



Function Reference (FUNC)

For

***TK-2180/ TK-3180/
TK-7180/ TK-7180H/
TK-8180/ TK-8180H
(MPT version)***

Version:

2.00

Last Updated:

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Language:

English

Type:

K

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Revision history

Date	Description
2005.10	<ul style="list-style-type: none">1) High-power model (TK-7180H/ TK-8180H) was added. TK-7180H and TK-8180H were added to model name. Transmit Power was added.2) The following items were added.<ul style="list-style-type: none">2.1.4 Searching for Control Channel8.16.6 Emergency Display8.17.5 Codeword Error Counter10.3.4 Transceiver Operation after Manually Changing the Call Address during the Group Scan17.4 PC COM port Polarity20.1.2 Clear Down.3) The following items were deleted.<ul style="list-style-type: none">3.6.4 Display Language8.4.3 Call Address Display8.4.4 Changing Call Address Display Mode10.8 Conventional Monitor10.9 Revert Call Address20.1.10 Mic Sense4) The description of 8.4 Block Select was modified.5) The description 20.1.10 Mic Sense was moved to 20.1.1 External PTT.6) Correction was made to correct errors and update information due to change in the specifications.7) The version number was changed from 1.00 to 2.00.

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About this Manual

This In-depth manual describes the functions of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H and explains how to configure its various functions.

How to Read this Manual

This manual has the following sections. Each function has reference data that allows you to find the cross-referenced information. Refer to “Configuration using KPG-96D” for functions that can be configured using KPG-96D. The abbreviations of section names are used to specify the reference.

(Function Reference: FUNC)

This In-depth manual describes all functions of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H. “2 BASIC OPERATION” describes basic functions and explains how to use various functions.

(Field Programming Reference: FPRG)

This In-depth manual describes how to configure data of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H by using KPG-96D.

About Notations

The following notations are used in this manual.

[]

The characters in parentheses indicate the name of the operating portion of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H and the keys of the PC.

“ ”

The characters in quote marks indicate the name of the functions, buttons, and menus shown on the displays of KPG-96D and characters displayed on the display of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

Bold Letters

The characters in bold letters indicate the name of the windows, tabs, and checkboxes for KPG-96D, and functions assigned to the operating portion of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

[] + []

This notation is used for pressing 2 keys at the same time using the keyboard of the PC. When the notation is **[Shift]** + **[a]**, you must press the **[a]** key and shift key at the same time to enter A (uppercase character).

Programmable Function (PF) Key

This notation is used when a function is assigned to a key on the transceiver. If Call is assigned to the **[C>]** key, the **[C>]** key is described as **Call** key.

Terms Modification for the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H

In the in-depth manual, conventional ambiguous function names, function names that do not correspond to operations, grammatical mistakes, and lack of unity in terms are revised. Therefore, some function names were changed even though operations are not changed. Refer to the comparison list for new and old function names.

New Name	Old Name
2-tone	2 Tone
3 Reference Levels Adjustment	3 Point Adjustments
5 Reference Levels Adjustment	5 Point Adjustments
Autodial	Auto Dial
Battery Saver	Battery Save
End of Transmit	End of TX
Key Beep	Key Press Tone
Key-entry Error Tone	Key Input Error Tone
Low Transmit Power	Low Power
Low Transmit Power	RF Power Low
Manual Dialing	Manual Dial
Off-hook	Off Hook
On-hook	On Hook
Optional Board	Option Board
Optional Signaling	Option Signaling
OST Status Memory	OST Back Up
Password Authorization Tone	Password agreement Tone
Power-on Scan	Power On Scan
Power-on Text	Power On Text
Power-on Tone	Power On Tone
Pre-alert	Pre-Alert
Read Authorization Password	Read Password
Receive Frequency	RX Frequency
Ringer Tone	Ringing Tone
Scrambler Status Memory	Scrambler Backup
Sidetone	Side Tone
Signal Strength Indicator	Signal Meter
Single Reference Level Adjustment	1 Point Adjustment
Store & Send	Store&Send
Stun-off Tone	Stun Off Tone
Stun-on Tone	Stun On Tone
Time-out Timer	Time Out Timer
Tone Off	Selectable No Tone
TOT	T.O.T.
Transceiver	Radio

New Name	Old Name
Transceiver Password	Radio Password
Transceiver-kill	Radio-kill
Transmit Frequency	TX Frequency
Transmit Power	TX Power
Trunking Logic Board	Trunking Board
Turn-off Code	Turn off Code
Transmit Inhibit while Receiving	TX Inhibit on Receive
Warning Tone	Warning Alert Tone
While Transmitting	On TX
Zone-name Text Length	Zone Name Text length

Abbreviations Used in this Document

The following abbreviations are used in the in-depth manual since this manual is created in English.

Abbreviations	Full Spelling or its meaning
ACK	Acknowledgement
ANT	Antenna
AQUA	Kenwood's audio signal processing IC
AUX	Auxiliary
BCL	Busy Channel Lockout
CH	Channel
COM port	Communication port
COR	Carrier Operated Relay
Dec ID	Decode ID code
deg	degree(s)
Del	Delete
DI	Data Input
DQT	Digital Quiet Talk code
DTC	Data Transmission Control
DTMF	Dual Tone Multi Frequency
Enc ID	Encode ID code
ETX	End of Text
External PTT	an external PTT switch
FEC	Forward Error Correction
FOACSU	Full Off Air Call Set Up
GID	Group ID code
GPS	Global Positioning System
GTC	Go to Channel
Hi	High
I/O	Input/ Output
LOK	Link OK (connected to the repeater)

Abbreviations	Full Spelling or its meaning
MI2	Microphone Input II
Mic	Microphone
Mid	Medium
MPT	Ministry of Post and Telecommunication
MSK	Minimum Shift Keying
NPD	Non-Prescribed Data
OST	Operator Selectable Tone
PA	Public Address
PABX	Private Automatic Branch Exchange
PF	Programmable Function
PSTN	Public Switched Telephone Network
PTT ID	PTT (Push-to-talk) ID code
QT	Quiet Talk signaling
RSSI	Received Signal Strength Indication
RTC	Real Time Clock
RX	Reception, Receiver
RXD	Received exchange data
RXVCO	Receiver's voltage controlled oscillator
SDM	Short Data Message
STX	Start of Text
SW	Switch
TEL	Telephone
TOR	Tone Operated Relay
TOT	Time-out Timer
TSC	Trunking System Controller
TX	Transmission, Transmitter
TX LED	Transmit LED
TXD	Transmitted exchange data
TXS	Transmission Sense
TXVCO	Transmitter's voltage controlled oscillator
UTC	Universal Coordinated Time
VGS-1	Voice Guide and Storage Unit
With QT/DQT	With QT signaling and DQT code
With STE	With Squelch Tail Eliminator

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Transceiver Description

■ About the TK-2180/ TK-3180

TK-2180/ TK-3180 is a VHF/UHF portable transceiver that supports Conventional and MPT Trunking Systems.

■ About the TK-7180/ TK-7180H/ TK-8180/ TK-8180H

TK-7180/ TK-7180H/ TK-8180/ TK-8180H is a VHF/UHF mobile transceiver that supports Conventional and MPT Trunking Systems.

■ Features

- A maximum of 8 network can be configured.
- A maximum of 250 Individual Addresses and Group Addresses can be configured.
- A maximum of 32 Conventional channels can be configured.
- Single head remote is available. (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)
- The transceiver supports QT Encode/Decode, DQT Encode/Decode and DTMF Encode.
- The transceiver has a D-sub 25-pin connector on its rear panel. (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)
- The transceiver has a built-in entry level Scrambler function.

- The transceiver supports the following Optional Boards.
Voice Scrambler: SC20-460 (Transcrypt)
GPS Receiver: GPS35-HVS, GPS-15L (Garmin)
(TK-7180/ TK-7180H/ TK-8180/
TK-8180H only)
Voice Guide & Storage Unit: VGS-1 (Kenwood)
- The transceiver has a password function to protect its configuration data.
- The transceiver displays the remaining battery capacity. (TK-2180/ TK-3180 only)
- The transceiver has a time display function.

About the Programming Software

Functions of the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H can be configured using the KPG-96D software. Configuration data configured using KPG-96D can be written to the transceiver by connecting the TK-2180/ TK-3180/ TK-7180/ TK-7180H/ TK-8180/ TK-8180H to a PC using the KPG-36/ KPG-46 programming cable. In this manual, the description of each function in the Function Reference may have a corresponding reference in the Field Programming Reference. Therefore, you can configure the function by referring to the information also appearing in the Field Programming Reference.

1 DESCRIPTION

1.1 Functions and Panel Layout

1.1.1 TK-2180/ TK-3180

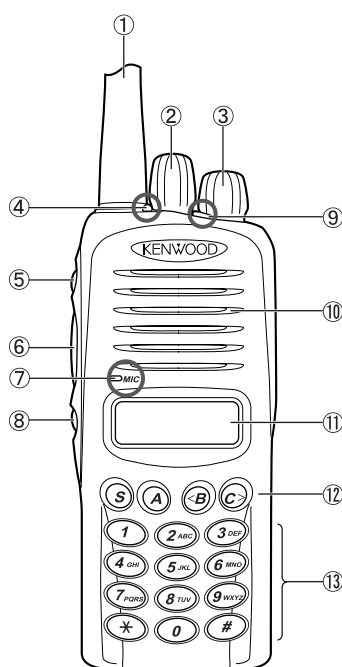


Figure 1-1 Front View of the TK-2180 and TK-3180

① **Antenna**

This is the antenna of the transceiver.

② **Selector**

This selector can be used to change the Call Address or channel.

③ **Power Switch/ Volume Control**

Turn this switch to turn the transceiver ON. The **Volume** control allows a user to adjust the volume level from the speaker.

④ **Transmit LED/ Busy LED**

These LEDs light when the transceiver sends or receives signals.

⑤ **Side 1 Key**

Press this key to activate the assigned function.

⑥ **PTT Switch**

Press the **PTT** switch to talk.

⑦ **Microphone**

Speak into the microphone to talk.

⑧ **Side 2 Key**

Press this key to activate the assigned function.

⑨ **AUX Key**

Press this key to activate the assigned function.

⑩ **Speaker**

The speaker emits the received audio signals and alert tones.

⑪ **LCD Display**

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

⑫ **PF Key**

Press a **PF** key to activate the function assigned to that function key.

⑬ **Keypad**

Press keys on the keypad to enter characters or numbers. (The transceivers with a 12-key Keypad only)

1.1.2 TK-7180/ TK-7180H/ TK-8180/ TK-8180H

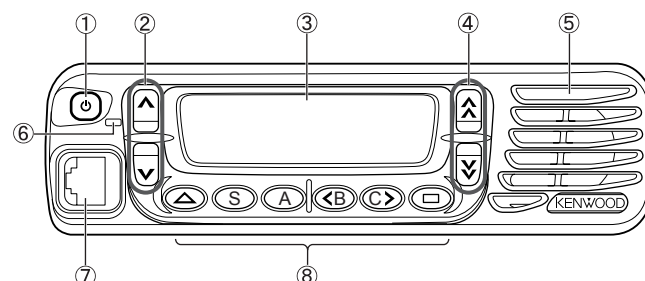


Figure 1-2 Front View of the TK-7180/ TK-7180H/ TK-8180/ TK-8180H

① **Power Switch**

Press this switch to turn the transceiver ON and press this switch again to turn the transceiver OFF.

② **[▲]/ [▼] Keys**

These keys allow a user to adjust the volume level from the speaker.

③ **LCD Display**

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

④ **[▲]/ [▼] Keys**

These keys can be used to change the Call Address or channel.

⑤ **Speaker**

The speaker emits the received audio signals and Alert Tones.

⑥ **Transmit LED/ Busy LED**

These LEDs light when the transceiver sends or receives signals.

⑦ **Microphone Connector**

A microphone can be connected to this connector.

⑧ **PF Key**

Press a **PF** key to activate the function assigned to that function key.

1 DESCRIPTION

Table 1-1 Function Fixed Keys

Key Name	TK-7180/ TK-7180H/ TK-8180/ TK-8180H	TK-2180/ TK-3180	Description
Power Switch	O	-	Turns the transceiver ON/ OFF.
[^] Key	O	-	Increases the speaker volume. Press and hold this key for 1 second to increase the volume level by 1 step every 100 ms.
[v] Key	O	-	Decreases the speaker volume. Press and hold this key for 1 second to decrease the volume level by 1 step every 100 ms.
Power Switch/ Volume Control	-	O	Increases or decreases the speaker volume. This switch can also be used to turn the transceiver ON or OFF.
[^] Key	O	-	Selects the target party and status to be sent.
[v] Key	O	-	
Selector	-	O	
PTT Switch	*1	O	Press this switch to make a call and communicate.
Keypad	*1	O	Enables dialing and data entry in MPT1343 and DTMF transmission. A 12-key or 16-key microphone is available if the transceiver is TK-7180/TK-7180H/TK-8180/TK-8180H. The 16-key keypad has [A], [B], [C] and [D] keys and these keys can be configured by using KPG-96D.

*1 Indicates keys on the external microphone.

1.2 Description of MPT Trunking System

MPT stands for Ministry of Post and Telecommunication and MPT Trunking Systems utilize signaling compliant with MPT1327.

1200 bps FFSK is used as the signaling type in an MPT Trunking System. The control channel is duplex (allowing transmission and reception at the same time) and half duplex control channels and full duplex control channels are used for the transceiver. Dedicated type control channels and undedicated type control channels can be used. Communication takes place on the traffic channel.

1.3 Transmit and Receive Frequencies

This is a frequency pair used for transmitting and receiving data.

Table 1-2 Transmit and Receive Frequencies

Model	Transmit Frequency and Receive Frequency Range [MHz]
TK-2180	136 to 174
TK-3180	400 to 470 450 to 520
TK-7180/ TK-7180H	136 to 174
TK-8180/ TK-8180H	400 to 470 450 to 520

1.4 Transmit Power

Low can be configured for the transmit power to reduce battery consumption if the repeater or the receiving party is nearby.

This configuration also extends the operating time of the TK-2180/ TK-3180 transceiver.

Transmit power of the transceiver can be configured for each channel in Conventional Mode by using KPG-96D. Transmit power can be configured for the transceiver in MPT Trunking System.

Following are the available transmit power settings.

Table 1-3 Transmit Power: Low/ High

Model	Transmit Power [W]	
	High	Low
TK-2180/ TK-3180	5	1
TK-7180	30	5
TK-7180H	50	10
TK-8180	30: 400 to 490 MHz (including 490 MHz) 25: 490 to 520 MHz (excluding 490 MHz)	5
TK-8180H	45: 400 to 490 MHz (490 MHz is included.) 40: 490 to 512 MHz (490 MHz is excluded. 512 MHz is included.) 35: 512 to 520 MHz (512 MHz is excluded.)	10

■ Configuration using KPG-96D

- Configuring the Transmit Power for each channel (Refer to FPRG 6.3.9 Conventional (Channel) Window.)
- Configuring the Transmit Power in MPT Trunking System (Refer to FPRG 6.3.2 Trunking Features Window.)

1.5 Channel Spacing

Channel Spacing is the channel bandwidth used for communication.

Channel Spacing of the transceiver can be configured for each channel in Conventional Mode by using KPG-96D. Channel Spacing of the transceiver can be configured for each network system in MPT Trunking System.

Table 1-4 Channel Spacing: Wide/ Narrow

Channel Spacing [kHz]	
Wide	Narrow
25	12.5

■ Configuration using KPG-96D

- Configuring the Channel Spacing (Wide or Narrow) for each Channel (Refer to FPRG 6.3.9 Conventional (Channel) Window.)
- Configuring the Channel Spacing in MPT Trunking System (Refer to FPRG 6.1.1 Network Information Window.)

2 BASIC OPERATION

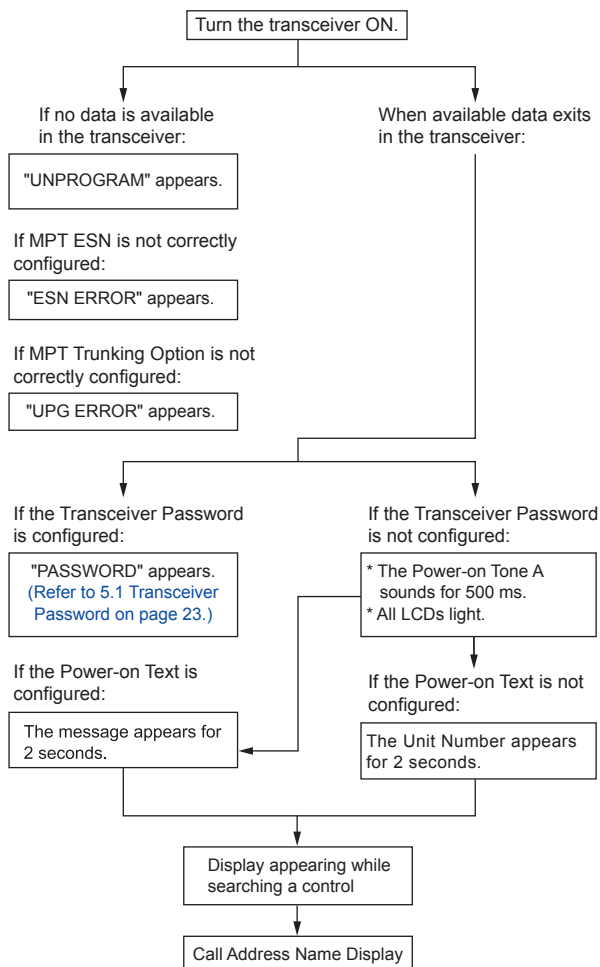
2.1 Turning the Transceiver ON/ OFF

2.1.1 Power ON

Turn the **Power** switch clockwise to turn ON the transceiver if the transceiver is TK-2180 or TK-3180.

Press the **Power** switch to turn ON the transceiver if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

The transceiver emits Power-on Tone for 500 ms when the transceiver is turned ON and all LCD segments appear. In this case, the transceiver checks for firmware and available frequency data.

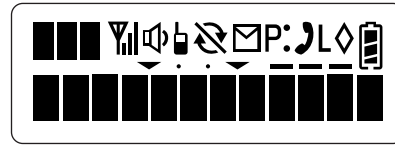


Note: Transceiver operation may vary depending on the Power Switch Status Memory configuration if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H. (Refer to 2.1.3 Power Switch Status Memory (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 6.)

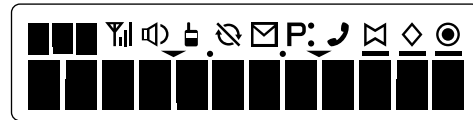
■ Display and Operation

● All Segments on the LCD Appear

The transceiver emits Power-on Tone A for 500 ms when the transceiver is turned ON and all segments on the LCD appear.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: Timed Power-off is disabled when the transceiver is turned ON by pressing and holding the **Power** switch for more than 1 second while Ignition Sense is configured for "Ignition & Switch". In this case, the transceiver emits Power-on Tone B to notify a user that Timed Power-off is disabled. (Refer to 7.2 Timed Power-off (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 26.)

● Unprogram Display

"UNPROGRAM" appears on the main display if there is no available data.



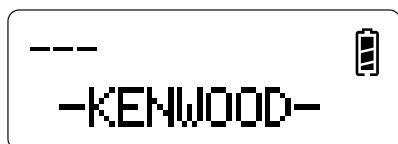
TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Power-on Text Display

If the Power-on Text is configured for the transceiver, the message appears on the main display for 2 seconds. (Refer to 3.6.4 Power-on Text on page 17.)



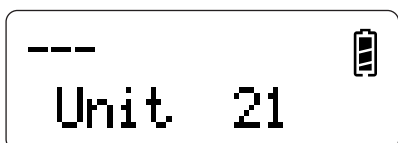
TK-2180/ TK-3180



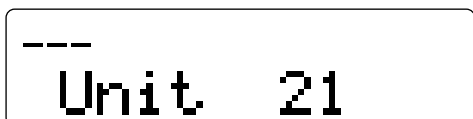
TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Unit Number Display

The Unit Number appears on the main display for 2 seconds if no Power-on Message is configured.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: The clock appears on the display for 2 seconds if Clock is configured for Power-on Message Type.
(Refer to 15.2 Power-on Clock Display on page 87.)

● Display Appearing while Searching a Control Channel

When the Power-on Message display or Unit Number display disappears, the transceiver checks if an available control channel stored in memory is available.

If the transceiver cannot find a control channel stored in memory within a certain period, the transceiver searches for another control channel.

“▶▶” scrolls from left to right on the main display if the transceiver is searching for a control channel.

The transceiver cannot make a call while “▶▶” is displayed.

The “SVC” icon appears and the Call Address stored in the transceiver memory appears on the display when an available control channel is found. “SVC” appears on the sub display.

“▶▶” does not appear during registration. The triangle mark starts scrolling when registration fails.



TK-2180/ TK-3180

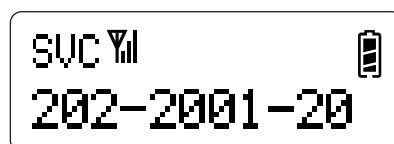


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Call Address Display

The Call Address Name (a maximum of 12 alphanumeric digits) configured for the transceiver appears on the main display.

If no Call Address Name is configured for the transceiver, “DR*” (* is a Call Address number) appears on the display.



TK-2180/ TK-3180

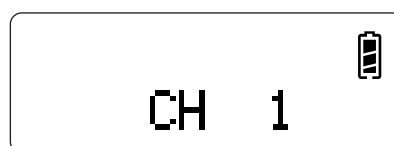


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Channel Name Display

When the transceiver is turned OFF and ON in Conventional Mode, the Channel Name configured for the transceiver appears on the main display after displaying the Unit Number for 2 seconds.

If no Channel Name is configured for the transceiver, “CH*” (* is a channel number) appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2.1.2 Power OFF

Turn the **Power** switch fully counterclockwise to turn OFF the transceiver if the transceiver is TK-2180/ TK-3180.

Press the **Power** switch while the transceiver is turned ON to turn OFF the transceiver if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

Only the clock function works when the transceiver is turned OFF.

2.1.3 Power Switch Status Memory (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

When the power connector is connected, this function can be used to turn the transceiver ON or OFF in conjunction with the **Power** switch status stored in the transceiver.

Power Switch Status Memory can be configured to be enabled or disabled by using KPG-96D.

■ Power Switch Status Memory Enabled

The transceiver turns ON and activates if the power connector is removed while the transceiver is turned ON, and then the connector is re-connected. The transceiver remains OFF if the power connector is removed while the transceiver is turned OFF, and then the connector is re-connected. The transceiver does not activate unless the **Power** switch is pressed.

■ Power Switch Status Memory Disabled

The transceiver is always turned ON when the power connector is connected regardless of the transceiver power status.

Note: Power Switch Status Memory does not work if Ignition Sense is enabled.

■ Configuration using KPG-96D

- Configuring the Power Switch Status Memory to be Enabled or Disabled (Refer to FPRG 6.4.1 Common Page 1 Tab > ■ Power Switch Status Memory (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)

2.1.4 Searching for Control Channel

Search for the control channel can be executed by activating the following hunt sequence.

■ Hunt

This hunt sequence is enabled under the following conditions:

- When the transceiver is turned ON.
- When the network is changed with Network Select.
- When Random Access fails.

The hunt sequence is enabled in the following order and the transceiver can receive a control channel if conditions are met at each hunt sequence.

Table 2-1 Hunt Sequence

Order	Hunt Sequence	Description
1	Resuming a Control Channel Sequence	This sequence is used to resume hunting for a control channel.
2	Single Channel Hunt Sequence	This sequence is used to receive a single channel.
3	Preferential Hunt Sequence	This sequence is a preferential hunt sequence. This sequence has the following 3 steps. <ul style="list-style-type: none"> • Preferential NDD Sub-set Hunt Stage • Preferential Sampled Hunt Stage • Preferential Area Hunt Stage
4	Normal Hunt Sequence	This sequence is a normal hunt sequence.
5	Comprehensive Hunt Sequence	This sequence is a comprehensive hunt sequence.

Note: Refer to the MPT-1343's instruction manual for details of the hunt sequences.

■ Background Hunt

This sequence is the hunt sequence executed by the transceiver in the background.

If a possible channel is found in the Background Hunt, the hunt sequences shown in Table 2-1 activate and the transceiver tries to receive the channel.

■ Vote Now

This hunt sequence is enabled when the transceiver receives the Vote Now Message (Broadcast Message, SYSDEF = 00101) sent from the TSC. The transceiver detects the level on the specified channel when the transceiver receives a Vote Now Message and receives a control channel.

Following hunt sequences are available in Vote Now: Normal Vote Now and RegioNet43.

Conditions to receive a control channel vary depending on the hunt sequence type.

Note: Refer to the Vote Now's instruction manual for details of the hunt sequence in Vote Now.

2.2 Adjusting the Volume

The volume level is increased when the **Volume** control is turned clockwise and the level is decreased when the **Volume** control is turned counterclockwise.

Press the [**▲**] key to increase the volume level from the speaker and the [**▼**] key to decrease the volume level from the speaker if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

2.3 Using Function Keys

Press any key to activate the function assigned to that function key. (Refer to 11 KEY ASSIGNMENT on page 77.)

2.4 Changing the Call Address

Use the **Selector**, **Call Address Up** key or **Call Address Down** key to change the Call Address in MPT Trunking System. (Refer to 11 KEY ASSIGNMENT on page 77.)

The transceiver skips unregistered Call Addresses when the Call Address is changed.

The Rollover Tone sounds when the smallest Call Address is selected. (Refer to 4.1 Tone Patterns on page 18.)

■ Transceiver Operation

● Using the Selector (TK-2180/ TK-3180 only)

- Turn the **Selector** clockwise.
The Call Address number is increased by 1 step.
- Turn the **Selector** counterclockwise.
The Call Address number is decreased by 1 step.

● Using the PF Keys

- Press the **Call Address Up** key.
The Call Address number is increased by 1 step.
- Press and hold the **Call Address Up** key for more than 1 second.
The Call Address number keeps increasing by 1 step every 200 ms.
- Press the **Call Address Down** key.
The Call Address number is decreased by 1 step.
- Press and hold the **Call Address Up** key for more than 1 second.
The Call Address number keeps decreasing by 1 step every 200 ms.

■ Configuration using KPG-96D

- Assigning the Call Address Up and Call Address Down to PF keys (Refer to FPRG 6.5 Key Assignment Window.)

2.5 Changing the Channel

Use the **Selector**, **Channel Up** key or **Channel Down** key to change the channel in Conventional Mode. (Refer to 11 KEY ASSIGNMENT on page 77.)

Although the transceiver pauses scanning if the channel is changed during the scan, the transceiver resumes scanning after 1 second. (Refer to 10 SCAN on page 71.)

The transceiver skips unregistered channels if the channel is changed.

The Rollover Tone sounds when the smallest channel is selected. (Refer to 4.1 Tone Patterns on page 18.)

■ Transceiver Operation

● Using the Selector (TK-2180/ TK-3180 only)

- Turn the **Selector** clockwise.
The channel number is increased by 1 step.
- Turn the **Selector** counterclockwise.
The channel number is decreased by 1 step.

● Using the PF Keys

- Press the **Channel Up** key.
The channel number is increased by 1 step.
- Press and hold the **Channel Up** key for more than 1 second.
The channel number keeps increasing by 1 step every 200 ms.
- Press the **Channel Down** key.
The channel number is decreased by 1 step.
- Press and hold the **Channel Down** key for more than 1 second.
The channel number keeps decreasing by 1 step every 200 ms.

■ Configuration using KPG-96D

- Assigning Channel Up and Channel Down to PF keys (Refer to FPRG 6.5 Key Assignment Window.)

2.6 Receive

2.6.1 Receiving in MPT Trunking System

Refer to “8 MPT TRUNKING on page 27” for reception in MPT Trunking System.

2.6.2 Receiving in Conventional Mode

The transceiver unmutes and emits the received audio when the transceiver receives a carrier. If the QT/DQT code is configured, the transceiver unmutes and emits the received audio when the QT/DQT matches.

Receive Frequency and QT/DQT Decode must be configured by using KPG-96D.

■ Transceiver Operation

1. Select the target channel. (Refer to 2.5 Changing the Channel.)
2. Adjust the volume level if needed when the transceiver receives a call. (Refer to 2.2 Adjusting the Volume on page 7.)

■ Configuration using KPG-96D

- Configuring the Receive Frequency (Refer to FPRG 6.3.9 Conventional (Channel) Window.)
- Configuring the QT/DQT Decode (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

2.7 Transmit

2.7.1 Transmitting in MPT Trunking System

Refer to “8 MPT TRUNKING on page 27” for transmission in MPT Trunking System.

2.7.2 Transmitting in Conventional Mode

The transceiver transmits voice when a user speaks while pressing the **PTT** switch. When a QT/DQT is configured: The transceiver sends the QT/DQT code when the **PTT** switch is pressed to transmit. If the sent QT/DQT code matches the QT/DQT code configured in the receiving party's transceiver, the caller can communicate with the receiving party.

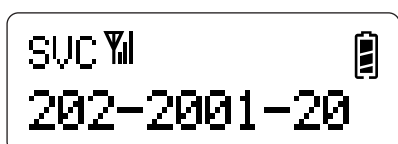
The transceiver sends Reverse Burst if QT is used or sends the Turn-off code if DQT is used to mute the speaker of the receiving party's transceiver, when the **PTT** switch is released.

Transmit Frequency and QT/DQT Encode not to sound a Squelch tail, must be configured by using KPG-96D.

■ Display and Operation

1. Turn the transceiver ON.

The transceiver attempts to register an available channel in MPT Trunking System. When the registration completes, the Call Address appears on the display.



TK-2180/ TK-3180

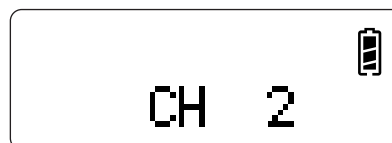


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: If the transceiver is turned OFF in Conventional Mode, the transceiver stores the status in the memory. In this case, the transceiver activates in Conventional Mode when the transceiver is turned ON.

2. Press the **Conventional** key.

The transceiver enters Conventional Mode and the previously selected channel name appears on the main display.



TK-2180/ TK-3180

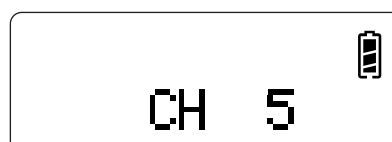


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: If the transceiver has exited from Conventional Mode during the scan, the transceiver resumes scanning.

3. Select a channel.

Select a channel using the **Selector** or **Channel Up** or **Channel Down** key.



TK-2180/ TK-3180

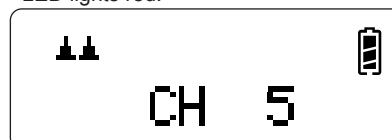


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

4. Press the **PTT** switch.

The transceiver transmits voice on the selected channel.

LED lights red.



TK-2180/ TK-3180

LED lights red.



