

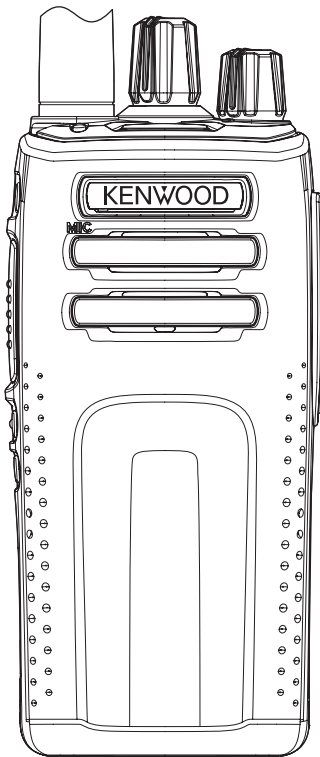
KENWOOD

SERVICE MANUAL

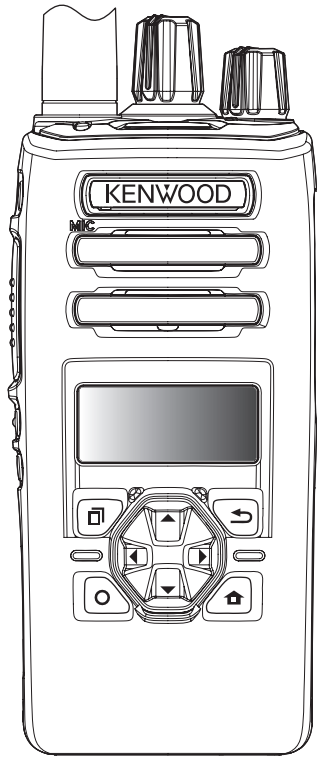
VHF DIGITAL TRANSCEIVER, UHF DIGITAL TRANSCEIVER

NX-3220, NX-3320

NX-3220, NX-3320 K,E3



NX-3220, NX-3320 K2,E2



NX-3220, NX-3320 K3,E

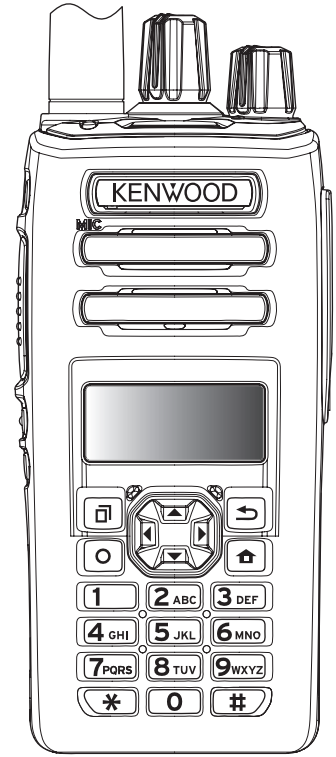


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This product complies with the RoHS directive for the European market.



This product uses Lead Free solder.

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NOTE

- This equipment should be serviced by only qualified technicians.
- Danger of explosion if the battery is incorrectly replaced; replace only with the same type.
- To dispose of batteries, be sure to comply with the laws and regulations in your country or region.

SPECIFICATION

(NX-3220(K,K2,K3) TYPE)

