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Listen to the Future

TK-90

Function Reference (FUNC)

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Type:	M

Kenwood Corporation

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Revision history

Date	Description
2007.3	<ol style="list-style-type: none">1) Added ALE Operation Mode to 4.1 Assigning Functions to PF Keys.2) Added No.11 and No.12 to 11.1 User Menu.3) Added 17.2 When Using Other Antenna Tuners. Revised the configuration of 17 ANTENNA TUNER due to additional information.4) Added 22.4 GPS Data Transfer using the ALE Function.5) Added 28 ALE (Automatic Link Establishment).6) Added commands relevant to the ALE function to APPENDIX 1 PC COMMAND.7) Added to the ALE function configuration items relevant to APPENDIX 2 CONFIGURATION LIST.8) Added other additional corrections due to the addition of ALE function information.9) Changed the version number from 1.00 to 2.00.

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APPENDIX 2 CONFIGURATION LIST144

About this Manual

This In-depth manual describes the functions of the TK-90 and explains how to configure its various functions.

How to Read this Manual

This manual has the following sections. Each function has reference data that allows you to find the cross-referenced information. Refer to “Configuration using KPG-102D” for functions that can be configured using KPG-102D. The abbreviations of section names are used to specify the reference.

Function Reference: FUNC

This In-depth manual describes all functions of the TK-90.

Field Programming Reference: FPRG

This In-depth manual describes how to configure data of the TK-90 by using KPG-102D.

Modification Information: MOD

This In-depth manual describes how to modify the TK-90.

About Notations

The following notations are used in this manual.

[]

The characters in parentheses indicate the name of the operating portion of the TK-90 and the keys of the PC.

“ ”

The characters in quote marks indicate the name of the functions, buttons, and menus shown on the displays of KPG-102D and characters displayed on the display of the TK-90.

Bold Letters

The characters in bold letters indicate the name of the windows, tabs, and checkboxes for KPG-102D, and functions assigned to the operating portion of the TK-90.

[] + []

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

Programmable Function (PF) Key

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

Terms Modification for the TK-90

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

New Name	Old Name
Background Transmission	Back Ground Transmission
COM Port	Communication Port
Receive Duration [s]	Duration of Receiving [s]
Message Memory	Message Backup
While Transmitting	On Transmission
Read Authorization Password	Read Password
High Transmit Power	RF High Power
Low Transmit Power	RF Low Power
Scrambler Status Memory	Scrambler Backup
High Volume Level (Fixed Volume)	Selectable High
Low Volume Level (Fixed Volume)	Selectable Low
Tone Off	Selectable No Tone
Setup COM Port	Setup Communication Port
Transmit [MHz]	Transmission [MHz]
Transmit Frequency	TX Frequency
New Description	Description in the Past
Key Beep	Key Press Tone
Key-entry Error Tone	Key Input Error Tone
Low Transmit Power	Low Power
Low Transmit Power	RF Power Low
Password Authorization Tone	Password agreement Tone
Read Authorization Password	Read Password
Scrambler Status Memory	Scrambler Backup
Single Reference Level Adjustment	1 Point Tuning
Tone Off	Selectable No Tone
Transceiver	Radio
Transceiver Password	Radio Password
Warning Tone	Warning Alert Tone
While Transmitting	On TX

Abbreviations Used in this Document

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

Abbreviations	Full Spelling or its meaning
ACK	Acknowledgement
ACC	Accessory
AF	Audio Frequency
AGC	Automatic Gain Control
ALC	Automatic Level Control
ALE	Automatic Link Establishment
AM	Amplitude Modulation
ANI	Automatic Number Identification
ANT	Antenna
AUX	Auxiliary
BCL	Busy Channel Lockout
BOT	Beginning of Transmit
CCIR	Comite Consultatif International des Radiocommunications
CH	Channel
COM port	Communication port (Serial port)
COR	Carrier-operated Relay
CTS	Clear To Send
CW	Contineous Wave (Carrier)
D/A	Digital to Analog
DATA	DATA Mode for data communications
deg	degree(s)
Del	Delete
DEO	Decoder output
DI	Data Input
DTC	Data Transmission Control
EIA	Electronics Industries Alliance, U.S.A.
EOT	End of Transmit
ESN	Electronic Serial Number
ETX	End of Text
FIFO	First-in First-out
FILO	First-in Last-out
FM	Frequency Modulation
FSK	Frequency Shift Keying
GPS	Global Positioning System
Hi	High
IF	Intermediate Frequency
IF GC	Intermediate Frequency Gain Control
I/O	Input/Output
LSB	Lower Sideband
LQA	Link Quality Analysis

Abbreviations	Full Spelling or its meaning
Mic	Microphone
MOD	Modulation
MSK	Minimum Shift Keying
PC	Personal Computer
PF	Programmable Function
POC	Power Output Control
PSTN	Public Switched Telephone Network
PTT ID	PTT (Push-to-talk) ID
RF	Radio Frequency
RTC	Real Time Clock
RTS	Request To Send
RTTY	Radio Teletype
RX	Reception, Receiver, Receive
RXD	Received Data
SQC	Squelch control
SSB	Single Sideband
SW	Switch
SWR	Standing Wave Ratio
TEL	Telephone
TOR	Tone-operated Relay
TOT	Time-out Timer
TX	Transmission, Transmitter, Transmit
TXD	Transmitted Data
TX SEN	Transmission Sense
USB	Upper Sideband
UTC	Universal Time Cordinated
VFO	Variable Frequency Oscillator
VOX	Voice operated Transmission

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Transceiver Description

The TK-90 transceiver is designed to be used as a commercial HF band mobile transceiver.

About the Programming Software

Functions of the TK-90 can be configured using the KPG-102D software. Configuration data configured using KPG-102D can be written to the transceiver by connecting the TK-90 to a PC using the KPG-46A programming cable. In this manual, the description of each function in the Function Reference may have a corresponding reference in the Field Programming Reference. Therefore, you can configure the function by referring to the information also appearing in the Field Programming Reference.

1 FUNCTIONS AND PANEL LAYOUT

1.1 Front Panel

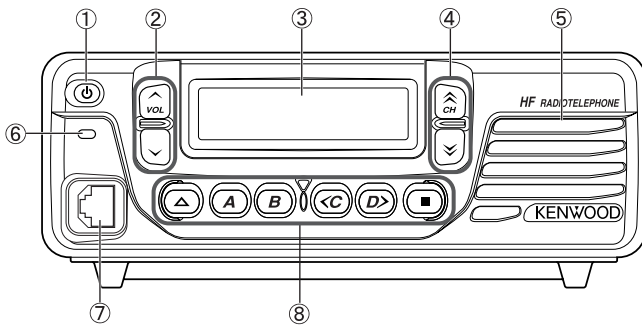


Figure 1-1 Front Panel

① Power Switch

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

② [▲]/[▼] (Volume Control) Keys

The Volume control allows a user to adjust the volume level of sound from the speaker.

③ LCD

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

④ [▲]/[▼] Keys

These keys allow a user to change channels.

⑤ Speaker

The speaker emits the received audio signals and alert tones.

⑥ Transmit LED/ BUSY LED

These LEDs light when the transceiver sends or receives signals.

⑦ Microphone Connector

A microphone can be connected to this connector.

⑧ PF Key

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

Note: A 12-key or 16-key microphone keypad is available. Functions can be assigned to the [A] to [D] (16-key microphone keypad), [*] and [#] keys.

1.2 Rear Panel

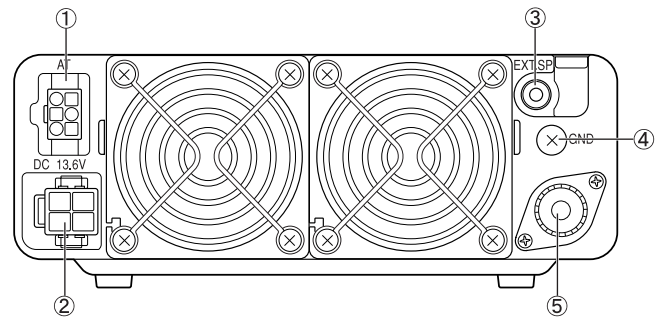


Figure 1-2 Rear Panel

① External Antenna Tuner Connector

An external tuner (KAT-1) can be connected to this connector.

② Power Connector

A power supply can be connected to this connector.

③ External Speaker Connector

An external speaker can be connected to this connector.

④ GND Terminal

A ground wire can be connected to this terminal.

⑤ Antenna Connector

An antenna can be connected to this connector.

The transceiver has the following indicator and display.

- LED (Transmit/ Busy)
- LCD

2.1 LED

The LED lights or flashes depending on the transceiver's status.

Table 2-1 Transmit/ Busy LED

LED Status	Transceiver Status
The LED lights green.	The transceiver is receiving signals.
The LED lights red.	The transceiver is transmitting.
The LED flashes orange.	The transceiver is receiving a Selcall. The link has been established by the ALE call.

2.2 LCD

2.2.1 Display Area

The following display is available.

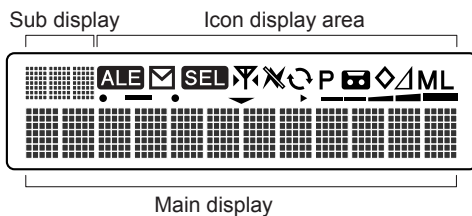


Figure 2-1 Display

2.2.2 Available Characters

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

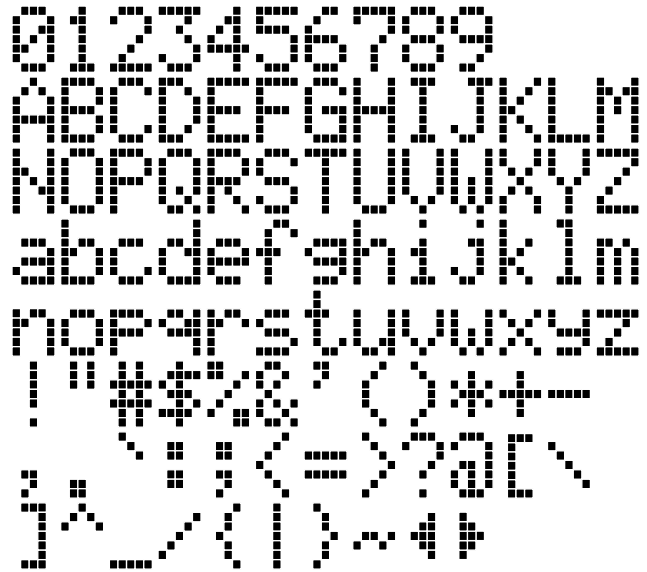


Figure 2-2 Character Pattern

Note: “◀” and “▶” cannot be used when entering characters to configure a channel name by using KPG-102D.

2.2.3 LCD Brightness

With this function, a user can decrease the brightness of the backlight LED when using the transceiver in dark places or at night.

The brightness of the backlight LED can be configured by using KPG-102D. The brightness of the backlight LED can be changed by selecting “BRIGHT” in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

Note:

- ◆ The configured brightness of the backlight is stored even if the transceiver is turned OFF.
- ◆ Key illumination (including Mic keys) can be enabled or disabled in conjunction with the brightness of the backlight LED. Key illumination is disabled if Off is configured for the backlight LED. If High or Low is configured for the backlight LED, the key illumination is enabled. However, the key illumination for the optional KMC-32 is always enabled regardless of the brightness of the backlight LED.

■ Transceiver Operation (User Menu only)

- Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [\wedge] or [\vee] key to select "BRIGHT".
 - Press the **LCD Brightness** key.
"BRIGHT" appears on the main display.
- Press the [**C**] or [**D>**] key to select the brightness of the backlight LED.
The brightness of the backlight LED changes if HIGH, LOW or OFF is selected.



- Press the [\triangle] key.
The previous display appears.

■ Configuration using KPG-102D










- Configuring the LCD Brightness Level (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)
- Assigning the LCD Brightness to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)




2.3 Icons

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

Table 2-2 Icon List

Icons	Function
	<p>ALE Icon This icon indicates the ALE state and the ALE Call state. This icon indicates the following 2 statuses.</p> <p>Flashing: When the link is being established by the ALE Call.</p> <p>Solid:</p> <ul style="list-style-type: none"> When ALE is enabled. When a link is established by an ALE Call. <p>(Refer to 28 ALE (Automatic Link Establishment) on page 92.)</p>
	<p>Message Icon (Selcall) This icon indicates the receive condition of Status Messages. The icon indicates the following 2 statuses.</p> <p>Flashing:</p> <ul style="list-style-type: none"> When the transceiver receives a new Status Message. When an unread Status Message(s) is stored. <p>Solid: When a Status Message is stored. (Refer to 20.2.7 Receiving a Status on page 62.)</p> <p>Message Icon (ALE Call) This icon indicates the AMD Message Stack status of ALE Call. The icon indicates the following 2 statuses.</p> <p>Flashing:</p> <ul style="list-style-type: none"> While handshaking to send an AMD Message. When the transceiver receives a new AMD Message. When an unread AMD Message(s) is stored. <p>Solid:</p> <ul style="list-style-type: none"> While an AMD Message is selected or edited. When an AMD Message is stored. (Refer to 28.3.1 Sending an AMD Message on page 105, 28.3.2 Receiving an AMD Message on page 107.)
	<p>Selcall Icon This icon indicates the Selcall status. The "Selcall" icon has 2 statuses.</p> <p>Flashing: When the transceiver starts making a Selcall.</p> <p>Solid: When Selcall is enabled. (Refer to 20 SELCALL on page 55.)</p>

Icons	Function
	Antenna Tuning Icon This icon indicates the tuning status of the external antenna tuner. The Antenna Tuning icon has 2 statuses. Flashing: When the external antenna tuner starts tuning. Solid: When the external antenna tuner completes tuning. (Refer to 17 ANTENNA TUNER on page 48.)
	Noise Blanker Icon This icon appears when Noise Blanker is enabled. (Refer to 7.5 Noise Blanker on page 18.)
	Scan Icon The "Scan" icon appears when the transceiver is scanning. (Refer to 16 SCAN on page 41.)
P	Preferred Channel Icon The "Preferred Channel" icon appears when the Preferred Channel number or name appears on the main display while the transceiver is scanning. (Refer to 16.6 Preferred Scan on page 46.)
	Auto Recording Icon This icon appears when the transceiver is storing recorded audio into the buffer. (Refer to 23.3 Auto Recording on page 85.)
	Scrambler Icon This icon appears when Scrambler is enabled. (Refer to 18 SCRAMBLER on page 51.)
	Clarifier Icon This icon appears when Clarifier is enabled. (Refer to 7.3 Clarifier on page 17.)
M	Transmit Power Icon This icon indicates the transmit power status. The "Transmit Power" icon has 3 statuses.
L	"L": When Low is configured for transmit power. "ML": When Medium-Low is configured for transmit power. "M": When Medium is configured for transmit power. No item appears on the display if High is configured for transmit power. (Refer to 5.3 Transmit Power on page 13.)
 (left)	AUX Output Icon This icon appears when the AUX Output port is activated. (Refer to 24 FUNCTION PORT on page 87.)
	VOX Icon This icon appears when VOX is enabled. (Refer to 9 VOX on page 22.)
 (right)	Not used

Icons	Function
	Scan Add Icon This icon appears if the current channel is added to the scan list. (Refer to 16.1 Selecting Scanning Channels on page 41.)
	Pre-amplifier Icon This icon appears when Pre-amplifier is enabled. This icon does not appear if "PRE OFF" or "ATT ON" is selected for Pre-amplifier. (Refer to 7.4 Pre-amplifier/ Attenuator on page 17.)
	S-Meter / RF-Meter Icon This bar-graph represents the S-meter while receiving, showing the receive signal strength, and the RF meter while transmitting.

2.4 Main Display

The following items and operations relevant to the main display can be configured.

- Channel Name
- Capability to switch the display between the channel name display and frequency display
- Power-on Text

Note: The following alphanumeric characters and symbols can be entered.

Table 2-3 Available Alphanumeric Characters and Symbols

(space)! " # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ [\] ^ _ ` A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z { } ~

2.4.1 Channel Name

A maximum of 12 characters can be configured for a channel. It may be difficult to remember the purpose for a channel by seeing only the frequency display. Using the Channel Name, a user can search for a channel by name, not frequency.

Channel Name can be configured by using KPG-102D. A new channel name can be configured and the configured channel name can be changed by selecting "CHANNEL" in Dealer Mode. (Refer to 11.2.1 Channel Configuration Mode on page 29.)

■ Configuration using KPG-102D

- Configuring the Channel Name (Refer to FPRG 5.1 Channel Information Window.)

2.4.2 Switching the Display between Channel Name and Frequency

The main display can be configured to display the channel name or frequency. If a user wants to display the frequency on the transceiver, the frequency display can be selected by using this function.

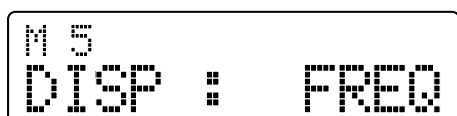
The main display format can be configured by using KPG-102D. The display configuration can be changed by selecting "DISP" in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

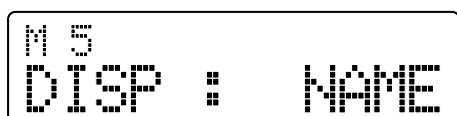
■ Transceiver Operation (User Menu only)

- Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [**△**] or [**▽**] key to select "DISP".
 - Press the **Display Character** key.
"DISP" appears on the main display.
- Press the [**<C**] or [**D>**] key to select FREQ or NAME.

If the frequency display is selected:



If the channel name display is selected:



- Press the [**△**] key.
The main display format is changed and the previous display appears.

■ Configuration using KPG-102D

- Configuring the Main Display Format (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)
- Assigning the Display Character to PF Keys (Refer to FPRG 5.3 Key Assignment Window.)

2.4.3 Power-on Text

Power-on Text can be used to display a text message on the main display when the transceiver is turned ON.

The message configured for Power-on Text appears for approximately 1 second after the transceiver is turned ON.

Power-on Text can be configured by using KPG-102D.

Note: Power-on Text cannot be disabled.

■ Configuration using KPG-102D

- Configuring the Power-on Text (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

2.5 Sub-display

A maximum of 3 alphanumeric digits can be displayed on the sub-display. The channel number and the following characters appear on the sub-display depending on the specific situation.

Table 2-4 Sub-display List

Display	Description
1 to 300	Channel Number Display This display appears if Channel Number Display is enabled. (Refer to 2.5.1 Channel Number Display on page 6.)
LSB, USB, CW, FSK, AM, DAT	Modulation Mode (Emission Mode) Display The current Modulation Mode appears when the transceiver is in VFO Mode. (Refer to 5.2 Modulation Mode (Emission Mode) on page 13.)
VFO	VFO Mode Display This display appears when the transceiver is in VFO Mode. (Refer to 10 VFO on page 25.)
M1 to M10	User Menu Display The selected user menu number appears on the sub-display. (Refer to 11.1 User Menu on page 28.)
M1 to M26	Dealer Menu Display The selected dealer menu number appears on the sub-display. (Refer to 11.2 Dealer Menu on page 29.)
ID	Selcall ID Display This display appears when the transceiver enters Selcall Mode after the Selcall key is pressed. (Refer to 20 SELCALL on page 55.)
MSG	Status Display This display appears when the transceiver enters Status Selection Mode. (Refer to 20.2.6 Sending a Status on page 60.)
L1 to L5	Status Message Display This display can be used to check the received Status Message. (Refer to 20.2.7 Receiving a Status on page 62.)
L 1 to L10	AMD Message Display This display can be used to check for received AMD Messages. (Refer to 28.3.2 Receiving an AMD Message on page 107.)
V1 to V4	Playback Display This display appears when recording or playing the Voice Memo or Voice Message. (Refer to 23.1 Voice Memo on page 83, 23.2 Sending a Voice Message on page 84.)
REC	Voicemail Display This display appears when recording a message on the receiving party's transceiver. (Refer to 20.3.3 Voicemail on page 63.)

Display	Description
m 0, m 1 to m10	AMD Message Number Display This display appears when an AMD Message to send is selected. "m 0" appears while editing an AMD Message. (Refer to 28.3.1 Sending an AMD Message on page 105.)
ALL	AllCall Display This display appears when a link is established after receiving an AllCall. (Refer to 28.2.11 Receiving an AllCall on page 103.)
	AMD Message Deletion Display This display appears when all stacked AMD Messages are deleted. (Refer to 28.3.3 Checking and Deleting an AMD Message on page 108.)

2.5.1 Channel Number Display

Channel Number Display can be used to display the channel number on the sub-display.

Channel Number Display can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Channel Number Display to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

3.1 Tone Type

The transceiver uses the following tones.

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

The volume level of each tone can be configured by using KPG-102D. (Refer to 3.3 Tone Volume on page 8.)

3.1.1 Power-on Tone

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

3.1.2 Control Tone

The transceiver emits this tone when the transceiver operates.

Table 3-1 Control Tone List

Tone Name	Description
Key Beep A	The transceiver emits this tone when a function is enabled by pressing a key. The transceiver emits this tone when the operation enabled by pressing a key is accepted.
Key Beep B	The transceiver emits this tone when a function is disabled by pressing a key.
Key-entry Error Tone	The transceiver emits this tone when the operation enabled by pressing a key is denied. The transceiver emits this tone if a user tries to configure a value outside of the range while configuring a menu, etc.
Roll Over Tone	The transceiver emits this tone if the lowest value or channel is selected when configuring a menu or changing a channel.
Call Error Tone	The transceiver emits this tone if the transceiver cannot receive an ACK within a certain time after sending a Status. This tone emits when various types of ALE calls fail.
Ack Receive Tone	The transceiver emits this tone if the transceiver receives an ACK within a certain time after sending a Status.
Link Reset Tone	The transceiver emits this tone when Selcall is reset.

Tone Name	Description
Tuning Timeout Tone	The transceiver emits this tone if the tuning is not completed within 20 seconds after starting the antenna tuning process.
Tuning End Tone	The transceiver emits this tone when the transceiver properly completes tuning.
Proceed Tone	The transceiver emits this tone when the transceiver finishes sending data with Selcall and communications is possible.

3.1.3 Warning Tone

The transceiver emits this tone to warn a user.

Table 3-2 Warning Tone List

Tone Name	Description
TOT Pre-alert Tone	The transceiver emits this tone 5 seconds before the transmission is restricted by the TOT.
PLL Unlock Beep	The transceiver emits this tone when the PLL circuit is unlocked.
Thermal Protection Tone	The transceiver emits this tone when Power Down is enabled by the thermal protection circuit.
TOT Warning Tone	The transceiver emits this tone when the transmission is terminated by the TOT.

3.1.4 Alert Tone

The transceiver emits Alert Tones when the transceiver receives a Selcall.

Tone pattern can be configured by using KPG-102D. (Refer to 3.2 Special Alert Tone on page 8.)

Table 3-3 Alert Tone List

Tone Name	Description
Selcall Tone	The transceiver emits this tone when the transceiver receives a Selcall.
Status Call Tone	The transceiver emits this tone when the transceiver receives a Status Call.
Emergency Response Tone	The transceiver emits this tone when the transceiver receives an Emergency Status. This tone emits when a link is established after receiving an ALE Emergency Call.

3.1.5 CW Sidetone

The transceiver emits this tone when a key is pressed in CW Mode. (Refer to 12.3 CW Pitch/CW Sidetone on page 34.)

3.1.6 Locator Tone

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

The duration to emit the Locator Tone can be configured by using KPG-102D. (Refer to 21.2.5 Duration of Locator Tone 1 on page 74, 21.2.7 Duration of Locator Tone 2 on page 75.)

3.2 Special Alert Tone

The following alert tones used for Selcalls or ALE Calls can be configured.

- Alert Tone that sounds if the transceiver receives a Selcall
- Link Establishment Tone that sounds when a link has been established after receiving various ALE calls
- Data Receive Tone that sounds when a received AMD Message is stacked in the transceiver

A total of 4 Alert Tones can be configured. An Alert Tone Pattern consists of 16 tones. The frequency and length of tones can be configured.

This function can be used to configure the duty cycle and interval of the Alert Tone for each Alert Tone Pattern.

Alert Tone Pattern can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Alert Tone Pattern (Refer to FPRG 5.8 Special Alert Tone Window.)

3.3 Tone Volume

This function can be used to configure the volume level for each tone. (Refer to 3.1 Tone Type on page 7.)

The function also can be used to fix the volume level and change the level in conjunction with the **Volume** keys. The transceiver does not emit any tones if Off is configured for Tone Volume.

Tone Volume can be configured for each tone by using KPG-102D.

Table 3-4 Tone Volume Configuration

Tone Level	Operation
Current	The transceiver emits Alert Tones in conjunction with the Volume keys.
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-102D

- Configuring the Tone Volume (Refer to FPRG 5.2 Optional Features Window > 5.2.2 Audio Tab.)

3.4 Audio Volume

This function can be used to configure the volume level for tones.

3.4.1 Minimum Volume

This function can be used to configure the minimum volume level for tones.

By configuring the minimum volume, a user can hear communication even if the Volume level is unintentionally changed to its lowest level.

The transceiver operates in the following way depending on the Minimum Volume Type configuration.

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

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

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

This function can be used to limit the minimum volume level if the Volume level is changed to its lowest level. With this function, a user can hear communication even if the Volume level is unintentionally changed to its lowest level. The volume level is increased from the Minimum Volume Level when pressing the **Volume** keys. The transceiver mutes completely if the Volume level is changed to its lowest position while a value of 0 is configured for Minimum Volume.

Minimum Volume and Minimum Volume Type can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Minimum Volume (Refer to FPRG 5.2 Optional Features Window > 5.2.2 Audio Tab.)
- Configuring the Minimum Volume Type (Refer to FPRG 5.2 Optional Features Window > 5.2.2 Audio Tab.)

4 KEY ASSIGNMENT

Various functions can be assigned to **PF** keys (12-key or 16-key) on the transceiver or microphone keypad.

The following table shows available keys and their default functions.

Table 4-1 Programmable Function Keys (Body Panel)

Key Name	Default Function
[Δ] key	Antenna Tuner
[A] key	Squelch Level
[B] key	Scan
[<C] key	Clarifier
[D>] key	Mode
[■] key	Menu

Table 4-2 Programmable Function Keys (Mic Keypad)

Key Name	Default Function
[A] key ^{*1}	Squelch Level
[B] key ^{*1}	Scan
[C] key ^{*1}	Clarifier
[D] key ^{*1}	Mode
[*] key	Volume Down
[#] key	Volume Up

^{*1} 16-key Mic Keypad only

Note: Only the following functions can be assigned to the [*] and [#] keys on the microphone keypad.

- Channel Down
- Channel Up
- Volume Down
- Volume Up

4.1 Assigning Functions to PF Keys

Functions can be assigned to a **PF** key on the transceiver by using KPG-102D.

The following functions can be assigned to **PF** keys on the transceiver.

Table 4-3 Programmable Function List

Function Name	Description
None	The transceiver does not respond. The Key-entry Error Tone beeps when a key that has no function assigned is pressed.
ALE	When the ALE key is pressed, the transceiver activates ALE Call Menu. (Refer to 28.2.2 ALE Call Menu on page 97.) Note: This function is available for a transceiver having firmware version 2.00 or later.
ALE Direct Call 1 to ALE Direct Call 4	When one of the ALE Direct Call 1 to ALE Direct Call 4 keys is pressed, the transceiver makes a direct call to the address configured for Target Address 1 to Target Address 4. (Refer to 28.3.4 ALE Direct Call on page 109.) Note: This function is available for a transceiver having firmware version 2.00 or later.
ALE Operation Mode	Each time the ALE Operation Mode key is pressed, the transceiver alternates between Net Mode and Channel Mode. If the ALE Operation Mode key is pressed and held for 1 second or more, the transceiver alternates between Net Mode and VFO Mode, or Channel Mode and VFO Mode. (Refer to 28.2.3 Selecting the ALE Operating Mode on page 97.) If the ALE Operation Mode key is pressed while the transceiver is in VFO Mode, the transceiver enters the frequency configuration mode. (Refer to 28.3.13 VFO Mode for ALE on page 115.) Note: This function can be configured for a transceiver having firmware version 2.00 or later.
Antenna Tuner	When the Antenna Tuner key is pressed while the external antenna tuner is used (connecting), the antenna tuner is not used (THRU state). If the Antenna Tuner key is pressed while the antenna tuner is not used (THRU), an error occurs. In this case, a user must press and hold the Antenna Tuner key for more than 1 second and perform the tuning again to reconnect. (Refer to 17 ANTENNA TUNER on page 48.) Note: This function is available only if the optional external antenna tuner KAT-1 is connected to the transceiver.

Function Name	Description
Anti-VOX Gain	When the Anti-VOX Gain key is pressed, User Menu is activated and Anti-VOX Gain Level can be configured. (Refer to 9.2.3 Anti-VOX Gain Level on page 23.)
Auto Recording	When the Auto Recording key is pressed and held for more than 1 second, audio is recorded on the continuous recording channel. The transceiver plays back the stored audio when the Auto Recording key is pressed. (Refer to 23.3 Auto Recording on page 85.) Note: This function is available only if an optional VGS-1 unit is installed in the transceiver.
AUX	When the AUX key is pressed, the status of AUX Output port changes. An external device connected to the AUX port can be controlled since the port output changes in conjunction with the AUX key.
Call Type	When the Call Type key is pressed, User Menu is activated and Selcall can be configured to be enabled or disabled. (Refer to 20.2.1 Enabling the Selcall on page 57.)
Channel Down	When the Channel Down key is pressed, the channel number is decreased. The channel number keeps decreasing every 200 ms if the Channel Down key is pressed and held for more than 1 second. The Rollover Tone sounds if the lowest channel number is selected.
Channel Up	When the Channel Up key is pressed, the channel number is increased. The channel number keeps increasing every 200 ms if the Channel Up key is pressed and held for more than 1 second. The Rollover Tone sounds if the lowest channel number is selected.
Clarifier	When the Clarifier key is pressed, the User Menu is activated and the Clarifier frequency can be adjusted. (Refer to 7.3 Clarifier on page 17.)
Direct Channel 1 to Direct Channel 4	When one of the Direct Channel 1 to Direct Channel 4 keys is pressed, the transceiver jumps to the configured channel. (Refer to 6.3.1 Direct Channel on page 15.)
Direct Selcall 1 to Direct Selcall 4	When one of the Direct Selcall 1 to Direct Selcall 4 keys is pressed, the transceiver makes a Selcall to the configured party. (Refer to 20.3.1 Direct Selcall on page 63.)
Direct Status Call 1 to Direct Status Call 4	When one of the Direct Status Call 1 to Direct Status Call 4 keys is pressed, the transceiver makes a Status Call to the configured party. (Refer to 20.3.2 Direct Status Call on page 63.)

Function Name	Description
Display Character	When the Display Character key is pressed, User Menu is activated and the channel name or frequency can be configured to be displayed on the main display. (Refer to 2.4.2 Switching the Display between Channel Name and Frequency on page 5.)
Emergency	When the Emergency key is pressed for longer than the Emergency-key Delay Time, the transceiver enters Emergency Mode. (Refer to 21 EMERGENCY on page 69.) Note: This function can be assigned only to the [Δ] key.
LCD Brightness	When the LCD Brightness key is pressed, User Menu is activated and the brightness of the backlight LED can be changed. (Refer to 2.2.3 LCD Brightness on page 2.)
Menu	When the Menu key is pressed, User Menu is activated. (Refer to 11.1 User Menu on page 28.)
Mode	When the Mode key is pressed, the current Mode appears. Every time the Mode key is pressed, Mode changes in the following order: USB \rightarrow LSB \rightarrow CW \rightarrow AM \rightarrow FSK \rightarrow DATA. (Refer to 5.2 Modulation Mode (Emission Mode) on page 13.)
Monitor	When the Monitor key is pressed, Squelch opens. (Refer to 7.2 Monitor on page 17.) This key can be used to reset the Selcall and unmute the received audio when Selcall is used.
Noise Blanker	When the Noise Blanker key is pressed, User Menu is activated and Noise Blanker can be configured to be enabled or disabled. (Refer to 7.5 Noise Blanker on page 18.)

4 KEY ASSIGNMENT

Function Name	Description
Playback 1 to Playback 4	<p>● Voice Memo: When one of the Playback 1 to Playback 4 keys is pressed, the transceiver starts recording the received audio. The transceiver plays the recorded audio if one of the Playback 1 to Playback 4 keys is pressed and held for 1 second. (Refer to 23.1 Voice Memo on page 83.)</p> <p>● Record/ Send Message: When one of the Playback 1 to Playback 4 keys is pressed and held for 1 second, the transceiver enters standby mode for recording audio spoken into the microphone. The transceiver plays the recorded audio and transmits if one of the Playback 1 to Playback 4 keys is pressed. (Refer to 23.2 Sending a Voice Message on page 84.)</p> <p>Note:</p> <ul style="list-style-type: none"> ◆ Voice Memo or Record/ Send Message can be assigned to the Playback 1 to Playback 4 keys by using KPG-102D. ◆ These functions are available only if an optional VGS-1 unit is installed in the transceiver.
Pre-amplifier/ Attenuator	When the Pre-amplifier/ Attenuator key is pressed, the current configuration appears. Every time the Pre-amplifier/ Attenuator key is pressed, Pre-amplifier/ Attenuator changes in the following order: PRE ON → PRE OFF → ATT ON. (Refer to 7.4 Pre-amplifier/ Attenuator on page 17.)
Scan	When the Scan key is pressed, the transceiver starts scanning. When the Scan key is pressed again, the transceiver stops scanning. (Refer to 16 SCAN on page 41.) When the Scan key is pressed while the transceiver is in VFO Mode, the transceiver enters VFO step frequency configuration mode. (Refer to 10.3 Changing the Step Frequency on page 25.)
Scan Delete/Add	When the Scan Delete/Add key is pressed, the current channel can be added to or removed from the Scan List. (Refer to 16 SCAN on page 41.)
Scrambler	When the Scrambler key is pressed, Scrambler can be configured to be enabled or disabled. When the Scrambler key is pressed and held for more than 1 second, the transceiver enters Scrambler Code configuration mode. (Refer to 18 SCRAMBLER on page 51.)
Selcall	When the Selcall key is pressed, a list of receiving parties appear. (Refer to 20 SELCALL on page 55.)

Function Name	Description
Squelch Level	When the Squelch Level key is pressed, User Menu is activated and Squelch Level can be configured. (Refer to 7.1 Squelch Level on page 17.)
Transmit Power	When the Transmit Power key is pressed, the transmit power can be changed in the following order: HIGH → MED → M-LO → LOW. (Refer to 5.3 Transmit Power on page 13.)
VFO	When the VFO key is pressed and held for more than 1 second, Channel Mode and VFO Mode can be switched. When the VFO key is pressed while the transceiver is in VFO Mode, the transceiver enters VFO step frequency configuration mode. (Refer to 10.3 Changing the Step Frequency on page 25.)
Volume Down	When the Volume Down key is pressed, the volume level is decreased in steps of 1. The volume level keeps decreasing every 100 ms if the Volume Down key is pressed and held for more than 1 second.
Volume Up	When the Volume Up key is pressed, the volume level is increased in steps of 1. The volume level keeps increasing every 100 ms if the Volume Up key is pressed and held for more than 1 second.
VOX	When the VOX key is pressed, User Menu is activated and VOX can be configured to be enabled or disabled. (Refer to 9.1 Enabling the VOX on page 22.)
VOX Delay	When the VOX Delay key is pressed, User Menu is activated and the VOX Delay Time can be configured. (Refer to 9.2.2 VOX Delay Time on page 23.)
VOX Gain Level	When the VOX Gain Level key is pressed, User Menu is activated and VOX Gain Level can be configured. (Refer to 9.2.1 VOX Gain Level on page 22.)

■ Configuration using KPG-102D

- Assigning Functions to PF Keys (Refer to FPRG 5.3 Key Assignment Window.)

5 BASIC CONFIGURATION

The transceiver can be operated by configuring transmit and receive frequencies, Modulation Mode (Emission Mode) and transmit power.

Channels can be configured by using KPG-102D. Channels also can be configured by selecting "CHANNEL" in Dealer Mode. (Refer to 11.2.1 Channel Configuration Mode on page 29.)

5.1 Transmit and Receive Frequencies

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

A transmit frequency and a receive frequency can be configured for each channel by using KPG-102D.

Table 5-1 Transmit and Receive Frequencies

	Range	Step Size
Receive Frequency	30.00 to 30000.00 kHz	0.01 kHz
Transmit Frequency	1605.00 to 30000.00 kHz	0.01 kHz

■ Configuration using KPG-102D

- Configuring the Transmit Frequency for each Channel (Refer to FPRG 5.1 Channel Information Window.)

5.2 Modulation Mode (Emission Mode)

The transceiver uses the following modes.

Modulation Mode can be configured for each channel by using KPG-102D.

Table 5-2 Modulation Mode

Modulation Mode	Description
LSB	These modes can be used for general voice communications. AM also can be used to receive signals sent from stations. (Refer to 6.4 Communicating in SSB or AM Mode on page 15.)
USB	
AM	
CW	This mode can be used to communicate by Morse code. (Refer to 12 CW COMMUNICATION on page 33.)
FSK	This mode can be used for RTTY communications. (Refer to 13 RTTY COMMUNICATION on page 35.)

Modulation Mode	Description
DATA	This mode can be used to send packet data (data communication in AFSK system). (Refer to 14 DATA COMMUNICATION on page 38.)

Note: When the **Mode** key is pressed, the configured Modulation Mode can be changed. (Refer to 15.1 Switching the Modulation Mode on page 40.)

■ Configuration using KPG-102D

- Configuring the Modulation Mode for each Channel (Refer to FPRG 5.1 Channel Information Window.)

5.3 Transmit Power

The possibility of the transceiver interfering with other stations decreases by configuring a lower transmit power in cases where communications is known to be reliable.

Transmit Power can be configured for each channel by using KPG-102D.

Transmit Power varies depending on the Modulation Mode.

Table 5-3 Transmit Power (Modulation Mode: AM)

Configuration	Transmit Power
Low	5 W
Medium-Low	
Medium	
High	25 W

Table 5-4 Transmit Power (Modulation Mode: Other than AM)

Configuration	Transmit Power
Low	5 W
Medium-Low	25 W
Medium	50 W
High	100 W

■ Configuration using KPG-102D

- Configuring the Transmit Power for each Channel (Refer to FPRG 5.1 Channel Information Window.)

6 BASIC OPERATION

6.1 Turning the Transceiver ON/OFF

Pressing and holding the **Power** switch for more than 200 ms will turn the transceiver ON. Ignition Sense can be used to automatically turn the transceiver ON in conjunction with the status of the Ignition Sense port of a vehicle.

Pressing and holding the **Power** switch for more than 300 ms will turn the transceiver OFF.

Note: The status of the **Power** switch can be stored in the transceiver. (Refer to 6.1.1 Power Switch Status Memory on page 14.)

■ Transceiver Operation (User Menu only)

1. Turn the transceiver ON.

Power-on Text appears for approximately 1 second and the transceiver emits a Power-on Tone.

If Power-on Clock is enabled while an ALE unit is installed in the transceiver, the current time appears on the main display for 1 second after the Power-on Text appears on the main display. (Refer to 28.4.2 Power-on Time Display on page 117.)

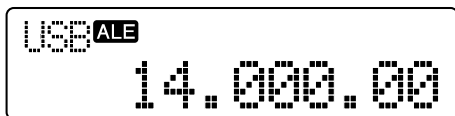


A channel or frequency appears on the main display. The net address appears on the main display while the transceiver is in ALE Net Mode.

Channel Display



Frequency Display

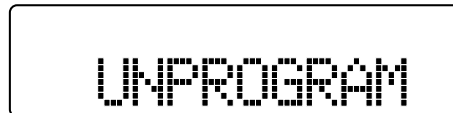


Net Address Display



"UNPROGRAM" appears on the main display if no channel data is configured.

If no normal channel is configured, "UNPROGRAM" appears on the main display even if ALE channels are configured.



2. Turn the transceiver OFF.
All displays are switched off.

6.1.1 Power Switch Status Memory

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

● If Power Switch Status Memory is Enabled:

The transceiver turns ON and starts up if the power connector is removed while the **Power** switch is ON state, and then the connector is re-connected. The transceiver remains OFF state if the power connector is removed while the **Power** switch is OFF, and then the connector is re-connected. The transceiver does not start up unless the **Power** switch is pressed.

● If Power Switch Status Memory is Disabled:

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

Power Switch Status Memory can be configured to be enabled or disabled by using KPG-102D.

Note: The status of the **Power** switch is always retained in the transceiver if Ignition Sense is used.

■ Configuration using KPG-102D

- Configuring the Power Switch Status Memory to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

6.2 Adjusting the Volume

Pressing the [**▲**] key will increase the volume level. Pressing the [**▼**] key will decrease the volume level.

If Volume Up and Volume Down are assigned to **PF** keys, the volume level can be adjusted by using these keys. (Refer to 4 KEY ASSIGNMENT on page 10.)

6.3 Changing the Channel

Pressing the [**▲**] key will increase the channel number in steps of 1. Pressing the [**▼**] key will decrease the channel number in steps of 1. If Channel Up and Channel Down are assigned to **PF** keys, the channel can be changed by using these keys. (Refer to 4 KEY ASSIGNMENT on page 10.)

The transceiver skips unregistered channels when the channel is changed.

The Rollover Tone sounds if the lowest channel is selected. (Refer to 3.1.2 Control Tone on page 7.)

Note: If Direct Channel is configured, the channel can be changed by pressing the **Direct Channel** key. (Refer to 6.3.1 Direct Channel on page 15.)

■ Transceiver Operation (User Menu only)

- Press the [**▲**] or **Channel Up** key.
The channel number increases in steps of 1.
- Press and hold the [**▲**] or **Channel Up** key for more than 1 second.
The channel number keeps increasing in steps of 1 every 200 ms.
- Press the [**▼**] or **Channel Down** key.
The channel number decreases in steps of 1.
- Press and hold the [**▼**] or **Channel Down** key for more than 1 second.
The channel number keeps decreasing in steps of 1 every 200 ms.

6.3.1 Direct Channel

Direct Channel is used to migrates to a programmed channel with a single press of a key.

Direct Channel can be configured and assigned to a **PF** key on the transceiver by using KPG-102D.

■ Transceiver Operation

- Press one of the **Direct Channel 1** to **Direct Channel 4** keys.
The transceiver directly jumps to the channel configured for keys.

Note:

- ◆ This function is enabled even if the transceiver is scanning.
- ◆ This function cannot be used if the transceiver is in VFO Mode or transmitting.

■ Configuration using KPG-102D

- Changing a Direct Channel (Refer to FPRG 5.3 Key Assignment Window > 5.3.4 Direct Channel Tab.)
- Assigning Direct Channel to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

6.4 Communicating in SSB or AM Mode

Configure the USB or LSB for the Modulation Mode when communicating by voice in SSB^{*1} Mode. AM must be configured for the Modulation Mode when communicating by voice in AM Mode. (Refer to 5.2 Modulation Mode (Emission Mode) on page 13.)