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Configuring the Transmit Frequency (Refer to FPRG 6.3.9 Conventional (Channel) Window.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

2.8 Mic PTT (TK-7180/TK-7180H/TK-8180/ TK-8180H only)

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

Mic PTT can be configured by using KPG-96D. The following functions are available for Mic PTT.

Note: Mic PTT is compliant with KMC-9C/ KMC-30/ KMC-32/ KMC-35/ KMC-36.

■ Connect to Modulation Line

Configure the modulation line for the Mic PTT. Following is the modulation line list. The default modulation line is the Mic line.

- Mic Line: The audio line of the Mic located on the front of the transceiver
- MI2 Line: The audio modulation line of the D-sub connector located on the rear of the transceiver
- DI Line: The data modulation line of the D-sub connector located on the rear of the transceiver

■ With QT/DQT

Configure the QT/DQT for a Conventional channel to be replaced when the transceiver sends code by a user pressing the Mic PTT. Normally, only QT/DQT is replaced.

■ With STE

Configure the STE (Squelch Tail Eliminator) to be sent after sending the QT/DQT code for a Conventional channel by a user pressing the Mic PTT. Normally, the transceiver sends STE.

■ Configuration using KPG-96D

- Configuring the Connect to Modulation Line (Refer to FPRG 6.7.5 Modulation Line Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)
- Configuring the With QT/DQT (Refer to FPRG 6.7.5 Modulation Line Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)
- Configuring the With STE (Refer to FPRG 6.7.5 Modulation Line Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)

2.9 Compander

This function improves the quality of the received audio signal by reducing the amount of electrical noise.

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

Compander can be used in MPT Trunking System and Conventional Mode.

Compander can be configured for normal voice communications and voice communications using the telephone line.

Compander can be configured to be enabled or disabled by using KPG-96D. The transmitting party and the receiving party must have the same configuration.

■ Configuration using KPG-96D

- Configuring the Compander (MPT Trunking) to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)
- Configuring the Compander (Conventional Mode) to be Enabled or Disabled (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

2.10 Key Lock (TK-2180/ TK-3180 only)

This function disables operation of the transceiver. This is useful to prevent accidentally changing the transceiver configuration while using a belt clip, etc.

Key Lock can be assigned to a **PF** key on the transceiver by using KPG-96D.

Key Lock is enabled when the **Key Lock** key is pressed and held for 1 second. Key Lock is disabled when the **Key Lock** key is pressed and held for 1 second again.

Keys other than the **PTT** switch and **Power** switch cannot be used while Key Lock is enabled.

The **PF** keys assigned with the following functions still function even if Key Lock is enabled.

Conventional: Key Lock, Squelch Off, Lamp

MPT Trunking: Emergency, Lamp, Key Lock, Clear, Call

■ Display and Operation

“LOCKED” appears on the main display for 500 ms and the Key-entry Error Tone sounds in the following conditions:

- When pressing and holding the **Key Lock** key for 1 second.
- When pressing an inoperable key while Key Lock is enabled.



TK-2180/ TK-3180

Note:

- ◆ The Key Lock status is stored in the memory even if the transceiver is turned OFF.
- ◆ Transceiver Password is enabled before Key Lock is enabled if the Transceiver Password is configured. Key Lock is enabled when Transceiver Password is disabled.

■ Configuration using KPG-96D

- Assigning the Key Lock to a PF Key
(Refer to FPRG 6.5 Key Assignment Window.)

2.11 Keypad Operation

Keypad Operation can be configured according to the usage of the transceiver.

Dialing codes and DTMF codes can be directly entered using the keypad.

This function can be enabled only if a keypad is equipped on the TK-2180 or TK-3180.

This function can be enabled when 12-key or 16-key is configured for Mic Keypad by using KPG-96D if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

Keypad Operation can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Keypad Operation
(Refer to FPRG 6.5 Key Assignment Window.)

2.12 Site Lock

Site Lock can be used to remain on the current control channel.

When Site Lock is enabled, the transceiver remains on the current control channel even if a control channel having higher signal strength is detected. If Site Lock is disabled, the transceiver jumps to another control channel when a control channel having higher signal strength is detected.

Site Lock can be assigned to a **PF** key on the transceiver by using KPG-96D.

■ Display and Operation

1. Press and hold the **Site Lock** key for 1 second.

The transceiver is locked on the current site. “SITE LOCKED” appears on the main display for 500 ms and the Key Beep A sounds.



TK-2180/ TK-3180

2. Press and hold the **Site Lock** key for 1 second again.

Site Lock is disabled. In this case, the Key Beep B sounds.

3 DISPLAY

The transceiver has the following displays and indicators.

- LED (Transmit/ Busy)
- LCD Display

3.1 Busy LED

The Busy LED is used to notify a user that the transceiver is receiving a carrier. The Busy LED lights green when the transceiver receives a carrier.

Note: This function is only available in Conventional Mode.
The Busy LED does not light in MPT Trunking System.

3.2 Transmit LED

The Transmit LED is used to notify a user that the transceiver is transmitting. The Transmit LED lights red while the transceiver is transmitting.

3.3 LCD Display

The following displays are available.

■ TK-2180/ TK-3180

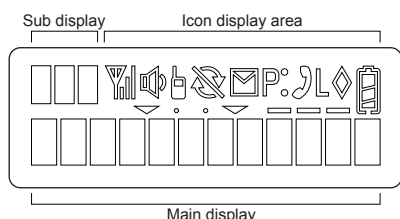


Figure 3-1 TK-2180/ TK-3180 LCD Display

■ TK-7180/ TK-7180H/ TK-8180/ TK-8180H

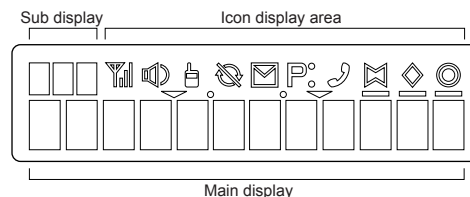


Figure 3-2 TK-7180/ TK-7180H/ TK-8180/ TK-8180H LCD Display

3.3.1 Available Characters on the Main Display and Sub Display

The following characters are available on the main display and sub display.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	{		}	~	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	÷	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	÷	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	÷
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Figure 3-3 Available Characters on the Main Display and Sub Display

3.3.2 Lamp (TK-2180/ TK-3180 only)

The backlight LEDs are located behind the LCD and the front keypad. With this function, a user can view the LCD in dark places or at night by using the backlight LEDs.

The LEDs light in the following conditions.

■ Pressing the Lamp Key

When the **Lamp** key is pressed, the backlight LED lights.

■ Using the Auto Backlight Functions

The backlight LED lights when a key other than the **PTT** switch or **Volume** control is used while Auto Backlight is enabled.

Note:

- ◆ The backlight LED lights for 5 seconds and automatically turns Off if no key is pressed after the backlight LED turns On.
- ◆ The illumination time is updated every time a key is pressed while the backlight LED is lit and the illumination time of the backlight LED extends for 5 seconds.
- ◆ The backlight LED turns Off when the **Lamp** key is pressed while the backlight light LED is lit.

■ Configuration using KPG-96D

- Assigning the Lamp Function to a PF key (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring the Auto Backlight to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

3.3.3 LCD Brightness (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

With this function, a user can decrease the brightness of the backlight LED when using the transceiver in dark places or at night. When the **LCD Brightness** key is pressed, the brightness of the backlight LED changes. The brightness changes in the following order: High → Low → Off.

The brightness status of the backlight configured by using the **LCD Brightness** key is retained even if the transceiver is turned OFF.

The brightness of the backlight LED can be configured using KPG-96D.









■ Configuration using KPG-96D

- Assigning the LCD Brightness to a PF key (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring the LCD Brightness Level (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

3.4 Icons

The following icons indicate the transceiver's status. Each icon appears in the icon display area of the LCD.

Table 3-1 Icon List

Icons	Function
	<ul style="list-style-type: none"> • RSSI Icon Displays the received signal level (RSSI). This icon does not appear while searching for a control channel.
	<ul style="list-style-type: none"> • Monitor Open Icon Conventional: This icon indicates the transceiver's status while Squelch Off is enabled. MPT Trunking System: Not used
	<ul style="list-style-type: none"> • Scan Mode Icon Conventional: This icon indicates the scan status. The Scan Mode icon has 2 statuses. Solid: The transceiver is scanning or has paused scanning while scanning. Flashing: When the scan is disabled while the transceiver is in Scan Mode. MPT Trunking System: Solid: The transceiver is doing a group scan.
	<ul style="list-style-type: none"> • Telephone ID Icon Conventional: Not used MPT Trunking System: Flashing: When Own Call Diversion is enabled.
	<ul style="list-style-type: none"> • Message Stack Icon This icon indicates Message Stack status. The Message Stack icon has 2 statuses. Solid: When a message is stacked. Flashing: When a new message is stored.
	<ul style="list-style-type: none"> • Horn Alert Icon (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) Conventional: Not used MPT Trunking System: This icon indicates the Horn Alert state.
	<ul style="list-style-type: none"> • Scrambler Icon This icon indicates the status of Scrambler.
	<ul style="list-style-type: none"> • Public Address Icon (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) Conventional: Not used MPT Trunking System: This icon indicates the status of Public Address.

Icons	Function
L	<ul style="list-style-type: none"> Low Transmit Power Icon (TK-2180/ TK-3180 only) Conventional: This icon indicates the status of Low Transmit Power. MPT Trunking System: Not used
(right)	<ul style="list-style-type: none"> Scan Channel Add Icon Conventional: This icon indicates the status of Scan Channel Add. MPT Trunking System: This icon indicates the status of Group Scan ID Add.
(left)	<ul style="list-style-type: none"> AUX A Icon Conventional: Not used MPT Trunking System: This icon indicates the AUX A status.
(center)	<ul style="list-style-type: none"> AUX B/ AUX Icon Conventional: Not used MPT Trunking System: This icon indicates the status of AUX B and AUX.
(left)	<ul style="list-style-type: none"> Auto Recording Icon This icon indicates the status of Auto Recording.
(right)	<ul style="list-style-type: none"> Auto Reply Message Icon Conventional: Not used MPT Trunking System: This icon appears when the transceiver is in Auto Reply Message Mode.
	<ul style="list-style-type: none"> Battery Indicator Icon (TK-2180/ TK-3180 only) This icon indicates the status of Battery Indicator. The Battery Indicator icon has 3 statuses. Solid: High, Sufficient, Low Flashing: Very Low Off: When alkaline batteries are used.

3.4.1 Signal Strength Indicator

This function is used to indicate the received signal strength at the transceiver.

When this function is enabled, the signal strength of the received signal appears.

Table 3-2 Signal Strength

Icons	Status	Signal Strength (dBm)	
		TK-2180/ TK-3180	TK-7180/ TK-7180H/ TK-8180/ TK-8180H
	High	Above -80	Above -74
	Medium	-95 to -80	-92 to -74
	Low	-110 to -95	-110 to -92
	Very weak	When a carrier is detected to -110	When a carrier is detected to -110
None	No signal	No carrier	No carrier

Note: Value shown represents signal strengths as measured at room temperature.

3.4.2 Battery Status/ Warning (TK-2180/ TK-3180 only)

This function is used to indicate the remaining battery life of the transceiver battery.

When Battery Status is enabled, the battery status is displayed in 4 stages according to the remaining battery capacity.

If Battery Warning is enabled, the transceiver emits a beep or displays a warning message if the battery voltage level is low.

Battery Status/ Warning can be configured to be enabled or disabled by using KPG-96D.

Table 3-3 Battery Status Icon List

Icons	Status
	High
	Sufficient
	Low
	Very Low

Table 3-4 Battery Warning Operations

Battery Warning	Operation
Off	Transmits as usual and no battery warning is given regardless of battery voltage status.
While Transmitting	The LED flashes red while the transceiver is transmitting.
Always	The LED flashes red continuously.
Always with Beep	The LED flashes red continuously and the Battery Warning Tone sounds.

Note:

- ◆ The status of alkaline batteries cannot be displayed.
- ◆ The transceiver operates in conjunction with the “While Transmitting” configuration if “Always” or “Always with Beep” is selected while alkaline batteries are used.

■ Configuration using KPG-96D

- Configuring the Battery Warning (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)
- Configuring the Battery Status (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

3.5 Sub-LCD Display

A maximum of 3 alphanumeric digits can be displayed on the sub display.

Normally, “SVC” appears on the sub display.

When the **Sub-LCD Display** key is pressed, the sub display switches in the following order: SVC display → Signal Strength display [dBm] → Control Channel display or Traffic Channel display.

Sub-LCD Display can be assigned to a key on the transceiver by using KPG-96D.

Note: This function is only available in MPT Trunking System.

■ Display and Operation

● SVC Display

Normally, “SVC” appears on the sub display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Signal Strength (dBm) Display

The signal strength (dBm) appears on the sub display if Signal Strength Level is configured.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The signal strength appears on the sub display depending on the signal strength level of the received signal.

- **When the signal strength level of the received signal is between -120 dBm to -70 dBm.**
A value between “120” (-120 dBm) and “70” (-70 dBm) appears on the sub display in steps of 1 dBm every 500 ms.
- **When the signal strength level of the received signal is less than -120 dBm.**
“> -” appears on the display.
- **When the signal strength level of the received signal is larger than -70 dBm.**
“>70” appears on the display.

● **Control Channel Display or Traffic Channel Display**

The control channel number appears on the sub display when a control channel is used and the traffic channel number appears when a traffic channel is used.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The following characters appear on the sub display depending on the specific situation.

Table 3-5 Sub Display List

Sub Display	Function
00 to 31	Status No.
R01 to R03	Redial No.
N1 to N8	Network No.
01 to 32	Stack No.
EMG	Emergency Call Display (Flash)
CAL	Individual Call Display (Flash)
GRP	Group Call Display (Flash)
BCC	Broadcast Message Display (Flash)
NEW	New Status Display
▲▲	Transmit Power Display (▲▲: High, ▲: Low)
▲	
HAD	Home Address
V01	VGS Recording Mode
ID	Own Prefix, Fleet, Ident Display
CNM	Control Channel Select
CH	Current Control Channel Number
SYS	Current System
CEC	Codeword Error Counter
B V	Beep Volume
R V	Ringer Volume
SIL	Speaker Mute
LMP	Lamp (TK-2180/ TK-3180 only)
C D	Current Traffic Channel Number
GR1 to GR7	Temporary Receive/Transmit Group

■ **Configuration using KPG-96D**

- Assigning the Sub-LCD Display to a PF key (Refer to FPRG 6.5 Key Assignment Window.)

3.6 Main Display

The following items relevant to the main display can be configured:

- Network Name
- Personal Name
- Channel Name
- Power-on Text

Note: The following alphanumeric digits and symbols can be entered using KPG-96D.

Table 3-6 Available Characters using KPG-96D

0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r
s t u v w x y z
À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ð Ñ Ò Ó Ô Õ Ö × Ø
Ù Ú Û Ü Ý Þ ß à á â ã ä å æ ç è é ê ë ì í î ï ð ñ ò ó ô
õ ö ÷ ø ù ú û ü ý þ ÿ
! " # \$ % & ' () ~ + - . , / : ; < = > ? @ [\] ^ _ ` { } * |
(space)

3.6.1 Network Name

Network Name can be used to assign a name to the network. Normally, these icons only appear in the KPG-96D window.

A maximum of 12 alphanumeric digits can be configured for each network.

Network Name can be configured by using KPG-96D.

■ **Configuration using KPG-96D**

- Configuring the Network Name (Refer to FPRG 6.1.1 Network Information Window.)

3.6.2 Personal Name

Personal Name can be used to assign a name to personal data. This function is only available in MPT Trunking System.

The personal name appears on the main display when selecting a network by using the **Network Select** key.

A maximum of 12 alphanumeric digits can be configured for each personal data.

Personal Name can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Personal Name (Refer to FPRG 6.3.1 Personalization Window.)

3.6.3 Channel Name

Channel Name can be used to assign a name to a channel. The function is only available in Conventional Mode.

A maximum of 12 alphanumeric digits can be configured for each channel. Channel Name can be assigned to allow easy recognition of each channel.

Channel Name can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Channel Name (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

3.6.4 Power-on Text

Power-on Text can be used to display characters on the display when the transceiver is turned ON.

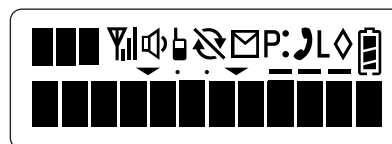
The message configured for Power-on Text appears for 2 seconds after the transceiver is turned ON.

Power-on Text can be configured using KPG-96D.

■ Display and Operation

- Turn the transceiver ON.

Power-on Tone A sounds for 500 ms when the transceiver is turned ON and all segments on the LCD appear.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The configured text appears for 2 seconds after all segments on the LCD disappear.

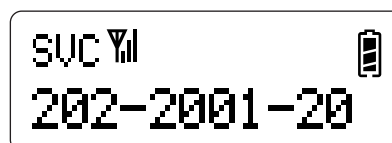


TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

When the registration completes, the Call Address appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Configuring the Power-on Text (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

4.1 Tone Patterns

The transceiver emits the following tones.

Table 4-1 Tone List

Tone Type	Type
Power-on Tone	Power-on Tone A Power-on Tone B (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)
Control Tone	Key Beep A Key Beep B Key Beep C Key-entry Error Tone Rollover Tone
Warning Tone	Warning Alert Tone TOT Pre-alert Tone Battery Warning Tone (TK-2180/ TK-3180 only) Stack in Tone Stack Alert Tone A/ B Pre-alert Timed Power-off Pre-alert Trunking Tone PLL Unlock Tone
Reception Tone	Phone Tone
MPT Tone	CSUIP (Calling)/ Call Queued Tone (Tone A) Called Party Ringing Tone (Tone B) System Busy Tone (Tone C) Unavailable Tone (Tone D) Called Party Busy Tone (Tone E) Number Unobtainable Tone (Tone F) Call Clear Indication Tone (Tone H) Alert Tone (Tone I) Transaction Confirmed Tone (Tone J) GTC Blip Tone (Tone K)
Transpond Tone	Transpond Tone
Locator Tone	Locator Tone

4.1.1 Power-on Tone

The transceiver emits this tone when the transceiver is turned ON.

Table 4-2 Power-on Tone List

Function	Description
Power-on Tone A	The transceiver emits this tone when the transceiver is turned ON.
Power-on Tone B (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)	The transceiver emits this tone to notify a user that Timed Power-off is disabled when the transceiver is turned ON by pressing and holding the Power switch for more than 1 second.

4.1.2 Control Tone

The transceiver emits this tone when a function activates.

Table 4-3 Control Tone List

Function	Description
Key Beep A	The transceiver emits this tone when a function is enabled by pressing a key.
Key Beep B	The transceiver emits this tone when a function is disabled by pressing a key.
Key Beep C	The transceiver emits this tone when the password matches or data, such as Test Mode adjustment value, is written to the transceiver by pressing a key.
Key-entry Error Tone	The transceiver emits this tone when the operation activated by pressing a key is denied. The transceiver emits this tone when a key with no function assigned or an inoperable key is pressed.
Rollover Tone	The transceiver emits this tone when the smallest Call Address number or channel number is selected.

4.1.3 Warning Tone

The transceiver emits this tone to warn a user.

Table 4-4 Warning Tone List

Function	Description
Warning Alert Tone	The transceiver emits this tone until the PTT switch is released if transmission is restricted with the Time-out Timer or there is no transmit frequency. The transceiver emits this tone until the PTT switch is released while Busy Channel Lockout is enabled in Conventional Mode.
TOT Pre-alert Tone	The transceiver emits this tone to notify a user that the transmission is going to be restricted by the Time-out Timer.
Battery Warning Tone (TK-2180/ TK-3180 only)	The transceiver emits this tone when the battery level reaches low.
Stack in Tone	The transceiver emits this tone when a message is stored.
Stack Alert Tone A/ B	The transceiver emits this tone when an unread message is stored.
Pre-alert	The transceiver emits this tone to notify a user that the transmission is going to be restricted in MPT Trunking System.

Function	Description
Timed Power-off Pre-alert	The transceiver emits this tone to notify a user that the transceiver is going to be turned OFF by Timed Power-off.
Trunking Tone	The transceiver emits this tone when a control channel is found during the Trunking Search.
PLL Unlock Tone	The transceiver emits this tone when the PLL circuit is unlocked.

4.1.4 Reception Tone

The transceiver emits this tone when the transceiver receives a call.

Table 4-5 Reception Tone List

Function	Description
Phone Tone	The transceiver emits this tone when the transceiver receives a call.

4.1.5 MPT Tone

The transceiver emits the following tones in MPT Trunking System.

Table 4-6 MPT Tone List

Function	Description
CSUIP (Calling)/ Call Queued Tone (Tone A)	The transceiver emits these tones when the transceiver of the transmitting party is in CSUIP or the transceiver is waiting to receive a call.
Called Party Ringing Tone (Tone B)	The transceiver emits this tone when the transceiver receives ACKI (QUAL '0') from TSC.
System Busy Tone (Tone C)	The transceiver emits this tone when the transceiver receives a message indicating a system overload from the TSC.
Unavailable Tone (Tone D)	The transceiver emits this tone when the receiving party does not respond.
Called Party Busy Tone (Tone E)	The transceiver emits this tone when the transceiver receives a message indicating a call failure from the TSC.
Number Unobtainable Tone (Tone F)	The transceiver emits this tone to notify a user that a dialing cannot be identified or processed.
Call Clear Indication Tone (Tone H)	The transceiver emits this tone to clear a call.
Alert Tone (Tone I)	The transceiver emits this tone to warn a user.

Function	Description
Transaction Confirmed Tone (Tone J)	The transceiver emits this tone when the transceiver receives an ACK corresponding to a transaction executed for the TSC.
GTC Blip Tone (Tone K)	The transceiver emits this tone when the transceiver receives a GTC message from the TSC.

4.1.6 Transpond Tone

When an available channel for the Auto Reply Message is found, the transceiver sends a Greeting Message (I am not available. Leave your message.) and transmits the Transpond Tone (2100 Hz) for 1 second. The transceiver only modulates this tone and does not emit the tone from the speaker.

4.1.7 Locator Tone

The transceiver emits this tone before the transceiver transmits or receives in Emergency Mode.

4.2 Minimum Volume

The Minimum Volume function differs between the TK-2180/ TK-3180 and TK-7180/ TK-7180H/ TK-8180/ TK-8180H transceivers.

Minimum Volume can be configured by using KPG-96D.

■ TK-2180/ TK-3180

This function can be used to limit the minimum volume level if the volume control is turned to its lowest level. With this function, the user can hear communication even if the **Volume** control is unintentionally turned to its lowest level. The volume level does not change from most counterclockwise position configured for Minimum Volume. The transceiver mutes completely if the **Volume** control is turned to the most counterclockwise position while Minimum Volume is not configured.

■ TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● When Preset is configured for Minimum Volume Type:

This function can be used to configure the Minimum Volume level for the volume level when the transceiver is turned ON even if the volume level was completely turned down and the transceiver was turned Off.

● When Lowest Limit is configured for Minimum Volume Type:

This function can be used to limit the minimum volume level if the **Volume** control is turned to its lowest level. With this function, a user can hear communication even if the **Volume** control is unintentionally turned to its lowest level. The volume level increases from the Minimum Volume Level when turning the **Volume** control. The transceiver mutes completely if the **Volume** control is turned to the most counterclockwise position while Minimum Volume is not configured.

■ Configuration using KPG-96D

- Configuring the Minimum Volume (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)
- Configuring the Minimum Volume Type (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

4.3 Maximum Volume (TK-2180/ TK-3180 only)

Maximum Volume restricts the volume level so as not to exceed the configured volume even if a user attempts to increase the volume.

This function prevents the user from hearing excessively loud volume levels when wearing a headset.

Maximum Volume can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Maximum Volume (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

4.4 Tone Level

Tone Level can be used to configure the tone volume. The transceiver emits tones from the speaker at the configured volume level.

Tone Level can be configured by using KPG-96D. The following Tone Levels are available.

Table 4-7 Available Tone Levels

Tone Level	Operation
Current	The transceiver emits tones in conjunction with the volume level.
1 to 31	The transceiver emits tones with a fixed tone volume. Larger values result in greater volume.
Off	The transceiver does not emit any tones.

■ Configuration using KPG-96D

- Configuring the Tone Level (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

4.5 Pre-alert (MPT Trunking)

This function can be used to notify a user that communication is going to be terminated while the user is communicating in MPT Trunking System. This function is only available in MPT Trunking System.

Pre-alert can be configured to be enabled or disabled by using KPG-96D.

The transceiver emits Alert Tones under the following conditions if Pre-alert is enabled.

Table 4-8 Timings for Pre-alert Tones

Timing	Operation
30 seconds before the communication is terminated	The transceiver emits the Alert Tone once.
6 to 10 seconds before the communication is terminated	The transceiver emits the Alert Tone every second.
5 seconds before the communication is terminated	The transceiver stops emitting the Alert Tone.

■ Configuration using KPG-96D

- Configuring the Pre-alert to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

4.6 Timed Power-off Pre-alert (TK-7180/TK-7180H/TK-8180/ TK-8180H only)

Timed Power-off Pre-alert can be used to notify a user that the transceiver is going to be turned OFF with Timed Power-off after emitting an Alert Tone.

Timed Power-off Pre-alert can be configured to be enabled or disabled by using KPG-96D.

The transceiver emits Alert Tones under the following conditions if Timed Power-off Pre-alert is enabled.

Table 4-9 Timings for Timed Power-off Pre-alert Tones

Timing	Operation
1 minute before the transceiver is turned OFF with Timed Power-off	The transceiver emits the Alert Tone twice.
10 seconds before the transceiver is turned OFF with Timed Power-off	The transceiver emits the Alert Tone 4 times.
2 seconds before the transceiver is turned OFF with Timed Power-off	The transceiver continuously emits the Alert Tone.

■ Configuration using KPG-96D

- Configuring the Timed Power-off Pre-alert to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

4.7 Stack Alert

Stack Alert can be used to notify a user that an unread message is stored. This function is only available in MPT Trunking System.

This function can be used for Voice Stack, Status Stack and Message Stack. If an unread message is stored in any of these stacks, the transceiver emits the Stack Alert Tone A or B.

The transceiver keeps emitting the Alert Tone until all stored messages are read.

Stack Alert functions as below:

Within 30 seconds after a message is stored:

The transceiver emits Stack Alert Tone A every 5 seconds.

More than 30 seconds after a message is stored:

The transceiver emits Stack Alert Tone B every 30 seconds.

The transceiver stops emitting the Alert Tone when all stored messages are read.

Stack Alert can be configured to be enabled or disabled by using KPG-96D.

Note: This function does not work for Voice Memo and Auto Reply Message stored in the Voice Stack. This function is only available for Auto Recording.

■ Configuration using KPG-96D

- Configuring the Stack Alert to be enabled or disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

4.8 Public Address (TK-7180/TK-7180H/TK-8180/ TK-8180H only)

This function allows a user to use the transceiver as a loudspeaker to amplify and emit the user's voice in the local area.

Public Address can be used to emit voice input via a microphone from the PA speaker connected to the rear side of the transceiver. This function is only available in MPT Trunking System.

Public Address can be assigned to a **PF** key on the transceiver by using KPG-96D.

■ Display and Operation

● Enabling Public Address

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

In this case, the “” icon appears.




TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- Press the **PTT** switch.

The user's voice sounds from the speaker connected to the PA line.

● Disabling Public Address

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

The “” icon disappears and Public Address is disabled.



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

4 SOUNDS

Note:

- ◆ The transceiver does not emit a received signal while the transceiver is emitting the user's voice by pressing the **PTT** switch.
- ◆ Public Address is automatically disabled if Call Address is changed.
- ◆ A user must prepare the KAP-2 and external speaker to use Public Address.

■ Configuration using KPG-96D

- Assigning the Public Address to a **PF** key (Refer to FPRG 6.5 Key Assignment Window.)

4.9 Ringer Tone on Call

Ringer Tone on Call can be used to emit the Ringer Tone when the transceiver receives an Individual Call or Group Call. A sound similar to a phone ringing is used instead of a normal beep.

Ringer Tone on Call can be configured to be enabled or disabled by using KPG-96D.

Note: Since a traffic channel is immediately assigned to the transceiver when FOACSU is disabled or the transceiver receives a Group Call, the transceiver may not emit the Ringer Tone.

■ Configuration using KPG-96D

- Configuring the Ringer Tone on Call to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

4.10 Alert Tone Pattern

This function can be used to configure the Alert Tone when the transceiver receives a call in MPT Trunking. An Alert Tone matching a user's environment can be configured.

One of 8 Alert Tones can be configured. An Alert Tone Pattern consists of 16 tones. The frequency and length of tones can be configured.

Cycle and Interval of the Alert Tone can be configured with this function.

Table 4-10 Alert Tone Configuration

Parameter	Description
Frequency	The frequency of the tone can be configured. The frequency can be configured between 400 and 2500 Hz in steps of 10 Hz. Gap is configured when "No Tone" is selected.
Length	The tone length can be configured. The tone length can be configured between 10 and 2500 ms in steps of 10 ms. No tone is emitted if 0 ms is configured.
Cycle	The alert tone cycle can be configured. A number from 1 to 255 can be configured for emitting the Alert Tone. The transceiver emits the Alert Tone until manually stopped when Infinite is configured. If the transceiver is configured to emit the Alert Tone several times, the transceiver does not emit the Alert Tone while the transceiver is unmuted.
Interval	The timing to repeat the Alert Tone can be configured. The interval can be configured between 0 and 255 s in steps of 1 s.

■ Configuration using KPG-96D

- Configuring the Alert Tone Pattern (Refer to FPRG 6.6 Special Alert Tone Window.)

This function protects transceiver operation and configuration data from unauthorized persons.

5.1 Transceiver Password

The Transceiver Password prevents the transceiver from being used by unauthorized persons.

The transceiver can be operated by entering the correct password after the transceiver is turned ON.

The Overwrite Password can be configured using KPG-96D (a maximum of 6 numeric digits). Transceiver Password can consist of any number between 0 and 999999.

Transceiver Password can be configured by using the keypad, **Selector** or **PF** keys.

■ Display and Operation

● Using the Keypad

1. Enter the password digits by pressing the numeric keys on the Keypad.
2. Press the **[S]** or **[*]** key.

The transceiver emits the Password Authorization Tone if the correct password is entered.

“PASSWORD” appears on the main display if a wrong password is entered and the transceiver enters Password Entry Mode.

● Using the Selector or PF Keys

1. Select a character using the **Selector** or **[^]/[v]** keys.
2. Press the **[C>]** key to confirm the character.
The entered character stops flashing and is confirmed on the main display.
3. Repeat steps 1 and 2 to enter the entire password.
4. Press the **[S]** or **[*]** key.

The transceiver emits the Password Authorization Tone if the correct password is entered.

“PASSWORD” appears on the main display if a wrong password is entered and the transceiver enters Password Entry Mode.

Note: The following keys can be used for entering a password.

