

KENWOOD

SERVICE MANUAL

700/800MHz DIGITAL TRANSCEIVER

NX-5400

NX-5400 F2,K2

NX-5400 F3,K3



Note :

Lead free solder used in the board (material : Sn, Ag, In, Bi, melting point : 227 Centigrade)

TABLE OF CONTENTS

1	PRECAUTION.....	1-4
2	SPECIFIC SERVICE INSTRUCTIONS.....	1-4
3	DISASSEMBLY	1-23
4	ADJUSTMENT	1-29
5	TROUBLESHOOTING	1-64

This product complies with the RoHS directive for the European market.



This product uses Lead Free solder.

Document Copyrights

Copyright 2014 by JVC KENWOOD Corporation. All rights reserved.

No part of this manual may be reproduced, translated, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, for any purpose without the prior written permission of JVC KENWOOD Corporation.

Disclaimer

While every precaution has been taken in the preparation of this manual, JVC KENWOOD Corporation assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

JVC KENWOOD Corporation reserves the right to make changes to any products herein at any time for improvement purposes.

Firmware Copyrights

The title to and ownership of copyrights for firmware embedded in KENWOOD product memories are reserved for JVC KENWOOD Corporation. Any modifying, reverse engineering, copy, reproducing or disclosing on an Internet website of the firmware is strictly prohibited without prior written consent of JVC KENWOOD Corporation. Furthermore, any reselling, assigning or transferring of the firmware is also strictly prohibited without embedding the firmware in KENWOOD product memories.

Transceivers containing AMBE+2™ Vocoder:

The AMBE+2™ voice coding technology is embedded in the firmware under the license of Digital Voice Systems, Inc.

Bluetooth Copyrights

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by JVC KENWOOD Corporation is under licence. Other trademarks and trade names are those of their respective owners.

SPECIFICATION

GENERAL		
Frequency Range	Receive	763~776, 851~870 MHz
	Transmit	763~776, 793~806, 806~825, 851~870 MHz
Max. Channels per Radio		1024 (Up to 4000 channels with option)
Number of Zones		128
Max. Channels per Zone		512
Channel Spacing	Analog	12.5 / 25 kHz
	Digital	12.5 kHz (6.25 kHz)
Operating Voltage		7.5V DC \pm 20%
Battery Life (5-5-90/10-10-80 duty cycle)	KNB-L1 (2,000mAh)	10 hours / 6.5 hours
	KNB-L2 (2,600mAh)	12.5 hours / 8.5 hours
	KNB-L3 (3,400mAh)	17 hours / 11 hours
Operating Temperature Range		-22°F ~ +140°F (-30°C ~ +60°C)
Frequency Stability		\pm 1.5ppm
Antenna Impedance		50 Ω
Dimensions (W x H x D) (Projections not included)	KNB-L1 (2,000mAh)	2.28 x 5.47 x 1.52 in. (58 x 139 x 38.8 mm)
	KNB-L2 (2,600mAh)	2.28 x 5.47 x 1.65 in. (58 x 139 x 41.8 mm)
	KNB-L3 (3,400mAh)	2.28 x 5.47 x 1.86 in. (58 x 139 x 47.2 mm)
Weight	KNB-L1 (2,000mAh)	15.52 oz (440 g)
	KNB-L2 (2,600mAh)	16.57 oz (470 g)
	KNB-L3 (3,400mAh)	17.98 oz (510 g)
RECEIVER		
Sensitivity	P25 Digital (5% BER)	0.25 μ V
	P25 Digital (1% BER)	0.40 μ V
	Analog (12dB SINAD)	0.25 μ V
Selectivity	P25 Digital	60dB
	Analog @ 12.5kHz	64dB
	Analog @ 25kHz	73dB
Intermodulation Distortion		75dB
Spurious Response		75dB
Audio Distortion		Less than 3%
Audio Output	3% Distortion	500mW / 8 Ω
	5% Distortion	1000mW / 8 Ω
TRANSMITTER		
RF Power Output		3W to 1W
Spurious Response		-70dB
FM Hum & Noise	Analog @ 12.5kHz	40dB
	Analog @ 25kHz	45dB
Audio Distortion		Less than 2%
Modulation		16K0F3E, 14K0F3E, 11K0F3E, 8K10F1E, 8K10F1D, 8K10F1W, (8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D)

Measurements made per TIA/EIA-603 and specifications shown are typical.

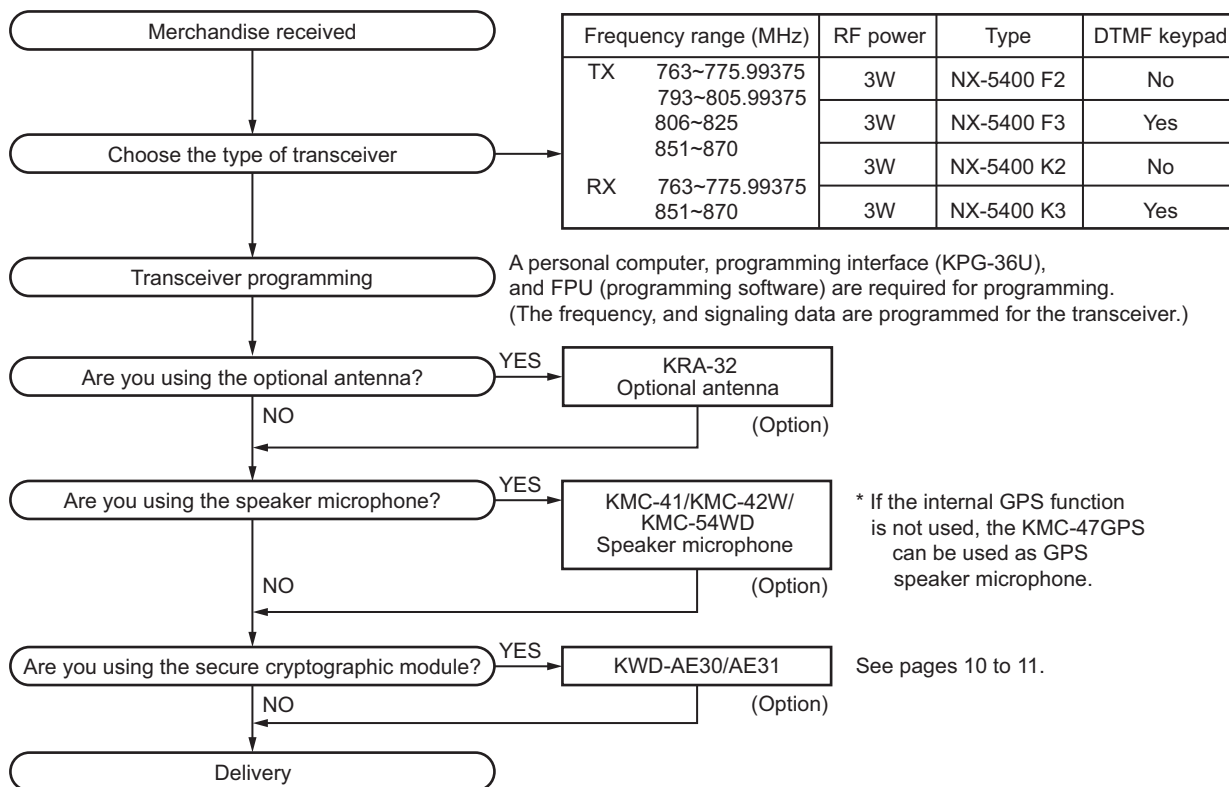
JVC KENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

SECTION 1 PRECAUTION

This service manual does not describe PRECAUTION.

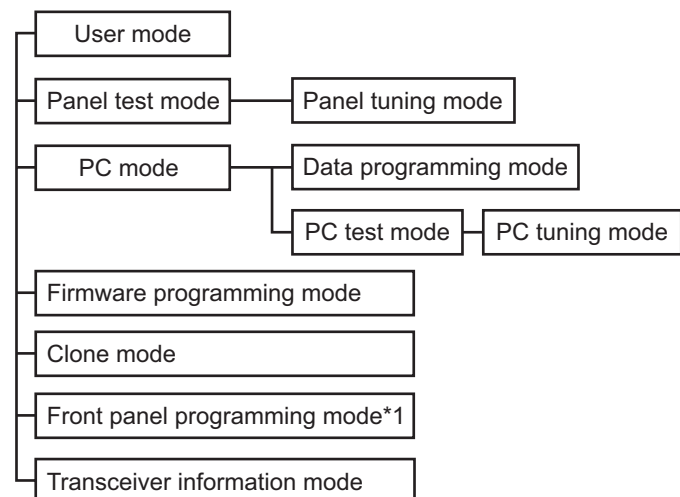
SECTION 2 SPECIFIC SERVICE INSTRUCTIONS

2.1 SYSTEM SET-UP



2.2 REALIGNMENT

2.2.1 Modes



Mode	Function
User mode	For normal use.
Panel test mode	Used by the dealer to check the fundamental characteristics.
Panel tuning mode	Used by the dealer to tune the transceiver.
PC mode	Used for communication between the transceiver and PC.
Data programming mode	Used to read and write frequency data and other features to and from the transceiver.
PC test mode	Used to check the transceiver using the PC. This feature is included in the FPU.
Firmware programming mode	Used when changing the main program of the flash memory.
Clone mode	Used to transfer programming data from one transceiver to another.
Front panel programming mode	Frequency, signaling and features write to the transceiver.
Transceiver information mode	Used to confirm the transceiver firmware version, SCM firmware version and SCM Hardware version.

*1: In order to use the Front panel programming mode, it is necessary to purchase the "Front panel program" feature option.

2.2.2 How to Enter Each Mode

Mode	Operation
User mode	Power ON
Panel test mode*2	<ul style="list-style-type: none"> • [↩] + Power ON • [□] + Power ON Select the "Panel Test" using the [▲] / [▼] key. Press the [□] key.
PC mode	Received commands from PC
Panel tuning mode	[Panel test mode] + [□]
Firmware programming mode*2	<ul style="list-style-type: none"> • [AUX (Orange)] + Power ON • [□] + Power ON Select the "Firmware Prog" using the [▲] / [▼] key. Press the [□] key. <ul style="list-style-type: none"> • If Write is performed by KFL, Firmware programming mode will start automatically.
Clone mode*2	<ul style="list-style-type: none"> • [○] + Power ON • [□] + Power ON Select the "Clone" using the [▲] / [▼] key. Press the [□] key.
Front panel programming mode*2	<ul style="list-style-type: none"> • Press the PF key to which Front panel programming mode is set during the user mode. • Press the [□] key and enter the Menu mode. Select the any icon assigned the Front panel programming mode using the [▲] / [▼] key. Press [□] key. Select the "Panel Program" using the [▲] / [▼] key. Press the [□] key.
Transceiver information mode*2	<ul style="list-style-type: none"> • [Side 3] + Power ON • [□] + Power ON Select the "Transceiver Info" using the [▲] / [▼] key. Press the [□] key.

*2 There is the two or three as how to enter.

2.2.3 Panel Test Mode

Setting method refer to ADJUSTMENT.

2.2.4 Panel Tuning Mode

Setting method refer to ADJUSTMENT.

2.2.5 PC Mode

2.2.5.1 Preface

The transceiver is programmed by using a personal computer, programming interface (KPG-36U) and FPU (programming software).

The programming software can be used with a PC. Figure 1 shows the setup of a PC for programming.

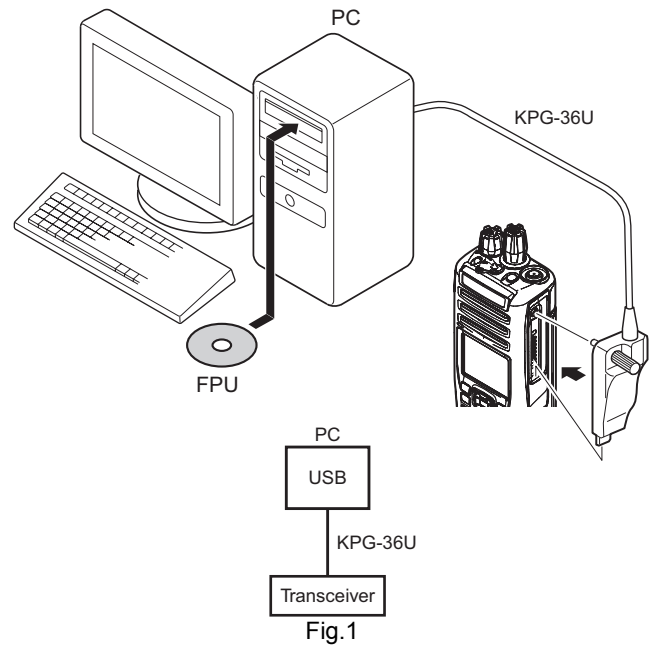


Fig.1

2.2.5.2 Connection procedure

- (1) Connects the transceiver to the computer using the interface cable (KPG-36U).

Note:

- You must install the KPG-36U driver in the computer to use the USB programming interface cable (KPG-36U).
- (2) When the POWER switch on, user mode can be entered immediately. When PC sends command the transceiver enter PC mode, and "PROGRAM" is displayed on the LCD. When data transmitting from the transceiver, the red LED lights. When data receiving to the transceiver, the green LED light.

Note:

The data stored in the computer must match the "Model Name" when it is written into the flash memory.

2.2.5.3 KPG-36U description (USB programming interface cable: Option)

The KPG-36U is a cable which connects to a USB port on a computer.

When using the KPG-36U, install the supplied CD (with driver software) in the computer. The KPG-36U driver runs under Windows XP, Vista, 7, 8 or 8.1.

The latest version of the USB driver is available for download from the following URL:

<http://www.kenwood.com/usb-com/>

(This URL may change without notice.)

2.2.5.4 Programming software KPG-D1/D1N description

The FPU is the programming software for the transceiver supplied on a CD-ROM. This software runs under Windows Vista, 7, 8 or 8.1 on a PC.

The data can be input to or read from the transceiver and edited on the screen.

2.2.6 Firmware Programming Mode

2.2.6.1 Preface

Flash memory is mounted on the transceiver. This allows the transceiver to be upgrade when new features are released in the future. (For details on how to obtain the firmware, contact Customer Service.)

2.2.6.2 Connection procedure

Connect the transceiver to the personal computer using the programming interface (KPG-36U). (Connection is same as in the PC mode.)



2.2.6.3 Programming

- (1) Start up the firmware programming software (KENWOOD Firmware Loader). The KFL.exe exists in the KPG-D1/D1N installed holder.
- (2) Set the baud rate to "auto" or 1152000, 576000, 115200, and 57600.
- (3) Set the firmware to be upgrade by file name item.
- (4) Enter the Firmware programming mode by using section "2.2.2 How to Enter Each Mode". Then, the yellow LED on the transceiver light and "FIRMWARE PROG" is displayed.
- (5) Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
- (6) Press "Write" button in the window. When the transceiver starts to receive data, the "LOADING" display lights.
- (7) If writing ends successfully, the checksum is calculated and a result is displayed.
- (8) If you want to continue programming other transceivers, repeat step (4) to (7).

Note:

If write is performed by KFL, Firmware programming mode will start automatically even if firmware programming is set to disable in the programming software.

2.2.6.4 Function

If you press the [] key while "FIRMWARE PROG" is displayed, the checksum is calculated, and a result is displayed. If you press the [] key again while checksum is displayed, "FIRMWARE PROG" is redisplayed.




2.2.7 Clone Mode

Programming data can be transferred from one transceiver to another by connecting them via their external universal connectors. The operation is as follows.

■The following data cannot be cloned.

- Tuning data
- Embedded message with password
- ESN (Electronic Serial Number) data

■Key guide on the Clone/ Front Panel Programming Password input screen.


- Confirm ([] key): The password confirmation
 - Delete ([] key): Delete the latest digit from the current password number (Press and hold to delete all password numbers)
 - Select ([] key): Determine the latest digit of the password number.
- (1) In the source transceiver, enter the clone mode by using section "2.2.2 How to Enter Each Mode". When the Clone/ Front Panel Programming Password is set to the transceiver, "Input Password" is displayed on the LCD. If the password is not set, the transceiver displays "CLONE MODE".
 - (2) When you enter the correct password, "CLONE MODE" is displayed, the transceiver can be used as the cloning source. The following describes how to enter the password.

(3)

- How to enter the password using the keypad;



If one of the keys 0 to 9 is pressed while the "Input Password" is displayed, the password number is displayed on the LCD.

Each press of the key shifts the display in order to the left.

When you enter the password and press [] or [*] key, "CLONE MODE" displayed if the entered password is correct. If password is incorrect, "Input Password" is redisplayed.


- How to enter password using the [▲] and [▼] keys;


If the [▲] / [▼] key is pressed while "Input Password" is displayed, the Clone/ Front Panel Programming Password input screen is displayed.

If the [▲] or [▼] key is pressed while the clone/ Front Panel Programming Password input screen is displayed, the number (0 to 9) blinks on the LCD. When you press the [] key, currently selected number is determined. If you press the [] key after entering password in this procedure, "CLONE MODE" is displayed if entered password is correct. If the password is incorrect, "Input Password" is redisplayed.

(4) Power ON the target transceiver.

(5) Connecting the cloning cable (part No.E30-3325-05) to the universal connectors on the source and target.

(6) Press [] key on the source while the source displays "CLONE MODE". The data of the source is sent to the target. While the target is receiving the data, "PROGRAM" is displayed. When cloning of the data is completed, the source displays "END", and the target automatically operates in the User mode. The target can then be operated by the same program as the source.

(7) The other target can be continuously cloned. When the [] key on the source is pressed while the source displays "END", the source displays "CLONE MODE". Carry out the operation in step (4) to (6).

Note:

- Cannot be cloned if the password (overwrite password) is programmed to the target.
- "Model name" must be same to clone the transceiver.

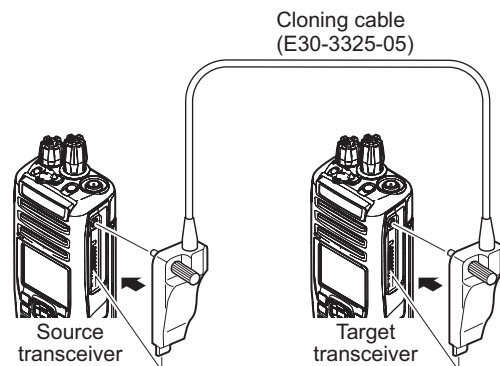


Fig.2

2.2.8 Front Panel Programming Mode




If the Front Panel Programming Mode is used, the frequency or other data of the conventional channel is rewritable only by the transceiver.

Moreover, the conventional channel can be added.

■The following setup items can be changed or added by using the Front panel programming mode.

- RX/TX Frequency
- Channel Type
- Channel Spacing
- Decode QT/DQT/RAN/NAC, Encode QT/DQT/RAN/NAC
- Talkgroup ID List No.
- Transmit Power
- Channel Name

■Key guide on the Clone/ Front Panel Programming Password input screen.

- Confirm ([] key): The password confirmation
- Delete ([] key): Delete the latest digit from the current password number (Press and hold to delete all password numbers)
- Select ([] key): Determine the latest digit of the password number.

2.2.8.1 Enter to the Front panel programming mode.

Enter to the Menu Mode by pressing [Front Panel Mode] PF key or [Menu] key. When the Front Panel Mode is selected, it can enter to the Front panel programming mode.









If the Clone/Front panel programming Password is not set to the transceiver, "Panel Program" is displayed on the LCD.

If the Clone/Front panel programming Password is set to the transceiver, "Panel Program" is displayed on the LCD when you enter the correct password while "Input Password" is displayed.

2.2.8.2 Data Writing

Before moving to next Zone/Channel, "Keep This Change?" appears on the LCD, if you select "OK", the new data is written to memory. If you select "Cancel", the new data not be written; the new data will be erased.

• Key operation

Key/Item	Zone Select	Channel Select	RX Frequency	TX Frequency	Channel Type	Channel Spacing	RX Signaling	TX Signaling
[]	Decision	Decision	Decision	Decision	Decision	Decision	Decision	Decision
[]	Unused	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item
[]	Unused	Unused	Unused	TX Frequency OFF	Unused	Unused	Unused	Unused
[]	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode
[]	Zone change	Channel change	Frequency up	Frequency up	Channel type change	Channel Spacing Change	Signaling number change	Signaling number change
[]	Zone change	Channel change	Frequency down	Frequency down	Channel type change	Channel Spacing Change	Signaling number change	Signaling number change
[]	Unused	Unused	Frequency step change	Frequency step change	Unused	Unused	Signaling type change	Signaling type change
[]	Unused	Unused	Frequency step change	Frequency step change	Unused	Unused	Signaling type change	Signaling type change
Keypad [0] ~ [9] *3	Zone number select	Channel number select	Go to the direct enter mode		Channel number select (1 or 2)	Channel spacing select (1 or 2)	Go to the direct enter mode	
Keypad [*] *3	Decision	Decision	Decision	Decision	Decision	Decision	Decision	Decision

• The setup items for Front panel programming mode are as follows.

No.	Setup item	Display	Remarks
1	RX Frequency	RX Frequency	Receive Frequency
2	TX Frequency	TX Frequency	Transmit Frequency
3	Channel Type	Channel Type	Analog/P25
4	Channel Spacing	Channel Space	Analog:12.5kHz/20kHz/25kHz P25: 12.5kHz
5	RX Signaling	RX QT/DQT	Receive QT/DQT
6	TX Signaling	TX QT/DQT	Transmit QT/DQT
7	RX RAN	RX RAN	None, 1~63
8	TX RAN	TX RAN	None, 1~63
9	RX NAC	RX NAC	000~FFF (Hexadecimal) Note: "F7F" cannot set.
10	TX NAC	TX NAC	000~FFF (Hexadecimal) Note: "F7F" cannot set.
11	Talkgroup ID List Number	Talkgroup	None, 1~1500
12	Transmit Power	Transmit Power	Low/Medium/High
13	Channel Name	Channel Name	

Key/Item	Zone Select	Channel Select	RX Frequency	TX Frequency	Channel Type	Channel Spacing	RX Signaling	TX Signaling
Keypad [#] *3	Unused	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item

Key/Item	RX RAN	TX RAN	RX NAC	TX NAC	TG ID List No.	Transmit Power	Channel Name
[F5]	Decision	Decision	Decision	Decision	Decision	Decision	Decision
[←]	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item/ Delete
[O]	Unused	Unused	Unused	Unused	Unused	Unused	Character/Digit switching
[Home]	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode	Exit panel program mode
[▲]	RX RAN up	TX RAN up	RX NAC up	TX NAC up	TG List number up	Transmit power change	Go to the direct enter mode
[▼]	RX RAN down	TX RAN down	RX NAC down	TX NAC down	TG List number down	Transmit power change	
[▶]	RX RAN ON/OFF	RX RAN ON/OFF	Unused	Unused	Unused	Unused	
[◀]	RX RAN ON/OFF	RX RAN ON/OFF	Unused	Unused	Unused	Unused	
Keypad [0] ~ [9] *3	Go to the direct enter mode				Talkgroup List number select	Transmit power select (1, 2 or 3)	
Keypad [*] *3	Decision	Decision	Decision	Decision	Decision	Decision	Decision/ Character/ Digit switching
Keypad [#] *3	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item	Back to the previous item

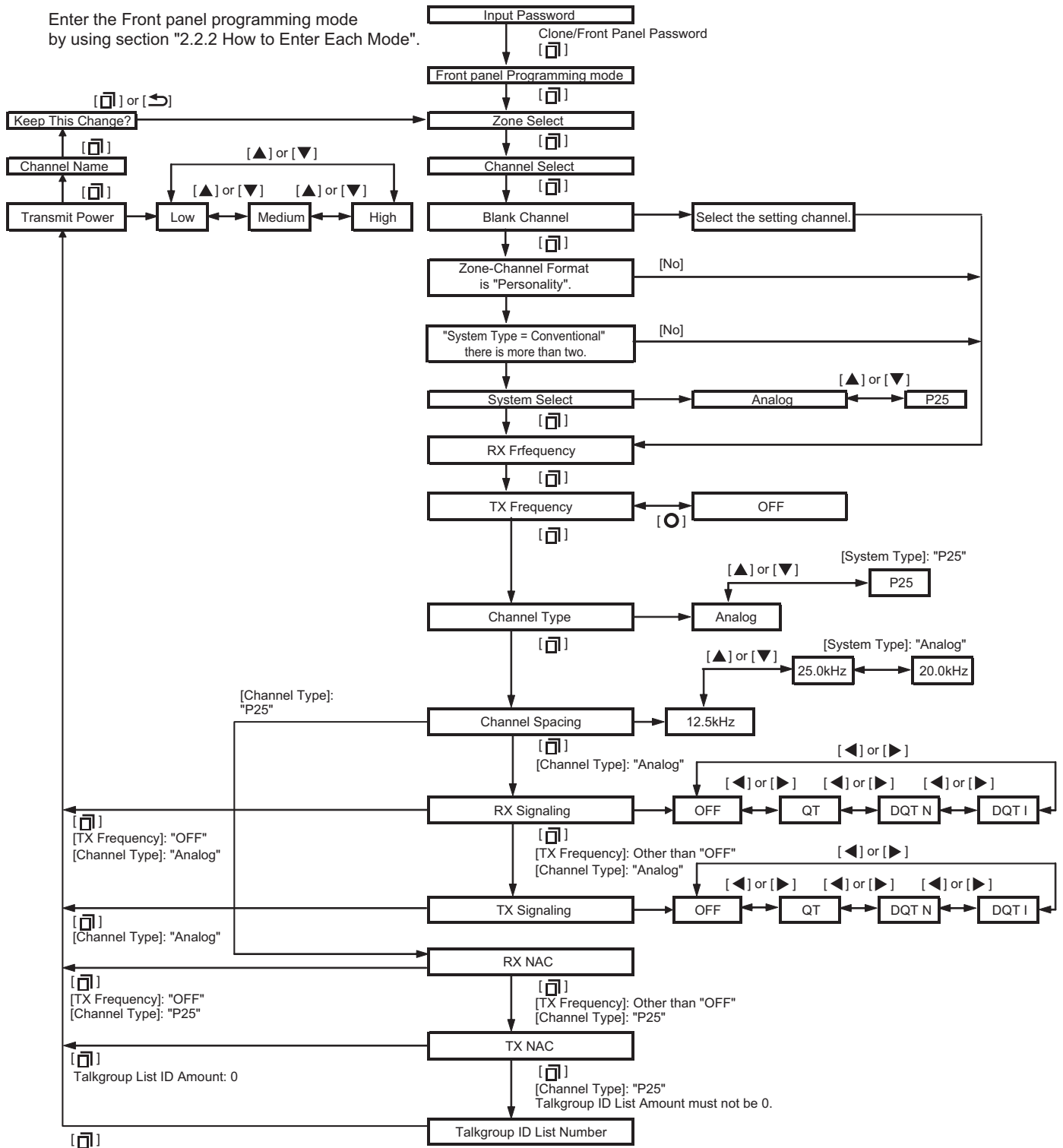
• Direct enter mode

Key/Item	RX Frequency	TX Frequency	RX Signaling	TX Signaling	RX RAN	TX RAN	RX NAC	TX NAC	Channel Name
[F5]	Decision								Character/Channel name decision
[←]	Delete								
[O]	Unused								
[Home]	Exit panel program mode								
[▲]	Unused								Character selection (upper case character → lower-case character → digit → upper case character...)
[▼]									Character selection (upper case character → lower-case character → digit → upper case character...)
[▶]									Move a cursor to the right
[◀]									Move a cursor to the left
Keypad [0] ~ [9] *3	Add a digit to the current number								
Keypad [*] *3	Decision								Input character switching
Keypad [#] *3	Delete/Back to the previous item								Delete

*3: F3,K3 models only

• Front panel programming mode flow chart

Enter the Front panel programming mode by using section "2.2.2 How to Enter Each Mode".

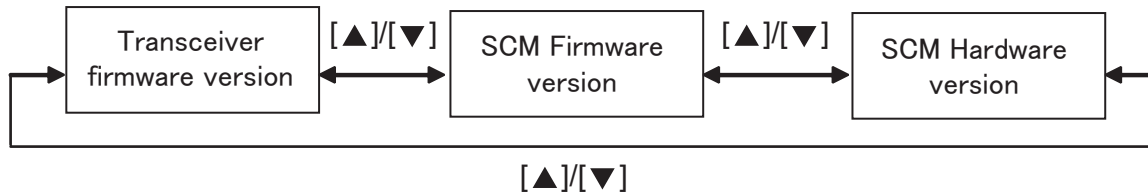


Note: Zone-Channel Format allows you to whether to configure for each zone the channels in the same system, or channels in different system. P25 can be configured for System Select or Channel Type if one or more P25 conventional system is preconfigured by the FPU.

2.2.9 Transceiver Information Mode

Use this function to confirm the transceiver firmware version, SCM Firmware version and SCM Hardware version.

- (1) Enter the Transceiver Information mode by using section "2.2.2 How to Enter Each Mode".
- (2) The transceiver firmware version appears on the LCD.
- (3) Use the [▲] and [▼] keys to select the confirmation items.



- (4) To exit the transceiver information mode, turn the transceiver power OFF.

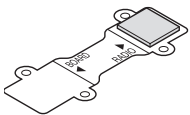
Note:

When the SCM board is not equipped to the transceiver, SCM Firmware Version and SCM Hardware Version are displayed as "-.-.-".

2.3 INSTALLATION

SECURE CRYPTOGRAPHIC MODULE (KWD-AE30/KWD-AE31:Option)

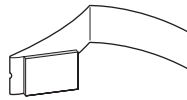
2.3.1 SUPPLIED ACCESSORIES



Connecting cable *
(X42-3330-XX)



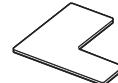
Cushion A *
(G13-2179-XX)



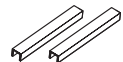
Cushion B *
(G13-2178-XX)



Cushion C *
(G1D-0006-XX)



Cushion D
(G1D-0055-XX)



Spacer
(F3K-0004-XX)

Note:

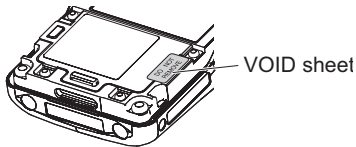
Supplied accessories with * mark are not used for the NX-5400.

2.3.2 INSTALLING THE MODULE IN THE TRANSCEIVER

ATTENTION:

When installing the module, please take measures to prevent static electricity.

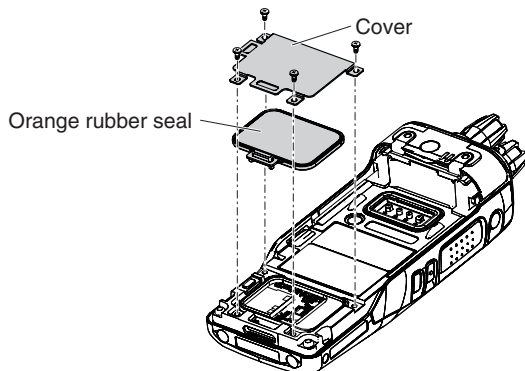
- (1) Remove the VOID sheet.



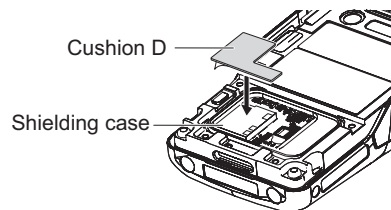
CAUTION:

Regarding VOID, confirm the service policy of the NX-5400 to KENWOOD (or authorized distributor). In addition, when installing the module, remove VOID sheet after understanding the service policy.

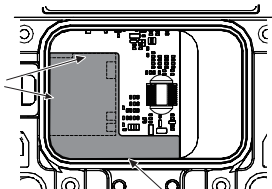
- (2) Remove the 4 screws from the cover.
- (3) Remove the cover and orange rubber seal from the transceiver.



- (4) Remove the release paper from one side of cushion D, then attach the cushion to the shielding case of the module.

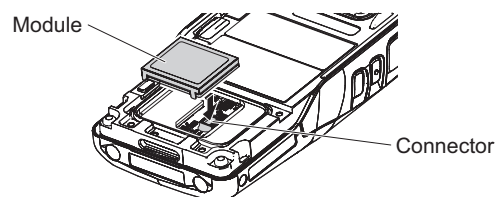


Attach the cushion correctly to the position of the chassis and shielding case (end-face).

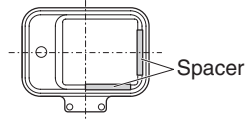


Insert the cushion under the chassis.

- (5) Insert the module to the connector of the PCB.



- (6) Attach two spacers to the back side of the orange rubber seal as indicated below.



Note:

Rubber seal may not attach correctly if the spacer is brought near by the corner too much.

- (7) Reinstall the cover and orange rubber seal using the 4 screws removed in step 2 and 3.

Note:

When installing the rubber orange seal on the chassis, ensure that you do not damage the rubber seal and that the contact area of the chassis is dust-free.

