



Function Reference (FUNC)

For

***TK-2170/ TK-3170/
TK-3173***

Version:

1.01

Last Updated:

July, 2005

Language:

English

Type:

K

About Copyright

All copyrights and other intellectual property rights for this technical document and relevant in-depth manuals as well as the software described in this technical document, relevant in-depth manuals, and help texts and manuals attached to the software are owned by Kenwood Corporation.

A right to use the software described in this technical document and relevant in-depth manuals is granted to a licensee by Kenwood Corporation; however, the title to and ownership of the software shall be owned by Kenwood Corporation. Refer to the help texts attached to this software for details.

Kenwood Corporation does not warrant quality and performance of the software described in this technical document and relevant in-depth manuals to conform to the applicability of any use, and Kenwood Corporation shall be free from liability for any defects, damage or loss, or from any warranty to anything other than expressly described in this technical document and relevant in-depth manuals.

Revision history

Date	Description
June 30, 2005	1) Volume control is corrected to Selector in 3.3 Lamp on page 14. 2) The title of Home Repeater is corrected to Repeater Information on page 56.

CONTENTS

1 BASIC FUNCTIONS	1	4 SOUNDS.....	19
1.1 Functions and Panel Layout	1	4.1 Tone Pattern	19
1.1.1 Model List.....	1	4.1.1 Power-on Tone.....	19
1.1.2 TK-2170/ TK-3170/ TK-3173.....	1	4.1.2 Control Tone	19
1.2 Zone Description.....	2	4.1.3 Warning Tone.....	20
1.3 Transmit and Receive Frequency	3	4.1.4 Locator Tone.....	20
1.4 Transmit Power.....	3	4.1.5 Sidetone.....	21
1.5 Channel Spacing.....	3	4.1.6 Alert Tone.....	21
1.6 Squelch Level	3	4.2 Minimum Volume	21
1.7 Compander	5	4.3 Tone Volume.....	21
1.8 Beat Shift	5	4.4 Alert Tone Pattern.....	22
1.9 Key Lock	5	4.5 PTT Release Tone.....	22
1.10 Keypad Operation	6	4.6 PTT Proceed Tone.....	23
1.11 Call Key.....	6	4.7 Proceed Tone Delay Time	23
1.12 Mic Sense	6		
1.13 Battery Saver	7	5 PASSWORD FUNCTION	24
1.14 Mode Reset Timer	7	5.1 Transceiver Password	24
		5.2 Read Authorization Password.....	25
2 BASIC OPERATION.....	8	5.3 Overwrite Password.....	26
2.1 Turning the Transceiver ON/ OFF	8		
2.1.1 Turning the Transceiver ON.....	8	6 EMBEDDED MESSAGE FUNCTION	27
2.1.2 Turning the Transceiver OFF	8	6.1 Embedded Message	27
2.2 Adjusting the Volume	9	6.2 Embedded Message with Password.....	27
2.3 Using Function Keys	9		
2.4 Changing the Zone	9	7 COMMUNICATION PORT.....	28
2.5 Changing the CH/GID	9	7.1 COM port 0, COM port 1.....	28
2.6 Channel Entry	10		
2.7 Home CH/GID.....	10	8 KEY ASSIGNMENT	29
2.8 Direct CH/GID	11	8.1 Assigning Functions to the Selector.....	29
2.9 Receive	12	8.2 Assigning Functions to PF keys.....	29
2.9.1 Conventional Group	12		
2.9.2 Trunking System (TK-3173 only)	12	9 TIME-OUT TIMER (TOT)	31
2.10 Transmit.....	12	9.1 Conventional Group	31
2.10.1 Conventional Group	12	9.1.1 Time-out Timer.....	31
2.10.2 Trunking System (TK-3173 only)	12	9.1.2 TOT Pre-alert	31
2.11 Transmitting with Talk Around	13	9.1.3 TOT Rekey Time.....	31
2.11.1 Conventional Group	13	9.1.4 TOT Reset Time.....	31
2.11.2 Trunking System (TK-3173 only)	13	9.2 Trunking System (TK-3173 only)	32
		9.2.1 Time-out Timer (Dispatch)	32
3 DISPLAY.....	14	9.2.2 Time-out Timer (Telephone)	32
3.1 Busy LED	14		
3.2 Transmit LED	14	10 BUSY CHANNEL LOCKOUT.....	33
3.3 Lamp	14	10.1 Busy Channel Lockout.....	33
3.4 LCD.....	15		
3.4.1 Zone Name	15		
3.4.2 Zone-name Text Length.....	15		
3.4.3 Channel Name	16		
3.4.4 GID Name	16		
3.4.5 Display Character.....	16		
3.4.6 Power-on Text.....	16		
3.5 Icons	17		
3.5.1 Battery Status/ Battery Warning.....	17		

CONTENTS

11 TALK AROUND34

11.1	Conventional Group.....	34
11.2	Trunking System (TK-3173 only).....	34
11.2.1	Talk Around Busy Channel Lockout	35
11.2.2	Talk Around Key	35

12 PTT ID36

12.1	PTT ID Type	36
12.1.1	Beginning of Transmit.....	36
12.1.2	End of Transmit	36
12.2	PTT ID (CH/GID)	36
12.3	Restricted ID in Talk Around.....	37

13 TRANSPOND38

13.1	Transpond Using Optional Signaling	38
13.2	Transpond Using the LTR ID (TK-3173 only).....	38
13.3	Conventional Group.....	38
13.3.1	Clear to Transpond.....	38
13.4	Trunking System (TK-3173 only).....	38
13.4.1	Transpond Delay Time	38

14 CONVENTIONAL GROUP.....39

14.1	Zone	39
14.1.1	Zone Name	39
14.1.2	Data Zone-channel	39
14.1.3	Home Channel.....	39
14.1.4	Operator Selectable Home-channel	39
14.1.5	Optional Signaling Decode Condition	40
14.1.6	Audio Control	40
14.1.7	Time-out Timer (TOT).....	40
14.1.8	TOT Pre-alert.....	40
14.1.9	TOT Rekey Time	40
14.1.10	TOT Reset Time	40
14.1.11	Zone Add	40
14.1.12	Scan List (TK-3173 only)	40
14.2	Channel	41
14.2.1	Receive Frequency.....	41
14.2.2	Transmit Frequency.....	41
14.2.3	QT/DQT Decode.....	41
14.2.4	QT/DQT Encode	41
14.2.5	Channel Name.....	41
14.2.6	ID	41
14.2.7	Transmit Power.....	42
14.2.8	Wide/ Narrow	42
14.2.9	Optional Signaling.....	42
14.2.10	Busy Channel Lockout.....	42
14.2.11	PTT ID	42
14.2.12	PTT ID (BOT).....	42
14.2.13	PTT ID (EOT).....	42
14.2.14	Scan Add	43
14.2.15	Beat Shift	43
14.2.16	Compander	43
14.2.17	Data	43

14.2.18	Voice Scrambler	43
14.2.19	Scrambler Code.....	43

15 LTR TRUNKING44

15.1	Zone	44
15.1.1	Zone Name	44
15.1.2	Scan Weight	45
15.1.3	Wide/ Narrow	45
15.1.4	Data Zone-GID	45
15.1.5	Data Delay Time	45
15.1.6	Home GID.....	45
15.1.7	Operator Selectable Home-GID.....	45
15.1.8	Time-out Timer (Dispatch).....	46
15.1.9	Time-out Timer (Telephone).....	46
15.1.10	Audio Control	46
15.1.11	Encode Data Type	46
15.1.12	Zone Add	46
15.1.13	Scan List.....	46
15.1.14	Auto Telephone Search.....	46
15.1.15	Talk Around Busy Channel Lockout	47
15.1.16	Talk Around Key	47
15.1.17	Fix ID	47
15.1.18	Telephone (Block ID).....	47
15.1.19	Transmit Inhibit (Block ID)	47
15.1.20	Decode ID (Block ID).....	48
15.2	Group ID	48
15.2.1	Encode ID/ Decode ID	48
15.2.2	GID Name	48
15.2.3	Transmit Power.....	48
15.2.4	Optional Signaling.....	49
15.2.5	PTT ID	49
15.2.6	Call Indicator.....	49
15.2.7	Scan Add	49
15.2.8	Transpond.....	49
15.2.9	Talk Around	49
15.2.10	Compander	49
15.2.11	Data	50
15.2.12	Scrambler	50
15.2.13	Scrambler Code.....	50
15.3	Repeater Information.....	50
15.3.1	Area Code.....	50
15.3.2	Home Repeater	50
15.3.3	Repeater Information Table	51
15.4	Telephone Interconnect.....	51
15.4.1	Connecting to the Phone Line	51
15.4.2	Auto Telephone Search.....	52
15.4.3	Free System Ringback	52
15.5	System Search	53
15.5.1	System Search for Voice Channels	53
15.5.2	System Search for Data Channels	53
15.6	Clear to Talk	54
15.7	ARQ Mode.....	54
15.7.1	Transceiver Operation When Using ARQ in FleetSync	54

16 SIGNALING	55	18.3.4	Alert Tone (Individual Call) (Conventional).....	70
16.1	QT/DQT Decode/ Encode.....	55	18.3.5	Alert Tone (Group Call) (Conventional).....
16.1.1	QT/DQT with STE (Squelch Tail Eliminator).....	55	18.3.6	Transpond (Conventional).....
16.2	Optional Signaling.....	55	18.3.7	Code (Trunking) (TK-3173 only)
16.3	Signaling (Audio Control).....	56	18.3.8	Transpond/ Alert Tone (Trunking) (TK-3173 only)
16.3.1	Conventional Group	56	18.3.9	Stun.....
16.3.2	Trunking System	56	18.3.10	Auto Reset Timer
16.4	Signaling (Optional Signaling Decode Condition)	57	18.3.11	Clear to Transpond
16.4.1	Conventional Group	57	18.3.12	Selective Call Alert LED
16.4.2	Trunking System (TK-3173 only)	57	18.3.13	DTMF Number Display.....
16.5	Monitor.....	57	18.4 Autodial.....	73
16.5.1	Transceiver Operation during the Scan in Conventional Group	58	18.4.1	Autodial List.....
16.5.2	Transceiver Operation during the Scan in Trunking System	58	18.4.2	Autodial Programming.....
16.6	Squelch Off	58		
16.6.1	Transceiver Operation during the Scan in Conventional Group	59	19 2-TONE	76
16.6.2	Transceiver Operation during the Scan in Trunking System	59	19.1	Transmitting 2-tone
17 OST	60	19.2	Encode.....	76
17.1	OST Status Memory	60	19.2.1	Duration of 1st Tone.....
17.2	Tone Off.....	60	19.2.2	Duration of 2nd Tone
17.3	Direct OST	61	19.2.3	Duration of Single Tone
17.4	OST Table.....	61	19.2.4	Gap Time
17.5	Standard QT	62	19.2.5	First Tone Delay Time.....
			19.2.6	Sidetone
			19.2.7	2-tone Encode Memory List
			19.3	Decode.....
			19.3.1	Decoder 1 to Decoder 2
			19.3.2	A Tone/ B Tone/ C Tone/ D Tone
			19.3.3	Auto Reset Timer
			19.3.4	Clear to Transpond
			19.3.5	Selective Call Alert LED
18 DTMF	63	20 FLEETSYNC	81	
18.1	Sending DTMF Code	63	20.1	PTT ID Function.....
18.1.1	Manual Dialing	63	20.1.1	Caller ID Display
18.1.2	Store & Send.....	63	20.1.2	PTT ID Sidetone.....
18.1.3	Keypad Auto PTT.....	65	20.2	Selcall Function.....
18.1.4	Autodial List Selection.....	65	20.2.1	Making a Selcall
18.1.5	Redial.....	66	20.2.2	Making a Selcall
18.1.6	Beginning of Transmit (BOT)	66	20.2.3	ID List.....
18.1.7	End of Transmit (EOT)	67	20.3	Status Message Function
18.2	Encode.....	67	20.3.1	Sending a Status Message
18.2.1	DTMF Speed.....	67	20.3.2	Receiving a Status Message.....
18.2.2	First Digit Delay Time.....	68	20.3.3	Reserved Status for Status Messages.....
18.2.3	First Digit Delay Time with QT	68	20.3.4	Status Message Stack
18.2.4	First Digit Time.....	68	20.3.5	Status Message on Data Zone-CH/GID.....
18.2.5	* and # Digit Time.....	68	20.3.6	Status Message Serial Output
18.2.6	DTMF Hold Time.....	68	20.3.7	Status List
18.2.7	D Code Assignment	68	20.3.8	Target Fleet/ Target ID (Status Message).....
18.2.8	Manual Dialing	69	20.3.9	Status 80 - 99 (Special).....
18.2.9	Store & Send.....	69	20.3.10	Emergency Status Response.....
18.2.10	Dial ID	69	20.4	Short Message Function
18.2.11	Auto Telephone (TK-3173 only).....	69	20.4.1	Sending a Short Message.....
18.2.12	DTMF Sidetone	69	20.4.2	Receiving a Short Message
18.3	Decode.....	70	20.4.3	Short Message Stack
18.3.1	DTMF Signaling (Conventional).....	70	20.4.4	Short Message on Data Zone-CH/GID
18.3.2	Intermediate Code (Conventional)	70	20.4.5	Short Message Serial Output.....
18.3.3	Group Code (Conventional)	70		

CONTENTS

20.5	Long Message Function	94	21.6.6	Dropout Delay Time	112
20.5.1	Sending a Long Message	94	21.6.7	Dwell Time	112
20.5.2	Receiving a Long Message	94	21.6.8	Lookback	113
20.5.3	Long Message on Data Zone-CH/GID	95	21.6.9	Scan Type	113
20.6	Stack	95	21.6.10	Revert CH/GID Display	113
20.6.1	Stores the Latest Received Messages	97	21.6.11	Priority-channel Stop Tone	113
20.6.2	Caller ID Stack	98	21.6.12	Power-on Scan	113
20.6.3	Message Memory	98			
20.7	Configuring FleetSync	98	22	EMERGENCY MODE	114
20.7.1	Fleet/ ID (Own)	99	22.1	Configuring Emergency Mode	114
20.7.2	Unit ID Encode Block	99	22.1.1	Emergency CH/GID Type	115
20.7.3	FleetSync Baud Rate	99	22.1.2	Emergency Zone-CH/GID	115
20.7.4	Message Display Type	99	22.1.3	Emergency Cycle	115
20.7.5	PC Interface Protocol	100	22.1.4	Duration of Locator Tone 1	115
20.7.6	Manual Dialing	100	22.1.5	Transmit Duration	116
20.7.7	Selective Call Alert LED	100	22.1.6	Duration of Locator Tone 2	116
20.7.8	Interfleet Call	100	22.1.7	Receive Duration	116
20.7.9	Group ID	100	22.1.8	Emergency Display	116
20.7.10	Auto Reset Timer	101	22.1.9	Emergency Text	116
20.7.11	Alert Tone (Individual Call)	101	22.1.10	Emergency Mode Type	117
20.7.12	Alert Tone (Other Selective Calls)	101	22.1.11	Emergency-key Delay Time	117
20.7.13	Alert Tone (Paging Call)	101	22.1.12	Emergency Mic Sense	117
20.7.14	Alert Tone (Status Message Call/ Short Message Call)	101	22.1.13	Emergency ACK Code	117
20.7.15	Alert Tone (Emergency Response)	102	22.1.14	Emergency Reset Code	117
20.7.16	Unit ID Serial Output	102	22.1.15	Emergency Recognition	117
20.7.17	GTC Count	102	22.1.16	Emergency LED	118
20.7.18	Number of Retries	102	22.1.17	Background Transmission	118
20.7.19	Transmit Busy Wait Time	103	22.1.18	Man-down Switch Type	118
20.7.20	Maximum ACK Wait Time	103	22.1.19	Man-down Delay Time	118
20.7.21	ACK Delay Time	103	22.1.20	Man-down Pre-alert	118
20.7.22	Transmit Delay Time (Receive Capture)	103	22.1.21	Man-down Logic Type	118
20.7.23	Data Transmit Modulation Delay Time	103	22.1.22	Emergency ID	119
20.7.24	Random Access (Contention)	104	22.1.23	Emergency DTMF ID	119
20.7.25	Data Transmit with QT/DQT	104	22.1.24	Emergency Call Fleet	119
			22.1.25	Emergency Call ID	119
21	SCAN	105	23	DATA COMMUNICATION	120
21.1	Scan Operation	105	23.1	Data Communication Configuration	120
21.1.1	Conditions to Start Scanning	105	23.1.1	Data	120
21.1.2	Conditions to Resume Scanning	105	23.1.2	Data Zone-CH/GID	120
21.1.3	Operations when Scan Cannot Resume	106	23.1.3	Data Transmit with QT/DQT	120
21.1.4	Operation after Manually Changing the Zone-CH/GID during the Scan	106	23.1.4	COM port	120
21.1.5	Operations when Manually Changing the Zone-CH/GID while Scan Pauses to Receive a Call	106			
21.1.6	Transceiver Operation during the Scan	106	24	EXTENDED FUNCTION	121
21.1.7	Single Scan	108	24.1	Squelch Logic Signal	121
21.2	Multi Scan	108			
21.3	List Scan (TK-3173 only)	109	25	VOX	122
21.4	Priority Scan	109	25.1	Configuring the VOX Function	122
21.5	Group Scan (TK-3173 only)	110	25.1.1	VOX Gain Level	122
21.6	Configuring the Scan	110	25.1.2	VOX Delay Time	123
21.6.1	Scan Delete/Add	110	25.1.3	Transmit Inhibit while Receiving	123
21.6.2	Scan List (TK-3173 only)	111	25.1.4	Cancel Operation	123
21.6.3	Scan List Table (TK-3173 only)	111	25.1.5	VOX Proceed Tone	123
21.6.4	Priority/ Priority Zone-channel	111			
21.6.5	Revert CH/GID	112			

26 VOICE SCRAMBLER 124

26.1	Configuring the Voice Scrambler	124
26.1.1	Scrambler (Built-in Scrambler)	124
26.1.2	Scrambler Status Memory (Built-in Scrambler)	124
26.1.3	Scrambler (Optional Scrambler)	125
26.1.4	Scrambler Status Memory (Optional Scrambler)	125

About this Manual

This In-depth manual describes the functions of the TK-2170/ TK-3170/ TK-3173 transceivers and how to configure the various functions.

Configuration of 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-101D” for functions that can be configured using KPG-101D.

Function Reference (Abbreviation: FUNC)

This section describes all functions of the transceiver.

Field Programming Reference (Abbreviation: FPRG)

This section describes how to configure the transceiver using KPG-101D.

Modification Information (Abbreviation: MOD)

This section describes how to modify the transceiver and how to install various options in the transceiver.

About Notations

The following notations are used in this manual.

[]:

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

“ ”:

The characters in quote marks indicate the name of the functions, buttons, and menus shown on the display of KPG-101D.

We updated names of functions that do not match with corresponding operations. Therefore, some function names were changed even though operations are not changed. Refer to the comparison list for new and old function names.

Table 1 Comparison List for New/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
Transceiver Password	Radio Password
Transceiver-kill	Radio-kill
Transmit Frequency	TX Frequency
Transmit Power	TX Power
SmarTrunk	Trunking Board
Turn-off Code	Turn off Code

New Name	Old Name
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

Following abbreviations may be used in this manual.
Refer to the abbreviation list.

Table 2 Abbreviation List

Abbreviation	Full Spelling or Meaning
ACK	Acknowledgement
ANI Board	Automatic Numbering Identification Board
ANT	Antenna
AQUA	Kenwood's audio signal processing IC
AUX	Auxiliary
BCL	Busy Channel Lockout
BOT	Beginning of Transmission
CH	Channel
COM port	Communication port
COR	Carrier Operated Relay
Dec ID	Decode ID code
deg	degree(s)
Del	Delete
DQT	Digital Quiet Talk code
DTC	Data Transmission Control
DTMF	Digital Tone Multi-Frequency
Enc ID	Encode ID code
EOT	End of Transmission
ETX	End of Text
External PTT	External PTT switch
FEC	Forward Error Correction
GID	Group ID code
GPS	Global Positioning System
GTC	Go to channel
Hi	High
I/O	Input/ Output
KDS-100	Kenwood Data Terminal
KGP-2A/ KGP-2B	GPS/ Modem Unit
LOK	Link OK (connected to the repeater)
LTR ID	ID used in a Logic Trunked Radio system
MI2	Microphone Input II
Mic	Microphone
Mid	Medium
MSK	Minimum Shift Keying
OST	Operator Selectable Tone

Abbreviation	Full Spelling or Meaning
PA	Public Address
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 variable carrier oscillator
STX	Start of Text
SW	Switch
TA	Talk Around
TEL	Telephone
TOR	Tone Operated Relay
TOT	Time-out Timer
TX	Transmission, Transmitter
TX LED	Transmission LED
TXD	Transmitted exchange data
TXS	Transmission Sense
TXVCO	Transmitter's variable carrier oscillator
UTC	Universal Coordinated Time
VGS-1	Voice Guide and Storage Unit
VOX	Voice-operated Transmission
With QT/DQT	With QT signaling and DQT code
With STE	With Squelch Tail Eliminator

About Trademark

FleetSync® and FleetSync® II are registered trademarks of Kenwood Corporation.

IBM® is a trademark or a registered trademark of International Business Machines Corporation.

Microsoft, Windows® 98, Windows® Me, Windows® 2000, Windows® XP and Windows logo are registered trademarks of Microsoft Corporation.

All other product names referenced herein are trademarks or registered trademarks of their respective manufacturers.

Description

■ About the TK-2170/ TK-3170/ TK-3173

TK-2170/ TK-3170/ TK-3173 is a versatile VHF/ UHF portable transceiver that supports Conventional System and LTR Trunked Radio System (TK-3173 only).

■ Features

- Channel data can be easily configured by using KPG-101D.
- Conventional Group and Trunking System (TK-3173 only) can be configured for each zone.
- FleetSync, DTMF or 2-tone can be configured for Signaling type.
- A maximum of 128 zones can be configured.
- A maximum of 128 channels can be configured for each zone.
- The transceiver supports the VOX function.
- The transceiver supports FleetSync.
- The transceiver has a built-in entry level Scrambler function.
- The transceiver has the Priority Scan function using Priority Channel.
- The transceiver has a password function to protect its configuration data.
- The transceiver displays the remaining battery capacity.

■ About the Programming Software

The transceiver's functions can be configured by using KPG-101D. Configuration data configured by using KPG-101D can be written to the transceiver by connecting the transceiver to the PC using the KPG-22 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 function also appearing in the Field Programming Reference.

1 BASIC FUNCTIONS

1.1 Functions and Panel Layout

1.1.2 TK-2170/ TK-3170/ TK-3173

1.1.1 Model List

TK-2170/ TK-3170 and TK-3173 have the following variations. The antenna is an optional part. A user must procure and install the following antenna or antenna recommended by Kenwood if an antenna is required.

Table 1-1 Model List

Model Name	Optional Antenna	Frequency Coverage	Keypad	System
TK-2170 K	KRA-16 (Stubby) KRA-22 (Helical) KRA-26 (Whip)	136 to 174 MHz	4-key	Conventional
TK-2170 K2	KRA-16 (Stubby) KRA-22 (Helical) KRA-26 (Whip)	136 to 174 MHz	16-key	Conventional
TK-3170 K	KRA-17 (Stubby) KRA-23 (Helical) KRA-27 (Whip)	450 to 490 MHz	4-key	Conventional
TK-3170 K3	KRA-17 (Stubby) KRA-23 (Helical) KRA-27 (Whip)	400 to 430 MHz	4-key	Conventional
TK-3170 K4	KRA-17 (Stubby) KRA-23 (Helical) KRA-27 (Whip)	450 to 490 MHz	16-key	Conventional
TK-3170 K6	KRA-17 (Stubby) KRA-23 (Helical) KRA-27 (Whip)	400 to 430 MHz	16-key	Conventional
TK-3173 K	KRA-17 (Stubby) KRA-23 (Helical) KRA-27 (Whip)	450 to 490 MHz	4-key	LTR Trunked radio system

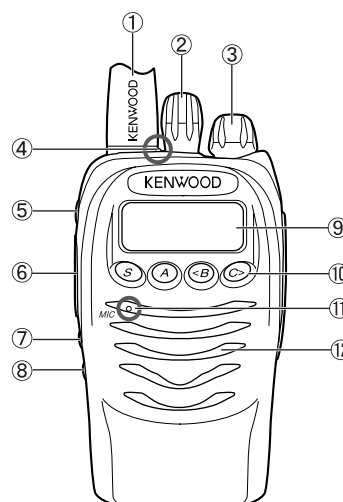


Figure 1-1 4-key Keypad Model

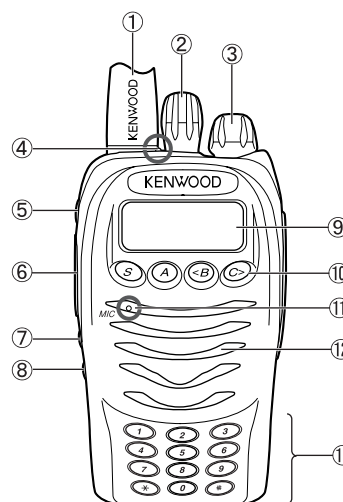


Figure 1-2 16-key Keypad Model

① Antenna

This is the antenna of the transceiver. A user must procure and install the antenna since the antenna is an optional part.

② Selector

The selector can be used to change the zone or channel.

③ Power Switch/ Volume Control

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

④ Transmit LED/ Busy LED

These LEDs light when the transceiver sends or receives signals. (Refer to 3 Display on page 14.)

⑤ AUX Key

Press the **AUX** key to activate the assigned function.

⑥ **PTT Switch**

Press the **PTT** switch to talk.

⑦ **Side 1 Key**

Press the **Side 1** key to activate the assigned function.

⑧ **Side 2 Key**

Press the **Side 2** key to activate the assigned function.

⑨ **LCD**

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

⑩ **PF Key**

Press any **PF** key to activate the function assigned to each function key.

⑪ **Microphone**

Speak into the microphone to talk.

⑫ **Speaker**

The speaker emits the received audio and Alert Tones.

⑬ **Keypad (TK-2170 K2, TK-3170 K4, TK-3170 K6 only)**

Press any key to activate the function assigned to a function key or to enter the key number.

1.2 Zone Description

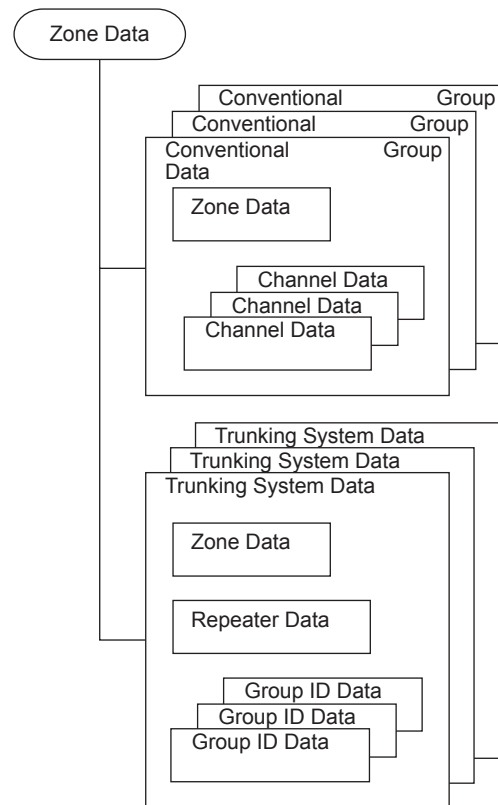


Figure 1-3 Zone Description

Conventional Groups and Trunking Systems can be configured for each zone using KPG-101D.

A maximum of 128 zones can be configured for the transceiver.

Conventional Group consists of Simplex and Semi-duplex Conventional Channels.

Trunking System consists of Group IDs (GIDs) used for communicating using the LTR (Logic Trunked Radio) Trunking protocol. Trunking System operation is only available with the TK-3173.

A maximum of 128 channels and 250 Group IDs can be configured for each zone and a maximum of 128 channels and 250 Group IDs can be configured for each transceiver.

Note:

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

1.3 Transmit and Receive Frequency

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

A transmit frequency and a receive frequency can be configured for each channel by using KPG-101D.

Table 1-2 Transmit/ Receive Frequencies and Step Sizes

Model	Transmit and Receive Frequency	
	Range [MHz]	Step [kHz]
TK-2170	136 to 174	2.5/ 5.0/ 6.25/ 7.5
TK-3170	400 to 430 450 to 490	5.0/ 6.25
TK-3173	450 to 490	5.0/ 6.25

■ Configuration using KPG-101D

- Configuring Transmit and Receive Frequency for each channel (Refer to FPRG 6.4.3 Receive frequency and 6.4.4 Transmit frequency.)
- Configuring Transmit and Receive Frequency for the Home Repeater (Refer to FPRG 6.5.3 Receive Frequency, 6.5.4 Transmit Frequency.)

1.4 Transmit Power

Low can be configured for the transmit power to conserve battery power if a repeater or the receiving party is nearby. Using low transmit power extends the operating time of the transceiver.

Transmit power can be configured for each CH/GID using KPG-101D.

Transmit Power can be configured using the **Low Transmit Power** key.

Table 1-3 Transmit Power: Low/ High

Model	Transmit Power [W]	
	Low	High
TK-2170	1	5
TK-3170	1	4
TK-3173	1	4

Note: The transmit power cannot be switched to High Transmit Power even if the **Low Transmit Power** key is pressed while on CH/GIDs configured for Low Transmit Power. In this case, the transceiver emits the Key-entry Error Tone.

■ Configuration using KPG-101D

- Configuring the Transmit Power (Low or High) for each channel (Refer to FPRG 6.4.9 Transmit Power.)
- Configuring the Transmit Power (High or Low) for each Group ID (Refer to FPRG 6.6.6 Transmit Power.)
- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)

1.5 Channel Spacing

Channel Spacing is the bandwidth used for communication.

Channel Spacing can be configured for each channel using KPG-101D.

Table 1-4 Channel Spacing: Wide/ Narrow

Model	Channel Spacing [kHz]	
	Wide	Narrow
TK-2170/ TK-3170/ TK-3173	25	12.5

■ Configuration using KPG-101D

- Configuring the Channel Spacing (Wide or Narrow) for each channel (Refer to FPRG 6.4.10 Wide/ Narrow.)
- Configuring the Channel Spacing (Wide or Narrow) for each repeater (Refer to FPRG 6.3.3 Wide/ Narrow.)

1.6 Squelch Level

Squelch Level determines the received signal level necessary for output to be heard from the speaker.

When the received signal is weak, configure a lower Squelch level value. Increase Squelch Level to block speaker output of unwanted weak signals.

Table 1-5 Squelch Level

Range	0	1 to 9
	Mute function is completely disabled.	Shallow (Small) to Tight (Large)
In steps of	1	

■ Transceiver Operation

Follow the procedure below to change the Squelch Level.

1. Press the **Squelch Level** key.

The “🔊” icon and current Squelch Level appear on the display.



2. Select the Squelch Level.

The Squelch Level changes in conjunction with the selection.

- Using **PF** Keys
Press the **[C>]** key to increase the Squelch Level.
Press the **[<B]** key to decrease the Squelch Level.
- Using the **Selector** *1
Turn the **Selector** clockwise to increase the Squelch Level.
Turn the **Selector** counterclockwise to decrease the Squelch Level.

*1 If the List Selection Key (Selector) is enabled.



3. Press the **[S]** key.

The Squelch Level changes and a normal display appears on the display. In this case, the “🔊” icon disappears.



Note: Following are the operations of the keys while changing the Squelch Level.

Table 1-6 Key Operation

Key	Operation
Selector	Increments or decrements the displayed digit and confirms the Squelch Level * If the List Selection Key (Selector) is enabled.
Side 1	The transceiver exits from the current mode.
[S]	The transceiver exits from the current mode.
[A]	-
[<B]	Decrements the displayed digit and confirms the Squelch Level.
[C>]	Increments the displayed digit and confirms the Squelch Level.
Side 2	-
[0] to [9]	-
[*]	The transceiver exits from the current mode.
[#]	-
PTT switch	The transceiver exits from the current mode and transmits.

■ Configuration using KPG-101D

- Configuring the Squelch Level for the transceiver (Refer to FPRG 6.7.3 Conventional Tab - Squelch Level.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

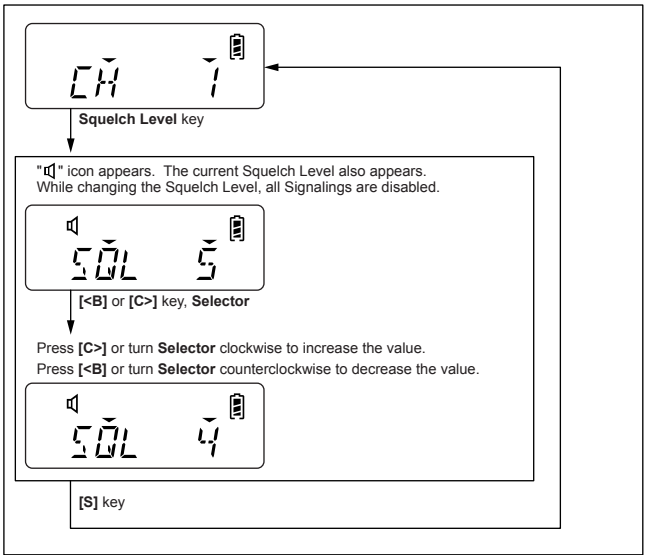


Figure 1-4 Squelch Level

1.7 Compander

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

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

Enable or disable Compander by using KPG-101D. The transmitting party and the receiving party must have the same configuration.

■ Configuration using KPG-101D

- Configuring the Compander to be enabled or disabled for each channel (Refer to FPRG 6.4.18 Compander.)
- Configuring the Compander to be enabled or disabled for each GID (Refer to FPRG 6.6.13 Compander.)

1.8 Beat Shift

This function eliminates internal harmonics caused by the transceiver's oscillators.

The harmonics of the oscillators may interfere with reception. The internal beat can be moved by slightly shifting the frequency of the oscillators.

Enable or disable Beat Shift by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Beat Shift to be enabled or disabled (Refer to FPRG 6.4.17 Beat Shift and 6.5.5 Beat Shift.)

1.9 Key Lock

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 configured by using KPG-101D to be enabled or disabled.

The following list shows the keys made inoperable by disabling Key Lock.

Table 1-7 Unavailable Keys while Key Lock is Enabled

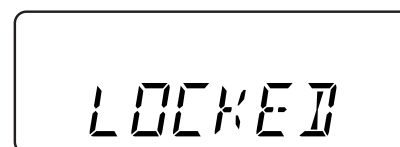
Configuration	Inoperable Keys
Front Key	Selector Front Key 12-key keypad
12-key	12-key keypad

Note: Transceiver Password is enabled before Key Lock operates if the Transceiver Password is configured. Key Lock is enabled when Transceiver Password is disabled.

■ Transceiver Operation

● Enabling Key Lock

1. Press and hold the **Key Lock** key for 1 second while Key Lock is disabled.
"LOCKED" appears on the display and the transceiver's keys are locked.



● Disabling Key Lock

1. Press and hold the **Key Lock** key for 1 second while Key Lock is enabled.
Key Lock is disabled.

■ Configuration using KPG-101D

- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Assigning keys to be locked with Key Lock (Refer to FPRG 6.8.2 General Tab - Key Lock.)

1.10 Keypad Operation

Keypad operation can be configured for the user preference.

A frequently used function can be configured for access via the keypad.

Keypad operation can be configured by using KPG-101D. The following functions can be assigned to the keypad.

Table 1-8 Available Functions

Configuration	Operation
OST (Operator Selectable Tone)	Using the keypad, the OST can be selected from the OST List 1 to 40.
Channel Entry	Using the keypad, channels can be directly selected.
DTMF (Autodial)	Using the keypad, the transceiver can send a selected DTMF code. The Autodial List configured by using KPG-101D can be selected and sent. A DTMF code can be entered and sent if Store & Send is enabled. A DTMF code can be entered and sent when the Autodial key is pressed.
DTMF (Keypad Auto PTT)	Using the keypad, the transceiver can directly send DTMF codes.
FleetSync (Selcall)	Using the keypad, the transceiver can make a FleetSync Selcall. The Selcall List configured by using KPG-101D can be selected and sent. A Selcall ID code can be entered and sent if Manual Dialing is enabled. A Selcall ID code can be entered and sent if the Selcall key is pressed.
FleetSync (Status)	Using the keypad, the transceiver can send a FleetSync Status message. The Status List configured by using KPG-101D can be selected and sent. A Status data number can be entered and status data can be sent if Manual Dialing is enabled. The transceiver can also send Status data when the Status key is pressed.
FleetSync (Selcall + Status)	Using the keypad, the transceiver can send FleetSync Selcall + Status. The Selcall List or Status List configured by using KPG-101D can be selected and sent. A Selcall or Status code can be entered and sent if Manual Dialing is enabled. The transceiver can also send the Selcall List or Status List when the Selcall + Status key is pressed.

■ Configuration using KPG-101D

- Configuring the Keypad Operation (Refer to FPRG 6.8.2 General Tab - Keypad Operation.)

1.11 Call Key

The **Call** key is used to send FleetSync Status, 2-tone and DTMF codes with single key operation.

The transceiver directly sends Status, 2-tone or DTMF codes configured by using KPG-101D if the **Call 1** or **Call 2** key is pressed. The timing and duration to send codes vary depending on the parameters of FleetSync, 2-tone or DTMF. The FleetSync Status code is sent to the Target Fleet/ Target ID.

Assign the function to be sent to the **Call 1** or **Call 2** key by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the **Call** Key (Refer to FPRG 6.8.4 Call Tab.)

1.12 Mic Sense

Mic Sense Control can be switched between Normal and High Level. The gain difference between Normal and High Level is approximately 4 dB.

Mic Sense Control can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Mic Sense (Refer to FPRG 6.7.1 Common Page 1 Tab - Mic Sense.)
- Configuring the Emergency Mic Sense (Refer to FPRG 6.14.12 Emergency Mic Sense.)

1.13 Battery Saver

Battery Saver turns Off the receiver circuits periodically to reduce battery consumption.

The transceiver receives intermittently in the following conditions:

- While no carrier is detected.
- If no key is pressed for more than 5 seconds while a carrier is detected and the QT/DQT does not match.

A user may have a chance to miss a call when the transceiver receives a call while Battery Saver is enabled. To avoid this, the transmitting party must be delayed to talk or sending data after the transceiver starts transmitting.

Battery Saver can be configured by using KPG-101D. Following are the duration of intermittent reception.

Table 1-9 Intermittent Reception Intervals

Battery Saver	QT/DQT or Optional Signaling Not Configured	QT/DQT or Optional Signaling Configured
Off	Off	Off
On	800 ms	200 ms

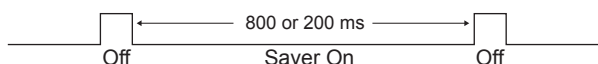


Figure 1-5 Battery Saver

■ Configuration using KPG-101D

- Configuring the Battery Saver (Refer to FPRG 6.7.2 Common Page 2 Tab - Battery Saver.)

1.14 Mode Reset Timer

Mode Reset Timer is used to exit from Special Mode or reset other statuses.

There are several Special Modes in the transceiver. When the transceiver enters Special Mode, the current Special Mode display appears on the display.

Key functions configured in Key Assignment cannot be used since the following keys are fixed.

- **[S]** Key
- **[A]** Key
- **[<B]** Key
- **[C>]** Key
- **Side 1** Key
- **Side 2** Key
- **Selector**
- 12-key keypad
(TK-2170 K2/ TK-3170 K4/ TK-3170 K6 only)

With the Mode Reset Timer, the transceiver can automatically and reliably exit from Special Mode.

The Mode Reset Timer is used for the following Special Modes and other statuses.

Table 1-10 Available Special Modes for Mode Reset Timer

2-tone Encode List Select Mode
Autodial Mode
Autodial Programming Mode
Channel Entry Mode
OST List Select Mode
Transceiver Password Mode
Scrambler Code Select Mode
Selcall Mode
Squelch Level Adjustment Mode
Stack Mode
Status Mode
VOX Level Adjustment Mode

Note: "PASSWORD" appears on the display when the Mode Reset Timer expires in Transceiver Password Mode.

■ Configuration using KPG-101D

- Configuring the Mode Reset Timer (Refer to FPRG 6.7.1 Common Page 1 Tab - Mode Reset Timer.)

2 BASIC OPERATION

2.1 Turning the Transceiver ON/OFF

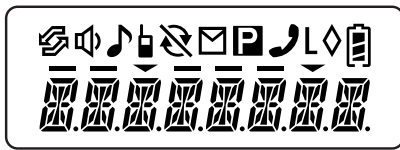
2.1.1 Turning the Transceiver ON

The transceiver can be turned ON or OFF by pressing the **Power** switch.