Table 5-1 Key Operation for Entering the Password

Key		Operation
TK-2180/ TK-3180	TK-7180/ TK-7180H/ TK-8180/ TK-8180H	
Selector	[^]/[v]	Increases or decreases the entered number (0 to 9).
Side 1	[△]	“PASSWORD” appears on the main display.
[S]	[S]	Password Confirmation
[A]	[A]	Press: Clears a character. Hold: Clears all characters.
[<B]	[<B]	
[C>]	[C>]	Confirms the selected value and enters the digit.
Side 2	[■]	
[0] to [9]	[0] to [9]	Enters a number.
[*]	[*]	Password Confirmation
[#]	[#]	Press: Clears a character. Hold: Clears all characters.
PTT	PTT	

■ Configuration using KPG-96D

- Configuring the Transceiver Password
(Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)
- Assigning the Transceiver Password to a PF Key
(Refer to FPRG 6.5 Key Assignment Window.)

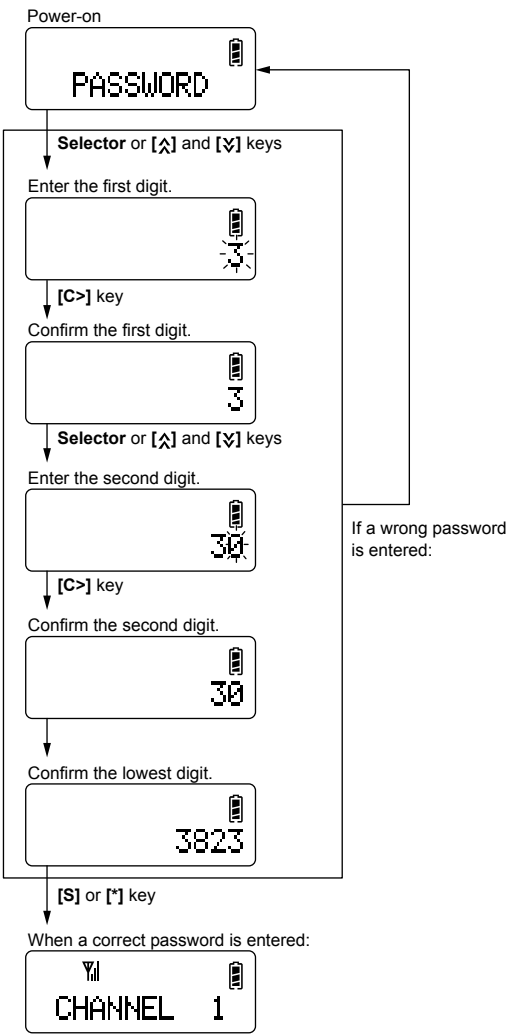


Figure 5-1 Transceiver Password Operation

5.2 Read Authorization Password

This function prevents configuration data or operating frequencies from being read by unauthorized persons. When data is read by using KPG-96D from a transceiver configured with a Read Authorization Password, the Read Authorization Password must be entered on the PC. If the password does not match, the data configured in the transceiver cannot be read.

Read Authorization Password can be configured by using KPG-96D. Read Authorization Password can consist of any number between 0 and 999999.

- Configuration using KPG-96D
 - Configuring the Read Authorization Password (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

5.3 Overwrite Password

Overwrite Password prevents configuration data or operating frequencies from being overwritten by unauthorized persons. When data is written by using KPG-96D to a transceiver configured with an Overwrite Password, the Overwrite Password must be entered on the PC.

Overwrite Password can be configured by using KPG-96D. Overwrite Password can consist of any number between 0 and 999999.

- Configuration using KPG-96D
 - Configuring the Overwrite Password (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

6 EMBEDDED MESSAGE

This function can be used to embed a text message (alphanumeric digits) in the transceiver.

6.1 Embedded Message

Embedded Message can be used to store a maximum of 64 alphanumeric digits in the transceiver.

The transceiver-specific information, such as its serial number, control code and configuration data file name can be stored in the Embedded Message.

A message can be written to the transceiver by using KPG-96D. The Embedded Message written to the transceiver is stored as a part of configuration data.

The stored messages can be read from the transceiver by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Embedded Message (Refer to FPRG 6.10 Embedded Message Window.)
- Writing Configuration Data to the Transceiver (Refer to FPRG 7.2 Write Data to the Transceiver.)
- Writing Configuration Data to the Transceiver (Refer to FPRG 7.1 Read Data from the Transceiver.)

■ Configuration using KPG-96D

- Configuring the Embedded Message with Password (Refer to FPRG 6.11 Embedded Message with Password Window.)
- Writing Configuration Data to the Transceiver (Refer to FPRG 7.2 Write Data to the Transceiver.)
- Writing Configuration Data to the Transceiver (Refer to FPRG 7.1 Read Data from the Transceiver.)

6.2 Embedded Message with Password

Embedded Message with Password can be used to store a maximum of 64 alphanumeric digits in the transceiver.

The transceiver-specific information, such as its serial number, control code and configuration data file name can be stored in the Embedded Message with Password.

Messages and password can be written to the transceiver by using KPG-96D. If a message is written to the transceiver using Embedded Message with Password, the message can be stored as separate data from configuration data.

The correct password must be entered to write a message. The message cannot be written to the transceiver unless the correct password is entered.

The stored messages can be read from the transceiver by using KPG-96D.

7 IGNITION SENSE (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

Ignition Sense can be used to automatically turn the transceiver ON or OFF in conjunction with the status of the Ignition Sense terminal of a vehicle. When the vehicle engine is running, the Ignition Sense terminal is in the High state and when the vehicle engine is not running, the Ignition Sense terminal is in the Low state.

When the Ignition Sense terminal is High, the transceiver does not activate Horn Alert regardless of the Ignition Sense configuration. (Refer to 14 HORN ALERT (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 85.)

Ignition Sense can be configured to be enabled or disabled by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Ignition Sense to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

7.1 Usage of the Ignition Sense Terminal

The operation of the Ignition Sense terminal varies depending on the Ignition Sense Type configuration.

Ignition Sense Type can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Ignition Sense Type (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

7.1.1 Turning the Transceiver ON/OFF using the Ignition Sense Terminal

The transceiver can be turned ON or OFF only with Ignition Sense terminal status if Ignition Only is configured for the Ignition Sense operation.

The transceiver is automatically turned ON if the Ignition Sense terminal status is High and is turned OFF when the terminal status is Low. The transceiver cannot be turned ON/OFF by pressing the **Power** switch.

Note: The transceiver is turned OFF after the duration configured for Timed Power-off elapses if Timed-off Power-off is enabled.

7.1.2 Turning the Transceiver ON/OFF using the Ignition Sense Terminal and the Power Switch

The transceiver can be turned ON or OFF with both the **Power** switch and Ignition Sense if Ignition & Switch is configured for Ignition Sense operation.

The transceiver can be turned OFF by pressing the **Power** switch even if the vehicle engine is running (Ignition Sense status is High). However, the state of the **Power** switch is not retained.

The transceiver is turned ON when the Ignition Sense terminal status changes from Low to High.

7.2 Timed Power-off (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

This function can be used to keep the transceiver ON for the configured duration while the vehicle engine is not running (the Ignition Sense status is Low).

This function is convenient for continuing communications even if the vehicle engine is not running.

The duration from when the Ignition Sense terminal is switched to Low until the transceiver is automatically turned OFF can be configured.

Timed Power-off Pre-alert functions in the following way if anything other than Off is configured for Warning Tone:

- One minute before the transceiver is turned OFF:**
The transceiver beeps twice.
- Ten seconds before the transceiver is turned OFF:**
The transceiver beeps 4 times.
- Two seconds before the transceiver is turned OFF:**
The transceiver beeps continuously.

Note:

- Timed Power-off does not function if Ignition Sense is disabled.
- Timed Power-off is reset if Ignition Sense is switched to High.
- Timed Power-off is disabled when the transceiver is turned ON by pressing and holding the **Power** switch for more than 1 second while "Ignition & Switch" is configured for Ignition Sense.
- Timed Power-off timer will be reset when the transceiver is turned ON or OFF by pressing and holding the **Power** switch while the Power switch Hold Time is elapses when "Ignition & Switch" is configured for Ignition Sense and Timed Power-off is enabled.
- If the transceiver is transmitting even after the duration configured for Timed Power-off elapses, the transceiver is turned OFF after the transceiver completes transmitting.

8 MPT TRUNKING

MPT stands for Ministry of Post and Telecommunication and refers to a trunking system that adheres to the MPT1327 protocol. MPT1327 is compliant with DTI (Department of Trade and Industry) as specified in the United Kingdom in the 1980s.

1200 bps FFSK is used as the signaling type in MPT Trunking Systems. The transceiver searches for an available traffic channel and transmits via a repeater.

8.1 Individual Call

Individual Call is used to establish and engage in voice communications. Using Individual Call, the transceiver calls a specific Call Address.

8.1.1 Making an Individual Call

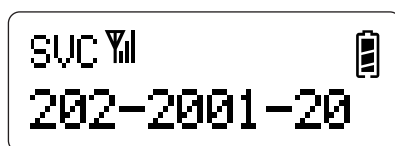
The transceiver transmits a transmission request to a repeater when the **PTT** switch is pressed and the transceiver waits to receive GTC. If GTC is correct, the transceiver assumes that the connection is properly established and re-transmits the transmission request to the receiving party.

Communications cannot be established unless the caller's ID matches the receiving party's ID. When the **Clear** key is released, the transceiver sends Clear Down Message to silence the speaker of the receiving party's transceiver.

Trunking Channel Plan and Personal data must be configured by using KPG-96D.

■ Display and Operation

1. Select a target Call Address.



Note: The following 5 methods are available to select a target Call Address:

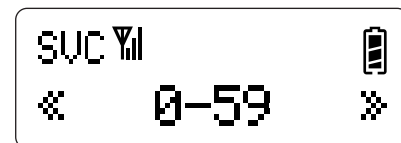
- Select a Call Address configured using KPG-96D.
- Dial a Call Address using the keypad.
- Select a Call Address using the **Redial** key.
- Respond to the stored Voice Call address.
- Select a receiving party in Numeric Mode.

2. Press the **PTT** switch or **Call** key.

The transceiver starts making a call. The CSUIP (Calling) Tone (Tone A) sounds and "<< CALLING >>" appears on the main display if the transceiver is making a call.



The GTC Blip Tone (Tone K) sounds when a link is established with the receiving party and the communication time appears on the main display.



Note: The **PTT** switch can be used only if anything other than Disable is configured for PTT to Initiate Call. (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

3. Press the **PTT** switch.

The transceiver transmits voice on the traffic channel.

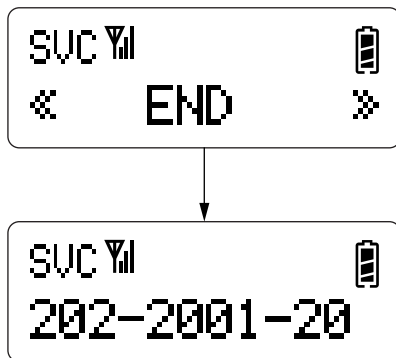
LED lights red.



Note: The transceiver enters voice transmission mode if the **PTT** switch is pressed and held from step 2 while GTC with Auto PTT is enabled. If GTC with Auto PTT is disabled, the transceiver does not enter voice transmission mode unless the **PTT** switch is released. (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

4. Press the **Clear** key to terminate a conversation.

The Call Clear Indication Tone (Tone H) sounds and "<< END >>" appears on the main display, then the Call Address appears on the main display.



■ Other Displays

The following windows appear on the LCD depending on the situation.

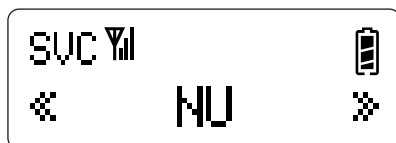
- **Receiving Party does not respond to a Call:**

The Unavailable Tone (Tone D) sounds and “<< NO REPLY >>” appears on the main display.



- **Unavailable Call Address is entered:**

The Number Unobtainable Tone (Tone F) sounds and “<< NU >>” appears on the main display.



- **Invalid Call is made:**

The dispatcher notifies a caller that the receiving party is not available when the dispatcher receives an invalid call. The Number Unobtainable Tone (Tone F) sounds and “<< INVALID >>” appears on the main display.



- **Holding Display appears:**

“<< HOLDING >>” appears on the main display if the dispatcher confirms a call.



- **Receiving Party is busy:**

“<< ENGAGED >>” appears on the main display while the receiving party is busy.



- **Call is made while Retransmission is restricted:**

The Called Party Busy Tone (Tone E) sounds and “<< PARTY BUSY >>” appears on the main display when a call is made while retransmission is restricted.



- **All Channels are used:**

“<< QUEUED >>” appears on the main display if all channels are used.



■ Configuration using KPG-96D

- Configuring the Trunking Channel Plan (Refer to FPRG 6.2 Trunking Channel Plan Window.)
- Configuring the Personal Data (Refer to FPRG 6.3 Personal.)

8.1.2 Receiving an Individual Call

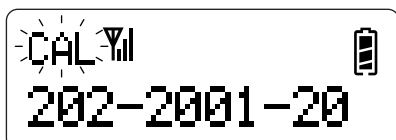
A user can communicate only if the received QT/DQT matches the configured QT/DQT. In this case, the transceiver emits the received audio.

Trunking Channel Plan and Personal data must be configured by using KPG-96D.

■ Display and Operation

1. The transceiver receives a call.

The transceiver emits the reception alert and “CAL” blinks on the sub display.



The following displays appear when the transceiver receives a call from an address that is not registered in the address list.

- “<< I-PREFIX >>” appears on the main display if the transceiver receives a call from Interprefix.



- “<< I-FLEET >>” appears on the main display if the transceiver receives a call from Interfleet.

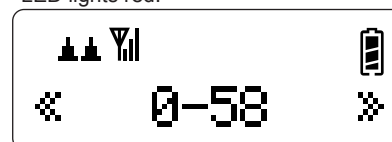


Note: The reception alert tone can be changed to the alert tone selected from Alert Tone Pattern. The default reception alert tone is GTC Blip Tone (Tone K).
(Refer to 4.10 Alert Tone Pattern on page 22.)

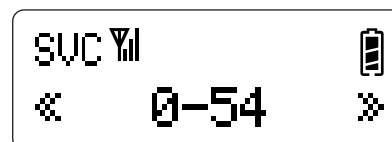
2. Press the **PTT** switch.

The communication time appears on the main display. The LED lights red and the transceiver transmits your voice.

LED lights red.

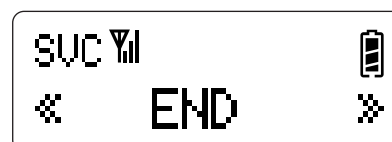


Releasing the **PTT** switch turns Off the LED and allows the transceiver to receive audio.



3. Press the **Clear** key to terminate a conversation.

The Call Clear Indication Tone (Tone H) sounds and “<< END >>” appears on the main display, then the Call Address appears on the main display.



Note: The Call Clear Indication Tone (Tone H) sounds when the communication time times out, then the Call Address automatically appears on the main display.

8.2 Group Call

Group Call is used to establish and engage in voice communications. Using Group Call, the transceiver calls a specific Call Address.

8.2.1 Making a Group Call

The transceiver transmits a transmission request to a repeater when the **PTT** switch is pressed and the transceiver waits to receive GTC. If GTC is correct, the transceiver assumes that the connection is properly established and re-transmits the transmission request to the receiving party.

Communications cannot be established unless the caller's ID matches the receiving party's ID. When the **Clear** key is released, the transceiver sends a Clear Down Message to silence the speaker of the receiving party's transceiver.

Trunking Channel Plan and Personal data must be configured by using KPG-96D.

■ Display and Operation

- 1. Select a target Group Address.

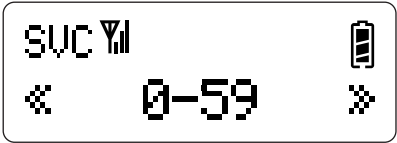


- Note:** The following 5 methods are available to select a target Group Address:
- Select a Group Address configured using KPG-96D.
 - Dial a Call Address using the keypad.
 - Select a Group Address using the **Redial** key.
 - Respond to the stored Voice Call address.
 - Select a receiving party in Numeric Mode.

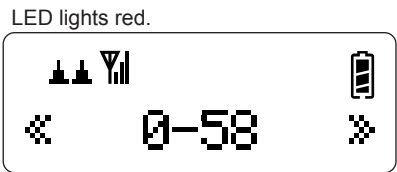
- 2. Press the **PTT** switch or **Call** key.
The transceiver starts making a call. The CSUIP (Calling) Tone (Tone A) sounds and “<< CALLING >>” appears on the main display if the transceiver is making a call.



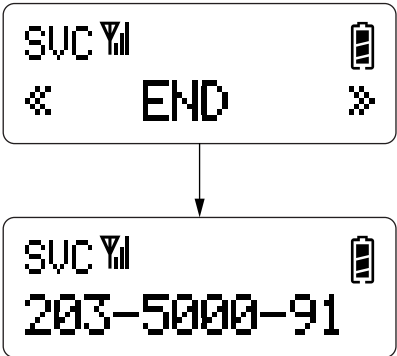
The GTC Blip Tone (Tone K) sounds when a link is established with the receiving party and the communication time appears on the main display.



- Note:** The **PTT** switch can be used only if anything other than Disable is configured for PTT to Initiate Call. (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)
- 3. Press the **PTT** switch.
The transceiver transmits voice on the traffic channel.



- Note:** The transceiver enters voice transmission mode if the **PTT** switch is pressed and held from step 2 while GTC with Auto PTT is enabled. If GTC with Auto PTT is disabled, the transceiver does not enter voice transmission mode unless the **PTT** switch is released. (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)
- 4. Press the **Clear** key to terminate a conversation.
The Call Clear Indication Tone (Tone H) sounds and “<< END >>” appears on the main display, then the Call Address appears on the main display.

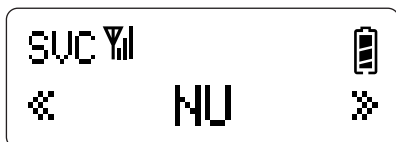


■ Other Displays

The following windows appear on the LCD depending on the situation.

- **Unavailable Call Address is entered:**

The Number Unobtainable Tone (Tone F) sounds and "<< NU >>" appears on the main display.



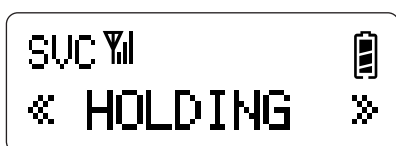
- **Invalid Call is made:**

The dispatcher notifies a caller that the receiving party is not available when the dispatcher receives an invalid call. In this case, the Number Unobtainable Tone (Tone F) sounds and "<< INVALID >>" appears on the main display.



- **Holding Display appears:**

"<< HOLDING >>" appears on the main display if the dispatcher confirms a call.



- **Receiving Party is busy:**

"<< ENGAGED >>" appears on the main display while the receiving party is busy.



- **Call is made while Retransmission is restricted:**

The Called Party Busy Tone (Tone E) sounds and "<< PARTY BUSY >>" appears on the main display when a call is made while retransmission is restricted.



- **All Channels are used:**

"<< QUEUED >>" appears on the main display if all channels are used.



■ Configuration using KPG-96D

- Configuring the Trunking Channel Plan (Refer to FPRG 6.2 Trunking Channel Plan Window.)
- Configuring the Personal Data (Refer to FPRG 6.3 Personal.)

8.2.2 Receiving a Group Call

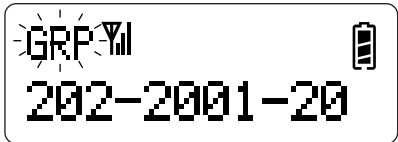
There are 2 types of Group Call: Conference Call and Broadcast Call.

- **Conference Call**
The receiving party can transmit voice.
- **Broadcast Call**
The receiving party cannot transmit voice.

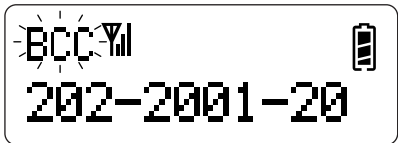
A Group Address must be configured for the transceiver by using KPG-96D.

■ Display and Operation

1. The transceiver receives a call.
The transceiver emits the reception alert tone and “GRP” blinks on the sub display when the transceiver receives a Conference Call.



The transceiver emits the reception alert tone and “BCC” blinks on the sub display when the transceiver receives a Broadcast Call.



The following displays appear when the transceiver receives a call from an address that is not registered in the address list.

- “<< I-PREFIX >>” appears on the main display if the transceiver receives a call from Transceiver with different prefix.

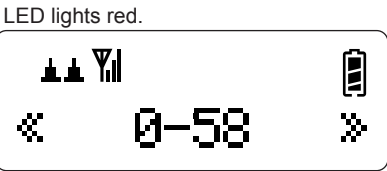


- “<< I-FLEET >>” appears on the main display if the transceiver receives a call from Transceiver with different fleet.

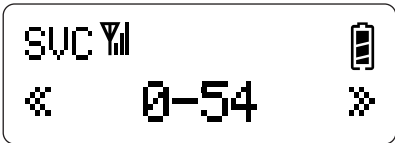


Note: The reception alert tone can be changed to the alert tone selected from Alert Tone Pattern. The default reception alert tone is GTC Blip Tone (Tone K). (Refer to 4.10 Alert Tone Pattern on page 22.)

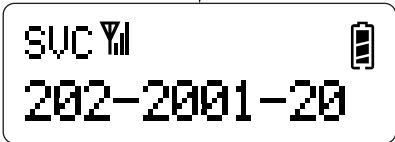
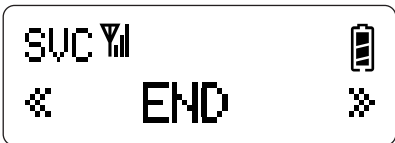
2. Press the **PTT** switch.
The communication time appears on the main display. The LED lights red and the transceiver transmits your voice.



Releasing the **PTT** switch turns Off the LED and allows the transceiver to receive audio.



3. Press the **Clear** key to terminate a conversation.
The Call Clear Indication Tone (Tone H) sounds and “<< END >>” appears on the main display, then the Call Address appears on the main display.



Note: The Call Clear Indication Tone (Tone H) sounds when the communication time times out, then the Call Address automatically appears on the display.

- **Configuration using KPG-96D**
 - Configuring the Group Address (Refer to FPRG 6.3.3 Individual/ Group Address Window.)

8.3 Status Call

By sending a configured status number, Status Call can be used to display a Status Message associated with the status number that is configured in the transceiver at the receiving party.

8.3.1 Making a Status Call

Status/ Stack can be assigned to a **PF** key on the transceiver by using KPG-96D.

■ Display and Operation

1. Select a Call Address to which a user wishes to send a Status Message.
2. Press the **Status/ Stack** key.

The Status Message appears on the main display.



Note: "STATUS 01" appears on the main display if no Status Message is configured. (Refer to FPRG 6.3.4 Status Message Window.)

3. Press the **PTT** switch or **Call** key.

The transceiver starts making a call. The CSUIP (Calling) Tone (Tone A) sounds and "<< CALLING >>" appears on the main display if the transceiver is making a call.



"<< COMPLETE >>" appears on the main display when the transceiver properly completes sending a status message, and then the Status Message appears on the main display.



Note: The **PTT** switch can be used only if anything other than Disable is configured for PTT to Initiate Call. (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

■ Configuration using KPG-96D

- Assigning the Status/ Stack to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

8.3.2 Receiving a Status Call

■ Display and Operation

1. The transceiver receives a Status Message.
The transceiver emits the reception alert tone and the "☐" icon blinks.



8.4 Block Select

Block Select can be used to configure the block number (1 to 32, "ALL") used for displaying the Call Address. This function can be used to limit the blocks used for displaying the Call Address.

Block Select can be configured to be enabled or disabled by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Block Select to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)
- Configuring the Block Number to Display the Call Address (Refer to FPRG 6.3.3 Individual/ Group Address Window.)

8.4.1 Entering a Block Number

The block number can be entered via the following methods.

- Enter a block number using the **Selector** or [**△**] and [**▽**] keys.
- Enter a block using the keypad.

The following keys are available to use.

Table 8-1 Key Operation

Key		Operation
TK-2180/ TK-3180	TK-7180/ TK-7180H/ TK-8180/ TK-8180H	
Selector	[△]/[▽]	Increases or decreases the block number (1 to 32, "ALL").
Side 1	[△]	
[S]	[S]	Confirms the entered block number.
[A]	[A]	Clears a character.
[<B]	[<B]	
[>C]	[>C]	
Side 2	[■]	Exits the Block Number Entry Mode.
[0] to [9]	[0] to [9]	Enters a block number.
[*]	[*]	Confirms the entered block number.
[#]	[#]	Clears a character.
PTT	PTT	

Block Select can be assigned to a **PF** key on the transceiver by using KPG-96D.

■ Display and Operation

- Press the **Block Select** key.

Block Select activates.

- **When Block ALL is selected:**



- **When there is a block name:**

The block name appears.

Block Name = BL1



- **When there is no block name:**

The block number appears

Block Number = 1



- Enter a block number.

- **Using the Selector or [**△**] and [**▽**] Keys**

Select a block number using the **Selector** or [**△**] and [**▽**] keys.



- **Using the Keypad**

Enter a block number using the [0] to [9] keys. The code is confirmed when the code is entered.

Press the [0] key first when selecting "ALL" in the block number.

Entering a value of 1.



Entering a value of 10.



3. Press the [A] or [#] key to clear an entered value. The rightmost digit is cleared.



The display before entering a value using a keypad will retrieve when all digits are cleared.

4. The Block Select function will be disabled by pressing the [S] or [*] key after entering all digits of numbers.



■ Configuration using KPG-96D

- Assigning the Block Select to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

8.4.2 Call Address Display

The address of the block corresponding to the block number configured with Block Select appears on the main display.

The range of address that can be displayed on the Call Address window varies depending on the selected block number.

- **When the block number is one of the numbers from 1 to 32.**

Only the address of the configured block number appears on the main display.

- **When the block number is "ALL".**

Addresses of all blocks appear on the main display.

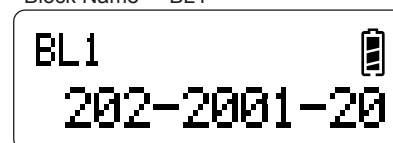
■ Display and Operation

- **When the block number is one of the numbers from 1 to 32.**

1. The address of the block corresponding to the block number appears on the main display.

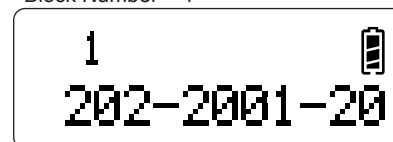
The block name (a maximum of 3 digits) corresponding to the block number appears on the sub display.

Block Name = BL1

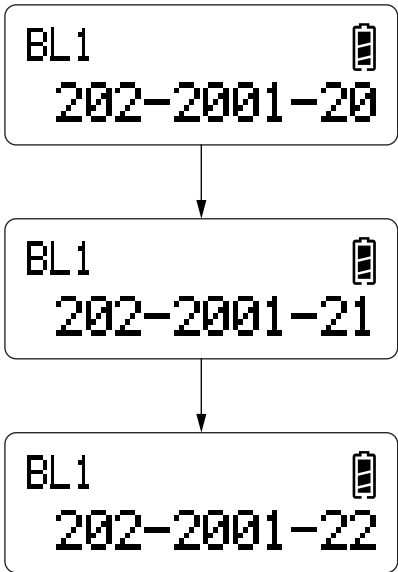


The block number appears on the main display if the block name corresponding to the block number is not configured.

Block Number = 1



2. Use the **Selector** or [↗] and [↘] keys.
The next address to the configured Block Number appears on the main display.



3. Press the **Home Address** key.
“HAD” appears on the sub display and the transceiver jumps to the address configured for Home.



- Note:**
- ◆ The transceiver returns to the previous address when the **Home Address** key is pressed again.
 - ◆ Only 1 Home Address can be configured for each address.
 - ◆ If Block Select is disabled, Home Address is also disabled.

4. Press the **Direct** key.
“DR” appears on the sub display and the transceiver jumps to the address configured for Direct Address.



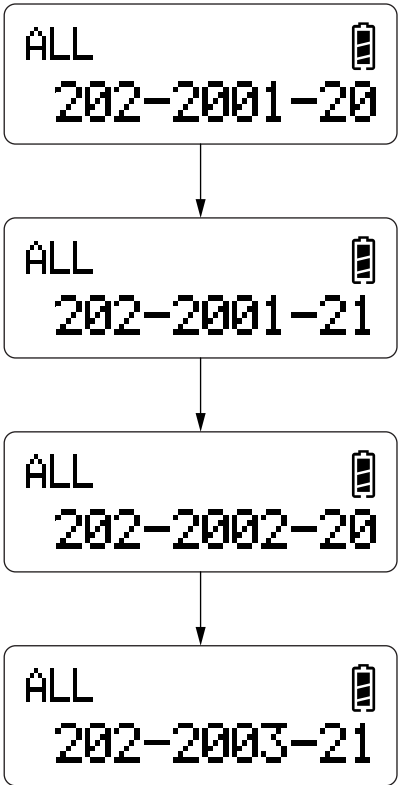
Note: Only 1 Direct Address can be configured for all blocks.

- **When the block number is “ALL”.**
1. Addresses of all blocks appear on the display.
“ALL” appears on the sub display.



Note: “ALL” does not appear on the sub display if Block Select is disabled.

2. Use the **Selector** or [↗] and [↘] keys.
The address of the following appears on the display.



- **Configuration using KPG-96D**
- Configuring the Block Number (Refer to FPRG 6.3.3 Individual/ Group Address Window.)
 - Configuring the Block Name (Refer to FPRG 6.3.3 Individual/ Group Address Window.)
 - Assigning the Home Address to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

8.4.3 Decode Group Address

Decode Group Address can be used to specify the Receive Groups that the transceiver can receive.

The call address that can be received varies depending on the Block Select configuration and Decode Group Address configuration as shown in the following table.

Table 8-2 Transceiver Operation when Decode Group Address Configured

Block Select Configuration	Decode Group Address Configuration	Specific Blocks	All Blocks
Block Number		Address in the specific block	Receive Group in all blocks
ALL		Address in all blocks	Receive Group in all blocks

Decode Group Address can be configured using KPG-96D.

Note:

- ◆ If Block Select is disabled, configuration of Decode Group Address and the **Block Select** key are disabled. If All Blocks is configured for Call Address Display Mode, the transceiver can receive a call from Receive Groups in all blocks.
- ◆ Receive Group is created with Group IDs where RX/TX Group or RX Group is configured for Call Type when registering a Call Address by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Group Address (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)

8.5 AUX Input Status Message (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

AUX Input Status Message can be used to send a Status Message when the status of the AUX Input port is changed (High to Low or Low to High).

The transceiver sends a Status Message when the status of the AUX Input port changes while a sensor is attached to the AUX Input port.

To enable this function, Status Message must be configured for one of the AUX Input ports.

AUX Input Status Message can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the AUX Input Status Message (Refer to FPRG 6.3.4 Status Message Window.)

