

**K
E
N
W
O
O
D**

Function Reference (FUNC)

For

TKR-750/850 Version2

TKR-751/851

Version:

1.01 USA

Last Updated:

Sep, 2005

Language:

English

Type:

K

About Copyright

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

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

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

Revision history

Date	Description
Sep. 2005	K-USA R&D modify

CONTENTS

1 BASIC OPERATION	1	5.5 Off-hook Decode	16
1.1 Functions and Panel Layout	1	6 PTT OPERATION	17
1.2 TX/RX Frequency	2	6.1 Time-out Timer (TOT)	17
1.3 Transmit output power	3	6.2 TOT Pre-alert	17
1.4 Bandwidth	3	6.3 TOT Rekey Time	17
1.5 Mode	3	6.4 TOT Reset Time	18
1.6 Display	4	6.5 Repeat Hold Time	18
1.6.1 7-segment LED	4	6.6 Busy Channel Lockout	18
1.6.2 TX LED	5	6.7 PTT Priority	18
1.6.3 BUSY LED	5	7 TOT (TIME OUT TIMER)	19
1.6.4 POWER LED	5	7.1 Repeater PTT or the External PTT	19
1.6.5 PF1 to PF6 keys LED	5	7.2 Using the Local Mic PTT	19
1.7 Operation	6	8 BUSY CHANNEL LOCKOUT	21
1.7.1 Turning ON/OFF	6	9 TONE	22
1.7.2 Adjusting Volume Level	6	9.1 Beep Tone	22
1.7.3 PF keys	6	9.1.1 Power-on Tone	22
1.8 Squelch Level	6	9.1.2 Control Tone	22
2 PASSWORD	7	9.1.3 Warning Tone	22
2.1 Data Password	7	9.2 Information Tone	23
3 EMBEDDED MESSAGE	8	9.2.1 Courtesy Tone	23
3.1 Embedded Message	8	9.2.2 Backup Battery Tone	23
3.2 Embedded Message w/Password	8	10 POWER CONTROL	24
4 CHANNEL INFORMATION	9	10.1 Backup Battery System	25
4.1 Reception Frequency	9	10.2 Power Supply Lower Level	26
4.2 Transmission Frequency	9	10.3 RX Signal Detect (Below)	26
4.3 QT/DQT Decode	9	10.4 DC Power Save	26
4.4 QT/DQT Encode	9	10.4.1 Save Delay Timer A	26
4.5 Channel Name	10	10.4.2 Save Delay Timer B	26
4.6 Wide/ Narrow	10	10.4.3 Save Mode Duration	26
4.7 Encode Tone in Multiple	10	10.4.4 Save On	27
4.8 Operation Mode	12	10.4.5 Save Off	27
4.9 Beat Shift	12	10.5 Start Up	27
4.10 TX High Power	12	10.6 Backup Power	27
4.11 QT Reverse Burst	12	10.7 Main Power	27
4.12 Scan Add	13	11 EXTERNAL MONITOR	28
4.13 Compaander	13	12 FAN ACTION	29
4.14 Voice Scrambler	13	13 TX STANDBY ON FREQUENCY	30
4.14.1 Scrambler Code	13		
4.14.2 Scrambler Backup	14		
4.15 CW ID	14		
5 QT/DQT	15		
5.1 QT/DQT	15		
5.2 DQT Turn-off Code	15		
5.3 QT Reverse Burst	15		
5.4 QT Decode Delay	15		

CONTENTS

14 FIRMWARE PROGRAMMING

MODE SETTING31

15 KEY ASSIGNMENT32

15.1 Available Functions32

16 SCAN34

16.1 Priority Scan34

16.2 Priority Channel34

16.3 Look Back Time A34

16.4 Look Back Time B35

16.5 Revert Channel35

16.6 Dropout Delay Time36

16.7 Dwell Time36

16.8 Off-hook Scan36

17 DTMF37

17.1 DTMF Speed37

17.2 First Digit Delay Time37

17.3 First Digit Time37

17.4 * and # Digit37

17.5 Encode37

17.6 Decode38

17.7 Frequency38

17.8 Period38

17.9 Side Tone38

18 REMOTE CONTROL39

18.1 Control PF keys39

18.1.1 PF Key Activation39

18.1.2 PF Key Deactivation39

18.1.3 PF Key Transponder40

18.1.4 Single Tone for the PF Key Transponder40

18.2 Control the Auxiliary Ports40

18.2.1 Aux Input Activation40

18.2.2 Aux Input Deactivation40

18.2.3 Aux Output Activation41

18.2.4 Aux Output Deactivation41

18.2.5 Aux In/Out Transpond41

18.2.6 Single Tone for the Aux Transponder function . 41

18.3 Remote Access with QT/DQT42

18.4 Clear to Transpond42

19 TRANSPOND43

19.1 Remote Controlled43

20 FUNCTION PORT44

20.1 AUX I/O Function45

20.2 AUXI Function46

20.2.1 Trigger Detection for Auxiliary Input Ports50

20.3 Assigning Functions to the Auxiliary Output Ports 50

20.3.1 Logic Type51

21 MULTI-TABLE52

22 CW ID/CW MESSAGE53

22.1 CW ID53

22.1.1 CW ID53

22.1.2 TX Interval Time53

22.1.3 TX Delay Time54

22.1.4 CW Speed (CW ID)54

22.1.5 CW Mod. Delay Time (CW ID)54

22.1.6 Audio Frequency (CW ID)54

22.1.7 TX Required in Interval54

22.1.8 CW ID Override54

22.1.9 Send CW ID to RA54

22.1.10 CW ID on Channel change54

22.1.11 Encode with QT/DQT (CW ID)55

22.2 CW Message55

22.2.1 CW Message55

22.2.2 CW Speed (CW Message)56

22.2.3 CW Mod. Delay Time (CW Message)56

22.2.4 Audio Frequency (CW Message)56

22.2.5 Send CW Message to RA56

22.2.6 Encode with QT/DQT (CW Message)56

23 TEST TONE57

24 PC MODE58

24.1 PC Programming Mode58

24.2 PC Test Mode58

24.2.1 Test Signalling58

24.2.2 Test Frequency59

24.2.3 PC Tuning Mode60

25 PROGRAM62

26 BACKUP63

About this manual

This manual describes the functions of the TKR-750/850 version2 and TKR-751/851 and how to configure these functions.

How to read this manual

This manual has the following sections. In each section, each function has the reference data in order to find the cross-referenced information. As for the functions that you can configure using KPG-91D, you can see the reference data since it is described as (< Configuration on the KPG-91D).

The abbreviation of sections are used to specify the documents.

Function Reference (FUNC)

This section describes every function.

Field Programming Reference (FPRG)

This section describes how to configure using KPG-91D.

Modification Information (MOD)

This section describes how to modify the hardware.

About notations

Following are notations used in this manual.

□

The characters in parentheses indicate the name of the operating portion of the TKR-750/850 version2 and the key of the PC.

““

The characters in these marks indicate the name of the functions, buttons, and menus displayed on the display of KPG-91D.

About trademark

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

Microsoft® and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.

Other company names and product names are trademarks or registered trademarks of the companies.

Description of the TKR-50 Series

■ About the TKR-50 Series

The TKR-750/850/751/851 is the rack-mounted repeater operating with the UHF/VHF band and it can be controlled by external devices and the Air Remote. You can build the most advanced communications system by using the monitoring function and the remote control function.

■ Features of the TKR-750/850 version 2 and 751/851

- Field Programming by KPG-91D.
- 16 channel capability.
- Firmware update into flash memory through the external source.
- QT/DQT signalling on each channel and decode up to 16 QT/DQT tones.
- DSP is processing audio frequency response.
- Time Out Timer limiting duration to make a continuous transmission.
- The Priority Scan allows you to configure the channels to be periodically scanned.
- CW ID function, you can configure the speed, transmission interval, and the frequency on each channel.
- Remote control by connecting the Remote Controller.
- Detect the malfunctions and report the status from the AUX terminal.
- External terminal for connecting the external controller to make Trunking systems.
- TKR-750/850 version2 has DTMF Air Remote function.
- Courtesy Tone notifying that is transmitted at end of the transmission.
- Multi-mode.

TKR-750/751 Wide:30/25 kHz Narrow:15/12.5 kHz

TKR-850/851 Wide:25 Narrow:12.5 kHz

You can configure following items through the PC using the KPG-91D.

- CW ID Deviation
- DQT Deviation
 - Maximum Deviation
 - QT Deviation
- Repeat Gain Level
- TX Power
- RX Audio Signal Output (RA)
- RX Detector Signal Output (RD)
- Test Tone Deviation
- TX Audio Input (TA)
- DTMF Deviation
- Battery Operation Tone

- Battery Warning Tone
- Courtesy Tone
- Squelch
- Frequency
- DQT Balance
- Power Down Detect

■ **About the TKR-*50 Series Programming Software**

You can program each functions into TKR-750/850 version2 by KPG-91D through KPG-46 programing cable. In this manual, the description of each function in the Function Reference may have the corresponding reference in the Field Programming Reference. Therefore, you can configure the function by referring to the function also appearing in the Field Programming Reference.

1 BASIC OPERATION

1.1 Functions and Panel Layout

■ Front Panel

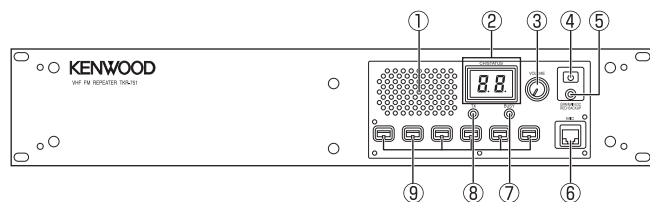


Figure 1-1 Front Panel

① Speaker

The speaker emits the received audio signals and alert tones.

② Channel/Status display

Two 7-segment LEDs can display channel numbers, name and the status.

③ Volume Knob

The volume increases while turning the volume knob clockwise and decreases while turning it counterclockwise.

④ Power switch

Press this switch to turn ON and press it again to turn OFF.

⑤ POWER LED

The LED lights green while using with main power (DC) or lights red while using with the backup power.

⑥ Microphone connector (8-pin connector)

You can connect a microphone with this connector. (Refer to Table 1-1 Assigning signals to the 8-pin connector.)

⑦ BUSY LED

This LED lights green while receiving signal.

⑧ TX LED

This LED lights red while transmitting.

⑨ PF key (Programmable Function key)

Press a PF (Programmable Function) key to activate the assigned function. A key LED lights orange while the assigned function is activated.

Table 1-1 Assigning signals to the 8-pin connector

Pin number	Pin name	Description
1	NC	No connection
2	SB	Switched + B output: 10.8 - 15.6 V/ 0.2 A max.
3	GND	Ground

Pin number	Pin name	Description
4	PTT/TXD1	PTT signal input./ PC serial data from TKR-750/ 850/751/851. PC read, PC tuning, Firmware programming
5	MIG	-
6	MIC	-
7	HOOK/RXD1	HOOK signal input. / PC serial data to TKR-750/850/ 751/851. PC write, PC tuning, Firmware programming
8	NC	No connection

■ Rear Panel

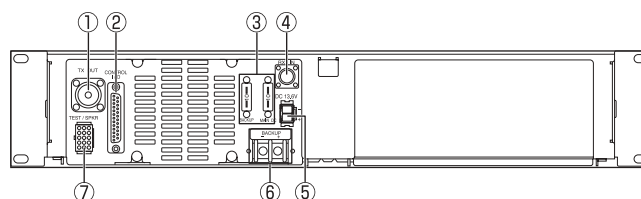


Figure 1-2 Rear panel

① Antenna jack for transmission

This jack allows you to connect the transmission antenna, duplexer or RF amplifier.

② Control Interface jack (25-pin connector)

This jack allows you to connect an external device or controller. (Refer to Table 1-2 Assigning signals to 25-pin connector.)

③ Fuse

You can attach a 10 A fuse.

④ Antenna jack for reception

This jack allows you to connect the reception antenna, duplexer or Pre-selector.

⑤ Power connector

This connector allows you to connect a power cable. With this code, DC 13.6 V (K-type) power are supplied into TKR-750/850/751/851.

⑥ Backup Battery terminal

This terminal allows you to connect the backup battery.

⑦ TEST/SPKR jack (15-pin connector)

This jack allows you to connect an external speaker. You can use this jack for making input/output tests. Also some signals arrive on these connector. (Refer to Table 1-3 Assigning signals to the 15-pin connector.)

1 BASIC OPERATION

Table 1-2 Assigning signals to 25-pin connector

Pin number	Pin name	Input/output	Description
1	NC	---	No connection
2	RXD2	Input	PC serial data input RS-232C Level/Polarity
3	TXD2	Output	PC serial data output RS-232C Level/Polarity
4	AUXI 1	Input	CMOS Input
5	AUXI 2	Input	CMOS Input
6	AUXI 3	Input	CMOS Input
7	DG	---	Digital GND
8	TD	Input	Transmitted data input
9	TA	Input	Transmitted audio signal input
10	RD	Output	Received Detect signal output
11	RA	Output	Received audio signal output
12	RXG	---	RX GND
13	SPM	Input	Speaker Mute input Mute "L"
14	NC	---	No connection
15	EXT. MON	Input	External Monitor Switch input Monitor "L"
16	EXT. PTT	Input	External PTT Switch input PTT ON "L"
17	SC	Output	Squelch Control output BUSY "L"
18	NC	---	No connection
19	TXG	---	TX GND
20	AUXIO 1	Input/output	CMOS Input/Output
21	AUXIO 2	Input/output	CMOS Input/Output
22	AUXIO 3	Input/output	CMOS Input/Output
23	AUXIO 4	Input/output	CMOS Input/Output
24	AUXIO 5	Input/output	CMOS Input/Output
25	AUXIO 6	Input/output	CMOS Input/Output

Table 1-3 Assigning signals to the 15-pin connector

Pin number	Pin name	Input/output	Description
1	SB	Output	Output voltage 10.8 - 15.6 V: 1 A maximum
2	SB	Output	Output voltage 10.8 - 15.6 V: 1 A maximum
3	NC	---	No connection
4	GND	---	Ground

Pin number	Pin name	Input/output	Description
5	GND	---	Ground
6	SPG	---	Speaker ground
7	RD	Output	Received Detect output
8	RSSI	Output	RSSI signal output
9	SPI	Input	Internal Speaker input
10	Auxiliary output 1	Output	Open collector
11	Auxiliary output 2	Output	Open collector
12	SPO	Output	External Speaker output (4 W/ 4Ω)
13	Auxiliary output 3	Output	CMOS Output
14	Auxiliary output 4	Output	CMOS output
15	Auxiliary output 5	Output	CMOS output

Note: Refer to the "Modification Information" for the detailed information.

1.2 TX/RX Frequency

This is a frequency pair used for transmitting and receiving. The value differs corresponding to the area, where a repeater is used.

Table 1-4 Transmission/Reception Frequency, Step

Model	Type	Transmission/Reception Frequency	
		Range [MHz]	Step [kHz]
TKR-751	K	146 - 174	2.5/ 5/ 6.25
TKR-851	K	450 - 480	5/ 6.25
	K2	480 - 512	5/ 6.25

You can program a transmission frequency and a reception frequency of TKR-750/850/751/851 to each channel.

■ Configuration of KPG-91D

- Configuring a transmission frequency and a reception frequency to a channel
(Refer to FPRG 6.2.1 Reception Frequency and 6.2.2 Transmission Frequency.)

1.3 Transmit output power

Table 1-5 Transmission Output Power: Low/High

Model	Transmission Output Power [W]	
	Low	High
TKR-750 Version 1	25	50
TKR-750 Version 2	25 (Adjustable to 15W)	50
TKR-850 Version 1	25	40
TKR-850 Version 2	25 Adjustable to 15W)	40

■ Configuration of KPG-91D

- Configuring the transmission output power (low or high) to a channel ([Refer to 4.10 TX High Power.](#))

1.4 Bandwidth

Frequency bandwidth is a width of frequency used for making a transmission. It has to select a bandwidth approved. The value differs corresponding to the area, where a repeater is used.

Table 1-6 Bandwidth: Wide/ Narrow

Model	Transmission Bandwidth [kHz]	
	Wide	Narrow
TKR-750(VHF)	30, 25	15, 12.5
TKR-850(UHF)	25	12.5

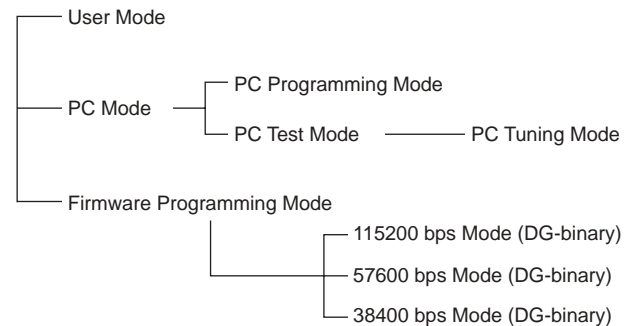
■ Configuration of KPG-91D

- Configuring the transmission bandwidth to a channel ([Refer to 4.6 Wide/ Narrow.](#))

1.5 Mode

Following are modes operating and transition to each mode:

● Mode



● User Mode

This mode allows you to operate the TKR-750/850/751/851 as a base station or repeater. The TKR-750/850/751/851 automatically starts up under User Mode when turning it ON while data is correctly configured. In this case, you do not have to press any keys. You can configure a base station function or repeater function on each channel. ([Refer to 4 Channel Information.](#))

With this mode, DSP program in a internal flash memory is written to the DSP RAM when turning it ON. When it is controlling remotely, high/low signal is entered from an external device via an auxiliary input terminal, then various functions are activated. ([Refer to 20 Function Port.](#))

This mode supports DTMF Air Remote function. ([Refer to 17 DTMF, 18 Remote Control.](#))

● PC Mode ([Refer to 24 PC Mode.](#))

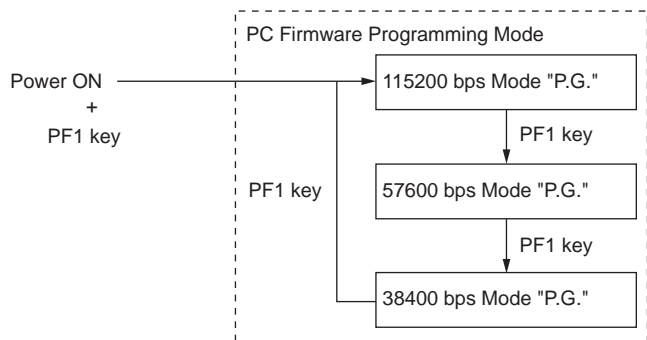
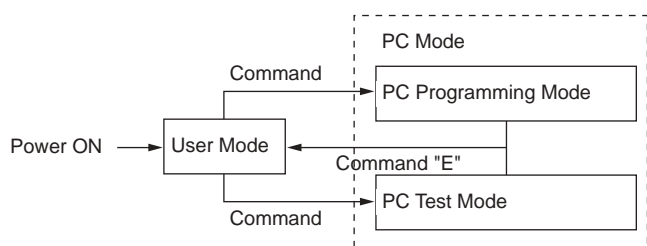
PC Mode is a mode activated after starting up under the User Mode and this mode is controlled with commands entered through a PC. Data communication is made through the microphone connector (8-pin connector) located on the front panel or the control interface jack (25-pin connector), which is in conformity with the RS-232C standard located on the rear panel. The baud rate of data communication is 9600 bps. ([Refer to Table 1-2 Assigning signals to 25-pin connector.](#))

● PC Programming Mode ([Refer to 24.1 PC Programming Mode.](#))

This Mode is activated by the PROGRAM command sent from a computer and allows you to read or write a configuration data between FPU and TKR-750/850/751/851.

1 BASIC OPERATION

- PC Test Mode** (Refer to 24.2 PC Test Mode.)
 The PC Test Mode is a mode to activate by the TUNING command sent from a computer, and in this mode, you can control transmission and reception by the computer.
 - PC Tuning Mode** (Refer to 24.2.3 PC Tuning Mode.)
 This mode allows you to adjust various transmission and reception adjustment under the PC Test Mode.
 - Firmware Programming Mode** (Refer to 25 Program.)
 You can program a firmware update in this mode. You are able to program the firmware using a special software (FPRO.EXE) and a programming speed is 115200 bps, 57600 bps, or 38400 bps. The DSP software is also written into a flash memory.
- **Transition to each mode**



Note: The Firmware Programming setting must be enabled by FPU before entering into PC Firmware Programming Mode. (Refer to 14 Firmware Programming Mode Setting.)