^{*1} SSB stands for single sideband and the transceiver can communicate using the sideband generated on either the upper or lower side of the carrier. USB uses the upper sideband. LSB uses the lower sideband.

■ Transceiver Operation (User Menu only)

1. Select the target channel.
2. Speak into the microphone while pressing the **PTT** (microphone) switch.
3. Release the **PTT** (microphone) switch to stop transmitting.

The transceiver returns to receive mode.

6.5 Adjusting the Squelch

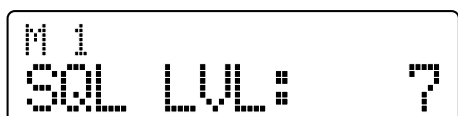
Squelch is adjusted to eliminate noise heard while the transceiver is receiving when no signal is present. (Refer to 7.1 Squelch Level on page 17.)

Squelch Level can be configured by using KPG-102D. Squelch Level can be changed by selecting "SQL LVL" in User Menu.

Refer to 11.1 User Menu on page 28 for User Menu.

■ Transceiver Operation (User Menu only)

- Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [\wedge] or [\vee] key to select "SQL LVL".
 - Press the **Squelch Level** key.
"SQL LVL" appears on the main display.
- Press the [**<C**] or [**D>**] key to change the Squelch Level.
Select from 0 to 10 the level at which noise will be eliminated.
 - Press the [**<C**] key to decrease the Squelch Level.
 - Press the [**D>**] key to increase the Squelch Level.



- Press the [\triangle] key.
The Squelch Level changes and the previous display appears.

Note:

- ◆ If a value of 0 is configured for Squelch Level, Squelch opens.
- ◆ If the **Monitor** key is pressed while Squelch is closed, Monitor is enabled. In this case, Squelch cannot be opened. (Refer to 7.2 Monitor on page 17.)

■ Configuration using KPG-102D

- Configuring the Squelch Level (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the Squelch Level to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

6.6 Adjusting the Receive Frequency (Clarifier)

This function can be used to adjust the receive frequency without changing your own transmit frequency. This can be useful if the other party's transmit frequency is not exactly the same as yours. (Refer to 7.3 Clarifier on page 17.)

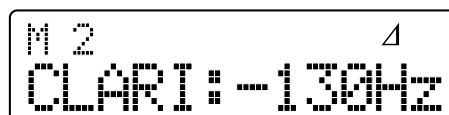
Receive frequency can be adjusted by selecting "CLARI" in User Menu.

Refer to 11.1 User Menu on page 28 for User Menu Mode.

■ Transceiver Operation (User Menu only)

- Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [\wedge] or [\vee] key to select "CLARI".
 - Press the **Clarifier** key.
"CLARI" appears on the main display.
- Press the [**<C**] or [**D>**] key.
The frequency range can be adjusted between -400 Hz to +400 Hz. The receive frequency can be adjusted in steps of 10 Hz.
 - Press the [**<C**] key to decrease the receive frequency.
 - Press the [**D>**] key to increase the receive frequency.

If the receive frequency is shifted in the - (minus) direction:



If a value of 0 is configured for the receive frequency:



If the receive frequency is shifted in the + (plus) direction:



Note: The current value is cleared when the [**A**] key is pressed.

- Press the [\triangle] key.
The receive frequency is changed and the previous display appears.

■ Configuration using KPG-102D

- Configuring the Clarifier Frequency (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the Clarifier to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

7 RECEIVE FUNCTIONS

7.1 Squelch Level

Squelch Level determines the received signal level necessary for the signal to be heard from the speaker. The transceiver emits the received audio if the transceiver receives the signal at a higher level than the configured level.

If the received signal is weak, a lower Squelch Level value must be configured. Increase the Squelch Level to block speaker output of unwanted weak signals.

Refer to [6.5 Adjusting the Squelch on page 15](#) for instructions on how to adjust the Squelch Level.

7.2 Monitor

If the transceiver receives a weak signal while Squelch is closed, voice communications may be interrupted. This function can be used to temporarily open Squelch.

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

■ Transceiver Operation

1. Press the **Monitor** key.
Squelch is open while the **Monitor** key is pressed.
2. Release the **Monitor** key.
Squelch closes.

■ Configuration using KPG-102D

- Assigning the Monitor to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

7.3 Clarifier

Clarifier can be used to adjust the receive frequency in steps as small as ± 10 Hz up to a maximum of ± 400 Hz without changing the transmit frequency. If the received signal changes in frequency and you alter your frequency to compensate for this change, communications may be interrupted since your own transmit frequency would also be shifted. With this function, you can change your receive frequency without changing your transmit frequency.

Refer to [6.6 Adjusting the Receive Frequency \(Clarifier\) on page 16](#) for instructions on how to configure the Clarifier.

7.4 Pre-amplifier/ Attenuator

This function can be used to amplify the received signal. This function is effective if the received signal level is low. If signals from adjacent frequencies do not interfere after switching on the pre-amplifier, the resulting amplified received signal can be more intelligible.

The attenuator can be used to attenuate the received signal. This function is effective if signals on adjacent frequencies often interrupt communications.

Pre-amplifier/ Attenuator can be configured for each channel by using KPG-102D. The Pre-amplifier/ Attenuator configuration can be temporarily changed by using the **Pre-amp/ Attenuator** key.

Note: Pre-amplifier/ Attenuator in VFO Mode can be configured by using KPG-102D.

■ Transceiver Operation (User Menu only)

1. Press the **Pre-amplifier/ Attenuator** key.
The current configuration appears on the main display.
2. Press the **Pre-amplifier/ Attenuator** key to configure the Pre-amplifier/ Attenuator.

Every time the **Pre-amplifier/ Attenuator** key is pressed, a status of Pre-amplifier/ Attenuator changes in the following order:
PRE ON → PRE/ATT OFF → ATT ON.

If no operation is done for more than 1 second, the previous display automatically appears. The “▶” icon appears on the main display if “PRE ON” is selected.



Note: Pressing the **Pre-amplifier/ Attenuator** key does not store the new configuration in the transceiver. The value originally configured for the channel is restored as soon as the channel is changed.

■ Configuration using KPG-102D

- Configuring the Pre-amplifier/ Attenuator for each Channel (Refer to FPRG 5.1 Channel Information Window.)
- Configuring the Pre-amplifier/ Attenuator in VFO Mode (Refer to FPRG 5.2 Optional Features Window > 5.2.4 VFO Tab.)

7.5 Noise Blanker

Noise Blanker can be used to electrically eliminate pulse noise generated by the ignition of a vehicle. This function is effective to reduce pulse noise, such as ignition noise, interfering with received signals.

Noise Blanker can be configured to be enabled or disabled by using KPG-102D. Noise Blanker can be configured by selecting “NB” in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [▲] or [▼] key to select “NB”.
 - Press the **Noise Blanker** key.
“NB” appears on the main display.
2. Press the [**C**] or [**D**] key to select “ON” or “OFF”.



3. Press the [▲] key.
Noise Blanker is configured and the previous display appears.

■ Configuration using KPG-102D

- Configuring the Noise Blanker to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the Noise Blanker to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

8 TRANSMIT FUNCTIONS

8.1 Methods of Transmitting

The transceiver can be made to transmit in the following ways.

■ Transmitting using the PTT (Microphone) Switch

The transceiver sends the audio spoken into the microphone while the **PTT** (microphone) switch is pressed. The transceiver returns to receive mode when the **PTT** (microphone) switch is released.

■ Transmitting using VOX

The transceiver can transmit by using VOX when VOX is enabled. Speaking into the microphone at a level that exceeds the configured VOX Gain Level causes the transceiver to start transmitting even if the **PTT** (microphone) switch is not pressed. The transceiver returns to receive mode when the speech audio stops or drops to a level that is lower than the VOX Gain Level. (Refer to 9 VOX on page 22.)

■ Transmitting using Keying

The transceiver enters CW Transmit Mode when the KEY port logic level goes low and the transceiver enters receive mode when the KEY port logic level goes high. (Refer to 12 CW COMMUNICATION on page 33.)

■ Transmitting using Data PTT

The transceiver sends the DI input signal while the Data PTT port logic level is low and the transceiver enters receive mode when the Data PTT port logic level goes high. The mic input signal is muted while the transceiver is transmitting with Data PTT.

■ Transmitting using VGS-1

If a message is recorded on the VGS-1 and Rec/Play Channel 1 to Rec/Play Channel 4 are configured for Record/ Send Message, the prerecorded message will be played and sent when one of the **Playback 1** to **Playback 4** keys is pressed while the transceiver is in SSB or AM Mode. (Refer to 23 VGS (VOICE GUIDE & STORAGE UNIT) on page 83.)

Note:

- ◆ The transmit frequency cannot be changed while the transceiver is transmitting. However, the VFO frequency can be changed.
- ◆ If a user attempts to transmit in a frequency range where transmission is disabled, "RX ONLY" appears on the main display and the transceiver cannot transmit. Frequencies lower than 1.605 MHz cannot be used for transmission.
- ◆ Transmission in Emergency Mode has the highest priority. The following priority applies for transmissions other than those made in Emergency Mode.
 1. Transmissions using VGS-1
 2. Transmissions using Data PTT
 3. Transmissions using PTT, the TX command or VOX

- ◆ The following operations are disabled while the transceiver is transmitting.
 - **Monitor** key operation
 - Changing the Call Type in User Menu Mode
 - Changing a channel in Channel Mode
 - Pressing one of the **Direct Channel 1** to **Direct Channel 4** keys
 - Starting a scan
 - Alternating between VFO Mode and Channel Mode
 - The transceiver transmits a carrier when the **PTT** (microphone) switch is pressed even if the transceiver is in CW Mode or FSK Mode. However, CW Break-in configuration affects transceiver operation if the transceiver enters transmit mode after the **PTT** (microphone) switch is pressed while the transceiver is in CW Mode. The transceiver transmits a carrier if CW Break-in is disabled when pressing the **PTT** (microphone) switch. If CW Break-in is enabled, the transceiver does not transmit a carrier even if the **PTT** (microphone) switch is pressed and the transceiver is in transmit mode.

8.2 Temporarily Changing the Transmit Power

Transmit Power can be temporarily changed.

■ Transceiver Operation (User Menu only)

- Press the **Transmit Power** key.

Transmit Power can be changed in the following order by pressing the **Transmit Power** key: High → Medium → Medium-Low → Low.

The transmit power levels available for selection vary when configuring Transmit Power depending on the largest value of the configured transmit power.

Table 8-1 Transmit Power Selections

Largest Value	Available Levels of Transmit Power
High	High, Medium, Medium-Low, Low
Medium	Medium, Medium-Low, Low
Medium-Low	Medium-Low, Low
Low	Low
Inhibit	Configuration is not available.

Note:

- ◆ Transmit Power configured in Channel Configuration Mode or by using KPG-102D is stored as the highest level of Transmit Power.
- ◆ The power level configured for Transmit Power by using the **Transmit Power** key is not stored in the transceiver.

■ Configuration using KPG-102D

- Assigning the Transmit Power to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

8.3 Mic Gain Level

Mic Gain Level can be configured while in SSB Mode or AM Mode.

Mic Gain Level can be configured by using KPG-102D. Mic Gain Level also can be configured by selecting "FUNCTION" in Dealer Mode.

■ Transceiver Operation (Dealer Menu only)

1. Select "MIC GAIN" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Mic Gain Level configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to configure the Mic Gain Level.

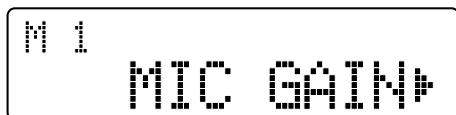
Select a level from "LEVEL 1" to "LEVEL 5".

Larger values result in a higher Mic sensitivity.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written. The configured value is cleared when the [C<] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.
Dealer Menu reappears.

Note:

- ◆ A value of 5 is configured for Mic Gain Level when the transceiver is in Emergency Mode.
- ◆ Mic Gain Level can be configured even while the transceiver is transmitting.

■ Configuration using KPG-102D

- Configuring the Mic Gain Level (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

8.4 Time-out Timer (TOT)

Time-out Timer (TOT) is used to restrict the continuous transmission time. This function prevents a user from unintentionally transmitting continuously.

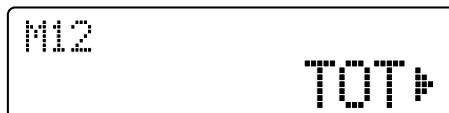
The transceiver emits the TOT Pre-alert Tone 5 seconds before the transmission is restricted. The transceiver returns to receive mode after the Time-out Timer expires. The transceiver can transmit after the user releases the PTT (microphone) switch and presses the PTT (microphone) switch again.

Time-out Timer can be configured by using KPG-102D. Time-out Timer also can be configured by selecting "FUNCTION" in Dealer Mode.

Note: Time-out Timer can be used for all transmissions other than those made in Emergency Mode.

■ Transceiver Operation (Dealer Menu only)

1. Select "TOT" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Time-out Timer configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Configure the Time-out Timer by pressing the [▲] or [▼] key.

Select the duration from "OFF", "3min", "5min", "10min", "20min" and "30min".



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written. The configured value is cleared when the [C<] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.
Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the Time-out Timer (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

8.5 Mic High Boost

Mic High Boost is useful to improve the quality of transmitted audio when using a waterproof microphone. By enabling this function, higher frequencies in the audio that is spoken into the microphone are emphasized and transmitted. This function can be used with the optional KMC-35 or KMC-36 microphone.

Mic High Boost can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Mic High Boost to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

VOX can be used to automatically transmit by speaking into the microphone without using the **PTT** (microphone) switch. This function is useful when a headset microphone is installed on the transceiver but the **PTT** (microphone) switch cannot be pressed.

Note:

- ◆ There is delay time between the time when audio is spoken into the microphone and the time when the transceiver transmits that audio. Considering this delay time, the receiving party may miss calls.
- ◆ This function cannot be used if transmission is disabled for VFO Mode or the transceiver is used on receive only channels.
- ◆ If VOX is enabled, the transceiver may transmit extraneous noises picked up by the microphone in addition to voice audio spoken into the microphone.
- ◆ VOX can be used in SSB, AM or DATA Mode.

9.1 Enabling the VOX

If VOX is enabled by using KPG-102D, VOX starts up when the transceiver is turned ON. VOX can be configured to be enabled or disabled by selecting “VOX” in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [**▲**] or [**▼**] key to select “VOX”.
 - Press the **VOX** key.
“VOX” appears on the main display.
2. Press the [**<C**] or [**D>**] key to select “ON”.
VOX is enabled and the “**—**” icon appears on the icon display area. If “OFF” is selected, VOX is disabled and the “**—**” icon disappears.



3. Press the [**▲**] key.
VOX is configured and the previous display appears.

■ Configuration using KPG-102D

- Configuring the VOX to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the VOX to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

9.2 Configuring VOX

Following items relevant to VOX can be configured:

- VOX Gain Level
- VOX Delay Time
- Anti-VOX Gain Level
- Cancel Operation

9.2.1 VOX Gain Level

VOX Gain Level is the level of the audio that must be spoken into the microphone to use VOX in SSB or AM Mode. This level can be adjusted so as not to transmit noise.

VOX Gain Level can be configured by using KPG-102D. VOX Gain Level also can be configured by selecting “VOX GAIN” in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [**▲**] or [**▼**] key to select “VOX GAIN”.
 - Press the **VOX Gain Level** key.
“VOX GAIN” appears on the main display.
2. Press the [**<C**] or [**D>**] key to adjust the VOX Gain Level.
Select a value from 1 to 9. Larger values result in a higher VOX sensitivity.
 - Press the [**<C**] key to decrease the Voice Gain Level.
 - Press the [**D>**] key to increase the Voice Gain Level.



Note: VOX is enabled while configuring the VOX Gain Level.

3. Press the [Δ] key.

VOX Gain Level is configured and the previous display appears.

■ Configuration using KPG-102D

- Configuring the VOX Gain Level (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the VOX Gain Level to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

9.2.2 VOX Delay Time

VOX Delay Time is the duration that the transceiver remains in transmit mode after transmitting with VOX. 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 a VOX transmission when the microphone senses no additional audio during the VOX Delay Time.

VOX Delay Time can be configured by using KPG-102D. VOX Delay Time also can be configured by selecting "VOX DLY" in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.

- Press the **Menu** key.
User Menu is activated. Press the [\wedge] or [∇] key to select "VOX DLY".

- Press the **VOX Delay** key.
"VOX DLY" appears on the main display.

2. Press the [**<C**] or [**D>**] key to adjust the VOX Delay Time.

VOX Delay Time can be configured by selecting OFF or a value from 200 to 3000 ms. VOX Delay Time can be adjusted in steps of 200 ms.

- Press the [**<C**] key to decrease the VOX Delay Time.
- Press the [**D>**] key to increase the VOX Delay Time.



3. Press the [Δ] key.

VOX Delay Time is configured and the previous display appears.

■ Configuration using KPG-102D

- Configuring the VOX Delay Time (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the VOX Delay to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

9.2.3 Anti-VOX Gain Level

Anti-VOX can be used to prevent the transceiver from making a VOX transmission in response to audio emitted from the speaker. Anti-VOX Gain Level is the sensitivity of Anti-VOX.

Anti-VOX Gain Level can be configured by using KPG-102D. Anti-VOX Gain Level also can be configured by selecting "ANTI VOX" in User Menu.

Refer to [11.1 User Menu on page 28](#) for User Menu Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.

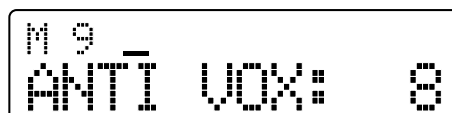
- Press the **Menu** key.
User Menu is activated. Press the [\wedge] or [∇] key to select "ANTI VOX".

- Press the **Anti-VOX Gain** key.
"ANTI VOX" appears on the main display.

2. Press the [**<C**] or [**D>**] key to adjust the Anti-VOX Gain Level.

Select the Anti-VOX Gain Level from 0 to 9.

- Press the [**<C**] key to decrease the Anti-VOX Gain Level.
- Press the [**D>**] key to increase the Anti-VOX Gain Level.



3. Press the [Δ] key.

Anti-VOX Gain Level is configured and the previous display appears.

■ Configuration using KPG-102D

- Configuring the Anti-VOX Gain Level (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)
- Assigning the Anti-VOX Gain to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

9.2.4 Cancel Operation

Cancel Operation disables the VOX when the **PTT** (microphone) switch is pressed while VOX is enabled.

● If Cancel Operation is enabled:

VOX is temporarily disabled when the **PTT** (microphone) switch is pressed. VOX can be enabled by turning the transceiver ON again.

● If Cancel Operation is disabled:

VOX is not disabled even if the **PTT** (microphone) switch is pressed.

Cancel Operation can be configured to be enabled or disabled using KPG-102D.

Note: VOX is enabled if a user activates User Menu after VOX is temporarily disabled. If Cancel Operation is enabled, VOX is disabled when the **PTT** (microphone) switch is pressed while the transceiver is in User Menu. When User Menu is deactivated, VOX is disabled.

■ Configuration using KPG-102D

- Configuring the Cancel Operation to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

VFO stands for Variable Frequency Oscillator. The transceiver enters VFO Mode when a frequency is selected.

A frequency can be configured by operating the transceiver in VFO Mode. This function is useful when using a frequency that is not configured for channels.

10.1 Entering VFO Mode

The transceiver enters VFO Mode when the **VFO** key is pressed.

The transceiver can be made to exit Channel Mode and enter VFO Mode by selecting "FUNCTION" in Dealer Mode. (Refer to 11.2.2 Function Configuration Mode on page 31.)

Note:

- ◆ The following configurations are retained even if the transceiver is turned OFF while the transceiver is in VFO Mode.
 - VFO Mode status
 - VFO frequency
 - Modulation Mode in VFO Mode
- ◆ VFO Mode is simplex.

■ Transceiver Operation

1. Press and hold the **VFO** key for more than 1 second while the transceiver is in Channel Mode.

Channel data is transferred to VFO Mode.



2. Press and hold the **VFO** key for more than 1 second. The transceiver returns to Channel Mode.

■ Configuration using KPG-102D

- Assigning the VOX to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

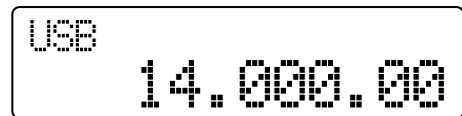
10.2 Changing the VFO Frequency

VFO frequency can be changed.

■ Transceiver Operation

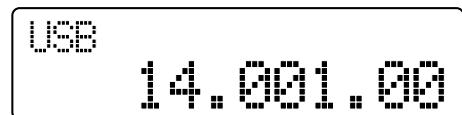
1. Press and hold the **VFO** key for more than 1 second while the transceiver is in Channel Mode.

Channel data is transferred to VFO Mode.



2. Press the [**▲**] or [**▼**] key to configure the frequency.

The frequency changes using the preconfigured steps.



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

The transceiver returns to Channel Mode.

■ Configuration using KPG-102D

- Assigning the VOX to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

10.3 Changing the Step Frequency

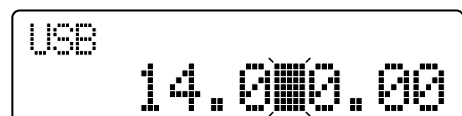
The minimum step size for configuring the VFO frequency can be configured.

■ Transceiver Operation

1. Press and hold the **VFO** or **Scan** key while the transceiver is in Channel Mode.

The transceiver enters VFO Step Frequency Configuration Mode and the digit configured for the minimum step size flashes.

The flashing digit moves when the [**<C**] or [**>D**] key is pressed and the frequency step changes. The VFO frequency can be configured using step sizes from 0.01 kHz (10 Hz) to 10000 kHz (10 MHz).



2. Press the [Δ] key.

The minimum step size is changed and the previous display appears.

■ Configuration using KPG-102D

- Assigning the VOX to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)
- Assigning the Scan to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

10.4 Directly Entering a Frequency

VFO frequency can be configured by pressing the [0] to [9] keys when using a 12-key or 16-key microphone keypad.

■ Transceiver Operation (User Menu only)

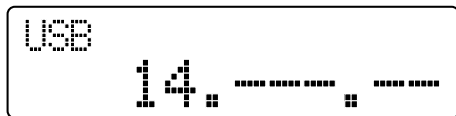
1. Press a [0] to [9] key on the microphone keypad while the transceiver is in VFO Mode.

The transceiver enters Frequency Direct Entry Mode.

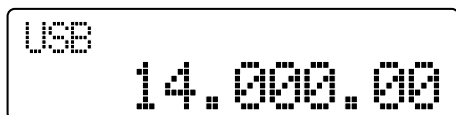
2. Enter a frequency by pressing the [0] to [9] keys.

Enter the frequency digit by digit.

For example, when the [1] and [4] keys are pressed:



The transceiver automatically exits Frequency Direct Entry Mode when the 10 Hz digit is entered. If the [#] key is pressed before entering the 10 Hz digit, a value of 0 is configured for the rest of the digits and the transceiver exits Frequency Direct Entry Mode.



Press the [*] key to exit Frequency Direct Entry Mode. In this case, the previous frequency appears.

Note:

- ◆ If one of the [4] to [9] keys is pressed when entering a frequency, a user must enter the frequency beginning with the 1 MHz digit.
- ◆ A value of 0 must be entered when entering a frequency less than 3 MHz. If the [0] and [2] keys are pressed to enter the frequency, "2.--.--" appears on the main display.
- ◆ The transceiver checks whether the entered frequency is in the available range when the transceiver exits Frequency Direct Entry Mode.
- ◆ If a frequency outside the available range is entered, an alert notifies the user that the frequency cannot be configured and the value is automatically overwritten with the previous value.
- ◆ The following keys cannot be used in Frequency Direct Entry Mode.
 - Volume Up and Volume Down keys
 - [0] to [9] keys
 - [#], [*] and [Δ] keys

10.5 Resetting the VFO

Values configured in VFO Mode can be reset to default.

Following are defaults for items to be reset.

Table 10-1 VFO Reset

Item	Default
VFO Frequency	Configuration using KPG-102D
VFO Receive/Transmit Mode	
Transmit Power for VFO Mode	
VFO AUX	
Pre-amplifier/ Attenuator for VFO Mode	
Squelch Level ^{*1}	0
Clarifier Frequency ^{*1}	0 Hz
Noise Blanker ^{*1}	OFF
LCD Brightness ^{*1}	HIGH
Switching the Display between Channel Name and Frequency ^{*1}	NAME
VOX ^{*1}	OFF
VOX Gain Level ^{*1}	5
VOX Delay Time ^{*1}	1600 ms
Anti-VOX Gain Level ^{*1}	3
Selecting a Call Type ^{*1}	OFF

^{*1} Configurable in User Menu

VFO Reset can be configured to be enabled or disabled by using KPG-102D. Values configured in VFO can be reset only if VFO Reset is enabled.

■ Transceiver Operation (User Menu only)

1. Turn the Transceiver OFF while the transceiver is in VFO Mode.
2. Press the **Power** switch while pressing the [Δ] key.
“RESET?” appears on the main display.



3. Select one of the following options.
 - Press the [■] key.
The transceiver does a VFO Reset and starts up with in User Mode.
 - Press the [Δ] key.
The transceiver cancels the VFO Reset and starts up with User Mode.

■ Configuration using KPG-102D

- Configuring the VOX Reset to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

11 MENU FUNCTION

A user can configure various functions in User Menu.

A dealer can configure various functions in Dealer Menu.

11.1 User Menu

This mode allows a user to configure various functions with menu format.

This mode can be used by pressing the **Menu** key or assigning function keys corresponding to menu items to the **PF** keys on the transceiver. When the **PF** key is pressed, the corresponding menu is activated.

Table 11-1 Configuration List in User Menu

No.	Description	Display	Function Keys
1	Configuring the Squelch Level.	SQL LVL:	Squelch Level
2	Configuring the Clarifier Frequency.	CLARI:	Clarifier
3	Configuring the Noise Blanker.	NB:	Noise Blanker
4	Configuring the LCD Brightness.	BRIGHT:	LCD Brightness
5	Switching the display between the Channel Name and Frequency.	DISP:	Display
6	Configuring the VOX.	VOX:	VOX
7	Configuring the VOX Delay Time.	VOX DLY:	VOX Delay
8	Configuring the VOX Gain Level.	VOX GAIN:	VOX Gain
9	Configuring the Anti-VOX Gain Level.	ANTI VOX:	Anti-VOX Gain
10	Configuring the Call Type.	CALL TYP:	Call Type
11	Configuration of ALE Monitor ^{*1}	ALE MONI:	-
12	Time display ^{*1}	14:45 ^{*2}	-

^{*1} This option is available only if ALE is configured for Call Type.

^{*2} Example of time display: Refer to [28.4.1 Current Time Display on page 116](#) for details.

■ Transceiver Operation (User Menu only)

- Select one of the following options.
 - Press the **Menu** key.
User Menu is activated. Press the [**▲**] or [**▼**] key to select a function to configure.
 - Press a corresponding function key.
User Menu corresponding to the function key pressed is activated.

- Press the [**<C**] or [**D>**] key to adjust the value.

- Press the [**△**] key.

The configuration is changed and the previous display appears.

Note:

- Pressing the **Menu** key to activate User Menu results in the last configured menu function appearing.
- The following keys are available to use in User Menu.

Table 11-2 Key Operation List in User Menu

Key	Operation
Power Switch	Turning the transceiver OFF (Canceling the change).
[▲] key	Increasing the volume level.
[▼] key	Decreasing the volume level.
[▲] key	Changing the menu item.
[▼] key	
[△] key	Exiting User Menu.
[A] key	Used as a clear key to clear the configuration when configuring the Clarifier.
[B] key	-
[<C] key	Changing the configuration.
[D>] key	
[■] key	-
[*] key (Mic Keypad)	Deactivating User Menu.
[A] key ^{*1}	Used as a clear key to clear the configuration when configuring the Clarifier.
[B] key ^{*1}	-
[C] key ^{*1}	Changing the configuration.
[D] key ^{*1}	

^{*1} 16-key Mic Keypad only

- If the transceiver is turned OFF while configuring a function, the configured value is cleared.
- The configuration of Call Type cannot be changed while the transceiver is scanning.

■ Configuration using KPG-102D

- Assigning the Menu to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)
- Assigning the User Menu Configuration Items to PF Keys (Refer to FPRG 5.3 Key Assignment Window.)

11.2 Dealer Menu

Dealer Menu allows a dealer to configure channels and various functions corresponding to a user's environment. Channel Configuration Mode and Function Configuration Mode are available in Dealer Menu.

Note: Selcall Mode and ALE Mode are automatically disabled while the transceiver is in Dealer Mode.

11.2.1 Channel Configuration Mode

This mode can be used to configure a channel. Functions configurable in this mode correspond to functions in the **Channel Information** window in KPG-102D.

Table 11-3 Function List (Channel Configuration Mode)

No.	Configuration
1	Receive Frequency
2	Transmit Frequency
3	Modulation Mode
4	Transmit Power
5	Channel Name
6	Scan Add
7	Pre-amplifier/ Attenuator
8	Selcall
9	Scrambler Code
10	AUX Port

■ Transceiver Operation (Dealer Menu only)

Note: The channel configuration is canceled if the [▲] key is pressed midway through steps 5 to 24 and Function Configuration Mode in Dealer Menu appears on the main display.

● Entering Channel Configuration Mode

1. Press the **Power** switch while pressing the [B] key.
Dealer Menu is activated and "DEALER MODE" appears for 1 second.



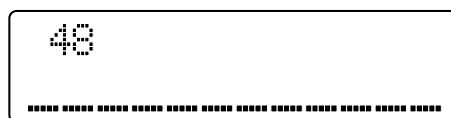
2. Press the [▲] or [▼] key to select "CHANNEL".



3. Press the [D>] key.
Channel Configuration Mode is activated.

● Selecting a Channel

4. Select a channel by pressing the [▲] or [▼] key.
If a channel with data is selected, the channel name appears on the main display. "_" appears for each digit if no data is configured for the selected channel.



● Configuring the Receive Frequency

5. Press the [■] key.
The configured Receive Frequency appears on the main display. "_" appears for each digit if no data is configured for a channel. In this case, the 10 MHz digit flashes and the frequency step appears.



The flashing digit moves when the [<C] or [D>] key is pressed and the frequency step changes.

6. Press the [▲] or [▼] key to configure the receive frequency.
 - Press the [▲] key to increase the Receive Frequency.
 - Press the [▼] key to decrease the Receive Frequency.

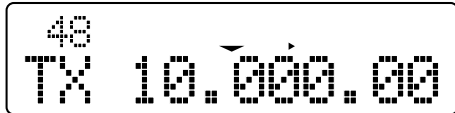
Note:

- ◆ Receive Frequency can be configured by directly pressing the [0] to [9] keys on the keypad. Receive Frequency cannot be cleared by using the keypad.
- ◆ If the [■] key is pressed while no Receive Frequency is entered, Channel Configuration Mode reappears while the channel is configured as a free channel.
- ◆ The configuration of the Receive Frequency is cleared when the [A] key is pressed while configuring the Receive Frequency.

● **Configuring the Transmit Frequency**

7. Press the [■] key.

The configured Transmit Frequency appears on the main display. The same frequency as the Receive Frequency is configured for the Transmit Frequency if no data is configured for the channel. In this case, the 10 MHz digit flashes and the frequency step appears.



The flashing digit moves when the [<C>] or [D>] key is pressed and the frequency step changes.

8. Press the [▲] or [▼] key to configure the Transmit Frequency.

- Press the [▲] key to increase the Transmit Frequency.
- Press the [▼] key to decrease the Transmit Frequency.

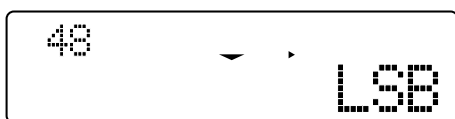
Note:

- ◆ Transmit Frequency can be configured by directly pressing the [0] to [9] keys on the keypad. The Transmit Frequency cannot be cleared by using the keypad.
- ◆ If the [■] key is pressed while the Transmit Frequency is not entered, Channel Configuration Mode reappears while the channel is configured as a free channel.
- ◆ The configuration of the Receive Frequency is cleared when the [A] key is pressed while configuring the transmit frequency.
- ◆ If no transmit frequency is configured, the channel is configured as a receive only channel. If a user attempts to transmit on a receive only channel, "RX ONLY" appears on the main display and the transceiver cannot transmit.

● **Configuring the Modulation Mode (Emission Mode)**

9. Press the [■] key.

The Modulation Mode configuration display appears.



10. Select a modulation mode by using the [▲] or [▼] key.

Select a mode from "LSB", "USB", "CW", "FSK", "DATA" and "AM".

● **Configuring the Transmit Power**

11. Press the [■] key.

The Transmit Power configuration display appears.



12. Select the transmit power by pressing the [▲] or [▼] key.

Select the transmit power from "HIGH (High)", "MED (Medium)", "M-LO (Medium-Low)", "LOW (Low)" and "INHI (Inhibit)".

Note: If no transmit frequency is configured, Inhibit (INHI) is automatically configured for the transmit power and the configuration of transmit power cannot be changed.

● **Configuring the Channel Name**

13. Press the [■] key.

The Channel Settings display appears. The configured channel name appears and the first digit flashes.



14. Press the [▲] or [▼] key to enter the channel name.

Press the [D>] key to move to the right digit and [<C>] key to move to the left digit.

Note: The following alphanumeric characters and symbols can be entered.

Table 11-4 Available alphanumeric characters and symbols

(space) ! " # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ [\] ^ _ ` A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 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 { } ~
--

● **Configuring Scan Add**

15. Press the [■] key.

The Scan Add configuration display appears.

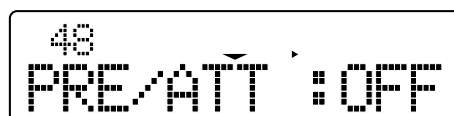


16. Configure Scan Add by using the [▲] or [▼] key. Select "YES" or "NO".

● **Configuring the Pre-amplifier/ Attenuator**

17. Press the [■] key.

The Pre-amplifier/ Attenuator configuration display appears.



18. Press the [\wedge] or [\vee] key to configure the Pre-amplifier/ Attenuator.
Select "OFF", "PRE" (On) or "ATT" (On) to configure the Pre-amplifier/ Attenuator.

● **Configuring the Selcall**

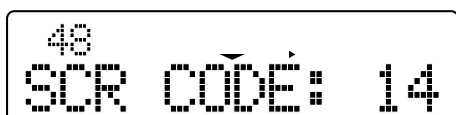
19. Press the [\blacksquare] key.
The Selcall configuration display appears.



20. Press the [\wedge] or [\vee] key to configure the Selcall.

● **Configuring the Scrambler Code**

21. Press the [\blacksquare] key.
The Scrambler Code configuration display appears.



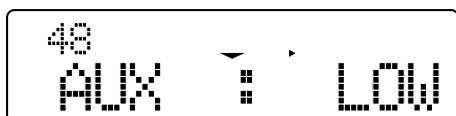
22. Press the [\wedge] or [\vee] key to configure the Scrambler Code.
Select "OFF" or "1" to "16" to configure the Scrambler Code.

Note:

- ◆ Scrambler is available only if the optional Scrambler board is installed in the transceiver.
- ◆ Scrambler can be used only if LSB, USB or AM is configured for Modulation Mode.

● **Configuring the AUX Port**

23. Press the [\blacksquare] key.
The AUX Output Logic configuration display appears.



24. Configure the AUX output logic by pressing the [\wedge] or [\vee] key.
Select "HIGH" or "LOW".

● **Writing Configuration Data to the EEPROM**

25. Press the [\blacksquare] key.
The configured channel data is written to the EEPROM. Channel Configuration Mode reappears when the configured value is written to the EEPROM.

26. Press the [\triangle] key.
Dealer Menu reappears.

11.2.2 Function Configuration Mode

This mode allows a user to configure general functions with menu format.

The following functions can be configured in Function Configuration Mode.

**Table 11-5 Configuration List
(Function Configuration Mode)**

No.	Description	Display
1	Configuring the Mic Gain Level.	MIC GAIN
2	Configuring the Minimum Volume.	MIN VOLUME
3	Configuring the Ignition Sense.	IGNIT SENSE
4	Configuring Scan Resume.	SCAN RESUME
5	Configuring Time-Operated Wait.	TO WAIT
6	Configuring the Dropout Delay Time.	DROP DELAY
7	Configuring Scan Resume after Transmit.	SCAN-RSM TX
8	Configuring the Dwell Time.	DWELL TIME
9	Configuring the Revert Channel.	REVERT CH
10	Configuring the Preferred Channel Scan Interval.	P-SCN INTVL
11	Configuring the Preferred Channel.	PREF CH
12	Configuring the Time-out Timer.	TOT
13	Configuring Transmit Power for VFO Mode.	VFO TX PWR
14	Selecting the IF Filter (SSB).	IF-FIL SSB
15	Selecting the IF Filter (DATA).	IF-FIL DATA
16	Selecting the IF Filter (FSK).	IF-FIL FSK
17	Configuring CW Break-in.	BREAK-IN
18	Configuring the CW Break-in Delay Time.	CW DELAY
19	Configuring the AF Input Level.	DI LEVEL
20	Configuring the AF Output Level.	DEO LEVEL
21	Configuring FSK Reverse.	FSK REVERSE
22	Changing the Sideband in DATA Mode.	DATA S-BAND
23	Configuring the FSK Transmit Polarity.	POLARITY
24	Configuring the FSK Transmit Shift Frequency.	FSK SHIFT
25	Configuring the FSK Receive Tone Frequency.	FSK TONE
26	Alternating between VFO Mode and Channel Mode.	MCH/VFO

■ **Transceiver Operation (Dealer Menu only)**

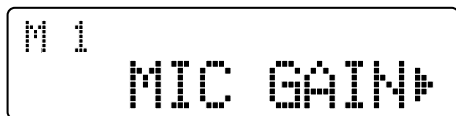
1. Press the **Power** switch while pressing the **[B]** key.
Dealer Menu is activated and "DEALER MODE" appears for 1 second.



2. Select "FUNCTION" by pressing the **[▲]** or **[▼]** key.



3. Press the **[D>]** key.
Function Configuration Mode is activated.
4. Select a function to configure by pressing the **[▲]** or **[▼]** key.



5. Press the **[D>]** key.
The configuration display appears.
6. Change the configured value by pressing the **[▲]** or **[▼]** key.



7. Press the **[■]** key.
The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the **[<C]** key is pressed and Function Configuration Mode in Dealer Menu reappears.
8. Press the **[△]** key.
Dealer Menu reappears.

Note:

- ◆ The following keys are available to use in Function Configuration Mode.

Table 11-6 Key Operation List in Function Configuration Mode

Key	Operation
Power Switch	Turning the transceiver OFF (Canceling the change).
[▲] key	Increasing the volume level.
[▼] key	Decreasing the volume level.
[▲] key	Changing the menu item and the configured value.
[▼] key	
[△] key	Exiting Function Settings Mode.
[A] key	-
[B] key	-
[<C] key	Jumping to the Menu Item Selection Mode.
[D>] key	Jumping to the configuration display for each function.
[■] key	-

- ◆ If the transceiver is turned OFF while configuring a function, the configured value is cleared.
- ◆ Dealer Menu appears if the **[△]** key is pressed midway through steps 4 to 7. Configuration data is written to the EEPROM.

12 CW COMMUNICATION

The following actions are required to communicate in CW Mode.

- **Connecting the CW Key**

Connect the **CW** key to Pin 1 of the optional KCT-39 cable connected to the transceiver.

- **Configuring the Modulation Mode (Emission Mode)**

Configure CW for Modulation Mode. (Refer to [5.2 Modulation Mode \(Emission Mode\)](#) on page 13.)

- **Enabling CW Break-in**

CW Break-in can be configured to be enabled. (Refer to [12.1 CW Break-in](#) on page 33.)

The following functions relevant to CW communication can be configured.

- CW Break-in Delay Time
- CW Pitch/CW Sidetone

12.1 CW Break-in

CW Break-in can be used to enable the transceiver to automatically enter transmit mode each time the key is pressed, then change back to receive mode when the key is released. This action occurs so rapidly that a user can monitor the frequency between each CW character sent. This method of operating does not require the user to manually switch between transmit and receive. Normally, this function is enabled when communicating in CW Mode.

If this function is disabled, the transceiver sends Sidetone only even if the key is pressed in CW Mode. In this case, the transceiver transmits a signal when the **PTT** (microphone) switch is pressed.

CW Break-in can be configured to be enabled or disabled by using KPG-102D. CW Break-in also can be configured to be enabled or disabled by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

1. Select "BREAK-IN" on Function Configuration Mode in Dealer Menu and press the **[D>]** key.



The CW Break-in configuration display appears. Refer to [11.2.2 Function Configuration Mode](#) on page 31 for instructions on how to select a desired mode.

2. Select "ON" or "OFF" by pressing the **[▲]** or **[▼]** key.



3. Press the **[■]** key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written. The configured value is cleared when the **[<C]** key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the **[△]** key.
Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the CW Break-in (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

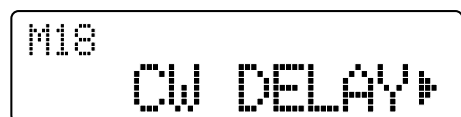
12.2 CW Break-in Delay Time

CW Break-in Delay Time is the duration that the transceiver remains in transmit mode after the transceiver transmits by using CW Break-in and the key is released.

CW Break-in Delay Time can be configured by using KPG-102D. CW Break-in Delay Time can be configured by selecting "FUNCTION" in Dealer Mode.

■ Transceiver Operation (Dealer Menu only)

1. Select "CW DELAY" on Function Configuration Mode in Dealer Menu and press the **[D>]** key.



The CW Break-in Delay Time configuration display appears. Refer to [11.2.2 Function Configuration Mode](#) on page 31 for instructions on how to select a desired mode.

2. Configure the CW Break-in Delay Time by pressing the [▲] or [▼] key.

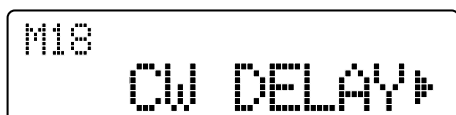
CW Break-in Delay Time can be configured by selecting FULL or a value from 50 to 1000 ms. CW Break-in Delay Time can be configured in steps of 50 ms.

If FULL is selected, the transceiver immediately returns to receive mode when the key is released.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written. The configured value is cleared when the [C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.
Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the CW Break-in Delay Time (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

12.3 CW Pitch/CW Sidetone

This function can be used to configure the Sidetone and the pitch frequency used when the transceiver communicates in CW Mode.

Sidetone is the tone emitted from the speaker when the transceiver transmits in CW Mode that allows the user to monitor their CW transmission. Pitch is the resulting beat frequency of the received signal that is heard while receiving in CW Mode. The pitch frequency works in conjunction with the sidetone frequency. Although 800 Hz is configured by default, 400 Hz can be configured.