8.6 AUX Output Status Message (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

AUX Output Status Message can be used to send a Status Message when the status of the AUX IN port is changed (High to Low or Low to High). A user can use this function to remotely turn the external device On or Off.

To enable this function, Status Message must be configured for one of the AUX Output ports.

AUX Output Status Message can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the AUX Output Status Message (Refer to FPRG 6.3.4 Status Message Window.)

Power-on Status Message can be configured by using KPG-96D.

1. Turn the transceiver ON.

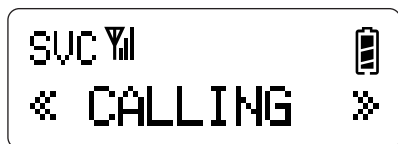
TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

HELLO!

-
2. The status message configured for Power-on Status is sent after completing the registration. “<< CALLING >>” appears on the main display while the transceiver is sending a status message.



“<< COMPLETE >>” appears on the main display when the transceiver properly completes sending a status message, and then the Status Message appears on the main display.



- Configuring the Power-on Status Message
(Refer to FPRG 6.3.4 Status Message Window.)

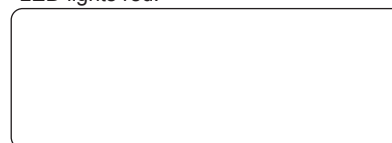
8.8 Power-off Status Message

Power-off Status Message can be configured by using KPG-96D.

1. Turn the transceiver OFF.

The transceiver is turned OFF when the transceiver completes sending the Power-off Status message.

LED lights red.



Note:

- ◆ Keys other than the **Power** switch do not function. The speaker is also muted.
- ◆ The transceiver is turned ON after sending the status message if the **Power** switch is pressed while sending the Power-off Status Message.
- ◆ The transceiver is turned OFF if Power-off Status is not configured.
- ◆ The transceiver does not send a status message if the **Power** switch is pressed to turn the transceiver OFF during Channel Hunt.

■ Configuration using KPG-96D

- Configuring the Power-off Status Message (Refer to FPRG 6.3.4 Status Message Window.)

8.9 Data Call

Data Call can be used to send configured text. There are 2 methods to send data: SDM2 and NPD. The SDM2 method uses control channels and the NPD method uses communication channels.

The SDM2 method can be further classified into MPT1327, MPT1343 (SST) and MPT1343 (MST). The method to send data varies depending on data length and KPG-96D configuration. The following Data Call transmission methods are available.

■ Data Call Transmission Method 1

Call Facilities Configuration of KPG-96D

- Short Data Message Call = Enable
- Non-prescribed Data Transfer = Enable

Table 8-3 Data Call Transmission Method 1

SDM2 Format	1 to 22 bytes	23 to 25 bytes	26 to 100 bytes	More than 100 bytes
MPT1327	SDM2	NPD	NPD	NPD
MPT1343 (SST)	SDM2	SDM2	NPD	NPD
MPT1343 (MST)	SDM2	SDM2	SDM2	NPD

■ Data Call Transmission Method 2

Call Facilities Configuration of KPG-96D

- Short Data Message Call = Enable
- Non-prescribed Data Transfer = Disable

Table 8-4 Data Call Transmission Method 2

SDM2 Format	1 to 22 bytes	23 to 25 bytes	26 to 100 bytes	More than 100 bytes
MPT1327	SDM2	-	-	-
MPT1343 (SST)	SDM2	SDM2	-	-
MPT1343 (MST)	SDM2	SDM2	SDM2	-

■ Data Call Transmission Method 3

Call Facilities Configuration of KPG-96D

- Short Data Message Call = Disable
- Non-prescribed Data Transfer = Enable

Table 8-5 Data Call Transmission Method 3

SDM2 Format	1 to 22 bytes	23 to 25 bytes	26 to 100 bytes	More than 100 bytes
MPT1327	NPD	NPD	NPD	NPD
MPT1343 (SST)	NPD	NPD	NPD	NPD
MPT1343 (MST)	NPD	NPD	NPD	NPD

■ Configuration using KPG-96D

- Configuring the Call Facilities (Refer to FPRG 6.1.8 Call Facilities (Network) Window.)
- Configuring the SDM2 Format (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

8.10 SDM (Short Data Message)

SDM can be used to send a data message by using a control channel.

8.10.1 Entering a Message

A message can be entered in the following format: “*2*message to be sent* target ID”.



Message to transmit _____ Target ID _____

The data message to be sent can be entered via the following methods.

- Enter a block number using the **Selector** or [^] and [v] keys.
- Enter a message by using the keypad.

The following keys are available to use.

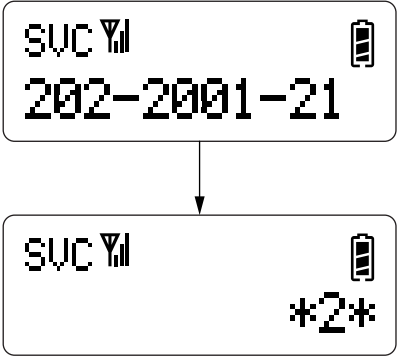
Table 8-6 Key Operation

Key		Operation
TK-2180/ TK-3180	TK-7180/ TK-7180H/ TK-8180/ TK-8180H	
Selector	[^]/[v]	Selects a character.
Side 1	[^]	
[S]	[S]	Operation configured in Key Assignment
[A]	[A]	Operation configured in Key Assignment
[<B]	[<B]	Confirms the entered character. (This key functions in the same way as the [C>] key.)
[C>]	[C>]	Confirms the entered character. (This key functions in the same way as the [<B] key.)
Side 2	[■]	
[0] to [9]	[0] to [9]	Enters a character.
[*]	[*]	Enters “*”.
[#]	[#]	Transmits.
PTT	PTT	Transmits.

■ Display and Operation

- **Entering a Message using the Selector or [^] and [v] Keys**

1. Enter “*2*” in the Call Address display.
Enter “*2” for the control code and “*” before entering a message.



Note:

- ◆ Refer to “8.23 Control Codes on page 64” for the control code.
- ◆ Alphanumeric digits can be entered after entering “2”.

2. Enter a message using the **Selector** or [^] and [v] keys

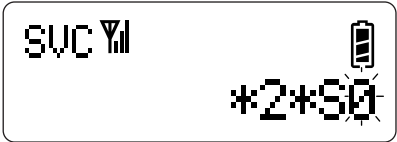
“0” appears on the main display followed by “*2*”.



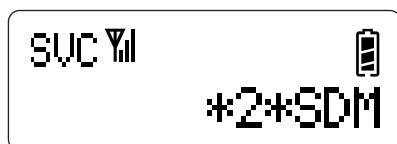
3. Select a character using the **Selector** or [^] and [v] keys.



4. Press the [<B] or [C>] key.
The current character is confirmed and the next character can be entered. “0” appears on the main display.



5. Repeat steps 3 and 4 to enter the entire message.



Note: The following alphanumeric digits can be selected using the **Selector** or [↗] and [↘] keys.

Available Characters																									
0123456789ABCDEFGHIJKLMN																									
OPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz																									
!"#\$%&'()*~+-,./:;<=>?@[\\]^_`{ }* (space)																									

6. Enter the target ID after entering “*”.

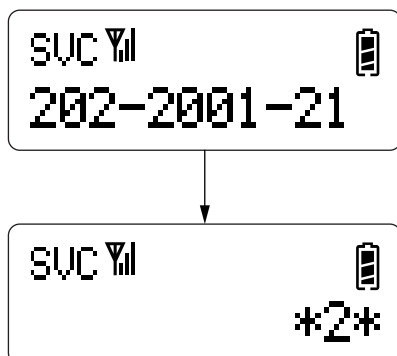


Note: Alphanumeric digits and symbols cannot be entered if the [*] key is pressed while alphanumeric digits and symbols can be entered.

● Entering the Target using the Keypad

1. Enter “*2*” in the Call Address display.

Enter “*2” for the control code and “*” before entering a message.



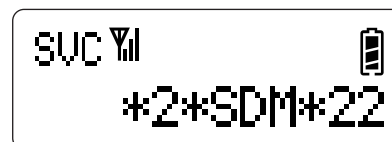
Note:

- ◆ Refer to “8.23 Control Codes on page 64” for the control code.
- ◆ Alphanumeric digits can be entered after entering “*2”.

2. Enter the message to be sent and password by using the keypad.

The following alphanumeric digits and symbols can be entered using the keypad. Available alphanumeric digits can be switched every time a key is pressed. For example, press the [2] key twice to enter “A”.

Key	Available Characters
0	(space), 0
1	1
2	2, A, B, C
3	3, D, E, F
4	4, G, H, I
5	5, J, K, L
6	6, M, N, O
7	7, P, Q, R, S
8	8, T, U, V
9	9, W, X, Y, Z



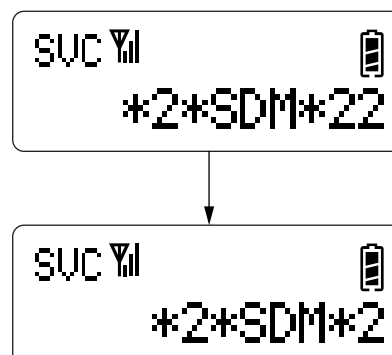
Note:

- ◆ The following key operation is required to enter “SDM”:
Press the [7] key 5 times.
Press the [3] key twice.
Press the [6] key twice.
- ◆ Alphanumeric digits and symbols cannot be entered if the [*] key is pressed while alphanumeric digits and symbols can be entered.

● Clearing Entered Characters

1. Press the **Clear** key once.

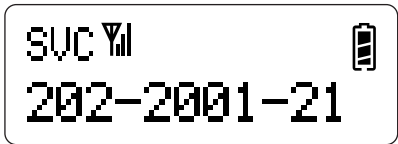
A character will be cleared.



2. Press the **Clear** key 7 times.
7 characters will be cleared.



The Call Address display appears if all characters are cleared.



Note: Press and hold the **Clear** key for 1 second. All characters will be cleared and the Call Address display appears.

"<< COMPLETE >>" appears on the main display when the transceiver properly completes sending a status message, and then the Call Address display appears.



Note: The transceiver sends a message to Base Prefix, Base Fleet and Base Ident without the user selecting a target party.

- **Configuration using KPG-96D**
 - Configuring the Short Data Message in Call Facilities to be Enabled (Refer to FPRG 6.1.8 Call Facilities (Network) Window.)

8.10.3 Receiving a Message

- **Display and Operation**
 1. The transceiver receives a Short Data Message.
The Transaction Confirmed Tone (Tone J) sounds and the "☑" icon blinks.



8.10.2 Sending a Message

The transceiver sends a message by a user entering the message in the following format: "<2*message to be sent*target ID".
Short Data Message in Call Facilities must be enabled by using KPG-96D.

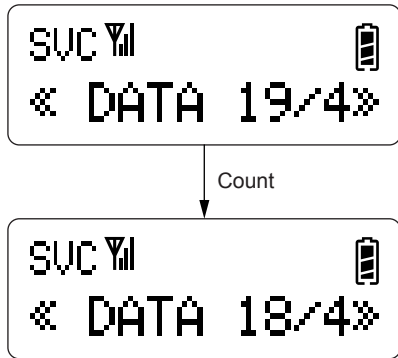
- **Display and Operation**
 1. Select one of the following options:
 - Press the **PTT** switch or **[#]** key.
 - Press the **Call** key.



The transceiver starts making the call. The CSUIP (Calling) Tone (Tone A) sounds and "<< CALLING >>" appears on the main display if the transceiver is making a call.



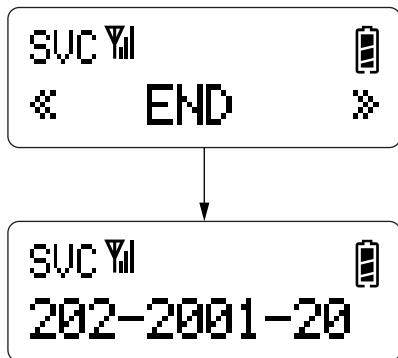
“<< DATA 00/0 >>” appears on the main display while the transceiver is sending a data message. If data amount is large, the counter for data is activated.



Note:

- ◆ “19” indicates the number of packets to be sent. The number is decreased every time the transceiver successfully sends data.
- ◆ “4” indicates the remaining number of times to resend data when the transceiver cannot receive an ACK. The number is decreased every time the transceiver resends data. The number of times to resend a message can be configured in the **Number of Messages Sent on Traffic Channel** edit box by using KPG-96D. (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

2. The transceiver terminates the communication.
“<< END >>” appears on the main display and the Call Address display appears.



■ **Configuration using KPG-96D**

- Configuring the Call Facilities (Refer to FPRG 6.1.8 Call Facilities (Network) Window.)
- Configuring the SDM2 Format (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

8.11.2 Receiving NPD

■ **Display and Operation**

1. The transceiver receives an NPD message.
“<< DATA 00 >>” appears on the main display while the transceiver is communicating. If data amount is large, the counter for data activates.



Note:

- ◆ “08” indicates the number of received packets. “09” indicates that the transceiver is receiving the 9th packet.
- ◆ Refer to “8.14 View Stack on page 47” for the stack display after receiving data.
- ◆ To receive a message, the **Message Stack** checkbox must be checked by using KPG-96D. When the checkbox is unchecked, the transceiver cannot receive a message even if the LED flashes red.

8.11.3 NPD Function

The following functions can be configured for data communications with NPD by using KPG-96D:

- Number of Messages Sent on Traffic Channel
- Transmit Delay Time on NPD
- Transmit-on FFSK Delay Time on NPD
- Transmit-off FFSK Delay Time on NPD
- Initial Transmit Delay Time on NPD
- Data ACK Waiting Time

■ **Number of Messages Sent on Traffic Channel**

Number of Messages Sent on Traffic Channel is the maximum number of times to resend data during NPD communication. The transmitting party resends data if the transceiver does not receive an ACK. The transceiver executes the clear down operation after resending data for the configured number of times and returning to the control channel.

Number of Messages Sent on Traffic Channel can be configured by using KPG-96D.

■ **Configuration using KPG-96D**

- Configuring the Number of Messages Sent on Traffic Channel (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

■ Transmit Delay Time on NPD

Transmit Delay Time on NPD is the duration from the time when the transceiver receives a message until the transceiver sends a message. The configuration varies between the transmitting party and receiving party.

• Transmitting party

The duration from the time when the transceiver receives an ACK until the transceiver sends the next data.

• Receiving party

The duration from the time when the transceiver receives data until the transceiver sends an ACK.

Transmit Delay Time on NPD can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Transmit Delay Time on NPD (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

■ Transmit-on FFSK Delay Time on NPD

Transmit-on FFSK Delay Time on NPD is the unmodulated carrier time from the time when the transceiver starts transmitting until the transceiver starts modulating the carrier with FFSK data.

Transmit-on FFSK Delay Time on NPD can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Transmit-on FFSK Delay Time on NPD (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

■ Transmit-off FFSK Delay Time on NPD

Transmit-off FFSK Delay Time on NPD is the time from when the transceiver finishes sending the FFSK data until the transceiver enters receiving mode.

Transmit-off FFSK Delay Time on NPD can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Transmit-off FFSK Delay Time on NPD (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

■ Initial Transmit Delay Time on NPD

Initial Transmit Delay Time on NPD is the delay time to start sending data while transmitting NPD.

Initial Transmit Delay Time on NPD can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Initial Transmit Delay Time on NPD (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

■ Data ACK Waiting Time

Data ACK Waiting Time is the maximum duration to wait to receive an Acknowledge from the receiving party while transmitting NPD. If the transceiver does not receive an ACK within the Data ACK Waiting Time, the transceiver of the transmitting party decides that the transmission has failed and resends the message for the number of times configured for Number of Messages Sent on Traffic Channel. The transceiver executes the clear down operation and returns to the control channel if the transceiver does not receive an ACK within the number of times configured for Number of Messages Sent on Traffic Channel.

Data ACK Waiting Time can be configured by using KPG-96D.

Note: The Data ACK Waiting Time must be longer than the following length of times:

- Transmit Delay Time on NPD
- Transmit-on FFSK Delay Time on NPD
- Transmit-off FFSK Delay Time on NPD
- Initial Transmit Delay Time on NPD

■ Configuration using KPG-96D

- Configuring the Data ACK Waiting Time (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

8.12 PABX Call

PABX Call can be used to call via a PABX (Private Automatic Branch Exchange). If this function is available in the current system, a user can make a PABX Call.

The following methods are used to make a PABX call:

- Make a call by dialing 4 to 9 numeric digits.
(Refer to 8.22 Dialing List on page 63.)
- Select a Call Address that was entered by dialing.

PABX Call can be configured to be enabled or disabled by using KPG-96D.

■ Display and Operation

1. The transceiver receives a PABX Call.

The transceiver emits the receive alert tone and "CAL" blinks on the sub display. "<< PABX >>" appears on the main display.



Note: The receive alert tone can be changed to the alert tone selected from Alert Tone Pattern. The default receive alert tone is GTC Blip Tone (Tone K). (Refer to 4.10 Alert Tone Pattern on page 22.)

■ Configuration using KPG-96D

- Configuring the PABX Call to be Enabled or Disabled (Refer to FPRG 6.1.8 Call Facilities (Network) Window.)

8.13 PSTN Call

PSTN Call can be used to make a call via the PSTN (Public Switched Telephone Network). If this function is available in the current system, a user can make a PSTN Call.

The following methods are used to make a PSTN call:

- Make a call by dialing 8 to 11 numeric digits.
(Refer to 8.22 Dialing List on page 63.)
- Select a Call Address that was entered by dialing.

PSTN Call can be configured to be enabled or disabled by using KPG-96D.

■ Display and Operation

1. The transceiver receives a PSTN Call.

The transceiver emits the reception alert and "CAL" blinks on the sub display. "<< PSTN >>" appears on the main display.



Note: The receive alert tone can be changed to the Alert Tone selected from Alert Tone Pattern. The default receive Alert Tone is GTC Blip Tone (Tone K). (Refer to 4.10 Alert Tone Pattern on page 22.)

■ Configuration using KPG-96D

- Configuring the PSTN Call to be Enabled or Disabled (Refer to FPRG 6.1.8 Call Facilities (Network) Window.)

8.14 View Stack

View Stack can be used to view the stored Ident and messages.

The transceiver can store voice, status and data. The transceiver can store the received Ident and messages to a maximum quantity of 1024 bytes. If 32 data are stored and the capacity exceeds 1024 bytes, the oldest message is cleared from the stack and the new Ident or message is stored.

Press the **Status/ Stack** key to display the received and stored Ident and messages.

Status/ Stack can be assigned to the **[S]** key on the transceiver by using KPG-96D.

Note: The transceiver displays the stack if the **Status/ Stack** key is pressed 1 to 3 times. The number of times to press the key varies depending on the ST Menu configuration. The Stack does not appear if Stack Mode is disabled in ST Menu. (Refer to FPRG 6.5.4 Trunking Tab.)

8.14.1 Voice Stack

Voice Stack can be used to store the caller's Ident when a user cannot respond to the voice call.

To use this function, Voice Stack must be enabled by using KPG-96D.

■ Display and Operation

This display appears when the transceiver receives a voice call from "202-2001-20".

1. The transceiver receives a voice call.

The "☒" icon blinks when the transceiver does not respond to the voice call.

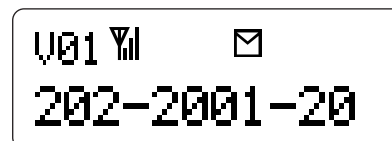
2. Press the **Status/ Stack** key.

The transceiver enters Stack Mode. "NEW" appears on the sub display if the stack is displayed for the first time.



"NEW" disappears from the sub display after 1 second and "V + Stack number" appears on the sub display.

In this case, the "☒" icon appears.



Note: A Group Call is not stored in the Voice Stack.

■ Configuration using KPG-96D

- Enabling the Voice Stack (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

8.14.2 Status Stack

Status Stack can be used to store received Status Messages in Stack Memory.

To use this function, Status Stack must be enabled by using KPG-96D.

■ Display and Operation

This display appears when the transceiver receives a status call from "202-2001-20".

1. The transceiver receives a status call.

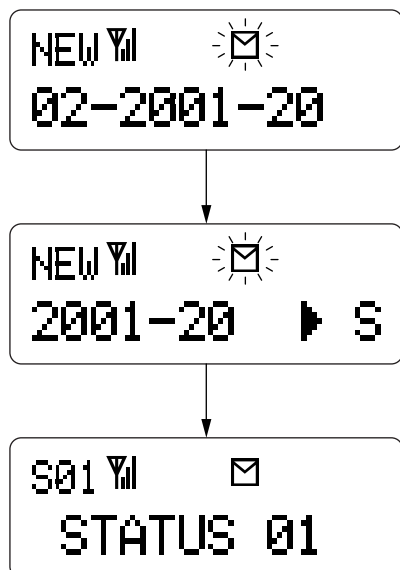
The "☒" icon blinks.

2. Press the **Status/ Stack** key.

The transceiver enters Stack Mode. "NEW" appears on the sub display if the stack is displayed for the first time.



The received data message can be displayed by scrolling after displaying the caller's ID. The "NEW" disappears from the sub display after scrolling, and "S + Stack number" appears on the sub display. In this case, the "☑" icon appears.



Note: Press the [C>] key to stop scrolling and to manually scroll.

■ Configuration using KPG-96D

- Enabling the Status Stack (Refer to FPRG 6.3.4 Status Message Window.)

8.14.3 Data Stack

Data Stack can be used to store received SDM2 and NPD Calls.

To use this function, Message Stack must be enabled by using KPG-96D.

■ Display and Operation

This display appears when the transceiver receives and stores a data call with "DATA01" from "202-2001-20".

- The transceiver receives a Data Call.

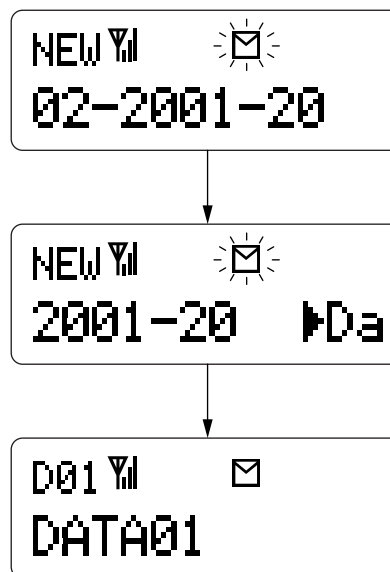
The "☑" icon blinks.

- Press the **Status/ Stack** key.

The transceiver enters Stack Mode. "NEW" appears on the sub display if the stack is displayed for the first time.



The received data message can be displayed by scrolling after displaying the caller's ID. The status message display disappears when the status message is scrolled and the transceiver jumps to the beginning of data after 1 second. The "NEW" disappears from the sub display after scrolling and "D + Stack number" appears on the main display. In this case, the "☑" icon appears.



Note: Press the [C>] key to stop scrolling and to manually scroll.

■ Configuration using KPG-96D

- Enabling the Message Stack (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

8.14.4 Stack Clear

All stacks stored in the transceiver can be cleared.

■ Display and Operation

● Clearing All Stacks

- Press the **Clear** key while the stack is displayed. "DELETE?" appears on the main display.

The selected Stack List number appears on the sub display.



D01  
DELETE?

2. Press the [S] or [*] key.

All stacks will be cleared.

Note: The stack display appears on the display without clearing the stack when the [A] or [#] key is pressed.

If all stacks are cleared, “-00” appears on the sub display and “-----” appears on the main display.



-00 

If another stack exists even if a stack is cleared, one of the following displays appears:

- **When Stack01 is cleared while Stack01 and Stack02 are stored:** Stack 02 appears on the display. In this case, the sub display switches from “D01” to “D02”.



D02  
02-2001-21

- **When Stack02 is cleared while Stack01 and Stack02 are stored:** Stack 01 appears on the display. In this case, the sub display switches from “D02” to “D01”.



D01  
02-2001-21

- **When Stack02 is cleared while Stack01, Stack02 and Stack03 are stored:** Stack 03 appears on the display. In this case, the sub display switches from “D02” to “D03”.



D03  
02-2001-21

● Clearing all Stacks

1. Press and hold the **Clear** key for more than 1 second.

“DELETE?” appears on the main display.

“ALL” appears on the sub display.



ALL  
DELETE?

2. Press the [S] or [*] key.

All stacks will be cleared.

“-00” appears on the sub display and “-----” appears on the main display.



-00 

Note: The stack display appears on the display without clearing the stack when the [A] or [#] key is pressed.

8.14.5 Time Stamp

Time Stamp can be used to store a received message with the received time. Press the [A] key while Voice Stack, Status Stack or Data Stack is displayed to present the receive time of the message. The time stamp is stored with the internal clock of the transceiver being used as a reference.

12H display or 24H display can be used for Time Stamp. An error message appears on the display if RTC is not oscillating or operating properly when a message is stored.

The time display format can be configured by using KPG-96D.

■ Display and Operation

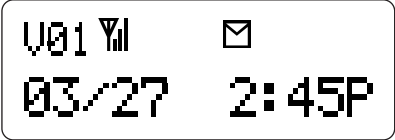
● Time Stamp Display

1. Press the [A] key while Voice Stack, Status Stack or Data Stack is displayed.

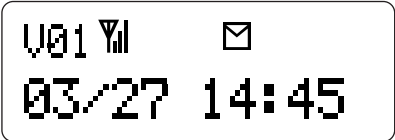
The receive time of each message appears on the display.

• Voice Stack

Time Stamp (12H) Display

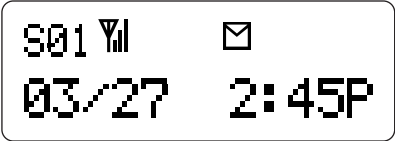


Time Stamp (24H) Display

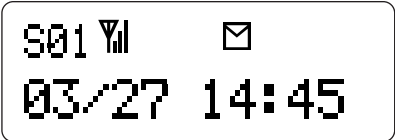


• Status Stack

Time Stamp (12H) Display

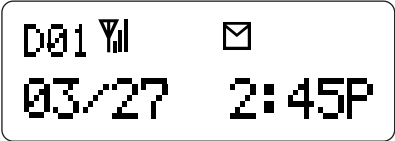


Time Stamp (24H) Display

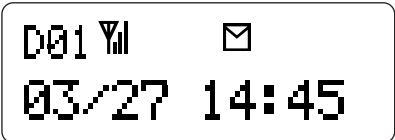


• Data Stack

Time Stamp (12H) Display



Time Stamp (24H) Display

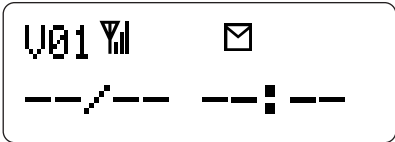


• Time Stamp Error Display

- 1. Press the [A] key while Voice Stack, Status Stack or Data Stack is displayed.

“--” appears on the main display. This display indicates that the transceiver could not properly receive time information.

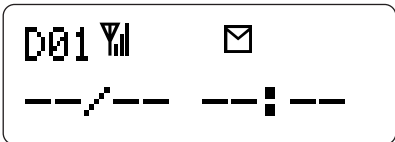
• Voice Stack



• Status Stack



• Data Stack



Note: Press the [A] key while the Time Stamp is displayed and each stack appears on the display.

■ Configuration using KPG-96D

- Configuring the Time Format (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

Note:

- ◆ Press the [A] key while the Time Stamp is displayed and each stack appears on the display.
- ◆ When the **Selector** or [^] and [v] keys are used while the Time Stamp appears on the main display, the previous or subsequent Time Stamp with respect to the current Time Stamp appears on the main display.

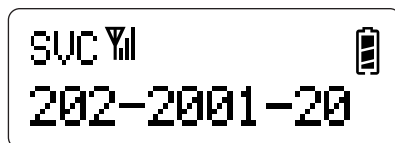
8.15 FOACSU (Full Off Air Call Set Up)

FOACSU (Full Off Air Call Set Up) can be used to remain in receiving mode and stop making a call until the receiving party manually responds to the call. With this function, a traffic channel can be prevented from being assigned to a receiving party that is away from the transceiver.

FOACSU can be configured to be enabled or disabled by using KPG-96D.

■ Display and Operation

1. Select a target Call Address.



2. Press the **PTT** switch or **Call** key.

The transceiver starts making a call.
“<< CALLING >>” appears on the main display while the transceiver is making a call.

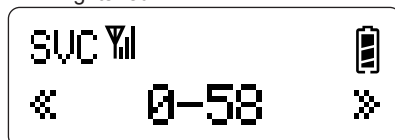


“<< HOLDING >>” appears on the main display while the transceiver waits to receive a response from the receiving party.



The communication time display appears on the main display if the receiving party presses the **PTT** switch.

LED lights red.



Note: The **PTT** switch can be used only if anything other than Disable is configured for PTT to Initiate Call.
(Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

■ Configuration using KPG-96D

- Configuring the FOACSU to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)

8.16 Emergency Call

Emergency Call can be used to make an Emergency Call. If a user makes an Emergency Call, the call has the highest priority and a channel is assigned to the call first. If the controller receives an Emergency Call while all traffic channels are used, one of the traffic channels is automatically disconnected and the channel will be assigned to the Emergency Call.

Transceiver operation varies depending on the status of the **Emergency Mode** checkbox configured to be enabled or disabled using KPG-96D.

● When Emergency Mode is enabled:

The transceiver enters Emergency Mode when the **Emergency** key is pressed and held for longer than the Key Hold Time. The Key Hold Time prevents Emergency Mode from being entered unintentionally.

● When Emergency Mode is disabled:

The transceiver makes an Emergency Call when the **Emergency** key is pressed and held for longer than the Key Hold Time. The Key Hold Time prevents Emergency Mode from being entered unintentionally.

Emergency must be selected from the **Call Type** dropdown list in Emergency to make an Emergency Call.

Note:

- ◆ The following methods are available to make a call without using the **Emergency** key:
 - Select the Call Address.
 - Enter the control code “*9*” using the keypad.
 - The transceiver transmits when the Man-down Delay Time elapses after the Man-down tilt switch input activates. (TK-2180/ TK-3180 only)
- ◆ Emergency Mode is disabled if Dialing is selected from the **Emergency Address** dropdown list.
- ◆ The transceiver functions in a similar way as when the transceiver receives an individual call if “Non-priority” or “High Priority” is selected from the **Call Type** dropdown list. The transceiver enters Emergency Mode when Emergency Mode is enabled.
- ◆ The **PTT** switch can be used even if the transceiver is in Emergency Mode. The transceiver enters automatic receive mode after transmitting using the **PTT** switch.
- ◆ The microphone sensitivity in Emergency Mode can be configured in conjunction with the Emergency Mic Sense configuration.
- ◆ **Emergency** can be assigned to the **AUX** or **PF 1** key if the transceiver is TK-2180/ TK-3180. Emergency can be assigned to the [△] key or AUX Input port if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
- ◆ Normally, the [△] key is used to exit from each mode. If **Emergency** is assigned to the [△] key and a value of 0 is configured for the Key Hold Time, the transceiver executes Emergency functions first.