1.6 Display

Following are display functions of the front panel:

- **LED**
 - 7-segment LED: 2 digits
 - TX LED: red
 - BUSY LED: green
 - POWER LED: green and red
 - PF1 to PF6 keys LED

1.6.1 7-segment LED

Alpha-numeric characters are displayed by switching On and Off 7 bars.

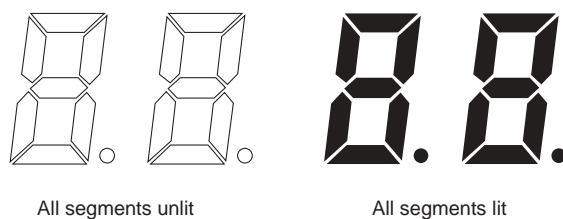


Figure 1-3 All 7-segment LEDs while lit and un-lit.

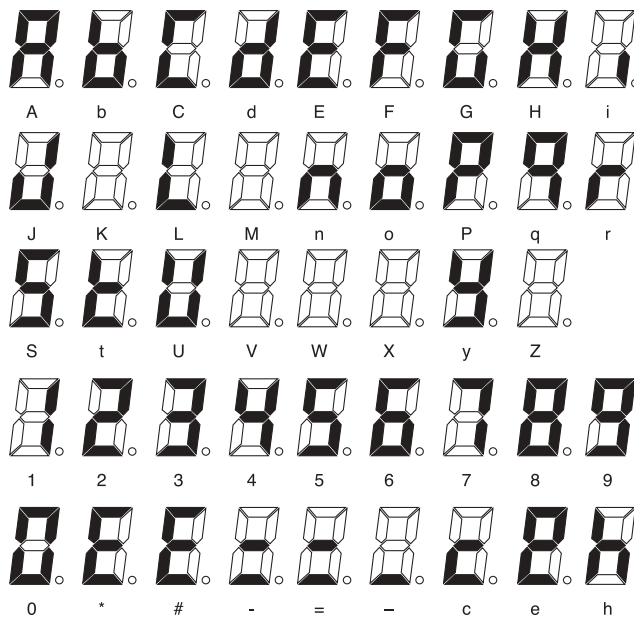


Figure 1-4 Available characters

Note:

- ◆ Although you can use "A" to "_", you cannot use the upper "C" since it is used in the scanning display and the Programming Mode display.
- ◆ In addition, you cannot use "K", "M", "V", "W", "X", and "Z".

Table 1-7 Example of LED display

Repeater status	LED display	Description
Non-Priority Channel (ADD)	16.	DOT (.) appears on the right side of the right digit.
Non-Priority Channel (DEL)	16	-
Priority Channel	.1	DOT (.) appears on the right side of the left digit.
PC Programming Mode PC Test Mode PC Tuning Mode	PC	"PC" appears automatically after receiving PC command.
Firmware Programming Mode	P.G.	DOTs (.) appear on the right side of left and right digits for 115200 bps data speed.
	PG.	DOT (.) appears on the right side of the right digit for 57600 bps data speed.
	PG	No DOT for 38400 bps data speed.
Un-Programmed	E1	This character appears when all channels are blank.
Channel data blank	E2	This character appears when the selected channel is blank. (In case of a blank channel is selected in remote controller, etc.)
PLL Un-Lock	E3	TX PLL Un-Lock: TX LED blinking. RX PLL Un-Lock: BUSY LED blinking.
TX frequency data blank	E4	This character appears when attempting to transmit with a channel which does not be assigned a transmission frequency. (Valid for Repeater PTT, local microphone PTT, external PTT)
Scanning Mode	SC	"SC" appear automatically.

1.6.2 TX LED

Following are the conditions for the TX LED to light red:

- TKR-750/850/751/851 is transmitting.
- TKR-750/850/751/851 is sending data to PC during FPU reading.

You can assign a function for switching the display On/Off function to an auxiliary port and PF key. (Refer to 15 Key Assignment, 18 Remote Control, 20 Function Port.)

■ Configuration of KPG-91D

- Configuring the function for switching On/Off the display (Refer to FPRG 6.5 "Key Assignment" window, 6.9 "Remote Control" window, and 6.10 "Function Port" window.)

1.6.3 BUSY LED

Following are the conditions for the BUSY LED to light green:

- TKR-750/850/751/851 is receiving a signal.
- TKR-750/850/751/851 reads data by KPG-91D.

You can assign the function for switching the display On/Off function to an auxiliary port and PF key. (Refer to 15 Key Assignment, 18 Remote Control, 20 Function Port.)

■ Configuration of KPG-91D

- Configuring the function for switching On/Off the display (Refer to FPRG 6.5 "Key Assignment" window, 6.9 "Remote Control" window, and 6.10 "Function Port" window.)

1.6.4 POWER LED

The LED lights green while TKR-750/850/751/851 is using a main power and the LED lights red while using a backup power.

Note: You must connect backup battery terminal with a backup battery to use the backup power.

1.6.5 PF1 to PF6 keys LED

When functions are assigned to PF1 to PF6 keys and pressed, the LED lights and the assigned function is activated.

You can assign switching the display On/Off function to auxiliary ports and PF keys. (Refer to 15 Key Assignment, 18 Remote Control, 20 Function Port.)

■ Configuration of KPG-91D

- Configuring the function for switching On/Off the display (Refer to FPRG 6.5 "Key Assignment" window, 6.9 "Remote Control" window, and 6.10 "Function Port" window.)

1.7 Operation

1.7.1 Turning ON/OFF

Press the Power switch to turn TKR-750/850/751/851 ON. Press the switch again to turn it OFF.

When TKR-750/850/751/851 is turned ON, the PF keys, TX LED, BUSY LED, and Channel/Status display light for one second, then the status appears on the Channel/Status display. (Refer to 1.6 Display.)

The POWER LED lights green when TKR-750/850/751/851 is using a main power (DC) or lights red while using backup power.

1.7.2 Adjusting Volume Level

Turn the VOLUME knob clockwise to increase the audio level from the speaker and decreases by turning it counterclockwise.

Note: You cannot change the beep volume by the VOLUME knob since it is configured by FPU. (Refer to 9 Tone.)

1.7.3 PF keys

Press a PF key to activate a function assigned on each key. A key LED lights orange while the assigned function is activating. (Refer to 15 Key Assignment.)

1.8 Squelch Level

Squelch is a function that eliminate noise occurring when there is no signal to receive. With this function, TKR-750/850/751/851 automatically eliminates the noise and it opens squelch during receiving a call in order to listen to the received audio signals.

The squelch level is a open level of the squelch when receiving signal is weak.

Table 1-8 Squelch level

Range	0	1 - 15
	Mute function is completely disabled.	Shallow - Tight
Step	1	

You can configure the squelch level and assign On/Off status to auxiliary ports and PF keys.

(Refer to 15 Key Assignment, 20 Function Port.)

The configured squelch level is used as the starting level of the repeat operation.

■ Configuration of KPG-91D

- Configuring the squelch level (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Assign the function for switching On/Off. (Refer to FPRG 6.5 "Key Assignment" window, 6.10 "Function Port" window.)

TKR-750/850/751/851 has a function for setting a password to prevent the configuration data.

2.1 Data Password

The data password function prevents a configuration data from being read by unauthorized persons. With this function, the configuration data of TKR-750/850/751/851 will not be read even when it is stolen.

You can configure the password by FPU (up to 6 characters).

When the password is set to TKR-750/850/751/851, it is impossible to read its configuration data by KPG-91D unless you enter the correct password. If you lost the password, call our Technical Support or Service center.

Note: Data Password prevents from reading the configured data, and this does not prevent from writing the configured data.

■ Configuration on the KPG-91D

- Configuring the function for setting a password to the configuration data of TKR-750/850/751/851. (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

3 EMBEDDED MESSAGE

The TKR-750/850/751/851 has the function to embed a message.

3.1 Embedded Message

This function allows you to store a message with up to 64 alphanumeric characters (combination of alphabets and numerals) into TKR-750/850/751/851.

You can embed the specific information, such as the control number and the name of the configuration data

You can write/ read messages into/ from TKR-750/850/751/851 by FPU. The message is stored as a part of the configuration data.

■ Configuration of KPG-91D

- Configuring a message to be embedded in TKR-750/850/751/851 (Refer to FPRG 6.14 "Embedded Message" window.)
- Writing the configuration data to TKR-750/850/751/851 (Refer to FPRG 7.2 Write Data to TKR-750/850/751/851.)
- Reading the configuration data from TKR-750/850/751/851 (Refer to FPRG 7.1 Read Data from TKR-750/850/751/851.)

3.2 Embedded Message w/ Password

Embedded Message w/Password is a function for storing a message with up to 64 alphanumeric and protecting it with a password.

You can embed the specific information of TKR-750/850/751/851, such as the control number and the name of the configuration data with a password.

You are able to write the message and password into TKR-750/850/751/851 by FPU.

By writing the Embedded Message w/Password, you can store the message as a separate data from the configuration data instead of as a part of the configuration data, which differs from writing the Embedded message.

You must enter the correct password to write a message. You are not allowed to embed the message unless you enter correct password.

You can read the messages embedded into TKR-750/850/751/851.

■ Configuration on the KPG-91D

- Writing a message with password to TKR-750/850/751/851 (Refer to FPRG 7.2 Write Data to TKR-750/850/751/851.)
- Reading the configuration data from TKR-750/850/751/851 (Refer to FPRG 7.1 Read Data from TKR-750/850/751/851.)

4 CHANNEL INFORMATION

A pair of transmission and reception frequencies is called as channel for making a communication. You can configure maximum 16 channels in order to transmit and receive.

You can configure following functions by KPG-91D.

RX Frequency

TX Frequency

QT/DQT Decode

QT/DQT Encode

Channel Name

Wide/ Narrow

Encode Tone in Multiple

Operation Mode

Multi Table

Beat Shift

TX High Power

QT Reverse Burst

Scan Add

Compander

CW ID

Scrambler

■ Configuration of KPG-91D

- Configuring a channel (Refer to FPRG 6.1 "Channel Information" window.)

4.1 Reception Frequency

This is a frequency used for reception.

You can specify your desired receiving frequency within the range. ([Refer to 1.2 TX/RX Frequency.](#))

■ Configuration of KPG-91D

- Configuring the Reception Frequency (Refer to FPRG 6.2.1 Reception Frequency.)

4.2 Transmission Frequency

This is a frequency used for transmitting.

You can specify your desired transmitting frequency within the range. ([Refer to 1.2 TX/RX Frequency.](#))

■ Configuration of KPG-91D

- Configuring the Transmission Frequency (Refer to FPRG 6.2.2 Transmission Frequency.)

4.3 QT/DQT Decode

QT/DQT Decode is a function to wait for a specific call.

QT/DQT Decode facilitates communication within the specified group when the same channel is sharing with other groups. It will effects to exclude the other group communication with muting. With this function, you can communicate without listening to conversations of other groups.

It is possible to configure the QT/DQT Decode code on each channel by FPU.

TKR-750/850/751/851 unmutes audio when the received QT/DQT matched and a received audio is transmitted under repeat operating.

TKR-750/850/751/851 does not unmute when the received QT/DQT does not matched and a received audio is not transmitted if it is operating as Repeater.

You can use the QT/DQT Decode function of the Multi Table at the same time in order to wait for a call. ([Refer to 4.7 Encode Tone in Multiple, 21 Multi-table.](#))

■ Configuration of KPG-91D

- Configuring the QT/DQT Decode (Refer to FPRG 6.2.3 QT/DQT Decode.)

4.4 QT/DQT Encode

QT/DQT Encode is a function to make a Group call.

Encoding QT/DQT limits communication within the specified group when the same channel is sharing with other groups. Signals from other groups are muted. With this function, you can communicate without listening to conversations of other groups.

It is possible to configure the QT/DQT Encode code on the each channel by FPU.

The configured QT/DQT Encode code is transmitted while transmitting with audio continuously.

Note:

4 CHANNEL INFORMATION

- ◆ When QT Encode and the QT Reverse Burst function are enabled, TKR-750/850/751/851 transmits the QT Reverse Burst code at end of transmission.
- ◆ When the DQT Encode is selected, TKR-750/850/751/851 transmits the QT Turn-off Code at end of transmission.

transmit. (The operation of repeat PTT switch is excluded.)

The encode operation varies depending on the PTT type.

■ Configuration of KPG-91D

- Configuring the QT/DQT Encode (Refer to FPRG 6.2.4 QT/DQT Encode.)

4.5 Channel Name

You can assign 2 digit characters to each channel name. The configured channel name appears on the Channel/Status display. ([Refer to 1.6 Display.](#))

■ Configuration of KPG-91D

- Configuring a Channel Name (Refer to FPRG 6.2.5 Channel Name.)

4.6 Wide/ Narrow

You can choose a transmission bandwidth. The value depends on the area or your license. ([Refer to 1.4 Bandwidth.](#))

■ Configuration of KPG-91D

- Configuring the frequency bandwidth (Refer to FPRG 6.2.6 Wide/ Narrow.)

4.7 Encode Tone in Multiple

This function allows you to wait calls with maximum 16 different QT/DQT codes by setting additional 15 QT/DQT (Current) as well as the QT/DQT code (Primary) set on a each channel. You can set a Main code and a Sub code in a Multi table. ([Refer to 21 Multi-table.](#))

TKR-750/850/751/851 encodes QT/DQT Encode code matching QT/DQT Decode in primary and current QT/DQT codes while it operates under Repeat Mode or Duplex Mode.

Note: You cannot use Multi Table while the TKR-750/850/751/851 operates under Simplex Mode. ([Refer to 4.8 Operation Mode.](#))

If TKR-750/850/751/851 receives a transmission request from Local Mic PTT or external PTT except Simplex Mode, it automatically selects the signalling code to

Table 4-1 Primary: TKR-750/850/751/851 transmits with a configured signalling on each channel.

Status	PTT Priority	Operation	Description
A channel becomes free or a signalling of Multi-table is unmatched.	Repeater PTT < Local Mic PTT, External PTT	Local Mic PTT / External PTT is On	TKR-750/850/751/851 transmits a Primary signalling code configured on each channel. It keeps to transmit the Primary code even if it receives a signalling code of Multi-table during transmitting. When Local Mic PTT or External PTT is released, It starts repeat operation with a Current signalling code of Multi-table after transmitting a QT Reverse Burst or DQT Turn-off Code of Primary code.
	Repeater PTT > Local Mic PTT, External PTT		TKR-750/850/751/851 transmits a Primary signalling code configured on each channel. It starts repeat operation with a Current signalling code when it receives a signalling of Multi-table during transmitting. When the receiving signalling code of Multi-table is unmatched, It starts to transmit Primary code after transmitting a QT Reverse Burst or DQT Turn-off Code of Current signalling code.
TKR-750/850/751/851 makes a repeat operation since a signalling on Multi-table is matched.	Repeater PTT < Local Mic PTT, External PTT		TKR-750/850/751/851 transmits a Priority signalling code configured on each channel. When Local Mic PTT or External PTT is released while it is receiving a Current signalling code, it starts repeat operation with the Current signalling code of the Multi-table after transmitting a QT Reverse Burst or DQT Turn-off Code of Primary signalling code.
	Repeater PTT > Local Mic PTT, External PTT		TKR-750/850/751/851 keeps repeat operation with a Current signalling code of Multi-table. When Local Mic PTT or External PTT keeps On and a signalling of Multi-table is unmatched, It transmits a Primary signalling code configured on a channel after transmitting a QT Reverse Burst or DQT Turn-off Code of Current signalling code.

Table 4-2 Current: TKR-750/850/751/851 transmits with a encode signalling in order to match a Current decoded signalling code.

Status	PTT Priority	Operation	Description
A channel becomes free or a signalling of Multi-table is unmatched.	Repeater PTT < Local Mic PTT, External PTT	Local Mic PTT/ External PTT is On	TKR-750/850/751/851 transmits a Primary signalling code configured on each channel. It keeps to transmit the Primary code even if it receives a signalling of the Multi-table during transmitting. When Local Mic PTT or external PTT is released, It starts repeat operation with a Current signalling code of Multi-table after transmitting a QT Reverse Burst or DQT Turn-off Code of Primary signalling code.
	Repeater PTT > Local Mic PTT, External PTT		TKR-750/850/751/851 transmits a Primary signalling code configured on each channel. It starts repeat operation with a Current signalling code when a signalling of Multi-table is matched during transmitting. When the signalling of Multi-table is unmatched, It starts to transmit a Primary code after transmitting a QT Reverse Burst or DQT Turn-off Code of Current signalling code.
TKR-750/850/751/851 makes the repeat operation since a signalling of Multi-table is matched.	Repeater PTT < Local Mic PTT, External PTT		TKR-750/850/751/851 keep to transmit with the Current signalling code on the Multi-table. When Local Mic PTT or External PTT is On and a signalling of Multi-table is unmatched, it starts to transmit a Primary signalling code of Multi-table after transmitting a QT Reverse Burst or DQT Turn-off Code of Current signalling code.
	Repeater PTT > Local Mic PTT, External PTT		TKR-750/850/751/851 keep to transmit a Current signalling code of Multi-table. When Local Mic PTT or External PTT is On and a signalling of Multi-table is unmatched, it starts to transmit a Primary signalling code of Multi-table after transmitting a QT Reverse Burst or DQT Turn-off Code of Current signalling code.

■ **Configuration of KPG-91D**

- Configuring the Encode Tone in Multiple (Refer to FPRG 6.2.7 Encode Tone in Multiple.)
- Configuring Operation Mode (Refer to FPRG 6.2.8 Operation Mode.)

- Configuring the Multi Table (Refer to FPRG 6.2.9 Multi Table (Channel Edit).)

4.8 Operation Mode

You can configure Repeat, Simplex or Duplex mode to each channel.

Select Repeat Mode for repeat operation channel.

Select Duplex Mode for two-way simultaneous communication channel (using different frequencies for transmission and reception).

Select Simplex Mode for one-way communication channel (using a same frequency for transmission and reception).

Table 4-3 Operation Mode Function

Mode	Description
Repeat	TKR-750/850/751/851 starts a repeat operation when QT/DQT code is matched and transmits using the transmission frequency and a QT/DQT Encode code. When it is operating under this mode, a received audio is modulated and you can monitor the audio.
Simplex	This communication method is referred to as "Simplex system" since same frequency, which is for RX and TX is used for each other. On a channel configured this Mode, it is impossible to receive a call while transmitting. A received audio is muted when the Local Mic PTT or the External PTT is on.
Duplex	This communication method is referred to as "Duplex system" since different frequencies, which is for RX and TX are used. On the channel configured this Mode, it is possible to receive a call even while transmitting. TKR-750/850/751/851 transmits without muting the received audio when the Local Mic PTT or the External PTT is on.

Note: Scan does not work on the Repeat channel. That channel is limited for repeat operation only. (Refer to 4.12 Scan Add.)

■ Configuration of KPG-91D

- Configuring Operation Mode (Refer to FPRG 6.2.8 Operation Mode.)

4.9 Beat Shift

This function eliminates a problem of receiver's internal interference caused by internal oscillators.

The harmonic of oscillator implemented for the microprocessor may interfere with receiving audio. You can eliminate this problem by slightly shifting a frequency of oscillator used for the microprocessor.

Each channel can be assigned as enable or disable this function separately by KPG-91D.

■ Configuration of KPG-91D

- Enabling/disabling the Beat Shift function in each channel (Refer to FPRG 6.2.10 Beat Shift.)

4.10 TX High Power

You can select a transmission output power (high or low) on each channel.

■ Configuration of KPG-91D

- Configuring the transmission output power (high or low) to each channel (Refer to FPRG 6.2.11 TX High Power.)

4.11 QT Reverse Burst

This function eliminates a squelch tail noise of the end of communication. TKR-750/850/751/851 transmits a QT Reverse Burst code immediately at end of transmitting. (Refer to 5 QT/DQT.)