Note:

- When the KWD-AE30/ KWD-AE31 is installed, select the "Secure Cryptographic Module" checkbox in the Product Information of the KPG-D1/KPG-D1N (programming software), and then set each parameter.
- If the KWD-AE30/ KWD-AE31 connector is not properly installed, the TX/RX indicator will blink red or "No SCM" will appear on the display when the transceiver power is turned on.
- If the Encryption Key data is not written at the Keyloader, or the Encryption Key data is zeroized, "Key Fail" will appear on the display.
- If the KWD-AE30/ KWD-AE31 is installed in other transceivers, the Encryption Key data will be forced to zeroize.

2.4 CIRCUIT DESCRIPTION

2.4.1 Overview

The NX-5400 is a 700/800MHz FM & P25 Portable transceiver designed to operate in the frequency range of 763 to 775.99375MHz, 793 to 805.99375MHz (700M) and 806 to 825MHz, 851 to 870MHz (800M).

The unit consists of a receiver, a transmitter, a phase-locked loop (PLL) frequency synthesizer, a digital control unit, and a power supply circuit.

2.4.2 Frequency Configuration

The receiver is a double-conversion super-heterodyne using a first intermediate frequency (IF) of 58.05MHz and second IF of 2.25MHz. Incoming signals from the antenna are mixed with the local signal from the PLL circuit to produce the first IF of 58.05MHz. This is then mixed with the 55.8MHz second local oscillator output to produce the 2.25MHz second IF.

The transmit signal frequency is generated by the PLL VCO, and modulated by the signal from the DSP. It is then amplified and fed to the antenna.

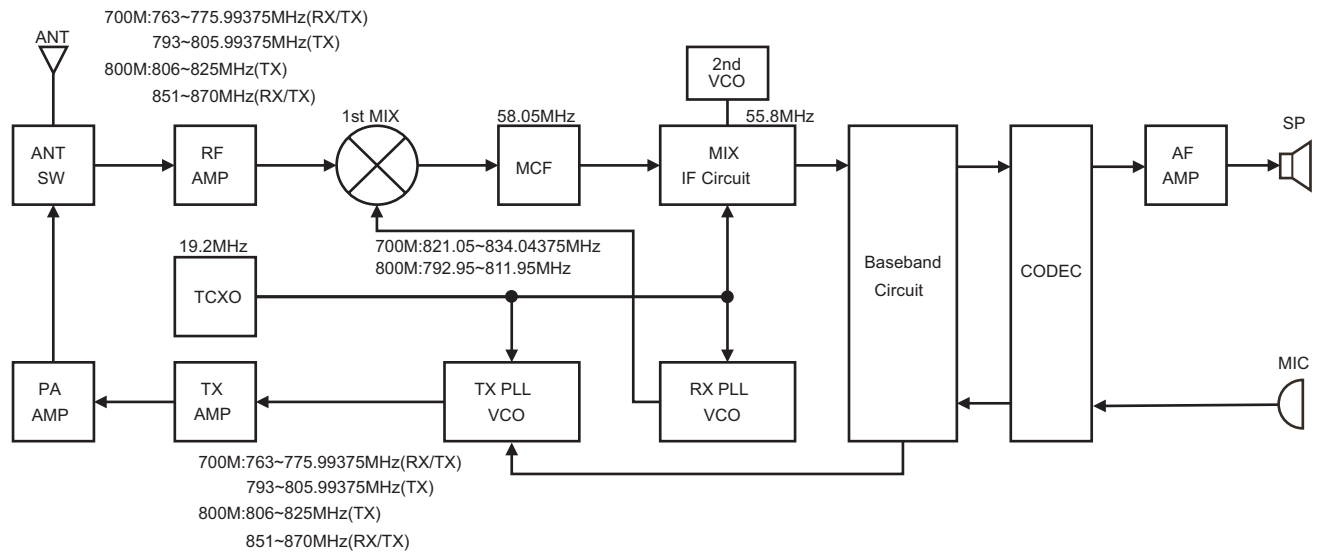


Fig.1 Frequency configuration

2.4.3 Receiver System

2.4.3.1 RF Circuit

The receive signal from antenna switch (D350, D370 and D371) is amplified by a RF amplifier (700MHz band: Q530, 800MHz band: Q550) and passes through the band-pass filter (700MHz band: L536, L530, 800MHz band: L556, L550) to remove unwanted signals. These are controlled with the RF filter switch (IC570 and IC520). The signal is then fed to the 1st mixer (IC500).

2.4.3.2 IF Circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF670) to reject adjacent channel signals. The filtered first IF signal is amplified by the first IF amplifier (Q670 and Q660) and then applied to the IF system IC (IC600). The IF system IC provides a second mixer, second PLL, AGC and A/D converter.

The second mixer mixes the first IF signal with the 55.8MHz of second local oscillator output and produces the second IF signal of 2.25MHz.

The second IF signal is then be fed into an A/D converter, generates the I and Q data. This data is in the form of SSI (Serial Synchronous Interface), and sent to the DSP (IC702).

2.4.3.3 Audio Amplifier Circuit

Audio processing (high-pass filter, low-pass filter, de-emphasized and so on) at FM mode and decoding at P25 mode are processed by DSP. SSI signal from DSP is converted to audio signal at IC902. The signal goes to amplifier (IC904 or IC905).

While INTAMT is High, IC904 is activated and audio is heard from internal speaker.

While EXTAMT is High, IC905 is activated and audio is heard from external speaker.

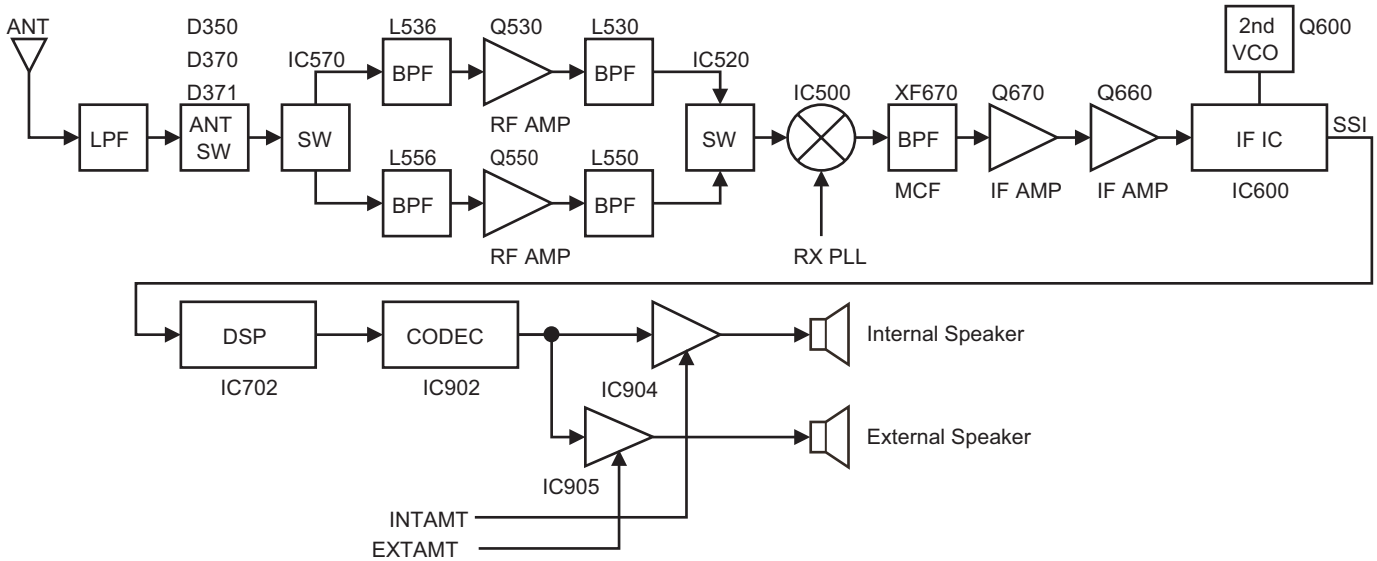


Fig.2 RF and IF circuit

2.4.4 Transmitter System

2.4.4.1 Audio Band Circuit

The signal from microphone is amplified and converted to digital signal by IC902. IC902 includes AGC function.

Digital signal is transferred to IC702 through SSI.

2.4.4.2 Baseband Circuit

The audio signal transferred from IC902 is processed at IC702. Voice signals of 300Hz or lower and frequencies of 3kHz or higher are cut off and an audio range 300Hz to 3kHz is extracted. The audio signal is then pre-emphasized in FM mode and synthesized with the signals, such as QT and DQT, as required, and is transferred to PLL Frequency Synthesizer block. The DTMF and MSK baseband signals are also generated by IC702.

In Digital mode, the audio signal is converted to the 4-Level FSK baseband signal and is transferred to PLL Frequency Synthesizer block.

The output level according to the transmit carrier is fine-adjusted according to each modulation method.

2.4.4.3 Drive and Final Amplifier

The signal from the TX PLL is amplified by pre-drive amplifier (IC300 and Q310). The output of the pre-drive amplifier is amplified by the drive amplifier (Q320) and final amplifier (Q330) to 2.9W at 700MHz band or 3.0W at 800MHz band (0.95W when the power is low). IC300 is MMIC. Q310, Q320 and Q330 are MOS FET. The output of the final amplifier is then passed through the harmonic filter (LPF) and antenna switch (D350, D370 and D371) and applied to the antenna terminal.

2.4.4.4 APC Circuit

The APC circuit always monitors the current flowing through the drive amplifier (Q320) and final amplifier (Q330). The APC keeps a current constant.

The voltage drop at R400 and R402 is caused by the current flowing through the RF power amplifier and this voltage is applied to APC circuit. Output voltage from APC controls the VGG of Q310, Q320 and Q330 to keep the current constant. The change of power high/low is carried out by the change of the reference voltage.

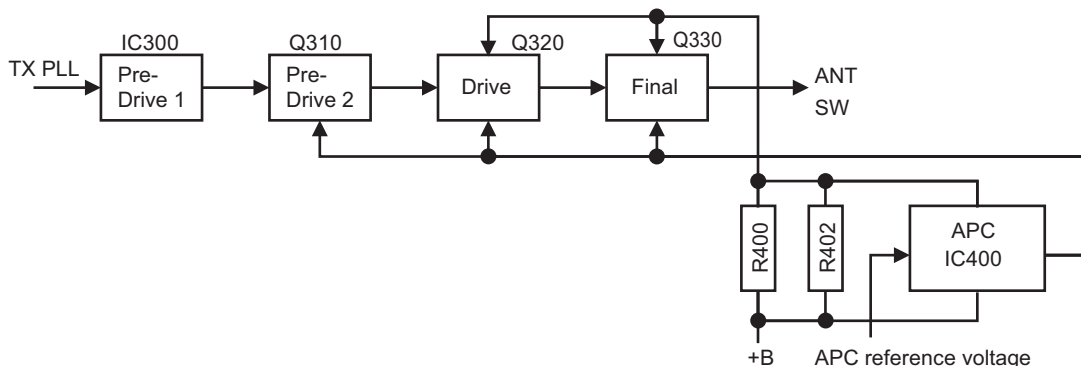


Fig.3 Drive and Final amplifier and APC circuit

2.4.5 PLL Frequency Synthesizer

2.4.5.1 TCXO (X700)

TCXO (X700) generates a reference frequency of 19.2MHz for the PLL frequency synthesizer. This reference signal is buffered by Q700 and IC700. And it is distributed to TX PLL (IC100), RX PLL (IC200), IF IC (IC600), BT/GPS IC (IC850), and IC702. The frequency adjustment is achieved by adjusting a D/A converter (IC901) output in the voltage of the control terminal of TCXO.

2.4.5.2 VCO

There are TX VCO and RX VCO.

The TX VCO (Q160) generates the carrier for the transmitter. The oscillation frequency of the VCO is half of transmit frequency. The VCO oscillation frequency range is 381.5 to 435MHz. The transmit frequency range is 763 to 870MHz.

The RX VCO (Q240) generates the 1st local signal for the receiver.

The oscillation frequency of the VCO is half of the 1st local signal for the receiver. The VCO oscillation frequency range is 396.475 to 417.021875MHz. The 1st local signal frequency range is 792.95 to 834.04375MHz.

The VCO oscillation frequency is determined by voltage control terminals "CV" and "ASSIST". The voltage control terminal "CV" is controlled by PLL IC (IC100 for TX PLL, IC200 for RX PLL). The voltage control terminal "ASSIST" is controlled by the control voltage from D/A converter (IC901).

For the modulation input terminal, "VCO_MOD" of TX PLL (IC100), the output frequency changes according to the applied voltage. This is used to modulate the VCO output.

2.4.5.3 PLL IC

There are TX PLL IC and RX PLL IC. PLL ICs compare the difference in phases of the VCO oscillation signal and the TCXO reference frequency. And it returns the difference voltage to the VCO CV terminal and realizes the "Phase Locked Loop". This allows the VCO oscillation frequency to accurately match (lock) the desired frequency.

When the frequency is controlled by the PLL, the frequency convergence time increases as the frequency difference increases when the set frequency is changed. To supplement this, the MPU is used before control by the PLL IC to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CV voltage does not change and is always stable at approx. 2.5V.

The desired frequency is set for the PLL IC by the MPU (IC702) through the 3-line "SDO1", "SCK1", "/PCS_R" serial bus for RX PLL and "SDO1", "SCK1", "/PCS_T" serial bus for TX PLL. The MPU monitors through the "PLD_R" and "PLD_T" signal line, whether the PLL IC is locked or not. If the VCO does not lock to desired frequency (unlock), the "PLD_R" and "PLD_T" logic is low.

2.4.6 Control Circuit

The control circuit consists of MPU/DSP (IC702) and its peripheral circuits. IC702 mainly performs the following;

- (1) Switching between transmission and reception by PTT signal input.
- (2) Reading system, zone, frequency, and program data from the memory circuit.
- (3) Sending frequency program data to the PLL.
- (4) Controlling the audio mute circuit by decode data input.

2.4.6.1 MPU

The MPU/DSP (IC702) is 32-bit RISC processor and fixed floating-point VLIW DSP, equipped with peripheral function.

This MPU operates at 288MHz (MAX) clock and 3.3V /1.8V/ 1.2V DC. Controls the flash memory, Mobile DDR, the receive circuit, the transmitter circuit, the control circuit, and the display circuit and transfers data to or from an external device.

2.4.6.2 Memory Circuit

Memory circuit consists of the MPU (IC702) and the Mobile DDR (IC703), the flash memory (IC705). The flash memory has capacity of 512M-bit that contains the transceiver control program for the MPU and stores the data. It also stores the data for transceiver channels and operating parameter that are written by the FPU. This program can be easily written from external devices. The Mobile DDR has capacity of 512 M-bit. The MPU copies the program to the Mobile DDR from the flash memory. The MPU is used as a work area Mobile DDR.

■Flash Memory

Note:

The flash memory stores the data that is written by the FPU (KPG-D1/D1N), tuning data (Deviation, Squelch, etc.), and firmware program (User mode, Test mode, Tuning mode, etc.). This data must be rewritten when replacing the flash memory.

■Mobile DDR (static memory)

Note:

Mobile DDR is used as a work area of the MPU.

2.4.6.3 LCD

The LCD is controlled using parallel interface from the MPU (IC702).

2.4.6.4 Key Detection Circuit

Keys are detected using I/O Expander IC (IC708). If pressed key is detected by IC708, it is informed to the MPU (IC702) through serial line.

2.4.6.5 Low Battery Warning

The battery voltage is divided using R40 and R41 and is detected by A/D converter (IC900). When the battery voltage falls below the voltage set by the Low battery warning adjustment, the red LED blinks to notify the operator that it is time to replace the battery. If the battery voltage falls even more (approx. 5.8V), a beep sounds and transmission stops.

Low battery warning	Battery condition
The red LED blinks during transmission.	The battery voltage is low but the transceiver is still usable.
The red LED blinks and the warning tone beeps while the PTT switch is pressed.	The battery voltage is low and the transceiver is not usable to make calls.

Low battery warning

The red LED blinks during transmission.

The red LED blinks and the warning tone beeps while the PTT switch is pressed.

Battery condition

The battery voltage is low but the transceiver is still usable.

The battery voltage is low and the transceiver is not usable to make calls.

2.4.6.6 DSP

The DSP circuit consists of a MPU/DSP (IC702) and processes the baseband signal. The DSP operates at 288MHz (MAX) clock, the I/O section operates at 3.3V/1.8V and the core section operates at 1.2V.

The DSP carries out the following processes:

- 4 Level FSK processing
- Analog FM pre-emphasis/de-emphasis
- Vocoder processing between audio codec and modulation/demodulation
- CAI processing, such as error correction encoding
- QT/DQT encoding/decoding
- DTMF encoding/decoding
- MSK encoding/decoding
- 2-tone encoding/decoding
- Compressor/expander processing
- Voice scrambler processing
- Transmit/receive audio filtering processing
- Microphone amplifier AGC processing
- Audio mute processing
- Modulation level processing
- Active Noise Reduction
- Voice recording/playback processing
- Voice announce processing

2.4.7 Power Supply Circuit

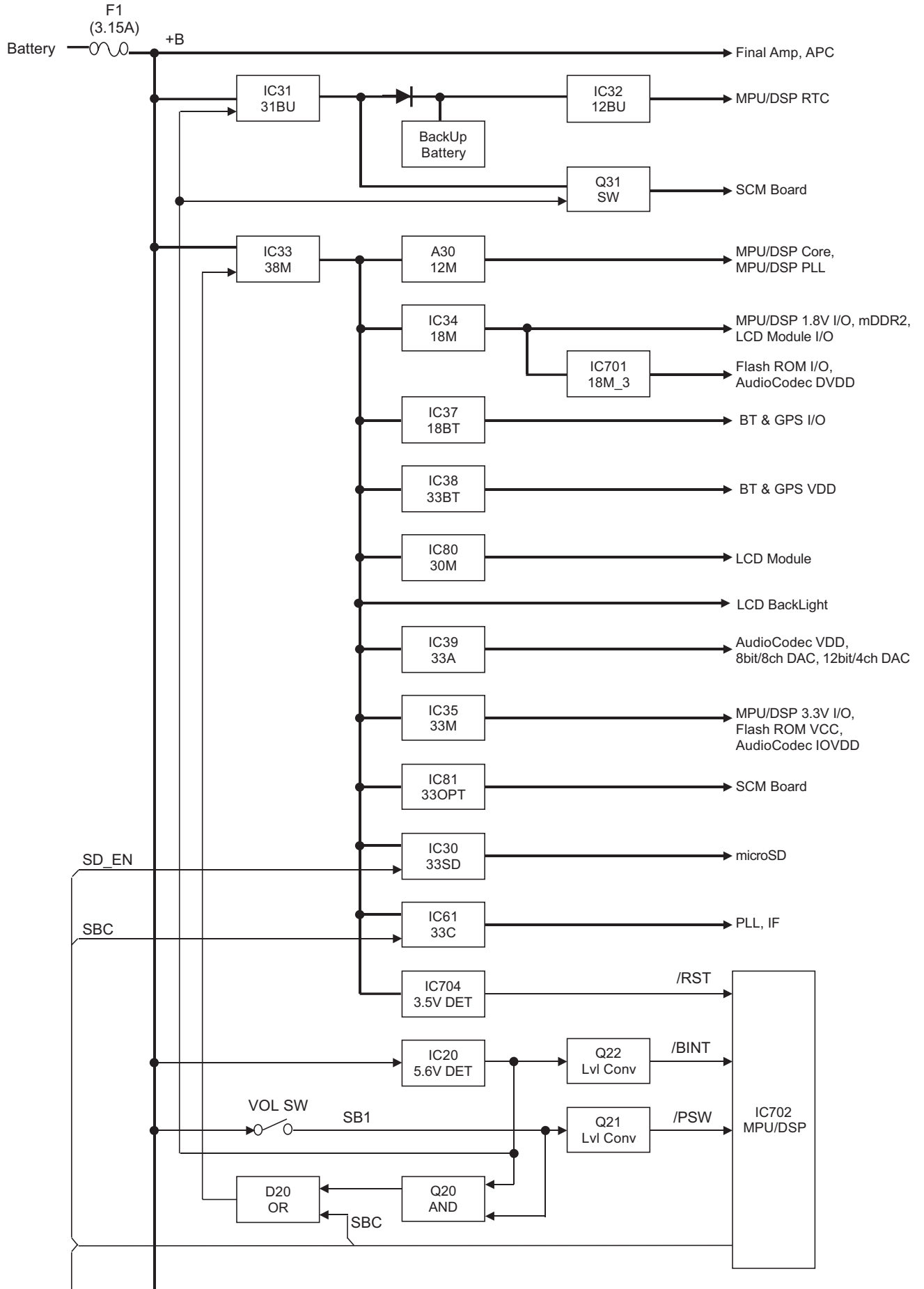
The battery voltage (+B) is provided from battery terminal. The battery voltage passes through the 3.15A fuse (F1), and goes to RF final amplifier, AVR ICs (IC31, IC82, IC801, IC36, IC63, IC65, IC64), DC/DC converter (IC33), transistor (Q32, Q71 through the 1A fuse (F2)), and voltage detector IC (IC20). Voltage detector (IC20) watches battery voltage. If the battery voltage is enough higher than 5.6V, detector outputs High. Then, IC31 (31BU) outputs 3.1V, and IC32 (12BU) outputs 1.2V, and Q31 is turned on.

When the VOL SW is turned on, SB1 becomes high (battery voltage). The DC/DC (IC33) operates if both SB1 and output of detector are high. IC33 (38M) outputs 3.8V, and A30 (12M) outputs 1.2V. Then, IC34 (18M) and IC37 (18BT) outputs 1.8V. Then, IC80 (30M) outputs 3.0V, and IC38 (33BT) and IC35 (33M) and IC81 (33OPT) outputs 3.3V. Then, IC39 (33A) outputs 3.3V, and IC82 (50A) outputs 5.0V. Then, IC701 (18M_3) outputs 1.8V, and Q71 (53AF) is turned on. Voltage detector (IC704) watches IC33 (38M) output voltage. If the 38M output voltage is enough higher than 3.5V, detector outputs High. As a result, the MPU/DSP operate.

The SBC signal becomes High after the MPU/DSP operates, and IC61 (33C), IC36 (50C), IC63 (50VCO) and Q32 (SB2) are turned on. When SD_EN signal becomes High, IC30 (33SD) operates. When 5UC signal becomes High, IC801 (50U) operates. When TXC signal becomes High, IC65 (50T) operates. IC65 (50T) is turned on in transmit mode.

When RXC signal becomes High, IC64 (50R) operates. IC64 (50R) is turned on in receive mode. Switches are controlled by the MPU/DSP.

When the VOL SW is turned off /PSW signal becomes Low. After detecting /PSW signal, the MPU/DSP changes SBC signal to Low. The 50C is fed to IC60 (200C). IC60 (200C) is the DC/DC boost converter. IC60, D60, C64 consist of a voltage quadruple. The 200C circuit then outputs approximately +20VDC.



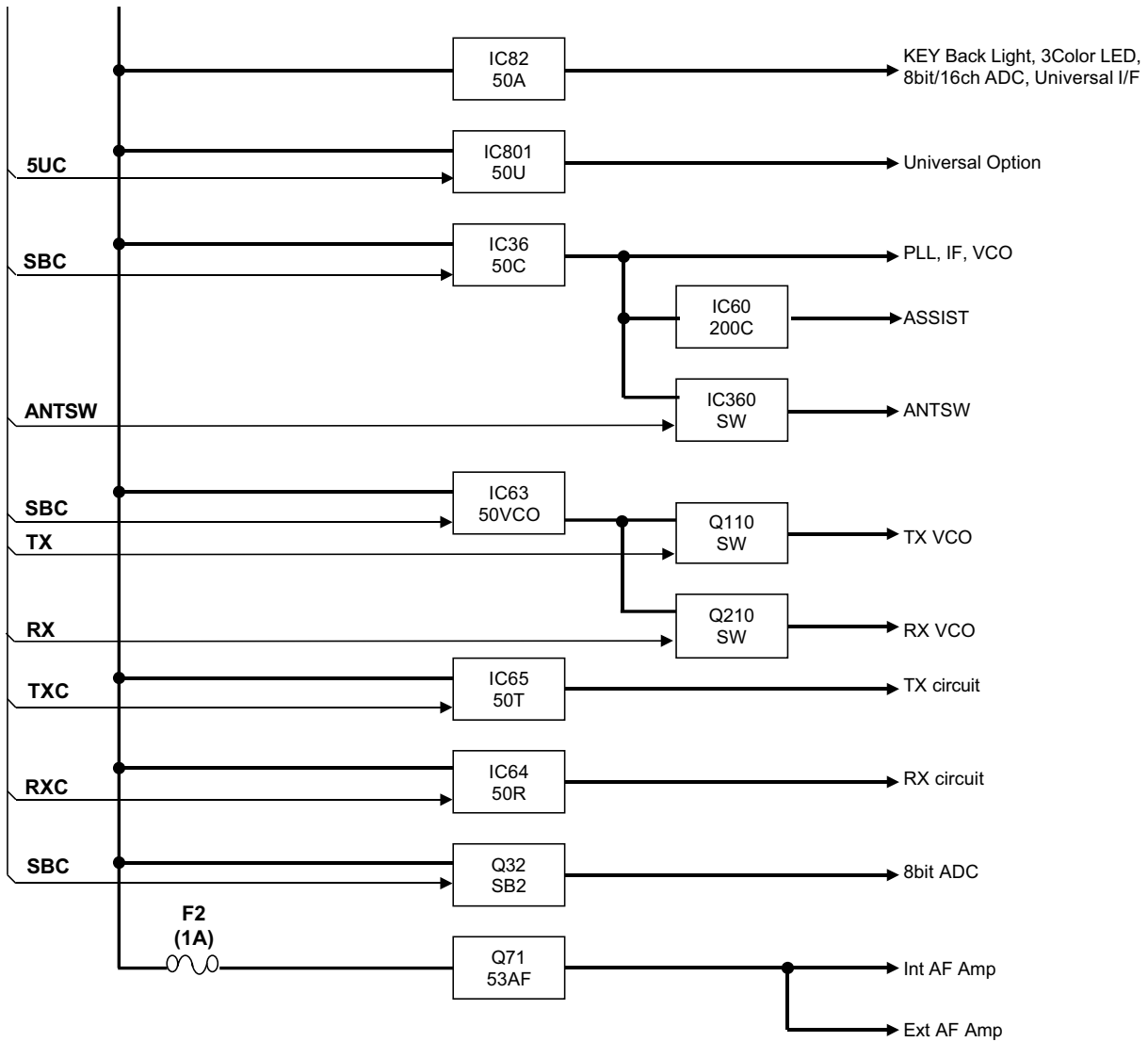


Fig.4 Power supply circuit

2.4.8 Signaling Circuit

2.4.8.1 Encode (QT/DQT/DTMF/2-tone/MSK)

Each signaling data signal of QT, DQT, DTMF, 2-tone and MSK is generated by IC702, superposed on a modulation signal and is sent to TX VCO and TX PLL IC.

2.4.8.2 Decode (QT/DQT/DTMF/2-tone/MSK)

The audio signal is removed from the FM detection signal sent to the IC702 and the resulting signal is decoded by IC702.

2.4.9 Bluetooth/GPS Circuit

The main component of the Bluetooth/GPS circuit is BT/GPS IC (IC850).

The clocks of BT/GPS IC require 19.2MHz for core and 32.768kHz slow clock (X850) for UART.

19.2MHz clock (X700) is shared with MPU/DSP (IC702), and is supplied through the clock buffer IC (IC700).

The BT/GPS IC communicates to the MPU/DSP (IC702) on the HCI UART. Interface of UART & Digital audio (PCM) between the MPU/DSP (IC702) and the BT/GPS IC (IC850), have level conversion at the level shift IC (IC852, IC853).

The BT/GPS IC is powered by 1.8V and 3.3V which are supplied from two discrete external regulators (IC38 and IC37). The input of these regulators is sourced from a switching regulator (IC33) which regulates the battery voltage to 3.8V.

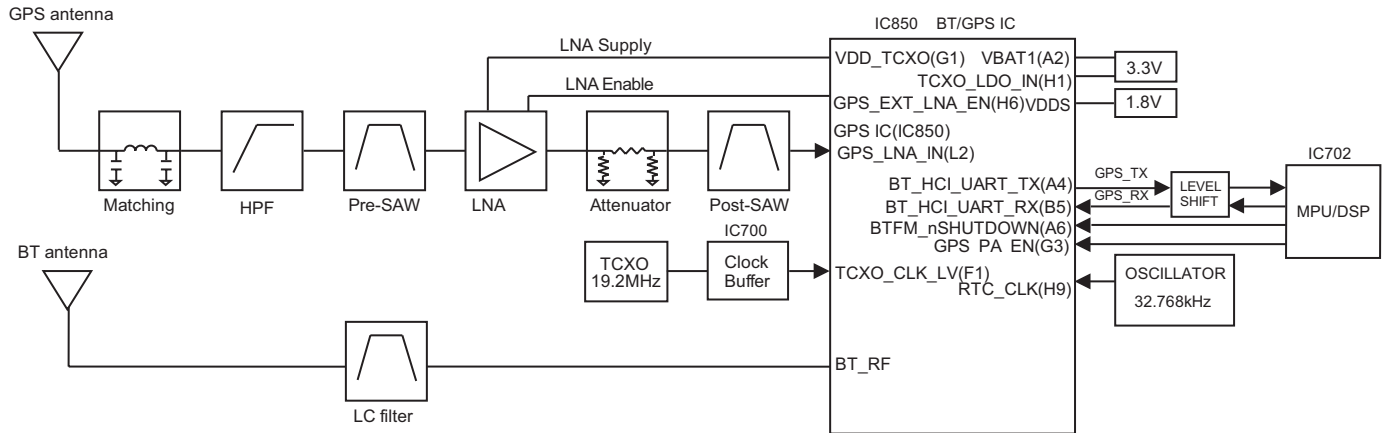


Fig.5 Bluetooth/GPS circuit

2.4.9.1 Bluetooth Circuit

The BT/GPS IC (IC850) support Bluetooth 3.0 up to HCI level.

The TX/RX frequency is 2400-2483.5MHz (79ch Hopping, 2402-2480MHz, 1MHz step). The transmit power is +2dBm at Bluetooth antenna input.

The Bluetooth antenna is made of sheet metal, and connected to the BT/GPS IC (IC850) through the LC filter (L855).

Frequency configuration for Bluetooth is following:

There are two LO modes: 2X and Offset LO (OSLO). 2X where LO is $2 * RF_FREQ$ (e.g. when transmitting at 2441MHz it is at 4882MHz). OSLO where LO is at $2/3 * RF_FREQ$ (e.g. when transmitting at 2441MHz it is at 1627.333MHz).

In RX the 2X is always used.

In GFSK TX if power is 10dBm or more then OSLO is used.

In EDR2 TX if power is -12dBm or more then OSLO is used.

In EDR3 TX if power is -12dBm or more then OSLO is used.

Otherwise 2X is used for TX as well.

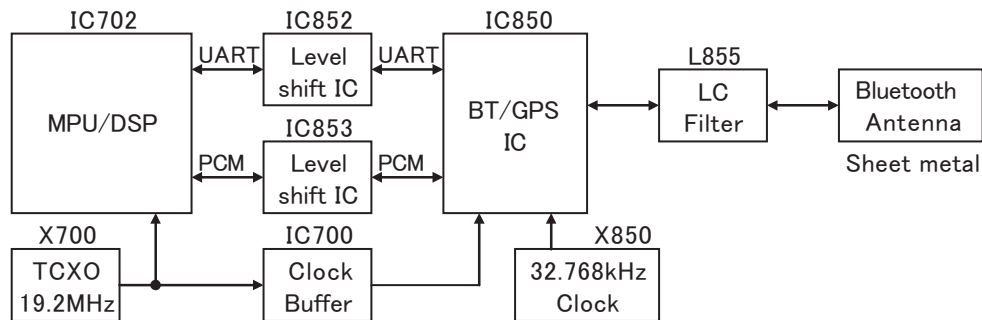


Fig.6 Bluetooth circuit

2.4.9.2 GPS Circuit

The RF signal is received by the antenna matched by the matching circuit. The matching circuit consists of L905, C948 and C883. And this signal applied to a high-pass filter. The filter consists of C882, C881, C880, L859 and L858. The filtered RF signal is then applied to a SAW filter (L857).

The output of the SAW filter is fed into the LNA (IC851). The LNA is enabled by GPS_EXT_LNA_EN (pin H6 of the BT/GPS IC, IC850). The LNA input match comprises of C879, C878 and L856. The LNA output match comprises of C874. And through the Attenuator comprised of R857, R856 and R855, the RF signal is further filtered by a second SAW filter (L853).

The output of the second SAW filter is passed to pin L2 of the BT/GPS IC. The input match for pin L2 comprises of C867, C866 and L852. The control and data lines for the BT/GPS IC are GPS_PA_EN, BTFM_nSHUTDOWN, GPS_TX and GPS_RX. GPS_TX and GPS_RX are shared with the Bluetooth data line.