GENERAL		
Frequency Range		136-174 MHz
Max. Channels per Radio		Up to 1000 channels with option
Number of Channels		260 (64 for no LCD models)
Number of Zones		128 (4 for no LCD models)
Channel Spacing	Analog	12.5/15/20/25*1/30*1 kHz
	Digital	6.25 / 12.5 kHz
Power Supply		7.5V DC±20%
Battery Life (FDMA/TDMA) 5-5-90 duty cycle	With KNB-55L (1,480 mAh)	Approx. 8 hours / Approx. 9.5 hours
	With KNB-56N (1,400 mAh)	Approx. 8 hours / Approx. 9 hours
	With KNB-57L (2,000 mAh)	Approx. 11 hours / Approx. 13.5 hours
Operating Temperature		-22°F to +140°F (-30°C to +60°C)
Frequency Stability		±2.0ppm
Antenna Impedance		50ohm
Dimensions (W x H x D)*2 (Projections not included)	Radio only	2.20 x 4.71 x 1.43 in (56 x 119.6 x 36.4 mm)
	With KNB-55L	2.20 x 4.71 x 1.43 in (56 x 119.6 x 36.4 mm)
	With KNB-56N	2.20 x 4.71 x 1.68 in (56 x 119.6 x 42.7 mm)
	With KNB-57L	2.20 x 4.71 x 1.53 in (56 x 119.6 x 39 mm)
Weight (net)*3	Radio only	7.41 oz (220 g)
	With KNB-55L	11.1 oz (315 g)
	With KNB-56N	14.46 oz (410 g)
	With KNB-57L	11.99 oz (340 g)
RECEIVER		
Sensitivity	NXDN 6.25kHz Digital(3%BER)	0.20µV
	NXDN 12.5kHz Digital(3%BER)	0.25µV
	DMR 12.5 kHz Digital (5% BER)	0.30µV
	DMR 12.5 kHz Digital (1% BER)	0.45µV
	Analog (12dB SINAD)	0.25µV
Selectivity	Analog@12.5kHz	65dB
	Analog@25kHz	72dB
Intermodulation		70dB
Spurious Rejection		70dB
Audio Distortion		3%
Audio Output (Internal Speaker)	3% Distortion	500mW / 8ohm
	5% Distortion	1000mW / 8ohm
TRANSMITTER		
RF Power Output		5 W / 4 W / 1 W
Spurious Emission		-70dB
FM Hum & Noise	Analog @ 25 kHz	45dB
	Analog @ 12.5 kHz	40dB
Audio Distortion		3%
Emission Designator		16K0F3E*1, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 7K60FXE, 7K60FXD, 4K00F2D

*1 25 and 30 kHz are not included in the models sold in USA or US territories.

*2 Full Keypad/Std Keypad Models

*3 Full Keypad Model

Analog measurements made per TIA603. Specifications are measured according to applicable standards. JVC KENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

SPECIFICATION

(NX-3220(E,E2,E3) TYPE)

GENERAL		
Frequency Range		136-174 MHz
Max. Channels per Radio		Up to 1000 channels with option
Number of Channels		260 (64 for no LCD models)
Number of Zones		128 (4 for no LCD models)
Channel Spacing	Analog	12.5/20/25 kHz
	Digital	6.25 / 12.5 kHz
Power Supply		7.5V DC±20%
Battery Life (FDMA/TDMA) 5-5-90 duty cycle	With KNB-55L (1,480 mAh)	Approx. 8 hours / Approx. 9.5 hours
	With KNB-56N (1,400 mAh)	Approx. 8 hours / Approx. 9 hours
	With KNB-57L (2,000 mAh)	Approx. 11 hours / Approx. 13.5 hours
Operating Temperature		-30°C to +60°C
Frequency Stability		±2.0ppm
Antenna Impedance		50ohm
Dimensions (W x H x D)*1 (Projections not included)	Radio only	56 x 119.6 x 36.4 mm
	With KNB-55L	56 x 119.6 x 36.4 mm
	With KNB-56N	56 x 119.6 x 42.7 mm
	With KNB-57L	56 x 119.6 x 39 mm
Weight (net)*2	Radio only	220 g
	With KNB-55L	315 g
	With KNB-56N	410 g
	With KNB-57L	340 g
RECEIVER		
Sensitivity	NXDN 3 % BER (6.25 kHz/12.5 kHz)	0.20 μV / 0.25 μV
	NXDN 1 % BER (6.25 kHz/12.5 kHz)	-4.0 dBμV (0.32μV) / -1 dBμV (0.45μV)
	DMR 12.5 kHz Digital (5 % BER)	-4.5 dBμV (0.30μV)
	DMR 12.5 kHz Digital (1 % BER)	-1 dBμV (0.45μV)
	Analog, EIA 12 dB SINAD (12.5/20&25 kHz)	0.25 μV
	Analog, EN 20 dB SINAD (12.5/20&25 kHz)	-1 dBμV (0.45 μV) / -3 dBμV (0.35 μV)
Selectivity	Analog@12.5kHz	68dB
	Analog@20kHz	74dB
	Analog@25kHz	76dB
Intermodulation		65dB
Spurious Rejection		75dB
Audio Distortion		3%
Audio Output (Internal Speaker)	3% Distortion	500mW / 8ohm
	5% Distortion	1000mW / 8ohm
TRANSMITTER		
RF Power Output		5 W / 4 W / 1 W
Spurious Emission		-36 dBm ≤1 GHz, -30 dBm > 1 GHz
FM Hum & Noise	Analog @ 25 kHz	45dB
	Analog @ 20 kHz	45dB
	Analog @ 12.5 kHz	40dB
Audio Distortion		3%
Emission Designator		16K0F3E, 14K0F2D, 14K0F3E, 12K0F2D, 8K50F3E, 7K50F2D, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 7K60FXE, 7K60FXD, 4K00F2D

