are unable to press the **PTT** switch.

To make use of the VOX feature, you need to connect a headset to the transceiver.

18.1 Enabling VOX

When a channel for which VOX is enabled is selected, the feature is automatically enabled.

VOX can be enabled or disabled for each channel using KPG-166D.

When a channel for which VOX is enabled is selected, transmission starts upon voice input into the microphone.

Note

- To enable VOX for each channel using KPG-166D, you first need to enable the VOX Function.
- When transmission by the transceiver is prohibited such as by the Stun state, transmission via VOX is also disabled.
- If the time interval configured in Time-out Timer has elapsed during transmission via VOX, transmission ends and the transceiver switches to the standby state.

Configuration using KPG-166D

- Enabling/Disabling VOX Function (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)
- Enabling/Disabling VOX (See Edit > Zone Information > Channel Edit > Page 2)

18.2 Configuring the Microphone Input Sensitivity Level (VOX Gain Level)

VOX Gain Level is the microphone input sensitivity level for activating VOX. Adjust the level according to the volume level of the speaker and the surrounding noise conditions to ensure that VOX functions properly when the speaker speaks into the microphone.

VOX Gain Level can be configured using KPG-166D. You can also adjust the VOX Gain Level using the transceiver. The larger the value of the VOX Gain Level, the more sensitive it becomes.

Operating the Transceiver

1 **Turn the transceiver ON while pressing and holding the Side 1 key.**

A Key Beep A tone is output from the transceiver and the LED lights up in orange. The transceiver is now in the VOX Gain Level Mode.
Next, the current VOX Gain Level value is announced.
A Key Beep B tone is output from the transceiver if the VOX Gain Level is “Off”.

2 **Press the Side 1 key to adjust the VOX Gain Level.**

Each time the **Side 1** key is pressed, the VOX Gain Level value changes as follows and the new value is announced.
1 → 2 → 3 ••• 9 → 10 → Off → 1 •••
A Key Beep B tone is output from the transceiver if “Off” is selected.

3 **After changing the VOX Gain Level, press the PTT switch.**

A tone is output from the transceiver and the finalized VOX Gain Level value is announced.
Power off and on the transceiver to start up the transceiver in the User mode.

Note

- Pressing the **Side 2** key while in the VOX Gain Level Mode enables you to enable or disable VOX for the selected channel.
- If “DMR” is configured for Channel Type and Individual Call Acknowledge Request is enabled, enabling or disabling VOX for each channel is not allowed.
- When the VOX Gain Level is higher, it switches to the VOX transmission state upon reacting to softer sound. It is therefore necessary to set the VOX Gain Level to an appropriate value according to the background noise of the surrounding environment.
- VOX can be toggled between enabled or disabled for the channel number selected by the **Selector** regardless of the **Selector** configuration.

Configuration using KPG-166D

Configuring the VOX Gain Level (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)

18.3 Maintaining the Transmission State after VOX Transmission (VOX Delay Time)

VOX Delay Time is the time interval for maintaining the transmission state of the transceiver after VOX transmission is complete. When a user interrupts a conversation, the transceiver returns to the receiving state immediately and the initial part of the conversation after the conversation resumes may not be transmitted. To prevent this from occurring, it is necessary to configure the VOX Delay Time to ensure that all conversations are transmitted and the time interval for maintaining the transmission state is not too long.

After voice input to the microphone ends and the time interval configured in VOX Delay Time has elapsed, the transceiver ends the VOX transmission process.

If there is voice input to the microphone before the time interval configured in VOX Delay Time elapsed, the VOX Delay Time counter is reset and the voice transmission continues.

Configuration using KPG-166D

Configuring the VOX Delay Time (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)

18.4 Disabling VOX Transmission during Voice Output (Transmit Inhibit while Receiving)

Transmit Inhibit while Receiving is a feature that disables VOX transmission while the speaker of the transceiver is unmuted.

You can use this feature to prevent VOX from being activated using voice output from the speaker.

When Transmit Inhibit while Receiving is enabled, VOX transmission is disabled while the speaker is unmuted.

When Transmit Inhibit while Receiving is disabled, VOX transmission is enabled even while the speaker is unmuted.

Configuration using KPG-166D

Enabling/Disabling Transmit Inhibit while Receiving (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)

18.5 Canceling VOX Using PTT Switch (Cancel Operation)

Cancel Operation is a feature for disabling VOX while it is enabled by pressing the **PTT** switch.

When Cancel Operation is enabled, pressing the **PTT** switch disables VOX if it is in the enabled state.

Even if VOX is disabled by the Cancel Operation, VOX can be enabled again by turning off and on the power.

Configuration using KPG-166D

Enabling/Disabling Cancel Operation (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)

18.6 Notifying the Start of VOX Transmission with a Tone (VOX Proceed Tone)

VOX Proceed Tone is a tone that is output from the transceiver to inform the user that voice transmission is now enabled after transmission via VOX has started.

When VOX Proceed Tone is enabled, a tone is output from the transceiver to inform the user that voice transmission is now enabled after transmission via VOX has started.

Note

However, VOX Proceed Tone is not output if output of other tones such as Sidetone and PTT ID Sidetone has been configured.

Configuration using KPG-166D

Enabling/Disabling VOX Proceed Tone (See Edit > Optional Features > Optional Features 2 > Conventional > VOX)

Compatible model: TK-Dx40 (Mobile)

Mobile comes with a function port (AUX Input/ AUX Output) that is programmable for the D-sub 15-pin connector on the rear.

19.1 Functions Assignable to the AUX Input Port

The table below shows functions that can be assigned to the AUX Input port.

Table 19-1 Functions Assignable to the AUX Input Port

Function Name	Description
None	No action even when there is a change in the state of the port.
Audio Mute	Audio Mute is a port for muting the audio reception circuit. Setting the Audio Mute port to low level mutes the audio reception circuit of the transceiver. Setting the Audio Mute port to high level unmutes the audio reception circuit of the transceiver.

Data PTT	Data PTT is a transmission request port used specially for data communication.
	When the Data PTT port is set to low level, the transceiver moves to the analog channel configured in Data Zone-Channel (Analog) and starts transmission.
	When the Data PTT port is set to high level, the transceiver ends the transmission.
	If Data Zone-Channel (Analog) is not configured, a Key-entry Error Tone sounds from the transceiver, and the transceiver does not behave.
	
	Note
	• Data PTT port, External PTT (Voice) port and External PTT (Data) port cannot be used together at the same time.
	• Data PTT port is disabled while the transceiver is in the following modes.
	  • Scrambler Code
	  • Squelch Level
	  • Public Address
	  • Channel Entry
	• All key functions except Emergency and LED Brightness are disabled while the Data PTT port is at low level.

External PTT (Voice)	External PTT is a transmission request port for the voice channel. It is used for transmission requests with respect to devices such as a headset or external microphone. When the External PTT port is set to low level, the transceiver starts the transmission. When the External PTT port is set to high level, the transceiver ends the transmission. Note Data PTT port, External PTT (Voice) port and External PTT (Data) port cannot be used together at the same time.

Function Name	Description
External PTT (Data)	External PTT (Data) is a transmission request port used specially for data communication. External PTT (Data) port can be used in two different ways as follows. ● **When used in combination with DTC** It becomes a transmission request port in the ARQ Mode. After DTC switches to low level, the transceiver switches the External PTT (Data) port to low level and starts transmission. ● **When used in combination with CH/GID Select A to CH/GID Select D** It becomes a transmission request port for an external device for data communication. However, as with the Data PTT port, the transceiver carries out transmission in the selected channel without moving to Data Zone-Channel (Analog). The behavior of the transceiver varies as follows according to the channel when the External PTT (Data) port is at low level. ● **Conventional Zone- Channel (Analog)** Carries out transmission. ● **Conventional Zone- Channel (DMR)** Key-entry Error Tone is output from the transceiver, and transmission is not executed. Note Data PTT port, External PTT (Voice) port and External PTT (Data) port cannot be used together at the same time.

Channel Select A to Channel Select D	Channel Select are ports for using the Remote Zone-Channel List. You can alter the zone channel of the transceiver according to the external device connected to the transceiver. (Refer to 19.3Switching the Zone-Channel Using a Connected External Device (Remote Zone-Channel) on page 455.)
	
	Note
	• The Channel Select ports are disabled while the transceiver is in the following modes.
	  • Time-out Timer
	  • Busy Channel Lockout
	  • Squelch Level
	  • Scrambler Code
	  • Channel Entry
	• All key functions except Emergency, LED Brightness and AUX are disabled while the Channel Select ports are at low level.
	• The AUX (Output), Emergency and External PTT ports remain enabled while the Channel Select ports are at low level.
	• The Data PTT and DTC ports are disabled while the Channel Select ports are at low level.

DTC	DTC is a port for moving to the Data Zone-Channel (Analog) used for data communication. When the DTC port is set to low level, the transceiver moves to the analog channel configured in Data Zone-Channel (Analog). When the DTC port is set to high level, the transceiver returns to the original channel. Note • The transceiver moves to the Data Zone-Channel of Revert Zone if the DTC port switches to low level during scanning. • “DTC” cannot be assigned if “Data PTT” has been assigned to other ports. • “DTC” can be assigned if “External PTT (Data)” has been assigned to other ports. • All key functions except Emergency, LED Brightness and AUX are disabled while the DTC port is at low level or Data Dwell Time.
External Monitor	External Monitor is a port for activating the monitor feature. Setting the External Monitor port to low level enables the monitor feature. Setting the External Monitor port to high level disables the monitor feature.

Function Name	Description
Emergency	Emergency is a port for activating the Emergency feature. Setting the Emergency port to low level switches the transceiver to the Emergency Mode. In the Emergency Mode, the transceiver behaves according to the setting in KPG-166D. Configure and use Emergency Delay Time to prevent any erroneous operation. (Refer to 14COMMUNICATIONS IN AN EMERGENCY on page 394.)
External Hook	As with Local Mic Hook, External Hook is a port for switching the hook state of the microphone. Setting the External Hook port to low level switches the microphone to On-hook. Setting the External Hook port to high level switches the microphone to Off-hook. If both Local Mic Hook and External Hook ports are in the Off-hook state, the microphone switches to Off-hook. The microphone switches to On-hook if any of them is in the On-hook state.
Microphone Mute	Microphone Mute is a port for muting the modulation line of the microphone. Setting the Microphone Mute port to low level mutes the modulation line of the microphone. Setting the Microphone Mute port to high level unmutes the modulation line of the microphone.
AUX Input Status Message	AUX Input Status Message is used as the trigger port for transmitting the DMR or FleetSync Status Message. When the AUX Input Status Message port switches from high level to low level or from low level to high level, a Status Message is sent to the ID configured in Base ID (DMR) or Target ID (FleetSync). KPG-166D can be used to configure two statuses (High → Low and Low → High) for the AUX Input Status Message. In general, it is used as a sensor port for telemetry purposes. (Refer to AUX Input Status Message on page 161.)

Configuration using KPG-166D

Assigning Functions to the AUX Input Port (See Edit > Extended Function > AUX)

Data Dwell Time

Data Dwell Time is the time interval before the transceiver returns to the voice channel when the DTC port or Data PTT port of the AUX Input port switches from low level to high level. It is used in cases such as when an external device is waiting for the receipt confirmation from the transceiver at the other end.

Configuration using KPG-166D

Configuring the Data Dwell Time (See Edit > Extended Function > AUX > AUX Input)

Emergency Delay Time

Emergency Delay Time is the time interval before the transceiver enters the Emergency Mode after the Emergency port switches to low level.

Configuration using KPG-166D

Configuring the Emergency Delay Time (See Edit > Extended Function > AUX > AUX Input)

19.2 Functions Assignable to the AUX Output Port

The table below shows functions that can be assigned to the AUX Output port.

Table 19-2 Functions Assignable to the AUX Input Port

Function Name	Description
None	No action.
COR	The output port switches to low level when the transceiver receives a carrier. In all other instances, the output switches to high level.
TOR	The output port switches to low level when the QT Tone, DQT Code (Analog) or Color Code (DMR) received matches the QT Tone, DQT Code (Analog) or Color Code (DMR) of the transceiver. The output port switches to low level when the transceiver receives a carrier while QT/DQT Decode is not configured. If “Mixed” is configured in Channel Type, the output port switches to low level when QT, DQT, or Color Code matches.
AUX	Port output varies with the AUX key. You can control an external device connected to the AUX port.
PTT Output	The output port switches to low level while the **PTT** switch is pressed down or when the External PTT (Voice) port switches to low level. In all other instances, the output switches to high level.
TXS	The output port switches to low level when the transceiver is in the transmission state. In all other instances, the output switches to high level.
AUX Output Status Message	This is a port for changing the state when the transceiver receives a DMR Status Message. If a Status Message is received and matches with the status number configured for the port, the port switches from high level to low level or low level to high level according to the configuration. KPG-166D can be used to configure two statuses (High → Low and Low → High) for the AUX Output Status Message. In general, it is used as a remote control port for the external device connected to the AUX Output port. (Refer to AUX Output Status Message on page 161.) You can maintain the status of the port even when the power of the transceiver is turned OFF. (Refer to Status Memory (AUX Output Status Message) on page 454.)

Status Memory (AUX Output Status Message)

Status Memory (AUX Output Status Message) is a feature for maintaining the output status of AUX Output Status Message.

When this feature is enabled, you can maintain the output status of AUX Output Status Message. Turning ON the power of the transceiver restores the status to that before it is powered off (high level or low level).

When this feature is disabled, the output status of AUX Output Status Message is not maintained, and the status always switches to high level each time the power of the transceiver is turned ON.

Configuration using KPG-166D

Configuring the Status Memory (AUX Output Status Message) (See Edit > Extended Function > AUX > AUX Output)

19.3 Switching the Zone-Channel Using a Connected External Device (Remote Zone-Channel)

Remote Zone-Channel is a feature that enables switching of up to 15 zones or channels using the Channel Select A to Channel Select D ports.

When the status of the Channel Select A to D ports switches to low level, the zone or channel switches to that configured in the Remote Zone-Channel List.

Table 19-3 Remote Zone-Channel List Numbers Corresponding to Each Channel Select Port

Remote Zone-Channel	AUX Input port			
	Channel Select D	Channel Select C	Channel Select B	Channel 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 specified*1	High	High	High	High

*1 The zone or channel cannot be switched when Remote Zone-Channel is not configured.

Note

Zones or channels for which the channel data is not configured cannot be configured in the Remote Zone-Channel List.

Configuration using KPG-166D

- Assigning Functions to the AUX Input Port (See Edit > Extended Function > AUX)
- Configuring the Remote Zone-Channel List (See Edit > Extended Function > Remote Zone-Channel)

Compatible model: TK-Dx40 (Mobile)

When a transceiver is installed in a vehicle, you can make use of features that are interlinked with the vehicle, such as Ignition Sense and Horn Alert.