Frequency configuration for GPS is following:

Lo is GPS: 1571.324MHz

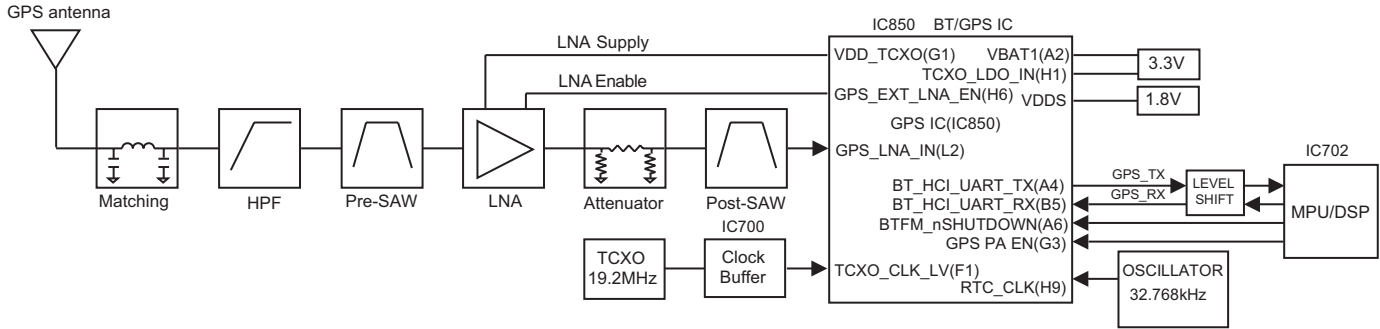


Fig.7 GPS circuit

2.5 COMPONENTS DESCRIPTION

2.5.1 TX-RX unit (XC1-0321-80)

Ref. No.	Part Name	Description
IC20	IC	Reset
IC30	IC	Voltage regulator (33OPT/33SD)
IC31	IC	Voltage regulator (31BU)
IC32	IC	Voltage regulator (12BU)
IC33	IC	DC/DC converter (38M)
IC34	IC	DC/DC converter (18M)
IC35	IC	Voltage regulator (33M)
IC36	IC	Voltage regulator(50R/50T/50C/50VCO/50A)
IC37	IC	Voltage regulator (18BT)
IC38	IC	Voltage regulator (33C/33BT)
IC39	IC	Voltage regulator (33A)
IC60	IC	DC/DC converter (200C)
IC61	IC	Voltage regulator (33C/33BT)
IC63~65	IC	Voltage regulator (50R/50T/50C/50VCO/50A)
IC70	IC	Voltage regulator (53AF)
IC80	IC	Voltage regulator (30M)
IC81	IC	Voltage regulator (33OPT/33SD)
IC82	IC	Voltage regulator (50R/50T/50C/50VCO/50A)
IC100	IC	PLL IC
IC101	IC	DC AMP
IC102	IC	Voltage buffer
IC200	IC	PLL IC
IC201	IC	DC AMP

Ref. No.	Part Name	Description
IC300	IC	Pre-drive AMP 1
IC360	IC	DC SW (Antenna SW)
IC400	IC	APC
IC500	IC	Mixer
IC520	IC	RX band control SW
IC570	IC	RX band control SW
IC600	IC	IF IC
IC700	IC	Clock buffer
IC701	IC	DC SW (18M)
IC702	IC	MPU
IC703	IC	SDRAM
IC704	IC	Reset
IC705	IC	Flash memory
IC706	IC	Logic control
IC708	IC	I/O control
IC709	IC	Motion sensor
IC711,712	IC	Logic control
IC800	IC	LED driver
IC801	IC	Voltage regulator (50U)
IC802	IC	Analog SW
IC803	IC	Level converter
IC804,805	IC	Logic control
IC806	IC	Logic control
IC850	IC	GPS/Bluetooth
IC851	IC	GPS LNA
IC852,853	IC	Level converter

Ref. No.	Part Name	Description
IC900	IC	A/D converter
IC901	IC	D/A converter
IC902	IC	Codec
IC903	IC	D/A converter
IC904,905	IC	Audio AMP
IC906	IC	Logic control
Q20	Transistor	DC SW
Q21~30	FET	DC SW
Q31	Transistor	DC SW
Q32,33	FET	DC SW
Q70	Transistor	DC SW
Q71	Transistor	Voltage regulator (53AF)
Q100	FET	DC SW
Q101	Transistor	Ripple filter
Q110,111	FET	DC SW
Q160	FET	VCO oscillation
Q180	Transistor	Buffer AMP
Q181	Transistor	Doubler
Q200	FET	DC SW
Q201	Transistor	Ripple filter
Q210,211	FET	DC SW
Q240	FET	VCO oscillation
Q280	Transistor	Buffer AMP
Q281	Transistor	Doubler
Q310	FET	Pre-drive AMP 2
Q320	FET	Drive AMP
Q330	FET	Final AMP
Q390~400	Transistor	DC SW
Q401,402	FET	DC SW
Q403	Transistor	DC SW
Q404	FET	DC SW
Q530	FET	LNA
Q550	FET	LNA
Q570,571	FET	DC SW
Q580	Transistor	Buffer AMP
Q600	FET	VCO oscillation
Q601	Transistor	DC SW
Q602	Transistor	Ripple filter
Q660	Transistor	IF AMP
Q670	FET	IF AMP
Q700	Transistor	TCXO buffer
Q701	FET	DC SW
Q702	Transistor	DC SW
Q703	FET	DC SW
Q800	FET	DC SW
Q801	Transistor	DC SW

Ref. No.	Part Name	Description
D1	Diode	+B
D2	Diode	Overvoltage protection
D20	Diode	DC SW
D30	Diode	Backup battery charge
D60	Diode	DC/DC converter
D100	Zener diode	Overvoltage protection
D101	Diode	Ripple filter
D160~164	Variable capacitance diode	VCO frequency control
D200	Zener diode	Overvoltage protection
D201	Diode	Ripple filter
D240~243	Variable capacitance diode	VCO frequency control
D350	Diode	Antenna SW
D370,371	Diode	Antenna SW
D390	Zener diode	APC protect
D570,571	Diode	Overvoltage protection
D600,601	Variable capacitance diode	VCO frequency control
D603~703	Diode	Overvoltage protection
D704	LED	LED
D705~804	Diode	Overvoltage protection
D805,806	Zener diode	Surge protection
D807	Diode	Surge protection
D808	Zener diode	Surge protection
D850,851	Diode	Overvoltage protection
D900,901	Zener diode	Surge protection
D902	Diode	Overvoltage protection
D903	Diode	DC SW
D904~907	Diode	Overvoltage protection
D910,911	Varistor	Surge protection

2.6 TERMINAL FUNCTION

2.6.1 TX-RX unit (XC1-0321-80)

Pin No.	Name	I/O	Function
CN4			
1	+B	O	Power output after passing through the fuse
2	SB1	I	Switched B input
3	NC	-	No connection
4	NC	-	No connection
5	VOL	I	Volume level input
6	50A	O	5.0V output
7	ENC0	I	Rotary switch input
8	GND	-	GND
9	ENC1	I	Rotary switch input

Pin No.	Name	I/O	Function
10	GND	-	GND
11	ENC2	I	Rotary switch input
12	ENC3	I	Rotary switch input
13	CNTSW	I	Lever switch input
14	GND	-	GND
15	GND	-	GND
16	ME	-	MIC GND
17	GND	-	GND
18	INTM_S	I	Internal MIC (SUB)
19	INTM_M	I	Internal MIC (MAIN)
20	ME	-	MIC GND
CN8			
1	/Side0	I	Side 0 input
2	GND	-	GND
3	/Side2	I	Side 2 input
4	/Side1	I	Side 1 input
5	/PTT	I	PTT input
6	NC	-	No connection
CN9			
1	LEDK3	I	LCD backlight (Cathode)
2	LEDK2	I	LCD backlight (Cathode)
3	LEDK1	I	LCD backlight (Cathode)
4	LEDA	O	LCD backlight (Anode)
5	VSSA	-	GND
6	VSSA	-	GND
7	VCC	O	3.0V output
8	VCC	O	3.0V output
9	DC	O	Data/Command control signal
10	/CS	O	LCD CS signal
11	/RESET	O	LCD reset signal
12	/RD	O	LCD read signal
13	/WR	O	LCD write signal
14	IM0	O	System interface select
15	BD15	I/O	LCD Data Bus 15
16	BD14	I/O	LCD Data Bus 14
17	BD13	I/O	LCD Data Bus 13
18	BD12	I/O	LCD Data Bus 12
19	BD11	I/O	LCD Data Bus 11
20	BD10	I/O	LCD Data Bus 10
21	BD9	I/O	LCD Data Bus 9
22	BD8	I/O	LCD Data Bus 8
23	BD7	I/O	LCD Data Bus 7
24	BD6	I/O	LCD Data Bus 6
25	BD5	I/O	LCD Data Bus 5
26	BD4	I/O	LCD Data Bus 4
27	BD3	I/O	LCD Data Bus 3

Pin No.	Name	I/O	Function
28	BD2	I/O	LCD Data Bus 2
29	BD1	I/O	LCD Data Bus 1
30	BD0	I/O	LCD Data Bus 0
31	CABC	I	Backlight control signal
32	IOVCC	O	1.8V output
33	IOVCC	O	1.8V output
34	VSSD	-	GND
35	VSSD	-	GND
CN10			
1	GND	-	GND
2	/KEY10	I	Key matrix input
3	GND	-	GND
4	/KEY11	I	Key matrix input
5	GND	-	GND
6	/KEY12	I	Key matrix input
7	KEY_BLC	O	Key backlight output
8	/KEY13	I	Key matrix input
9	KEY_BLC	O	Key backlight output
10	/KEY14	I	Key matrix input
11	KEYO3	O	Key matrix output
12	GND	-	GND
13	KEYO2	O	Key matrix output
14	GND	-	GND
15	KEYO1	O	Key matrix output
16	GND	-	GND
17	KEYO0	O	Key matrix output
18	GND	-	GND
19	GND	-	GND
20	GND	-	GND
CN11 (for production)			
1~20	-	-	-
CN12			
1	SMIC	I	External MIC input
2	RXD	I/O	Serial data input/USB DM
3	TXD	I/O	Serial data output/USB DP
4	5V	O	5V power supply output
5	E	-	GND
6	OPT	I	MIC identification
7	PF	I	Programmable function key input
8	/PTT	I	PTT input
9	ME	-	MIC GND
10	EMC	I	External MIC input/USB VBUS
11	/MSW	I	EXT/INT MIC switch input
12	SP-	O	BTL output for external speaker -
13	SP+	O	BTL output for external speaker +
14	SSW	I	EXT/INT speaker switch input

Pin No.	Name	I/O	Function
CN13			
1	SP-	O	BTL output for internal speaker -
2	SP+	O	BTL output for internal speaker +
J1			
1	DAT2	I/O	Data 2
2	CD/DAT3	I/O	Data 3
3	CMD	I/O	Command input/output
4	VDD	O	3.3V output
5	CLK	O	Clock output
6	VSS	-	GND
7	DAT0	I/O	Data 0
8	DAT1	I/O	Data 1
9	CD	I	Card detect switch
10	COMMON	-	GND
11	GND1	-	GND
12	GND2	-	GND

2.6.2 Universal connector specification

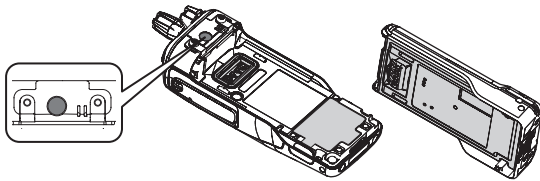
Pin No.	Name	I/O	Signal Type	Function	Rating and Condition				
					Parameter	Min	Typ	Max	Unit
1	SSW	I	Digital	EXT/INT speaker switch input	VIH	2.5	-	5.3	V
					VIL	0.0	-	0.15	V
2	SP+	O	Analog	BTL output for external speaker	[8Ω load]				
					Max output power (1kHz, Batt=7.5V)		1.3	1.8	W
					DC Bias		2.5		V
					Allowable Frequency	300		3000	Hz
3	SP-	O	Analog	BTL output for external speaker	[16Ω load]				
					Max output power (1kHz, Batt=7.5V)		0.9	1.4	W
					DC Bias		2.5		V
					Allowable Frequency	300		3000	Hz
4	MSW	I	Digital	EXT/INT MIC switch input	VIH	3.5	-	5.3	V
					VIL	0.0	-	0.15	V
5	EMC	I	Analog	External MIC input	Audio Level (STD deviation)	7.7	12.5	17.3	mV
					DC Bias		3.3		V
					Allowable Frequency	300		3000	Hz
					Input impedance	-	1.8	-	kΩ
	VBUS		Analog	USB VBUS (5V) input	VIH	4.8	-	5.3	V
					VIL	0.0	-	0.50	V
6	ME	-	-	MIC GND	This is GND port for Microphone.				
7	PTT	I	Digital	PTT input	VIH	2.5	-	5.3	V
					VIL	0.0	-	0.40	V
8	PF	I	Analog	Programmable function key input	V(PF2)	3.5	-	3.9	V
					V(PF1)	2.5	-	3.5	V
9	OPT	I	Digital	MIC identification	VIH	4.0	-	5.3	V
					VIL	0.0	-	0.7	V
10	GND	-	-	GND					

Pin No.	Name	I/O	Signal Type	Function	Rating and Condition					
					Parameter	Min	Typ	Max	Unit	
11	5U	-	Power	5V power supply output	Output Voltage(Iout = 100mA)	4.9	5.0	5.1	V	
					Maximum Current	-	-	0.2	A	
12	TXD	O	Digital	Serial data output	VOH(Io=-5mA)	4.1	-	5.1	V	
					VOL(Io=5mA)	0.0	-	0.8	V	
					Baud Rate			1.1875	Mbps	
	USB_DP	IO	Analog	USB DP	VIH	2.7	-	3.6	V	
					VIL	-	-	0.8	V	
					VOH	2.8	-	3.5	V	
					VOL	0.0	-	0.3	V	
					Baud Rate (Full-Speed)			12	Mbps	
	13	RXD	I	Digital	Serial data input	VIH	2.0	-	5.3	V
						VIL	0.0	-	0.8	V
Baud Rate								1.1875	Mbps	
USB_DM		IO	Analog	USB DM	VIH	2.7	-	3.6	V	
					VIL	-	-	0.8	V	
					VOH	2.8	-	3.5	V	
					VOL	0.0	-	0.3	V	
					Baud Rate (Full-Speed)			12	Mbps	
14		SMIC	I	Analog	External MIC input	Audio Level (STD deviation)	7.7	12.5	17.3	mV
						DC Bias		3.3		V
	Allowable Frequency					300		3000	Hz	
	Input impedance					-	1.8	-	kΩ	

SECTION 3 DISASSEMBLY

3.1 Precautions for Waterproof

- Do not remove the black sheet from the reverse side of the transceiver (refer to the illustration below). Removal of this sheet decreases the waterproof efficiency of the transceiver and may cause malfunctions if water seeps into the transceiver.
- The orange packing material on the reverse side of the transceiver is important with respect to the waterproof efficiency of the transceiver. Do not place stickers or other materials on or around the packing material shown in the figure, or on the reverse side of the battery pack. Doing so will impair the waterproof efficiency of the transceiver and may cause it to break down. Additionally, in order to prevent damage to the packing material, do not allow it to come in contact with foreign materials.



3.2 Precautions for Disassembly

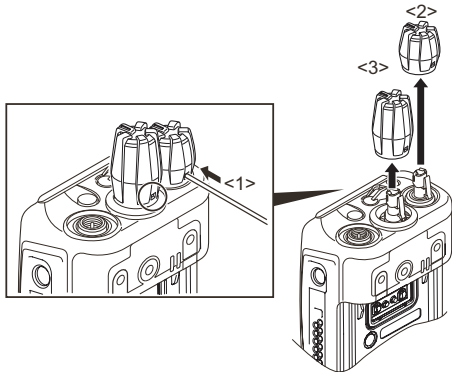
3.2.1 Removing the selector knob and volume knob

- Using a thin tool, insert it in the hole on the selector knob side and push the knob spring. <1>

Note:

When you push the knob spring, take care not to damage the resin of the knob.

- Lift and remove the selector knob <2> while pushing the knob spring.
- Repeat steps 1 and 2 for the volume knob, to remove the volume knob <3>.



Note:

Perform the following procedures when installing the selector knob and volume knob.

- Match the direction for the hole of the knob and the knob spring.
- Push the knob onto the knob spring until a click sounds.

3.2.2 Removing the selector knob spring and volume knob spring

- Lightly grasp the left and right sides of the selector knob spring together, and lift up as shown in the figure. <1>

Note:

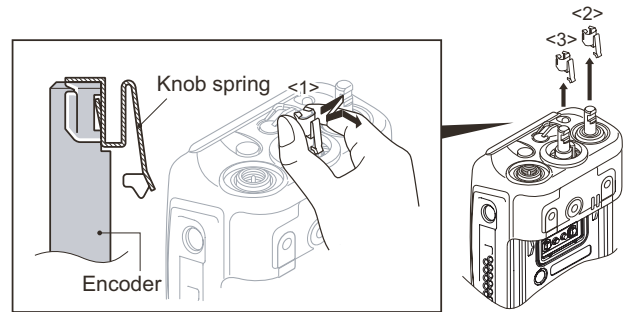
Do not grasp the knob spring tightly.

- Remove the selector knob spring <2>.

Note:

Use minimal contact with your fingers on the knob spring.

- Repeat steps 1 and 2 for the volume knob spring, to remove the volume knob spring <3>.



Note:

Perform the following procedures when installing the selector knob spring and volume knob spring.

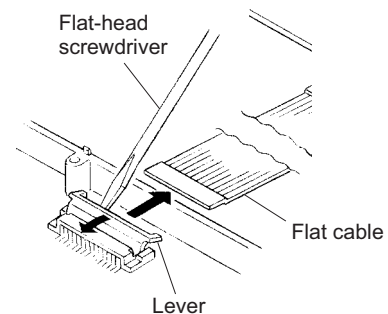
- Match the direction for the knob spring and the encoder.
- Insert the encoder onto the knob spring until a click sounds.

3.2.3 How to remove the flat cable

- Gently rise up the connector lever in the direction of the arrow with a flat-head screwdriver or tweezers. (CN8, CN9, CN12)

Note:

Gently push both sides of the connector lever, when put in the flat cable.

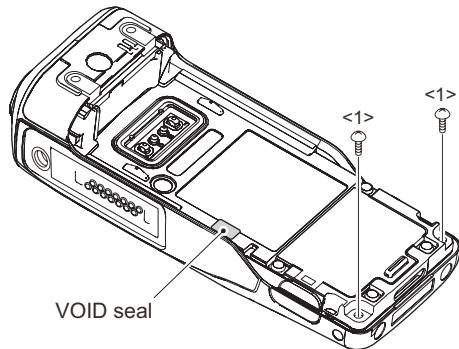


3.2.4 Remove the front case from the chassis

- (1) Remove two screws <1>.
- (2) Lift the base of the chassis and remove the chassis from the front case.

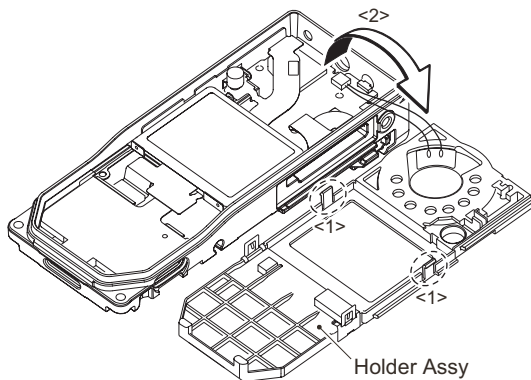
Note:

- There is a void seal stuck to the chassis and the front case, the void sheet peels off of when the chassis is removed from the case. Once the void seal is peeled off, it cannot be used again.
- When the chassis does not remove from the front case, remove by pushing in the key top with the finger.
- Regarding VOID, confirm the service policy of the NX-5400 to KENWOOD (or authorized distributor).



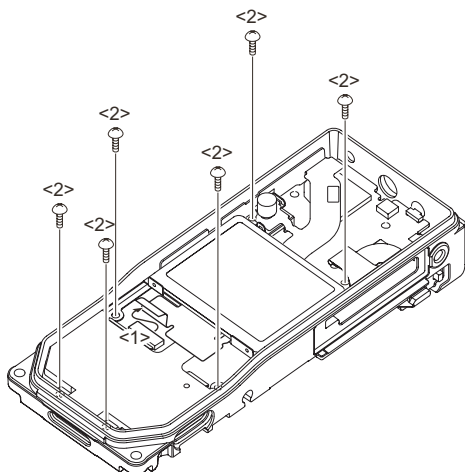
3.2.5 Remove the holder ASSY from the chassis

- (1) Remove the two hooks on the holder ASSY from the chassis. <1>
- (2) Rotate the holder ASSY to the right as shown in the figure. <2>

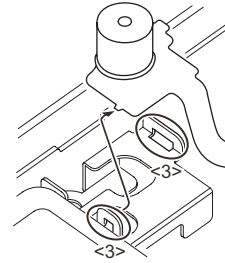


3.2.6 Removing the LCD shielding case from the Main unit

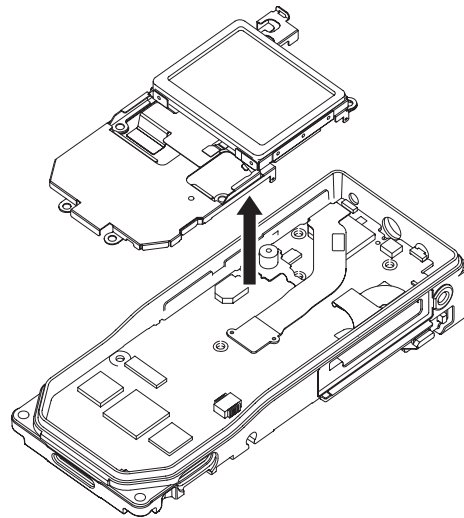
- (1) Remove the LCD FPC from the connector (CN9). <1>
- (2) Remove the six screws. <2>



- (3) Remove the VOL/SEL/MIC FPC from the two holes of the LCD shielding case. <3>

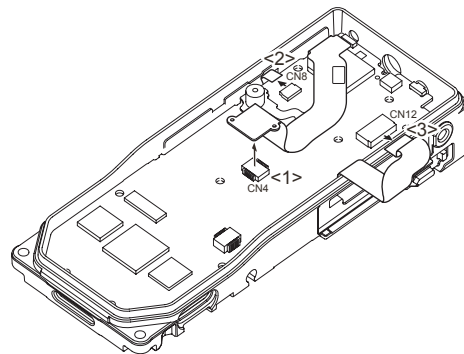


- (4) Remove the LCD shielding case from the Main unit. <4>



3.2.7 Removing the Main unit from the chassis

- (1) Remove the VOL/SEL/MIC FPC from the connector (CN4). <1>
- (2) Remove the PTT FPC from the connector (CN8). <2>
- (3) Remove the Universal connector FPC from the connector (CN12). <3>

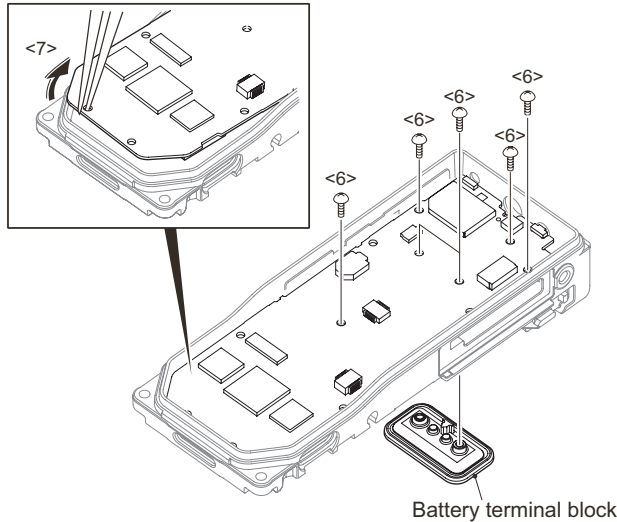


(4) Remove the six screws <6>.

Note:

When you remove two screws (black), the battery terminal block is removed.

(5) Anchor the screw hole of the Main unit using the tip of a pair of tweezers as shown in the figure. Then lift the Main unit to remove it from the chassis. <7>



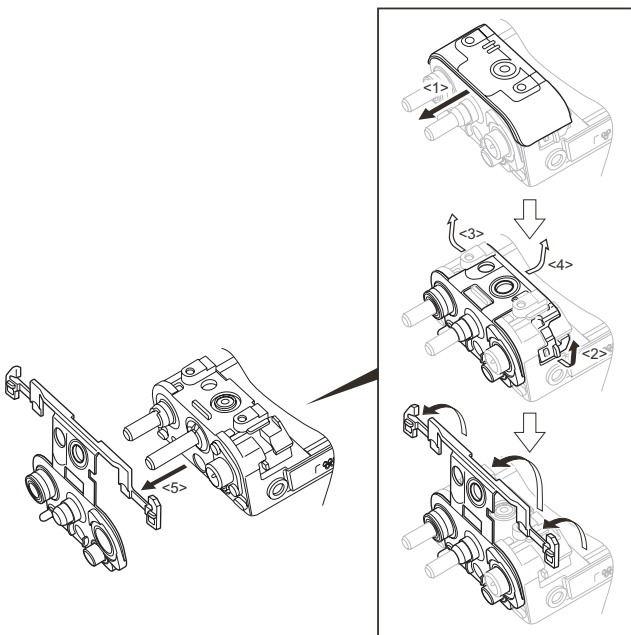
3.2.8 Removing the TOP packing

- (1) Remove the rear panel by sliding it upwards. <1>
- (2) Pull the TOP packing to the left to remove the packing that is fit into the left groove of the chassis. <2>
- (3) Pull the TOP packing to the right to remove the packing that is fit into the right groove of the chassis. <3>
- (4) Pull the TOP packing to the center to remove the packing that is fit into the center groove of the chassis. <4>
- (5) Remove the TOP packing. <5>

Note:

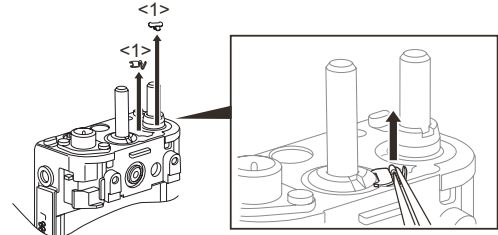
Remove the packing slowly, as the packing of the selector part might be overset when the TOP packing is removed.

If the packing is turned over, return it to the original position using a soft tipped item (e.g., your finger).



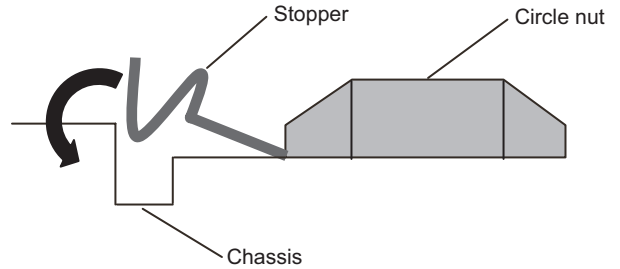
3.2.9 Removing the stopper of the selector circle nut and volume circle nut

(1) Remove the stopper <1> using a pair of tweezers.



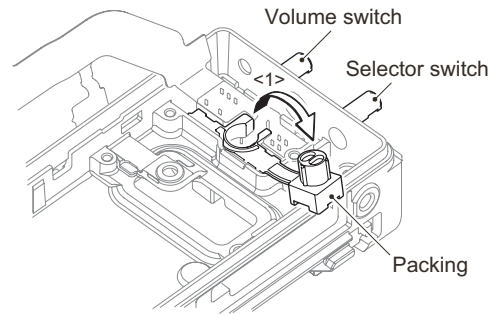
Note:

When reassembling the stopper, install it as shown in the figure.

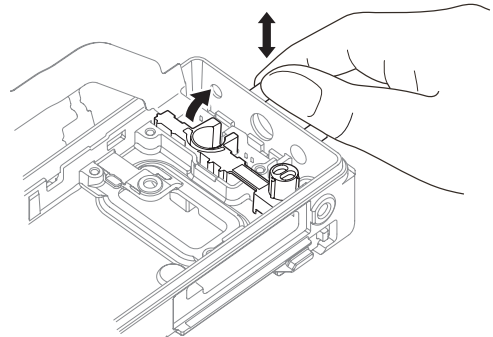


3.2.10 Remove the selector and volume switches from the chassis

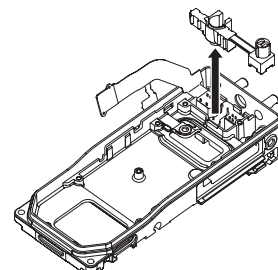
(1) Pull up the cover of the packing. <1>



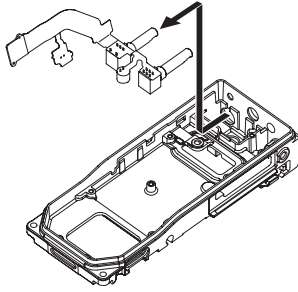
(2) Move the selector and volume switches vertically to lift the packing.



(3) Pull on the packing and remove it from the chassis.

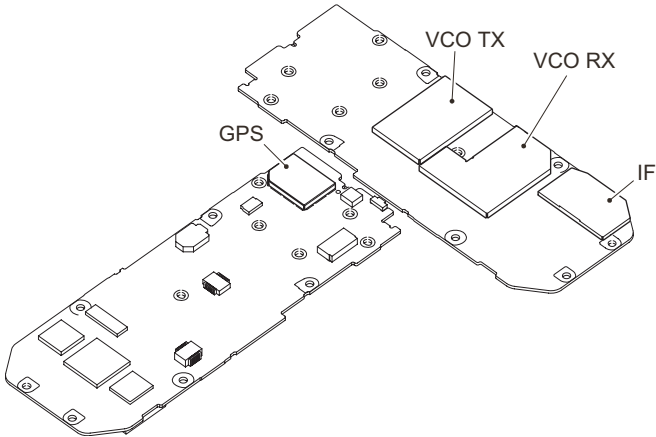


- (4) Move the selector and volume switches and then remove them both from the holes in the chassis.



3.2.11 Remove the top cover from the shield cover

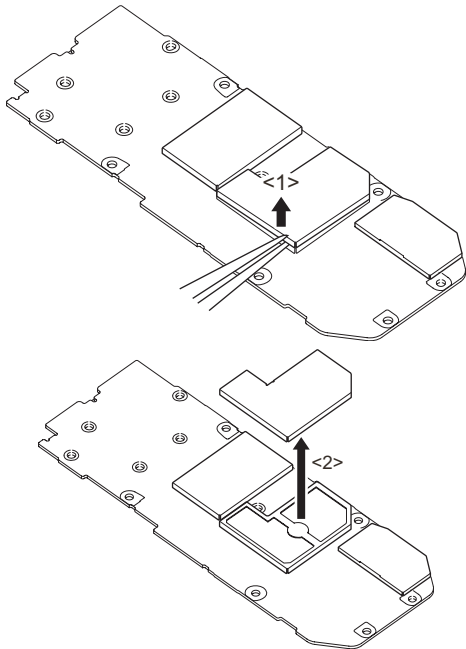
- (1) There are four shield covers (GPS, IF, VCO RX, and VCO TX) on the main unit, the top covers can be removed.



- (2) Use tweezers to slightly lift the edge of the top cover. <1>
 (3) As you do step 2 above, vary the position you hold the top cover as you lift it, and remove the top cover <2>.

Note:

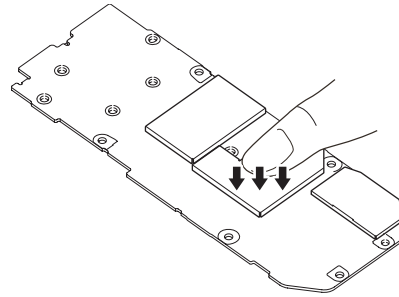
Once the top cover is removed, it cannot be used again. Order new cover.



Note:

Perform the following procedures when you reassemble the shield cover.

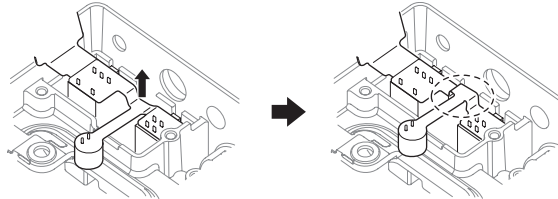
- (1) Push evenly on the top cover and be careful that you do not bend it as you install it on a new shield cover.