*1 Full Keypad/Std Keypad Models

*2 Full Keypad Model

Analog measurements made per TIA603. Specifications are measured according to applicable standards.

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

SPECIFICATION

(NX-3320(K,K2,K3) TYPE)

GENERAL		
Frequency Range		400-520 MHz
Max. Channels per Radio		Up to 1000 channels with option
Number of Channels		260 (64 for no LCD models)
Number of Zones		128 (4 for no LCD models)
Channel Spacing	Analog	12.5/25*1 kHz
	Digital	6.25 / 12.5 kHz
Power Supply		7.5V DC±20%
Battery Life (FDMA/TDMA) 5-5-90 duty cycle	With KNB-55L (1,480 mAh)	Approx. 8 hours / Approx. 9.5 hours
	With KNB-56N (1,400 mAh)	Approx. 8 hours / Approx. 9 hours
	With KNB-57L (2,000 mAh)	Approx. 11 hours / Approx. 13.5 hours
Operating Temperature		-22°F to +140°F (-30°C to +60°C)
Frequency Stability		±1.0ppm
Antenna Impedance		50ohm
Dimensions (W x H x D)*2 (Projections not included)	Radio only	2.20 x 4.71 x 1.43 in (56 x 119.6 x 36.4 mm)
	With KNB-55L	2.20 x 4.71 x 1.43 in (56 x 119.6 x 36.4 mm)
	With KNB-56N	2.20 x 4.71 x 1.68 in (56 x 119.6 x 42.7 mm)
	With KNB-57L	2.20 x 4.71 x 1.53 in (56 x 119.6 x 39 mm)
Weight (net)*3	Radio only	7.41 oz (220 g)
	With KNB-55L	11.1 oz (315 g)
	With KNB-56N	14.46 oz (410 g)
	With KNB-57L	11.99 oz (340 g)
RECEIVER		
Sensitivity	NXDN 6.25kHz Digital(3%BER)	0.20µV
	NXDN 12.5kHz Digital(3%BER)	0.25µV
	DMR 12.5 kHz Digital (5% BER)	0.30µV
	DMR 12.5 kHz Digital (1% BER)	0.45µV
	Analog (12dB SINAD)	0.25µV
Selectivity	Analog@12.5kHz	65dB
	Analog@25kHz	72dB
Intermodulation		70dB
Spurious Rejection		70dB
Audio Distortion		3%
Audio Output (Internal Speaker)	3% Distortion	500mW / 8ohm
	5% Distortion	1000mW / 8ohm
TRANSMITTER		
RF Power Output		5 W / 4 W / 1 W
Spurious Emission		-70dB
FM Hum & Noise	Analog @ 25 kHz	45dB
	Analog @ 12.5 kHz	40dB
Audio Distortion		3%
Emission Designator		16K0F3E*1, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 7K60FXE, 7K60FXD, 4K00F2D

*1 25 kHz are not included in the models sold in USA or US territories.