20.1 Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense)

Ignition Sense is a feature that is able to power on or off the transceiver automatically according to the Ignition Sense port status of the vehicle. High level is input to the Ignition Sense port when the engine of the vehicle is turned on, and low level is input when the engine is off.

Ignition Sense can be enabled or disabled using KPG-166D.

Note

To make use of the Ignition Sense feature, it is necessary to connect the Ignition Sense cable (KCT-18) with the Ignition Line of the vehicle using KCT-60.

Configuration using KPG-166D

Enabling/Disabling Ignition Sense (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

How to Use the Ignition Sense Port

The way to power on or off the transceiver using the Ignition Sense port varies depending on the Ignition Sense Type configuration.

- **Powering On/Off the Transceiver According to the Ignition Sense Port Status**

  When “Ignition Only” is configured in Ignition Sense Type, the transceiver can be powered on or off according to the state of the Ignition Sense port.

  The transceiver powers on automatically when the Ignition Sense port switches to high level, and the transceiver powers off when it switches to low level. The **Power** switch cannot be used to power on or off the transceiver.

- **Powering On/Off the Transceiver Using Both the Ignition Sense Port and Power Switch**

  When “Ignition and Switch” is configured in Ignition Sense Type, the transceiver can be powered on or off using both the **Power** switch and the Ignition Sense port.

  You can power off the transceiver by pressing the **Power** switch (when the Ignition Sense port is at the high level) even when the vehicle engine is on. However, the status of the **Power** switch will not be memorized in this case. The transceiver powers on automatically when the Ignition Sense port switches from low level to high level.

  You can power on the transceiver by pressing the **Power** switch (when the Ignition Sense port is at the low level) even when the vehicle engine is off.

Configuration using KPG-166D

Configuring the Ignition Sense Type (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

Time Interval before Transceiver Powers Off (Timed Power-off)

Timed Power-off is the time interval from the point the vehicle engine is turned off (Ignition Sense port is at the low level) up to the point when the transceiver power automatically turns OFF.

The transceiver powers off automatically after the vehicle engine is turned off and the time interval configured in Timed Power-off has elapsed. Use it when you want to continue radio communication for some time after the vehicle engine is turned off.

If Warning Tone is configured to a value other than “Off”, the transceiver will output the Timed Power-off Pre-alert Tone as follows.

- “Beep beep” 1 minute before the power shuts down (Timed Power-off Pre-alert Tone A)
- “Beep beep beep beep” 10 seconds before the power shuts down (Timed Power-off Pre-alert Tone B)
- “Long beep” 2 seconds before the power shuts down (Timed Power-off Pre-alert Tone C)

Note

- Timed Power-off is reset when the Ignition Sense port switches to high level.
- When “Ignition and Switch” is configured in Ignition Sense Type, Timed Power-off is not activated if the transceiver is powered on by pressing and holding down the **Power** switch for 1 sec or more.
- When “Ignition and Switch” is configured in Ignition Sense Type, pressing the **Power** switch while Timed Power-off timer is active resets the Timed Power-off timer. Pressing and holding down the **Power** switch turns off the power.

Configuration using KPG-166D

Configuring Timed Power-off (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Ignition Function)

20.2 Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert)

Horn Alert is a feature for activating the Horn Alert port for a specific time interval when the transceiver receives a call.

You can use this feature to turn on the headlights or sound the horn of the vehicle connected to the Horn Alert port. It notifies the user that a call has been received through the vehicle headlights or horn even when the user is away from the transceiver.

Pressing the **Horn Alert** key toggles Horn Alert between enabled and disabled.

Note

To activate Horn Alert, the optional KAP-2 is needed.

Operating the Transceiver

● Enabling Horn Alert

1 **Press the Horn Alert key to enable Horn Alert.**

Enables Horn Alert. “HA” appears in the LED display for 1 second.
When the two dots in the LED display (left dot and right dot) as well as the LED (blue) are configured to light up, each of the LEDs will remain lit while Horn Alert is enabled.

● Disabling Horn Alert

1 **Press the Horn Alert key while Horn Alert is enabled.**

Disables Horn Alert.

Note

- The Horn Alert port behavior varies according to the Horn Alert Logic Signal configuration. (Refer to Horn Alert Logic Signal on page 459.)
- When the Ignition Sense port is at the high level, the Horn Alert port does not become active even when the transceiver has received a call. (Refer to 20.1Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) on page 456.)
- When Horn Alert is enabled, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)

Configuration using KPG-166D

Assigning Functions to the PF Keys (See Edit > Key Assignment)

Conditions for Activating Horn Alert

The conditions for activating Horn Alert are as follows. The conditions vary between analog and digital (DMR).

Table 20-1 Conditions for Activating Horn Alert

Zone Type	Condition
Analog	• When Optional Signaling received while Horn Alert is enabled matches with Optional Signaling configured on the transceiver • When Paging Call is received while Horn Alert is enabled • When Status 89 of FleetSync is received regardless of whether Horn Alert is enabled or disabled • When a 5-tone code with Horn Alert of Decode Code enabled is received while Horn Alert is enabled
Digital (DMR)	• When Optional Signaling received while Horn Alert is enabled matches with Optional Signaling configured on the transceiver • When Paging Call is received while Horn Alert is enabled • When the Horn Alert Status of DMR is received regardless of whether Horn Alert is enabled or disabled

Note

Horn Alert Status can be configured using KPG-166D. (See Edit > DMR > Status)

Horn Alert Logic Signal

Horn Alert Logic Signal is a feature for activating the Horn Alert port according to the configuration when Horn Alert is activated.

When Horn Alert is activated using KPG-166D, you can configure how the Horn Alert port becomes active.

Table 20-2 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 during the preset time interval.
Pulse	The Horn Alert port becomes active for 3 times at an interval of 500 ms.

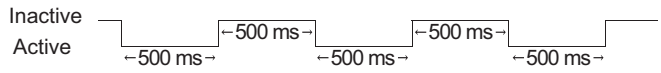


Figure 20-1 Pulse

Note

- If time configured for Horn Alert Logic Signal is longer than the time limit of the Auto Reset Timer, the Horn Alert port does not become inactive even after the time interval configured for Auto Reset Timer has elapsed. The Horn Alert port becomes inactive after the time interval configured for Horn Alert Logic Signal has elapsed.
- Performing any of the operations below while Horn Alert is activated will deactivate Horn Alert.
  - When the **Horn Alert** key is pressed (disables Horn Alert)
  - When there is a change in the mic hook status
  - When any of the keys is operated

Configuration using KPG-166D

Configuring Horn Alert Logic Signal (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

Activating Horn Alert According to the Mic Hook Status (Off-hook Horn Alert)

Off-hook Horn Alert is a feature for activating Horn Alert according to the mic hook status.

Refer to Conditions for Activating Horn Alert on page 459 for details about conditions for activating Horn Alert.

Table 20-3 Off-hook Horn Alert

Configuration	Description
Enabled	Activates Horn Alert regardless of whether the mic is in the on-hook or off-hook state.
Disabled	Activates Horn Alert only when the mic is in the on-hook state.

Note

The hook status of the microphone can be switched using the AUX Input port that is assigned to “External Hook”. (Refer to 19.1Functions Assignable to the AUX Input Port on page 451.)

Configuration using KPG-166D

Configuring the Off-hook Horn Alert (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

Horn Alert Status when Power is On (Horn Alert Mode)

Horn Alert Mode is a feature for enabling or disabling Horn Alert according to the configuration when the power of the transceiver is turned ON.

You can configure the state that Horn Alert enters when the transceiver is powered on using KPG-166D.

Table 20-4 Horn Alert Mode

Configuration	Description
Current	The transceiver is activated with the Horn Alert disabled at all times when the power of the transceiver is turned ON.
Status Memory	When Horn Alert is enabled or disabled by pressing the **Horn Alert** key, this state is stored in the memory of the transceiver. The transceiver is activated with the Horn Alert in the state stored in the memory of the transceiver (enabled or disabled) when the power of the transceiver is turned ON.
Startup	The transceiver is activated with the Horn Alert enabled at all times when the power of the transceiver is turned ON.

Configuration using KPG-166D

Configuring the Horn Alert Mode (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Horn Alert)

The transceiver has password functions for protecting the transceiver operation and the security of the configuration data.

21.1 Password for Transceiver Operation (Transceiver Password)

Compatible model: TK-Dx00 with LCD/ TK-Dx40

Transceiver Password protects the transceiver from unauthorized usage.

Operating TK-Dx00 with LCD

Placing the transceiver in Transceiver Password Mode prevents the transceiver from being used. The transceiver exits Transceiver Password Mode and becomes used if a password is entered and the password is correct.

Pressing the **Transceiver Password** key places the transceiver in Transceiver Password Mode.

Or, pressing the **Menu** key places the transceiver in Menu Mode, and then selecting “Transceiver Password” places the transceiver in Transceiver Password Mode. (Refer to 3.4 Using Menu Mode on page 24.)

A password can be configured for the transceiver using KPG-166D. The password can be configured using any numbers between 0 and 999999 inclusive.

Note

If Transceiver Password is configured but no Transceiver Password is configured for the **Transceiver Password** and **Menu** key, the transceiver automatically enters Transceiver Password Mode when the transceiver is turned ON.

Operating the Transceiver

- **Placing the transceiver in Transceiver Password Mode**

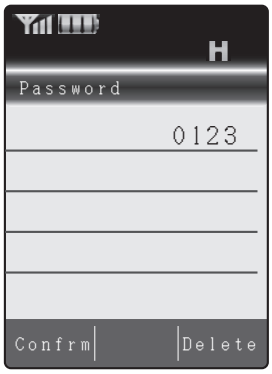
1 **Press the Transceiver Password key.**

The transceiver enters Transceiver Password Mode.

● Exiting the Transceiver Password Mode

1 **Enter a password in Transceiver Password Mode.**

Refer to Entering or Deleting a Code on page 49 for entry methods.



2 **Press the Menu ([ ]) 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-166D

- Configuring the Transceiver Password (See Edit > Optional Features > Optional Features 1 > Common Page 1)
- Assigning functions to the PF keys (See Edit > Key Assignment)

Operating TK-Dx40

When the transceiver with Transceiver Password configured is turned ON, the transceiver enters Transceiver Password Mode. For Portable, the LED lights blue. For Mobile, “PS” appears on the LED display.

After the password is entered and it matches, the transceiver exits Transceiver Password Mode and the transceiver starts in User Mode.

A password can be configured for the transceiver by using KPG-166D. The password can be configured within the following range:

Portable: 0 to 9999

Mobile: 0 to 999999

Operating the Transceiver (Entering the Password) Portable

1 **Select a digit of the password by rotating the Selector.**

The positions from 1 to 4 of the **Selector** correspond to each digit of the password.
For example, the **Selector** must be positioned at 1 to enter “9” as the first digit of “9876”.

2 **Press the Side 1 or Side 2 key to select the number (0 to 9).**

The selected number is announced when the **Side 1** or **Side 2** key is pressed.
By pressing the **Side 1** key, the number increases by one step. By pressing the **Side 2** key, the number decreases by one step.

3 **Enter numbers in all digits by repeating Step 1 and 2.**

4 **Press the PTT switch after entering the password.**

If the password matches, a Password Authorization Tone sounds from the transceiver and the transceiver starts in User Mode.

Operating the Transceiver (Entering the Password) Mobile

- **Entering by Using the Right Up/ Right Down Key**

1 **Press the Right Up or Right Down key to select the number (0 to 9).**

2 **Press the [C>] key.**

The number selected in Step 1 is confirmed.

3 **Enter numbers in all digits by repeating Step 1 and 2.**

Note

Pressing the **[A]** key deletes the value in the rightmost digit. Pressing and holding the **[A]** key deletes the values in all entered digits.

4 **Press the [S] key after entering the password.**

If the password matches, a Password Authorization Tone sounds from the transceiver and the transceiver starts in User Mode.

- **Entering by Using the Microphone Keypad**

1 **Enter a number by pressing the [0] to [9] keys on the microphone keypad.**

For example, to enter “1234”, press the **[1]**, **[2]**, **[3]** and **[4]** keys in this order.

2 **Press the [*] key after entering the password.**

If the password matches, a Password Authorization Tone sounds from the transceiver and the transceiver starts in User Mode.

Note

Pressing the **[#]** key deletes the value in the rightmost digit. Pressing and holding the **[#]** key deletes the values in all entered digits.

Configuration using KPG-166D

Configuring the Transceiver Password (See Edit > Optional Features > Optional Features 1 > Common Page 1)

21.2 Password for Reading Configuration Data in a PC (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-166D 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.

Read Authorization Password can be configured for the transceiver using KPG-166D. Read Authorization Password can be configured using any numbers between 0 and 999999 inclusive.

Configuration using KPG-166D

Configuring the Read Authorization Password (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Data Password)

21.3 Password for Writing Configuration Data (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-166D 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-166D. Overwrite Password can be configured using any numbers between 0 and 999999 inclusive.

Configuration using KPG-166D

Configuring the Overwrite Password (See Edit > Optional Features > Optional Features 1 > Common Page 1 > Data Password)

The transceiver has the following modes: the mode for adjusting the transceiver, and the mode for updating the firmware and confirming the version number of the firmware.

- Panel Test Mode
- Panel Tuning 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-166D.

The transceiver is also equipped with PC Test Mode to be used for testing transmit and receive capabilities of the transceiver and PC Tuning Mode to be used for adjusting the transceiver by using KPG-166D.

22.1 Testing the Transmit and Receive Capabilities of the Transceiver (Panel Test Mode)

Compatible model: TK-Dx00 with LCD

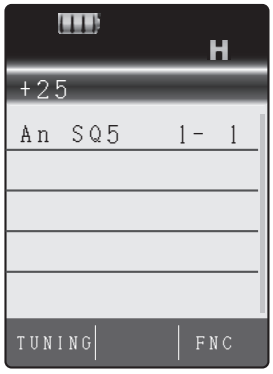
Panel Test Mode can be used to test transmit and receive capabilities of the transceiver using the operation panel of the transceiver.

Operating the Transceiver

1 Press and hold the Back key to turn the transceiver ON.

A Power-on Tone sounds from the transceiver, and then the market code of the transceiver and battery type appear for 2 sec.

The transceiver enters Panel Test Mode after a lapse of 2 sec.



Note

- Refer to the service manual for instructions on how to operate the transceiver in Panel Test Mode, and 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-166D

Configuring whether to permit the use of Panel Test Mode (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

22.2 Adjusting the Transmit and Receive Capabilities of the Transceiver (Panel Tuning Mode)

Compatible model: TK-Dx00 with LCD

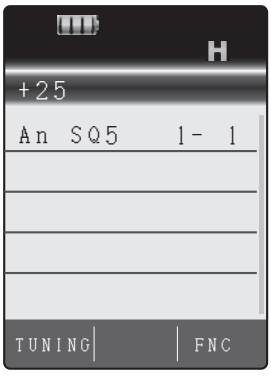
Panel Tuning Mode can be used to adjust transmit and receive capabilities of the transceiver by using the operation panel of the transceiver.