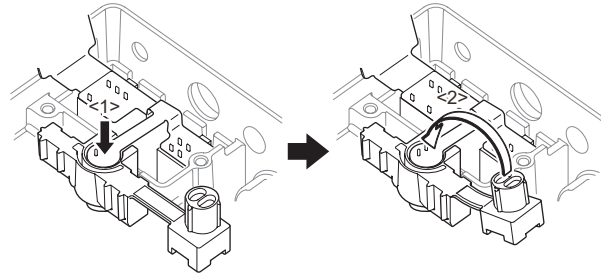
3.3 Precautions for Reassembly

3.3.1 Install the packing in the chassis

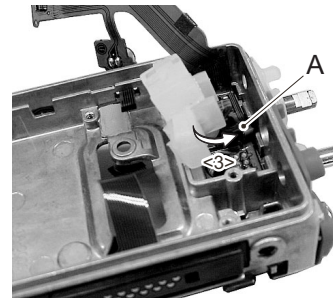
- (1) Lift up the VOL/SEL/MIC FPC as shown by the arrow in the figure so it is in the shape shown inside the dotted line.



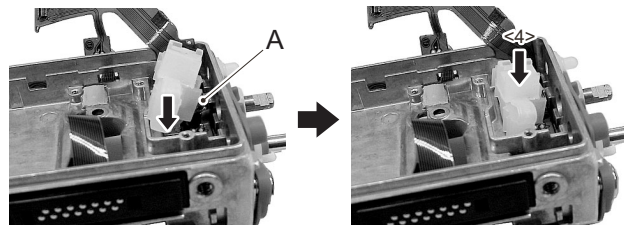
- (2) Insert the microphone into the packing. <1>
 (3) Insert the cover into the packing. <2>



- (4) Tuck the packing under the A part of the FPC. <3>



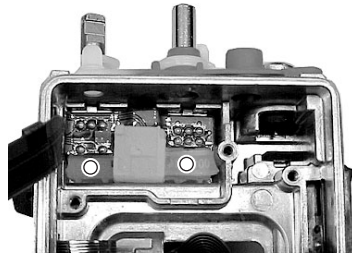
- (5) Keep the packing tucked under A as you insert it into the chassis. <4>



(6) Press the packing evenly to the base of the chassis.

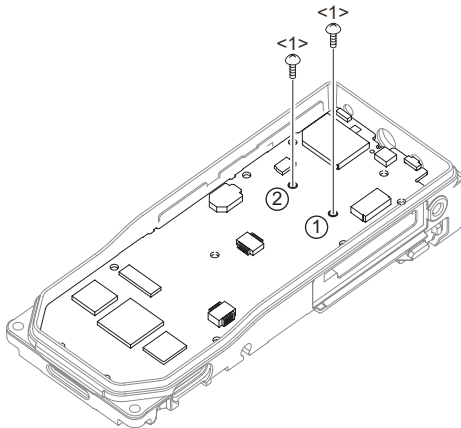
Note:

To prevent doing any damage, do not press forcefully on the packing.

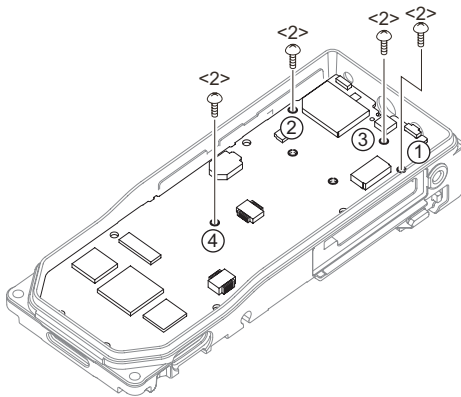


3.3.2 Install the main unit in the chassis

(1) Tighten the two screws (black) <1> to affix the battery terminal block to the chassis.



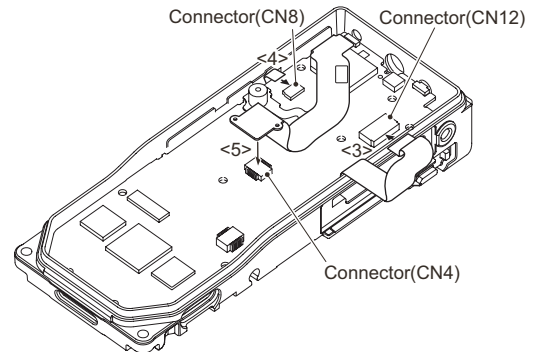
(2) Tighten the four screws <2> to affix the main unit to the chassis.



(3) Insert the universal connector FPC into the connector (CN12). <3>

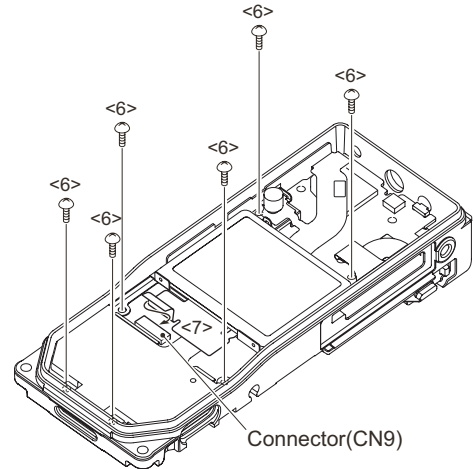
(4) Insert the PTT FPC into the connector (CN8). <4>

(5) Insert the VOL/SEL/MIC FPC into the connector (CN4). <5>

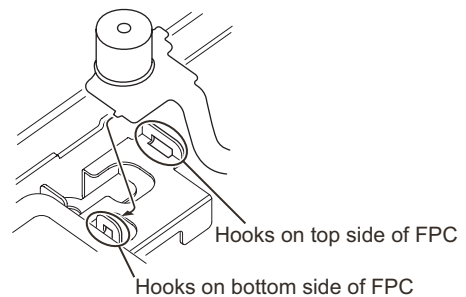


(6) Place the LCD shield cover on the main unit and tighten the six screws. <6>

(7) Insert the LCD FPC into the connector (CN9). <7>



(8) After inserting the hooks on the top side of the VOL/SEL/MIC FPC (mic part) into the holes on the top side of the LCD shield cover, insert the hooks on the bottom side of the FPC into the holes on the bottom side of the shield cover.



3.3.3 Mounting the chassis onto the case

- (1) Place the key top on the chassis. Then, fit the chassis tightly into the groove of the key top. <1>

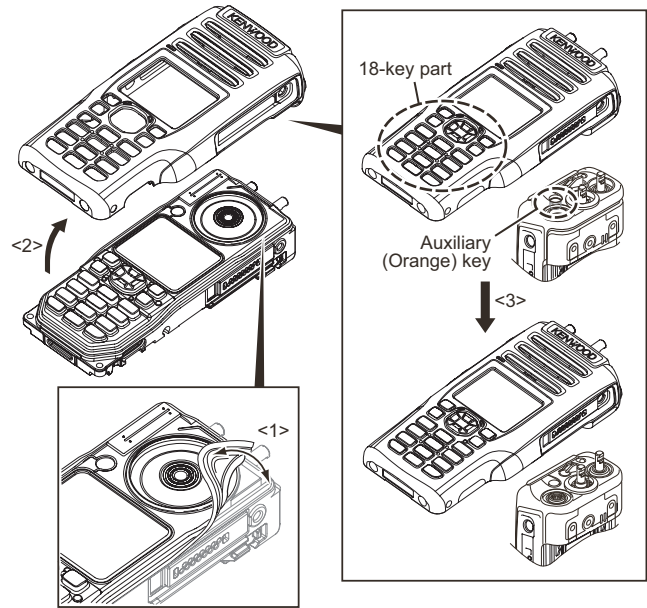
Note:

Confirm that the entire groove of the key top fits to the chassis tightly.

- (2) Mount the chassis onto the case. <2>

Note:

- After mounting the chassis onto the case, if the 18-key part on the key top or the Auxiliary (Orange) key part of the VOL/SEL packing gets stuck inside the case as shown in the figure, return it to the normal position using a soft tipped item (e.g., finger) . <3>
- Prying it with a pointed metal tool such as forceps, may damage the key top or packing.



3.3.4 Assembly Information (Sheet/Cushion)

When “Main Parts” is changed (ordered), “Assembled Sheet / Cushion” should also be changed (ordered) together.

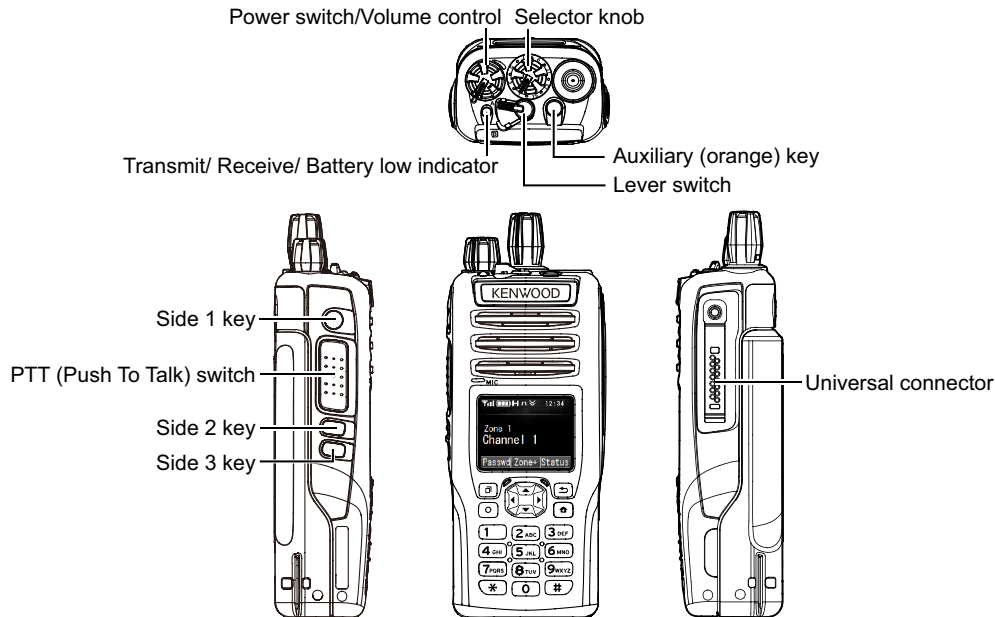
The Sticker and Sheet etc are non-reusable parts. It requires the new one to get the radio’s performance after repairs.

For example, when “Plastic Cabinet (A0C-0001-00 (F3,K3)/ A0C-0002-00 (F2,K2))” is changed, “Badge (B4D-0002-00)”, “Fibrous Sheet (G1A-0001-00)”, “Sheet (G1B-0074-00)”, “Spacer (J3K-0003-00)” and “Knob (K2K-0013-00)” should be ordered and changed together because Badge (B4D-0002-00), Fibrous Sheet (G1A-0001-00), Sheet (G1B-0074-00), Spacer (J3K-0003-00) and Knob (K2K-0013-00) are non-reusable.

Main Parts		Assembled Sheet/ Cushion		
Part Name	Part Number	Part Name	Part Number	Remark
Plastic Cabinet (F3,K3) Plastic Cabinet (F2,K2)	A0C-0001-00 A0C-0002-00	Badge	B4D-0002-00	“KENWOOD” is printed.
		Fibrous Sheet (SP)	G1A-0001-00	
		Sheet (LCD)	G1B-0074-00	
		Spacer (2CH)	J3K-0003-00	
		Knob (2CH)	K2K-0013-00	
Rear Panel	A8A-0005-00	Sheet (Air)	G11-4440-04	
Terminal (ANT)	E2D-0003-00	Cushion (ANT)	G1D-0041-00	
Terminal Block	E7C-0001-00	Terminal Sticker	B4C-0105-00	
Cover (OP board)	F0G-0005-00	Cushion (Cover)	G1D-0062-00	
Shielding Cover (MPU)	F1B-0005-00	Sheet (Insulating)	G1B-0031-00	
Shielding Cover (LCD)	F1B-0006-00	Cushion (LCD/Front)	G1D-0009-00	
Holder (F3,K3)	J1K-0004-00	Cushion (20-pin Connector)	G1D-0021-00	
FPC (UNIV)	J87-0056-05	R.Receptacle	E58-0532-05	
FPC (PTT)	J87-0057-05	Sheet (PTT)	G1B-0016-00	
FPC (VOL, SEL, ECM)	J87-0058-05	Sheet (Conducting)	G11-4459-04	
		Cushion	G1D-0025-00	
Speaker	T0H-0002-00	Rubber Cushion (SP)	G1B-0045-10	

SECTION 4 ADJUSTMENT

4.1 Controls



4.1.1 Preparations for checking/tuning the transceiver

Before attempting to check/tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned on, the unit must be connected to a suitable dummy load (i.e. power meter).

The speaker output connector must be terminated with an 8Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during checking/tuning.

4.2 Panel Test Mode

4.2.1 Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [↵] key while turning the transceiver power ON or press the [□] key and select the "Panel Test". Before the transceiver enters test mode, the frequency version information appears on the LCD momentarily. Test mode can be inhibited by programming. To exit test mode, turn the transceiver power OFF. The following functions are available in test mode.

- When the panel test mode is activated, the channel selected with the [Selector] knob and the last used signaling number are displayed. When it is activated for the first time, the signaling number is 1.
- If test signaling 10 (P25 Phase1), 7 (P25 Phase2) and 7 (NXDN Mode) is selected, the result of Bit Error Rate (BER) calculation is displayed on the LCD.

4.2.2 Key operation

Key	"FNC" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[▼]	Push: Test channel down Hold: Test channel down continuously	Channel No.

Key	"FNC" not appears on the sub LCD display	
	Function	Display
[◀]	Push: Squelch level up *1 Hold: Squelch off	Squelch level Squelch off: [🔊] icon appears
[▶]	Wide 5k/Wide 4k/Narrow/ Very Narrow *2	Wide 5k: "w" Wide 4k: "s" Narrow: "n" Very Narrow: "v"
[Side1]	-	-
[Side2]	-	-
[Side3]	Push: Microphone (Front MIC/Rear MIC) select	Rear MIC: [🔊] icon appears
[□]	Shift to panel tuning mode	-
[↵]	Function on	"FNC" appears on the sub LCD display
[○]	MSK 1200bps and 2400bps *1	2400bps: [📧] icon appears
[🏠]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[AUX (Orange)]	-	-
[PTT]	Transmit	-
[0] to [9] and [#], [✖]	-	-

*1: When the mode is selected as Analog, this function is enabled.

*2: When the Mode is selected as P25, bandwidth is fixed to Narrow.

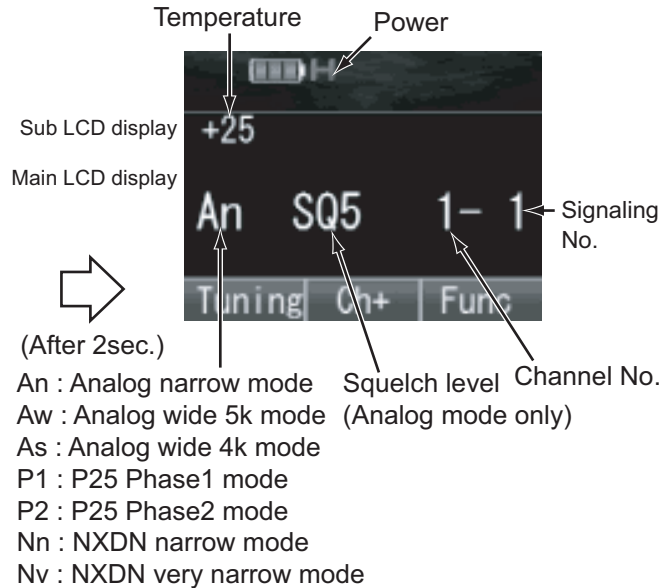
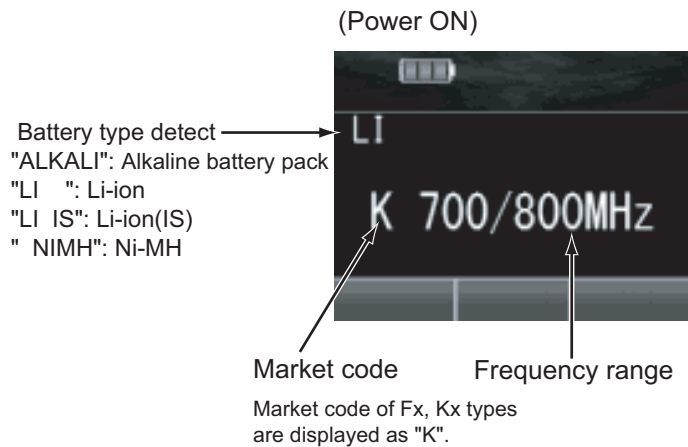
Key	"FNC" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Talk Around on/off	On: icon appears
[▼]	Analog/Phase1/Phase2/NXDN	Analog: "A" P25 phase1: "P1" P25 phase2: "P2" NXDN: "N"
[◀]	-	-
[▶]	Key/LCD check	The position of the selector knob, etc., appear.
[Side1]	Function off	-
[Side2]	Function off	-
[Side3]	P25 Modulation Type (C4FM/LSM) *3	LSM : icon appears
	High power/Low power	High: "H" Medium: "M" Low: "L"

Key	"FNC" appears on the sub LCD display	
	Function	Display
	Function off	-
	Compander on/off	On: icon appears
	Function off	-
[AUX (Orange)]	For production	-
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

*3: When the mode is selected as P25, this function is enabled.

- **LED indicator**
Red LED Lights during transmission.
Green LED Lights when there is carrier.
- **Sub LCD indicator**
"FNC" Appears at function on.

• **LCD display in panel test mode**



4.2.3 Frequency and Signaling

The transceiver has been adjusted for the frequencies shown in the following table. When required, readjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

(1) Test frequency

CH	RX (MHz)	TX (MHz)
1	763.05000	793.05000
2	769.05000	799.05000
3	775.95000	805.95000
4	763.55000	793.55000
5	769.55000	799.55000
6	775.45000	805.45000
7	851.05000	806.05000

CH	RX (MHz)	TX (MHz)
8	860.05000	815.05000
9	869.95000	824.95000
10	851.55000	806.55000
11	860.55000	815.55000
12	869.45000	824.45000
13~16	-	-

(2) Test signaling
 ■Analog mode signaling

No.	RX	TX
1	None	None
2	None	Square Wave
3	LTR Data	LTR Data
4	QT:67.0Hz	QT:67.0Hz
5	QT:151.4Hz	QT:151.4Hz
6	QT:210.7Hz	QT:210.7Hz
7	QT:254.1Hz	QT:254.1Hz
8	DQT:D023N	DQT:D023N
9	DQT:D754I	DQT:D754I
10	DTMF Decode (CODE: 159D)	DTMF Encode (CODE: 159D)
11	None	DTMF Encode (CODE: 9)
12	2-tone Decode (A: 304.7Hz, B: 3106.0Hz)	2-tone Encode (A: 304.7Hz, B: 3106.0Hz)
13	Single Tone Decode (979.9Hz)	Single Tone Encode (979.9Hz)
14	None	Single Tone Encode (1000Hz)
15	None	MSK PN9
16	MSK Decode	MSK Encode

■P25 Phase1 signaling

No.	RX	TX
1	NAC 293	NAC 293
2	NAC 023	NAC 023
3	NAC 5EA	NAC 5EA
4	None	PN9
5	NAC 293	Symbol Rate Pattern
6	NAC 293	1/3 Deviation Pattern
7	NAC 293	0 Continuous Pattern
8	NAC 293	Fidelity Pattern
9	None	FSW+PN9
10	NAC 293	1011Hz Tone Test Pattern
11	Tone Pattern	1011Hz Tone Test Pattern
12	Silence Pattern	Silence Pattern
13	Audio Test Pattern	NAC293 + Audio Test Pattern
14	Vocoder Loop	None

■P25 Phase2 signaling

No.	RX	TX
1	STTP-OB-1031-0	STTP-IB1031-1+Audio
2	None	PN9 Phase2
3	STTP-OB-1031-1	Symbol Rate Pattern Phase2
4	STTP-OB-1031-1	1/3 Deviation Pattern Phase2
5	STTP-OB-1031-1	0 Continuous Pattern
6	STTP-OB-1031-1	0 Burst Pattern

No.	RX	TX
7	STTP-OB-1031	Symmetrical STTP-IB1031-1
8	Tone Pattern (Half rate)	STTP-IB1031-1
9	Silence Pattern (Half Rate)	STP-IB-1 + Silence Pattern (Half Rate)
10	Audio Test Pattern (Half Rate)	STTP-IB1031-1 + Audio Test Pattern (Half Rate)
11	Codec Loop	STTP-IB1031-1 + Codec Loop
12	Vocoder Loop (Half Rate)	STTP-IB1031-1 + Vocoder Loop (Half Rate)





■NXDN Mode signaling




No.	RX	TX
1	RAN1	RAN1
2	None	PN9
3	RAN1	Maximum Deviation Pattern
7	FSW + PN9	FSW + PN9
9	Tone Pattern (1031Hz)	Tone Pattern (1031Hz)

RAN: Radio Access Number
 PN9: Pseudo-Random Pattern
 No.7, 9 Item: PC test mode only

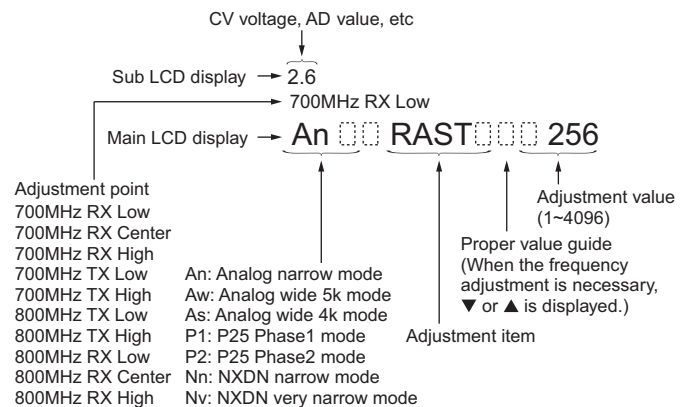
4.3 Panel Tuning Mode

4.3.1 Transceiver tuning (To enter tuning mode)





To enter tuning mode, press the [] key while the transceiver is in test mode. Use the [] key to write tuning data through tuning modes, and the []/[] key to adjust tuning requirements (1 to 4096 appears on the LCD).

Use the [] key to select the adjustment item through tuning modes. Use the [] key to adjust 4, 6 or 8 reference level adjustments, and use the [] key to switch between Wide5k/Wide4k/Narrow.

• LCD display in panel tuning mode



4.3.2 Key operation

Key	Function	
	Push	Hold (1 second)
[Selector]	-	
[▲]	Adjustment value up	Continuation up
[▼]	Adjustment value down	Continuation down
[◀]	Auto adjustment start	-
[▶]	Wide5k/Wide4k/Narrow/P25/NXDN	-
[Side1]	-	
[Side2]	-	
[Side3]	-	
[]	Shift to panel test mode	-
[]	To enter 4, 6 or 8 reference level adjustments	-
[]	Writes the adjustment value	-
[]	Go to next adjustment item	Back to last adjustment item (At the time of 4, 6 or 8 point adjustment: Adjustment point change)
[AUX (Orange)]	Output tone pattern change of balance adjustment (A change is possible only during balance adjustment.)	-
[PTT]	Transmit	
[0] to [9] and [#],[*]	-	

4.3.3 4, 6 or 8 reference level adjustments frequency

Receive Assist

Tuning point	Display	RX (MHz)	TX (MHz)
700M RX/TA Low	700M RX/TA Low	763.100000	763.000000
700M RX/TA High	700M RX/TA High	775.900000	776.000000
800M RX/TA Low	800M RX/TA Low	851.100000	851.000000
800M RX/TA High	800M RX/TA High	869.900000	870.000000

QT Deviation, DQT Deviation, LTR Deviation, DTMF Deviation, MSK Deviation

Tuning point	Display	RX (MHz)	TX (MHz)
700M RX/TA High	700M RX/TA High	775.900000	776.000000
700M TX High	700M TX High	775.900000	805.993750
800M TX High	800M TX High	869.900000	825.000000
800M RX/TA High	800M RX/TA High	869.900000	870.000000

RSSI Reference, Open Squelch, Low RSSI, High RSSI, Tight Squelch

Tuning point	Display	RX (MHz)	TX (MHz)
700M RX/TA Low	700M RX/TA Low	763.100000	763.000000
700M RX/TA Center	700M RX/TA Center	769.100000	769.000000
700M RX/TA High	700M RX/TA High	775.900000	776.000000
800M RX/TA Low	800M RX/TA Low	851.100000	851.000000
800M RX/TA Center	800M RX/TA Center	859.900000	860.000000
800M RX/TA High	800M RX/TA High	869.900000	870.000000

Transmit Assist, High Transmit Power, Medium Transmit Power, Low Transmit Power, Balance, Maximum Deviation, P25 High Deviation, P25 H-CPM Deviation, NXDN High Deviation

Tuning point	Display	RX (MHz)	TX (MHz)
700M RX/TA Low	700M RX/TA Low	763.100000	763.000000
700M RX/TA High	700M RX/TA High	775.900000	776.000000
700M TX Low	700M TX Low	763.100000	793.000000
700M TX High	700M TX High	775.900000	805.993750
800M TX Low	800M TX Low	851.100000	806.000000
800M TX High	800M TX High	869.900000	825.000000
800M RX/TA Low	800M RX/TA Low	851.100000	851.000000
800M RX/TA High	800M RX/TA High	869.900000	870.000000

4.3.4 Adjustment item supplement

Adjustment Item	Description
Receive Assist	The lock voltage of VCO (Receive) is adjusted. This item must be adjusted before all adjustment items for receiver section are adjusted.
Transmit Assist	The lock voltage of VCO (Transmit) is adjusted. This item must be adjusted before all adjustment items for transmitter section are adjusted.
Frequency	Frequency is adjusted under receiving condition with SSG. The SSG needs 0.001ppm accuracy so please use a standard oscillator if necessary. This item can be adjusted only in PC Test Mode so that the adjustment value is not changed easily.
Ramp Offset	Adjust this item to the optimal Ramp voltage.

Adjustment Item	Description
High Transmit Power	High Transmit Power is adjusted.
Medium Transmit Power	Medium Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Balance	The transmit modulation frequency response is adjusted. This item is adjusted so that the deviation of 2kHz becomes the same deviation of 20Hz. This item must be adjusted before all adjustment items for deviations are adjusted.
Maximum Deviation (P25/NXDN)	Maximum Deviation of P25/NXDN is adjusted.
Maximum Deviation (Analog Wide 5K/ Wide 4K/Narrow)	Maximum Deviation of Analog (Wide 5K/ Wide 4K/Narrow) is adjusted. This item must be adjusted before all adjustment items for tone deviations are adjusted.

Adjustment Item	Description
QT Deviation	QT deviation is adjusted.
DQT Deviation	DQT deviation is adjusted.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Open Squelch	The squelch level at level "1" is adjusted.
Low RSSI	RSSI display level " ∇ " is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)
Tight Squelch	The squelch level at level "9" is adjusted.
Battery Warning Level	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.

4.3.5 Adjustment item and Display

Order	Adjustment item	Main LCD display	Sub LCD display	Aw	As	An	P1	P2	Nn	Nv	Adjust item Number
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(P25 Phase1)	(P25 Phase2)	(NXDN Narrow)	(NXDN Very Narrow)	
				Adjustment range							
1	Receive Assist	RAST	(CV voltage)	4 point ADJ							Common Section 2
				1 ~ 4096							
2	Transmit Assist	TAST	(CV voltage)	8 point ADJ							Common Section 3
				1 ~ 4096							
3	RTC Correction	RTC	-	-							Common Section 5
				-2.00~-0.01 ,0.00 ,+0.01~+2.00							
4	Ramp Up Offset	RAMPU	(ADC measurement value)	-							Transmitter Section 1
				1~1024							
5	Ramp Down Offset	RAMPD	(ADC measurement value)	-							Transmitter Section 2
				1~1024							
6	High Transmit Power	H_PWR	-	-	-	8	-	-	-	-	Transmitter Section 3
				1~1024							
7	Medium Transmit Power	M_PWR	-	-	-	8	-	-	-	-	Transmitter Section 4
				1~1024							
8	Low Transmit Power	L_PWR	-	-	-	8	-	-	-	-	Transmitter Section 5
				1~1024							
9	Balance	BAL	(Encode frequency)	-	-	8	-	-	-	-	Transmitter Section 6
				1~1024							
10	Maximum Deviation	ADEV	-	8	8	8	-	-	-	-	Transmitter Section 7
				1~1024							
11	P25 High Deviation	PDEV	-	-	-	-	8	-	-	-	Transmitter Section 8
				1~1024							

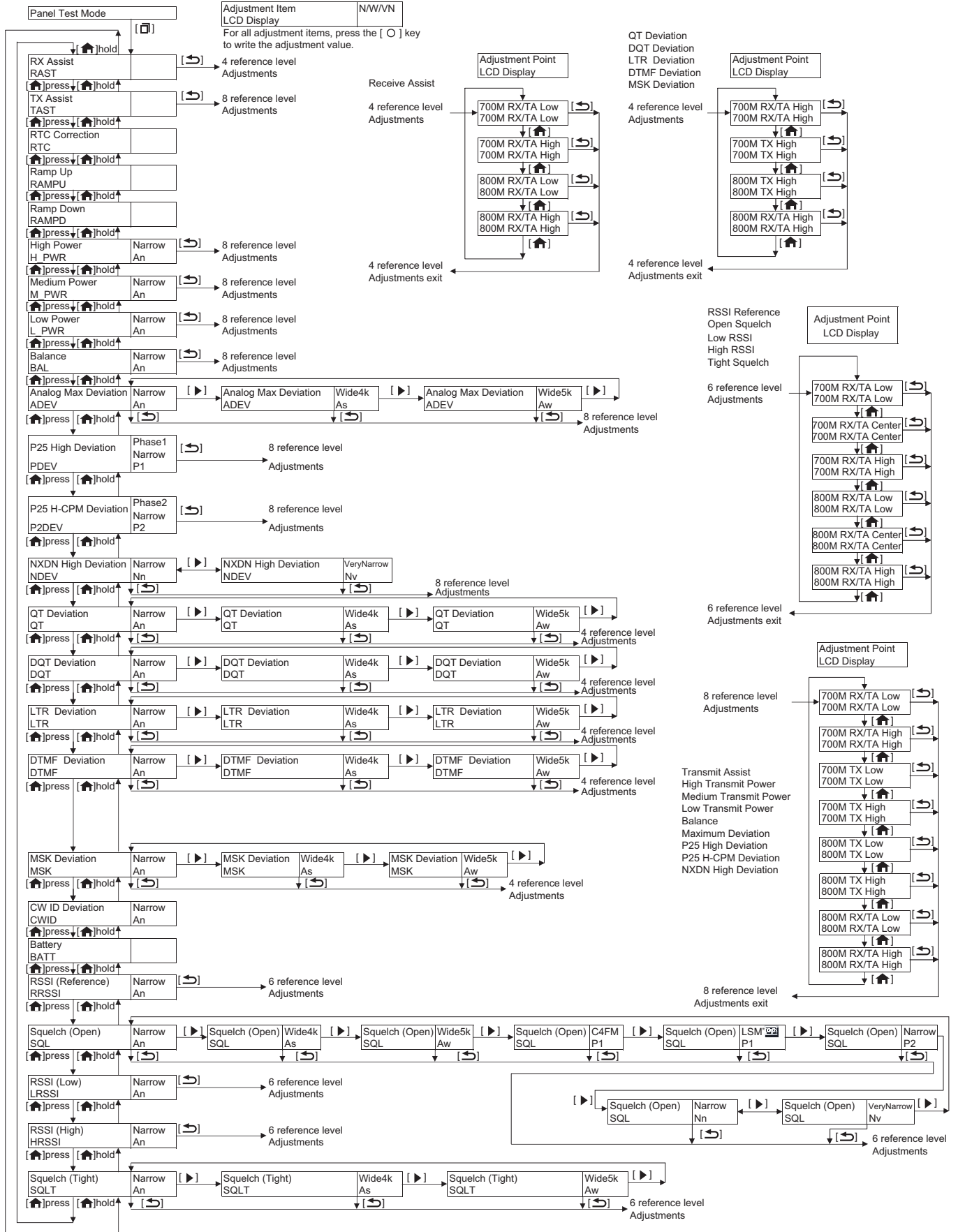
Order	Adjustment item	Main LCD display	Sub LCD display	Aw	As	An	P1	P2	Nn	Nv	Adjust item Number
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(P25 Phase1)	(P25 Phase2)	(NXDN Narrow)	(NXDN Very Narrow)	
Adjustment range											
12	P25 H-CPM Deviation	P2DEV	-	-	-	-	-	8	-	-	Transmitter Section 9
				1~1024							
13	NXDN High Deviation	NDEV	-	-	-	-	-	-	8	8	Transmitter Section 10
				1~1024							
14	QT Deviation	QT	-	4	4	4	-	-	-	-	Transmitter Section 11
				1~1024							
15	DQT Deviation	DQT	-	4	4	4	-	-	-	-	Transmitter Section 12
				1~1024							
16	LTR Deviation	LTR	-	4	4	4	-	-	-	-	Transmitter Section 13
				1~1024							
17	DTMF Deviation	DTMF	-	4	4	4	-	-	-	-	Transmitter Section 14
				1~1024							
18	MSK Deviation	MSK	-	4	4	4	-	-	-	-	Transmitter Section 15
				1~1024							
19	CW ID Deviation	CWID	-	-	-	1	-	-	-	-	Transmitter Section 16
				1~1024							
20	Battery Warning Level	BATT	(BATT measurement value)	1point ADJ							Transmitter Section 17
				1~256							
21	RSSI Reference	RRSSI	(RSSI measurement value)	-	-	6	-	-	-	-	Receive Section 2
				1~256							
22	Open Squelch	SQL	(ASQDET measurement value)	6	6	6	6 *1	6	6	6	Receive Section 3
				1~256							
23	Low RSSI	LRSSI	(RSSI measurement value)	-	-	6	-	-	-	-	Receive Section 4
				1~256							
24	High RSSI	HRSSI	(RSSI measurement value)	-	-	6	-	-	-	-	Receive Section 5
				1~256							
25	Tight Squelch	SQLT	(ASQDET measurement value)	6	6	6	-	-	-	-	Receive Section 6
				1~256							

*1: When P25 Phase1 is selected, in C4FM and LSM, there is an adjustment item, respectively.