*2 Full Keypad/Std Keypad Models

*3 Full Keypad Model

Analog measurements made per TIA603. Specifications are measured according to applicable standards.

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

SPECIFICATION

(NX-3320(E,E2,E3) TYPE)

GENERAL		
Frequency Range		400-520MHz
Max. Channels per Radio		Up to 1000 channels with option
Number of Channels		260 (64 for no LCD models)
Number of Zones		128 (4 for no LCD models)
Channel Spacing	Analog	12.5/20/25kHz
	Digital	6.25 / 12.5 kHz
Power Supply		7.5V DC±20%
Battery Life (FDMA/TDMA) 5-5-90 duty cycle	With KNB-55L (1,480 mAh)	Approx. 8 hours / Approx. 9.5 hours
	With KNB-56N (1,400 mAh)	Approx. 8 hours / Approx. 9 hours
	With KNB-57L (2,000 mAh)	Approx. 11 hours / Approx. 13.5 hours
Operating Temperature		-30°C to +60°C
Frequency Stability		±1.0ppm
Antenna Impedance		50ohm
Dimensions (W x H x D)*1 (Projections not included)	Radio only	56 x 119.6 x 36.4 mm
	With KNB-55L	56 x 119.6 x 36.4 mm
	With KNB-56N	56 x 119.6 x 42.7 mm
	With KNB-57L	56 x 119.6 x 39 mm
Weight (net)*2	Radio only	220 g
	With KNB-55L	315 g
	With KNB-56N	410 g
	With KNB-57L	340 g
RECEIVER		
Sensitivity	NXDN 3 % BER (6.25 kHz/12.5 kHz)	0.20 μV / 0.25 μV
	NXDN 1 % BER (6.25 kHz/12.5 kHz)	-4.0 dBμV (0.32μV) / -1 dBμV (0.45μV)
	DMR 12.5 kHz Digital (5 % BER)	-4.5 dBμV (0.30μV)
	DMR 12.5 kHz Digital (1 % BER)	-1 dBμV (0.45μV)
	Analog, EIA 12 dB SINAD (12.5/20&25 kHz)	0.25 μV
	Analog, EN 20 dB SINAD (12.5/20&25 kHz)	-1 dBμV (0.45 μV) / -3 dBμV (0.35 μV)
Selectivity	Analog@12.5kHz	68dB
	Analog@20kHz	74dB
	Analog@25kHz	76dB
Intermodulation		65dB
Spurious Rejection		75dB
Audio Distortion		3%
Audio Output (Internal Speaker)	3% Distortion	500mW / 8ohm
	5% Distortion	1000mW / 8ohm
TRANSMITTER		
RF Power Output		5 W / 4 W / 1 W
Spurious Emission		-36 dBm ≤1 GHz, -30 dBm > 1 GHz
FM Hum & Noise	Analog @ 25 kHz	45dB
	Analog @ 20 kHz	45dB
	Analog @ 12.5 kHz	40dB
Audio Distortion		3%
Emission Designator		16K0F3E, 14K0F2D, 14K0F3E, 12K0F2D, 8K50F3E, 7K50F2D, 8K30F1E, 8K30F1D, 8K30F7W, 4K00F1E, 4K00F1D, 4K00F7W, 7K60FXE, 7K60FXD, 4K00F2D

*1 Full Keypad/Std Keypad Models

*2 Full Keypad Model

Analog measurements made per TIA603. Specifications are measured according to applicable standards.