Operating the Transceiver

1 Press and hold the Back key to turn the transceiver ON.

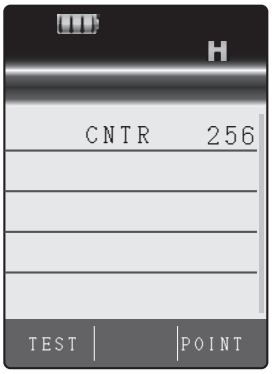
A Power-on Tone sounds from the transceiver, and then the market code of the transceiver and battery type appear for 2 sec.

The transceiver enters Panel Test Mode after a lapse of 2 sec.



2 Press the Menu ([ ]) key.

The transceiver enters Panel Tuning Mode.



Note

- Refer to the service manual for instructions on how to operate the transceiver in Panel Tuning Mode, and on how to adjust transmit and receive capabilities.
- To end Panel Tuning Mode, the transceiver must be turned OFF.

Configuration using KPG-166D

Configuring whether to permit the use of Panel Tuning Mode (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

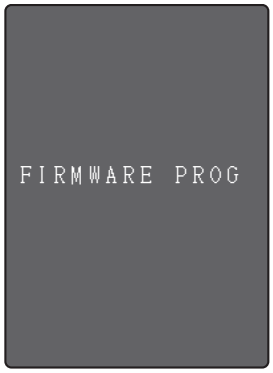
22.3 Overwriting the Firmware (Firmware Programming Mode)

Firmware Programming Mode can be used to write the firmware to the transceiver.

Operating the Transceiver

1 Press and hold the Menu ([▯]) key (or the AUX key in the case of TK-Dx00 without LCD) to turn the transceiver ON. (TK-Dx00)

The LED lights orange, and the transceiver enters Firmware Programming Mode.



Note

- Refer to the service manual for instructions on how to operate the transceiver in Firmware Programming Mode, and on how to write the firmware to the transceiver.
- To end Firmware Programming Mode, the transceiver must be turned OFF.
- If no firmware is written to the transceiver, the transceiver enters Firmware Programming Mode when the transceiver is turned ON.
- The transceiver enters Firmware Programming Mode when the transceiver is turned ON while pressing and holding the **Side 2** key on TK-Dx40 (Portable) or the **[A]** key on TK-Dx40 (Mobile).
- For TK-Dx40, the firmware can also be written using User Mode.

Configuration using KPG-166D

Configuring whether to permit the use of Firmware Programming Mode (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

22.4 Checking the Firmware Version (Firmware Version Information Mode)

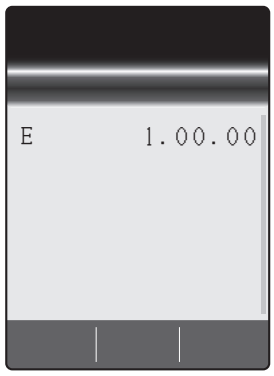
Compatible model: TK-Dx00 with LCD

Firmware Version Information Mode can be used to check the version number of the firmware written to the transceiver.

Operating the Transceiver

1 Turn the transceiver ON while pressing and holding the Side 1 key.

The transceiver enters Firmware Version Information Mode.
The version number of the transceiver written to the transceiver appears.



2 Release the Side 1 key.

The transceiver exits Firmware Version Information Mode, and then the transceiver enters User Mode.

Configuration using KPG-166D

Configuring whether to permit the use of Firmware Version Information Mode (See Edit > Optional Features > Optional Features 1 > Common Page 2 > Mode)

22.5 Testing or Adjusting the Transmit and Receive Capabilities of the Transceiver (PC Test Mode/ PC Tuning Mode)

PC Test Mode can be used to test transmit and receive capabilities of the transceiver by using KPG-166D.

PC Tuning Mode can be used to adjust transmit and receive capabilities of the transceiver by using KPG-166D.

To test or adjust the transceiver in each mode, the transceiver and a PC with KPG-166D installed need to be connected by using the programming cable. (Refer to 2.2 Connecting the Transceiver to a PC on page 12.)

After connecting the transceiver and the PC, selecting “Test Mode” from the **Program** pulldown menu in the main window of KPG-166D opens the **Test Mode** dialog box. By selecting an item from the tuning item list in the **Test Mode** dialog box and double-clicking it, the tuning dialog box of the selected item opens.

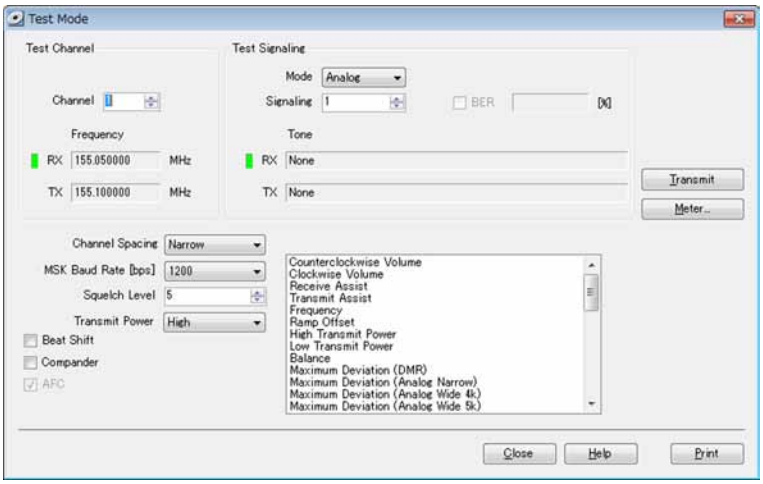


Figure 22-1 Test Mode Dialog Box

Note

Refer to the service manual for instructions on how to operate the transceiver in PC Tuning Mode, and on how to adjust transmit and receive capabilities.

A.1 Available Functions for the PF Keys

The following functions can be assigned to the **PF** keys of the transceiver using KPG-166D.

TK-Dx00

Table A-1 Available Functions for the PF Keys (TK-Dx00)

Function Name	Description	Available System*1
None	No function is activated.	-
Activity Detection	Toggles the Activity Detection between enabled and disabled. (Refer to 14.8 Placing the Transceiver in Emergency Mode Using Activity Detection on page 417.)	ALL
Activity Reset	Resets the count of Man-down Delay Time, Stationary Delay Time, or Motion Delay Time. (Refer to 14.8 Placing the Transceiver in Emergency Mode Using Activity Detection on page 417.)	ALL
Backlight	The backlight of the transceiver lights. (Refer to 5.5 Lighting the Backlight (Backlight) on page 74.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Broadcast	Alternates between Broadcast Call and Conference Call. This function can be used only for initiating a Group Call. (Refer to 8.8 Making an Informative Group Call (Broadcast Group Call) on page 145.)	DMR Conventional
Call 1 to Call 6	Sends the 5-tone code, DMR ID, or DMR status configured for the transceiver.	ALL
Call Interruption	A Call Interruption request message is sent. (Refer to 8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) on page 188.)	DMR Conventional
Channel Down	Decreases the channel number in steps of 1.	ALL
Channel Down (Continuous)	Pressing and holding the **Channel Down** key causes the channel number to be decreased in steps of 1 at 200-ms intervals.	ALL
Channel Entry	Directly specify the channel number by pressing a key(s) on the keypad. (Refer to Changing the Channel by Specifying the Number (Channel Entry) on page 34.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Channel Up	Increases the channel in steps of 1.	ALL
Channel Up (Continuous)	Pressing and holding the **Channel Up** key causes the channel number to be increased in steps of 1 at 200-ms intervals.	ALL
Contact List	Places the transceiver in Contact List Mode. (Refer to 3.5 Using the Contact List (DMR Conventional System Only) on page 26.) Note This feature cannot be assigned for TK-Dx00 without LCD.	DMR Conventional

Function Name	Description	Available System*1
Digit 10x Down	Pressing the **Digit 10x Down** key in 5-tone Selcall Mode decreases the code in the 2nd digit from the last digit of the Selcall code by one. (Refer to Changing the Selcall Code with the Digit Specified on page 262.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Digit 10x Up	Pressing the **Digit 10x Up** key in 5-tone Selcall Mode increases the code in the 2nd digit from the last digit of the Selcall code by one. (Refer to Changing the Selcall Code with the Digit Specified on page 262.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Digit 1x Down	Pressing the **Digit 1x Down** key in 5-tone Selcall Mode decreases the code in the 1st digit from the last digit of the Selcall code by one. (Refer to Changing the Selcall Code with the Digit Specified on page 262.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Digit 1x Up	Pressing the **Digit 1x Up** key in 5-tone Selcall Mode increases the code in the 1st digit from the last digit of the Selcall code by one. (Refer to Changing the Selcall Code with the Digit Specified on page 262.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Display Format	Toggles the display on the transceiver display between the channel name and the Zone-channel number. Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Emergency	Places the transceiver in Emergency Mode. (Refer to 14 COMMUNICATIONS IN AN EMERGENCY on page 394.) Note This function can be assigned to the **AUX** key or the **PF 1** key of the speaker microphone.	ALL
Fixed Volume	Changes the tone level in the following order: Low → High → Off. (Refer to 6 SOUND on page 82.)	ALL
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. Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL

Function Name	Description	Available System*1
GPS Position Display	Places the transceiver in GPS Position Display Mode. (Refer to 13 GPS on page 388.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Home Channel	Migrates to the channel configured as the Home Channel. (Refer to Changing the Channel with a Single Touch (Home Channel) on page 36.)	ALL
Home Channel Select	Configures the selected channel as the Home Channel. (Refer to Changing the Channel with a Single Touch (Home Channel) on page 36.)	ALL
Key Lock	Toggles the Key Lock between enabled and disabled. (Refer to 3.10 Locking the Transceiver Keys (Key Lock) on page 61.)	ALL
LCD Brightness	Switches the LCD brightness of the transceiver in this order: High, Medium, and Low. (Refer to 5.6 Changing the Brightness of the Backlight (LCD Brightness) on page 75.)	ALL
Lone Worker	Toggles the Lone Worker between enabled and disabled. (Refer to 14.7 Placing the Transceiver in Emergency Mode Using Lone Worker on page 412.)	ALL
Low Transmit Power	Toggles the transceiver transmission power between high power and low power. This function is available only on the channel where “High” is configured for Transmit Power in KPG-166D.	ALL
Maintenance	Places the transceiver in Maintenance Display Mode. (Refer to 4.5 Displaying the Signal Strength Level (RSSI Level) (Maintenance Display) on page 66.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Menu	Places the transceiver in Menu Mode. In Menu Mode, various functions can be configured or activated. (Refer to 3.4 Using Menu Mode on page 24.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Message	Places the transceiver in Message Mode. (Refer to Sending a Short Message in Message Mode on page 167.) Note This feature cannot be assigned for TK-Dx00 without LCD.	DMR Conventional
Monitor	The transceiver disables the QT tone or DQT code, and unmutes the speaker upon detection of a carrier.	Analog Conventional
Monitor Momentary	While the **Monitor Momentary** key is pressed and held, the transceiver disables the QT tone or DQT code, and unmutes the speaker upon detection of a carrier.	Analog Conventional
OVCM	Toggles the OVCM between enabled and disabled. (Refer to 8.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode) on page 186.)	DMR Conventional

Function Name	Description	Available System*1
Receive Entry	Places the transceiver in Receive Entry Mode. In Receive Entry Mode, the Receive code can be changed by directly entering a Receive code. (Refer to Changing the Receive Code on page 258.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Remote Control	Places the transceiver in Remote Control Mode. (Refer to 8.17 Remote Operation by Radio Communication (Remote Control) on page 194.)	DMR Conventional
Scan	Starts or stops scanning. (Refer to 17 SCAN on page 431.)	ALL
Scan Delete/Add	Determines whether the selected channel will be scanned. (Refer to 17 SCAN on page 431.)	ALL
Scrambler	Toggles the Scrambler between enabled and disabled. (Refer to 15 COMMUNICATION SECURITY on page 420.)	DMR Conventional
Scrambler Key	Pressing and holding the **Scrambler** key causes the transceiver to enter Scrambler Code Mode. The encryption key data can be changed in Scrambler Code Mode. (Refer to 15 COMMUNICATION SECURITY on page 420.)	DMR Conventional
Selcall	Places the transceiver in 5-tone Selcall Mode. In Selcall Mode, the Selcall code can be changed by selecting a Selcall code configured in the Selcall List or directly entering a Selcall code. (Refer to Changing the Selcall Code on page 254.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Selcall + Status	Places the transceiver in 5-tone Selcall Mode. In Selcall Mode, the Selcall code can be changed by selecting a Selcall code configured in the Selcall List or directly entering a Selcall code. Then, pressing the **Menu** (**[▢]**) or **[*]** key while the transceiver is in Selcall Mode allows the transceiver to enter Status Mode. In Status Mode, the Status code can be changed by selecting a Status code configured in the Status List or directly entering a Status code. (Refer to Changing the Selcall Code on page 254, Changing the Status Code on page 273.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Send the GPS Data	Sends the received GPS data to the base station. (Refer to Sending GPS Data Manually by Using a Key (Send the GPS Data) on page 191.)	DMR Conventional
Speaker Attenuation	Temporarily attenuates the volume level of the speaker microphone. This function can only be assigned to the **PF 1** and **PF 2** keys on a microphone. (Refer to Temporarily Reducing the Volume Level of the Speaker Microphone (Speaker Attenuation) on page 94.)	ALL
Squelch Level	Places the transceiver in Squelch Level Mode. In Squelch Level Mode, the Squelch level can be changed. (Refer to Adjusting the Squelch Level (Squelch Level) on page 202.)	Analog Conventional

Function Name	Description	Available System*1
Squelch Off	The transceiver opens squelch and unmutes the speaker. (Refer to Temporarily Disabling the Squelch (Squelch Off) on page 200.)	Analog Conventional
Squelch Off Momentary	The transceiver opens squelch and unmutes the speaker while the **Squelch Off Momentary** key is pressed and held. (Refer to Temporarily Disabling the Squelch (Squelch Off) on page 200.)	Analog Conventional
Stack	Places the transceiver in Stack Mode. In Stack Mode, the data, such as call records and Status Messages, stored in the stack memory of the transceiver can be viewed or cleared. Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
Status	**DMR:** Places the transceiver in DMR Status Mode. In Status Mode, a status can be sent by selecting a status configured in the DMR Status List or directly entering a status. (Refer to 8.10 Sending and Receiving a Status Message (Status Call) on page 149.) **5-tone:** Places the transceiver in 5-tone Status Mode. In Status Mode, the Status code can be changed by selecting a Status code configured in the Status List or directly entering a Status code. (Refer to Changing the Status Code on page 273.) Note This feature cannot be assigned for TK-Dx00 without LCD.	Analog Conventional
Talk Around	Toggles the Talk Around between enabled and disabled.	ALL
Transceiver Password	Places the transceiver in Transceiver Password Mode. In Transceiver Password Mode, the transceiver cannot be used until the correct password is entered. (Refer to 21.1 Password for Transceiver Operation (Transceiver Password) on page 461.) Note This feature cannot be assigned for TK-Dx00 without LCD.	ALL
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 at 200-ms intervals.	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 at 200-ms intervals.	ALL

*1 ALL indicates that a function can be used in both an Analog Conventional system and a DMR Conventional system.