4.3.6 Panel tuning mode flow chart

Note:

* In this Panel tuning mode flow chart, the Adjustment item name is modified.



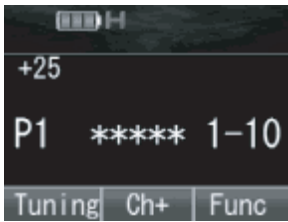
4.4 BER (Bit Error Rate) Measurement

- (1) The Panel Test Mode is used to measure the BER (Refer "4.2.1 Test mode operation features").
- (2) Select "10" (P25 Phase1), "7" (P25 Phase2) and "7" (NXDN Mode) for test signaling (Refer to "4.2.3 Frequency and Signaling" (2) Test signaling).

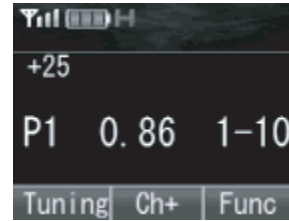
Note:

"7" (NXDN Mode) can be selected only by PC test mode.

- (3) Select a bandwidth (Narrow/Very Narrow) by pressing the [▶] key. When P25 Phase1 or P25 Phase2 is selected, it is not necessary to select a bandwidth.
- (4) Select a test frequency ("4.2.3 Frequency and Signaling" (2) Test signaling Test frequency).



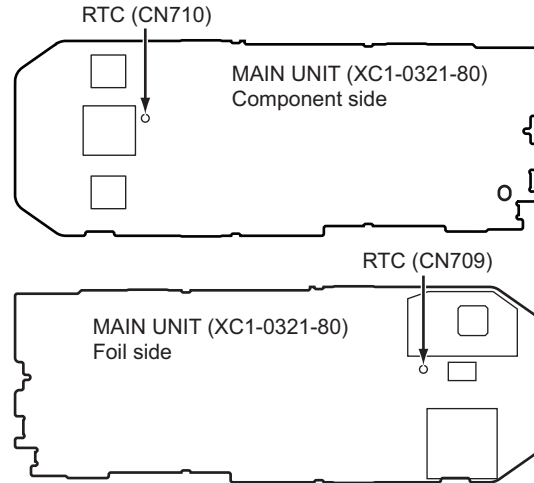
- (5) Measure the BER (Bit Error Rate) using the digital radio tester.
Enter a standard input signal into the transceiver as a standard tone test pattern for P25, FSW+PN9 for NXDN.
- (6) Adjust the input signal level to achieve the standard bit error rate (BER).
(For example, if the BER is 0.86%, the display shows "0.86".)



Note:

"4", "9" (P25 Phase1), "2" (P25 Phase2) is for production.

4.5 Adjustment points



4.6 Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	100 to 900MHz
	Modulation	Frequency modulation and external modulation
	Output	-127dBm/0.1uV to greater than -20dBm/22.4mV
	When performing the Frequency adjustment, the following accuracy is necessary.	
	• 0.001ppm	
	Use a standard oscillator for adjustments, if necessary.	
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	100 to 900MHz
	Measurement Capability	Vicinity of 10W
3. Deviation Meter	Frequency Range	100 to 900MHz
4. Digital Volt Meter (DVM)	Measuring Range	10mV to 10V DC
	Input Impedance	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
	To measure the oscillating frequency of the internal clock 32766.00Hz~32770.00Hz for RTC Correction Resolution 0.01Hz is better for accuracy adjustment.	
7. Ammeter		5A
8. AF Volt Meter (AF VM)	Frequency Range	50Hz to 10kHz
	Voltage Range	1mV to 10V
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz or more
	Output	0 to 1V
10. Distortion Meter	Capability	3% or less at 1kHz
	Input Level	50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. 8Ω Dummy Load		Approx. 8Ω, 3W
13. Regulated Power Supply		5V to 10V, approx. 3A
		Useful if ammeter equipped

■Antenna connector adapter

The antenna connector of this transceiver uses an SMA terminal.

Use an antenna connector adapter [SMA(f) - BNC(f) or SMA(f) - N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

■Nut wrench

In order to turn the volume nut and the channel selector nut, use a recommendation tool.

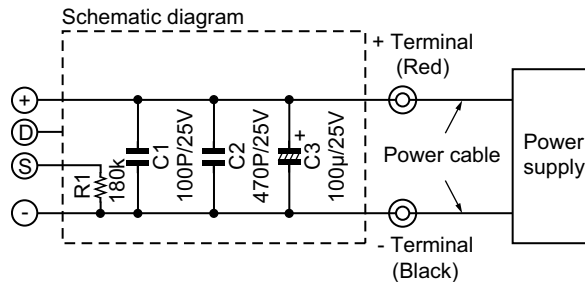
KENWOOD part No.: W05-1123-00

■Battery Jig (W3F-0001-00)

Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or both.

Note:

*When using the battery jig, you must measure the voltage at the terminals of the battery jig. Otherwise, a slight voltage drop may occur within the power cable, between the power supply and the battery jig, especially while the transceiver transmits.



■Universal connector

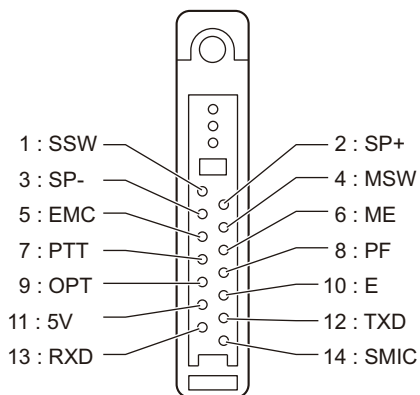
Use the interface cable (KPG-36U) for PC tuning or the lead wire with plug (E30-3287-28) and screw (N08-0535-08) for panel tuning. Connect the plug to the universal connector of the transceiver and tighten the screw.

The lead wire with plug (E30-3287-28) and screw (N08-0535-08) terminals are as follows. Numbers are universal connector terminal numbers.

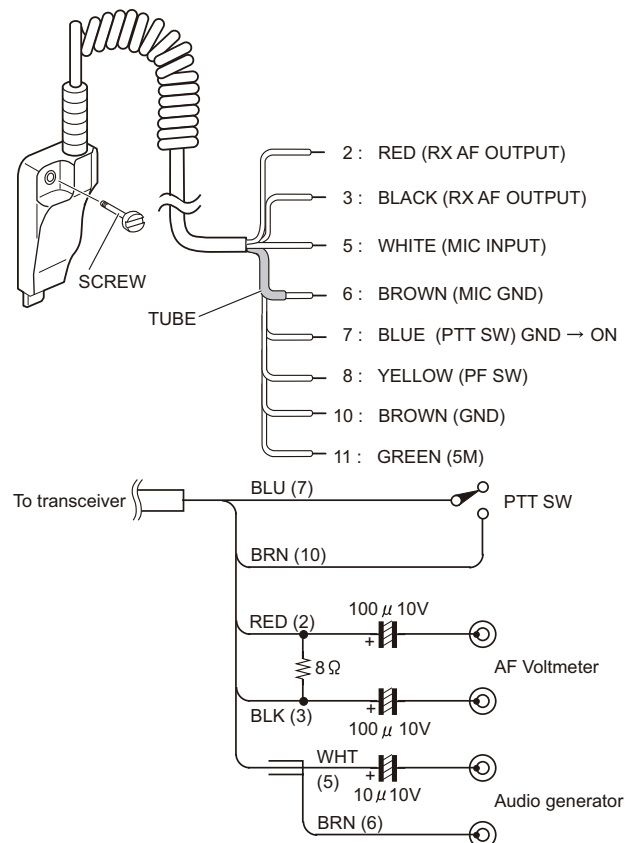
Caution

- (1) When connecting the plug to the universal connector of the transceiver, a short circuit may occur. To prevent this, be sure to turn the transceiver POWER switch off.
- (2) Since the RX AF output is a BTL output, there is a DC component. Isolate this with a capacitor or transformer as shown in the figure.
- (3) Do not connect an instrument between red or black and GND.

*Universal connector



*Panel tuning

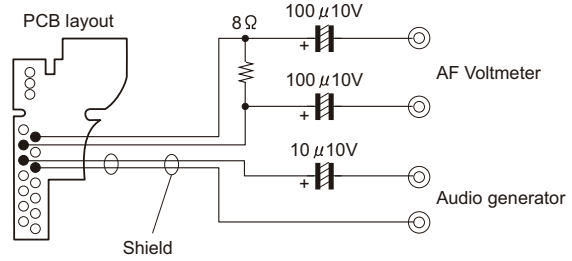
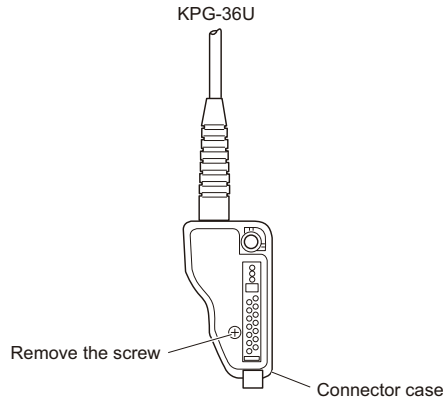


Note: Pin 1 (SSW) and Pin 4 (MSW) are connected to Pin 10 (GND) to active External SP and External MIC.

***PC tuning**

Connect the wires to the PCB in the connector case of interface cable.

For output the wires out of the connector case, need to process the connector case.



4.7 Radio check Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter	Panel	ANT			Check an internal temperature of radio from 20°C to 33°C.	±0.25ppm ±198.3Hz@ 793.05MHz
2-1. High power check (Battery voltage: 7.5V) [700M band]	1)CH-Sig: 1-1 PTT: ON TA: OFF	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less
	2)CH-Sig: 2-1 PTT: ON TA: OFF	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less
	3)CH-Sig: 3-1 PTT: ON TA: OFF	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less
2-2. High power check (Battery voltage: 7.5V) [700M band Talk around]	1)CH-Sig: 1-1 PTT: ON TA: ON	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less
	2)CH-Sig: 2-1 PTT: ON TA: ON	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less
	3)CH-Sig: 3-1 PTT: ON TA: ON	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.0W 2.2A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
2-3. High power check (Battery voltage: 7.5V) [800M band]	1)CH-Sig: 7-1 PTT: ON TA: OFF	1)Test Channel Channel: 7 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
	2)CH-Sig: 8-1 PTT: ON TA: OFF	2)Test Channel Channel: 8 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
	3)CH-Sig: 9-1 PTT: ON TA: OFF	3)Test Channel Channel: 9 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
2-4. High power check (Battery voltage: 7.5V) [800M band Talk around]	1)CH-Sig: 7-1 PTT: ON TA: ON	1)Test Channel Channel: 7 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
	2)CH-Sig: 8-1 PTT: ON TA: ON	2)Test Channel Channel: 8 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
	3)CH-Sig: 9-1 PTT: ON TA: ON	3)Test Channel Channel: 9 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	2.5W~3.5W 2.2A or less
3-1. Low power check (Battery voltage: 7.5V) [700M band]	1)CH-Sig: 1-1 PTT: ON TA: OFF	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	2)CH-Sig: 2-1 PTT: ON TA: OFF	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	3)CH-Sig: 3-1 PTT: ON TA: OFF	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3-2. Low power check (Battery voltage: 7.5V) [700M band talk around]	1)CH-Sig: 1-1 PTT: ON TA: ON	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	2)CH-Sig: 2-1 PTT: ON TA: ON	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	3)CH-Sig: 3-1 PTT: ON TA: ON	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
3-3. Low power check (Battery voltage: 7.5V) [800M band]	1)CH-Sig: 7-1 PTT: ON TA: OFF	1)Test Channel Channel: 7 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	2)CH-Sig: 8-1 PTT: ON TA: OFF	2)Test Channel Channel: 8 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	3)CH-Sig: 9-1 PTT: ON TA: OFF	3)Test Channel Channel: 9 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
3-4. Low power check (Battery voltage: 7.5V) [800M band talk around]	1)CH-Sig: 7-1 PTT: ON TA: ON	1)Test Channel Channel: 7 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	2)CH-Sig: 8-1 PTT: ON TA: ON	2)Test Channel Channel: 8 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
	3)CH-Sig: 9-1 PTT: ON TA: ON	3)Test Channel Channel: 9 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.5W~1.5W 1.4A or less
4. MIC sensitivity check	1)CH-Sig: 1-1 AG: 1kHz PTT: ON	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM	Panel	ANT Univer- sal con- nector			Adjust AG input to get a standard MOD.	12.5mV ±5.8mV

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5-1. Sensitivity check [700M band]	1)CH-Sig: 2-1 SSG output Wide 5k: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Wide 4k: -117dBm (0.32μV) (MOD: 1kHz/±2.4kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	1)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 SSG output Wide 5k: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Wide 4k: -117dBm (0.32μV) (MOD: 1kHz/±2.4kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope Distortion meter 8Ω Dummy load	Panel	ANT Universal connector			Check	12dB SINAD or more
5-2. Sensitivity check [800M band]	1)CH-Sig: 8-1 SSG output Wide 5k: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Wide 4k: -117dBm (0.32μV) (MOD: 1kHz/±2.4kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	1)Test Channel Channel: 8 Test Signaling Mode: Analog Signaling: 1 SSG output Wide 5k: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Wide 4k: -117dBm (0.32μV) (MOD: 1kHz/±2.4kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope Distortion meter 8Ω Dummy load	Panel	ANT Universal connector			Check	12dB SINAD or more

4.8 Common Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage:7.5V 2) SSG standard modulation [Wide 5k] MOD:1kHz,DEV:3kHz [Wide 4k] MOD:1kHz,DEV:2.4kHz [Narrow] MOD:1kHz,DEV:1.5kHz								

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Receive Assist	1) Adj item: [RAST] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA High] Adjust:[****] Press [O] key to store the adjustment value.	[Manual Adjustment] 1) Adj item: [Receive Assist] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA High] Press [Apply All] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	[PC test mode] [Automatic Adjustment] 1) Press [Tune Assist Voltage] button. 2) Press [Apply All] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] [V] indicator on the PC window shows VCO lock voltage. Change the adjustment value to get VCO lock voltage within the limit of the specified voltage. Note: Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.	2.5V±0.1V [Automatic Adjustment] After the automatic adjustment is performed, verify that the VCO lock voltage is within the voltage range which is specified by the manual adjustment. [Manual Adjustment] Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted. Note: The assist adjustment value must be between from 340 to 3550.
3. Transmit Assist	1) Adj item: [TAST] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT: ON Press [O] key to store the adjustment value.	[Manual Adjustment] 1) Adj item: [Receive Assist] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	[PC test mode] [Automatic Adjustment] 1) Press [Tune Assist Voltage] button. 2) Press [Apply All] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] [V] indicator on the PC window shows VCO lock voltage. Change the adjustment value to get VCO lock voltage within the limit of the specified voltage. Note: Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.	2.5V±0.1V [Automatic Adjustment] After the automatic adjustment is performed, verify that the VCO lock voltage is within the voltage range which is specified by the manual adjustment. [Manual Adjustment] Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted. Note: The assist adjustment value must be between from 340 to 3550.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Frequency *1	*The Frequency adjustment can be performed only in PC test mode.	1) Adj item: [Frequency] SSG output: -20dBm (22.4mV) (CW (without modulation)) Caution: Perform the frequency adjustment under the following conditions. • Temperature range of +20°C to +33°C (+68.0°F to +91.4°F). (The temperature is displayed on the Frequency adjustment screen of the KPG-D1/D1N and the LCD of the transceiver.) • Use an accuracy of 0.003ppm for the SSG. (Use a standard oscillator if necessary.)	SSG	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	[PC test mode] Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	[PC test mode] "IF20" value = Within 0±30 digits. The value of "IF20" will become around "0" after the adjustment has finished. Remark: "Frequency" is adjusted under receiving condition with SSG.
5. RTC Correction	1) Adj item: [RTC] Adjust:[****] Press [○] key to store the adjustment value.	1) Adj item: [RTC Correction] Data: {****} Press [Apply] button to store the adjustment value.	Frequency Counter	Panel	TEST POINT (CN709 or CN710)		[Panel tuning mode] [▲],[▼] [PC test mode] [←],[→]	[Panel tuning mode] Press [○] key to store the adjustment value. [PC test mode] Press [Apply] button to store the adjustment value.	Remarks: Change the adjustment value so that the frequency currently displayed on "Crystal Oscillation Frequency" on the PC window and the frequency currently displayed on the frequency counter are in agreement.

4.9 Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Ramp up Offset	1) Adj item: [RAMPU] Adjust:[****] PTT : ON Press [○] key to store the adjustment value.	1) Adj item: [Ramp Up Offset] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel		Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	[PC test mode] 1) Set the adjustment value to "1". 2) Increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "40".	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Ramp down Offset	1) Adj item: [RAMPD] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Ramp Down Offset] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel		Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	[PC test mode] 1) Set the adjustment value to "1". 2) Increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "20".	
3. High transmit power (Battery voltage: 7.5V)	1) Adj item: [An H_PWR] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[***] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	700MHz Band: 2.9W 800MHz Band: 3.0W	700MHz Band: ±0.05W 2.2A or less 800MHz Band: ±0.1W 2.2A or less [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
4. Medium transmit power (Battery voltage: 7.5V)	1) Adj item: [An M_PWR] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[***] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Medium Transmit Power] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Note: Medium transmit power is the purpose of the custom power (adjustment). This power must be lower than High transmit power. In the production, this Medium transmit power is adjusted at same power as Low transmit power.	[PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Low transmit power (Battery voltage: 7.5V)	1) Adj item: [An L_PWR] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[***] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	700MHz Band: 0.95W 800MHz Band: 0.95W	700MHz Band: ±0.1W 1.4A or less 800MHz Band: ±0.1W 1.4A or less [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
6. Balance *1	1) Adj item: [An BAL] Adjust:[****] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[***] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Balance] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	The Deviation of 20Hz frequency is fixed. Change the 2kHz adjustment value to become the same deviation of 20Hz within the specified range. (a supplementary expansion-Another way to adjust is ready. (Same as TK-5400, the old model of NX-5400). Press [AUX(Orange)] key to switch the tone to 100Hz square wave. Then, make the demodulation waveform shown on oscilloscope into square shape.)	2kHz Tone deviation is within ±1.0% of 20Hz tone deviation. [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

*1 : Refer to the "4.9.1 Necessary Deviation adjustment item for each signaling and mode" table.
Balance adjustment is common with the adjustment of all signaling deviations.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Maximum Deviation *2 [Analog Wide 5K]	1) Adj item: [Aw ADEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Maximum Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "496" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 4150Hz and 4250Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	4150~4250Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
[Analog Wide 4K] *2	1) Adj item: [As ADEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [Maximum Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "496" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 3310Hz and 3410Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	3310~3410Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Narrow] *2	1) Adj item: [An ADEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [Maximum Devia- tion (Analog Nar- row)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "488" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 2050Hz and 2150Hz. Deviation meter LPF: 15kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2050~2150Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
*2 : Refer to the "4.9.1 Necessary Deviation adjustment item for each signaling and mode" table. Regarding Maximum Deviation (Analog), it is common with the adjustment of all analog signalings.									
8. P25 High Deviation adjust	1) Adj item: [P1 PDEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [P25 High Devia- tion] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "505" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 2771Hz and 2883Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2771~2883Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. P25 H-CPM Deviation adjust	1) Adj item: [P2 P2DEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [P25 H-CPM Deviation] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "485" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 3090Hz and 3215Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	3090~3215Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
10. NXDN High Deviation adjust [NXDN Narrow]	1) Adj item: [Nn NDEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "505" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 2995Hz and 3117Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2995~3117Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[NXDN Very Narrow]	1) Adj item: [Nv NDEV] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [NXDN High Devia- tion (NXDN Very Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX Low]→ [TX High] [Frequency: 800MHz Band] [TX Low]→ [TX High]→ [RX/TA Low]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write fixed value "503" for each adjustment point. Transmit at each adjustment point and check that the deviation is between 1331Hz and 1363Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	1311~1363Hz [PC test mode] Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
11. QT Deviation *3 [Analog Wide 5k]	1) Adj item: [Aw QT] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [QT Deviation (An- alog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as fol- lowings. 513 (Reference value)	0.75kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Wide 4k]	<p>1) Adj item: [As QT] Adjust:[****]</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.</p>	<p>1) Adj item: [QT Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 405 (Reference value)	0.60kHz±0.05 kHz
[Analog Narrow]	<p>1) Adj item: [An QT] Adjust:[****]</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.</p>	<p>1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 405 (Reference value)	0.35kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. DQT Deviation *3 [Analog Wide 5k]	1) Adj item: [Aw DQT] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 405 (Reference value)	0.75kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DQT] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 405 (Reference value)	0.60kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Narrow]	1) Adj item: [An DQT] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 405 (Reference value)	0.35kHz±0.05 kHz
13. LTR Deviation *3 [Analog Wide 5k]	1) Adj item: [Aw LTR] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [LTR Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	1.00kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Wide 4k]	1) Adj item: [As LTR] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [LTR Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	0.75kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An LTR] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	0.75kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
14. DTMF Deviation *3 [Analog Wide 5k]	1) Adj item: [Aw DTMF] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	2.50kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DTMF] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	2.00kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Narrow]	1) Adj item: [An DTMF] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as fol- lowings. 513 (Reference value)	1.25kHz±0.05 kHz
15. MSK Devia- tion *3 [Analog Wide 5k]	1) Adj item: [Aw MSK] Adjust:[****] 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjust- ment value.	1) Adj item: [MSK Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Devia- tion meter Oscil- lo- scope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as fol- lowings. 513 (Reference value)	3.00kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Wide 4k]	<p>1) Adj item: [As MSK] Adjust:[****]</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.</p>	<p>1) Adj item: [MSK Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	2.40kHz±0.05 kHz
[Analog Narrow]	<p>1) Adj item: [An MSK] Adjust:[****]</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.</p>	<p>1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	1.50kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. CWID Deviation *3 [Analog Narrow]	1) Adj item: [An CWID] Adjust:[****] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Adjust:[****] PTT : ON Press [O] key to store the adjustment value.	1) Adj item: [CWID Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Frequency: 700MHz Band] [RX/TA High]→ [TX High] [Frequency: 800MHz Band] [TX High]→ [RX/TA High] Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [←], [→]	Write the value as followings. 513 (Reference value)	1.00kHz±0.10 kHz
*3: Refer to the "4.9.1 Necessary Deviation adjustment item for each signaling and mode" table.									
17. Battery Warning Level writing	1) Adj item: [BATT] Adjust:[***] PTT: ON	1) Adj item: [Battery Warning Level] Press [Transmit] button.	Power meter DVM	Panel	ANT BATT terminal			Press the PTT switch or [Transmit] button on the PC window. Apply 6.20V to battery terminal. Confirm that one pre-determined numeric in the range 1 to 256 appears. [Panel tuning mode] Press [O] key to store the adjustment value. [PC test mode] Press [Apply] button to store the adjustment value.	
18. Battery Warning Level check	[Panel test mode] 1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting						Check	The transceiver can transmit with causing the LED to blink.

4.9.1 Necessary Deviation adjustment item for each signaling and mode

The following shows the necessary adjustment items for each signaling deviation. Please read the following table like the following example. In the case of the signaling “QT (Analog Wide 5k)”, this signaling is composed of three elements [Balance, Maximum Deviation (Analog Wide 5k) and QT Deviation (Analog Wide 5k)]. Please adjust Balance and Maximum Deviation (Analog Wide 5k) before adjusting QT Deviation (Analog Wide 5k).

Mode	Signaling	Necessary adjustment and order			
		Wide 5k	Wide 4k	Narrow	Very Narrow
Analog	Audio	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow]	-
	QT	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. QT Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. QT Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. QT Deviation [Analog Narrow]	-
	DQT	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. DQT Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. DQT Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DQT Deviation [Analog Narrow]	-
	LTR	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. LTR Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. LTR Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. LTR Deviation [Analog Narrow]	-
	DTMF	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. DTMF Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. DTMF Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DTMF Deviation adjust [Analog Narrow]	-
	MSK (Fleet sync)	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. MSK Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. MSK Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. MSK Deviation [Analog Narrow]	-
	P25	-	-	1. Balance 2. P25 High Deviation 3. P25 High Deviation (H-CPM)	-
NXDN	Audio	-	-	1. Balance adjust 2. Maximum Deviation [NXDN Narrow]	1. Balance adjust 2. Maximum Deviation [NXDN Very Narrow]
	CWID	-	-	-	1. Balance adjust 2. Maximum Deviation [NXDN Very Narrow] 3. CWID Deviation [NXDN Very Narrow]

- Balance is common with all the above deviation adjustments. If Balance (Transmitter Section 6) has already adjusted, please skip Step1 and adjust from Step2.
- Maximum Deviation (Analog Wide 5k/Wide 4k/Narrow) is common with all the analog signaling deviations and CWID Deviation (NXDN Very Narrow). If Balance and Maximum Deviation (Analog Wide 5k/Wide 4k/Narrow) (Transmitter Section 7) have already adjusted, please skip Step2 and adjust from Step3.

4.10 Receiver Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	[Panel test mode] 1) CH-Sig: 1-1 SSG output: -47dBm (1mV) (MOD: 1kHz/ ±1.5kHz)	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 SSG output: -47dBm (1mV) (MOD:1kHz/ ±1.5kHz)	SSG DVM AF VTVM Dummy load	Panel	ANT Uni- versal con- nector	Panel	Vol- ume knob	Turn the Volume knob to obtain 0.90V AF output.	0.90V ±0.1V
2. RSSI reference	1) Adj item: [An RRSSI] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level -3dB (MOD:1kHz/ ±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level -3dB (MOD:1kHz/ ±1.5kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
3. Open Squelch [Analog Wide 5k]	1) Adj item: [Aw SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±3kHz)	1) Adj item: [Open Squelch (Analog Wide 5k)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±3kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Wide 4k]	1) Adj item: [As SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±2.4kHz)	1) Adj item: [Open Squelch (Analog Wide 4k)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±2.4kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±1.5kHz)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[P25 (C4FM)]	1) Adj item: [P1 SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -1dB (MOD:1kHz/ ±2.2kHz)	1) Adj item: [Open Squelch (P25 C4FM)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -1dB (MOD:1kHz/ ±2.2kHz)	SSG Distortion meter Oscilloscope	Panel	ANT Universal connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equip-ment	Unit	Ter- minal	Unit	Parts	Method	
[P25 (LSM)]	1) Adj item: [P1 SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:1kHz/ ±3.3kHz)	1) Adj item: [Open Squelch (P25 LSM)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Ana- log Narrow -3dB (MOD:1kHz/ ±3.3kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[NXDN Narrow]	1) Adj item: [Nn SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -1dB (MOD:400Hz/ ±2.5kHz)	1) Adj item: [Open Squelch (NXDN Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Ana- log Narrow -1dB (MOD:400Hz/ ±2.5kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Analog Narrow -3dB (MOD:400Hz/ ±1.2kHz)	1) Adj item: [Open Squelch (NXDN Very Nar- row)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output:12dB SINAD level at Ana- log Narrow -3dB (MOD:400Hz/ ±1.2kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Condition		Measurement			Adjustment			Specifications/Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Low RSSI	1) Adj item: [An LRSSI] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -118dBm(0.28μV) (MOD:1kHz/ ±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -118dBm(0.28μV) (MOD:1kHz/ ±1.5kHz)	SSG	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
5. High RSSI	1) Adj item: [An HRSSI] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -80dBm(22.4μV) (MOD:1kHz/ ±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: -80dBm(22.4μV) (MOD:1kHz/ ±1.5kHz)	SSG	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
6. Tight Squelch [Analog Wide 5k]	1) Adj item: [Aw SQLT] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±3kHz)	1) Adj item: [Tight Squelch (Ana- log Wide 5k)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±3kHz)	SSG Distor- tion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equip-ment	Unit	Ter-minal	Unit	Parts	Method	
[Analog Wide 4k]	1) Adj item: [As SQLT] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±2.4kHz)	1) Adj item: [Tight Squelch (Ana- log Wide 4k)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±2.4kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQLT] Adjust:[***] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±1.5kHz)	1) Adj item: [Tight Squelch (Ana- log Narrow)] 2) Adj item: [Frequency: 700MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] [Frequency: 800MHz Band] [RX/TA Low]→ [RX/TA Center]→ [RX/TA High] SSG output: 12dB SINAD level at Analog Narrow +6dB(MOD:1kHz/ ±1.5kHz)	SSG Distortion meter Oscillo- scope	Panel	ANT Uni- versal con- nector	Panel		[Panel tuning mode] After input signal from SSG, press [O] key to store the adjustment val- ue. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	

SECTION 5 TROUBLESHOOTING

5.1 Fault Diagnosis of the BGA (Ball Grid Array) IC

■Overview:

A flowchart for determining whether or not the transceiver can be powered on (the LCD does not function even if the power switch is turned on) due to broken BGA parts.

■BGA parts:

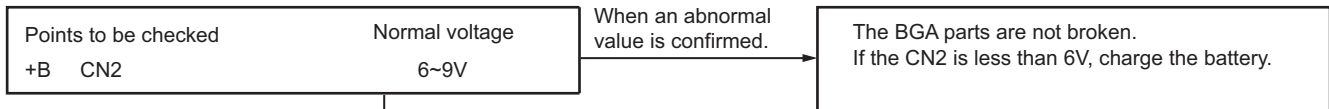
MPU/DSP (IC702), mobile DDR (IC703), Flash memory (IC705)

When the BGA IC is problematic, please bring the printed circuit board (XC1-0321-81) in for service. Various ESN/ default adjustment values are written on the printed circuit board for service.

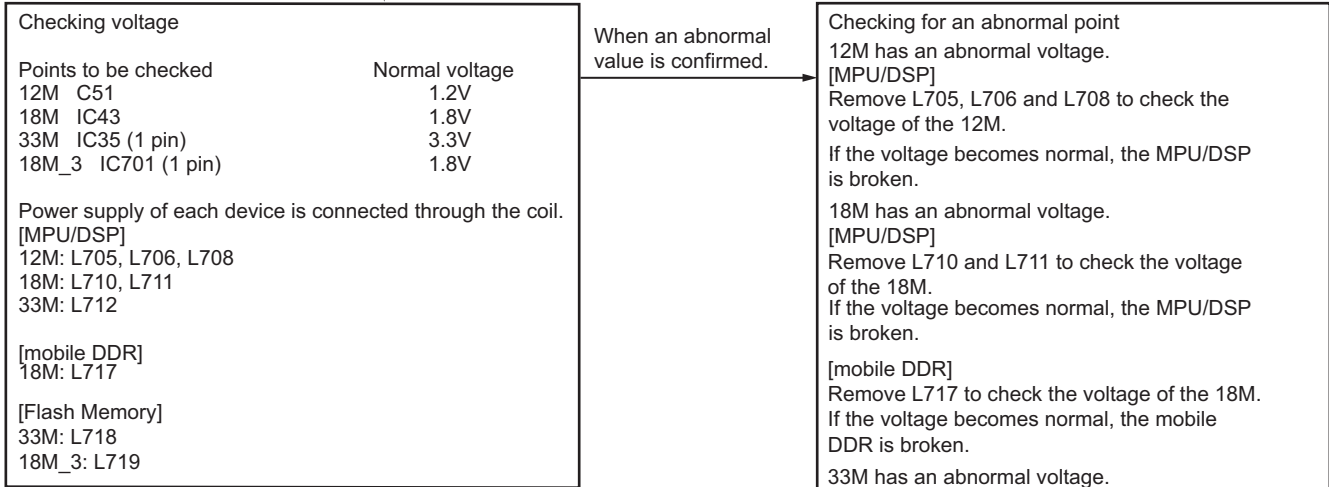
Additionally various ESN stickers are included. (Please refer to "5.3 Replacing Main Unit".)