■ If Data is Written to the Transceiver and No Password is Configured:

1. Turn the **Power** switch clockwise while the transceiver is turned OFF.

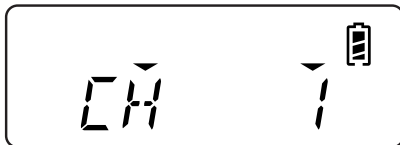
The transceiver is turned ON, emits Power-on Tone for 500 ms if the Power-on Tone is configured and all LCD segments light.



The Power-on Text appears for 2 seconds if the Power-on Text is configured. (Refer to 3.4.6 Power-on Text on page 16.)



The CH/GID Name or Zone-CH/GID number appears on the display. (Refer to 3.4.5 Display Character on page 16.)



■ If Data is Written to the Transceiver and the Password is Configured:

1. Turn the **Power** switch clockwise while the transceiver is turned OFF.

The transceiver is turned ON, emits Power-on Tone for 500 ms and "PASSWORD" appears on the LCD. (Refer to 5.1 Transceiver Password on page 24.)



2. Enter the password.

The transceiver emits Password Authorization Tone when a correct password is entered.

The Power-on Text appears for 2 seconds if the Power-on Text is configured. (Refer to 3.4.6 Power-on Text on page 16.)



The CH/GID Name or Zone-CH/GID number appears on the display. (Refer to 3.4.5 Display Character on page 16.)



■ If No Data is Written to the Transceiver:

1. Turn the **Power** switch clockwise while the transceiver is turned OFF.

"UNPROGRAM" appears on the LCD after the transceiver is turned ON.



2.1.2 Turning the Transceiver OFF

The transceiver is turned OFF if the **Power** switch is fully turned counterclockwise while the transceiver is turned ON.

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.

2.3 Using Function Keys

Press a key to activate the function assigned to each function key. (Refer to 8 Key Assignment on page 29.)

2.4 Changing the Zone

The Zone number can be changed by using the **Selector**, **Zone Up** or **Zone Down** key. (Refer to 8 Key Assignment on page 29.)

Although the transceiver pauses scanning if the zone is changed during the scan, the transceiver resumes scanning after 1 second. (Refer to 21 Scan on page 105.)

The transceiver skips unprogrammed zones if the zone is changed.

The Rollover Tone sounds if the smallest zone number is selected. (Refer to 4.1 Tone Pattern on page 19.)

■ Transceiver Operation

● Using the Selector

- Turn the **Selector** clockwise.
The zone number increments in steps of 1.
- Turn the **Selector** counterclockwise.
The zone number decrements in steps of 1.

● Using the PF keys

- Press the **Zone Up** key.
The zone number increments in steps of 1.
- Press and hold the **Zone Up** key for more than 1 second.
The zone number keeps incrementing in steps of 1 every 200 ms.
- Press the **Zone Down** key.
The zone number decrements in steps of 1.
- Press and hold the **Zone Down** key for more than 1 second.
The zone number keeps decrementing in steps of 1 every 200 ms.

■ Configuration using KPG-101D

- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)

2.5 Changing the CH/GID

CH/GID can be changed using the **Selector**, **CH/GID Up** or **CH/GID Down** key. (Refer to 8 Key Assignment on page 29.)

Although the transceiver pauses scanning if the CH/GID is changed during the scan, the transceiver resumes scanning after 1 second. (Refer to 21 Scan on page 105.)

The transceiver skips unprogrammed CH/GID numbers if the CH/GID number is changed.

The Rollover Tone sounds if the smallest CH/GID is selected. (Refer to 4.1 Tone Pattern on page 19.)

■ Transceiver Operation

● Using the Selector

- Turn the **Selector** clockwise.
The CH/GID number increments in steps of 1.
- Turn the **Selector** counterclockwise.
The CH/GID number decrements in steps of 1.

● Using the PF keys

- Press the **CH/GID Up** key.
The CH/GID number increments in steps of 1.
- Press and hold the **CH/GID Up** key for more than 1 second.
The CH/GID number keeps incrementing in steps of 1 every 200 ms.
- Press the **CH/GID Down** key.
The CH/GID number decrements in steps of 1.
- Press and hold the **CH/GID Down** key for more than 1 second.
The CH/GID number keeps decrementing in steps of 1 every 200 ms.

■ Configuration using KPG-101D

- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)

2.6 Channel Entry

Channel Entry can be used to directly change the CH/GID.

A CH/GID number in the current zone can be selected by entering numbers after pressing the **Channel Entry** key.

The transceiver automatically detects the highest channel number. Enter the number to specify the channel.

■ Transceiver Operation

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

1. Press the **Channel Entry** key.
The transceiver enters Channel Entry Mode.

2. Enter the channel number.
 - Press the **[1]**, **[2]** and **[8]** keys to recall the channel number 128.
 - Press the **[0]**, **[9]**, and **[0]** keys to recall the channel 90.
 - Press the **[0]**, **[0]** and **[7]** keys to make a call to recall the channel number 7.

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

1. Press the **Channel Entry** key.
The transceiver enters Channel Entry Mode.

2. Enter the channel number.
 - Press the **[9]** and **[0]** keys to recall the channel number 90.
 - Press the **[0]** and **[7]** keys to recall the channel number 7.

- **If the maximum channel number has only 1 numeric digit:**

1. Press the **Channel Entry** key.
The transceiver enters Channel Entry Mode.
2. Enter the Channel number.
 - Press the **[7]** key to recall the channel number 7.

Note:

- ◆ If no key is pressed before the Mode Reset Timer expires while in Channel Entry Mode, the previous display appears on the display.
- ◆ If an unprogrammed channel is specified, the transceiver returns to the channel used before the transceiver entered Channel Entry Mode.
- ◆ The transceiver pauses scanning when the transceiver enters Channel Entry Mode during the scan and resumes scanning when the transceiver exits from Channel Entry Mode.
- ◆ Following key operations are available while entering the channel number in Channel Entry Mode.

Table 2-1 Key Operation

Key	Operation
Selector	Increments or decrements the CH/GID* ¹
Side 1	The transceiver exits from the current mode.
[S]	The transceiver exits from the current mode. * ¹ Confirms the channel number* ²
[A]	The transceiver exits from the current mode. * ¹ Deletes a character.
[<B]	-
[C>]	-
Side 2	-
[0] to [9]	Enters the channel number.
[*]	Confirms the CH/GID.
[#]	Deletes a character.
PTT switch	The transceiver exits from the current mode and transmits.

*¹ If "4-key" is selected from the **Product Information** window > **Key** dropdown list:

*² When "16-key" is selected from the **Product Information** window > **Key** dropdown list:

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

2.7 Home CH/GID

This function is used to jump to a frequently used CH/GID with a single press of a key. The transceiver can jump to a CH/GID in the same zone instantly.

Home CH/GID can be changed using the **PF** key if Operator Selectable Home-CH/GID is configured by using KPG-101D.

Home CH/GID can be configured by using KPG-101D.

Note: Refer to Scan Function for operation if the **Home CH/GID** key is pressed during the scan. (Refer to 21.1.4 Operation after Manually Changing the Zone-CH/GID during the Scan on page 106.)

■ Transceiver Operation

- **Jumping to the Home CH/GID**

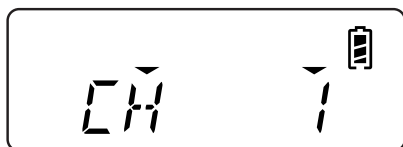
1. Press the **Home CH/GID** key.
The transceiver jumps to the Home CH/GID configured for the current zone.



- **Returning to the Previous CH/GID**

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

The transceiver returns to the previous CH/GID.



- **Changing the Home CH/GID**

1. Select a CH/GID to be used as the Home CH/GID.



2. Press and hold the **Home CH/GID** key for 3 seconds.

The transceiver emits Key Beep C and the Home CH/GID is changed.

- **Configuration using KPG-101D**

- Configuring the Home Channel (Refer to FPRG 6.2.3 Home Channel.)
- Configuring the Home GID (Refer to FPRG 6.3.6 Home GID.)
- Configuring the Operator Selectable Home-channel (Refer to FPRG 6.2.4 Operator Selectable Home-channel.)
- Configuring the Operator Selectable Home-GID (Refer to FPRG 6.3.7 Operator Selectable Home-GID.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

2.8 Direct CH/GID

Direct CH/GID is used to jump to a programmed CH/GID with a single press of a key. The transceiver can jump to the CH/GID in a different zone instantly.

Direct CH/GID can be changed using the **PF** key if Operator Selectable is enabled by using KPG-101D.

Direct CH/GID can be configured by using KPG-101D.

Note: Refer to Scan Function for operation if one of the **Direct CH/GID 1** to **Direct CH/GID 4** keys is pressed during the scan. (Refer to 21.1.4 Operation after Manually Changing the Zone-CH/GID during the Scan on page 106.)

- **Transceiver Operation**

- **Jumping to the Direct CH/GID**

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

The transceiver jumps to the Direct CH/GID even if it is not within the current zone.



- **Changing the Direct CH/GID**

1. Select a CH/GID to be used as the Direct CH/GID.



2. Press and hold one of the **Direct CH/GID 1** to **Direct CH/GID 4** keys for 3 seconds.

The transceiver emits Key Beep C and the Direct CH/GID is changed.

- **Configuration using KPG-101D**

- Configuring the Direct CH/GID (Refer to FPRG 6.8.5 Direct CH/GID Tab - CH/GID.)
- Configuring the Operator Selectable Direct-CH/GID (Refer to FPRG 6.8.5 Direct CH/GID Tab - Operator Selectable.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

2.9 Receive

2.9.1 Conventional Group

The transceiver can communicate with the receiving party only if the received QT/DQT code matches the configured QT/DQT code. The transceiver emits the received audio when the QT/DQT code matches.

Receive frequency and QT/DQT Decode must be configured by using KPG-101D.

■ Transceiver Operation

1. Select a Zone-channel to be used. ([Refer to 2.4 Changing the Zone on page 9](#), [2.5 Changing the CH/GID on page 9](#).)
2. Adjust the volume level if needed when the transceiver receives a call. ([Refer to 2.2 Adjusting the Volume on page 9](#).)

■ Configuration using KPG-101D

- Configuring the Receive Frequency (Refer to FPRG 6.4.3 Receive Frequency.)
- Configuring the QT/DQT Decode (Refer to FPRG 6.4.5 QT/DQT Decode.)

2.9.2 Trunking System (TK-3173 only)

The transceiver can communicate with the receiving party only if the received LTR ID matches the configured LTR ID. The transceiver emits the received audio when the LTR ID matches.

Receive Frequency and the Decode ID must be configured by using KPG-101D.

■ Transceiver Operation

1. Select a Zone-Group ID to be used. ([Refer to 2.4 Changing the Zone on page 9](#), [2.5 Changing the CH/GID on page 9](#).)
2. Adjust the volume level if needed when the transceiver receives a call. ([Refer to 2.2 Adjusting the Volume on page 9](#).)

■ Configuration using KPG-101D

- Configuring the Receive Frequency (Refer to FPRG 6.5.3 Receive Frequency.)
- Configuring the Decode ID (Refer to FPRG 6.6.4 Decode ID.)

2.10 Transmit

2.10.1 Conventional Group

The transceiver sends the programmed QT/DQT code if the **PTT** switch is pressed. If the sent QT/DQT code matches the QT/DQT code configured at the receiving party's transceiver, the caller can communicate with the receiving party.

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

Transmit frequency and QT/DQT Encode must be configured by using KPG-101D.

■ Transceiver Operation

1. Select a Zone-channel to be used. ([Refer to 2.4 Changing the Zone on page 9](#), [2.5 Changing the CH/GID on page 9](#).)
2. Confirm that the channel is available.
3. Speak into the microphone while pressing the **PTT** switch.
4. Release the **PTT** switch to stop the transmission.

■ Configuration using KPG-101D

- Configuring the Transmit Frequency (Refer to FPRG 6.4.4 Transmit Frequency.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.4.6 QT/DQT Encode.)

2.10.2 Trunking System (TK-3173 only)

The transceiver sends the LTR ID while the **PTT** switch is pressed to transmit. The transceiver connects to the repeater and waits to receive data that is echoed back. If the data is correct, the transceiver assumes the connection is properly established and re-transmits to the receiving party.

When the transmitted LTR ID matches the LTR ID configured in the receiving party's transceiver, the transceiver can communicate with the receiving party.

When the **PTT** switch is released, the transceiver sends EOT data to close the speaker of the receiving party's transceiver.

Transmit Frequency and Encode ID must be configured by using KPG-101D.

■ Transceiver Operation

1. Select a Zone-Group ID to be used. ([Refer to 2.4 Changing the Zone on page 9, 2.5 Changing the CH/GID on page 9.](#))
2. Keep pressing the **PTT** switch.
3. Speak into the microphone after the transceiver establishes a link to a repeater.
4. Release the **PTT** switch.

The transceiver enters receiving mode.

■ Configuration using KPG-101D

- Configuring the Transmit Frequency (Refer to FPRG 6.5.4 Transmit Frequency.)
- Configuring the Encode ID (Refer to FPRG 6.6.3 Encode ID.)

2.11 Transmitting with Talk Around

This function allows a user to communicate with another transceiver without using a repeater. ([Refer to 11 Talk Around on page 34.](#))

2.11.1 Conventional Group

■ Transceiver Operation

1. Select a Zone-channel to be used. ([Refer to 2.4 Changing the Zone on page 9, 2.5 Changing the CH/GID on page 9.](#))
2. Press the **Talk Around** key.
3. Press the **PTT** switch.

The transceiver transmits on the Receive Frequency and sends the Receive QT/DQT instead of transmitting on the Transmit Frequency and sending the Transmit QT/DQT.

2.11.2 Trunking System (TK-3173 only)

■ Transceiver Operation

1. Select a Talk Around Group to be used.
2. Press the **PTT** switch.

The transceiver transmits on the Receive Frequency instead of on the Transmit Frequency. An Encode ID is used as the Transmit ID.

The transceiver has the following displays and indicators:

Busy LED

Transmit LED

LCD

Backlight

3.1 Busy LED

The Busy LED lights green when the transceiver receives the following signals:

- The transceiver receives a carrier.
- The transceiver receives data in PC Mode, Firmware Programming Mode or Clone Mode.

The Busy LED can be configured to light when the transceiver is receiving a carrier by using KPG-101D.

The Transmit LED and Busy LED can be configured to light when the transceiver is communicates in Emergency Mode by using KPG-101D.

Note: The Busy LED does not light in LTR Trunked radio system even if the transceiver receives a carrier.

■ Configuration using KPG-101D

- Configuring the Busy LED to light (Refer to FPRG 6.7.3 Conventional Tab - Busy LED.)
- Configuring the Transmit LED and Busy LED to light in Emergency Mode (Refer to FPRG 6.14.16 Emergency LED.)

3.2 Transmit LED

The Transmit LED lights red when the transceiver starts transmitting the following signals:

- The transceiver sends a carrier.
- The transceiver sends data in PC Mode, Firmware Programming Mode or Clone Mode.

The Transmit LED and Busy LED can be configured to light when the transceiver is communicates in Emergency Mode by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit LED and Busy LED to light in Emergency Mode (Refer to FPRG 6.14.16 Emergency LED.)

3.3 Lamp

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

Press the **Lamp** key to light the backlight LED.

The backlight LED lights when a key or switch other than the **PTT** switch is pressed or the **Selector** is turned if Auto Backlight is enabled.

The backlight LED lights for approximately 5 seconds and automatically turns Off if no key is pressed after the backlight LED turns On.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Configuring the Auto Backlight to be enabled or disabled (Refer to FPRG 6.7.1 Common Page 1 - Auto Backlight.)

3.4 LCD

The LCD of the transceiver appears as follows:

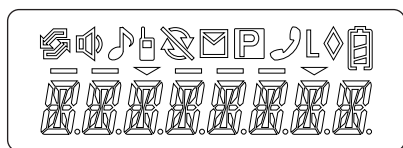


Figure 3-1 TK-2170/ TK-3170/ TK-3173 LCD

■ Available Alphanumeric Digits and Symbols for the Display

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

Figure 3-2 Available Alphanumeric Digits and Symbols for the Display

The following items can be configured for the LCD:

- Zone Name
- Zone-name Text Length
- CH/GID Name
- Display Character
- Power-on Text

Note: Following alphanumeric digits and symbols can be entered.

Table 3-1 Available Characters

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

3.4.1 Zone Name

Zone Name can be used to assign a name to a zone.

A maximum of 8 alphanumeric digits can be configured for each zone. Using Zone Name allows a user to more easily recognize each zone.

A part of the Zone Name appears on the display if Zone Name and Zone-name Text Length are configured.

(Refer to 3.4.2 Zone-name Text Length on page 15.)

Zone Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Zone Name (Conventional Group)
(Refer to FPRG 6.2.1 Zone Name.)
- Configuring the Zone Name (Trunking System)
(Refer to FPRG 6.3.1 Zone Name.)

3.4.2 Zone-name Text Length

Zone-name Text Length can be used to display a part of the Zone Name on the display.

The numeric value configured for Zone-name Text Length determines the number of characters of the Zone Name that appear on the display.

Zone-name Text Length can be configured by using KPG-101D.

Table 3-2 Example of Zone-name Text Length Display

Item	Configuration
Zone-name Text Length	3
Zone Name	KENWOOD
CH/GID Name	CH 1
Annunciator	

■ Configuration using KPG-101D

- Configuring the Zone-name Text Length (Refer to FPRG 6.7.1 Common Page 1 Tab - Zone-name Text Length.)

3.4.3 Channel Name

Channel Name can be used to assign a name to a channel.

A maximum of 8 alphanumeric digits can be configured for each channel. Using Channel Name allows a user to more easily recognize each channel.

Channel Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Channel Name (Refer to FPRG 6.4.7 Channel Name.)

3.4.4 GID Name

GID Name is a name assigned to a Group ID.

A maximum of 8 alphanumeric digits can be configured for each GID. Using GID Name allows a user to more easily recognize each Group ID.

GID Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the GID Name (Refer to FPRG 6.6.5 GID Name.)

3.4.5 Display Character

Display Character can be used to display the CH/GID Name or Zone-CH/GID Number.

CH/GID Name and Zone-CH/GID Number can be switched by pressing the **Display Character** key.

Display Character can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Display Character (Refer to FPRG 6.7.1 Common Page 1 Tab - Display Character.)
- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)

3.4.6 Power-on Text

Power-on Text can be used to display characters 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 by using KPG-101D.

Note:

- ◆ The power-on text disappears if a key is pressed while the power-on text is displayed.
- ◆ If Transceiver Password is configured, the power-on text appears on the display after the Transceiver Password is reset and all LCD segments appear.















■ Configuration using KPG-101D


- Configuring the Power-on Text (Refer to FPRG 6.7.2 Common Page 2 Tab - Text.)

3.5 Icons

The LCD has the following icons.

Table 3-3 Icon List

Icons	Function
	<ul style="list-style-type: none"> Priority Channel Icon This icon represents a Priority Channel.
	<ul style="list-style-type: none"> Monitor Open Icon This icon displays the status of the Mute function and Signaling.
	<ul style="list-style-type: none"> Call Indicator Icon This icon displays the status of Call Indicator when the transceiver receives a call from other users. The status of the icon varies depending on the presence of Trunking Zone Data. If Trunking Zone Data is present: LTR Call Indicator appears. If there is no Trunking Zone Data: DTMF/ 2-tone Call Indicator appears.
	<ul style="list-style-type: none"> Scan Mode Icon This icon indicates the scan status. The Scan Mode icon has 2 statuses. Solid: The transceiver is scanning. Blinking: The transceiver pauses scanning.
	<ul style="list-style-type: none"> Telephone ID Icon (TK-3173 only) This icon indicates the status of Telephone ID. Solid: This icon indicates the Telephone ID status. Blinking: This icon indicates Auto Telephone Search status.
	<ul style="list-style-type: none"> Message Stack Icon This icon indicates Message Stack status. The Message Stack icon has 2 statuses. Solid: All messages are already read. Blinking: There is an unread message.
	<ul style="list-style-type: none"> Talk Around Icon This icon appears if Talk Around is enabled.
	<ul style="list-style-type: none"> Scrambler Icon This icon appears if Scrambler is enabled.
	<ul style="list-style-type: none"> Low Transmit Power Icon This icon appears if Low Transmit Power is selected.
	<ul style="list-style-type: none"> Zone Add Icon This icon appears if Zone Add is enabled.
	<ul style="list-style-type: none"> CH/GID Add Icon This icon appears if CH/GID Add is enabled.
	<ul style="list-style-type: none"> VOX Icon This icon appears if VOX is enabled.
	<ul style="list-style-type: none"> AUX Icon This icon appears if AUX is enabled.
	<ul style="list-style-type: none"> Operator Selectable Tone Icon This icon appears if Operator Selectable Tone is enabled.

Icons	Function
	<ul style="list-style-type: none"> Battery Indicator Icon This icon indicates the status of the battery.

3.5.1 Battery Status/ Battery Warning

This function notifies a user of the remaining battery life and warns of insufficient battery capacity.

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

If this function is enabled, the transceiver emits a beep or displays a warning message if the battery voltage level goes low.

Battery Status/ Battery Warning can be configured to be enabled or disabled by using KPG-101D.

Table 3-4 Battery Status Icon List





Icons	Status
	High
	Sufficient
	Low
	Very Low

Table 3-5 Battery Warning Operation

Battery Warning	Operation
Off	The transceiver can transmit regardless of the battery voltage and the battery warning does not appear.
While Transmitting	<p>The transceiver monitors the battery voltage level while transmitting. When the battery voltage is lowered to the warning voltage level, the LED blinks red and Battery Warning Tone sounds while transmitting.</p> <p>Furthermore, the battery voltage is lowered and the transceiver tries to transmit below the transmission restricted voltage level, the transmission is rejected. The Transmission Restriction Tone also sounds while the PTT switch is pressed.</p>

3 DISPLAY

Battery Warning	Operation
Always	The transceiver always monitors the battery voltage level. When the battery voltage is lowered to the warning voltage level, the LED blinks red. Furthermore, the transceiver transmits below the transmission restricted voltage level, a continuous beep sounds while transmitting.
Always with Beep	The transceiver always monitors the battery voltage level. When the battery voltage is lowered to the warning voltage level, the LED blinks red and Battery Warning Tone sounds while receiving. Furthermore, the transceiver transmits below the transmission restricted voltage level, the Transmission Restriction Tone also sounds while the PTT switch is pressed. The Battery Warning Tone continues to sound even after releasing the PTT switch.

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-101D

- Configuring the Battery Status (Refer to FPRG 6.7.2 Common Page 2 Tab - Battery Status.)
- Configuring the Battery Warning (Refer to FPRG 6.7.2 Common Page 2 Tab - Battery Warning.)

4.1 Tone Pattern

Following tones can be configured for the transceiver.

Table 4-1 Tone List

Tone Type	Description and Tone Names
Power-on Tone	This tone notifies a user that the transceiver is turned ON. • Power-on Tone
Control Tone	The transceiver emits this tone when the transceiver operates. • Key Beep A • Key Beep B • Key Beep C • Key-entry Error Tone • Rollover Tone • Password Authorization Tone • Queue Tone • Free System Ringback Tone • System Search Mode Tone • Ringer Tone • Priority Channel Tone • Scan Stop Tone • Free Channel Tone • Individual Call Tone • Fleet Call Tone • Group Call Tone
Warning Tone	The transceiver emits this tone to warn a user. • Warning Tone A • Warning Tone B • Warning Tone C • TOT Pre-alert Tone • Battery Warning Tone • PLL Unlock Tone • Busy Tone • Man-down Pre-alert Tone • Delay Tone • Intercept Tone • Deny Tone • System Search Tone • System Search End Tone • Data Send Error Tone
Locator Tone	The transceiver emits this tone when the transceiver starts or finishes an automatic transmission in Emergency Mode. • Duration of Locator Tone 1 to Duration of Locator Tone 2
Sidetone	The transceiver emits this tone when communication is established or the transceiver finishes transmitting. • PTT Proceed Tone • VOX Proceed Tone • PTT ID Sidetone • Sidetone (DTMF) • Sidetone (2-tone)
Alert Tone	The transceiver emits this tone when the transceiver receives a call or message. • Alert Tone 1 to Alert Tone 8

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

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 data, such as DTMF Memory or a 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 if an inoperable key is pressed in Selcall Entry or OST Select Mode.
Rollover Tone	The transceiver emits this tone when the smallest zone number or CH/ GID is selected.
Password Authorization Tone	The transceiver emits this tone if the password matches.
Queue Tone	The transceiver emits this tone while the transceiver searches for an available RIC repeater using Auto Telephone in LTR Trunking System. The transceiver keeps emitting this tone until Auto Telephone is disabled due to not finding an available RIC repeater within 60 seconds.
Free System Ringback Tone	The transceiver emits this tone if the transceiver enters Free System Ringback Mode in LTR Trunked System.
System Search Mode Tone	The transceiver emits this tone if the transceiver enters System Search Mode in LTR Trunked System.

4 SOUNDS

Function	Description
Ringer Tone	The transceiver emits this tone if a repeater is available in Free System Ringback Mode in LTR Trunked System.
Priority Channel Tone	The transceiver emits this tone if the transceiver pauses scanning on the Priority Channel.
Free Channel Tone	The transceiver emits this tone if the PTT switch is released while transmission is disabled with Busy Channel Lockout or transmission is enabled.
Scan Stop Tone	The transceiver jumps to the Home CH/GID or Direct CH/GID if the Home CH/GID or Direct CH/GID key is pressed during the scan. In this case, the transceiver emits this tone every 5 seconds while the transceiver is pausing the scan.
Individual Call Tone	The transceiver emits this tone when the transceiver makes a FleetSync Individual Call.
Fleet Call Tone	The transceiver emits this tone when the transceiver makes a FleetSync Fleet Call.
Group Call Tone	The transceiver emits this tone when the transceiver makes a FleetSync Group Call.

4.1.3 Warning Tone

The transceiver emits this tone to warn a user.

Table 4-4 Warning Tone List

Function	Description
Warning Tone A	The transceiver emits this tone until the PTT switch is released if transmission is restricted with the TOT or there is no transmit frequency. In Conventional Group, the transceiver emits this tone until the PTT switch is released while Busy Channel Lock is enabled.
Warning Tone B	The transceiver emits this tone under the same conditions as Warning Tone A while sending with VOX.
Warning Tone C	The transceiver emits this tone under the same conditions as Warning Tone A while making a Paging Call or transmitting by pressing the Call 1 or Call 2 key.
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.

Function	Description
Battery Warning Tone	The transceiver emits this tone if the battery voltage reaches the battery warning level.
PLL Unlock Tone	The transceiver emits this tone if PLL is unlocked.
Busy Tone	The transceiver emits this tone if no repeater is available in LTR Trunked System.
Man-down Pre-alert Tone	The transceiver emits this tone when the remaining time for the Man-down Delay Time is the same as the Man-down Pre-alert Time after the Man-down tilt switch input activates.
Delay Tone	The transceiver emits this tone if a user tries to access the repeater 3 to 6 times in LTR Trunked radio system by pressing the PTT switch. With this tone, the user can recognize that the connection to the repeater is delayed.
Intercept Tone	The transceiver emits this tone if the connection to the repeater fails while the transceiver is trying to access the repeater by pressing the PTT switch in LTR Trunked System.
Deny Tone	The transceiver emits this tone if the transceiver cannot connect to an available RIC repeater within 60 seconds using Auto Telephone in LTR Trunked System.
System Search Tone	The transceiver emits this tone if System is changed while the transceiver is executing System Search in LTR Trunked System.
System Search End Tone	The transceiver emits this tone if no available repeater is found after executing System Search in LTR Trunked System.
Data Send Error Tone	The transceiver emits this tone if the transceiver cannot establish a link to a repeater while sending FleetSync data.

4.1.4 Locator Tone

The transceiver emits this tone if the transceiver starts or finishes automatic transmission in Emergency Mode.

Table 4-5 Locator Tone List

Function	Description
Duration of Locator Tone 1 to Duration of Locator Tone 2	The transceiver emits this tone before or after making an automatic transmission in Emergency Mode.

4.1.5 Sidetone

The transceiver emits this tone if a communication is established or the transceiver finishes transmitting.

Table 4-6 Sidetone List

Function	Description
PTT Proceed Tone	This tone prevents the transceiver on the receiving side from missing calls in Conventional Group. This tone can be used in conjunction with the Proceed Tone Delay Time. The transceiver emits this tone if the transceiver establishes a connection to the repeater by pressing the PTT switch in Trunking System.
VOX Proceed Tone	The transceiver emits this tone when transmitting with VOX.
PTT ID Sidetone	The transceiver emits this tone when sending the FleetSync PTT ID.
Sidetone (DTMF)	The transceiver emits this tone when sending DTMF codes.
Sidetone (2-tone)	The transceiver emits this tone when sending 2-tone codes.

4.1.6 Alert Tone

The transceiver emits this tone when the transceiver receives a call with DTMF, 2-tone or FleetSync.

Select 1 of 8 tones by using KPG-101D.

Table 4-7 Alert Tone List

Function	Description
Alert Tone 1 to Alert Tone 8	The transceiver emits this tone when the transceiver receives a call or message.

4.2 Minimum Volume

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 does not change from the level heard while the control is set to the most counterclockwise position. The transceiver mutes completely if the **Volume** control is turned to the most counterclockwise position while Minimum Volume is not configured.

■ Configuration using KPG-101D

- Configuring the Minimum Volume (Refer to FPRG 6.7.1 Common Page 1 Tab - Minimum Volume.)

4.3 Tone Volume

This function can be used to configure the volume level of various tones by using KPG-101D.

This function can be used to adjust the tone volume level as appropriate for the operating environment.

Tone Volume can be configured for each tone by using KPG-101D. The following Tone Volumes can be configured.

Table 4-8 Available Tone Volume Settings

Tone Volume	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-101D

- Configuring the Power-on Tone (Refer to FPRG 6.7.1 Common Page 1 Tab - Power-on Tone.)
- Configuring the Control Tone (Refer to FPRG 6.7.1 Common Page 1 Tab - Control Tone.)
- Configuring the Warning Tone (Refer to FPRG 6.7.1 Common Page 1 Tab - Warning Tone.)
- Configuring the Alert Tone (Refer to FPRG 6.7.1 Common Page 1 Tab - Alert Tone.)
- Configuring the Sidetone (Refer to FPRG 6.7.1 Common Page 1 Tab - Sidetone.)
- Configuring the Locator Tone (Refer to FPRG 6.7.1 Common Page 1 Tab - Locator Tone.)

4.4 Alert Tone Pattern

This function can be used to configure the Alert Tone pattern when the transceiver receives a DTMF, 2-tone or FleetSync call. An Alert tone matching a user's environment can be configured.

A maximum of 8 Alert Tones can be configured for Alert Tone Pattern. An Alert Tone pattern consists of 16 tones.

Alert Tone Pattern can be configured by using KPG-101D. Below is a list of configuration items for Alert Tone Pattern.

Table 4-9 Alert Tone Pattern

Alert Tone Pattern	Description
Frequency	The tone frequency 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 number of times that the Alert Tone sounds can be configured. A number from 1 to 255 can be configured. The transceiver emits an 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-101D

- Configuring the Alert Tone Pattern (Refer to FPRG 6.13 Special Alert Tone.)

4.5 PTT Release Tone

The PTT Release Tone function notifies a user that communication has ended and the **PTT** switch was released. With this function, the receiving party can easily recognize the appropriate time to transmit since this tone sounds when the caller finishes transmitting.

The transceiver transmits the PTT Release Tone prior to finishing transmission when the caller releases the **PTT** switch.

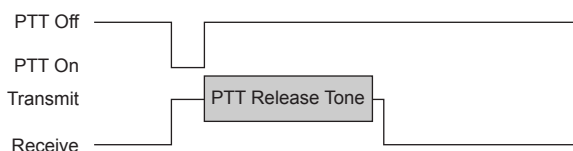


Figure 4-1 PTT Release Tone

The transceiver can be configured to emit the PTT Release Tone in Conventional Group.

The transceiver can be configured to send the Dispatch ID or Telephone ID in Trunking System. This function helps avoid emitting 2 or more different types of tones simultaneously, since some repeaters have a similar function for Telephone IDs.

The transceiver can be configured to emit the PTT Release Tone by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the PTT Release Tone in Conventional Group (Refer to FPRG 6.7.3 Conventional Tab - PTT Release Tone.)
- Configuring the PTT Release Tone (Dispatch) in Trunking System (Refer to FPRG 6.7.4 Trunking Tab - Dispatch.)
- Configuring the PTT Release Tone (Telephone) in Trunking System (Refer to FPRG 6.7.4 Trunking Tab - Telephone.)

4.6 PTT Proceed Tone

The transceiver emits this tone if communication is possible after the **PTT** switch is pressed. The transceiver can be configured to emit the PTT Proceed Tone.

In Trunking System, a user must start talking after the repeater is allocated when the **PTT** switch is pressed. However, this duration is not always same, so that it is difficult for the user to know when to start talking after pressing the **PTT** switch. With this tone enabled, the user can smoothly start talking after the Proceed Tone sounds.

The PTT Proceed Tone can be also used while the transceiver is executing a Conventional Group scan.

The transceiver can be configured to emit the Proceed Tone by using KPG-101D.

Note:

- ◆ The audio is not emitted until the transceiver emits the Proceed Tone sound even if a user starts talking after pressing the **PTT** switch.
- ◆ If the PTT ID is configured for the channel while sending the DTMF, 2-tone or Fleetsync code, the PTT Proceed Tone configuration is reset. In this case, the configuration for PTT ID Sidetone (FleetSync), Sidetone (DTMF) or Sidetone (2-tone) is enabled.

■ Configuration using KPG-101D

- Configuring the PTT Proceed Tone (Conventional Group) (Refer to FPRG 6.7.3 Conventional Tab - PTT Proceed Tone.)
- Configuring the PTT Proceed Tone (Trunking System) (Refer to FPRG 6.7.4 Trunking Tab - PTT Proceed Tone.)

4.7 Proceed Tone Delay Time

This function can be used to control the caller's speaker to emit the PTT Proceed Tone after the configured Proceed Tone Delay Time elapses.

This function prevents the transceiver on the receiving side from missing the first part of calls.

The Proceed Tone Delay Time can be configured by using KPG-101D. The Proceed Tone Delay Time for the caller can be configured in conjunction with the Decode time of the receiving party.

Note: The Proceed Tone Delay Time cannot be configured if the PTT Proceed Tone is disabled.

■ Configuration using KPG-101D

- Configuring the Proceed Tone Delay Time (Conventional Group) (Refer to FPRG 6.7.3 Conventional Tab - Proceed Tone Delay Time.)
- Configuring the Proceed Tone Delay Time (Trunking System) (Refer to FPRG 6.7.4 Trunking Tab - Proceed Tone Delay Time.)

5 PASSWORD FUNCTION

The transceiver has a password function to protect the transceiver operation and configuration of data.

5.1 Transceiver Password

This password prevents unauthorized persons from operating the transceiver. The transceiver activates normally if the correct password is entered after the transceiver is turned ON.

The Transceiver Password can be configured by using KPG-101D. The Transceiver Password can be configured using any numbers between 0 and 999999.

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

■ Transceiver Operation

● Using the keypad

1. Press the numeric keys on the keypad to enter the password.
2. Press the **[S]** or **[*]** key after the password is entered.

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

“PASSWORD” appears on the LCD if an incorrect password is entered and the transceiver returns to Password Entry Mode.

● Using the Selector

1. Select a character using the **Selector**.
2. Press the **[C>]** key to confirm the number.
3. Repeat steps 1 and 2 to enter the entire password.
4. Press the **[S]** or **[*]** key after the entire password is entered.

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

“PASSWORD” appears on the LCD if an incorrect password is entered and the transceiver returns to Password Entry Mode.

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

Table 5-1 Key Operation

Key	Operation
Selector	Increases or decreases the displayed number (0 to 9).
Side 1	The “PASSWORD” appears on the display.
[S]	Password Confirmation
[A]	Press: Deletes a number. Hold: Deletes all numbers.
[<B]	-
[C>]	Confirms the selected number.
Side 2	-
[0] to [9]	Enters the number.
[*]	Password Confirmation
[#]	Press: Deletes a number. Hold: Deletes all numbers.
PTT switch	-

■ Configuration using KPG-101D

- Configuring the Transceiver Password (Refer to FPRG 6.7.1 Common Page 1 Tab - Transceiver Password.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

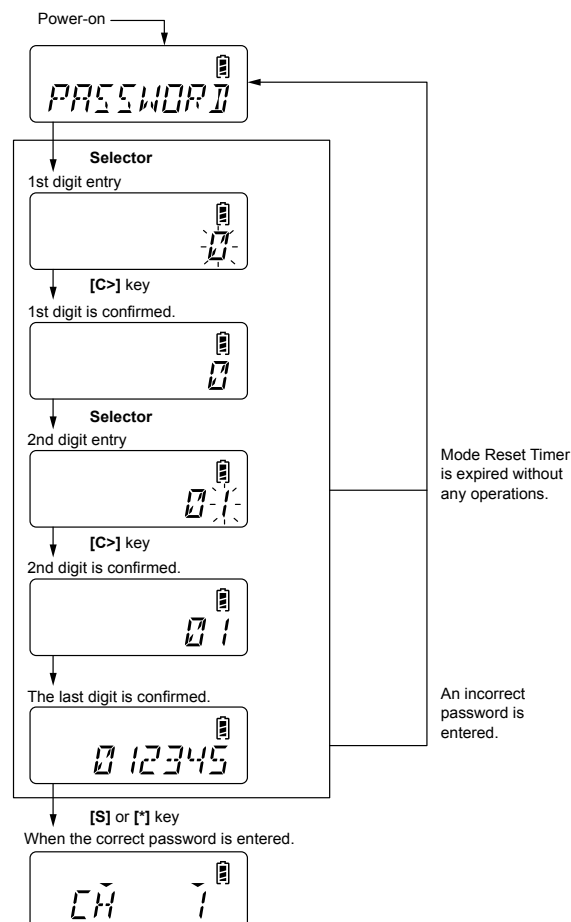


Figure 5-1 Transceiver Password Operation

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-101D from the transceiver configured with a Read Authorization Password, the Read Authorization Password must be entered on a PC. If the password does not match, the data configured on the transceiver cannot be read.

When a Read Authorization Password is configured for the source transceiver, Cloning cannot be started unless the entered password matches.

The Read Authorization Password can be configured by using KPG-101D. The Read Authorization Password can be configured using any numbers between 0 and 999999.

The Read Authorization Password can be configured by using the keypad or **Selector**.

■ Transceiver Operation

● Using the keypad

1. Press the numeric keys on the keypad to enter the password.
2. Press the **[S]** or **[*]** key when the entire password is entered.

● Using the Selector

1. Select a character using the **Selector**.
The selected characters blink.
2. Press the **[C>]** key to confirm the character.
The entered character stops blinking and is confirmed on the display.
3. Repeat steps 1 and 2 to enter the entire password.
4. Press the **[S]** or **[*]** key after the entire password is entered.

Note: The following keys can be used for entering a Read Authorization Password.

Table 5-2 Key Operation

Key	Operation
Selector	Increases or decreases the displayed number (0 to 9).
Side 1	Exits from the current mode.
[S]	Password Confirmation
[A]	Press: Deletes a number. Hold: Deletes all numbers.
[<B]	-
[C>]	Confirms the selected number.
Side 2	-
[0] to [9]	Enters the number.
[*]	Password Confirmation
[#]	Press: Deletes a number. Hold: Deletes all numbers.
PTT switch	-

■ Configuration using KPG-101D

- Configuring the Read Authorization Password (Refer to FPRG 6.7.1 Common Page 1 Tab - Read Authorization Password.)
- Configuring the Clone (Refer to FPRG 6.7.2 Common Page 2 Tab - Clone.)

5.3 Overwrite Password

This function prevents configuration data or operating frequencies from being overwritten by unauthorized persons.

When data is written by using KPG-101D to the transceiver configured with an Overwrite Password, the Overwrite Password must be entered on a PC.

The Overwrite Password can be configured by using KPG-101D. The Overwrite Password can be configured using any numbers between 0 and 999999.

Note: The user cannot clone data to the transceiver with the Overwrite Password.

■ Configuration using KPG-101D

- Configuring the Overwrite Password (Refer to FPRG 6.7.1 Common Page 1 Tab - Overwrite Password.)