CW Pitch/CW Sidetone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the CW Pitch/CW Sidetone (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

13 RTTY COMMUNICATION

RTTY (Radio Teletype) is one of the data communication systems that converts the characters entered via a keyboard into codes and transmits and receives these codes for the purpose of communication.

The following actions are required to communicate using RTTY.

- **Connecting the RTTY Unit**

Connect the RTTY unit to Pin 7 of the optional KCT-39 cable connected to the transceiver.

- **Configuring the Modulation Mode (Emission Mode)**

Configure FSK for the modulation mode. (Refer to [5.2 Modulation Mode \(Emission Mode\)](#) on page 13.)

The following functions relevant to RTTY communication can be configured.

- FSK Reverse
- FSK Transmit Polarity
- FSK Transmit Shift Frequency
- FSK Receive Tone Frequency

13.1 FSK Reverse

LSB (FSK Normal) or USB (FSK Reverse) can be configured for the method for receiving FSK signals while the transceiver is in FSK Mode.

Normally, LSB is configured for FSK Reverse if the transceiver uses a downshift such that the space frequency is lower than the mark frequency. If the receiving party uses the reverse shift, USB is configured for FSK Reverse.

FSK Reverse can be configured by using KPG-102D. FSK Reverse also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

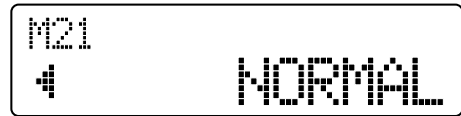
1. Select "FSK REVERSE" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The FSK Reverse configuration display appears. Refer to [11.2.2 Function Configuration Mode](#) on page 31 for instructions on how to select a desired mode.

2. Select "NORMAL" or "REVERSE" by using the [▲] or [▼] key.

If "NORMAL" is selected:



If "REVERSE" is selected:



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C<] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

Note: Reverse Shift is configured for FSK Key Polarity if "REVERSE" is configured for FSK Reverse.

■ Configuration using KPG-102D

- Configuring the FSK Reverse (Refer to [FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.](#))

13.2 FSK Transmit Polarity

FSK Transmit Polarity is the key polarity used to transmit in FSK Mode.

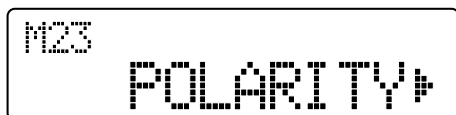
If NORMAL is configured for Key Polarity, the transceiver sends a mark signal when a key is closed and a space signal when the key is opened. If REVERSE is configured for Key Polarity, the transceiver sends a space signal when a key is closed and a mark signal when the key is opened.

Key Polarity may need to be changed depending on the RTTY unit connected.

FSK Transmit Polarity can be configured by using KPG-102D. FSK Transmit Polarity also can be configured by selecting "FUNCTION" in Dealer Mode.

■ Transceiver Operation (Dealer Menu only)

1. Select "POLARITY" on Function Configuration Mode in Dealer Menu and press the [D>] key.



M23
POLARITY➤

The FSK Transmit Polarity configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Select "NORMAL" or "REVERSE" by using the [▲] or [▼] key.

If "NORMAL" is selected:



M23
← NORMAL

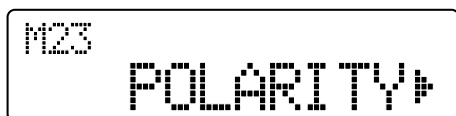
If "REVERSE" is selected:



M23
← REVERSE

3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C<] key is pressed and Function Configuration Mode in Dealer Menu reappears.



M23
POLARITY➤

4. Press the [▲] key.
Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the FSK Transmit Polarity (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

13.3 FSK Transmit Shift Frequency

FSK Transmit Shift Frequency is the frequency difference between a mark signal and space signal. This function can be used to configure how much a mark frequency is shifted from a space frequency.

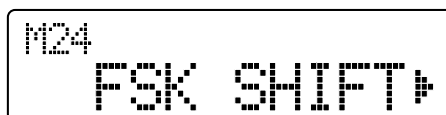
FSK Transmit Shift Frequency can be configured by using KPG-102D. FSK Transmit Shift Frequency also can be configured by selecting "FUNCTION" in Dealer Menu.

Note:

- ◆ In Transmit Frequency, the mark transmit frequency is higher than the space transmit frequency.
- ◆ In Receive Frequency, the space transmit frequency is higher than the mark transmit frequency by the shift amount. If the shift amount is 170 Hz, the space receive frequency is 2295 Hz and the mark receive frequency is 2125 Hz.

■ Transceiver Operation (Dealer Menu only)

1. Select "FSK SHIFT" on Function Configuration Mode in Dealer Menu and press the [D>] key.



M24
FSK SHIFT➤

The FSK Transmit Shift Frequency configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. FSK Transmit Shift Frequency can be configured by pressing the [▲] or [▼] key.

Select the FSK Transmit Shift Frequency from 170 Hz, 200 Hz, 425 Hz and 850 Hz.



M24
← 170Hz

3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the FSK Transmit Shift Frequency (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

13.4 FSK Receive Tone Frequency

High tone (2125 Hz) or low tone (1275 Hz) can be configured for the mark frequency used to communicate in FSK Mode.

FSK Receive Tone Frequency can be configured by using KPG-102D. FSK Receive Tone Frequency also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

1. Select "FSK TONE" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The FSK Receive Tone Frequency configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. FSK Receive Tone Frequency can be configured by pressing the [▲] or [▼] key.

Select 1275 Hz or 2125 Hz.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the FSK Receive Tone Frequency (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

14 DATA COMMUNICATION

Data communications is possible by connecting a modem, such as a TNC, and using a PC. The following preparations are required for data communications.

- **Connecting the Modem or a PC to the Transceiver**

Connect the modem (the unit converting data into audio signals) to Pin 4 and Pin 5 of the optional KCT-39 cable connected to the transceiver, then connect the modem to a PC.

- **Configuring the Modulation Mode (Emission Mode)**

Configure DATA for the modulation mode. (Refer to 5.2 Modulation Mode (Emission Mode) on page 13.)

The following functions relevant to data communications can be configured.

- DATA Sideband
- DI Level
- DEO Level

Note: KIF-2 can be used as the IF filter when operating high-speed data communications. A user must check the specifications of the modem used to ensure compatibility with this filter. (Refer to 19 IF FILTER on page 53.)

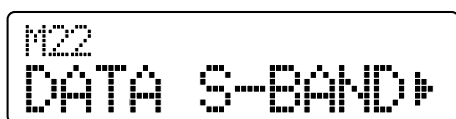
14.1 DATA Sideband

Configure the USB or LSB for the sideband in DATA Mode depending on the usage.

DATA Sideband can be configured by using KPG-102D. DATA Sideband also can be configured by selecting "FUNCTION" in Dealer Mode.

■ Transceiver Operation (Dealer Menu only)

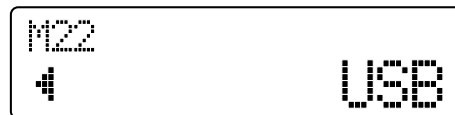
1. Select "DATA S-BAND" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The DATA Sideband configuration display appears. Refer to 11.2.2 Function Configuration Mode on page 31 for instructions on how to select a desired mode.

2. Select "USB" or "LSB" by using the [▲] or [▼] key.

If "USB" is selected:

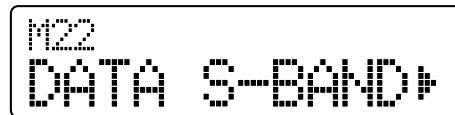


If "LSB" is selected:



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [▲] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the DATA Sideband (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

14.2 DI Level

The input sensitivity of the data input port (DI port) used in DATA Mode can be configured.

If the output level of the modem is high and the transmit signal is distorted, the sensitivity must be lowered.

DI Level can be configured by using KPG-102D. DI Level also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

1. Select "DI LEVEL" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The DI Level configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to configure the DI Level. Select the DI level from "Level 0" to "Level 9". Larger values result in a higher input sensitivity.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key. Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the DI Level (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

14.3 DEO Level

The output level of the data output port (DEO port) used in DATA Mode can be configured.

The output level of the transceiver when the TNC operates can be configured.

DEO Level can be configured by using KPG-102D. DEO Level also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

1. Select "DEO LEVEL" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The DEO Level configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

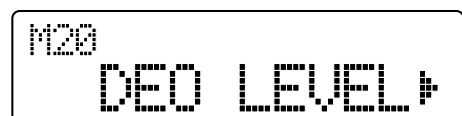
2. Press the [▲] or [▼] key to configure the DEO Level.

Select the DEO level from "Level 0" to "Level 9". Larger values result in a higher output level.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key. Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the DEO Level (Refer to FPRG 5.2 Optional Features Window > 5.2.5 FSK/DATA/CW Tab.)

15 MODULATION MODE (EMISSION MODE)

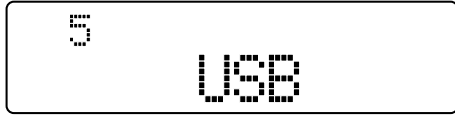
15.1 Switching the Modulation Mode

The modulation mode (emission mode) can be switched.

■ Transceiver Operation

1. Press the **Mode** key.

The current mode appears on the main display.



2. Alternate the mode by pressing the **Mode** key.

Every time the **Mode** key is pressed, the mode alternates in the following order: USB → LSB → CW → AM → FSK → DATA.

If no operation is done for more than 1 second, the previous display automatically appears.

Note:

- ◆ The previously selected mode is retained if the transceiver is in VFO Mode.
- ◆ Although it is possible to temporarily switch the mode while the transceiver is in Channel Mode, Channel data cannot be changed in Channel Mode.
- ◆ FAST is configured for the AGC time constant while the transceiver is in CW, FSK or DATA Mode. If the transceiver is in a mode other than CW, FSK or DATA Mode, SLOW is configured for the AGC time constant.

■ Configuration using KPG-102D

- Assigning the Mode to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

Scan can be used to acquire signals by sequentially scanning the receive channels.

The transceiver checks whether a channel configured for Scan Add has a signal and, thus, determines whether to open Squelch.

When the **Scan** key is pressed, the transceiver starts or stops scanning.

■ Transceiver Operation

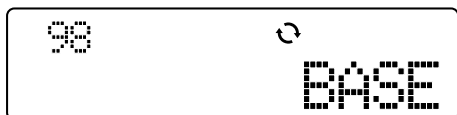
1. Press the **Scan** key.

The transceiver starts scanning. The “↻” icon appears while the transceiver is scanning.

The transceiver scans from the lowest channel to highest channel.

The transceiver skips unprogrammed channels and channels configured for Scan Delete.

If the number of channels configured for Scan Add is less than 2, the transceiver does not start scanning even if the **Scan** key is pressed. In this case, the transceiver emits the Key-entry Error Tone.



2. Press the **Scan** key.

The transceiver stops scanning and the “↻” icon disappears.

Note:

- ◆ The channel number, channel name and frequency appear every time the channel is changed while the transceiver is scanning.
- ◆ If the **Scan** key is pressed while the transceiver is in VFO Mode, the transceiver enters VFO Step Frequency Configuration Mode.
- ◆ The channel can be changed by pressing the **Channel Up** or **Channel Down** key even if the transceiver is scanning.
- ◆ Clarifier is temporarily disabled while the transceiver is scanning.
- ◆ If the transceiver makes a Selcall while the transceiver is scanning, the transceiver transmits on the Revert Channel.
- ◆ The transceiver pauses scanning if Squelch is open.
- ◆ If the transceiver is turned OFF while the transceiver is scanning, the transceiver stops scanning if the transceiver activates in other than User Mode. In this case, the transceiver starts scanning if the transceiver is turned ON in User Mode (excluding Dealer Mode).
- ◆ If the transceiver performs the scan while making a Selcall, the transceiver skips channels for which Selcall is disabled regardless of the Scan Add/ Scan Delete configuration.
- ◆ Call Type cannot be changed in User Menu while the transceiver is scanning.

■ Configuration using KPG-102D

- Assigning the Scan to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

16.1 Selecting Scanning Channels

The current channel can be added to or removed from the Scan List.

The Scan Add or Scan Delete configuration for each channel can be edited by using the **Scan Delete/Add** key.

■ Transceiver Operation

- Press the **Scan Delete/Add** key.

ADD or DEL is configured for the current channel every time the **Scan Delete/Add** key is pressed. The “◀” icon appears if ADD is configured for the current channel.



Note:

- ◆ If configuration data is edited by pressing the **Scan Delete/Add** key while the transceiver pauses scanning, channel configuration data is edited and stored in the transceiver.
- ◆ If configuration data is edited by pressing the **Scan Delete/Add** key while the transceiver is scanning, channel configuration data is not edited. The edited configuration is retained until the transceiver stops scanning.
- ◆ The transceiver does not resume scanning and the “↻” icon blinks if only 1 channel is configured for Scan Add.
- ◆ If the transceiver is making a Selcall, the transceiver skips channels for which Selcall is disabled regardless of the Scan Add/ Scan Delete configuration. In this case, the “◀” icon disappears. An error message appears if the **Scan Delete/Add** key is pressed and the configuration cannot be edited.

■ Configuration using KPG-102D

- Assigning the Scan Delete/Add to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

16.2 Busy Stop and Conditions to Resume Scanning

Busy Stop can be used to pause scanning if the transceiver finds a channel with a signal during the scan.

Conditions to resume scanning after the transceiver stops scanning with Busy Stop vary depending on the Scan Resume configuration.

- **Time Operated**

The transceiver resumes scanning after the Time Operated Wait elapses even if a signal exists on the channel. (Refer to [16.2.1 Time Operated Wait on page 42.](#))

Time Operated must be configured to check signals.

- **Carrier Operated**

The transceiver pauses scanning while there is a signal to receive and resumes scanning when there is no signal to receive and the Dropout Delay Time elapses. (Refer to [16.2.2 Dropout Delay Time on page 43.](#))

Carrier Operated must be configured when receiving on a channel with signals.

Scan Resume can be configured by using KPG-102D. Scan Resume also can be configured by selecting "FUNCTION" in Dealer Menu.

- **Transceiver Operation (Dealer Menu only)**

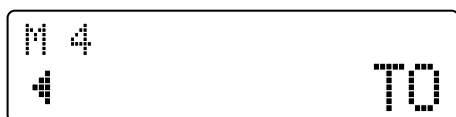
1. Select "SCAN RESUME" on Function Configuration Mode in Dealer Menu and press the [D>] key.



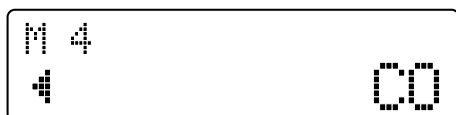
The Scan Resume configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to select "TO" or "CO".

If "TO" is selected:



If "CO" is selected:



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

- **Configuration using KPG-102D**

- Configuring the Scan Resume (Refer to FPRG 5.4 Scan Information Window.)

16.2.1 Time Operated Wait

Time Operated Wait is the time to resume scanning while the transceiver is receiving signals.

If Time Operated is configured for Scan Resume, the transceiver resumes scanning after receiving signals and the Time Operated Wait elapses.

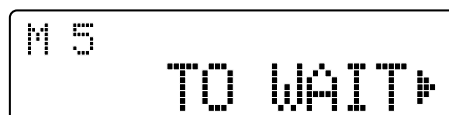
Time Operated Wait can be configured by using KPG-102D. Time Operated Wait also can be configured by selecting "FUNCTION" in Dealer Menu.

Note:

- ◆ The transceiver checks for the presence of signals with Squelch status.
- ◆ The transceiver stops operating for 3 seconds regardless of the presence of signals if Busy Stop is enabled while Time Operated is configured for Scan Resume. The transceiver checks for the presence of signals after 3 seconds. The transceiver resumes scanning regardless of Time Operated Wait if there is no signal to receive. If there is a signal to receive, the transceiver resumes scanning after the duration configured by deducting 3 seconds from the Time Operated Wait.

- **Transceiver Operation (Dealer Menu only)**

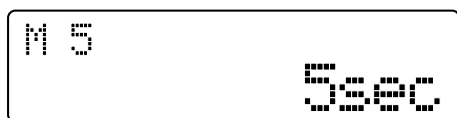
1. Select "TO WAIT" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Time Operated Wait configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

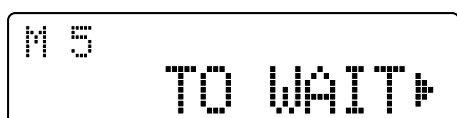
- Press the [\wedge] or [\vee] key to configure the Time Operated Wait.

Select a value from “3sec” to “10sec”.



- Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C>] key is pressed and Function Configuration Mode in Dealer Menu reappears.



- Press the [\triangle] key.

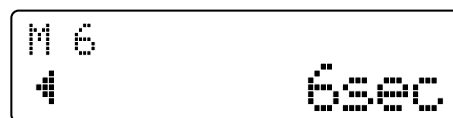
Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the Time Operated Wait (Refer to FPRG 5.4 Scan Information Window.)

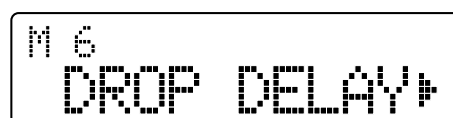
- Press the [\wedge] or [\vee] key to configure the Dropout Delay Time.

Select a value from “0sec” to “300sec”.



- Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C>] key is pressed and Function Configuration Mode in Dealer Menu reappears.



- Press the [\triangle] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the Dropout Delay Time (Refer to FPRG 5.4 Scan Information Window.)

16.2.2 Dropout Delay Time

Dropout Delay Time is delay time from the time when the received signal ends until the transceiver resumes scanning.

If Carrier Operated is configured for Scan Resume, the transceiver pauses scanning when receiving signals during the scan. The transceiver resumes scanning after the signal being received ends and the Dropout Delay Time elapses.

Dropout Delay Time can be configured by using KPG-102D. Dropout Delay Time also can be configured by selecting “FUNCTION” in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

- Select “DROP DELAY” on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Dropout Delay Time configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

16.3 Scan Resume after Transmit

Scan Resume after Transmit can be used to resume scanning after the transceiver completes transmitting.

If this function is enabled, the transceiver transmits on the Revert Channel during the scan. ([Refer to 16.4 Revert Channel on page 44.](#))

The transceiver automatically resumes scanning after the Dwell Time elapses if there is no signal to receive after the transceiver completes transmitting. ([Refer to 16.5 Dwell Time on page 45.](#))

If there is a signal to receive, the transceiver functions according to conditions to resume scanning. ([Refer to 16.2 Busy Stop and Conditions to Resume Scanning on page 42.](#))

If this function is disabled, the transceiver stops scanning during the scan.

Scan Resume after Transmit can be configured to be enabled or disabled by using KPG-102D. Scan Resume after Transmit also can be configured to be enabled or disabled by selecting “FUNCTION” in Dealer Menu.

■ **Transceiver Operation (Dealer Menu only)**

1. Select "SCAN-RSM TX" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Scan Resume after Transmit configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to select "ON" or "OFF".



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [◀C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.
Dealer Menu reappears.

■ **Configuration using KPG-102D**

- Configuring the Scan Resume after Transmit to be Enabled or Disabled (Refer to FPRG 5.4 Scan Information Window.)

16.4 Revert Channel

Revert Channel can be used to select a channel on which the transceiver transmits while scanning.

Following are Revert Channel operations.

Table 16-1 Revert Channel Operation

Configuration	During the Scan	While the Transceiver Pauses Scanning
Selected (Type 1) *1	Transmits on the last channel selected before the scan starts.	
Selected + Talkback (Type 2) *1	Transmits on the last channel selected before the scan starts.	Transmits on the channel on which the transceiver pauses scanning.
Preferred Channel (Type 3) *1	Transmits on the channel configured for Preferred Channel.	
Preferred Channel + Talkback (Type 4) *1	Transmits on the channel configured for Preferred Channel.	Transmits on the channel on which the transceiver pauses scanning.

*1 Options when configuring in Function Configuration Mode

Revert Channel can be configured by using KPG-102D. Revert Channel also can be configured by selecting "FUNCTION" in Dealer Menu.

■ **Transceiver Operation (Dealer Menu only)**

1. Select "REVERT CH" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Revert Channel configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to configure the Revert Channel.

Select a type from "TYPE 1" to "TYPE 4".



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

Note:

- ◆ The transceiver makes the following transmissions on the Revert Channel.
 - Transmissions with the PTT (microphone) switch
 - Transmissions with VOX
 - Transmissions with Data PTT
 - Transmissions with VGS-1
- ◆ If the transceiver makes a Selcall while the transceiver is scanning, the transceiver transmits on the Revert Channel.
- ◆ If the transceiver receives on the Revert Channel immediately after the transceiver returns to receive mode, the transceiver resumes scanning after the Dwell Time elapses.
- ◆ If the transceiver enters Busy state after the Dwell Time elapses, the transceiver functions according to the conditions to resume scanning. (Refer to 16.2 Busy Stop and Conditions to Resume Scanning on page 42.)
- ◆ If the transceiver is making a Selcall, an error message appears when the Revert Channel for which Selcall is disabled is selected and the transceiver cannot transmit. In this case, the transceiver enters Selcall Code Entry Mode without transmitting even if the PTT (microphone) switch is pressed.

■ Configuration using KPG-102D

- Configuring the Revert Channel (Refer to FPRG 5.4 Scan Information Window.)

16.5 Dwell Time

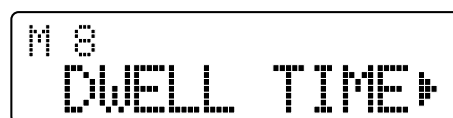
The transceiver pauses scanning when the transceiver transmits while the transceiver is scanning. Dwell Time is the time from when the transceiver completes scanning until the transceiver resumes scanning.

The transceiver resumes scanning when the Dwell Time elapses. If the transceiver stops scanning with Busy Stop, the transceiver functions according to the conditions to resume scanning. (Refer to 16.2 Busy Stop and Conditions to Resume Scanning on page 42.)

Dwell Time can be configured by using KPG-102D. Dwell Time also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

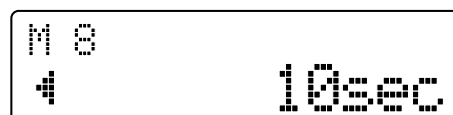
1. Select "DWELL TIME" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Dwell Time configuration display appears. Refer to 11.2.2 Function Configuration Mode on page 31 for instructions on how to select a desired mode.

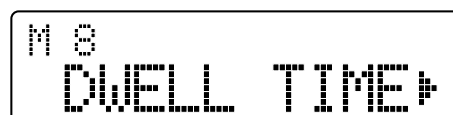
2. Press the [▲] or [▼] key to configure the Dwell Time.

Select the duration from "0sec" to "300sec".



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the Dwell Time (Refer to FPRG 5.4 Scan Information Window.)

16.6 Preferred Scan

Preferred Scan can be used to scan a channel having high priority as a Preferred Channel.

The transceiver preferentially scans Preferred Channels at the configured interval. (Refer to [16.6.1 Preferred Channel Scan Interval on page 46.](#))

Preferred Channels can be configured by using KPG-102D. Preferred Channels also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

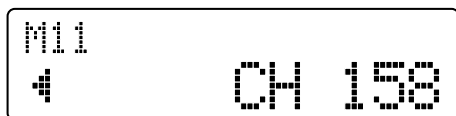
1. Select "PREF CH" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Preferred Channel configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to configure the Preferred Channel.

Select "None" or "1" to "300" to configure the Preferred Channel.



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [◀C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.
Dealer Menu reappears.

Note:

- ◆ A Preferred Channel cannot be configured for a channel with no data.
- ◆ The transceiver scans a channel configured as a Preferred Channel even if the channel is configured as Scan Delete.
- ◆ If None is configured for Preferred Channel, Preferred Scan is disabled.
- ◆ The "P" icon appears while the transceiver is scanning Preferred Channels.

■ Configuration using KPG-102D

- Configuring the Preferred Channels (Refer to FPRG 5.4 Scan Information Window.)

16.6.1 Preferred Channel Scan Interval

Preferred Channel Scan Interval specifies how many Scan Add channels the transceiver scans between scanning each Priority Channel.

If the transceiver starts scanning while a channel is configured for Preferred Channel, the transceiver starts scanning from the Preferred Channel. Then, the transceiver preferentially scans Preferred Channels at the interval configured for Preferred Channel Scan Interval. For example, if a value of 3 is configured for Preferred Channel Scan Interval, the transceiver scans the Preferred Channel after scanning every 3 Scan Add channels.

■ Operation Example of Preferred Scan

Transceiver Configuration

- Scan Add Channel = CH 1 to CH 3
- Preferred Channel = CH 3
- Preferred Channel Scan Interval = 1

The transceiver scans in the following way if the transceiver is configured as shown in the above.

PREF CH	CH1	PREF CH	CH2	PREF CH	CH1
---------	-----	---------	-----	---------	-----

Figure 16-1

Preferred Channel Scan Interval can be configured by using KPG-102D. Preferred Channel Scan Interval also can be configured by selecting "FUNCTION" in Dealer Menu.

■ Transceiver Operation (Dealer Menu only)

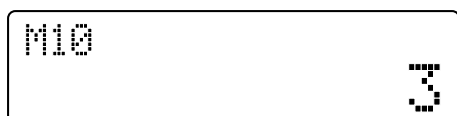
1. Select "P-SCN INTVL" on Function Configuration Mode in Dealer Menu and press the [D>] key.



The Preferred Channel Scan Interval configuration display appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to configure the Preferred Channel Scan Interval.

Select a value from "1" to "5".



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [<C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [△] key.

Dealer Menu reappears.

Note:

- ◆ If the transceiver resumes scanning after the transceiver transmits on the Revert Channel, the count for Preferred Channel Scan Interval is reset.
- ◆ The "P" icon appears while the transceiver is scanning Preferred Channels.

■ Configuration using KPG-102D

- Configuring the Preferred Channel Scan Interval (Refer to FPRG 5.4 Scan Information Window.)

17 ANTENNA TUNER

An antenna can be tuned by using the optional external antenna tuner (KAT-1) or other antenna tuners.

17.1 Using KAT-1

The KAT-1 cable must be connected to the external antenna tuner connector and antenna connector on the transceiver.

The connection to the KAT-1 is automatically confirmed when the transceiver is turned ON.

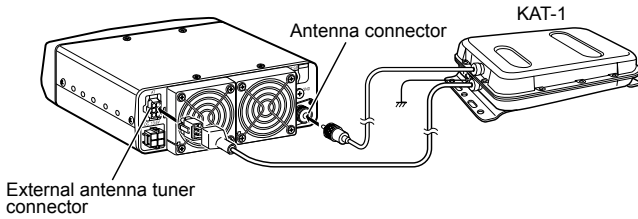


Figure 17-1


There are 2 methods to tune the antenna.

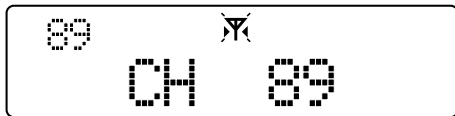
- **Antenna Tuning with the Antenna Tuner Key**
The antenna can be tuned by pressing the **Antenna Tuner** key.
- **Antenna Tuning with the PTT (Microphone) Switch**
The antenna can be tuned by pressing the **PTT** (microphone) switch.


17.1.1 Antenna Tuning with Antenna Tuner Key

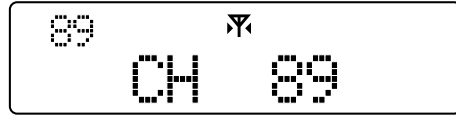
The antenna can be tuned by pressing the **Antenna Tuner** key.

■ Transceiver Operation


1. Press and hold the **Antenna Tuner** key for 1 second.
TX LED lights and the transceiver automatically starts tuning the antenna.
The “” icon blinks while the transceiver is tuning the antenna.

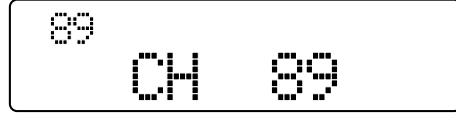


If the antenna is tuned within 20 seconds, the TX LED turns Off and the preconfigured value is updated. The “” stops blinking and the transceiver emits the Tuning End Tone to notify a user that the tuning has been completed.





2. Press the **Antenna Tuner** key while the antenna is tuned.

The antenna tuner enters the THRU state and the “” icon disappears.



Note:

- ◆ If the antenna cannot be tuned within 20 seconds, the antenna tuner stops tuning the antenna and enters the THRU state. In this case, the TX LED turns Off and the transceiver emits the Tuning Timeout Tone and returns to the previous mode to receive a call. The “” icon disappears when the antenna tuner enters the THRU state.
- ◆ If the **Antenna Tuner** key is pressed while the antenna tuner is tuning the antenna and enters the THRU state. In this case, the TX LED turns Off and the transceiver returns to the previous mode to receive a call. The “” icon disappears when the antenna tuner enters the THRU state.
- ◆ If the transceiver is turned OFF while the antenna tuner is tuning the antenna, the antenna tuner enters the THRU state.
- ◆ If the channel or frequency is changed, the antenna tuner automatically enters the THRU state.
- ◆ The transceiver transmits in CW Mode (10 W) while the antenna tuner is tuning and returns to the previous mode when the antenna tuner completes tuning.
- ◆ The antenna tuner enters IN-LINE state when the antenna tuner completes tuning.
- ◆ If the **Antenna Tuner** key is pressed and held for 1 second while the transceiver is transmitting, the antenna tuner starts tuning.
- ◆ The status of the antenna tuner cannot be changed from IN-LINE to THRU while the transceiver is transmitting.

■ Configuration using KPG-102D

- Assigning the Antenna Tuner to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

17.1.2 Antenna Tuning with PTT (Microphone) Switch

If the **PTT** (microphone) switch is pressed while the antenna tuner is in the THRU state, the antenna tuner automatically starts tuning before the transceiver transmits.

To use this function, Auto Antenna Tuning with PTT must be enabled by using KPG-102D.

Note:

- ◆ This function is enabled even if the **PTT** (microphone) switch is pressed while the transceiver is scanning. This function can be used even if the transceiver is transmitting in Emergency Mode.
- ◆ This function cannot be used for the following transmissions:
 - Transmissions with VOX
 - Message Transmissions with VGS-1
 - Transmissions with Selcall
 - GPS transmissions

To make the above transmissions, the channel must be configured in advance and the antenna must be tuned.

■ Transceiver Operation

1. Press the **PTT** (microphone) switch while the antenna tuner is in the THRU state.

The antenna tuner automatically tunes before transmitting.

If the **PTT** (microphone) switch is pressed while the antenna tuner is in the IN-LINE state, the transceiver immediately starts transmitting and the antenna tuner cannot tune.

Note: If the antenna cannot be tuned (including the time when the tuning is canceled), the transceiver starts transmitting and the antenna tuner does not tune the antenna even if the **PTT** (microphone) switch is pressed again. This state can be reset by changing the frequency or channel.

2. Keep pressing the **PTT** (microphone) switch.

When the antenna tuner completes tuning, the transceiver emits the Tuning End Tone and enters transmit mode.

If the **Antenna Tuner** key is pressed while the antenna tuner is tuning, the antenna tuner cancels tuning.

Note: If the **PTT** (microphone) switch is kept pressed, the antenna tuner stops tuning and the transceiver enters transmit mode even if the antenna cannot be tuned.

■ Configuration using KPG-102D

- Configuring the Auto Antenna Tuning with PTT to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

17.2 Using Other Antenna Tuners

Another antenna tuner cable must be connected to the external antenna tuner connector and antenna connector respectively on the transceiver. The output logic level of the TS signal from the external antenna tuner connector changes linked with the tuning operation.

The following 2 methods are available to tune the antenna by using other antenna tuners:


- Antenna Tuning by using the **Antenna Tuner** key
Antenna tuning is done by pressing the **Antenna Tuner** key. To use this function, Auto Antenna Tuning must be enabled by using KPG-102D to configure the Manual Antenna Tuning Duration.
- Automatic tuning when the ALE is used
Antenna tuning is automatically done while the transceiver is operated with an ALE unit. Refer to [28.2.13 Auto Antenna Tuning on page 104](#) for details.

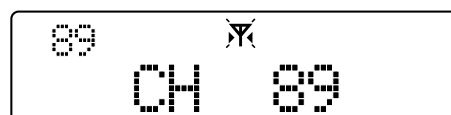
■ Transceiver Operation


● Starting the Tuning

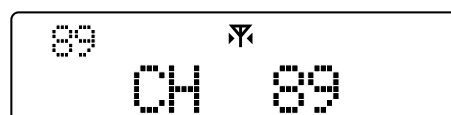
1. Press and hold the **Antenna Tuner** key for 1 second.


The transceiver automatically starts transmitting in CW Mode, and then the transceiver starts tuning the antenna.


The “” icon blinks while the antenna is tuned. In this case, the TS signal indicator for the external antenna tuner connector will change from “H” to “L”.

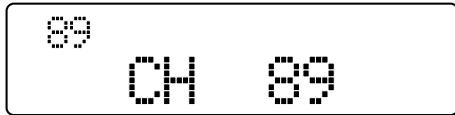


If the **Antenna Tuner** key is pressed while tuning the antenna or the amount of time configured for Manual Antenna Tuning Duration elapses, the “” icon stops blinking and the antenna tuner automatically completes tuning. In this case, the TS signal indicator for the external antenna tuner connector will remain on “L”.




2. Press the **Antenna Tuner** key while the “” icon is lit.

The antenna tuner enters THRU state and the “” icon disappears. In this case, the TS signal indicator for the external antenna tuner connector will change from “L” to “H”.



Note:

- ◆ If the amount of time configured for Manual Antenna Tuning Duration elapses after the antenna tuner starts tuning, the antenna tuner stops tuning even if the antenna tuning could not be succeeded and then the “” icon appears.
- ◆ If the channel or VFO frequency is changed, the antenna tuner automatically becomes THRU state.
- ◆ If the **Antenna Tuner** key is pressed and held for 1 second while the transceiver is transmitting, the antenna tuner starts to tune.
- ◆ The antenna tuner state cannot be changed from IN-LINE to THRU while the transceiver is transmitting.
- ◆ When the **PTT** (microphone) switch is pressed, the antenna tuner can automatically tune the antenna before the transceiver starts transmitting.
- ◆ If Antenna Tuner Control is disabled, a control by an antenna tuner does not start. However, the transceiver is automatically controlled by the KAT-1 regardless of the Antenna Tuner Control configuration if the transceiver detects that KAT-1 is connected to the transceiver.
- ◆ If an external antenna tuner that requires DC power control is used, the auxiliary circuit must be separately created and installed in the transceiver. Refer to 3.4 Changing the Configuration for Connecting other External Antenna Tuner to the Transceiver for instructions on how to create and install the auxiliary circuit.

■ Configuration using KPG-102D

- Assigning the Antenna Tuner to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)
- Configuring the Antenna Tuner Control to be Enabled or Disabled (Refer to FPRG 5.2.3 Receive/Transmit Tab.)
- Configuring the Manual Antenna Tuning Duration (Refer to FPRG 5.2.3 Receive/Transmit Tab.)

18 SCRAMBLER

Scrambler allows the transceiver to scramble voice communications to ensure privacy.

The following actions are required to use Scrambler.

- **Installing the Scrambler Board**

This function is available only if an optional Scrambler board is installed in the transceiver.

The transceiver supports Scrambler board SC20-455 (TRANSCRYPT). SC20-455 can be installed in the transceiver by soldering the board to the solder pads of the accessory board in the transceiver. If a special connector is connected to the SC20-455, the board can be connected to the 14-pin connector in the transceiver without soldering.

- **Enabling the Scrambler**

Scrambler can be configured for each channel. This function is available only if Scrambler is enabled for the channel. If this function is used in VFO or ALE Mode, Scrambler must be enabled in VFO or ALE Mode.

- **Configuring the Scrambler Code**

The Scrambler Code used for Scrambler can be configured. If this function is used in VFO or ALE Mode, the Scrambler Code used in VFO or ALE Mode must be configured.

Note:

- ◆ Scrambler can be used only if LSB, USB or AM is configured for the modulation mode.
- ◆ When Scrambler is used, high audio frequencies are attenuated due to the specifications of the Scrambler board. If a user attempts to quickly switch between transmit and receive, the receiving party may not be able to immediately disable the Scrambler.

18.1 Configuring the Scrambler

Scrambler can be configured for each channel and VFO Mode.

18.1.1 Configuring the Scrambler for each Channel

Scrambler can be configured to be enabled or disabled for each channel by using KPG-102D.

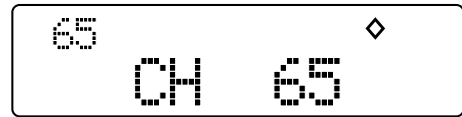
Scrambler also can be configured to be enabled or disabled by using the **Scrambler** key.

■ Transceiver Operation

- Press the **Scrambler** key.

When the **Scrambler** key is pressed, Scrambler can be configured to be enabled or disabled.

The “◇” icon appears if Scrambler is enabled.



If Scrambler Status Memory is disabled, Scrambler Status Memory can be temporarily changed by using the **Scrambler** key. However, the channel configuration cannot be edited. (Refer to 18.3 Scrambler Status Memory on page 52.)

Note:

- ◆ Communications are established only if Scrambler is enabled in the receiving party's transceiver and the Scrambler Code matches.
- ◆ Scrambler can be used only if LSB, USB or AM is configured for the Modulation Mode. The “◇” icon does not appear even if Scrambler is enabled in other modes.
- ◆ The “ALE” icon appears while the transceiver is in ALE Mode.

■ Configuration using KPG-102D

- Configuring the Scrambler to be Enabled or Disabled for each Channel (Refer to FPRG 5.1.10 Channel Edit Window.)

18.1.2 Configuring the Scrambler in VFO Mode

Scrambler in VFO Mode can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Scrambler in VFO Mode to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.4 VFO Tab.)

18.1.3 Configuring the Scrambler in ALE Mode

Scrambler used in ALE Mode can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Scrambler used in ALE Mode to be Enabled or Disabled (Refer to FPRG 5.5.6 Misc. Features Window.)

18.2 Configuring the Scrambler Code

Scrambler Code can be configured for each channel and VFO Mode.

18.2.1 Configuring the Scrambler Code for each Channel

Scrambler Code used in Scrambler can be configured for each channel by using KPG-102D.

The Scrambler Code configuration can be edited by using the **Scrambler** key.

■ Transceiver Operation

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

The transceiver enters Scrambler Code Configuration Mode.

2. Press the [**<C**] or [**D>**] key to edit the Scrambler Code.

Select a value from "1" to "16".

- Press the [**<C**] key to decrease the Scrambler Code value.
- Press the [**D>**] key to increase the Scrambler Code value.



If Scrambler Status Memory is disabled, Scrambler Code can be temporarily changed by using the **Scrambler** key. However, the channel configuration cannot be edited. (Refer to [18.3 Scrambler Status Memory on page 52.](#))

3. Press the [**△**] key.

The configuration is edited and the previous display appears.

■ Configuration using KPG-102D

- Configuring the Scrambler Code for each Channel (Refer to FPRG 5.1.10 Channel Edit Window.)

18.2.2 Configuring the Scrambler Code in VFO Mode

Scrambler Code used in VFO Mode can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Scrambler Code in VFO Mode (Refer to FPRG 5.2 Optional Features Window > 5.2.4 VFO Tab.)

18.2.3 Configuring the Scrambler Code used in ALE Mode

Scrambler Code used in ALE Mode can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Scrambler Code used in ALE Mode (Refer to FPRG 5.5.6 Misc. Features Window.)

18.3 Scrambler Status Memory

Scrambler Status Memory can be used to store the Scrambler configuration edited by the **Scrambler** key and the Scrambler Code configuration.

The transceiver performs in the following way depending on the Scrambler Status Memory configuration.

● If Scrambler Status Memory is Disabled:

The Scrambler configuration can be temporarily edited by using the **Scrambler** key. However, the channel configuration cannot be edited. The Scrambler configuration is cleared if a channel or operation is changed.

● If Scrambler Status Memory is Enabled:

The channel configuration is replaced by configuration data edited by using the **Scrambler** key and stored in the transceiver.

Scrambler Status Memory can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Scrambler Status Memory to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

19 IF FILTER

The transceiver supports the built-in IF filter and an optional IF filter. The IF filter type (built-in IF filter or optional IF filter) can be configured for the following modulation modes: SSB (LSB, USB), FSK and DATA. Using the appropriate filter for the mode selected ensures transceiver bandwidth will be correct and the reduction of interfering signals and noise.

The transceiver supports the following 2 optional IF filters.

- KIF-2 (2.7 kHz SSB filter)
- YF-107C (500 Hz CW filter)

The IF filter type (built-in IF filter or optional IF filter) can be configured for each modulation mode by using KPG-102D.

■ Configuration using KPG-102D

- Selecting the Built-in IF Filter or Optional IF Filter for each Modulation Mode (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

19.1 Selecting an IF Filter

The configuration of built-in IF filter or optional IF filter configured for each modulation mode can be edited.

■ Transceiver Operation (Dealer Menu only)

1. Select the mode that requires the IF filter configuration to be edited on Function Configuration Mode in Dealer Menu and press the [D>] key.

Select "IF-FIL SSB", "IF-FIL DATA" or "IF-FIL FSK".

The IF Filter configuration display for the selected mode appears. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

2. Press the [▲] or [▼] key to select "BUILT-IN" or "OPTION".

If "BUILT-IN" is selected:



If "OPTION" is selected:



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. The configured value is cleared when the [C] key is pressed and Function Configuration Mode in Dealer Menu reappears.



4. Press the [▲] key.

Dealer Menu reappears.

Note:

- ◆ If the YF-107C (500 Hz CW filter) is installed in the transceiver, YF-107C is automatically selected in CW Mode. If the KIF-2 (2.7 kHz SSB filter) is installed in the transceiver, the built-in filter is automatically selected.
- ◆ If no optional IF filter is installed in the transceiver, the built-in filter is selected in all modes.
- ◆ If the YF-107 (500 kHz CW filter) is installed in the transceiver, the built-in filter is automatically selected while the transceiver is transmitting even if optional IF filter is selected in SSB or DATA Mode.
- ◆ If the KIF-2 (2.7 kHz SSB filter) is installed in the transceiver, the built-in filter is automatically selected even if the optional IF filter is selected in FSK Mode.
- ◆ If the YF-107C (500 Hz CW filter) is installed in the transceiver and the ALE function is enabled, the built-in (standard) filter is automatically selected even if the optional IF filter is selected in SSB mode.

19.2 Configuring the Center Frequency for Optional IF Filter

The center frequency of the passband for the optional IF filter (YF-107C) can be configured.

If the optional IF filter is used while the transceiver is being used for data communications, the IF filter center frequency can be adjusted to the center of the audio bandwidth used for data communications.

The center frequency for the audio frequency passband of the received signal can be configured for the optional IF filter center frequency.