After the printed circuit board has been readjusted, please attach any ESN stickers to the chassis. When "ESN Validation" is used, you must modify the ESN register.

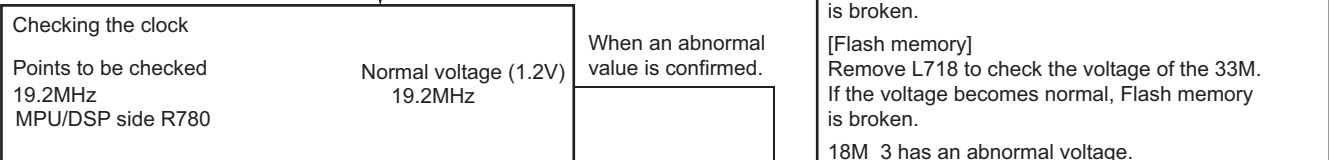
- Checking battery voltage



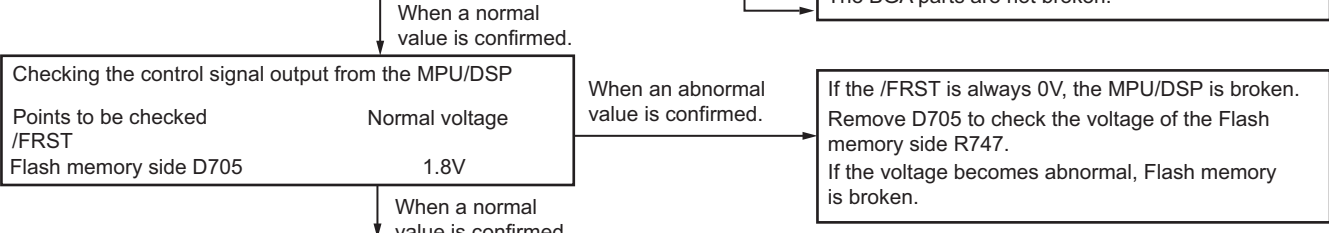
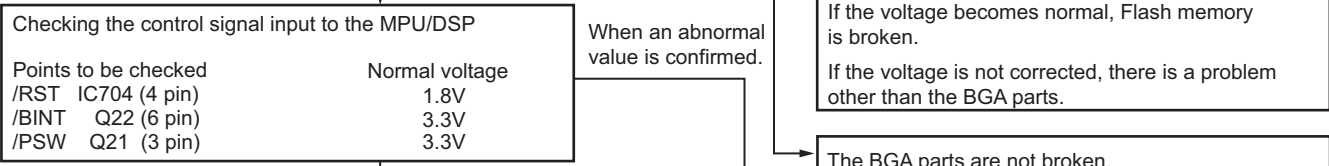
- Checking power supply voltage

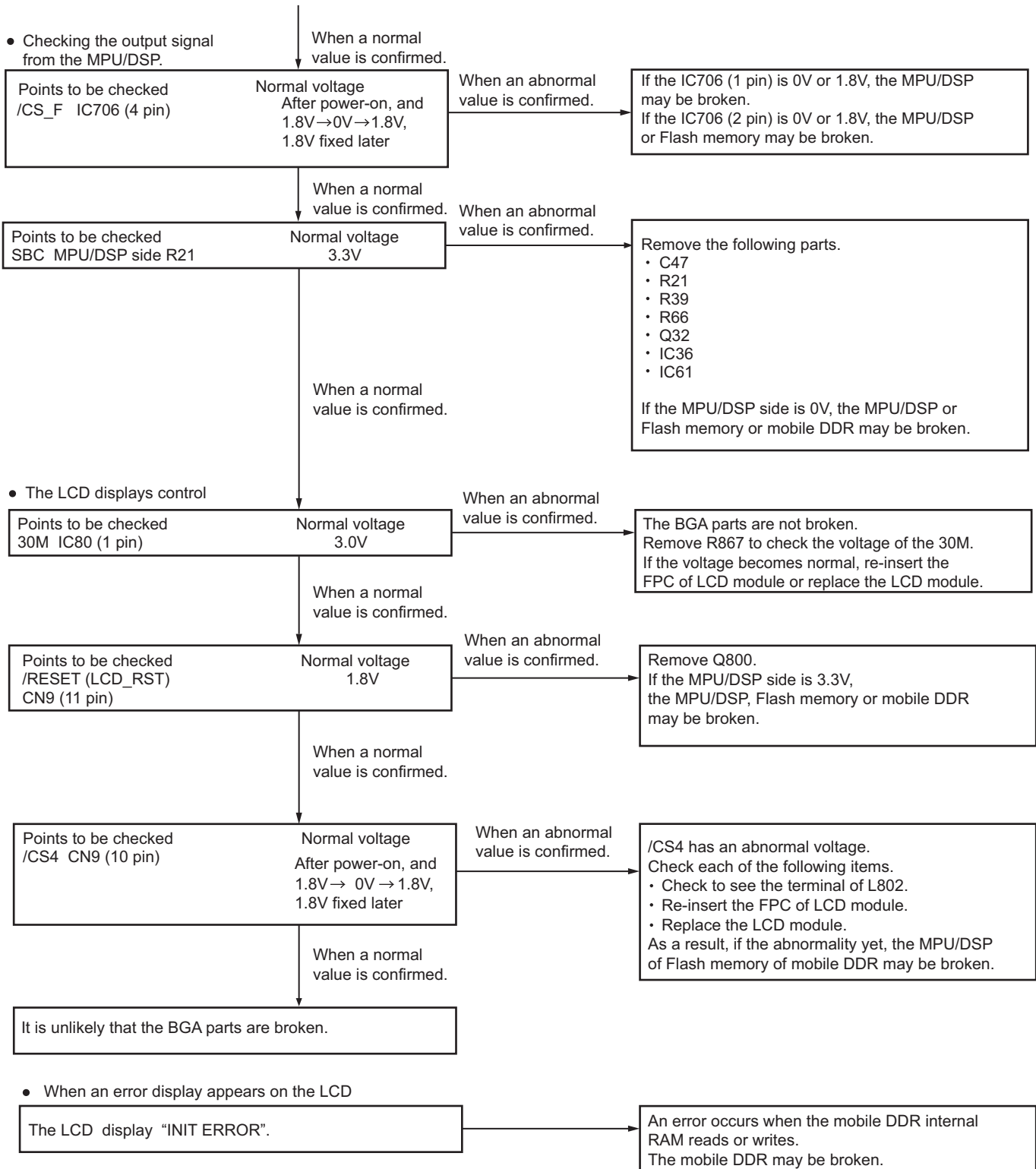


- Checking the clock



- Checking the Reset/Control signal





■ Descriptions of signal names

1) /RST	: MPU/DSP reset signal	LOW → Reset
2) /BINT	: Battery final voltage monitoring	LOW → Final voltage
3) /PSW	: Power switch signal	LOW → ON
4) /FRST	: Flash memory reset signal	LOW → Reset
5) /CS_F	: Flash memory chip select signal	LOW → Active
6) SBC	: Switch +B control	HIGH → ON
7) 30M	: LCD module control 3.0V power supply	
8) /RESET (LCD_RST)	: LCD reset signal	LOW → Reset
9) /CS4	: LCD controller chip select signal	LOW → Active

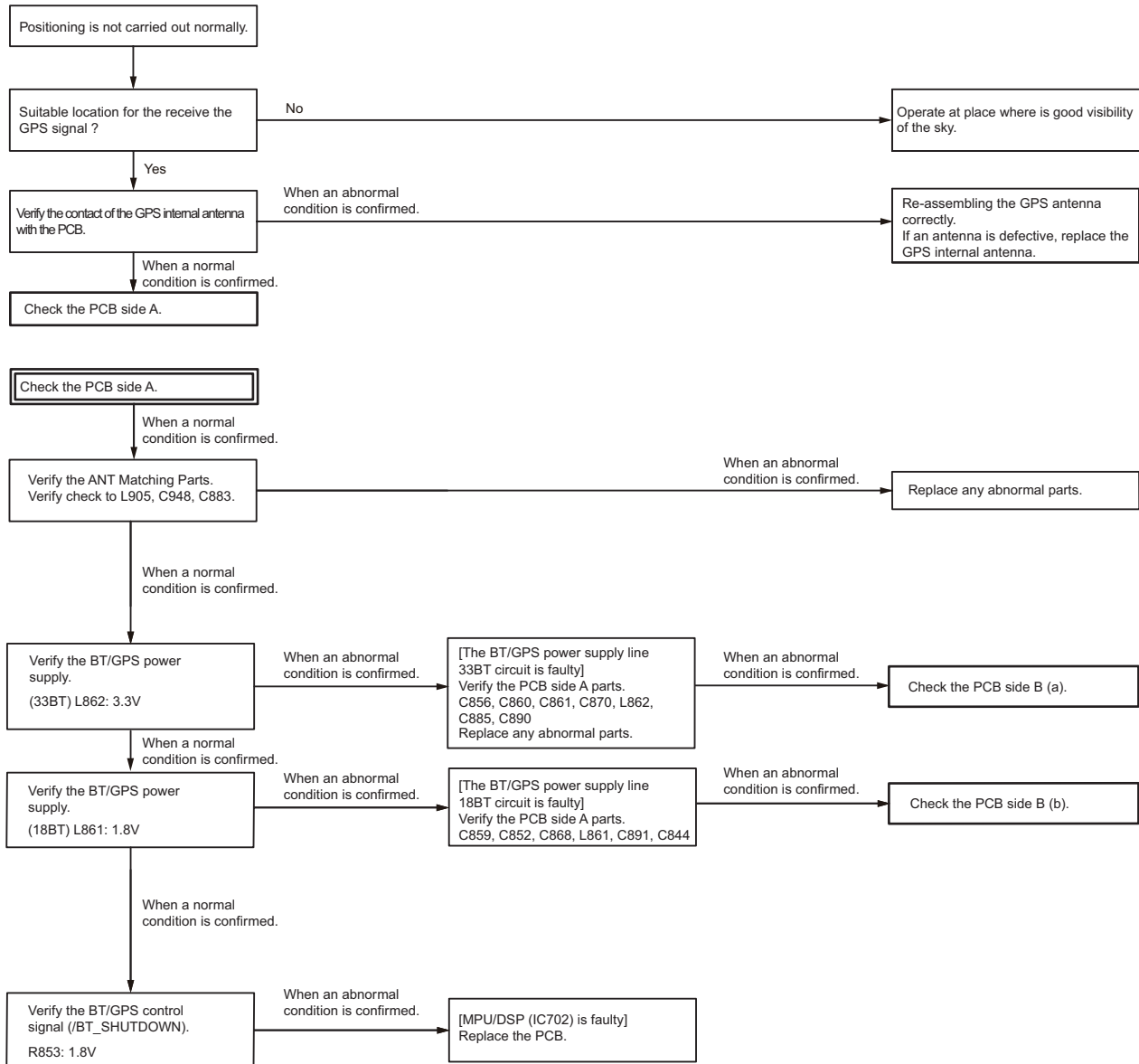
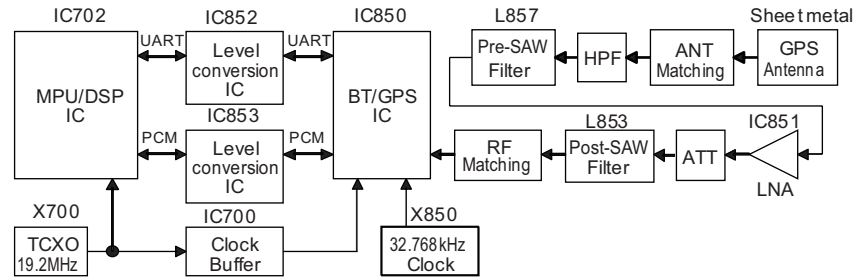
5.2 Failure diagnosis of the GPS section

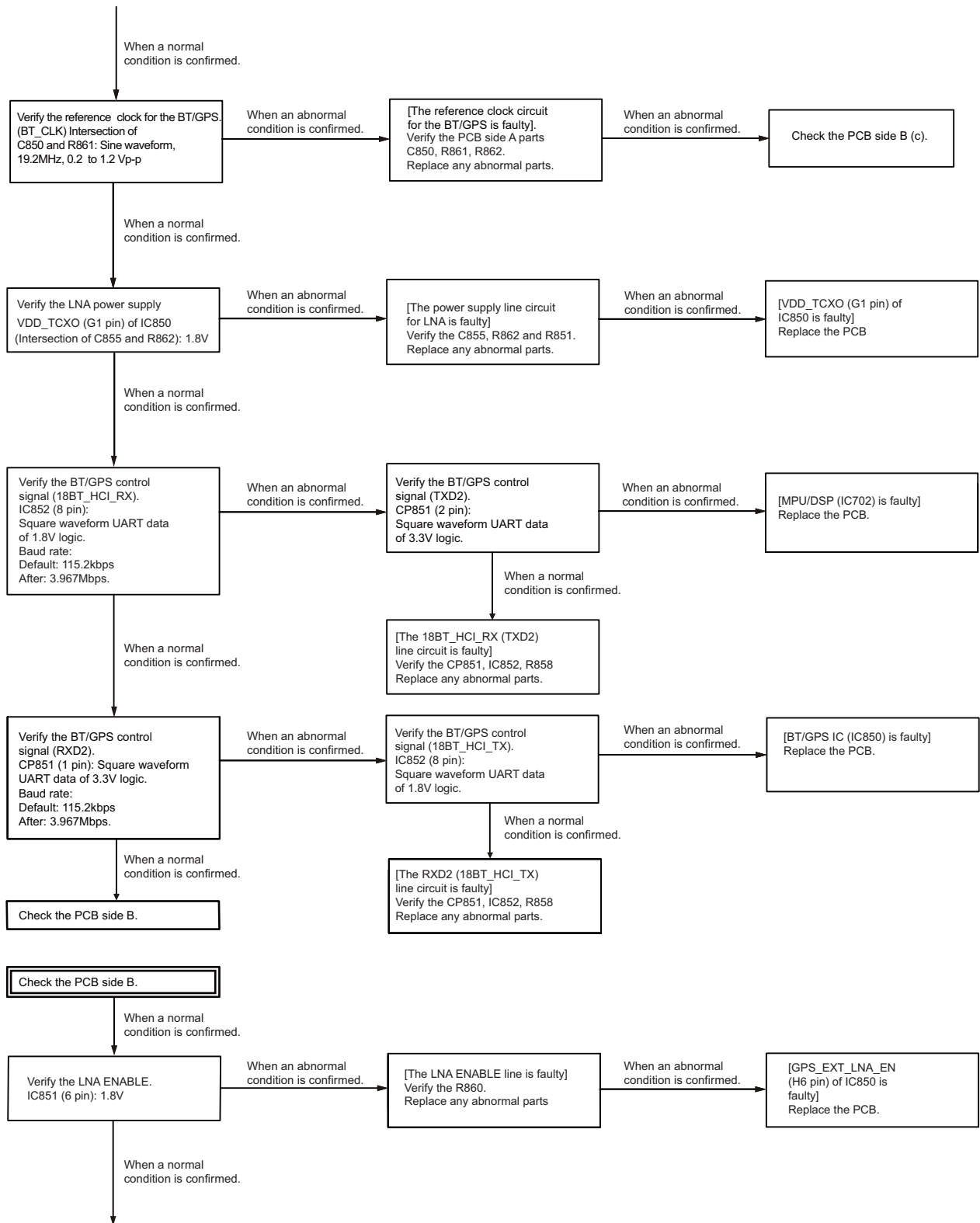
■ Overview:

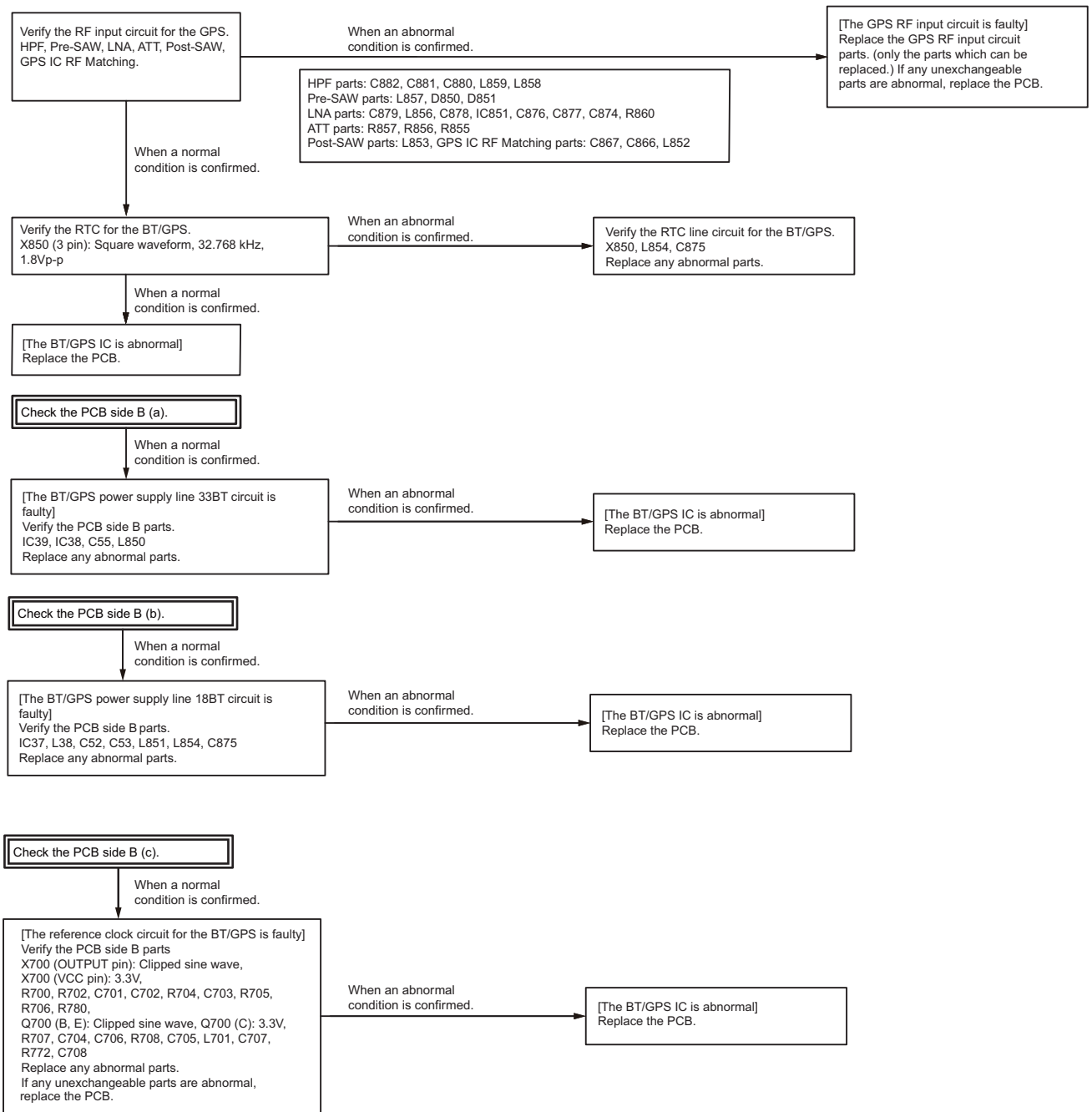
When the GPS function does not operate, use this flowchart to determine the problem.

Major parts for a GPS circuit

- GPS antenna (Connect on CN907)
- LNA IC (IC851)
- Pre-SAW Filter (L857)
- Post-SAW Filter (L853)
- Bluetooth/GPS IC (IC850)
- Level conversion IC (IC852, IC853)
- TCXO 19.2MHz (X700)
- Clock Buffer (IC700)
- 32.769 KHz clock (X850)
- 33BT Regulator (IC38)
- 18BT Regulator (IC37)
- MPU/DSP IC (IC702)







■ Descriptions of signal names

- 1) 33BT: BT/GPS IC 3.3V power supply
- 2) 18BT: BT/GPS IC 1.8V power supply
- 3) TXD2: BT/GPS serial data line connected to UART TX of MPU/DSP IC (MPU/DSP to BT/GPS IC)
- 4) RXD2: BT/GPS serial data line connected to UART RX of MPU/DSP IC (MPU/DSP to BT/GPS IC)
- 5) 18BT_HCI_RX: BT/GPS serial data line connected to UART RX of BT/GPS IC (MPU to BT/GPS IC)
- 6) 18BT_HCI_TX: BT/GPS serial data line connected to UART TX of BT/GPS IC (BT/GPS IC to MPU)
- 7) /BT_SHUTDOWN: BT/GPS active control of MPU/DSP IC (MPU/DSP to BT/GPS IC) High → Active, Low → Reset

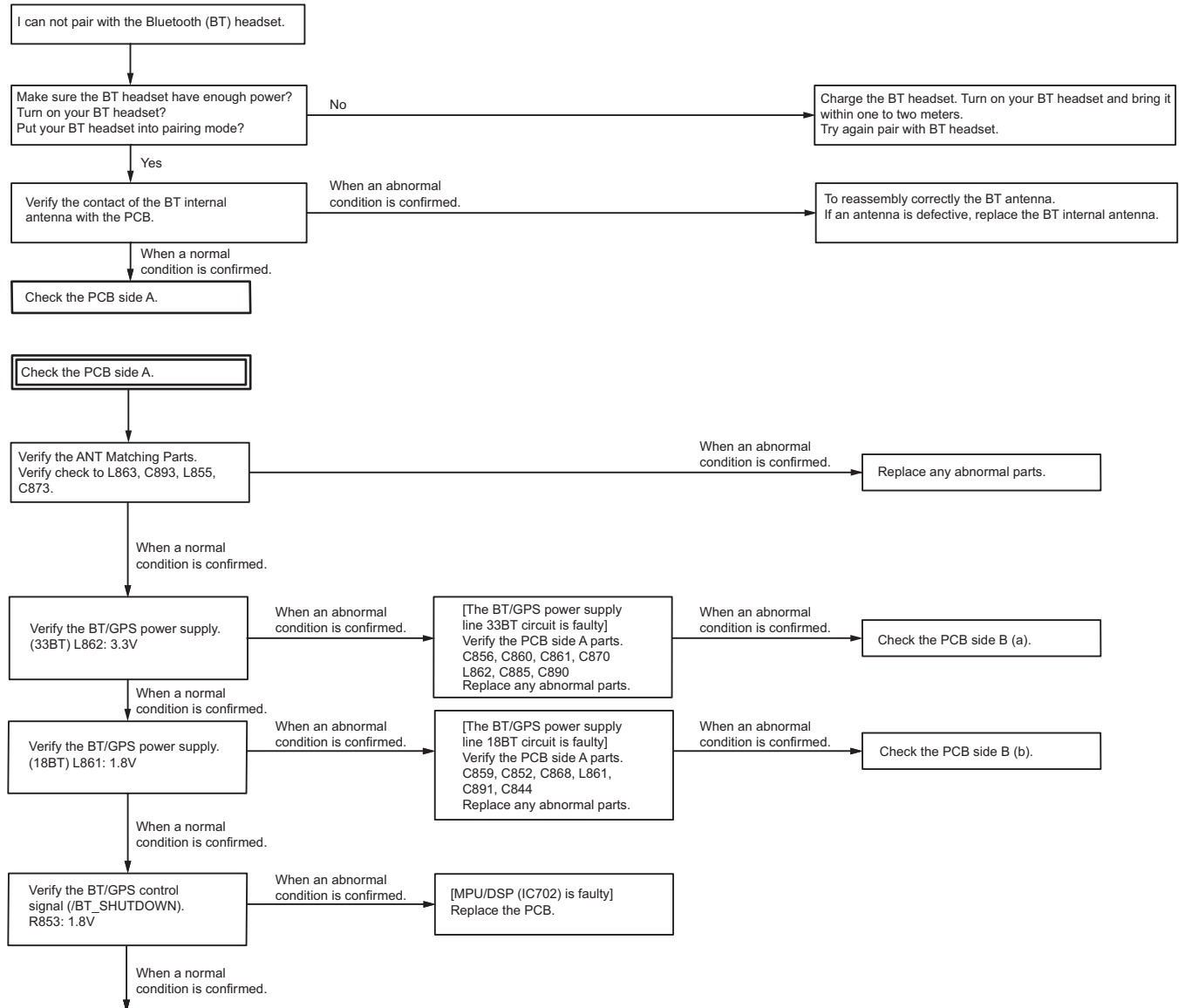
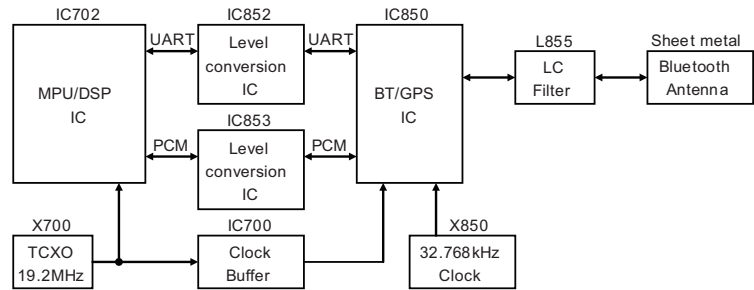
5.3 Failure diagnosis of the Bluetooth section

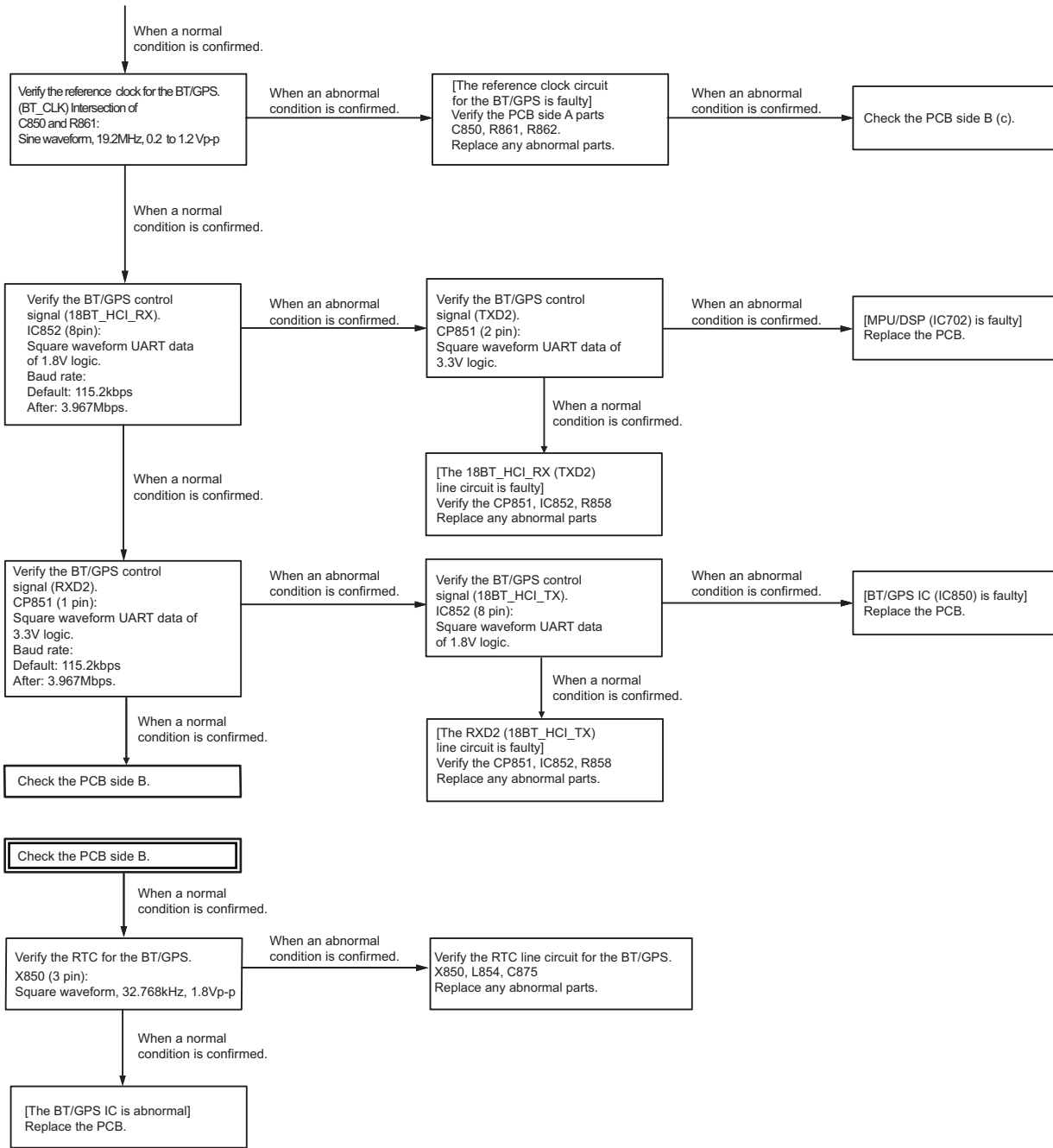
■Overview:

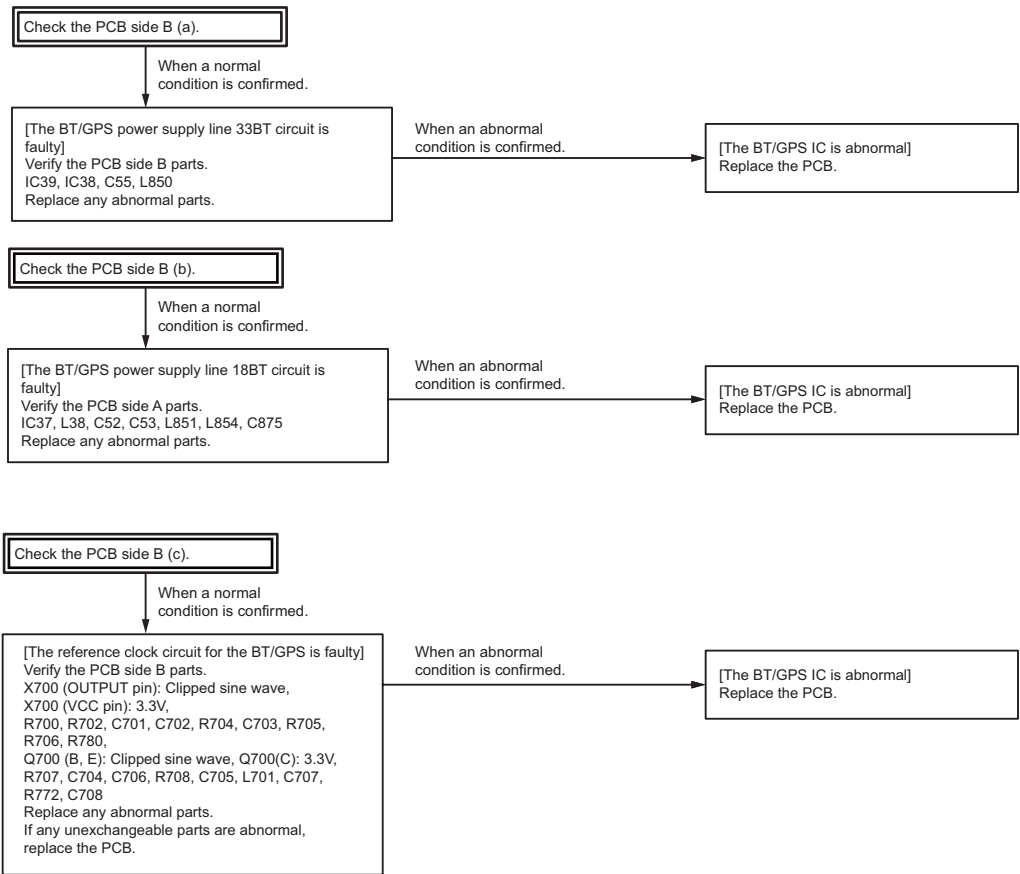
When the Bluetooth function does not operate, use this flowchart to determine the problem.