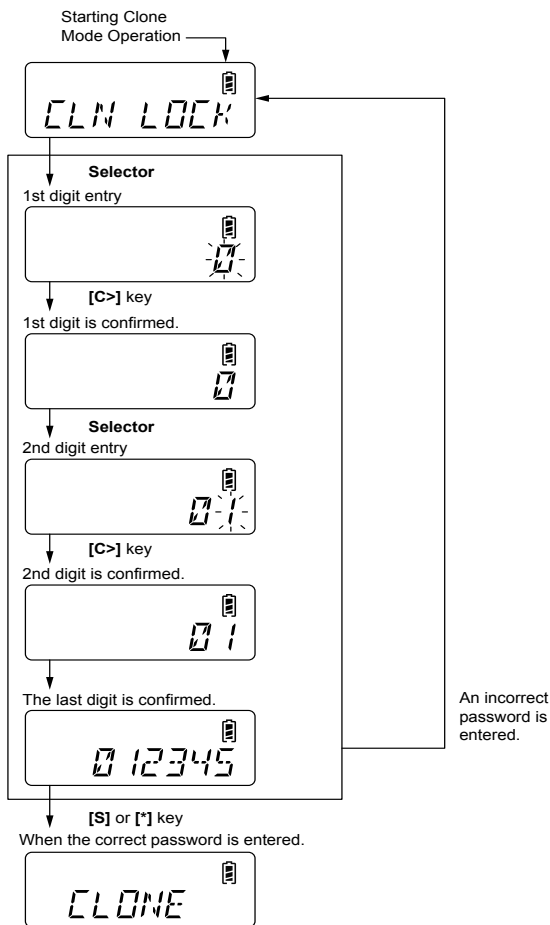


Figure 5-2 Clone Operation Using the Read Authorization Password

6 EMBEDDED MESSAGE FUNCTION

This function can be used to embed a text message (alphanumeric text) 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-101D. 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-101D.

Embedded Message can be viewed if the stored data file is opened.

■ Configuration using KPG-101D

- Configuring the Embedded Message (Refer to FPRG 6.17 Embedded Message.)
- Writing configuration data to the transceiver (Refer to FPRG 7.2 Write Data to the Transceiver.)
- Reading configuration data from 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-101D. 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-101D.

■ Configuration using KPG-101D

- Configuring the Embedded Message with Password (Refer to FPRG 6.18 Embedded Message with Password.)
- Writing configuration data to the transceiver (Refer to FPRG 7.2 Write Data to the Transceiver.)
- Reading configuration data from the transceiver (Refer to FPRG 7.1 Read Data from the Transceiver.)

7 COMMUNICATION PORT

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

7.1 COM port 0, COM port 1

The TK-2170/ TK-3170/ TK-3173 has the following 2 communication ports:

- 2-pin connector is used for the COM port 0.
- The solder pads is used for the COM port 1.

COM 1 is located at the TXD/ RXD pad in the Optional Board Area.

The following functions can be assigned to each communication port by using KPG-101D.

Table 7-1 Available Functions for COM Ports

Function	Communication Port	
	COM port 0	COM port 1
None	This port functions as the KPG-101D communication port.	Disabled
Data	This port functions as the KPG-101D or FleetSync communication port.	

Note: Data cannot be assigned to both COM port 0 and COM port 1 at the same time.

■ Configuration using KPG-101D

- Configuring the COM port 0 and COM port 1 (Refer to FPRG 6.7.3 Common-Page 1 Tab - Function (COM port).)

8 KEY ASSIGNMENT

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

■ Configuration using KPG-101D

- Assigning functions to the **Selector** and **PF** keys (Refer to FPRG 6.8 Key Assignment.)

8.1 Assigning Functions to the Selector

A function can be assigned to the **Selector** by using KPG-101D.

Table 8-1 Assigning Functions to the Selector

Function Name	Description
None	Transceiver does not respond. When the Selector is rotated, the Key-entry Error Tone sounds.
CH/GID Up/Down	When the Selector is rotated, the CH/GID number is incremented or decremented in steps of 1.
Zone Up/Down	When the Selector is rotated, the Zone number is incremented or decremented in steps of 1.

8.2 Assigning Functions to PF keys

A function can be assigned to the **PF** key by using KPG-101D.

Table 8-2 Assigning Functions to PF Keys

Function Name	Description
None	Transceiver does not respond. The transceiver emits the Key-entry Error Tone when the None key is pressed.
2-tone	The 2-tone code stored in the 2-tone Encode List can be selected when the 2-tone key is pressed. The transceiver sends the 2-tone code when the PTT switch or Side 2 key is pressed. (Refer to 19 2-tone on page 76.)
Auto Telephone (TK-3173 only)	The transceiver automatically connects to the LTR System in order to communicate by using a telephone when the Auto Telephone key is pressed. (Refer to 15.1.14 Auto Telephone Search on page 46.)

Function Name	Description
Autodial	When the Autodial key is pressed, a user can select the DTMF code configured in the DTMF Autodial List. The transceiver sends the DTMF code when the PTT switch or Side 2 key is pressed. (Refer to 18 DTMF on page 63.)
Autodial Programming	When the Autodial Programming key is pressed, the DTMF Autodial List can be configured, changed or cleared. (Refer to 18.4.2 Autodial Programming on page 73.)
AUX	When the AUX key is pressed, the AUX 1 Output terminal status can be changed. The AUX 1 Output terminal status is switched to Inactive when the status is Active. On the other hand, the AUX 1 Output terminal status is switched to Active when the status is Inactive. An external device connected to the AUX 1 port can be controlled since the port output changes in conjunction with the AUX key.
Call 1 or Call 2	When one of the Call 1 to Call 2 keys is pressed, the transceiver sends the assigned FleetSync Status, DTMF code or 2-tone code. (Refer to 1.11 Call Key on page 6.)
CH/GID Down	When the CH/GID Down key is pressed, the CH/GID number decrements in steps of 1. The CH/GID is decremented in steps of 1 every 200 ms if the CH/GID Down key is pressed or held for more than 1 second. (Refer to 2.5 Changing the CH/GID on page 9.)
CH/GID Up	When the CH/GID Up key is pressed, the CH/GID number increments in steps of 1. The CH/GID is incremented in steps of 1 every 200 ms if the CH/GID Up key is pressed or held for more than 1 second. (Refer to 2.5 Changing the CH/GID on page 9.)
Channel Entry	When the Channel Entry key is pressed, the channel number can be directly selected using the keypad. (Refer to 2.6 Channel Entry on page 10.)
Direct CH/GID 1 to Direct CH/GID 4	When one of the Direct CH/GID 1 to Direct CH/GID 4 keys is pressed, the transceiver jumps to the configured CH/GID. (Refer to 2.8 Direct CH/GID on page 11.)
Display Character	When the Display Character key is pressed, the CH/GID Name or Zone-CH/GID Number appears on the display. (Refer to 3.4.5 Display Character on page 16.)
Emergency	When the Emergency key is pressed, the transceiver enters Emergency Mode. (Refer to 22 Emergency Mode on page 114.)

8 KEY ASSIGNMENT

Function Name	Description
Home CH/GID	When the Home CH/GID key is pressed, the transceiver jumps to the configured Home CH/GID. (Refer to 2.7 Home CH/GID on page 10.)
Key Lock	When the Key Lock key is pressed, Key Lock can be enabled or disabled. (Refer to 1.9 Key Lock on page 5.)
Lamp	When the Lamp key is pressed, the backlight LED lights. (Refer to 3.3 Lamp on page 14.)
Low Transmit Power	When the Low Transmit Power key is pressed, the transmit power can be changed (High or Low).
Monitor	When the Monitor key is pressed, the QT/DQT or Optional Signaling is reset. (Refer to 16.5 Monitor on page 57.)
Monitor Momentary	When the Monitor Momentary key is pressed and held, the QT/DQT or Optional Signaling is reset. (Refer to 16.5 Monitor on page 57.)
OST	When the OST key is pressed, OST can be enabled or disabled. When the OST key is pressed and held, the Encode/Decode pair can be selected from the OST List. (Refer to 17 OST on page 60.)
Scan	When the Scan key is pressed, the transceiver starts or stops scanning. (Refer to 21 Scan on page 105.)
Scan Delete/Add	When the Scan Delete/Add key is pressed, the Zone-CH/GID can be added to or removed from the Scan List. (Refer to 21.6.1 Scan Delete/Add on page 110.)
Scrambler	When the Scrambler key is pressed, the Voice Scrambler function is enabled or disabled. (Refer to 26 Voice Scrambler on page 124.)
Selcall	The transceiver can make a Selcall when the Selcall key is pressed and the Fleet or ID number is directly entered. (Refer to 20.2 Selcall Function on page 82.)
Selcall + Status	The transceiver can make a Selcall and send a Status Message when the Selcall + Status key is pressed and the Fleet or ID number and Status number are directly entered. (Refer to 20.2 Selcall Function on page 82.)
Squelch Level	When the Squelch Level key is pressed, the transceiver enters the mode allowing a user to change the Squelch Level. (Refer to 1.6 Squelch Level on page 3.)
Squelch Off	When the Squelch Off key is pressed, the transceiver unmutes and received audio can be heard. (Refer to 16.6 Squelch Off on page 58.)

Function Name	Description
Squelch Off Momentary	When the Squelch Off Momentary key is pressed and held, the transceiver unmutes and received audio can be heard. (Refer to 16.6 Squelch Off on page 58.)
Status	When the Status key is pressed, the Status number can be entered directly and the transceiver can send a Status Message. (Refer to 20.3 Status Message Function on page 86.)
Talk Around	When the Talk Around key is pressed, the Talk Around function is enabled or disabled. (Refer to 11 Talk Around on page 34.)
Telephone Disconnect (TK-3173 only)	When the Telephone Disconnect key is pressed, the phone line is disconnected. (Refer to 15.4 Telephone Interconnect on page 51.)
Transceiver Password	When the Transceiver Password key is pressed, the functions of the transceiver are restricted and the transceiver enters Password Entry Mode. (Refer to 5.1 Transceiver Password on page 24.)
VOX	When the VOX key is pressed, the transceiver enters the mode allowing a user to configure the VOX Gain Level. When the VOX key is pressed and held, VOX is enabled or disabled. (Refer to 25 VOX on page 122.)
Zone Down	When the Zone Down key is pressed, the zone number decrements in steps of 1. The zone is decremented in steps of 1 every 200 ms if the Zone Down key is pressed or held for more than 1 second. (Refer to 2.4 Changing the Zone on page 9.)
Zone Up	When the Zone Up key is pressed, the zone number increments in steps of 1. The zone is incremented in steps of 1 every 200 ms if the Zone Up key is pressed or held for more than 1 second. (Refer to 2.4 Changing the Zone on page 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 channel for a long period of time when the channel is shared with other users. The transceiver stops transmitting when the transceiver is continuously transmitting longer than the configured time.

The Time-out Timer can be configured for each zone. The operation of this function varies between Conventional Group and Trunking System (TK-3173 only).

9.1 Conventional Group

The following timers relevant to Time-out Timer functions can be configured in Conventional Group:

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

9.1.1 Time-out Timer

Time-out Timer (TOT) is used to restrict the continuous transmission time.

Time-out Timer can be configured by using KPG-101D.

Note: Time-out Timer does not activate in Emergency Mode.

■ Configuration using KPG-101D

- Configuring the continuous transmission time for each zone (Refer to FPRG 6.2.7 Time-out Timer (TOT).)

9.1.2 TOT Pre-alert

The transceiver emits the TOT Pre-alert to notify a user that the transmission is going to be terminated by the Time-out Timer. The transceiver emits the TOT Pre-alert when the remaining time of TOT is decreased to the duration configured for TOT Pre-alert time.

The timing to emit the TOT Pre-alert tone before the TOT terminates the transmission can be configured by using KPG-101D.

Note: The transceiver emits the TOT Pre-alert tone only when the transceiver is transmitting. This tone does not sound while the transceiver pauses transmitting within the TOT Reset Time. ([Refer to 9.1.4 TOT Reset Time on page 31.](#))

■ Configuration using KPG-101D

- Configuring the TOT Pre-alert Tone (Refer to FPRG 6.2.8 TOT Pre-alert.)

9.1.3 TOT Rekey Time

The function is used to configure the duration of time from when the Time-out Timer terminates the transmission to when the transceiver starts transmitting again. This function is used to temporarily restrict the transmission when a user occupies the repeater or the channel for a long time.

The TOT Rekey Time can be configured by using KPG-101D.

Note:

- ◆ The TOT Rekey Time is reset and transmission is possible after the transceiver is turned ON or OFF while the TOT Rekey Time is counting down.
- ◆ When a CH/GID is changed using the **CH/GID Up** or **CH/GID Down** key while the TOT Rekey Timer is counting down, the timer is reset.

■ Configuration using KPG-101D

- Configuring the TOT Rekey Time (Refer to FPRG 6.2.9 TOT Rekey Time.)

9.1.4 TOT Reset Time

The 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 channel for a long time by transmitting intermittently.

The TOT Reset Time can be configured by using KPG-101D.

Note: When a CH/GID is changed using the **CH/GID Up** or **CH/GID Down** key while the TOT Reset Timer is counting down, the timer is reset.

■ Configuration using KPG-101D

- Configuring the TOT Reset Time (Refer to FPRG 6.2.10 TOT Reset Time.)

9.2 Trunking System (TK-3173 only)

The following timers relevant to Time-out Timer functions can be configured in a Trunking System:

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

9.2.1 Time-out Timer (Dispatch)

The Time-out Timer (Dispatch) is the maximum continuous transmission time to communicate using the Dispatch ID.

The transceiver pauses transmitting and emits the Warning Tone when the transceiver attempts to transmit after the configured Time-out Timer (Dispatch) expires. The Warning Tone keeps sounding until the **PTT** switch is released.

The maximum continuous transmission time using a Dispatch ID can be configured by using KPG-101D.

Note:

- ◆ The transceiver returns to receive mode after the EOT emits if the timer pauses the transmission in FleetSync, etc.
- ◆ The Time-out Timer (Dispatch) does not activate in Emergency Mode.

■ Configuration using KPG-101D

- Configuring the Time-out Timer (Dispatch) (Refer to FPRG 6.3.8 Time-out Timer (Dispatch).)

9.2.2 Time-out Timer (Telephone)

The Time-out Timer (Telephone) is the maximum continuous transmission time to communicate using the Telephone ID.

The transceiver pauses transmitting and emits the Warning Tone when the transceiver attempts to transmit after the configured Time-out Timer (Telephone) expires. The Warning Tone keeps sounding until the **PTT** switch is released.

The maximum continuous transmission time using a Telephone ID can be configured by using KPG-101D.

Note:

- ◆ The transceiver returns to receive mode after the EOT emits if the timer pauses the transmission in FleetSync, etc.
- ◆ The Time-out Timer (Telephone) does not activate in Emergency Mode.

■ Configuration using KPG-101D

- Configuring the Time-out Timer (Telephone) (Refer to FPRG 6.3.9 Time-out Timer (Telephone).)

10.1 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 communications. This function prevents such interference.

“BUSY” appears on the LCD even if the **PTT** switch is pressed while this function is enabled. In this case, the transceiver emits the Warning Tone and does not transmit. The transceiver emits the Warning Tone until the **PTT** switch is released.

Busy Channel Lockout can be configured for each channel by using KPG-101D. Following are the conditions to restrict transmissions with Busy Channel Lockout.

Table 10-1 Conditions to Restrict Transmissions with Busy Channel Lockout

Busy Channel Lockout	Condition
No	Busy Channel Lockout does not activate.
QT/DQT Tone	Disables transmission when QT/DQT configured for a channel does not match the received QT/DQT.
Optional Signaling	Disables transmission until Optional Signaling matches.
Carrier Only	Disables transmission while the carrier is being received. However, the transceiver transmits even if a carrier is detected while the Monitor is enabled.

Note:

- ◆ Busy Channel Lockout is only available in Conventional Group.
- ◆ Talk Around Busy Channel Lockout is used for Trunking System. ([Refer to 11.2.1 Talk Around Busy Channel Lockout on page 35.](#))
- ◆ Busy Channel Lockout does not activate in Emergency Mode.
- ◆ The transceiver transmits even if a signal is detected while Squelch Off and Monitor functions are enabled.

■ Configuration using KPG-101D

- Configuring the Busy Channel Lockout (Refer to FPRG 6.4.12 Busy Channel Lockout.)

11 TALK AROUND

This function allows a user to communicate with another transceiver directly without using a repeater.


11.1 Conventional Group

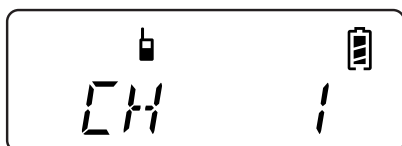
If Talk Around is available on the channel, the transceiver transmits on the receive frequency with Decode Signaling (QT/DQT) configured for the channel.

■ Transceiver Operation

● Enabling Talk Around


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

The “” icon appears and Talk Around is enabled.



● Disabling Talk Around

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

The “” icon disappears and Talk Around is disabled.

Note:

- ◆ Talk Around is disabled when the Zone-channel is changed while Talk Around is enabled.
- ◆ Talk Around does not activate in Emergency Mode.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

11.2 Trunking System (TK-3173 only)

If Talk Around is available on the channel, the transceiver transmits on the transmit frequency of the home repeater with Encode ID configured for the selected zone.

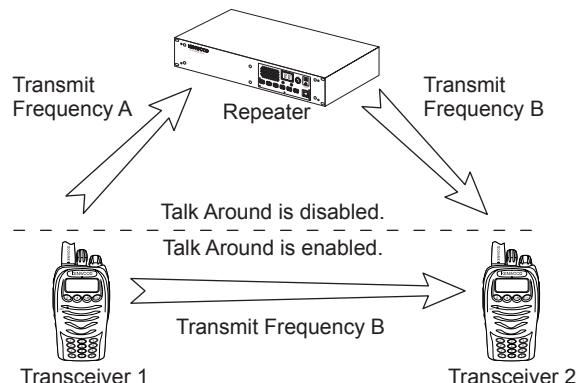



Figure 11-1 Talk Around

Talk Around can be configured to be enabled or disabled for each Group ID by using KPG-101D.

The “” icon appears for the Group ID that Talk Around is enabled. Talk Around cannot be disabled using the **Talk Around** key.

Talk Around can be configured to be enabled or disabled on the Group ID that Talk Around is not enabled by using the **Talk Around** key. **Talk Around** key operation can be enabled or disabled for each zone. (Refer to FPRG 6.3.18 Talk Around Key.)


Note:

- ◆ Talk Around is disabled when the Zone-GID is changed while Talk Around is enabled.
- ◆ **Talk Around** key operation can be configured to be enabled or disabled for each zone.

■ Transceiver Operation


● GIDs where Talk Around is Enabled:

1. Select the GID where Talk Around is enabled.


The “” icon appears and Talk Around is enabled.

● GIDs where Talk Around is Disabled:

1. Press the **Talk Around** key.

The “” icon appears and Talk Around is enabled.

2. Press the **Talk Around** key.

The “” icon disappears and Talk Around is disabled.

■ Configuration using KPG-101D

- Configuring the Talk Around (Refer to FPRG 6.6.12 Talk Around.)
- Assigning functions to the **PF** keys (Refer to 6.8 Key Assignment.)

11.2.1 Talk Around Busy Channel Lockout

This function automatically restricts the transmission automatically not to interfere with other communications.

This function is convenient if the transceiver cannot communicate with a repeater when the distance between the transceiver and the repeater is too far away. If a user transmits on a channel while other groups are using that channel, the user may interfere with communications. This function prevents such interference.

“BUSY” appears on the LCD even if the **PTT** switch is pressed while this function is enabled. In this case, the transceiver emits the Warning Tone and does not transmit. The Warning Tone keeps sounding until the **PTT** switch is released.

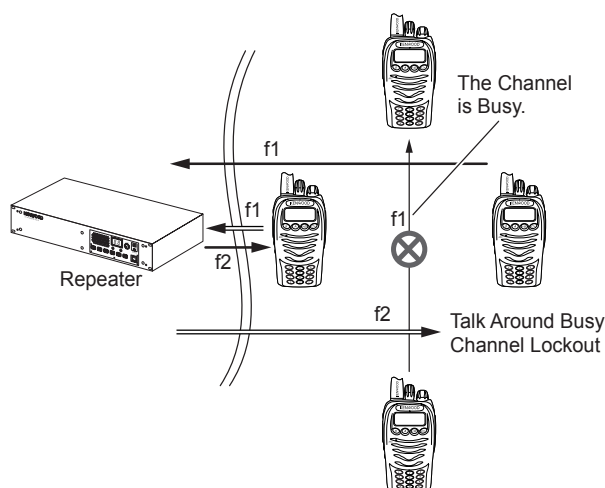


Figure 11-2 Talk Around Busy Channel Lockout

Talk Around Busy Channel Lockout can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Talk Around Busy Channel Lockout (Refer to FPRG 6.3.17 Talk Around Busy Channel Lockout.)

11.2.2 Talk Around Key

Talk Around key can be used to enable or disable the Talk Around key operation in Trunking System.

This function can be used to prevent the Talk Around function from being enabled unintentionally when the **Talk Around** key is pressed when using the Talk Around function only with default setting.

Talk Around key operation can be configured to be enabled or disabled for each zone by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Talk Around Key (Refer to FPRG 6.3.18 Talk Around Key.)

PTT ID is the identification code sent when the **PTT** switch is pressed and/or released.

By using this ID, the dispatcher can identify the caller without asking the user for their name.

The following items relevant to PTT ID can be configured by using KPG-101D:

- PTT ID Type
- Beginning of Transmit
- End of Transmit
- PTT ID (CH/GID)
- Restricted ID in Talk Around

12.1 PTT ID Type

PTT ID Type is the ID type for transmitting the PTT ID. There are 2 types of PTT ID formats: DTMF and FleetSync.

DTMF or FleetSync can be configured for PTT ID Type by using KPG-101D.

Beginning of Transmit and End of Transmit can be configured if DTMF is configured for PTT ID Type. ([Refer to 12.1.1 Beginning of Transmit on page 36](#), [12.1.2 End of Transmit on page 36](#).)

Fleet (Own) and ID (Own) can be configured if FleetSync is configured for PTT ID Type. ([Refer to 20.7.1 Fleet/ ID \(Own\) on page 99](#).)

■ Configuration using KPG-101D

- Configuring the PTT ID Type (Refer to FPRG 6.7.2 Common Page 2 Tab - PTT ID Type.)

12.1.1 Beginning of Transmit

Beginning of Transmit is the ID transmitted at the beginning of transmission when DTMF is selected for the PTT ID Type.

The content of the ID transmitted as BOT can be configured by using KPG-101D. The transceiver does not transmit an ID if the content of the ID is not configured. ID can be configured for each channel in Conventional Group.

■ Configuration using KPG-101D

- Configuring the Beginning of Transmit (Refer to FPRG 6.7.2 Common Page 2 Tab - Beginning of Transmit.)
- Configuring the PTT ID (BOT) (Refer to FPRG 6.4.14 PTT ID (BOT).)

12.1.2 End of Transmit

End of Transmit is the ID transmitted at the end of transmission when DTMF is selected for the PTT ID Type.

The content of the ID transmitted as EOT can be configured by using KPG-101D. The transceiver does not transmit an ID if the content of the ID is not configured. ID can be configured for each channel in Conventional Group.

■ Configuration using KPG-101D

- Configuring the End of Transmit (Refer to FPRG 6.7.2 Common Page 2 Tab - End of Transmit.)
- Configuring the PTT ID (EOT) (Refer to FPRG 6.4.15 PTT ID (EOT).)

12.2 PTT ID (CH/GID)

PTT ID (CH/GID) is the timing to transmit the PTT ID.

PTT ID can be enabled or disabled for each channel by using KPG-101D. Following is the configuration list.

Table 12-1 Timing To Transmit PTT ID
(DTMF Configured for PTT ID Type)

PTT ID	Timing To Transmit PTT ID
Off	No PTT ID is transmitted.
BOT	Transceiver transmits the PTT ID each time the PTT switch at the transmitting party is pressed.
EOT	Transceiver transmits the PTT ID each time the PTT switch at the transmitting party is released.
Both	PTT ID is transmitted when the PTT switch is pressed or released.

Table 12-2 Timing To Transmit PTT ID
(FleetSync Configured for PTT ID Type)

PTT ID	Timing To Transmit PTT ID
Off	No PTT ID is transmitted.
BOT	Transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is pressed.
EOT	Transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is released.
Both	Transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is pressed or released.
List 1 to 100	A user can make an individual call. The ID from 1 to 100 in the Selcall List can be selected. A user can make a Selcall using the Fleet and ID.

Table 12-3 Timing To Transmit PTT ID
(ANI Board Configured for PTT ID Type)

PTT ID	Timing To Transmit PTT ID
Off	No PTT ID is transmitted.
On	Transceiver sends the ANI code of the ANI Board. The timing to send the ANI code is configured at the ANI Board side.

Note:

- ◆ “List 1 to 100” and “On” do not appear on the display if “DTMF” is selected from the **PTT ID Type** dropdown list.
- ◆ “On” does not appear on the display if “FleetSync” is selected from the **PTT ID Type** dropdown list.
- ◆ “BOT”, “EOT”, “Both” and “List 1 to 100” do not appear if “ANI Board” is selected using the **PTT ID Type** dropdown list.
- ◆ The ID configured using **FleetSync** window > **ID List** tab can be selected if List 1 to 100 is selected.

■ **Configuration using KPG-101D**

- Configuring the PTT ID (Conventional Group)
(Refer to FPRG 6.4.13 PTT ID.)
- Configuring the PTT ID (Trunking System) (Refer to FPRG 6.6.8 PTT ID.)

12.3 Restricted ID in Talk Around

This function disables the PTT ID transmission in Talk Around Mode even if the **PTT** switch is pressed or released.

This function can be used when PTT ID is not required such as when directly communicating with other transceivers. Because the PTT ID is normally used for communicating to the base station.

Restricted ID in Talk Around can be configured to be enabled or disabled by using KPG-101D.

Note: Restricted ID in Talk Around is only available in Conventional Group.

■ **Configuration using KPG-101D**

- Configuring the Restricted ID in Talk Around
(Refer to FPRG 6.7.3 Conventional Tab - Restricted ID in Talk Around.)

This function allows the receiving party to send the acknowledge message after the transceiver receives a call. The transceiver also transmits the Transpond Tone when the Acknowledge is sent.

Using this function, a user can confirm a transceiver is within communication range.

Transceiver operation varies between an Optional Signaling call and LTR ID call.

13.1 Transpond Using Optional Signaling

The transceiver sends an acknowledge message to the dispatcher after receiving the individual call with 2-tone or DTMF, or DTMF Stun code.

Note:

- ◆ Transpond does not function with group calls.
- ◆ Transpond is cancelled when the channel is changed while the transceiver is in Transpond Standby Mode.
- ◆ If Clear to Transpond is enabled, the transceiver does not transmit Transpond while the channel is being used. (Refer to [13.3.1 Clear to Transpond on page 38.](#))

13.2 Transpond Using the LTR ID (TK-3173 only)

This function allows the transceiver to send an acknowledge message to the dispatcher after the transceiver receives a call with the LTR ID. The transceiver starts transponding when the Transpond Delay Time elapses. (Refer to [13.4.1 Transpond Delay Time on page 38.](#))

Note:

- ◆ If the ID used for transponding is received during the scan, the transceiver starts transponding after the Transpond Delay Time elapses. The transceiver resumes scanning after the Dwell Time elapses. If the Dropout Delay Time is shorter than the Transpond Delay Time, the transceiver starts transponding after the Dropout Delay Time elapses.
- ◆ Transpond is cancelled if the Zone or GID is changed during the Transpond Delay Time.
- ◆ While Transmit Inhibit is enabled, the transceiver does not start transponding. (Refer to [15.1.19 Transmit Inhibit \(Block ID\) on page 47.](#))

13.3 Conventional Group

13.3.1 Clear to Transpond

Clear to Transpond forces the transceiver to wait while other users are using a channel before starting to transpond.

Clear to Transpond can be configured to be enabled or disabled by using KPG-101D. Clear to Transpond can be configured for 2-tone and DTMF.

■ Configuration using KPG-101D

- Configuring the Clear to Transpond (DTMF) (Refer to FPRG 6.10.2 Decode Tab - Clear to Transpond.)
- Configuring the Clear to Transpond (2-tone) (Refer to FPRG 6.11.2 Decode Tab - Clear to Transpond.)

13.4 Trunking System (TK-3173 only)

This function allows the transceiver to send an acknowledge message to the dispatcher after the transceiver receives a call with the LTR ID. The transceiver starts transponding after the Transpond Delay Time elapses.

Transpond can be configured to be enabled or disabled for each Group ID by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transpond (Refer to FPRG 6.6.11 Transpond.)

13.4.1 Transpond Delay Time

The Transpond Delay Time is the time between when the transceiver receives a Group ID for which Transpond is enabled and when it sends the Transpond code.

If the Dropout Delay Time is shorter than the Transpond Delay Time, the transceiver starts transponding after the Dropout Delay Time elapses. (Refer to [21.6.6 Dropout Delay Time on page 112.](#))

The Transmit Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transpond Delay Time (Refer to FPRG 6.7.4 Trunking Tab - Transpond Delay Time.)

14 CONVENTIONAL GROUP

Conventional Groups are groups of Simplex and Semi-duplex Conventional Channels.

A zone can be configured for Conventional Group by using KPG-101D.

14.1 Zone

The following functions relevant to the zone in Conventional Group can be configured by using KPG-101D:

- Zone Name
- Data Zone-channel
- Home Channel
- Operator Selectable Home-channel
- Optional Signaling Decode Condition
- Audio Control
- Time-out Timer (TOT)
- TOT Pre-alert
- TOT Rekey Time
- TOT Reset Time
- Zone Add
- Scan List

14.1.1 Zone Name

Zone Name can be used to assign a name to a zone. (Refer to 3.4.1 Zone Name on page 15.)

Zone Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Zone Name (Refer to FPRG 6.2.1 Zone Name.)

14.1.2 Data Zone-channel

Data Zone-channel can be used to separate channels for data communications from channels for voice communications. (Refer to 23.1.2 Data Zone-CH/GID on page 120.)

Data Zone-channel can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Data Zone-channel (Refer to FPRG 6.2.2 Data Zone-CH/GID.)

14.1.3 Home Channel

This function can be used to jump to a frequently used channel with a press of the key. (Refer to 2.7 Home CH/GID on page 10.)

The Home Channel can be configured by using KPG-101D.

Note: With this function, the transceiver can only jump to a channel in the same zone.

■ Configuration using KPG-101D

- Configuring the Home Channel (Refer to FPRG 6.2.3 Home Channel.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

14.1.4 Operator Selectable Home-channel

Operator Selectable Home-channel can be used to configure the Home Channel via transceiver operation. A user can change the Home Channel by selecting the channel to be configured as the Home Channel and pressing and holding the **Home CH/GID** key for than 3 seconds while this function is enabled.

When the **Home CH/GID** key is pressed and held for more than 3 seconds while Operator Selectable Home-channel is enabled, the Home Channel can be changed.

Operator Selectable Home-channel can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Configuring the Operator Selectable Home-channel (Refer to FPRG 6.2.4 Operator Selectable Home-channel.)

14.1.5 Optional Signaling Decode Condition

Carrier Decode or QT/DQT Decode can be configured for Optional Signaling Decode Condition.

Optional Signaling Decode Condition can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Optional Signaling Decode Condition (Refer to FPRG 6.2.5 Optional Signaling Decode Condition.)

14.1.6 Audio Control

Audio Control can be used to configure conditions for the transceiver to unmute with QT/DQT and Optional Signaling. (Refer to 16.3 Signaling (Audio Control) on page 56.)

Audio Control can be configured by using KPG-101D. This function can be configured for each zone.

■ Configuration using KPG-101D

- Configuring the Audio Control (Refer to FPRG 6.2.6 Audio Control.)

14.1.7 Time-out Timer (TOT)

Time-out Timer is used to restrict the continuous transmission time. (Refer to 9 Time-out Timer (TOT) on page 31.)

The Time-out Timer can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Time-out Timer (TOT) (Refer to FPRG 6.2.7 Time-out Timer (TOT).)

14.1.8 TOT Pre-alert

The transceiver emits the TOT Pre-alert to notify a user that the transmission is going to be terminated by the Time-out Timer. (Refer to 9.1.2 TOT Pre-alert on page 31.)

The timing to emit the TOT Pre-alert Tone before the TOT terminates the transmission can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the TOT Pre-alert (Refer to FPRG 6.2.8 TOT Pre-alert.)

14.1.9 TOT Rekey Time

The TOT Rekey Time can be used to configure the duration of time from when the transmission ends by the Time-out Timer until a transmission is possible again. (Refer to 9.1.3 TOT Rekey Time on page 31.)

The TOT Rekey Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the TOT Rekey Time (Refer to FPRG 6.2.9 TOT Rekey Time.)

14.1.10 TOT Reset Time

The TOT Reset Time is the period to reset the Time-out Timer. (Refer to 9.1.4 TOT Reset Time on page 31.)

The TOT Reset Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the TOT Reset Time (Refer to FPRG 6.2.10 TOT Reset Time.)

14.1.11 Zone Add

Zone Add can be used to add a zone to the scan list by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Zone Add (Refer to FPRG 6.2.11 Zone Add.)

14.1.12 Scan List (TK-3173 only)

Scan List can be configured for each zone in conjunction with the Scan List Table configuration by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scan List (Refer to FPRG 6.3.13 Scan List and FPRG 6.3.15 Scan List Table Window.)

14.2 Channel

The following functions relating to Conventional Group Channels can be configured by using KPG-101D:

- Receive Frequency
- Transmit Frequency
- QT/DQT Decode
- QT/DQT Encode
- Channel Name
- ID
- Transmit Power
- Wide/ Narrow
- Optional Signaling
- Busy Channel Lockout
- PTT ID
- PTT ID (BOT)
- PTT ID (EOT)
- Scan Add
- Beat Shift
- Compander
- Data
- Voice Scrambler
- Scrambler Code

14.2.1 Receive Frequency

Receive Frequency can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Receive Frequency (Refer to FPRG 6.4.3 Receive Frequency.)

14.2.2 Transmit Frequency

Transmit Frequency can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Frequency (Refer to FPRG 6.4.4 Transmit Frequency.)

14.2.3 QT/DQT Decode

QT/DQT is the signaling used for facilitating communication within a group when sharing the same channel with several groups (Talk Group). ([Refer to 16.1 QT/DQT Decode/ Encode on page 55.](#))

QT/DQT Decode can be configured for each channel by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the QT/DQT Decode (Refer to FPRG 6.4.5 QT/DQT Decode.)

14.2.4 QT/DQT Encode

QT/DQT is the signaling used for facilitating communication within a group when sharing the same channel with several groups (Talk Group). ([Refer to 16.1 QT/DQT Decode/ Encode on page 55.](#))

QT/DQT Encode can be configured for each channel by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the QT/DQT Encode (Refer to FPRG 6.4.6 QT/DQT Encode.)

14.2.5 Channel Name

Channel Name can be used to assign a name to a channel. ([Refer to 3.4.3 Channel Name on page 16.](#))

Channel Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Channel Name (Refer to FPRG 6.4.7 Channel Name.)

14.2.6 ID

ID is used for DTMF Signaling.

ID can be configured by using KPG-101D. (Refer to FPRG 6.4.8 ID.)

14.2.7 Transmit Power

Transmit Power is the transmission power of the transceiver. Low can be configured for the transmit power to reduce battery consumption if a repeater or the receiving party is nearby.

Therefore, the operating time of the transceiver is also extended.

Transmit Power can be switched between High and Low by pressing the **Low Transmit Power** key.

Transmit Power can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Power (Refer to FPRG 6.4.9 Transmit Power.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

14.2.8 Wide/ Narrow

Select the Channel Spacing for available channels.

Wide/ Narrow can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Wide/ Narrow (Refer to FPRG 6.4.10 Wide/ Narrow.)

14.2.9 Optional Signaling

Optional Signaling is signaling used for making an individual call. ([Refer to 16.2 Optional Signaling on page 55.](#))

Optional Signaling can be configured for each channel by using the KPG-101D.

■ Configuration using KPG-101D

- Configuring the Optional Signaling (Conventional Group) (Refer to FPRG 6.4.11 Optional Signaling.)

14.2.10 Busy Channel Lockout

If a user transmits on a channel while other groups are using that channel, the user may interfere with the other groups' communications. Busy Channel Lockout prevents such interference. ([Refer to 10 Busy Channel Lockout on page 33.](#))

Busy Channel Lockout can be configured for each channel by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Busy Channel Lockout (Refer to FPRG 6.4.12 Busy Channel Lockout.)

14.2.11 PTT ID

PTT ID is the transceiver identification code sent when the **PTT** switch is pressed and/or released. ([Refer to 12 PTT ID on page 36.](#))

The timing to send the PTT ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the PTT ID (Refer to FPRG 6.4.13 PTT ID.)

14.2.12 PTT ID (BOT)

PTT ID (BOT) is the ID Code sent at the beginning of the transmission when the transceiver sends the PTT ID while DTMF is configured for PTT ID Type.

PTT ID (BOT) can be configured by using KPG-101D. (Refer to FPRG 6.4.14 PTT ID (BOT).)

14.2.13 PTT ID (EOT)

PTT ID (EOT) is the ID Code sent at the end of the transmission when the transceiver sends the PTT ID while DTMF is configured for PTT ID Type.

PTT ID (EOT) can be configured by using KPG-101D. (Refer to FPRG 6.4.15 PTT ID (EOT).)

14.2.14 Scan Add

Scan Add can be used to add a channel to the Scan List. Scan Add can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scan Add (Refer to FPRG 6.4.16 Scan Add.)

14.2.15 Beat Shift

Beat Shift eliminates internal harmonics caused by the transceiver's oscillators. (Refer to 1.8 Beat Shift on page 5.)

Beat Shift can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Beat Shift to be enabled or disabled for each channel (Refer to FPRG 6.4.17 Beat Shift.)

14.2.16 Compander

Compander can be used to improve the quality of the received audio. (Refer to 1.7 Compander on page 5.)

Compander can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Compander to be enabled or disabled for each channel (Refer to FPRG 6.4.18 Compander.)

14.2.17 Data

A channel can be configured to be used for data communications or voice communications. If the **Data** checkbox is checked, the channel is used for data communications.

Data can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Data (Refer to FPRG 6.4.19 Data.)

14.2.18 Voice Scrambler

Voice Scrambler can be used to scramble speech to allow users to engage in private communications. (Refer to 26 Voice Scrambler on page 124.)

Voice Scrambler can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Voice Scrambler (Refer to FPRG 6.4.20 Voice Scrambler.)

14.2.19 Scrambler Code

Scrambler Code can be configured. (Refer to 26 Voice Scrambler on page 124.)

Two types of scrambler are available. The transceiver can be configured to use a built-in scrambler or an optional scrambler to be installed in the transceiver. As for Scrambler Code configuration, a user can configure the Scrambler Code that may be required for the optional scrambler board.

Scrambler Code can be configured by using KPG-101D.

Note: Scrambler Code cannot be used with a built-in scrambler.

■ Configuration using KPG-101D

- Configuring the Scrambler Code (Refer to FPRG 6.4.21 Scrambler Code.)

15 LTR TRUNKING

An LTR Trunked Radio System is a multiple repeater system that utilizes the LTR Trunking protocol.

In LTR Trunked Radio Systems, the transceiver communicates with other parties via a repeater. In this type of system, a user can communicate automatically with other parties by using an available repeater channel.

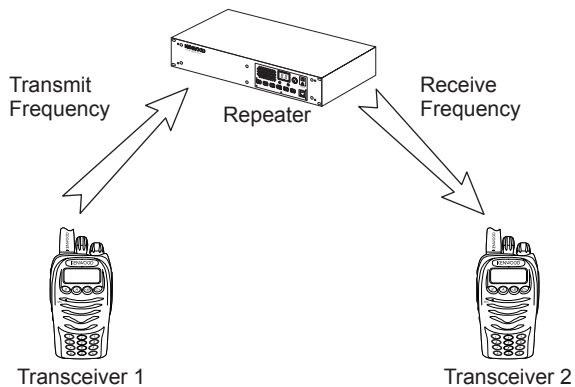


Figure 15-1 LTR Trunked Radio System

The following data format is used to transmit and receive LTR data between a repeater and a transceiver.

Sync	Area	Go to Channel	Home Channel	ID	Free Channel	CRC
9	1	5	5	8	5	7
(40-bit @ 3.36 ms for 134.4 ms frame)						

Figure 15-2 LTR Data Format

The transceiver uses the LTR ID (Group ID) to make a call to the receiving party. A user can communicate if the transmitting party's Encode ID matches the receiving party's Decode ID.