19 IF FILTER

Configuration Example:

2210 Hz, which is the center frequency between 2125 Hz and 2295 Hz, is configured for the optional IF filter center frequency to receive FSK signals with the following configuration.

- Mark signal: 2125 Hz
- Space signal: 2295 Hz
- Shift width: 170 Hz

The center frequency for the optional IF filter can be configured by using KPG-102D.

Note:

- ◆ The value configured for the center frequency for the optional CW filter is used if YF-107C (500 Hz CW filter) is configured to be enabled in LSB, USB or DATA Mode.
- ◆ The value configured for the center frequency for the optional CW filter is disabled if KIF-2 (2.7 kHz SSB filter) is configured to be enabled.

■ Configuration using KPG-102D

- Configuring the Center Frequency for Optional IF Filter (Refer to FPRG 5.2 Optional Features Window > 5.2.3 Receive/Transmit Tab.)

Selcall can be used to make an individual call, group call or status call when using FSK data communications.

The following actions are required to use Selcall.

- **Configuring Own ID**
The ID assigned to your transceiver and used for Selcall can be configured. (Refer to 20.1.1 ID (Own) on this page.)
- **Enabling Selcall**
Selcall can be configured to be enabled. (Refer to 20.2.1 Enabling the Selcall on page 57.)
Selcall can be configured to be enabled for each channel. (Refer to 11.2.1 Channel Configuration Mode on page 29.)
- **Assigning the Selcall Key**
Selcall can be assigned to a PF key. (Refer to 4 KEY ASSIGNMENT on page 10.)

Note: The compatibility of TK-80 and TK-90 for Selcall is as follows.

Table 20-1 Selcall Compatibility Table

Function	TK-80	TK-90
ID (Own)	○	○
ID List		○
Status List		○
Memory Code	○	○
Data Transmit Delay Time	○	○
Number of Retries		○
Selcall Tone	Fixed	○
Status Call Tone		○
Auto Reset	○	○
Making and Receiving a Selcall	○	○
Sending and Receiving a Memory Code	○	○
Making and Receiving a Status Call		○
Selcall Reset and UNMUTE	○	○
Direct Selcall		○
Direct Status Call		○
Voicemail		○
AUX Input Status Message		○
AUX Output Status Message		○
Stun		○
Sending and Receiving a PC Message		○
GPS Functions		○
Emergency Status Call		○

20.1 Basic Configuration of Selcall

This section describes the basic configuration to use Selcall.

20.1.1 ID (Own)

ID (Own) is the 3-digit ID assigned to your transceiver and used for Selcall. Selcall cannot be used if no ID (Own) is configured.

ID (Own) can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the ID (Own) (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.1.2 ID List

The receiving party's ID list used for making a Selcall can be configured. A user can select the receive party's ID from the ID list when making a Selcall. A maximum of 100 IDs can be registered in the ID List.

The following parameters are included in an ID List.

- **ID**
The list of target party's IDs used for making a Selcall can be configured in the range from 000 to 999. If "*" is entered as a wild-card character, an ID used for making a group call can be configured.
- **ID Name**
A maximum of 12 alphanumeric characters and symbols can be configured for the configured ID. A user can send a Selcall signal by selecting an ID Name if the ID Name is configured. When the transceiver receives a Selcall signal, the caller's ID Name appears if the caller's ID Name is configured in the ID List.

ID List can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the ID List (Refer to FPRG 5.6 Selcall Function Window > 5.6.2 ID List Tab.)

20.1.3 Status List

This function can be used to configure statuses that can be sent with Selcall. A user can select the status to send from the Status List. A maximum of 50 statuses can be registered in the Status List.

The following parameters are included in a Status List.

- **Status**

The status number can be configured in the range from 10 to 79.

- **Status Name**

A name can be assigned to the configured status number. It may be hard to understand the meaning of a status only from the status number. Therefore, a status name indicating the meaning of the status can be assigned to a status. A maximum of 12 alphanumeric characters and symbols can be configured for a status name.

- **TX Inhibit**

Transmissions to a target party can be configured to be enabled or disabled. If “Yes” is configured for TX Inhibit, the transceiver only receives a status and does not send any statuses. In this case, the status to send cannot be selected from the Status List.

Status List can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Status List (Refer to FPRG 5.6 Selcall Function Window > 5.6.3 Status List Tab.)

20.1.4 Memory Code

Memory Code can be used to send a character message with a maximum of 7 alphanumeric characters and symbols. A character message can be sent by selecting the caller's ID from the ID List. A maximum of 4 Memory Codes can be configured in the transceiver.

The following parameters are included in a Memory Code.

- **Target**

The target party's ID used for sending a character message can be selected from the ID List.

- **Characters**

A maximum of 7 alphanumeric characters and symbols can be configured for a Character Message that is sent.

Memory Code can be configured by using KPG-102D.

Note: Refer to [Table 2-3 Available Alphanumeric Characters and Symbols on page 4](#) for characters and symbols to send.

■ Configuration using KPG-102D

- Configuring the Memory Code (Refer to FPRG 5.6 Selcall Function Window > 5.6.5 Memory Code Tab.)

20.1.5 Data Transmit Delay Time

Data Transmit Delay Time is the duration for sending the first space signal while the transceiver is sending data.

If the transceiver scans channels and sends data to a party waiting to receive a call, the transceiver sends the first space signal for a certain period before sending data in order to make the target party pause scanning. A longer duration needs to be configured if the number of channels is large.

Data Transmit Delay Time can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Data Transmit Delay Time (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.1.6 Number of Retries

If the transceiver cannot receive an ACK within a certain time after sending a status, the transceiver sends the status again. Number of Retries is the number of times for the transceiver to re-send the status.

Number of Retries can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Number of Retries (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.1.7 Selcall Tone

The pattern of Alert Tones emitted when the transceiver receives a Selcall signal can be selected. Selcall Tone can be selected from 4 patterns. ([Refer to 3.2 Special Alert Tone on page 8.](#))

Selcall Tone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Selcall Tone (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.1.8 Status Call Tone

The pattern of Alert Tones emitted when the transceiver receives a Status Call signal can be selected. Status Call Tone can be selected from 4 patterns. (Refer to 3.2 Special Alert Tone on page 8.)

Status Call Tone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Status Call Tone (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.1.9 Auto Reset

Auto Reset Timer can be used to reset the display to the previous state after a certain period elapses.

The following parameters are included for Auto Reset.

• Auto Reset Timer

The duration to unmute after making or receiving a Selcall and display the caller ID when receiving a Status Call signal can be configured.

• LCD

This function can be used to configure whether the transceiver displays the previous channel name/number or Caller ID after the Auto Reset Timer expires.

If this function is disabled, the Caller ID display is retained even if the Auto Reset Timer expires. The previous display appears when the [▲] key is pressed. The transceiver responds to the caller when the [■] key or PTT (microphone) switch is pressed while the Caller ID is displayed.

Auto Reset can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Auto Reset (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.2 Basic Configuration of Selcall

This section describes basic operations when making or receiving a Selcall.

20.2.1 Enabling the Selcall

Selcall can be configured to be enabled or disabled by using KPG-102D. Selcall can be configured to be enabled or disabled by selecting "CALL TYP" in User Menu.

Refer to 11.1 User Menu on page 28 for User Menu Mode.

Note: Selcall must be configured to be enabled for each channel. The transceiver does not wait to receive a Selcall on a channel where Selcall is disabled. In this case, various calls cannot be made.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.

- Press the **Menu** key.

The transceiver enters User Menu. Press the [▲] or [▼] key to select "CALL TYP".

- Press the **Call Type** key.

"CALL TYP" appears on the main display.

2. Press the [C] or [D] key to select "SEL".

Selcall is enabled and the "SEL" icon appears. If "OFF" is selected, Selcall is disabled and the "SEL" icon does not appear.



3. Press the [▲] key.

The configuration is edited and the previous display appears.

Note:

- ◆ "SEL" cannot be configured if no ID (Own) is configured.
- ◆ The following transmissions are not available when the transceiver is waiting for a call with Selcall:
 - Transmissions with PTT (microphone) switch
 - Transmissions with VOX
 - Transmissions with the keying in CW Mode
 - Transmissions with Data PTT

The transceiver can transmit if the transceiver is unmuted.

■ Configuration using KPG-102D

- Configuring the Selcall to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

20.2.2 Making a Selcall

The following 2 methods are available to make a Selcall:

- **Selecting an ID from the ID List**

A Selcall can be made by directly selecting an ID from the ID List by using keys on the transceiver. (Refer to 20.1.2 ID List on page 55.)

- **Directly Entering an ID and Making a Selcall**

A Selcall can be made by directly entering an ID by using the microphone keypad.

■ Transceiver Operation

- **Selecting an ID from the ID List to Make a Selcall**

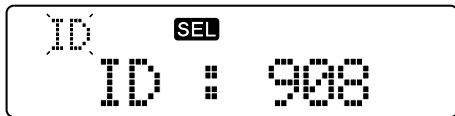
1. Press the **Selcall** key.

The target party selection display appears. The ID Name of the last selected party appears on the main display. ID appears on the main display if no ID Name is configured.

ID Name Display



ID Display



2. Press the [▲] or [▼] key to select the target party.

Select an ID from the ID List configured by using KPG-102D.

3. Press the [■] key or **PTT** (microphone) switch.

The transceiver starts transmitting. The “SEL” icon blinks and the LED lights red.

While making a Selcall:



The transceiver emits the Proceed Tone and unmutes when the transceiver completes making a Selcall. In this case, the LED flashes orange and the “SEL” icon stops blinking.

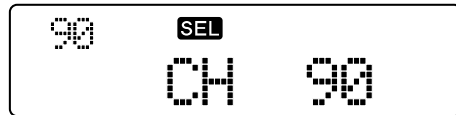
When the **PTT** (microphone) switch is pressed, the transceiver transmits audio spoken into the microphone until the transceiver enters standby mode.

If the transceiver is in the busy state while the LED flashes orange, the LED lights green and orange alternately. The LED lights red when the transceiver transmits while the LED flashes orange.

When the transceiver finishes the Selcall:



The transceiver starts waiting to receive a Selcall after the Auto Reset Timer expires or when the [#] key on the microphone keypad or **Monitor** key on the panel is pressed while the transceiver is not in the busy state.



- **Directly Entering an ID to Make a Selcall**

1. Enter the ID (3 digits) by using the microphone keypad while pressing the **PTT** (microphone) switch.

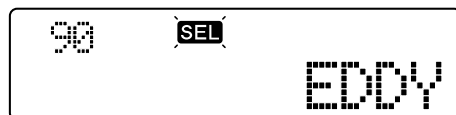


Note: The entered code is cleared if the **PTT** (microphone) switch is released while entering the code.

2. Press the [#] key.

The transceiver starts transmitting. The “SEL” icon blinks and the LED lights red.

ID name appears when the entered ID is registered in the ID List. ID appears on the main display if no ID Name is configured.



The transceiver emits the Proceed Tone and unmutes when the transceiver completes sending the Selcall signal. Refer to Selecting an ID from the ID List to Make a Selcall for the following operations.

Note:

- ◆ If the target ID has a digit configured as “*”, the transceiver makes a group call. Since “*” is used as a wild-card character, the receiving party’s transceiver determines that the “*” digit matches with their own ID digit.
- ◆ If the [△] key is pressed before making a call, the configuration is canceled and the transceiver starts waiting to receive a Selcall.
- ◆ The transceiver does not make a Selcall even if the PTT (microphone) switch is pressed while the transceiver is waiting to receive a Selcall.
- ◆ The channel cannot be changed while the transceiver unmutes.

20.2.3 Receiving a Selcall

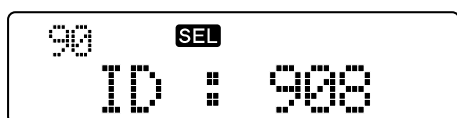
The caller’s ID Name or ID appears when the transceiver receives a Selcall. The transceiver unmutes for the Auto Reset Time and the LED lights orange.

ID Name appears if the caller’s ID is registered in the ID List. ID appears on the main display if no ID Name is configured. ID appears if the caller’s ID is not registered in the ID List.

ID Name Display



ID Display



If the transceiver receives a character message, the received character message appears on the main display and the transceiver unmutes for the Auto Reset Time and the LED flashes orange.



If the transceiver is in the busy state while the LED flashes orange, the LED lights green and orange alternately. The LED lights red when the transceiver transmits while the LED flashes orange.

Auto Reset Timer is reset if the transceiver transmits while the transceiver unmutes. The transceiver starts waiting to receive a Selcall after the Auto Reset Timer expires or when the [#] key on the microphone keypad or **Monitor** key on the panel is pressed after the transceiver completes transmitting.

Note: The channel cannot be changed while the transceiver unmutes.

20.2.4 Sending a Memory Code

The transceiver sends the configured character message when a code is selected from Memory Code A to Memory Code D configured by using KPG-102D. (Refer to 20.1.4 Memory Code on page 56.)

The following 2 methods are available to send a Memory Code:

- **Sending a Memory Code by using Keys on the Transceiver**

A user can send a Memory Code by using keys on the transceiver.

- **Sending a Memory Code by using Keys on the Microphone Keypad**

A user can send a Memory Code by using keys on the microphone keypad.

■ Transceiver Operation

- **Sending a Memory Code by Using Keys on the Transceiver**

1. Press the **Selcall** key.

The target party selection display appears. The ID Name of the last selected party appears on the main display. ID appears on the main display if no ID Name is configured.



2. Press the [▲] or [▼] key to select a Memory Code. Select a Memory Code from “CODE A” to “CODE D”.



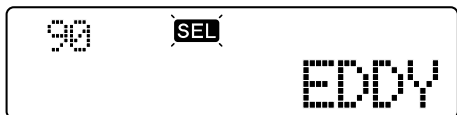
When the [D>] key is pressed while the Memory Code is selected, the configured character message appears. The previous display appears when the [<C] key is pressed.



3. Press the [■] key or PTT (microphone) switch.

The transceiver sends a character message.

The ID Name (ID if no ID Name is configured) configured for the Target receiving a Memory Code appears while the transceiver is transmitting and the “SEL” icon blinks.



The transceiver emits the Proceed Tone and unmutes when the transceiver completes sending the Selcall signal. Refer to 20.2.2 Making a Selcall on page 58 for the following operations.

● **Sending a Memory Code by using Keys on the Microphone Keypad**

1. Press the [#] key while pressing the PTT (microphone) switch, then press one of the [A] to [D] keys.

The configuration of the selected Memory Code appears. The [A] to [D] keys correspond to CODE A to CODE D.

Example:

When the transceiver sends CODE A (Target ID: 321, Characters: KENWOOD):

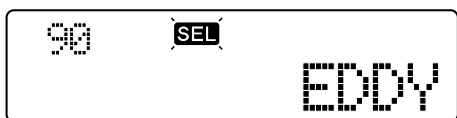
Pressing the [#] and [A] keys



2. Press the [#] key.

The transceiver sends a character message.

The ID Name (ID if no ID Name is configured) configured for the Target receiving a Memory Code appears while the transceiver is transmitting and the "SEL" icon blinks.



The transceiver emits the Proceed Tone and unmutes when the transceiver completes sending the Selcall signal. Refer to 20.2.2 Making a Selcall on page 58 for the following operations.

Note:

- ◆ The following alphanumeric characters and symbols are displayed on the TK-80 if the TK-80 receives a character message. If the TK-80 receives alphanumeric characters and symbols that are not displayed in the following table, no character will appear on the main display.

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

- ◆ If the [△] key is pressed before making a call, the configuration is canceled and the transceiver starts waiting to receive a Selcall.
- ◆ The channel cannot be changed while the transceiver unmutes.

20.2.5 Receiving a Memory Code

Refer to 20.2.3 Receiving a Selcall on page 59 for instructions on how to receive a Memory Code.

20.2.6 Sending a Status

The following 2 methods are available to send a status:

- **Selecting a Status from the Status List:**
The transceiver sends a status when the status is selected from the Status List. (Refer to 20.1.3 Status List on page 56.)
- **Directly Entering a Status to Send**
The transceiver sends a status when the status is directly selected by using the microphone keypad.

Normally, the transceiver can send 70 statuses (10 to 79). If Special Status is enabled, the transceiver can send the following statuses.

Table 20-2 Special Status ID List

Status ID No.	Status Name	Reserved *1	Transceiver Operation by receiving a Status ID
80	Undefined	-	-
81	Sending GPS data	Yes	The transceiver sends GPS data sent with an over-the-air command to a PC.
82	GPS Data Polling	-	The transceiver sends GPS data with an over-the-air command to a caller by using Status 81.
83	GPS Data Automatic Transmission disabled	-	GPS data automatic transmission is disabled.
84	GPS Data Automatic Transmission enabled	-	GPS data automatic transmission is enabled.
85	Voicemail	Yes	The transceiver starts recording the received audio and sends an ACK.
86	PC Message Transmission	Yes	The transceiver sends the PC Message sent with an over-the-air command to a PC.
87 to 89	Undefined	-	-
90 to 95	STUN Transmission Restricted	-	The transceiver sends an ACK. Transmission is restricted. *2
	STUN Transmission and Reception Restricted	-	The transceiver sends an ACK. Transmission and reception are restricted. *2
	REVIVE	-	The transceiver sends an ACK. Stun is disabled. *2

Status ID No.	Status Name	Reserved ^{*1}	Transceiver Operation by receiving a Status ID
96 to 97	Undefined	-	-
98	EMERGENCY STATUS	Yes	The transceiver sends an ACK.
99	EMERGENCY STATUS ADD GPS DATA	Yes	The transceiver sends GPS data with an over-the-air command after sending an ACK.

^{*1} This status cannot be selected since the communication protocol and operations to send this status is different from a normal status transmission.

^{*2} Status ID can be configured by selecting "None" or a value from 90 to 95. If None is configured, this function is disabled.

The transceiver operates in the following way depending on the Special Status configuration.

- **If Special Status is Enabled:**

A user can select Stun Status when selecting a status. (Refer to 20.3.6 Stun on page 66.)

All Special Statuses can be selected when directly entering a status by using the microphone keypad.

- **If Special Status is Disabled:**

A Special Status cannot be selected when selecting a status.

Special Status can be configured to be enabled or disabled by using KPG-102D.

■ Transceiver Operation

- **If a Status to Send is Selected from the Status List:**

1. Press the **Selcall** key.

The target party selection display appears. The ID Name of the last selected party appears on the main display. ID appears on the main display if no ID Name is configured.



2. Press the [▲] or [▼] key to select the target party. Select an ID from the ID List configured by using KPG-102D.



3. Press the [D>] key.

The transceiver enters Status Selection Mode.



Note: "-VOICE REC-" appears when selecting a status that can be used for Voicemail. This display appears even if Special Status is disabled. (Refer to 20.3.3 Voicemail on page 63.)

4. Press the [▲] or [▼] key to select the status to send.



5. Press the [■] key or PTT (microphone) switch.

The transceiver starts transmitting. The "SEL" icon blinks and the LED lights red.

The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



The transceiver emits an ACK Receive Tone and "COMPLETE" appears on the main display for 5 seconds if the transceiver receives an ACK within a certain period. Then, the transceiver starts waiting to receive a Selcall.



The transceiver emits the Call Error Tone and "NO REPLY" appears on the main display for 5 seconds if the transceiver cannot receive an ACK within a certain period. Then, the transceiver starts waiting to receive a Selcall.



- **Sending a Status by Directly Entering a Status**

1. Enter the ID (3 digits), the [*] key and Status (2 digits) by using the microphone keypad while pressing the PTT (microphone) switch.



2. Press the [#] key.

The transceiver starts transmitting. The “SEL” icon blinks and the LED lights red.
The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



Refer to operations described in “If a Status to Send is Selected from the Status List” for the following operations.

Note:

- ◆ If the transceiver sends a status to an ID when making a Group Call, “COMPLETE” immediately appears on the main display since the receiving party does not send an ACK.
- ◆ If the [△] key is pressed before making a call, the configuration is canceled and the transceiver starts waiting to receive a Selcall.
- ◆ If a user attempts to send using the microphone keypad a status configured with a reserved ID, the transceiver cannot send the status.
- ◆ The transceiver stops scanning while the transceiver is waiting to receive an ACK.

■ **Configuration using KPG-102D**

- Configuring the Special Status to be Enabled or Disabled (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

20.2.7 Receiving a Status

The transceiver automatically sends an ACK when the transceiver receives a status. The transceiver emits the Status Call Tone and the “SEL” icon blinks. An ID Name appears for the Auto Reset Time if the caller’s ID is registered in the ID List. ID appears on the main display if no ID Name is configured. ID appears if the caller’s ID is not registered in the ID List.



The latest 5 received messages are stored in the Stack List. If the transceiver continuously receives the same message from the same caller, the message is not stored in the Stack List. An unread message cannot be stored.

When the [D>] key is pressed while the caller’s ID Name or ID appears on the main display, the configured message appears on the main display. In this case, the “SEL” icon stops blinking and the transceiver stops counting down the Auto Reset Timer.



When the [△] key is pressed while the caller’s ID Name, ID or the received message appears on the main display, the transceiver starts waiting to receive a Selcall.



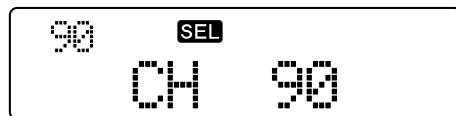
20.2.8 Selcall Reset and Unmute

Selcall Reset can be used to make the transceiver exit Selcall unmute state and enter receive mode. Unmute can be used to make the transceiver stop waiting to receive a Selcall and enter Unmute state.

■ **Transceiver Operation**

1. Press the [#] key on the microphone keypad or **Monitor** key on the panel while the transceiver is in unmute state.

The transceiver starts waiting to receive a Selcall.



2. Press the [#] key on the microphone keypad or **Monitor** key on the panel while the transceiver is waiting to receive a Selcall.

“UNMUTE” appears on the main display and the transceiver unmutes.



Note: Auto Reset Timer is reset if the transceiver transmits while the transceiver unmutes. The transceiver starts waiting to receive a Selcall after the Auto Reset Timer expires or when the [#] key on the microphone keypad or **Monitor** key on the panel is pressed after the transceiver completes transmitting.

20.3 Advanced Operation of Selcall

This section describes advanced operations when making or receiving a Selcall.

20.3.1 Direct Selcall

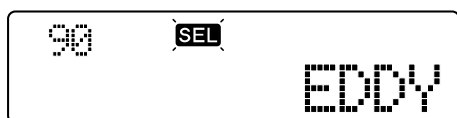
Direct Selcall can be used to send a Selcall to a programmed ID with a single press of a key. A maximum of 4 target IDs can be selected from the ID List and stored.

Direct Selcall can be assigned to a **PF** key on the transceiver and the target party's ID can be configured by using KPG-102D.

■ Transceiver Operation

1. Press one of the **Direct Channel 1 to Direct Channel 4** keys.

The transceiver starts making a Selcall to the configured target ID. The “**SEL**” icon blinks and the LED lights red.



The transceiver emits the Proceed Tone and unmutes when the transceiver completes making the Selcall. Refer to [20.2.2 Making a Selcall on page 58](#) for the following operations.

■ Configuration using KPG-102D

- Configuring the Target ID for Direct Selcall (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)
- Assigning the Direct Selcall to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

20.3.2 Direct Status Call

Direct Status Call can be used to jump to a programmed ID with a single press of a key. The target party's ID can be selected from the ID List and registered. A maximum of 4 statuses to send can be selected from the Status List and stored.

Direct Status Call can be assigned to a **PF** key on the transceiver and the target party's ID and the status to send can be configured by using KPG-102D.

■ Transceiver Operation

1. Press one of the **Direct Channel 1 to Direct Channel 4** keys.

The transceiver starts transmitting. The “**SEL**” icon blinks and the LED lights red.

The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



Refer to [20.2.6 Sending a Status on page 60](#) for the following operations.

Note: Direct Status Call is available only if the transceiver is waiting to receive a Selcall.

■ Configuration using KPG-102D

- Configuring the Target Party's ID (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)
- Configuring the Direct Status Call Status (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)
- Assigning the Direct Status Call to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

20.3.3 Voicemail

Voicemail can be used to leave a message for a maximum of 15 seconds on the receiving party's transceiver by using Selcall Status Call.

If the receiving party does not respond to the individual call made by using Selcall, a user can leave a message on the target party's transceiver by using Voicemail.

This function is available only if a VGS-1 is installed in the receiving party's transceiver and VGS-1 is configured to be enabled by using KPG-102D.

■ Transceiver Operation

● Transceiver Operation at Transmitting Party

1. Press the **Selcall** key.

The target party selection display appears. The ID name of the last selected party appears on the main display. ID appears on the main display if no ID Name is configured.



- Press the [▲] or [▼] key to select the target party.
Select an ID from the ID List configured by using KPG-102D.



- Press the [D>] key.
The transceiver enters Status Selection Mode.



- Press the [▲] or [▼] key to select "-VOICE REC-".



- Press the [■] key or PTT (microphone) switch.
The transceiver starts transmitting. The "SEL" icon blinks and the LED lights red.
The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



The transceiver emits the Call Error Tone and the transceiver starts waiting to receive a Selcall if the transceiver cannot receive an ACK within a certain period.



The transceiver emits an Proceed Tone and the Message Recording Time starts counting down if the transceiver receives an ACK within a certain period.

- Speak into the microphone within 15 seconds while pressing the PTT (microphone) switch.
The "☑" icon blinks and the transceiver starts recording. The transceiver simultaneously starts counting down the Message Recording Time.

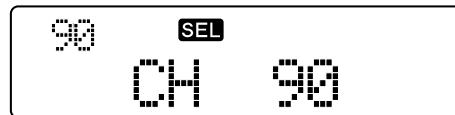
When the transceiver starts recording:



1 second before the recording is terminated:



If the [▲] key is pressed while the transceiver is counting down the recording time, the Countdown window closes and the transceiver starts waiting to receive a Selcall. The transceiver automatically starts waiting to receive a Selcall if the transceiver finishes counting down the recording time.



● **Transceiver Operation at Receiving Party**

- The transceiver receives the Voicemail Status sent to your own station.

The transceiver automatically sends an ACK. Then, the transceiver disables the mute and starts recording the received audio. The Countdown display appears on the main display.

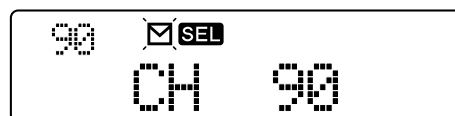
Note: The transceiver stops recording when the [▲] key is pressed while the transceiver is counting down the recording time. The recorded audio is stored in flash memory and the transceiver starts waiting to receive a Selcall.

- The transceiver finishes counting down 15 seconds.
The transceiver terminates the recording. "WRITING" appears on the main display while the transceiver is storing the recorded data to flash memory. Then, the transceiver starts waiting to receive a Selcall and the "☑" icon blinks.

Storing the recorded audio:



When the transceiver finishes recording:



3. Press and hold the **Selcall** key for more than 1 second while the “☑” icon is visible (no unread messages) or blinking (unread messages).

The transceiver enters Message Confirmation Mode and the caller's ID Name appears on the main display.

If the ID Name for the unread message appears on the main display, the “☑” icon blinks. If the ID Name for the read message appears on the main display, the “☑” icon blinks.

The “📧” icon blinks if there is a Voicemail message.

Displaying an unread voicemail message:



When the [D>] key is pressed while selecting a voicemail message, “VOICE MSG” appears on the main display and the transceiver starts playing the recorded message. When the [<C] key is pressed while the transceiver is playing the recorded message, the transceiver stops playing the message and the caller appears on the main display.



Note:

- ◆ A message of approximately 15 seconds can be stored on 2 record only channels. The receiving party keeps recording for 15 seconds even if the party leaving the message stops transmitting.
- ◆ If 2 messages already have been recorded, the oldest message is cleared when the transceiver starts recording the new message.
- ◆ If multiple voicemails are recorded on the last 5 statuses, only the last 2 messages can be retained. If a voice message is retained, the “📧” icon blinks when the transceiver enters Message Confirmation Mode.
- ◆ The recorded data is not stored if the transceiver is turned OFF while writing recorded data to the EEPROM. The received call record for voicemail status is stored.
- ◆ If the status is cleared, the voice message is also cleared.
- ◆ If the VGS-1 unit is not installed in the receiving party's transceiver or VGS-1 is disabled by using KPG-102D, the transceiver does not send an ACK and record a message. In this case, the transmitting party attempts to retransmit for the number of times configured for Number of Retries since the receiving party does not receive an ACK. Then, the transmission failure display appears. If Infinite is configured for Number of Retries, the transceiver keeps transmitting until the transmission is canceled.
- ◆ If a group is selected as a target party, the transceiver cannot transmit (the transceiver does not start transmitting even if step 5 of transceiver operation at the transmitting party is done.)

20.3.4 AUX Input Status Message

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

The transceiver sends a status if the AUX Input port logic level changes while a sensor is attached to the AUX Input port. The target party has the ID configured for Target (Status).

The following actions are required to use this function.

- **Assigning Functions to AUX Input Ports**

AUX Input Status Message 1 or AUX Input Status Message 2 can be configured for one of AUX Input ports by using KPG-102D.

- **Configuring the Target Party's ID**

Target ID (Target Status) can be configured by using KPG-102D.

- **Configuring the Status to Send**

Status can be configured for AUX Input Status Message 1 or AUX Input Status Message 2 by using KPG-102D.

If the AUX port logic level changes, the transceiver sends the corresponding status.

Note:

- ◆ The same status can be configured for both AUX Input Status Message 1 and AUX Input Status Message 2.
- ◆ The target ID (Target (Status)) used for this function is the same as the ID used in Direct Status Call. ([Refer to 20.3.2 Direct Status Call on page 63.](#))

■ Configuration using KPG-102D

- Assigning the Functions to AUX Input Ports (Refer to FPRG 5.10 Extended Function Window.)
- Configuring the Target Party's ID (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)
- Configuring the AUX Input Status Message (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)

20.3.5 AUX Output Status Message

AUX Output Status Message can be used to change the AUX Output port logic level (High to Low or Low to High) when the transceiver receives a status. A user can use this function to remotely turn the external device ON or OFF.

The following actions are required to use this function.

- **Assigning Functions to AUX Output Ports**

AUX Output Status Message can be assigned to one of the AUX Output ports by using KPG-102D.

- **Configuring a Status**

Status can be configured for AUX Output Status Message by using KPG-102D.

If the transceiver receives a status in which High or Low is configured for AUX Output Status Message, the AUX port logic level changes.

Note: The same status cannot be configured for AUX Output Status Message.

- **Configuration using KPG-102D**

- Assigning Functions to the AUX Output Port (Refer to FPRG 5.10 Extended Function Window.)
- Configuring the AUX Output Status Message (Refer to FPRG 5.6 Selcall Function Window > 5.6.4 Direct Tab.)

20.3.6 Stun

Stun can be used to disable the transceiver by sending a Special Status, for example, if the transceiver is stolen.

The following actions are required to use this function.

- **Enabling Special Status**

Special Status can be enabled by using KPG-102D. (Refer to 20.2.6 Sending a Status on page 60.)

- **Configuring the Stun Status**

Stun Status can be configured by using KPG-102D. Stun Status also can be configured by selecting “None” or a value from 90 to 95. If None is configured, this function is disabled.

The following statuses are used to enable or disable Stun.

Table 20-3 Statuses used for Stun

Configuration using KPG-102D	Transceiver Display	Description
Stun (Transmit Inhibit)	STUN TX	Transmission capability is restricted when the transceiver receives this status.
Stun (Transceiver Inhibit)	STUN	Transmission and reception capabilities are restricted when the transceiver receives this status.
Revive	REVIVE	The transceiver disables Stun when the transceiver receives this status.

- **Transceiver Operation (User Menu only)**

- **Transceiver Operation at Transmitting Party**

1. Press the **Selcall** key.

The target party selection display appears. The ID Name of the last selected party appears on the display. ID appears on the display if no ID Name is configured.



2. Press the [▲] or [▼] key to select the target party.

Select an ID from the ID List configured by using KPG-102D.



3. Press the [D>] key.

The transceiver enters Status Selection Mode.



4. Press the [▲] or [▼] key to select the Stun Status.

Select a status from “STUN” “TX”, “STUN” and “REVIVE”.

If STUN TX status is selected:



If "STUN TX/RX" status is selected:



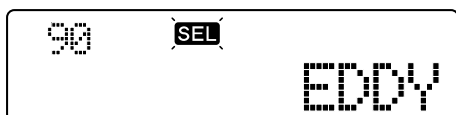
If "REVIVE" status is selected:



5. Press the [■] key or PTT (microphone) switch.

The transceiver starts transmitting. The "SEL" icon blinks and the LED lights red.

The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



Refer to [20.2.6 Sending a Status on page 60](#) for the following operations.

● **Transceiver Operation at Receiving Party**

1. The transceiver receives a STUN status while the transceiver is waiting to receive a Selcall.

The transceiver automatically sends an ACK. Then, "STUN" appears on the main display and Stun is enabled.



2. The transceiver receives the Revive status while Stun is enabled.

The transceiver automatically sends an ACK. Then, Stun is disabled.



Note:

- ◆ If a status is configured for a receive only channel, the transceiver disables Stun without sending an ACK when the transceiver receives the Revive status.
- ◆ Stun is not disabled even if the transceiver is turned OFF.
- ◆ Keys other than the **Power** switch do not function while Stun is enabled. If Stun is enabled while the transceiver is scanning, the transceiver keeps scanning. In this case, no icon appears.
- ◆ The transceiver does not emit the Status Call Tone if the transceiver receives a Stun status.
- ◆ If the receiving party is in a group (stations having * in ID), the transceiver cannot receive a Stun status.
- ◆ If Stun is enabled, the transceiver automatically enters receive mode regardless of its busy state after the Auto Reset Timer expires.
- ◆ If Special Status is configured to be disabled, Stun statuses cannot be selected.
- ◆ If None is configured for Stun Statuses by using KPG-102D, these statuses cannot be selected.

■ **Configuration using KPG-102D**

- Configuring the Special Status to be Enabled or Disabled (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)
- Configuring the Stun Status (Refer to FPRG 5.6 Selcall Function Window > 5.6.3 Status List Tab.)

20.3.7 Sending a PC Message

The transceiver can send or receive a message with a maximum of 48 characters by using a PC command.

A PC sends the PC Message.

■ **Transceiver Operation**

● **Operation at Transmitting Party**

1. Enter the PC Message command on a PC.

The PC automatically sends the entered PC Message. The "SEL" icon blinks and the LED lights red.

The transceiver starts waiting to receive an ACK after the transceiver completes transmitting.



The transceiver emits an ACK Receive Tone and “COMPLETE” appears for 5 seconds if the transceiver receives an ACK within a certain period. Then, the transceiver starts waiting to receive a Selcall.



The transceiver emits the Call Error Tone and “NO REPLY” appears on the main display for 5 seconds if the transceiver cannot receive an ACK within a certain period. Then, the transceiver starts waiting to receive a Selcall.



Note: The transceiver starts waiting to receive a Selcall if the [▲] key is pressed during the operation.

● **Transceiver Operation at Receiving Party**

1. The transceiver receives a PC Message sent to your own station while the transceiver is waiting to receive a Selcall.

The “SEL” icon blinks and ID Name appears while sending an ACK. ID number appears on the main display if no ID Name is configured.

The transceiver sends the received PC Message data from the serial communication port.



The transceiver restarts receiving a selcall after receiving the data.



20.3.8 Compatible with the TK-80 Selcall

Compatible with the TK-80 Selcall can be used to allow compatibility with the TK-80 for Selcall. This function must be enabled when using the TK-90 in a TK-80 system.

The following functions cannot be used if this function is enabled. (Refer to Table 20-1 Selcall Compatibility Table on page 55.)

- Sending and receiving a status
- Stun
- GPS Functions
- Voicemail with VGS-1
- Emergency Functions (Emergency Status Call)

Compatible with the TK-80 Selcall can be configured to be enabled or disabled by using KPG-102D.

■ **Configuration using KPG-102D**

- Configuring the Compatible with the TK-80 Selcall to be Enabled or Disabled (Refer to FPRG 5.6 Selcall Function Window > 5.6.1 General Tab.)

21 EMERGENCY

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.

To use Emergency Mode, Emergency must be assigned to a **PF** key and various functions corresponding to the type of Emergency must be configured.

21.1 Emergency Type and Basic Operation

The following 3 methods are available to send an Emergency Message:

- Voice Call type
- CW Call type
- Selcall type
- ALE Call type

21.1.1 Voice Call Type

The transceiver alternates audio transmission and audio reception at the configured duty cycle to notify that the transceiver is in Emergency status.

The following actions are required to use voice call type Emergency.

- **Assigning the Emergency Key**

Emergency can be assigned to a **PF** key by using KPG-102D. (Refer to 4 KEY ASSIGNMENT on page 10.)

- **Configuring the Emergency Call Type**

Voice can be configured for Emergency Call Type by using KPG-102D. (Refer to 21.2.1 Emergency Call Type on page 74.)

- **Configuring Channels for Emergency**

Channels used for Emergency Mode can be configured by using KPG-102D. (Refer to 21.2.2 Emergency Channel on page 74.)

Emergency also can be configured according to need. (Refer to 21.2 Emergency Configuration on page 73.)

■ Transceiver Operation

- **Entering Emergency Mode**

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

The transceiver enters Emergency Mode and jumps to an Emergency Channel.

In this case, icons disappear. If Text is configured for Emergency Display, the configured text appears on the main display. If Selected is configured for Emergency Display, the previous display is retained.

If Text is configured for Emergency Display:



If Selected is configured for Emergency Display:



The transceiver alternates between transmission and reception at the configured duty cycle. The transceiver can be configured to emit the Locator Tone before and after sending an Emergency message according to the configuration. The Background Tone can be added to the audio to send.

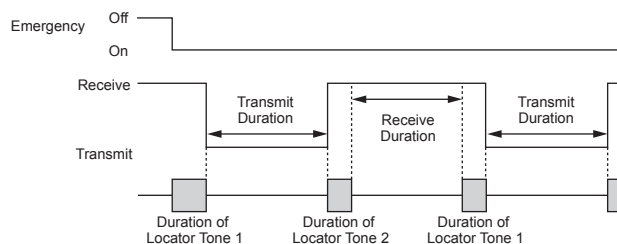


Figure 21-1 Emergency Mode

- **Exiting Emergency Mode**

1. Select one of the options to exit from Emergency Mode.
 - Press the **Emergency** key for longer than the Emergency-key Delay Time while the transceiver is in Emergency Mode.
 - Turn the transceiver OFF.
 - The transceiver exits Emergency Mode if the transceiver alternates between transmit and receive for the number of times configured for Emergency Cycle.

Note:

- ◆ A value of 5 is configured for Mic Gain Level when the transceiver is in Emergency Mode.
- ◆ If the transceiver enters Emergency Mode while the transceiver is scanning, the transceiver stops scanning.
- ◆ The Time-out Timer does not function in Emergency Mode. Keys other than the **Emergency** key and **Power** switch do not function.
- ◆ If a receive only channel is configured for Emergency Channel, the transceiver does not enter Emergency Mode.
- ◆ If the transceiver uses Selcall, Emergency for voice call type does not function.
- ◆ The transceiver cannot transmit with Data PTT if the transceiver is in Emergency Mode.

21.1.2 CW Call Type

The transceiver alternates between CW message transmission and audio reception at the configured duty cycle to notify that the transceiver is in Emergency state.

The following actions are required to use CW Call type Emergency.

- **Assigning the Emergency Key**

Emergency can be assigned to a **PF** key by using KPG-102D. (Refer to 4 **KEY ASSIGNMENT** on page 10.)

- **Configuring the Emergency Call Type**

Emergency Call Type can be configured by using KPG-102D. (Refer to 21.2.1 **Emergency Call Type** on page 74.)

- **Configuring an Emergency Channel**

Channels used for Emergency Mode can be configured by using KPG-102D. (Refer to 21.2.2 **Emergency Channel** on page 74.)

- **Configuring a CW Message to Send**

A CW Message sent in Emergency Mode can be configured by using KPG-102D. (Refer to 21.2.14 **Emergency CW Code** on page 76.)

Emergency also can be configured according to need. (Refer to 21.2 **Emergency Configuration** on page 73.)

■ Transceiver Operation

- **Entering Emergency Mode**

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

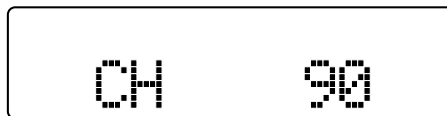
The transceiver enters Emergency Mode and jumps to an Emergency Channel. The transceiver sends a CW message.

In this case, icons disappear. If Text is configured for Emergency Display, the configured text appears on the main display. If Selected is configured for Emergency Display, the previous display is retained.

If Text is configured for Emergency Display:



If Selected is configured for Emergency Display:



The transceiver receives in the mode configured for Emergency Channel after sending a CW message. The transceiver sends the CW message again after the configured time elapses. The transceiver may emit a Sidetone according to the configuration when the transceiver is sending a CW message.

- **Exiting Emergency Mode**

1. Select one of the options to exit from Emergency Mode.
 - Press the **Emergency** key for longer than the Emergency-key Delay Time while the transceiver is in Emergency Mode.
 - Turn the transceiver OFF.
 - The transceiver exits Emergency Mode if the transceiver alternates between transmit and receive for the number of times configured for Emergency Cycle.

Note:

- ◆ The transceiver enters receive mode immediately after sending a CW message.
- ◆ If other than CW is configured for Emergency Channel, the transceiver shifts the transmission to compensate for the pitch frequency.
- ◆ The keying speed is fixed.
- ◆ If the transceiver enters Emergency Mode while the transceiver is scanning, the transceiver stops scanning.
- ◆ Time-out Timer does not function in Emergency Mode. Keys other than the **Emergency** key and **Power** switch do not function.
- ◆ The audio spoken into the microphone is not transmitted even if the **PTT** (microphone) switch is pressed while the transceiver is sending a CW message.
- ◆ If a receive only channel is configured for Emergency Channel, the transceiver does not enter Emergency Mode.
- ◆ If the transceiver uses Selcall, CW Call type Emergency does not function.
- ◆ The transceiver cannot transmit with Data PTT if the transceiver is in Emergency Mode.
- ◆ Do not use an Emergency Channel in AM Mode. The receiving party cannot receive a CW message if an Emergency Channel is used in AM Mode.

21.1.3 Selcall Type

This function is Emergency using Selcall.

The transceiver sends an Emergency Status message to the configured party to notify them that the transceiver is in Emergency Mode.

The following actions are required to use Selcall type Emergency.