■ Display and Operation

● Entering Emergency Mode

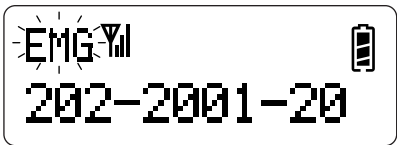
- 1. Press the **Emergency** key for longer than the Key Hold Time.

● Exiting Emergency Mode

- 1. The following methods are available to exit from Emergency Mode:
 - Press the **Emergency** key for longer than the Key Hold Time.
 - Turn the transceiver OFF.

● Receiving an Emergency Call

- 1. The transceiver receives an Emergency Call.
The transceiver emits the receive alert tone and “EMG” blinks on the sub display.



The following displays appear when the transceiver receives a call from an address that is not registered in the address list.

- “<< I-PREFIX >>” appears on the main display if the transceiver receives a call from Interprefix.



- “<< I-FLEET >>” appears on the main display if the transceiver receives a call from Interfleet.



Note: The receive alert tone can be changed to the alert tone selected from Alert Tone Pattern. The default receive alert tone is GTC Blip Tone (Tone K).
(Refer to 4.10 Alert Tone Pattern on page 22.)

The transceiver operates according to Emergency configuration in Emergency Mode. The following section describes emergency functions.

Note: The transceiver may not operate in the configured way on a system since the transceiver may forcibly be cleared down if there is no transmission in a certain period.

■ Configuration using KPG-96D

- Assigning the Emergency to the Transceiver (Refer to FPRG 6.5 Key Assignment Window and FPRG 6.7 Extended Function Window.)
- Configuring the Emergency Functions (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.1 Emergency Cycle

Emergency Cycle is the time for switching between transmit and receive in Emergency Mode.

Emergency Cycle can be configured using KPG-96D.

Emergency Cycle functions in the following way.

Table 8-7 Emergency Cycle Operation

Emergency Cycle	Operation
1 to 200	The transceiver repeats automatic transmission start tone > automatic transmission end tone > automatic reception for configured time and exits from Emergency Mode.
Infinite	The transceiver alternates between transmit and receive until the Emergency key is pressed again or the transceiver is turned OFF.

■ Configuration using KPG-96D

- Configuring the Emergency Cycle (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.2 Duration of Locator Tone 1

Duration of Locator Tone 1 is the duration to emit the Alert Tone beeping before an automatic transmission begins in Emergency Mode.

This tone sounds when the transceiver alternates between transmit and receive in Emergency Mode.

With this tone, a user can easily recognize that the transceiver is about to make an Emergency Call. The dispatcher can use this tone to locate the user who is in emergency situations.

The duration to emit the Alert Tone can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Duration of Locator Tone 1 (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.3 Transmit Duration

Transmit Duration is the transmission duration in Emergency Mode.

The transceiver returns to Emergency Automatic Reception Mode when the Transmit Duration elapses after the transceiver starts Automatic Transmission in Emergency Mode.

The Transmit Duration can be configured using KPG-96D.

Note:

- ◆ The transceiver cannot transmit while Stun is enabled.
- ◆ The transceiver resends RQS when the communication time elapses and the transceiver automatically returns to a control channel in conjunction with the configuration at the system side.

■ Configuration using KPG-96D

- Configuring the Transmit Duration (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.4 Duration of Locator Tone 2

Duration of Locator Tone 2 is the duration to emit the alert tone beeping before an automatic reception begins in Emergency Mode.

This tone sounds when the transceiver alternates between transmit and receive in Emergency Mode.

With this tone, a user can easily recognize that the transceiver is about to receive an Emergency Call. The dispatcher can use this tone to locate the user who is in emergency situations.

The duration to emit the Alert Tone can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Duration of Locator Tone 2 (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.5 Receive Duration

Receive Duration is the reception duration in Emergency Mode.

The transceiver returns to Emergency Automatic Transmission Mode when the Receive Duration elapses after the transceiver starts Automatic Transmission in Emergency Mode.

The Receive Duration can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Receive Duration (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.6 Emergency Display

Configure the content that appears on the main display in Emergency Mode.

Emergency Display can be configured in the following way using KPG-96D.

Table 8-8 Emergency Display Operation

Emergency Display	Operation
Selected	The previously selected Call Address appears on the main display even if the transceiver enters Emergency Mode. The icons are also retained even if the transceiver enters Emergency Mode. This function is convenient when a user wants to hide that the transceiver is in Emergency Mode.
Text	A pre-programmed message configured for the Emergency Text appears on the main display when the transceiver enters Emergency Mode.

■ Configuration using KPG-96D

- Configuring the Emergency Display (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.7 Emergency Text

Emergency Text is the text displayed on the main display. Text to be displayed can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Emergency Text (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.8 Emergency Mode Type

The transceiver can be configured to emit the received audio in Emergency Mode.

Emergency Mode Type can be configured in the following way by using KPG-96D.

Table 8-9 Emergency Mode Type Operation

Emergency Mode Type	Operation
Silent	The transceiver mutes the received audio and Locator Tone while the transceiver is in Emergency Mode.
Audible	The transceiver emits the received audio in Emergency Mode.

■ Configuration using KPG-96D

- Configuring the Emergency Mode Type (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.9 Locator Tone

The volume level of the alert tone can be configured in Emergency Mode.

Locator Tone can be configured in the following way by using KPG-96D.

Table 8-10 Locator Tone Operation

Locator Tone	Operation
Off	The transceiver does not emit any tones.
0 to 31	The tone volume is fixed. Larger values result in greater volume.
Current	The transceiver emits Alert Tones in conjunction with the Volume control (TK-2180/ TK-3180) or Volume keys (TK-7180/ TK-7180H/ TK-8180/ TK-8180H) configuration when Current is configured for Locator Tone.

Note: The transceiver does not emit any tones if Silent is configured for Emergency Mode Type.

■ Configuration using KPG-96D

- Configuring the Locator Tone (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.10 Emergency Mic Sense

Emergency Mic Sense is the microphone gain in Emergency Mode.

Emergency Mic Sense can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Emergency Mic Sense (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.11 Emergency LED

The transceiver can be configured to turn the Transmit LED on when the transceiver transmits in Emergency Mode.

Emergency LED can be configured to be enabled or disabled using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Emergency LED to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.12 Background Transmission

Background Transmission can be used to superimpose on the transmitted audio a 1630 Hz tone and emit the tone every second while the transceiver is in Emergency Mode.

The transceiver does not mute since the tone to be superimposed is transmitted with lower deviation than normal. The receiving party can easily recognize that the caller is in Emergency Mode since the tone is superimposed during voice communication.

Background Transmission can be configured to be enabled or disabled using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Background Transmission to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.13 Man-down (TK-2180/ TK-3180 only)

Man-down can be used to decide whether to connect the Man-down tilt switch. The Man-down tilt switch can be connected inside or outside the transceiver.

Man-down can be configured to be enabled or disabled using KPG-96D.

Note: The TK-2180/ TK-3180 supports the Man-down tilt switch (KCT-47MS) that can be connected to the universal connector located on the side of the transceiver. Man-down can be used without any additional operations, such as soldering.

■ Configuration using KPG-96D

- Configuring Man-down to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.14 Man-down Delay Time (TK-2180/ TK-3180 only)

The Man-down Delay Time is the duration from the time when the Man-down tilt switch is enabled until the Man-down tilt switch is activated.

Emergency function activates when the Man-down tilt switch is activated. The Man-down Delay Time prevents the transceiver from Emergency Mode being entered unintentionally.

The Man-down Delay Time can be configured by using KPG-96D.

Note: The Emergency function does not activate if the Man-down tilt switch is disabled before the Man-down Delay Time elapses.

■ Configuration using KPG-96D

- Configuring the Man-down Delay Time (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.15 Man-down Pre-alert (TK-2180/ TK-3180 only)

Man-down Pre-alert is one of the Alert Tones that sounds from the time when the Man-down tilt switch is enabled until the Man-down tilt switch is activated.

When the Man-down tilt switch is activated (perhaps unintentionally), the transceiver emits the Pre-alert before activating the Emergency function to notify a user that the Man-down tilt switch is enabled.

The Man-down Pre-alert time can be configured by using KPG-96D. The Man-down Pre-alert time must be configured for a shorter time than the Man-down Delay Time.

■ Configuration using KPG-96D

- Configuring the Man-down Pre-alert (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.16.16 Man-down Logic Type (TK-2180/ TK-3180 only)

Man-down Logic Type is the logic of the Man-down tilt switch (External Switch).

The transceiver operation when the input port is Low or High can be configured by using KPG-96D.

• Active Low

The Man-down tilt switch is enabled when the input port is Low.

• Active High

The Man-down tilt switch is enabled when the input port is High.

■ Configuration using KPG-96D

- Configuring the Man-down Logic Type (Refer to FPRG 6.3.2 Trunking Features Window > ■ Emergency Tab.)

8.17 Function Menu

Function Menu can be used to check and edit the configuration of each function. Function Menu activates when the **Function Menu** key is pressed.

Function Menu can be configured to be enabled or disabled by using KPG-96D. Since Own Prefix, Fleet and Ident display appear as a part of Function Menu, these displays cannot be configured using KPG-96.

The following items can be checked or edited in Function Menu.

Table 8-11 Function Menu Item

Display Order	Configuration Name	KPG-96D Configuration
1	Own Prefix, Fleet and Ident Display	Disabled (Always active)
2	Control Channel Select	Enabled
3	Current Control Channel Number Display	Enabled
4	Current System Display	Enabled
5	Codeword Error Counter	Enabled
6	Beep Volume	Enabled
7	Ringer Volume	Enabled
8	Speaker Mute	Enabled
9	Lamp (TK-2180/ TK-3180 only)	Enabled
10	Current Traffic Channel Number	Enabled
11	Temporary Receive/Transmit Group	Enabled

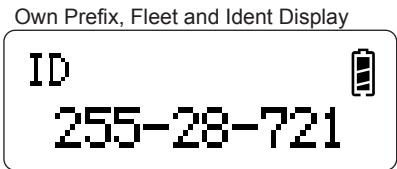
Function Menu can be assigned to a **PF** key on the transceiver by using KPG-96D.

Using KPG-96D, configurable items in Function Menu can be selected.

■ Display and Operation

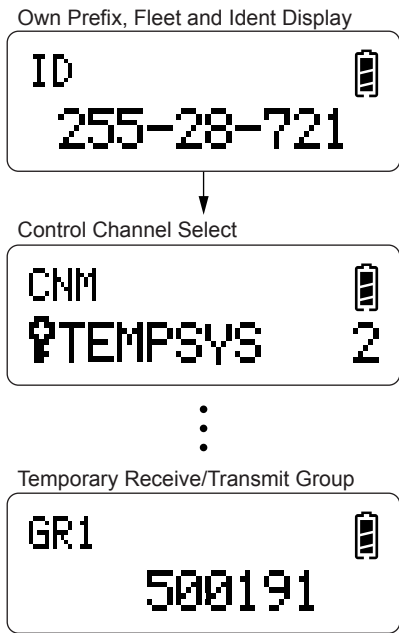
1. Press the **Function Menu** key.

Function Menu activates and “Own Prefix, Fleet, Ident Display” of the first configuration item appears on the display.



2. Press the **Function Menu** key.

The configuration item switches every time the **Function Menu** key is pressed.



Function Menu deactivates and the previous display appears when the **Function Menu** key is pressed while the last configuration item is Temporary Receive/Transmit Group.

Press the **Clear** or **[*]** key to exit Function Menu while other items are displayed.

Note:

- ◆ The number of times to press the **Function Menu** key varies depending on the Function Menu configuration. The configuration items that are disabled in Function Menu cannot be displayed. (Refer to FPRG 6.5.4 Trunking Tab.)
- ◆ **[<B]** and **[<C>]** keys can be used to select PERMSYS or TEMPSYS in Control Channel Select. Note that the transceiver does not exit from the Function Menu even if the **Clear** key is pressed if Clear is assigned to the **[<B]** or **[<C>]** key. Function Menu cannot be assigned to the **[<B]** or **[<C>]** key.

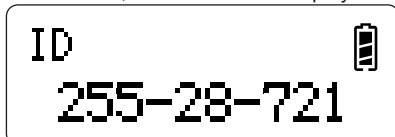
■ Configuration using KPG-96D

- Assigning the Function Menu to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring Configuration Items in Function Menu to be Enabled or Disabled using KPG-96D (Refer to FPRG 6.5 Key Assignment Window.)

8.17.1 Own Prefix, Fleet and Ident Display

Own Prefix, Fleet and Unit configured in the transceiver can be displayed. Own Prefix, Fleet and Unit cannot be changed on this window.

Own Prefix, Fleet and Ident Display



8.17.2 Control Channel Select

The number of the channel list for normal hunt that is configured in the transceiver can be selected.

The channel list for normal hunt can be configured using KPG-96D.

■ Display and Operation

1. Select the Control Channel Select menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

When TEMPSYS = 2 is selected



When no system is selected



The target system can be configured by using the keypad, **Selector** or [^] and [v] keys.

2. Press the [<B] or [C>] key.

System can be selected.

- PermSys can be selected by pressing the [<B] key.

PERMSYS = 2



- TempSys can be selected by pressing the [<C] key.

TEMPSYS = 2



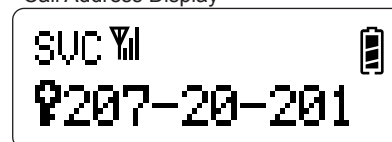
3. Press the [#] or **Call** key.

The key icon appears on the icon display area indicating that the system has been configured. This configuration is stored in the transceiver.



The key icon appears on the icon display area when the system is configured even if the Call Address display is displayed.

Call Address Display



Note:

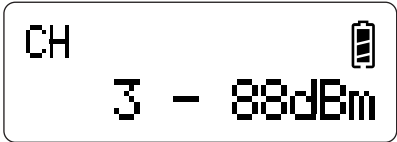
- ◆ The Key Input Error Tone beeps when the [#] or **Call** key is pressed while no system is configured.
- ◆ Since the Out of Service Alert Tone sounds during Control Channel Select, a user can notice that the system is not configured without pressing the [#] or **Call** key.
- ◆ Control Channel Select can only switch systems for which Yes is selected from the **Normal Hunt Channel Numbers** window > **List** dropdown list.

■ Configuration using KPG-96D

- Configuring the Channel List for Normal Hunt (Refer to FPRG 6.1.4 Normal Hunt Channel Numbers Window.)

8.17.3 Current Control Channel Number Display

The number of the control channel hunted by the transceiver and signal strength (RSSI Level) appear on the main display. The control channel cannot be changed.

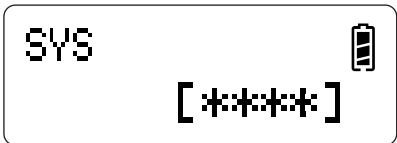


8.17.4 Current System Display

The Syscode of the control channel hunted by the transceiver appears on the main display.



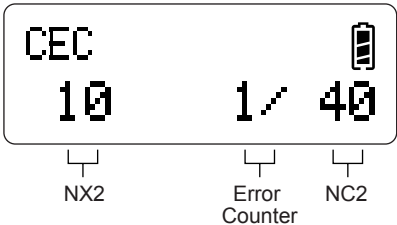
“****” appears on the main display if the hunt fails.



8.17.5 Codeword Error Counter

The detected codeword error information appears on the display. The following appears:

- Count of the detected codeword error
- NX2 configured by using KPG-96D
- NC2 configured by using KPG-96D



■ Configuration using KPG-96D

- Configuring various timers (Refer to FPRG 6.1.6 Timers Window.)

8.17.6 Beep Volume

The Beep Volume level can be configured.

■ Display and Operation

1. Select the Beep Volume menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

Configuration	Meaning
DEFAULT	The transceiver emits beeps with the volume level configured with Tone Level.
0 to 16	The volume level can be configured in 17 steps. 1 step is equal to 2 steps in Tone Level.



Beep Volume can be configured by using the **Selector** or [**▲**] and [**▼**] keys.

Note: Beep Volume level is fixed if 0 to 16 is configured for the volume level. Beep Volume cannot be configured by using the **Volume** key.

■ Configuration using KPG-96D

- Configuring the Tone Level (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

8.17.7 Ringer Volume

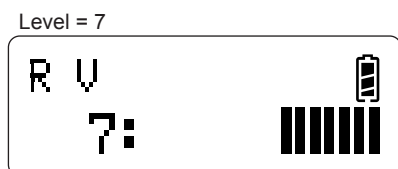
The Ringer Volume level can be configured.

■ Display and Operation

1. Select the Ringer Volume menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

Configuration	Meaning
DEFAULT	The transceiver emits the Ringer Tone with the volume level configured with Tone Level.
0 to 16	The volume level can be configured in 17 steps. 1 step is equal to 2 steps in Tone Level.



Ringer Volume can be configured by using the **Selector** or [**△**] and [**▽**] keys.

Note: Ringer Volume level is fixed if 0 to 16 is configured for the volume level. Ringer Volume cannot be configured by using the **Volume** key.

■ Configuration using KPG-96D

- Configuring the Tone Level (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

8.17.8 Speaker Mute

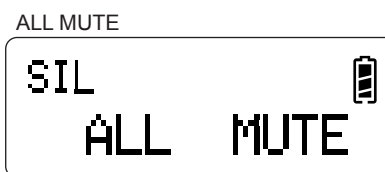
Speaker Mute can be configured.

■ Display and Operation

1. Select the Speaker Mute menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

Configuration	Meaning
MUTE OFF	Beep and Ringer Tones are not muted.
BEEP MUTE	Beeps other than voice are always muted.
RING MUTE	Ringer Tones other than voice are always muted.
ALL MUTE	Beeps and Ringer Tones other than voice are always muted.



Speaker Mute can be configured by using the **Selector** or [**△**] and [**▽**] keys.

8.17.9 Lamp
(TK-2180/ TK-3180 only)

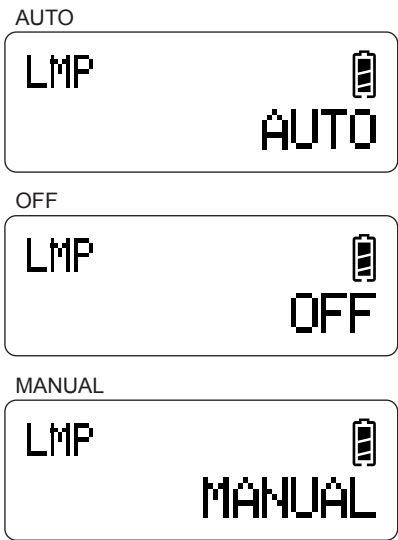
Lamp can be configured.

■ Display and Operation

- 1. Select the Lamp menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

Configuration	Meaning
AUTO	The lamp lights when a key is pressed or the transceiver receives a call.
OFF	The lamp does not light.
MANUAL	When the Lamp key is pressed, the lamp lights.



Lamp can be configured by using the **Selector** or **[^]** and **[v]** keys.

Note:

- ◆ MANUAL can be configured only if the **Lamp** key is assigned to a **PF** key.
- ◆ OFF can be configured only if the **Lamp** key is not assigned to a **PF** key.

■ Configuration using KPG-96D

- Assigning the Lamp Function to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring the Auto Backlight (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

8.17.10 Current Traffic Channel Number

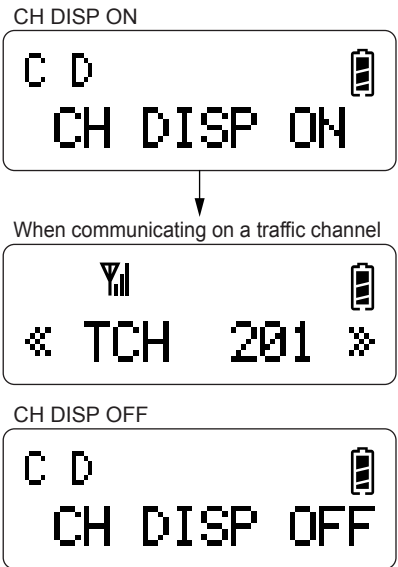
The traffic channel number can be displayed while the transceiver is communicating.

■ Display and Operation

- 1. Select the Current Traffic Channel Number menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the main display.

Configuration	Meaning
CH DISP ON	The traffic channel number appears on the main display while the transceiver is communicating.
CH DISP OFF	The traffic channel number does not appear while the transceiver is communicating.



Current Traffic Channel Number can be configured by using the **Selector** or **[^]** and **[v]** keys.

8.17.11 Temporary Receive/Transmit Group

A Group Address can be temporarily added.

■ Display and Operation

- 1. Select the Temporary Receive/Transmit Group menu by pressing the **Function Menu** key.

The current configuration of the transceiver appears on the display.

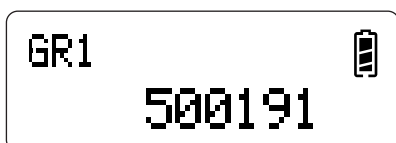
- 2. Select the memory number of Group Address to configure.

Select a memory number using the **Selector** or **[▲]** and **[▼]** keys.



3. Enter a Group Address.

Group Address can be entered with the MPT1343 method in the following order using the keypad: Fleet Group Number (FGN) → Unit Number (UN).



4. Press the **[#]** or **Call** key.

The entered Group Address is registered in the transceiver. The transceiver returns to the previous state when the **[*]** key is pressed.

Note:

- ◆ The Temporary Receive/Transmit Group menu does not appear if Keypad Operation is disabled. Keypad Operation must be enabled using KPG-96D to display the Temporary Receive/Transmit Group menu.
- ◆ Only a Group Address that is enabled with Group ID Encode Block can be configured.
- ◆ A maximum of 3 Temporary Receive/Transmit Groups can be configured. If a Group Address is added for the first time, Add is configured for the Group Address.
- ◆ The Number Unobtainable Tone sounds and "NU" appears on the main display when the entered Group Address is out of range.
- ◆ The system configuration must be changed to use the Group ID added to the transceiver in the system.

■ Configuration using KPG-96D

- Enabling the Keypad Operation (Refer to FPRG 6.5 Key Assignment Window > 6.5.3 General Tab.)

8.18 Transmit Power in Trunking Mode

Transmit Power in Trunking Mode is the transmit power of the transceiver in MPT Trunking System.

High, Low or Auto (TK-2180/ TK-3180 only) can be configured for the transmit power of the transceiver in MPT Trunking System by using KPG-96D.

Transmit Power can be switched by pressing the **Transmit Power** key.

The transceiver operates in the following way when the **Transmit Power** key is pressed.

Table 8-12 Transceiver Operation when the Transmit Power Key is Pressed

Transceiver Status	Operation
Low Transmit Power or Auto	Switches to High Transmit Power.
High Transmit Power	Switches to the transmit power configured using KPG-96D.

Note:

- ◆ Transmit Power cannot be changed by pressing the **Transmit Power** key if High is configured for Transmit Power in Trunking Mode in KPG-96D. The **Transmit Power** key can be used only if Low or Auto is configured for Transmit Power.
- ◆ The configuration of Transmit Power edited using the **Transmit Power** key is not stored in the transceiver.

■ Configuration using KPG-96D

- Configuring the Transmit Power in Trunking Mode (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 1 Tab.)
- Assigning the Transmit Power to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

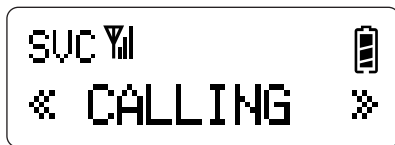
8.19 Searching for the New Control Channel

Searching for the New Control Channel can be used to search for another control channel when the transceiver does not receive any response from the system even if the transceiver requests a call.

Searching for the New Control Channel can be configured to be enabled or disabled using KPG-96D.

■ Display and Operation


1. Request a call.

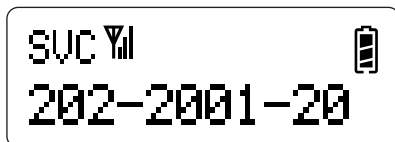


The transceiver searches other control channels in the following situations:

- When the transceiver does not respond even if the transceiver retransmits the signaling for NR times or TC time.
- When the control channel stored in the memory cannot be found in a certain period.



The “” icon appears and the Call Address stored in the transceiver memory appears on the main display when an available control channel is found.



■ Configuration using KPG-96D

- Configuring the Searching for the New Control Channel to be Enabled or Disabled
(Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)

8.20 QT/DQT Decode/Encode (MPT Trunking)

QT/DQT Decode/Encode can be used to facilitate communication within MPT Trunking System when communicating using a traffic channel.

This function is enabled in an environment where an interfering signal from another user is present.

If an interfering signal accesses the repeater, the same QT/DQT must be configured for the transmitting party's transceiver and the receiving party's repeater. With this function, the possibility of an interfering signal being repeated can be reduced.

QT/DQT Decode/Encode can be configured for each channel using KPG-96D.

■ Configuration using KPG-96D

- Configuring the QT/DQT Decode/Encode
(Refer to FPRG 6.1.5 QT/DQT Decode/Encode Window.)

8.21 Out of Service Alert

Out of Service Alert can be used to emit the Alert Tone when no available control channel is found while searching for a control channel.

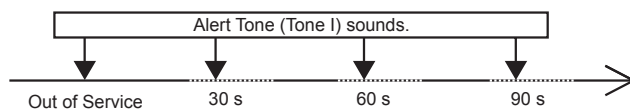
A user realizes that the transceiver is out of the service area when hearing the Alert Tone.

The transceiver emits the Alert Tone (Tone I) once with the configured duty cycle if no available control channel is found while Out of Service Alert is enabled. If Off is configured for the duty cycle for emitting the Out of Service Alert, the transceiver emits the Alert Tone (Tone I) continuously. ([Refer to 4.1.5 MPT Tone on page 19.](#))

The transceiver emits the Alert Tone (Tone I) once before entering Conventional Mode without following the duty cycle for emitting the Out of Service Alert while Enter Conventional Mode Delay Time is enabled.

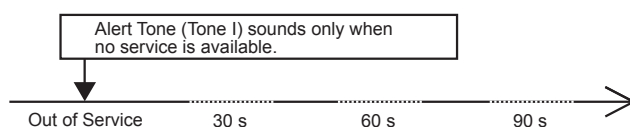
Out of Service Alert Tone: Check

Alert Tone Interval Time: 30 sec



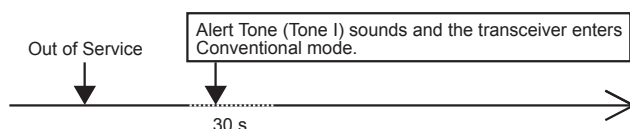
Out of Service Alert Tone: Check

Alert Tone Interval Time: Off



Out of Service Alert Tone: Check

Enter Conventional Mode Delay Time: 30 sec



Out of Service Alert can be configured to be enabled or disabled by using KPG-96D. The duty cycle for emitting the Out of Service Alert can also be configured.

■ Configuration using KPG-96D

- Configuring the Out of Service Alert to be Enabled or Disabled (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)
- Configuring the Cycle for Emitting the Out of Service Alert (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)

8.22 Dialing List

The following numeric digits can be entered by dialing for each call.

■ Dialing 2 Numeric Digits

Function	Dial String
Individual Number	20 to 89
Group Number	90 to 99

■ Dialing 3 Numeric Digits

Function	Dial String
Individual Number	200 to 899
Group Number	900 to 998
Emergency Operator	999 or 112
Entering Open Channels	101 to 110
Network Operator Services	100, 111, 121, 131, 141, 151, 161, 171, 181, 191

■ Dialing 4 Numeric Digits

Function	Dial String
PABX Call	1000 to 8999

■ Dialing 5 Numeric Digits

Function	Dial String
PABX Call (Single address word calls)	First String (3 to 6) + Second String (1000 to 8999)
PABX Call (extended addressing protocol)	First String (0, 7 or 8) + Second String (0000 to 9999)

■ Dialing 6 Numeric Digits

Function	Dial String
Common Prefix Interfleet Individual Call	Fleet Number (2001 to 6050) + Individual Number (20 to 89)
Common Prefix Interfleet Group Call	Fleet Number (2001 to 6050) + Group Number (90 to 99)
PABX Call (extended addressing protocol)	First String (0, 7 or 8) + Second String (00000 to 99999)

■ Dialing 7 Numeric Digits

Function	Dial String
Common Prefix Interfleet Individual Call	Fleet Number (2001 to 6050) + Individual Number (200 to 899)
Common Prefix Interfleet Group Call	Fleet Number (2001 to 6050) + Group Number (900 to 998)
PABX Call (extended addressing protocol)	First String (0, 7 or 8) + Second String (000000 to 999999)

■ Dialing 8 Numeric Digits

Function	Dial String
PSTN Call	First String (0) + Second String (0000000 to 9999999)
PABX Call (extended addressing protocol)	First String (7 or 8) + Second String (0000000 to 9999999)

■ Dialing 9 Numeric Digits

Function	Dial String
Interprefix Interfleet Individual Call	Prefix Number (200 to 327) + Fleet Number (2001 to 6050) + Individual Number (20 to 89)
Interprefix Interfleet Group Call	Prefix Number (200 to 327) + Fleet Number (2001 to 6050) + Group Number (90 to 99)
PSTN Call	First String (0) + Second String (00000000 to 99999999)
PABX Call (extended addressing protocol)	First String (7 or 8) + Second String (00000000 to 99999999)

■ Dialing 10 Numeric Digits

Function	Dial String
Interprefix Interfleet Individual Call	Prefix Number (200 to 327) + Fleet Number (2001 to 6050) + Individual Number (200 to 899)
Interprefix Interfleet Group Call	Prefix Number (200 to 327) + Fleet Number (2001 to 6050) + Group Number (900 to 998)
PSTN Call	First String (0) + Second String (000000000 to 999999999)

■ Dialing 11 (or more) numeric digits

Function	Dial String
PSTN Call	First String (0) + Second String (0000000000 to 9999999999)

8.23 Control Codes

The following control codes are available for each call.

Function	Dial String
Call setup abandoned, call complete.	*#
Send status for dispatcher (status 0)	*0
Send status for dispatcher (status nn)	*0nn
Conference call	*1
Broadcast call	*11
Priority voice system-wide-call	*1981#
Emergency voice system-wide-call	*1982#
Priority np data system-wide-call	*1983#
Emergency np data system-wide-call	*1984#
Short data system-wide-call	*1985#
Standard voice system-wide-call	*1987#
Short data on the Control Channel	*2
Divert own calls	*41, *411, *412
Divert third party calls	*44, *441, *442
Queue Incoming Calls	*48#
Don't disturb (both, voice, data)	*49#, *491#, *492#
Priority call	*8
Emergency call	*9
End dialed string	#
Send status for dispatcher (status 31)	#0
Cancel Divert own calls	#41#, #411#, #412#
Cancel Divert third party calls	#44, #441, #442
General cancellation by recipient	#45#, #451#, #452#
Cancel Queue Incoming Calls	#48#
Cancel Don't disturb (both, voice, data)	#49#, #491#, #492#

If # is not entered at the end of the Dial String, a parameter, such as target party, can be entered. The **Call** key can be used for the last # of the Dial String. “*” must be entered at the beginning when entering a parameter, such as target party.