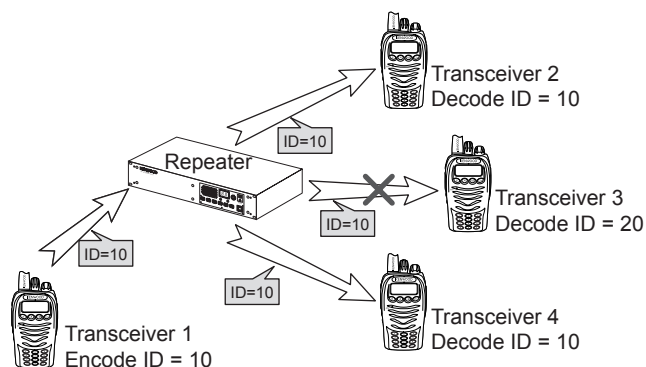


Figure 15-3 Communication in LTR Trunked Radio System

15.1 Zone

The following functions relevant to an LTR Trunked Radio System Zone can be configured by using KPG-101D:

- Zone Name
- Scan Weight
- Wide/ Narrow
- Data Zone-CH/GID
- Data Delay Time
- Home GID
- Operator Selectable Home-GID
- Time-out Timer (Dispatch)
- Time-out Timer (Telephone)
- Audio Control
- Encode Data Type
- Zone Add
- Scan List
- Auto Telephone Search
- Talk Around Busy Channel Lockout
- Talk Around Key
- Fix ID
- Telephone (Block ID)
- Transmit Inhibit (Block ID)
- Decode ID (Block ID)

15.1.1 Zone Name

Zone Name can be used to assign a name to a zone. (Refer to 3.4.1 Zone Name on page 15.)

Zone Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Zone Name (Refer to FPRG 6.3.1 Zone Name.)

15.1.2 Scan Weight

Scan Weight can be used to configure the duration to decode the LTR ID sent from the repeater during the scan.

The transceiver uses the LTR ID provided by the repeater to unmute and Trunkout. If there are several Group IDs having the same Home number in the LTR Trunked Radio System, other users having the same Home number must Trunkout. Therefore, it may take a long time for a user to receive their own LTR ID.

In this case, Scan Weight must be configured longer so as not to miss LTR Data during the scan.

1 weight is approximately 500 ms long.

Scan Weight can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scan Weight (Refer to FPRG 6.3.2 Scan Weight.)

15.1.3 Wide/ Narrow

Select the desired Channel Spacing for the available LTR Trunked Radio System.

Wide/ Narrow can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Wide/ Narrow (Refer to FPRG 6.3.3 Wide/ Narrow.)

15.1.4 Data Zone-GID

Data Zone-GID can be used to separate the GIDs for data communications from the GIDs for voice communications. ([Refer to 23.1.2 Data Zone-CH/GID on page 120.](#))

Data Zone-GID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Data Zone-GID (Refer to FPRG 6.3.4 Data Zone-GID.)

15.1.5 Data Delay Time

The Data Delay Time is the duration from when the transceiver starts transmitting to when the transceiver starts sending LTR Data. This delay time can be used when the transceiver cannot establish a link to the repeater.

The Data Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Data Delay Time (Refer to FPRG 6.3.5 Data Delay Time.)

15.1.6 Home GID

Home GID can be used to jump to a frequently used GID with a press of a key. ([Refer to 2.7 Home CH/GID on page 10.](#))

Home GID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Home GID (Refer to FPRG 6.3.6 Home GID.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

15.1.7 Operator Selectable Home-GID

Operator Selectable Home-GID can be used to configure the Home GID. A user can change the Home GID by selecting the GID to be configured as the Home GID and pressing and holding the **Home CH/GID** key for 3 seconds while this function is enabled.

Operator Selectable Home-GID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Operator Selectable Home-GID (Refer to FPRG 6.3.7 Operator Selectable Home-GID.)

15.1.8 Time-out Timer (Dispatch)

The Time-out Timer (Dispatch) is the maximum continuous transmission time to communicate using the Dispatch ID. (Refer to 9.2.1 Time-out Timer (Dispatch) on page 32.)

The maximum continuous transmission time using a Dispatch ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Time-out Timer (Dispatch) (Refer to FPRG 6.3.8 Time-out Timer (Dispatch).)

15.1.9 Time-out Timer (Telephone)

The Time-out Timer (Telephone) is the maximum continuous transmission time to communicate using the Telephone ID. (Refer to 9.2.2 Time-out Timer (Telephone) on page 32.)

The maximum continuous transmission time using a Telephone ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Time-out Timer (Telephone) (Refer to FPRG 6.3.9 Time-out Timer (Telephone).)

15.1.10 Audio Control

Audio Control can be used to configure conditions for the transceiver to unmute with the LTR ID and Optional Signaling. (Refer to 16.3 Signaling (Audio Control) on page 56.)

Audio Control can be configured for each zone by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Audio Control (Refer to FPRG 6.3.10 Audio Control.)

15.1.11 Encode Data Type

Encode Data Type can be used to invert the logic of the LTR Message to be sent.

Encode Data Type can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Encode Data Type (Refer to FPRG 6.3.11 Encode Data Type.)

15.1.12 Zone Add

Zone Add can be used to add a zone to the scan list by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Zone Add (Refer to FPRG 6.3.12 Zone Add.)

15.1.13 Scan List

Scan List can be configured for each zone in conjunction with the Scan List Table configuration by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scan List (Refer to FPRG 6.3.13 Scan List and FPRG 6.3.15 Scan List Table Window.)

15.1.14 Auto Telephone Search

Auto Telephone Search can be used to search for an available RIC repeater and automatically connect to the repeater.

Zones that meet the following conditions are targeted for the search. If no zone matches the following conditions, the transceiver emits the Deny Tone. In this case, the transceiver does not execute the Auto Telephone Search function.

- Zones in which “Yes” is selected from the **Zone Edit** window > **Auto Telephone Search** dropdown list.
- Zones with at least 1 repeater in which “Yes” is selected from the **Repeater Information** window > **Telephone Repeater** dropdown list.
- Zones in which Group ID is configured in the **Zone Edit** window > **Telephone (Block ID)** edit box and there is at least 1 Group ID in the configured range.

A zone can be added to the Auto Telephone Search List by using KPG-101D.

Note: The zone from which Auto Telephone Search starts is always searched.

■ Configuration using KPG-101D

- Configuring the Auto Telephone Search (Refer to FPRG 6.3.16 Auto Telephone Search.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

15.1.15 Talk Around Busy Channel Lockout

If a user transmits on a channel while other groups are using that channel, the user may interfere with other groups' communications. Talk Around Busy Channel Lockout prevents such interference. ([Refer to 11.2.1 Talk Around Busy Channel Lockout on page 35.](#))

Talk Around Busy Channel Lockout can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Talk Around Busy Channel Lockout (Refer to FPRG 6.3.17 Talk Around Busy Channel Lockout.)

15.1.16 Talk Around Key

Talk Around Key can be used to enable or disable Talk Around key operation in LTR Trunked Radio System. ([Refer to 11.2.2 Talk Around Key on page 35.](#))

Talk Around Key operation can be configured to be enabled or disabled for each zone by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Talk Around Key (Refer to FPRG 6.3.18 Talk Around Key.)

15.1.17 Fix ID

Fix ID is the ID having a higher priority than Group ID. The transceiver automatically jumps to the Fix ID even if the transceiver is receiving with the Group ID. Fix ID can be used to receive a call while the transceiver is receiving a call with other IDs.

Following is the priority of the Fix ID.

1st Fix ID > 2nd Fix ID > Displayed Group ID (Revert ID) > Selectable ID (Scan Add = Yes) > Decode ID

Call Indicator and Optional Signaling can be used when the transceiver receives a Fix ID.

The transceiver does not receive the Fix ID under the following conditions:

- Receiving a Fix ID call while communicating with a telephone
- Receiving a call in Trunkout mode using a repeater other than the Home Repeater
- Receiving a Fix ID call in the Data Group

Fix ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the ID (Refer to FPRG 6.3.19 ID (Fix ID).)
- Configuring the Call Indicator (Refer to FPRG 6.3.20 Call Indicator (Fix ID).)
- Configuring the Optional Signaling (Refer to FPRG 6.3.21 Optional Signaling (Fix ID).)

15.1.18 Telephone (Block ID)

Telephone (Block ID) can be used to configure a unique ID to communicate with a telephone. A user can make a telephone call and receive a telephone call from the transceiver.

Telephone (Block ID) can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Telephone (Block ID) (Refer to FPRG 6.3.22 Telephone (Block ID).)

15.1.19 Transmit Inhibit (Block ID)

Transmit Inhibit (Block ID) can be used to restrict the transmission immediately after receiving the specified ID.

Transmit Inhibit (Block ID) can be used if a user does not want to transmit immediately after the transceiver receives the ID while sharing the same Group ID with other parties.

The user cannot transmit until the Transmit Inhibit Time elapses after the transceiver receives the Transmit Inhibit ID if Transmit Inhibit (Block ID) is enabled.

Transmit Inhibit (Block ID) and the Transmit Inhibit Time can be configured by using KPG-101D. Transmit Inhibit (Block ID) can be configured for each user.

Note:

- ◆ Transmit Inhibit (Block ID) is reset if the Zone or Group ID is changed, and the transmission is enabled.
- ◆ If the transceiver receives the Transmit Inhibit (Block ID) during the scan, the transmission remains restricted for the Transmit Inhibit Time. The Transmit Inhibit Time is reset when the transceiver resumes scanning and the transmission is enabled.
- ◆ If the transceiver receives the Transmit Inhibit ID while communicating with the repeater, the transmission remains restricted until the Transmit Inhibit Time elapses.

■ Configuration using KPG-101D

- Configuring the Transmit Inhibit (Block ID) (Refer to FPRG 6.3.23 Transmit Inhibit (Block ID).)
- Configuring the Transmit Inhibit Time (Refer to FPRG 6.7.4 Trunking Tab - Transmit Inhibit Time.)

15.1.20 Decode ID (Block ID)

Decode ID (Block ID) can be used to configure the ID used for receiving only and restricting the transmission. The transceiver emits the received audio if the transceiver receives a call with the Decode ID.

Decode ID (Block ID) can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Decode ID (Block ID) (Refer to FPRG 6.3.24 Decode (Block ID).)

15.2 Group ID

The following functions relevant to the LTR Trunked Radio System Group ID can be configured by using KPG-101D:

- Encode ID/ Decode ID
- GID Name
- Transmit Power
- Optional Signaling
- PTT ID
- Call Indicator
- Scan Add
- Transpond
- Talk Around
- Compander
- Data
- Voice Scrambler
- Scrambler Code

15.2.1 Encode ID/ Decode ID

Encode ID is the LTR ID sent when the transceiver transmits.

Decode ID is the LTR ID used to open squelch and then allow a user to communicate.

The transceiver communicates within a Group using the same LTR ID.

Encode ID/ Decode ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Encode ID (Refer to FPRG 6.6.3 Encode ID.)
- Configuring the Decode ID (Refer to FPRG 6.6.4 Decode ID.)

15.2.2 GID Name

GID Name is a name assigned to a Group ID. ([Refer to 3.4.4 GID Name on page 16.](#))

GID Name can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the GID Name (Refer to FPRG 6.6.5 GID Name.)

15.2.3 Transmit Power

Transmit Power is the transmission power of the transceiver. ([Refer to 1.4 Transmit Power on page 3.](#))

Transmit Power can be switched between High and Low by pressing the **Low Transmit Power** key.

Transmit Power can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Power (Refer to FPRG 6.6.6 Transmit Power.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

15.2.4 Optional Signaling

Optional Signaling is signaling used for making an individual call. (Refer to [16.2 Optional Signaling on page 55.](#))

Optional Signaling can be configured for each Group ID by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Optional Signaling (LTR Trunked Radio System) (Refer to FPRG 6.6.7 Optional Signaling.)

15.2.5 PTT ID

PTT ID is the identification code sent when the PTT switch is pressed and/or released. (Refer to [12 PTT ID on page 36.](#))

The timing to send the PTT ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the PTT ID (Refer to FPRG 6.6.8 PTT ID.)









15.2.6 Call Indicator



Call Indicator can be used to notify a user that the transceiver received calls.

The user can use this function in noisy environments or when away from the transceiver. The Call Indicator operation varies between when the transceiver receives the Group ID and when the transceiver receives the Fix ID.

Call Indicator can be configured by using KPG-101D.

Table 15-1 Call Indicator Operation

Received ID	Operation
Group ID	<p>The “” icon blinks to notify a user that the transceiver received a call. The “” icon keeps blinking on the display even if the call is finished.</p> <p>The “” icon remains when the transceiver receives a call with a Fix ID having high priority.</p> <p>The “” icon disappears when a key is pressed.</p>
Fix ID	<p>The “” icon appears to notify a user that the transceiver received a call. The “” icon remains on the display even if the call is finished.</p> <p>The “” icon remains even if the transceiver receives a call with Group ID.</p> <p>The “” icon disappears when a key is pressed. However, the Lamp key cannot be used.</p>

Note: The “” icon remains even if the transceiver receives another Group ID or a Group ID in which Call Indicator is enabled after the “” icon appears or blinks.

■ Configuration using KPG-101D

- Configuring the Call Indicator (Refer to FPRG 6.6.9 Call Indicator.)

15.2.7 Scan Add

Group ID can be added to the scan list by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scan Add (Refer to FPRG 6.6.10 Scan Add.)

15.2.8 Transpond

Transpond can be configured to be enabled or disabled by using KPG-101D. (Refer to [13 Transpond on page 38.](#))

■ Configuration using KPG-101D

- Configuring the Transpond (Refer to FPRG 6.6.11 Transpond.)

15.2.9 Talk Around

Talk Around can be configured to be enabled or disabled by using KPG-101D. (Refer to [11 Talk Around on page 34.](#))

■ Configuration using KPG-101D

- Configuring the Talk Around (Refer to FPRG 6.6.12 Talk Around.)

15.2.10 Compander

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

Compander can be configured to be enabled or disabled by using KPG-101D. (Refer to [1.7 Compander on page 5.](#))

■ Configuration using KPG-101D

- Configuring the Compander to be enabled or disabled for the Group ID (Refer to FPRG 6.6.13 Compander.)

15.2.11 Data

A Group ID can be configured to be used for data communications or voice communications by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Data (Refer to FPRG 6.6.14 Data.)

15.2.12 Scrambler

Voice Scrambler can be used to scramble speech to allow users to communicate in private. ([Refer to 26 Voice Scrambler on page 124.](#))

Voice Scrambler can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Voice Scrambler (Refer to FPRG 6.6.15 Voice Scrambler.)

15.2.13 Scrambler Code

The Scrambler Code can be configured. ([Refer to 26 Voice Scrambler on page 124.](#))

Scrambler Code can be configured by using KPG-101D.

Two types of scrambler are available. The transceiver can be configured to use a built-in scrambler or an optional scrambler to be installed in the transceiver. As for the Scrambler Code configuration, a user can configure the Scrambler Code that may be required for the optional scrambler board.

■ Configuration using KPG-101D

- Configuring the Scrambler Code (Refer to FPRG 6.6.16 Scrambler Code.)

15.3 Repeater Information

The following functions relevant to repeaters in LTR Trunked Radio System can be configured by using KPG-101D:

- Area Code
- Home Repeater
- Repeater Information Table

15.3.1 Area Code

This function can be used to prevent interference from adjacent systems. Area Code is normally configured for a value of 0. When the transceiver suffers from interference, configure the Area Code of one system for a value of 0 and the code for the other system for a value of 1.

Area Code can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Area Code (Refer to FPRG 6.5.1 Area Code.)

15.3.2 Home Repeater

Home Repeater can be used to receive various information from the LTR Trunked Radio System. The transceiver always transmits, receives and executes Trunkout via the Home Repeater.

A user can transmit or receive using a repeater if the repeater is available.

The Home Repeater provides the repeater number to the user if the repeater is shared with other parties. The transceiver at the receiving party receives the repeater number and jumps to the Trunkout Repeater to receive a call.

Home Repeater can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Home Repeater (Refer to FPRG 6.5.2 Home Repeater.)

15.3.3 Repeater Information Table

In LTR Trunked Radio System, the transceiver communicates via a repeater.

Information for a maximum of 20 repeaters can be configured in the Repeater Information Table for each zone.

The following functions relevant to Repeater Table Information can be configured by using KPG-101D.

Table 15-2 Repeater Information Table Configuration

Repeater Configuration	Operation
Receive Frequency	Receive Frequency can be configured.
Transmit Frequency	Transmit Frequency can be configured.
Beat Shift	Beat Shift can be configured. (Refer to 1.8 Beat Shift on page 5.)
Telephone	A repeater can be configured to be used as the RIC (Repeater Interconnect).

■ Configuration using KPG-101D

- Configuring the Receive Frequency (Refer to FPRG 6.5.3 Receive Frequency.)
- Configuring the Transmit Frequency (Refer to FPRG 6.5.4 Transmit Frequency.)
- Configuring the Beat Shift (Refer to FPRG 6.5.5 Beat Shift.)
- Configuring the Telephone (Refer to FPRG 6.5.6 Telephone.)

15.4 Telephone Interconnect

In LTR Trunked Radio System, the transceiver connects to the PSTN (Public Switched Telephone Network) via the RIC (Repeater Interconnect).

15.4.1 Connecting to the Phone Line

The transceiver can connect to a phone line with Autodial.


■ Transceiver Operation

● Connecting to the Phone Line with Auto Telephone

1. Select the phone number to call with Autodial. (Refer to 18 DTMF on page 63.)
2. Press the **Side 2** key.

The transceiver is automatically connected to the phone line and makes a call to the selected telephone number.

● Connecting to the Phone Line with PTT

1. Select the GID with the Telephone ID.
In this case, the “” icon appears.
2. Select the phone number to call with Autodial. (Refer to 18 DTMF on page 63.)
3. Press the **PTT** switch.

The transceiver is automatically connected to the phone line and makes a call to the selected telephone number.

● Disconnecting from the Phone Line

1. Press the **Telephone Disconnect** key.

The transceiver terminates the communication.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

15.4.2 Auto Telephone Search

Auto Telephone Search can be used to search for an available RIC repeater and automatically connect to the repeater.


The transceiver automatically searches for an available telephone line to make a call. This function is similar to the memory function of a mobile phone, allowing a user to easily make a call.

Zones satisfying the following conditions are searched. If no zone matches the following conditions, the transceiver emits the Deny Tone and does not activate Auto Telephone Search:

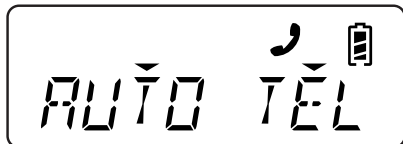
- At least 1 zone is in the Auto Telephone Search list.
- There is a RIC repeater in the above zone.
- There is a GID having the LTR ID configured as the Encode ID used to connect to a phone line in the above zone.


■ Transceiver Operation

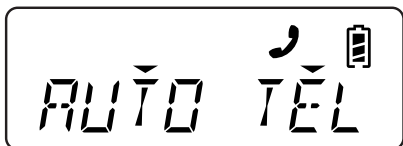
1. Select the phone number to call with Autodial.
(Refer to 18 DTMF on page 63.)
2. Press the **Side 2** key.

“AUTO TEL” appears on the display and the “” icon blinks.

The transceiver starts executing the Auto Telephone Search.



The “” icon stops blinking when the transceiver establishes a link to the phone line.



If a transceiver cannot establish a link to the phone line within 60 seconds, the transceiver emits the Deny Tone and Auto Telephone Search ends.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Configuring the Auto Telephone Search (Refer to FPRG 6.3.16 Auto Telephone Search.)
- Configuring the Auto Telephone (Refer to FPRG 6.10.1 Encode Tab - Auto Telephone.)

15.4.3 Free System Ringback

Free System Ringback can be used to make the transceiver emit a tone if a repeater is available.

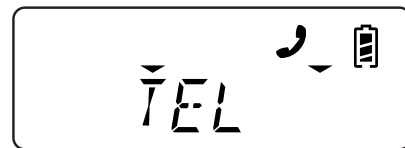
A user can use this function if they want to be notified that a repeater is available when all repeaters are busy.

Free System Ringback can be configured to be enabled or disabled by using KPG-101D.

■ Transceiver Operation

1. Release the **PTT** switch while the transceiver is emitting a Busy tone.

The transceiver emits the Free System Ringback Mode Tone and enters Free System Ringback Mode.



The transceiver emits the Ringer Tone when a repeater is available.

Note:

- ◆ Free System Ringback can be used to make a phone call. Free System Ringback does not activate for Dispatch purposes.
- ◆ The transceiver stops executing Free System Ringback when the Zone or Group ID is changed or the transceiver is receiving a call.
- ◆ The transceiver pauses scanning when the transceiver enters Free System Ringback Mode during the scan. The transceiver resumes scanning after the transceiver exits from Free System Ring Back Mode.

■ Configuration using KPG-101D

- Configuring the Free System Ringback (Refer to 6.7.4 Trunking Tab - Free System Ringback.)

15.5 System Search

System Search can be used to automatically search for an available system. The transceiver may be outside of the repeater service area when the **PTT** switch is pressed. In this case, System Search can be used to search for an available system.

The transceiver also executes System Search when the transceiver cannot establish a link with a data channel. In this case, a receiving party must be also configured to scan in order to receive data from the transmitting party.

■ Configuration using KPG-101D

- Configuring the System Search (Refer to FPRG 6.7.4 Trunking Tab - System Search.)

15.5.1 System Search for Voice Channels

Two types of System Search are available: Manual and Auto.

■ Transceiver Operation

● Manual

1. Press the **[S]** key while the transceiver is emitting the Intercept Tone.
The transceiver stops emitting the Intercept Tone.
2. Release the **PTT** switch.
The System Search Mode Tone sounds.
System Search starts from the next system following the system to which the transceiver failed to connect.
The transceiver stops searching if an available system is found.
If no system is available, the System Search ends and the transceiver emits the Search End Tone.
3. Press the **PTT** switch to talk.

● Auto

1. Press the **PTT** switch while the transceiver is emitting the Intercept Tone.
The transceiver stops emitting the Intercept Tone and starts emitting the System Search Mode Tone.
The transceiver starts the System Search.
The transceiver stops searching if an available system is found.
If no system is available, the System Search ends and the transceiver emits the Search End Tone.
2. Press the **PTT** switch to talk.

Note:

- ◆ The System Search for voice channels starts from the next available system to which the connection failed.
- ◆ The transceiver emits the System Search Tone if System Up is executed during the System Search.

15.5.2 System Search for Data Channels

Select "Auto" from the **System Search** dropdown list by using KPG-101D. System Search does not activate if "Manual" or "Disable" is selected.

Follow the procedure below to activate the System Search.

1. The transceiver starts the System Search when the transceiver fails to connect to the repeater.
2. System Search starts from the next available zone after the current zone. The transceiver stops searching when the transceiver finds an available system. The transceiver searches all zones configured by using KPG-101D. If no System is available, the System Search ends.
3. The transceiver jumps to a data channel to transmit.

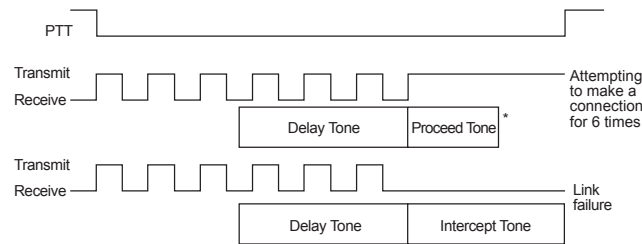
Note: The transceiver executes the System Search even if GTC is configured for FleetSync data communications.

15.6 Clear to Talk

Clear to Talk can be used to emit the Delay Tone when the transceiver accesses the repeater more than 3 times after the **PTT** switch is pressed.

The transceiver emits the Delay Tone if the **Clear to Talk** checkbox is not checked. If the transceiver emits the Delay Tone, a user will notice that it is difficult to access to the repeater.

Note: The transceiver emits the PTT Proceed Tone if Clear to Talk is enabled in the TK-280/ TK-780. The PTT Proceed Tone can be separately configured for the TK-3173.



* When the Proceed Tone is enabled.

Figure 15-4 Clear to Talk

Clear to Talk can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Clear to Talk (Refer to FPRG 6.7.4 Trunking Tab - Clear to Talk.)

15.7 ARQ Mode

This function allows a user to finish data communications in LTR Trunked Radio System with a single link operation.

When sending data in LTR Trunked Radio System, the transceiver is normally required to link to a repeater every time to send data. Therefore, data transmission may fail when the system is busy and there is no available channel on the repeater. To solve this problem, ARQ Mode allows a user to finish data communications with a single link.

ARQ can be used in FleetSync.

ARQ Mode can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the ARQ Mode (Refer to 6.7.4 Trunking Tab - ARQ Mode.)

15.7.1 Transceiver Operation When Using ARQ in FleetSync

If the transceiver starts sending FleetSync data, the transceiver enters ARQ mode. In this case, the transceiver does not send the EOT even if the transceiver finishes sending data. The transceiver sends the EOT to terminate ARQ operation when the transceiver finishes sending all FleetSync data.

The TOR port is low if the receiving end receives the Data GID signal. When the transceiver acknowledges that it received FleetSync data, the transceiver enters ARQ operation. The transceiver sends data with the channel specified by the repeater without sending the ACK message. In this case, the transceiver sends LTR Data only and does not send the EOT. The transceiver sends TOR from the AUX 2 Output port.

16 SIGNALING

Signaling methods supported by this transceiver include Optional Signaling (DTMF, 2-tone and FleetSync) and QT/DQT for making selective calls. QT/DQT is used to control the Mute function.

16.1 QT/DQT Decode/ Encode

QT/DQT is the signaling used for facilitating communication within a zone when sharing the same channel with several zones (Talk Group).

QT/DQT does not affect normal communications since it uses sub-audible frequencies.

QT/DQT allows a user to use the signaling in Conventional Group and enables Squelch Tail Eliminator. (Refer to 14 Conventional Group on page 39.)

The transceiver mutes unwanted calls if QT/DQT is configured for each channel or Talk Group. Therefore, a user can communicate within a Talk Group without hearing conversations of other groups.

Below 300 Hz in frequency, this signaling does not affect voice communications since it uses sub-audible frequencies. The transceiver recognizes the signaling even if the transceiver starts receiving on-going communication since this signaling type has a continuous wave form.

Table 16-1 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 signaling with 23 bit/word format (Code: 000 to 777 (octal number)). DQT has a polarity and Normal or Inverted can be configured.

The following QT/DQT operations are available.

Table 16-2 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 for the transceiver when the transceiver transmits. The transceiver keeps sending the programmed QT/DQT as long as the PTT switch is pressed.

QT/DQT Decode and QT/DQT Encode can be configured for each channel by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the QT/DQT Decode (Refer to FPRG 6.4.5 QT/DQT Decode.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.4.6 QT/DQT Encode.)

16.1.1 QT/DQT with STE (Squelch Tail Eliminator)

Squelch Tail Eliminator when used with QT/DQT eliminates the tail noise from the transmitting party signal in order to communicate comfortably.

16.2 Optional Signaling

Optional Signaling is signaling used for making an individual call. If DTMF or 2-tone is used, the transceiver emits the Alert Tone and starts transponding if the received Optional Signaling matches the Optional Signaling configured in the transceiver. The transceiver does not transpond if FleetSync is used.

DTMF, 2-tone and FleetSync can be used for Optional Signaling. (Refer to 18 DTMF on page 63, 20 FleetSync on page 81.)

Optional Signaling can be configured for each channel by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Optional Signaling (Conventional Group) (Refer to FPRG 6.4.11 Optional Signaling.)
- Configuring the Optional Signaling (Trunking System) (Refer to FPRG 6.6.7 Optional Signaling.)

16.3 Signaling (Audio Control)

Signaling (Audio Control) can be used to configure the conditions for disabling the Mute function by using QT/DQT, LTR ID or Optional Signaling. Signaling (Audio Control) can be configured for each zone.

16.3.1 Conventional Group

The transceiver unmutes and emits the received audio if the configured conditions are satisfied.

Conditions to unmute can be configured by using KPG-101D. The transceiver functions as follows.

Table 16-3 Conditions to Unmute and Operation

Condition	Operation
QT/DQT	The transceiver unmutes with QT/DQT. The conditions for unmuting do not affect the Optional Signaling. Mute canceling conditions remain unchanged even if the transceiver transmits.
QT/DQT or Optional Signaling	When Optional Signaling does not match, QT/DQT disables the Mute function. The transceiver unmutes if the transceiver receives a carrier while the Optional Signaling matches. Mute canceling conditions remain unchanged even if the transceiver transmits.
QT/DQT and Optional Signaling	The Mute function is not disabled unless Optional Signaling matches. When Optional Signaling matches, QT/DQT disables the Mute function. When the transceiver transmits, the transceiver enters Monitor Mode, and Optional Signaling is disabled. For this reason, the Mute function is disabled by QT/DQT after transmission ends.

■ Configuration using KPG-101D

- Configuring the Signaling (Audio Control) (Refer to FPRG 6.2.6 Audio Control.)

16.3.2 Trunking System

The transceiver unmutes and emits the received audio if the configured conditions are satisfied.

Conditions to unmute can be configured by using KPG-101D. The transceiver functions in the following way.

Table 16-4 Conditions to Unmute and Operation

Condition	Operation
LTR ID	The LTR ID disables the mute function. Mute canceling conditions remain unchanged even if the transceiver transmits.
LTR ID and Optional Signaling	When the LTR ID matches with the Optional Signaling, the transceiver unmutes, emits the Call Alert tones, opens the Call Alert display and transponds. Once Optional Signaling matches, the signaling status remains matched until it is reset. Once the Optional Signaling matches, the transceiver unmutes even if only the LTR ID matches. When the transceiver transmits, the transceiver enters Monitor Mode, and Optional Signaling is disabled. Therefore, the transceiver unmutes with the LTR ID when the transceiver completes transmitting.

■ Configuration using KPG-101D

- Configuring the Signaling (Audio Control) (Refer to 6.3.10 Audio Control.)

16.4 Signaling (Optional Signaling Decode Condition)

Signaling (Decode) can be used to configure how to decode the Optional Signaling. Signaling (Decode) can be configured for each zone.

16.4.1 Conventional Group

If the decoded Optional Signaling matches and the configured conditions are satisfied, the transceiver unmutes, emits the Call Alert tone, opens the Call Alert display and transponds.

Once Optional Signaling matches, the signaling status remains matched until it is reset.

Conditions for decoding the Optional Signaling can be configured by using KPG-101D. The transceiver functions in the following way.

Table 16-5 Conditions for Decoding and Operation

Condition	Operation
Carrier Decode	The transceiver decodes the Optional Signaling regardless of the QT/DQT status if a carrier is detected.
QT/DQT Decode	Optional Signaling decodes only when QT/DQT matches.

■ Configuration using KPG-101D

- Configuring the Signaling (Decode) (Refer to FPRG 6.2.5 Optional Signaling Decode Condition.)

16.4.2 Trunking System (TK-3173 only)

The LTR ID must be matched in Trunking System. Therefore, the condition for decoding in Trunking System is LTR ID Decode only.

If the decoded Optional Signaling matches, the transceiver emits the Call Alert tone, opens the Call Alert display and transponds.

Once Optional Signaling matches, the signaling status remains matched until it is reset.

16.5 Monitor

Monitor can be used to unmute and enter receive mode.

The operation of Monitor varies between Conventional Group and Trunking System.

Monitor is used to check channel status before transmitting in order to communicate without interfering with other parties.

Press the **Monitor** or **Monitor Momentary** key to use this function.

■ Transceiver Operation

● Monitor Key

- Press the **Monitor** key while Monitor is disabled.

The “” icon appears.

If the QT/DQT Decode is configured for the current channel, a user can hear the received audio when the transceiver receives a signal and the QT/DQT signaling is inactive.



- Press the **Monitor** key while Monitor is enabled.


The “” icon disappears.

If the QT/DQT is configured for the current channel, the transceiver returns to Signaling Squelch.



● Monitor Momentary Key

- Press the **Monitor Momentary** key.

The “” appears on the display while the **Monitor Momentary** key is pressed.

If the QT/DQT Decode is configured for the current channel, a user can hear the received audio when the transceiver receives a signal and the QT/DQT signaling is inactive.



2. Release the **Monitor Momentary** key.

The “” icon disappears.

If the QT/DQT is configured for the current channel, the transceiver returns to Signaling Squelch.



Note:



- ◆ Optional Signaling is reset and activates if the **Monitor** or **Monitor Momentary** key is pressed while the Optional Signaling is disabled.
- ◆ In Trunking System, the transceiver does not unmute unless the ID matches even if the transceiver receives a signal. If the Optional Signaling is configured for the Group ID, the transceiver unmutes only with the Optional Signaling.
- ◆ The status of the **Monitor** key is retained even if the transceiver is turned OFF.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)


16.5.1 Transceiver Operation during the Scan in Conventional Group

In Conventional Group, the transceiver resets the signaling and unmutes only with a carrier.

The “” icon appears if the **Monitor** key is pressed during the scan. In this case, the transceiver continues scanning. The transceiver starts Carrier Squelch while the “” icon appears.

The transceiver returns to Carrier Squelch if the **Monitor Momentary** key is pressed during the scan. The transceiver does not stop scanning even if the **Monitor Momentary** key is pressed.

16.5.2 Transceiver Operation during the Scan in Trunking System

In Trunking System, the transceiver resets the Optional Signaling and mutes only with the LTR ID. The “” icon appears if the **Monitor** or **Monitor Momentary** key is pressed during the scan. In this case, the transceiver continues scanning.

16.6 Squelch Off

Squelch Off can be used to open Squelch and unmute.


With Squelch Off, the transceiver can unmute without receiving a carrier. Monitor is used to check channel status before transmitting in order to communicate without interfering with other parties.

Press the **Squelch Off** or **Squelch Off Momentary** key to use this function.

■ Transceiver Operation

● Squelch Off

- Press the **Squelch Off** key if Squelch Off is disabled.


The “” icon appears. The Busy LED lights green if the Busy LED is configured.

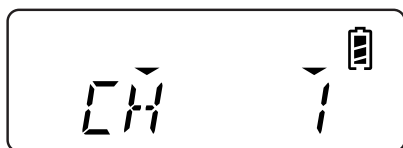
The transceiver unmutes and opens Squelch regardless of the QT/DQT Decode configuration. White noise is heard if the transceiver is not receiving any signals.

Squelch status of the transceiver is the same status as Squelch Level 0.




- Press the **Squelch Off** key while Squelch Off is enabled.

The “” icon disappears. If the QT/DQT is configured for the current channel, the transceiver returns to Signaling Squelch. Otherwise, the transceiver returns to Carrier Squelch.



● Squelch Off Momentary

- Press and hold the **Squelch Off Momentary** key.

The “” icon appears. The Busy LED lights green if the Busy LED is configured.

The transceiver opens Squelch regardless of the QT/DQT Decode configuration. White noise is heard if the transceiver has not received a carrier.

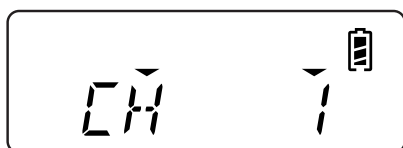
Squelch status of the transceiver is the same status as Squelch Level 0.



- Release the **Squelch Off Momentary** key.

The “” icon disappears.

If the QT/DQT is configured for the current channel, the transceiver returns to Signaling Squelch. Otherwise, the transceiver returns to Carrier Squelch.




Note:


- ◆ If the **Squelch Off** or **Squelch Off Momentary** key is pressed while the Optional Signaling is disabled, the Optional Signaling is reset and activates.
- ◆ In Trunking System, the transceiver does not unmute unless the ID matches even if the transceiver receives a carrier.
- ◆ The status of the **Squelch Off** key is stored even if the transceiver is turned OFF.

■ Configuration using KPG-101D


- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

16.6.1 Transceiver Operation during the Scan in Conventional Group

The “” icon appears if the **Squelch Off** key is pressed during the scan. The transceiver stops scanning and unmutes. The transceiver mutes if the transceiver is not receiving if the **Squelch Off** key is pressed again. The transceiver resumes scanning after the Key Dwell Time elapses if the transceiver is not receiving.

The “” icon appears if the **Squelch Off Momentary** key is pressed during the scan. The transceiver unmutes while the **Squelch Off Momentary** key is pressed. The transceiver mutes if the **Squelch Off Momentary** key is released. The transceiver resumes scanning after the Key Dwell Time elapses if the transceiver is not receiving.

16.6.2 Transceiver Operation during the Scan in Trunking System

The “” icon appears if the **Squelch Off** or **Squelch Off Momentary** key is pressed during the scan. In this case, the transceiver continues scanning.

OST (Operator Selectable Tone) can be used to change the Decode and Encode pair of the QT/DQT signaling without changing the transmit frequency and receive frequency.

If multiple talk groups use the same frequency but a different QT/DQT is used, the dispatcher can specify the talk group using this function.

A maximum of 40 pairs of QT/DQT Decode and QT/DQT Encode can be configured in the OST Table. A QT/DQT Encode/ Decode pair and the OST Table can be switched for each channel by pressing the **OST** key.

A QT/DQT Decode/ Encode pair for OST can be configured for each channel by using KPG-101D.

Note:

- ◆ OST is disabled if the zone or channel is changed. OST is enabled again if the transceiver returns to a channel while OST Status Memory is enabled. (Refer to 17.1 OST Status Memory on page 60.)
- ◆ If Operator Selectable Tone (OST) and Talk Around are both activated; the transceiver executes OST first.

■ Transceiver Operation

● Enabling OST

1. Press the **OST** key while OST is disabled.
The OST Name appears for 2 seconds and the OST function is enabled.

● Disabling OST

1. Press the **OST** key while OST is enabled.
OST will be disabled.

● Selecting the OST List

1. Press and hold the **OST** key for 1 second.
The transceiver enters List Selection Mode.
2. Select the desired OST List.
 - Using the **PF** keys
Press the [**<B**] or [**>C**] key.
 - Using the **Selector** ^{*1}
Turn the **Selector**.
3. Press the [**S**] or [*****] key.
The selected OST List is enabled.

^{*1} If the List Selection Key (Selector) is enabled.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

17.1 OST Status Memory

OST Status Memory can be used to stack the OST codes configured for each channel even if the transceiver is turned OFF or the channel is changed.

OST will be disabled when the channel is changed or the transceiver is turned OFF while this function is disabled.

OST Status Memory can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the OST Status Memory (Refer to FPRG 6.7.3 Conventional Tab - OST Status Memory.)

17.2 Tone Off

Tone Off enables a user to select "Tone Off" in OST List selection mode.

QT/DQT Encode/ Decode is disabled if "Tone Off" is selected.

Tone Off can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Tone Off (Refer to FPRG 6.7.3 Conventional Tab - Tone Off.)

17.3 Direct OST

Direct OST can be used to select OST by using the keypad.

Direct OST can be configured to be enabled or disabled by using KPG-101D.

■ Transceiver Operation

● Selecting OST List 1 to 9

1. Press and hold one of the [1] to [9] keys for more than 1 second.

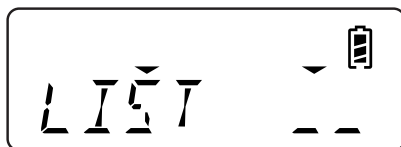
The OST Name appears on the display for 2 seconds.



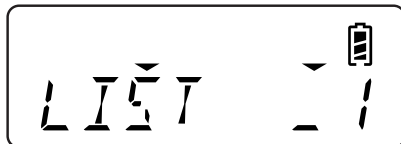
● Selecting OST List 1 to 40

1. Press and hold the [*] key for 1 second.

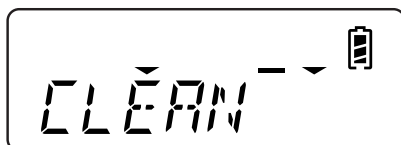
The transceiver enters List Number Enter Mode.



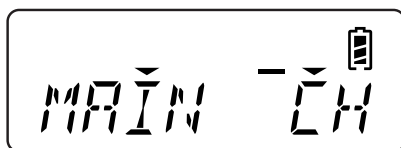
2. Enter the OST List number.



The OST Name appears for 2 seconds if a configured OST number is entered.



The channel name or number appears on the display after the OST Name disappears.



● Selecting Tone Off

1. Press and hold the [0] key for more than 1 second.
"TONE OFF" appears on the display for 2 seconds.

● Disabling OST

1. Press and hold the [#] key for more than 1 second.

The OST icon disappears.

■ Configuration using KPG-101D

- Configuring the OST (Refer to FPRG 6.8.2 General Tab - Keypad Operation.)

17.4 OST Table

OST Table can be used to configure a QT/DQT Decode/Encode pair for OST. A maximum of 40 pairs can be configured. The following functions can be configured for the OST Table.

Table 17-1 OST Table Configuration

OST Table	Configuration
OST Name	OST Name can be used to assign a name to an OST QT/DQT Encode/Decode pair. A maximum of 8 characters can be entered. "TONE 1" to "TONE 40" appears on the display if no OST Name is configured.
QT/DQT Decode	The QT/DQT Decode code used for receiving a call can be configured. The following QT/DQT Decode range is available. QT: 67 to 254.1 Hz/ 0.1 Hz steps DQT: 000N to 777N, 000I to 777I
QT/DQT Encode	The QT/DQT used to make a call can be configured. The following QT/DQT Encode range is available. QT: 67 to 254.1 Hz/ 0.1 Hz steps DQT: 000N to 777N, 000I to 777I

■ Configuration using KPG-101D

- Configuring the OST Name (Refer to FPRG 6.7.3 Conventional Tab - OST Name.)
- Configuring the QT/DQT Decode (Refer to FPRG 6.7.3 Conventional Tab - QT/DQT Decode.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.7.3 Conventional Tab - QT/DQT Encode.)