TK-Dx40

Table A-2 Available Functions for the PF Keys (TK-Dx40)

Function Name	Description	Available System *1
None	No function is activated.	-
Autodial	**TK-Dx40 (Portable):** The DTMF code corresponding to the list number in the Autodial List configured for the selected channel is sent. (Refer to Sending a DTMF Code by Using the Autodial Key (Autodial) on page 216.) **TK-Dx40 (Mobile):** The transceiver enters Autodial Mode. In Autodial Mode, a DTMF code can be selected from the Autodial List to send. (Refer to Sending a DTMF Code by Selecting from a List (Autodial Mode) on page 218.)	Analog Conventional
AUX (Mobile only)	Switches the status of the AUX Output port. The AUX Output port switches to high level if it is at low level, and vice versa. The port output changes in tandem with the AUX key, allowing you to control the external device connected to the AUX port. Note When the AUX Output port is at low level, you can configure the transceiver to light up the two dots in the LED display (left dot and right dot) as well as the LED (blue). (Refer to 5.4 Lighting up the LED According to the Transceiver Status on page 74.)	ALL
Broadcast	Alternates between Broadcast Call and Conference Call. This function can be used only for initiating a Group Call. (Refer to 8.8 Making an Informative Group Call (Broadcast Group Call) on page 145.)	DMR Conventional
Call 1 to Call 2	Sends the 5-tone code, DMR ID, DMR status, or FleetSync status configured for the transceiver.	ALL
Call Interruption	A Call Interruption request message is sent. (Refer to 8.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) on page 188.)	DMR Conventional
Channel Down	Decreases the channel number in steps of 1.	ALL
Channel Down (Continuous)	Pressing and holding the **Channel Down** key decreases the channel number in steps of 1 at an interval of 200 ms.	ALL
Channel Entry (Mobile only)	Directly specify the channel number by pressing a key(s) on the keypad. (Refer to Changing the Channel by Specifying the Number (Channel Entry) on page 34.)	ALL
Channel Up	Increases the channel in steps of 1.	ALL
Channel Up (Continuous)	Pressing and holding the **Channel Up** key increases the channel number in steps of 1 at an interval of 200 ms.	ALL

Function Name	Description	Available System *1
Emergency	Places the transceiver in Emergency Mode. (Refer to 14 COMMUNICATIONS IN AN EMERGENCY on page 394.) Note This function is only assignable when the **Triangle** key (Mobile) or Side 1 key (Portable) is pressed and held down.	ALL
External Speaker (Mobile only)	Switches between the external speaker connected to the transceiver and the built-in speaker of the transceiver.	ALL
Fixed Volume (Mobile only)	Changes the tone level in the following order: Low → High → Off. (Refer to 6 SOUND on page 82.)	ALL
Home Channel	Migrates to the channel configured as the Home Channel. (Refer to Changing the Channel with a Single Touch (Home Channel) on page 36.)	ALL
Home Channel Select	Configures the selected channel as the Home Channel. (Refer to Changing the Channel with a Single Touch (Home Channel) on page 36.)	ALL
Horn Alert (Mobile only)	Toggles the Horn Alert between enabled and disabled. (Refer to 20.2 Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert) on page 458.)	ALL
Key Lock (Portable only)	Toggles the Key Lock between enabled and disabled. (Refer to 3.10 Locking the Transceiver Keys (Key Lock) on page 61.)	ALL
LED Brightness (Mobile only)	Adjusts the brightness of the LED display to different levels. (Refer to Adjusting the LED Display Brightness (LED Brightness) on page 73.)	ALL
Lone Worker	Toggles the Lone Worker between enabled and disabled. (Refer to 14.7 Placing the Transceiver in Emergency Mode Using Lone Worker on page 412.)	ALL
Low Transmit Power (Portable only)	Toggles the transceiver transmission power between high power and low power. This function is available only on the channel where “High” is configured for Transmit Power in KPG-166D.	ALL
Monitor	The transceiver disables the QT tone or DQT code, and unmutes the speaker upon detection of a carrier.	Analog Conventional
Monitor Momentary	While the **Monitor Momentary** key is pressed and held, the transceiver disables the QT tone or DQT code, and unmutes the speaker upon detection of a carrier.	Analog Conventional
OVCM	Toggles the OVCM between enabled and disabled. (Refer to 8.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode) on page 186.)	DMR Conventional
Paging Call	Initiates a Paging Call to the FleetSync ID or DMR ID of the destination configured for the selected channel.	ALL
Priority-channel Select	Makes the selected channel the Priority Channel. (Refer to 17.4 Assigning Priority to Scanning of a Specific Channel (Priority Scan) on page 434.)	ALL
Public Address (Mobile only)	Toggles Public Address between enabled and disabled. (Refer to 6.7 Using the Transceiver as a Loudspeaker (Public Address) on page 103.)	ALL

Function Name	Description	Available System *1
Scan	Starts or stops scanning. (Refer to 17 SCAN on page 431.)	ALL
Scan Delete/Add	Determines whether the selected channel will be scanned. (Refer to 17 SCAN on page 431.)	ALL
Scrambler	Toggles the Voice Scrambler or Scrambler between enabled and disabled. (Refer to 15 COMMUNICATION SECURITY on page 420.)	ALL
Scrambler Key (Mobile only)	Pressing and holding the **Scrambler** key causes the transceiver to enter Scrambler Code Mode. The Scrambler Code and encryption key data can be changed in Scrambler Code Mode. (Refer to 15 COMMUNICATION SECURITY on page 420.)	ALL
Send the GPS data (Mobile only)	Sends the received GPS data to the base station.	ALL
Squelch Level (Mobile only)	Places the transceiver in Squelch Level Mode. In Squelch Level Mode, the Squelch level can be changed. (Refer to Adjusting the Squelch Level (Squelch Level) on page 202.)	Analog Conventional
Squelch Off	The transceiver opens squelch and unmutes the speaker. (Refer to Temporarily Disabling the Squelch (Squelch Off) on page 200.)	Analog Conventional
Squelch Off Momentary	The transceiver opens squelch and unmutes the speaker while the Squelch Off Momentary key is pressed and held. (Refer to Temporarily Disabling the Squelch (Squelch Off) on page 200.)	Analog Conventional
Talk Around	Toggles Talk Around between enabled and disabled.	ALL
Volume Down (Mobile only)	Lowers the volume in steps of 1.	ALL
Volume Down (Continuous) (Mobile only)	Pressing and holding the **Volume Down (Continuous)** key lowers the volume in steps of 1 at an interval of 100 ms.	ALL
Volume Up (Mobile only)	Increases the volume in steps of 1.	ALL
Volume Up (Continuous) (Mobile only)	Pressing and holding the **Volume Up (Continuous)** key increases the volume in steps of 1 at an interval of 100 ms.	ALL
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 decreases the zone number in steps of 1 at an interval of 200 ms.	ALL
Zone Up	Increases the zone number in steps of 1.	ALL
Zone Up (Continuous)	Pressing and holding the **Zone Up** key increases the zone number in steps of 1 at an interval of 200 ms.	ALL

Note

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

Key Function	Function Mode
Channel Entry	Channel Entry Mode
Contact List	Contact List Mode
GPS Position Display	GPS Position Display Mode
Maintenance Display	Maintenance Display Mode
Menu	Menu Mode
Mode	Message Mode
Receive Entry	Receive Entry Mode
Remote Control	Remote Control Mode
Scrambler Key	Scrambler Code Mode
Selcall	Selcall Mode
Squelch Level	Squelch Level Mode
Stack	Stack Mode
Status	Status Mode
Transceiver Password	Transceiver Password Mode

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

TK-Dx00 with LCD:

- **AUX key**
- **Up** key
- **Down** key
- **Side 1** key
- **Side 2** key
- **Menu** (**[ ]**) key
- **Back** key
- **Left** key
- **Right/Home** key
- Keypad
- **PTT** switch

TK-Dx00 without LCD:

- **AUX** key
- **Side 1** key
- **Side 2** key
- **PTT** switch

TK-Dx40 (Portable):

- **Side 1** key
- **Side 2** key
- **PTT** switch

TK-Dx40 (Mobile):

- **Left Up** key
- **Left Down** key
- **Right Up** key
- **Right Down** key
- **[S]** key
- **[A]** key
- **[<B]** key
- **Triangle** key
- Microphone Keypad
- **PTT** switch

Configuration using KPG-166D

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

A.2 Available Functions for Menu Mode

Compatible model: TK-Dx00 with LCD

Following are the functions that can be configured for Menu Mode. Each function is identical to the corresponding **PF** key. Refer to A.1 Available Functions for the PF Keys on page 471 for details of each function.

Table A-3 Available Functions for Menu Mode

Function	Display	Corresponding PF Keys
Activity Detection	Act Detection	Activity Detection
Broadcast	Broadcast	Broadcast
Contact List	Contact	Contact List
Display Format	Disp Format	Display Format
External Microphone Type	Ext MIC Type	-
Fixed Volume	Fixed Vol	Fixed Volume
GPS Position Display	GPS Pos	GPS Position Display
Home Channel Select	Home Ch Sel	Home Channel Select
LCD Brightness	LCD Bright	LCD Brightness
Lone Worker	Lone Worker	Lone Worker
Low Transmit Power	Low TX Power	Low Transmit Power
Maintenance	Maintenance	Maintenance
Message	Message	Message
Minimum Volume Level	Min Vol Level	-
Monitor	Monitor	Monitor
OVCM	OVCM	OVCM
Receive Entry	RECEIVE ENTRY	Receive Entry
Remote Control	Remote Control	Remote Control
RX Audio Equalizer	RX Audio EQ	-
RX Auto Gain Control	RX AGC	-
Scan	Scan	Scan
Scan Delete/Add	Scan D/A	Scan Delete/Add
Scrambler	Scrambler	Scrambler
Scrambler Key	SCR KEY	Scrambler Key
Selcall	Selcall	Selcall
Selcall + Status	Sel+Status	Selcall + Status
Send the GPS Data	Send GPS	Send the GPS Data
Squelch Level	Squelch Lvl	Squelch Level
Squelch Off	Squelch Off	Squelch Off
Stack	Stack	Stack

Function	Display	Corresponding PF Keys
Status	Status	Status
Talk Around	Talk Around	Talk Around
Transceiver Password	Password	Transceiver Password
TX Audio Equalizer	TX AUDIO EQ	-
TX Auto Gain Control	TX AGC	-
TX Noise Suppressor	TX Noise Suppr	-
Zone Delete/Add	Zone D/A	Zone Delete/Add

A.3 Available Functions for the Selector

Compatible model: Portable

The following functions can be assigned to the **Selector** using KPG-166D. What function can be selected will vary depending on the configuration for 16 Zone/Channel Selector.

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

Table A-4 Available Functions for the Selector

Function Name	Description
None	No function is activated. Rotating the **Selector** causes the Key-entry Error Tone to sound.
Channel Select	Rotating the **Selector** causes the transceiver to migrate to the channel indicated by the pointer of the **Selector**.
Zone Select	Rotating the **Selector** causes the transceiver to migrate to the zone indicated by the pointer of the **Selector**.

- **If 16 Zone/Channel Selector is disabled:**

Table A-5 Available Functions for the Selector

Function Name	Description
None	No function is activated. Rotating the **Selector** causes the Key-entry Error Tone to sound.
Channel Up/Down	Rotating the **Selector** increases or decreases the channel number in steps of 1.
Zone Up/Down	Rotating the **Selector** increases or decreases the zone number in steps of 1.

Note

For TK-Dx00 without LCD and TK-Dx40, 16 Zone/Channel Selector is always enabled.

Configuration using KPG-166D

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

A.4 Available Functions for COM Port

Portable

- **TK-Dx00**

  The external serial port of COM port 0 is assigned to the following pins of the transceiver 14-pin universal connector:

  TXD: Pin No. 12

  RXD: Pin No. 13

- **TK-Dx40**

  The external serial port of COM port 0 is assigned to the 2.5/ 3.5D connector pins of the transceiver as follows.

  TXD: Pin No. 7

  RXD: Pin No. 1

TK-Dx40 (Mobile)

TK-Dx40 (mobile) has the two communication ports as follows.

- **COM port 0**

  The external serial port of COM port 0 is assigned to the pins of the microphone jack on the front panel as follows.

  TXD: Pin No. 4

  RXD: Pin No. 7

- **COM port 1**

  The external serial port of COM port 1 is assigned to the pins of the D-sub 15-pin connector on the rear panel as follows.

  TXD: Pin No. 6

  RXD: Pin No. 7

Following functions can be assigned to COM port 0 and COM port 1.

Table A-6 Available Functions for COM Port

Configuration	Description
None	The transceiver cannot communicate with a PC by using PC commands.
Data	The transceiver can communicate with a PC by using PC commands.
GPS (TK-Dx00/ TK-Dx40 (Mobile))	This parameter is configured if a GPS receiver unit is connected to the transceiver. Position data can be acquired from the GPS receiver unit connected to the transceiver. Also, the transceiver can send the received GPS data to a PC without adding “STX” and “ETX” when the transceiver receives the GPS data from another transceiver.
Data + GPS Data Output	The transceiver can send the received GPS data to a PC according to the specifications of the PC Interface Protocol when the transceiver receives the GPS data from another transceiver. “STX” is added to the beginning and “ETX” to the end of GPS data to be sent to a PC The transceiver can communicate with a PC by using PC commands.
GPS Data Output	This parameter is configured if another port is used as the GPS data output port when the built-in GPS receiver unit is used. The transceiver can send the received GPS data to a PC without adding “STX” and “ETX” when the transceiver receives the GPS data from another transceiver. The transceiver can communicate with a PC by using PC commands.

Note

Regardless of the COM port 0 or COM port 1 configuration, the transceiver can communicate with KPG-166D by using COM port 0 or COM port 1.

Configuration using KPG-166D

Assigning a function to the COM port (See Edit > Optional Features > Optional Features 1 > Common Page 3 > COM port)

COM Port Functions

The following functions of each communication port can be configured using KPG-166D.