Entry example:

Short data on the control channel is used:

***2*SHORT_DATA*204**

Control code Message to transmit Target ID

The transceiver starts making a call if the target party is entered and the **Call** key is pressed. If PTT to Initiate Call is enabled, the transceiver can make a call when the **PTT** switch is pressed.

If the target party is entered with MPT1343 Dialing, the transceiver starts making a call when the **[#]** key is pressed.

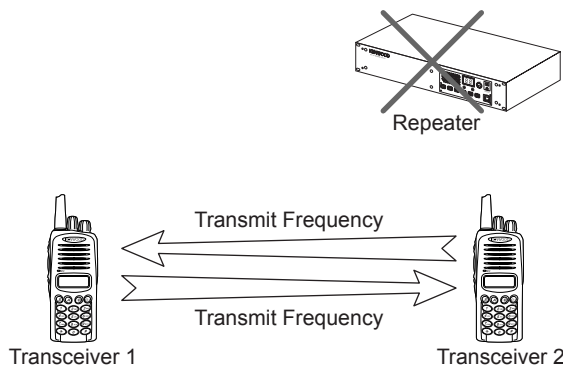
Note:

- ◆ When the **[*]** and **[#]** keys are continuously pressed while dialing, the current dialing is cleared, and the Call Address display appears.
- ◆ Queue Incoming Call and Don't Disturb are disabled if the transceiver is turned ON.

9 CONVENTIONAL MODE

9.1 General

If an MPT Trunking System is unavailable or a user is out of the service area, the transceiver enters Conventional Mode and directly communicates with other transceivers without using an MPT repeater.



Normally, the transceiver directly communicates with a target transceiver in Conventional Mode by using the following procedure:

- Enters Conventional Mode.
- Searches for a channel called by the scan.
- Selects a channel.
- The user presses the **PTT** switch to start transmitting their voice.

The following methods are available to enter Conventional Mode from MPT Trunking System:

- Manual Entry
- Auto Entry

9.1.1 Manual Entry

Manual Entry can be used to directly communicate with a target transceiver by entering Conventional Mode from MPT Trunking System.

When the **Conventional** key is pressed, the transceiver enters Conventional Mode from MPT Trunking System. The transceiver can directly communicate with the target transceiver by selecting an available channel.

The Conventional function can be assigned to a **PF** key on the transceiver by using KPG-96D.

Note: Refer to the [“2.7.2 Transmitting in Conventional Mode on page 9”](#) for displays and operations.

■ Configuration using KPG-96D

- Assigning Conventional Functions to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

9.1.2 Auto Entry

Auto Entry can be used to automatically allow a transceiver to enter Conventional Mode when the transceiver detects that MPT Trunking System is out of range for a certain period.

The Enter Conventional Mode Delay Time can be configured by using KPG-96D.

The transceiver automatically enters Conventional Mode if no control channel is found in MPT Trunking System within the Enter Conventional Mode Delay Time.

Note: Refer to the [“2.7.2 Transmitting in Conventional Mode on page 9”](#) for displays and operation.

■ Configuration using KPG-96D

- Configuring the Enter Conventional Mode Delay Time (Refer to FPRG 6.3.8 Conventional (General) Window.)

9.2 Trunking Search Delay Time

Trunking Search can be used to periodically search for a control channel in MPT Trunking System while the transceiver is in Conventional Mode.

The transceiver remains in Conventional Mode if no control channel is found.

If a control channel is found, the transceiver emits the Trunking Tone and executes the following operations corresponding to the Automatic Mode Change configuration.

- **Alert:**
The transceiver enters Conventional Mode.
- **Auto:**
The transceiver enters MPT Trunking System.

The transceiver executes the Trunking Search in the following manner when the scan starts.

Table 9-1 Trunking Search Operation

Scan Status	Trunking Search Operation
During the Scan	Trunking Search is not available.
During the Re-Scan	
Transmitting or Receiving	
While displaying the Channel Name (when the scan pauses.)	Trunking Search is available.

Note:

- ◆ The transceiver starts executing operations that are configured to be executed during the scan if the transceiver returns to Conventional Mode after finishing Trunking Search.
- ◆ The transceiver activates in the MPT Trunking System if the transceiver is turned OFF and ON again after entering the MPT Trunking System and a control channel is found with Trunking Search.

Trunking Search Delay Time can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Trunking Search Delay Time (Refer to FPRG 6.3.8 Conventional (General) Window.)
- Configuring the Automatic Mode Change (Refer to FPRG 6.3.8 Conventional (General) Window.)

9.3 QT/DQT Decode/Encode (Conventional)

QT/DQT is the signaling used for facilitating communication within a group when sharing the same channel with several groups (Talkgroup).

This signaling does not affect voice communications since it does not use audible frequencies.

If QT/DQT is configured for each channel, the transceiver mutes conversations made on unwanted channels. Therefore, a user can communicate within a group without hearing conversations of other groups.

This signaling at frequencies below 300 Hz does not affect voice communication since it does not use the audible frequency spectrum. The transceiver recognizes the signaling even if the transceiver starts receiving midway through a call since this signaling type has a continuous wave form.

Table 9-2 QT/DQT

QT	QT (Quiet Talk) uses a continuous sub-audible sine wave (67.0 to 254.1 Hz).
DQT	DQT (Digital Quiet Talk) is the signaling with 3 numeric digits (Code: 000 to 777 (octal number) (23 bit/word). The DQT signal has polarity and can be configured as Normal or Inverse, corresponding to a repeater or configuration of another transceiver.

The following QT/DQT operations are available.

Table 9-3 QT/DQT Operation

Reception	If the received QT/DQT signal matches the QT/DQT configured in a transceiver, the received audio is emitted from the transceiver. The transceiver mutes the received audio if the transceiver receives a Reverse Burst (QT) or Turn-off code (DQT).
Transmission	The transceiver sends the QT/DQT code configured in the transceiver when the transceiver transmits. The transceiver keeps sending the programmed QT/DQT as long as the PTT switch is pressed. The transceiver sends the Reverse burst code when the transceiver is sending QT or Turn-off code when the transceiver is sending DQT if the PTT switch is released or External PTT port is inactive.

QT/DQT Decode/Encode can be configured for each channel by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the QT/DQT Decode (Refer to FPRG 6.3.9 Conventional (Channel) Window.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

9.3.1 With STE (Squelch Tail Eliminator)

Squelch Tail Eliminator in QT/DQT eliminates the noise factor from the transmitting party's transceiver in order to communicate comfortably.

Squelch Tail Eliminator can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Squelch Tail Eliminator (Refer to FPRG 6.7.5 Modulation Line Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)

9.4 Transmit Power

Transmit Power is the transmission power of the transceiver. (Refer to 1.4 Transmit Power on page 2.)

Transmit power (Low or High) can be configured for each channel using KPG-96D.

- **Configuration using KPG-96D**
 - Configuring the Transmit Power for each Channel (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

9.5 Wide/ Narrow

Wide/ Narrow is the channel spacing of available channels. (Refer to 1.5 Channel Spacing on page 3.)

Wide/ Narrow can be configured for each channel by using KPG-96D. The transceiver transmits and receives on a channel using the configured Wide/ Narrow value.

- **Configuration using KPG-96D**
 - Configuring Wide/ Narrow for each Channel (Refer to FPRG 6.3.9 Conventional (Channel) Window.)

9.6 Busy Channel Lockout

This function automatically restricts the transmission so as not to interfere with other communications.

If a user transmits on a channel while other groups are using the same channel, the user may interfere with their communications.

If the **PTT** switch is pressed while the transmission is restricted by Busy Channel Lockout, “BUSY” appears on the main display and the transmission is disabled. In this case, the transceiver emits the Warning Alert Tone. The transceiver emits the Warning Alert Tone until the **PTT** switch is released.

Busy Channel Lockout can be configured for each channel by using KPG-96D. Following are the conditions for restricting transmissions with Busy Channel Lockout.

Table 9-4 Conditions for Restricting Transmissions with Busy Channel Lockout

Busy Channel Lockout	Condition
QT/DQT Tone	Disables transmission when QT/DQT configured for a channel does not match the received QT/DQT.
Carrier Only	Disables transmission while a carrier is being received. However, the transceiver transmits even if a carrier is detected while Squelch Off is enabled.

Busy Channel Lockout can be configured by using KPG-96D.

Note: Busy Channel Lockout is only available in Conventional Group.

- **Configuration using KPG-96D**
 - Configuring the Busy Channel Lockout (Refer to FPRG 6.3.10 Channel Edit Window.)

9.7 Beat Shift

Beat Shift can be used to eliminate internally generated tones caused by the transceiver's oscillators.

Harmonics from the oscillators may interfere with reception. The resulting beat tone that is produced can be prevented by slightly shifting the frequency of the oscillators.

Beat Shift can be configured to be enabled or disabled by using KPG-96D.

Note: If the VGS-1 unit is installed in the transceiver, Beat Shift of the VGS-1 can be enabled or disabled.

■ Configuration using KPG-96D

- Configuring the Beat Shift to be Enabled or Disabled (Refer to FPRG 6.3.10 Channel Edit Window.)

9.8 Squelch Off

Squelch Off can be used to open Squelch and unmute the transceiver.

With Squelch Off, the transceiver can unmute without receiving a carrier. Monitor is used to check a channel status before transmitting in order to communicate without interfering with other parties.

Press the **Squelch Off** key to use this function.

■ Transceiver Operation

- Press the **Squelch Off** key.

The transceiver unmutes and opens Squelch regardless of the QT/DQT Decode configuration.

White noise is heard if the transceiver is not receiving a carrier.

Squelch status of the transceiver is the same as when using Squelch Level 0.

LED lights green.




TK-2180/ TK-3180

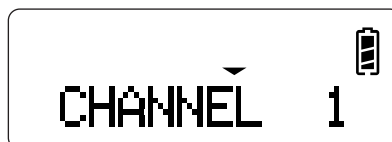
LED lights green.



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- Press the **Squelch Off** key.

In this case, the “” icon turns Off. If QT/DQT is configured for the current channel, the transceiver returns to Signaling Squelch. Otherwise, the transceiver returns to Carrier Squelch.





TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note:

- ◆ The status of the **Squelch Off** key is stored even if the transceiver is turned OFF.
- ◆ Squelch Off is enabled when the **Squelch Off** key is pressed during the scan and the “” icon appears in the icon display area. In this case, the transceiver pauses scanning. However, the scan is not disabled. The transceiver unmutes and opens Squelch regardless of the QT/DQT Decode configuration. White noise is heard if the transceiver is not receiving any signals while the “” icon appears.
- ◆ Squelch Off is only available in Conventional Group.

■ Configuration using KPG-96D

- Assigning the Squelch Off to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

9.9 Time-out Timer (TOT)

Time-out Timer (TOT) is used to restrict the continuous transmission time.

This function prevents a user from occupying a frequency for a long period of time when the frequency or repeater is shared with other users. The transceiver stops transmitting after the transceiver continuously transmits longer than the configured time.

The following timers relevant to Time-out Timer can be configured:

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

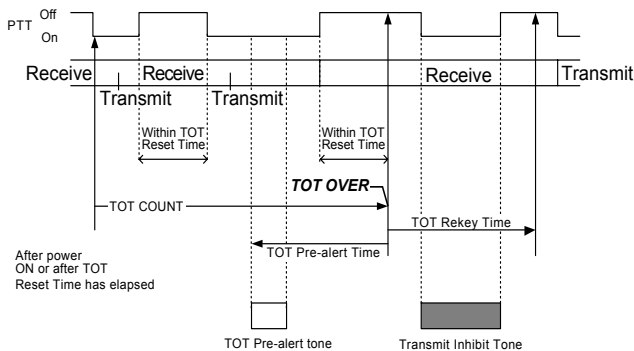


Figure 9-1 Timing to Activate the Time-out Timer

9.9.1 Time-out Timer

Time-out Timer (TOT) is used to restrict the continuous transmission time.

The continuous transmission time can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Continuous Transmit Duration Time (Refer to FPRG 6.3.8 Conventional (General) Window.)

9.9.2 TOT Pre-alert

TOT Pre-alert can be used to notify a user that the transmission is going to be restricted by the Time-out Timer. The transceiver emits the TOT Pre-alert tone at the configured timing.

The timing for the transceiver to emit the TOT Pre-alert tone can be configured by using KPG-96D.

Note: The transceiver emits the TOT Pre-alert tone only when the transceiver is transmitting. This tone does not sound while the transceiver stops transmitting within the TOT Reset Time. (Refer to 9.9.4 TOT Reset Time)

■ Configuration using KPG-96D

- Configuring the TOT Pre-alert (Refer to FPRG 6.3.8 Conventional (General) Window.)

9.9.3 TOT Rekey Time

TOT Rekey Time can be used to configure the duration from the time when the transmission ends by the Time-out Timer until a transmission is possible again. This function is used to temporarily restrict the transmission when a user occupies a repeater or the frequency for a long time.

The duration from the time when the transceiver is restricted by the Time-out Timer until a transmission is possible again can be configured by using KPG-96D.

Note:

- ◆ TOT Rekey Time is reset and transmission is possible after the transceiver is turned ON or OFF while the TOT Rekey Time is counting.
- ◆ TOT Rekey Time is reset when one of the following keys is pressed while the TOT Rekey Time is counting down:
 - **Channel Up** key
 - **Channel Down** key

■ Configuration using KPG-96D

- Configuring the TOT Rekey Time (Refer to FPRG 6.3.8 Conventional (General) Window.)

9.9.4 TOT Reset Time

TOT Reset Time is the period to reset the Time-out Timer.

When the transceiver transmits while the TOT Reset Time is counting down, the transceiver treats the transmission as a continuation of the previous transmission. This function prevents a user from occupying a frequency or repeater for a long time by transmitting intermittently.

TOT Reset Time can be configured using KPG-96D.

Note: TOT Reset Time is reset when one of the following keys is pressed while the transceiver is counting down the TOT Reset Time:

- **Channel Up** key
- **Channel Down** key

■ Configuration using KPG-96D

- Configuring the TOT Reset Time (Refer to FPRG 6.3.8 Conventional (General) Window.)

Scan can be used to check whether the transceiver is receiving a call from other transceivers. The transceiver checks for a signal on each channel in the Conventional Group. If a signal is detected, the transceiver receives on the channel where the signal was detected.

10.1 Scan Operation (Conventional Mode)

When the **Scan** key is pressed while the transceiver is not scanning, the transceiver starts scanning.

Conventional functions and Scan can be assigned to a **PF** key on the transceiver by using KPG-96D.

■ Display and Operation

1. Press the **Scan** key in Conventional Mode.

The transceiver starts scanning.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The transceiver searches for a signal on each channel. If a signal is detected, the transceiver stops scanning and receives on that channel.

Note: If the transceiver exited from Conventional Mode while the transceiver was not scanning, the channel name appears on the main display and the transceiver does not resume scanning.

2. Press the **Scan Delete/Add** key to resume scanning while the transceiver has paused scanning.

The transceiver resumes scanning from the following channel.

■ Configuration using KPG-96D

- Assigning the Conventional functions to a PF Key in Trunking Mode (Refer to FPRG 6.5 Key Assignment Window.)
- Assigning the Scan to a PF Key in Conventional Mode (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring the Scan (Refer to FPRG 6.3.7 Scan Information Window.)

10.1.1 Conditions to Start Scanning

The transceiver must have at least some Add Channels to start scanning. An Error Tone sounds and the transceiver does not start scanning if this condition is not met.

10.1.2 Conditions to Resume Scanning

The transceiver must have at least some Add Channels to start scanning or resume scanning.

The channel on which the scan pauses is added to or deleted from the Scan List when the **Scan Delete/Add** key is pressed while the transceiver pauses scanning. This status is retained until the transceiver stops scanning by pressing the **Scan** key.

10.1.3 Operation after Manually Changing the Channel during the Scan

The transceiver executes the following operations if the channel is changed while "SCAN" appears on the main display:

- The transceiver pauses scanning on the Selected Channel.
- The transceiver resumes scanning after the Key Delay Time elapses.

10.1.4 Transceiver Operation when Manually Changing the Channel

The transceiver pauses scanning on the selected channel when the selected channel is different from the channel on which the transceiver stops scanning.

10.1.5 Transceiver Operation during the Scan

The transceiver stops scanning when the received QT/DQT matches. The Dropout Delay Time activates when the QT/DQT matching status is reset. The transceiver resumes scanning after the Dropout Delay Time elapses.

The transceiver transmits on Revert Channel when the **PTT** switch is pressed. The Dwell Time activates when the transceiver finishes transmitting. The transceiver resumes scanning after the Dwell Time elapses.

10.2 Scan Configuration (Conventional Mode)

The following Scan functions in Conventional Mode can be configured using KPG-96D:

- Scan Delete/Add
- Revert Channel Display
- Revert Channel
- Dropout Delay Time
- Dwell Time
- Off-hook Scan (TK-7180/ TK-7180H/ TK-8180/ TK-8180H)

10.2.1 Scan Delete/Add (Conventional Mode)

Scan Delete/Add can be used to add a channel to the Scan List or remove a channel from the Scan List. With this function, unnecessary channels can be removed from the scan list to increase the scan speed. Therefore, the transceiver reliably receives calls from important channels.

When the **Scan Delete/Add** key is pressed, the channel is added to or removed from the Scan List. The transceiver operates in the following way when the **Scan Delete/Add** key is pressed:

- If the current channel is included in the Scan List, the channel is deleted from the Scan List. The “▼” icon (right) disappears.
- If the current channel is not included in the Scan List, the channel is added to the Scan List. The “▼” icon (right) appears.

Scan Delete/Add can be assigned to a **PF** key on the transceiver by using KPG-96D.

Note: The transceiver does not execute Scan Del/Add even if the **Scan Delete/Add** key is pressed during the scan.

■ Configuration using KPG-96D

- Assigning the Scan Delete/Add to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

10.2.2 Revert Channel Display

Revert Channel Display can be used to display the Revert Channel instead of “SCAN” during the scan. If this function is enabled, the transceiver scans while the Revert Channel is displayed.

Revert Channel Display can be configured to be enabled or disabled by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Revert Channel Display to be Enabled or Disabled (Refer to FPRG 6.3.7 Scan Information Window.)

10.2.3 Revert Channel

The Revert Channel is the zone or channel that is used for transmitting while pressing the **PTT** switch during the scan.

Revert Channel can be configured by using KPG-96D.

Following are Revert Channel operations.

Table 10-1 Revert Channel Operation

Configuration	During the Scan	While the Transceiver Pauses Scanning
Last Called	Channel on which the transceiver received last	Channel on which the transceiver pauses scanning
Last Used	Channel on which the transceiver transmitted last	Channel on which the transceiver pauses scanning
Selected	Last channel selected	
Selected + Talkback	Last channel selected	Channel on which the transceiver pauses scanning

Note: The Revert Channel is retained if Last Called or Last Used is selected. The stored Revert Channel will be deleted if other data is written to the transceiver by using KPG-96D. In this case, the lowest channel is temporarily used as the Revert Channel.

■ Configuration using KPG-96D

- Configuring the Revert Channel (Refer to FPRG 6.3.7 Scan Information Window.)

10.2.4 Dropout Delay Time

Dropout Delay Time is the time from when the received signal ends until the transceiver resumes scanning. The transceiver pauses scanning while receiving a call during the scan. After the call completes, the transceiver resumes scanning.

The transceiver resumes scanning when the following conditions are met:

- There is no signal to receive.
- QT/DQT does not match.

The transceiver activates Talkback during the Dropout Delay Time in conjunction with the Revert Channel configuration.

Dropout Delay Time can be configured using KPG-96D.

Note: Talkback is a function that allows the transceiver to transmit on the channel on which the transceiver pauses scanning.

■ Configuration using KPG-96D

- Configuring the Dropout Delay Time (Refer to FPRG 6.3.7 Scan Information Window.)

10.2.5 Dwell Time

Dwell Time is the time from when the transceiver completes scanning until the transceiver resumes scanning. The scan pauses when the **PTT** switch is pressed during the scan.

The transceiver activates Talkback during the Dwell Time in conjunction with the Revert Channel configuration.

Dwell Time can be configured by using KPG-96D.

Note: Talkback is a function that allows the transceiver to transmit on the channel on which the transceiver pauses scanning.

■ Configuration using KPG-96D

- Configuring the Dwell Time (Refer to FPRG 6.3.7 Scan Information Window.)

10.2.6 Off-hook Scan (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

Off-hook Scan can be used to configure scan operation according to the Mic Hook status. The transceiver executes the scan in the following way.

Table 10-2 Off-hook Scan Operation

Off-hook Scan	Operation
Check (Enable)	The transceiver starts scanning when the Scan key is pressed regardless of the microphone status.

Off-hook Scan	Operation
Uncheck (Disable)	The transceiver starts scanning when the Scan key is pressed while the microphone is On-hook. However, the transceiver does not start scanning even if the Scan key is pressed while the microphone is Off-hook and an error message appears. When the On-hook state changes to Off-hook in Scan Mode, the scan pauses on the Revert Channel. The transceiver resumes scanning when the microphone status changes from Off-hook to On-hook.

Off-hook Scan can be configured to be enabled or disabled by using KPG-96D.

Note: The transceiver functions in the same way as Mic Hook even if External Hook is configured for the AUX Input port. The transceiver executes the On-hook scan if either Mic Hook or External Hook is Low. The transceiver executes the Off-hook scan if both Mic Hook and External Hook are High.

■ Configuration using KPG-96D

- Configuring the Off-hook Scan to be Enabled or Disabled (Refer to FPRG 6.3.7 Scan Information Window.)

10.3 Scan Operation (MPT Trunking System)

The transceiver can always receive a call during the scan if Individual ID or Receive Group ID is configured in the transceiver. If Receive/ Transmit Group ID is configured in the transceiver, the transceiver receives calls only with the Receive/ Transmit Group IDs configured for Scan Add during the Group Scan.

When the **Scan** key is pressed while the Call Address Display is displayed, the transceiver starts the Group Scan. The transceiver scans Receive/ Transmit Group IDs configured for Scan Add with Group Scan.

Table 10-3 Addresses on which the Transceiver Stops in Group Scan

Status	Call Type		
	Receive/ Transmit Group Address	Receive Group Address	Own Individual Address
While "SCAN" appears	Only addresses configured for Scan Add can be decoded.	All addresses can be decoded.	All addresses can be decoded.

Status	Call Type		
	Receive/ Transmit Group Address	Receive Group Address	Own Individual Address
During the Scan Restart Delay	Only the address being displayed can be decoded.	All addresses can be decoded.	All addresses can be decoded.

Note:

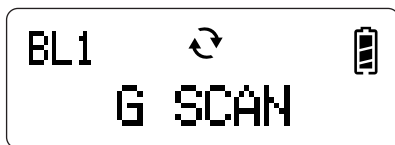
- ◆ If Full is configured for Decode Group Address by using KPG-96D, Receive/ Transmit Group ID configured in Scan Add in all blocks are searched. If Block Number is configured for Decode Group Address, Receive/ Transmit Group IDs configured in Scan Add in specific blocks are searched.
- ◆ The Del/Add configuration can be toggled by pressing the **Clear** key only if Call Address is a Receive/ Transmit Group Address.

Scan can be assigned to the **PF** key on the transceiver by using KPG-96D.

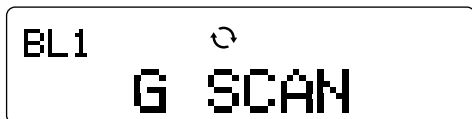
■ Display and Operation

1. Press the **Scan** key.

The transceiver starts the Group Scan.



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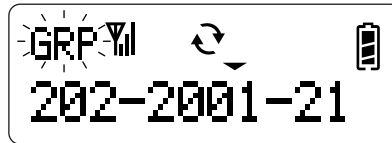
TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note:

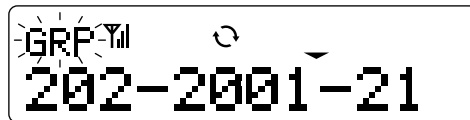
- ◆ The transceiver stops the Group Scan and the Call Address display appears when the **Scan** key is pressed again during the scan.
- ◆ Block Select is available in Group Scan.

- The transceiver receives a call from a Receive/ Transmit Group ID configured for Scan Add.

The Group Call window appears on the LCD. "GRP" blinks on the sub display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The transceiver executes the Clear Down operation and the address display of the current group appears when the **Clear** key is pressed. "G SCAN" appears on the main display when the Scan Restart Delay Time elapses. This operation varies with the address type of the received call. (Refer to [10.3.3 Receiving Party's Transceiver Operation after Executing the Clear Down Operation during the Group Scan on page 75.](#))

■ Configuration using KPG-96D

- Assigning the Scan to the PF key (Refer to FPRG 6.5 Key Assignment Window.)

10.3.1 Conditions to Start the Group Scan

When one of the following conditions is met, the transceiver starts the Group Scan when the **Scan** key is pressed. If no conditions are met, the Key-entry Error Tone sounds and the transceiver does not start the Group Scan even if the **Scan** key is pressed.

- When there are 2 or more Receive/ Transmit Group IDs configured for Scan Add.
- When there are 2 or more Receive/ Transmit Group IDs that are configured for Scan Add by pressing the **Clear** key while the Call Address display appears.
- When there are 2 or more Receive/ Transmit Group IDs that are configured for Scan Add in the specified block while a block number is configured for Decode Group Address.

10.3.2 Conditions for Toggling Delete/Add by Pressing the Clear Key

The Delete/Add configuration cannot be changed by pressing the **Clear** key during the Group Scan. The Delete/Add configuration can be temporarily changed during the Key Delay Time or Scan Restart Delay. In this case, the Delete/Add configuration returns to the previous conditions after the Group Scan ends.

10.3.3 Receiving Party's Transceiver Operation after Executing the Clear Down Operation during the Group Scan

The Selected Call Address appears on the display of the receiving party's transceiver when the a user clears down during the Group Scan, and then "G SCAN" appears on the main display after the Scan Restart Delay time elapses.

If the receiving party's transceiver receives a call with Receive/Transmit Group and executes the clear down operation, Del. is configured for the current address. ???

10.3.4 Transceiver Operation after Manually Changing the Channel during the Scan

If a call address is changed while "G SCAN" appears on the main display, the transceiver stops scanning on the Selected Call Address. The transceiver resumes scanning after the Key Delay Time elapses. ???

10.4 Scan Configuration (MPT Trunking System)

The following Scan functions in MPT Trunking System can be configured using KPG-96D:

- Scan Restart Delay
- Off-hook Scan (TK-7180/ TK-7180H/ TK-8180/ TK-8180H)
- Power-on Scan
- Revert Call Address Display

10.4.1 Scan Restart Delay

Scan Restart Delay is the time from the time when the transceiver executes the Clear Down operation during the Group Scan until the transceiver resumes scanning.

Scan Restart Delay can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Scan Restart Delay (Refer to FPRG 6.3.7 Scan Information Window.)

10.4.2 Off-hook Scan (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

Off-hook Scan can be used to configure scan operation according to the Mic Hook status. The transceiver executes the scan in the following way.

Table 10-4 Off-hook Scan Operation

Off-hook Scan	Operation
Check (Enable)	The transceiver starts the Group Scan when the Scan key is pressed regardless of the microphone status.
Uncheck (Disable)	The transceiver starts scanning when the Scan key is pressed while the microphone is On-hook. However, the transceiver does not start scanning even if the Scan key is pressed while the microphone is Off-hook and an error message appears. When the On-hook state changes to Off-hook in Scan Mode, the Group Scan pauses on the Revert Channel. The transceiver resumes the Group Scan when the microphone status changes from Off-hook to On-hook.

Off-hook Scan can be configured to be enabled or disabled by using KPG-96D.

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Note: The transceiver functions in the same way as Mic Hook even if External Hook is configured for the AUX Input port. The transceiver executes the On-hook scan if either Mic Hook or External Hook is Low. The transceiver executes the Off-hook scan if both Mic Hook and External Hook are High.

■ Configuration using KPG-96D

- Configuring the Off-hook Scan to be Enabled or Disabled (Refer to FPRG 6.3.7 Scan Information Window.)

10.4.3 Power-on Scan

Power-on Scan can be used to start scanning immediately after the transceiver is turned ON.

Power-on Scan can be configured to be enabled or disabled using KPG-96D.

Note: Block Select is enabled while the transceiver is doing Group Scan with Power-on Scan.

■ Configuration using KPG-96D

- Configuring the Power-on Scan to be Enabled or Disabled (Refer to FPRG 6.3.7 Scan Information Window.)

10.4.4 Revert Call Address Display

Revert Call Address Display can be used to display the Selected Call Address on the main display during the Group Scan.

When this function is enabled, “G SCAN” does not appear on the main display and the transceiver executes the Group Scan while the Selected Call Address is displayed.

A user can use the transceiver while checking the selected Selected Call Address displayed on the main display.

Revert Call Address Display can be configured to be enabled or disabled by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Revert Call Address Display to be Enabled or Disabled (Refer to FPRG 6.3.7 Scan Information Window.)

11 KEY ASSIGNMENT

This function can be used to assign functions to the keys of the transceiver.

The following table shows available keys and their default settings.

**Table 11-1 Programmable Function Keys
(TK-7180/ TK-7180H/ TK-8180/ TK-8180H)**

Key Name	Default Function (Conventional)	Default Function (MPT Trunking)
[△] key	Squelch Off	Call
[S] key	Scan	Status/ Stack
[A] key	Scan Delete/Add	Redial
[<B] key	LCD Brightness	LCD Brightness
[C>] key	Clock	Clock
[■] key	Clear	Clear
[A] (Mic) key	None	None
[B] (Mic) key	None	None
[C] (Mic) key	None	None
[D] (Mic) key	None	None

**Table 11-2 Programmable Function Keys
(TK-2180/ TK-3180)**

Key Name	Default Function (Conventional)	Default Function (MPT Trunking)
[S] key	Scan	Status/ Stack
[A] key	Scan Delete/Add	Redial
[<B] key	Lamp	Lamp
[C>] key	Clock	Clock
AUX key	None	None
Side 1 key	Squelch Off	Call
Side 2 key	Clear	Clear
PF 1 (Orange) key	None	None
PF 2 (Black) key	None	None

■ Configuration using KPG-96D

- Assigning the Functions to the PF Keys
(Refer to FPRG 6.5 Key Assignment Window.)

11.1 Assigning Functions to PF Keys (Conventional)

Functions can be assigned to a PF key on the transceiver by using KPG-96D.