- **Assigning the Emergency Key**

Emergency can be assigned to a **PF** key by using KPG-102D. (Refer to [4 KEY ASSIGNMENT on page 10.](#))

- **Configuring the Emergency Call Type**

Selcall can be configured for Emergency Call Type by using KPG-102D. (Refer to [21.2.1 Emergency Call Type on page 74.](#))

- **Configuring a Emergency Channel**

Channels used for Emergency Mode can be configured by using KPG-102D. (Refer to [21.2.2 Emergency Channel on page 74.](#))

- **Configuring the Target party's ID**

Target ID for sending an Emergency Status message can be configured by using KPG-102D. (Refer to [21.2.13 Emergency Selcall ID on page 76.](#))

Emergency also can be configured according to need. (Refer to [21.2 Emergency Configuration on page 73.](#))

■ Transceiver Operation

- **Transceiver Operation at Transmitting Party**

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

The transceiver enters Emergency Mode and jumps to an Emergency Channel. The transceiver sends the Emergency Status message.

In this case, icons disappear. If Text is configured for Emergency Display, the configured text appears on the main display. If Selected is configured for Emergency Display, the previous display is retained.

If Text is configured for Emergency Display:



If Selected is configured for Emergency Display:



The transceiver starts waiting to receive an ACK after the transceiver completes sending an Emergency Status message.

If the transceiver receives an ACK within the configured time, the transceiver alternates between transmit and receive at the configured duty cycle. If the transceiver cannot receive an ACK within the configured time, the transceiver keeps sending the Status message unless the transceiver receives an ACK or the transceiver exits from Emergency Mode.

If Add GPS Data is enabled, the transceiver sends GPS data when the transceiver receives an ACK within the configured period. If the transceiver completes sending GPS data, the transceiver enters the mode configured for Emergency Channel and alternates between transmit and receive at the configured cycle. (Refer to [21.2.18 Add GPS Data on page 77.](#))

The transceiver can be configured to emit the Locator Tone before and after sending an Emergency message according to the configuration. The Background Tone can be added to the audio to send.

Note: Refer to [21.1.1 Voice Call Type on page 69](#) for instructions on how to exit Emergency Mode.

- **Transceiver Operation at Receiving Party**

1. The transceiver receives the Emergency Status message.

The transceiver automatically sends an ACK. The transceiver emits the Emergency Response Tone and the caller appears on the display.

If the transceiver receives a status message with GPS data, the transceiver waits to receive GPS data after sending an ACK. The transceiver enters the mode configured for the channel after receiving GPS data.

If the transceiver receives a Status message without GPS data, the transceiver enters the mode configured for the channel immediately after the transceiver automatically sends an ACK.

■ **Timing to Transmit and Receive**

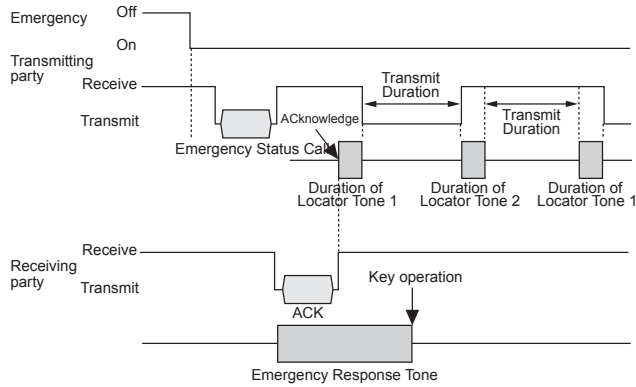


Figure 21-2 Timing to Transmit and Receive (Without GPS Data)

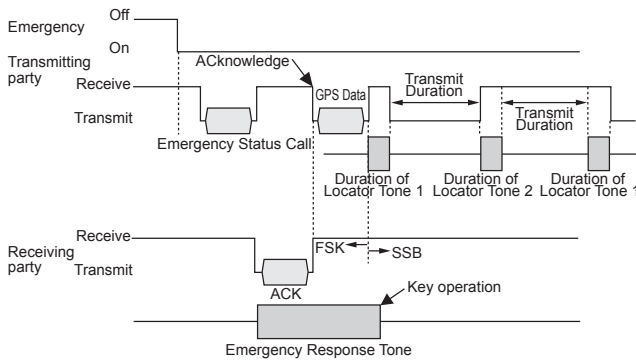


Figure 21-3 Timing to Transmit and Receive (With GPS data)

Note:

- ◆ If the transceiver receives the Emergency Status message, the Emergency Response Tone beeps until a key is pressed.
- ◆ If Selcall is disabled, the transceiver cannot send or receive Emergency Status messages.
- ◆ A value of 5 is configured for Mic Gain Level when the transceiver is in Emergency Mode.
- ◆ If the transceiver enters Emergency Mode while the transceiver is scanning, the transceiver stops scanning.
- ◆ The Time-out Timer does not function in Emergency Mode. Keys other than the **Emergency** key and **Power** switch do not function.
- ◆ If a receive only channel is configured for Emergency Channel, the transceiver does not enter Emergency Mode.
- ◆ If Compatible with the TK-80 Selcall is enabled, the transceiver does not enter Emergency Mode even if Emergency Status is configured while the transceiver uses Selcall.
- ◆ The transceiver cannot transmit with Data PTT if the transceiver is in Emergency Mode.

21.1.4 ALE Call Type

The transceiver can make an Emergency Call to the configured party while the transceiver is in ALE Mode.

The following configurations are required to make an ALE Emergency Call by using KPG-102D.

- **Assigning the Emergency Key:**
Assign the Emergency function to a PF key. (Refer to 4 [KEY ASSIGNMENT](#) on page 10.)
- **Configuring the Emergency Call Type:**
Configure the ALE for the Emergency Call Type. (Refer to 21.2.1 [Emergency Call Type](#) on page 74.)
- **Configuring the Target Address and Self Address:**
Configure the Target Address (Emergency Target Address) used for making an Emergency Call and the corresponding Self Address (Emergency Self Address). (Refer to 21.2.20 [Emergency Self Address](#) on page 77, 21.2.21 [Emergency Target Address](#) on page 78.)
- **Configuring the Emergency ALE Channel:**
Configure the ALE channel to be used while in Emergency Mode for ALE. (Refer to 21.2.19 [ALE Emergency Channel](#) on page 77.)
- **Configuring the Emergency AllCall**
Emergency AllCall must be enabled to make an Emergency Call by using an AllCall. (Refer to 21.2.22 [Emergency AllCall](#) on page 78.)

Emergency functions can be configured according to need. (Refer to 21.2 [Emergency Configuration](#) on page 73.)

■ **Transceiver Operation**

● **Transceiver Operation at the Calling Party**

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

The transceiver enters Emergency Mode for ALE. The transceiver migrates to an Emergency channel for ALE and starts Emergency Call to the party configured for Emergency Target Address.

In this case, all displayed icons disappear. If Text is configured for Emergency Display, the configured text appears on the main display. If Selected is configured for Emergency Display, the display shown previous to the transceiver entering Emergency Mode is retained.

The transceiver repeats making an Emergency Call until a link is established.

If Text is configured for Emergency Display:



If Selected is configured for Emergency Display:



The transceiver alternates between transmission and reception at the configured intervals after a link is established. Locator Tone can be configured to sound before and after making an Emergency call. Background Tone can be multiplexed with the transmitted audio signal.

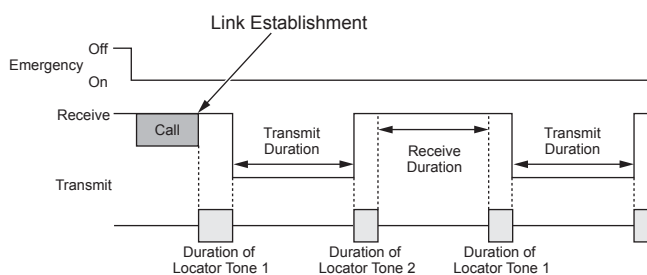


Figure 21-4 ALE Emergency Mode

The transceiver exits Emergency Mode and automatically terminates the link after automatic transmission and reception are repeated for the times configured for the Emergency Cycle.

If the **Emergency** key is pressed for longer than the Emergency-key Delay Time while the transceiver is in Emergency Mode, the transceiver exits Emergency Mode and terminates the link at the same time.

● Transceiver Operation at the Receiving Party

1. The transceiver receives an Emergency Call.

The Emergency Response Tone sounds when a link is established. Press a key to stop emitting the Emergency Response Tone.

2. Terminate the link.

The transceiver returns to standby mode when the link termination is completed. [Refer to 28.2.12 Terminating the Link on page 103](#) for details of link termination.

Note:

- ◆ If a GPS unit is connected to the transceiver, the transceiver can attach and send the GPS position data when making a call. If GPS location data is attached when making an Emergency Call, the receiving station can send the GPS location data from a COM port. Therefore, "GPS Data Output" or "PC Command" must be configured for COM Port Settings. ([Refer to 28.3.9 GPS Data Reception on page 112.](#))
- ◆ A value of 5 is fixed for the Mic Gain while the transceiver is in Emergency Mode.

- ◆ Time-out Timer does not function in Emergency Mode. Keys other than the **Emergency** key and **Power** switch do not function.
- ◆ The transceiver initiates an Emergency Call when the transceiver enters Emergency Mode even if the transceiver is establishing a link with another station. However, the transceiver cannot immediately receive a response to the Emergency Call from the target station while the target party has established a link to another station. In this case, the transceiver repeatedly continues making an Emergency Call until the target station terminates the link and responds to the Emergency Call.
- ◆ While the transceiver is in Emergency Mode, it continues Emergency operation until the transceiver exits Emergency Mode even if the transceiver receives a termination signal intended for it.

21.2 Emergency Configuration

The following items relevant to Emergency can be configured.

- Emergency Call Type
- Emergency Channel
- Emergency-key Delay Time
- Emergency Cycle
- Duration of Locator Tone 1
- Transmit Duration
- Duration of Locator Tone 2
- Receive Duration
- Emergency Display
- Emergency Text
- Emergency Mode Type
- Emergency Response Tone
- Emergency Selcall ID
- Emergency CW Code
- Background Transmission
- Suspended Power-off
- Emergency Sidetone
- Add GPS Data
- ALE Emergency Channel
- Emergency Self Address
- Emergency Target Address
- Emergency AllCall

21.2.1 Emergency Call Type

Emergency Call Type is the operational type of Emergency. Emergency Call Type can be configured in the following way by using KPG-102D.

Table 21-1 Emergency Call Type

Configuration	Description
Voice	Voice call type
CW	CW call type
Selcall	Selcall type
ALE	ALE call type

■ **Configuration using KPG-102D**

- Configuring the Emergency Call Type (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.2 Emergency Channel

Emergency Channel is a channel used for Emergency Mode. If the transceiver enters Emergency Mode, the transceiver jumps to this channel and sends or receives an Emergency message. If Emergency Channel is not configured, the transceiver cannot enter Emergency Mode. Emergency Channel can be configured by using KPG-102D.

■ **Configuration using KPG-102D**

- Configuring the Emergency Channel (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.3 Emergency-key Delay Time

The duration from when the **Emergency** key is pressed until 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 the transceiver from being placed in Emergency Mode unintentionally. Emergency-key Delay Time can be configured by using KPG-102D.

■ **Configuration using KPG-102D**

- Configuring the Emergency-key Delay Time (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.4 Emergency Cycle

Emergency Cycle is the number of times the transceiver alternates between transmission and reception in Emergency Mode. Emergency Cycle can be configured in the following way by using KPG-102D.

Table 21-2 Emergency Cycle

Configuration	Description
1 to 200	The transceiver repeats automatic transmission → automatic reception for configured time 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-102D**

- Configuring Emergency Cycle (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.5 Duration of Locator Tone 1

Duration of Locator Tone 1 is the duration to emit the Alert Tone sound before an automatic transmission begins in Emergency Mode. The transceiver emits the Locator Tone when the transceiver alternates between transmit and receive in Emergency Mode. With this tone, a user can easily recognize that the transceiver is about to make an Emergency Call. The dispatcher can use this tone to locate a user who is in an emergency situation. Duration of Locator Tone 1 can be configured by using KPG-102D.

■ **Configuration using KPG-102D**

- Configuring the Duration of Locator Tone 1 (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.6 Transmit Duration

Transmit Duration is the duration per individual automatic transmission in Emergency Mode.

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

Transmit Duration can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Transmit Duration (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.7 Duration of Locator Tone 2

Duration of Locator Tone 2 is the duration to emit the Alert Tone sound before automatic reception begins in Emergency Mode.

The transceiver emits the Locator Tone when the transceiver alternates between transmit and receive in Emergency Mode.

With this tone, a user can easily recognize without checking the LCD and LED that the transceiver is about to receive an Emergency Call. 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-102D.

■ Configuration using KPG-102D

- Configuring the Duration of Locator Tone 2 (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.8 Receive Duration

Receive Duration is the duration per individual automatic reception in Emergency Mode.

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

Receive Duration can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Receive Duration (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.9 Emergency Display

The content that appears on the main display in Emergency Mode can be configured.

Emergency Display can be configured in the following way by using KPG-102D.

Table 21-3 Emergency Display

Configuration	Description
Selected	The previous display appears even if the transceiver enters Emergency Mode. This function is convenient if a user wants to hide that the transceiver is in Emergency Mode.
Text	A pre-programmed message configured for Emergency Text appears on the main display when the transceiver enters Emergency Mode.

■ Configuration using KPG-102D

- Configuring the Emergency Display (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.10 Emergency Text

Emergency Text is characters displayed on the main display when the transceiver is in Emergency Mode. A maximum of 12 characters can be configured for Emergency Text. If no text is configured for Emergency Text, no text appears on the main display.

Emergency Text can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Text (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.11 Emergency Mode Type

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

Emergency Mode Type can be configured in the following way by using KPG-102D.

Table 21-4 Emergency Mode Type

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

■ Configuration using KPG-102D

- Configuring the Emergency Mode Type (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.12 Emergency Response Tone

This function can be used to select the pattern of Alert Tones emitted when the transceiver receives a Selcall Emergency Status. This function is available if Selcall is configured for Emergency Call Type.

Emergency Response Tone can be selected from 4 patterns. (Refer to 3.2 Special Alert Tone on page 8.)

Emergency Response Tone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Response Tone (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.13 Emergency Selcall ID

Emergency Selcall ID is the target party's ID for sending an Emergency Status Message with Selcall.

Emergency Selcall ID can be configured by selecting an ID from the ID List. This function is available if Selcall is configured for Emergency Call Type.

Emergency Selcall ID can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Selcall ID (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.14 Emergency CW Code

Emergency CW Code is the CW message sent in CW Call Type Emergency Mode.

A maximum of 24 alphanumeric characters and symbols can be configured for an Emergency CW Code. This function is available if CW is configured for Emergency Call Type.

Emergency CW Code can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency CW Code (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.15 Background Transmission

Background Transmission can be used to multiplex Background Tone on the transmitting audio.

If this function is enabled, a 1630 Hz tone is multiplexed on the transmitted audio and is sent at 1 second intervals. The receiving party can easily recognize that the caller is in Emergency Mode since the tone is multiplexed with transmitted audio.

Background Transmission is available if Voice or Selcall is configured for Emergency Call Type.

Background Transmission can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Background Transmission to be Enabled or Disabled (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.16 Suspended Power-off

This function can be used to remain in Emergency Mode without turning the transceiver OFF even if the **Power** switch is pressed while the transceiver is in Emergency Mode.

The transceiver functions according to the Emergency Display configuration when the transceiver enters Emergency Mode. If Suspended Power-off is enabled while Silent is configured for Emergency Mode Type, all LEDs and LCD are turned Off when the transceiver is turned OFF. In this case, the transceiver seems to be turned OFF. However, the transceiver is, in fact, not turned OFF and remains in Emergency Mode.

If Ignition Sense is enabled, the transceiver remains in Emergency Mode even if the Ignition Sense port logic level changes from high to low.

The transceiver functions in the following way if the transceiver is turned OFF while the transceiver is in Emergency Mode. The transceiver operation varies depending on the Emergency Mode Type configuration.

Table 21-5 Transceiver Operation when the Transceiver is Turned OFF (Emergency)

Configuration	Range	Operation
Suspended Power-off	Check	1) The transceiver remains in Emergency Mode.
Emergency Mode Type	Silent	2) The LCD turns Off. 3) The LED turns Off. 4) The transceiver does not emit Alert Tones.
Suspended Power-off	Check	1) The transceiver remains in Emergency Mode.
Emergency Mode Type	Audible	2) The LCD remains On. 3) The LED functions according to the Emergency Mode Type configuration. 4) The transceiver emits Alert Tones.
Suspended Power-off	Uncheck	The transceiver is turned OFF.
Emergency Mode Type	Silent	
Suspended Power-off	Uncheck	The transceiver is turned OFF.
Emergency Mode Type	Audible	

Note: Suspended Power-off cannot be disabled even if the transceiver is turned ON while Suspended Power-off is enabled. A user must press the **Emergency** key for longer than the configured Emergency-key Delay Time to disable the Suspended Power-off.

Suspended Power-off can be configured to be enabled or disabled using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Suspended Power-off to be Enabled or Disabled (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.17 Emergency Sidetone

The transceiver can be configured to emit a Sidetone when sending a CW Message in CW Emergency Mode.

Emergency Sidetone is available if CW is configured for Emergency Call Type.

Emergency Sidetone can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Sidetone to be Enabled or Disabled (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.18 Add GPS Data

Add are GPS Data can be used to send GPS data while sending a Selcall Emergency Status Message.

● If Add GPS Data is Enabled:

The transceiver sends an Emergency Status Message with GPS data.

● If Add GPS Data is Disabled:

The transceiver sends an Emergency Status Message without GPS data.

Add GPS Data can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Add GPS Data to be Enabled or Disabled (Refer to FPRG 5.9 Emergency Information Window > 5.9.1 General Tab.)

21.2.19 ALE Emergency Channel

ALE Emergency Channel is a channel used for ALE while in Emergency Mode.

If the transceiver enters ALE Emergency Mode, the transceiver automatically selects this channel and makes or receives an Emergency Call. If an ALE Emergency Channel is not configured, the transceiver cannot enter ALE Emergency Mode.

ALE Emergency Channel can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the ALE Emergency Channel (Refer to FPRG 5.9 Emergency Information Window > 5.9.2 ALE Tab.)

21.2.20 Emergency Self Address

Emergency Self Address is your own address used for making an ALE Emergency Call.

Emergency Self Address can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Self Address (Refer to FPRG 5.9 Emergency Information Window > 5.9.2 ALE Tab.)

21.2.21 Emergency Target Address

Emergency Target Address is the address of the target party used for making an Emergency Call.

Emergency Target Address can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency Target Address (Refer to FPRG 5.9 Emergency Information Window > 5.9.2 ALE Tab.)

21.2.22 Emergency AllCall

Emergency AllCall can be used to configure whether the transceiver makes an Emergency Call using an AllCall. If this function is enabled, the transceiver makes an Emergency Call by using an AllCall. AllCalls can establish a link to all stations in the area covered by the radio signals.

Emergency AllCall can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Emergency AllCall to be Enabled or Disabled (Refer to FPRG 5.9 Emergency Information Window > 5.9.2 ALE Tab.)

21.3 Emergency Operation in VFO Mode

If Emergency Mode is activated while the transceiver is in VFO Mode, channel data configured for Emergency Channel is shifted to VFO Mode and the transceiver enters Emergency Mode.

This function is available for all Emergency Call Types (Voice, CW, Selcall). Refer to [21.1 Emergency Type and Basic Operation on page 69](#) for Emergency operations.

GPS can be used to send the current location data of the transceiver.

The transceiver uses the Selcall protocol or ALE protocol to transfer GPS data.

The transceiver sends and receives GPS data by using the communication port. A user must connect the GPS receiver unit to the communication port of the transceiver (mobile station) to use this function.

This section describes the configuration of the mobile station and base station and GPS communication.

22.1 Configuring the Mobile Station

The transceiver at the mobile station sending GPS data can be configured in the following way.

The following actions are required to send GPS data.

- Configuring the Selcall or ALE
- COM port Settings
- Polarity
- GPS Report Interval Time
- GPS Time Mark
- ID for GPS Data Transmit

22.1.1 Configuring the Selcall or ALE

■ Configuring of Selcall

To send and receive GPS data by using the Selcall protocol, Selcall must be enabled and various Selcall functions must be configured. Refer to [20 SELCALL on page 55](#) for instructions on how to configure Selcall.

■ Configuration of ALE

To send and receive GPS data by using the protocol for the ALE function, ALE must be enabled and various ALE functions must be configured. Refer to [28 ALE \(Automatic Link Establishment\) on page 92](#) how to configure the ALE.

22.1.2 COM port Settings

The usage of the data communication line for connecting an external device can be configured.

If a GPS unit is connected to the mobile station, GPS Data Input must be configured for the serial data communication line.

COM port Settings can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the COM port Settings (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

22.1.3 Polarity

GPS data communication line logic can be changed if GPS Data Input is configured for COM port Settings.

If data logic needs to be inverted based on the connected GPS receiver, Invert must be configured for Polarity.

Polarity can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Polarity (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

22.1.4 GPS Report Interval Time

GPS Report Interval is the interval to send GPS data to the base station.

The interval to send GPS data to the base station can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the GPS Report Interval Time (Refer to FPRG 5.7 GPS Window > 5.7.1 GPS Report Interval Time.)

22.1.5 GPS Time Mark

The offset time for sending GPS data can be configured based on UTC (Coordinated Universal Time) received from the GPS receiver unit.

Each transceiver in the group sends GPS data with different timing. Therefore, transmission collisions can be avoided.

GPS Time Mark can be configured by using KPG-102D.

Note: GPS Time Mark must be configured with a smaller value than GPS Report Interval.

■ Configuration using KPG-102D

- Configuring the GPS Time Mark (Refer to FPRG 5.7 GPS Window > 5.7.2 GPS Time Mark.)

22.1.6 ID for GPS Data Transmit

ID for GPS Data Transmit is the ID of the base station sending GPS data.

This function must be configured for transferring GPS data by using the Selcall protocol.

This ID can be configured by selecting an ID from the ID List.

ID for GPS Data Transmit can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the ID for GPS Data Transmit (Refer to FPRG 5.7 GPS Window > 5.7.3 ID for GPS Data Transmit.)

22.2 Configuring the Base Station

This section describes the configuration of the base station transceiver receiving GPS data.

The following actions are required to receive GPS data.

- Configuring the Selcall or ALE
- COM port Settings
- GPS Base Station Settings

22.2.1 Configuring the Selcall or ALE

■ Configuring of Selcall

To send and receive GPS data by using the Selcall protocol, Selcall must be enabled and various Selcall functions must be configured. Refer to [20 SELCALL on page 55](#) for instructions on how to configure Selcall.

■ Configuration of ALE

To send and receive GPS data by using the protocol for the ALE function, ALE must be enabled and various ALE functions must be configured. Refer to [28 ALE \(Automatic Link Establishment\) on page 92](#) for instructions on how to configure the ALE.

22.2.2 COM port Settings

The usage of the data communication line for connecting an external device can be configured.

PC Command is configured for COM port Settings if the transceiver sends data to a PC by using the PC command format. If the transceiver sends data in NMEA format, GPS Data Output must be configured for COM port Settings.

COM port Settings can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the COM port Settings (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

22.2.3 Sending Output Sentences (GPS Base Station Settings)

The transceiver sends the following data to the mapping software.

The transceiver at the base station acquires the following data from GPS data sent from mobile stations and sends data from the COM port.

Table 22-1 Output Sentences

Output Sentence	Description
\$GPRMC (NMEA)	The transceiver at the base station acquires \$GPRMC data in NMEA-0183 format from GPS data sent from mobile stations and sends data from the COM port.
\$GPGGA (NMEA)	The transceiver at the base station acquires \$GPGGA data in NMEA-0183 format from GPS data sent from mobile stations and sends data from the COM port.
\$GPGLL (NMEA)	The transceiver at the base station acquires \$GPGLL data in NMEA-0183 format from GPS data sent from mobile stations and sends data from the COM port.
\$GPWPL (NMEA)	The transceiver at the base station acquires \$GPWPL data in NMEA-0183 format from GPS data sent from mobile stations and sends data from the COM port. The mobile station's ID Name (ID if no ID Name is configured) is configured for the Waypoint Identifier parameter.

Sentences sent in GPS data can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the \$GPRMC (NMEA) (Refer to FPRG 5.7 GPS Window > 5.7.4 \$GPRMC (NMEA) (GPS Base Station Settings.))
- Configuring the \$GPGGA (NMEA) (Refer to FPRG 5.7 GPS Window > 5.7.5 \$GPGGA (NMEA) (GPS Base Station Settings.))
- Configuring the \$GPGLL (NMEA) (Refer to FPRG 5.7 GPS Window > 5.7.6 \$GPGLL (NMEA) (GPS Base Station Settings.))
- Configuring the \$GPWPL (NMEA) (Refer to FPRG 5.7 GPS Window > 5.7.7 \$GPWPL (NMEA) (GPS Base Station Settings.))

22.3 GPS Data Transfer using the Selcall Function

This section describes operations for sending and receiving GPS data by using the Selcall function.

22.3.1 GPS Data Manual Transmission

A mobile station can manually send GPS data to send its current position to the base station.

The transceiver sends data originating from the GPS unit with special status (GPS status).

■ Transceiver Operation

● Transceiver Operation at Transmitting Party

1. Press the **Selcall** key.

The target party selection display appears. The ID name of the last selected party appears on the main display. ID number appears on the main display if no ID Name is configured.



2. Press the [↑] or [↓] key to select the target party.
Select an ID from the ID List configured by using KPG-102D.



3. Press the [D>] key.
The transceiver enters Status Selection Mode.



4. Press the [↑] or [↓] key to select "-GPS DATA-".



5. Press the [M] key or PTT (microphone) switch.

The transceiver sends GPS Status Call signal and GPS data. The "SEL" icon blinks and the LED lights red.



"COMPLETE" appears for 5 seconds when the transceiver finishes transmitting. Then, the transceiver starts waiting to receive a Selcall.



● **Transceiver Operation at Receiving Party**

1. The transceiver receives the GPS Status Call signal sent to its own station while the transceiver is waiting to receive a Selcall.

The "SEL" icon blinks, and ID Name appears.

The transceiver sends the received GPS data from the serial communication port.



2. Press the [A] key.

The transceiver starts waiting to receive a Selcall.



Note:

- ◆ The transceiver starts waiting to receive a Selcall if the [A] key is pressed during the operation.
- ◆ Refer to [20.2.7 Receiving a Status on page 62](#) for reception.
- ◆ "-GPS DATA-" can be selected in Status Selection Mode only if GPS Data Input is configured for COM port Settings. (Refer to [22.1.2 COM port Settings on page 79.](#))

22.3.2 GPS Data Polling

GPS Data Polling allows a user to request the target party's transceiver to send GPS data.

If a user sends a Status Message requesting a target party to send GPS data with Special Status, the user can receive GPS data from the target party. The transceiver at the receiving party automatically sends GPS data when the transceiver receives a Status Message requesting GPS data transmission.

■ **Transceiver Operation**

● **Transceiver Operation at Transmitting Party**

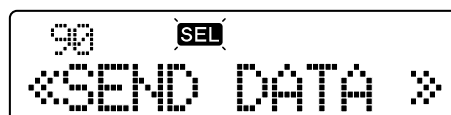
1. A PC sends the PC command requesting the target party to send GPS data.

● **Transceiver Operation at Receiving Party**

1. The transceiver receives the Status Message requesting GPS data.

The transceiver emits the Status Call Tone and the "SEL" icon blinks.

The transceiver automatically sends GPS data.



2. The transceiver starts waiting to receive a Selcall after sending data.



Note:

- ◆ Refer to [20.2.7 Receiving a Status on page 62](#) for reception.
- ◆ If the target party's ID is a group ID, a Status Message requesting GPS data cannot be sent.

22.4 GPS Data Transfer Using the ALE Function

Refer to [28.3.5 GPS Data Automatic Transmission on page 109](#) for instructions on how to send and receive GPS data by using the ALE function.

23 VGS (VOICE GUIDE & STORAGE UNIT)

The transceiver can record or play voice and enable Voice Guide by installing the VGS-1 (Voice Guide & Storage Unit) unit in the transceiver.

A message can be recorded on the target transceiver by using Selcall. (Refer to 20.3.3 Voicemail on page 63.)

23.1 Voice Memo

Voice Memo can be used to record communications by manually recording the received audio. There are 4 recording channels and a maximum of 15 seconds can be recorded for each channel.

The following actions are required to use Voice Memo.

- **Configuring a Recording Channel**

The recording channel for Voice Memo can be configured by using KPG-102D.

- **Assigning the Playback Key**

Playback can be assigned to a PF key by using KPG-102D. (Refer to 4 KEY ASSIGNMENT on page 10.)

■ Transceiver Operation

- **Recording Operation:**

1. Press and hold one of the **Playback 1 to Playback 4** keys for more than 1 second.

The transceiver starts recording the received audio and the remaining time appears on the main display.



2. Press the [△] key.

The transceiver terminates the recording. The transceiver automatically finishes recording if the remaining time is 0. "WRITING" appears on the main display while the transceiver is storing the recorded data to the flash memory.

The transceiver returns to the previous display when the transceiver finishes storing the received audio.



- **Playback Operation:**

1. Press one of the **Playback 1 to Playback 4** keys.

The transceiver plays the recorded audio. "PLAYBACK" appears on the main display. The recording channel number appears on the sub-display.



2. Press the [△] key while the transceiver is playing the received audio.

The transceiver stops playing the received audio. The transceiver stops playing the received audio if the recording time elapses.

- **Deleting the Recorded Data**

1. Press the [■] key while the transceiver is playing the received audio.

The transceiver stops playing the received audio and "DELETE?" appears on the main display.



2. Press the [■] key again.

The recorded data is deleted and the previous display appears. If the [△] key is pressed, the recorded data is not deleted and the previous display appears.

Note:

- ◆ The transceiver records the received audio regardless of Squelch status.
- ◆ The received audio cannot be recorded on multiple channels.
- ◆ The last recorded audio is cleared and the new audio is recorded when recording the received audio.
- ◆ If the transceiver receives a Selcall while the transceiver is recording the audio spoken into the microphone, the recorded data may not be stored since the recording is forcibly terminated.
- ◆ If the transceiver is turned OFF while the transceiver is recording audio, the current channel becomes free and the transceiver stops recording.
- ◆ The recorded data is not stored if the transceiver is turned OFF while writing recorded data to the transceiver.
- ◆ The transceiver cannot play the recorded audio while the transceiver is transmitting. If a user attempts to transmit while the transceiver is recording or playing the recorded audio, the transceiver stops recording the received audio or playing the recorded audio and transmits.
- ◆ The transceiver mutes the received audio while the transceiver is playing the recorded audio. The transceiver plays the recorded audio at a level controlled by the **Volume** key.
- ◆ If the transceiver transmits while the deletion confirmation display appears, the transceiver cancels deleting the recorded data.

■ Configuration using KPG-102D

- Configuring the Recording Channel for Voice Memo (Refer to FPRG 5.2 Optional Features Window > 5.2.6 VGS-1 Tab.)
- Assigning the Playback to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

23.2 Sending a Voice Message

Voice Message can be used to send recorded audio while playing the audio. There are 4 recording channels and a maximum of 15 seconds can be recorded for each channel.

The following actions are required to use Voice Message.

- **Configuring a Recording Channel**

The recording channel for Voice Message can be configured by using KPG-102D.

- **Assigning the Playback Key**

Playback can be assigned to a PF key by using KPG-102D. (Refer to 4 KEY ASSIGNMENT on page 10.)

■ Transceiver Operation

- **Recording Operation:**

1. Press and hold one of the **Playback 1 to Playback 4** keys for more than 1 second.

The transceiver starts waiting to record and play the recorded audio and "REC/PLAY" appears on the main display.



(The previous display appears when the [△] key is pressed.)

2. Press the [■] key.

The transceiver starts recording the audio spoken into the microphone and the remaining time appears on the main display.



3. Press the [△] key.

The transceiver terminates the recording. The transceiver automatically finishes recording if the remaining time is 0. "WRITING" appears on the main display while the transceiver is storing the recorded data to flash memory.



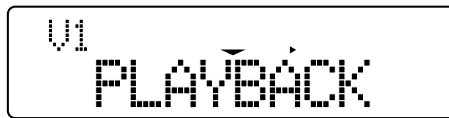
The transceiver returns to the previous display when the transceiver finishes storing the recorded data.

- **Playback and Transmission:**

1. Press one of the **Playback 1 to Playback 4** keys.

The transceiver plays the recorded audio. "PLAYBACK" appears on the main display. The recording channel number appears on the sub-display.

The transceiver starts transmitting while playing the recorded audio and enters receive mode when the transceiver finishes playing the audio.

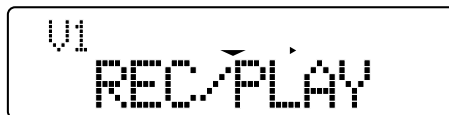


(When the [△] key is pressed while the transceiver is playing recorded audio, the transceiver immediately stops recording and transmits.)

- **Checking the Recorded Audio**

1. Press and hold one of the **Playback 1 to Playback 4** keys for more than 1 second.

The transceiver starts waiting to record and play the recorded audio and "REC/PLAY" appears on the main display.



(The previous display appears when the [△] key is pressed.)

2. Press the [D>] key.

The transceiver starts playing the recorded audio while the transceiver is in receive mode. "PLAYBACK" appears on the main display. The recording channel number appears on the sub-display.

The transceiver returns to the previous display when the transceiver starts waiting to record or play the recorded audio.

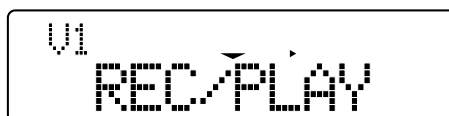


(When the [△] key is pressed while the transceiver is playing recorded audio, the transceiver immediately stops recording and the previous display appears.)

- **Deleting the Recorded Data**

1. Press and hold one of the **Playback 1 to Playback 4** keys for more than 1 second.

The transceiver starts waiting to record and play the recorded audio and "REC/PLAY" appears on the main display.



- Press and hold the **[■]** key for more than 1 second.
“DELETE?” appears on the main display.



- Press the **[■]** key again.
The recorded data is deleted and the previous display appears. If the **[△]** key is pressed, the recorded data is not deleted and the previous display appears.

Note:

- ◆ This function can be used only if LSB, USB, AM or DATA is configured for Modulation Mode.
- ◆ The received audio cannot be recorded on multiple channels.
- ◆ The last recorded audio is cleared and the new audio is recorded when recording the received audio.
- ◆ If the transceiver receives a Selcall while the transceiver is recording the audio, the recorded data may not be stored since the recording is forcibly terminated.
- ◆ If the transceiver is turned OFF while the transceiver is recording audio, the current channel becomes free and the transceiver stops recording.
- ◆ The recorded data is not stored if the transceiver is turned OFF while writing recorded data to the transceiver.
- ◆ If the transceiver transmits while recording the audio, or while checking or deleting the recorded audio, the transceiver cancels current operations and transmits.
- ◆ The transceiver mutes the received audio while the transceiver is playing the recorded audio. The transceiver plays the recorded audio at a level controlled by the **Volume** key.
- ◆ The transceiver transmits when the recorded audio is played and transmits regardless of the VOX configuration.
- ◆ If the **PTT** (microphone) switch is pressed while the transceiver is sending the recorded message, the transceiver sends the recorded message first.
- ◆ If the recorded audio is played and transmitted while the transceiver is transmitting with the Mic PTT, the microphone is muted while the transceiver is playing the recorded audio. If the recorded audio is played and transmitted while the transceiver is transmitting with the Data PTT, the external input audio line (DI) is muted.

■ Configuration using KPG-102D

- Configuring the Recording Channels for Voice Messages (Refer to FPRG 5.2 Optional Features Window > 5.2.6 VGS-1 Tab.)
- Assigning the Playback to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

23.3 Auto Recording

Auto Recording can be used to automatically record transmitted or received audio. The transmitted or received audio is always recorded and the transceiver can play the recorded audio for a maximum of 30 seconds.

The following actions are required to use Auto Recording.

• Enabling the Auto Recording


Auto Recording can be configured by using KPG-102D.

• Assigning the Auto Recording Key

Auto Recording can be assigned to a **PF** key by using KPG-102D. (Refer to 4 KEY ASSIGNMENT on page 10.)

■ Transceiver Operation

● While Storing Data to the Buffer:

- The “” icon appears while storing recorded data to the buffer.



■ Recording Operation:

- Press and hold the **Auto Recording** key for more than 1 second.

“WRITING” appears on the main display while the recorded data stored in the buffer is stored to flash memory.

The transceiver returns to the previous display when the transceiver finishes storing the recorded data to flash memory.



● Playback Operation:

- Press the **Auto Recording** key.

The transceiver starts playing the recorded audio.



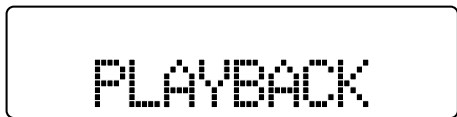
- Press the **[△]** key while the transceiver is playing the recorded audio.

The transceiver finishes playing the recorded audio. The transceiver finishes playing the recorded audio if the recording time elapses.

● **Deleting the Recorded Data**

1. Press the **Auto Recording** key.

The transceiver starts playing the recorded audio and "PLAYBACK" appears on the main display.



2. Press the **[■]** key while the transceiver is playing the recorded audio.

The transceiver stops playing the recorded audio and "DELETE?" appears on the main display.



3. Press the **[■]** key again.

The recorded data is deleted and the previous display appears. If the **[△]** key is pressed, the recorded data is not deleted and the previous display appears.

Note:

- ◆ If the transceiver transmits in CW or FSK Mode, the transceiver does not record Sidetone or FSK tones.
- ◆ The last recorded audio is cleared and the new audio is recorded when recording the received audio.
- ◆ If the transceiver receives a Selcall while the transceiver is recording the audio spoken into the microphone, the recorded data may not be stored since the recording is forcibly terminated.
- ◆ The recorded data is not stored if the transceiver is turned OFF while writing recorded data to the transceiver.
- ◆ The transceiver cancels playing the recorded audio if the transceiver transmits while the transceiver is playing the recorded audio.
- ◆ The transceiver mutes the received audio while the transceiver is playing the recorded audio. The transceiver plays the recorded audio at a level controlled by the **Volume** key.
- ◆ If the transceiver transmits while the deletion confirmation display appears, the transceiver cancels deleting the recorded data.

■ **Configuration using KPG-102D**

- Configuring the Auto Recording to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.6 VGS-1 Tab.)
- Assigning the Auto Recording to a PF Key (Refer to FPRG 5.3 Key Assignment Window.)

23.4 Channel Voice Guide

Channel Voice Guide can be used to announce the channel number when the channel is changed. The channel number can be checked with the announcement.

Channel Voice Guide can be configured to be enabled or disabled using KPG-102D.

Table 23-1 Example of Channel Voice Guide

Selected Channel Number	Audio Content
1	One
2	Two
...	...
21	Twenty-one
...	...
99	Ninety-nine
100	One-hundred
131	One-thirty-one
200	Two-hundred

Note:

- ◆ The transceiver mutes the received audio while the transceiver uses Voice Guide to announce channels. The transceiver emits the Voice Guide announcements at a level controlled by the **Volume** key.
- ◆ The channel number is not announced when the transceiver is turned ON. The channel number is not announced if the channel is continuously changed.

■ **Configuration using KPG-102D**

- Configuring the Channel Voice Guide to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.6 VGS-1 Tab.)

24 FUNCTION PORT

The transceiver has programmable Function Ports (AUX Input/ AUX Output).

AUX port can be assigned to Pins 9 to Pin 11 of the optional KCT-39 cable connected to the transceiver.

The operation of AUX port is as follows.

- **AUX Input Port**

If input is configured for an AUX port, the transceiver executes functions when the AUX port input signal logic level goes high or the transceiver detects a transition.

- **AUX Output Port**

If output is assigned to an AUX port, the AUX port output signal logic level changes if the status of the corresponding function changes.

Function Name	Description
AUX Input Status Message 1 to AUX Input Status Message 2	This port is used as the trigger port to send a Selcall Status Message. The transceiver sends a Status Message to the ID configured for Target (Status) when the port logic level changes (high to low or low to high). (Refer to 20.3.4 AUX Input Status Message on page 65.)
CTS *1	This is the flow control signal for PC commands. This signal is used with RTS if the transceiver communicates while the transceiver is connected to a PC. If the port logic level remains low, data transmission to the transceiver is enabled. This signal can be input at TTL level.

*1 This signal must be converted to RS-232C level to connect the transceiver to a PC.

24.1 Assigning Functions to the AUX Input Port

One of the following functions can be assigned to the AUX Input Port.

Functions can be assigned to the AUX Input Port by using KPG-102D.

Table 24-1 Assigning Functions to AUX Input Port

Function Name	Description
Audio Mute	This port can be used to mute the received audio. The transceiver mutes the received audio when the Audio Mute port logic level goes Low. The mute function is disabled when this port logic level goes High.
MIC Mute	This port can be used to mute the Mic modulation line. The transceiver mutes when the Speaker Mute port logic level goes low. The mute function is disabled when this port logic level goes high.
Emergency	This port allows the transceiver to enter Emergency Mode. Emergency-key Delay Time must be configured for this port to prevent the transceiver from being placed in Emergency Mode unintentionally. The transceiver enters Emergency Mode when the Emergency port logic level goes low. Emergency Mode functions according to the Emergency configuration. (Refer to 21 EMERGENCY on page 69.)
Direct Channel 1 to Direct Channel 4	This port can be used to enable a Direct Channel. The transceiver jumps to the channel configured for Direct Channel when the Direct Channel port logic level goes low. (Refer to 6.3.1 Direct Channel on page 15.)

■ Configuration using KPG-102D

- Assigning Functions to the AUX Input Port (Refer to FPRG 5.10 Extended Function Window.)

24.2 Assigning Functions to the AUX Output Port

One of the following functions can be assigned to the AUX Output Port.

Functions can be assigned to the AUX Output Port by using KPG-102D.

Table 24-2 Assigning Functions to AUX Output Port

Function Name	Description
SQC	This port can be used to send Squelch status. This port activates when Squelch opens and deactivates when Squelch closes.
TOR	This port can be used to send the Selcall unmute status. If the transceiver transmits or receives with Selcall and unmutes, this port activates. Otherwise, this port is disabled.
TX SENS	The transceiver notifies a user that the transceiver is transmitting. This port activates during transmission. Otherwise, this port is disabled.
AUX	The port output changes in conjunction with the AUX key. A user can control the external device connected to the AUX port. The AUX output logic level configured for the channel is configured when a channel is changed.

24 FUNCTION PORT

Function Name	Description
RTS *1	This port can be used as the flow control signal for PC commands. This signal is used with CTS if the transceiver communicates while the transceiver is connected to a PC. If the port logic level remains low, data transmission to a PC is enabled. The logic level of this port goes high if the buffer memory in the transceiver is going to be full. This signal can be input at TTL level.
Output Status Message	This port is used to change the status of the transceiver when the transceiver receives a Selcall Status Message. This port switches the logic level of the AUX Output Port (high to low or low to high) if the received Status Message matches the Status number configured for the ports. (Refer to 20.3.5 AUX Output Status Message on page 66.)