Table A-7 COM Port Functions

Function	Description
Polarity	Polarity is the logic of data lines for sending data using a communication port. However, Polarity of COM port 0 is fixed at Normal in order to communicate with KPG-166D and the configuration cannot be changed.
Stop Bit	Stop Bit is the bit information for sending data using a communication port. “1” or “2” can be configured for Stop Bit.
Baud Rate	Baud Rate is the communication rate for sending data using a communication port. Baud Rate can be configured by selecting from 1200 bps, 2400 bps, 4800 bps, 9600 bps or 19200 bps.

Configuration using KPG-166D

- Configuring the Polarity (See Edit > Optional Features > Optional Features 1 > Common Page 3 > COM port)
- Configuring the Stop Bit (See Edit > Optional Features > Optional Features 1 > Common Page 3 > COM port)
- Configuring the Baud Rate (See Edit > Optional Features > Optional Features 1 > Common Page 3 > COM port)

Serial Protocol Types

There are 2 types of serial protocols to be used for controlling a transceiver by using PC commands: Version 1 and Version 2. The serial protocol type (PC Interface Protocol) can be configured using KPG-166D.

Table A-8 Serial Protocol Types

Configuration	Description
Version 1	The command sequence of this version starts with STX (Start of Text) and ends with ETX (End of Text). This version is compatible with transceivers that support the Kenwood PC Interface Protocol.
Version 2	This version 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-166D

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

A.5 Functions Not Available for TK-Dx00 without LCD

The following functions are not available on TK-Dx00 without LCD.

Table A-9 Functions Not Available for TK-Dx00 without LCD

Item		Remarks
Basic Function		
	GPS Position Display	
	Transceiver Password	
	Keypad Operation	
	Menu	
	Key Assignment	Refer to Table A-10 Functions Not Available for TK-Dx00 without LCD (Key Function) on page 487.
Display Function		
	Display Format	
	Sub-LCD Display	
	Power-on Text	
	Backlight	
	Signal Strength Indicator	
	Battery Indicator	For TK-Dx00 without LCD, Battery Indicator is a function that shows a warning that the remaining battery level is low using the LED. Either Off or LED can be configured for Battery Indicator. The transceiver notifies a user that the remaining battery level is low by lighting or blinking the LED as follows: Lit green: Full Lit orange: Low Lit red: Low Blinking red: Very Low
	Key Guide	
	Display Customization	
	Custom Start-up Screen	
5-tone		
	Digit Entry Method	
	Selectable Selcall Digits	
	Selectable Status Digits	
	Selectable Receive Digits	
	Selectable Group Tone	
	Selcall Digit Display	
	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.
	Message Display Type	
	Message Memory	
	Stack	

Item		Remarks
DMR		
	Individual Call	Contact List Mode and Stack Mode are unavailable.
	Individual Call (Individual Call Acknowledge Request)	Contact List Mode and Stack Mode are unavailable.
	Individual Call (Message Trunked (Enhanced))	
	Group Call	Contact List Mode is unavailable.
	Group Call Display	
	Caller ID Display	
	Paging Call	
	Status Call	Status Mode is unavailable.
	Short Data Call	Message Mode is unavailable.
	Auto Reset Timer	The parameter of LCD is unavailable for Auto Reset Timer.
	Manual Dialing	
	Message Display Type	
	Call ID Stack	
	Short Message Stack	
	Latest Received Message Stack	
	Maintenance Display	
Panel Test Mode		PC Test Mode is available.
Panel Tuning Mode		PC Tuning Mode is available.
Firmware Version Information Mode		

Table A-10 Functions Not Available for TK-Dx00 without LCD (Key Function)

Key Function	Remarks
Backlight	
Channel Entry	
Contact List	
Digit 10x Down	
Digit 10x Up	
Digit 1x Down	
Digit 1x Up	
Display Format	
Function	
GPS Position Display	
LCD Brightness	
Maintenance	
Menu	
Message	
Receive Entry	
Selcall	
Selcall + Status	
Stack	
Status	
Transceiver Password	

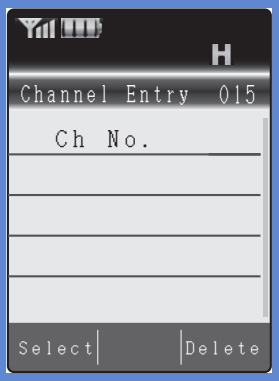
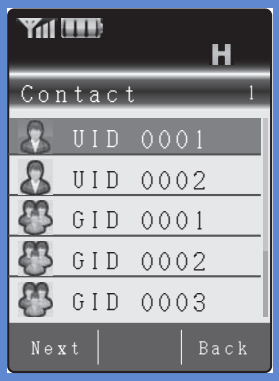
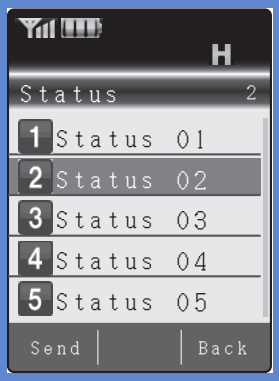
A.6 Key Operations for Each Mode

Compatible model: TK-Dx00 with LCD

Key operations for selecting a list or entering characters are described for each mode in this section. Refer to 3.9 Operating the Transceiver in Each Mode (Common Operation) on page 45 for operation methods.

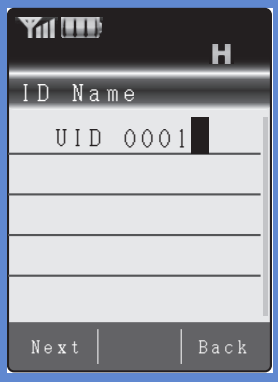
Note

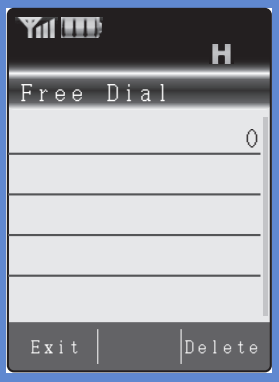
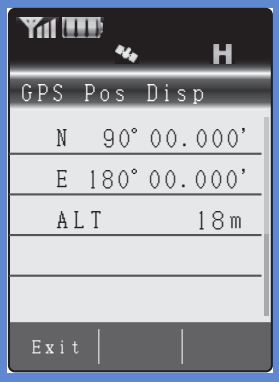
For TK-Dx00 without LCD, the operations described in this section are unavailable.

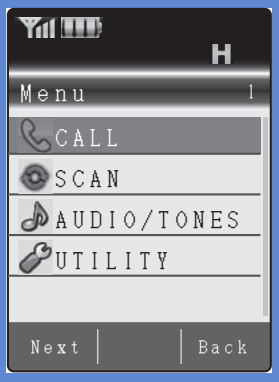
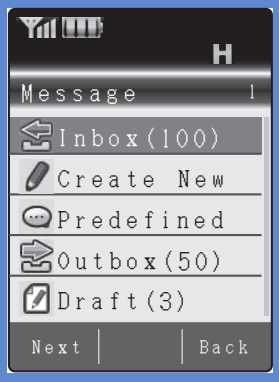
Key		Channel Entry	Contact List	
		Entering a Channel No. 	Selecting a list 	Selecting a list (Status) 
Up/ Down	Press	Selects a channel by changing it one at a time.	Selects an ID registered in the Contact List by changing the ID one at a time.	Selects a status configured in the Status List by changing the status one at a time.
	Hold Down	Selects a channel by changing from one channel to another continuously.	Selects an ID number from those registered in the Contact List by changing from one number to another continuously.	Selects a Status number from those configured in the Status List by changing from one number to another continuously.
Side 1	Press	Aborts the current mode.		
Side 2	Press	-	Makes a Paging Call if a Unit ID is selected.	Sends a Status Message.
Menu ([▯])	Press	Confirms the channel number.	Migrates to the options menu selection display.	Sends a Status Message.
Back	Press	Deletes one digit.	Restores the previous display.	
	Hold Down	Deletes all digits.	-	-
Left	Press	-	-	-
Right/Home	Press	Aborts the current mode.		
[0] to [9]	Press	Enter the channel number.	Selects an ID from the list.	Selects a status from the list.
[*]	Press	Confirms the channel number.	Aborts the current mode.	
[#]	Press	Deletes one digit.	Restores the previous display.	
	Hold Down	Deletes all digits.	-	-
PTT Switch	Press	Transmits after aborting the current mode.	Transmits.	Sends a Status Message.

Key		Contact List
		Short Message entry
Up/ Down	Press	**If "Line Up/Down" is configured for Up/Down[*1]:** Vertically shifts the cursor. **If "Characters" is configured for Up/Down[*1]:** Selects a character by changing one character at a time.
	Hold Down	**If "Line Up/Down" is configured for Up/Down[*1]:** Vertically shifts the cursor continuously. **If "Characters" is configured for Up/Down[*1]:** Selects a character by changing from one character to another continuously.
Side 1	Press	Aborts the current mode.
Side 2	Press	Sends a Short Message.
Menu ([▯])	Press	Transmits a Short Message if no character is selected. Confirms the selected character if a character is selected.
Back	Press	Restores the previous display or deletes one character while entering characters.
	Hold Down	Deletes characters continuously while entering the character.
Left	Press	Shifts the cursor to the left.
	Hold Down	Shifts the cursor to the left continuously.
Right/Home	Press	Shifts the cursor to the right.
	Hold Down	Shifts the cursor to the right continuously.
[0] to [9]	Press	Enters characters.
[*]	Press	Changing the input mode. (Upper case letters → lower case letters → numbers → upper case letters •••) Changes the input mode after the selected character is confirmed when a character is selected.
[#]	Press	Deletes one character.
	Hold Down	Deletes characters continuously.
PTT Switch	Press	Sends a Short Message.

[*1] Up/Down can be configured in the **Up/Down** frame of the **Key Assignment** window > **Character Entry** tab by using KPG-166D.

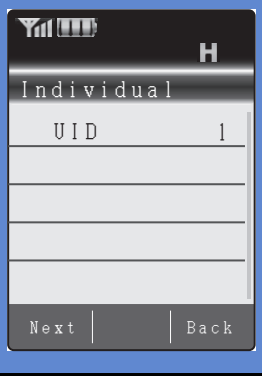
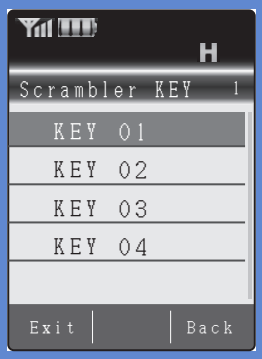
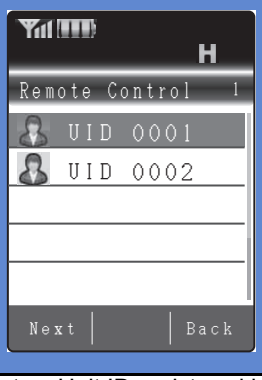
Key		Contact List		
		Selecting a list (Short Message)	Manual entry (Unit ID)	Manual entry (ID Name) 
Up/ Down	**Press**	Selects a Short Message registered in the Short Message List by changing the Short Message one at a time.	Selects a Digit No. by changing the Digit No. one at a time.	Selects a character by changing one character at a time.
	Hold Down	Selects a Short Message from those registered in the Short Message List by changing from one Short Message to another continuously.	Selects a Digit No. by changing from one number to another continuously.	Selects a character by changing from one character to another continuously.
Side 1	**Press**	Aborts the current mode.		
Side 2	**Press**	Sends a Short Message.	-	-
Menu ([⊡])	**Press**	Sends a Short Message.	Migrates to the ID name entry display. Confirms the selected Digit No. if a Digit No. is selected.	Migrates to the View display. Confirms the selected character if a character is selected.
Back	**Press**	Restores the previous display.	Restores the previous display or deletes one character while entering the Digit No.	Restores the previous display or deletes one character while entering characters.
	Hold Down	-	Deletes characters continuously while entering the Digit No.	Deletes characters continuously while entering the character.
Left	**Press**	-	-	Shifts the cursor to the left.
	Hold Down	-	-	Shifts the cursor to the left continuously.
Right/Home	**Press**	Aborts the current mode.		Shifts the cursor to the right.
	Hold Down	-	-	Shifts the cursor to the right continuously.
[0] to **[9]**	**Press**	Selects a Short Message from the list.	Enters the Digit No.	Enters characters.
[*]	**Press**	Aborts the current mode.	Confirms the selected Digit No. if a Digit No. is selected.	Changing the input mode. (Upper case letters → lower case letters → numbers → upper case letters •••) Changes the input mode after the selected character is confirmed when a character is selected.
[#]	**Press**	Restores the previous display.	Deletes one character.	Deletes one character.
	Hold Down	-	Deletes characters continuously.	Deletes characters continuously.
PTT Switch	**Press**	Sends a Short Message.	Transmits after aborting the current mode.	Transmits after aborting the current mode.

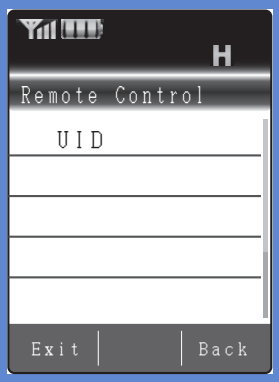
Key		Free-dial Entry	GPS Position Display	Maintenance
				
Up/ Down	**Press**	Selects a 5-tone code by changing the 5-tone code one at a time.	-	-
	Hold Down	Selects a 5-tone code by changing from one 5-tone code to another continuously.	-	-
Side 1	**Press**	Aborts the current mode.		
Side 2	**Press**	Aborts the current mode.	-	-
Menu ([▯])	**Press**	Aborts the current mode.		
	Hold Down	Aborts the current mode after confirming the 5-tone code.	-	-
Back	**Press**	Deletes one digit.	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	
	Hold Down	Deletes all digits.	-	-
Left	**Press**	-	-	-
Right/Home	**Press**	Aborts the current mode. Aborts the current mode. Aborts the current mode.		
[0] to **[9]**	**Press**	Enter a 5-tone code.	-	-
[*]	**Press**	Migrates to the 5-tone code entry mode. Then, press one of the following keys: **[0]**: Redial Code **[*]**: * **[#]**: #	Aborts the current mode.	
	Hold Down	Migrates to the 5-tone code entry mode. Then, pressing the **[2]**, **[5]**, **[8]** or **[0]** key to enters "A", "B", "C", or "D" respectively.	-	-
[#]	**Press**	Deletes one digit.	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	
	Hold Down	Deletes all digits.	-	-
PTT Switch	**Press**	Aborts the current mode.	Transmits.	