Table 11-3 Assigning Functions to PF Keys (Conventional)

Function Name	Description
None	The transceiver does not respond. The Key-entry Error Tone beeps when the None key is pressed.
Channel Down	When the Channel Down key is pressed, the channel number is decreased by 1 step. The channel number keeps decreasing every 200 ms if the Channel Down key is pressed and held for more than 1 second. The transceiver skips unprogrammed channels. The Rollover Tone sounds when the lowest channel number is selected.
Channel Up	When the Channel Up key is pressed, the channel number is increased by 1 step. The channel number keeps increasing every 200 ms if the Channel Up key is pressed and held for more than 1 second. The transceiver skips unprogrammed channels. The Rollover Tone sounds when the highest channel number is selected.
Clear	When the Clear key is pressed, the transceiver returns to MPT Trunking System.
Clock	When the Clock key is pressed, the current time appears on the main display. (Refer to 15 CLOCK on page 87.)
Key Lock	When the Key Lock key is pressed and held for 1 second, Key Lock is enabled or disabled. (Refer to 2.10 Key Lock (TK-2180/ TK-3180 only) on page 11.) Note: This function is only available on the TK-2180/ TK-3180.
Lamp	When the Lamp key is pressed, the backlight LED lights or turns Off. (Refer to 3.3.2 Lamp (TK-2180/ TK-3180 only) on page 13.) Note: This function is only available on the TK-2180/ TK-3180.
LCD Brightness	When the LCD Brightness key is pressed, the brightness of the backlight LED changes. (Refer to 3.3.3 LCD Brightness (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 13.) Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Playback	When the Playback key is pressed, the transceiver records or plays audio when the VGS-1 is installed in the transceiver.
Scan	When the Scan key is pressed, the transceiver starts scanning. The transceiver stops scanning when the Scan key is pressed again. (Refer to 10 SCAN on page 71.)
Scan Delete/Add	When the Scan Delete/Add key is pressed, the channel is added to or deleted from the Scan List. (Refer to 10.2.1 Scan Delete/Add (Conventional Mode) on page 72.)
Scrambler	When the Scrambler key is pressed, Voice Scrambler is enabled or disabled, if configured for this operation. Scramble codes 1 to 16 can be changed. (Refer to 13 VOICE SCRAMBLER on page 82.)

Function Name	Description
Squelch Off	When the Squelch Off key is pressed, the transceiver resets signaling and the transceiver unmutes only with a carrier.

11.2 Assigning Functions to PF Keys (MPT Trunking)

Functions can be assigned to a **PF** key on the transceiver by using KPG-96D.

Table 11-4 Assigning Functions to PF Keys (MPT Trunking)

Function Name	Description
None	The transceiver does not respond. The Key-entry Error Tone beeps when the None key is pressed.
Auto Reply Message	If the Auto Reply Message key is pressed, Auto Reply Message is switched On or Off when the VGS-1 is installed in the transceiver. (Refer to 16.3 Auto Reply Message on page 91.)
AUX	When the AUX key is pressed, the status of AUX Output port can be changed. An external device connected to the AUX port can be controlled since the port output changes in conjunction with the AUX key. Note: This function is only available on the TK-2180/ TK-3180.
AUX A	When the AUX A key is pressed, the status of the AUX A Output port can be changed. An external device connected to the AUX A port can be controlled since the port output is changed in conjunction with the AUX A key. Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
AUX B	When the AUX B key is pressed, the status of the AUX B Output port is changed. An external device connected to the AUX B port can be controlled since the port output is changed in conjunction with the AUX B key. Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Block Select	This function can be used to configure the block number to display the Call Address. When the Block Select key is pressed and released, Block Select activates and the block number can be configured. (Refer to 8.4 Block Select on page 34.)
Call	When the Call key is pressed, the transceiver executes one of the following operations: <ul style="list-style-type: none"> • Makes a call to the currently displayed address. • Confirms the function configured by dialing. • Confirms the menu selection.

Function Name	Description
Call Address Down	When the Call Address Down key is pressed, the address number is decreased by 1 step. The address number keeps decreasing every 200 ms when the Call Address Down key is pressed and held for more than 1 second. The transceiver skips unprogrammed channels. The Rollover Tone sounds when the lowest address number is selected. Note: <ul style="list-style-type: none"> ◆ If the transceiver is TK-2180 or TK-3180, Call Address Down can be assigned to a PF key only if the Key Assignment window > General tab > Optional Mic is enabled. Call Address Down can be assigned only to the PF 1 or PF 2 key. ◆ If the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H, Call Address Down can be assigned to a PF key only if "16-key" is selected from the Key Assignment window > General tab > Mic Keypad dropdown list. Call Address Down can be assigned to [A] (Mic), [B] (Mic), [C] (Mic) and [D] (Mic) keys.
Call Address Up	When the Call Address Up key is pressed, the address number is increased by 1 step. The address number keeps increasing every 200 ms when the Call Address Up key is pressed and held for more than 1 second. The transceiver skips unprogrammed channels. The Rollover Tone sounds when the highest address number is selected. Note: <ul style="list-style-type: none"> ◆ If the transceiver is TK-2180 or TK-3180, Call Address Down can be assigned to a PF key only if the Key Assignment window > General tab > Optional Mic is enabled. Call Address Up can be assigned only to the PF 1 or PF 2 key. ◆ If the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H, Call Address Up can be assigned to a PF key only if "16-key" is selected from the Key Assignment window > General tab > Mic Keypad dropdown list. Call Address Up can be assigned to [A] (Mic), [B] (Mic), [C] (Mic) and [D] (Mic) keys.
Clear	When the Clear key is pressed, the transceiver executes one of the following operations: <ul style="list-style-type: none"> • Terminates communications on the traffic channel. • Cancels the call request. • Clears the current stack.
Clock	When the Clock key is pressed, the current time appears on the main display. (Refer to 15 CLOCK on page 87.)
Conventional	When the Conventional key is pressed, the transceiver enters Conventional Mode. When the Clear key is pressed, the transceiver returns to MPT Trunking System. (Refer to 9 CONVENTIONAL MODE on page 66.)
Dialing	When the Dialing key is pressed, the transceiver makes a call to the address configured by dialing.

Function Name	Description
Direct Address	When the Direct Address key is pressed, the transceiver jumps to the address configured for Direct Address Number.
Emergency	When the Emergency key is pressed and held for a couple of seconds, the transceiver makes a call to an Emergency Address or the address configured for Dialing. (Refer to 8.16 Emergency Call on page 51.) Note: <ul style="list-style-type: none"> Emergency can be assigned only to the AUX or PF 1 key if the transceiver is TK-2180 or TK-3180. Emergency can be assigned only to the Triangle key if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Function Menu	When the Function Menu key is pressed, the transceiver jumps to Function Menu and the following configuration items can be checked and edited. The configuration item changes every time the Function Menu key is pressed. (Refer to 8.17 Function Menu on page 56.) <ul style="list-style-type: none"> • Own Prefix, Fleet, Ident display • Control Channel Select • Current Control Channel Number • Current System • Codeword Error Counter • Beep Volume • Ringer Volume • Speaker Mute • Lamp (TK-2180/ TK-3180 only) • Current Traffic Channel Number • Temporary Receive/Transmit Group
Home Address	When the Home Address key is pressed, the transceiver jumps to the address configured for Home Address. The transceiver returns to the previous address when the Home Address key is pressed again after the transceiver jumps to the Home Address. One Home Address can be configured for each Personal ID.
Horn Alert	When the Horn Alert key is pressed, Horn Alert is enabled. The horn sounds if the transceiver receives an individual call. This function does not work when the transceiver receives a Group Call. Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H. A user must prepare the KAP-2 to use this function.
Key Lock	When the Key Lock key is pressed, Key Lock is enabled or disabled. (Refer to 2.10 Key Lock (TK-2180/ TK-3180 only) on page 11.) Note: This function is only available on the TK-2180/ TK-3180.
Lamp	When the Lamp key is pressed, the backlight lights. (Refer to 3.3.2 Lamp (TK-2180/ TK-3180 only) on page 13.) Note: This function is only available on the TK-2180/ TK-3180.

Function Name	Description
LCD Brightness	When the LCD Brightness key is pressed, the brightness of the backlight changes. (Refer to 3.3.2 Lamp (TK-2180/ TK-3180 only) on page 13.) Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Network Select	When the Network Select key is pressed, the transceiver enters Network Select Mode. The network can be switched by using the Selector or [Δ] and [▽] keys. The transceiver starts searching for a control channel in the new network if the network is confirmed by pressing the Network Select key. This function can be used to manually select a newly added network.
Playback	When the Playback key is pressed, the transceiver records or plays audio when the VGS-1 is installed in the transceiver.
Public Address	When the Public Address key is pressed, Public Address can be used, if configured for this operation. (Refer to 4.8 Public Address (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 21.) Note: <ul style="list-style-type: none"> ◆ This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H. ◆ A user must prepare the KAP-2 to use Public Address.
Redial	When the Redial key is pressed, the latest redial number appears. A maximum of 3 called parties appear on the display if the Selector is used or the [Δ] or [▽] key is pressed. A user can make a call to the currently displayed number by pressing the PTT switch or Call key.
Scan	When the Scan key is pressed, the transceiver starts scanning. The transceiver stops scanning when the Scan key is pressed again. (Refer to 10.3 Scan Operation (MPT Trunking System) on page 73.)
Scrambler	When the Scrambler key is pressed, Voice Scrambler is enabled or disabled, if configured for this operation. Scramble codes 1 to 16 can be changed. (Refer to 13 VOICE SCRAMBLER on page 82.)
Send the GPS data	When the Send the GPS Data key is pressed, the transceiver sends GPS data to the configured party. Note: This function is only available on the TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Site Lock	When the Site Lock key is pressed and held for 1 second while Site Lock is disabled, the transceiver is locked on the current control channel. When the Site Lock key is pressed and held for 1 second again, Site Lock is disabled. (Refer to 2.12 Site Lock on page 11.)

11 KEY ASSIGNMENT

Function Name	Description
Status/ Stack	<p>When the Status/ Stack key is pressed while the unit number appears on the display, the display switches in the following order: Numeric Mode → Status Mode → Stack Mode.</p> <p>Note:</p> <ul style="list-style-type: none">◆ Status/ Stack can be assigned only to the [S] key if the transceiver is TK-2180 or TK-3180.◆ Status/ Stack can be assigned to [S], [A] (Mic), [B] (Mic), [C] (Mic), or [D] (Mic) keys if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.
Sub-LCD Display	<p>When the Sub-LCD Display key is pressed, the sub display switches in the following order: SVC display → Signal Strength display → Channel Number display. (Refer to 3.5 Sub-LCD Display on page 15.)</p>
Transceiver Password	<p>When the Transceiver Password key is pressed, the transceiver is restricted and enters Password Entry Mode. (Refer to 5.1 Transceiver Password on page 23.)</p>
Transmit Power	<p>When the Low Transmit Power key is pressed, Transmit Power is changed. (Refer to 8.18 Transmit Power in Trunking Mode on page 61.)</p>

■ Configuration using KPG-96D

- Assigning functions to the PF Keys
(Refer to FPRG 6.5 Key Assignment Window.)

DTMF (Dual Tone Multiple Frequency) uses 2 different tones simultaneously. This signaling is used to make an Individual Call or control the transceiver.

Manual Dial can be used to transmit DTMF tones.

12.1 Manual Dial

Manual Dialing can be used to send a DTMF tone corresponding to a particular key when the [0] to [9], [A] to [D], [*], or [#] key on the Mic Keypad is pressed while transmitting by pressing the **PTT** switch. Manual Dial can be used to make a phone call via a repeater or an Individual Call by using DTMF tones.

Table 12-1 DTMF Tones

Frequencies [Hz]	DTMF Digit
941 + 1336	DTMF tone "0"
697 + 1209	DTMF tone "1"
697 + 1336	DTMF tone "2"
697 + 1447	DTMF tone "3"
770 + 1209	DTMF tone "4"
770 + 1336	DTMF tone "5"
770 + 1447	DTMF tone "6"
852 + 1209	DTMF tone "7"
852 + 1336	DTMF tone "8"
852 + 1447	DTMF tone "9"
697 + 1633	DTMF tone "A"
770 + 1633	DTMF tone "B"
852 + 1633	DTMF tone "C"
941 + 1633	DTMF tone "D"
941 + 1209	DTMF tone "*"
941 + 1477	DTMF tone "#"

12.2 DTMF Sidetone

DTMF Sidetone is used to emit DTMF tones from the speaker for a user at the transmitting end to hear while transmitting DTMF tones.

DTMF Sidetone can be configured to be enabled or disabled by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the DTMF Sidetone to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

12.3 DTMF Hold Time

DTMF Hold Time is the duration from when the keypad is disabled until the transceiver stops transmitting when transmitting DTMF tones by using Manual Dialing.

The transceiver at the receiving end treats an uninterrupted DTMF signal that it receives as one code sequence. This DTMF Hold Time is therefore used to maintain an uninterrupted transmission to send a series of DTMF signals.

DTMF Hold Time can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring the DTMF Hold Time (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

13 VOICE SCRAMBLER

Voice Scrambler allows the transceiver to scramble voice communications to ensure privacy.

There are 2 types of Scrambler functions: Built-in scrambler and an optional scrambler function enabled by installing a voice scrambler in the transceiver.

The transceiver supports 2 Optional Scrambler Boards (TRANSCRYPT).

- SC20-460:
This Scrambler Board can be installed in the transceiver by soldering the board on the internal PCB.
- KW-21:
This Scrambler Board can be connected to the internal 26-pin connector. The board can be installed easily without any additional operations, such as soldering.

13.1 Configuring the Voice Scrambler

The following functions relevant to Voice Scrambler can be configured using KPG-96D.

- AQUA Scrambler
- Scrambler (Optional)
- Scrambler Status Memory

13.2 AQUA Scrambler

AQUA Scrambler is the internal Scrambler installed in the Audio AQUA IC. This entry level Scrambler allows a user to scramble the voice by using the carrier signal.

Scrambler can be enabled by pressing the **Scrambler** key prior to communicating.

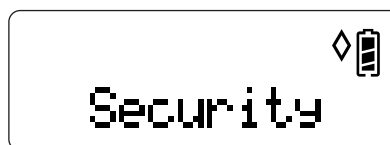
Note:

- ◆ The simple Scrambler cannot be used if "Voice Scrambler" is selected from the **Optional Board** dropdown list.
- ◆ Voice Scrambler cannot be configured to be enabled or disabled during the scan.

■ Display and Operation

1. Press the **Scrambler** key while Scrambler is disabled.

The "◆" icon appears and Scrambler is enabled.



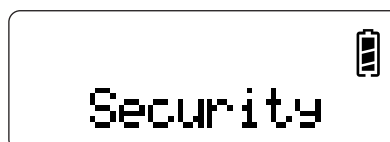
TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **Scrambler** key again.

The "◆" icon turns Off and Scrambler is disabled.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Assigning the Scrambler Function to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)
- Configuring the Scrambler (Refer to FPRG 6.3.10 Channel Edit Window.)
- Configuring the Scrambler (Refer to FPRG 6.3.8 Conventional (General) Window.)
- Configuring the Scrambler (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)

13.3 Scrambler (Optional)

The Optional Scrambler can be installed in the transceiver.

Scrambler (Optional) is enabled if Voice Scrambler is configured for Optional Board by using KPG-96D.

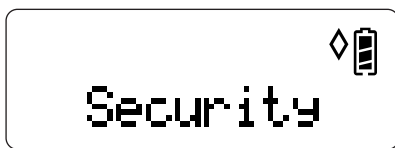
Note: Voice Scrambler cannot be configured to be enabled or disabled during the scan.

■ Display and Operation

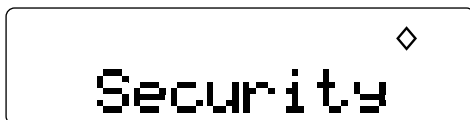
● Enabling the Scrambler (Optional)

1. Press the **Scrambler** key while Scrambler (Optional) is disabled.

The “◇” icon appears and Scrambler (Optional) is enabled.



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2. Press the **Scrambler** key again.

The “◇” icon turns Off and Scrambler (Optional) is disabled.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

● Changing the Scrambler Code

1. Press and hold the **Scrambler** key for more than 1 second.

The current Scrambler Code appears on the display.

The “◇” icon appears and Scrambler (Optional) is enabled.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Change the Scrambler Code using the [****] and [**<C>**] keys, **Selector** or [**△**] and [**▽**] keys.



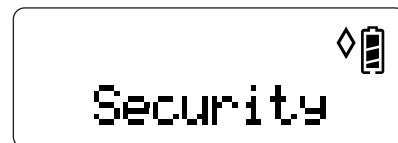
TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

3. Press the [**S**] or [*****] key.

The transceiver exits from the current mode and the configuration is enabled.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Configuring the Optional Board (Refer to FPRG 6.7 Extended Function Window.)
- Configuring the Scrambler Code (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab and FPRG 6.3.8 Conventional (General) Window.)
- Assigning the Scrambler Function to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

13.4 Scrambler Status Memory

Scrambler Status Memory can be used to store Scrambler On/ Off configuration of the SC20-460 Scrambler and Scrambler Code.

The Scrambler On/Off configuration is retained even if the transceiver is turned OFF while Scrambler Status Memory is enabled.

If Scrambler Status Memory is enabled, the stored Scrambler On/ Off configuration is read as default when reading data from the transceiver by using KPG-96D.

Scrambler On/ Off configuration and Scrambler Code can be stored by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Scrambler Status Memory (Refer to FPRG 6.3.2 Trunking Features Window > ■ Option 2 Tab.)

14 HORN ALERT (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

This function can be used to activate the Horn Alert port when the transceiver receives an Individual Call in an MPT Trunking System. A user must connect the KAP-2 to the transceiver to use this function.

Horn Alert can be used to turn On the horn and headlights of a vehicle connected to the Horn Alert port. Therefore, a user can recognize that the transceiver has received a call even if the user is away from the transceiver.

Considering driving safety, it would not be safe to activate the Horn Alert while the user is driving. If the Ignition Sense port is connected to the Ignition port of the vehicle, the Horn Alert functions in the following way. (Refer to 7 [IGNITION SENSE \(TK-7180/ TK-7180H/ TK-8180/ TK-8180H only\)](#) on page 26.)

Table 14-1 Horn Alert Operation


Ignition	Ignition Sense	Power	Horn Alert Port
On	Ignition Only	On	
	Ignition & Switch	Power switch On → On	
		Power switch Off → Off	
Off	Ignition Only	Off	
	Ignition & Switch	Power switch On → On	Active
		Power switch Off → Off	
On	Disable	Power switch On → On	
		Power switch Off → Off	
Off		Power switch On → On	Active
		Power switch Off → Off	

14.1 Configuring the Horn Alert to be Enabled or Disabled

When the **Horn Alert** key is pressed, Horn Alert can be enabled or disabled.

■ Display and Operation


1. Press the **Horn Alert** key while Horn Alert is disabled.

The “” icon appears and Horn Alert is enabled.



The Horn Alert port activates when the transceiver receives an Individual Call. This port functions according to the Horn Alert Logic Signal configuration.

2. Press the **Horn Alert** key again.

The “” icon turns Off and Horn Alert is disabled.



■ Configuration using KPG-96D

- Assigning the Horn Alert to a PF Key
(Refer to FPRG 6.5 Key Assignment Window.)

14.2 Horn Alert Logic Signal

Horn Alert Logic Signal can be used to configure the HOR port operation when Horn Alert is enabled.

Horn Alert Logic Signal can be configured using KPG-96D. The HOR port functions as below.

Table 14-2 Horn Alert Logic Signal Operation

Configuration	Description
Pulse	The HOR port activates 3 times every 500 ms when the transceiver receives an individual call.
Continuous	The HOR port activates until communication ends when Until Reset is configured. The HOR port is active for the configured duration if 1 to 30 s is configured.

Note:

- ◆ The transceiver pauses the Horn Alert operation if the **Horn Alert** key is pressed while Horn Alert is enabled. In this case, Horn Alert is disabled.
- ◆ The transceiver pauses the Horn Alert operation if the Call Address is changed while Horn Alert is enabled. In this case, Horn Alert is not disabled.
- ◆ If Until Reset is configured for Horn Alert Logic Signal, the transceiver pauses the Horn Alert operation when the transceiver receives an individual call in MPT Trunking System and executes the following operations while Horn Alert is enabled:
 - Simulates pressing of the **Horn Alert** key.
 - Changes the Mic Hook status.
 - Changes the Call Address.

■ Configuration using KPG-96D

- Configuring the Horn Alert Logic Signal (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

14.3 Off-hook Horn Alert

Off-hook Horn Alert can be used to activate the Horn Alert function in conjunction with the Mic Hook status.

Off-hook Horn Alert can be configured to be enabled or disabled by using KPG-96D. Horn Alert functions under the following conditions.

Table 14-3 Conditions to Activate the Horn Alert

Off-hook Horn Alert Configuration	Horn Alert Configuration	Hook Status (On/ Off)	Horn Alert Operation
Disable	On	Off	Disables the Horn Alert.
		On	Enables the Horn Alert.
	Off	Off	Disables the Horn Alert.
		On	Disables the Horn Alert.
Enable	On	Off	Enables the Horn Alert.
		On	Enables the Horn Alert.
	Off	Off	Disables the Horn Alert.
		On	Disables the Horn Alert.

■ Configuration using KPG-96D

- Configuring the Off-hook Horn Alert to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

14.4 Horn Alert Mode

Horn Alert Mode can be used to configure the method to control Horn Alert.

Horn Alert Mode can be configured by using KPG-96D. The following methods are available in Horn Alert Mode.

Table 14-4 Horn Alert Mode Type

Configuration	Description
Current	Horn Alert standby state is disabled when the transceiver is turned OFF even with Horn Alert in standby state. When the transceiver is turned ON, the transceiver always starts up with Horn Alert disabled.
Status Memory	Maintains Horn Alert standby state. Turns the transceiver OFF while Horn Alert is in standby state. In this case, Horn Alert standby state is enabled when the transceiver is turned ON.
Startup	The transceiver always starts up with Horn Alert in standby state.

■ Configuration using KPG-96D

- Configuring the Horn Alert Mode to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

15 CLOCK

The transceiver is equipped with an internal clock IC. Using this IC, the current time can be displayed on the main display.

Clock Function makes possible the following 5 functions:

- Current Time Display
- Power-on Time Display
- Clock Configuration
- Adjustment Time (Written from a PC)
- Time Stamp activates when receiving a Status Message or Data Message

15.1 Current Time Display

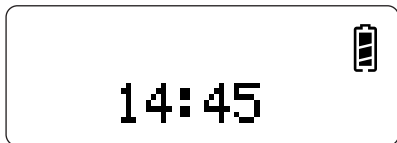
The current time can be shown on the main display.

■ Display and Operation

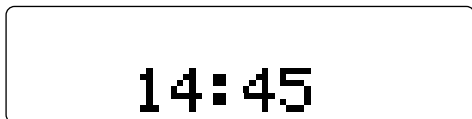
1. Press the **Clock** key.

The current time appears on the main display.

- 24H Display

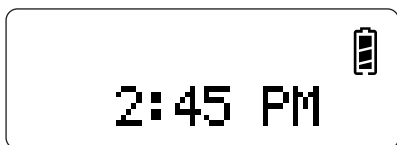


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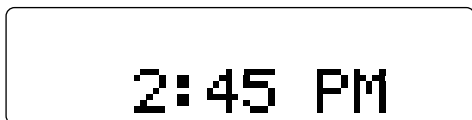


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- 12H Display



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press a key.

The channel name or number appears on the LCD.

Note: The clock does not display the time properly if the Time IC is not operating or the RTC (Real Time Clock) is not oscillating. .

■ Configuration using KPG-96D

- Assigning the Clock Function to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

15.2 Power-on Clock Display

This function can be used to display the time when the transceiver is turned ON.

The time appears on the display for 2 seconds and then the channel name or number appears. The time appears on the display when the transceiver is turned ON if "Clock" is selected from the **Power-on Message Type** dropdown list.

Power-on Clock can be configured to be enabled or disabled by using KPG-96D.

Note:

- ◆ This function cannot be used with Power-on Text.
- ◆ Power-on Clock does not appear if the Transceiver Password is configured.

■ Configuration using KPG-96D

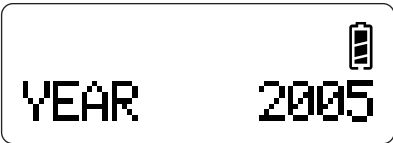
- Configuring the Power-on Clock Function (Refer to FPRG 6.4 Optional Features Window > 6.4.2 Common Page 2 Tab.)

15.3 Clock Configuration

The time can be configured by using keys on the transceiver.
Clock Adjustment must be enabled by using KPG-96D.

■ Display and Operation

- 1. Turn the transceiver ON by pressing the **Power** switch while pressing the **[C>]** key.
The transceiver enters Year Entry Mode.
- 2. Configure the year using the **Selector** or **[^]** and **[v]** keys, then press the **[S]** key.



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- 3. Press the **[S]** key after configuring the month.



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Note: Only 2 numeric digits (01 to 12) can be entered.

- 4. Press the **[S]** key after configuring the date.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: Only 2 numeric digits (01 to 31) can be entered.

- 5. Press the **[S]** key after configuring the time.
The time can be configured in 24 hour format.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- 6. Press the **Power** switch to turn the transceiver OFF after configuring the minutes.
The time is configured.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note:

- ◆ The Key-entry Error tone sounds if the **[S]** key is pressed when the entered value is invalid. In this case, the entered value must be corrected before you can move to the next step.
- ◆ Press the **[S]** key after configuring the minutes to return to Year Entry Mode.

■ Configuration using KPG-96D

- Configuring the Clock Adjustment Function
(Refer to FPRG 6.4 Optional Features Window > 6.4.1 Common Page 1 Tab.)

15.4 Adjustment Time

Adjustment Time can be used to configure the time when writing data to the transceiver by using KPG-96D.

Adjustment Time can be configured to be enabled by checking the **Adjustment Time** checkbox in the **Write Data to the Transceiver** window.

Adjustment Time can be configured to be enabled or disabled using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Adjustment Time (Refer to FPRG 7.2 Write Data to the Transceiver.)

16 VGS (VOICE GUIDE & STORAGE UNIT)

The transceiver can record or play voice and enable Voice Guide and GPS Data Storage using the VGS-1 (Voice Guide & Storage Unit). GPS Data Storage is not available in Conventional Mode.

16.1 Auto Recording

Auto Recording can be used to automatically record transmitted or received audio.

The transceiver can record the following:

- Audio on the input line of the microphone while the **PTT** switch is pressed.
- Audio transmitted in Emergency Mode
- Received audio

Audio transmitted by pressing the **PTT** switch in Emergency Mode can be recorded. Audio transmitted by pressing the external PTT or sent data is not recorded.

A user can hear stored audio by using Message Playback. (Refer to 16.4 Message Playback on page 93.)

Auto Recording can be configured in steps of 30 seconds or can be disabled by using KPG-96D. Auto Recording is not available if Disable is selected.

Note:

- ◆ A maximum of 300 seconds total recording time is available divided among Auto Recording, Voice Memo and Auto Reply Message.
- ◆ Auto Recording does not function when the transceiver is in Voice Memo Mode, Auto Reply Message Mode or Message Playback Mode.
- ◆ When GPS Data Storage is enabled, the transceiver may not be able to record all incoming signals.

■ Display and Operation

1. The left dot lights on the display when Auto Recording is enabled.



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■ Configuration using KPG-96D

- Configuring the Auto Recording Function (Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)

16.2 Voice Memo (Manual Recording)

Voice Memo (Manual Recording) can be used to manually record transmitted or received audio.

The transceiver can record the following:

- Voice spoken into the microphone
- Audio transmitted by pressing the **PTT** switch
- Audio transmitted in Emergency Mode
- Received audio

When the transceiver completes recording audio, the audio data is automatically stored in the VGS-1 Flash Memory. A user can hear stored audio by using Message Playback. (Refer to 16.4 Message Playback on page 93.)

Voice Memo can be configured to be enabled or disabled, and the maximum recording time and Stores the Latest Received Messages can be configured by using KPG-96D.

Voice Memo can be used to configure the recording time in steps of 30 seconds.

Table 16-1 Voice Memo Functions

Item	Range	Operation
Voice Memo	Disable/ 30 to 300	VGS-1 recording channel used in Voice Memo can be configured in steps of 30 seconds. Voice Memo is not available if "Disable" is selected. A maximum of 300 seconds can be configured for the recording channel.
Stores the latest received messages	Check (Enable)	New recording data overwrites old recordings. Old messages are cleared.
	Uncheck (Disable)	If messages are stored in all recording channels, the transceiver rejects new messages.

Note:

- ◆ A maximum of 300 seconds total recording time is available divided among Auto Recording, Voice Memo and Auto Reply Message.
- ◆ Voice Memo does not function when the transceiver is in Auto Recording Mode, Auto Reply Message Mode or Message Playback Mode.
- ◆ When GPS Data Storage is enabled, the transceiver may not be able to record all incoming signals.

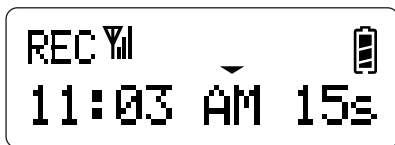
■ Display and Operation

● Recording Audio

1. Press and hold the **Playback** key for more than 1 second.

The transceiver enters Voice Memo Mode and starts recording audio.

“REC” appears on the sub display and the recording start time and remaining time appear on the main display.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **[S]** or **[*]** key.

The transceiver terminates the recording. The transceiver finishes recording if the recording time elapses.

The audio data is written to Flash Memory.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Configuring the Voice Memo (Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)
- Configuring the Stores the latest received message (Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)
- Assigning the Playback to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

16.3 Auto Reply Message

Auto Reply Message enables a user to record a Voice Message even if the user is away from the transceiver.

Auto Reply Message can be used with Individual Call.

When the transceiver completes recording audio, the audio data is automatically stored in the VGS-1 Flash Memory. The user can hear stored audio by using Message Playback.

The Auto Reply Message recording channel can be configured in steps of 30 seconds by using KPG-96D. Auto Reply Message is not available if “Disable” is selected.

Note:

- ◆ Auto Reply Message is only available in MPT Trunking System.
- ◆ A maximum of 300 seconds total recording time is available divided among Auto Recording, Voice Memo and Auto Reply Message.
- ◆ Auto Reply Message does not function when the transceiver is in Auto Recording Mode, Voice Memo Mode, or Message Playback Mode.
- ◆ If FOACSU is enabled in the **Trunking Features** window > **Option 1** tab by using KPG-96D, the transceiver cannot enter Auto Reply Message Mode. FOACSU must be disabled to use Auto Reply Message.

■ Display and Operation

● Entering or Exiting Auto Reply Message Mode

1. Press the **Auto Reply Message** key.

The transceiver enters Auto Reply Message Mode.

“AUTO REPLAY” appears on the main display for 1 second and the right dot appears.



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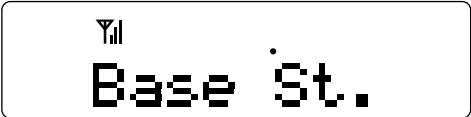
TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **Auto Reply Message** key again.
The dot disappears and the transceiver exits from Auto Reply Message Mode.