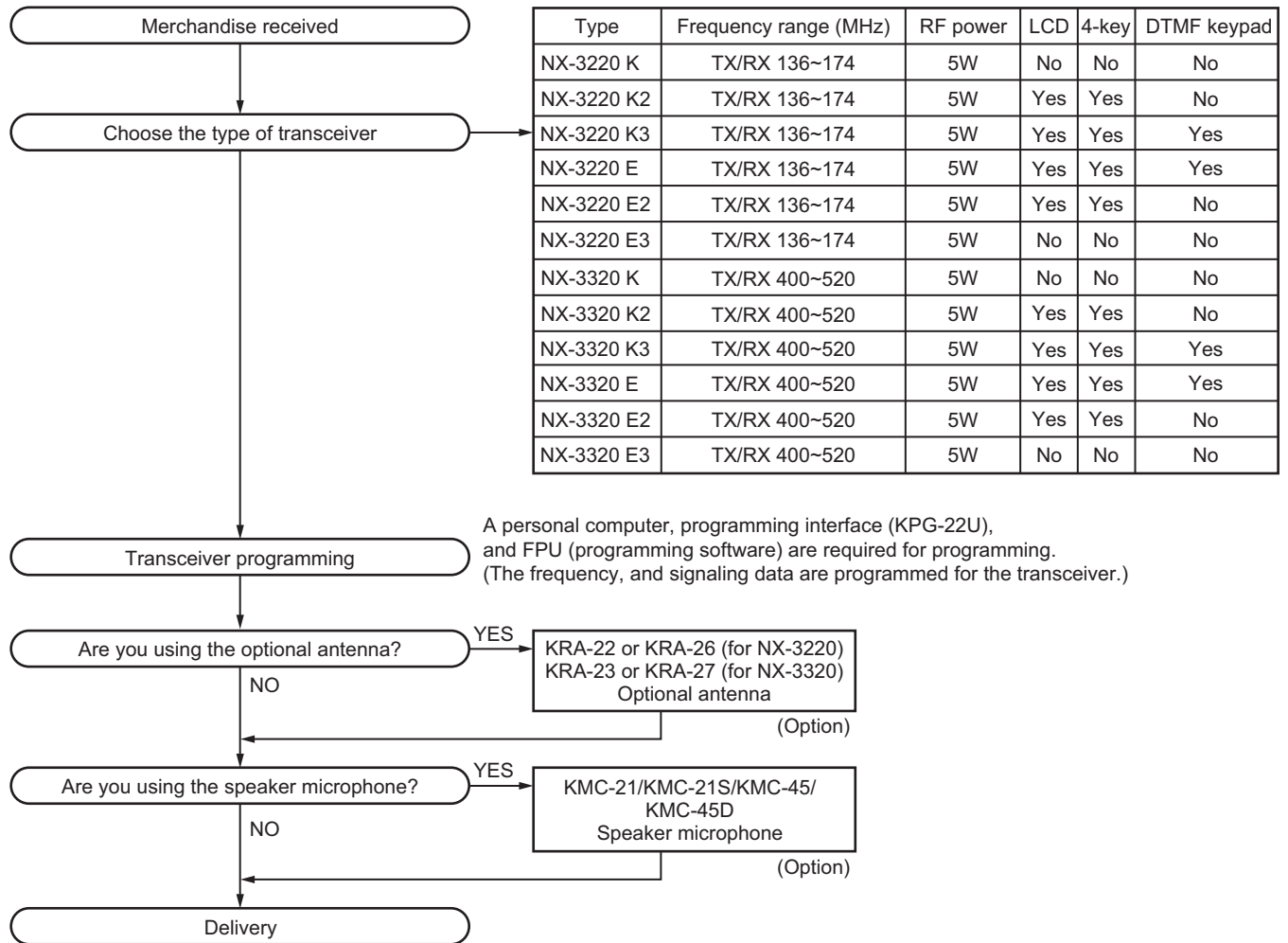
JVC KENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

SECTION 1 PRECAUTION

This service manual does not describe PRECAUTION.