17.5 Standard QT

The 39 standard QT frequencies specified by EIA-603 can be configured.

■ Configuration using KPG-101D

- Automatically configuring the Standard QT (Refer to FPRG 6.7.3 Conventional Tab - Standard QT Button.)

The transceiver supports DTMF (Dual Tone Multiple Frequency) as a signaling method.

DTMF uses 2 different tones simultaneously. DTMF can be used to make a call with a PTT ID or an individual call, transmit the telephone number while connecting to the phone line, and remotely control the transceiver.

DTMF signaling uses 2 different frequencies (a high frequency and a low frequency) and consists of DTMF 0 to 9, A to D, *and # Code.

Table 18-1 DTMF Code Frequency List

Frequency	1209 Hz	1336 Hz	1447 Hz	1633 Hz
697 Hz	1	2	3	A
770 Hz	4	5	6	B
852 Hz	7	8	9	C
941 Hz	*	0	#	D

18.1 Sending DTMF Code

The following methods can be used to send a DTMF code:

- Manual Dialing
- Store & Send
- Keypad Auto PTT
- Autodial List Selection

18.1.1 Manual Dialing

Manual Dialing allows a user to send a DTMF tone corresponding to a particular key when the [0] to [9], [*], or [#] keys on the keypad is pressed while transmitting by pressing the **PTT** switch.

Manual Dialing can be configured to be enabled or disabled by using KPG-101D.

■ Transceiver Operation

1. Press the **PTT** switch.
2. Press a key corresponding to the DTMF code to send.
The transceiver sends the DTMF code.
3. Repeat the step 2 if necessary.

■ Configuration using KPG-101D

- Configuring the Manual Dialing (Refer to FPRG 6.10.1 Encode Tab - Manual Dialing.)

18.1.2 Store & Send

When using Store & Send, the desired series of DTMF codes can be entered via the keypad but then be sent at a later time. A maximum of 16 digits can be transmitted in a single Store & Send operation.

Store & Send can be configured to be enabled or disabled by using KPG-101D. Select “DTMF (Autodial)” from the **Keypad Operation** dropdown list unless the **Autodial** key is used.

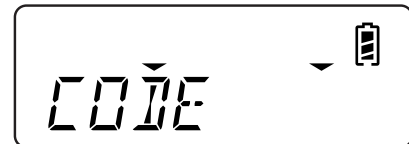
■ Transceiver Operation

● Using the Keypad

1. Press the **Autodial** key.

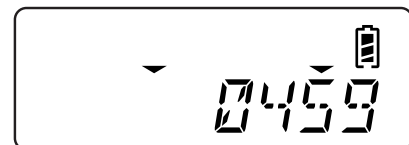
The Store & Send Entry display appears on the display.

Select “DTMF (Autodial)” from the **Key Assignment** window > **General** tab > **Keypad Operation** dropdown list unless the **Autodial** key is used.



2. Enter the DTMF code to send using the keypad.

The entered code is confirmed.



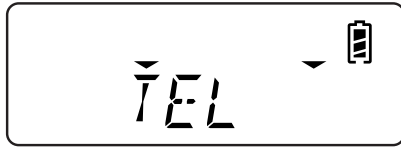
3. Repeat step 2 if necessary.



4. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.

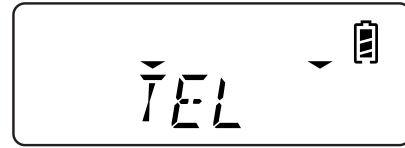
The transceiver sends the DTMF code.



5. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.

The transceiver sends the DTMF code.



● Using the Selector ^{*1}

^{*1} If the List Selection Key (Selector) is enabled.

1. Press the **Autodial** key.

The Store & Send Entry display appears on the display.

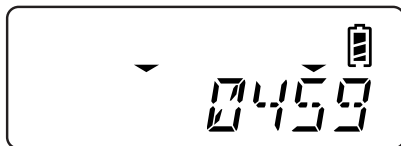


2. Select characters to enter a DTMF code.

Turn the **Selector** ^{*1} clockwise or counterclockwise.

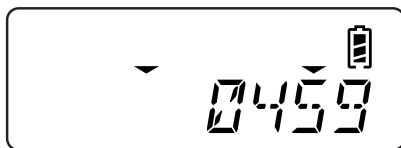
A current entry blinks and entered characters are shifted to left.

^{*1} If the List Selection Key (Selector) is enabled.



3. Press the **[C>]** key after the code is confirmed.

The entered digit stops blinking and is confirmed on the display.



4. Repeat steps 2 and 3 if necessary.



■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Assigning functions to the Keypad Operation (Refer to FPRG 6.8.2 General Tab - Keypad Operation.)
- Configuring the Store & Send (Refer to FPRG 6.10.1 Encode Tab - Store & Send.)
- Configuring the List Selection Key (Selector) (Refer to FPRG 6.8.2 General Tab - List Selection Key (Selector).)

Note:

- ◆ Press and hold the **[*]** key for 1 second, then press the **[2]** key to enter the DTMF "A" code.
- ◆ Press and hold the **[*]** key for 1 second, then press the **[5]** key to enter the DTMF "B" code.
- ◆ Press and hold the **[*]** key for 1 second, then press the **[8]** key to enter the DTMF "C" code.
- ◆ Press and hold the **[*]** key for 1 second, then press the **[0]** key to enter the DTMF "D" code.
- ◆ Press and hold the **[*]** key for 1 second, then press the **[*]** key again to enter the DTMF "*" code.
- ◆ Press and hold the **[*]** key for 1 second, then press the **[#]** key to enter the DTMF "#" code.

18.1.3 Keypad Auto PTT

Keypad Auto PTT can be used to send the corresponding DTMF codes automatically when one of the [0] to [9], [*] and [#] keys on the keypad is pressed.

Keypad Auto PTT can be configured to be enabled or disabled by using KPG-101D.

Table 18-2 DTMF Tone Key Operation

Frequency	DTMF Digit
941.000 + 1336.000 Hz	DTMF Code "0"
697.000 + 1209.000 Hz	DTMF Code "1"
697.000 + 1336.000 Hz	DTMF Code "2"
697.000 + 1447.000 Hz	DTMF Code "3"
770.000 + 1209.000 Hz	DTMF Code "4"
770.000 + 1336.000 Hz	DTMF Code "5"
770.000 + 1447.000 Hz	DTMF Code "6"
852.000 + 1209.000 Hz	DTMF Code "7"
852.000 + 1336.000 Hz	DTMF Code "8"
852.000 + 1447.000 Hz	DTMF Code "9"
941.000 + 1209.000 Hz	DTMF Code "*"
941.000 + 1447.000 Hz	DTMF Code "#"

■ Transceiver Operation

1. Press a key corresponding to the DTMF code to send.

The transceiver sends the DTMF code corresponding to the selected key.

2. Repeat step 1 if necessary.

■ Configuration using KPG-101D

- Assigning functions to the Keypad Operation (Refer to FPRG 6.8.2 General Tab - Keypad Operation.)

18.1.4 Autodial List Selection

Autodial List Selection can be used to select a DTMF code stored in the Auto Dial Memory List and send the code.

Autodial List Selection is available when Store & Send is disabled.

■ Transceiver Operation

1. Press the **Autodial** key.
2. Press the [0] to [9] keys.

The transceiver enters the Shortcut Entry Mode of List Selection.

The smallest Autodial list number appears on the display immediately after the transceiver is turned ON. Otherwise, the previous list number appears.

Select "DTMF (Autodial)" from the **Key Assignment** window > **General** tab > **Keypad Operation** dropdown list unless the **Autodial** key is used.



3. Select the Autodial List.

- Using the **PF** Keys
Press the [****] or [**<C>**] key.
- Using the Selector ^{*1}
Turn the Selector.

^{*1} If the List Selection Key (Selector) is enabled.



4. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.
The transceiver sends the DTMF code.



■ Configuration using KPG-101D

- Configuring the List Selection Key (Selector)
(Refer to FPRG 6.8.2 General Tab - List Selection Key (Selector).)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)
- Assigning functions to the Keypad Operation
(Refer to FPRG 6.8.2 General Tab - Keypad Operation.)
- Configuring the Store & Send (Refer to FPRG 6.10.1 Encode Tab - Store & Send.)

18.1.5 Redial

This function allows the transceiver to send the previously sent DTMF code again.

■ Transceiver Operation

1. Press the **Autodial** key while the transceiver is in standby mode.

The Autodial List appears on the display.



2. Press the **[*]** and **[0]** keys.

The last sent DTMF code appears on the display.

Press the **[S]** or **[*]** key to cancel sending the code.



3. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.

18.1.6 Beginning of Transmit (BOT)

Beginning of Transmit can be used to send the DTMF code configured for Beginning of Transmit.

■ Transceiver Operation

1. Press the **Autodial** key while the transceiver is in standby mode.

The Autodial List appears on the display.



2. Press the **[*]** key twice.

The DTMF code configured for Beginning of Transmit appears on the display.

Press the **[S]** key to cancel sending the code.



3. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.

18.1.7 End of Transmit (EOT)

End of Transmit can be used to send the DTMF code configured for End of Transmit.

■ Transceiver Operation

1. Press the **Autodial** key while the transceiver is in standby mode.

The Autodial List appears on the display.



2. Press the **[*]** and **[#]** keys.

The DTMF code configured for End of Transmit appears on the display.

Press the **[S]** or **[*]** key to cancel sending the code.



3. Press the **PTT** switch to send the DTMF code and voice.

Press the **Side 2** key to send the DTMF code only.

18.2 Encode

The following functions relevant to DTMF Encode can be configured by using KPG-101D:

- DTMF Speed
- First Digit Delay Time
- First Digit Delay Time with QT
- First Digit Time
- * and # Digit Time
- DTMF Hold Time
- D Code Assignment
- Manual Dialing
- Store & Send
- Dial ID
- Auto Telephone
- DTMF Sidetone

18.2.1 DTMF Speed

DTMF Speed can be used to configure the DTMF automatic transmission speed when the transceiver automatically sends PTT ID, Autodial, Store & Send, BOT, or EOT.

The transmission speed for DTMF can be configured in digits/second.

DTMF Speed can be configured by using KPG-101D. The following items can be configured when selecting the DTMF automatic transmission speed.

Table 18-3 DTMF Automatic Transmission Speed

Option	Digit Time (Transmission Period)	Gap Time (Silent Period)
6-digit/s	83.3 ms	83.3 ms
8-digit/s	62.5 ms	62.5 ms
10-digit/s	50.0 ms	50.0 ms
15-digit/s	33.3 ms	33.3 ms

■ Configuration using KPG-101D

- Configuring the DTMF Speed (Refer to FPRG 6.10.1 Encode Tab - DTMF Speed.)

18.2.2 First Digit Delay Time

The First Digit Delay Time is the delay used for sending a DTMF code when a DTMF code is automatically sent in the following cases:

- Automatically sending the DTMF code using PTT ID, Autodial, Store & Send, BOT, EOT or Telephone Disconnect (TK-3173 only).
- When sending the DTMF code using Keypad Auto PTT.

The transceiver transmits unmodulated signals until the First Digit Delay Time elapses if the transceiver sends the DTMF code.

The First Digit Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the First Digit Delay Time (Refer to FPRG 6.10.1 Encode Tab - First Digit Delay Time.)

18.2.3 First Digit Delay Time with QT

The First Digit Delay Time with QT is the duration between when the transceiver starts transmitting and when it starts transmitting the first digit of the DTMF code if the transceiver automatically sends the DTMF code on a channel configured with QT/DQT with PTT ID, Autodial, Store & Send, Beginning of Transmit, End of Transmit or Keypad Auto PTT. The transceiver transmits unmodulated signals until the First Digit Delay Time elapses.

The First Digit Delay Time with QT can be configured by using KPG-101D. (Refer to FPRG 6.10.1 Encode Tab - First Digit Delay Time with QT.)

18.2.4 First Digit Time

The First Digit Time is used to adjust the time length of the first DTMF digit when a DTMF code is automatically sent.

The duration of the transmitted first digit of DTMF is the sum of the transmission time configured for DTMF Speed and the First Digit Time.

By extending the transmission time of the first digit of the sent code, the DTMF code can be reliably received by the transceiver at the receiving end even if its Power Saver is enabled or the transceiver is scanning.

The First Digit Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the First Digit Time (Refer to FPRG 6.10.1 Encode Tab - First Digit Time.)

18.2.5 * and # Digit Time

The * and # Digit Time is the extended transmission time for a * tone or # tone when a DTMF code is automatically sent.

The duration of the transmitted * tone and # tone is the sum of the transmission time configured for DTMF Speed and the * and # Digit Time.

If the first digit of the DTMF code is the * tone or # tone, the transceiver compares the extension time to send the first digit configured for the First Digit Time with the * and # Digit Time and uses the longer extension time to send the first digit.

The * and # Digit Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the * and # Digit Time (Refer to FPRG 6.10.1 Encode Tab - * and # Digit Time.)

18.2.6 DTMF Hold Time

The DTMF Hold Time is the duration from when the keypad is disabled to when the transceiver returns to receive mode if the transceiver sends a DTMF code by using Keypad Auto PTT or Manual Dialing.

The transceiver at the receiving end treats an uninterrupted DTMF signal that it receives as one code sequence. The DTMF Hold Time is therefore used to maintain an uninterrupted transmission to send a series of DTMF codes.

The DTMF Hold Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the DTMF Hold Time (Refer to FPRG 6.10.1 Encode Tab - DTMF Hold Time.)

18.2.7 D Code Assignment

D Code Assignment can be used to configure whether the D code is used for D code of DTMF or a dialing pause.

D Code Assignment can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the D Code Assignment (Refer to FPRG 6.10.1 Encode Tab - D Code Assignment.)

18.2.8 Manual Dialing

Manual Dialing allows a user to send a DTMF code corresponding to a particular key when the [0] to [9], [*], or [#] key on the Mic keypad is pressed while transmitting by pressing the **PTT** switch.

Manual Dialing can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Keypad Operation (Refer to FPRG 6.8.2 General Tab - Keypad Operation.)
- Configuring the Manual Dialing (Refer to FPRG 6.10.1 Encode Tab - Manual Dialing.)

18.2.9 Store & Send

When using Store & Send, the desired series of DTMF codes can be entered via the keypad, but then be sent at a later time. A maximum of 16 digits can be transmitted in a single Store & Send operation.

Store & Send can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Store & Send (Refer to FPRG 6.10.1 Encode Tab - Store & Send.)

18.2.10 Dial ID

Dial ID can be configured to be enabled or disabled.

Dial ID can be used to send the BOT and EOT codes of the DTMF PTT ID configured for the channel by pressing the [*] + [*] or [*] + [#] keys on the keypad.

Dial ID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Dial ID (Refer to FPRG 6.10.1 Encode Tab - Dial ID.)

18.2.11 Auto Telephone (TK-3173 only)

Auto Telephone can be configured to be enabled or disabled. Auto Telephone can be used if the **Side 2** key is pressed in Autodial Mode.

Auto Telephone can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Auto Telephone (Refer to FPRG 6.10.1 Encode Tab - Auto Telephone.)

18.2.12 DTMF Sidetone

DTMF Sidetone can be used to make the transceiver emit DTMF tones from the speaker when the transceiver sends DTMF code.

DTMF Sidetone can be configured to be enabled or disabled by using KPG-101D.

Note: The transceiver does not emit the DTMF monitor tones in Emergency Mode in the following conditions:

- When "Silent" is selected from the **Emergency Information** window > **Emergency Type** dropdown list.
- When "DTMF" is selected from the **Emergency Information** window > **Emergency Type** dropdown list.

■ Configuration using KPG-101D

- Configuring the DTMF Sidetone (Refer to FPRG 6.10.1 Encode Tab - Sidetone.)

18.3 Decode

The following functions relevant to DTMF Decode can be configured by using KPG-101D:

- DTMF Signaling
- Intermediate Code
- Group Code
- Alert Tone (Individual Call)
- Alert Tone (Group Call)
- Transpond
- Code
- Transpond/ Alert Tone
- Stun
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED
- DTMF Number Display

18.3.1 DTMF Signaling (Conventional)

Configure the DTMF signaling type.

Configuration	Operation
Off	Disables DTMF Signaling.
Code Squelch	The transceiver waits for a call with the ID configured in the Channel Edit window > ID edit box. 3 to 10 numeric digits can be configured for the ID. The transceiver executes the operation selected for Alert Tone (Individual Call) and Transpond when the ID matches. The transceiver can communicate only with QT/DQT.
Selective Call	The transceiver waits for a call with the ID configured in the Channel Edit window > ID edit box and Intermediate Code + Status Code. 3 to 4 numeric digits can be configured for the ID. The transceiver executes the operation selected for Alert Tone (Individual Call) and Transpond when the ID and Intermediate Code match and the transceiver receives the Status Code. The transceiver can communicate only with QT/DQT.

DTMF Signaling can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - DTMF Signaling (Conventional).)

Note: DTMF signaling is available in Conventional Group.

18.3.2 Intermediate Code (Conventional)

Intermediate Code is used for receiving a call if Selective Call is configured for DTMF signaling.

Intermediate Code can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Intermediate Code (Conventional).)

Note: Intermediate Code is available in Conventional Group.

18.3.3 Group Code (Conventional)

Group Code is used as a wild card to receive a call with DTMF signaling (Code Squelch/ Selective Call). The Group Code is treated as a wild card in standby ID code. So, the rest of received code digits match the standby ID code, it is treated as a Group Call.

Group Code can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Group Code (Conventional).)

Note: Group Code is available in Conventional Group.

18.3.4 Alert Tone (Individual Call) (Conventional)

The type of alert tone emitted from the transceiver when the Individual Call ID matches while Code Squelch is enabled, or when the Individual Call ID and Intermediate Code match after the transceiver receives a Selective Call, can be configured.

Alert Tone (Individual Call) can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Alert Tone (Individual Call) (Conventional).)

Note: Alert Tone (Individual Call) is available in Conventional Group.

18.3.5 Alert Tone (Group Call) (Conventional)

The type of alert tone emitted from the transceiver when the Individual Call ID matches while Code Squelch is enabled, or when the Individual Call ID and Intermediate Code match after the transceiver receives a Selective Call using a call with a Group Code, can be configured.

Alert Tone (Group Call) can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Alert Tone (Group Call) (Conventional).)

Note: Alert Tone (Group Call) is available in Conventional Group.

18.3.6 Transpond (Conventional)

This function allows the caller to confirm that the receiving party has received the individual call code.

Transceiver operation when the receiving party receives the code can be configured.

Configuration	Operation
Off	Transceiver does not respond.
Alert	The transceiver multiplexes the Transpond Tone and transmits the tone.
ID Code	The transceiver multiplexes the ID Code configured for the receive channel and sends the code.
Transpond Code	The transceiver multiplexes the Autodial Memory 1 and sends the code.
Ringing Tone	The transceiver multiplexes the Ringing tone and transmits the tone.

Transpond can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Transpond (Conventional).)

Note: Transpond is available in Conventional Group.

18.3.7 Code (Trunking) (TK-3173 only)

The standby DTMF code for receiving an individual call in Trunking System can be configured.

The transceiver executes the operation configured for Transpond and Alert Tone if the DTMF code matches. The transceiver can communicate only with LTR ID.

Code can be configured by using KPG-101D. (Refer to FPRG 6.10.2 Decode Tab - Code (Trunking).)

Note: Code (Trunking) is available in Trunking System.

18.3.8 Transpond/ Alert Tone (Trunking) (TK-3173 only)

The transceiver executes Transpond/ Alert Tone if the code matches in Trunking System. If the code matches, the transceiver executes the operation configured for Transpond and Alert Tone.

Transpond and Alert Tone can be configured by using KPG-101D. Below is a list of configuration items for Alert Tone and Transpond.

Table 18-4 Transpond/ Alert Tone Operation

Configuration	Operation
Alert Tone	The transceiver emits the configured Alert Tone.
Transpond	The transceiver transponds, multiplexes the Transpond tone and transmits the tone.

Note:

- ◆ The transceiver emits the alert tone after transponding when both Transpond and Alert Tone are configured at the same time.
- ◆ Alert Tone is delayed if the transmission of the Transpond is delayed when the channel is being used while Clear To Transpond is enabled in the Conventional Group.
- ◆ The transceiver stops emitting the alert tone if a key is pressed while the transceiver intermittently emits the alert tone when "Infinite" is selected for **Special Alert Tone** window > > **Cycle** edit box. The received tone is emitted first if the transceiver intermittently emits the alert tone.
- ◆ The matching status of DTMF is reset in the following conditions:

Table 18-5 Conditions for Resetting DTMF Matching Status

Operation	Condition
Pressing a key	If one of the following keys is pressed: <ul style="list-style-type: none"> • Monitor key • Monitor Momentary key • Squelch Off key • Squelch Off Momentary key • Zone Up key • Zone Down key • Zone Up/Down key • CH/GID Up key • CH/GID Down key • CH/GID Up/Down key • Scan key • Home Channel key • Direct CH/GID 1 to Direct CH/GID 4 keys
Expiration of Timers	When the Auto Reset Timer expires.

- The status of Transpond is reset in the following conditions:

Table 18-6 Conditions for Resetting Transpond

Operation	Condition
Pressing a key	If one of the following keys is pressed: <ul style="list-style-type: none"> • Monitor key • Monitor Momentary key • Squelch Off key • Squelch Off Momentary key • Zone Up key • Zone Down key • Zone Up/Down key • CH/GID Up key • CH/GID Down key • CH/GID Up/Down key • Scan key • Home Channel key • Direct CH/GID 1 to Direct CH/GID 4 keys
Transmission	When the PTT switch is pressed to transmit.

■ Configuration using KPG-101D

- Configuring the Transpond (Refer to FPRG 6.10.2 Decode Tab - Transpond (Trunking).)
- Configuring the Alert Tone (Refer to FPRG 6.10.2 Decode Tab - Alert Tone (Trunking).)

18.3.9 Stun

Stun can be used to disable the transceiver by means of a transmitted DTMF code, for example, if the transceiver is stolen.

The transceiver multiplexes the Stun Code on Tone and starts transponding when the transceiver receives the Stun Code. Then, the transceiver executes the operation configured for Stun Code Response.

The operation configured for Stun Code Response is stored even if the transceiver is turned OFF. The status of Stun Response is reset only when the transceiver receives the Stun Reset code.

Stun Code and Stun Code Response can be configured by using KPG-101D.

Table 18-7 Stun Configuration

Operation	Condition
Stun Code	Stun Code is a standby code for Stun.
Stun Code Response	<p>Stun Response is the operation of the transceiver when the Stun Code matches. The following operations are available for Stun Response.</p> <ul style="list-style-type: none"> • Transmit Inhibit: Disables transmit capability. • Transceiver Inhibit: Disables transmit and receive capability. All transceiver functions are disabled.

Note: The transceiver does not enter Emergency Mode if Stun is enabled.

■ Configuration using KPG-101D

- Configuring the Stun Code (Refer to FPRG 6.10.2 Decode Tab - Stun Code (Stun).)
- Configuring the Stun Response (Refer to FPRG 6.10.2 Decode Tab - Stun Code Response.)

18.3.10 Auto Reset Timer

The Auto Reset Timer controls the duration from when the DTMF code matches to when the code is automatically reset.

The Auto Reset Timer can be configured by using KPG-101D. Transceiver operation after the Auto Reset Timer expires can also be configured.

Table 18-8 Auto Reset Timer Operation

Configuration	Operation
Off	The Auto Reset Timer does not activate.
1 to 300 s	LED, Alert Tone, Monitor, and the display return to their previous statuses when configured time elapses.

Table 18-9 Transceiver Operation after the Auto Reset Timer Expires

Item	Operation
LCD	The DTMF code shown on the DTMF Number Display disappears when the Auto Reset Timer expires.
LED	The Selective Call Alert LED stops blinking when the Auto Reset Timer expires.
Alert Tone	The transceiver stops intermittently emitting the Alert Tone when the Auto Reset Timer expires.
Monitor	The matching status of the DTMF is reset when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Auto Reset Timer (Refer to FPRG 6.10.2 Decode Tab - Auto Reset Timer (Auto Reset).)

18.3.11 Clear to Transpond

Clear to Transpond forces the transceiver to wait while other users are using a channel before starting to transpond.

Clear to Transpond can be configured to be enabled or disabled by using KPG-101D.

Note: Clear to Transpond is available only in Conventional Group.

■ Configuration using KPG-101D

- Configuring the Clear to Transpond (Refer to FPRG 6.10.2 Decode Tab - Clear to Transpond.)

18.3.12 Selective Call Alert LED

Selective Call Alert LED can be used to make the Selective Call Alert LED blink when the transceiver receives a code.

This function allows a user to monitor a call when away from the transceiver.

Selective Call Alert LED can be configured to be enabled or disabled by using KPG-101D. (Refer to 20.2 Selcall Function on page 82.)

■ Configuration using KPG-101D

- Configuring the Selective Call Alert LED (Refer to FPRG 6.10.2 Decode Tab - Selective Call Alert LED.)

18.3.13 DTMF Number Display

DTMF Number Display allows a user to view a received DTMF code if the transceiver receives a DTMF code with at least 3 numeric digits. The received code appears on the display while the Channel Name or DTMF code appears on the display.

The display is updated when the transceiver does not receive another code for more than 1 second after the transceiver received the DTMF code. Only the first 8 numeric digits can be displayed if the transceiver receives a code with more than 8 numeric digits.

DTMF Number Display functions only for a channel on which Off is configured for DTMF signaling and DTMF is configured for Optional Signaling. The display is not updated in the following conditions:

- When the transceiver receives the Stun Code or Stun Deactivation Code.
- When the transceiver is in Emergency Mode.

The previous channel appears on the display if any key is pressed while the DTMF code appears on the display. The previous CH/GID appears on the display when the Auto Reset Timer expires if the display for the Auto Reset Timer is configured.

DTMF Number Display can be configured to be enabled or disabled by using KPG-101D.

Note:

- ◆ DTMF Number Display is only used for viewing the caller's ID. A user cannot reply to the ID displayed on the display.
- ◆ Optional Signaling cannot be decoded if DTMF Number Display is enabled.

■ Configuration using KPG-101D

- Configuring the DTMF Number Display (Refer to 6.12.2. Decode Tab - DTMF Number Display (Conventional).)

18.4 Autodial

The following functions relevant to Autodial can be configured by using KPG-101D:

- Autodial List
- Autodial Programming

18.4.1 Autodial List

Autodial List can be used to configure the DTMF code used in Autodial.

Autodial List can be configured by using KPG-101D. Below is a list of configuration items for Autodial List.

Table 18-10 Autodial List Configuration

Autodial List	Operation
Name	A name can be assigned to the DTMF code. A maximum of 8 characters can be configured for each DTMF code.
Code	The DTMF code to send can be configured. A maximum of 16 characters can be configured for each DTMF code.

■ Configuration using KPG-101D

- Configuring the Name (Refer to FPRG 6.10.3 Autodial List Tab - DTMF Name.)
- Configuring the Code (Refer to FPRG 6.10.3 Autodial List Tab - Code.)

18.4.2 Autodial Programming

Autodial Programming can be used to configure, change or delete the Autodial List using the **PF** key.

Name and DTMF code can be changed by pressing the **Autodial Programming** key while Autodial Programming is enabled.

Autodial Programming can be configured to be enabled or disabled by using KPG-101D.

Note: Keys operate as below if the List name or the DTMF code is entered.

Table 18-11 Key Operation

Key	Operation
Selector	Increments or decrements the entered character.
Side 1	Exits from the current mode.
[S]	Moves to next item.
[A]	Press: Deletes a character. Hold: Deletes all characters
[<B]	-
[C>]	Confirms the entered character.
Side 2	-
[0]	(Space)/ 0
[1]	1
[2]	A/ B/ C/ 2
[3]	D/ E/ F/ 3
[4]	G/ H/ I/ 4
[5]	J/ K/ L/ 5
[6]	M/ N/ O/ 6
[7]	P/ Q/ R/ S/ 7
[8]	T/ U/ V/ 8
[9]	W/ X/ Y/ Z/ 9
[*]	Confirms the entered character.
[#]	Press: Deletes a character. Hold: Deletes all characters
PTT switch	The transceiver exits from the current mode and transmits.

■ Transceiver Operation

● Configuring and Changing the Autodial

1. Press the **Autodial Programming** key.

The list number 1 of the Autodial List appears on the display. No list number appears on the display if the Autodial List is not configured.

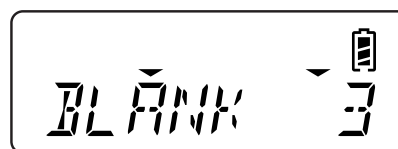


2. Select the Autodial List number to configure.

"BLANK + List number" appears on the display.

- Using the **PF** keys
Press the **[<B]** or **[C>]** key.
- Using the **Selector** ^{*1}
Turn the **Selector**.

^{*1} If the List Selection Key (Selector) is enabled.



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

The list number is confirmed.

4. Enter the List name using the **Selector** or keypad.



5. Press the **[S]** key after entering the character.

The Autodial List Name is confirmed.

6. Enter the DTMF code using the **Selector** or keypad.



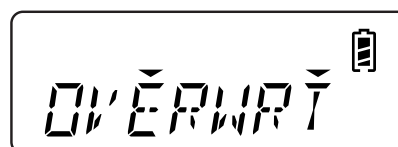
7. Press the **[S]** key after entering the entire code.

The writing confirmation window appears on the display.

"STORE" appears on the display if no data is stored in the memory.



"OVERWRT" appears on the display if data exists in the memory.



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

Data is written to the memory and the Autodial List Selection window appears on the display.

● Deleting the Autodial List

1. Press the **Autodial Programming** key.

The list number 1 of the Autodial List appears on the display. "BLANK + List number" appears on the display if no Autodial List is configured.



2. Select the Autodial List number to delete.

- Using the **PF** keys

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

- Using the **Selector** ^{*1}

Turn the **Selector**.

^{*1} If the List Selection Key (Selector) is enabled.

3. Press the [**A**] or [**#**] key after selecting the list.

"DELETE" appears on the display.



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

The Autodial List will be deleted.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

19 2-TONE

This transceiver supports 2-tone signaling.

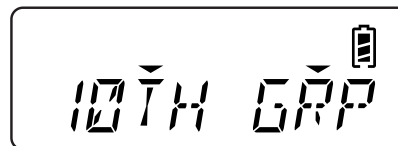
2-tone signaling uses a pair of 2 different continuous tone frequencies. 2-tone signaling is used to make an individual call in Conventional Group.

2-tone signaling uses 2 different sequential tones. The frequency range is from 288.5 to 3106.0 Hz. Sometimes, only single tone is used.

Note: 2-tone is available only in Conventional Group.

3. Press the **PTT** switch to send the 2-tone Encode Tone and voice.

Press the **Side 2** key to transmit only the 2-tone Encode Tone.



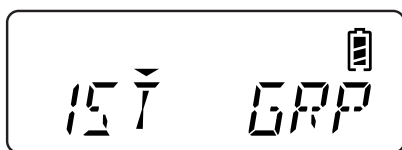
19.1 Transmitting 2-tone

An Encode Tone configured for the Encode Memory List can be selected by pressing the **2-tone** key. Select the tone to transmit and press the **PTT** switch to transmit the tone.

■ Transceiver Operation

1. Press the **2-tone** key.

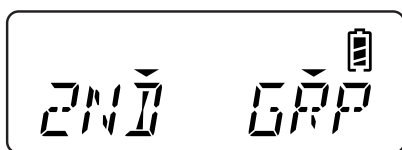
The smallest Autodial list number appears on the display immediately after the transceiver is turned ON. Otherwise, the previous list number appears.



2. Select the 2-tone Encode List to send.

- Using the **PF** keys
Press the [****] or [**<C>**] key.
- Using the **Selector** ^{*1}
Turn the **Selector**.

^{*1} If the List Selection Key (Selector) is enabled.



19.2 Encode

The following functions relevant to 2-tone Encode can be configured by using KPG-101D:

- Duration of 1st Tone
- Duration of 2nd Tone
- Duration of Single Tone
- Gap Time
- First Tone Delay Time
- Sidetone
- 2-tone Encode Memory List

19.2.1 Duration of 1st Tone

The Duration of 1st Tone can be used to configure the 1st Tone Encode duration for transmitting the 2-tone configured for the 2-tone Encode Memory List.

The Duration of 1st Tone can be configured by using KPG-101D. Normally, the Duration of 1st Tone is configured for 1 second.

■ Configuration using KPG-101D

- Configuring the Duration of 1st Tone (Refer to FPRG 6.11.1 Encode Tab - Duration of 1st Tone.)

19.2.2 Duration of 2nd Tone

The Duration of 2nd Tone can be used to configure the 2nd Tone Encode duration for transmitting the 2-tone configured for the 2-tone Encode Memory List.

The Duration of 2nd Tone can be configured by using KPG-101D. Normally, the Duration of 2nd Tone is configured for 3 seconds.

■ Configuration using KPG-101D

- Configuring the Duration of 2nd Tone (Refer to FPRG 6.11.1 Encode Tab - Duration of 2nd Tone.)

19.2.3 Duration of Single Tone

The Duration of Single Tone is the Single Tone Encode duration for transmitting the Single Tone configured for the 2-tone Encode Memory List.

The Duration of Single Tone can be configured by using KPG-101D. Normally, the Duration of Single Tone is configured for 5 seconds.

■ Configuration using KPG-101D

- Configuring the Duration of Single Tone (Refer to FPRG 6.11.1 Encode Tab - Duration of Single Tone.)

19.2.4 Gap Time

The Gap Time can be used to configure the period of no modulation between the 1st Tone and 2nd Tone used for transmitting the 2-tone configured in the 2-tone Encode Memory List.

The Gap Time can be configured by using KPG-101D. Normally, the Gap Time is configured for 0 ms.

■ Configuration using KPG-101D

- Configuring the Gap Time (Refer to FPRG 6.11.1 Encode Tab - Gap Time.)

19.2.5 First Tone Delay Time

The First Digit Delay Time is the time between when the transceiver starts transmitting a 2-tone and when the transceiver actually starts transmitting the 2-tone tone. During the First Tone Delay Time, the transceiver transmits an unmodulated signal.

The First Tone Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the First Tone Delay Time (Refer to FPRG 6.11.1 Encode Tab - First Tone Delay Time.)

19.2.6 Sidetone

Sidetone can be used to monitor the 2-tone tones when the transceiver transmits 2-tone signaling.

The Sidetone can be configured to be monitored by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Sidetone (Refer to FPRG 6.11.1 Encode Tab - Sidetone.)

19.2.7 2-tone Encode Memory List

2-tone Encode Memory List is the code list for encoding the 2-tone. The transceiver transmits the 2-tone when the code configured for the list is selected.

The following functions can be configured for the 2-tone Encode Memory List.

Table 19-1 2-tone Encode Memory List Configuration

2-tone Encode Memory List	Operation
Single Tone	The code sent for each list number can be configured as a Single Tone. 2nd Tone cannot be configured if Single Tone is configured.
2-tone Name	2-tone Name can be used to assign a name to each list number. A maximum of 8 characters can be configured for the 2-tone Name.
1st Tone	The 1st Tone frequency can be configured. The frequency can be configured between 288.5 and 3106.0 Hz.
2nd Tone	The 2nd Tone frequency can be configured. The frequency can be configured between 288.5 and 3106.0 Hz. 2nd Tone cannot be configured if Single Tone is configured.

■ Configuration using KPG-101D

- Configuring the Single Tone (Refer to FPRG 6.11.1 Encode Tab - Single Tone.)
- Configuring the 2-tone Name (Refer to FPRG 6.11.1 Encode Tab - 2-tone Name.)
- Configuring the 1st Tone (Refer to FPRG 6.11.1 Encode Tab - 1st Tone.)
- Configuring the 2nd Tone (Refer to FPRG 6.11.1 Encode Tab - 2nd Tone.)

19.3 Decode

There are 3 types of Optional Signaling for each channel in the Conventional Group: 2-tone 1, 2-tone 2 and 2-tone 3.

The following functions can be configured for 2-tone 1, 2-tone 2 and 2-tone 3:

- Decoder 1 to Decoder 2
- A Tone/ B Tone/ C Tone/ D Tone
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED

19.3.1 Decoder 1 to Decoder 2

Two types of Decoders can be configured for 2-tone 1, 2-tone 2 and 2-tone 3. The transceiver can receive the 2-tone code configured for Decoder 1 to Decoder 2 at the same time.

The following functions can be configured for each Decoder.

■ Call Format

Call Format can be used to configure the A Tone, B Tone, C Tone and D Tone combinations for receiving a call. Below is a list of the combinations.

Table 19-2 Call Format Combination List

Combination	Combination Pattern	Standby
1	<ul style="list-style-type: none"> • A-B (The transceiver waits to receive A Tone and B Tone.) • A-C (The transceiver waits to receive A Tone and C Tone.) • A-D (The transceiver waits to receive A Tone and D Tone.) 	The transceiver waits to receive the 1st Tone for 1 second and the 2nd Tone for 3 seconds.
2	<ul style="list-style-type: none"> • B-A (The transceiver waits to receive B Tone and A Tone.) • B-C (The transceiver waits to receive B Tone and C Tone.) • B-D (The transceiver waits to receive B Tone and D Tone.) 	
3	<ul style="list-style-type: none"> • C-A (The transceiver waits to receive C Tone and A Tone.) • C-B (The transceiver waits to receive C Tone and B Tone.) • C-D (The transceiver waits to receive C Tone and D Tone.) 	
4	<ul style="list-style-type: none"> • D-A (The transceiver waits to receive D Tone and A Tone.) • D-B (The transceiver waits to receive D Tone and B Tone.) • D-C (The transceiver waits to receive D Tone and C Tone.) 	
5	• Long A (The transceiver waits to receive A Tone.)	The transceiver waits to receive a Single Tone for more than 5 seconds.
6	• Long B (The transceiver waits to receive B Tone.)	
7	• Long C (The transceiver waits to receive C Tone.)	
8	• Long D (The transceiver waits to receive D Tone.)	

■ Transpond/ Alert Tone

Transpond/ Alert Tone can be used to configure the transceiver operation when the transceiver receives a call with 2-tone.

Table 19-3 Transpond/ Alert Tone Operation

Transpond	Alert	Operation
No	Off	The transceiver does not respond.
Alert Tone or Ringing Tone	Off	The transceiver transmits the Transpond tone.
No	Other than Off	The transceiver emits the Alert Tone.
Alert Tone	Other than Off	The transceiver emits the Alert Tone after transmitting the Transpond tone.
Ringing Tone	Other than Off	The transceiver emits the Ringing Tone after transmitting the Transpond tone.

■ Alert Tone

Alert Tone can be used to configure the Alert Tone emitted when the transceiver receives a call with 2-tone.

Alert Tone can be selected from 8 tones configured for the Alert Tone Pattern. (Refer to 4.4 Alert Tone Pattern on page 22.)

■ Configuration using KPG-101D

- Configuring the Call Format (Refer to FPRG 6.11.2 Decode Tab - Call Format.)
- Configuring the Transpond (Refer to FPRG 6.11.2 Decode Tab - Transpond.)
- Configuring the Alert Tone (Refer to FPRG 6.11.2 Decode Tab - Alert Tone.)

19.3.2 A Tone/ B Tone/ C Tone/ D Tone

This function can be used to select the tone frequency for A Tone, B Tone, C Tone and D Tone. The frequency can be configured between 288.5 and 3106.0 Hz.

■ Configuration using KPG-101D

- Configuring the A Tone, B Tone, C Tone and D Tone (Refer to FPRG 6.11.2 Decode Tab - A Tone, 6.11.2 Decode Tab - B Tone, 6.11.2 Decode Tab - C Tone and 6.11.2 Decode Tab - D Tone.)

19.3.3 Auto Reset Timer

Auto Reset Timer controls the duration from when the DTMF code matches to when the code is automatically reset.

The Auto Reset Timer can be configured by using KPG-101D. Transceiver operation after the Auto Reset Timer expires can also be configured.

Table 19-4 Auto Reset Timer Operation

Configuration	Operation
Off	The Auto Reset Timer does not activate.
1 to 300 s	LED, Alert Tone, Monitor, and the display return to their previous statuses when configured time elapses.

Table 19-5 Transceiver Operation after the Auto Reset Timer Expires

Item	Operation
LED	The Selective Call Alert LED stops blinking when the Auto Reset Timer expires.
Alert Tone	The transceiver stops intermittently emitting the Alert Tone when the Auto Reset Timer expires.
Monitor	The matching status of the 2-tone is reset when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Auto Reset Timer (Refer to FPRG 6.11.2 Decode Tab - Auto Reset Timer.)
- Configuring the LED (Refer to FPRG 6.11.2 Decode Tab - LED.)
- Configuring the Alert (Refer to FPRG 6.11.2 Decode Tab - Alert Tone.)
- Configuring the Monitor (Refer to FPRG 6.11.2 Decode Tab - Monitor.)