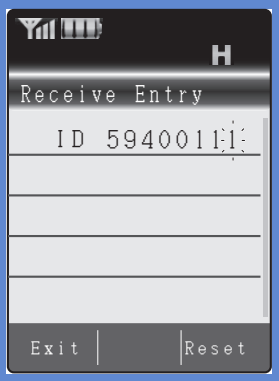
Key		Menu	Message Mode	
		Selecting a list	Selecting a list	Selecting a list (Short Message)
				
Up/ Down	**Press**	Selects an option by changing the option one at a time.	Selects a message by changing the message one at a time.	Selects a Short Message registered in the Short Message List by changing the Short Message one at a time.
	Hold Down	Selects an option by changing from one option to another continuously.	Selects a message by changing the message continuously.	Selects a Short Message from those registered in the Short Message List by changing from one Short Message to another continuously.
Side 1	**Press**	Aborts the current mode.		
Side 2	**Press**	-	-	-
Menu ([▯])	**Press**	Migrates to the Function List.	Displays a message.	Migrates to the Contact List display.
Back	**Press**	Restores the previous display.		
Left	**Press**	-	-	-
Right/Home	**Press**	Aborts the current mode.		
[0] to **[9]**	**Press**	Selects from the list.	Selects a message from the list.	Selects a Short Message from the list.
[*]	**Press**	Migrates to the Function List.	Aborts the current mode.	
[#]	**Press**	Restores the previous display.		
PTT Switch	**Press**	Transmits after aborting the current mode.		

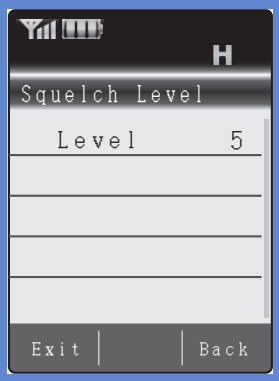
Key		Message Mode
		Short Message entry
Up/ Down	Press	**If "Line Up/Down" is configured for Up/Down[*1]:** Vertically shifts the cursor. **If "Characters" is configured for Up/Down[*1]:** Selects a character by changing one character at a time.
	Hold Down	**If "Line Up/Down" is configured for Up/Down[*1]:** Vertically shifts the cursor continuously. **If "Characters" is configured for Up/Down[*1]:** Selects a character by changing from one character to another continuously.
Side 1	Press	Aborts the current mode.
Side 2	Press	**If "Reply" is selected from the Inbox options menu selection display:** Sends a Short Message. **If "Create New" is selected:** Migrates to the Create New options menu selection display.
Menu ([▯])	Press	**If "Reply" is selected from the Inbox options menu selection display:** Transmits a Short Message if no character is selected. **If "Create New" is selected:** Migrates to the Create New options menu selection display if no character is selected. **If "Resend" is selected from the Outbox options menu selection display:** Sends a Short Message. **If "Send" is selected from the Draft options menu selection display:** Migrates to the Contact List display if no character is selected. Confirms the selected character if a character is selected.
	Hold Down	**If "Send" is selected from the Draft options menu selection display:** Migrates to the Draft display after storing a message.
Back	Press	Restores the previous display or deletes one character while entering characters.
	Hold Down	Deletes characters continuously while entering the character.
Left	Press	Shifts the cursor to the left.
	Hold Down	Shifts the cursor to the left continuously.
Right/Home	Press	Shifts the cursor to the right.
	Hold Down	Shifts the cursor to the right continuously.
[0] to [9]	Press	Enters characters.
[*]	Press	Changing the input mode. (Upper case letters → lower case letters → numbers → upper case letters •••) Changes the input mode after the selected character is confirmed when a character is selected.
[#]	Press	Deletes one character.
	Hold Down	Deletes characters continuously.
PTT Switch	Press	**If "Reply" is selected from the Inbox options menu selection display:** Sends a Short Message. **If "Create New" is selected:** Transmits after aborting the current mode. **If "Resend" is selected from the Outbox options menu selection display:** Sends a Short Message. **If "Send" is selected from the Draft options menu selection display:** Transmits after aborting the current mode.

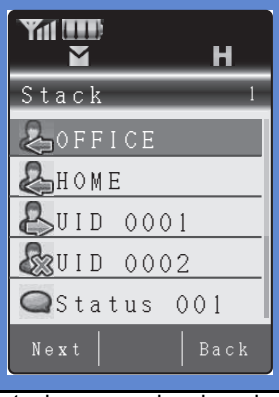
[*1] Up/Down can be configured in the **Up/Down** frame of the **Key Assignment** window > **Character Entry** tab by using KPG-166D.

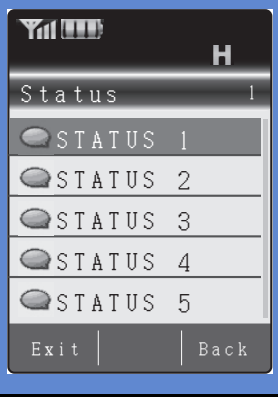
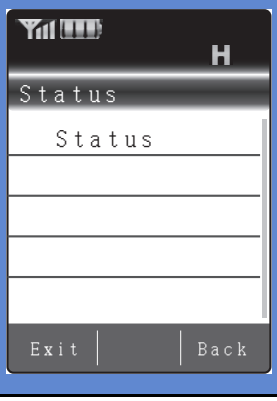
Key		Message Mode	Scrambler Key	Remote Control
		Manual entry (Unit ID) 		Selecting a list (Unit ID) 
Up/ Down	**Press**	Selects a Digit No. by changing the Digit No. one at a time.	Selects a Scrambler Key registered in the Multi-key List by changing the key one at a time.	Selects a Unit ID registered in the Unit ID List by changing the ID one at a time.
	Hold Down	Selects a Digit No. by changing from one number to another continuously.	Selects a Scrambler Key from those registered in the Multi-key List by changing from one key to another continuously.	Selects a Unit ID from those registered in the Unit ID List by changing from one ID to another continuously.
Side 1	**Press**	Aborts the current mode.	Enables the Scrambler after confirming the Multi-key List and then aborting the current mode.	Aborts the current mode.
Side 2	**Press**	Sends a Short Message.	-	-
Menu ([▯])	**Press**	Sends a Short Message. Confirms the selected Digit No. if a Digit No. is selected.	Enables the Scrambler after confirming the Multi-key List and then aborting the current mode.	Migrates to the options menu selection display.
	Hold Down	Migrates to the Contact List display.	-	Migrates to the code entry mode (only if Manual Dialing is enabled).
Back	**Press**	Restores the previous display or deletes one character while entering the Digit No.	Determines the Multi-key List and then restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Restores the previous display.
	Hold Down	Deletes characters continuously while entering the Digit No.	-	-
Left	**Press**	Migrates to the Contact List display.	-	-
Right/Home	**Press**	Aborts the current mode.	Enables the Scrambler after confirming the Multi-key List and then aborting the current mode.	Aborts the current mode.
[0] to **[9]**	**Press**	Enters the Digit No.	Selects a Scrambler Key from the list.	Selects a Unit ID from the list.
[*]	**Press**	Confirms the selected Digit No. if a Digit No. is selected.	Enables the Scrambler after confirming the Multi-key List and then aborting the current mode.	Migrates to the options menu selection display.
	Hold Down	-	-	Migrates to the code entry mode (only if Manual Dialing is enabled).
[#]	**Press**	Deletes one character.	Determines the Multi-key List and then restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Restores the previous display.
	Hold Down	Deletes characters continuously.	-	-
PTT Switch	**Press**	Sends a Short Message.	Enables the Encryption and transmits after confirming the Multi-key List and then aborting the current mode.	Transmits after aborting the current mode.

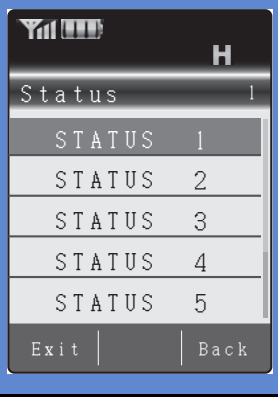
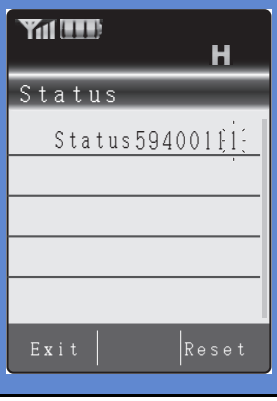
Key		Remote Control
		Manual entry (Unit ID) 
Up/ Down	Press	Selects a Digit No. by changing the Digit No. one at a time.
	Hold Down	Selects a Digit No. by changing from one number to another continuously.
Side 1	Press	Aborts the current mode.
Side 2	Press	-
Menu ([□])	Press	Migrates to the options menu selection display.
	Hold Down	Migrates to the list selection mode.
Back	Press	Restores the previous display or deletes one character while entering the Digit No.
	Hold Down	Deletes characters continuously while entering the Digit No.
Left	Press	Shifts the cursor to the left.
	Hold Down	Shifts the cursor to the left continuously.
Right/Home	Press	Shifts the cursor to the right.
	Hold Down	Shifts the cursor to the right continuously.
[0] to [9]	Press	Enters a Digit No.
[*]	Press	Confirms the selected Digit No. if a Digit No. is selected.
	Hold Down	-
[#]	Press	Deletes one character.
	Hold Down	Deletes characters continuously.
PTT Switch	Press	Transmits after aborting the current mode.

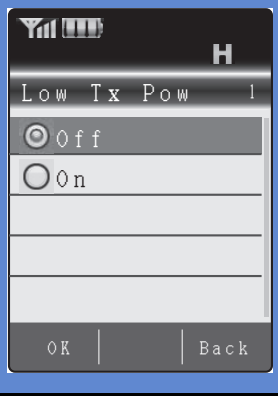
Key		Receive Entry	Selcall/ Selcall + Status (5-tone)	
		Manual entry	Selecting a list	Manual entry
				
Up/ Down	**Press**	Selects a Digit No. by changing the Digit No. one at a time.	Selects a Selcall code from those registered in the Selcall List by changing the Selcall code one at a time.	Selects a Digit No. by changing the Digit No. one at a time.
	Hold Down	Selects a Digit No. by changing from one number to another continuously.	Selects a Selcall code from those registered in the Selcall List by changing from one code to another continuously.	Selects a Digit No. by changing from one number to another continuously.
Side 1	**Press**	Aborts the current mode after determining the Digit No.	Aborts the current mode.	Aborts the current mode after determining the Digit No.
Side 2	**Press**	-	-	-
Menu ([▯])	**Press**	Aborts the current mode after determining the Digit No.	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	-	Migrates to the mode for entering a Selcall code.	Migrates to the list selection mode.
Back	**Press**	Receive codes are restored to defaults.	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Selcall codes are restored to defaults.
Left	**Press**	Shifts the cursor to the left.	Migrates to the mode for entering a Selcall code.	Shifts the cursor to the left.
	Hold Down	Shifts the cursor to the left continuously.	-	Shifts the cursor to the left continuously.
Right/Home	**Press**	Shifts the cursor to the right.	Aborts the current mode.	Shifts the cursor to the right.
	Hold Down	Shifts the cursor to the right continuously.	-	Shifts the cursor to the right continuously.
[0] to **[9]**	**Press**	Enters a Digit No.	Selects a Selcall code from the list.	Enters a Digit No.
[*]	**Press**	Aborts the current mode after determining the Digit No.	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	-	Migrates to the mode for entering a Selcall code.	Migrates to the list selection mode.
[#]	**Press**	Receive codes are restored to defaults.	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Selcall codes are restored to defaults.
PTT Switch	**Press**	Aborts the current mode after determining the Digit No.	Aborts the current mode.	Aborts the current mode after determining the Digit No.

Key		Squelch Level
		Configuring the level 
Up/ Down	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.
Side 1	Press	Determines the Squelch Level and then aborts the current mode.
Side 2	Press	-
Menu ([▯])	Press	Determines the Squelch Level and then aborts the current mode.
Back	Press	Determines the Squelch Level and then restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).
Left	Press	-
Right/Home	Press	Determines the Squelch Level and then aborts the current mode.
[0] to [9]	Press	-
[*]	Press	Determines the Squelch Level and then aborts the current mode.
[#]	Press	Determines the Squelch Level and then restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).
PTT Switch	Press	Transmits after determining the Squelch Level and then aborting the current mode.

Key		Stack
		Selecting a list 
Up/ Down	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 data entry to another continuously.
Side 1	Press	Aborts the current mode.
Side 2	Press	-
Menu ([▯])	Press	Switches the mode. DMR all stack data display → DMR Incoming display → DMR Outgoing display → DMR Missed display → 5-tone all stack data display → DMR Status Message display → DMR all stack data display →...
	Hold Down	Switches the displays. **DMR:** For a display other than the display for Status Messages ID Name → the channel where the message is received → ID Name →... For the display for Status Messages ID Name → Status Message → the channel where the message is received → ID Name →... **5-tone:** Selcall Name → Status Message → the channel where the message is received → Selcall Name →...
Back	Press	Restores the previous display.
	Hold Down	Clears one data entry stored in the transceiver stack memory. Press and hold for 2 sec or more to clear all data displayed for the selected mode.
Left	Press	Switches the displays. **DMR:** For a display other than the display for Status Messages ID Name → the channel where the message is received → ID Name →... For the display for Status Messages ID Name → Status Message → the channel where the message is received → ID Name →... **5-tone:** Selcall Name → Status Message → the channel where the message is received → Selcall Name →...
Right/Home	Press	Aborts the current mode.
[0] to [9]	Press	Selects stacked data from the list.
[*]	Press	Aborts the current mode.
	Hold Down	Switches the displays. **DMR:** For a display other than the display for Status Messages ID Name → the channel where the message is received → ID Name →... For the display for Status Messages ID Name → Status Message → the channel where the message is received → ID Name →... **5-tone:** Selcall Name → Status Message → the channel where the message is received → Selcall Name →...
[#]	Press	Clears one data entry stored in the transceiver stack memory.
	Hold Down	Clears all data displayed for the selected mode.
PTT Switch	Press	Transmits. (Caller ID Stack display only)

Key		Status (DMR)	
		Selecting a list  	Manual entry 
Up/ Down	**Press**	Selects a status configured in the Status List by changing the status one at a time.	Selects a Digit No. by changing the Digit No. one at a time.
	Hold Down	Selects a Status number from those configured in the Status List by changing from one number to another continuously.	Selects a Digit No. by changing from one number to another continuously.
Side 1	**Press**	Aborts the current mode.	
Side 2	**Press**	Sends a Status Message.	
Menu ([□])	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	Migrates to the code entry mode (only if Manual Dialing is enabled).	Migrates to the list selection mode.
Back	**Press**	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key) or deletes one character while entering the Digit No.
	Hold Down	-	Deletes all characters while entering the Digit No.
Left	**Press**	Migrates to the code entry mode (only if Manual Dialing is enabled).	Migrates to the list selection mode.
Right/Home	**Press**	Aborts the current mode.	
[0] to **[9]**	**Press**	Selects a status from the list.	Enters a Digit No.
[*]	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	Migrates to the code entry mode (only if Manual Dialing is enabled).	Migrates to the list selection mode.
[#]	**Press**	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key) or deletes one character while entering the Digit No.
	Hold Down	-	Deletes all characters while entering the Digit No.
PTT Switch	**Press**	Sends a Status Message.	