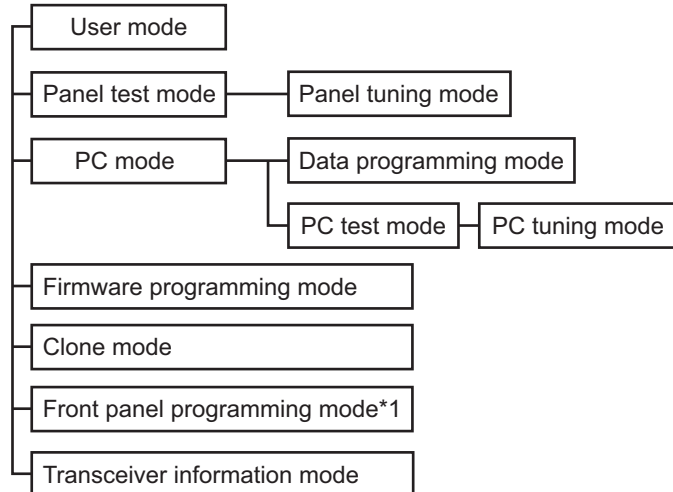
SECTION 2 SPECIFIC SERVICE INSTRUCTIONS

2.1 SYSTEM SET-UP



2.2 REALIGNMENT

2.2.1 Modes



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

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, Encryption Library version.

2.2.2 How to Enter Each Mode

Mode	Operation
User mode	Power ON
Panel test mode*2,*3	<ul style="list-style-type: none"> • [↩] + Power ON • [⏏] + Power ON *3 Select the "Panel Test" using the [▲] / [▼] button. Press the [⏏] button.
PC mode	Received commands from PC
Panel tuning mode *2	[Panel test mode] + [⏏]
Firmware programming mode*3	<ul style="list-style-type: none"> • [AUX (Orange)] + Power ON • [⏏] + Power ON *2 Select the "Firmware Prog" using the [▲] / [▼] button. Press the [⏏] button.
Clone mode*2,*3	<ul style="list-style-type: none"> • [🏠] + Power ON
	<ul style="list-style-type: none"> • [⏏] + Power ON Select the "Clone" using the [▲] / [▼] button. Press the [⏏] button.
Front panel programming mode*2,*3	<ul style="list-style-type: none"> • Press the PF button to which Front panel programming mode is set during the user mode.
	<ul style="list-style-type: none"> • Press the [⏏] button and enter the Menu mode. Select the any icon assigned the Front panel programming mode using the [▲] / [▼] button. Press [⏏] button. Select the "Panel Program" using the [▲] / [▼] button. Press the [⏏] button.
Transceiver information mode*2,*3	<ul style="list-style-type: none"> • [Side 1] + Power ON
	<ul style="list-style-type: none"> • [⏏] + Power ON Select the "Transceiver Info" using the [▲] / [▼] button. Press the [⏏] button.

*2 K2, K3, E and E2 types only.

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

2.2.3 Panel Test Mode (K2, K3, E and E2 types only)

Setting method refer to ADJUSTMENT.

2.2.4 Panel Tuning Mode (K2, K3, E and E2 types only)

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-22U) and FPU (programming software).