You can configure a QT Reverse Burst using KPG-91D

■ Configuration of KPG-91D

- Configuring the QT Reverse Burst (Refer to FPRG 6.2.12 QT/DQT Reverse Burst.)

Note: A DQT Turn-off code is always transmitted even if a QT Reverse Burst is configured as disabled. (Refer to 5.2 DQT Turn-off Code.)

4.12 Scan Add

This function is to check a signal on each channel.

TKR-750/850/751/851 scans an available signal to receive and when it finds an available signal, scanning is paused.

You can configure the scan operation and select channels to be scanned. (Refer to 16 Scan.)

You can also configure the function for activating/deactivating scan to an auxiliary port and PF keys.

■ Configuration of KPG-91D

- Selecting a channel to be scanned (Refer to FPRG 6.2.13 Scan Add.)
- Configuring the scan operation (Refer to FPRG 6.6 "Scan Information" window.)

Note: It is impossible to assign a scan function on a channel configured Repeat Mode since it is only used for repeat operation. (Refer to 4.8 Operation Mode.)

4.13 Compander

This function is a function to improve quality of the received audio by reducing noise while transmitting.

A compressor effects on the Local microphone input signal and TA input signal, and a expander effects on a speaker audio and RA audio.

It is possible to assign Compander function enable or disable on each channel separately.

■ Configuration of KPG-91D

- Enabling/disabling the Compander function for each channel (Refer to FPRG 6.2.14 Compander.)

Note: The Compander function does not operate on the audio signal to be repeated.

4.14 Voice Scrambler

Voice Scrambler is a function to keep a conversation private within a group. With this function, a communication is made using a special signal in order to prevent communications from being monitored by unauthorized people intercepting communications. You can use this function only when a optional voice scramble board is installed into the TKR-750/850/751/851. (Refer to: FPRG 5.1 "Model Information" window.)

The Voice Scrambler function can be turned On when TKR-750/850/751/851 is ON or changing a channel. The

code selection ports are available inside of TKR-750/850/751/851 for a Scrambler code selection.

(Refer to 4.14.1 Scrambler Code.)

■ Configuration of KPG-91D

- Enabling/disabling the Compander function on each channel (Refer to FPRG 6.2.17 Voice Scrambler.)

Note:

- ◆ The repeat audio under the Repeat Mode is not scrambled even if the Voice Scrambler function is enabled.
- ◆ When the function for switching Scrambler On/Off is assigned to the PF key, the key top LED lights when the Voice Scrambler function is On.

4.14.1 Scrambler Code

The Voice Scrambler function is switched On when TKR-750/850/751/851 is ON or a channel is changed. The code selection ports are available inside of TKR-750/850/751/851 to select a Scrambler code.

It is possible to select a Scrambler code on each channel.

Table 4-4 Scrambler Code

Scrambler Code	Code selection port			
	CODE4	CODE3	CODE2	CODE1
1	L	L	L	L
2	L	L	L	H
3	L	L	H	L
4	L	L	H	H
5	L	H	L	L
6	L	H	L	H
7	L	H	H	L
8	L	H	H	H
9	H	L	L	L
10	H	L	L	H
11	H	L	H	L
12	H	L	H	H
13	H	H	L	L
14	H	H	L	H
15	H	H	H	L
16	H	H	H	H

■ Configuration of KPG-91D

- Configuring the Scrambler code to each channel (Refer to FPRG 6.2.18 Scrambler Code.)

Note: The code selection port in TKR-750/850/751/851/751/851 selects a Scrambler code when TKR-750/850/751/851/751/851 is ON a channel is changed even if the Voice Scrambler function is off.

4.14.2 Scrambler Backup

This function restores a Voice Scrambler configuration. With this function, the configuration is not cleared even if TKR-751/851 is turned OFF after configure Voice Scrambler function. When this function is switched Off, the configuration of the Voice Scrambler is cleared and returns to the default values.

■ Configuration of KPG-91D

- Configuring the Scrambler Backup function (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

Note:

- ◆ You can use this function only when the optional Voice Scrambler Board is installed into the TKR-750/850/751/851.
- ◆ Refer to the Modification Manual when installing a optional Voice Scrambler Board into the TKR-750/850/751/851.

4.15 CW ID

You can transmit a fixed message, such as Call sign by Morse code. ([Refer to 22 CW ID/CW Message.](#))

■ Configuration of KPG-91D

- Configuring the CW ID to each channel (Refer to FPRG 6.2.15 CW ID.)

The TKR-750/850/751/851 supports the QT/DQT signalling.

The QT/DQT allows you to ignore unwanted calls from other persons who are using a same frequency. With the QT/DQT signalling, you can hear calls from only specific persons or group that have a same QT/DQT code. (Refer to [4.3 QT/DQT Decode](#), [4.4 QT/DQT Encode](#).)

You can also receive and make a call by a QT/DQT Decode code of Multi-table at the same time. (Refer to [21 Multi-table](#).)

5.1 QT/DQT

The QT (Quiet Talk) uses a sub-audible tone (67.0 - 254.1 [Hz]). The DQT (Digital Quiet Talk) uses a 3-digit octal number (23-bit/word) (code: 000 - 777). The DQT signal has polarity and can be configured as Normal or Inverse.

Note: QT/ DQT cannot be heard from the speaker since it uses a sub-audible tone.

You can configure the QT/DQT Encode and Decode codes for each channel. (Refer to [4.3 QT/DQT Decode](#), [4.4 QT/DQT Encode](#).)

This function allows you to wait for a call a maximum of 16 QT/DQT codes while configuring 15 QT/DQT codes (Current) as well as the QT/DQT code (Primary) to each channel. (Refer to [4.7 Encode Tone in Multiple](#).)

■ Configuration of KPG-91D

- Configuring the QT/DQT Decode (Refer to FPRG 6.2.3 QT/DQT Decode.)
- Configuring the QT/DQT Encode (Refer to FPRG 6.2.4 QT/DQT Encode.)
- Configuring the Encode Tone in Multiple (Refer to FPRG 6.2.7 Encode Tone in Multiple.)

5.2 DQT Turn-off Code

This function eliminates squelch tail noise when the transmitting party ends the communications. A DQT Turn-off Code is transmitted at the end of communications. TKR-750/850/751/851 mutes the output audio when the Turn-off Code is received.

When the QT/DQT Encode configured to the channel is DQT, TKR-750/850/751/851 transmits the Turn-off Code.

You can configure the duration for transmitting the DQT Turn-off Code in conjunction with the DQT Decode performance of receiver.

■ Configuration on the KPG-91D

- Configuring the duration for the DQT Turn-off Code transmission (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

5.3 QT Reverse Burst

This function eliminates squelch tail noise when the transmitting party ends the communications. TKR-750/850/751/851 transmits the QT Reverse Burst code at the end of communications. It mutes the output audio when it receives the QT Reverse Burst.

When the QT/DQT Encode code configured to the channel is QT, TKR-750/850/751/851 transmits the QT Reverse Burst Code.

You can configure the duration for transmitting the QT Reverse Burst code in conjunction with the DQT Decode performance of receiver.

■ Configuration of KPG-91D

- Configuring the duration for transmitting the QT Reverse Burst Code (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

5.4 QT Decode Delay

This function is a delay time to start detecting a QT/DQT signalling, which is transmitted from the radio as a normal QT signalling, as the QT Reverse Burst code. You must configure the duration between the time that the received QT signalling unmatched and starts the QT Decode operation in order to use this function.

■ Configuration of KPG-91D

- Configuring the QT Decode Delay (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

5.5 Off-hook Decode

TKR-750/850/751/851 receives the QT/DQT signalling and opens squelch (Signalling Squelch) regardless of the position of the local microphone. It operates under the signalling squelch mode when the microphone is in on-hook position and it receives a carrier and opens squelch (Carrier squelch) while the microphone is in off-hook position if this function is disabled.

■ Configuration on the KPG-91D

- Configuring the off-hook Decode (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

Note: When this function is disabled and the local microphone is in off-hook position, TKR-750/850/751/851 operates in the carrier squelch mode to mute or unmute the speaker. TKR-750/850/751/851 operates in the signalling squelch mode when TKR-750/850/751/851 makes the repeat operation.

6 PTT OPERATION

You can control the transmission using three methods, the Repeater PTT, the External PTT, and the Local Mic PTT.

PTT (Push to Talk or Press to Talk) is a switch to transmit. You can talk while pressing this switch. TKR-750/850/751/851 returns to receive when the PTT switch is released. The local microphone uses a push switch. As for the repeater PTT and the external PTT, the PTT is used to transmit and send a transmission signal.

- Local Mic PTT

You can use this PTT by connecting microphone to the microphone connector that is located on the front panel of the TKR-750/850/751/851. You can talk into the microphone while pressing this switch. TKR-750/850/751/851 stop transmitting when the PTT switch is released. (Refer to Table 1-1 Assigning signals to the 8-pin connector.)

- External PTT

You can use this PTT switch by connecting an external device to the control interface jack (25-pin connector) that is located on the rear panel of the TKR-750/850/751/851. This PTT switch controls the transmission from the external device. (Refer to Table 1-2 Assigning signals to 25-pin connector.)

- Repeater PTT

TKR-750/850/751/851 starts a repeater operation when the received QT/DQT code matches. It enters transmission mode with the configured frequency. In this case, the QT/DQT Encode activates.

You can configure following functions by KPG-91D.

Time Out Timer

TOT Pre-alert

TOT Rekey Time

TOT Reset Time

Repeat Hold Time

PTT Priority

6.1 Time-out Timer (TOT)

TOT is a count-down timer to limit continuous transmission. TKR-750/850/751/851 automatically stops transmission and returns to receiving mode when the TOT expires. (Refer to 7 TOT (Time Out Timer).)

■ Configuration of KPG-91D

- Configuring the Time-out Timer for the repeater PTT and the external PTT (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the Time-out Timer for the Local Mic PTT (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

6.2 TOT Pre-alert

You can configure a duration of the TOT Pre-alert Tone notifying a user that TOT is about to expire to end the operation. (Refer to 9 Tone, 7 TOT (Time Out Timer).)

■ Configuration on the KPG-91D

- Setting the TOT Pre-alert for the repeater PTT and the external PTT (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Setting the TOT Pre-alert for the Local Mic PTT (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

6.3 TOT Rekey Time

TOT Rekey Time is a duration between the time that the transmission ends with the TOT and start transmission again.

When the transmission terminates by TOT while transmitting using PTT, you are not able to transmit using the PTT until the TOT Rekey Time expires. (Refer to 7 TOT (Time Out Timer).)

Table 6-1 Transmission availability during TOT Rekey Time

Repeater status	When the TOT Rekey Time for the Local Mic PTT:	When the TOT Rekey Time for the External PTT or the Repeater PTT:
Air Remote	○	○
Air Remote Transpond	○	○
CW ID/Message	○	○
Local PTT	X	○
Ext-PTT	○	X
Repeat	○	X

■ Configuration of KPG-91D

- Configuring the TOT Rekey Time for the repeater PTT and the external PTT (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

- Configuring the TOT Rekey Time for the Local Mic PTT (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

6.4 TOT Reset Time

TOT Reset Time is a period between the time that the transmission ends before the TOT configured to each PTT expires and when the count of the TOT, which is configured while the transmission pauses, resets. (Refer to 7 TOT (Time Out Timer).)

■ Configuration of KPG-91D

- Configuring the TOT Reset Time for the Repeater PTT and the External PTT (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the TOT Reset Time for the Local Mic PTT (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

6.5 Repeat Hold Time

(Repeater PTT only)

Repeat Hold Time is a period between the time that a repeat signal gone and TKR-750/850/751/851 stops transmission. (Refer to 7 TOT (Time Out Timer).)

■ Configuration of KPG-91D

- Configuring the Repeat Hold Time (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

6.6 Busy Channel Lockout

(Local Mic PTT only)

If you transmit using a local microphone's PTT without checking the channel status, you may interfere with other groups communication. This function prevents you from such interference. TKR-750/850/751/851 does not start transmitting even PTT is pressed while other signal is on the same frequency. (Refer to 8 Busy Channel Lockout.)

■ Configuration of KPG-91D

- Configuring the Busy Channel Lockout function (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

6.7 PTT Priority

You can configure a priority of the repeater PTT, external PTT, and Local Mic PTT. When the selected PTT configuration has higher priority than the current PTT, TKR-750/850/751/851 switches a QT/DQT signalling and a modulation signal line corresponding to the selected PTT configuration that has higher priority.

Table 6-2 PTT Priority

PTT	Signalling	Modulation input
Local Mic PTT	Depending on the configuration of the Encode Tone in Multiple (Refer to 4.7 Encode Tone in Multiple.)	Local microphone
External PTT		TA
Repeater PTT		Received Audio

■ Configuration of KPG-91D

- Configuring the PTT Priority (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

7 TOT (TIME OUT TIMER)

This function limits the continuous transmission time (TOT). Therefore, this function is used to prevent a certain user from occupying a channel for long time when sharing the same channel with other parties.

The transmission automatically terminates when TKR-750/850/751/851 continues to transmit for more than the configured time and returns to the reception mode. The Warning Alert Tone ([Refer to 9 Tone.](#)) beeps until the PTT signal input is disabled.

You can configure this function to the Repeater PTT, the External PTT, and the Local Mic PTT.

Note: The TOT of the Repeater PTT/External PTT is different from the PTT of the Local Mic PTT. The TOT of the Local Mic PTT starts counting down when the Local Mic PTT is pressed during the repeat transmission. In this case, the TOT of the Repeater/External PTT resets. The TOT of the Repeater/External PTT resets even if the TOT reset Time of the repeater/external PTT is counting down since TKR-750/850/751/851 is transmitting.

7.1 Repeater PTT or the External PTT

You can configure the following functions relating to TOT.

- **Time Out Timer**
Time Out Timer is the count-down timer to limit the continuous transmission using the Repeater PTT or the External PTT. It automatically stops transmission and returns to the reception mode when the TOT expires.
- **TOT Pre-alert**
You can configure the timing to emit the TOT Pre-alert tone to notify a user that the transmission is going to be terminated shortly.
- **TOT Rekey Time**
TOT Rekey Time is a duration between the time that the transmission ends by TOT and start transmitting again.
- **TOT Reset Time**
TOT Reset Time is a period between the time that the transmission ends before the TOT (each transmission) expires and the counter of the TOT (while the transmission pauses) is reseted.
- **Repeat Hold Time**
Repeat Hold Time is the duration between the time from the Repeater PTT is released and stop transmission.

Note:

- ◆ A time configured in the Repeat Hold Time is handled as the TOT.
- ◆ A TOT function is not applicable to transmit the CW ID.

■ Configuration of KPG-91D

- Configuring the Time Out Timer (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the TOT Pre-alert (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the TOT Rekey Time (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the TOT Reset Time (Refer to FPRG 6.4.1 "Optional Features 1" tab.)
- Configuring the Repeat Hold Time (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

7.2 Using the Local Mic PTT

You can configure the following functions relating to TOT.

- **Time Out Timer**
TOT is a duration for making continuous transmission using the Local Mic PTT. It automatically stops transmission and returns to the reception mode when the TOT expires.
- **TOT Pre-alert**
You can configure a timing to activate the TOT Pre-alert tone to notify a user that the transmission is going to be terminated shortly.
- **TOT Rekey Time**
TOT Rekey Time is a duration between the time that the transmission ends by TOT and start transmitting again.
- **TOT Reset Time**
TOT Reset Time is a period between the time that the transmission ends before the TOT (each transmission) expires and the counter of the TOT (while the transmission pauses) is reseted.
- **Busy Channel Lockout**
If the Local Mic PTT is pressed while other groups are using at the same channel, it may interfere on-going communications. This function prevents you from such interference. ([Refer to 8 Busy Channel Lockout.](#))

Note: The TOT function is not applicable to transmit the CW ID.

■ Configuration of KPG-91D

- Configuring the Time Out Timer (Refer to FPRG 6.4.2 "Optional Features 2" tab.)
- Configuring the TOT Pre-alert (Refer to FPRG 6.4.2 "Optional Features 2" tab.)
- Configuring the TOT Rekey Time (Refer to FPRG 6.4.2 "Optional Features 2" tab.)
- Configuring the TOT Reset Time (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

- Configuring the Busy Channel Lockout (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

8 BUSY CHANNEL LOCKOUT

If the Local Mic PTT is pressed while other groups are using same channel, it may interfere with communications. The Busy Channel Lockout function prevents you from such an interference automatically. TKR-750/850/751/851 can decode a QT/DQT code to control a transmission.

When a selected channel is busy, pressing the PTT switch causes the Busy Channel Tone to beep and does not start transmitting. ([Refer to 9 Tone.](#))

Note: You must release the PTT to transmit even when the channel becomes available to transmit.

■ Configuration of KPG-91D

- Configuring the Busy Channel Lockout (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

You can configure a beep tone to sound when turning TKR-750/850/751/851 ON and pressing a PF key. You can also configure a Information Tone to beep when the transmission ends using the PTT switch and the power source of TKR-750/850/751/851 is switched to the backup battery. You can configure each tone by KPG-91D. You are also able to adjust the volume level of Power-on Tone, the Control Tone, and Warning Alert Tone.

■ Configuration of KPG-91D

- Adjusting the volume of tones (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

9.1 Beep Tone

You can configure the following Beep Tones by KPG-91D.

Table 9-1 List of Beep Tones

Type	Description of functions
Power On Tone	This tone notifies the user that TKR-750/850/751/851 is turned ON.
Control Tone	This tone sounds when TKR-750/850/751/851 is operated. <ul style="list-style-type: none"> • Key Press Tone (A) • Key Press Tone (B) • Key Input Error Tone • Roll Over Tone
Warning Tone	This tone warns a user. <ul style="list-style-type: none"> • Warning Alert Tone • TOT Pre-alert Tone • Busy Tone

9.1.1 Power-on Tone

This tone sounds when turning the TKR-750/850/751/851 ON.

■ Configuration of KPG-91D

- Configuring the Power-on Tone (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

9.1.2 Control Tone

This tone sounds when TKR-750/850/751/851 is operated following operation.

Table 9-2 List of Control Tones

Function	Description
Key Press Tone (A)	This tone sounds when the assigned function activates by pressing a PF key.
Key Press Tone (B)	This tone sounds when the assigned function is disabled by pressing a PF key.
Key Input Error Tone	This tone sounds when the operation of the PF key is denied.
Roll Over Tone	This tone sounds when selecting the lowest channel by a PF key.

■ Configuration of KPG-91D

- Configuring Control Tones (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

9.1.3 Warning Tone

This tone is used to warn a user.

Table 9-3 List of Warning Tones

Function	Description
Warning Alert Tone	This tone sounds when a PTT switch is kept to press even after the Time Out Timer of the Local Mic PTT expires or while the Rekey Time is activated.
TOT Pre-alert Tone	This tone sounds when Time Out Timer is going to be expired shortly.
Busy Tone	This tone sounds when a transmission is disabled while the Busy Channel Lockout is enabled.

■ Configuration of KPG-91D

- Configuring the Warning Alert Tone (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

9.2 Information Tone

You can configure the following Information Tones by KPG-91D.

Table 9-4 List of Information Tones

Type	Description of functions
Courtesy Tone	This tone notifies the end of the transmission using Repeater PTT, External PTT, or Local Mic PTT.
Backup Battery Operation Tone	This tone notifies a user that TKR-750/850/751/851 is operating with a Backup Battery. <ul style="list-style-type: none"> Battery Warning Tone Battery Operation Tone

9.2.1 Courtesy Tone

The Courtesy Tone can be referred to as Courtesy Beep or Go Ahead Tone. This tone is transmitted at end of the transmissions using Repeater PTT, External PTT, or Local Mic PTT.

You can easily recognize that the repeater becomes available with the Courtesy Tone.

Courtesy Tone

- Frequency
- Period
- Send to RA

■ Configuration of KPG-91D

- Configuring the Courtesy Tone (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

9.2.2 Backup Battery Tone

This tone warns a user that TKR-750/850/751/851 is operating with the backup battery.

Table 9-5 List of Backup Battery Operation Tones

Function	Description
Backup Battery Warning Tone	This tone sounds for 5 seconds when the power of TKR-750/850/751/851 is switched to the backup battery.
Backup Battery Operation Tone	This tone sounds in certain intervals during transmitting by Repeater PTT, External PTT, or Local Mic PTT while TKR-750/850/751/851 operates with the backup battery.