*1 This signal must be converted to RS-232C level to connect the transceiver to a PC.

Note: If AUX is configured for the AUX Output port, the AUX state (Active or Inactive) configured for each channel can be sent to the AUX port. When the **AUX** key is pressed, AUX state can be changed.

■ Configuration using KPG-102D

- Assigning Functions to the AUX Output Port (Refer to FPRG 5.10 Extended Function Window.)

25 IGNITION SENSE

Ignition Sense can be used to automatically turn the transceiver ON or OFF in conjunction with the status of the Ignition Sense terminal of a vehicle.

The transceiver operation varies depending on the Ignition Sense configuration.

- **Ignition and Switch (TYPE 1)**

The transceiver can be turned ON or OFF by using the **Power** switch and Ignition Sense.

The transceiver remains OFF even if the vehicle engine is turned ON after the transceiver is turned OFF by using the **Power** switch. The transceiver is always turned ON when the power connector is connected regardless of the transceiver power status.

- **Ignition only (TYPE 2)**

The transceiver can be turned ON or OFF only with the Ignition Sense port. The transceiver cannot be turned ON and OFF by pressing the **Power** switch.

Ignition Sense Type can be configured by using KPG-102D. Ignition Sense Type also can be configured by selecting "FUNCTION" in Dealer Mode.

Note: A user must prepare the KCT-18 Ignition Sense cable to use Ignition Sense.

■ Transceiver Operation (Dealer Menu only)

1. Select "IGNIT SENSE" from in Function Configuration Mode in Dealer Menu and press the [D>] key.

The Ignition Sense configuration display appears on the main display. Refer to [11.2.2 Function Configuration Mode on page 31](#) for instructions on how to select a desired mode.

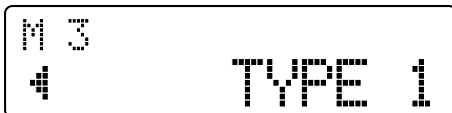
2. Press the [▲] or [▼] key to configure Ignition Sense.

Select "OFF", "TYPE 1" or "TYPE 2".

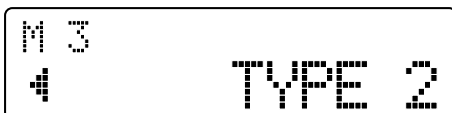
If "OFF" is selected:



If "TYPE 1" is selected:

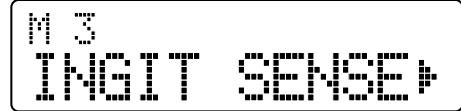


If "TYPE 2" is selected:



3. Press the [■] key.

The configured value is written to the EEPROM. Function Configuration Mode in Dealer Menu reappears when the configured value is written to the EEPROM. When the [◀C] key is pressed, the modification is canceled and the transceiver enters Function Setting Menu.



4. Press the [△] key.

Dealer Menu reappears.

■ Configuration using KPG-102D

- Configuring the Ignition Sense Type (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

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

26.1 Embedded Message

Embedded Message can be used to store a maximum of 64 alphanumeric characters and symbols 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-102D. 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-102D.

■ Configuration using KPG-102D

- Configuring the Embedded Message (Refer to FPRG 5.11 Embedded Message Window.)
- Writing the Configuration Data to the Transceiver (Refer to FPRG 6.2 Write Data to the Transceiver Window.)
- Reading the Configuration Data from the Transceiver (Refer to FPRG 6.1 Read Data from the Transceiver Window.)

26.2 Embedded Message with Password

Embedded Message with Password can be used to store a maximum of 64 alphanumeric characters and symbols 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-102D. If a message is written to the transceiver by 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-102D.

■ Configuration using KPG-102D

- Configuring the Embedded Message with Password (Refer to FPRG 5.12 Embedded Message with Password Window.)
- Writing the Configuration Data to the Transceiver (Refer to FPRG 6.2 Write Data to the Transceiver Window.)
- Reading the Configuration Data from the Transceiver (Refer to FPRG 6.1 Read Data from the Transceiver Window.)

27 WIRED CHANNEL CLONE FUNCTION

Wired Channel Clone can be used to copy channel data to another transceiver.

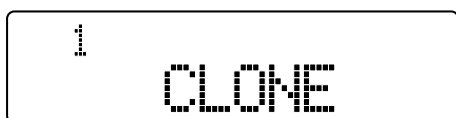
Only channel data can be copied. However, no ALE channel is copied.

■ Transceiver Operation

1. Connect MIC ports on 2 transceivers by using the clone cable.
2. Turn the target transceiver ON by pressing the **Power** switch.



3. The source transceiver enters Clone Mode. The transceiver activates in Clone Mode if the **Power** switch is pressed while pressing the **[■]** key.



4. Press the **[■]** key on the source transceiver. The transceiver starts copying data. The LED on the source transceiver lights red while the transceiver is transferring data.

While transferring data (source):

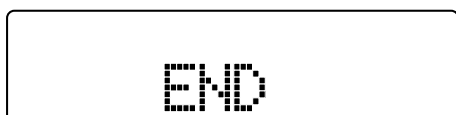


While transferring data (target):



“END” appears on the source transceiver when the transceiver completes transferring data. The transceiver returns to Clone Mode when the **[■]** key is pressed.

Source Transceiver:



The target transceiver returns to User Mode when the transceiver finishes receiving data.

Target Transceiver



● If data is not Properly Transferred:

“ERROR” appears on the source transceiver. The transceiver returns to Clone Mode when the **[■]** key is pressed.

Source Transceiver



“UNPROGRAM” appears on the target transceiver when the transceiver is turned ON again.

Target Transceiver



Note:

- ◆ Selcall and ALE Mode are automatically disabled while the transceiver is in Clone Mode.
- ◆ The transceiver cannot activate in Clone Mode while data is not correctly written to the transceiver. Data must be written to the transceiver before executing Clone.
- ◆ If Overwrite Transceiver is configured on the target transceiver, Clone is disabled and an error message appears on the source transceiver.
- ◆ The source transceiver executes the Clone operation if Wired Channel Clone is enabled regardless of Read Authorization Password.
- ◆ The transceiver must be turned OFF to exit Clone Mode.

28 ALE (AUTOMATIC LINK ESTABLISHMENT)

ALE can be used to select a channel according to radio propagation conditions and then establish a link with the target party.

ALE in the TK-90 is compliant with MIL-STD-188/141A as follows:

- Sending and receiving of the Sounding signal.
- Making and receiving an Individual Call.
- Making and receiving a Net Call.
- Making and receiving an AllCall.
- Sending and receiving an AMD Message.

ALE requires the advanced signal processing referred to as octal FSK. The TK-90 transceiver does the signal processing by using the DSP (Digital Signal Processor) installed in an optional ALE unit (KPE-2).

To use ALE, install an optional ALE unit (KPE-2) in the transceiver and write ALE configuration data to the transceiver by using KPG-102D.

Note: ALE is only available for a transceiver having firmware version 2.00 or later. KPG-102D version 2.00 or later is required to configure the ALE functions.

28.1 Basic Configuration of ALE

This section describes the basic configuration for using ALE.

28.1.1 Transmit and Receive Frequencies

Transmit and receive frequencies must be configured for sending and receiving on ALE channels.

A transmit frequency and a receive frequency can be configured for each ALE channel by using KPG-102D.

Table 28-1 Transmit/Receive Frequency

	Range [kHz]	In steps of [kHz]
Receive Frequency	30.00 kHz to 30000.00 kHz	0.01 kHz
Transmit Frequency	1605.00 kHz to 30000.00 kHz	

■ Configuration using KPG-102D

- Configuring the Transmit Frequency and Receive Frequency for each Channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.2 Communication Mode (Signal Type)

The signal type used on an ALE channel is configurable. LSB or USB can be configured for the communication mode.

The communication mode can be configured for each channel by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Communication Mode for each ALE channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.3 Transmit Power

Using the correct Transmit Power reduces the possibility of interfering with other stations. The transmission power of the transceiver should be configured as low as possible, yet the configuration should still allow stable and reliable communication.

Transmit power can be configured for each ALE channel by using KPG-102D.

Table 28-2 Transmit Power

Configuration	Transmit Power
Low	5 W
Medium-Low	25 W
Medium	50 W
High	100 W

■ Configuration using KPG-102D

- Configuring the Transmit Power for each ALE channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.4 Pre-amplifier/ Attenuator

Pre-amplifier/ Attenuator can be configured for each ALE channel by using KPG-102D. Refer to 7.4 Pre-amplifier/ Attenuator on page 17 for details of Pre-amplifier/ Attenuator.

■ Configuration using KPG-102D

- Configuring the Pre-amplifier/ Attenuator for each ALE channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.5 AT Auto Tune

AT Auto Tune automatically tunes the antenna if an external antenna tuner is used. On an ALE channel on which this function is enabled, the transceiver automatically tunes the antenna as necessary. To use this function, connect an optional KAT-1 external antenna tuner or other antenna tuners to the transceiver and enable this function.

AT Auto Tune can be configured to be enabled or disabled for each ALE channel by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the AT Auto Tune to be Enabled or Disabled for each ALE Channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.6 ANT

The logic level available at the AUX Output port can be configured for use when the ALE channel is changed. If the ALE channel is changed while AUX is configured for one of AUX 1 to AUX 3 ports on the transceiver, the AUX Output port goes to the logic level (High or Low) configured by using this function.

Following are the logic levels according to the ANT # configuration and AUX Output port status.

Table 28-3 Output Logic Level

ANT # Configuration	AUX Output Port Status	
	Active = Low	Active = High
1	High	Low
2	Low	High

AUX must be configured for one of AUX 1 to AUX 3 ports and the ANT # must be configured for each channel by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the AUX for one of AUX 1 to AUX 3 ports on the Transceiver (Refer to FPRG 5.10 Extended Function Window.)
- Configuring the ANT # for each ALE Channel (Refer to FPRG 5.5.1 Channel Information Window.)

28.1.7 Net Address

Net Address is used for making a Net Call. A "Net" is an aggregate of stations that are associated with the net address.

Net Address can be configured for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Net Address for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.8 Self Address

Self Address is your own address.

Self Address can be configured for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Self Address for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.9 Scan Rate

Scan Rate is the interval for scanning ALE channels. The transceiver continues to scan channels repeatedly with the interval configured for Scan Rate while the transceiver is in standby mode.

Scan Rate can be configured for each Net by using KPG-102D.

Note: If Net Mode is configured for ALE operation, the transceiver always scans while the transceiver is in standby mode. Scan cannot be manually stopped. The transceiver does not scan if Channel Mode is configured for ALE operation.

■ Configuration using KPG-102D

- Configuring the Scan Rate for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.10 Tune Time

Tune Time is configured the maximum amount of time allocated for the target (called) station to complete antenna tuning. The source (calling) station making a call adds this amount of time to the maximum time to wait to receive the response from the target (called) station.

Tune Time can be configured for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Tune Time for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.11 Listen-before-transmit Time

Listen-before-transmit Time is the amount of time for the transceiver to search for an available ALE channel before making an ALE Call.

Listen-before-transmit Time can be configured for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Listen-before-transmit Time for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.12 Receive AllCall

Receive AllCall is used to receive an AllCall. If this function is enabled, the transceiver can receive an AllCall. If the transceiver receives an AllCall and the link is established, the transceiver can communicate with all stations that received the AllCall (Refer to 28.2.11 Receiving an AllCall on page 103.)

Receive AllCall can be configured by using KPG-102D to allow the transceiver to receive an AllCall for each Net.

■ Configuration using KPG-102D

- Configuring whether the Transceiver is Enabled to Receive an AllCall for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.13 Send AllCall

Send AllCall is used to send an AllCall. If this function is enabled, the transceiver can send an AllCall (Refer to 28.2.10 Making an AllCall on page 102.)

Send AllCall can be configured by using KPG-102D to allow the transceiver to make an AllCall for each Net.

■ Configuration using KPG-102D

- Configuring whether the Transceiver is Enabled to Send an AllCall for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.14 LQA (Link Quality Analysis) Request

LQA (Link Quality Analysis) Request is used to request the target (receiving) party to report the LQA Score when making an Individual Call or Net call.

LQA (Link Quality Analysis) allows the transceiver to evaluate the quality of channels to determine the optimum channel to communicate. The report of the LQA Score contains data obtained by evaluating the communication quality over a particular channel and scoring the results of the evaluation. The target (receiving) station that receives the request for the LQA Score from the source (calling) station sends the LQA Score back to the source (calling) station.

LQA (Link Quality Analysis) Request can be configured to be enabled or disabled for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the LQA (Link Quality Analysis) Request to be Enabled or Disabled for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.15 Net Members

The Self Address of a station that belongs to the net (net member of your group) can be registered in Net Members. All members in the same net can be called by making a Net Call. A maximum of 20 net members can be configured for each net. (Refer to 28.2.8 Making a Net Call on page 100.)

Net Member can be configured for each Net by using KPG-102D.

■ Configuration using KPG-102D

- Configuring a Net Member for each Net (Refer to FPRG 5.5.2 Net Configuration Window.)

28.1.16 Wait for Activity Timer

Wait for Activity Timer is the amount of time from when the link is established until the link is automatically terminated (link termination) when the transceiver makes or receives an ALE Call. The link is automatically terminated after this duration elapses when no **PTT** (microphone) switch has been pressed and the time for link establishment exceeds the amount of time configured for the Wait for Activity Timer.

Wait for Activity Timer can be configured by using KPG-102D.

Note: Selecting "TERMINATION" from the ALE Call menu manually terminates the link. (Refer to [28.2.12 Terminating the Link on page 103.](#))

■ Configuration using KPG-102D

- Configuring the Wait for Activity Timer (Refer to FPRG 5.5.4 Options Window.)

28.1.17 LQA Score Threshold Level

LQA Score Threshold Level is the minimum level of the LQA score needed for link establishment. If the signal quality from the target (receiving) station responding does not exceed the LQA Score Threshold Level, the transceiver does not establish the link. (Refer to [28.1.14 LQA \(Link Quality Analysis\) Request on page 94.](#))

LQA Score Threshold Level can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the LQA Score Threshold Level (Refer to FPRG 5.5.4 Options Window.)

28.1.18 LQA Timeout

LQA Timeout is the amount of time to retain the LQA score. The LQA score is reset if the score is not updated before the time configured for LQA Timeout elapses. (Refer to [28.1.14 LQA \(Link Quality Analysis\) Request on page 94.](#))

LQA Timeout can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the LQA Timeout (Refer to FPRG 5.5.4 Options Window.)

28.1.19 AMD Frame

AMD Frame can be used to configure the transceiver to send an AMD message when making a call or sending an ACK. Normally the default setting is used, but the configuration must be changed if the transceiver cannot link with other manufacturers transceivers. (Refer to [28.3.1 Sending an AMD Message on page 105.](#))

AMD Frame can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the AMD Frame (Refer to FPRG 5.5.4 Options Window.)

28.1.20 Auto Address

When the transceiver receives data from a station that does not exist in the Address List, Auto Address can be used to add a receive address to the list used for making a call. If this function is enabled, a received address that does not exist in the Other Address List is automatically added. (Refer to FPRG 5.5.3 Other Address List Window.)

The addresses added to the Other Address List by using Auto Address are not retained in the transceiver.

Auto Address can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Auto Address to be Enabled or Disabled (Refer to FPRG 5.5.4 Options Window.)

28.1.21 Link Establishment Tone

Link Establishment Tone is the Alert Tone that sounds when the transceiver makes or receives an ALE call and the link is established.

Link Establishment Tone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Link Establishment Tone (Refer to FPRG 5.5.6 Misc. Features Window.)

28.1.22 Data Receive Tone

Data Receive Tone is the Alert Tone that sounds when the transceiver receives and stores an AMD message addressed to own station.

Data Receive Tone can be configured by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Data Receive Tone (FPRG 5.5.6 Misc. Features Window.)

28.2 Basic Operation of ALE

This section describes the basics of using the ALE function.

28.2.1 Enabling the ALE Function

ALE functions can be configured to be enabled or disabled by using KPG-102D. ALE functions can be enabled or disabled by selecting "CALL TYP" from User Menu.

Refer to 11.1 User Menu on page 28 for User Menu.

Note: ALE can be preset for Call Type by using KPG-102D if the transceiver is designated to be used in ALE Mode.

■ Transceiver Operation (User Menu only)

1. Select one of the following options.

- Press the **Menu** key.

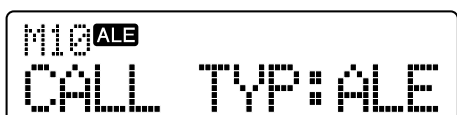
The transceiver enters User Menu Mode. Press the [▲] or [▼] key until "CALL TYP" appears.

- Press the **Call Type** key.

"CALL TYP" appears on the main display.

2. Press the [C] or [D>] key until "ALE" appears.

ALE is enabled and the "ALE" icon appears. If "OFF" or "SEL" is selected, ALE is disabled and the "ALE" icon does not appear.



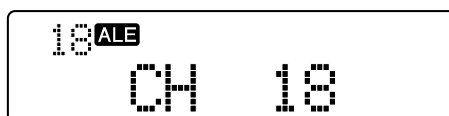
3. Press the [▲] key.

If Net Mode is configured for the ALE operating mode, the net address appears on the main display and the receiving ALE channel number appears on the sub-display.

If Net Mode is configured for the ALE operating mode, the transceiver always scans while the transceiver is in standby mode. Scan cannot be manually stopped.



The ALE channel appears if Channel Mode is configured for the ALE operating mode.



Note:

- ◆ The ALE channel cannot be used if ALE is disabled. If ALE is enabled, normal channels cannot be used.
- ◆ If ALE is enabled and the transceiver receives a call while Net Mode is configured for the ALE operating mode and "OFF" is configured for the ALE Monitor function, the transceiver mutes the received audio. The transceiver unmutes received audio when the link is established. (Refer to 28.2.14 ALE Monitor on page 104.)
- ◆ "ALE ERROR" appears on the main display if the transceiver cannot communicate with other ALE units properly while the ALE function is enabled.
- ◆ The transceiver automatically exits the current menu mode, etc. if the transceiver receives an ALE signal while you are making various configurations in User Menu, etc. after enabling the ALE function.
- ◆ If "ALE" is configured for Call Type and configuration data indicating that ALE is enabled is written to the ALE unit, ALE is available even if no normal channel is configured.
- ◆ If no ALE channel is configured while ALE is enabled, ALE cannot be disabled.
- ◆ If the transceiver is turned ON while ALE is enabled, "WAIT ..." appears on the main display until the ALE unit is activated after the Power-on Text appears on the main display.
- ◆ "ALE UNPRGD" appears on the main display if any ALE channel and Net are not configured while the ALE function is enabled.

■ Configuration using KPG-102D

- Configuring the ALE to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

28.2.2 ALE Call Menu

Prior to using various ALE functions, ALE must be assigned to any key on the transceiver. Various types of ALE calls can be made in ALE Call Menu. The following items are available in ALE Call Menu.

Table 28-4 ALE Call Menu

ALE Call Menu Item (Display)	Description
CALL ^{*1 *2}	Individual Call, Net Call, AllCall and transmission of AMD messages
GPS CALL ^{*1 *2 *3}	Manually sending GPS data
BI-DIRECT ^{*1 *4}	LQA score exchange
SOUNDING ^{*1 *4}	Manually sending Sounding
TERMINATION ^{*5}	Terminating the link

^{*1} This item cannot be configured while a link is established.

^{*2} This item cannot be selected if Channel Mode is configured for ALE operation and Net No. 1 is not configured.

^{*3} This item cannot be selected unless GPS Data Input is configured for COM port Settings.

^{*4} This item cannot be selected if Channel Mode is configured for ALE operation.

^{*5} This item can be selected while a link is established.

■ Transceiver Operation

1. Press the **ALE** key while the ALE function is enabled. ALE Call Menu is activated.
2. Press the [▲] or [▼] key to switch the ALE Call menu item.

The target station selection menu appears on the main display if the [D>] key is pressed while the "▶" appears on the right end of the main display for that item. Refer to each function for the following operations.

28.2.3 Selecting the ALE Operating Mode

While the ALE function is enabled, the operation mode can be selected from Net Mode, Channel Mode and VFO Mode.

The channel or frequency can be manually changed by changing the operation mode to Channel Mode or VFO Mode. This could be useful, for example, when the signal strength drops after a link is established in Net Mode.

In Net Mode, the transceiver can make an ALE call on the optimal channel in the selected Net by using the LQA. However, the transceiver cannot communicate until the link is established. The transceiver scans ALE channels that are configured in the Scan List while the transceiver is in standby mode.

In Channel Mode, the transceiver can be operated manually to communicate. The transceiver can also make various ALE calls in Channel Mode.

In VFO Mode, the transceiver frequency can be manually changed to establish communication.

The ALE operating mode can be changed by pressing the **ALE Operation Mode** key.

Note:

- ◆ Since the transceiver transmits and receives an ALE call in Channel Mode based on information configured for Net No.1, the transceiver cannot make an ALE call if Net No.1 is not configured for the transceiver. Net No.1 must be configured by using KPG-102D before making an ALE call in Channel Mode. (Refer to FPRG 5.5.2 Net Configuration Window.)
- ◆ In VFO Mode, the transceiver cannot transmit and receive various ALE calls except ALE Emergency Calls.

■ Transceiver Operation

● Alternating between Net Mode and Channel Mode

1. Press the **ALE Operation Mode** key.

If the **ALE Operation Mode** key is pressed while Net Mode is configured for the ALE operation mode, the transceiver enters Channel Mode. If the transceiver has already established a link, the transceiver enters Channel Mode on the current channel.

If the **ALE Operation Mode** key is pressed while Channel Mode is configured for the ALE operation mode, the transceiver enters Net Mode.

The mode name ("NET MODE", "CHANNEL MODE") appears on the main display for 1 second after the ALE operation mode is changed.

● Alternating between Net Mode and VFO Mode, or Channel Mode and VFO Mode

1. Press and hold the **ALE Operation Mode** key for 1 second.

If the **ALE Operation Mode** key is pressed and held for 1 second while Channel Mode is configured for the ALE operation mode, the transceiver enters VFO Mode.

If the **ALE Operation Mode** key is pressed and held for 1 second after the link is established and Net Mode is configured for the ALE operation mode, the transceiver enters VFO Mode.

If the **ALE Operation Mode** key is pressed and held for 1 second while VFO Mode is configured for the ALE operation mode, the transceiver reverts to the previous mode.

The mode name ("NET MODE", "CHANNEL MODE", "VFO MODE") appears on the main display for 1 second after the ALE operation mode is changed.

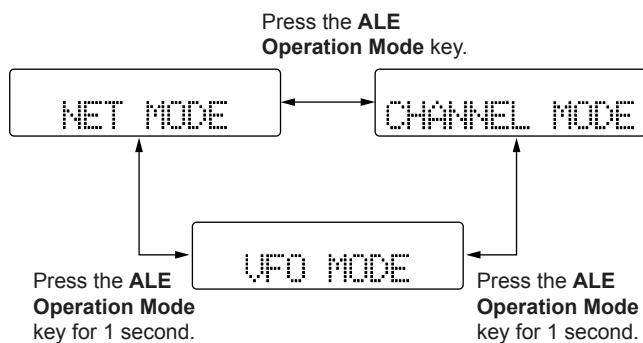


Figure 28-1 ALE Operation Mode Transition Diagram

Note:

- ◆ The default for ALE operating mode is Net Mode.
- ◆ The Net can be altered by pressing the [↗] or [↘] key in Net Mode. The ALE channel cannot be altered manually.
- ◆ The ALE channel can be altered by pressing the [↗] or [↘] key in Channel Mode.
- ◆ Transmission by user operation (such as pressing the PTT (microphone) switch) is disabled if no link is established in Net Mode.
- ◆ Carrier Squelch is enabled all the time in Channel Mode and VFO Mode.
- ◆ The transceiver does not scan in Channel Mode.
- ◆ If the transceiver enters VFO Mode, the receive frequency of the previous ALE channel is configured for the VFO frequency (simplex) default.
- ◆ If the transceiver enters VFO Mode, the configuration (Mode, Power, Pre-amp/Attenuator, AT Auto Tune and ANT #) of the previous ALE channel will be retained.
- ◆ If the ALE operation mode is changed while a link is established, the link will be terminated.

28.2.4 Changing the Net

The Net can be altered while the ALE operating mode is in Net Mode.

■ **Transceiver Operation**

1. Confirm that ALE operating mode is in Net Mode.



2. Press the [↗] or [↘] key.
The Net is changed.

Note:

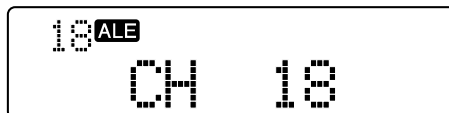
- ◆ The Net cannot be changed while the link is established.
- ◆ If the Net is changed while the transceiver is handshaking after receiving various calls (waiting to send a response or receive an ACK), the transceiver pauses the handshake operation and returns to standby mode.
- ◆ The Net cannot be changed while the transceiver is sending a response.
- ◆ The Net Address appears on the main display regardless of the display configuration in User Menu.
- ◆ If Net Mode is configured for the ALE operation mode, the transceiver always scans while the transceiver is in standby mode. Scan cannot be manually stopped. However, the transceiver may pause scanning due to a received signal or noise.

28.2.5 Changing the Channel

The ALE channel can be changed while Channel Mode is configured for the ALE operating mode.

■ **Transceiver Operation**

1. Confirm that ALE operating mode is in Channel Mode.



2. Press the [↗] or [↘] key.
The ALE channel is changed.

Note:

- ◆ The ALE channel cannot be changed while the link is established.
- ◆ If the ALE channel is changed while the transceiver is handshaking after receiving various calls (waiting to send a response or receive an ACK), the transceiver pauses the handshake operation and returns to standby mode.
- ◆ The ALE channel cannot be changed while the transceiver is sending a response.
- ◆ If Frequency Display is configured for Display in User Menu, the frequency of the selected ALE channel appears on the main display.

28.2.6 Making an Individual Call

The transceiver can make an Individual Call to a selected individual target party.

■ Transceiver Operation

1. Press the **ALE** key while the ALE function is enabled. ALE Call Menu is activated.
2. Press the [**▲**] or [**▼**] key until "CALL" appears.



Note: A user can make a call to the last called station by pressing the [**■**] key or the **PTT** (microphone) switch.

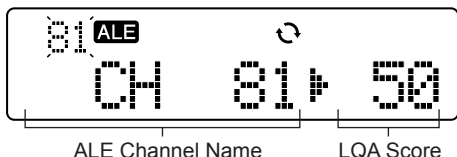
3. Press the [**D>**] key. The address of the last called party appears.
4. Press the [**▲**] or [**▼**] key until the target station address appears. Select an address from the registered Other Address list.



Go to step 5 in order to make a call by selecting a channel. Otherwise, go to step 6.

5. Press the [**D>**] key. The best ALE channel from the Scan List in the Net is selected by the LQA and this channel appears on the main display. In this case, the ALE channel name appears using the left 8 digits on the main display and the LQA score on the right 4 digits (3 digits) on the main display.

A different ALE channel can be selected by pressing the [**▲**] or [**▼**] key in Net Mode.



Note:

- ◆ The LQA score can be displayed or hidden by pressing the [**B**] key. If the LQA score is hidden, the 12-digit ALE channel name appears.
 - ◆ In Net Mode, the channel selection menu does not appear on the main display if the transmission is prohibited on all channels configured in the Scan List of the selected Net.
 - ◆ In Channel Mode, the channel selection menu does not appear on the main display.
 - ◆ If a call is made by selecting a channel, the transceiver attempts to establish a link by using that channel only.
6. Press the [**■**] key or **PTT** (microphone) switch. The transceiver starts transmitting. The target station's address and the "**ALE**" icon blink.



If the link is established, "LINKED" appears and the Link Establishment Tone sounds. In this case, the "**ALE**" icon stops blinking and the LED flashes orange.



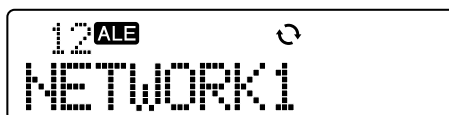
The target station's name appears on the main display if the transceiver starts transmitting by a user pressing the **PTT** (microphone) switch or any key.



If the link fails, the Call Error Tone sounds and "NO REPLY" appears. "NO REPLY" automatically disappears when the transceiver receives a valid call or Sounding signal.



The transceiver returns to standby mode if a key is pressed.



28 ALE (Automatic Link Establishment)

Note:

- ◆ If the [△] key is pressed while the transceiver is making an Individual Call, the transceiver stops transmitting and returns to standby mode.
- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before making an ALE Call. If the antenna cannot be tuned, the transceiver does not transmit on the ALE channel and the link cannot be established. (Refer to 28.1.5 AT Auto Tune on page 93.)
- ◆ The LQA Score is reset if the score is not updated before the time configured for LQA Timeout elapses. (Refer to 28.1.18 LQA Timeout on page 95.)
- ◆ If the transceiver starts making a call without selecting a channel and no link is established, the transceiver attempts to establish a link by changing the channel according to the Call Channel Sequence.
- ◆ If the measured LQA score to make a call is lower than the LQA Score Threshold Level, the transceiver moves to the next available channel to make a call without establishing a link on the current channel. The link test using the LQA Score Threshold Level is not done if no link is established on any channel and the transceiver attempts to make a call on the channel where the transceiver first made a call. In Channel Mode, the transceiver does not do a link test using the LQA Score Threshold Level.
- ◆ Refer to 28.5 Receiving a Call while a Link is Established on page 118 for transceiver response when the transceiver receives a call including the LQA score exchange while a link is established.
- ◆ In Channel Mode, an error occurs if the [■] key or the PTT (microphone) switch is pressed while a transmission on the selected channel is prohibited. In Net Mode, an ALE channel on which transmission is prohibited cannot be selected. An error may occur if the [■] key or the PTT (microphone) switch is pressed while no channel is selected and transmission on all channels configured in the Scan List of the selected Net is prohibited.
- ◆ If the transceiver fails to make an Individual Call, the Call Error Tone sounds and the following appears on the main display.

If the last channel on which the transceiver attempted to establish a link was Busy:	CH BUSY
If the antenna tuning failed on the last channel on which the transceiver attempted to establish a link:	AT.TUNE FAIL

The transceiver returns to normal standby mode if any key is pressed while the above appears on the main display. The above display automatically disappears when the transceiver receives a valid call or Sounding signal.

28.2.7 Receiving an Individual Call

If the link is established after receiving an Individual Call, the transceiver can communicate with the linked party.

■ Transceiver Operation

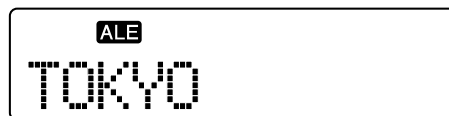
1. The transceiver detects an ALE signal.

The “ALE” icon blinks.



2. The transceiver automatically starts a handshake for an Individual Call addressed to own station.

The address of the caller appears and the Link Establishment Tone sounds when the link is established. In this case, the “ALE” icon stops blinking and the LED flashes orange.



Note:

- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before transmitting a response. If the antenna is not tuned, the transceiver automatically returns to standby mode without transmitting the response. (Refer to 28.1.5 AT Auto Tune on page 93.)
- ◆ Refer to 28.5 Receiving a Call while a Link is Established on page 118 for transceiver response when the transceiver receives a call including the LQA score exchange while a link is established.

28.2.8 Making a Net Call

All members in the selected net can be called by making a Net Call.

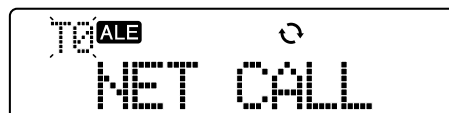
■ Transceiver Operation

1. Press the ALE key while the ALE function is enabled. ALE Call Menu is activated.
2. Press the [▲] or [▼] key until “CALL” appears.



Note: A user can make a call to the last called station by pressing the [■] key or the PTT (microphone) switch.

3. Press the [D>] key. The address of the last called party appears.
4. Press the [▲] or [▼] key until “NET CALL” appears.

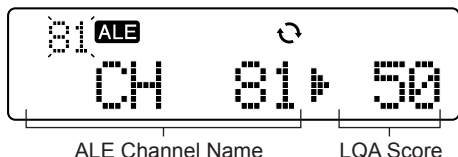


Go to step 5 in order to make a call by selecting a channel. Otherwise, go to step 6.

5. Press the [D>] key.

The best ALE channel from the Scan List in the Net is selected by the LQA and the channel appears on the main display. In this case, the ALE channel name appears on the 8 digits from the left of the main display and the LQA score appears on the 4 digits from the right of the main display.

A different ALE channel can be selected by pressing the [▲] or [▼] key in Net Mode.

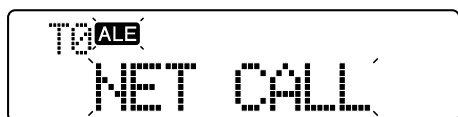


Note:

- ◆ The LQA score can be displayed or hidden by pressing the [B] key. If the LQA score is hidden, the 12-digit ALE channel name appears.
- ◆ In Net Mode, the channel selection menu does not appear on the main display if the transmission is prohibited on all channels configured in the Scan List of the selected Net.
- ◆ In Channel Mode, the channel selection menu does not appear on the main display.
- ◆ If a call is made by selecting a channel, the transceiver attempts to establish a link by using that channel only.

6. Press the [■] key or PTT (microphone) switch.

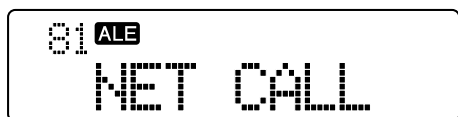
The transceiver starts transmitting. "NET CALL" and the "ALE" icon blink.



If the link is established, "LINKED" appears and the Link Establishment Tone sounds. In this case, the "ALE" icon stops blinking and the LED flashes orange.



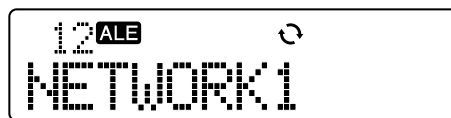
The target station's name appears on the main display if the transceiver starts transmitting by a user pressing the PTT (microphone) switch or any key.



If the link fails, the Call Error Tone sounds and "NO REPLY" appears. "NO REPLY" automatically disappears when the transceiver receives a valid call or Sounding signal.



The transceiver returns to standby mode if a key is pressed.



Note:

- ◆ If the [▲] key is pressed while the transceiver is making a Net Call, the transceiver stops transmitting and returns to standby mode.
- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before making an ALE Call. If the antenna cannot be tuned, the transceiver does not transmit on the ALE channel and the link cannot be established. (Refer to 28.1.5 AT Auto Tune on page 93.)
- ◆ The LQA score is reset if not updated before the time configured for LQA Timeout elapses. (Refer to 28.1.18 LQA Timeout on page 95.)
- ◆ If a user starts making a call without selecting a channel, the transceiver attempts to establish a link by changing the channel according to the Call Channel Sequence.
- ◆ Refer to 28.5 Receiving a Call while a Link is Established on page 118 for transceiver action when the transceiver receives a call including the LQA score exchange while a link is established.
- ◆ In Channel Mode, an error occurs if the [■] key or the PTT (microphone) switch is pressed while transmission on the selected channel is prohibited. In Net Mode, an ALE channel on which transmission is prohibited cannot be selected. An error occurs if the [■] key or the PTT (microphone) switch is pressed while no channel is selected and transmission on all channels configured in the Scan List of the selected Net is prohibited.
- ◆ If the transceiver fails to make a Net Call, the Call Error Tone sounds and the following appears on the main display.

If the last channel on which the transceiver attempted to establish the link was Busy:	CH BUSY
If the antenna tuning failed on the last channel on which the transceiver attempted to establish the link:	AT.TUNE FAIL

The transceiver returns to normal standby mode if any key is pressed while the above appears on the main display. The above display automatically disappears when the transceiver receives a valid call or Sounding signal.

28.2.9 Receiving a Net Call

If the link is established after receiving a Net Call, the transceiver can communicate with multiple Net Members in the same Net.

■ Transceiver Operation

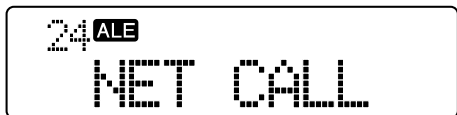
1. The transceiver detects an ALE signal.

The “ALE” icon blinks.

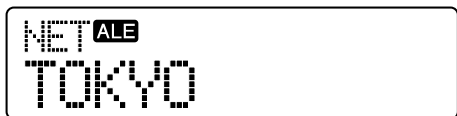


2. The transceiver automatically starts a handshake if the selected station receives the Net Call.

“NET CALL” appears on the main display.



The net address appears and the Link Establishment Tone sounds when the link is established. In this case, the “ALE” icon stops blinking and the LED flashes orange.



Note:

- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before transmitting a response. If the antenna is not tuned, the transceiver automatically returns to standby mode without transmitting the response. (Refer to 28.1.5 AT Auto Tune on page 93.)
- ◆ Refer to 28.5 Receiving a Call while a Link is Established on page 118 for transceiver action when the transceiver receives a call including the LQA score exchange while a link is established.

28.2.10 Making an AllCall

All stations can be called by making an AllCall. AllCall can establish a link to all stations in the area covered by your radio signal.

The following configurations by using KPG-102D are required to make an AllCall.

- **Configuring the AllCall Channel:**
Configure the channel used for making an AllCall.
- **Enabling Send AllCall:**
Enable Send AllCall to make an AllCall. (Refer to 28.1.13 Send AllCall on page 94.)

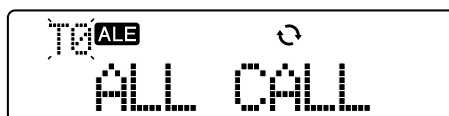
■ Transceiver Operation

1. Press the **ALE** key while the ALE function is enabled. ALE Call Menu is activated.
2. Press the [**▲**] or [**▼**] key until “CALL” appears.



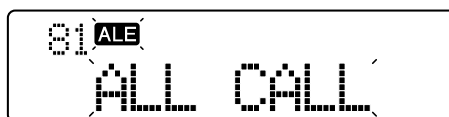
Note: A user can make a call to the last called party by pressing the [**■**] key or the PTT (microphone) switch.

3. Press the [**D>**] key.
The address of the last called party appears.
4. Press the [**▲**] or [**▼**] key until “ALL CALL” appears.



5. Press the [**■**] key or PTT (microphone) switch.

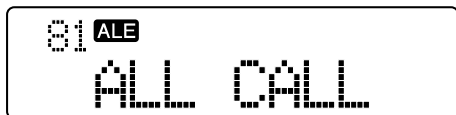
“ALL CALL” and the “ALE” icon blink and the transceiver makes an AllCall on the AllCall Channel. If AllCall Channel is not configured, the transceiver makes an AllCall on the lowest-numbered channel in the Scan List.



If the link is established, “LINKED” appears and the Link Establishment Tone sounds. In this case, the “ALE” icon stops blinking and the LED flashes orange.



The target station's name appears on the main display if the transceiver starts transmitting by a user pressing the PTT (microphone) switch or any key.

**Note:**

- ◆ If Channel Mode is configured for the ALE operating mode, the transceiver transmits on the selected ALE channel ignoring the AllCall Channel configuration.
- ◆ If the [Δ] key is pressed while the transceiver is making an AllCall, the transceiver stops transmitting and returns to standby mode.
- ◆ Refer to [28.5 Receiving a Call while a Link is Established on page 118](#) for transceiver action when the transceiver receives various types of call including the LQA score exchange while a link is established.
- ◆ An error also occurs if the [■] key or the PTT (microphone) switch is pressed while transmissions on the AllCall Channel are prohibited.
- ◆ If the transceiver fails to make an AllCall, the Call Error Tone sounds and the following appears on the main display.

If the channel was Busy:	CH BUSY
If Antenna Tuning failed:	AT.TUNE FAIL

The transceiver returns to normal standby mode if any key is pressed while the above display appears. The above display automatically disappears when the transceiver receives a valid call or Sounding signal.

■ Configuration using KPG-102D

- Configuring the AllCall Channel (Refer to FPRG 5.5.2 Net Configuration Window > ■ Scan List Window, ■ AllCall Channel.)
- Configuring whether to enable the Transmission of an AllCall (Refer to FPRG 5.5.2 Net Configuration Window.)

28.2.11 Receiving an AllCall

If the transceiver receives an AllCall and the link is established, the transceiver can communicate with all stations that made or received the AllCall.

To receive an AllCall, Receive AllCall must be enabled by using KPG-102D. (Refer to [28.1.12 Receive AllCall on page 94.](#))

■ Transceiver Operation

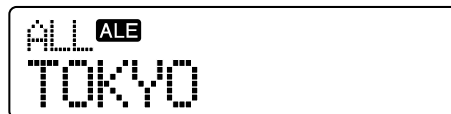
1. The transceiver detects an ALE signal.

The “ALE” icon blinks.



2. The link for making an AllCall is established.

Link Establishment Tone sounds. In this case, the “ALE” icon stops blinking and the LED flashes orange.

**Note:**

- ◆ When the transceiver receives an AllCall, the link is established without a handshaking operation.
- ◆ Refer to [28.5 Receiving a Call while a Link is Established on page 118](#) for transceiver action when the transceiver receives various types of call including the LQA score exchange while a link is established.

■ Configuration using KPG-102D

- Configuring whether to enable the Transmission of an AllCall (Refer to FPRG 5.5.2 Net Configuration Window.)

28.2.12 Terminating the Link

Terminating the link is referred to as link termination. The link is automatically terminated after a duration equal to the Wait for Activity Timer elapses without the PTT (microphone) switch being pressed after link establishment. (Refer to [28.1.16 Wait for Activity Timer on page 95.](#))

If a user wishes to terminate the link, the link can be manually terminated.

■ Transceiver Operation

1. Press the ALE key while the link to the target station is established.

ALE Call Menu is activated and “TERMINATION” appears on the main display.



2. Press the [■] key or PTT (microphone) switch.

The transceiver terminates the link. “TERMINATION” and the “ALE” icon blink while the transceiver is sending link termination data.



The transceiver returns to standby mode when link termination is completed.



Note:

- ◆ The link termination cannot be canceled while the transceiver is sending link termination data.
- ◆ If the link was established after receiving a Net Call or AllCall, the transceiver does not send the link termination data when terminating the link.

28.2.13 Auto Antenna Tuning

The antenna can automatically be tuned while the transceiver is operated with an ALE unit. Auto Antenna Tuning is done on an ALE channel for which AT Auto Tune is enabled. (Refer to 28.1.5 AT Auto Tune on page 93.)

This function is available for the KAT-1 and other antenna tuners besides the KAT-1 as well.

When using another antenna tuner, Auto Antenna Tuning must be enabled by using KPG-102D and the Auto Antenna Tuning Duration must be configured. The antenna tuner tunes for the amount of time configured for the Auto Antenna Tuning Duration. However, other antenna tuners will not tune if the transceiver responds to receive the Net Call.