19.3.4 Clear to Transpond

Clear to Transpond forces the transceiver to wait while other users are using a channel before starting to transpond.

Clear to Transpond can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Clear to Transpond (Refer to FPRG 6.11.2 Decode Tab - Clear to Transpond.)

19.3.5 Selective Call Alert LED

Selective Call Alert LED can be used to make the Selective Call Alert LED blink when the transceiver receives a code.

Selective Call Alert LED can be configured to be enabled or disabled by using KPG-101D. (Refer to 20.2 Selcall Function on page 82.)

Note:

- ◆ The matching status of 2-tone is reset in the following conditions:

**Table 19-6 Conditions for Resetting
2-tone Matching Status**

Operation	Condition
Pressing a key	If one of the following keys is pressed: <ul style="list-style-type: none"> • Monitor key • Monitor Momentary key • Squelch Off key • Squelch Off Momentary key • Zone Up key • Zone Down key • Zone Up/Down key • CH/GID Up key • CH/GID Down key • CH/GID Up/Down key • Scan key • Home CH/GID key • Direct CH/GID 1 to Direct CH/GID 4 keys
Expiration of Timers	When the Auto Reset Timer expires.

- ◆ The status of Transpond is reset in the following conditions. The transceiver does not transpond if the transmission is restricted by Busy Channel Lockout.

Table 19-7 Conditions for Resetting Transpond

Operation	Condition
Pressing a key	If one of the following keys is pressed: <ul style="list-style-type: none"> • Monitor key • Monitor Momentary key • Squelch Off key • Squelch Off Momentary key • Zone Up key • Zone Down key • Zone Up/Down key • CH/GID Up key • CH/GID Down key • CH/GID Up/Down key • Scan key • Home CH/GID key • Direct CH/GID 1 to Direct CH/GID 4 keys
Transmission	When the PTT switch is pressed to transmit.

■ Configuration using KPG-101D

- Configuring the Selective Call Alert LED (Refer to FPRG 6.11.2 Decode Tab - Selective Call Alert LED.)

FleetSync is a Kenwood proprietary message communication system using MSK modulation. FleetSync can be used to identify individual transceivers and enable text message communications.

A user can also send messages by connecting the transceiver to the PC or to external devices since FleetSync supports serial communications.

20.1 PTT ID Function

PTT ID can be used to transmit an identification code stored in the transceiver.

A user can view the caller's ID with the received PTT ID. Therefore, the user can confirm the caller's identity not only by voice, but also through the PTT ID displayed on the display.

PTT ID can be configured for each CH/GID. The PTT ID can be transmitted according to the following timing. (Refer to 12 PTT ID on page 36.)

Table 20-1 Timing To Transmit the PTT ID

PTT ID	Timing To Transmit the PTT ID
Off	No PTT ID is transmitted.
BOT	The transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is pressed.
EOT	The transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is released.
Both	The transceiver sends Fleet (Own) and ID (Own) as the PTT ID when the PTT switch is pressed or released.
List 1 to 100	List 1 to 100 can be used to make a Selcall. The ID from 1 to 100 in the Selcall List can be selected. A user can make a Selcall using the Fleet and ID.

Note:

- ◆ Only IDs configured for the **FleetSync** window > **ID List** tab can be selected if "List 1 to 100" is selected.
- ◆ PTT ID can be used for voice communications.

■ Configuration using KPG-101D

- Configuring the PTT ID (Channel) (Refer to FPRG 6.4.13 PTT ID.)
- Configuring the PTT ID (GID) (Refer to FPRG 6.6.8 PTT ID.)

20.1.1 Caller ID Display

This function can be used to display the received PTT ID (Caller ID) on the display.

A user can confirm the caller's identity not only by voice, but also through the PTT ID displayed on the display.

The display reverts to the CH/GID display after the Auto Reset Timer expires if the Auto Reset Timer is configured. The display also reverts to the CH/GID display when 1 of the keys is pressed.

If the transceiver receives the PTT ID while the conditions for unmuting do not match, the transceiver continues muting the speaker and displays the PTT ID.

The received PTT ID can be configured to be displayed or hidden by using KPG-101D.

Note:

- ◆ A user cannot reply to the ID displayed on the display.
- ◆ The PTT ID is displayed even if the transceiver receives BOT or EOT.

■ Configuration using KPG-101D

- Configuring the Caller ID Display (Refer to FPRG 6.12.1 General 1 Tab - Caller ID Display.)

20.1.2 PTT ID Sidetone

PTT ID Sidetone notifies a user when the transceiver is available for voice communications after the transceiver sends the FleetSync ID. With this tone, a user knows exactly when to begin speaking after the **PTT** switch is pressed.

PTT ID Sidetone prevents the transceiver from missing calls by starting a conversation while the transceiver is transmitting the FleetSync PTT ID.

PTT ID Sidetone can be configured to be enabled or disabled by using KPG-101D.

Note: If the PTT ID is configured for the CH/GID, the transceiver does not emit the PTT Proceed Tone.

■ Configuration using KPG-101D

- Configuring the PTT ID Sidetone (Refer to FPRG 6.12.1 General 1 Tab - PTT ID Sidetone.)

20.2 Selcall Function

Selcall can be used to make a selective call using the FleetSync ID.

A user can make a call with their own FleetSync ID and the receiving party's ID by pressing the **PTT** switch after selecting the receiving party. The transceiver unmutes the received audio if the receiving party receives the FleetSync ID.

The caller's ID appears on the receiving party's transceiver. The receiving party can respond to the caller by pressing the **PTT** switch while the caller's ID is displayed.

The following Selcall types are available.

Table 20-2 Selcall Type

Call Type	Description
Individual Call	Individual Call can be used to make a call to one transceiver. The transceiver acknowledges that the received call is an Individual Call when the transceiver receives a Selcall having the Fleet and Unit ID matching a user's own ID.
Group Call	Group Call can be used to make a call to several transceivers in the selected Fleet. The transceiver acknowledges that the received call is a Group Call when the received Fleet number matches and the Unit ID is configured for the Group ID.
Fleet Call	Fleet Call can be used to make a call to all transceivers having a FleetSync ID in the same Fleet. The transceiver acknowledges that the received call is a Fleet Call when receiving a Selcall with a Unit ID of 0 (ALL) and the same Fleet number.
Supervisor Call	Supervisor Call can be used to make a call to a party having the same Unit ID in each Fleet. The transceiver acknowledges that the received call is a Supervisor Call when receiving a Selcall with a Fleet number of 0 (ALL) and the same Unit ID.
Broadcast Call	Broadcast Call can be used to make a call to all transceivers having a FleetSync ID. The transceiver acknowledges that the received call is a Broadcast Call when receiving a Selcall with a Fleet number and Unit ID that are both 0 (ALL).

20.2.1 Making a Selcall

List Selection or Manual Dialing can be used to make a Selcall.

With List Selection, a user can make a Selcall by selecting a FleetSync ID configured for the ID List. (Refer to 20.2.3 ID List on page 85.)

With Manual Dialing, a user can make a Selcall by directly selecting the FleetSync ID. The call type is decided according to the number of the entered digits.

Table 20-3 Call Type with Manual Dialing

Number of Digits	Range	Call Type
7 numeric digits ffffiii	The transceiver recognizes the entered value as the Fleet and ID. fff: Fleet: 100 to 349 iii: ID: 1000 to 4999	Individual Call
4 numeric digits iiii	The transceiver recognizes the entered value as the ID. iiii: ID: 1000 to 4999	Individual Call/ Group Call
3 numeric digits fff	The transceiver recognizes the entered value as the Fleet. fff: Fleet: 100 to 349	Fleet Call

Paging Call can be used to make a Selcall. This function allows a user to call a specific party. This function can be used to make a call without using voice communication.

Note:

- ◆ Auto Reply Message does not function if the transceiver receives a Paging Call.
- ◆ Supervisor Call and Broadcast Call are available only when List Selection is enabled.

■ Transceiver Operation

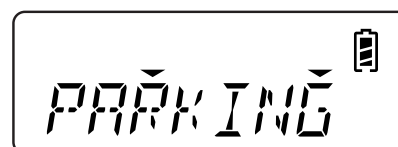
● Making a Selcall with List Selection

1. Press the **Selcall** or **Selcall + Status** key.

The transceiver enters List Selection Mode.

The last used ID Name appears on the display.

The list with the smallest list number in the ID List appears on the display when the transceiver enters List Selection Mode for the first time.



2. Select the list number.

- Using the **PF** keys
When the [**<B**] or [**C>**] key is pressed, the list number increments or decrements.
- Using the **Selector** *¹
Turn the **Selector** clockwise to increment the List number.
Turn the **Selector** counterclockwise to decrement the List number.

*¹ If the List Selection Key (Selector) is enabled.



- Using the keypad
Press the [**0**] key on the keypad and enter the List number.
Example:
Press the [**1**], [**0**] and [**0**] keys to make a call to List number 100.
Press the [**0**], [**9**] and [**0**] keys to make a call to List number 90.
Press the [**0**], [**0**] and [**7**] keys to make a call to List number 7.
The ID List Name appears on the display when the last digit is entered.

3. Press the **PTT** switch to make a Voice Call.

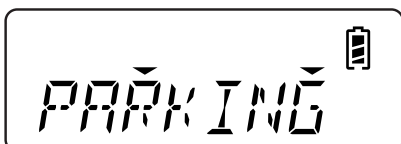
Press the **Side 2** key to make a Paging Call.

Press the [**S**] or [*****] key to enter a Status Message. (Only if the transceiver enters Status Message Entry Mode after the **Selcall + Status** key is pressed.) (Refer to 20.3 Status Message Function on page 86.)

● **Making a Selcall with Manual Dialing**

1. Press the **Selcall** or **Selcall + Status** key.

The transceiver enters List Selection Mode.

2. Press and hold the [**S**] or [*****] key for 1 second.

The transceiver enters Selcall ID Entry Mode.

The last used ID appears on the display.

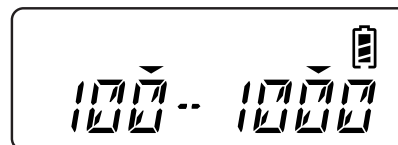
No ID appears on the display when the transceiver enters Selcall ID Entry Mode for the first time.



3. Enter the ID.

- Using the **Selector** or **PF** keys *¹
Select a code using the **Selector**.
Press the [**C>**] key after selecting the code.
*¹ If the List Selection Key (Selector) is enabled.

- Using the keypad
Enter the code using the [**0**] to [**9**] keys.
- Deleting the Entered Code
Press the [**A**] or [**#**] key.
The selected code will be deleted.
Press and hold the [**A**] or [**#**] key.
All codes will be deleted.

4. Press the **PTT** switch to make a Voice Call.

Press the **Side 2** key to make a Paging Call.

Press the [**S**] or [*****] key to enter a Status Message. (Only if the transceiver enters Status Message Entry Mode after the **Selcall + Status** key is pressed.) (Refer to 20.3 Status Message Function on page 86.)

20.2.2 Making a Selcall

The transceiver waits to receive a call under the following conditions when the transceiver receives a Selcall.

The conditions for the FleetSync ID to match when receiving a Selcall are as follows.

Call Type	Conditions to Unmute	
	Fleet fff: 100 to 399	ID iiii: 1000 to 4999
Individual Call	Match	Match
Group Call	Match	Group ID matches
Fleet Call	Match	ALL ID
Supervisor Call	ALL Fleet	Match
Broadcast Call	ALL Fleet	ALL ID

Note: "FleetSync" must be selected from the **Channel Edit** window > **Optional Signaling** dropdown list.

Individual Call/ Group Call

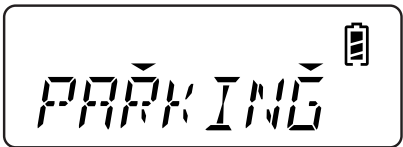
A user can respond to the party appearing on the display by pressing the **PTT** switch or **Side 2** key.

The transceiver only controls the mute function and does not enter Call Mode in the following conditions:

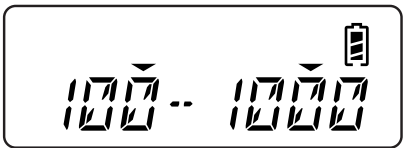
- If the transceiver receives a call from the party having Fleet inhibited by the Interfleet configuration.
- When the transmitting party's ID is outside of the Unit ID Encode Block range.
- When the ID has "Yes" configured for Transmit Inhibit in the Selcall List.

The display returns to the previous display when a key is pressed. The display also returns to the previous display after the Auto Reset Timer expires if LCD (Auto Reset) is enabled.

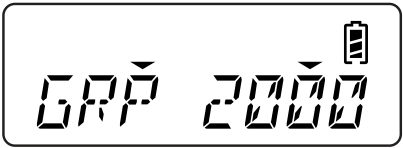
- **Display when an ID is registered in the ID List (Individual Call)**



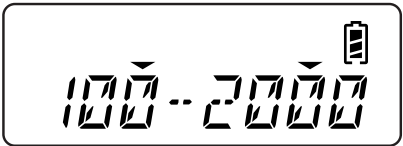
- **Display when no ID is registered in the ID List (Individual Call)**



- **Display when an ID is registered in the ID List (Group Call)**



- **Display when no ID is registered in the ID List (Group Call)**



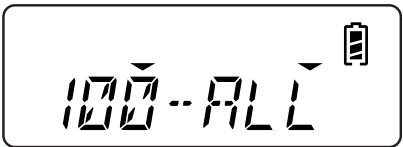
Fleet Call

A user can make a call to the party appearing on the display by pressing the **PTT** switch or **Side 2** key.

The transceiver only controls the mute function and does not enter Call Mode when receiving a call from a party having a Fleet that is not registered in the ID List.

The display returns to the previous display when a key is pressed. The display also returns to the previous display after the Auto Reset Timer expires if LCD (Auto Reset) is enabled.

- **Display when an ID is registered in the ID List**



- **Display when an ID is not registered in the ID List**



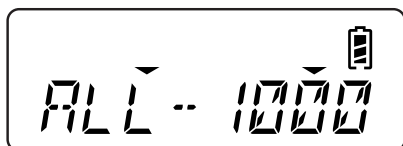
Supervisor Call/ Broadcast Call

A user can make a call to the party appearing on the display by pressing the **PTT** switch or **Side 2** key if an ID is registered in the ID List.

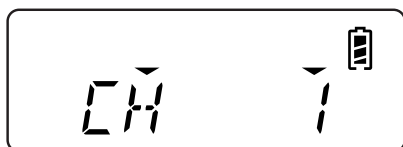
The transceiver only controls the mute function and does not enter Call Mode when receiving a call from the party having an ID that is not registered in the ID List.

The display returns to the previous display when a key is pressed. The display also returns to the previous display after the Auto Reset Timer expires if LCD (Auto Reset) is enabled.

- Display when an ID is registered in the ID List (Supervisor Call)



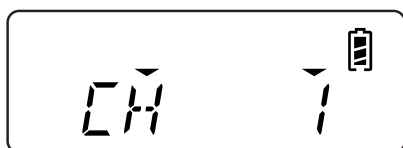
- Display when no ID is registered in the ID List (Supervisor Call)



- Display when an ID is registered in the ID List (Broadcast Call)



- Display when no ID is registered in the ID List (Broadcast Call)



Note: When the transceiver receives a Group Call, Fleet Call, or Broadcast Call, the Fleet and ID of the received Selcall appear on the display instead of the Fleet and ID of the caller. Since the call information is more important than the caller's information.

20.2.3 ID List

The transceiver uses an individual FleetSync ID for communications if FleetSync is enabled. The receiving party's FleetSync IDs must be pre-programmed in the transceiver by using KPG-101D. The transceiver can store a maximum of 100 FleetSync IDs.

The following functions can be configured in the ID List by using KPG-101D.

Table 20-5 ID List Configuration

ID List	Operation
Fleet	Configures the Fleet of the FleetSync ID. Select ALL or a value between 100 and 349. A user can call all transceivers in the same Fleet.
ID	Configures the ID of the FleetSync ID. Select ALL or a value between 1000 and 4999. A user can call all transceivers having the same ID.
ID Name	Configures the caller's ID name. A maximum of 8 characters can be configured for the ID Name. If the transceiver receives an Individual Call and the received Fleet and ID are configured in the ID List, the ID Name of the caller appears. The Call ID Name appears on the display when the transceiver receives a Selcall other than Individual Call and the received ID is configured in the ID List.
Transmit Inhibit	Enables or disables the transmit capability. When the transceiver receives a call from the ID configured for Transmit Inhibit, the ID does not appear on the ID Selection window and a user cannot select the ID. The caller's ID Name appears if the transceiver receives a call from the ID configured for Transmit Inhibit. In this case, a user cannot respond even if the PTT switch is pressed.

■ Configuration using KPG-101D

- Configuring the ID List (Refer to FPRG 6.12.4 ID List Tab.)

20.3 Status Message Function

Status Message is a simple messaging system that allows a user to send or receive a status message (Statuses 10 to 99) by selecting numbers. With this function enabled, the dispatcher can send a message to the transceiver.

20.3.1 Sending a Status Message

The following methods are available to send a Status Message.

Table 20-6 Sending Status Messages

Status Message	Description
Message Mode	The transceiver enters Message Mode and sends a Status Message when the Selcall + Status or Status key is pressed. If the transceiver enters Message Mode after the Status key is pressed, a Status Message is sent to the Target Fleet/ Target ID.
PF Key Direct	When one of the Call 1 to Call 2 keys is pressed, the transceiver sends the assigned Status Message. In the Key Assignment window, one of statuses 1 to 50 in the Status List can be assigned to a key. In this case, a Status Message is always sent to the Target Fleet/ Target ID.
PC Command	The transceiver sends the Status Message using the serial command. To use serial communications, a user must connect the PC or external devices to the transceiver.

■ Transceiver Operation

● Sending a Status Message with List Selection

1. Press the **Status** or **Selcall + Status** key.

The transceiver enters Status List Selection Mode.

The last used status appears on the display.

The list with the smallest list number in the ID List appears on the display when the transceiver enters List Selection Mode for the first time.

If the **Status** key is pressed, the ID to transmit is fixed to the Target Fleet/ Target ID.

The transceiver enters Status List Selection Mode if the **[S]** or **[*]** key is pressed after the **Selcall + Status** key is pressed and the Selcall ID is selected. (Refer to 20.2.1 Making a Selcall on page 82.)



2. Select the list number.
- Using the **PF** keys
When the **[<B]** or **[C>]** key is pressed, the list number increments or decrements.
 - Using the **Selector** ^{*1}
Turn the **Selector** clockwise to increment the List number in steps of 1.
Turn the **Selector** counterclockwise to decrement the List number in steps of 1.

^{*1} If the List Selection Key (Selector) is enabled.



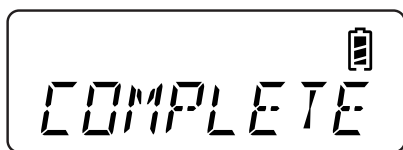
- Using the keypad
Enter the List number using a key on the keypad.
Example:
Press the **[6]** and **[0]** keys to make a call to List number 60.
Press the **[0]** and **[7]** keys to make a call to List number 7.
3. Press the **PTT** switch or **Side 2** key to send the selected Status List.

The transceiver sends a Status Message.



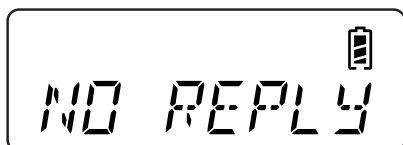
- **When the Status Message is properly sent to the receiving party:**

"COMPLETE" appears on the display.



- **When the Status Message is not properly sent to the receiving party:**

"NO REPLY" appears on the display.



- **When the channel is busy and the transceiver cannot send the Status Message:**

"BUSY" appears on the display.



- **When canceling the Status Message transmission:**

Press the **Side 1** key while "SEND DAT" appears on the display.

"CANCEL" appears on the display and the transmission is cancelled.



- **Sending a Status Message with Manual Dialing**

1. Press the **Status** or **Selcall + Status** key.

The transceiver enters Status List Selection Mode.

The transceiver enters Status List Selection Mode if the **[S]** or **[*]** key is pressed after the **Selcall + Status** key is pressed and the Selcall ID is selected. (Refer to 20.2.1 Making a Selcall on page 82.)



2. Press and hold the **[S]** or **[*]** key for 1 second.

The transceiver enters Status Code Entry Mode.

The last used status appears on the display.

No code appears on the display when the transceiver enters Status Code Entry Mode for the first time.



3. Enter the code.

- Using the **Selector** ^{*1}

Select a code using the **Selector**.

Press the **[C>]** key after selecting the code.

^{*1} If the List Selection Key (Selector) is enabled.

- Using the keypad

Enter the code using the **[0]** to **[9]** keys.

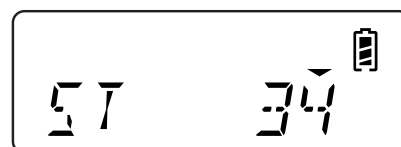
- Deleting the Entered Code:

Press the **[A]** or **[#]** key.

The selected character will be deleted.

Press and hold the **[A]** or **[#]** key.

All characters will be deleted.



4. Press the **PTT** switch or **Side 2** key.

The transceiver sends the Status Message.

20.3.2 Receiving a Status Message

The received Status Message is transferred in the following way.

Table 20-7 Receiving a Status Message

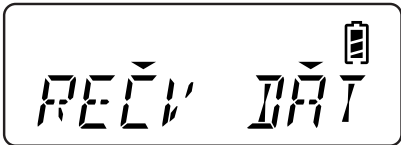
Status Message	Description
LCD	The received Status Message appears on the display. The Status Message appears on the display if "Fixed" is selected from the Message Display Type dropdown list. The received Status Message appears on the display for 3 seconds and Selcall ID appears for 2 seconds if "Alternate" is selected from the Message Display Type dropdown list.
PC Command	The transceiver sends the Status Message using the serial command. To use serial communications, a user must connect the PC or external devices to the transceiver.

Note:

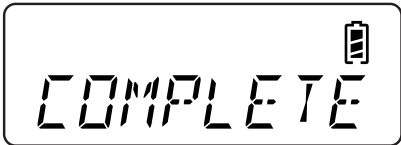
- ◆ To use serial communications, a user must prepare FleetSync compatible software or external devices.
- ◆ The transceiver can store a maximum of 5 Status Messages and 1 Short Message.
- ◆ The Status Name appears on the display if the transceiver receives a Status Message. "ST nn" appears on the display if the transceiver receives a Status Message without Status Name. (Refer to 20.3.7 Status List on page 90.)

■ Transceiver Operation

1. "RECV DAT" appears on the display when the transceiver starts receiving a Status Message.



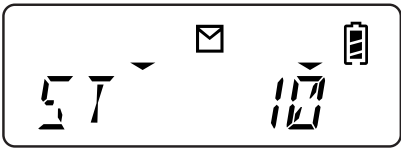
2. "COMPLETE" appears on the display when the transceiver receives a Status Message. (Individual Call only)



3. The "✉" icon blinks.
 - If a Status Name is registered in Status List:
The Status Name configured in the Status List appears on the display.

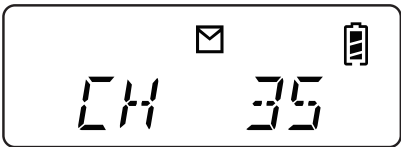


- If no Status Name is registered in Status List:
The Status Number appears on the display.



4. The display returns to the previous display.

The "✉" icon stops blinking when the received Status Message is read. (Refer to 20.6 Stack on page 95.)



20.3.3 Reserved Status for Status Messages

Status Message has reserved statuses. Below is a list of reserved status.

Table 20-8 Reserved Status List

Status	Function	Operation at Receiving Side	Entry of Status with Entry Method	
			Manual Dial	PC Control
10 to 79	Statuses intended for users	Normal Status operation.	Yes	Yes
80	Default Status	-	Yes/ No *1	
81 to 87	Undefined	-		
88	Emergency Reset Command	Exits from Emergency Mode.		
89	Horn Alert Activation Command	-		
90	Remote Stun Transmit Restriction Command	The transceiver sends the ACK. Transmission is restricted. "93" is configured for Current Status. *2		
91	Remote Stun Transmit and Receive Restriction Command	The transceiver sends the ACK. Transmission and reception are restricted. "94" is configured for Current Status. *2		
92	Remote Stun Reset Command	The transceiver sends the ACK. Disables Stun. "80" is configured for Current Status.		
93	Remote Stun Transmit Restriction Response	-		
94	Remote Stun Transmit and Receive Restriction Response	-		
95 to 99	Reserved Status for Emergency Mode 98: Man-down Status 99: Emergency Status other than Man-down	The transceiver sends the ACK. Alert/ Horn/ None *3		

*1 Entry of Statuses 80 to 99 can be enabled or disabled by using KPG-101D when directly entering a status number with Manual Dialing. (Refer to 20.3.9 Status 80 - 99 (Special) on page 91.)

*2 Stun Status does not change even if a user changes the Status in Status Mode.

*3 Entry of Statuses 95 to 99 in Emergency Mode can be configured to be enabled or disabled by using KPG-101D. (Refer to 20.3.9 Status 80 - 99 (Special) on page 91.)

■ Emergency

Alert Tone configured for Emergency Status Response sounds when receiving a reserved Status.

■ Remote Stun

Remote Stun can be used to disable almost all the transceiver's functions. Only the following operations are available when Stun is enabled. The transceiver recovers from the Stun status when receiving the Stun Deactivation status message or the DTMF Stun Deactivation command.

Table 20-9 Operation when Stun Enabled

Status Message	Transmit Restriction	Transmit and Receive Restriction
Normal Status Message operation	Transmit Restriction	Transmit and Receive Restriction
PC Control	The transceiver does not accept a transmission request. The transceiver does not send received data.	The transceiver does not accept a transmission request. The transceiver does not send received data.

■ Statuses 90 to 92


These statuses are used to activate or reset Stun. The statuses are enabled regardless of the Stun status in the receiving party's transceiver.

■ Statuses 93 to 94

These statuses are used to respond with the Stun status of the transceiver when receiving the RSTM (Request Status).

20.3.4 Status Message Stack

Status Message Stack can be used to store received Status Messages in Stack Memory. The transceiver can store a maximum of 5 Status Messages.

When a message is stacked, the “” icon blinks. In this case, a user can read the stored Status Message when the transceiver enters Stack Mode. (Refer to 20.6 Stack on page 95.)

The transceiver can be configured to store Status Messages by using KPG-101D.

Note: The transceiver can store a maximum of 5 Status Messages and 1 Short Message.

■ Configuration using KPG-101D

- Configuring the Status Message Stack (Refer to FPRG 6.12.2 General 2 Tab - Status Message Stack.)

20.3.5 Status Message on Data Zone-CH/GID

This function allows the transceiver to automatically change the channel to the Data Zone-CH/GID to send a Status Message.

The transceiver returns to the previous Zone-CH/GID when the transceiver finishes sending the Status Message. This function can be used to send data using the specific Zone-CH/GID.

Status Message on Data Zone-CH/GID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Status Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Status Message on Data Zone-CH/GID.)

20.3.6 Status Message Serial Output

Status Message Serial Output can be used to send the status, caller's Fleet and ID from the transceiver's COM port when the transceiver receives a Status Message.

The dispatcher can remote control the transceivers with the PC. With this function, a user can check the caller status by connecting an external device to the transceiver.

Status Message Serial Output can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Status Message Serial Output (Refer to FPRG 6.12.2 General 2 Tab - Status Message Serial Output.)

20.3.7 Status List

The transmitted or received statuses must be pre-programmed to use Status List. A maximum of 50 statuses can be stored in the Status List.

Status List can be configured by using KPG-101D. The following items are available for the Status List.

Table 20-10 Status Type

Call Type	Description
Status	Configure the status number. Select a status number between 10 and 99.
Status Name	Configure the status name. It may be hard to recognize the meaning of Status only with the status number. Therefore, the status name showing the contents of the status can be assigned to a status. A maximum of 16 characters can be configured for the Status Name.
Transmit Inhibit	Enable or disable the transmit capability. If the Status is configured for Transmit Inhibit, the status does not appear on the Status Selection window in Message Mode.

■ Configuration using KPG-101D

- Configuring the Status List (Refer to FPRG 6.12.5 Status List Tab.)

20.3.8 Target Fleet/ Target ID (Status Message)

Target Fleet/ Target ID is the target FleetSync ID for sending the following Status Messages:

- Status Message transmission using the **Call 1** or **Call 2** key
- Transmission when the transceiver enters Transmission Mode by pressing the **Status** key

Target FleetSync ID can be configured by using KPG-101D. The FleetSync ID of the dispatcher is normally configured for the Target Fleet/ Target ID (Status Message).

■ Configuration using KPG-101D

- Configuring the Target Fleet (Refer to FPRG 6.12.3 Parameter Tab - Target Fleet (Status Message).)
- Configuring the Target ID (Refer to FPRG 6.12.3 Parameter Tab - Target ID (Status Message).)

20.3.9 Status 80 - 99 (Special)

Status 80 to 99 (reserved status) are used to make the specified operations. This function prevents a user from accidentally sending Status 80 to 99.

Configure whether the transceiver sends Status 80 to 99 (Special).

■ Configuration using KPG-101D

- Configuring the Status 80 - 99 (Special) (Refer to FPRG 6.12.1 General 1 Tab - Status 80 - 99 (Special).)

20.3.10 Emergency Status Response

Emergency Status Response is the transceiver's reaction to receiving an emergency status message.

"MAN DOWN" appears on the display when the transceiver receives Status 98. "EMG" appears on the display when the transceiver receives Status 99. However, the configured data appears on the display when the Emergency Status is configured in the Status List.

The following functions can be configured for Emergency Status Response by using KPG-101D.

Table 20-11 Emergency Status Response Operation

Emergency Status Response	Operation
None	The transceiver activates as normal.
Alert Tone	Alert Tone configured for Emergency Status sounds when receiving an Emergency Status. Press any key other than the Volume Up or Volume Down key to stop the Alert Tone.

■ Configuration using KPG-101D

- Configuring the Emergency Status Response (Refer to FPRG 6.12.1 General 1 Tab - Emergency Status Response.)

20.4 Short Message Function

This function is the data communication function used to transmit or receive a maximum of 48 characters. With this function, the dispatcher can reliably send information to a transceiver.

20.4.1 Sending a Short Message

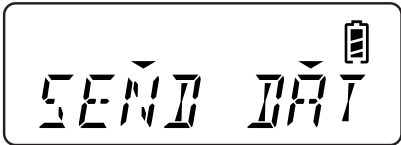
A Short Message must be sent from the PC. The transceiver cannot send a Short Message.

Note: Short Message cannot be sent if “Data” is not selected from the **COM port** dropdown list.

■ Transceiver Operation

- 1. Send the serial command to the transceiver from the PC.

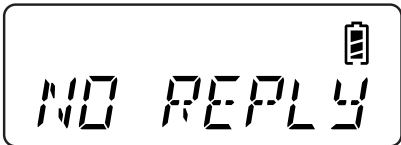
The transceiver sends a Short Message.



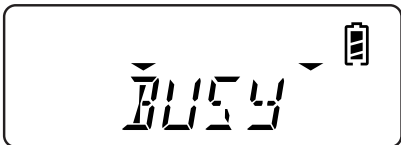
- When the Short Message is properly sent to the receiving party:
“COMPLETE” appears on the display.



- When the Short Message is not properly sent to the receiving party:
“NO REPLY” appears on the display.



- When the channel is busy and the transceiver cannot send the Short Message:
“BUSY” appears on the display.



20.4.2 Receiving a Short Message

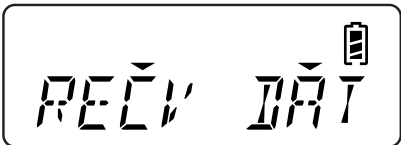
The received Short Message can be sent as follows.

Table 20-12 Sending a Short Message

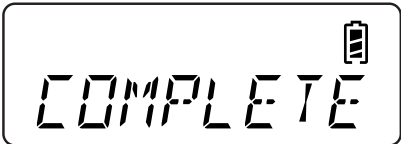
Short Message	Description
LCD	The received Short Message appears on the display. The Short Message appears on the display if “Fixed” is selected from the Message Display Type dropdown list. The received Short Message appears on the display for 3 seconds and Selcall ID appears for 2 seconds if “Alternate” is selected from the Message Display Type dropdown list.
PC Command	The transceiver sends the received Short Message using the serial command. To use serial communications, a user must connect the PC or external devices to the transceiver.

■ Transceiver Operation

- 1. “RECV DAT” appears on the display when the transceiver starts receiving a Short Message.



- 2. “COMPLETE” appears on the display when the transceiver has received a Short Message. (Individual Call only)




- 3. The “✉” icon blinks.

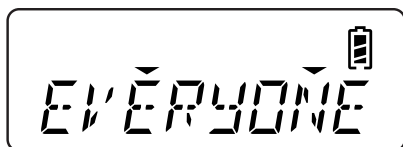
The received Short Message appears on the display.

A message is scrolled on the display if the Short Message is longer than 8 characters.



4. The display returns to the previous display.


The “” stops blinking when the received Short Message is read. (Refer to 20.6 Stack on page 95.)



Note: To use serial communications, a user must prepare FleetSync compatible software or external devices.

20.4.3 Short Message Stack

Short Message Stack can be used to store received Short Messages in Stack Memory. One short message can be stored in the Short Message Stack.

When a message is stacked, the “” icon blinks. In this case, a user can read the stored Short Message when the transceiver enters Stack Mode. (Refer to 20.6 Stack on page 95.)

The transceiver can be configured to store Short Messages by using KPG-101D.

Note: The transceiver can store a maximum of 5 Status Messages and 1 Short Message.

■ Configuration using KPG-101D

- Configuring the Short Message Stack (Refer to FPRG 6.12.2 General 2 Tab - Short Message Stack.)

20.4.4 Short Message on Data Zone-CH/GID

This function allows the transceiver to automatically change the channel to the Data Zone-CH/GID to send a Short Message.

The transceiver returns to the previous Zone-CH/GID when the transceiver finishes sending the Short Message. This function can be used to send data using a specific channel.

Short Message on Data Zone-CH/GID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Short Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Short Message on Data Zone-CH/GID.)

20.4.5 Short Message Serial Output

Short Message Serial Output can be used to send a Short Message and the caller's Fleet and ID from the transceiver's COM port when the transceiver receives a Short Message.

The dispatcher can remote control the transceivers with the PC. With this function, a user can check the caller status by connecting an external device to the transceiver.

Short Message Serial Output can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Short Message Serial Output (Refer to FPRG 6.12.2 General 2 Tab - Short Message Serial Output.)

20.5 Long Message Function

This function is the data communication function used to transmit or receive a maximum of 1024 characters. With this function, the dispatcher can reliably send information to a transceiver.

Note: "Data" must be selected from the **Optional Features** window > **Common Page 1** tab > **COM port 0** or **COM port 1** dropdown list to use Long Message Serial Output.

- When the channel is busy and the transceiver cannot send the Long Message:
"BUSY" appears on the display.



20.5.1 Sending a Long Message

A Long Message must be sent from external devices, such as the PC. The transceiver cannot send a Long Message.

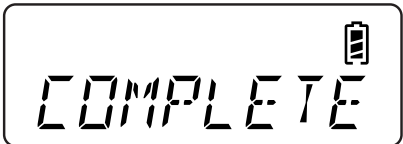
■ Transceiver Operation

1. Send the serial command to the transceiver from the PC.

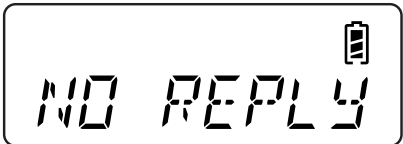
The transceiver sends a Long Message.



- When the Long Message is properly sent to the receiving party:
"COMPLETE" appears on the display.



- When the Long Message is not properly sent to the receiving party:
"NO REPLY" appears on the display.



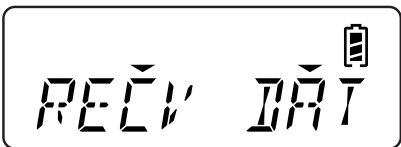
20.5.2 Receiving a Long Message

The transceiver sends the received Long Message using the serial command. Refer to the PC Interface Protocol manual for details.

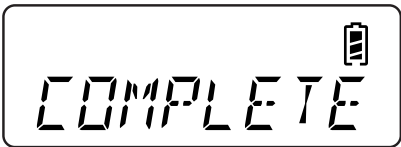
Note: To use serial communications, a user must prepare FleetSync compatible software or external devices.

■ Transceiver Operation

1. "RECV DAT" appears on the display when the transceiver starts receiving a Long Message.



2. "COMPLETE" appears on the display when the transceiver has received a Long Message. (Individual Call only)



3. The display returns to the previous display.
The transceiver sends the received Long Message to the PC using the serial command.

20.5.3 Long Message on Data Zone-CH/GID

This function allows the transceiver to automatically change the channel to the Data Zone-CH/GID to send a Long Message.

The transceiver returns to the previous Zone-CH/GID when the transceiver finishes sending the Long Message. This function can be used to send data using a specific channel.

Long Message on Data Zone-CH/GID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Long Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Long Message on Data Zone-CH/GID.)

20.6 Stack

Received Selcalls, Status Messages and Short Messages are stored in Stack Memory. A user can confirm or delete the messages by operating the transceiver.

■ Transceiver Operation

● Confirm the message.

- Press and hold the **Selcall**, **Status** or **Selcall + Status** key for 1 second.

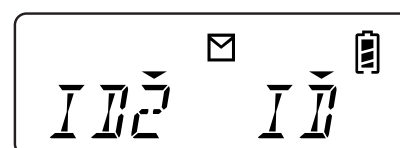
The transceiver enters Stack Mode.

- Select the message to be checked.

- Using the **PF** keys
Press the [**<B**] or [**<C**] key to increment or decrement the Stack List number.
- Using the **Selector** ^{*1}
Turn the **Selector** clockwise to increment the Stack List number.
Turn the **Selector** clockwise to decrement the Stack List number.

^{*1} If the List Selection Key (Selector) is enabled.

Stack Number Display



ID Name Display (Caller ID)

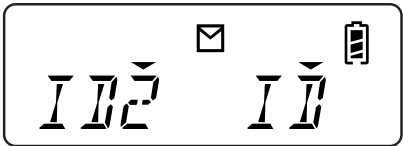


- Confirm the message.

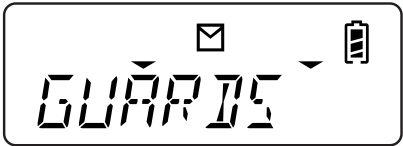
The message appears on the display.

- Selcall
The Name configured for the received ID List and Stack number are displayed alternately.
The Code and Stack number appear alternately if the Name is not configured.

Stack Number Display

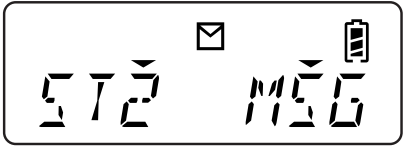


ID Name Display

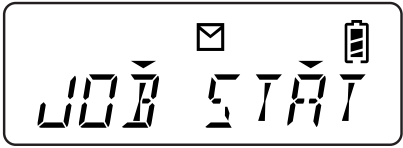


- Status Message
The Status Name and Stack number are displayed alternately.

Stack Number Display



Status Display



- Short Message
The received Short Message and Stack number are displayed alternately.

Stack Number Display



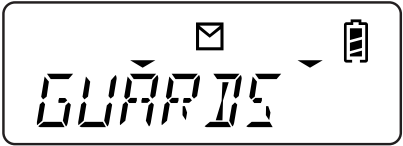
Short Message Display



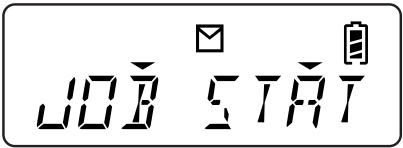
● Switching the Message Display

1. Press and hold the [S] or [*] key for 1 second while the message is displayed.
The received message displays switch in the following order: ID > Stack Number > Status Message > Channel Name.

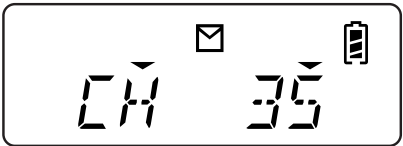
ID



Status Message



Channel Name



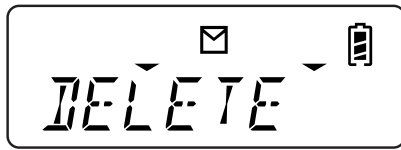
● Deleting the Message

1. Select the Stack List to be deleted.
 - Using the PF keys
Press the [<B] or [>C] key increment or decrement the Stack List number.
 - Using the Selector*1
Turn the Selector clockwise to increment the Stack List number.
Turn the Selector counterclockwise to decrement the Stack List number.