Major parts for a Bluetooth circuit

- Bluetooth antenna (Connect on CN909)
- LC filter (L855)
- Bluetooth/GPS (IC850)
- Level conversion IC (IC852, IC853)
- TCXO 19.2MHz (X700)
- Clock Buffer (IC700)
- 32.768kHz clock (X850)
- 33BT Regulator (IC38)
- 18BT Regulator (IC37)
- MPU/DSP IC (IC702)







■ Descriptions of signal names

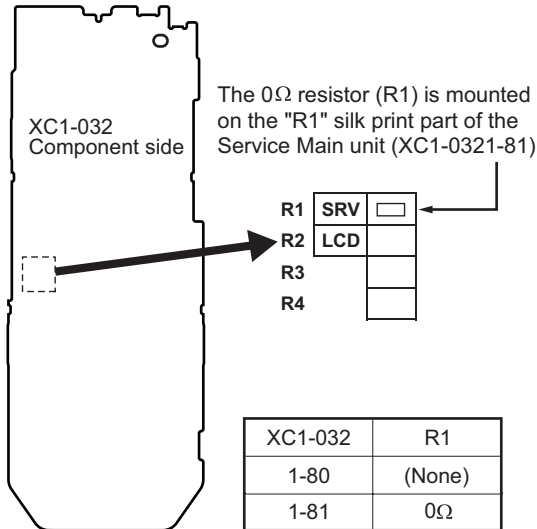
- 1) 33BT: BT/GPS IC 3.3V power supply
- 2) 18BT: BT/GPS IC 1.8V power supply
- 3) TXD2: BT/GPS serial data line connected to UART TX of MPU/DSP IC (MPU/DSP to BT/GPS IC)
- 4) RXD2: BT/GPS serial data line connected to UART RX of MPU/DSP IC (MPU/DSP to BT/GPS IC)
- 5) 18BT_HCI_RX: BT/GPS serial data line connected to UART RX of BT/GPS IC (MPU to BT/GPS IC)
- 6) 18BT_HCI_TX: BT/GPS serial data line connected to UART TX of GPS IC (BT/GPS IC to MPU)
- 7) /BT_SHUTDOWN: BT/GPS active control of MPU/DSP IC (MPU/DSP to BT/GPS IC) High → Active, Low → Reset

5.4 Replacing Main Unit

■Main unit information

Model Name	Original Main unit Number	For Service Main unit Number
NX-5400	XC1-0321-80	XC1-0321-81

■Method of confirming “Original Main unit” and “Service Main unit”



Note:

- The 0Ω resistor (R1) is used to differentiate the destination with a visual check. These are not connected with any PCB pattern; they are specifically for production control. There is no need to change the mount of these resistors.
- There is no difference between the schematic diagram of the Service Main unit (XC1-0321-81) and the schematic diagram of the original Main unit (XC1-0321-80). (R1 is connected with GND (ground) only.)

■Supplied Accessories of “Service Main unit”

Item (Including Parts Number)	Quantity
Main Unit (XC1-032)	1
KENWOOD ESN/ NXDN ESN/ Product Number/ MPT ESN/P25 ESN Label	1

■“Service Main unit” Data

The following data is written on the service unit:

Data Type	Description
Firmware	NX-5400 Firmware.
FPU Data (PC programming mode)	XC1-032 (NX-5400) F2, K2 type data.
Various Adjustment Data (PC Test mode)	General adjustment values for the XC1-032 (NX-5400).
KENWOOD ESN	Model name: [XC1-032] NX-5400S Type: F2 The same number as the KENWOOD ESN label is written.
NXDN ESN/ MPT ESN/ Product number/ P25 ESN	The same number as the NXDN ESN/ MPT ESN/Product Number/P25 ESN label is written.

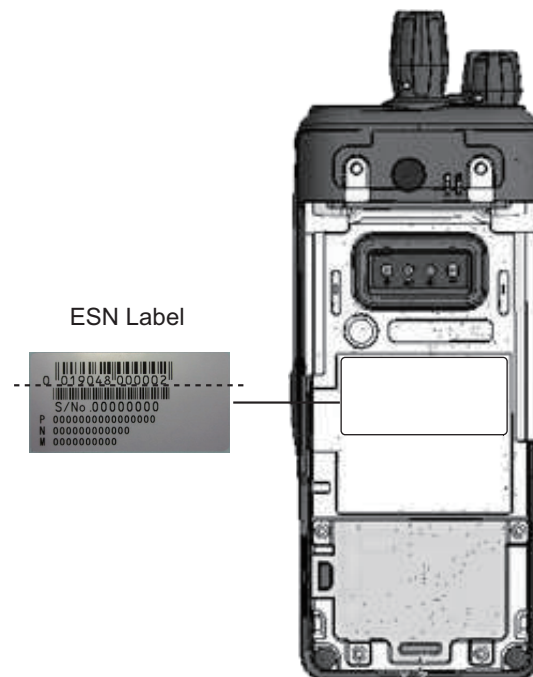
■After Changing the PCB

- (1) After changing the printed circuit board, write the up-to-date Firmware following the instructions in the “5.2 REALIGNMENT - 5.2.6 Firmware Programming Mode”.
 - Write the Firmware in accordance to the Market. If you write different Market Firmware, there are times communication with the FPU is not possible.
- (2) Using the KPG-D1/D1N, select your desired item (Model Name and Frequency) from the Model> Product Information menu, then use Program> Write Data to the Transceiver to write the FPU data (PC Programming mode). When writing to the transceiver, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
- (3) Enter Program> Test Mode, then adjust the various adjustment data (PC Test Mode) as described in the “SECTION 4 ADJUSTMENT”.
- (4) Attach the new labels corresponding to the new printed circuit board. (Refer to the images below for label placement.)
- (5) If necessary, write the FPU data used by the customer with the KPG-D1/D1N.

Note:

- When using the ESN Validation function of NXDN Trunking, the NXDN ESN number changes when the circuit board is changed (the number is written on the circuit board); the NXDN Trunking System cannot be accessed. Use the KPG-110SM on the NXDN Trunking System side to reprogram the NXDN ESN number.
- When a new printed circuit board is used, the KENWOOD ESN changes, as does the Transceiver Information display of the KPG-D1/D1N, but this does not have any effect on the operation of the transceiver.
- If changing to the original ESN, please contact our service center.

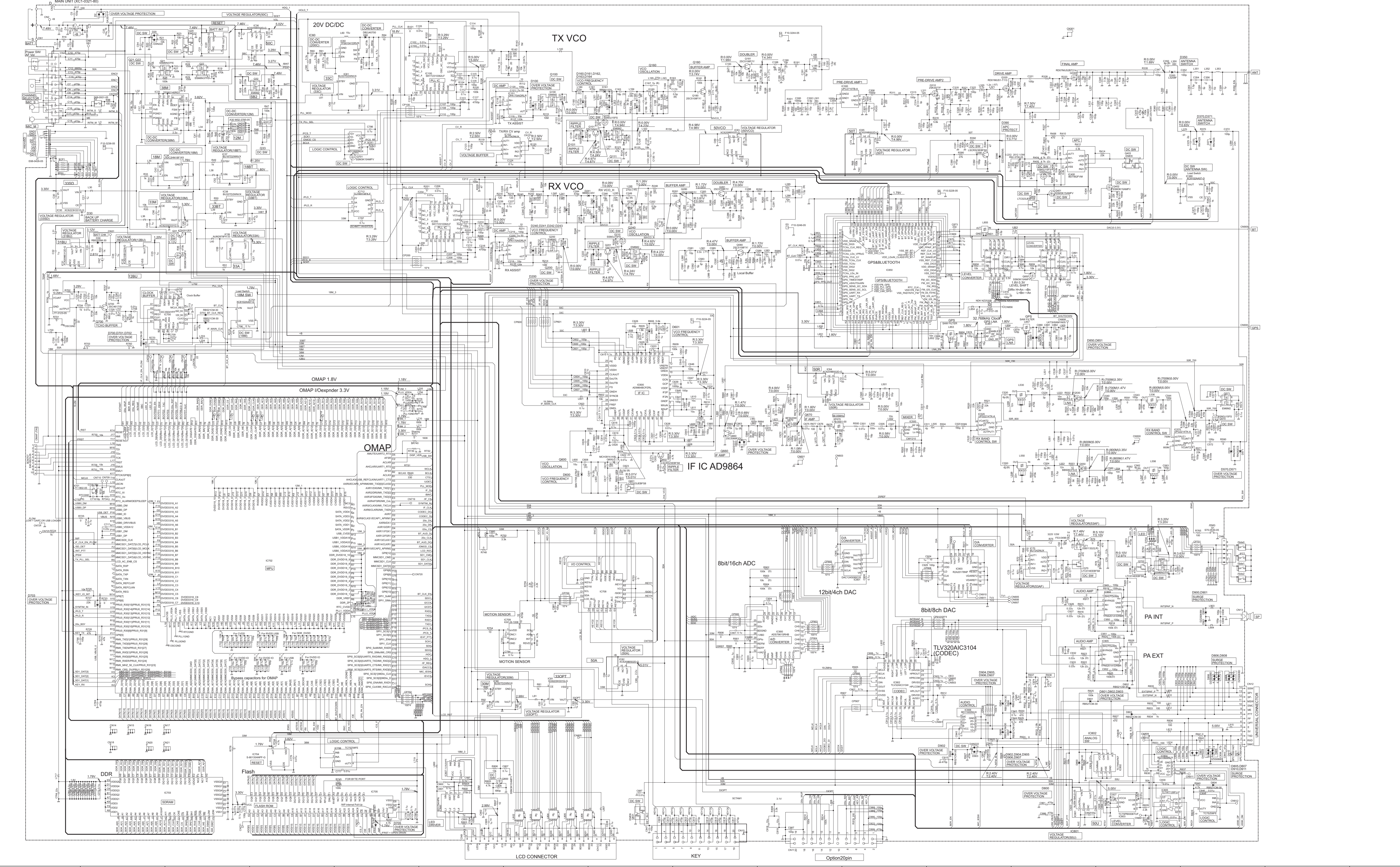
■ESN Label Layout



Note:

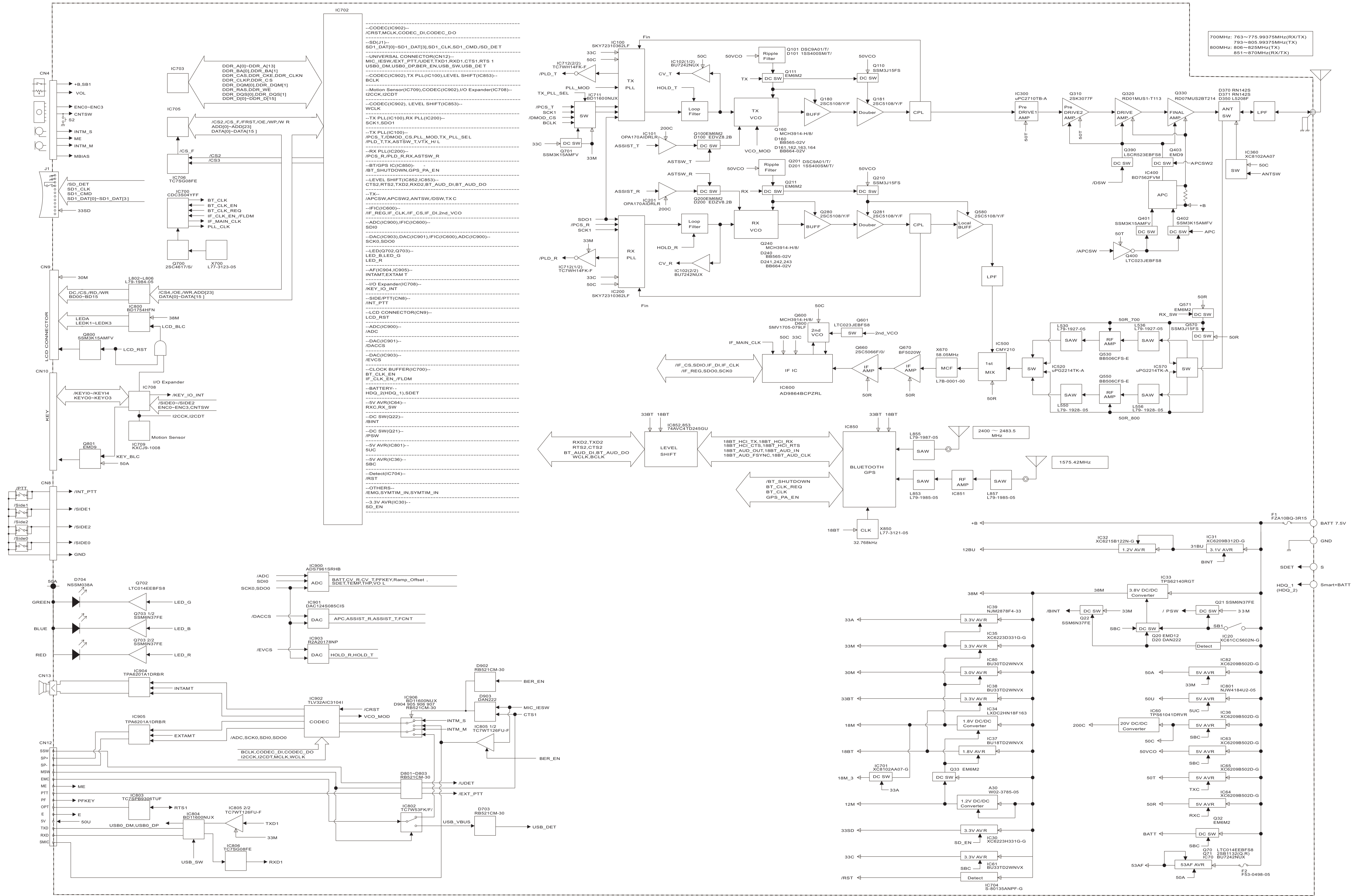
Cut a UPC code and UPC barcode at dotted line.

MAIN UNIT (XC1-0321-80)



BLOCK DIAGRAM

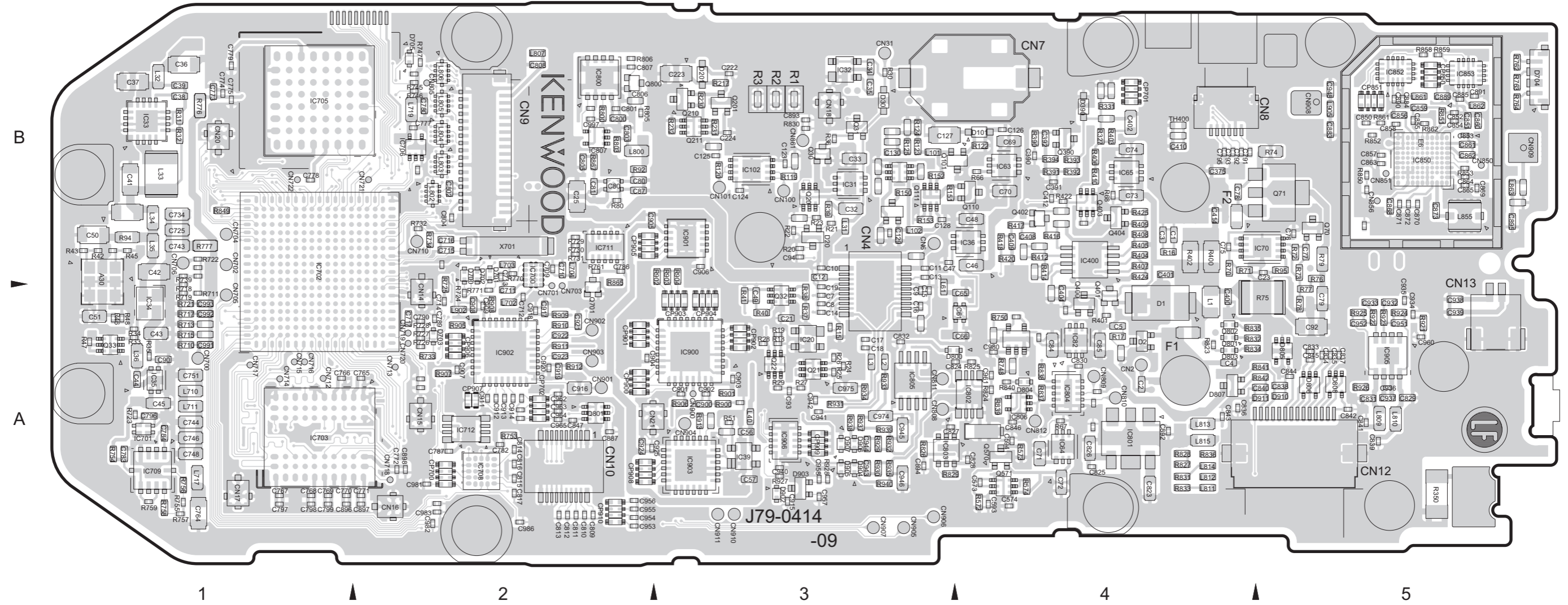
MAIN UNIT (XC1-0321-80)



PRINTED CIRCUIT BOARD

■ MAIN UNIT (XC1-0321-80)

--- Component side view (J79-0414-09) ---



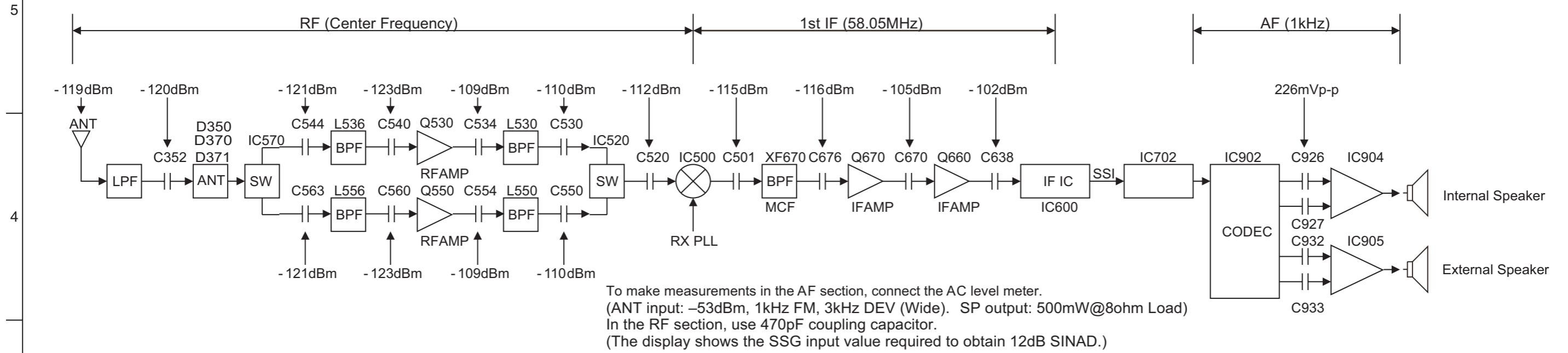
■ MAIN UNIT (XC1-0321-80)

--- Foil side view (J79-0414-09) ---

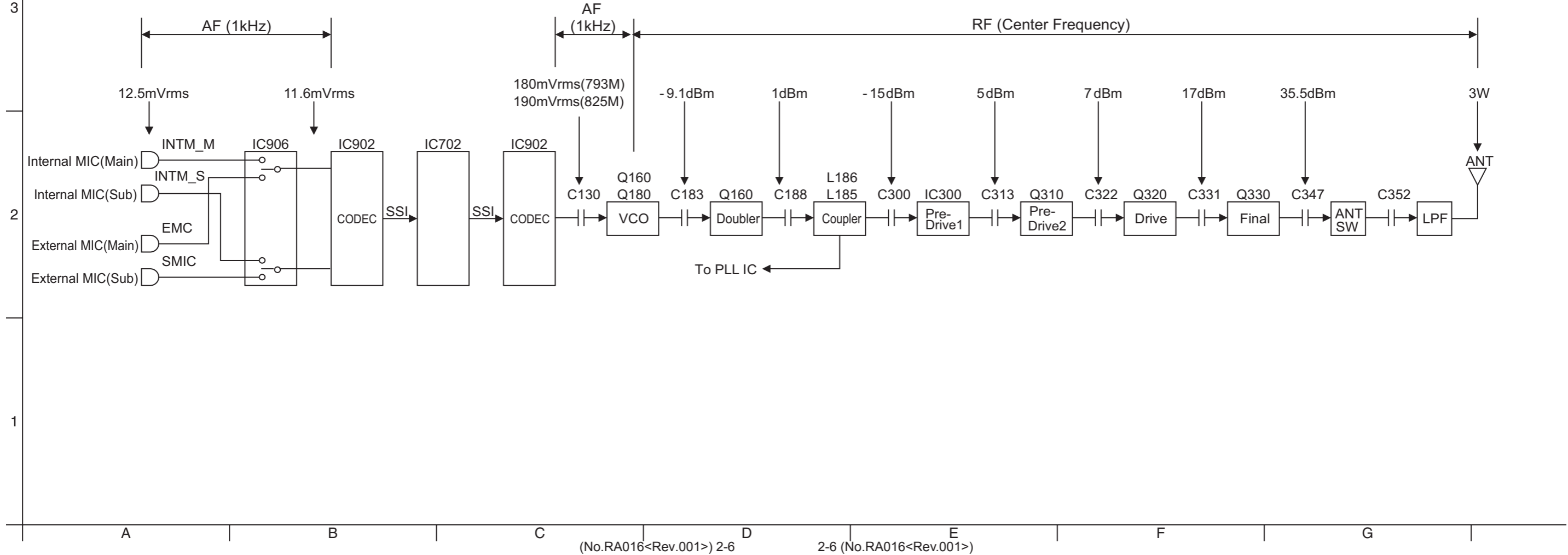


LEVEL DIAGRAM

Receiver Section



Transmitter Section



PARTS LIST

[NX-5400]

* SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

* BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine parts be used.

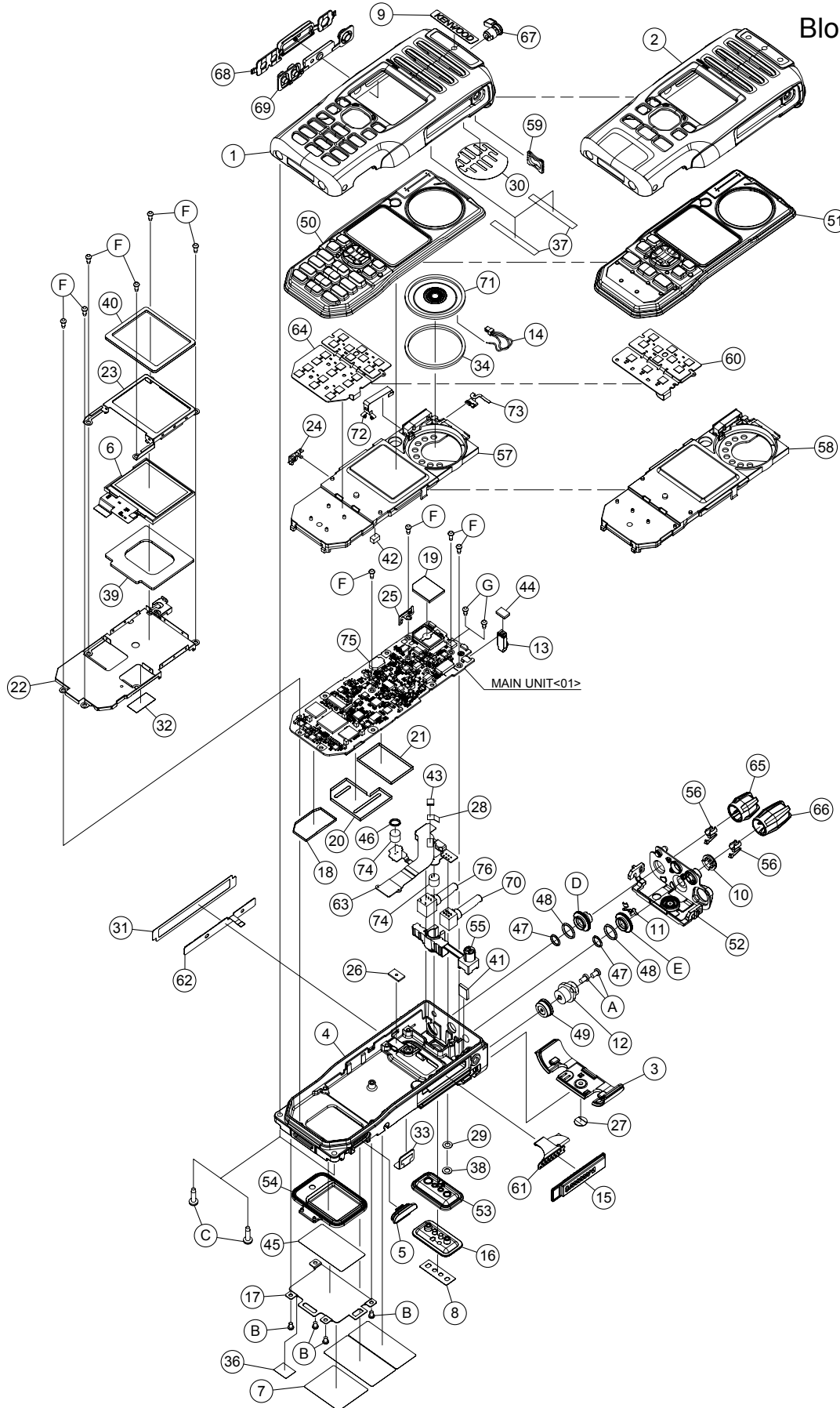
* (x_) in a description column shows the number of the used part.

- Contents -

Exploded view of general assembly and parts list	3-2
Electrical parts list	3-5
Packing materials and accessories parts list	3-15

Exploded view of general assembly and parts list

Block No.M1MM



General assembly

Block No. [M][1][M][M]

△ Symbol No.	Part No.	Part Name	Description	Local
1	A0C-0001-00	PLASTIC CABINET(FULL KEY)		F3,K3
2	A0C-0002-00	PLASTIC CABINET(STANDARD KEY)		F2,K2
3	A8A-0005-00	REAR PANEL		
4	A1A-0005-00	CHASSIS		
5	B0K-0024-00	CAP(SD)		
6	B38-0960-05	LCD ASSY		
7	B4B-0006-00	CAUTION STICKER		
8	B4C-0105-00	TERMINAL STICKER		
9	B4D-0002-00	KENWOOD BADGE		
10	D32-0454-04	STOPPER(16CH)		
11	D3C-0001-10	STOPPER(CIRCULAR NUT)		
12	E04-0467-15	RF COAXIAL RECEPTACLE(SMA)		
13	E2D-0003-00	TERMINAL(ANT)		
14	E3H-0007-00	LEAD WIRE WITH CONNECTOR(SP)		
15	E58-0532-05	RECTANGULAR RECEPTACLE(14P)		
16	E7C-0001-00	TERMINAL BLOCK		
17	F0G-0005-00	COVER(OP BOARD)		
18	F10-3223-05	SHIELDING COVER(IF)		
19	F10-3227-05	SHIELDING COVER(GPS)		
20	F10-3243-15	SHIELDING COVER(VCO TX)		
21	F10-3245-15	SHIELDING COVER(VCO RX)		
22	F1B-0005-00	SHIELDING CASE(OMAP)		
23	F1B-0006-00	SHIELDING COVER(LCD)		
24	G0B-0031-00	EARTH SPRING(KEY FPC)		
25	G0B-0032-00	EARTH SPRING(XC1)		
26	G11-4090-14	SHEET(COOLING)		
27	G11-4440-04	SHEET(LEAK COVER)		
28	G11-4459-04	SHEET(VOL CH FPC)		
29	G11-4500-04	SHEET(LEAK)		
30	G1A-0001-00	FIBROUS SHEET		
31	G1B-0016-00	SHEET(PTT)		
32	G1B-0031-00	SHEET(LI BATT INSULATING)		
33	-----	SHEET(VOID/CABINET)		
34	G1B-0045-10	RUBBER CUSHION(SP)		
36	-----	SEAL(VOID/OP BOARD)		
37	G1B-0074-00	SHEET(CABINET)	(x2)	
38	G1B-0087-00	SHEET(LEAK)		
39	G1D-0008-00	CUSHION(LCD/BACK)		
40	G1D-0009-00	CUSHION(LCD/FRONT)		
41	G1D-0010-00	CUSHION(ANT TERMINAL)		
42	G1D-0021-00	CUSHION(20KEY CONN)		
43	G1D-0025-00	CUSHION(VOL/FPC)		
44	G1D-0041-00	CUSHION(ANT TERMINAL SIDE A)		
45	G1D-0062-00	CUSHION(OP BOARD COVER)		
46	G53-1768-04	PACKING(ECM)		F2,K2
47	G53-1792-04	PACKING(VOL)	(x2)	
48	G53-2206-04	O RING(CIRCULAR NUT)	(x2)	
49	G53-2207-04	PACKING(ANT)		
50	G5D-0002-00	PACKING(FULL KEY)		F3,K3
51	G5D-0003-00	PACKING(STANDARD KEY)		F2,K2
52	G5D-0005-00	PACKING(TOP)		
53	G5D-0006-00	PACKING(TERMINAL BLOCK)		
54	G5D-0007-00	PACKING(OP BOARD)		
55	G5D-0018-00	PACKING(VOL/2ECM)		
56	G09-0443-14	KNOB SPRING(VOL/SELECTOR)	(x2)	
57	J1K-0004-00	HOLDER(FULL KEY)		F3,K3
58	J1K-0005-00	HOLDER(STANDARD KEY)		F2,K2
59	J3K-0003-00	SPACER(2CH)		
60	J8C-0001-00	FLEX PRINTED BOARD(STANDARD KEY)		F2,K2
61	J87-0056-05	FPC(UNIVERSAL)		
62	J87-0057-05	FPC(PTT)		
63	J87-0058-05	FPC(VOL/SELECTOR/ECM)		
64	J87-0059-05	FPC(FULL KEY)		F3,K3
65	K2K-0011-00	KNOB(VOL)		
66	K2K-0012-00	KNOB(16CH)		
67	K2K-0013-00	KNOB(2CH)		
68	K2K-0014-00	KNOB(PTT)		
69	K2K-0015-00	BUTTON KNOB(PTT)		
70	S6A-0004-00	ROTARY SWITCH		
71	T0H-0002-00	SPEAKER		
72	T9A-0001-00	ANTENNA ELEMENT(GPS)		
73	T9A-0004-00	ANTENNA ELEMENT(BLUETOOTH)		
74	T9B-0004-00	MIC ELEMENT	(x2)	
75	W09-0971-05	LITHIUM CELL		
76	R31-0692-05	VARIABLE RESISTOR		
A	N09-2438-05	BINDING HEAD SCREW(ANT)	(x2)	
B	N09-2441-25	SPECIAL SCREW(OP BOARD)	(x4)	
C	N09-6646-05	SPECIAL SCREW(CASE)	(x2)	
D	N14-1011-00	CIRCULAR NUT(VOL)		

Symbol No.	Part No.	Part Name	Description	Local
E	N14-1012-00	CIRCULAR NUT(RO-SW)		
F	N83-2005-48	PAN HEAD TAPTITE SCREW(UNIT/FIX)	(x10)	
G	N84-2004-43	PAN HEAD TAPTITE SCREW(TERM-BL(+,-))	(x2)	
-	XC1-0321-81	SERVICE MAIN UNIT		

Electrical parts list

MAIN UNIT

XC1-0321-80

***Note1 : This part cannot be replaced. Therefore, this part is not supplied as a service part.**

Block No. [0][1]

△ Symbol No.	Part No.	Part Name	Description	Local
IC20	XC61CC5602N-G	IC(MOS-IC)		
IC30	XC6223H331G-G	IC(MOS-IC)		
IC31	XC6209B312D-G	IC(MOS-IC)		
IC32	XC6215B122N-G	IC(MOS-IC)		
IC33	TPS62140RGT	IC(MOS-IC)		
IC34	LXDC2HN18F163	IC(MOS-IC)		
IC35	XC6223D331G-G	IC(MOS-IC)		
IC36	XC6209B502D-G	IC(MOS-IC)		
IC37	BU18TD2WNVX	IC(MOS-IC)		
IC38	BU33TD2WNVX	IC(MOS-IC)		
IC39	NJM2878F4-33	BIPOLAR IC		
IC60	TPS61041DRVR	IC(ANALOGUE)		
IC61	BU33TD2WNVX	IC(MOS-IC)		
IC63	XC6209B502D-G	IC(MOS-IC)		
IC64	XC6209B502D-G	IC(MOS-IC)		
IC65	XC6209B502D-G	IC(MOS-IC)		
IC70	BU7242NUX	IC(MOS-IC)		
IC80	BU30TD2WNVX	IC(MOS-IC)		
IC81	XC6223H331G-G	IC(MOS-IC)		
IC82	XC6209B502D-G	IC(MOS-IC)		
IC100	SKY72310362LF	IC(MOS-IC)		
IC101	OPA170AIDRLR	IC(MOS-IC)		
IC102	BU7242NUX	IC(MOS-IC)		
IC200	SKY72310362LF	IC(MOS-IC)		
IC201	OPA170AIDRLR	IC(MOS-IC)		
IC300	UPC2710TB-A	BIPOLAR IC		
IC360	XC8102AA07-G	IC(MOS-IC)		
IC400	BD7562FVM	IC(MOS-IC)		
IC500	CMY210	IC(MOS-IC)		
IC520	UPG2214TK-A	IC(ANALOGUE)		
IC570	UPG2214TK-A	IC(ANALOGUE)		
IC600	AD9864BCPZRL	IC(MOS-IC)		
IC700	CDC3S04YFF	IC(MOS-IC)		
IC701	XC8102AA07-G	IC(MOS-IC)		
IC702	-----	Note 1		
IC703	-----	Note 1		
IC704	S-80135ANPF-G	IC(MOS-IC)		
IC705	-----	Note 1		
IC706	TC7SZ08FE	IC(MOS-IC)		
IC708	-----	Note 1		
IC709	KXCJ9-1008	IC(MOS-IC)		
IC711	BD11600NUX	IC(MOS-IC)		
IC712	TC7WH14FK-F	IC(MOS-IC)		
IC800	BD1754HFN	IC(MOS-IC)		
IC801	NJW4184U2-05	MOS IC		
IC802	TC7W53FKF	MOS IC		
IC803	TC7SPB9306TUF	IC(MOS-IC)		
IC804	BD11600NUX	IC(MOS-IC)		
IC805	TC7WT126FU-F	IC(MOS-IC)		
IC806	TC7SZ08FE	IC(MOS-IC)		
IC807	TC7SZ08FE	IC(MOS-IC)		
IC850	-----	Note 1		
IC851	-----	Note 1		
IC852	74AVC4TD245GU	IC(MOS-IC)		
IC853	74AVC4TD245GU	IC(MOS-IC)		
IC900	ADS7961SRHB	IC(MOS-IC)		
IC901	DAC124S085CIS	IC(MOS-IC)		
IC902	TLV32AIC3104I	IC(MOS-IC)		
IC903	R2A20178NP	MICROCONTROLLER IC		
IC904	TPA6201A1DRBR	IC(ANALOGUE)		
IC905	TPA6201A1DRBR	IC(ANALOGUE)		
IC906	BD11600NUX	IC(MOS-IC)		
Q20	EMD12	TRANSISTOR		
Q21	SSM6N37FE	FET		
Q22	SSM6N37FE	FET		
Q30	SSM3K15AMFV	FET		