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

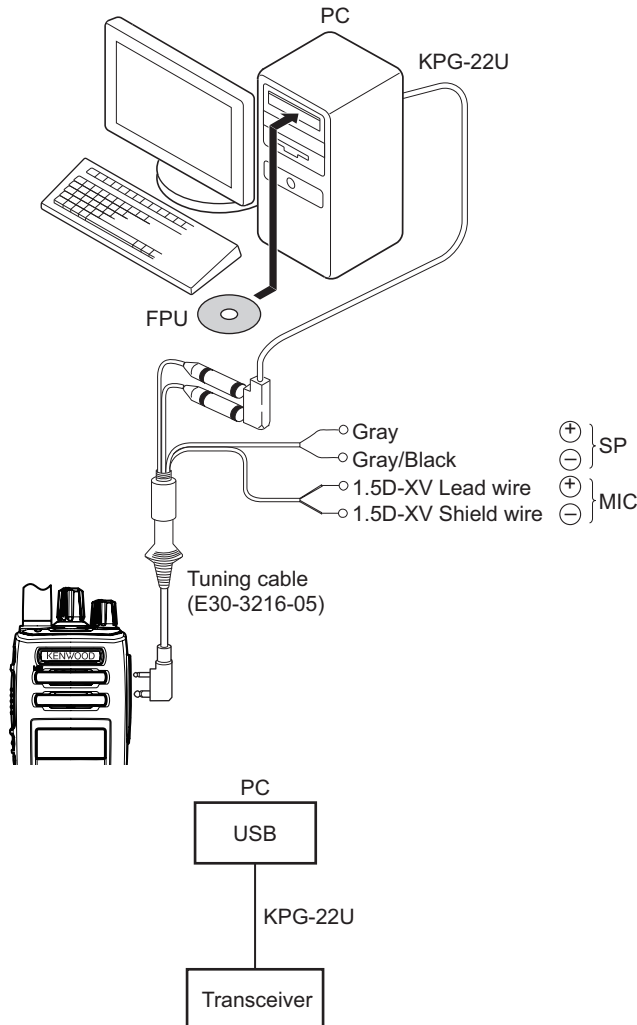


Fig.1

2.2.5.2 Connection procedure

- (1) Connects the transceiver to the computer using the interface cable (KPG-22U).

Note:

You must install the KPG-22U driver in the computer to use the USB programming interface cable (KPG-22U).

- (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-22U description (USB programming interface cable: Option)

The KPG-22U is a cable which connects to a USB port on a computer.

When using the KPG-22U, install the supplied CD (with driver software) in the computer. The KPG-22U driver runs under Windows 7, 8.1, 10.

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-D3/D3N description

The FPU is the programming software for the transceiver supplied on a CD-ROM. This software runs under Windows 7, 8.1, 10.

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

Note:

KPG-D3N can't be used for E, E2 and E3 types.

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-22U). (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-D3/D3N 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 [] button while "FIRMWARE PROG" is displayed, the checksum is calculated, and a result is displayed. If you press the [] button again while checksum is displayed, "FIRMWARE PROG" is redisplayed.

Note:

The text message are displayed for K2, K3, E and E2 types only.




2.2.7 Clone Mode (K2, K3, E and E2 types only)

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

■The following data cannot be cloned.


- Tuning data
- Transceiver Embedded Message
- ESN (Electronic Serial Number) data

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

- Confirm ([] button): The password confirmation
- Delete ([] button): Delete the latest digit from the current password number (Press and hold to delete all password numbers)
- Select([] button): 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 buttons 0 to 9 is pressed while the "Input Password" is displayed, the password number is displayed on the LCD. Each press of the button shifts the display in order to the left.
When you enter the password and press [] or [*] button, "CLONE MODE" displayed if the entered password is correct. If password is incorrect, "Input Password" is redisplayed.

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

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

If the [▲] or [▼] button 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 [] button, currently selected number is determined. If you press the [] button 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.E30-3410-05) to the SP/MIC connectors on the source and target.
(6) Press [] button 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 [] button 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 (Write) is programmed to the target.
- "Model name" must be same to clone the transceiver.