You can configure the following functions by KPG-91D.

Backup Battery Warning Tone

- Frequency
- Send to RA

Backup Battery Operation Tone

- Frequency
- Interval
- Send to RA

■ Configuration of KPG-91D

- Configuring the Backup Battery Warning Tone (Refer to FPRG 6.4.2 "Optional Features 2" tab.)
- Configuring the Backup Battery Operation Tone (Refer to FPRG 6.4.2 "Optional Features 2" tab.)

10 POWER CONTROL

The TKR-750/850/751/851 has various power control functions, such as the Power Save function, a function to switch the power from the main power to the backup power, and the operation when turning TKR-750/850/751/851 ON. You can operate a assigned function interlocking with Save On/Off, the Start Up operation, and a function to switch the power from the main power and the backup power.

- Save On/Off
- Start Up
- Backup Power
- Main Power

Table 10-1 Available functions

Name of functions	Description of functions
None	TKR-750/850/751/851 does not perform any operation.
AUX Out 1 Off - AUX Out 5 Off	The function assigned to a specified Auxiliary Output port is disabled when TKR-750/850/751/851 starts operation. You can assign functions when "Selectable" is configured to the Auxiliary Output 1 - Auxiliary Output 5 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX I/O 1 Off - AUX I/O 6 Off	The function assigned to a specified Auxiliary I/O port is disabled when TKR-750/850/751/851 starts operation. You can assign functions when "Selectable" is configured to the Auxiliary I/O 1 to Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX Out 1 On - AUX Out 5 On	The function assigned to a specified Auxiliary Output port is enabled when TKR-750/850/751/851 starts operation. You can assign functions when "Selectable" is configured to the Auxiliary Output 1 - Auxiliary Output 5 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX I/O 1 On - AUX I/O 6 On	The function assigned to a specified Auxiliary I/O port is enabled when TKR-750/850/751/851 starts operation. You can assign functions when "Selectable" is configured to the Auxiliary I/O 1 - Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
Channel 1 - Channel 16	Move to the channel selected from CH 1 to CH 16 immediately. You are not allowed to perform this function when Channel Select is configured to the Auxiliary I/O 1 to Auxiliary I/O 4 ports. "E2" appears on the display when specifying the channel has no data. (Refer to 20.1 AUX I/O Function.)
Channel Down	Decrease a channel to the next. The blank channel is skipped.

Name of functions	Description of functions
Channel Up	Increase a channel to the next. The blank channel is skipped.
CW ID On	Transmits a CW ID when it starts operation. (Refer to 22.1 CW ID.) This function performs on a channel having CW ID.
CW Message 1 - CW Message 8	Transmits a assigned CW tone from CW Messages 1 to 8 when it starts operation. (Refer to 22.2 CW Message.)
DC Power Save Off	Exits Save Mode when it starts operation. You cannot configure this function to the Save On/Off Function.
DC Power Save On	Enters Save Mode when it starts operation. You cannot configure this function to the Save On/Off Function.
Display Off	All LEDs other than the Power SW LED that is located on the front panel are unlit. This function activates only when TKR-750/850/751/851 is in Save Mode.
Display On	All LEDs on the front panel light. This function activates only when TKR-750/850/751/851 operates in Save Mode.
Hold Time Disable	Disables the Repeat Hold Time. You can configure this function only when at least one channel is configured as Repeat Operation mode and the Repeat Hold Time is enabled. (Refer to 6.5 Repeat Hold Time.)
Hold Time Enable	Enables the Repeat Hold Time. You can configure this function only when at least one channel is configured as Repeat Operation mode and the Repeat Hold Time is enabled. (Refer to 6.5 Repeat Hold Time.)
Local TX Disable	Inhibits a transmission by Local Mic PTT.
Local TX Enable	Enables a transmissions by Local Mic PTT.
Low Power Off*1	Switches a transmission power from Low to High. This function activates only when at least one channel is configured as High for TX Power. (Refer to 4.10 TX High Power.)
Low Power On*1	Switches a transmission power from High to Low. This function activates only when at least one channel is configured as High for TX Power. (Refer to 4.10 TX High Power.)
Monitor Off	Enables a Signalling Decode function.
Monitor On	Disables a Signalling Decode function.
Multi-table Sub	The signalling specified in a Multi-table Select is switched to the Sub-table. (Refer to 20.1 AUX I/O Function.)
Multi-table Main	The signalling specified in the Multi-table Select is switched to the Main-table. (Refer to 20.1 AUX I/O Function.)
QT/DQT Decode Disable	Disables a QT/DQT Decode function. It becomes carrier squelch. This function activates even when the repeater is making the repeat operation.

10 POWER CONTROL

Name of functions	Description of functions
QT/DQT Decode Enable	Enables a QT/DQT Decode code. It becomes signalling squelch.
QT/DQT Encode Disable	Disables a QT/DQT Encode function. A signalling code configured on each channel is NOT transmitted.
QT/DQT Encode Enable	Enables the QT/DQT Encode function. A signalling code configured on each channel is transmitted.
Repeat Disable	Disables a repeat function. It is necessary to assign a repeat channel to be valid this function.
Repeat Enable	Enables the repeat operation. It is necessary to assign a repeat channel to be valid this function.
Scan Off	Disables the scan function. The channel scan is stopped.
Scan On	Enables the scan function. The channel scan is started.
Scrambler Off	Disables the Scrambler function. It is necessary to install a scrambler board into TKR-750/850/751/851 to be valid.
Scrambler On	Enables the Scrambler function. It is necessary to install a scrambler board into TKR-750/850/751/851 to be valid.
Squelch Off	Disables the squelch function. The squelch is opened.
Squelch On	Enables the squelch function. The squelch is closed.
Test Tone Off	Test tone is stopped modulating.
Test Tone On	Test tone is started modulating.
TOT Disable*2	Disables the Time Out Timer function.
TOT Enable*2	Enables the Time Out Timer function.
TX Disable	All transmission is restricted.
TX Enable	All transmission is permitted.

*1: You cannot switch the power to Low Power while TKR-750/850/751/851 is transmitting or scanning. The Low Power status is held even if a channel is changed or turned ON/OFF.

*2: This function can be used for the TOT of Local Mic PTT and Repeater/External PTT.

■ Configuration of KPG-91D

- Configuring the functions relating to the operation of the power (Refer to FPRG 6.4.3 "Others" tab (Optional Features))

The Backup Battery System is a function to configure the timing to emit the Backup Battery Warning Tone/ Operation Tone. (Refer to 9.2.2 Backup Battery Tone.)

You can configure the Backup Battery Warning Tone/ Operation Tone to sound when the power is switched from the main power to the backup power, and the voltage of the main power becomes lower than the Power Supply Lower Level. (Refer to 10.2 Power Supply Lower Level.)

■ Configuration of KPG-91D

- Configuring the Backup Battery System (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

10.1 Backup Battery System

10.2 Power Supply Lower Level

This function activates an auxiliary output port that is assigned to a Power Supply Lower Limit function when a voltage of power becomes lower than a configured level. You can configure the reference voltage in order to activate/deactivate an auxiliary output port. (Refer to 20.3 [Assigning Functions to the Auxiliary Output Ports.](#))

■ Configuration of KPG-91D

- Configuring the Power Supply Lower Level (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

10.3 RX Signal Detect (Below)

This function activates an auxiliary output port that is assigned to a RX Signal Detect function when the RSSI voltage becomes lower than a configured level and the port deactivates when the voltage level becomes higher than the configured level. You can configure the reference voltage to activate/deactivate the auxiliary output port. (Refer to 20.3 [Assigning Functions to the Auxiliary Output Ports.](#))

Note: RSSI voltage is changed along with a strength of a reception signal and it is used to detect the presence of carrier.

■ Configuration of KPG-91D

- Configuring the RX Signal Detect function (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

10.4 DC Power Save

This function is one of the Save Mode functions reducing consumption current of the TKR-750/850/751/851. With this function, you can configure a duration to operate in Save Mode and operations working in conjunction with auxiliary ports and PF keys.

You can configure the following functions relating to Save Mode by KPG-91D.

Save Delay Timer A

Save Delay Timer B

Save Mode Duration

Save On

Save Off

Note:

- ◆ When TKR-750/850/751/851 receives a carrier while operating in Save Mode, a wait time is added until it exits save mode.
- ◆ The illumination of PF [Save Mode On/Off] key remains switched Off immediately after entering into Save Mode.

10.4.1 Save Delay Timer A

You can configure a duration between the time when an Auxiliary Input port or a PF key assigned to the Display On function receives a signal and the time when the LED is switched Off or an AF Amp is switched Off while TKR-750/850/751/851 is in Save Mode.

■ Configuration of KPG-91D

- Configuring the Save Delay Timer A (Refer to FPRG 6.4.3 "Others" tab (Optional Features).)

Note: The Power LED does not unlit even when sending a signal to an Auxiliary Input port or a PF key assigned to the Display On function while TKR-750/850/751/851 is in Save Mode.

10.4.2 Save Delay Timer B

You can configure a duration between the time when TKR-750/850/751/851 enters into Save Mode and the Save function is switched On (Display Off). You can also configure a duration from the time when TKR-750/850/751/851 switches from Busy status to Not Busy status to the time when it enters Save On status.

■ Configuration of KPG-91D

- Configuring the Save Delay Timer B (Refer to FPRG 6.4.3 "Others" tab (Optional Features).)

10.4.3 Save Mode Duration

This function allows you to make TKR-750/850/751/851 automatically exit Save Mode when a configured time elapses after it enters Save Mode.

■ Configuration on the KPG-91D

- Configuring the Save Mode Duration (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

10.4.4 Save On

This function activates when TKR-750/850/751/851/751/851 enters Save Mode. You can assign three types of function and they operate in the order of 1st, 2nd, then 3rd when TKR-750/850/751/851/751/851 enters Save Mode. (Refer to [Table 10-1 Available functions.](#))

You can configure the Save On using the KPG-91D.

■ Configuration on the KPG-91D

- Configuring the Save On (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

10.4.5 Save Off

This function activates when TKR-750/850/751/851/751/851 exits Save Mode (when the status switches from Not Busy to Busy or a PF key other than the [Save Mode On/Off] key is pressed). You can configure three types of function and they operate in the order of 1st, 2nd, then 3rd when TKR-750/850/751/851/751/851 exits Save Mode. (Refer to [Table 10-1 Available functions.](#))

You can configure the Save OFF using the KPG-91D.

■ Configuration on the KPG-91D

- Configuring the Save Off (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

Note: The key press tone (A/B) does not sound even if Save Mode is switched On/Off with the PF [Save Mode On/Off] key since no beep tones sound in Save Mode.

10.5 Start Up

This function activates when turning the TKR-750/850/751/851/751/851 ON. You can assign three types of function and they operate in the order of 1st, 2nd, then 3rd when TKR-750/850/751/851/751/851 is turned ON. (Refer to [Table 10-1 Available functions.](#))

You can configure the function operating when TKR-750/850/751/851/751/851 is turned ON using the KPG-91D.

■ Configuration on the KPG-91D

- Configuring the function operating when the repeater is turned ON (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

10.6 Backup Power

This function operates when a power is switched from the main power to the backup power. You can assign three types of function and they operate in order of 1st, 2nd, then 3rd when the power of TKR-750/850/751/851 is switched to the backup power. (Refer to [Table 10-1 Available functions.](#))

■ Configuration of KPG-91D

- Configuring the Backup Power Function (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

10.7 Main Power

This function operates when the power is switched from the backup power to the main power. You can assign three types of function and they operate in order of 1st, 2nd, then 3rd when the power is switched to the main power. (Refer to [Table 10-1 Available functions.](#))

■ Configuration of KPG-91D

- Configuring the Main Power (Refer to FPRG 6.4.3 “Others” tab (Optional Features).)

11 EXTERNAL MONITOR

This function opens squelch when Ext. Monitor terminal receives a signal.

The signal is assigned to pin 15 of control interface jack (25-pin connector) that is located on rear panel. (Refer to [Table 1-2 Assigning signals to 25-pin connector.](#))

■ Configuration of KPG-91D

- Configuring the External Monitor (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

Note:

- ◆ The Ext. Monitor terminal is fixed to Active Low.
- ◆ TKR-750/850/751/851 operates in the signalling squelch mode when a channel is configured to the decode signalling mode even if the Ext. Monitor terminal is operating.

12 FAN ACTION

This function activates a fan that is located on the rear panel corresponding to TKR-750/850/751/851 status.

You can configure the fan to be always working or start when the inside temperature of TKR-750/850/751/851 increases and stop when the temperature decreases.

You cannot disable the operation of the fan.

■ Configuration of KPG-91D

- Configuring the Fan Action (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

13 TX STANDBY ON FREQUENCY

This function allows you to make TKR-750/850/751/851 standby at a transmission frequency configured to each channel when it operates in a reception mode. You must switch this function Off in case of transmission frequency shifts.

When TKR-750/850/751/851 is installed within a building, not on a position, such as the top of a building or mountain, the user having a transceiver may approach within a couple meters of it. In this case, the transceiver may become busy even when it does not transmit due to the cabinet radiation of TKR-750/850/751/851 while the TX VCO standby on the programmed frequency. This problem also may occur when making a operation test or demonstration during the installation. This problem can be avoided by shifting the TX frequency by 18.75 kHz when it is operating in standby mode while the TX Standby on Frequency is disabled. However, the rise time of the transmissions delay approximately 15 to 20 ms when this function is disabled, so that we recommend you to normally switch this function On.

■ Configuration of KPG-91D

- Configuring the TX Standby on Frequency (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

14 FIRMWARE PROGRAMMING MODE SETTING

You can configure the operation of the TKR-750/850/751/851 when it enters Firmware Programming Mode.

When this function is enabled, TKR-750/850/751/851 can be entered in the Firmware Programming Mode when pressing and hold the PF1 key while the power on. TKR-750/850/751/851 does not enter into the Firmware Programming Mode when this function is disabled.

■ Configuration of KPG-91D

- Configuring the Firmware Program (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

15 KEY ASSIGNMENT

You can assign functions to PF1 to PF6 keys that are located on the front panel of the TKR-750/850/751/851/751/851.

■ Configuration of KPG-91D

- Assigning functions to PF keys (Refer to FPRG 6.5 “Key Assignment” window.)

15.1 Available Functions

You can assign functions to PF1 to PF6 keys by KPG-91D.

When the Channel Up function is assigned to the PF1 key, the PF1 key is referred to as “PF [Channel Up] key”.

Table 15-1 Available functions

Name of functions	Description of functions
None	TKR-750/850/751/851/751/851 does not perform any operation.
AUX Out 1 On/Off - AUX Out 5 On/Off	You can enable/disable a function assigned to an auxiliary output port by pressing one of PF [AUX Out 1 On/Off] to PF [AUX Out 5 On/Off] keys. You can assign functions when Selectable is configured to an Auxiliary Output 1 to Auxiliary Output 5 port. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX I/O 1 On/Off - AUX I/O 6 On/Off	You can enable/disable a function assigned to an auxiliary I/O port by pressing one of the PF [AUX Out 1 On/Off] to PF [AUX Out 6 On/Off] keys. You can assign functions when Selectable is configured to the Auxiliary I/O 1 to Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
Channel 1 - Channel 16	Change a channel from one of CH 1 to CH 16 channels directly by pressing one of the PF [Channel 1] to PF [Channel 16] keys. TKR-750/850/751/851/751/851 cannot configure this function when Channel Select is configured to an Auxiliary I/O 1 to Auxiliary I/O 4 ports. “E2” appears on the display when specifying the channel has no data. (Refer to 20.1 AUX I/O Function.)
Channel Down	Change channel to the next lower by pressing a PF [Channel Down] key. The blank channel is skipped.
Channel Up	Change channel to the next higher by pressing the PF [Channel Up] key. The blank channel is skipped.
CW ID On	Transmits a CW ID by pressing the PF [CW ID On] key. (Refer to 22.1 CW ID.) This function is available on a channel having CW ID configuration.

Name of functions	Description of functions
CW Message 1 - CW Message 8	Transmits one of CW Message 1 to CW Message 8 by pressing one of the PF [CW Message 1] to PF [CW Message 8] keys. (Refer to 22.2 CW Message.)
DC Power Save On/Off	Enable/disable Save Mode by pressing the PF [DC Power Save On/Off] key. (Refer to 10.4 DC Power Save.)
Display On/Off	Switch the panel LED On/Off by pressing the PF [Display On/Off] key. This function operates only when TKR-750/850/751/851/751/851 is in Save Mode.
Hold Time Disable/Enable	Disable/enable the Repeat Hold Time by pressing a PF [Hold Time Disable/Enable] key. You are able to configure this function only when at least one channel is configured as Repeat Operation mode and the Repeat Hold Time is enabled. (Refer to 6.5 Repeat Hold Time.)
Local TX Disable/Enable	Disable/enable a transmissions caused by Local Mic PTT by pressing the PF [Local TX Disable/Enable] key. (Refer to 6 PTT Operation.)
Low Power On/Off	Switch High or Low of a transmission power by pressing the PF [Low Power On/Off]. This function is available only when at least one channel is configured as High Power. (Refer to 4.10 TX High Power.)
Monitor On/Off	Disable/enable the Signalling Decode function by pressing a PF [Monitor On/Off] key.
Monitor Momentary	TKR-750/850/751/851 activates the Monitor function while pressing the PF [Monitor Momentary] key.
Multi Table Main/Sub	You can toggle between Main and Sub for the signalling specified by the Multi-table Select by pressing the PF [Multi Table Main/Sub] key. (Refer to 20.1 AUX I/O Function.)
QT/DQT Decode Disable/Enable	You can disable/enable the QT/DQT Decode function by pressing the PF [QT/DQT Decode Disable/Enable] key.
QT/DQT Encode Disable/Enable	You can disable/enable the QT/DQT Encode function by pressing the PF [QT/DQT Encode Disable/Enable] key.
Repeat Disable/Enable	You can disable/enable a repeat operation by pressing the PF [Repeat Disable/Enable] key. You are not allowed to assign this function when no channel is configured as Repeat Operation mode.
Reset	The operation of the TKR-750/850/751/851 is reseted and it returns to the default value by pressing the PF [Reset] key.
Scan On/Off	Enable/disable the Scan function by pressing the PF [Scan On/Off] key.

15 KEY ASSIGNMENT

Name of functions	Description of functions
Scrambler On/Off	Enable/disable the Scrambler function by pressing the PF [Scrambler On/Off] key. You cannot configure this function when the optional Scrambler board is not installed.
Squelch On/Off	Disable/enable the Squelch function by pressing the PF [Squelch On/Off] key.
Squelch Momentary	The squelch function is disabled while pressing the PF [Squelch Momentary] key.
Take Over On/Off *1	Enable/disable the control from an external device by pressing the PF [Take Over On/Off] key.
Test Tone On/Off	Enable/disable the Test Tone function by pressing the PF [Test Tone On/Off] key.
TOT Disable/Enable	Enable/disable the Time-out Timer by pressing the PF [TOT Disable/Enable] key.
TX Disable/Enable	Restrict/permit all transmissions by pressing the PF [TX Disable/Enable] key.

Note:

- ◆ The level detection for the auxiliary input port is performed even if the PF key is pressed during the detection when the auxiliary input port is active. In this case, the Key Input Error Tone sounds and the function assigned to the PF key does not operate.
(Refer to 9.1 Beep Tone, 20.2.1 Trigger Detection for Auxiliary Input Ports.)
- ◆ When the control from the external device is enabled by pressing the PF [Take Over On/Off] key, you cannot control the external Monitor, the external PTT, the auxiliary input port, and the auxiliary I/O (In) port. However, you can control the Auxiliary Out port and the Auxiliary I/O (Out) port. (*1)

This is a scan function that automatically change channel and check a signal. The channel scan starts from the current channel to next higher channel. This function is available when channels are stored and the range of frequency is specified.

TKR-750/850/751/851 monitors a presence of available signal in each channel and stop scanning at the channel having a signal to receive.

You can assign the [Scan On/Off] function on the PF key and switch the scan function On/Off by pressing the key. (Refer to 15 Key Assignment.)