*1 If the List Selection Key (Selector) is enabled.



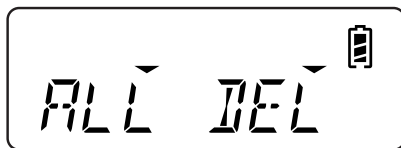
2. Press the **[A]** or **[#]** key.
“DELETE” appears on the display.



3. Press the **[S]** or **[*]** key.
The message is deleted.
The Stack List display appears without deleting the message when the **[A]** or **[#]** key is pressed.

- **Deleting All Messages**

1. Press and hold the **[A]** or **[#]** key for 1 second.
“ALL DEL” appears on the display.



2. Press the **[S]** or **[*]** key.
All messages are deleted and “EMPTY” appears on the display.
The Stack List display appears without deleting the message when the **[A]** or **[#]** key is pressed.



20.6.1 Stores the Latest Received Messages

This function can be used to configure the method for storing the Caller IDs, Status Messages and Short Messages.

Stores the Latest Received Messages can be configured by using KPG-101D.

Table 20-13 Stores the Latest Received Messages Configuration

Stores the Latest Received Messages	Function
Check (Enable)	The transceiver stacks a maximum of 9 received messages in the order received. When the transceiver receives a message while the memory is full, the transceiver deletes the oldest message from the stack memory and stores the latest message.
Uncheck (Disable)	The transceiver stacks a maximum of 9 received messages in the order received. When the transceiver receives a message while the memory is full, the transceiver does not store the message.

Note: The transceiver can store a maximum of 3 Caller IDs, 5 Status Messages and 1 Short Message in total of 9 Messages. The number of messages that can be stored in the memory varies if the memory is not full.

■ Configuration using KPG-101D


- Configuring the Stores the latest received messages (Refer to FPRG 6.12.2 General 2 Tab - Stores the latest received messages.)

20.6.2 Caller ID Stack

Caller ID Stack can be used to store IDs of the callers to Stack Memory.

A maximum of 3 Call IDs can be stored. The transceiver can also store a maximum of 9 received messages (Status Message + Short Message).

A user can respond to the displayed Caller ID by pressing the **PTT** switch after the transceiver enters Caller ID Stack Mode.

When the transceiver receives a call with FleetSync ID, the “” icon blinks to notify a user that the ID is stored. The user can check stored FleetSync IDs when the transceiver enters Stack Mode.

The method to store a Caller ID varies corresponding to Stores the Latest Received Messages configuration. (Refer to [20.6.1 Stores the Latest Received Messages on page 97.](#))

Caller ID Stack can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Caller ID Stack (Refer to FPRG 6.12.2 General 2 Tab - Caller ID Stack.)

20.6.3 Message Memory

Message Memory can be used to stack Caller IDs, Status Messages and Short Messages even if the transceiver is turned OFF.

The transceiver can be configured to store messages by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Message Memory (Refer to FPRG 6.12.2 General 2 Tab - Message Memory.)

20.7 Configuring FleetSync

The following FleetSync functions can be configured by using KPG-101D:

- Fleet/ ID (Own)
- Unit Encode Block
- FleetSync Baud Rate
- Message Display Type
- PC Interface Protocol
- Manual Dialing
- Selective Call Alert LED
- Interfleet Call
- Group ID
- Auto Reset Timer
- Alert Tone (Individual Call)
- Alert Tone (Other Selective Calls)
- Alert Tone (Paging Call)
- Alert Tone (Status Message Call / Short Message Call)
- Alert Tone (Emergency Response Call)
- Unit ID Serial Output
- GTC Count
- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- ACK Delay Time
- Transmit Delay Time (Receive Capture)
- Data Transmit Modulation Delay Time
- Random Access (Contention)
- Data Transmit with QT/DQT

20.7.1 Fleet/ ID (Own)

FleetSync ID is the 7-digit ID consisting of a 3-digit Fleet number (100 to 349) and a 4-digit ID number (1000 to 4999).

This ID is used for the PTT ID, for making a call and for FleetSync data communications.

FleetSync ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Fleet (Refer to FPRG 6.12.1 General 1 Tab - Fleet (Own).)
- Configuring the ID (Refer to FPRG 6.12.1 General 1 Tab - ID (Own).)

20.7.2 Unit ID Encode Block

The Unit ID Encode Block is the FleetSync ID range used to make a call.

It is possible to limit the FleetSync ID range by using KPG-101D. The FleetSync ID configured in the ID List can be used even if the ID is outside the Unit ID Encode Block range.

If Unit ID Encode Block is not configured; the transceiver can call all FleetSync IDs.

The following FleetSync IDs can be called with Unit ID Encode Block.

Table 20-14 Available FleetSync ID

Unit ID Encode Block	Interfleet Call Configuration	
	On (Check)	Off (Uncheck)
On	Unit ID Encode Block in all Fleets	Unit ID Encode Block in Fleet
Off	All Fleet IDs	All IDs in Fleet (Own)

■ Configuration using KPG-101D

- Configuring the Unit ID Encode Block (Refer to FPRG 6.12.1 General 1 Tab - Unit ID Encode Block.)

20.7.3 FleetSync Baud Rate

FleetSync Baud Rate is the data baud rate for the MSK modem.

The FleetSync Baud Rate configuration of both the transmitting and receiving parties must be the same.

FleetSync Baud Rate can be configured by using KPG-101D. Below is a list of available baud rates.

Table 20-15 Available FleetSync Baud Rates

FleetSync Baud Rate	Operation
1200 bps	Enables data communication at 1200 bps. This configuration is recommended for normal communications.
2400 bps	The transceiver can send more data in a shorter time as compared with 1200 bps. However, errors are more likely to occur due to the faster rate. In addition, the available data communication area is smaller than for 1200 bps.

■ Configuration using KPG-101D

- Configuring the FleetSync Baud Rate (Refer to FPRG 6.12.1 General 1 Tab - FleetSync Baud Rate.)

20.7.4 Message Display Type

Message Display Type can be used to configure the display when receiving a Status Message or Short Message.

Message Display Type can be configured by using KPG-101D. The following methods are available for Message Display Type.

Table 20-16 Message Display Type Operation

Message Display Type	Operation
Fixed	"Status Message/ Short Message" appears on the display when the transceiver receives a call. The message is scrolled on the display if the message is longer than 9 characters.
Alternate	"Status Message/ Short Message" appears for 3 seconds and Selcall ID appears for 2 seconds alternately when the transceiver receives a call.

Note: The previous CH/GID appears on the display when any key is pressed while a message is displayed.

■ Configuration using KPG-101D

- Configuring the Message Display Type (Refer to FPRG 6.12.1 General 1 Tab - Message Display Type.)

20.7.5 PC Interface Protocol

There are 2 types of PC Interface Protocols: Version 1 and Version 2.

Version 1 is same protocol used in the TK-780 and TK-7150.

Version 2 is the new protocol. In this version, a Sequence number is added to the command, and ACK (acknowledge) can be sent after receiving a command. Therefore, it is easier to manage and control the transceiver from the PC.

PC Interface Protocol can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the PC Interface Protocol (Refer to FPRG 6.12.1 General 1 Tab - PC Interface Protocol.)

20.7.6 Manual Dialing

Manual Dialing can be used to directly enter the Fleet and ID numbers.

Enter directly the Fleet and ID using the keypad or **Selector** when Manual Dialing is enabled.

Manual Dialing can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Manual Dialing (Refer to FPRG 6.12.1 General 1 Tab - Manual Dialing.)

20.7.7 Selective Call Alert LED

Selective Call Alert LED can be used to make the Selective Call Alert LED blink when the transceiver receives a Selcall. (Refer to 20.2 Selcall Function on page 82.)

The Selective Call Alert LED can be configured to blink by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Selective Call Alert LED (Refer to FPRG 6.12.1 General 1 Tab - Selective Call Alert LED.)

20.7.8 Interfleet Call

This function allows a user to make a call to a FleetSync ID in a different Fleet.

A user can inhibit making a call to a FleetSync ID having a different Fleet number by disabling Interfleet Call (Uncheck) by using KPG-101D. This function also prevents a user from making a call to an Interfleet ID inadvertently.

Interfleet Call can be configured to be enabled or disabled by using KPG-101D.

Note: A user can make an Interfleet Call regardless of the Interfleet configuration when making an Interfleet Call with a PC Command.

■ Configuration using KPG-101D

- Configuring the Interfleet Call (Refer to FPRG 6.12.1 General 1 Tab - Interfleet Call.)

20.7.9 Group ID

A user can make a Group Call using FleetSync. The same Group ID must be assigned to transceivers in each group when making a Group Call. A user can make a call to a smaller unit than Fleet Call and Supervisor Call. Normally, Group ID is used in the same Fleet.

Table 20-17 Response Scenarios for Group IDs

Call Type	Response	
	ID Configured in ID List	ID Not Configured in ID List
Group Call	A user can respond with a Group Call.	A user can respond with a Group Call. However, a user may not be able to respond according to the Interfleet configuration and Unit Encode Block configuration.

Group ID can be configured if the **Group ID** checkbox is checked. A user can configure a maximum of 10 groups.

Group ID can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Group ID (Refer to FPRG 6.12.1 General 1 Tab - Group ID.)
- Configuring the Group ID (1 to 10) (Refer to FPRG 6.12.1 General 1 Tab - Group ID (1 to 10).)

20.7.10 Auto Reset Timer

Auto Reset Timer can be used to reset the LED, Alert Tone, Monitor, and LCD to the previous statuses after a certain period elapses.

The following functions can be configured for the Auto Reset Timer.

Table 20-18 Auto Reset Timer Operation

Configuration	Operation
Off	The Auto Reset Timer does not activate.
1 to 300 s	LED, Alert Tone, Monitor, and the LCD return to their previous statuses when configured time elapses.

Table 20-19 Transceiver Operation after the Auto Reset Timer expires

Item	Operation
LED	The Selective Call Alert LED turns Off when the Auto Reset Timer expires.
Alert Tone	The transceiver stops intermittently emitting the Alert Tone when the Auto Reset Timer expires.
Monitor	The matching status of Selcall is reset when the Auto Reset Timer expires.
LCD	The previous CH/GID appears on the display when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Auto Reset Timer (Refer to FPRG 6.12.2 General 2 Tab - Auto Reset Timer.)

20.7.11 Alert Tone (Individual Call)

The Alert Tone (Individual Call) sounds when the transceiver receives an individual call. One of 8 tones configured in Special Alert Tone can be selected for the Alert Tone (Individual Call).

Note: If Infinite is configured in the **Special Alert Tone** window > **Cycle** edit box and the **Auto Reset Timer (Alert)** checkbox is checked, the transceiver stops emitting this tone when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Alert Tone (Individual Call) (Refer to FPRG 6.12.2 General 2 Tab - Individual Call (Alert Tone).)

20.7.12 Alert Tone (Other Selective Calls)

The Alert Tone (Other Selective Calls) sounds when the transceiver receives a Selcall. One of 8 tones configured in Special Alert Tone can be selected for the Alert Tone (Other Selective Calls).

Note:

- The Alert Tone (Other Selective Calls) is used for Group Call, Fleet Call, Supervisor Call and Broadcast Call.
- If Infinite is configured in the **Special Alert Tone** window > **Cycle** edit box and the **Auto Reset Timer (Alert)** checkbox is checked, the transceiver stops emitting this tone when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Alert Tone (Other Selective Calls) (Refer to FPRG 6.12.2 General 2 Tab - Other Selective Calls (Alert Tone).)

20.7.13 Alert Tone (Paging Call)

The Alert Tone (Paging Call) sounds when the transceiver receives a paging call. One of 8 tones configured in Special Alert Tone can be selected for the Alert Tone (Paging Call).

Note: If Infinite is configured in the **Special Alert Tone** window > **Cycle** edit box and the **Auto Reset Timer (Alert)** checkbox is checked, the transceiver stops emitting this tone when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Alert Tone (Paging Call) (Refer to FPRG 6.12.2 General 2 Tab - Paging Call (Alert Tone).)

20.7.14 Alert Tone (Status Message Call/ Short Message Call)

The Alert Tone (Status Message Call/ Short Message Call) sounds when a Status Message or Short Message is stacked. One of 8 tones configured in Special Alert Tone can be selected for the Alert Tone (Status Message Call/ Short Message Call).

Note: If Infinite is configured in the **Special Alert Tone** window > **Cycle** edit box and the **Auto Reset Timer (Alert)** checkbox is checked, the transceiver stops emitting this tone when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Alert Tone (Status Message Call/ Short Message Call) (Refer to FPRG 6.12.2 General 2 Tab - Status Message Call/ Short Message Call (Alert Tone).)

20.7.15 Alert Tone (Emergency Response)

The Alert Tone (Emergency Response) sounds when Alert is configured for Emergency Response. One of 8 tones configured in Special Alert Tone can be selected for the Alert Tone (Emergency Response).

Note: If Infinite is configured in the **Special Alert Tone** window > **Cycle** edit box and the **Auto Reset Timer (Alert)** checkbox is checked, the transceiver stops emitting this tone when the Auto Reset Timer expires.

■ Configuration using KPG-101D

- Configuring the Alert Tone (Emergency Response) (Refer to FPRG 6.12.2 General 2 Tab - Emergency Response (Alert Tone).)

20.7.16 Unit ID Serial Output

Unit ID Serial Output allows the transceiver to send the caller's Fleet and ID from the transceiver's COM port when the transceiver receives the PTT ID.

With this function, the dispatcher can monitor and control transceivers that are transmitting in real time.

Unit ID Serial Output can be configured to be enabled or disabled by using KPG-101D.

Note: "Data" must be selected in COM port when using Unit ID Serial Output.

■ Configuration using KPG-101D

- Configuring the Unit ID Serial Output (Refer to FPRG 6.12.2 General 2 Tab - Unit ID Serial Output.)

20.7.17 GTC Count

GTC Count is a number of times to send the GTC from the transmitting party.

GTC (Go To Channel) is a message allowing the transmitting party to lead the receiving party to a data channel.

The transmitting party's transceiver transmits the GTC and automatically jumps to the data channel, if Status Message on Data Channel, Short Message on Data Channel, or Long Message on Data Channel is enabled. The receiving party's transceiver automatically jumps to the data channel and waits to receive data if GTC is received.

The transceiver can be configured to send the GTC by using KPG-101D. The number of times to send the GTC can also be configured. Normally, the default setting is used.

Note:

- ◆ The receiving party's transceiver automatically jumps to the data channel and waits to receive data of Status Message, Short Message or Long Message. The transceiver returns to the voice channel when the transceiver does not receive data within the Maximum ACK Wait Time.
- ◆ The transmitting party's transceiver automatically jumps to the data channel, sends a Status Message, Short Message or Long Message. The transceiver returns to the voice channel when the transceiver does not receive an ACK within the Maximum ACK Wait Time.

■ Configuration using KPG-101D

- Configuring the GTC Count (Refer to FPRG 6.12.3 Parameter Tab - GTC Count.)

20.7.18 Number of Retries

If the transceiver does not receive an ACK within the Maximum ACK Wait Time, the transceiver resends data. Number of Retries is the number of times for the transceiver to resend data. Decrease the number when communication conditions are better and increase the number when the communication conditions are poorer.

Number of Retries can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Number of Retries (Refer to FPRG 6.12.3 Parameter Tab - Number of Retries.)

20.7.19 Transmit Busy Wait Time

Transmit Busy Wait Time is the maximum time for the transceiver to withhold data transmission when the channel is busy. The transmission is canceled when the channel is busy even if the Transmit Busy Wait Time elapses.

Transmit Busy Wait Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Busy Wait Time (Refer to FPRG 6.12.3 Parameter Tab - Transmit Busy Wait Time.)

20.7.20 Maximum ACK Wait Time

Maximum ACK Wait Time is the wait time for receiving ACK after ending a data transmission. If the transceiver does not receive an ACK within the Maximum ACK Wait Time, the transceiver resends data.

Maximum ACK Wait Time can be configured by using KPG-101D. Normally, the default setting is used.

Note:

- ◆ Maximum ACK Wait Time can also be used for the transceiver to automatically jump to the data channel with GTC and wait to receive data.
- ◆ A Long Data Message is sent several times. The receiving party's transceiver waits to receive the next data for the Maximum ACK Wait Time. If the transceiver does not receive the Long Data Message within the Maximum ACK Wait Time, the transceiver stops waiting to receive the Long Data Message.

■ Configuration using KPG-101D

- Configuring the Maximum ACK Wait Time (Refer to FPRG 6.12.3 Parameter Tab - Maximum ACK Wait Time.)

20.7.21 ACK Delay Time

ACK Delay Time is the time between when the transceiver receives data and when the transceiver sends an ACK.

This time must be shorter than Maximum ACK Wait Time configured in the caller's transceiver. In addition, this period must be shorter than the Hang Time configured for the repeater if ARQ is used in the LTR Trunked Radio System.

ACK Delay Time can be configured by using KPG-101D. Normally, the default setting is used.

■ Configuration using KPG-101D

- Configuring the ACK Delay Time (Refer to FPRG 6.12.3 Parameter Tab - ACK Delay Time.)

20.7.22 Transmit Delay Time (Receive Capture)

Transmit Delay Time is the duration that the transceiver transmits unmodulated signals prior to data transmission.

With this function, a user can reliably receive data since the transceiver at the receiving end stops scanning when the transceiver at the transmitting end transmits unmodulated signals. Therefore, a user can reliably receive data even if the transceiver at the receiving end is scanning or the Battery Saver function is enabled.

The Transmit Delay Time can be configured by using KPG-101D. Normally, the default setting is used.

■ Configuration using KPG-101D

- Configuring the Transmit Delay Time (Refer to FPRG 6.12.3 Parameter Tab - Transmit Delay Time.)

20.7.23 Data Transmit Modulation Delay Time

The Data Transmit Modulation Delay Time is the duration between when the transceiver starts transmitting and when the transceiver starts modulating the MSK data.

This delay time is used to stabilize the transceiver before starting the MSK modulation. For example, it may be difficult to establish data communications when the transmit and receive frequencies are widely separated or the transceiver is used in extremely cold areas. In such cases, configure this delay time longer in order to improve data communications.

The Data Transmit Modulation Delay Time can be configured by using KPG-101D. Normally, the default setting is used.

■ Configuration using KPG-101D

- Configuring the Data Transmit Modulation Delay Time (Refer to FPRG 6.12.3 Parameter Tab - Data Transmit Modulation Delay Time.)

20.7.24 Random Access (Contention)

Random Access can be used to randomize the transmission start time for each transceiver to send data on an available channel.

If a large number of transceivers start transmitting immediately after the channel becomes available, transmission contention may occur. This function prevents this contention.

Random Access can be configured to be enabled or disabled by using KPG-101D.

Note: Random Access duration varies depending on the configuration in **FleetSync** window > **General 1** Tab > **FleetSync Baud Rate** edit box.

■ Configuration using KPG-101D

- Configuring the Random Access (Refer to FPRG 6.12.3 Parameter Tab - Random Access.)

20.7.25 Data Transmit with QT/DQT

Data Transmit with QT/DQT allows the transceiver to multiplex QT/ DQT on channels used for data transmission.

This function is available for Conventional Group channels that handle Status Messages, Short Messages or Long Messages.

While a repeater uses QT/DQT, the transceiver establishes data communications with multiplexed QT/DQT when this function is enabled.

When data and voice communications shares the same channel and data transmission sound is not necessary this function must be disabled. In this case, QT/DQT is not multiplexed with the data transmission.

Data Transmit with QT/DQT can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring Data Transmit with QT/DQT (Refer to FPRG 6.12.3 Parameter Tab - Data Transmit with QT/DQT.)

Scan can be used to receive multiple CH/GIDs.

The transceiver checks for a signal on each channel in the Conventional Group. If a signal is detected, the transceiver receives on the channel with the signal.

The transceiver checks for calls with Group ID in Trunking System. If a decodable Group ID is detected, the transceiver receives the Group ID.

There are 2 types of Scan: Manual Scan and Auto Scan.

■ Manual Scan

When the **Scan** key is pressed, the transceiver executes the scan configured for Scan Type.

• Single Scan:

The transceiver scans CH/GIDs in the zone displayed at the beginning of the scan. The transceiver always scans Priority Channel even if the Priority Channel is not configured in the current zone.

• Multi Scan:

The transceiver scans all Zone-CH/GIDs in multiple zones. The transceiver always scans Priority Channel even if the Priority Channel is not configured in the selected zone.

• List Scan (TK-3173 only):

The transceiver scans all Zone-CH/GIDs configured to the Scan List Table. The transceiver always scans Priority Channel even if the Priority Channel is not configured in the selected zone.

■ Auto Scan

• Group Scan (TK-3173 only):

The transceiver automatically scans the Add ID in the selected zone if a zone is selected in Trunking System.

21.1 Scan Operation


21.1.1 Conditions to Start Scanning

If the **Scan** key is pressed while the transceiver is not scanning, the transceiver executes Single Scan, Multi Scan or List Scan.

One of the following conditions must be met to start scanning by pressing the **Scan** key: An Error Tone sounds and the transceiver does not start scanning if the conditions are not met.

- At least 2 Add CH/GIDs are configured in the Scan Start Zone.
- At least 1 Add CH/GID is configured in the Scan Start Zone, or the Priority Channel is configured in the same zone or another zone.
- No Add CH/GID is configured in the Scan Start Zone or the Priority Channel is configured in the same zone or another zone.

21.1.2 Conditions to Resume Scanning


One of the following conditions must be met to resume scanning: The “” icon blinks and the transceiver pauses scanning if the conditions are not met.


- At least 2 Add CH/GIDs are configured in the Scan Start Zone.
- At least 1 Add CH/GID is configured in the Scan Start Zone, or the Priority Channel is configured in the same zone or another zone.
- No Add CH/GID is configured in the Scan Start Zone or the Priority Channel is configured in the same zone or another zone.

The transceiver temporarily deletes or adds the CH/GID on which the scan is pausing 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.

The Priority Channel is always treated as the Add Channel regardless of the Delete/Add display.

21.1.3 Operations when Scan Cannot Resume

During the scan, the selected CH/GID appears and “” icon blinks on the display if the transceiver is manually changed to a zone that does not meet the requirements to resume the scan. In this case, the transceiver does not resume scanning.

The transceiver transmits using the Revert CH/GID when the **PTT** switch is pressed while the “” icon is blinking. The transceiver returns to the selected CH/GID if the Dwell Time elapses after the transceiver finishes transmitting. However, the transceiver does not resume scanning.

21.1.4 Operation after Manually Changing the Zone-CH/GID during the Scan

The transceiver activates in the following way if the Zone-CH/GID is changed during the scan.

Table 21-1 Operation after Changing the Zone-CH/GID

Display	Operation
Scan	The transceiver stops scanning on the selected CH/GID. The transceiver resumes scanning after the Dwell Time elapses.
Revert CH/GID	The transceiver pauses scanning on the selected CH/GID when the Revert CH/GID is different from the selected CH/GID.

The transceiver activates in the following way if the **Home CH/GID** key is pressed during the scan.

Table 21-2 Operation after Pressing the Home CH/GID Key

Scan Type	Operation
Scan	The transceiver stops scanning on the Home CH/GID. The transceiver checks and looks back for signals during the Priority Scan. When the Home CH/GID key is pressed again, the transceiver returns to the selected CH/GID and resumes scanning. The transceiver emits the Scan Stop Tone every 5 seconds while the transceiver pauses scanning.
Single Scan	The transceiver jumps to the Home CH/GID of the selected Zone. In this case, the selected CH/GID is not changed.
Multi Scan	The transceiver jumps to the Home CH/GID of the Revert Zone. In this case, the selected CH/GID is not changed.

The transceiver activates in the following way if one of the **Direct CH/GID 1** to **Direct CH/GID 4** keys is pressed during the scan.

- The transceiver stops scanning on the Direct CH/GID 1 to Direct CH/GID 4.
If no signal is present, the transceiver resumes scanning from the current Direct CH/GID after the Key Dwell Time elapses. The transceiver activates in the same way even if the transceiver is executing the Priority Scan.
- If a Conventional Group channel is configured for Direct CH/GID nn and “Selected” is selected from the **Priority** dropdown list, Direct CH/GID nn is configured for the Priority Channel.
- If “Selected” is selected from the **Revert CH/GID** dropdown list, Direct CH/GID nn is configured for the Revert CH/GID.

21.1.5 Operations when Manually Changing the Zone-CH/GID while Scan Pauses to Receive a Call

The transceiver activates in the following way if the Zone-CH/GID is manually changed during the scan to receive a call.

- The transceiver pauses scanning on the selected CH/GID when the selected CH/GID is different from the CH/GID on which the transceiver stops scanning.

21.1.6 Transceiver Operation during the Scan

Transceiver operation during the scan varies between Conventional Group and Trunking Systems.

■ Conventional Group

The transceiver activates as configured in the **Zone Edit** window (Conventional Group) > **Audio Control** dropdown list.

**Table 21-3 Transceiver Operation during Scan
(Conventional Group)**

Configuration	Operation
QT/DQT Operation	The transceiver pauses scanning when the received QT/DQT matches. 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 transceiver starts counting down the Dwell Time when the transmission ends, then resumes scanning when the Dwell Time elapses.
QT/DQT - Optional Signaling AND Operation	The transceiver pauses scanning when the received QT/DQT matches. The transceiver does not emit the received audio and waits to receive an Optional Signaling. The transceiver resumes scanning after the Dropout Delay Time elapses when the QT/DQT does not match the configured QT/DQT while waiting to receive an Optional Signaling. The transceiver emits the received audio and Alert Tone or starts transponding when the received Optional Signaling matches the Optional Signaling configured for the transceiver. The transceiver stands by on the channel when the Optional Signaling matches.
QT/DQT - Optional Signaling OR Operation	The transceiver pauses scanning when the received QT/DQT matches. The transceiver emits the received audio and waits to receive an Optional Signaling. The transceiver mutes the received audio and resumes scanning after the Dropout Delay Time elapses when the QT/DQT does not match the configured QT/DQT while waiting to receive an Optional Signaling. The transceiver pauses scanning if the received Optional Signaling matches. The transceiver pauses scanning on the current channel regardless of the QT/DQT until the Optional Signaling is reset.

**Table 21-4 Transceiver Operation during Scan
(Trunking System)**

Configuration	Operation
LTR ID Operation	The transceiver stops scanning if the decoded LTR ID matches the target Group ID. The Dropout Delay Time starts counting down if the decoded LTR ID matching status is reset. The transceiver resumes scanning after the Dropout Delay Time elapses. The transceiver transmits on Revert GID when the PTT switch is pressed. The Dwell Time starts counting down when the transmission ends, then resumes scanning when the Dwell Time elapses.
LTR ID - Optional Signaling AND Operation	The transceiver pauses scanning if the decoded LTR ID matches the target Group ID. The transceiver does not emit the received audio and waits to receive an Optional Signaling. The transceiver resumes scanning after the Dropout Delay Time elapses when the decoded LTR ID does not match the configured Group ID while waiting to receive an Optional Signaling. The transceiver emits the received audio and Alert Tone or starts transponding when the received Optional Signaling matches the Optional Signaling configured for the transceiver. The transceiver stands by on the Group ID if the Optional Signaling matches.
LTR ID - Optional Signaling OR Operation	The transceiver pauses scanning if the decoded LTR ID matches the target Group ID. The transceiver emits the received audio and waits to receive an Optional Signaling. The transceiver mutes the received audio and resumes scanning after the Dropout Delay Time elapses when the decoded LTR ID does not match the configured Group ID while waiting to receive an Optional Signaling. The transceiver emits the Alert Tone or starts transponding when the received Optional Signaling matches the Optional Signaling configured for the transceiver.

■ Trunking System

The transceiver functions as configured in the **Zone Edit** window (Trunking System) > **Audio Control** dropdown list.

Note: The transceiver jumps to the LTR ID having the higher priority when the transceiver receives an LTR ID having higher priority than the current LTR ID in Trunking System.

21.1.7 Single Scan

Single Scan can be used to only scan the zone in which the transceiver started scanning.

The following CH/GIDs can be scanned:

- CH/GID on which Scan Add is enabled in the **Channel Edit** window or **GID Edit** window.
- A CH/GID added to the Scan List with the **Scan Delete/Add** key

The transceiver always scans Priority Channel even if the Priority Channel is not configured in the target zone when a Priority Channel is configured.

“Single” must be selected from the **Scan Type** dropdown list to enable Single Scan.

■ Transceiver Operation

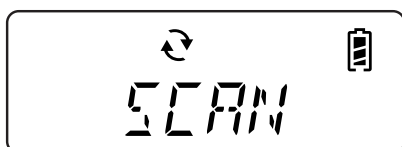
● Starting the Scan

1. Press the **Scan** key.

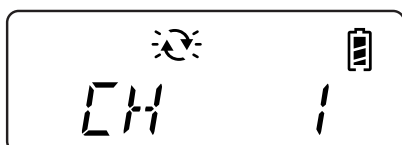
The transceiver starts scanning.

- Normal Scan

“SCAN” and the “↻” icon appear on the display.



- If the transceiver enters Scan Termination Condition during the scan:
The transceiver pauses scanning. The “↻” icon blinks.



● Exiting from Scan Mode

1. Press the **Scan** key while the transceiver is scanning.

The “↻” icon disappears and the transceiver finishes scanning.



■ Configuration using KPG-101D

- Configuring the Scan Type (Refer to FPRG 6.9.8 Scan Type.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

21.2 Multi Scan

Multi Scan can be used to scan all zones and CH/GID.

The following Zone-CH/GIDs can be scanned with Multi Scan:

- A Zone that Zone Add has selected by using KPG-101D
- A CH/GID that Scan Add has selected by using KPG-101D
- A CH/GID added to the Scan List with the **Scan Delete/Add** key

The transceiver always scans Priority Channel even if the Priority Channel is not configured in the target zone when a Priority Channel is configured.

“Multi” must be selected from the **Scan Type** to enable Multi Scan.

■ Transceiver Operation

● Starting the Scan

1. Press the **Scan** key.

The transceiver starts scanning.

“SCAN” and the “↻” icon appear on the display.

● Exiting from Scan Mode

1. Press the **Scan** key while the transceiver is scanning.

The “↻” icon disappears and the transceiver finishes scanning.

■ Configuration using KPG-101D

- Configuring the Scan Type (Refer to FPRG 6.9.8 Scan Type.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

21.3 List Scan (TK-3173 only)

List Scan can be used to scan all Zone-CH/GIDs added in the Scan List Table.

The following CH/GIDs can be scanned:

- A CH/GID in a Zone that Scan Add is selected in Scan List Table by using KPG-101D
- A CH/GID added to the Scan List with the **Scan Delete/Add** key

The transceiver always scans Priority Channel even if the Priority Channel is not configured in the target zone when a Priority Channel is configured.

"List" must be selected from the **Scan Type** to enable List Scan.

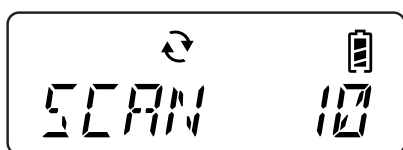
■ Transceiver Operation

● Starting the Scan

1. Press the **Scan** key.

The transceiver starts scanning.

"SCAN n" and the "↻" icon appear on the display. The zone number configured for the Scan List can be entered in "n".



● Exiting from Scan Mode

1. Press the **Scan** key while the transceiver is scanning.

The "↻" icon disappears and the transceiver finishes scanning.

■ Configuration using KPG-101D

- Configuring the Scan Type (Refer to FPRG 6.9.8 Scan Type.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

21.4 Priority Scan

Priority Scan can be used to scan the high priority channels regardless of the configuration in each channel.

The transceiver monitors the Priority Channel with Lookback even if the transceiver is receiving a normal channel using Single Scan, Multi Scan or List Scan when a Priority Channel is configured.

The transceiver scans the Priority Channel in the following conditions:

- When Priority Channel is in a different Zone from the scanning Zones while executing the Single Scan.
- When Priority Channel is in a different Zone from the scanning Zones while executing the Multi Scan.
- When Priority Channel is in a different Zone from the scanning Zones configured with the Scan List Table while executing the List Scan.

The transceiver scans Priority Channels with the cycle configured in the **Lookback Time A** or **Lookback Time B** edit box in the **Scan Information** window when the transceiver executes Single Scan, Multi Scan or List Scan.

Priority Channel can be configured in the following ways by using KPG-101D.

Table 21-5 Priority Scan Operation

Priority Scan	Operation
Fixed	The channel configured by KPG-101D is configured as Priority Channel.
Selected	The transceiver scans the selected channel as Priority Channel. Priority Channel cannot be configured by using KPG-101D.
Operator Selectable	The transceiver scans channels configured by a user as Priority Channel. Priority Channel can be changed in Priority-channel Configuration Mode when the Scan key is pressed and held for 2 seconds.

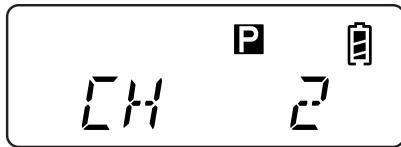
Note:

- ◆ Lookback can be used to monitor the presence of a signal on the Priority Channel while receiving a call on a normal channel during the Priority Scan.
- ◆ The Group ID in Trunking System cannot be configured for Priority Channel.
- ◆ The transceiver does not look back to the Priority Channel while the transceiver pauses scanning in Trunking System.

■ Transceiver Operation

● Priority Channel

The “**P**” icon appears in the following way.



21.5 Group Scan (TK-3173 only)

Group Scan can be used to automatically scan all Group IDs in the current Trunking System. A user does not need to press the **Scan** key to execute the Group Scan.

The following Group IDs can be scanned:

- A Group ID that Scan Add is selected by using KPG-101D
- A Group ID added to the Scan List with the **Scan Delete/Add** key

The transceiver can execute Group Scan even if the transceiver is executing Single Scan, Multi Scan or List Scan by pressing the **Scan** key.

Scan operation differs between when the transceiver automatically executes Group Scan and when the transceiver executes Group Scan in Scan Mode.

- The transceiver does not scan Priority Channel while the transceiver is automatically executing Group Scan.
- The transceiver scans Priority Channel while the transceiver is executing Group Scan in Scan Mode.

21.6 Configuring the Scan

The following scan functions can be configured by using KPG-101D:

- Scan Delete/Add
- Scan List
- Scan List Table
- Priority/ Priority Zone-channel
- Revert CH/GID
- Dropout Delay Time
- Dwell Time
- Lookback
- Scan Type
- Revert CH/GID Display
- Priority-channel Stop Tone
- Power-on Scan

21.6.1 Scan Delete/Add

Scan Delete/Add can be used to add a CH/GID to the Scan List or remove a CH/GID from the Scan List.

With this function, the transceiver can reliably receive calls from important CH/GIDs by deleting unnecessary CH/GIDs to improve the scan speed.

■ Transceiver Operation

● Adding a CH/GID to the Scan List or Deleting a CH/GID from the Scan List

- Press the **Scan Delete/Add** key.

If the current CH/GID is registered in the Scan List, the CH/GID is deleted from the Scan List. The “▼” icon (right) disappears.

If the current CH/GID is not registered in the Scan List, the CH/GID is added to the Scan List. The “▼” icon (right) appears.

● Adding a Zone to the Scan List or Deleting a Zone from the Scan List

- Press and hold the **Scan Delete/Add** key for 1 second.

If the current zone is registered in the Scan List, the zone is deleted from the Scan List. The “▼” icon (left) disappears.

If the current zone is not registered in the Scan List, the zone is added to the Scan List. The “▼” icon (left) appears.

Note:

- ◆ The transceiver does not execute Scan Delete/Add even if the **Scan Del/Add** key is pressed during the scan.
- ◆ The transceiver can execute Scan Delete/Add only when the transceiver pauses scanning while List is configured for Scan Type.
- ◆ A zone cannot be added to or deleted from the Scan List if Single is configured for Scan Type.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

21.6.2 Scan List (TK-3173 only)

Scan List can be used to execute the List Scan for each zone.

Scan List Table can be configured if Scan List is enabled.

Scan List can be configured to be enabled or disabled by using KPG-101D.

Note: Scan List is available if List Scan is configured for Scan Type.

■ Configuration using KPG-101D

- Configuring the Scan List (Refer to FPRG 6.2.11 Scan List.)

21.6.3 Scan List Table (TK-3173 only)

Scan List Table can be used to select the target zone for List Scan. The **Zone** checkbox of the target zone must be checked to execute the List Scan.

■ Configuration using KPG-101D

- Configuring the Scan List Table (Refer to FPRG 6.2.14 Scan List Table Window.)

21.6.4 Priority/ Priority Zone-channel

Priority Zone-channel can be used to configure the Zone-channel having high priority. The following functions can be configured for Priority.

Table 21-6 Priority Operation

Priority	Operation
None	Does not configure the Priority Channel.
Fixed	The channel configured for the Priority Zone-channel configured by using KPG-101D is used as Priority Channel.
Selected	The Selected channel is configured for Priority Channel. Priority cannot be configured by using KPG-101D.
Operator Selectable	The channel selected by a user is configured as a Priority Channel. The transceiver enters Priority-channel Configuration Mode when the Scan key is pressed and held for 2 seconds.

Note: Priority Zone-channel cannot be configured if "Selected" is selected from the **Priority** dropdown list.

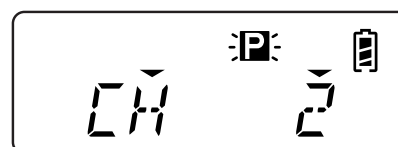
■ Transceiver Operation

● Configuring the Priority Channel

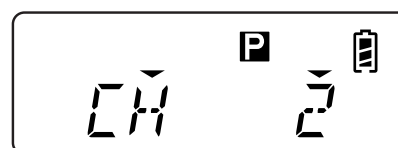
1. Select the channel to be configured as Priority Channel.



2. Press and hold the **Scan** key for 2 seconds.
The transceiver enters Priority-channel Configuration Mode and the "**P**" icon blinks.



3. Press the **[S]** key.
The selected channel is configured as Priority Channel and the channel name or number appears on the display.
The "**P**" icon stops blinking.



■ Configuration using KPG-101D

- Configuring the Priority (Refer to FPRG 6.9.1 Priority.)
- Configuring the Priority Zone-channel (Refer to FPRG 6.9.2 Priority Zone-channel.)

21.6.5 Revert CH/GID

Revert CH/GID can be used to configure the Zone-CH/GID to be used for transmission when the **PTT** switch is pressed during the scan.

Revert CH/GID can be configured by using KPG-101D. Following are Revert CH/GID operations.

Table 21-7 Revert CH/GID Operation

Configuration	While Transceiver is Scanning	While Transceiver Pauses Scanning
Last Called	Last called Zone-CH/GID	Zone-channel on which the transceiver pauses scanning
Last Used	Last used Zone-CH/GID for transmission	Zone-channel on which the transceiver pauses scanning
Selected	Last Zone-CH/GID selected before starting the scan	
Selected + Talkback	Last Zone-CH/GID selected before starting the scan	Zone-channel on which the transceiver pauses scanning
Priority	Priority Channel	
Priority + Talkback	Priority CH/GID	Zone-channel on which the transceiver pauses scanning

Note: The next Zone-CH/GID used for the Last Called or Last Used is stored even if the transceiver is turned OFF.

- Revert CH/GID
- The last CH/GID on which the transceiver receives a call
- The last CH/GID on which the transceiver transmits

■ Configuration using KPG-101D

- Configuring the Revert CH/GID (Refer to FPRG 6.9.3 Revert CH/GID.)

21.6.6 Dropout Delay Time

Dropout Delay Time is the time from when the received signal ends to when the transceiver resumes scanning.

The transceiver pauses scanning while receiving a call during the scan. The transceiver resumes scanning when the Dropout Delay Time elapses after receiving a signal.

The transceiver resumes the scan when the following conditions are met:

- There is no receiving signal.
- QT/DQT does not match.
- Group ID does not match.

The transceiver activates Talkback during the Dropout Delay Time in conjunction with the Revert CH/GID configuration.

When the transceiver pauses scanning during the Dropout Delay Time, the transceiver checks and looks back for signals on Priority Channel if the channel on which scan pauses is not configured as Priority Channel.

Dropout Delay Time can be configured by using KPG-101D.

Note: Talkback is an operation to transmit on the Zone-CH/GID on which the transceiver pauses the scan.

■ Configuration using KPG-101D

- Configuring the Dropout Delay Time (Refer to FPRG 6.9.4 Dropout Delay Time.)

21.6.7 Dwell Time

The scan pauses when the **PTT** switch is pressed during the scan. Configure the delay time to resume scanning after the transceiver stops transmitting.

The transceiver activates Talkback during the Dwell Time in conjunction with the Revert CH/GID configuration.

When the transceiver pauses scanning during the Dwell Time, the transceiver checks and looks back for signals on Priority Channel if the channel on which scan pauses is not configured as Priority Channel.