- **Auto Reply (voicemail and auto replay) Operation**
1. The transceiver receives an individual call.
The caller's unit ID appears on the main display.
The transceiver starts executing Auto Reply.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. The transceiver sends the Greeting Message.
- When an available channel for recording Auto Reply Message is found, the transceiver sends a Greeting Message (I am not available. Leave your Message). Then, the transceiver transmits Transpond Tone (2100 Hz) for 1 second.
 - If no available channel for recording Auto Reply Message is found, the transceiver sends a Greeting Message (I am not available.).

LED lights red. (While Transmission)



TK-2180/ TK-3180

LED lights red. (While Transmission)



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

The timing to send the Greeting Message varies depending on the Continuous Ringer Tone for Incoming call configuration.

Enabled: The transceiver sends the Greeting Message 3 seconds after receiving an individual call.

Disabled: The transceiver sends the Greeting Message immediately after receiving an individual call.

3. The transceiver starts recording audio.

The recording time and remaining time appear on the main display while recording.

The transceiver counts down the remaining time.

The transceiver automatically executes the Clear Down operation if the recording time elapses.



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TK-7180/ TK-7180H/ TK-8180/ TK-8180H

■ Configuration using KPG-96D

- Configuring the Auto Reply Message
(Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)
- Assigning the Auto Reply Message to a PF Key
(Refer to FPRG 6.5 Key Assignment Window.)

16.4 Message Playback

Message Playback can be used to play the received or transmitted audio recorded in Auto Recording Mode, Voice Memo Mode or Auto Reply Message Mode. Unnecessary recorded data can be deleted.

If the last recording is configured for Auto Recording, the transceiver plays the data first. Otherwise, the transceiver plays audio data stored in the VGS-1 Flash Memory.

Audio data is played in the following order:

- Auto Recording Playing Buffer
- Auto Recording Recording Channel
- Voice Memo Recording Channel
- Auto Reply Message Recording Channel (Return to the top)

Note:

- ◆ The transceiver exits from play mode and enters receiving mode when the transceiver receives data while playing data.
- ◆ The transceiver exits from playing mode and enters receiving mode when the transceiver sends data while playing data.
- ◆ Message Playback does not function when the transceiver is in Auto Recording Mode, Voice Memo Mode, Auto Reply Message Mode or GPS Data Storage is enabled.

■ Display and Operation

● Playing Audio

1. Press the **Playback** key.

The transceiver plays the recorded audio. The following characters are displayed while the transceiver plays the recorded audio.

• **Playing Audio Recorded in Auto Recording Buffer**

"STORE?" appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

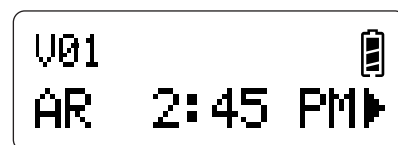
Note: The following operations can be executed while playing the Auto Recording Buffer.

- Pressing the [**<B**] key: The transceiver rewinds data for 5 seconds and plays data.
- Pressing the [**>C**] key: The transceiver fast-forwards data for 5 seconds and plays data.

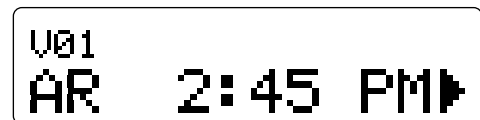
• **Playing Audio Recorded on Auto Recording Channel**

The recording type, time and date appear on the display.

"AR 2:45 PM" and "05/16" appear on the display if the message is recorded at 14:45 on 16th of May.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

Note: The following operations can be executed while playing the Auto Recording Buffer.

- Pressing the [**<B**] key: The transceiver rewinds data for 5 seconds and plays data.
- Pressing the [**>C**] key: The transceiver fast-forwards data for 5 seconds and plays data.

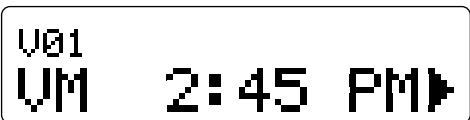
- **Playing Audio Recorded on the Voice Memo Recording Channel**

The recording type, time and date appear on the display.

“VM 2:45 PM” and “05/16” appear on the main display if the message is recorded at 14:45 on 16th of May.



TK-2180/ TK-3180

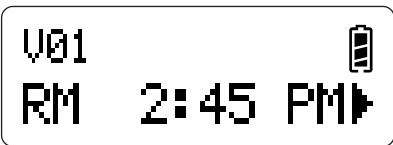


TK-7180/ TK-7180H/ TK-8180/ TK-8180H

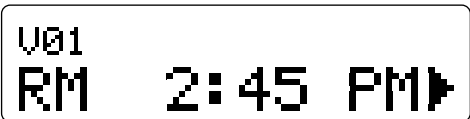
- **Playing Audio Recorded on Auto Reply Message Recording Channel**

The recording type, time, date and caller's ID appear on the main display.

“RM 2:45 PM” and “05/16 User Name” appear on the main display if the message is recorded at 14:45 on 16th of May.



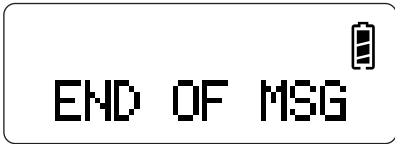
TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- **Transceiver Completes Playing Message**

“END OF MSG” appears on the main display if the transceiver finishes playing audio recorded on the last channel. The transceiver resumes playing audio if the **Selector** or [↗] and [↘], or the [S] key is pressed.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- **No recording data to play**

“<< EMPTY >>” appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

- **Selecting a Recording Channel**

1. Use the **Selector** or [↗] and [↘] keys while playing the recorded channel.

A user can change the recording channel.

- **Clearing a Recording Channel**

1. Select a recording channel to clear using the **Selector** or [↗] and [↘] keys.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **[A]** or **[#]** key.

Voice Message number appears on the sub display and “DELETE?” appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

3. Press the **[S]** or **[*]** key.

The transceiver clears the recording channel and plays audio recorded on the next recording channel.

- **Clearing All Recording Channels**

1. Press and hold the **[A]** or **[#]** key for 1 second while the recording channel is displayed.

“ALL” appears on the sub display and “DELETE?” appears on the main display.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **[S]** or **[*]** key.

The transceiver clears all recording channels and “EMPTY” appears on the main display.

- **Storing Auto Recording Data to the VGS-1 Flash Memory**

1. Confirm that the transceiver can play audio recorded in the Auto Recording buffer.



TK-2180/ TK-3180



TK-7180/ TK-7180H/ TK-8180/ TK-8180H

2. Press the **Side 2** or **[■]** key.

“WRITING” appears on the main display and recorded data is stored in the flash memory.

- **Configuration using KPG-96D**

- Assigning the Playback Function to a PF Key (Refer to FPRG 6.5 Key Assignment Window.)

16.5 Voice Guide

Voice Guide can be used to annunciate the configured Key Function when a **PF** key on the transceiver is pressed.

Voice Guide can be configured in the following way:

- Call Address Guide
- Function Guide

16.5.1 Call Address Guide

The transceiver emits the following voice guides when Call Address Guide is enabled.

Table 16-2 Call Address Guide Content

Key Function	Selected Call Address Number	Audio Content
Call Address Down	1	One
Call Address Up	2	Two
Call Address Up/Down
	20	Twenty
	21	Twenty one

	99	Ninety nine
	250	Two-fifty

■ Configuration using KPG-96D

- Configuring the Call Address Guide to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)

16.5.2 Function Guide

The transceiver emits the following voice guides when Function Guide is enabled.

Table 16-3 Function Guide Content

Key Function	Audio Content	
	Key Function On	Key Function Off
Clock	Reads the time.	-
Home Address	Home On	Call Address Number
Horn Alert	Horn Alert On	Horn Alert Off
Key Lock	Key Locked	Key Unlocked
Public Address	Public Address On	Public Address Off
Scrambler	Scrambler On	Scrambler Off
Scan	Scan On	Scan Off
Send the GPS Data	Send GPS	-

The transceiver emits the transceiver status and following audio by using Voice Guide.

Table 16-4 Transceiver Status and Audio Content

Category	Transceiver Status	Guide Content
Transceiver Password	The transceiver is operated with the Transceiver Password.	"Radio Locked"
Key Lock	The transceiver is operated while Key Lock is enabled.	"Key Locked"
Message Playback	Message is selected.	"Time" - "Message Type" (Example) "ten-thirty AM Voice Memo" "Twelve-fifty PM Reply Message" "Three-eleven PM Auto Recording"

Note:

- ◆ The transceiver does not emit Key Beep A and Key Beep B when the transceiver emits the Voice Guide.
- ◆ Voice Guide in Auto Reply Message is emitted regardless of the configuration of Call Address Guide and Function Guide.

■ Configuration using KPG-96D

- Configuring the Function Guide to be Enabled or Disabled (Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)

16.6 GPS Data Storage (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

GPS Data Storage can be used to store GPS data. The transceiver can store GPS data in the VGS-1 memory for each Data Storage Cycle. The transceiver can store GPS data up to a maximum of 17,920 messages (3,584 blocks). If data is written in all memories, the oldest memory will be overwritten.

Only a PC can read the stored GPS data from the transceiver.

16.6.1 GPS Data Storage (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

GPS data is stored to the VGS-1 according to the configuration for Data Storage Cycle.

GPS Data Storage and Data Storage Cycle can be configured by using KPG-96D.

Note:

- ◆ When the transceiver properly receives data from the GPS Unit, the data is written to the VGS-1 unit.
- ◆ GPS data is not stored when the transceiver is in Auto Recording Mode, Voice Memo Mode, or Message Playback and Message Playback is enabled.

■ Configuration using KPG-96D

- Configuring the GPS Data Storage Function
(Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)
- Configuring the Data Storage Cycle Function
(Refer to FPRG 6.4 Optional Features Window > 6.4.3 VGS-1 Tab.)

16.6.2 Reading GPS Data Storage

The transceiver can read back by using a PC the stored GPS data.

The transceiver requests GPS data by using the PC protocol. The transceiver with a VGS-1 is connected to a PC. The transceiver sends GPS data stored in the VGS-1 when the transceiver receives a receive request.

Note:

- ◆ The PC application controls the GPS data request.
- ◆ The transceiver sends data written in the VGS-1 unit.
- ◆ If the GPS unit receives the latest data while the transceiver is sending data to the PC, the transceiver does not send the new data to the PC. The transceiver sends all data received from GPS data as requested.
- ◆ If the number of GPS data corresponding to the GPS data request sent from the dispatcher are stored in the VGS-1 unit, all data stored in the VGS-1 unit are sent to the PC.
- ◆ Stored GPS data is deleted under the following conditions:
 - When data is written to the transceiver by using KPG-96D.
 - When the recorded data and GPS Data Storage are cleared.
 - When the VGS-1 firmware is updated.

17 DATA INTERFACE

Data Interface can be used to send or receive a text message or GPS data. A user can use serial communications by connecting the transceiver to the PC or external devices.

The following functions can be configured for data communications by using KPG-96D:

- COM port
- PC COM port Baud Rate
- PC COM port Stop Bit
- PC COM Port Polarity
- SDM2 Format
- MAP27 (Mobile Access Protocol for MPT1327)
- Kenwood Protocol
- Conversation Mode
- Voice COM port Output
- Status COM port Output
- ACKB
- Quiet Pip
- Status COM port Output Enable Block

17.1 COM port

The COM port is a serial communication port. The functionality of a serial communication port can be selected.

The TK-7180/ TK-7180H/ TK-8180/ TK-8180H have COM port 0 and COM port 2. The TK-2180/ TK-3180 have COM port 0 and COM port 1.

The following functions can be assigned to each communication port by using KPG-96D.

Table 17-1 Assigning Functions to a COM port (TK-2180/ TK-3180)

Function	Communication Port	
	COM port 0	COM port 1
None	This port functions as the KPG-96D communication port.	Disabled
Data	This port functions as the KPG-96D or data communication port.	

Table 17-2 Assigning Functions to a COM port (TK-7180/ TK-7180H/ TK-8180/ TK-8180H)

Function	Communication Port		
	COM port 0	COM port 1	COM port 2
None	This port functions as the KPG-96D communication port.	Disabled	
Data	This port functions as the KPG-96D or data communication port.		
GPS	-	This port functions as the KPG-96D or GPS receiver communication port.	

■ Configuration using KPG-96D

- Configuring COM port 0 (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)
- Configuring COM port 1 (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)
- Configuring COM port 2 (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

17.2 PC COM port Baud Rate

PC COM port Baud Rate can be used to configure the baud rate for communications between the transceiver and PC. This function is available for the COM port configured for Data.

PC COM port Baud Rate can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the PC COM port Baud Rate (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

17.3 PC COM port Stop Bit

PC COM port Stop Bit can be used to configure the number of stop bits for communications between the transceiver and PC.

PC COM port Stop Bit can be configured for COM port 0 to COM port 2 if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

PC COM port Stop Bit can be configured for COM port 0 and COM port 1 if the transceiver is TK-2180/ TK-3180.

PC COM port Stop Bit can be configured by using KPG-96D.

Note: COM 0 is fixed at 2 stop bits if the transceiver is TK-7180/ TK-7180H/ TK-8180/ TK-8180H.

■ Configuration using KPG-96D

- Configuring the PC COM port Stop Bit (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

17.4 PC COM port Polarity

The logic of the GPS data line can be changed. However, the polarity of COM port 0 cannot be changed in order to communicate with KPG-96D.

PC COM port Polarity can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the PC COM port Polarity (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

17.5 SDM2 Format

SDM2 Format is the method to send a Short Data Message.

The transceiver can send a Short Data Message by using the following 4 methods: Disable, MPT1327, MPT1343 (SST) and MPT1343 (MST). ([Refer to 8.9 Data Call on page 39.](#))

SDM2 Format can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the SDM2 Format (Refer to FPRG 6.3.6 Data Interface Window > ■ Option Tab.)

17.6 MAP27 (Mobile Access Protocol for MPT1327)

The transceiver can send or receive a message via the PC by using the MAP27 protocol.

Refer to MAP27 (Mobile Access Protocol for MPT1327 equipment) Ver 1.5 for details.

MAP27 can be configured by using KPG-96D.

Note:

- ◆ MAP 27 and Kenwood Protocol cannot be used simultaneously.
- ◆ MAP 27 supports 7-bit or 8-bit ASCII. Only MPT1343 (SST) and MPT1343 (MST) can support 8-bit ASCII.
- ◆ An NPD with a maximum of 100 bytes can be sent using MAP 27.

■ Configuration using KPG-96D

- Configuring the MAP27 (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.7 Kenwood Protocol

The transceiver can send or receive a message via the PC using the Kenwood Protocol. Contact Kenwood for details.

Kenwood Protocol can be configured using KPG-96D.

Note:

- ◆ MAP 27 and Kenwood Protocol cannot be used simultaneously.
- ◆ MPT1327, MPT1343 (SST), MPT1343 (MST) and NPD support 7-bit ASCII only.

■ Configuration using KPG-96D

- Configuring the Kenwood Protocol (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.8 Conversation Mode

Conversation Mode can be used to remain on a traffic channel without executing the Clear Down operation even if the transceiver completes data communications on the traffic channel by using NPD. (Refer to 8.11 NPD on page 43.)

In this case, the transceiver can send data from the data port while the transceiver remains on the traffic channel. Both the calling and receiving party can start sending data if the transceiver remains on the traffic channel.

Conversation Mode can be configured to be enabled or disabled by using KPG-96D.

Note: Conversation Mode is only available for Kenwood Protocol.

■ Configuration using KPG-96D

- Configuring the Conversation Mode to be Enabled or Disabled (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.9 Voice COM port Output (Alert232)

Voice COM port Output (Alert232) can be used to output the receiving party information (Prefix and Ident) and call type (Individual, Group and Emergency, or Simple Call) to the data port.

Voice COM port Output (Alert232) can be configured to be enabled or disabled by using KPG-96D.

Note: Conversation Mode is only available for Kenwood Protocol.

■ Configuration using KPG-95D

- Configuring the Voice COM port Output (Alert232) to be Enabled or Disabled (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.10 Status COM port Output (Gpsm1)

Status COM port Output (Gpsm1) can be used to output the received status message type (Same Prefix Call and Interprefix Call), status number and caller's information (Prefix and Ident) to the data port.

Status COM port Output (Gpsm1) can be configured to be enabled or disabled by using KPG-96D.

Note: Status COM port Output (Gpsm1) is only available for Kenwood Protocol.

■ Configuration using KPG-96D

- Configuring the Status COM port Output (Gpsm1) to be Enabled or Disabled (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.11 Status COM port Output Enable Block

Status COM port Output Enable Block can be used to configure the range for outputting a status message to the data port. This function can be used to separate the received status messages into status messages to be stacked and status messages to be output to the data port.

Status COM port Output Enable Block can be configured by using KPG-96D.

Note: Status COM port Output Enable Block is only available for Kenwood Protocol.

■ Configuration using KPG-96D

- Configuring the Status COM port Output Enable Block (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.12 ACKB

ACKB can be used to respond to all voice calls using Call Back (ACKB). This function can be used to configure the dispatcher, etc.

ACKB can be configured using KPG-96D.

■ Configuration using KPG-96D

- Configuring ACKB (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

17.13 Quiet Pip

Quiet Pip can be used to prevent the transceiver from emitting beeps when the transceiver communicates via the PC. This function is only available for the transmitting party.

If a user makes a voice call while the transceiver is sending data via the PC, the transceiver jumps to a traffic channel and emits the received audio.

Quiet Pip can be configured by using KPG-96D.

■ Configuration using KPG-96D

- Configuring the Quiet Pip (Refer to FPRG 6.3.6 Data Interface Window > ■ Interface Tab.)

18 GPS (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only)

GPS can be used to send the current location data of the transceiver.

The transceiver sends and receives GPS data by using the communication port.

Only Kenwood Protocol supports GPS and a GPS board compliant with NMEA-0183 must be obtained to send and receive GPS data. To use this function, a PC having mapping software used for receiving and displaying GPS data on a map must be connected to the communication port of the transceiver receiving GPS data.

The PC displays the position data of each transceiver. This function is convenient for dispatch control or in a traffic control system.

If an optional VGS-1 unit is installed in the transceiver, GPS data is stored in the VGS-1 unit with Report Interval.

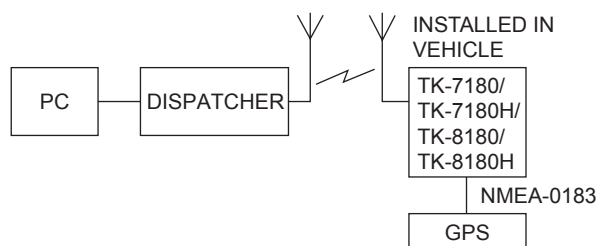


Figure 18-1 Description of GPS System

18.1 GPS Data Communication

The following functions can be configured for GPS data communications by using KPG-96D.

Table 18-1 GPS Data Communication

Function	Function Description
One-shot	The transceiver sends GPS data when the transceiver receives a status message having a status number configured in the KPG-96D.
Auto Report Start	The transceiver sends GPS data at the configured Auto Report Interval when the transceiver receives a status message having a status number configured in the KPG-96D.
Auto Report Stop	The transceiver stops sending GPS data when the transceiver receives a status message having a status number configured in the KPG-96D.
Power-on Auto Report Start	Auto Report Interval is enabled when the transceiver is turned ON.
Power-off Report	The transceiver is turned OFF after sending GPS data. This function works in conjunction with Ignition, so that Timed Power-off must be enabled.
Auto Report Interval Time (Ignition On, Ignition Off)	Auto Report Interval is the interval to send GPS data. The transceiver sends GPS data using the duration configured in GPS Report Interval. The interval can be configured for Ignition On and Off. If the vehicle engine is not running (Ignition is Off), a long duration can be configured for Auto Report Interval.
Transmit Time Mark	Transmit Time Mark is the offset time for sending GPS data based on the UTC (Coordinated Universal Time) received from the GPS receiver unit. Each transceiver in the Fleet sends GPS data with different timing. Therefore, transmission collisions can be avoided. Transmit Time Mark must be configured with a smaller value than GPS Report Interval.
GPS Data Storage	GPS Data Storage can be used to store GPS data in the VGS-1 unit. The transceiver stores GPS data with GPS Report Interval Time. The PC can read stored GPS data from the VGS-1 unit. GPS data equivalent to 17920 messages (3,584 blocks) can be stored in the VGS-1 unit. (Refer to 16.6 GPS Data Storage (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) on page 97.)

■ Configuration using KPG-96D

- Configuring Functions Relevant to GPS Data Communication (Refer to FPRG 6.3.6 Data Interface Window > ■ GPS (Transmit) Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)

The transceiver can be configured to send the Map Header to the mapping software by using KPG-96D.

Note: Refer to the GPS unit's instruction manual for commands sent from the transceiver to the PC.

■ Configuration using KPG-96D

- Configuring the Transceiver to Send the Map Header to the Mapping Software (Refer to FPRG 6.3.6 Data Interface Window > ■ GPS (Receive) Tab.)

18.2 Map Header

The transceiver sends the following data to the mapping software.

The transceiver at the dispatcher obtains these data from GPS data sent from transceivers and sends data from the COM port.

Table 18-2 Data in NMEA-0183 Format

Map Header	Data Description
\$GPGGA (NMEA)	Positioning time, latitude, longitude, GPS quality, number of receive satellites, antenna altitude from mean sea level (meter), altitude difference between WGS-84 ellipsoid and mean sea level (meter), DGPS data age (second) and ID information of DGPS standard bureau
\$GPGLL (NMEA)	Latitude (north latitude), longitude (west longitude), positioning time (UTC), status, mode information
\$GPRMC (NMEA)	Positioning time (UTC), status, latitude (north latitude), longitude (west longitude), absolute speed (knots), traveling direction, date (UTC), inclination of the geomagnetism and mode information

Table 18-3 Kenwood Proprietary Sentence Data

Map Header	Description
\$PKLDS (KW)	\$PKLDS consists of \$GPRMC + ID + Status. The transceiver at the dispatcher creates \$GPRMC + ID + Status data by using GPS data sent from transceivers and sends data from the COM port.
\$PKLID (KW)	The transceiver at the dispatcher obtains ID from GPS data sent from transceivers and sends data from the COM port. We recommend using this sentence with Map Header NMEA (\$GPGGA, \$GPGLL, \$GPRMC). The transceiver sends \$GPGGA data + ID to the PC if both Map Header NMEA (\$GPGGA) and \$PKLID are used.

Remote Call Address can be used to make a call using Dialing configured by an external device by using KPG-96D.

To use this function, Dialing Select A, Dialing Select B, Dialing Select C or Dialing Select D must be assigned to the AUX Input port by using KPG-96D.

The transceiver makes a call to the corresponding Remote Dialing if the AUX Input port activates.

The port activates if the port status is Low after the port status changes from High to Low and the Delay Time elapses.

If multiple ports activate, the transceiver makes a call using the port activated first. If one of the ports activates, the transceiver makes a call after finishing the current call.

■ Display and Operation

1. Switch the status of the AUX Input Port to which Dialing Select A is configured from High to Low.
The transceiver determines that the port is active if the port is Low even after the Select A Delay Time elapses.
2. The transceiver makes a call to Remote Dialing A.
3. The transceiver makes a call to Remote Dialing B after making a call to Remote Dialing A if the AUX Input Port configured as Dialing Select B becomes active during a call to Remote Dialing B.
4. The transceiver makes a call to Remote Dialing C if the AUX Input Port configured as Dialing Select C becomes active after making a call to Remote Dialing B.

■ Configuration using KPG-96D

- Assigning the Function to the AUX Input Port (Refer to FPRG 6.7 Extended Function Window > 6.7.3 AUX Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)
- Configuring the Remote Dialing (Refer to FPRG 6.7 Extended Function Window > 6.7.4 Remote Call Tab (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only).)

20 FUNCTION PORT (TK-7180/ TK-7180H/ TK-8180/ TK-8180H only) =

The TK-7180/ TK-7180H/ TK-8180/ TK-8180H have programmable Function Ports (AUX Input/ AUX Output).

The input/ output ports are assigned to the D-sub 25-pin connector on the back panel.

■ Mic Sense

The Mic Gain of the MI2 line can be changed when the transceiver transmits by using the External PTT (Voice).

Note: High and Low can be switched with IC415: AQA-L.

20.1 Assigning Functions to AUX Input

One of the following functions can be assigned to the AUX Input port.

A function can be assigned to the AUX Input port by using KPG-96D.

20.1.1 External PTT

The External PTT (Voice) port can be used to request a voice channel. This port can be used for a transmission request from a headset or external microphone. The transceiver starts transmitting if the External PTT port is Low. The transmission ends when the External PTT port goes High.

The following functions can be configured for the External PTT port.

Table 20-1 External PTT Configuration

External PTT	Configuration
Modulation Line	The modulation line can be configured for the External PTT port. The following modulation lines are available. <ul style="list-style-type: none">• Mic (the audio line of the Mic located on the front of the transceiver)• MI2 (the audio modulation line of the 6-pin D-sub connector located on the rear of the transceiver)• DI (the data modulation line of the 5-pin D-sub connector located on the rear of the transceiver) The default modulation line is the MI2 line.
With QT/DQT	QT/DQT configured for the channel can be replaced when the transceiver sends codes through the External PTT port. Normally, only QT/DQT is replaced.
With STE	STE (Squelch Tail Eliminator) can be sent after sending the QT/DQT code for a Conventional channel using the External PTT port. Normally, the transceiver sends STE.

20.1.2 Clear Down

This port can be used to clear down calls and call requests.

When the Clear port is configured and goes low in MPT Trunking System, the transceiver executes one of the following operations:

- Terminates communications on the traffic channel.
- Cancels the call request.

20.1.3 Dialing Select A/ Dialing Select B/ Dialing Select C/ Dialing Select D

These ports can be used as the Dialing Select ports for using Remote Dialing.

These ports are configured in the following order: Dialing Select A → Dialing Select B → Dialing Select C → Dialing Select D.

20.1.4 Speaker Mute

This port can be used to mute the speaker audio output line.

The transceiver mutes when the Speaker Mute port goes Low. The mute function is disabled when this port goes High.

20.1.5 Mic Mute

This port can be used to mute the Mic modulation line.

The Mic Line (Front Mic, MI2) mutes when the Mic Mute port goes Low. The mute function is disabled when this port goes High.

20.1.6 External Squelch Off

This port can be used to activate Squelch Off.

Squelch Off is enabled when the External Squelch Off port goes Low. Squelch Off is disabled when the External Squelch Off port goes High.

Note: Squelch Off cannot be disabled with External Squelch Off.

20.1.7 External Hook

This port functions in the same way as Local Mic Hook.

The Microphone goes to On-hook status when the External Hook port goes Low. The Microphone goes to Off-hook status when the port goes High.

Mic off-hook as RFCC and Mic on-hook as Clear Down, Off-hook Decode, Off-hook Horn Alert, Off-hook Scan and Optional Signaling can be reset in the same way as the Local Mic Hook.

When both Local Mic Hook and External Hook ports are Off-hook, the transceiver activates in Off-hook status. If either of them is switched On, the transceiver operates in On-hook status.

20.1.8 Emergency

This port allows the transceiver to activate the Emergency function.

The Key Hold Time must be configured for this port to prevent Emergency Mode from being entered unintentionally.

The transceiver enters Emergency Mode when the Emergency port goes Low. Emergency Mode functions according to the Emergency configuration. ([Refer to 8.16 Emergency Call on page 51.](#))

20.1.9 AUX Input Status Message 1/ AUX Input Status Message 2

This port is used as the trigger port to send a Status Message.

The transceiver sends the status message configured for each port to the unit configured for Base Prefix, Base Fleet, and Base Unit when the status of AUX Input port changes (High to Low or Low to High).

2 statuses (High → Low, Low → High) can be configured for each port for AUX Input ports. These ports are normally used as the sensor port for telemetry purposes.

Note: The transceiver does not send the status message immediately after the transceiver is turned ON since the transceiver does not recognize that the status of the AUX Input port assigned to AUX Input Status Message 1 and AUX Input Status Message 2 has changed.

20.2 Assigning Functions to AUX Output

One of the following functions can be assigned to the AUX Output port.

A function can be assigned to the AUX Output port by using KPG-96D.

Note: Active levels other than AUX Output Status Message can be configured by using KPG-96D.

20.2.1 LOK

The transceiver notifies a user that voice communications are available in MPT Trunking System or Conventional Mode through this port.

This port activates if the transceiver jumps to the traffic channel in MPT Trunking System. Otherwise, this port is deactivated.

The port activates when the QT/ DQT matches on a channel on which the QT/ DQT Decode is configured while the transceiver is in Conventional Mode. Otherwise, this port is deactivated.

20.2.2 COR

This port notifies a user that the transceiver is receiving a carrier.

The port activates if the transceiver receives a carrier in either MPT Trunking System or Conventional Modes. Otherwise, this port is deactivated.

20.2.3 TOR

This port notifies a user that QT/DQT matches.

The port activates if the transceiver receives a carrier on a traffic channel in MPT Trunking System. Otherwise, this port is deactivated.

The port activates when the QT/ DQT matches on a channel on which the QT/ DQT Decode is configured while the transceiver is in Conventional Mode. Otherwise, this port is deactivated.

20.2.4 AUX A

The port output changes in conjunction with the **AUX A** key. A user can control an external device connected to the AUX A port.

20.2.5 AUX B

The port output changes in conjunction with the **AUX B** key. A user can control an external device connected to the AUX B port.

20.2.6 Idle

This port notifies a user that the transceiver is receiving a control channel in MPT Trunking System.

The port activates while the transceiver is receiving a control channel in MPT Trunking System. Otherwise, this port is deactivated.

20.2.7 PTT Output

This port notifies a user that the **PTT** switch is pressed. The function is available when an Optional Board or an external device is connected to the transceiver.

The port is activated when the **PTT** switch is pressed. Otherwise, this port is deactivated.

20.2.8 Transceiver Busy

This port notifies a user that a remote control request from an external device is rejected.

The port activates if the transceiver is in transmission mode, including automatic transmissions, and the transmission was initiated by using the **PTT** switch. Otherwise, this port is deactivated.

20.2.9 COR or Transceiver Busy

This port is activated if either the COR port or Transceiver Busy port is active. The port deactivates if both the COR and Transceiver Busy ports are inactive.

20.2.10 TOR or Transceiver Busy

This port is activated if either the TOR port or Transceiver Busy port is active. The port deactivates if both the TOR and Transceiver Busy ports are inactive.

20.2.11 TXS

This port notifies a user that the transceiver is transmitting.

The port is activated while the transceiver is transmitting. Otherwise, this port is deactivated.

20.2.12 AUX Output Status Message 1/ AUX Output Status Message 2

These ports can be used to change the status of the transceiver when the transceiver receives a Status Message.

The ports switch the status of the AUX Output port (High to Low or Low to High) when the received Status Message matches the Status number configured for the ports.

2 statuses (High → Low, Low → High) can be configured for each AUX Input port.

These ports are normally used to remotely control the transceiver by connecting an external device to the AUX Output port.

20.2.13 Trunking System

This port notifies a user that the transceiver is in MPT Trunking System.

The port activates when the transceiver is in MPT Trunking System. Otherwise, this port is deactivated.

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[^]/[v] Keys	1

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