You are also able to assign the [Scan On] function or the [Scan Off] function to an auxiliary input port in order to activate the Scan operation by the external device. (Refer to 20 Function Port.)

You can configure the following functions relating to the scan function by KPG-91D.

Priority

Priority Channel

Look Back Time A

Look Back Time B

Revert Channel

Dropout Delay Time

Dwell Time

Off-hook Scan

16.1 Priority Scan

This is a monitoring function for priority channel during receiving at normal channel. When a signal appear on the priority channel, a channel is changed to the priority channel even if TKR-750/850/751/851 is receiving a signal on the normal channel. The scan is started from the priority channel. You are able to configure the conditions for specifying the priority channel. (Refer to 16.2 Priority Channel.)

- Fixed

The channel configured as the priority channel by FPU is preferentially scanned.

- Selected

The current channel selected by channel Up/Down key is configured as the priority channel and preferentially scanned.

TKR-750/850/751/851 scans channels in numerical order (Normal Scan) when the priority scan function is not configured. (Refer to 4.12 Scan Add.)

■ Configuration of KPG-91D

- Configuring the Priority conditions (Refer to FPRG 6.6.1 Priority.)

16.2 Priority Channel

The Priority Channel is a channel to be scanned periodically when TKR-750/850/751/851 performs the scan operation.

You can configure one of the channels 1 to 16 as the priority channel.

The priority channel and other channels are displayed in the following way. (Refer to Table 1-7 Example of LED display.)

- X.X When the selected channel is the priority channel (right side dot of left segment is on)
- XX. When the selected channel is the channel to be scanned (right side dot of right segment is on)
- XX When the selected channel is not the channel to be scanned (No dot)

■ Configuration of KPG-91D

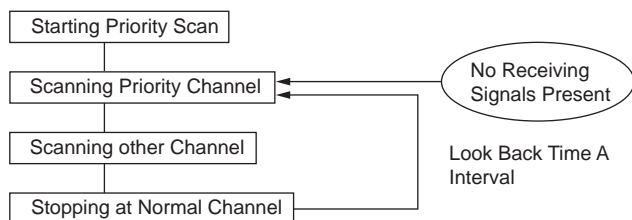
- Configuring the Priority Channel (Refer to FPRG 6.6.2 Priority Channel.)

Note:

- ◆ You cannot configure a Priority Channel when the priority scan condition is configured Off or Selected by FPU.
- ◆ A channel does not have a receiving frequency configuration cannot be assigned to the priority channel.
- ◆ It is possible to assign a priority channel to a repeat Channel. (Refer to 4.8 Operation Mode.) Although TKR-750/850/751/851 transmits a receiving signal when it receives a call on the Priority Channel, it changes channel to revert channel and transmits on when the PTT higher priority than the repeat PTT is activated on the revert channel. (Refer to 16.5 Revert Channel.)

16.3 Look Back Time A

The Look Back Time A is a period from the time when TKR-750/850/751/851 pauses scanning on a normal channel to the time when it resumes priority scan when there is no signal to receive on the Priority Channel during the Priority Scan.



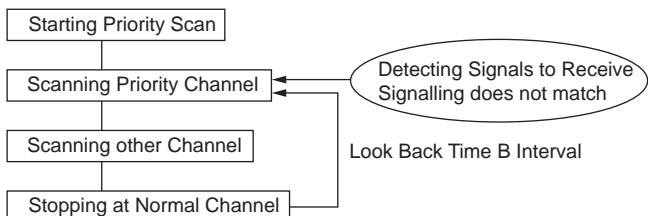
■ Configuration of KPG-91D

- Configuring the Look Back Time A (Refer to FPRG 6.6.3 Look Back Time A.)

Note: TKR-750/850/751/851 pauses on the Priority Channel when there is a signal to receive and a signalling matches while scanning the Priority Channel.

16.4 Look Back Time B

The Look Back Time B is a period from the time when TKR-750/850/751/851 pauses scanning on a normal channel to the time when it resumes a Priority Scan when the received QT/DQT code does not match with a QT/DQT Decode code configured on the Priority Channel even if there is a signal to receive in the Priority Channel during the Priority Scan.



■ Configuration of KPG-91D

- Configuring the Look Back Time B (Refer to FPRG 6.6.4 Look Back Time B.)

Note: TKR-750/850/751/851 pauses on the Priority Channel when a carrier and a signalling matches while scanning the Priority Channel.

16.5 Revert Channel

This is a revert channel configuration to transmit when PTT is pressed while scanning

Select from following 6 type for the revert channel.

Table 16-1 Revert Channel Configuration

Function	Description
Last Called	You can transmit on a channel that was used until TKR-750/850 paused scanning in order to receive a signal while scanning. When it pauses scanning after changing the channel by pressing a PF [Channel Up/Down] key, it uses the newly selected channel to transmit. When TKR-750/850 pauses scanning to receive a signal, it uses a currently selected channel to transmit.
Last Used	You can transmit on a channel that was previously used to transmit while scanning. When TKR-750/850 pauses scanning after changing the channel by pressing a PF [Channel Up/Down] key, it uses the newly selected channel to transmit. When TKR-750/850 pauses scanning to receive a signal, it uses the currently selected channel to transmit.
Selected	You can transmit on a channel that was selected to change the channel while scanning. When TKR-750/850 pauses scanning after changing the channel by pressing a PF [Channel Up/Down] key, it uses the newly selected channel to transmit. You can transmit on a channel that was selected to change the channel while TKR-750/850 pauses scanning in order to receive a signal.
Selected + Talk Back	You can transmit on a channel that was selected to change the channel while scanning. When TKR-750/850 pauses scanning after changing the channel by pressing a PF [Channel Up/Down] key, it uses the newly selected channel to transmit. When TKR-750/850 pauses scanning to receive a signal, it uses the currently selected channel to transmit.
Priority	You can use a Priority Channel for transmitting. When TKR-750/850 pauses scanning after changing a channel by pressing a PF [Channel Up/Down] key, the Priority Channel is used to transmit. When TKR-750/850 pauses scanning to receive a signal, the priority channel is used to transmit.

Function	Description
Priority + Talk Back	You can use a Priority Channel to transmit while scanning. When TKR-750/850 pauses scanning after changing at the channel by pressing a PF [Channel Up/Down] key, it uses the newly selected channel to transmit. When TKR-750/850 pauses scanning to receive a signal, it uses the currently selected channel to transmit.

Note: You are able to configure a channel used for the repeat operation as a Priority Channel. (Refer to [16.2 Priority Channel](#).) Although TKR-750/850/751/851 performs the repeat operation on the Priority Channel when receiving a call on the Priority Channel, it transmits on a channel matching the conditions configured in the Revert Channel function when receiving the transmission request having higher priority than the transmission with the repeater PTT.

■ Configuration of KPG-91D

- Configuring the Revert Channel (Refer to FPRG 6.6.5 Revert Channel.)

16.6 Dropout Delay Time

The TKR-750/850/751/851 pauses scanning to receive and resumes scanning after the signal drops. The Dropout Delay Time is a period between the time when TKR-750/850/751/851 finishes receiving the signal and it resumes scanning.

Following are conditions to resume scanning:

- There is no signal to receive.
- The received QT/DQT code configured on the channel does not match.

■ Configuration of KPG-91D

- Configuring the Dropout Delay Time (Refer to FPRG 6.6.6 Dropout Delay Time.)

16.7 Dwell Time

The TKR-750/850/751/851 pauses scanning if the PTT switch is pressed to transmit during the scan and resumes scanning after transmitting. The Dwell Time is a duration between the time when TKR-750/850/751/851 ends transmissions and it resumes scanning.

■ Configuration of KPG-91D

- Configuring the Dwell Time (Refer to FPRG 6.6.7 Dwell Time.)

16.8 Off-hook Scan

This function allows you to operate the Scan function regardless of the local microphone position.

- **Off-hook Scan is enable.**
TKR-750/850/751/851 performs the Scan operation regardless of the local microphone's position.
- **Off-hook Scan is disabled.**
TKR-750/850/751/851 performs scanning only when the local microphone is on the On-hook position.
 - TKR-750/850/751/851 does not perform scanning when the local microphone is leaving from hook.
 - TKR-750/850/751/851 pauses scanning and switches to the Revert Channel when the microphone's position changes from On-hook to Off-hook. TKR-750/850/751/851 resumes scanning when the microphone returns to the On-hook position. (Refer to [16.5 Revert Channel](#).)

Note: TKR-750/850/751/851 continues scanning without pausing on the revert channel when receiving a transmission command while the TX Disable function is enabled. When the Off-hook Scan function is disabled, TKR-750/850/751/851 moves to the revert channel. (Refer to [20 Function Port](#).)

■ Configuration of KPG-91D

- Configuring the Off-hook Scan (Refer to FPRG 6.6.8 Off-hook Scan.)

The TKR-750/850/751/851 supports DTMF (Dual Tone Multiple Frequency) Signalling.

The DTMF signalling uses two different frequency tones simultaneously. DTMF is used to remotely control TKR-750/850/751/851. (Refer to 18 Remote Control.)

DTMF signalling uses two different frequencies (high frequency and low frequency) and consists of (0) - (9), (A) - (D), (*), (#) and (#) tone.

Table 17-1 List of DTMF tone frequency:

Low/High	1209 [Hz]	1336 [Hz]	1447 [Hz]	1633 [Hz]
697 [Hz]	1	2	3	A
770 [Hz]	4	5	6	B
852 [Hz]	7	8	9	C
941 [Hz]	*	0	#	D

You can configure the following functions relating to the DTMF by KPG-91D.

Remote w/o QT/DQT

DTMF Speed

First Digit Delay Time

First Digit Time

* and # Digit

Encode

Decode

Frequency

Period

Side Tone

■ Configuration of KPG-91D

- Configuring the DTMF (Refer to FPRG 6.7 “DTMF” window.)

17.1 DTMF Speed

The DTMF speed is a speed [digit/sec.] to automatically transmit the DTMF code.

■ Configuration of KPG-91D

- Configuring the DTMF Speed (Refer to FPRG 6.7.1 DTMF Speed.)

17.2 First Digit Delay Time

The First Digit Delay Time is a delay time between the time that the TKR-750/850/751/851 begins to transmit and the time that it starts to send DTMF code.

■ Configuration of KPG-91D

- Configuring the First Digit Delay Time (Refer to FPRG 6.7.2 First Digit Delay Time.)

17.3 First Digit Time

The First Digit Time is a extension time to transmit a first digit of the DTMF code. (Refer to 17.6 Decode, 17.7 Frequency.)

The transmitting time of the first digit is obtained by adding the DTMF Speed to the First Digit Time. (Refer to 17.1 DTMF Speed.)

■ Configuration of KPG-91D

- Configuring the First Digit Time (Refer to FPRG 6.7.3 First Digit Time.)

17.4 * and # Digit

* and # Digit Time is a extension time to transmit * Tone and # Tone of DTMF code.

The transmitting time of * tone and # tone is obtained by adding the DTMF Speed to the * and # Digit Time. (Refer to 17.1 DTMF Speed.)

When the first digit of the DTMF code is “*” tone or “#” tone, TKR-750/850/751/851 compares the extension time to transmit the first digit configured in the First Digit Time with the * and # Digit Time and uses the longer extension time to transmit. (Refer to 17.3 First Digit Time.)

■ Configuration of KPG-91D

- Configuring the * and # Digit Time (Refer to FPRG 6.7.4 * and # Digit Time.)

17.5 Encode

Encode is a DTMF code to be transmitted when the command is entered from the external device or the function assigned to an auxiliary port activates/deactivates. (Refer to 18 Remote Control.)

It is possible to transmit maximum 16 character.

■ Configuration of KPG-91D

- Configuring the DTMF Encode code (Refer to FPRG 6.8.1 Encode Code.)

17.6 Decode

Decode is a DTMF code to receive the code transmitted from other radio in order to remote control the TKR-750/850/751/851. The function assigned to an auxiliary port or the PF key is disabled when this code matches. ([Refer to 18 Remote Control.](#))

You can transmit a Transpond code notifying the transmitting party that TKR-750/850/751/851 is remotely controlled by receiving DTMF code. You can assign a DTMF or Single Tone as the Transpond code. ([Refer to 19 Transpond.](#))

It is possible to configure maximum 16 character.

■ Configuration of KPG-91D

- Configuring the DTMF Decode code (Refer to FPRG 6.8.5 Decode Code.)

17.7 Frequency

This is a Single tone frequency to transmit as the Transpond code when the function assigned to a PF key or an auxiliary port activates/deactivates.

■ Configuration of KPG-91D

- Configuring TKR-750/850/751/851 to transmit the Single Tone as the Transpond code (Refer to FPRG 6.8.2 Frequency.)

17.8 Period

This is a period to transmit a Single Tone as the Transpond code when the function assigned to a PF key or an auxiliary port activates/deactivates.

■ Configuration of KPG-91D

- Configuring the period to transmit the Single Tone as the Transpond code (Refer to FPRG 6.8.3 Period.)

17.9 Side Tone

It is possible to sound the transmitted DTMF code tone from front speaker. Side Tone is a function to feedback the audio tone to the receiving speaker.

■ Configuration of KPG-91D

- Configuring the Side Tone (Refer to FPRG 6.8.4 Side Tone.)

18 REMOTE CONTROL

The TKR-750/850/751/851 has a function to be controlled by another transceiver. You can remotely control the assigned PF key function or the Auxiliary Port by the Air Remote code.

Air Remote activates the functions configured to the TKR-750/850/751/851 (Channel Up function and Scan On/Off function, etc.) when the code sent from other transceiver is matched. The authorization code used for this function is referred to as the "Air Remote code".

■ Conditions to Activate the Air Remote

1. TKR-750/850/751/851 gives a preference to a status of Auxiliary Input (Level) port if same function is assigned on AUX1 and Air remote function or PF key. In this case, the Air remote command is canceled and not transmit the Transpond code even when code is matched. For example, when the scan function is configured to the Auxiliary Input (Level) port and the Scan is activating, the scan function of the PF keys and the Air Remote become invalid.
2. It is possible to select a timing to transmit Transpond code within "Before", "After" or "both" of the received Air Remote code processing.

Before:

TKR-750/850/751/851 transmits a Transpond code before the Air Remote code function is done.

After:

TKR-750/850/751/851 transmits a Transpond code after the received Air Remote code function is done. The Transpond code is not transmitted when the Air Remote code function cannot be done. It means the same thing as when the function is disabled corresponding to the status against the PF key is pressed, the function will be invalid.

Both:

TKR-750/850/751/851 transmits a Transpond code before the Air Remote code function is done and after the received code is done properly.

Note: The Transpond code is not sent when the transmission is restricted.

3. Following channels are used to transmit the Transpond code during scan: (Refer to 16.5 Revert Channel.)

Table 18-1 Transmit Channel:

Transmission event	During scan	While scan is paused.
AUX In & In (I/O)	Revert CH	Revert CH
AUX Out	Revert CH	Current CH
Air Remote Transpond	-	Current CH

Note:

- ◆ TKR-750/850/751/851 transmits a Transpond code while scan is paused.

- ◆ TKR-750/850/751/851 sends a Transpond code on the Revert CH when the Scan is switched On during the Air Remote mode.

18.1 Control PF keys

You can control an assigned PF key function with the Air Remote. (Refer to 15 Key Assignment.)

You can configure the following functions relating to the control of PF keys by KPG-91D.

PF Key Activation

PF Key Deactivation

PF Key Transpond

PF Key Transpond Activation

PF Key Transpond Deactivation

18.1.1 PF Key Activation

This function allows activates an assigned PF key function by the Air Remote. (Refer to 15 Key Assignment.)

TKR-750/850/751/851 activates the assigned PF key function when a received code matches.

You can configure the Air Remote code by selecting the Encode/Decode code of the DTMF.

■ Configuration of KPG-91D

- Configuring the PF Key Activation (Refer to FPRG 6.9.1 "PF Key" tab.)

18.1.2 PF Key Deactivation

This function disables an assigned PF key function by the Air Remote. (Refer to 15 Key Assignment.)

The TKR-750/850/751/851 disables an assigned PF key function when a received code matches.

You can configure the Air Remote code by selecting the Encode/Decode code of the DTMF.

Note: it is impossible to configure this function that cannot be disabled, such as Channel Up function.

■ Configuration of KPG-91D

- Configuring the PF Key Deactivation (Refer to FPRG 6.9.1 "PF Key" tab.)

18.1.3 PF Key Transponder

This function notifies the transmitting party that TKR-750/850/751/851 has accepted the transmitted Air remote code and the assigned PF key function has been activated/deactivated. (Refer to 19 Transpond.)

It is possible to select a timing to transmit Transpond code within "Before", "After" or "both"

Also it is possible to configure a transpond code to activate/deactivate each other by FPU.

PF Key Transponder Activation

TKR-750/850/751/851 transmits a Transpond code when the assigned PF key function is activated by the Air Remote.

PF Key Transponder Deactivation

TKR-750/850/751/851 transmits a Transpond code when the assigned PF key function is disabled by the Air Remote.

■ Configuration of KPG-91D

- Configuring the PF Key Transponder (Refer to FPRG 6.9.1 "PF Key" tab.)
- Configuring the PF Key Transponder Activation (Refer to FPRG 6.9.1 "PF Key" tab.)
- Configuring the PF Key Transponder Deactivation (Refer to FPRG 6.9.1 "PF Key" tab.)

18.1.4 Single Tone for the PF Key Transponder

You can select DTMF or Single Tone as the Transpond code when the DTMF signalling is configured.

■ Configuration of KPG-91D

- Configuring the Single Tone for the PF Key Transponder (Refer to FPRG 6.9.1 "PF Key" tab.)

Note: You cannot individually select the DTMF/Single Tone for the PF Key Transponder Activation and Deactivation.

18.2 Control the Auxiliary Ports

It can control the assigned function to Auxiliary Port by the Air Remote. (Refer to 20 Function Port.)

When no function is assigned to an Auxiliary Ports, you can control an external devices as I/O port.

For instance, TKR-750/850/751/851 alerts you that the door has been opened if the door sensor is connected to an Auxiliary port, or you can turn the air conditioner On/Off by the operation of the Auxiliary Output port.

You can configure the following functions to control an Auxiliary Ports by KPG-91D.

Aux In Activation

Aux In Deactivation

Aux Out Activation

Aux Out Deactivation

Aux In/Out Transpond

Aux Transpond Activation

Aux Transpond Deactivation

18.2.1 Aux Input Activation

This function activates the function assigned to Auxiliary Input port by Air Remote.

TKR-750/850/751/851 activates the function when the received code matches.

When no function is assigned to the Auxiliary Port, you can perform the Encode function by interlocking with the sensor input of the external device.

Note: Although you can configure three functions (1st, 2nd and 3rd) to the Auxiliary Input port, you can activate only the function configured to the 1st function by Air Remote. (Refer to 20 Function Port.)

■ Configuration of KPG-91D

- Configuring the Aux Input Activation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)

18.2.2 Aux Input Deactivation

This function disables the function assigned to the Auxiliary Input port by the Air Remote.

TKR-750/850/751/851 disables the function when the received code matches.

You can configure the Air Remote code by selecting the Encode/Decode code of the DTMF.

When no function is assigned to an Auxiliary Input Port, you can enable the encode function by interlocking with the sensor input of the external device.

Note:

18 REMOTE CONTROL

- ◆ Although you can configure three functions (1st, 2nd and 3rd) to the Auxiliary Input port, you can activate only the 1st function by Air Remote. (Refer to [20 Function Port.](#))
- ◆ You cannot configure this function that TKR-750/850/751/851 would not accept, such as the Channel Up function.

■ Configuration of KPG-91D

- Configuring the Aux Input Deactivation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)

18.2.3 Aux Output Activation

This function is to transmit an Air Remote code when the function assigned to the Auxiliary Input port is activated.

When no function is assigned to an Auxiliary Output port, you can control external devices by specifying a Decode code.

Note:

- ◆ You cannot use this function for TX Unlock and TXS.
- ◆ Although you can use the RF Power Down Detect with the Air Remote, the Air Remote code is sent with the low transmission power.

■ Configuration of KPG-91D

- Configuring the Aux Output Activation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)

18.2.4 Aux Output Deactivation

This function is to transmit the Air Remote code when the function assigned to an Auxiliary Input port is disabled.