Transceiver action in each mode is as follows.

● **Transceiver Response in Net Mode:**

Auto Antenna Tuning is done before making a Net Call or response.

● **Transceiver Response in Channel Mode:**

Auto Antenna Tuning is done when the transceiver migrates to an ALE channel for which AT Auto Tune is enabled. The antenna tuner starts tuning the antenna 1 second after the transceiver migrates to a new channel in order to change channels continuously.

● **Transceiver Response in VFO Mode:**

Auto Antenna Tuning is done when the VFO frequency is changed in VFO Mode after the transceiver migrates to an ALE channel for which AT Auto Tune is enabled.

The antenna tuner starts tuning the antenna 1 second after the frequency is changed in order to change frequencies continuously.

Note: Auto Antenna Tuning is done when the transceiver is turned OFF and ON while the transceiver is in Channel Mode or VFO Mode.

■ **Configuration using KPG-102D**

- Configuring the AT Auto Tune to be Enabled or Disabled (Refer to FPRG 5.5.1 Channel Information Window.)
- Configuring the Antenna Tuner Control to be Enabled or Disabled (Refer to FPRG 5.2.3 Receive/Transmit Tab.)
- Configuring the Auto Antenna Tuning Duration (Refer to FPRG 5.2.3 Receive/Transmit Tab.)

28.2.14 ALE Monitor

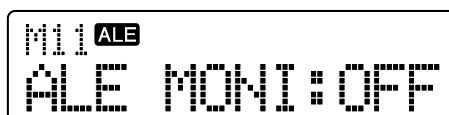
ALE Monitor allows a user to monitor ALE signals while the transceiver is in standby mode. ALE Monitor can be configured by selecting “ALE MONI” from the User Menu, and then selecting “ON” or “OFF”.

Refer to 11.1 User Menu on page 28 for User Menu.

■ **Transceiver Operation (User Menu only)**

1. Press the **Menu** key.

The transceiver enters User Menu Mode. Select “ALE MONI” by pressing the [▲] or [▼] key.



2. Press the [**C**] or [**D**] key to select “ON” or “OFF”.

If “OFF” is selected, received audio is muted while no link is established (the transceiver is in standby mode). If “ON” is selected, Carrier Squelch is enabled regardless of the link status.



- Press the [▲] key.
The transceiver exits User Menu Mode.

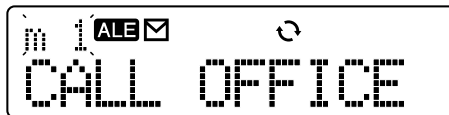
Note:

- ◆ If the configuration data is written to the transceiver by using KPG-102D, ALE Monitor will be reset to "OFF".
- ◆ In Channel Mode, Carrier Squelch is always enabled regardless of the configuration of ALE Monitor ("ON" or "OFF").
- ◆ Squelch is always open while a link is established.

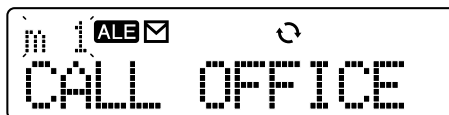
- Press the [▲] or [▼] key until the address or net address of the target station appears to send an AMD message.



- Press the [A] key.
The last selected AMD Message appears and the "☑" icon appears. The AMD Message number blinks on the sub-display.



- Press the [▲] or [▼] key until the desired AMD Message appears.
Select an AMD message from AMD Message 1 to AMD Message 10 configured in the transceiver and AMD Message 0 that can be modified.



If the length of the AMD Message to display exceeds 12 digits, the message is automatically scrolled. The message can manually be scrolled by pressing the [C] or [D] key.
If no AMD Message is configured, "EMPTY" appears.



Go to step 7 in order to make a call by selecting a channel. Otherwise, go to step 8.

- Press the [D] key.
The best ALE channel from the Scan List in the Net is selected by the LQA and it appears on the main display. In this case, the ALE channel name appears on the 8 digits from the left of the main display and the LQA score appears on the 4 digits from the right of the main display.

A different ALE channel can be selected by pressing the [▲] or [▼] key in Net Mode.

28.3 Advanced Operation of ALE

This section describes advanced operation of ALE.

28.3.1 Sending an AMD Message

The transceiver can send an AMD message with a maximum of 90 alphanumeric characters and symbols while making an Individual Call, Net Call or AllCall.

A maximum of 10 AMD messages to be sent can be configured by using KPG-102D. A configured AMD Message also can be edited on the transceiver.

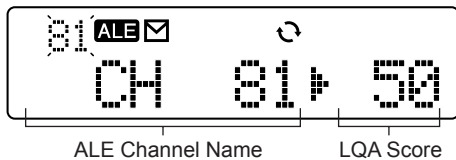
■ Transceiver Operation

- **Selecting and Sending an AMD Message**
 - Press the ALE key while the ALE function is enabled.
ALE Call Menu is activated.
 - Press the [▲] or [▼] key until "CALL" appears.



Note: A user can make a call to the last called party by pressing the [M] key or the PTT (microphone) switch.

- Press the [D] key.
The address or Net Address of the last called party appears.



The transceiver returns to standby mode if any key is pressed.



Note:

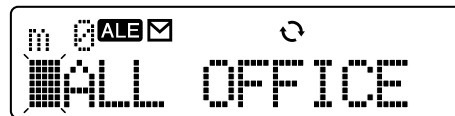
- ◆ The LQA score can be displayed or hidden by pressing the [B] key. If the LQA score is hidden, the 12-digit ALE channel name appears.
 - ◆ In Channel Mode, the channel selection display does not appear on the main display.
 - ◆ If a call is made by selecting a channel, the transceiver attempts to establish a link by using that channel only.
8. Press the [M] key or PTT (microphone) switch.
The transceiver starts transmitting. The target station's address, "ALE" and "☑" icon blink until the link is established.

● **Editing and Sending an AMD Message**

1. Select an AMD Message to edit.
Select the AMD Message to edit by referring to steps 1 to 6 in "● Selecting and Sending an AMD Message".

2. Press and hold the [A] key for 1 second or press the microphone keypad.

The source AMD Message is copied to AMD Message 0 and the transceiver enters Edit Mode for the AMD Message 0. If the source message is AMD Message 0, the transceiver enters Edit Mode directly.



If the link is established, "LINKED" appears and the Link Establishment Tone sounds. In this case, the "ALE" icon stops blinking and the LED flashes orange.

Key operation in Edit Mode is as follows.



The target station's name appears on the main display if the transceiver starts transmitting by a user pressing the PTT (microphone) switch or any key.



If the link fails, the Call Error Tone sounds and "NO REPLY" appears. "NO REPLY" automatically disappears when the transceiver receives a valid call or Sounding signal.



Table 28-5 Key Operation

Key	Operation	
Front Panel	[△] key	Finishes editing the message.
	[A] key	Press: Clears a character. Hold Down: Clears all characters.
	[B] key	Disabled
	[<C] key	Moves the cursor to the left.
	[D>] key	Moves the cursor to the right.
	[■] key	Starts making a call (end of editing).
	[∧] key	Selects a character (all types).
	[∨] key	Selects a character (all types).
	[^] key	Increases the volume level.
	[v] key	Decreasing the volume level.
Mic Keypad	[1] key	Selects a character (1).
	[2] key	Selects a character (A, B, C, 2).
	[3] key	Selects a character (D, E, F, 3).
	[4] key	Selects a character (G, H, I, 4).
	[5] key	Selects a character (J, K, L, 5).
	[6] key	Selects a character (M, N, O, 6).
	[7] key	Selects a character (P, Q, R, S, 7).
	[8] key	Selects a character (T, U, V, 8).
	[9] key	Selects a character (W, X, Y, Z, 9).
	[0] key	Selects a character (SP, 0, *, #).
	[*] key	Moves the cursor to the right.
	[#] key	Press: Clears a character. Hold Down: Clears all characters.
	[A], [B], [C] and [D] keys	Disabled

The following alphanumeric characters and symbols can be entered.

Table 28-6 Available Alphanumeric Characters and Symbols

(space) ! " # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ [\] ^ _ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

- Press the [△] key after editing the AMD Message. The display returns to the Message selection menu.



The address appears if the [A] key is pressed while the Message selection menu is visible.



If the [A] key is pressed while an address is displayed, the "ALE" icon disappears and the AMD Message is no longer added to a call. Press the [A] key again and select an AMD Message when adding an AMD Message to a call.

- Make an Individual Call or Net Call after adding the selected AMD Message. Refer to steps 7 to 8 in "Selecting and Sending an AMD Message".

Note:

- If the transceiver starts making a call without attaching the AMD Message, the call will be a normal Individual Call or Net Call. Refer to each section for supplemental information on an Individual Call and Net Call. (Refer to 28.2.6 Making an Individual Call on page 99, 28.2.8 Making a Net Call on page 100.)
- AMD Message 0 is initialized and any data will be erased for the AMD Message 0 when the transceiver is turned ON.

Configuration using KPG-102D

- Configuring an AMD Message (Refer to FPRG 5.5.5 Applications Window > AMD 1 and AMD 2 Tabs.)

28.3.2 Receiving an AMD Message

The transceiver can receive an AMD Message sent to your own station.

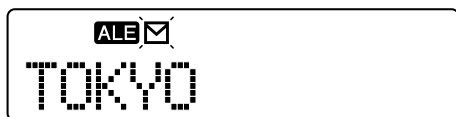
Transceiver Operation

- The transceiver detects an ALE signal. The "ALE" icon blinks.



- The received AMD Message is stored in the transceiver.

The Data Receive Tone sounds and the "ALE" icon blink. The transceiver automatically starts a handshake operation and the Link Establishment Tone sounds when the link is established, and then the caller's address appears. In this case, the "ALE" icon stops blinking and the LED flashes orange.



The transceiver automatically returns to standby mode if the received call does not request a link.



Note:

- ◆ The transceiver can store a maximum of 10 received AMD Messages.
- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before transmitting a handshake. If the antenna is not tuned, the transceiver automatically returns to standby mode without transmitting the handshake. (Refer to 28.1.5 AT Auto Tune on page 93.)
- ◆ Refer to 28.5 Receiving a Call while a Link is Established on page 118 for transceiver action when the transceiver receives various types of call including the LQA score exchange while a link is established.

28.3.3 Checking and Deleting an AMD Message

The transceiver can store a maximum of 10 received AMD messages. The stored AMD Message can be checked or deleted.

The “☑” icon appears if there is a stored AMD Message. The “⏏” icon blinks if there is an unread AMD Message.

■ Transceiver Operation

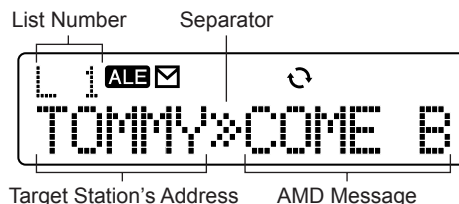
● Checking the Stored AMD Message

1. Press the **ALE** key while an AMD Message is stored.

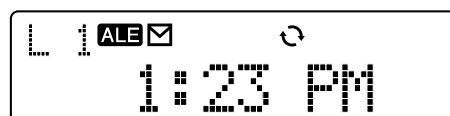
The transceiver enters AMD Stack Mode and the latest message (list number 1) appears. The caller’s address and AMD Message appear on the main display.

If the length of the AMD Message to display exceeds 12 digits, the message can automatically be scrolled 1.5 seconds after the message appears. The message can be manually scrolled by pressing the **<C>** or **[D>]** key.

Press the **[▲]** or **[▼]** key to switch the list number and view other AMD messages.



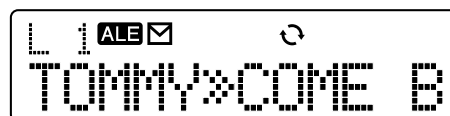
Press the **[B]** key to view the time that the transceiver received the AMD Message. If the **[B]** key is pressed again, the transceiver returns to the message display.



2. Press the **[▲]** key.
The transceiver exits from AMD Stack Mode.

● Deleting the Stored AMD Message

1. Press the **ALE** key for one second while an AMD Message is stored.
The transceiver enters AMD Stack Mode.
2. Select an AMD Message to delete by pressing the **[▲]** or **[▼]** key.



3. Press the **[A]** key.
“DELETE?” appears on the main display.



Press the **[▲]** key to return to standby mode without deleting messages.

4. Press the **[■]** key.
The selected AMD Message will be deleted.

● Deleting All Stored AMD Messages

1. Press the **ALE** key for one second while an AMD Message is stored.
The transceiver enters AMD Stack Mode.
2. Press and hold the **[A]** key for 1 second.
“ALL” appears on the sub-display and “DELETE?” appears on the main display.



Press the [Δ] key to return to standby mode without deleting messages.

3. Press the [■] key.

All stored AMD Messages will be deleted and "EMPTY" appears on the main display for 1 second. Then, the transceiver returns to standby mode.

Note:

- ◆ If 10 AMD messages have already been stored and the transceiver receives a new AMD Message, the oldest message is cleared from the stack and the newest AMD Message is stored.
- ◆ If the same message sent from the same caller has already been stored when the transceiver receives a new AMD Message, the time stamp of the stack will be updated.

28.3.4 ALE Direct Call

The transceiver can make an Individual Call to a preconfigured station when the user presses one of the **ALE Direct Call 1** to **ALE Direct Call 4** keys. The transceiver can also send an AMD Message.

To use this function, the following configurations are required by using KPG-102D.

- **Configuring the Target Address and Self Address:**

Configure the Target Address used for making a Direct Call and the corresponding Self Address.

- **Configuring the AMD Message:**

Configure the desired AMD Message to be sent with Direct Call when making a Direct Call with AMD Message.

- **Assigning ALE Direct Call 1 to ALE Direct Call 4 Keys:**

Assign the ALE Direct Call 1 to ALE Direct Call 4 to PF keys. (Refer to 4 KEY ASSIGNMENT on page 10.)

- **Transceiver Operation**

1. Press one of the **ALE Direct Call 1** to **ALE Direct Call 4** keys.

The transceiver initiates an Individual Call to the station that is configured for the Target Address. The calling station's address appears and the "ALE" icon blinks until the link is established.



If the link is established, "LINKED" appears and the Link Establishment Tone sounds. In this case, the "ALE" icon stops blinking and the LED flashes orange.



The target party's name appears on the main display if the transceiver starts transmitting by a user pressing the **PTT** (microphone) switch or any key.



If the link is not established, the Call Error Tone sounds and "NO REPLY" appears.



The transceiver returns to standby mode if a key is pressed.



- **Configuration using KPG-102D**

- Configuring a Direct Call (Refer to FPRG 5.5.5 Applications Window > ■ Direct Call Tab.)
- Assigning the Direct Call 1 to Direct Call 4 to PF Keys (Refer to FPRG 5.3 Key Assignment Window.)

28.3.5 GPS Data Automatic Transmission

The GPS data can be automatically sent by using the AMD function.

To send the GPS data, the following configurations are required by using KPG-102D.

- **Configuring the Target Address and Self Address:**

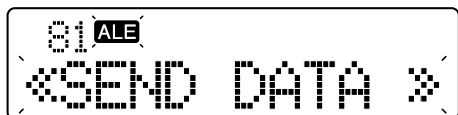
Configure the Target Address used for automatically sending the GPS data and the corresponding Self Address.

- Configuring the Data Transmit Channel:**
 Configure the ALE channel used for automatically sending the GPS data. If Auto is configured for Data Transmit Channel, the transmit channel is automatically determined by LQA.
- Configuring the COM port Settings:**
 To send the GPS data, GPS Data Input must be configured for COM Port Settings.
- Configuring the GPS Report Interval Time:**
 Configure the interval to automatically send the GPS data to the target party. (Refer to 22.1.4 GPS Report Interval Time on page 79.)
- Configuring the GPS Time Mark:**
 Configure the offset time before sending the GPS data. This configuration allows a user to differentiate the transmission start time for each transceiver to send data. (Refer to 22.1.5 GPS Time Mark on page 80.)

■ **Transceiver Operation**

- The duration configured for GPS Report Interval Time elapses.

 This transceiver automatically starts sending the GPS data. "SEND DATA" and the "ALE" icon blink while the transceiver is sending data.



The transceiver automatically returns to standby mode when the transceiver finishes sending data.



Note:

- ◆ If the [▲] key is pressed while the transceiver is sending the GPS data, the transceiver stops transmitting and returns to standby mode.
- ◆ If no Self Address for the GPS data transmission is configured, the Self Address configured for the selected Net is used.
- ◆ In Channel Mode, the transceiver transmits on the selected ALE channel ignoring the configuration of Data Transmit Channel.
- ◆ If a link has been established for another call, the transceiver does not send the GPS data automatically.
- ◆ The transceiver returns to standby mode if the transceiver could not send the GPS data automatically due to a busy channel or antenna tuning failure.

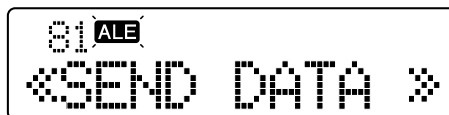
■ **Configuration using KPG-102D**

- Configuring the GPS Data Automatic Transmission (Refer to FPRG 5.5.5 Applications Window > ■ GPS data transmission Tab.)
- Configuring the COM Port Settings (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)
- Configuring the GPS Report Interval Time (Refer to FPRG 5.7 GPS Window > 5.7.1 GPS Report Interval Time.)
- Configuring the GPS Time Mark (Refer to FPRG 5.7 GPS Window > 5.7.2 GPS Time Mark.)

28.3.6 Requests for Stopping or Resuming the GPS Data Automatic Transmission

A transceiver can request a mobile station to stop or resume automatic transmission of the GPS data.

A transceiver that receives a PC command from the COM port requesting it to stop or resume automatic transmission of the GPS data, sends request data to the target station.



When the transceiver completes the handshake operation, the transceiver returns to standby mode without establishing the link. If the handshake operation fails, the Call Error Tone sounds and the transceiver returns to standby mode.



The target party that received the request data operates according to the request.

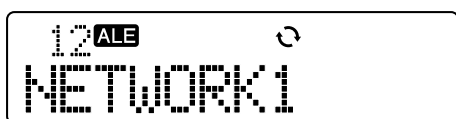
28.3.7 GPS Data Request

A transceiver can request a mobile station to send the GPS data.

A transceiver that receives a PC command from the COM port requesting it to send the GPS data, sends request data to the configured station.



When the transceiver completes the handshake operation, the transceiver returns to standby mode without establishing the link. If the handshake fails, the Call Error Tone sounds and the transceiver returns to standby mode.



The transceiver sends the GPS data using the PC command format that was received during the handshake.

Note:

- ◆ PC Command must be configured for COM Port Settings in a transceiver to send a request.
- ◆ If a transceiver that receives a request cannot receive data from the GPS receiver, the transceiver sends dummy data back to the requesting party. In this case, Disabled is configured for the status parameter of the GPS positioning information.

28.3.8 GPS Data Manual Transmission

The GPS data can be manually sent by using AMD.

To send the GPS data manually, the following configurations are required by using KPG-102D.

- **Configuring the Target Address and Self Address:**

Configure the Target Address used for sending the GPS data and the corresponding Self Address.

- **Configuring the Data Transmit Channel:**

Configure the ALE channel used for automatically sending the GPS data. If Auto is configured for Data Transmit Channel, the transmit channel is automatically determined by LQA.

- **Configuring the COM port Settings:**

To send the GPS data, GPS Data Input must be configured for COM Port Settings.

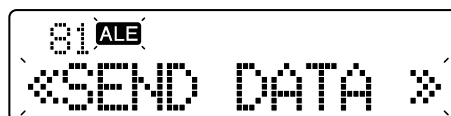
■ Transceiver Operation

1. Press the **ALE** key while ALE is enabled.
ALE Call Menu is activated.
2. Press the [**▲**] or [**▼**] key until "GPS CALL" appears.

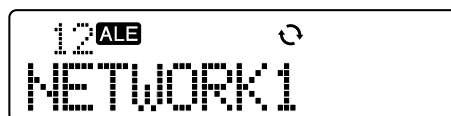


3. Press the [**■**] key or **PTT** (microphone) switch.

The transceiver starts sending the GPS data. "SEND DATA" and the "**ALE**" icon blink while the transceiver is sending data.



The transceiver automatically returns to standby mode when the transceiver finishes sending data.



Note:

- ◆ If the [**▲**] key is pressed while the transceiver is sending the GPS data, the transceiver stops sending data and returns to standby mode.
- ◆ "GPS CALL" cannot be selected from the ALE Call Menu if GPS Data Input is configured for COM Port Settings.
- ◆ In Channel Mode, the transceiver transmits on the selected ALE channel ignoring the configuration of Data Transmit Channel.
- ◆ If the transceiver fails to make a call, the Call Error Tone sounds and the following appears on the main display.

If the last channel on which the transceiver attempted to establish a link was Busy:	CH BUSY
If the antenna tuning failed on the last channel on which the transceiver attempted to establish a link:	AT.TUNE FAIL

The transceiver returns to normal standby mode if any key is pressed while the above appears on the main display. The above display automatically disappears when the transceiver receives a valid call or Sounding signal.

■ Configuration using KPG-102D

- Configuring the GPS Data Transmission (Refer to FPRG 5.5.5 Applications Window > ■ GPS data transmission Tab.)
- Configuring the COM port Settings (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

28.3.9 GPS Data Reception

The transceiver can transfer received information to an external device when the transceiver receives the GPS data from other stations.

To send received GPS data to an external device, GPS Data Output or PC Command must be configured for COM Port Settings by using KPG-102D.

■ Transceiver Operation

1. The transceiver detects an ALE signal.

The “ALE” icon blinks.



If the GPS data is received at your own station, the transceiver completes receiving the GPS data and the transceiver returns to standby mode after sending the received information to COM ports.



Note: If GPS Data Output is configured for COM Port Settings, GPS Base Station Settings can be configured when it is necessary. (Refer to 22.2.3 Sending Output Sentences (GPS Base Station Settings) on page 80.)

■ Configuration using KPG-102D

- Configuring the COM port Settings (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)
- Configuring the GPS Base Station Settings (Refer to FPRG 5.7 GPS Window.)

28.3.10 Sending a Sounding Signal

The receiving station can use Sounding signal to evaluate the quality of channel communication with own station by frequently sending a sounding signal. The Sounding signal can be automatically or manually sent.

To send a Sounding signal, the following configurations are required by using KPG-102D.

• Configuring the Method to send the Sounding Signal:

Auto must be configured when automatically sending a Sounding signal. Manual must be configured when manually sending a Sounding signal.

• Configuring the Sounding Interval Time:

Configure the interval to send the Sounding signal automatically if Auto is configured for the Sounding signal transmission method.

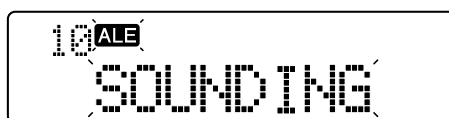
■ Transceiver Operation

• Automatically Sending the Sounding Signal

1. The duration configured for the Sounding Interval Time elapses.

The transceiver automatically starts sending the Sounding signal.

The “ALE” icon blinks while the transceiver is sending the Sounding signal and “SOUNDING” blinks on the main display. The ALE channel used for sending the Sounding signal appears on the sub-display.



2. The transceiver completes sending the Sounding signal.

The transceiver automatically returns to standby mode.



3. A certain period of time elapses.

The transceiver automatically starts sending the Sounding signal on the next ALE channel.



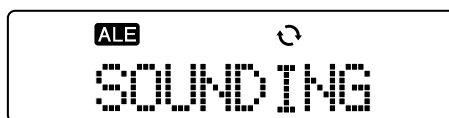
Repeat steps 2 and 3 to send the Sounding signal on all ALE Channels configured in the Scan List for the selected Net.

• Manually Sending the Sounding Signal

1. Press the ALE key while the ALE function is enabled.

The transceiver activates in ALE Call Menu.

2. Press the [▲] or [▼] key until “SOUNDING” appears.



3. Press the [■] key.

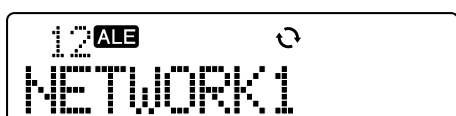
The transceiver starts sending the Sounding signal.

The "ALE" icon blinks while the transceiver is sending the Sounding signal and "SOUNDING" blinks on the main display. The ALE channel used for sending the Sounding signal appears on the sub-display.



4. The transceiver completes sending the Sounding signal.

The transceiver automatically returns to standby mode.



5. A certain period of time elapses.

The transceiver automatically starts sending the Sounding signal on the next ALE channel.



Repeat steps 4 and 5 to send the Sounding signal on all ALE Channels configured in the Scan List for the selected Net.

Note:

- ◆ The transceiver cannot send the Sounding signal in Channel Mode.
- ◆ If the [△] key is pressed while the transceiver is sending the Sounding signal, the transceiver stops sending the signal and returns to standby mode.
- ◆ If the link is established, the transceiver does not send the Sounding signal even if the duration configured for Sounding Interval Time elapses. The transceiver initiates sending the Sounding signal and resumes counting down Sounding Interval Time when the link is terminated and the transceiver returns to standby mode.
- ◆ Sounding Interval Time is not reset even if the Sounding signal is manually sent.
- ◆ On an ALE channel where AT Auto Tune is enabled, the antenna is automatically tuned before sending the Sounding signal. If the antenna is not tuned, the transceiver does not send the Sounding signal on the ALE channel. (Refer to [28.1.5 AT Auto Tune on page 93.](#))

28.3.11 Receiving a Sounding Signal

The transceiver updates the quality of channel data between your own station and the transmitting station on the received ALE channel when the Sounding signal is received.

■ Transceiver Operation

1. The transceiver detects the ALE signal.

The "ALE" icon blinks.



2. The transceiver receives the Sounding signal.

The caller's address appears.



The transceiver automatically returns to standby mode when there is no Sounding signal to send.



28.3.12 LQA Score Exchange

The transceiver can exchange the LQA score by handshaking (Non-Link call) without establishing a link with another party. This function can be used if the LQA score is not acquired by using Auto Sounding, or a user wants to intentionally update the LQA score before making a call.

The transceiver can exchange the LQA score with an individual party or the selected net. The transceiver can also send an AMD message while exchanging the LQA score.

■ Transceiver Operation

- **If Making a Call without Selecting a Channel:**

1. Press the ALE key while the ALE function is enabled. The ALE Call Menu is activated.

Note: A user can make a call to the last called party by pressing the [■] key or the PTT (microphone) switch.

28 ALE (Automatic Link Establishment)

- Press the [\wedge] or [\vee] key until "BI-DIRECT" appears.



- Press the [D>] key.

The address of the last-called party appears.

- Press the [\wedge] or [\vee] key until the address of the target party or "NET CALL" appears.

Select an address from a registered Other Address.



- Press the [M] or PTT (microphone) switch.

The transceiver starts handshaking for the LQA score exchange. The transceiver exchanges the LQA score for all ALE channels sequentially configured in the Scan List. The "ALE" icon blinks while the transceiver is exchanging the LQA score.



The transceiver returns to standby mode when the transceiver finishes exchanging the LQA score.



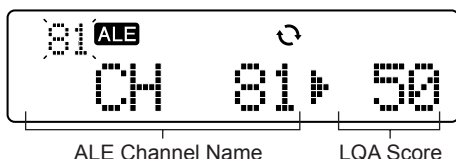
● If Making a Call by Selecting a Channel:

- Press the [D>] key after step 4.

The ALE channel selection menu appears on the main display.

- Press the [\wedge] or [\vee] key to select the ALE channel on which the LQA score will be exchanged.

The ALE channel can be selected from the Scan List that is registered for the selected net. When the ALE channel is selected, the ALE channel name appears on the 8 digits from the left of the main display and the LQA score appears on the 4 digits from the right of the main display.



Note: The LQA score can be displayed or hidden by pressing the [B] key. If the LQA score is hidden, the 12-digit ALE channel name appears on the main display.

- Press the [M] or PTT (microphone) switch.

The transceiver starts handshaking for the LQA score exchange on the selected ALE channel. The "ALE" icon blinks until the transceiver completes exchanging the LQA score.



The transceiver returns to standby mode when the transceiver finishes exchanging the LQA score.



● When Adding an AMD Message:

- Press the [A] key after completing step 4 of "If Making a Call without Selecting a Channel" or step 1 of "If Making a Call by Selecting a Channel".

The last-selected AMD Message appears and the "M" icon appears on the main display. The AMD Message number blinks on the sub-display.



- Press the [\wedge] or [\vee] key until the desired AMD Message.

Select an AMD message from the AMD Message 1 to AMD Message 10 configured in the transceiver and AMD Message 0 which can be edited.



Note: Refer to [28.3.1 Sending an AMD Message on page 105](#) for instructions on how to edit a message and relevant operations.

- Press the [■] or PTT (microphone) switch.

The transceiver starts transmitting. The target station's address appears on the main display and the "ALE" and "☑" icons blink until a link is established.



The transceiver returns to standby mode when the transceiver finishes exchanging the LQA score.



Note:

- ◆ This function cannot be used in Channel Mode.
- ◆ If the transceiver starts making a call without attaching the AMD Message, the call will be a normal Individual Call or Net Call. Refer to each section for supplemental information on Individual Calls and Net Calls. (Refer to 28.2.6 Making an Individual Call on page 99, 28.2.8 Making a Net Call on page 100.)

■ Configuration using KPG-102D

- Configuring the LQA Timeout (Refer to FPRG 5.5.4 Options Window > ■ LQA Timeout.)

28.3.13 VFO Mode for ALE

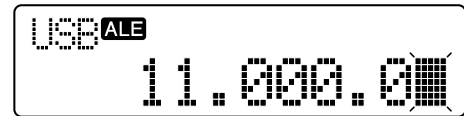
Transmit and receive frequencies can be temporarily changed in VFO Mode for ALE while the transceiver is controlled by the ALE unit.

■ Transceiver Operation

- Press and hold the **ALE Operation Mode** key for 1 second to activate VFO Mode in place of ALE Operation Mode.
Refer to 28.2.3 Selecting the ALE Operating Mode on page 97 for details.
- Press the [▲] or [▼] key until the desired channel number appears.
- Press the **ALE Operation Mode** key.

The transceiver enters the frequency configuration mode and the current digit being edited blinks.

Press the [←C] key to move the cursor to a digit to the left. Press the [D>] key to move the cursor to a digit to the right.



- Press the [0] to [9] keys to enter a frequency.
- Press the [△] key after configuring the frequency.
The transceiver exits the frequency configuration mode.

Note:

- ◆ The step size for changing the frequency is the same as the step size for changing the frequency in normal VFO Mode. (Refer to 10.3 Changing the Step Frequency on page 25.)
- ◆ A frequency can be changed by pressing the [▲] or [▼] key while the transceiver is in the frequency configuration mode.
- ◆ The VFO reset function cannot be used. (Refer to 10.5 Resetting the VFO on page 26.)
- ◆ While the transceiver is in VFO Mode, Call Type cannot be changed. Therefore, if ALE has already been configured for Call Type, then no other Call Type can be configured. If anything other than ALE is configured for Call Type, then ALE cannot be configured for Call Type.

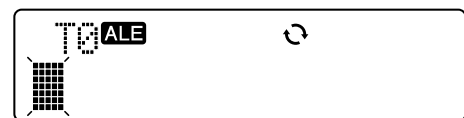
28.3.14 Directly Entering a Call Address

The target station's address can be directly entered by using the microphone keypad.

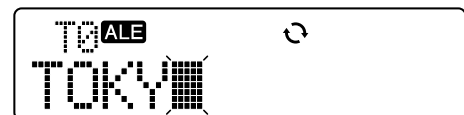
This function can be used to make an Individual Call or send an AMD Message.

■ Transceiver Operation

- Press the [0] to [9] keys on the microphone keypad while the transceiver is in standby mode.
The transceiver enters the call address entry mode and the first digit on the main display blinks.



- Press the [0] to [9] keys to enter a call address.

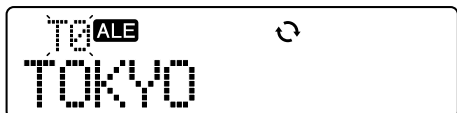


Go to step 4 if you wish to make a call after entering the call address.

Go to step 3, if you wish to make a call by selecting a channel or adding an AMD Message when making a call.

3. Press the [Δ] key.
The target party selection menu appears on the main display.

 - **If Making a Call by Selecting a Channel:**
Press the [D>] key. A channel can be selected from the channel selection menu.
 - **If Adding an AMD Message:**
Press the [A] key. An AMD Message can be selected in the AMD Message selection menu. Refer to [28.3.1 Sending an AMD Message on page 105](#) for instructions on how to select and configure an AMD Message.



4. Press the PTT (microphone) switch or [■] key.
The transceiver starts making a call. Refer to [28.2.6 Making an Individual Call on page 99](#) for transceiver actions after making a call.

Note:

- ◆ Key operation and the character entry rule are the same as configuring and sending an AMD Message. Refer to [28.3.1 Sending an AMD Message on page 105](#) for details. However, only 0 to 9 and A to Z are available for entering a call address.
- ◆ A maximum of a 15-digit call address can be entered. If no address is entered, the transceiver does not start making a call even if the PTT (microphone) switch or the [■] key is pressed. When the [Δ] key is pressed, the last-selected target address appears on the main display and the target station can be selected from the main display.
- ◆ The last-entered call address is added to the target station selection list. However, the call address will not be retained in the transceiver.
- ◆ A call address can be directly entered by using the microphone keypad even if the target station has been selected by using panel keys.

28.4 Time Display

The ALE unit has a real time clock display function (RTC). Using this function, the current time can be displayed on the main display.

28.4.1 Current Time Display

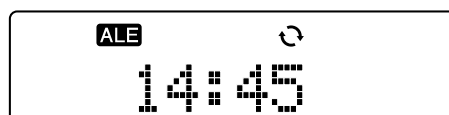
The current time can be shown on the main display. Time Format can be configured to be either 12H display or 24H display by using KPG-102D.

■ Transceiver Operation (User Menu only)

1. Press the **Menu** key.

The transceiver enters User Menu Mode. The time display can be selected by pressing the [\wedge] or [∇] key.

24H Display



12H Display



2. Press the [Δ] key.

The transceiver exits ALE Call Menu and returns to standby mode.

■ Configuration using KPG-102D

- Configuring the Time Display Format (Refer to FPRG 5.5.6 Misc. Features Window.)

28.4.2 Power-on Time Display

This function can be used to display the current time when the transceiver is turned ON. When the Power-on Clock is enabled, and the transceiver is turned ON and the current time appears for 1 second after the Power-on Text and the "WAIT ..." display (indicating that the ALE unit is trying to activate) appears.

Power-on Clock can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Power-on Clock to be Enabled or Disabled (Refer to FPRG 5.2 Optional Features Window > 5.2.1 Common Page Tab.)

28.4.3 Clock Configuration

The time of RTC installed in the ALE unit can be configured. When ALE is used for the first time, the time must be configured.

■ Transceiver Operation

- Press the **Power** switch while pressing the [**<C>**] key.
The transceiver waits for Year entry.

Note: "ALE ERROR" appears on the main display if no ALE unit is installed in the transceiver.

- Press the [**▲**] or [**▼**] key until the desired year (2000 to 2099) appears, and then press the [**D>**] key.

A rectangular display box showing the word "YEAR" on the left and the number "2005" on the right.

- Press the [**▲**] or [**▼**] key until the desired month (01 to 12) appears, and then press the [**D>**] key.

A rectangular display box showing the word "MONTH" on the left and the number "02" on the right.

- Press the [**▲**] or [**▼**] key until the desired date (01 to 31) appears, and then press the [**D>**] key.

A rectangular display box showing the word "DAY" on the left and the number "26" on the right.

- Press the [**▲**] or [**▼**] key until the desired o'clock appears, and then press the [**D>**] key.

A rectangular display box showing the word "HOUR" on the left and the number "21" on the right.

- Press the [**▲**] or [**▼**] key until the desired minute (00 to 59) appears.

A rectangular display box showing the word "MINUTE" on the left and the number "30" on the right.

- Press the [**■**] key.

The update data is transferred to the ALE unit. 00 seconds are configured for the seconds.

- Turn the transceiver OFF.

Note: The transceiver returns to the previous display when the [**<C>**] key is pressed. If the [**<C>**] key is pressed after configuring the year, the transceiver returns to minutes configuration mode. If the [**D>**] key is pressed after configuring the minutes, the transceiver returns to year configuration mode.

28.4.4 Adjustment Time

Adjustment Time can be used to configure the time when writing data to the transceiver by using KPG-102D.

If this function is enabled, time data on your PC is transferred to the transceiver and the time is automatically adjusted when the ALE data is written to the transceiver by using KPG-102D.

Adjustment Time can be configured to be enabled or disabled by using KPG-102D.

■ Configuration using KPG-102D

- Configuring the Adjustment Time to be Enabled or Disabled (Refer to FPRG 6.2.1 Adjustment Time.)

28.5 Receiving a Call while a Link is Established

The transceiver responds in the following manner if the transceiver receives various calls including the LQA score exchange while a link has been established by making or receiving various calls.

- If the transceiver receives an Emergency Call and establishes a link, the transceiver will ignore all link establishment requests even if the transceiver receives a call. However, the transceiver accepts calls from the linked party (the party that made the Emergency Call).
- If the transceiver receives an AMD Message and a new link is established while the link has been already established, the ALE Data Receive Tone does not sound.

Table 28-7 Receiving a Call while a Link is Established

		Causes for Establishing the Current Link					
		AllCall		Net Call		Individual Call	
		TX	RX	TX	RX	TX	RX
Call while a Link has been Established	AllCall	O	O	O	O	O	O
	Net Call	O	O	O	O	O	O
	Individual Call	X	Δ	O	O	Δ	Δ

- O: The transceiver establishes a link.
- X: The transceiver does not establish a link. However, the transceiver establishes a link when the transceiver receives an Emergency Call.
- Δ: The transceiver establishes a link if the transceiver receives a call from the linked station. However, the transceiver establishes a link to any other stations who made an Emergency Call.

- If the transceiver receives another call and establishes a new link, the target station display will also be updated. In this case, the Link Establishment Tone does not sound.
- Conditions to accept an LQA score exchange call are the same as conditions to receive a normal call.
- The current link state will be retained even if the LQA score exchange has been completed.
- The transceiver rejects a request to stop or resume automatic transmission of GPS data and GPS data transmission requests while a link is established.
- The transceiver sends the received information from the COM port if the transceiver receives GPS data sent to own station even if a link has been established. In this case, the link will be retained.
- Actions of the calling party when the link request was rejected are as follows.

The Call Error Tone sounds and "BUSY" appears on the main display. The transceiver returns to standby mode display if a key is pressed.



- If the transceiver makes an Emergency Call and establishes a link, the transceiver will ignore all link establishment requests even if the transceiver receives a call.

APPENDIX 1 PC COMMANDS

1.1 Description

Various functions can be controlled with PC commands by connecting the transceiver to a PC by using the KCT-31 cable.

1.2 Transmission System

The following data transmission systems are available.

Interface Type	Serial Interface
Communication System	Full double communication system
Synchronization System	Asynchronous communication system
Start Bit	1 bit
Stop Bit	2 bit
Parity Bit	None
Data	8 bit
Baud Rate	9,600 bps
Flow control	Flow cannot be controlled if the KCT-31 cable is used. Flow can be controlled by assigning CTS or RTS to the AUX port and using a self-made cable.

1.3 Connecting the Transceiver to a PC

Connect the transceiver to the PC by using the optional KCT-31 cable. Following are connectors and signals.

Table 1-1 Connecting the Transceiver to a PC

Connector	Pin No.	Signal Name	Input/Output	Function
CN7	1	NC	-	-
	2	GND	-	GND
	3	SB	Output	13.6V
CN8	1	NC	-	-
	2	RXD1	Input	Serial data input
	3	TXD1	Output	Serial data output

1.4 Command Format

Command format consists of command, parameter and terminator.

Example:

M	D	3	<CR>
Command		Parameter	Terminator

● Commands

Commands can be configured by entering 2-digit ASCII character codes.

● Parameter ^{*1}

A parameter can be configured by entering ASCII character codes. The length and number of the parameter may vary depending on commands and some commands do not have a parameter.

● Terminator

Enter the carriage return code (=0Dh) indicating the end of the command in ASCII format. In this section, the terminator is described as <CR>.

^{*1} The transceiver exceptionally sends the following special commands.

- Acknowledge

!	<CR>
---	------

- Command error

?	<CR>
---	------

1.5 Differences from TK-80

There are differences between the TK-80 and TK-90 for control with PC commands.

Table 1-2 Differences from TK-80

Item	TK-80	TK-90
Connecting the Transceiver to a PC	IF-232C is used.	KCT-31 is used.
Flow control	Enabled	Flow cannot be controlled if the KCT-31 cable is used. Flow can be controlled by assigning CTS or RTS to the AUX port and using a self-made cable.
Baud rate	4,800 bps	9,600 bps
Terminator	“;” Semicolon (= 3Bh)	Carriage return (=0Dh)

1.6 Command List

Table 1-3 Command List

Command	Name
AC	This command can be used to configure and read the antenna tuner's status.
AG	This command can be used to configure and read the volume level.
AV	This command can be used to configure and read the Anti-VOX Gain.
BY	This command can be used to read the transceiver's busy status.
CS	This command can be used to read the checksum.
DN/UP	This command can be used to increase or decrease the channel number.
FA	This command can be used to configure and read the operating frequency in VFO Mode.
FR	This command can be used to alternate between VFO Mode and Channel Mode.
IF	This command can be used to read the transceiver's status.
LM	This command can be used to order the transceiver to record VGS voice.
MC	This command can be used to configure and read the channel number.
MD	This command can be used to configure and read the Emission Mode.
MG	This command can be used to configure and read the Mic Gain.
MO	This command can be used to configure and read monitor functions.
MR	This command can be used to read channel information.
MW	This command can be used to write channel information to the transceiver.
NB	This command can be used to configure and read Noise Blanker.
PA	This command can be used to configure and read Pre-amplifier.
PB	This command can be used to order the transceiver to play VGS voice.
PC	This command can be used to configure and read the transmit power.
PS	This command can be used to configure and read power status.
PT	This command can be used to configure and read CW pitch frequency.
RA	This command can be used to configure and read Attenuator.
RC	This command can be used to clear the Clarifier frequency.
RD/RU	This command can be used to increase or decrease the Clarifier frequency.
RX/TX	This command can be used to alternate between transmit and receive.
SC	This command can be used to configure and read Scan.
SM	This command can be used to read S meter and RF meter from the transceiver.
SQ	This command can be used to configure and read Squelch Level.
ST	This command can be used to configure and read the VFO frequency step.
VD	This command can be used to configure and read the VOX Delay Time.
VG	This command can be used to configure and read VOX Gain.
VX	This command can be used to configure and read VOX.
Selcall	
C0	This command can be used to configure and read Selcalls.
C1	This command can be used to make a Selcall.
C2	This command can be used to make a Direct Selcall.
C3	This command can be used to read the link status (receiving end) for Selcall.
C4	This command can be used to notify the caller's ID when the transceiver receives a Selcall.
C5	This command can be used to make a Status Call (including special statuses).
C6	This command can be used to make a Direct Status Call.
C7	This command can be used to notify a user that the transceiver has received a Status Call signal.