Key		Status (5-tone)	
		Selecting a list 	Manual entry 
Up/ Down	**Press**	Selects a status configured in the Status List by changing the status one at a time.	Selects a Digit No. by changing the Digit No. one at a time.
	Hold Down	Selects a Status number from those configured in the Status List by changing from one number to another continuously.	Selects a Digit No. by changing from one number to another continuously.
Side 1	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.
Side 2	**Press**	-	-
Menu ([□])	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	Migrates to the mode for entering a code.	Migrates to the list selection mode.
Back	**Press**	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Status codes are restored to defaults.
Left	**Press**	Migrates to the mode for entering a code.	Shifts the cursor to the left.
	Hold Down	-	Shifts the cursor to the left continuously.
Right/Home	**Press**	Aborts the current mode.	Shifts the cursor to the right.
	Hold Down	-	Shifts the cursor to the right continuously.
[0] to **[9]**	**Press**	Selects a status from the list.	Enters a Digit No.
[*]	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.
	Hold Down	Migrates to the mode for entering a code.	Migrates to the list selection mode.
[#]	**Press**	Restores the previous display (if the transceiver enters this mode by a user pressing the **Menu** key).	Status codes are restored to defaults.
PTT Switch	**Press**	Aborts the current mode.	Aborts the current mode after determining the Digit No.

Key		Transceiver Password	Operations in Menu Mode*1
		Entering a code	Configuration of On and Off (Example: Low Transmit Power) 
Up/ Down	**Press**	Selects a code by changing the codes one at a time.	Selects an option by changing the option one at a time.
	Hold Down	Selects a code by changing from one code to another continuously.	Selects an option by changing from one option to another continuously.
Side 1	**Press**	Restores the “PASSWORD” display.	Aborts the current mode.
Side 2	**Press**	-	-
Menu ([ ])	**Press**	Verifies the password or determines the code.	Aborts the current mode after determination.
Back	**Press**	Deletes a code.	Restores the previous display.
	Hold Down	Deletes all codes.	-
Left	**Press**	-	-
Right/Home	**Press**	Restores the “PASSWORD” display.	Aborts the current mode.
[0] to **[9]**	**Press**	Enters a code.	Selects from the list.
[*]	**Press**	Verifies the password or determines the code.	Aborts the current mode after determination.
[#]	**Press**	Deletes a code.	Restores the previous display.
	Hold Down	Deletes all codes.	-
PTT Switch	**Press**	-	Transmits after aborting the current mode.

*1 Operations common to all Menu Modes.

Symbols

* and # Digit Time 225

Numerics

5-tone Outline 237
5-tone 237
5-tone Encode Format Executed When Emergency Mode Is Activated (Emergency Encode Format) (Analog System Only) 411
5-tone Encode/ Decode Format 295

A

Abbreviations Used in this Document iii
About 5-tone Code 239
About 5-tone Signaling Formats (5-tone Standard) 242
About Communication Methods xi
About Communications Systems x
About Configuration Using KPG-166D 244
About Copyright iv
About LCD 7
About Notations i
About Own ID 110
About the Programming Software v
About the Slot Numbers (Slot Selection) 119
About this Manual i
About Trademarks and Patent Rights iv
About Zones ix
ACK Delay Time 378
Activating Horn Alert According to the Mic Hook Status (Off-hook Horn Alert) 460
Activity Detection 471
Activity Reset 471
Adding or Deleting a Channel to/from the Target Channels for Scanning (Scan Delete/Add) 440
Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add) 442
Adjusting Audio Characteristics (DMR Conventional System Only) 97
Adjusting the LED Display Brightness (LED Brightness) 73
Adjusting the Squelch Level (Squelch Level) 202
Adjusting the Transmit and Receive Capabilities of the Transceiver (Panel Tuning Mode) 467
Adjusting the Volume Level 19
Adjusting the Volume Level (Fine Volume Control) 94
ALERT num 295, 336
Alert Tone 86
ALERTG num 336
ALERTI num 337
Analog Conventional System 200
ANALOG MODES viii
APPENDIX 471
Assigning Priority to Scanning of a Specific Channel (Priority Scan) 434
Audio Equalizer (RX Audio Response) 100
Audio Equalizer (TX Audio Response) 102
Auto Gain Control (RX Audio Response) 99
Auto Gain Control (TX Audio Response) 101
Auto Reset Timer 111, 230, 234, 249, 371
Autodial List (TK-Dx40 (Mobile)) 218
Autodial List (TK-Dx40 (Portable)) 216
Automatic Close 283
Automatically Transmitting and Receiving in Emergency Mode 401
AUTR 295, 337
AUX Input Status Message 161
AUX Input Status Message (Mobile Only) 376
AUX Output Status Message 161
AUX Output Status Message (Mobile Only) 376
Available Calls 122, 363
Available Communication Functions 237
Available Functions for COM Port 483
Available Functions for Menu Mode 481
Available Functions for the PF Keys 471
Available Functions for the Selector 482
Avoiding Interference with Other Communications (Busy Channel Lockout (Analog)) 206
Avoiding Interference with Other Communications (Busy Channel Lockout (DMR)) 115

B

Background Transmission 404
Backlight 471
Base ID 160
Basic FleetSync Settings 362
Basic Operations 17
Basic Workflows 11
Battery 105
Beat Shift 65
BEEP num 296, 337
BEEPG num 338
BEEPI num 338

BKTOF 296
BKTON 297
BLTOF 297, 338
BLTON 339
Broadcast 471
Built-in Voice Scrambler (Analog) 420
Busy LED 67

C

Call 1 to Call 6 471
Call All Transceivers of the Matching Color Code (Unaddressed Call) 187
Call ID Stack (DMR Conventional System Only) 42
Call Interruption 471
Canceling VOX Using PTT Switch (Cancel Operation) 450
Causing Transceivers Other than of the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode) 186
Change History xii
Changing the Brightness of the Backlight (LCD Brightness) 75
Changing the Channel 31
Changing the Channel by Specifying the Number (Channel Entry) 34
Changing the Channel with a Single Touch (Home Channel) 36
Changing the Receive Code 258
Changing the Selcall Code 254
Changing the Selcall Code with the Digit Specified 262
Changing the Status Code 273
Changing the Tone Volume Level with a Single Touch (Selectable Tone Level) 93
Changing the Zone 29
Changing the Zone-channel 29
Channel Down 471
Channel Down (Continuous) 471
Channel Entry 471, 488
Channel Select 482
Channel Spacing 65
Channel Spacing (DMR) 65
Channel Up 471
Channel Up (Continuous) 471
Channel Up/Down 482
Channel Used when Sending GPS Data (GPS Report Channel Type) 190
Character Entry 60
Checking the Firmware Version (Firmware Version Information Mode) 469
Checking Whether Another Transceiver is in Operation (Radio Check) 199
Viewing, Sending, Editing, and Deleting the Stored Short Message (Draft) 180
CKSAT 339
Clear to Transpond 230, 234
CLOSE 298
CMP ^K1 to CMP ^K8 340
CMP ^M1 to CMP ^M8 341
CMP ^Q1 to CMP ^Q8 341
CMP ^RX1 to CMP ^RX8 342
CMP ^TONE 342
CMP ^TX1 to CMP ^TX8 342
CMP ^U1 to CMP ^U8 343
CMP ^V1 to CMP ^V8 343
CMP #* 339
CMP #0 to CMP #F 340
Code Used for Receiving a Group Call (Group Code) 227
COM Port Functions 484
Common Functions for Data Communications 147
Common Functions for Scan 440
Communicating via a Repeater (Repeater Mode) 119
Communicating Without Using a Repeater (Talk Around) 208
Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode) 117
Communication Security 420
Communications in an Emergency 394
Conditions for Activating Horn Alert 459
Conditions to Activate the Scan 437
Conditions to Pause Scanning (Scan Configuration) 287
Conditions to Pause the Scan (Scan Configuration) (5-tone System Only) 439
Conditions to Resume the Scan 437
Configuring Scrambler Code 422
Configuring the Alert Tone (Alert Tone Pattern) 88
Configuring the Encryption Key Data Used for Communications 426
Configuring the GPS Position Display 391
Configuring the Maximum Volume Level (Maximum Volume) 92
Configuring the Microphone Input Sensitivity Level (VOX Gain Level) 448
Configuring the Minimum Volume Level (Minimum Volume) 91
Configuring the Offset Value for Volume Level (Tone Volume Offset) 92
Configuring the Priority Channel 435

Configuring the Volume Level of Various Tones (Tone Volume) 92
Connecting the Transceiver to a PC 12
Contact List 471, 488, 489, 490
CONTENTS xv
Contents by Purpose xxv
Control Tone 83
Controlling the Vehicle Behavior According to the Horn Alert Port Status (Horn Alert) 458
Copy from Default TX/RX Address 248
CTTP 298
Customizing a Displayed Text String (Display Customization) 81

D

D Code Assignment 225
Data Communication Feature 377
Data Dwell Time 453
Data Transmit Modulation Delay Time 379
DECA dec 344
DECAT time dec 344
DECF dec 345
DECG dec 345
DECGT time dec 346
DECI dec 346
DECIT time dec 347
Decode Format 336
Decode Functions 292
Decode Single Tone Duration 241
Decode Single Tone Frequency 241
DEL xtime 299
DELL ltime 299
DIFIX 300
Digit 10x Down 472
Digit 10x Up 472
Digit 1x Down 472
Digit 1x Up 472
Digit Entry Method 269, 277
DIGITAL MODES viii
Disabling Repeated Sending of PTT ID (PTT ID Pause (Analog)) 221, 366
Disabling the Transceiver Capability by Remote Control (Stun) 222, 235
Disabling the Transceiver Capability by Remote Control (Stun/ Kill) 197, 236, 387
Disabling VOX Transmission during Voice Output (Transmit Inhibit while Receiving) 449
DISPF 300, 347
Display Format 79, 472
Display When the Transceiver Receives a Group Call (Group Call Display Type) 143
Displaying a Bitmap Image When the Transceiver is Turned ON (Custom Start-up Screen) 81
Displaying the ID of the Communicating Caller on the LCD (Caller ID Display) 131
Displaying the Remaining Battery Power Level (Battery Indicator) 105
Displaying the Signal Strength (Signal Strength Indicator) 77
Displaying the Signal Strength Level (RSSI Level) (Maintenance Display) 66
DISPM 348
DISPQ 348
DISPS 301
DMR CONVENTIONAL SYSTEM 110
DMR Direct Mode 118
Dropout Delay Time 444
DSPMT 349
DSPQT 349
DTAIL 301
DTMF Hold Time 226
DTMF Speed 223
Duration of Locator Tone 1 402
Duration of Locator Tone 2 402
Duration of Lone Worker Tone 416
Dwell Time 444

E

Editing the Contact List 128
Embedded Message 16
Embedded Message with Password 16
Embedding a Message in the Transceiver (Embedded Message) 16
Emergency 472
Emergency 5-tone 410
Emergency Alarm (DMR Conventional System Only) 396
Emergency Call Fleet 409
Emergency Call ID 410
Emergency Channel Type 398
Emergency Cycle 401
Emergency Delay Time 453
Emergency Display 405
Emergency DMR ID 408
Emergency DMR ID Type 408
Emergency DTMF ID 409
Emergency ID 407
Emergency LED 406

Emergency Mic Sense 404
Emergency Mode Type 406
Emergency Status 158, 410
Emergency Status Response 160, 375
Emergency Text 405
Emergency Zone-Channel 400
EMGOF 350
EMGON 301
Emitting the DTMF Code Tone (Sidetone) 226
Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode 412
Enabling Voice Scrambler 420
Enabling VOX 447
ENC enc 302
ENCA enc 350
ENCG enc 351
ENCI enc 351
Encode Format 295
Encode Functions 291
Entering a 5-tone Code Directly Using the Keypad to Send (Free-dial Entry) 279
Entering or Deleting a Code 49
Entering or Deleting Characters 55
ENTTM ltime 302
ERASE time 352
ERRX0 303
ERRX1 303
External Microphone Type 97
External Speaker Type 102

F

Firmware Copyrights iv
First Digit Delay Time 224
First Digit Time 224
Fixed Volume 472
FleetSync 362
FleetSync Baud Rate 362
Free-dial Entry 491
Frequencies for Standby Code (A Tone/ B Tone/ C Tone/ D Tone) 233
Function 472
Function Port 451
Functions and Panel Layout 1
Functions Assignable to the AUX Input Port 451
Functions Assignable to the AUX Output Port 454
Functions in Lone Worker Mode 414
Functions Not Available for TK-Dx00 without LCD 485
Functions Related to 2-tone Code Decoding 232
Functions Related to 2-tone Code Encoding 231
Functions Related to DTMF Code Decoding 227
Functions Related to DTMF Code Encoding 223
Functions Related to the Volume Configuration 91
Functions Relevant to Communicating with External Devices 429

G

GENERAL FEATURES vi
Getting Started 11
GPS 388
GPS Functions 385, 388
GPS Message Type 192, 390
GPS Position Display 194, 391, 473, 491
GPS Report Back to Requested ID 192, 390
GPS Report Interval Time 191, 389
GPS Report on Data Zone-Channel 390
GPS Time Mark 192, 389
Group Call 238
Group ID 370
Group ID List 142
Group ID Scan 144
Group Tone 267
GRP0 352
GRP0A 353
GRPA 353
GRPN 354
GRPP 354
GTC Count 377

H

Home Channel 473
Home Channel Select 473
Horn Alert Logic Signal 459
Horn Alert Status 162
Horn Alert Status when Power is On (Horn Alert Mode) 460
How to Search for Information v
How to Use the Ignition Sense Port 456

I

Icons 8
ID List 369
ID of the Target Transceiver (Base ID) 189

ID Sent when Emergency Mode Is Activated 407
IDLOF 303
IDLON vtime enc 304
Improving the Sound Quality for Transmitting and Receiving (Compander) 235
Indication and Display 67
Indication and Sound in Emergency Mode 405
Indication Functions of the Display 78
Individual Call 237
Information in the LED Display 69
Initiating a Broadcast Call 145
Initiating a Group Call 139
Initiating a Paging Call 125, 368
Initiating a Selective Call 368
Initiating an Individual Call 123
Initiating an Individual Call (Individual Call Acknowledge Request) 134
Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) 133
Initiating Voice Communications (Basic Transmission and Reception) 110, 200
Input Sensitivity of the Microphone (Mic Sense) 38
Interrupt Emergency CALL (DMR Conventional System Only) 396

K

Key Guide 9
Key Lock 473
Key Lock for Selector 62
Key Operations for Each Mode 488
KEYD 304
KEYE 305
Keypad Operation 22
KNOBD 305
KNOBE 305