When no function is assigned to an Auxiliary Output port, you can control external devices by specifying the Decode code.

Note: You cannot use this function for TX Unlock and TXS.

■ Configuration of KPG-91D

- Configuring the Aux Output Deactivation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)

18.2.5 Aux In/Out Transpond

This function notifies the transmitting party that TKR-750/850/751/851 accepts an Air remote code for Auxiliary I/O. (Refer to [19 Transpond.](#))

It is possible to select a timing to transmit Transpond code within "Before", "After" or "both"

Also it is possible to configure a transpond code to activate/deactivate each other by FPU.

Aux Transpond Activation

TKR-750/850/751/851 transmits a Transpond code when the function assigned to the Auxiliary port activates by the Air Remote.

Aux Transpond Deactivation

TKR-750/850/751/851 transmits a Transpond code when the function assigned to the Auxiliary port disables by the Air Remote.

You can use a Single Tone as the Transpond code when the DTMF signalling is configured. (Refer to [18.1.4 Single Tone for the PF Key Transponder.](#))

■ Configuration of KPG-91D

- Configuring the Aux In/Out Transpond function (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)
- Configuring the Aux Transpond Activation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)
- Configuring the Aux Transpond Deactivation (Refer to FPRG 6.9.2 "AUX Input/Output" tab.)

18.2.6 Single Tone for the Aux Transponder function

You can select DTMF or Single Tone as the Transpond code when the DTMF signalling is configured.

■ Configuration of KPG-91D

- Configuring the Single Tone of the Aux Transponder (Refer to FPRG 6.9.2 "Aux Input/Output" tab.)

Note: You cannot individually select DTMF/Single Tone for Aux Transpond Activation and Deactivation.

18.3 Remote Access with QT/DQT

Using the QT/DQT code, you can permit TKR-750/850/751/851 to receive the Air-Remote code.

You can configure the Reception function for the Air Remote code corresponding to the match/unmatch status of the QT/DQT code by KPG-91D.

■ Configuration of KPG-91D

- Configure the Reception function for the Air Remote code with the match/unmatch status of the QT/DQT: ([Refer to 5 QT/DQT.](#))

Note:

- ◆ This function is available only to receive an Air Remote code. This function does not affect the repeat operation.
- ◆ When TKR-750/850/751/851 is configured to receive the Air Remote code only when the QT/DQT matches, the QT/DQT Decode function works to receive the Air Remote code even when the QT/DQT Decode function is disabled like following
 - When the Off-hook Decode is disabled and the microphone is on Off-hook position.
 - When the monitor is switched On:

18.4 Clear to Transpond

The Clear to Transpond is a function to wait to transmit a Transpond code until the channel becomes available.

■ Configuration of KPG-91D

- Configuring the Clear to Transpond (Air Remote) ([Refer to FPRG 6.9.2 "AUX Input/Output" tab.](#))

19 TRANSPOND

This function is to notify the transmitting party that TKR-750/850/751/851 is remotely controlled by Air remote. TKR-750/850/751/851 transmits a Transpond code as responding.

Transponder is a complex word of the Transmitter and the Responder, so it is the transmission mechanism used to respond the call.

19.1 Remote Controlled

This function notifies the transmitting party that TKR-750/850/751/851 accepts a remote code when the function assigned to the PF key or the auxiliary port is activates/deactivates with the Remote Control function. ([Refer to 18 Remote Control.](#))

It is possible to select a timing to transmit Transpond code within "Before", "After" or "both"

The Single Tone can be used as the Transpond code when selecting the DTMF signalling.

■ Configuration of KPG-91D

- Configuring the timing to transmit the Transpond code (Refer to FPRG 6.9.1 "PF Key" tab and 6.9.2 "AUX Input/Output" tab.)
- Configuring the Single Tone as the Transpond code (Refer to FPRG 6.9.1 "PF Key" tab and 6.9.2 "AUX Input/Output" tab.)

20 FUNCTION PORT

Following input/output ports are available on the TKR-750/850/751/851:

- **Auxiliary Input/Output 1 - 6**

You can use these ports to perform the auxiliary input operation and auxiliary output operation. You are able to assign the Channel Select function or the Multi-table Select function to these ports. (Refer to 20.1 AUX I/O Function.)

- **Auxiliary Input 1 - 3**

You can assign various functions to control the TKR-750/850/751/851 through this port. When this port receives the signal from the external device, the TKR-750/850/751/851 activates/deactivates the function. (Refer to 20.2 AUXI Function.)

- **Auxiliary Output 1 - 5**

You can assign various functions to control external devices to these ports. The TKR-750/850/751/851 emits the control signals to external devices according to the configured value. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)

The input/output ports are assigned to the connectors (25-pin connector and 15-pin connector) located on the rear panel. (Refer to 1.1 Functions and Panel Layout.)

Table 20-1 Assigning Function Port signals to the 25-pin connector

Pin number	Pin name	Input/Output	Description
4	AUXI 1	Input	Auxiliary Input 1
5	AUXI 2	Input	Auxiliary Input 2
6	AUXI 3	Input	Auxiliary Input 3
20	AUXIO 1	Input/Output	AUX Input, AUX Output 1
21	AUXIO 2	Input/Output	AUX Input, AUX Output 2
22	AUXIO 3	Input/Output	AUX Input, AUX Output 3
23	AUXIO 4	Input/Output	AUX Input, AUX Output 4
24	AUXIO 5	Input/Output	Auxiliary Input, AUX Output 5
25	AUXIO 6	Input/Output	AUX Input, AUX Output 6

Table 20-2 Assigning Function Port signals to the 15-pin connector

Pin number	Pin name	Input/Output	Description
10	AUXO 1	Output	Auxiliary Output 1
11	AUXO 2	Output	Auxiliary Output 2
13	AUXO 3	Output	Auxiliary Output 3
14	AUXO 4	Output	Auxiliary Output 4
15	AUXO 5	Output	Auxiliary Output 5

20.1 AUX I/O Function

You can assign one of the following functions to the Auxiliary Input/Output ports by KPG-91D.

- **AUX Input**

This port can be used as the PF (Programmable Function) input port.

- **AUX Output**

This port can be used as the PF (Programmable Function) output port.

- **Channel Select**

You can change channel to one of the CH 1 - CH 16 when the voltage level of the Auxiliary Input pots is High or Low. You can assign this function to the Auxiliary Input/Output 1 - 4 ports. these port works as BCD.

Table 20-3 Channel Select (H: High, L: Low)

Channel	AIO4	AIO3	AIO2	AIO1
1	H	H	H	L
2	H	H	L	H
3	H	H	L	L
4	H	L	H	H
5	H	L	H	L
6	H	L	L	H
7	H	L	L	L
8	L	H	H	H
9	L	H	H	L
10	L	H	L	H
11	L	H	L	L
12	L	L	H	H
13	L	L	H	L
14	L	L	L	H
15	L	L	L	L
16	H	H	H	H

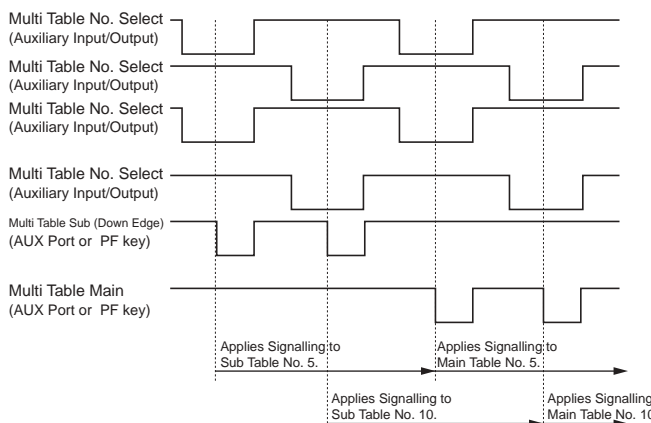
- **Multi-table Select**

You can specify one of No. 2 to No. 16 codes configured in the Multi-table when the voltage level of the Auxiliary Input ports is High or Low. You are able to switch the Multi-table Main and Sub by configuring one of the “Multi-table Main”, “Multi-table Sub”, “Multi-table Main/Sub” functions to a PF key or an AUX Input port.

You can assign this function to the Auxiliary Input/Output 1 - 4 ports.

Table 20-4 Multi-table Select (H: High, L: Low)

Multi-table No.	AIO4	AIO3	AIO2	AIO1
None	H	H	H	L
2	H	H	L	H
3	H	H	L	L
4	H	L	H	H
5	H	L	H	L
6	H	L	L	H
7	H	L	L	L
8	L	H	H	H
9	L	H	H	L
10	L	H	L	H
11	L	H	L	L
12	L	L	H	H
13	L	L	H	L
14	L	L	L	H
15	L	L	L	L
16	H	H	H	H



Note: You can only assign an Auxiliary Input function or an Auxiliary Output function to the Auxiliary Input/Output ports 5 and 6.

■ Configuration of KPG-91D

- Configuring the Auxiliary Input/Output ports (Refer to FPRG 6.10.1 “AUX Select” tab.)

20.2 AUXI Function

Following are functions to be able to assign to the Auxiliary Input ports: (Refer to [Table 20-5 Assigning functions to the Auxiliary Input ports.](#))

It is possible to assign three functions to each Auxiliary Input port (1st, 2nd, and 3rd). When the signal is applied

to the Auxiliary Input port, each function assigned to the port is enabled one by one.

When assigning the “Channel Up” function to the [Auxiliary Input 1] port, the port is referred to as the “PF [Channel Up] input port”.

Table 20-5 Assigning functions to the Auxiliary Input ports (Functions in are available only when the Down Edge is detected.)

Function Name	Description
None	TKR-750/850/751/851 does not perform any operation.
AUX Out 1 Off - AUX Out 5 Off	When the signal is applied to one of the PF [AUX Out 1 Off] - PF [AUX Out 5 Off] input ports, the function assigned to the Auxiliary Output port is disabled. You can assign this function when “Selectable” is configured to the Auxiliary Output 1 to Auxiliary Output 5 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX I/O 1 Off - AUX I/O 6 Off	When the signal is applied to one of the PF [AUX Out 1 Off] - PF [AUX Out 6 Off] input ports, the function assigned to the Auxiliary I/O port is disabled. You can assign the function when “Selectable” is configured to the Auxiliary I/O 1 to Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX Out 1 On - AUX Out 5 On	When the signal is applied to one of the PF [AUX Out 1 On] - PF [AUX Out 5 On] input ports, the function assigned to the Auxiliary Output port is enabled. You can assign this function when “Selectable” is configured to the Auxiliary Output 1 to Auxiliary Output 5 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX I/O 1 On - AUX I/O 6 On	When the signal is applied to one of the PF [AUX I/O 1 On] - PF [AUX I/O 6 On] input ports, the function assigned to the Auxiliary I/O port is disabled. You can assign the function when “Selectable” is configured to the Auxiliary I/O 1 to Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.)
AUX Out 1 On/Off - AUX Out 5 On/Off	You can enable/disable the function assigned to the Auxiliary Output port when a signal is applied to one of the PF [AUX Out 1 On/Off] to PF [AUX Out 5 On/Off] input ports. You can assign this function when “Selectable” is configured to the Auxiliary Output 1 to Auxiliary Output 5 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.) You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
AUX I/O 1 On/Off - AUX I/O 6 On/Off	You can enable/disable the function assigned to the Auxiliary I/O port when a signal is applied to one of the PF [AUX I/O 1 On/Off] to PF [AUX I/O 6 On/Off] ports. You can assign the function when “Selectable” is configured to the Auxiliary I/O 1 to Auxiliary I/O 6 ports. (Refer to 20.3 Assigning Functions to the Auxiliary Output Ports.) You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Channel 1 - Channel 16	TKR-750/850/751/851 moves to a channel from one of CH 1 to CH 16 channels when a signal is applied to one of the PF [Channel 1] to PF [Channel 16] ports. You cannot configure this function when “Channel Select” is configured to Auxiliary I/O 1 to Auxiliary I/O 4 ports. “E2” appears on the display when specifying the channel without data. (Refer to 20.1 AUX I/O Function.)
Channel Down	TKR-750/850/751/851 moves to the next lower channel when a signal is applied to the PF [Channel Down] input port. The channel without data is skipped.
Channel Up	TKR-750/850/751/851 moves to the next higher channel when a signal is applied to the PF [Channel Down] input port. The channel without data is skipped.
CW ID On	TKR-750/850/751/851 transmits a CW ID when a signal is applied to the PF [CW ID On] key. This function is available on the channel having the CW ID. (Refer to 22.1 CW ID.)
CW Message 1 - CW Message 8	TKR-750/850/751/851 transmits one of the messages from CW Messages 1 to 8 when a signal is applied to one of the PF [CW Message 1] to PF [CW Message 8] input ports. (Refer to 22.2 CW Message.)
DC Power Save Off	TKR-750/850/751/851 switches the Save Mode off when a signal is applied to the PF [DC Power Save Off] input port. Even if the signal is detected with the Down Edge, Save Mode does not switch On after the mode is once enabled. It should be used with DC Power Save On function.
DC Power Save On	TKR-750/850/751/851 switches the Save Mode On when a signal is applied to the PF [DC Power Save On] input port. Even if the signal is detected with the Down Edge, Save Mode does not switch Off after the mode is once enabled. It should be used with DC Power Save Off function.

20 FUNCTION PORT

Function Name	Description
DC Power Save On/Off	TKR-750/850/751/851 switches the Save Mode On/Off when a signal is applied to the PF [DC Power Save On/Off] input port. (Refer to 10.4 DC Power Save.) You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Display Off	All LEDs other than the Power SW LED located on the front panel unlit when a signal is applied to the PF [Display Off] input port. This function is enabled only when TKR-750/850/751/851 is in Save Mode. When the signal is detected with the Down Edge, you cannot make all LEDs light when this function is once switched On. It should be used with Display On function.
Display On	All LEDs on the front panel light when a signal is applied to the PF [Display On] input port. This function activates only when TKR-750/850/751/851 is in Save Mode. When the signal is detected with the Down Edge, you cannot make all LEDs unlit when this function is once switched On. It should be used with Display Off function.
Display On/Off	the LEDs located on the front panel is switched On/Off when a signal is applied to the PF [Display On/Off] input port. This function activates only when TKR-750/850/751/851 is in Save Mode. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Hold Time Disable	The Repeat Hold Time is disabled when a signal is applied to the PF [Hold Time Disable] input port. You can configure this function only when at least one channel is configured as the Repeat for Operation mode and the Repeat Hold Time is enabled. (Refer to 6.5 Repeat Hold Time.) When the signal is detected with the Down Edge, you cannot switch the Hold Time On when this function is once enabled. It should be used with Hold Time Enable function.
Hold Time Enable	The Repeat Hold Time is enable when a signal is applied to the PF [Hold Time Enable] input port. You can configure this function only when at least one channel is configured as the Repeat for Operation mode and the Repeat Hold Time is enabled. (Refer to 6.5 Repeat Hold Time.) When the signal is detected with the Down Edge, you cannot switch the Hold Time Off after this function is once enabled. It should be used with Hold Time Disable function.
Hold Time Disable/Enable	The Repeat Hold Time is switched disable/enable when a signal is applied to the PF [Hold Time Disable/Enable] input port. You can configure this function only when at least one channel is configured as the Repeat for Operation mode and the Repeat Hold Time is enabled. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Local TX Disable	The transmissions using the Local Mic PTT is disabled when the signal is applied to the PF [Local TX Disable] input port. When the signal is detected with the Down Edge, you cannot enable the transmission using the Local Mic PTT after this function is once enabled. It should be used with Local TX Enable function.
Local TX Enable	The transmission using the Local Mic PTT is enabled when a signal is applied to the PF [Local TX Enable] input port. When the signal is detected with the Down Edge, you cannot restrict the transmissions using the Local Mic PTT after this function is once enabled. It should be used with Local TX Disable function.
Local TX Disable/Enable	The transmissions using the Local Mic PTT is switched disable/enable when a signal is applied to the PF [Local TX Disable/Enable] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Low Power Off*2	The transmission power is changed from Low to High when a signal is applied to the PF [Low Power Off] input port. This function activates only when at least one channel is configured as High for TX Power. (Refer to 4.10 TX High Power.)
Low Power On*2	The transmission power is changed from High to Low when a signal is applied to the PF [Low Power On] input port. This function activates only when at least one channel is configured as High for TX Power. (Refer to 4.10 TX High Power.)
Low Power On/Off*2	The transmission power is switched High and Low when a signal is applied to the PF [Low Power On/Off] input port. This function activates only when at least one channel is configured as High for TX Power. (Refer to 4.10 TX High Power.) You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Monitor Off	The Signalling Decode function is enabled when the signal is applied to the PF [Monitor Off] input port. When a signal is detected with the Down Edge, you cannot switch the Monitor On after this function is once enabled. This function does not operate when TKR-750/850/751/851 enables the repeat operation. It should be used with Monitor On function.

Function Name	Description
Monitor On	The Signalling Decode function is disabled when the signal is applied to the PF [Monitor On] input port. When a signal is detected with the Down Edge, you cannot switch the monitor Off after this function is once enabled. It should be used with Monitor Off function.
Monitor On/Off	The Signalling Decode function is switched disable and enable when the signal is applied to the PF [Monitor On/Off] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Multi-table Sub	TKR-750/850/751/851 switches the signalling specified with the Multi-table Select to the Sub-table signalling when a signal is applied to the PF [Multi-table Sub] input port. (Refer to 20.1 AUX I/O Function.) When the signal is detected with the Down Edge, you cannot return to the Main-table after the Sub-table is once selected. So it should be used with Multi-Table Main function.
Multi-table Main	TKR-750/850/751/851 switches the signalling specified with the Multi-table Select to the Main-table when a signal is applied to the PF [Multi-table Main] input port. (Refer to 20.1 AUX I/O Function.) When the signal is detected with the Down Edge, you cannot switch to the Sub-table after the Main-table is once selected. So it should be used with Multi-Table Sub function.
Multi-table Main/Sub	TKR-750/850/751/851 switches Main/Sub for the signalling specified with the Multi-table Select when a signal is applied to the PF [Multi-table Main/Sub] input port. (Refer to 20.1 AUX I/O Function.) You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
QT/DQT Decode Disable	The QT/DQT Decode function is disabled when the signal is applied to the PF [QT/DQT Decode Disable] input port. When a signal is detected with the Down Edge, you cannot switch the QT/DQT Decode function On after this function is once enabled. So it should be used with enable function. This function is available even when TKR-750/850/751/851 is performing the repeat operation.
QT/DQT Decode Enable	The QT/DQT Decode function is enabled when a signal is applied to the PF [QT/DQT Decode Enable] input port. So it should be used with Disable function. When the signal is detected with the Down Edge, you cannot switch the QT/DQT Decode function Off after this function is once enabled.
QT/DQT Decode Disable/Enable	The QT/DQT Decode function is switched disable and enable when a signal is applied to the PF [QT/DQT Encode Disable/Enable] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
QT/DQT Encode Disable	The QT/DQT Encode function is disabled when a signal is applied to the PF [QT/DQT Encode Disable] input port. When the signal is detected with the Down Edge, you cannot switch the QT/DQT Encode On after this function is once enabled. So it should be used with Enable function.
QT/DQT Encode Enable	The QT/DQT Encode function is enabled when a signal is applied to the PF [QT/DQT Encode Enable] input port. When the signal is detected with the Down Edge, you cannot switch the QT/DQT Encode Off after this function is once enabled. So it should be used with Disable function.
QT/DQT Encode Disable/Enable	The QT/DQT Encode function is switched disable and enable when a signal is applied to the PF [QT/DQT Encode Disable/Enable] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Repeat Disable	The Repeat operation is disabled when a signal is applied to the PF [Repeat Disable] input port. You cannot configure this function if no channel is configured to the repeat operation. When the signal is detected with the Down Edge, you cannot enable the Repeat operation after this function is once enabled. It should be used with Enable function.
Repeat Enable	The Repeat operation is enabled when a signal is applied to the PF [Repeat Enable] input port. You cannot configure this function if no channel is configured to the repeat operation. When the signal is detected with the Down Edge, you cannot disable the repeat operation after this function is once enabled. It should be used with Disable function.
Repeat Disable/Enable	The repeat operation is switched enable and disable when a signal is applied to the PF [Repeat Disable/Enable] input port. You cannot configure this function if no channel is configured to the repeat operation. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Reset	The TKR-750/850/751/851 resets the operations and returns to the default value when a signal is applied to the PF [Reset] input port.
Scan Off	The Scan is disabled when a signal is applied to the PF [Scan Off] input port. When a signal is detected with the Down Edge, you cannot enable the Scan after this function is once enabled. So it should be used with On function.