Command	Name
C8	This command can be used to notify a user that the transceiver is receiving GPS data while making a Selcall.
C9	This command can be used to notify a user that the transceiver has received a Selcall Memory Code.
D0	This command can be used to notify a user that the transceiver has received a Memory Code.
D1	This command can be used to read a Message Stack.
D2	This command can be used to notify transmit status with Status Call.
D3	This command can be used to send or receive PC messages while making a Selcall.
ALE	
A0	This function can be used to configure the ALE function and read its status.
A1	This function can be used to change and read the ALE operating mode.
A2	This function can be used to change and read the ALE net.
A3	This function can be used to change and read the ALE channel.
A4	This function can be used to change and read the ALE monitor status.
A5	This function can be used to make various types of ALE calls.
A6	This function can be used to receive various types of ALE calls.
A7	This function can be used to read the link status of the ALE.
A8	This function can be used to output a request status relevant to GPS data transmission.
A9	This function can be used to output GPS data reception information.
B0	This function can be used to configure and read time in the ALE unit.

AC	This command can be used to configure and read the antenna tuner's status.									
Set	1	2	3	4	5	6	7	8	9	10
	A	C	P1	P2	P3	CR				
Read	1	2	3	4	5	6	7	8	9	10
	A	C	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	C	P1	P2	P3	CR				

Parameter

P1: Antenna tuner status (IN/THRU) while the transceiver is receiving. This command is always the same as P2.
P2: Antenna tuner status (IN/THRU) while the transceiver is transmitting
0: THRU, 1: IN
P3: Tuning operation
0: Stop command/ The transceiver is not operating. 1: Start command/ The transceiver is operating.
Configuration example:
Tuning start command: AC111<CR>
Tuning stop command: AC110<CR> (If the KAT-1 is not connected to the transceiver and Antenna Tuner Control is disabled.)
THRU command: AC000<CR>
Reading example:
When the antenna tuner is in IN state: AC110<CR>
When the antenna tuner is in THRU state: AC000<CR>
While the antenna tuner is tuning: AC111<CR>

Note: The status of the antenna tuner cannot be changed from IN to THRU while the transceiver is transmitting.

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AG	This command can be used to configure and read the volume level.									
Set	1	2	3	4	5	6	7	8	9	10
	A	G	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	A	G	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	G	P1			CR				
Parameter										
P1: AF level										
Range: 000 to 031										
Note:										
◆ If the value configured for this parameter exceeds the highest value, the value is automatically overwritten with the highest value.										
◆ If Lowest Limit is configured for Minimum Volume Type, the value configured for Minimum Volume is automatically configured even if a value smaller than the Minimum Volume is configured with the configuration command. (Refer to 3.4.1 Minimum Volume on page 9.)										

AV	This command can be used to configure and read the Anti-VOX Gain.									
Set	1	2	3	4	5	6	7	8	9	10
	A	V	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	A	V	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	V	P1			CR				
Parameter										
P1: Anti-VOX Gain										
Range: 000 to 009										
Fixed length										

BY	This command can be used to read the transceiver's busy status.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	B	Y	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	B	Y	P1	CR						
Parameter										
P1: Busy status										
0: The transceiver is not in Busy state.										
1: The transceiver is in Busy state.										

CS	This command can be used to read the checksum.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	C	S	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	C	S	P1			CR				
Parameter										
P1: Checksum										
Fixed length										

DN/UP	This command can be used to increase or decrease the channel number.									
Set	1	2	3	4	5	6	7	8	9	10
	D/U	N/P	CR							
Read										
Answer										
<p>This command can be used in the same way as Channel Up and Channel Down keys. Operation example: The configured channel changes while transceiver is in Channel Mode. The configured frequency changes in the configured step while the transceiver is in VFO Mode.</p>										

FA	This command can be used to configure and read the operating frequency in VFO mode.										
Set	1	2	3	4	5	6	7	8	9	10	
	F	A	P1								
	11	12	13	14	15	16	17	18	19	20	
	P1			CR							
Read	1	2	3	4	5	6	7	8	9	10	
	F	A	CR								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	A	P1								
	11	12	13	14	15	16	17	18	19	20	
	P1			CR							
<p>Parameter P1: Frequency [Hz] A value of 0 is entered for unused digits. Configuration example: 7.036000 MHz → "00007036000"</p> <p>Note: This command is accepted only if the transceiver is in VFO Mode. This operation is disabled while the transceiver is transmitting.</p>											

FR	This command can be used to alternate between VFO Mode and Channel Mode.									
Set	1	2	3	4	5	6	7	8	9	10
	F	R	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	F	R	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	F	R	P1	CR						
<p>Parameter P1: VFO Mode/ Channel Mode 0: VFO 1: Configuration is disabled. 2: Memory Channel</p> <p>Note:</p> <ul style="list-style-type: none"> ◆ This parameter cannot be configured while the transceiver is transmitting or is in Emergency Mode. ◆ This command is not available when the transceiver is in Unprogrammed state. 										

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IF	This command can be used to read the transceiver's status.										
Set											
Read	1	2	3	4	5	6	7	8	9	10	
	I	F	CR								
Answer	1	2	3	4	5	6	7	8	9	10	
	I	F	P1								
	11	12	13	14	15	16	17	18	19	20	
	P1			P2					P3		
	21	22	23	24	25	26	27	28	29	30	
	P3			P4	P5	P6		P7	P8		
	31	32	33	34	35	36	37	38	39	40	
	P9	P10	P11	P12	P13	P14	CR				

Parameter

P1: The current operating frequency. A value of 0 is entered for unused digits.

P2: Space

P3: Clarifier frequency, ± 0400 . " " (space) is entered if + (plus) is configured. "-" is entered if "-" (minus) is configured.

P4, P5: Always 0

P6: Channel number

P7: 0 = RX, 1 = TX

P8: Mode (Refer to the MD command parameter.)

P9: 0: VFO Mode, 2: Channel Mode, 3: ALE Mode

P10: Scan status (Refer to the SC command parameter.)

P11 to P14: Always 0

LM	This command can be used to order the transceiver to record VGS voice.									
Set	1	2	3	4	5	6	7	8	9	10
	L	M	P1	P2	CR					
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	L	M	P1	O	CR					

Parameter

P1: VGS-1 channel

1 to 4: Recording channel command

5: Auto Recording channel command

P2: Contents of the operation command

0: Stores or finishes recording (This parameter is disabled while the transceiver is doing Auto Recording.)

1: Recording command (Store command is issued while the transceiver is doing Auto Recording.)

2: Clear command (The same command is issued when the transceiver is doing Auto Recording.)

Note:

- ◆ This command is automatically issued when the transceiver finishes recording.
- ◆ Each channel can be configured to be used for received audio memo or recording and sending messages by using KPG-102D.
- ◆ This function cannot be used if VGS-1 is disabled by using KPG-102D. An error occurs when VGS-1 is enabled while the VGS-1 unit is not installed in the transceiver.
- ◆ An error occurs when the recording command is issued while the VGS-1 is operating. However, the transceiver receives the recording stop command.

MC	This command can be used to configure and read the channel number.									
Set	1	2	3	4	5	6	7	8	9	10
	M	C	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	M	C	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	M	C	P1			CR				
Parameter P1: Channel number Range: 001 to 300 Note: ♦ The transceiver sends an error message if the specified channel cannot be configured. ♦ This parameter cannot be configured while the transceiver is transmitting. ♦ If the ALE function is enabled, the ALE channel number can be retrieved. However, no ALE channel number can be configured.										

MD	This command can be used to configure and read the emission mode.									
Set	1	2	3	4	5	6	7	8	9	10
	M	D	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	M	D	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	M	D	P1	CR						
Parameter P1: Mode 0: Configuration is disabled. 1: LSB 2: USB 3: CW 4: FSK 5: AM 6: DATA										

MG	This command can be used to configure and read the Mic Gain.									
Set	1	2	3	4	5	6	7	8	9	10
	M	G	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	M	G	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	M	G	P1			CR				
Parameter P1: Mic Gain Range: 001 to 005										

APPENDIX 1 PC COMMANDS

MO	This command can be used to configure and read monitor functions.									
Set	1	2	3	4	5	6	7	8	9	10
	M	O	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	M	O	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	M	O	P1	CR						
Parameter										
P1: Monitor status, Selcall reset and unmute status 0: OFF (Selcall reset) 1: ON (Selcall unmute)										
Note:										
◆ Monitor is disabled if the Monitor key is pressed after Monitor is enabled with this command.										
◆ Configuration is disabled if the transceiver was placed in Selcall Code Entry Mode with the microphone keypad.										

MR	This command can be used to read channel information.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	M	R	P1			CR				
Answer	1	2	3	4	5	6	7	8	9	10
	M	R	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2			P3						
	21	22	23	24	25	26	27	28	29	30
	P3	P4	P5	P6	P7	P8	P9		P10	P11
	31	32	33	34	35	36	37	38	39	40
	P12	P13								
	41	42	43	44	45	46	47	48	49	50
	P13			CR						
Parameter										
P1: Channel number (Refer to the MC command parameter.)										
P2: A value of 0 is entered for receive frequency and unused digits. Entry example: 7099.000 MHz → "07099000"										
P3: A value of 0 is entered for transmit frequency and unused digits.										
P4: Receive Mode (Refer to the MD command parameter.)										
P5: Transmit Mode										
P6: Pre-amplifier status (On/Off), 0: OFF, 1: ON										
P7: Transmit Power, 0: Inhibit, 1: Low, 2: Medium-Low, 3: Medium, 4: High										
P8: Scrambler status (On/Off), 0: OFF, 1: ON										
P9: Scrambler Code (00 to 15)										
P10: Scan Add, 0: DEL, 1: ADD										
P11: Active/ Non Active status of the AUX port, 0: None Active, 1: Active										
P12: Selcall, 0: Disabled, 1: Enabled										
P13: Spaces (20 h) are entered for the memory name and unused digits.										
Note:										
◆ The transceiver sends a value of 0 if the specified channel is vacant. However, P13 returns a blank message.										
◆ ALE channels cannot be read from the transceiver.										

MW	This command can be used to write channel information to the transceiver.									
Set	1	2	3	4	5	6	7	8	9	10
	M	W	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2			P3						
	21	22	23	24	25	26	27	28	29	30
	P3	P4	P5	P6	P7	P8	P9		P10	P11
	31	32	33	34	35	36	37	38	39	40
	P12	P13								
	41	42	43	44	45	46	47	48	49	50
	P13			CR						
Read										
Answer										

Parameter

- P1: Channel number (Refer to the MC command parameter.)
- P2: A value of 0 is entered for receive frequency and unused digits.
Entry example: 7099.000 MHz → "07099000"
- P3: A value of 0 is entered for transmit frequency and unused digits.
- P4: Receive mode (Refer to the MD command parameter.)
- P5: Transmit Mode
- P6: Pre-amplifier and Attenuator status (On/Off), 0: OFF, 1: Pre-amp ON, 2: ATT ON
- P7: Transmit Power, 0: Inhibit, 1: Low, 2: Medium-Low, 3: Medium, 4: High
- P8: Scrambler status (On/Off), 0: OFF, 1: ON
- P9: Scrambler Code (00 to 15)
- P10: Scan Add, 0: DEL, 1: ADD
- P11: AUX port status (Active/ Non Active), 0: Non Active, 1: Active
- P12: Selcall, 0: Disabled, 1: Enabled
- P13: Spaces (20h) are entered for the memory name and unused digits.

Note:

- ◆ If channel data is configured by using the MW command while all channels in the transceiver are blank and the transceiver is in UNPROGRAM state, channel data can be refreshed with original data by turning the transceiver OFF and ON again.
- ◆ If a channel is added by using the MW command during the scan, the channel is not added to the Scan Add list. The channel data can be refreshed with original data by turning the transceiver OFF and ON again.
- ◆ ALE channels cannot be written to the transceiver.

NB	This command can be used to configure and read Noise Blanker.									
Set	1	2	3	4	5	6	7	8	9	10
	N	B	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	N	B	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	N	B	P1	CR						

Parameter

- P1: Noise Blanker status
0: NB OFF
1: NB ON

Note: This command can be used to overwrite the EEPROM. The value configured for this parameter is configured even if the value is changed in User Menu Mode. (Refer to 7.5 Noise Blanker on page 18.)

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PA	This command can be used to configure and read Pre-amplifier.									
Set	1	2	3	4	5	6	7	8	9	10
	P	A	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	P	A	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	P	A	P1	CR						
Parameter										
P1: Pre-amplifier status 0: Pre-amplifier OFF 1: Pre-amplifier ON										

PB	This command can be used to play VGS voice.									
Set	1	2	3	4	5	6	7	8	9	10
	P	B	P1	CR						
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	P	B	P1	CR						
Parameter										
P1: Playing channel 0: Stop playing 1: Playing channel 1 2: Playing channel 2 3: Playing channel 3 4: Playing channel 4 5: Playing Auto Recording										
Note:										
<ul style="list-style-type: none"> ◆ The command is automatically issued when the transceiver finishes recording. ◆ Each channel can be configured to be used for received audio memo or recording and sending messages by using KPG-102D. The received audio memo or continuous recording channel is used to request the transceiver to start or stop playing the recorded audio. The message recording/ transmission channel can be used to request the transceiver to start or stop playing and sending the message. ◆ The transceiver plays and sends the message if the PB command is issued for the message recording/ transmission channel. However, the content of the recorded audio cannot be checked. ◆ This function cannot be used if VGS-1 is disabled by using KPG-102D. An error occurs when VGS-1 is enabled while the VGS-1 unit is not installed in the transceiver. ◆ The transceiver automatically responds to a call when the transceiver finishes playing the recorded voice. 										

PC	This command can be used to configure and read the transmit power.									
Set	1	2	3	4	5	6	7	8	9	10
	P	C	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	P	C	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	P	C	P1			CR				
Parameter P1: Transmit Power 0: Inhibit (reading only) 1: Low 2: Medium-Low 3: Medium 4: High Note: ♦ Transmit power higher than the highest transmit power configured for each channel cannot be configured. ♦ Transmit power cannot be configured if Inhibit is configured for a channel. ♦ 25 W is configured for transmit power if High is configured in AM Mode. Otherwise, 5 W is configured for transmit power.										

PS	This command can be used to configure and read power status.									
Set	1	2	3	4	5	6	7	8	9	10
	P	S	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	P	S	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	P	S	P1	CR						
Parameter P1: Power status 0: Power OFF 1: Power ON Note: The following process is required to turn the transceiver ON with the command. 1) Connect SB at Pin 3 of CN7 to 14 V when using the KCT-31 cable. 2) Send a dummy <CR> before sending PS1<CR>.										

PT	This command can be used to configure and read CW pitch frequency.									
Set	1	2	3	4	5	6	7	8	9	10
	P	T	P1		CR					
Read	1	2	3	4	5	6	7	8	9	10
	P	T	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	P	T	P1		CR					
Parameter P1: Pitch frequency 00: (400 Hz) 01: (800 Hz) Note: Pitch frequency works in conjunction with the Sidetone frequency.										

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RA	This command can be used to configure and read Attenuator.									
Set	1	2	3	4	5	6	7	8	9	10
	R	A	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	R	A	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	R	A	P1	CR						
Parameter										
P1: Attenuator status										
0: Attenuator OFF										
1: Attenuator ON										

RC	This command can be used to clear the Clarifier frequency.									
Set	1	2	3	4	5	6	7	8	9	10
	R	C	CR							
Read										
Answer										
This PC command can be used to overwrite the EEPROM. The value configured for this parameter is automatically configured even if the value is changed in User Menu Mode. (Refer to 7.3 Clarifier on page 17.)										

RD/RU	This command can be used to increase or decrease the Clarifier frequency.									
Set	1	2	3	4	5	6	7	8	9	10
	R	D/U	P1				CR			
Read										
Answer										
Parameter										
P1: Frequency step [Hz]										
Range: 00000 to 00400										
Note:										
◆ If this parameter is omitted, the frequency can be configured in steps of 10 Hz.										
◆ If this parameter is configured, the frequency indicated by the parameter is configured. The frequency is configured in the + (plus) direction if the RU command is used. If the RD command is used, the frequency is configured in the - (minus) direction. A value of less than a single step size (10 Hz) is discarded.										
◆ This PC command can be used to overwrite the EEPROM. The value configured for this parameter is automatically configured even if the value is changed in User Menu. (Refer to 7.3 Clarifier on page 17.)										

RX/TX	This command can be used to alternate between transmit and receive.									
Set	1	2	3	4	5	6	7	8	9	10
	R	X	CR							
	T	X	P1	CR						
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	R	X	CR							
	T	X	P1	CR						

Parameter

P1: Transmitting audio line configuration (only TX command)

0: MIC audio

1: DI input audio

The transceiver enters receive mode when it receives the RX command. The transceiver enters transmit mode when it receives the TX command.

Note:

- ◆ The transceiver transmits the audio spoken into the microphone if parameter P1 in the TX command is omitted.
- ◆ The transceiver does not accept the TX command while transmit capability is disabled.
- ◆ The transceiver accepts the TX command only if the transceiver unmutes audio while the transceiver is making a Selcall.

SC	This command can be used to configure and read Scan.									
Set	1	2	3	4	5	6	7	8	9	10
	S	C	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	S	C	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	S	C	P1	CR						

Parameter

P1: Scan status

0: SCAN OFF

1: SCAN ON

Note:

- ◆ Scan cannot be enabled while the transceiver is transmitting.
- ◆ Scan cannot be enabled while the transceiver is in VFO Mode.
- ◆ If the ALE function is enabled, scan state can be retrieved. However, scan state cannot be configured.

SM	This command can be used to read S meter and RF meter from the transceiver.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	S	M	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	S	M	P1				CR			

Parameter

P1: Number of dots on the meter display

Readable range: 0000 to 0005

Note:

- ◆ The number of dots on the meter display is sent.
- ◆ The S meter appears while the transceiver is receiving and the RF (POWER) meter appears while the transceiver is transmitting.

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SQ	This command can be used to configure and read Squelch Level.									
Set	1	2	3	4	5	6	7	8	9	10
	S	Q	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	S	Q	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	S	Q	P1			CR				
Parameter										
P1: Squelch Level										
Range: 000 to 010										

ST	This command can be used to configure and read the VFO frequency step.									
Set	1	2	3	4	5	6	7	8	9	10
	S	T	P1		CR					
Read	1	2	3	4	5	6	7	8	9	10
	S	T	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	S	T	P1		CR					
Parameter										
P1: Frequency step [Hz]										
01: 10 Hz										
02: 100 Hz										
03: 1 kHz										
04: 10 kHz										
05: 100 kHz										
06: 1 MHz										
07: 10 MHz										

VD	This command can be used to configure and read the VOX Delay Time.									
Set	1	2	3	4	5	6	7	8	9	10
	V	D	P1				CR			
Read	1	2	3	4	5	6	7	8	9	10
	V	D	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	S	Q	P1				CR			
Parameter										
P1: VOX Delay Time										
Range: 0000 to 3000 (in steps of 200, Unit: ms)										

VG	This command can be used to configure and read VOX Gain.									
Set	1	2	3	4	5	6	7	8	9	10
	V	G	P1			CR				
Read	1	2	3	4	5	6	7	8	9	10
	V	G	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	V	G	P1			CR				
Parameter										
P1: VOX Gain Range: 001 to 009										

VX	This command can be used to configure and read VOX.									
Set	1	2	3	4	5	6	7	8	9	10
	V	X	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	V	X	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	V	X	P1	CR						
Parameter										
P1: VOX status 0: VOX OFF 1: VOX ON										
Note: The transceiver VOX does not operate unless the link is established even if VOX is enabled by the PC command while the transceiver is in VFO Mode.										

C0	This command can be used to configure and read Selcalls.									
Set	1	2	3	4	5	6	7	8	9	10
	C	0	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	C	0	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	C	0	P1	CR						
Parameter										
P1: Selcall status 0: Selcall OFF 1: Selcall ON										
Note: The C0 command is disabled if the transceiver is in User Menu.										

C1	This command can be used to make a Selcall.									
Set	1	2	3	4	5	6	7	8	9	10
	C	1	P1			CR				
Read										
Answer										
Parameter										
P1: Caller's Selcall ID 000 to 999, *: Wild-card character										
Note: The transceiver accepts this command if the transceiver can make a Selcall. If the transceiver cannot accept this command, the transceiver sends the error message (?<CR>).										

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C2	This command can be used to make a Direct Selcall.									
Set	1	2	3	4	5	6	7	8	9	10
	C	2	P1	CR						
Read										
Answer										
Parameter										
P1: Direct Call number										
1: Direct Call 1										
2: Direct Call 2										
3: Direct Call 3										
4: Direct Call 4										
Note: The transceiver accepts this command if the transceiver can make a Direct Selcall. If the transceiver cannot accept this command, the transceiver sends the error message (?<CR>).										

C3	This command can be used to read the link status (receiving end) for Selcall.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	C	3	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	C	3	P1	CR						
Parameter										
P1: Link status for Selcall										
0: Standby Mode (mute)										
1: Linking with the receiving party (unmute)										
Note: Selcall can be reset with the MO command.										

C4	This command can be used to report the caller's ID when the transceiver receives a Selcall.									
Set										
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	C	4	P1			CR				
Parameter										
P1: Caller's Selcall ID										
000 to 999										
Note: The response command is automatically issued when the transceiver receives a Selcall.										

C5	This command can be used to make a Status Call (including special statuses).									
Set	1	2	3	4	5	6	7	8	9	10
	C	5	P1			P2		CR		
Read										
Answer										
Parameter										
P1: Caller's Selcall ID										
000 to 999, *: Wild-card character										
P2: Status number										
10 to 80, Special statuses										
Note:										
◆ The transceiver accepts this command if the transceiver can make a Status Call. If the transceiver cannot accept this command, the transceiver sends the error message (?<CR>).										
◆ Refer to 20.2.6 Sending a Status on page 60 for special statuses.										

C6	This command can be used to make a Direct Status Call.									
Set	1	2	3	4	5	6	7	8	9	10
	C	6	P1	CR						
Read										
Answer										
Parameter										
P1: Direct Status Call number										
1: Direct Status Call 1										
2: Direct Status Call 2										
3: Direct Status Call 3										
4: Direct Status Call 4										

C7	This command can be used to notify a user that the transceiver has received a Status Call signal.									
Set										
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	C	7	P1			P2		CR		
Parameter										
P1: Caller's Selcall ID										
000 to 999										
P2: Status number										
10 to 80, Special statuses										
Note: The response command is automatically issued when the transceiver receives the Status Call signal.										

C8	This command can be used to notify a user that the transceiver is receiving GPS data while making a Selcall.									
Set										
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	C	8	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2									
	21	22	23	24	25	26	27	28	29	30
	P2									
	31	32	33	34	35	36	37	38	39	40
	P2									
	41	42	43	44	45	46	47	48	49	50
	P2									CR
Parameter										
P1: Caller's Selcall ID										
000 to 999										
P2: GPS data, \$GPGLL sentence in NMEA format (Variable length, Max. 44 byte)										
Note:										
◆ The response command is automatically issued when the transmitting party sends GPS data.										
◆ GPS data example:										
\$GPGLL,4916.452349,N,12311.123215,W,225444.00,A,A*6A										

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C9	This command can be used to notify a user that the transceiver has received a Selcall Memory Code.									
Set	1	2	3	4	5	6	7	8	9	10
	C	9	P1	CR						
Read										
Answer										
Parameter										
P1: Memory Code configuration										
0: CODE A										
1: CODE B										
2: CODE C										
3: CODE D										
Note: The C9 command is available only if Selcall is enabled and the transceiver is waiting for a Selcall.										

D0	This command can be used to notify a user that the transceiver has received a Memory Code.									
Set										
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	D	0				P1				CR
Parameter										
P1: Received Memory Code (Fixed length: 7 byte)										
Note: The response command is automatically issued when the transceiver receives a Memory Code.										

D1	This command can be used to read a Message Stack.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	D	1	P1	CR						
Answer	1	2	3	4	5	6	7	8	9	10
	D	1	P1		P2		P3		CR	
Parameter										
P1: Message stack number										
1 to 5										
P1: Caller's Selcall ID										
000 to 999										
P3: Status number										
10 to 80, Special statuses										

D2	This command can be used to notify transmit status with a Status Call.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	D	2	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	D	2	P1	CR						
Parameter										
P1: Status Call status										
0: Standby Mode										
1: Waiting for ACK										
2: Status message transmission completed										
3: Status message transmission failed (automatic response only)										
Note: The response command is automatically issued in conjunction with the change of status after the transceiver finishes sending the Status Call signal.										

D3	This command can be used to send or receive PC messages while making a Selcall.									
Set	1	2	3	4	5	6	7	8	9	10
	D	3	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2									
	21	22	23	24	25	26	27	28	29	30
	P2									
	31	32	33	34	35	36	37	38	39	40
	P2									
	41	42	43	44	45	46	47	48	49	50
	P2									
	51	52	53	54	55	56	57	58	59	60
P2			CR							
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	D	3	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2									
	21	22	23	24	25	26	27	28	29	30
	P2									
	31	32	33	34	35	36	37	38	39	40
	P2									
	41	42	43	44	45	46	47	48	49	50
	P2									
	51	52	53	54	55	56	57	58	59	60
P2			CR							

Parameter

- P1: Caller's Selcall ID
000 to 999 (Wild-card character can be used when configuring the parameter.)
- P2: Message (Variable length, Max. 48 byte)
Characters in front of <CR> are configured for a message. 20h is configured for space.

Note:

- ◆ The response command is automatically issued when the transceiver receives a PC message.
- ◆ The transceiver receiving the PC message transmission command notifies an operator of the transmission status by using the following D2 commands:

Transceiver Status	Display	D2 Command
If the transceiver is waiting to receive the ACK after sending a message.	SEND DATA	D21
When the transceiver receives the ACK	COMPLETE	D22
If the transceiver cannot receive the ACK even if the transceiver re-transmits for the configured number of times.	NO REPLY	D23
If the transceiver returns to the standby (channel) display.	Standby (channel) display	D20

- ◆ The transceiver can send a PC message only if the transceiver is waiting to receive a Selcall.
- ◆ The transceiver accepts this command if the transceiver can make a Status Call. If the transceiver cannot accept this command, the transceiver sends the error message (?<CR>).

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A0	This command can be used to configure the ALE function and read its status.									
Set	1	2	3	4	5	6	7	8	9	10
	A	0	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	A	0	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	0	P1	CR						
Parameter										
P1: ALE status 0: ALE Off 1: ALE On										
Note: ALE cannot be enabled if Selcall is enabled.										

A1	This command can be used to change and read the ALE operating mode.									
Set	1	2	3	4	5	6	7	8	9	10
	A	1	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	A	1	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	1	P1	CR						
Parameter										
P1: Operating mode 0: Net Mode 1: Channel Mode 2: VFO Mode										

A2	This command can be used to change and read the ALE net.									
Set	1	2	3	4	5	6	7	8	9	10
	A	2	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	A	2	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	2		P2		CR				
Parameter										
P1: Net switching direction 0: Descending order (List No.: Large to Small) 1: Ascending order (List No.: Small to Large)										
P2: Net Address (Variable length: A maximum of 15 digits)										
Note: The transceiver does not accept this configuration command while the transceiver is in Channel Mode.										

A3	This command can be used to change and read an ALE channel.									
Set	1	2	3	4	5	6	7	8	9	10
	A	3	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	A	3	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	3	P2			CR				
Parameter P1: ALE channel switching direction 0: Descending order (List No.: Large to Small) 1: Ascending order (List No.: Small to Large) P2: Channel Number (3 digits) Note: The transceiver does not accept this configuration command while the transceiver is in Net Mode.										

A4	This function can be used to change and read the ALE monitor status.									
Set	1	2	3	4	5	6	7	8	9	10
	A	4	P1	CR						
Read	1	2	3	4	5	6	7	8	9	10
	A	4	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	4	P1	CR						
Parameter P1: ALE Monitor status 0: Off 1: On										

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A5	This function can be used to make various types of ALE calls.											
Set	1	2	3	4	5	6	7	8	9	10		
	A	5	P1	P2								
	11	12	13	14	15	16	17	18	19	20		
	P2								P3 (Variable length)			
	21	22	23	24	25	26	27	28	29	30		
	P3 (Variable length)			CR								
Read												
Answer												

Parameter

P1: Call Type

- 0: Terminate
- 1: Sounding
- 2: Individual Call
- 3: Net Call

- 4: LQA score exchange (Individual Call)
- 5: LQA score exchange (Net Call)

P2: Caller Address (Fixed at 15 digits; ALE Address: spaces are used for unused digits.)

- * If the call type is anything other than an Individual Call with LQA score exchange (Individual Call), this parameter is omitted.
- * Configure "@?@" when making an AllCall. However, a channel cannot be specified by using the LQA score exchange.

P3: AMD message (Variable length: A maximum of 90 digits)

- *This parameter is omitted when it is unnecessary.

Note:

- ◆ The Self Address registered for the selected Net is used. The Self Address configured for Net No.1 is used in Channel Mode.
- ◆ The transceiver makes a Net Call to the selected Net. The transceiver makes a Net Call to Net No.1 in Channel Mode.
- ◆ Operations other than Terminate cannot be done while the link is established.
- ◆ The link cannot be terminated while the transceiver is in standby mode.

Configuration Example

Sending Terminate:

A50<CR>

Sending Sounding:

A51<CR>

Making an Individual Call:

A52SAM_____<CR> (If the caller address is SAM.)

A52SAM_____HELLO<CR> (If the caller address is SAM and the message is HELLO.)

Making a Net Call

A53<CR>

A53HELLO<CR> (If the message is HELLO.)

Making an AllCall

A52@?@<CR>

A52@?@_____HELLO<CR> (If the message is HELLO.)

Sending the LQA score exchange (Individual Call):

A54TOM<CR>

A54TOM_____HELLO<CR> (If the message is HELLO.)

A6	This command can be used to receive various types of ALE calls.											
Set												
Read												
Answer	1	2	3	4	5	6	7	8	9	10		
	A	6	P1	P2								
	11	12	13	14	15	16	17	18	19	20		
	P2							P3 (Variable length)				
	21	22	23	24	25	26	27	28	29	30		
P3 (Variable length)			CR									

Parameter

P1: Call Type

- 1: Sounding
- 2: Individual Call
- 3: Net Call
- 4: AllCall
- 5: Emergency Call

P2: Caller Address (Fixed at 15 digits; ALE Address: spaces are used for unused digits.)

P3: AMD message (Variable length: A maximum of 90 digits)

Note: The response command is automatically sent when the transceiver receives various calls.

Configuration Example

Receiving Sounding:

A61SAM_____ <CR> (If the caller address is SAM.)

Receiving an Individual Call:

A62SAM_____ <CR> (If the caller address is SAM.)

A62SAM_____ HELLO<CR> (If the caller address is SAM and the message is HELLO.)

Receiving a Net Call

A63SAM_____ <CR> (If the caller address is SAM.)

A63SAM_____ HELLO<CR> (If the caller address is SAM and the message is HELLO.)

Receiving an AllCall

A64SAM_____ <CR> (If the caller address is SAM.)

A64SAM_____ HELLO<CR> (If the caller address is SAM and the message is HELLO.)

Emergency Call

A65SAM_____ <CR> (If the caller address is SAM.)

A7	This command can be used to read the link status of the ALE.									
Set										
Read	1	2	3	4	5	6	7	8	9	10
	A	7	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	A	7	P1	CR						

Parameter

P1: Link status

- 0: Available State (Standby)
- 1: Linking State (Linking)
- 2: Linked State (Link has been established.)
- 3: Call failed.

Note: The response command is automatically sent when the link status changes.

APPENDIX 1 PC COMMANDS

A8	This command can be used to output a request status relevant to GPS data transmission.									
Set	1	2	3	4	5	6	7	8	9	10
	A	8	P1			P2				
	11	12	13	14	15	16	17	18	19	20
	P2								P3	
	21	22	23	24	25	26	27	28	29	30
	P3									
	31	32	33	34	35	36	37	38	39	40
	P3				P4			CR		
Read										
Answer										
Parameter										
P1: Request type										
82: GPS data transmission request										
83: GPS data automatic transmission stop request										
84: GPS data automatic transmission resume request										
P2: Target Address (Fixed at 15 digits; ALE Address: spaces are used for unused digits.)										
P3: Own Address (Fixed at 15 digits; ALE Address: spaces are used for unused digits.)										
If spaces are configured for all digits, the Self Address configured for the selected Net is used.										
P4: Channel (000, 001 to 100)										
* If 000 is configured, Channel is automatically selected by the LQA.										
Note:										
◆ The received GPS data is transferred with the A9 command.										
◆ A call fails an unavailable channel is configured at P4.										

A9	This command can be used to output the GPS data reception information.									
Set										
Read										
Answer	1	2	3	4	5	6	7	8	9	10
	A	9	P1							
	11	12	13	14	15	16	17	18	19	20
	P1							P2		
	21	22	23	24	25	26	27	28	29	30
	P2									
	31	32	33	34	35	36	37	38	39	40
	P2									
	41	42	43	44	45	46	47	48	49	50
	P2									
	51	52	53	54	55	56	57	58	59	60
	P2									
	61	62	63	64	65	66	67	68	69	70
P2	CR									
Parameter										
P1: Target Address (Fixed at 15 digits; ALE address with more than 3 digits: spaces are used for unused digits.)										
P2: GPS data (NMEA format with variable length (a maximum of 44 digits) (\$GPGLL sentence)										
Note: The response command is automatically sent when the transceiver receives GPS data.										
GPS Data Example										
\$GPGLL,4916.452349,N,12311.123215,W,225444.00,A,A*6A										

B0	This command can be used to configure and read time in the ALE unit.									
Set	1	2	3	4	5	6	7	8	9	10
	B	0	P1	P2				P3		P4
	11	12	13	14	15	16	17	18	19	20
	P4	P5		P6		P7		CR		
Read	1	2	3	4	5	6	7	8	9	10
	B	0	CR							
Answer	1	2	3	4	5	6	7	8	9	10
	B	0	P1	P2				P3		P4
	11	12	13	14	15	16	17	18	19	20
	P4	P5		P6		P7		CR		

Parameter

P1: (Fixed at space(s))

P2: Year (4 digits)

P3: Month (2 digits)

P4: Date (2 digits)

P5: Hour (2 digits)

P6: Minutes (2 digits)

P7: Seconds (2 digits)

Note:

- ◆ The time is entered in 24-hour format.
- ◆ If 12-hour format is configured, AM or PM is omitted for the time of the response command.
- ◆ The transceiver sends an error message (?<CR>) if the time cannot be configured. The transceiver sends the response command if the time is configured.

Configuration Example

When configuring 1:00:00 p.m. April 1, 2006 for the time and date: B0 20060401130000<CR>

APPENDIX 2 CONFIGURATION LIST

The following functions can be configured in User Menu and Dealer Menu.

Functions must be assigned to PF keys by using KPG-102D when configuring functions in User Menu. (Refer to 11 MENU FUNCTION on page 28.)

Refer to the Field Programming Reference for instructions on how to configure functions by using KPG-102D.

Table 2-1 Configuration List

Function	KPG-102D	User Menu	Dealer Menu	
			Channel Settings Mode	Function Settings Mode
Channel Information	RX Frequency (Receive Frequency)	○		○
	TX Frequency (Transmit Frequency)	○		○
	Mode	○		○
	Channel Name	○		○
	Power (Transmit Power)	○		○
	AUX	○		○
	Pre-amp/ Attenuator (Pre-amplifier / Attenuator)	○		○
	Scan Add	○		○
	Selcall	○		○
	Voice Scrambler (Scrambler Settings)	○		○
	Scrambler Code (Scrambler Settings)	○		○
Optional Features	LCD Brightness	○	○	
	Display	○	○	
	Call Type	○	○	
	Ignition Sense	○		○
	COM port Settings	○		
	Polarity	○		
	Channel Number Display	○		
	Power Switch Status Memory (Power-on)	○		
	Clock (Power-on)	○		
	Power-on Text (Power-on)	○		
	Panel Test	○		
	Panel Tuning	○		
	Channel Settings	○		
	Function Settings	○		
	Clone	○		
	Firmware Programming	○		
	Firmware Version Information	○		
	VFO Reset	○		
	ALE Firmware Programming	○		
	ALE Firmware Version Information	○		
Data Password	○			
Power-on Tone (Tone Volume)	○			
Control Tone (Tone Volume)	○			

Function	KPG-102D	User Menu	Dealer Menu	
			Channel Settings Mode	Function Settings Mode
Warning Tone (Tone Volume)	0			
Alert Tone (Tone Volume)	0			
CW Sidetone (Tone Volume)	0			
Locator Tone (Tone Volume)	0			
Minimum Volume Type (Audio Volume)	0			
Minimum Volume (Audio Volume)	0			0
Squelch Level	0	0		
Clarifier Frequency	0	0		
Time-out Timer	0			0
Mic Gain Level	0			0
Manual Antenna Tuning Duration	0			
Auto Antenna Tuning Duration	0			
Mic High Boost	0			
Noise Blanker	0	0		
Auto Antenna Tuning with PTT	0			
Scrambler Status Memory	0			
Antenna Tuner Control	0			
IF Filter SSB (IF Filter)	0			0
IF Filter FSK (IF Filter)	0			0
IF Filter DATA (IF Filter)	0			0
Center frequency for optional CW filter (IF Filter)	0			
VOX (VOX)	0	0		
Cancel Operation (VOX)	0			
VOX Delay Time (VOX)	0	0		
VOX Gain Level (VOX)	0	0		
Anti-VOX Gain Level (VOX)	0	0		
VFO Frequency	0			
VFO Receive/Transmit Mode	0			
Transmit Power for VFO Mode	0			0
VFO AUX	0			
Pre-amplifier/ Attenuator for VFO Mode	0			
VFO Scrambler (VFO Scrambler)	0			
VFO Scrambler Code (VFO Scrambler)	0			
FSK Reverse (FSK)	0			0
FSK Transmit Polarity (FSK)	0			0
FSK Transmit Shift Frequency (FSK)	0			0
FSK Receive Tone Frequency (FSK)	0			0
DATA Sideband (DATA)	0			0
DI Level (DATA)	0			0
DEO Level (DATA)	0			0

Optional Features

APPENDIX 2 CONFIGURATION LIST

	Function	KPG-102D	User Menu	Dealer Menu	
				Channel Settings Mode	Function Settings Mode
Optional Features	CW Break-in (CW)	0			0
	CW Break-in Delay Time (CW)	0			0
	CW Pitch/CW Sidetone (CW)	0			
	Rec/Play Channel 1 to Rec/Play Channel 4	0			
	Auto Recording	0			
	Channel Voice Guide	0			
Key Assignment	Assigning Functions to PF keys on panels and Mic keypad	0			
	Direct Channel	0			
Scan Information	Revert Channel	0			0
	Preferred Channel	0			0
	Scan Resume	0			0
	Dropout Delay Time	0			0
	Dwell Time	0			0
	Time Operated Wait	0			0
	Preferred Channel Scan Interval	0			0
	Scan Resume after Transmit	0			0
ALE - Channel Information	RX Frequency	0			
	TX Frequency	0			
	Mode	0			
	Channel Name	0			
	Power	0			
	Pre-amp/ Attenuator	0			
	AT Auto Tune	0			
	ANT #	0			
	Antenna Tuner Auto Tune	0			
ALE - Net Configuration	Net Number	0			
	Net Address	0			
	Self Address	0			
	Scan Rate	0			
	Sounding	0			
	Sounding Interval Time	0			
	Tune Time	0			
	Listen-before-transmit Time	0			
	Receive AllCall	0			
	LQA (Link Quality Analysis) Request	0			
	Send AllCall	0			
	Scan List	0			
	Net Members	0			
	AllCall Channel	0			

Function	KPG-102D	User Menu	Dealer Menu	
			Channel Settings Mode	Function Settings Mode
ALE - Other Address List ALE - Options	Other Address	0		
	Wait for Activity Timer	0		
	LQA Score Threshold Level	0		
	LQA Timeout	0		
	AMD Frame	0		
	Calling Channel Sequence	0		
ALE - Applications	Auto Address	0		
	AMD Message 1 to AMD Message 10	0		
	Target Address 1 to Target Address 4	0		
	Self Address 1 to Self Address 4	0		
	Message 1 to Message 4	0		
	Target Address	0		
ALE - Misc. Features	Self Address	0		
	Data Transmit Channel	0		
	Link Establishment Tone	0		
	Data Receive Tone	0		
	Time Format	0		
Selcall Function	Voice Scrambler	0		
	Scrambler Code	0		
	ID (Own)	0		
	Data Transmit Delay Time	0		
	Number of Retries	0		
	Selcall Tone	0		
	Status Call Tone	0		
	Auto Reset Timer (Auto Reset)	0		
	LCD (Auto Reset)	0		
	Caller ID Memory	0		
	Special Status	0		
	Compatible with the TK-80 Selcall	0		
	ID List	0		
	Status List	0		
	Stun (Transmit Inhibit)	0		
	Stun (Transceiver Inhibit)	0		
	Revive	0		
	Direct Selcall 1 to Direct Selcall 4	0		
	Target (Status)	0		
	Direct Status Call 1 to Direct Status Call 4	0		
AUX Input Status Message 1 and AUX Input Status Message 2	0			
AUX Output Status Message	0			
Memory Code	0			

APPENDIX 2 CONFIGURATION LIST

Function	KPG-102D	User Menu	Dealer Menu	
			Channel Settings Mode	Function Settings Mode
GPS	GPS Report Interval Time	0		
	GPS Time Mark	0		
	ID for GPS Data Transmit	0		
	\$GPRMC (NMEA) (GPS Base Station Settings)	0		
	\$GPGGA (NMEA) (GPS Base Station Settings)	0		
GPS	\$GPGLL (NMEA) (GPS Base Station Settings)	0		
	\$GPWPL (NMEA) (GPS Base Station Settings)	0		
Special Alert Tone	Cycle	0		
	Interval	0		
	Frequency	0		
	Length	0		
Emergency Information	Emergency Call Type	0		
	Emergency Channel	0		
	Emergency-key Delay Time	0		
	Emergency Cycle	0		
	Duration of Locator Tone 1	0		
	Transmit Duration	0		
	Duration of Locator Tone 2	0		
	Receive Duration	0		
	Emergency Display	0		
	Emergency Text	0		
	Emergency Mode Type	0		
	Emergency Response Tone	0		
	Emergency Selcall ID	0		
	Emergency CW Code	0		
	Background Transmission	0		
	Suspended Power-off	0		
	Emergency Sidetone	0		
Add GPS Data	0			
Extended Function	Assigning Functions to Auxiliary Ports	0		
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