L

LCD 7
LCD Brightness 473
LED (Individual/ Group Call) 370
LED (Other Selective Calls) 371
LED Display 68
LEDF 306, 354
LEDS 306
LEN xtime 306
Lighting the Backlight (Backlight) 74
Lighting up the LED According to the Transceiver Status 74
Location Information Display 393
Locator Tone 85, 405
Locking the Transceiver Keys (Key Lock) 61
Lone Worker 473
Lone Worker Interval 415
Lone Worker Type 414
Lookback 436
Low Transmit Power 473

M

Maintaining the Transmission State after VOX Transmission (VOX Delay Time) 449
Maintenance 473, 491
Making a Group Call 139
Making a Selective Call 251, 367
Making an Individual Call 122
Making an Informative Group Call (Broadcast Group Call) 145
Man-down Detection 418
Manual Dialing (DMR Conventional System Only) 23
Manual Emergency Reset 397
Map Header 193, 386
Maximum ACK Wait Time 147, 378
Menu 473, 492
Message 473
Message Display Type 250
Message Memory (5-tone System Only) 44
Message Mode 492, 493, 494
Minimum Mute Tone Period 286
Mode 466
Mode Reset Timer 21
MONC 355
MONF 355
Monitor 473
Monitor Function 281
Monitor Functions 280
Monitor Key Action 282
Monitor Momentary 473
Monitor Operation Other than the PTT Switch 285
Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor) 198
MONO 355
Motion Detection 419
Multi-key List 428
Multiplexing QT/DQT during Data Transmission (Data Transmit with QT/DQT) 236

Mute Monitor Tone 286
Muting the PTT ID Tone (PTT ID Mute (Analog)) 221, 365
My ID 244
My ID Digits 245

N

Noise Suppressor 101
Notations Used for the Target Models ii
Notifying Status Changes of the Transceiver by Sending PC Commands (J Command Serial Output) 387, 430
Notifying the Changed Zone- channel Number by Voice (Voice Announcement) 33
Notifying the Start of VOX Transmission with a Tone (VOX Proceed Tone) 450
Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone) 138
Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) 138
Number of Retries 147, 377
Number of Times 388

O

OPEN 307
Operating the Transceiver in Each Mode (Common Operation) 45
Operating TK-Dx00 with LCD 461
Operating TK-Dx40 463
Others 238
Outline of This Transceiver vi
Output of PTT ID Tone (PTT ID Sidetone) 365
Output of the Received FleetSync ID from the Communication Port (Unit ID Serial Output) 366
OVCM 473
Overwriting the Firmware (Firmware Programming Mode) 468
Own ID (Fleet (Own)/ ID (Own)) 362

P

Password for Reading Configuration Data in a PC (Read Authorization Password) 465
Password for Transceiver Operation (Transceiver Password) 461
Password for Writing Configuration Data (Overwrite Password) 465
PAUSE lwtime 307
Placing the Transceiver in Emergency Mode 394
Placing the Transceiver in Emergency Mode Using Activity Detection 417
Placing the Transceiver in Emergency Mode Using Lone Worker 412
Powering On/Off the Transceiver According to the Ignition Sense Port Status (Ignition Sense) 456
Power-off Status Message 159, 374
Power-on My ID Edit 245
Power-on Scan 445
Power-on Status Message 159, 374
Power-on Text 79
Power-on Tone 83
Preamble Length 148
Preferentially Using a Channel Being Used by Other Parties (BCL Override) 116, 207
Pressing PTT/ Release PTT 284
Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only)) 144
Primary Address 247
Prioritizing Data Communications Using an External Device (Data Override) 429
Priority-channel Stop Tone 436
PTT ID Type 220, 363

Q

QUEUE 356
Queue Type (5-tone System Only) 43

R

RACK stime dec 308
Random Access (Contention) 380
Reading the Configuration Data from the Transceiver 15
Receive Duration 403
Receive Entry 474, 496
Receive Gap Period 240
Receive Group Digits 268
Received Message Display Type (Message Display Type) 148
Receiving 111, 200
Receiving a Broadcast Group Call 146
Receiving a Group Call 141
Receiving a Selective Call 253, 369
Receiving a Short Message 184

Receiving a Status Message 155, 272, 372
Receiving an Individual Call 125
Receiving an Individual Call (Individual Call Acknowledge Request) 137
Receiving GPS Data 193, 386
Reception during the Scan 439
Redialing 219
Reducing Battery Consumption (Battery Saver) 109
Reducing the DTMF Data Burst Tones (PTT ID with QT/DQT) 226
Remote Control 474, 494, 495
Remote Operation by Radio Communication (Remote Control) 194
REP rep 308
Repeat Tone 240
REPOF 356
Restricting Alert Tone When Consecutively Receiving a Call (Alert Tone Restriction from 2nd Call) (DMR Conventional System Only) 95
Restricting IDs for Which the Transceiver Can Initiate a Call (Unit ID Encode Block) 132
Restricting IDs that Support Talkback (Unit ID Encode Block) 371
Restricting the Duration of Continuous Transmission (Time-out Timer) 113, 204
Revert Channel 443
Revert Channel Display 444
RIGN stime 309
RKILL1 .....309, 357
RKILL2 .....310, 357
Rollover/ End Stop 32
RSML ltime 311
RSMS stime 311
RSTUN 312, 358
RVIVE 313, 358
RX 314
RXF rf-freq 313
RXP 314

S

SBUSY 314
Scan 431, 474
Scan Behavior 288
Scan Delete/Add 474
Scan Stop Tone 445
Scanning All Target Zones for Scanning (Multi Scan) 433
Scanning in One Zone (Single Scan) 431
SCHK 315
SCLOS 315
SCOFF 316
SCPH 316
SCR st-tone 316
Scrambler 474
Scrambler (DMR Digital) 423
Scrambler Key 474, 494
Scrambler Status Memory 423, 428
SCRP 317
SCT st-tone 317
SCTP 317
SDIAL 318
Searching Whether the Transceiver Receives a Call (Scan) 112, 204
SELC 318
Selcall 474
Selcall + Status 474
Selcall Digit Display 261
Selcall List 266
Selcall/ Selcall + Status (5-tone) 496
SELCH channel 319
SELD 319
Selectable Group Tone 265
Selectable Receive Digits 260
Selectable Selcall Digits 270
Selectable Status Digits 278
Selected Channel Scan 445
Selecting or Clearing Data from a List 45
Selective Call Alert LED 112, 234, 370
SELGR zone 320
SELM 320
SELMC 321
SELS 321
SELTXT ‘text’ 359
SEND ^K1 to SEND ^K8 322
SEND ^M1 to SEND ^M8 322
SEND ^Q1 to SEND ^Q8 323
SEND ^RX1 to SEND ^RX8 323
SEND ^TX1 to SEND ^TX8 323
SEND ^U1 to SEND ^U8 324
SEND ^V1 to SEND ^V8 324
SEND #0 to SEND #F 322
Send the GPS Data 474
SENDC 325
Sending a DTMF Code by Selecting from a List (Autodial Mode) 218
Sending a DTMF Code by Using the Autodial Key (Autodial) 216
Sending a PTT ID 220, 363
Sending a Selective Call 252

Sending a Short Message by Newly Entering a Message (Create New) 172
Sending a Short Message by Selecting a Message from a List (Predefined) 174
Sending a Short Message in Contact List Mode 163
Sending a Short Message in Message Mode 167
Sending a Status Message 271, 372
Sending a Status Message in Contact List Mode 150
Sending a Status Message in Status Mode 152
Sending and Receiving a Short Message (Short Data Call) 163, 167
Sending and Receiving a Status Message (Status Call) 149, 271, 372
Sending GPS Data 189, 381
Sending GPS Data According to the Request from the Base Station (GPS Report Mode) 191, 382
Sending GPS Data Automatically at Certain Intervals (GPS Report Mode) 190, 382
Sending GPS Data Based On Travel Distance (GPS Distance Change) 385
Sending GPS Data Manually by Using a Key (Send the GPS Data) 191, 383
Sending GPS Data Together With Emergency Call (GPS Combination) 384
Sending GPS Data Together With Operation of the PTT Switch (GPS Combination) 383
Sending GPS Data Together With Status Call (GPS Combination) 384
Sending Remote Control Messages by Remote Control Mode 195
Sending the DTMF Code by Pressing a Key on the Microphone Keypad without Using the PTT Switch (Keypad Auto PTT) 217
Sending the DTMF Code While Transmitting (Manual Dialing) 217
Sending the Received Short Message from the Communication Port (Short Message Serial Output) 185
Sending the Received Status Message from the Communication Port (Status Message Serial Output) 159
SENDPC 359
SENDS 325
Serial Protocol Types 484
Sharing the Same Channel (Frequency) by Several Groups (Color Code) 120
Sharing the Same Channel (Frequency) by Several Groups (QT/DQT) 209
Short Decode 234
Short Message on Data Zone-Channel 185
Sidetone 86, 250
Simultaneous Communications by Dual Slot Direct Mode 118
SLEN ofs 326
Software Copyrights iv
SOPEN 327
Sound 82
SPAUS 327
Speaker Attenuation 474
Specifying the Zone-channel Selected When the Transceiver Is Turned ON (Power-on Zone-Channel) 34
Squelch Level 474, 497
Squelch Off 475
Squelch Off Momentary 475
SSTO 1 to SSTO 8 360
Stack 475, 498
Stack Procedure of the Receive History (Latest Received Message Stack) (DMR Conventional System Only) 41
Standby Code (Decoder 1 and Decoder 2) 232
Standby Code (ID Code) 227
Starting Scanning in Tandem with the Microphone (Off-hook Scan) 446
Starting the Scan 431
Stationary Detection 419
Status 475
Status (5-tone) 500
Status (DMR) 499
Status List 157, 276, 374
Status Memory (AUX Output Status Message) 454
Status Message 238
Status Message on Data Zone-Channel 158, 380
Status Message Stack (DMR Conventional System Only) 42
STO 1 to 8 360
STOPS 327
Storing the Selected or Sent Status (Status Hold) 162
STRTS 328
STTXT ‘text’ 361
Sub-LCD Display 80
Suspended Power-off 397
Switching between the Built-in and External Speakers (External Speaker) 104
Switching the Zone-Channel Using a Connected External Device (Remote Zone-Channel) 455

T

Talk Around 117, 475
Target Fleet/ ID 375
Target Models ii

Temporarily Disabling the Signaling (Monitor) 211
Temporarily Disabling the Squelch (Squelch Off) 200
Temporarily Reducing the Volume Level of the Speaker Microphone (Speaker Attenuation) 94
Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) 188
Testing or Adjusting the Transmit and Receive Capabilities of the Transceiver (PC Test Mode/ PC Tuning Mode) 470
Testing the Transmit and Receive Capabilities of the Transceiver (Panel Test Mode) 466
TEXT 'text' 328
The Icons on the LCD 75
The ID of the Target Transceiver (Base Fleet/ Base ID) 381
Time Interval before Transceiver Powers Off Timed Power-off) 457
Timing for Sending a PTT ID 220, 364
TK-D200/ TK-D200G/ TK-D300/ TK-D300G 1
TK-D240/ TK-D340 4
TK-D740/ TK-D840 5
TK-Dx00 with LCD 17, 105
TK-Dx00 without LCD 17
TK-Dx00 without LCD/ TK-Dx40 (Portable) 106
Toggling On and Off in Menu Mode 501
Toggling the Scrambler between Enabled and Disabled 424
Toggling the Voice Scrambler between Enabled and Disabled 421
TONE af-freq 328
Tone Period 240
Tones that Sound When a User Operates the Transceiver or When the Transceiver Status Is Changed 82
Tones that Sound When the Communication Starts/ Ends 89
Tones that Sound When the Transceiver Receives a Call 87
TOT Pre-alert 113, 204
TOT Rekey Time 114, 205
TOT Reset Time 114, 205
TPD 329
TPE 329
Transceiver Behavior during the Scan 213, 437
Transceiver Behavior in the Case That a Zone Channel Is Changed during the Scan 438
Transceiver Behavior in the Case That a Zone Channel Is Changed Manually while the Scan Pauses to Receive 438
Transceiver Behavior in the Case that the Scan Cannot Be Resumed 438
Transceiver Behavior of When Responding to the Call ID Stored in the Stack Memory 42
Transceiver Behavior When Receiving a Selective Call 228
Transceiver Data Protection with Password 461
Transceiver Password 475, 501
Transceiver's Behavior upon Receipt of the Encrypted Audio Data 427
Transmission Method of GPS Data 189, 381
Transmission Power 63
Transmission/ Reception 63
Transmit Busy Wait Time 147, 378
Transmit Delay Time (Receive Capture) 379
Transmit Duration 403
Transmit LED 67
Transmit/ Receive Frequencies 63
Transmitting 113, 204
Transmitting/ Receiving 38
TSET toneset 330
Turning the Transceiver OFF 19
Turning the Transceiver ON 17
Turning the Transceiver ON/ OFF 17
TX Address/ RX Address 247
TXF rf-freq 330
TXM 330
TXP 331
TXS 331
TXT 331
TXTOF 332

U

Unit ID List 127
Unmuting in Tandem with the Microphone (Off-hook Decode) 213
Unmuting the Speaker (Audio Control (Analog)) 211
Using 2-tone to Initiate a Selective Call 231
Using 5-tone to Communicate 214
Using DMR ID to Initiate a Selective Call 122
Using DTMF to Initiate a Selective Call 215
Using FleetSync to Initiate a Selective Call 214
Using Function Keys 20
Using Menu Mode 24
Using Optional Signaling (Analog) 210
Using Sound to Notify the Other Party that the Communication Ends (PTT Release Tone) 90
Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone) 89

Using the Contact List (DMR Conventional System Only) 26
Using the Signaling 120, 209
Using the Transceiver as a Loudspeaker (Public Address) 103

V

Vehicle-interlinked Features 456
Viewing the Configuration for Each ID 27
Viewing the Receive History (Stack) 39
Viewing, Replying to, Forwarding, and Deleting the Received Short Message (Inbox) 168
Viewing, Resending, Forwarding, and Deleting the Sent Short Message (Outbox) 176
Volume Level Tone 86
VOX 447

W

Waiting for Both Digital Signals and Analog Signals (Mixed Mode) 121
Warning that the Battery Voltage Is Low (Battery Warning) 107
Warning That the Battery Voltage of the Vehicle Battery Is Low (Battery Warning) 108
Warning Tone 84
Writing the Configuration Data to the Transceiver 14

X

XCARR 332
XCLOS 332
XCTCM 333
XCTCN 333
XCTCW 334
XOPEN 334
XPASS 361
XSAT st-tone 335
XSCAN 335
XSENS 335

Z

Zone Delete/Add 475
Zone Down 475
Zone Down (Continuous) 475
Zone Name Display 78
Zone Select 482
Zone Up 475
Zone Up (Continuous) 475
Zone Up/Down 482
Zone-channel Used for Emergency Mode 398