20 FUNCTION PORT

Function Name	Description
Scan On	The Scan is enabled when a signal is applied to the PF [Scan On] input port. When the signal is detected with the Down Edge, you cannot disable the Scan after this function is once enabled. It should be used with Off function.
Scan On/Off	The Scan On/Off is switched enable and disable when a signal is applied to the PF [Scan On/Off] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Scrambler Off	The Scrambler function is disabled when a signal is applied to the PF [Scrambler Off] input port. You cannot configure this function when the optional Scrambler board is not installed in TKR-750/850/751/851. When the signal is detected with the Down Edge, you cannot switch the Scrambler operation On after this function is once enabled. So it should be used with On function.
Scrambler On	The Scrambler function is enabled when a signal is applied to the PF [Scrambler On] input port. You cannot configure this function when the optional Scrambler board is not install in TKR-750/850/751/851. When the signal is detected with the Down Edge, you cannot disable the Scrambler function after this function is once enabled. So it should be used with Off function.
Scrambler On/Off	The Scrambler operation is switched On/Off when a signal is applied to the PF [Scrambler On/Off] input port. You cannot configure this function when the optional Scrambler board is not installed in TKR-750/850/751/851. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
Squelch Off	The Squelch function is disabled when a signal is applied to the PF [Squelch Off] input port. When a signal is detected with the Down Edge, you cannot switch the Squelch function On when this function is once enabled. It should be used with Enable function.
Squelch On	The Squelch function is enabled when a signal is applied to the PF [Squelch On] input port. When a signal is detected with the Down Edge, you cannot switch the Squelch function Off after this function is once enabled. It should be used with Disable function.
Squelch On/Off	The Squelch function is switched On/Off when a signal is applied to the PF [Squelch On/Off] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
TA Line Pre-emphasis On/Off	The pre-emphasis of the TA terminal input signal is switched Enable and Disable.
Test Tone Off	The Test Tone is Off when the signal is applied to the PF [Test Tone Off] input port. When a signal is detected with the Down Edge, you cannot switch the Test Tone On after this function is once enabled. It should be used with On function.
Test Tone On	The Test Tone is On when the signal is applied to the PF [Test Tone On] input port. When a signal is detected with the Down Edge, you cannot switch the Test Tone Off after this function is once enabled. It should be used with Off function.
Test Tone On/Off	The Test Tone is switched On and Off when a signal is applied to the PF [Test Tone On/Off] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
TOT Disable*1	The Time Out Timer is Off when a signal is applied to the PF [TOT Disable] input port. When the signal is detected with the Down Edge, you cannot switch the Time Out Timer On when this function is once enabled. It should be used with On function.
TOT Enable*1	The Time Out Timer is On when a signal is applied to the PF [TOT Enable] input port. When the signal is detected with the Down Edge, you cannot switch the Time Out Timer Off after this function is once enabled. It should be used with Off function.
TOT Disable/Enable*1	The Time Out Timer is switched On and Off when a signal is applied to the PF [TOT Disable/Enable] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)
TX Disable	All transmissions is restricted when a signal is applied to the PF [TX Disable] input port. When the signal is detected with the Down Edge, you cannot permit transmissions after this function is once enabled. It should be used with Enable function.
TX Enable	All transmissions is permitted when a signal is applied to the PF [TX Enable] input port. When the signal is detected with the Down Edge, you cannot restrict transmissions after this function is once enabled. It should be used with Disable function.
TX Disable/Enable	The transmissions is switched disable/enable when a signal is applied to the PF [TX Disable/Enable] input port. You can use this function only when the signal is detected with the Down Edge. (Refer to 20.2.1 Trigger Detection for Auxiliary Input Ports.)

Note:

- ◆ This function is available on the TOT of the Local Mic PTT and the Repeater/External PTT. (*1)
 - ◆ You cannot switch to Low Power while transmitting or scanning. The Low Power status is retained even if the channel is changed or TKR-750/850/751/851 is turned ON/OFF. (*2)
 - ◆ When assigning similar functions to Auxiliary Input ports, TKR-750/850/751/851 activates the function according to the status of the last used Auxiliary Input port.
 - ◆ When the same function or similar functions are assigned to the Auxiliary Input port and the PF key, the operation may become unstable due to the chattering.
- Example: When the PF [Scan On/Off] key is switched from Off to On:
- ① TKR-750/850/751/851 starts scanning since the Scan starts by the PF [Scan On/Off] key. (Channel/Status display)
 - ② TKR-750/850/751/851 pauses scanning when the signal is applied to the PF [Scan On/Off] input port.
- ◆ When the DTMF signalling is configured, TKR-750/850/751/851 determines that the received code is a continuous code even when it is intermittently received for a couple seconds. Therefore, TKR-750/850/751/851 activates the "Reset" function in any of the following cases.

Example)

Decode Table		Function
No.	Code	
1	0123456	Take Over On
2	0123456789ABCD	Reset
3	789ABCD	Repeat Disable

TKR-750/850/751/851 assumes that it has received the No. 2 Reset signal when receiving the No. 3 Repeat Disable signal after receiving the No. 1 Take Over On signal.

■ Configuration of KPG-91D

- Configuring the Auxiliary Input port (Refer to FPRG 6.10.2 "AUX" tab.)

20.2.1 Trigger Detection for Auxiliary Input Ports

Two methods are available to detect the signal applied to an Auxiliary Input port.

• Down Edge Detection

You can perform the trigger detection with the Down Edge on the input signal.

• Level Detection

You can perform the trigger detection when TKR-750/850/751/851 is in Active Low. Although TKR-750/850/751/851 performs the detection when the detection is enabled, it preferentially performs the Start Up operation when the Start Up function is enabled.

(Refer to 10.5 Start Up.)

■ Configuration of KPG-91D

- Configuring the detection method for Auxiliary Input ports (Refer to FPRG 6.10.2 "AUX" tab.)

20.3 Assigning Functions to the Auxiliary Output Ports

The following functions can be assigned to an Auxiliary Output port or AUX Input/Output ports by KPG-91D. (Refer to Table 20-6 Assigning functions to the Auxiliary Output ports.)

TKR-750/850/751/851 outputs a signal from the Auxiliary Output ports when the TKR-750/850/751/851 enters the configured status.

It is possible to assign functions to each Auxiliary Output port 1 - 5 by KPG-91D.

When assigning the "Power Supply Lower Level" function to the Auxiliary Output port 1, the port is considered as the "PF [Power Supply Lower Level] input port".

Table 20-6 Assigning functions to the Auxiliary Output ports

Function Name	Description
None	TKR-750/850/751/851 does not perform any operation.
COR	The PF [COR] output port become active when receiving the signal. The PF [COR] output port become inactive when TKR-750/850/751/851 is not receiving the signal.
Fan Status	The PF [Fan Status] output port become active when the fan starts operating. The PF [Fan Status] output port become inactive when the fan stops operating.
Power Supply Lower Limit*1	The PF [Power Supply Lower Level] output port become active when the power voltage is decreased. The PF [Power Supply Lower Level] output port become inactive when the power voltage is increased.
RF Power Down Detect*2	The PF [RF Power Down Detect] output port become active when the transmission power output is decreased. The PF [RF Power Down Detect] output port become inactive when the transmission power output is increased.
RX Signal Detect (Below) *1	The PF [RX Signal Detect] output port become active when the RSSI voltage is decreased. The PF [RX Signal Detect] output port become inactive when the RSSI voltage is increased.

20 FUNCTION PORT

Function Name	Description
RX Unlock	The PF [RX Unlock] output port become active when RX PLL is unlocked. The PF [RX Unlock] output port become inactive when RX PLL is locked.
Selectable	You can toggle the PF [Selectable] output port between Active and Inactive when the signal is applied to an Auxiliary Input port or a PF key.
TOR	The PF [TOR] output port become active when a signalling code is matched while receiving a signal. The PF [TOR] output port become inactive when a signalling code is not matched. The PF [TOR] output port become active on the channel which a signalling is disabled by QT/DQT Decode Disable function while receiving a signal. The PF [TOR] output port is disabled when TKR-750/850/751/851 is not receiving the signal.
TXS	The PF [TXS] output port become active while transmitting. The PF [TXS] output port become inactive when TKR-750/850/751/851 is not transmitting.
TX Unlock	The PF [TX Unlock] output port become active when the TX PLL is unlocked. The PF [TX Unlock] output port become inactive when the TX PLL is locked.

Note:

- ◆ It is possible to configure any voltage value to detect the voltage decrease/increase. (*1) (Refer to [10.2 Power Supply Lower Level](#), [10.3 RX Signal Detect \(Below\)](#).)
- ◆ It is possible to configure "Power Down Detect" adjustment of PC Tuning mode to Hi Power and Low Power. This function notifies a user that the transmission power is suddenly decreased. However, you cannot use this function as a real-time power monitor. (*2) (Refer to [24.2.3 PC Tuning Mode](#).)
Default: Hi (25 W) power: Approximately 10 W
: Low (1 W) power: Approximately 0.3 W
- ◆ When configuring the Activation code to the PF [COR] output port or the PF [TOR] output port, TKR-750/850/751/851 cannot activate the repeat operation since it transmits the code while it is in Busy status, so that it cannot receive the Air Remote code. (Refer to [18.2.3 Aux Output Activation](#).)
- ◆ Since the status of the Air Remote Encode function is retained while transmitting using the Repeater PTT, the Local Mic PTT, or the External PTT, or CW ID, TKR-750/850/751/851 cannot transmit the Activation code even when the function is activated while the Activation code is configured to the PF [Power Supply Lower Limit] output port. In this case, TKR-750/850/751/851 transmits the Activation code after ending the transmission (the function deactivates). When the Deactivation code is configured to the port, TKR-750/850/751/851 transmits the Deactivation code after transmitting the Activation code. (Refer to [18.2.3 Aux Output Activation](#), [18.2.4 Aux Output Deactivation](#).)

■ Configuration of KPG-91D

- Configuring the Auxiliary Output ports (Refer to FPRG 6.10.2 "AUX" tab.)

20.3.1 Logic Type

You can select an Auxiliary Output port output logic type (High/Low) when the function is assigned to the Auxiliary Output port.

- **When the Active Low is selected:**
When the Auxiliary Output port is enabled, the voltage level becomes Low.
- **When the Active High is selected:**
When the Auxiliary Output port is enabled, the voltage level becomes High.

■ Configuration of KPG-91D

- Configuring the Logic Type (Refer to FPRG 6.10.2 "AUX" tab.)

This function allows you to wait for a call a maximum of 15 QT/DQT by configuring 15 QT/DQT (Current) as well as a single QT/DQT (Primary) to each channel. With this function, you can receive a call from many transceivers that have different QT/DQT code. You can activate/deactivate the Multi-table function for each channel.

[\(Refer to 4.7 Encode Tone in Multiple.\)](#)

With the Multi-table function, you can configure the QT/DQT code to the Main-table and the Sub-table. You can switch the Main-table and the Sub-table interlocking with the operation of the function key and the input/output operation of the auxiliary port. (Refer to FPRG 13 Function List.)

Note: You cannot use the Main-table and the Sub-table at the same time. TKR-750/850/751/851 waits for a call with the QT/DQT code configured to each channel and the QT/DQT code configured to the Main-table or the Sub-table.

■ Configuration of KPG-91D

- Configuring the QT/DQT code of the Multi-table
(Refer to FPRG 6.11 "Multi-table" window.)

CW stands for Continuous Wave and it is one of the telegraph methods (communication with Morse codes). With this communication, the characters and numbers are sent with the combination of dots and dashes. It has an advantage to be able to keep wide area communication with small transmit power.

It is possible to transmit a message using Morse code by the CW ID function and the CW Message function.

The specification of the CW is compliant with the items in the "FCC 90.425 Station identification" and "International Morse Code".

22.1 CW ID

CW ID is a function to send a Morse code configured at transmission by configuring Morse codes to each channel. Each message has capability with a maximum of 32 characters and symbols. Also it can send a CW ID by interlocking with a PF keys and an AUX I/O port. (Refer to FPRG 13 Function List.)

You can configure the following functions relating to the transmission of CW ID by KPG-91D.

CW ID

TX Interval Time

TX Delay Time

CW Speed

CW Mod. Delay Time

Audio Frequency

TX Required in Interval

CW ID Override

Send CW ID to RA

CW ID on Channel change

Encode with QT/DQT

Note:

- ◆ You cannot send the CW ID while scanning or pausing the Scan.
- ◆ When the CW ID On or the CW Message On function is enabled while sending the CW ID, TKR-750/850/751/851 stops sending the current CW ID and sends the newly configured CW ID.

22.1.1 CW ID

It is possible to compose a message with a maximum of 32 characters.

Table 22-1 Available Characters/Symbols

Characters and Symbols	Description
A,B...Y,Z	Alphabet (Large characters)
(Left parenthesis
)	Right parenthesis
+	Adding symbol
"	Quotation mark
?	Question mark
-	Continuous line, subtracting symbol, horizontal line
Space	Space (You cannot enter the space continuously or use it as the first letter of the ID.)
0 - 9	Numbers
=	Double line
/	Slash
.	Period
,	Comma
'	Abbreviation mark
:	Colon

■ Configuration of KPG-91D

- Configuring the CW ID (Refer to FPRG 6.3.1 CW ID.)

22.1.2 TX Interval Time

TX Interval Time is a duration to send each CW ID. You can repeatedly send the CW ID with the interval configured in this function.

Note: The TX Interval Time starts counting down when resetting TKR-750/850/751/851, changing the channel, and activating the CW ID On Function or the Scan Off Function.

■ Configuration of KPG-91D

- Configuring the TX Interval Time (Refer to FPRG 6.3.2 TX Interval Time.)

22.1.3 TX Delay Time

TX Delay Time is a duration between the time when the transmission ends due to the expiration of the TX Interval Time, the changing channel, or the deactivation of the CW ID Override function and the time when TKR-750/850/751/851 resumes transmitting in order to send the CW ID. TKR-750/850/751/851 sends the CW ID after the CW Mod. Delay Time expires. ([Refer to 22.1.5 CW Mod. Delay Time \(CW ID\).](#))

Note: TX Delay Time function is not applicable when sending the CW ID with the CW ID On function.

■ Configuration of KPG-91D

- Configuring the TX Delay Time (Refer to FPRG 6.3.3 TX Delay Time.)

22.1.4 CW Speed (CW ID)

CW Speed is a speed in WPM (word per minute) to send the CW ID.

■ Configuration of KPG-91D

- Configuring the CW Speed (Refer to FPRG 6.3.4 CW Speed.)

22.1.5 CW Mod. Delay Time (CW ID)

CW Mod. Delay Time is a duration between the time when the TKR-750/850/751/851 starts transmitting and it sends the CW ID.

■ Configuration of KPG-91D

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

22.1.6 Audio Frequency (CW ID)

Audio Frequency is a CW Tone frequency to send the CW ID. The CW Tone frequency can be configured within 400 Hz and 2000 Hz.

■ Configuration of KPG-91D

- Configuring the Audio Frequency (Refer to FPRG 6.3.6 Audio Frequency.)

22.1.7 TX Required in Interval

TX Required in Interval is used to send a CW ID with the configured interval when TKR-750/850/751/851 tries to transmit during the TX Interval Time. ([Refer to 22.1.2 TX Interval Time.](#))

Note: The TX Required in Interval function is not applicable when sending the CW ID with the CW ID On function since you can only configure the interval with this function.

■ Configuration of KPG-91D

- Configuring the TX Required in Interval (Refer to FPRG 6.3.7 TX Required in Interval.)

22.1.8 CW ID Override

CW ID Override function is used to send a CW ID with the audio signal when the TX Interval Time expires during the transmission.

Note:

- ◆ When sending the CW ID configured with CW ID Override On, the QT/DQT code configured to the channel is encoded regardless of the Encode with QT/DQT configuration. ([Refer to 22.1.11 Encode with QT/DQT \(CW ID\).](#))
- ◆ TKR-750/850/751/851 does not send the CW ID even when the CW ID On function is enabled during transmission while the CW ID Override function is disabled.

■ Configuration of KPG-91D

- Configuring the CW ID Override function (Refer to FPRG 6.3.8 CW ID Override.)

22.1.9 Send CW ID to RA

Send CW ID to RA is used to monitor the CW ID sounds when sending the CW ID from TKR-750/850/751/851, the RA line, and the front speaker. TKR-750/850/751/851 transmits the audio signals with the CW ID during the reception.

Note: The CW ID is only sent to RA line when the channel is in Simplex mode. In this case, the CW ID is not sent to the speaker.

■ Configuration of KPG-91D

- Configuring the Send CW ID to RA (Refer to FPRG 6.3.9 Send CW ID to RA.)

22.1.10 CW ID on Channel change

CW ID on Channel Change is used to send a CW ID when the channel is selected or changed. TKR-750/850/751/851 sends the CW ID regardless of the configuration of the CW Mod. Delay Time and the TX Interval Time.

■ Configuration of KPG-91D

- Configuring the CW ID on Channel Change (Refer to FPRG 6.3.1 CW ID on Channel change.)

22.1.11 Encode with QT/DQT (CW ID)

Encode with QT/DQT is a function to encode a QT/DQT (Primary) code configured to each channel while sending the CW ID.

Note: TKR-750/850/751/851 sends the QT/DQT code configured to each channel when the Encode with QT/DQT function is enabled, and it does not send the QT/DQT code when the Encode with QT/DQT function is disabled. However, the newly configured CW ID/CW Message is sent corresponding to the Encode with QT/DQT configuration when TKR-750/850/751/851 sends another CW ID or CW Message while the CW ID is independently sent. (Refer to 22.2 CW Message.)

■ Configuration of KPG-91D

- Configuring the Encode with QT/DQT (Refer to FPRG 6.3.11 Encode with QT/DQT (CW ID).)

22.2 CW Message

CW Message is a function to transmit the configured Morse code by interlocking with the PF keys and the AUX I/O port. It is possible to configure 8 messages with a maximum of 32 characters and symbols. (Refer to FPRG 13 Function List.)

You can control a transmission of the CW Message with the following functions.

- **Key Function**
TKR-750/850/751/851 transmits a CW Message when the PF key is pressed if the CW Message transmission function is assigned on it. (Refer to 15.1 Available Functions.)
- **Auxiliary Input port**
TKR-750/850/751/851 transmits a CW Message when a signal is applied to an Auxiliary Input port if the CW Message transmission function is assigned on it. (Refer to 20.2 AUXI Function.)
- **Save On/Off Function**
TKR-750/850/751/851 transmits a CW Message when it enters/exists Save mode if the CW Message transmission function is assigned to the Save On/Off function. (Refer to Table 10-1 Available functions.)
- **Start Up Function**
TKR-750/850/751/851 transmits a CW Message when it is turned ON if the CW Message transmission function is assigned to the Start Up function. (Refer to Table 10-1 Available functions.)
- **Backup Power Function**
TKR-750/850/751/851 transmits a CW Message when the power TKR-750/850/751/851 is switched from the main power to the backup power if the CW Message

transmission function is assigned to the Backup Power function. (Refer to Table 10-1 Available functions.)

- **Main Power Function**

TKR-750/850/751/851 transmits a CW Message when the power is switched from the backup power to the main power if the CW Message transmission function is assigned to the Main Power function. (Refer to Table 10-1 Available functions.)

You can configure the following functions relating to the transmission of the CW Message by KPG-91D.

- CW Message
- CW Speed
- CW Mod. Delay Time
- Audio Frequency
- Send CW Message to RA
- Encode with QT/DQT (CW ID)

22.2.1 CW Message

You can configure 8 messages with a maximum of 32 characters and symbols.