△ Symbol No.	Part No.	Part Name	Description	Local
Q31	KTA2012EP	TRANSISTOR		
Q32	EM6M2	FET		
Q33	EM6M2	FET		
Q70	LTC014EEBFS8	DIGI TRANSISTOR		
Q71	2SB1132(Q,R)	TRANSISTOR		
Q100	EM6M2	FET		
Q101	DSC9A01/T/	TRANSISTOR		
Q110	SSM3J15FS	FET		
Q111	EM6M2	FET		
Q160	MCH3914-H/8/	FET		
Q180	2SC5108F/Y/	TRANSISTOR		
Q181	2SC5108F/Y/	TRANSISTOR		
Q200	EM6M2	FET		
Q201	DSC9A01/T/	TRANSISTOR		
Q210	SSM3J15FS	FET		
Q211	EM6M2	FET		
Q240	MCH3914-H/8/	FET		
Q280	2SC5108F/Y/	TRANSISTOR		
Q281	2SC5108F/Y/	TRANSISTOR		
Q310	2SK3077F	FET		
Q320	RD01MUS1-T113	FET		
Q330	RD07MUS2BT214	FET		
Q390	LSCR523EBFS8	TRANSISTOR		
Q400	LTC023JEBFS8	DIGI TRANSISTOR		
Q401	SSM3K15AMFV	FET		
Q402	SSM3K15AMFV	FET		
Q403	EMD9	TRANSISTOR		
Q404	SSM3J15FS	FET		
Q530	BB506CFS-E	FET		
Q550	BB506CFS-E	FET		
Q570	SSM3J15FS	FET		
Q571	EM6M2	FET		
Q580	2SC5108F/Y/	TRANSISTOR		
Q600	MCH3914-H/8/	FET		
Q601	LTC023JEBFS8	DIGI TRANSISTOR		
Q602	LSCR523EBFS8	TRANSISTOR		
Q660	2SC5066F/O/	TRANSISTOR		
Q670	BF5020W	FET		
Q700	2SC4617/S/	TRANSISTOR		
Q701	SSM3K15AMFV	FET		
Q702	LTC014EEBFS8	DIGI TRANSISTOR		
Q703	SSM6N37FE	FET		
Q800	SSM3K15AMFV	FET		
Q801	EMD9	TRANSISTOR		
Q850	SSM3K15AMFV	FET		
D1	1SR154-400	DIODE		
D2	DA3S101F	MULTIPLE DIODE		
D20	DAN222	MULTIPLE DIODE		
D30	RB520SM-30	DIODE		
D60	DB2J40700	DIODE		
D100	EDZV8.2B	Z DIODE		
D101	1SS400SM	DIODE		
D160	BB565-02V	VARIABLE CAPACITANCE DIODE		
D161	BB664-02V	VARIABLE CAPACITANCE DIODE		
D162	BB664-02V	VARIABLE CAPACITANCE DIODE		
D163	BB664-02V	VARIABLE CAPACITANCE DIODE		
D164	BB664-02V	VARIABLE CAPACITANCE DIODE		
D200	EDZV8.2B	Z DIODE		
D201	1SS400SM	DIODE		
D240	BB565-02V	VARIABLE CAPACITANCE DIODE		
D241	BB664-02V	VARIABLE CAPACITANCE DIODE		
D242	BB664-02V	VARIABLE CAPACITANCE DIODE		
D243	BB664-02V	VARIABLE CAPACITANCE DIODE		
D350	L5208F	DIODE		
D370	RN142S	DIODE		
D371	RN142S	DIODE		
D390	DZ2S056(M)	Z DIODE		
D570	RN262CS	DIODE		
D571	RN262CS	DIODE		
D600	SMV1705-079LF	VARIABLE CAPACITANCE DIODE		
D601	SMV1705-079LF	VARIABLE CAPACITANCE DIODE		
D603	DA3S101F	MULTIPLE DIODE		
D700	RB521CM-30	DIODE		
D701	RB521CM-30	DIODE		
D702	RB521CM-30	DIODE		

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
D703	RB521CM-30	DIODE			C63	CK73HBB1H681K	C CAPACITOR	680PF K	
D704	NSSM038A	LED			C64	CK73EB1H475KM	C CAPACITOR	4.7UF K	
D705	RB521CM-30	DIODE			C65	CK73HB1A105K	C CAPACITOR	1.0UF K	
D800	RB521CM-30	DIODE			C66	CK73HB1A105K	C CAPACITOR	1.0UF K	
D801	RB521CM-30	DIODE			C69	CK73GXR1C225K	C CAPACITOR	2.2UF K	
D802	RB521CM-30	DIODE			C70	CK73GB1H105K	C CAPACITOR	1.0UF K	
D803	RB521CM-30	DIODE			C71	CK73GB1H105K	C CAPACITOR	1.0UF K	
D804	RB521CM-30	DIODE			C72	CK73GXR1C225K	C CAPACITOR	2.2UF K	
D805	DZ5S068D	Z DIODE			C73	CK73GB1E105K	C CAPACITOR	1.0UF K	
D806	DZ5S068D	Z DIODE			C74	CK73GXR1C225K	C CAPACITOR	2.2UF K	
D807	DAN222	MULTIPLE DIODE			C75	C93-1959-05	C CAPACITOR	0.10UF K	
D808	DZ5S068D	Z DIODE			C76	C93-1959-05	C CAPACITOR	0.10UF K	
D850	RN262CS	DIODE			C77	CC73HCH1H101J	C CAPACITOR	100PF J	
D851	RN262CS	DIODE			C78	CK73HBB1H471K	C CAPACITOR	470PF K	
D900	DZ2S068M	Z DIODE			C79	CK73GXR1C225K	C CAPACITOR	2.2UF K	
D901	DZ2S068M	Z DIODE			C80	CK73HB1A105K	C CAPACITOR	1.0UF K	
D902	RB521CM-30	DIODE			C81	CK73HB1A105K	C CAPACITOR	1.0UF K	
D903	DAN222	MULTIPLE DIODE			C82	CK73HB1A105K	C CAPACITOR	1.0UF K	
D904	RB521CM-30	DIODE			C83	CK73GB1E105K	C CAPACITOR	1.0UF K	
D905	RB521CM-30	DIODE			C84	CK73GB1H105K	C CAPACITOR	1.0UF K	
D906	RB521CM-30	DIODE			C85	CK73GXR1C225K	C CAPACITOR	2.2UF K	
D907	RB521CM-30	DIODE			C86	CK73HBB1H681K	C CAPACITOR	680PF K	
D910	SPC10501A01	VARIATOR			C87	CK73HB1A105K	C CAPACITOR	1.0UF K	
D911	SPC10501A01	VARIATOR			C90	CK73HB1E104K	C CAPACITOR	0.10UF K	
C1	CK73HBB1H102K	C CAPACITOR	1000PF K		C92	CK73FB1C106K	C CAPACITOR	10UF K	
C2	CC73HCH1H220J	C CAPACITOR	22PF J		C93	C93-1967-05	C CAPACITOR	470PF K	
C3	CK73HBB1H682K	C CAPACITOR	6800PF K		C94	C93-1967-05	C CAPACITOR	470PF K	
C4	CC73HCH1H220J	C CAPACITOR	22PF J		C101	CC73HCH1H100B	C CAPACITOR	10PF B	
C5	CC73HCH1H101J	C CAPACITOR	100PF J		C102	CK73HB1H103K	C CAPACITOR	0.010UF K	
C7	C93-1967-05	C CAPACITOR	470PF K		C103	CK73HB1H103K	C CAPACITOR	0.010UF K	
C8	C93-1967-05	C CAPACITOR	470PF K		C105	CK73HB1H103K	C CAPACITOR	0.010UF K	
C9	C93-1967-05	C CAPACITOR	470PF K		C107	CC73JCH1H101J	C CAPACITOR	100PF J	
C10	C93-1967-05	C CAPACITOR	470PF K		C108	CC73JCH1H101J	C CAPACITOR	100PF J	
C11	C93-1967-05	C CAPACITOR	470PF K		C110	CC73JCH1H101J	C CAPACITOR	100PF J	
C12	CK73HBB1H682K	C CAPACITOR	6800PF K		C111	CC73JCH1H101J	C CAPACITOR	100PF J	
C13	C93-1967-05	C CAPACITOR	470PF K		C112	C93-1959-05	C CAPACITOR	0.10UF K	
C14	C93-1967-05	C CAPACITOR	470PF K		C113	CC73JCH1H101J	C CAPACITOR	100PF J	
C15	C93-1967-05	C CAPACITOR	470PF K		C114	CC73HCH1H101J	C CAPACITOR	100PF J	
C16	C93-1967-05	C CAPACITOR	470PF K		C115	C93-1959-05	C CAPACITOR	0.10UF K	
C17	C93-1967-05	C CAPACITOR	470PF K		C116	CC73JCH1H101J	C CAPACITOR	100PF J	
C18	C93-1967-05	C CAPACITOR	470PF K		C117	CK73HBB1H472K	C CAPACITOR	4700PF K	
C19	C93-1967-05	C CAPACITOR	470PF K		C118	CK73HB1H103K	C CAPACITOR	0.010UF K	
C20	CK73HB1E104K	C CAPACITOR	0.10UF K		C119	CC73HCH1H330G	C CAPACITOR	33PF G	
C21	CK73HBB1H471K	C CAPACITOR	470PF K		C120	CC73JCH1H101J	C CAPACITOR	100PF J	
C22	CC73JCH1H101J	C CAPACITOR	100PF J		C121	CK73GB1H105K	C CAPACITOR	1.0UF K	
C23	C93-1959-05	C CAPACITOR	0.10UF K		C122	CC730AD1H104J	C CAPACITOR	100PF J	
C25	CK73FB1C106K	C CAPACITOR	10UF K		C123	CC73JCH1H101J	C CAPACITOR	100PF J	
C30	CK73GB1E105K	C CAPACITOR	1.0UF K		C124	C93-1959-05	C CAPACITOR	0.10UF K	
C31	CK73HB1A105K	C CAPACITOR	1.0UF K		C125	CC73JCH1H101J	C CAPACITOR	100PF J	
C32	CK73GB1H105K	C CAPACITOR	1.0UF K		C126	C93-1967-05	C CAPACITOR	470PF K	
C33	CK73GB1E105K	C CAPACITOR	1.0UF K		C127	CS77BP1A4R7M	C CAPACITOR	4.7UF M	
C34	CK73HB1A105K	C CAPACITOR	1.0UF K		C128	C93-1967-05	C CAPACITOR	470PF K	
C35	CK73HB1A105K	C CAPACITOR	1.0UF K		C129	CK73HB1A105K	C CAPACITOR	1.0UF K	
C36	CK73FB1C106K	C CAPACITOR	10UF K		C130	CK73HB1A105K	C CAPACITOR	1.0UF K	
C37	CK73FB1C106K	C CAPACITOR	10UF K		C140	CK73FBB1H154K	C CAPACITOR	0.15UF K	
C38	CK73HBB1H332K	C CAPACITOR	3300PF K		C141	CS77ABE1D100M	TA E CAPACITOR	10UF M	
C39	CK73HB1E104K	C CAPACITOR	0.10UF K		C142	CK73FB1H473K	C CAPACITOR	0.047UF K	
C41	CK73FXR0J226M	C CAPACITOR	22UF M		C160	CK73HB1H103K	C CAPACITOR	0.010UF K	
C42	CK73FXR1E475K	C CAPACITOR	4.7UF K		C161	CK73HBB1H471K	C CAPACITOR	470PF K	
C43	CK73GB0J106K	C CAPACITOR	10UF K		C162	CC73HCH1H101J	C CAPACITOR	100PF J	
C44	CK73HB1A105K	C CAPACITOR	1.0UF K		C163	CC73HCH1H180G	C CAPACITOR	18PF G	
C45	CK73GB1E105K	C CAPACITOR	1.0UF K		C164	CC73HCH1H030B	C CAPACITOR	3.0PF B	
C46	CK73GB1H105K	C CAPACITOR	1.0UF K		C165	CC73HCH1H0R5B	C CAPACITOR	0.5PF B	
C47	C93-1967-05	C CAPACITOR	470PF K		C166	CC73HCH1H050B	C CAPACITOR	5.0PF B	
C48	CK73GXR1C225K	C CAPACITOR	2.2UF K		C167	CC73HCH1H070B	C CAPACITOR	7.0PF B	
C49	CK73HBB1H682K	C CAPACITOR	6800PF K		C168	CC73HCH1H060B	C CAPACITOR	6.0PF B	
C50	CS77PBL1A470M	C CAPACITOR	47UF M		C169	CK73HBB1H471K	C CAPACITOR	470PF K	
C51	CK73GB0J106K	C CAPACITOR	10UF K		C170	CC73HCH1H0R5B	C CAPACITOR	0.5PF B	
C52	CK73HB1A474K	C CAPACITOR	0.47UF K		C171	CC73JCH1H101J	C CAPACITOR	100PF J	
C53	CK73HB1A474K	C CAPACITOR	0.47UF K		C181	CC73HCH1H080B	C CAPACITOR	8.0PF B	
C54	CK73HB1A474K	C CAPACITOR	0.47UF K		C182	CC73HCH1H101J	C CAPACITOR	100PF J	
C55	CK73HB1A474K	C CAPACITOR	0.47UF K		C183	CC73HCH1H070B	C CAPACITOR	7.0PF B	
C56	CK73HB1A105K	C CAPACITOR	1.0UF K		C184	CC73HCH1H101J	C CAPACITOR	100PF J	
C57	CK73HB1A105K	C CAPACITOR	1.0UF K		C186	CC73HCH1H101J	C CAPACITOR	100PF J	
C60	CK73GB1A335K	C CAPACITOR	3.3UF K		C187	CC73HCH1H100B	C CAPACITOR	10PF B	
C61	CK73GB1A335K	C CAPACITOR	3.3UF K		C188	CC73HCH1H080B	C CAPACITOR	8.0PF B	
C62	CK73FXR1E475K	C CAPACITOR	4.7UF K		C189	CC73HCH1H070B	C CAPACITOR	7.0PF B	
					C190	CC73HCH1H100B	C CAPACITOR	10PF B	

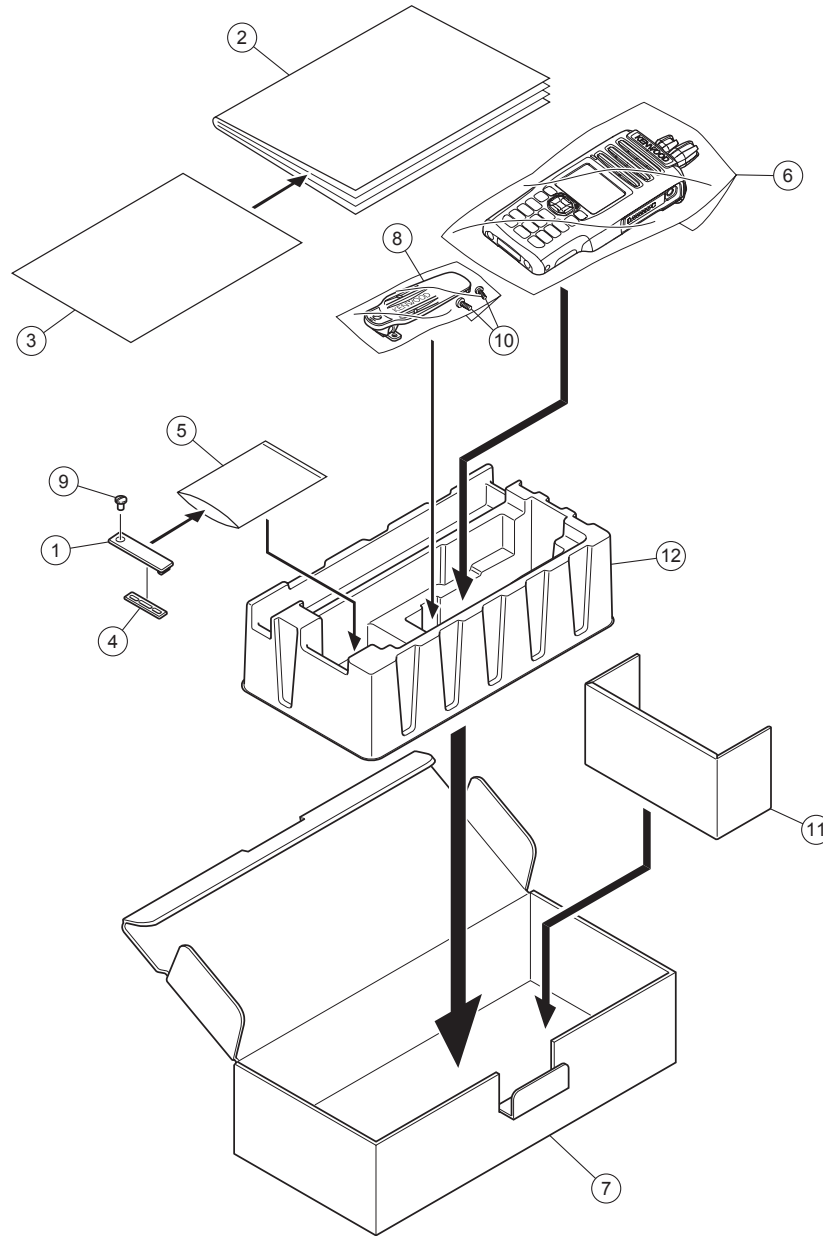
△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C772	C93-1959-05	C CAPACITOR	0.10UF K		C857	C93-1959-05	C CAPACITOR	0.10UF K	
C773	CK73HB1A105K	C CAPACITOR	1.0UF K		C858	C93-1959-05	C CAPACITOR	0.10UF K	
C774	C93-1959-05	C CAPACITOR	0.10UF K		C859	CC73HCH1H180G	C CAPACITOR	18PF G	
C775	CC73JCH1H101J	C CAPACITOR	100PF J		C860	CC73HCH1H180G	C CAPACITOR	18PF G	
C776	CK73HB1H103K	C CAPACITOR	0.010UF K		C861	CK73HB1A105K	C CAPACITOR	1.0UF K	
C777	C93-1953-05	C CAPACITOR	0.010UF K		C862	CK73HB1A105K	C CAPACITOR	1.0UF K	
C778	C93-1959-05	C CAPACITOR	0.10UF K		C863	C93-1959-05	C CAPACITOR	0.10UF K	
C779	C93-1959-05	C CAPACITOR	0.10UF K		C864	C93-1959-05	C CAPACITOR	0.10UF K	
C780	CK73HB1A105K	C CAPACITOR	1.0UF K		C865	C93-1959-05	C CAPACITOR	0.10UF K	
C782	C93-1959-05	C CAPACITOR	0.10UF K		C866	CC73HCH1H220J	C CAPACITOR	22PF J	
C783	CK73HB1H103K	C CAPACITOR	0.010UF K		C867	CC73HCH1H2R5B	C CAPACITOR	2.5PF B	
C784	CK73HB1E104K	C CAPACITOR	0.10UF K		C868	CK73HB1A105K	C CAPACITOR	1.0UF K	
C786	C93-1959-05	C CAPACITOR	0.10UF K		C869	C93-1959-05	C CAPACITOR	0.10UF K	
C787	C93-1959-05	C CAPACITOR	0.10UF K		C870	C93-1959-05	C CAPACITOR	0.10UF K	
C788	CK73HBB1H471K	C CAPACITOR	470PF K		C871	C93-1959-05	C CAPACITOR	0.10UF K	
C789	C93-1967-05	C CAPACITOR	470PF J		C872	C93-1959-05	C CAPACITOR	0.10UF K	
C790	CC73JCH1H101J	C CAPACITOR	100PF J		C873	CC73HCH1H220J	C CAPACITOR	22PF J	
C791	CC73JCH1H101J	C CAPACITOR	100PF J		C874	CC73HCH1H121J	C CAPACITOR	120PF J	
C792	CC73JCH1H101J	C CAPACITOR	100PF J		C875	C93-1959-05	C CAPACITOR	0.10UF K	
C793	CC73JCH1H101J	C CAPACITOR	100PF J		C876	CC73HCH1H180G	C CAPACITOR	18PF G	
C795	CC73JCH1H101J	C CAPACITOR	100PF J		C877	CK73HBB1H102K	C CAPACITOR	1000PF K	
C796	CK73HB1E104K	C CAPACITOR	0.10UF K		C879	CC73HCH1H121J	C CAPACITOR	120PF J	
C797	CC73JCH1H101J	C CAPACITOR	100PF J		C880	CC73HCH1H1R5B	C CAPACITOR	1.5PF B	
C798	CC73JCH1H101J	C CAPACITOR	100PF J		C881	CC73HCH1H010B	C CAPACITOR	1.0PF B	
C799	CC73JCH1H101J	C CAPACITOR	100PF J		C882	CC73HCH1H1R5B	C CAPACITOR	1.5PF B	
C800	CK73HB1A105K	C CAPACITOR	1.0UF K		C883	CC73HCH1H020B	C CAPACITOR	2.0PF B	
C801	C93-1959-05	C CAPACITOR	0.10UF K		C884	C93-1959-05	C CAPACITOR	0.10UF K	
C802	CK73HB1A105K	C CAPACITOR	1.0UF K		C885	C93-1959-05	C CAPACITOR	0.10UF K	
C803	CK73HB1A105K	C CAPACITOR	1.0UF K		C887	C93-1953-05	C CAPACITOR	0.010UF K	
C804	C93-1969-05	C CAPACITOR	1000PF K		C889	CC73HCH1H470J	C CAPACITOR	47PF J	
C805	CK73HB1A105K	C CAPACITOR	1.0UF K		C890	C93-1959-05	C CAPACITOR	0.10UF K	
C806	CK73HBB1H681K	C CAPACITOR	680PF K		C891	C93-1959-05	C CAPACITOR	0.10UF K	
C807	C93-1959-05	C CAPACITOR	0.10UF K		C892	CC73JCH1H101J	C CAPACITOR	100PF J	
C808	CK73HB1E104K	C CAPACITOR	0.10UF K		C893	C93-1967-05	C CAPACITOR	470PF K	
C809	C93-1967-05	C CAPACITOR	470PF K		C894	C93-1953-05	C CAPACITOR	0.010UF K	
C810	C93-1967-05	C CAPACITOR	470PF K		C895	CC73HCH1H0R5B	C CAPACITOR	0.5PF B	
C811	C93-1967-05	C CAPACITOR	470PF K		C896	CC73JCH1H101J	C CAPACITOR	100PF J	
C812	C93-1967-05	C CAPACITOR	470PF K		C897	CC73JCH1H101J	C CAPACITOR	100PF J	
C813	C93-1967-05	C CAPACITOR	470PF K		C898	CC73JCH1H101J	C CAPACITOR	100PF J	
C814	C93-1967-05	C CAPACITOR	470PF K		C899	C93-1967-05	C CAPACITOR	470PF K	
C815	C93-1967-05	C CAPACITOR	470PF K		C900	CK73HB1A105K	C CAPACITOR	1.0UF K	
C816	C93-1967-05	C CAPACITOR	470PF K		C901	C93-1959-05	C CAPACITOR	0.10UF K	
C817	C93-1967-05	C CAPACITOR	470PF K		C902	C93-1959-05	C CAPACITOR	0.10UF K	
C818	CK73GB0J106K	C CAPACITOR	10UF K		C903	C93-1959-05	C CAPACITOR	0.10UF K	
C819	CK73GB0J106K	C CAPACITOR	10UF K		C904	C93-1959-05	C CAPACITOR	0.10UF K	
C822	CC73JCH1H101J	C CAPACITOR	100PF J		C905	CK73HB1A105K	C CAPACITOR	1.0UF K	
C823	CK73GB1H105K	C CAPACITOR	1.0UF K		C906	C93-1959-05	C CAPACITOR	0.10UF K	
C824	C93-1953-05	C CAPACITOR	0.010UF K		C907	C93-1959-05	C CAPACITOR	0.10UF K	
C825	C93-1953-05	C CAPACITOR	0.010UF K		C908	CK73HB1A105K	C CAPACITOR	1.0UF K	
C826	CK73GXR1C225K	C CAPACITOR	2.2UF K		C909	C93-1959-05	C CAPACITOR	0.10UF K	
C827	C93-1953-05	C CAPACITOR	0.010UF K		C911	C93-1959-05	C CAPACITOR	0.10UF K	
C828	C93-1953-05	C CAPACITOR	0.010UF K		C912	C93-1959-05	C CAPACITOR	0.10UF K	
C829	CK73HBB1H102K	C CAPACITOR	1000PF K		C913	C93-1959-05	C CAPACITOR	0.10UF K	
C830	C93-1953-05	C CAPACITOR	0.010UF K		C914	C93-1959-05	C CAPACITOR	0.10UF K	
C831	CK73HBB1H102K	C CAPACITOR	1000PF K		C915	C93-1967-05	C CAPACITOR	470PF K	
C832	C93-1953-05	C CAPACITOR	0.010UF K		C916	CK73GB0J106K	C CAPACITOR	10UF K	
C833	CC73JCH1H101J	C CAPACITOR	100PF J		C917	CK73HB1A105K	C CAPACITOR	1.0UF K	
C834	CC73JCH1H101J	C CAPACITOR	100PF J		C918	C93-1959-05	C CAPACITOR	0.10UF K	
C835	CC73JCH1H101J	C CAPACITOR	100PF J		C919	CK73HB1A105K	C CAPACITOR	1.0UF K	
C836	CC73JCH1H101J	C CAPACITOR	100PF J		C920	C93-1959-05	C CAPACITOR	0.10UF K	
C837	CC73JCH1H101J	C CAPACITOR	100PF J		C921	CK73HBB1H472K	C CAPACITOR	4700PF K	
C838	CC73HCH1H470J	C CAPACITOR	47PF J		C922	CK73HB1A105K	C CAPACITOR	1.0UF K	
C839	CC73JCH1H101J	C CAPACITOR	100PF J		C923	CK73HB1A105K	C CAPACITOR	1.0UF K	
C840	CC73HCH1H470J	C CAPACITOR	47PF J		C924	CK73HB1A105K	C CAPACITOR	1.0UF K	
C841	CC73JCH1H101J	C CAPACITOR	100PF J		C925	CC73JCH1H101J	C CAPACITOR	100PF J	
C842	CC73JCH1H101J	C CAPACITOR	100PF J		C926	CK73HB1E224K	C CAPACITOR	0.22UF K	
C843	CC73JCH1H101J	C CAPACITOR	100PF J		C927	CK73HB1E224K	C CAPACITOR	0.22UF K	
C844	CC73JCH1H101J	C CAPACITOR	100PF J		C928	C93-1959-05	C CAPACITOR	0.10UF K	
C845	CC73JCH1H101J	C CAPACITOR	100PF J		C929	C93-1959-05	C CAPACITOR	0.10UF K	
C846	C93-1953-05	C CAPACITOR	0.010UF K		C930	C93-1969-05	C CAPACITOR	1000PF K	
C847	CC73JCH1H101J	C CAPACITOR	100PF J		C931	CK73HB1A105K	C CAPACITOR	1.0UF K	
C850	C93-1953-05	C CAPACITOR	0.010UF K		C932	CK73HB1E224K	C CAPACITOR	0.22UF K	
C851	CK73HB1A105K	C CAPACITOR	1.0UF K		C933	CK73HB1E224K	C CAPACITOR	0.22UF K	
C852	C93-1959-05	C CAPACITOR	0.10UF K		C934	C93-1959-05	C CAPACITOR	0.10UF K	
C853	C93-1959-05	C CAPACITOR	0.10UF K		C935	C93-1959-05	C CAPACITOR	0.10UF K	
C854	C93-1959-05	C CAPACITOR	0.10UF K		C936	CC73JCH1H101J	C CAPACITOR	100PF J	
C855	C93-1959-05	C CAPACITOR	0.10UF K		C937	CK73HB1A105K	C CAPACITOR	1.0UF K	
C856	CK73HB1A105K	C CAPACITOR	1.0UF K		C938	CC73HCH1H101J	C CAPACITOR	100PF J	

△ Symbol No. Part No. Part Name Description Local

Symbol No.	Part No.	Part Name	Description	Local
CN9	E40-6962-05	FLAT CABLE CONNECTOR(35P)		
CN10	E40-6720-05	SOCKET FOR PIN ASSY(20P)		
CN11	E40-6720-05	SOCKET FOR PIN ASSY(20P)		
CN12	E41-3167-05	FLAT CABLE CONNECTOR(14P)		
CN13	E41-1486-05	PIN ASSY(2P)		
CN14	G0B-0005-00	EARTH SPRING		
CN15	G0B-0005-00	EARTH SPRING		
CN16	G0B-0005-00	EARTH SPRING		
CN17	G0B-0005-00	EARTH SPRING		
CN18	G0B-0005-00	EARTH SPRING		
CN20	G0B-0005-00	EARTH SPRING		
CN21	G0B-0005-00	EARTH SPRING		
CN301	E23-1278-05	TERMINAL		
CN500	E23-1278-05	TERMINAL		
CN601	E23-1278-05	TERMINAL		
CN603	G0B-0002-00	EARTH SPRING		
CP100	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP200	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP600	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP601	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP700	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP701	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP702	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP850	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP851	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP900	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP901	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP902	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP903	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP904	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
CP905	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP906	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP907	RK74HA1J100J	NET RESISTOR	10 J 1/16W	
CP908	RK74HB1J100J	NET RESISTOR	10 J 1/16W	
CP909	RK74HB1J104J	NET RESISTOR	100K J 1/16W	
CP910	RK74HB1J101J	NET RESISTOR	100 J 1/16W	
E1	F10-3224-05	SHIELDING CASE		
E3	F10-3244-05	SHIELDING CASE		
E4	F10-3236-05	SHIELDING CASE		
E5	F10-3246-05	SHIELDING CASE		
E6	F10-3228-05	SHIELDING CASE		
F1	FZA10BQ-3R15	FUSE(3.15A)		
F2	F53-0498-05	FUSE(1.0A)		
J1	E68-0426-05	JACK OTHERS		
S1	S70-0530-05	TACT SWITCH		
S2	S68-0931-05	PUSH SWITCH		
TH400	ERTJ0V104H	NEGATIVE TEMP THERMISTOR		
TH700	ERTJ0V104H	NEGATIVE TEMP THERMISTOR		
X700	L77-3123-05	TCXO(19.2MHZ)		
X701	L77-1802-05	CRYSTAL RESONATOR(32.768KHZ)		
X850	L77-3121-05	CRYSTAL RESONATOR(32.768KHZ)		
XF670	L7B-0001-00	MCF		

Packing materials and accessories parts list

Block No.M2MM



Packing and accessories

Block No. [M][2][M][M]
Local

△ Symbol No.	Part No.	Part Name	Description
1	B0K-0002-00	CAP	
2	B5A-0049-00	INSTRUCTION MANUAL	
3	-----	PAMPHLET	
4	G5D-0027-00	PACKING	
5	-----	PROTECTION BAG (60/110/0.07)	
6	-----	PROTECTION BAG (100/250/0.07)	
7	H5A-0012-00	ITEM CARTON CASE	
8	J29-0730-05	BELT CLIP	
9	N08-0571-04	DRESSED SCREW(CAP)	
10	N09-6585-15	SPECIAL SCREW(BELT CLIP)	(x2)
11	H1C-0036-00	PACKING FIXTURE	
12	H1C-0011-00	PACKING FIXTURE	



KENWOOD

JVC KENWOOD Corporation
Communications Equipment BU

(No.RA016<Rev.001>)

Printed in Japan
VSE