Note: Talkback is an operation to transmit on the Zone-CH/GID on which the transceiver pauses the scan.

■ Configuration using KPG-101D

- Configuring the Dwell Time (Refer to FPRG 6.9.5 Dwell Time.)

21.6.8 Lookback

Lookback can be used to receive the Priority Channel at certain intervals while the scan pauses on a normal channel if the Priority Channel is configured for the transceiver.

The transceiver selects the interval to start the Priority Scan (Lookback Time A or Lookback Time B) according to the receiving status of the Priority Channel.

■ Lookback Time A

Lookback Time A is the duration to resume Priority Scan from a normal channel if no carrier is detected on a Priority Channel. Configure a shorter interval time than Lookback Time B because there is a possibility that the transceiver will always be waiting for a Priority Channel signal.

■ Lookback Time B

Lookback Time B is the duration to resume the Priority Scan from a normal channel if a signal is detected on the Priority Channel but QT/DQT does not match.

■ Configuration using KPG-101D

- Configuring the Lookback Time A (Refer to FPRG 6.9.6 Lookback Time A.)
- Configuring the Lookback Time B (Refer to FPRG 6.9.7 Lookback Time B.)

21.6.9 Scan Type

Scan Type can be configured when the scan is manually executed by pressing the **Scan** key. (Refer to [21.1.7 Single Scan on page 108](#), [21.2 Multi Scan on page 108](#), [21.3 List Scan \(TK-3173 only\) on page 109](#).)

■ Configuration using KPG-101D

- Configuring the Scan Type (Refer to FPRG 6.9.8 Scan Type.)

21.6.10 Revert CH/GID Display

Revert CH/GID Display can be used to display Revert Zone-CH/GID during the scan.

■ Configuration using KPG-101D

- Configuring the Revert CH/GID Display (Refer to FPRG 6.9.9 Revert CH/GID Display.)

21.6.11 Priority-channel Stop Tone

Priority-channel Stop Tone can be used to make the transceiver emit a tone when the transceiver pauses scanning on the Priority Channel.

Priority-channel Stop Tone can be configured to be enabled or disabled by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Priority-channel Stop Tone (Refer to FPRG 6.9.10 Priority-channel Stop Tone.)

21.6.12 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 by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Power-on Scan (Refer to FPRG 6.9.11 Power-on Scan.)

22 EMERGENCY MODE

Emergency Mode can be activated when a user is placed in an emergency situation. In such emergency situations, a user can immediately contact the base station using this function.

The transceiver enters Emergency Mode when the **Emergency** key is pressed and held for longer than Emergency-key Delay time. The Emergency-key Delay Time prevents the transceiver from entering Emergency Mode unintentionally.

The transceiver does not enter Emergency Mode in the following conditions:

- When Stun is enabled.
- When the transceiver is in Transceiver Password Entry Mode.
- When the transceiver is in Remote Mode.
- When the CH/GID to transmit is not configured.

■ Configuration using KPG-101D

- Assigning functions to the **AUX** key (Refer to FPRG 6.8 Key Assignment.)

22.1 Configuring Emergency Mode

The following Emergency Mode functions can be configured by using KPG-101D:

- Emergency CH/GID Type
- Emergency Zone-CH/GID
- Emergency Cycle
- Duration of Locator Tone 1
- Transmit Duration
- Duration of Locator Tone 2
- Receive Duration
- Emergency Display
- Emergency Text
- Emergency Mode Type
- Emergency-key Delay Time
- Emergency Mic Sense
- Emergency ACK Code
- Emergency Reset Code
- Emergency Recognition
- Emergency LED
- Background Transmission
- Man-down Switch Type
- Man-down Delay Time
- Man-down Pre-alert
- Man-down Logic Type
- Emergency ID
- Emergency DTMF ID
- Emergency Call Fleet
- Emergency Call ID

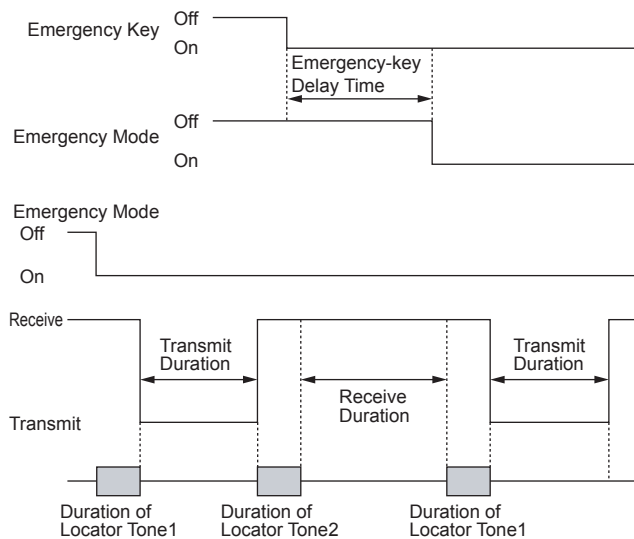


Figure 22-1 Emergency Mode

Note:

- ◆ The sensitivity of the microphone in Emergency Mode is configured according to the Emergency Mic Sense configuration. (Refer to 1.12 Mic Sense on page 6.)
- ◆ **Emergency** key can be assigned to the **AUX** key.
- ◆ Busy Channel Lockout configured for the CH/GID is disabled in Emergency Mode.
- ◆ The transceiver does not decode the Stun Code and Optional Signaling in Emergency Mode.

■ Transceiver Operation

● Entering Emergency Mode

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

● Exiting from Emergency Mode

1. Press and hold the **Emergency** key for longer than the Emergency-key Delay Time to exit from Emergency Mode.

22.1.1 Emergency CH/GID Type

Configure the CH/GID Type for Emergency Mode.

Emergency CH/GID Type can be configured by using KPG-101D. Emergency CH/GID Type can be used in the following way.

Table 22-1 Emergency CH/GID Type Operation

Emergency CH/GID Type	Operation
Selected	The transceiver transmits or receives using the selected CH/GID when the transceiver enters Emergency Mode.
Fixed	The transceiver jumps to the Zone-CH/GID configured in Emergency Zone-CH/GID and begins transmitting or receiving when the transceiver enters Emergency Mode.

■ Configuration using KPG-101D

- Configuring the Emergency CH/GID Type (Refer to FUNC 6.14.1 Emergency CH/GID Type.)

22.1.2 Emergency Zone-CH/GID

Emergency Zone-CH/GID can be used to configure the Zone-CH/GID available in Emergency Mode if “Fixed” is selected from the **Emergency CH/GID Type** dropdown list.

The transceiver jumps to the Emergency Zone-CH/GID in the following ways:

- Pressing the **Emergency** key.
- The switch that is connected to the Man-down tilt switch input port is active.

Note: The transceiver does not decode the Stun Code and Optional Signaling in Emergency Mode.

■ Configuration using KPG-101D

- Configuring the Emergency Zone-CH/GID (Refer to FPRG 6.14.2 Emergency Zone-CH/GID.)

22.1.3 Emergency Cycle

Emergency Cycle is the number of times to switch between transmission and reception in Emergency Mode.

Emergency Cycle can be configured by using KPG-101D. Emergency Cycle activates in the following way.

Table 22-2 Emergency Cycle Operation

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

■ Configuration using KPG-101D

- Configuring the Emergency Cycle (Refer to FPRG 6.14.3 Emergency Cycle.)

22.1.4 Duration of Locator Tone 1

Duration of Locator Tone 1 is the alert tone beeping before automatic transmission begins in Emergency Mode.

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

A user can easily recognize that the transceiver is about to transmit the Emergency when the Tone sounds. The dispatcher can use this tone to locate a user who is in an emergency situation.

The Duration of Locator Tone 1 can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Duration of Locator Tone 1 (Refer to FPRG 6.14.4 Duration of Locator Tone 1.)

22.1.5 Transmit Duration

Transmit Duration is the duration for a single transmission in Emergency Mode.

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

The Transmit Duration can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Duration (Refer to FPRG 6.14.5 Transmit Duration.)

22.1.6 Duration of Locator Tone 2

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

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

A user can easily recognize that the transceiver is about to receive an Emergency when the Tone sounds. The dispatcher can use this tone to locate a user who is in an emergency situation.

Duration of Locator Tone 2 can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Duration of Locator Tone 2 (Refer to FPRG 6.14.6 Duration of Locator Tone 2.)

22.1.7 Receive Duration

Receive Duration is the duration for a single reception in Emergency Mode.

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

The Receive Duration can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Receive Duration (Refer to FPRG 6.14.7 Receive Duration.)

22.1.8 Emergency Display

The information that is shown on the display in Emergency Mode can be configured.

Emergency Display can be configured in the following way by using KPG-101D.

Table 22-3 Emergency Display Operation

Emergency Display	Operation
Selected	The previous selected CH/GID appears even if the transceiver enters Emergency Mode.
Text	A pre-programmed message configured for the Emergency Text appears on the display when the transceiver enters Emergency Mode.

Note: Icons do not appear while in Emergency Mode.

■ Configuration using KPG-101D

- Configuring the Emergency Display (Refer to FPRG 6.14.8 Emergency Display.)

22.1.9 Emergency Text

Emergency Text shown on the display can be configured if "Text" is selected from the **Emergency Display** dropdown list.

Text to be displayed can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency Text (Refer to FPRG 6.14.9 Emergency Text.)

22.1.10 Emergency Mode Type

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

Man-down Mode Type can be configured in the following way by using KPG-101D.

Table 22-4 Emergency Mode Type Operation

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

■ Configuration using KPG-101D

- Configuring the Emergency Mode Type (Refer to FPRG 6.14.10 Emergency Mode Type.)

22.1.11 Emergency-key Delay Time

The duration from when the **Emergency** key is pressed to when the transceiver enters Emergency Mode can be configured. When the **Emergency** key is pressed and held for the configured duration, the transceiver enters Emergency Mode. This delay time prevents Emergency Mode from being entered unintentionally.

The Emergency-key Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency-key Delay Time (Refer to FUNC 6.14.11 Emergency-key Delay Time.)

22.1.12 Emergency Mic Sense

Mic Gain in Emergency Mode can be configured by using KPG-101D. ([Refer to 1.12 Mic Sense on page 6.](#))

■ Configuration using KPG-101D

- Configuring the Emergency Mic Sense (Refer to FPRG 6.14.12 Emergency Mic Sense.)

22.1.13 Emergency ACK Code

A user in Emergency status can notice that the transceiver received a response from the dispatcher when the transceiver receives the Emergency ACK Code sent from the dispatcher if DTMF is configured for Emergency ID.

Two dots located on the lower right of the display appear when the transceiver receives the Emergency ACK Code while in Emergency Mode.

Emergency ACK Code can be configured by using KPG-101D. (Refer to FPRG 6.4.13 Emergency ACK Code.)

Note: Emergency ACK Code cannot be configured if anything other than "DTMF" is selected from the **Emergency ID** dropdown list.

■ Configuration using KPG-101D

- Configuring the Emergency ACK Code (Refer to FPRG 6.14.13 Emergency ACK Code.)

22.1.14 Emergency Reset Code

The transceiver exits from Emergency Mode when the transceiver receives the Emergency Reset Code while DTMF is configured for Emergency ID.

Emergency Reset Code can be configured by using KPG-101D. (Refer to FPRG 6.4.14 Emergency Reset Code.)

Note: Emergency Reset Code cannot be configured if anything other than "DTMF" is selected from the **Emergency ID** dropdown list.

■ Configuration using KPG-101D

- Configuring the Emergency Reset Code (Refer to FPRG 6.4.14 Emergency Reset Code.)

22.1.15 Emergency Recognition

Emergency Recognition can be used to notify a user that the transceiver is in Emergency Mode when DTMF is configured for Emergency ID.

Three dots located on the lower left of the display appear when the transceiver enters Emergency Mode.

Emergency Recognition can be configured to be enabled or disabled by using KPG-101D. (Refer to FPRG 6.4.15 Emergency Recognition.)

Note: Emergency Recognition cannot be configured if anything other than "DTMF" is selected from the **Emergency ID** dropdown list.

■ Configuration using KPG-101D

- Configuring the Emergency Recognition (Refer to FPRG 6.14.15 Emergency Recognition.)

22.1.16 Emergency LED

Configure whether the Transmit LED lights when the transceiver transmits in Emergency Mode and the Busy LED lights when the transceiver receives in Emergency Mode.

LED can be configured to light by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency LED (Refer to FPRG 6.14.16 Emergency LED.)

22.1.17 Background Transmission

This function allows the transceiver to multiplex a 1630 Hz tone on the transmitted audio and emit a tone every second while in Emergency Mode.

The transceiver does not mute since the tone is transmitted with lower deviation than normal. The receiving party can easily recognize that the caller is in Emergency Mode since the tone is multiplexed with audio signal.

The transceiver can be configured to emit the tone by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Background Transmission (Refer to FPRG 6.14.17 Background Transmission.)

22.1.18 Man-down Switch Type

Man-down Switch Type is an input port used for the Man-down tilt switch.

Man-down Switch Type can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Man-down Switch Type (Refer to FPRG 6.14.18 Man-down Switch Type (Man-down).)

22.1.19 Man-down Delay Time

Man-down Delay Time is the duration between when the Man-down tilt switch is turned On and when the transceiver enters Emergency Mode.

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

The Man-down Delay Time can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Man-down Delay Time (Refer to FPRG 6.14.19 Man-down Delay Time (Man-down).)

22.1.20 Man-down Pre-alert

Man-down Pre-alert is one of the Alert Tones that sounds when the Man-down tilt switch is going to be activated in a short time.

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

The Man-down Pre-alert can be configured by using KPG-101D. The Man-down Pre-alert must be configured for a shorter duration than the Man-down Delay Time.

■ Configuration using KPG-101D

- Configuring the Man-down Pre-alert (Refer to FPRG 6.14.20 Man-down Pre-alert (Man-down).)

22.1.21 Man-down Logic Type

The logic of the Man-down tilt switch (Optional switch) can be configured.

Man-down Logic Type can be configured in the following way by using KPG-101D.

Table 22-5 Man-down Logic Type Operation

Man-down Logic Type	Operation
Active Low	When the Man-down switch is enabled, the input port becomes Low.
Active High	When the Man-down switch is enabled, the input port becomes High.

■ Configuration using KPG-101D

- Configuring the Man-down Logic Type (Refer to FPRG 6.14.21 Man-down Logic Type (Man-down).)

22.1.22 Emergency ID

The type of control and the code to be sent each time the transceiver starts an automatic transmission or reception in Emergency Mode can be configured.

Emergency ID can be configured by KPG-101D. The following Emergency IDs are available.

Table 22-6 Emergency ID Operation

Emergency ID	Operation
None	The transceiver transmits and receives according to the configuration programmed by using KPG-101D.
DTMF	The transceiver transmits and receives according to the configuration programmed by using KPG-101D. The transceiver first sends the DTMF code selected from the Emergency DTMF ID when sending a message in Emergency Mode.
FleetSync	The transceiver transmits and receives according to the configuration programmed by using KPG-101D. The transceiver first sends the FleetSync Selcall ID selected from the Emergency Call Fleet and Emergency Call ID when sending a message in Emergency Mode.
ANI Board	The transceiver transmits and receives in conjunction with the ANI Board control.

Note: ANI Board can be configured only when "ANI Board" is selected from the **Product Information** window > **Optional Board** dropdown list.

■ Configuration using KPG-101D

- Configuring the Emergency ID (Refer to FPRG 6.14.22 Emergency ID.)

22.1.23 Emergency DTMF ID

The DTMF code sent first in Emergency Mode can be configured if "DTMF" is selected from the **Emergency ID** dropdown list.

Emergency DTMF ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency DTMF ID (Refer to FPRG 6.14.23 Emergency DTMF ID.)

22.1.24 Emergency Call Fleet

The Call Fleet sent first in Emergency Mode can be configured if "FleetSync" is selected from the **Emergency ID** dropdown list.

Emergency Call Fleet can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency Call Fleet (Refer to FPRG 6.14.24 Emergency Call Fleet.)

22.1.25 Emergency Call ID

The Call ID sent first in Emergency Mode can be configured if "FleetSync" is selected from the **Emergency ID** dropdown list.

Emergency Call ID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Emergency Call ID (Refer to FPRG 6.14.25 Emergency Call ID.)

23 DATA COMMUNICATION

Data communications can be established by using FleetSync or connecting an external modem to the transceiver.

23.1 Data Communication Configuration

The following functions can be configured for data communications by using KPG-101D:

- Data
- Data Zone-CH/GID
- Data Transmit with QT/DQT
- COM port

23.1.1 Data

The CH/GID can be used for data or voice communications. The transceiver mutes the speaker if the CH/GID is configured for data communications.

The CH/GID can be configured for data communications by using KPG-101D.

■ Configuration using KPG-101D

- Configuring Data for the channel (Refer to FPRG 6.4.19 Data.)
- Configuring Data for the Group ID (Refer to FPRG 6.6.14 Data.)

23.1.2 Data Zone-CH/GID

Data Zone-CH/GID can be used to separate the CH/GIDs for data communications from the CH/GIDs for voice communications.

The transceiver sends a message after jumping to the Data Zone-CH/GID configured for the current zone when following items are configured and the transceiver sends a Status Message, Short Message or Long Message.

- Status Message on Data Zone-CH/GID
- Short Message on Data Zone-CH/GID
- Long Message on Data Zone-CH/GID

The transceiver returns to the previous Zone-CH/GID when the transmission ends.

Data Zone-CH/GID can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Status Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Status Message on Data Zone-CH/GID.)
- Configuring the Short Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Short Message on Data Zone-CH/GID.)
- Configuring the Long Message on Data Zone-CH/GID (Refer to FPRG 6.12.3 Parameter Tab - Long Message on Data Zone-CH/GID.)

23.1.3 Data Transmit with QT/DQT

Data Transmit with QT/DQT can be used for multiplexing QT/DQT on channels for data transmission.

The function can be used on channels for sending a Status Message, Short Message or Long Message. This function is also available to establish data communications using an external device.

While a repeater uses QT/DQT signaling, the transceiver performs data communications with multiplexing QT/DQT when this function is enabled.

When data and voice communications shares the same channel and data transmission sound is not necessary this function must be disabled. In this case, QT/DQT is not multiplexed with the data transmission.

Data Transmit with QT/DQT can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring Data Transmit with QT/DQT (Refer to FPRG 6.12.3 Parameter Tab - Data Transmit with QT/DQT.)

23.1.4 COM port

The COM port is a serial communication port. The functionality of a serial communication port can be selected.

COM port 0 or 1 can be selected. ([Refer to 7 Communication Port on page 28.](#))

COM 0 is assigned to the 2-pin jack.

COM 1 is located at the TXD and RXD in the optional board area.

COM port can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the COM port (Refer to FPRG 6.7.1 Common-Page 1 Tab - Function (COM port).)

24 EXTENDED FUNCTION

The transceiver has programmable Function Ports located in the Optional Board Area.

Configuration using KPG-101D

- Configuring the Squelch Logic Signal (Refer to FPRG 6.15.1 Squelch Logic Signal.)

24.1 Squelch Logic Signal

Squelch Logic Signal can be used to send the receive status of the transceiver to the A2 solder pad of the optional board area.

Configuration	Operation
TOR	This port notifies the matching status of QT/DQT in Conventional Group and of GID reception in Trunking System. This port activates when the QT/DQT matches on a channel on which the QT/DQT Decode is configured while the transceiver is in a Conventional Group. This port also activates when the transceiver receives a carrier on a channel on which the QT/DQT Decode is not configured. Otherwise, this port is deactivated. This port activates when the transceiver receives a call with GID in Trunking System. Otherwise, this port is deactivated.
COR	The transceiver notifies a user that the transceiver is receiving a carrier. This port activates when the transceiver receives a carrier in both Conventional Group and Trunking System. Otherwise, this port is deactivated.
LOK (TK-3173 only)	The transceiver notifies a user that voice communication is available in both Conventional Group and Trunking System. This port is activated when transmitting in Conventional Group. Otherwise, this port is deactivated. This port activates when the transceiver establishes a link to the repeater in Trunking System. Otherwise, this port is deactivated.

Squelch Logic Signal can be configured by using KPG-101D.

Note:

- ◆ Squelch Logic Signal cannot be configured if "Voice Scrambler" is selected from the **Product Information** window > **Optional Board** dropdown list.
- ◆ "LOK" cannot be selected if anything other than "ANI Board" is selected from the **Product Information** window > **Optional Board** dropdown list.

VOX function can be used to transmit automatically by speaking into the microphone without using the **PTT** switch.

This function is useful when a headset microphone is installed on the transceiver but the **PTT** switch cannot be pressed.

This function is available only when a user wears the headset and the transceiver is in Conventional Group.

If the **VOX Function** checkbox is checked, VOX is activated when the transceiver is turned ON.

Note:

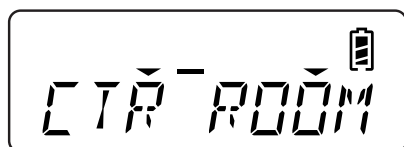
- ◆ The transceiver cannot transmit with VOX if the transmission is restricted by Stun, etc.
- ◆ If the transceiver terminates the VOX transmission due to the Time-out Timer, the transceiver does not transmit until both the VOX and **PTT** switch are disabled.

■ Transceiver Operation

● Enabling VOX

1. Press and hold the **VOX** key for more than 2 seconds.

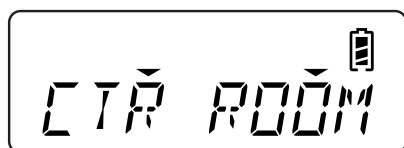
The “**—**” icon (left) appears and VOX is enabled.



● Disabling VOX

1. Press and hold the **VOX** key for more than 2 seconds.

The “**—**” icon (left) disappears and VOX is disabled.



Note: The VOX configuration is stored even if the transceiver is turned OFF.

■ Configuration using KPG-101D

- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

25.1 Configuring the VOX Function

The following functions relevant to the VOX function can be configured by using KPG-101D:

- VOX Gain Level
- VOX Delay Time
- Transmit Inhibit while Receiving
- Cancel Operation
- VOX Proceed Tone

25.1.1 VOX Gain Level

VOX Gain Level can be used to configure the sensitivity of the microphone to transmit.

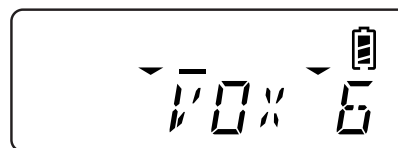
VOX Gain Level can be configured by using KPG-101D. VOX Gain Level can also be configured using the keys on transceiver.

■ Transceiver Operation

1. Press the **VOX** key.

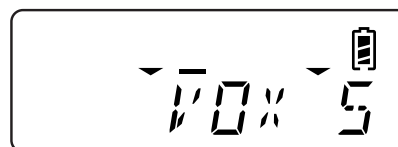
The transceiver activates VOX.

The “**—**” icon (left) and the current VOX Gain Level appear on the display.



2. Adjust the VOX Gain Level using the [**<B**] or [**>C**] key or **Selector**^{*1}.

^{*1} If the List Selection Key (Selector) is enabled.



Note: The LED lights orange when the Mic input level reaches the transmission reference value. In this case, the transceiver does not actually transmit.

3. Press the **Side 1** key.

The channel name or number appears on the display.

VOX is enabled.

Note: The VOX Gain Level configuration is retained even if the transceiver is turned OFF.

■ Configuration using KPG-101D

- Configuring the VOX Gain Level (Refer to FPRG 6.7.3 Conventional Tab - VOX Gain Level.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

25.1.2 VOX Delay Time

The VOX Delay Time is the duration that the transceiver remains in transmit mode after a user stops speaking. If the transceiver returns to receive mode too quickly after a user stops speaking, their final word(s) may not be transmitted. To avoid this, select an appropriate VOX Delay Time that allows all words to be transmitted without an overly long delay after the user stops speaking.

The transceiver completes the VOX transmission when the microphone collects no additional audio during the VOX Delay Time.

The VOX Delay Time can be configured by using KPG-101D.

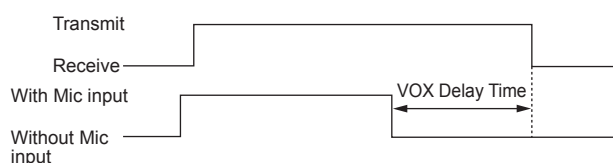


Figure 25-1 VOX Delay Time

■ Configuration using KPG-101D

- Configuring the VOX Delay Time (Refer to FPRG 6.7.3 Conventional Tab - VOX Delay Time.)

25.1.3 Transmit Inhibit while Receiving

Transmit Inhibit while Receiving is used to restrict VOX transmission while the speaker unmutes.

Transmit Inhibit while Receiving can be configured by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Transmit Inhibit while Receiving (Refer to FPRG 6.7.3 Conventional Tab - Transmit Inhibit while Receiving.)

25.1.4 Cancel Operation

Cancel Operation disables the VOX function when the **PTT** switch is pressed while VOX is enabled.

A user can enable the VOX function by pressing the **VOX** key even if the VOX function is disabled with the **PTT** switch. If the **VOX** key is not configured for the transceiver, VOX is enabled when the transceiver is turned ON.

Cancel Operation can be configured by using KPG-101D.

Table 25-1 Cancel Operation

Cancel Operation	Operation
Check (Enable)	VOX is disabled when the PTT switch is pressed.
Uncheck (Disable)	VOX is not disabled even if the PTT switch is pressed.

■ Configuration using KPG-101D

- Configuring the Cancel Operation (Refer to FPRG 6.7.3 Conventional Tab - Cancel Operation.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

25.1.5 VOX Proceed Tone

The transceiver can be configured to emit the VOX Proceed Tone to notify a user of the start of transmission when VOX is used for transmission.

VOX Proceed Tone can be configured to be enabled or disabled by using KPG-101D.

Table 25-2 VOX Proceed Tone Operation

VOX Proceed Tone	Operation
Check (Enable)	The transceiver emits the Proceed Tone when the transceiver starts transmitting with VOX.
Uncheck (Disable)	The transceiver does not emit the Proceed Tone even if the transceiver starts transmitting with VOX.

Note: The transceiver does not emit the Proceed Tone if DTMF, 2-tone or FleetSync is used. The VOX Proceed Tone does not sound since the transceiver emits the Sidetone if Sidetone is configured for 2-tone, DTMF, or FleetSync.

■ Configuration using KPG-101D

- Configuring the VOX Proceed Tone (Refer to FPRG 6.7.3 Conventional Tab - VOX Proceed Tone.)

26 VOICE SCRAMBLER

Voice Scrambler enables the transceiver to scramble speech to allow users to engage in private communications.

Two types of scrambler are available. The transceiver can be configured to use a built-in scrambler or an optional scrambler that is installed in the transceiver.

26.1 Configuring the Voice Scrambler

The following functions relevant to Voice Scrambler can be configured by using KPG-101D:

- Scrambler (Built-in Scrambler)
- Scrambler Status Memory (Built-in Scrambler)
- Scrambler (Optional Scrambler)
- Scrambler Status Memory (Optional Scrambler)

26.1.1 Scrambler (Built-in Scrambler)

The built-in entry level scrambler allows a user to scramble the transmission voice with reversing carrier signal.

Scrambler is enabled if the **Voice Scrambler** checkbox in the **Channel Edit** window or **GID Edit** window is checked.

Voice Scrambler can be configured to be enabled or disabled by using KPG-101D.

Note: The built-in Scrambler cannot be used if "Voice Scrambler" is selected from the **Optional Board** dropdown list.

■ Transceiver Operation

● Enabling Scrambler

1. Press the **Scrambler** key while Scrambler is disabled.

The "◇" icon appears and Scrambler is enabled.



● Disabling Scrambler

1. Press the **Scrambler** key while Scrambler is enabled.

The "◇" icon disappears and Scrambler is disabled.



■ Configuration using KPG-101D

- Configuring the Scrambler (Conventional Group) (Refer to FPRG 6.4.20 Voice Scrambler.)
- Configuring the Scrambler (Trunking System) (Refer to FPRG 6.6.15 Voice Scrambler.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

26.1.2 Scrambler Status Memory (Built-in Scrambler)

Scrambler Status Memory can be used to store the Scrambler status.

Scrambler configuration can be stored by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scrambler Status Memory (Refer to FPRG 6.7.1 Common Page 1 Tab - Scrambler Status Memory.)

26.1.3 Scrambler (Optional Scrambler)

The Optional Scrambler can be installed in the transceiver.

Optional Scrambler is enabled if "Voice Scrambler" is selected from the **Product Information** window > **Optional Board** dropdown list.

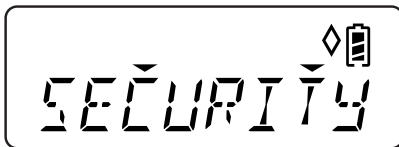
Optional Scrambler can be configured by using KPG-101D.

■ Transceiver Operation

● Enabling Optional Scrambler

1. Press the **Scrambler** key while Optional Scrambler is disabled.

The "◇" icon appears and Optional Scrambler is enabled.



● Changing the Scrambler Code

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

The current Scrambler Code appears on the display.



2. Change the Scrambler Code by using the [**<B**] or [**>C**] key or **Selector**^{*1}.

^{*1} When the List Selection Key (Selector) is enabled.



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

Scrambler Code is enabled.



● Disabling Optional Scrambler

1. Press the **Scrambler** key while Optional Scrambler is enabled.

The "◇" icon disappears and Optional Scrambler is disabled.



■ Configuration using KPG-101D

- Configuring the Optional Board (Refer to FPRG 5.1.4 Optional Board.)
- Configuring the Scrambler Code (Conventional Group) (Refer to FPRG 6.4.21 Scrambler Code.)
- Configuring the Scrambler Code (Trunking System) (Refer to FPRG 6.6.16 Scrambler Code.)
- Assigning functions to the **PF** keys (Refer to FPRG 6.8 Key Assignment.)

26.1.4 Scrambler Status Memory (Optional Scrambler)

Scrambler Status Memory can be used to store the Optional Scrambler On or Off configuration and Scrambler Code.

If Scrambler Status Memory is enabled, the stored Scrambler On or Off configuration is read as default when data is read from the transceiver using KPG-101D.

Scrambler configuration and Scrambler Code can be stored by using KPG-101D.

■ Configuration using KPG-101D

- Configuring the Scrambler Status Memory (Refer to FPRG 6.7.1 Common Page 1 Tab - Scrambler Status Memory.)

Symbols

* and # Digit Time..... 68

Numerics

2-tone..... 76

2-tone Encode Memory List 77

A

A Tone/ B Tone/ C Tone/ D Tone 79

ACK Delay Time..... 103

Adjusting the Volume 9

Alert Tone 21

Alert Tone (Emergency Response)..... 102

Alert Tone (Group Call) (Conventional)..... 70

Alert Tone (Individual Call)..... 101

Alert Tone (Individual Call) (Conventional) 70

Alert Tone (Other Selective Calls)..... 101

Alert Tone (Paging Call)..... 101

Alert Tone (Status Message Call/
Short Message Call)..... 101

Alert Tone Pattern 22

Antenna..... 1

Area Code..... 50

ARQ Mode 54

Assigning Functions to PF keys 29

Assigning Functions to the Selector 29

Audio Control 40, 46

Auto Reset Timer 72, 79, 101

Auto Telephone..... 69

Auto Telephone Search 46, 52

Autodial 73

Autodial List 73

Autodial List Selection..... 65

Autodial Programming..... 73

AUX Key 1, 29, 114

B

Background Transmission..... 118

Basic Functions..... 1

Basic Operation 8

Battery Saver 7

Battery Status/ Battery Warning..... 17

Beat Shift 5, 43

Beginning of Transmit 36

Beginning of Transmit (BOT) 66

Busy Channel Lockout 33, 42

Busy LED 14

C

Call Indicator 49

Call Key..... 6

Caller ID Display 81

Caller ID Stack 98

Cancel Operation 123

Changing the CH/GID 9

Changing the Zone 9

Channel..... 41

Channel Entry 10

Channel Name 16, 41

Channel Spacing..... 3

Clear to Talk..... 54

Clear to Transpond 38, 72, 79

Code (Trunking)..... 71

COM port 120

COM port 0, COM port 1 28

Communication Port 28

Compander 5, 43, 49

Conditions to Resume Scanning..... 105

Conditions to Start Scanning 105

Configuring Emergency Mode 114

Configuring FleetSync..... 98

Configuring the Scan 110

Configuring the Voice Scrambler 124

Configuring the VOX Function 122

Connecting to the Phone Line..... 51

Control Tone 19

Conventional Group 31, 34, 38, 39, 56, 57

D

D Code Assignment 68

Data 43, 50, 120

Data Communication 120

Data Communication Configuration 120

Data Delay Time 45

Data Transmit Modulation Delay Time..... 103

Data Transmit with QT/DQT 104, 120

Data Zone-CH/GID 120

Data Zone-channel 39

Data Zone-GID..... 45

Decode..... 70, 78

Decode ID (Block ID) 48

Decoder 1 to Decoder 2 78

Dial ID 69

Direct CH/GID 11

Direct OST 61

Display 14

Display Character 16

Dropout Delay Time 112

DTMF 63

DTMF Hold Time..... 68

DTMF Number Display 73

DTMF Sidetone 69

INDEX

DTMF Signaling (Conventional).....	70
DTMF Speed	67
Duration of 1st Tone	76
Duration of 2nd Tone	77
Duration of Locator Tone 1	115
Duration of Locator Tone 2	116
Duration of Single Tone	77
Dwell Time	112

E

Embedded Message	27
Embedded Message Function	27
Embedded Message with Password.....	27
Emergency ACK Code	117
Emergency Call Fleet	119
Emergency Call ID.....	119
Emergency CH/GID Type	115
Emergency Cycle	115
Emergency Display	116
Emergency DTMF ID	119
Emergency ID	119
Emergency LED	118
Emergency Mic Sense	117
Emergency Mode	114
Emergency Mode Type	117
Emergency Recognition	117
Emergency Reset Code	117
Emergency Status Response	91
Emergency Text	116
Emergency Zone-CH/GID.....	115
Emergency-key Delay Time.....	117
Encode	67, 76
Encode Data Type	46
Encode ID/ Decode ID	48
End of Transmit	36
End of Transmit (EOT).....	67
Extended Function	121

F

First Digit Delay Time	68
First Digit Delay Time with QT	68
First Digit Time	68
First Tone Delay Time	77
Fix ID	47
Fleet/ ID (Own)	99
FleetSync.....	81
FleetSync Baud Rate.....	99
Free System Ringback	52
Functions and Panel Layout	1

G

Gap Time	77
GID Name	16, 48
Group Code (Conventional).....	70
Group ID	48, 100
Group Scan	110
GTC Count	102

H

Home CH/GID	10
Home Channel.....	39
Home GID.....	45

I

Icons	17
ID	41
ID List	85
Interfleet Call	100
Intermediate Code (Conventional).....	70

K

Key Assignment.....	29
Key Lock	5
Keypad	2
Keypad Auto PTT	65
Keypad Operation.....	6

L

Lamp.....	14
LCD	2, 15
List Scan	109
Locator Tone	20
Long Message Function	94
Long Message on Data Zone-CH/GID	95
Lookback	113
LTR Trunking	44

M

Making a Selcall	82, 84
Man-down Delay Time.....	118
Man-down Logic Type	118
Man-down Pre-alert	118
Man-down Switch Type	118
Manual Dialing	63, 69, 100
Maximum ACK Wait Time	103

Message Display Type.....	99
Message Memory.....	98
Mic Sense	6
Microphone	2
Minimum Volume	21
Mode Reset Timer.....	7
Model List.....	1
Monitor	57
Multi Scan	108

N

Number of Retries	102
-------------------------	-----

O

Operation after Manually Changing the Zone-CH/GID during the Scan	106
Operations when Manually Changing the Zone-CH/GID while Scan Pauses to Receive a Call....	106
Operations when Scan Cannot Resume	106
Operator Selectable Home-channel.....	39
Operator Selectable Home-GID	45
Optional Signaling	42, 49, 55
Optional Signaling Decode Condition	40
OST.....	60
OST Status Memory.....	60
OST Table.....	61
Overwrite Password	26

P

Password Function.....	24
PC Interface Protocol	100
PF Key	2
Power Switch/ Volume Control.....	1
Power-on Scan	113
Power-on Text.....	16
Power-on Tone	19
Priority Scan.....	109
Priority/ Priority Zone-channel.....	111
Priority-channel Stop Tone.....	113
Proceed Tone Delay Time	23
PTT ID.....	36, 42, 49
PTT ID (BOT).....	42
PTT ID (CH/GID).....	36
PTT ID (EOT).....	42
PTT ID Function	81
PTT ID Sidetone	81
PTT ID Type.....	36
PTT Proceed Tone.....	23
PTT Release Tone	22
PTT Switch.....	2

Q

QT/DQT Decode	41
QT/DQT Decode/ Encode.....	55
QT/DQT Encode	41
QT/DQT with STE (Squelch Tail Eliminator).....	55

R

Random Access (Contention)	104
Read Authorization Password.....	25
Receive	12
Receive Duration	116
Receive Frequency	41
Receiving a Long Message.....	94
Receiving a Short Message	92
Receiving a Status Message	88
Redial.....	66
Repeater Information	50
Repeater Information Table	51
Reserved Status for Status Messages.....	89
Restricted ID in Talk Around	37
Revert CH/GID	112
Revert CH/GID Display	113

S

Scan.....	105
Scan Add	43, 49
Scan Delete/Add	110
Scan List	40, 46, 111
Scan List Table	111
Scan Operation	105
Scan Type	113
Scan Weight.....	45
Scrambler.....	50
Scrambler (Built-in Scrambler).....	124
Scrambler (Optional Scrambler)	125
Scrambler Code.....	43, 50
Scrambler Status Memory (Built-in Scrambler).....	124
Scrambler Status Memory (Optional Scrambler)	125
Selcall Function.....	82
Selective Call Alert LED	73, 79, 100
Selector.....	1
Sending a Long Message	94
Sending a Short Message.....	92
Sending a Status Message	86
Sending DTMF Code	63
Short Message Function	92
Short Message on Data Zone-CH/GID	93
Short Message Serial Output.....	93
Short Message Stack.....	93
Side 1 Key.....	2
Side 2 Key.....	2
Sidetone.....	21, 77

INDEX

Signaling	55
Signaling (Audio Control)	56
Signaling (Optional Signaling Decode Condition)	57
Single Scan	108
Sounds	19
Speaker	2
Squelch Level	3
Squelch Logic Signal	121
Squelch Off	58
Stack	95
Standard QT	62
Status 80 - 99 (Special)	91
Status List	90
Status Message Function	86
Status Message on Data Zone-CH/GID	90
Status Message Serial Output	90
Status Message Stack	90
Store & Send	63, 69
Stores the Latest Received Messages	97
Stun	72
System Search	53
System Search for Data Channels	53
System Search for Voice Channels	53

T

Talk Around	34, 49
Talk Around Busy Channel Lockout	35, 47
Talk Around Key	35, 47
Target Fleet/ Target ID (Status Message)	91
Telephone (Block ID)	47
Telephone Interconnect	51
Time-out Timer (Dispatch)	32, 46
Time-out Timer (Telephone)	32, 46
Time-out Timer (TOT)	31, 40
TK-2170/ TK-3170/ TK-3173	1
Tone Off	60
Tone Pattern	19
Tone Volume	21
TOT Pre-alert	31, 40
TOT Rekey Time	31, 40
TOT Reset Time	31, 40
Transceiver Operation during the Scan	106
Transceiver Operation during the Scan in Conventional Group	58, 59
Transceiver Operation during the Scan in Trunking System	58, 59
Transceiver Operation When Using ARQ in FleetSync	54
Transceiver Password	24
Transmit	12
Transmit and Receive Frequency	3
Transmit Busy Wait Time	103
Transmit Delay Time (Receive Capture)	103
Transmit Duration	116
Transmit Frequency	41

Transmit Inhibit (Block ID)	47
Transmit Inhibit while Receiving	123
Transmit LED	14
Transmit LED/ Busy LED	1
Transmit Power	3, 42, 48
Transmitting 2-tone	76
Transmitting with Talk Around	13
Transpond	38, 49
Transpond (Conventional)	71
Transpond Delay Time	38
Transpond Using Optional Signaling	38
Transpond Using the LTR ID	38
Transpond/ Alert Tone (Trunking)	71
Trunking System	12, 13, 32, 34, 38, 56, 57
Turning the Transceiver OFF	8
Turning the Transceiver ON	8
Turning the Transceiver ON/ OFF	8

U

Unit ID Encode Block	99
Unit ID Serial Output	102
Using Function Keys	9

V

Voice Scrambler	43, 124
VOX	122
VOX Delay Time	123
VOX Gain Level	122
VOX Proceed Tone	123

W

Warning Tone	20
Wide/ Narrow	42, 45

Z

Zone	39, 44
Zone Add	40, 46
Zone Description	2
Zone Name	15, 39, 44
Zone-name Text Length	15