Table 22-2 Available Characters/Symbols

Characters and symbols	Description
A,B...Y,Z	Alphabet (Upper case characters)
(Left parenthesis
)	Right parenthesis
+	Adding symbol
“ ”	Quotation mark
?	Question mark
-	Continuous line, subtracting symbol, horizontal line
Space	Space (You cannot enter the space continuously or use it as the first letter of the message.)
0 - 9	Numbers
=	Double line
/	Slash
.	Period
,	Comma
'	Abbreviation mark
:	Colon

■ Configuration of KPG-91D

- Configuring the CW Message (Refer to FPRG 6.12.1 CW Message.)

22.2.2 CW Speed (CW Message)

CW Speed is a speed in WPM to transmit a CW Message.

■ Configuration of KPG-91D

- Configuring the CW Speed (Refer to FPRG 6.12.2 CW Speed.)

22.2.3 CW Mod. Delay Time (CW Message)

CW Mod. Delay Time is a duration between the time when TKR-750/850/751/851 starts transmitting and the time when it sends the CW Message.

■ Configuration of KPG-91D

- Configuring the CW Mod. Delay Time (Refer to FPRG 6.12.3 CW Mod. Delay Time.)

22.2.4 Audio Frequency (CW Message)

Audio Frequency is used to send a CW Message. You can configure the frequency within the range between 400 Hz and 2000 Hz.

■ Configuration of KPG-91D

- Configuring the Audio Frequency (Refer to FPRG 6.12.4 Audio Frequency.)

22.2.5 Send CW Message to RA

Send CW Message to RA monitors a CW Message sound when sending the CW Message to RA line and the front speaker. TKR-750/850/751/851 transmits the audio signals with the CW Message while it is in the reception mode.

Note: The CW Message is only sent from the RA line when the channel is in Simplex mode. In this case, the CW Message is not sent from the speaker.

■ Configuration of KPG-91D

- Configuring the Send CW Message to RA (Refer to FPRG 6.12.5 Send CW Message to RA.)

22.2.6 Encode with QT/DQT (CW Message)

Encode with QT/DQT encodes the QT/DQT (Primary) code configured to each channel while sending the CW Message.

Note: TKR-750/850/751/851 sends the QT/DQT code configured to each channel when the Encode with QT/DQT function is enabled, and it does not send the QT/DQT code when the Encode with QT/DQT function is disabled. However, the newly configured CW ID/CW Message is sent corresponding to the Encode with QT/DQT configuration when TKR-750/850/751/851 sends another CW Message or CW ID while sending only the CW Message. (Refer to 22.1 CW ID.)

■ Configuration of KPG-91D

- Configuring the Encode with QT/DQT (Refer to FPRG 6.12.6 Encode with QT/DQT (CW Message).)

This function is used to transmit a single tone when the function assigned to the PF key or the Auxiliary Input Port activates. You can use this function when adjusting the output level of the TKR-750/850/751/851. You can also configure the frequency of the single tone to be transmitted.

■ Configuration of KPG-91D

- Configuring the frequency of the Test Tone (Refer to FPRG 6.4.1 "Optional Features 1" tab.)

Note: TKR-750/850/751/851 only transmits the CW ID/Message when transmitting the CW ID/Message while transmitting the Test Tone. TKR-750/850/751/851 does not modulate the audio signal while transmitting the Test Tone. ([Refer to 22 CW ID/CW Message.](#))

24 PC MODE

PC Mode can be switched from the User Mode. In this mode, you can control the TKR-750/850/751/851 through the PC. You can read/write the program and adjust parameters by KPG-91D. (Refer to 1.5 Mode.)

Data communication is made through the microphone connector (8-pin connector) located on the front panel and the control interface jack, which complies with the RS-232C standard (25-pin connector) located on the rear panel. TKR-750/850/751/851 returns to User Mode automatically after communication with PC. (Refer to Table 1-2 Assigning signals to 25-pin connector.)

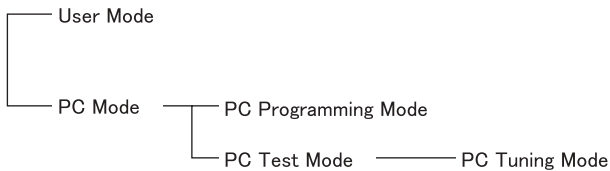


Figure 24-1 PC Mode configuration

24.1 PC Programming Mode

This function allows you to write the configuration data, such as frequencies, to the flash memory or read the data from the memory with the ASCII characters and commands transmitted from KPG-91D. The baud rate is 9600 bps.

■ Configuration of KPG-91D

- Reading/writing the configuration data (Refer to FPRG 7.1 Read Data from Repeater, 7.2 Write Data to Repeater.)

24.2 PC Test Mode

PC Test Mode allows you to check TKR-750/850/751/851's performance. In this mode, you can make various adjustments, such as checking the RF environment of the location and the adjustment of the reception frequency, before installing or operating the TKR-750/850/751/851. It can start a test without writing data since the encode/decode signalling and the test frequency are already memorized. (Refer to 24.2.1 Test Signalling.)

You can select the following functions.

Table 24-1 PC Test Mode Function

Function	Operation of the repeater
TX/RX	Toggle between transmission and reception.

Function	Operation of the repeater
Wide/ Narrow [Wide/ Narrow]	Select the transmission and reception bandwidth. You can toggle Wide/ Narrow. The value differs depending on the market code. (Refer to 1.4 Bandwidth.)
Beat Shift [Yes/No]	Enable/disable the Beat Shift function. When it is enabled, the microprocessor clock frequency is shifted. (Refer to 4.9 Beat Shift.)
Monitor [On/Off]	Disable the Squelch function.
Companer [On/Off]	Eliminate noises during communications. (Refer to 4.13 Companer.)
Power [High/Low]	Switch High/Low power.
Repeat [On/Off]	Repeat operation enable/disable

Note: The FAN runs operates when TKR-750/850/751/851 is in PC Test Mode.

■ Configuration of KPG-91D

- Configuring PC Test Mode (Refer to FPRG 7.3 "Test Mode" window.)

24.2.1 Test Signalling

PC Test Mode presets the Decode Tone/Encode Tone for the signalling to the TKR-750/850/751/851.

Channel No.: Signalling Table of the Test Channel

Decode Tone: Reception signalling

Encode Tone: Transmission signalling

Table 24-2 Test Signalling

Channel No.	Decode Tone	Encode Tone
1	None	None
2	None	100 Hz square wave
3	QT 67.0 Hz	QT 67.0 Hz
4	QT 151.4 Hz	QT 151.4 Hz
5	QT 210.7 Hz	QT 210.7 Hz
6	QT 250.3 Hz	QT 250.3 Hz
7	DQT 023N	DQT D023N
8	DQT 754I	DQT D754I
9	None	CW ID Encode [ID = VVV]
10	None	Single Tone
11	DTMF 159D	DTMF 159D
12	None	DTMF Tone 9
13	None	Courtesy Tone
14	None	Battery Warning Tone
15	None	Battery Operation Tone
16	-	-

Note: TKR-750/850/751/851 disables the AF Mute function when the signalling is decoded with the QT/DQT code and the signalling matches.

24.2.2 Test Frequency

The Reception Frequency/Transmission Frequency is already memorized for PC Test Mode in the TKR-750/850/751/851. You can configure a maximum of 16 channels as the test frequency by KPG-91D. You can modify the test frequency by copying the frequency configured in the “Channel Edit” window to the test frequency channel. The available frequency range varies depending on the model type and the market code.

Channel No.: Frequency table of the test channel

RX Frequency: Reception frequency

TX Frequency: Transmission frequency

Table 24-3 Default Test Frequency of the TKR-750/751 (K)

CH No.	Reception Frequency [MHz]	Transmission Frequency [MHz]
1	146.10000	146.00000
2	160.10000	160.00000
3	173.90000	174.00000
4	150.10000	150.00000
5	155.10000	155.00000
6	165.10000	165.00000
7	170.10000	170.00000
8	158.50000	161.50000
9	161.50000	158.50000
10	136.10000	136.00000
11	151.90000	151.95000
12	152.10000	152.00000
13	-	-
14	-	-
15	-	-
16	-	-

Table 24-4 Default Test Frequency of the TKR-850/851 (K)

CH No.	Reception Frequency [MHz]	Transmission Frequency [MHz]
1	450.10000	450.00000
2	465.10000	465.00000
3	479.90000	480.00000
4	455.10000	455.00000
5	460.10000	460.00000
6	470.10000	470.00000
7	475.10000	475.00000
8	462.60000	462.50000

CH No.	Reception Frequency [MHz]	Transmission Frequency [MHz]
9	467.60000	467.50000
10	440.10000	440.00000
11	459.90000	460.00000
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

Table 24-5 Default Test Frequency of the TKR-850/851 (K2)

CH No.	Reception Frequency [MHz]	Transmission Frequency [MHz]
1	480.10000	480.00000
2	496.10000	496.00000
3	511.90000	512.00000
4	485.10000	485.00000
5	490.10000	490.00000
6	500.10000	500.00000
7	505.10000	505.00000
8	493.60000	493.50000
9	498.60000	498.50000
10	499.90000	500.00000
11	519.90000	520.00000
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

■ Configuration of KPG-91D

- Configuring the test frequency (Refer to FPRG 6.13 “Test Frequency” window.)

24.2.3 PC Tuning Mode

PC Tuning Mode allows you to configure the parameters according to the various environment by adjusting the voltage conversion level in the TKR-750/850/751/851.

You can make adjustments by selecting the functions from PC Test Mode by KPG-91D.

You can configure the following functions.

Table 24-6 Functions that you can adjust in PC Tuning Mode

Function	Wide/Narrow	Description	Signalling
Reception Frequency	-	Adjust the VCO frequency for receiving. (VHF): Single Reference Level Adjustment (UHF): Single Reference Level Adjustment	
Reception Frequency (Low)	-	Adjust the VCO frequency for receiving. VHF only: Single Reference Level Adjustment You can make the adjustment in steps of 2.5 kHz.	
Reception Frequency (High)	-	Adjust the VCO frequency for receiving. VHF only: Single Reference Level Adjustment You can make the adjustment in steps of 2.5 kHz.	
Transmission Frequency	-	Adjust the VCO frequency for transmitting. VHF: Single Reference Level Adjustment UHF: Single Reference Level Adjustment	
Transmission Frequency (Low)	-	Adjust the VCO frequency for transmitting. VHF only: Single Reference Level Adjustment You can make the adjustment in steps of 2.5 kHz.	
Transmission Frequency (High)	-	Adjust the VCO frequency for transmitting. VHF only: Single Reference Level Adjustment You can make the adjustment in steps of 2.5 kHz.	
Squelch Tight	Wide	Adjust the Squelch Level 15.	
	Narrow	Single Reference Level Adjustment	
Squelch open	Wide	Adjust the Squelch Level 1. Single Reference Level Adjustment	
	Narrow	The repeater stores the RSSI Level at the same time.	
RD (RX Detector Output) Level	Wide	Adjust the RD (RX Detector) Signal Output level.	
	Narrow	Single Reference Level Adjustment	
RA (RX Audio Output) Level	Wide	Adjust the RA (RX Audio) Signal Output level.	
	Narrow	Single Reference Level Adjustment	
TX High power	-	Adjust the TX High Power level. High power: 3 Reference Level Adjustments	
TX Low power	-	Adjust the TX Low Power level. Low power: 3 Reference Level Adjustments	
Power Down Detect (High)	-	Configure the threshold level to detect the degradation of the output power while transmitting in High Power mode. Single Reference Level Adjustment	
Power Down Detect (Low)	-	Configure the threshold value to detect the degradation of the output power while transmitting in Low Power mode. Single Reference Level Adjustment	
Max Deviation	Wide	Adjust the Maximum Deviation level.	
	Narrow	VHF: 6 Reference Level Adjustments (3 points for VCO A/ B) UHF: 3 Reference Level Adjustments	
DQT Balance	Wide	Adjust the DQT Encode balance.	Sig CH = 2
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
TD (Ext. Signalling) Deviation	Wide	Adjust the TD (TX Data) Input level.	
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
TA (TX Audio) Deviation	Wide	Adjust the TA (TX Audio) Input level.	
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	

Function	Wide/Narrow	Description	Signalling
DQT Deviation	Wide	Adjust the DQT Encode level.	Sig CH = 7
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
QT Deviation	Wide	Adjust the QT Encode level.	Sig CH = 4
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
CW ID Deviation	Wide	Adjust the CW ID Encode level.	Sig CH = 10
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
Test Tone Deviation	Wide	Adjust the Test Tone (single tone) Encode level.	Sig CH = 10
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
DTMF Deviation	Wide	Adjust the DTMF Encode level.	Sig CH = 12
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
Courtesy Tone Deviation	Wide	Adjust the Courtesy Tone Encode level.	Setting value in the KPG-91D
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
Buttery Warning Tone Deviation	Wide	Adjust the Battery Warning Tone Encode level.	Setting value in the KPG-91D
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
Buttery Operation Tone Deviation	Wide	Adjust the Battery Operation Tone Encode level.	Setting value in the KPG-91D
	Narrow	VHF: 2 Reference Level Adjustments UHF: Single Reference Level Adjustment	
Repeat Gain	Wide	Adjust the Repeat Audio level.	
	Narrow	Single Reference Level Adjustment	

Note:

- ◆ Courtesy Tone Deviation: Default value: 20%, Range: 10 - 80%/
in steps of 10%
- ◆ Deviation is a frequency modulation bandwidth.

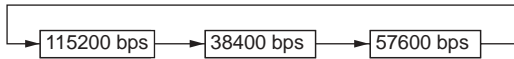
■ Configuration of KPG-91D

- Adjusting the TKR-750/850/751/851 (Refer to FPRG 7.3 "Test Mode" window.)

25 PROGRAM

Firmware Programming Mode is a mode to write software to the flash memory. TKR-750/850/751/851 enters this mode press and hold the PF [1] key while turning TKR-750/850/751/851 ON. In this case, the 7-segment LED of the Channel/Status display lights "P.G.". ([Refer to 1.6 Display.](#))

The default baud rate to communicate with the computer is 115200 bps. You can change the baud rate by pressing the PF [1] key. ([Refer to 1.5 Mode.](#))



The display of the Channel/Status display changes when the baud rate changes.

- Two dots light. (P.G.): 115200 bps, DG-binary format
- One dot lights (P G.): 57600 bps, DG-binary format
- Dots do not light (P G): 38400 bps, DG-binary format

You can write data to the flash ROM using the special software (FPRO.EXE). The TX LED lights red when the data is correctly written into the flash ROM. The BUSY LED lights green when an error occurs while writing data to the flash ROM.

The TKR-750/850/751/851 has a function to restore the operation state when TKR-750/850/751/851 is turned ON or reset.

The state of Scan, Channel, Scrambler, Multi-table, and Low Power functions are back upped.

- When the Scan is enabled and the configuration is restored, TKR-750/850/751/851 starts scanning after turning it ON or resetting it. The status of the Revert Channel is also restored. ([Refer to 16 Scan, 16.5 Revert Channel.](#))
- The channel number is restored every time it is changed. The current channel number is also restored when changing the channel from the external terminal by assigning the Channel Select function to the Auxiliary Input port. "E2" appears on the Channel/Status display when there is no configured channel. ([Refer to 20 Function Port.](#))
- When the Scrambler is switched ON and the configuration is restored, TKR-750/850/751/851 enables the Scrambler after turning it ON or it is reset. However, the Scrambler Backup must be enabled in order to restore the configuration of the Scrambler. ([Refer to 4.14.2 Scrambler Backup.](#))
- When the Signalling No. of the Multi-table is switched from Main to Sub, the selected Signalling No. is used as the Signalling of the Sub-table after TKR-750/850/751/851 is turned ON or it is reset. ([Refer to 21 Multi-table.](#))
- When the transmission output power of each channel is switched from High to Low, the state of the transmission output power is restored after TKR-750/850/751/851 is turned ON or it is reset. ([Refer to 4.10 TX High Power.](#))

Note: The backup data is cleared when a new data is written into the TKR-750/850/751/851 by KPG-91D.

Symbols

* and # Digit 37

Numerics

15-pin connector 2
 25-pin connector 2
 8-pin connector 1

A

Assigning functions to the Auxiliary Input/Output ports 1 ~ 6 45
 Assigning functions to the Auxiliary Output ports 1 ~ 5 50
 Audio Frequency (CW ID) 54
 Audio Frequency (CW Message) 56
 Aux In/Out Transpond 41
 AUX Input 45
 Aux Input Activation 40
 Aux Input Deactivation 40
 AUX Output 45
 Aux Output Activation 41
 Aux Output Deactivation 41
 Auxiliary Input 44
 Auxiliary Input/Output 44
 Auxiliary Output 44
 Available Functions 32

B

Backup 63
 Backup Battery System 25
 Backup Battery Tone 23
 Backup Power 27
 Beat Shift 12
 Busy Channel Lockout 18, 21
 BUSY LED 5

C

Channel Name 10
 Channel Select 45
 Clear To Transpond (Air Remote) 42
 Compander 13
 Control Tone 22
 Controlling PF keys 39
 Controlling the Auxiliary Ports 40
 Courtesy Tone 23
 CW ID 14, 53
 CW ID on Channel Change.) 54
 CW ID Override 54
 CW Message 55
 CW Mod. Delay Time (CW Message) 56
 CW Mod. Delay Time (CW ID) 54
 CW Speed (CW ID) 54
 CW Speed (CW Message) 56

D

Data Password 7
 DC Power Save 26
 Decode 38
 Description of the TKR-751 I
 Down Edge Detection 50
 DQT Tun-off code 15
 Dropout Delay Time 36
 DTMF 37
 DTMF Speed 37
 Dwell Time 36

E

Embedded Message 8
 Embedded Message w/Password 8
 Encode 37
 Encode Tone in Multiple 10
 Encode with QT/DQT (CW ID) 55
 Encode with QT/DQT (CW Message) 56
 External Monitor 28
 External PTT 19

F

Fan Action 29
 Firmware Programming Mode 4, 31, 62
 First Digit Delay Time 37
 First Digit Time 37
 Frequency 38
 Function Port 44
 Functions and Panel Layout 1
 Functions that you can assign to the Auxiliary Input ports 1 ~ 3: 46

K

Key Assignment 32

L

LED 4
 Level Detection 50
 Local Mic PTT 19
 Logic Type 51
 Look Back Time A 34
 Look Back Time B 35

M

Main Power 27
 Multi-table 52
 Multi-table Select 45

O

Off Hook Decode 16
 Off Hook Scan 36

INDEX

Operation Mode 12

P

PC Mode 3, 58
PC Programming Mode 3, 58
PC Test Mode 4, 58
PC Tuning Mode 4, 60
Period 38
PF key 5
PF Key Activation 39
PF Key Deactivation 39
PF Key Transponder 40
Power Control 24
POWER LED 5
Power Supply Lower Level 26
Power-on Tone 22
Priority Channel 34
Priority Scan 34
PTT Priority 18

Q

QT Decode Delay 15
QT Reverse Burst 12, 15
QT/DQT 15
QT/DQT Decode 9
QT/DQT Encode 9

R

Reception Frequency 9
Remote Access with QT/DQT 42
Remote Control 39
Repeat Hold Time 18
Repeater PTT 19
Revert Channel 35
RX Signal Detect (Below) 26

S

Save Delay Timer A 26
Save Delay Timer B 26
Save Mode Duration 26
Save Off 27
Save On 27
Scan 34
Scan Add 13
Scrambler Backup 14
Scrambler Code 13
Send CW ID to RA 54
Send CW Message to RA 56
Side Tone 38
Single Tone for the Aux Transponder function 41
Single Tone for the PF Key Transponder 40
Squelch Level 6
Start Up 27

T

Test Frequency 59
Test Signaling 58
Test Tone 57
Time Out Timer (TOT) 17
Tone 22
TOT Pre-Alert 17
TOT Rekey Time 17
TOT Reset Time 18
TOT (Time Out Timer) 19
Transmission Frequency 9
Transmission Output 3
Transmission/Reception Frequency 2
Transpond 43
Trigger Detection for Auxiliary Input ports 50
TX Delay Time 54
TX High Power 12
TX Interval Time 53
TX LED 5
TX Required in Interval 54
TX Standby on Frequency 30

U

User Mode 3

V

Voice Scrambler 13

W

Warning Tone 22
Wide/Narrow 10