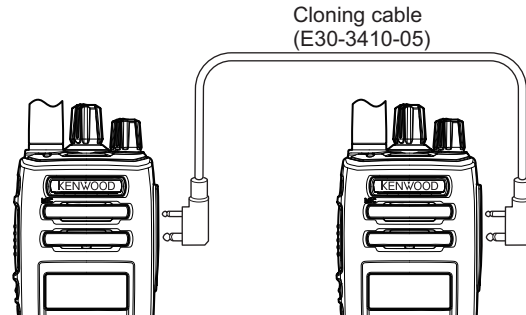


Fig.2

2.2.8 Front Panel Programming Mode (K2, K3, E and E2 types only)




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
- Transmit Mode (Mixed mode only)
- Channel Spacing
- Decode QT/DQT/RAN, Encode QT/DQT/RAN
- Color Code
- Slot Selection
- Transmit Power
- Channel Name

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

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

- 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/NXDN/DMR
4	Transmit Mode*4	Transmit Mode	Analog/NXDN/DMR
5	Channel Spacing	Channel Space	Analog: 12.5kHz/20kHz/25kHz Note: 20kHz is applied for E, E2 and E3 types only.
			NXDN: 6.25kHz/12.5kHz
			DMR: 12.5kHz

No.	Setup item	Display	Remarks
6	RX Signaling	RX QT/DQT	Receive QT/DQT
7	TX Signaling	TX QT/DQT	Transmit QT/DQT
8	RX RAN	RX RAN	None, 1~63
9	TX RAN	TX RAN	None, 1~63
10	Color Code	Color Code	0 ~15
11	Slot Selection	Slot Selection	Slot 1, Slot 2
12	Transmit Power	Transmit Power	Low/Medium/High
13	Channel Name	Channel Name	

*4: In "Channel Type" display, "Transmit Mode" can be entered only when Mixed mode is selected.

- Button operation

Button\ Item	Zone Select	Channel Select	RX Frequency	TX Frequency	Channel Type	Transmit Mode *7	Channel Spacing
[]	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
[]	Unused	Unused	Go to the TX Frequency	Go to the RX Frequency	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
[]	Zone change	Channel change	Fresuency up	Fresuency up	Channel type change	Transmit Mode Change	Channel Spacing Change
[]	Zone change	Channel change	Frequency down	Frequency down	Channel type change	Transmit Mode Change	Channel Spacing Change
[]	Unused	Unused	Frequency step change	Frequency step change	Unused	Unused	Unused
[]	Unused	Unused	Frequency step change	Frequency step change	Unused	Unused	Unused
Keypad [0] ~ [9] *5	Zone number select	Channel number select	Go to the direct enter mode		Channel number select (1,2 or 3)	Transmit Mode number select (1 or 2)	Channel spacing select *6
Keypad [*] *5	Decision	Decision	Decision	Decision	Decision	Decision	Decision
Keypad [#] *5	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

Button\ Item	RX Signaling	TX Signaling	RX RAN	TX RAN	Color Code	Slot Selection	Transmit Power	Channel Name
[]	Decision	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	Back to the previous item/ Delete
[○]	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Character/Digit switching
[⏏]	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
[▲]	Signaling number change	Signaling number change	RX RAN up	TX RAN up	Color Code up	Slot up	Transmit power change	Go to the direct enter mode
[▼]	Signaling number change	Signaling number change	RX RAN down	TX RAN down	Color Code down	Slot down	Transmit power change	
[▶]	Signaling type change	Signaling type change	RX RAN ON/OFF	TX RAN ON/OFF	Unused	Unused	Unused	
[◀]	Signaling type change	Signaling type change	RX RAN ON/OFF	TX RAN ON/OFF	Unused	Unused	Unused	
Keypad [0] ~ [9] *5	Go to the direct enter mode					Slot number select (1 or 2)	Transmit power select (1, 2 or 3)	
Keypad [*] *5	Decision	Decision	Decision	Decision	Decision	Decision	Decision	Decision/ Character/ Digit switching
Keypad [#] *5	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	Back to the previous item

*5: K3, K6, E types only

*6: K type

Channel spacing select (1 or 2)

E type

Channel spacing select (1, 2 or 3)

*7: Mixed Mode only

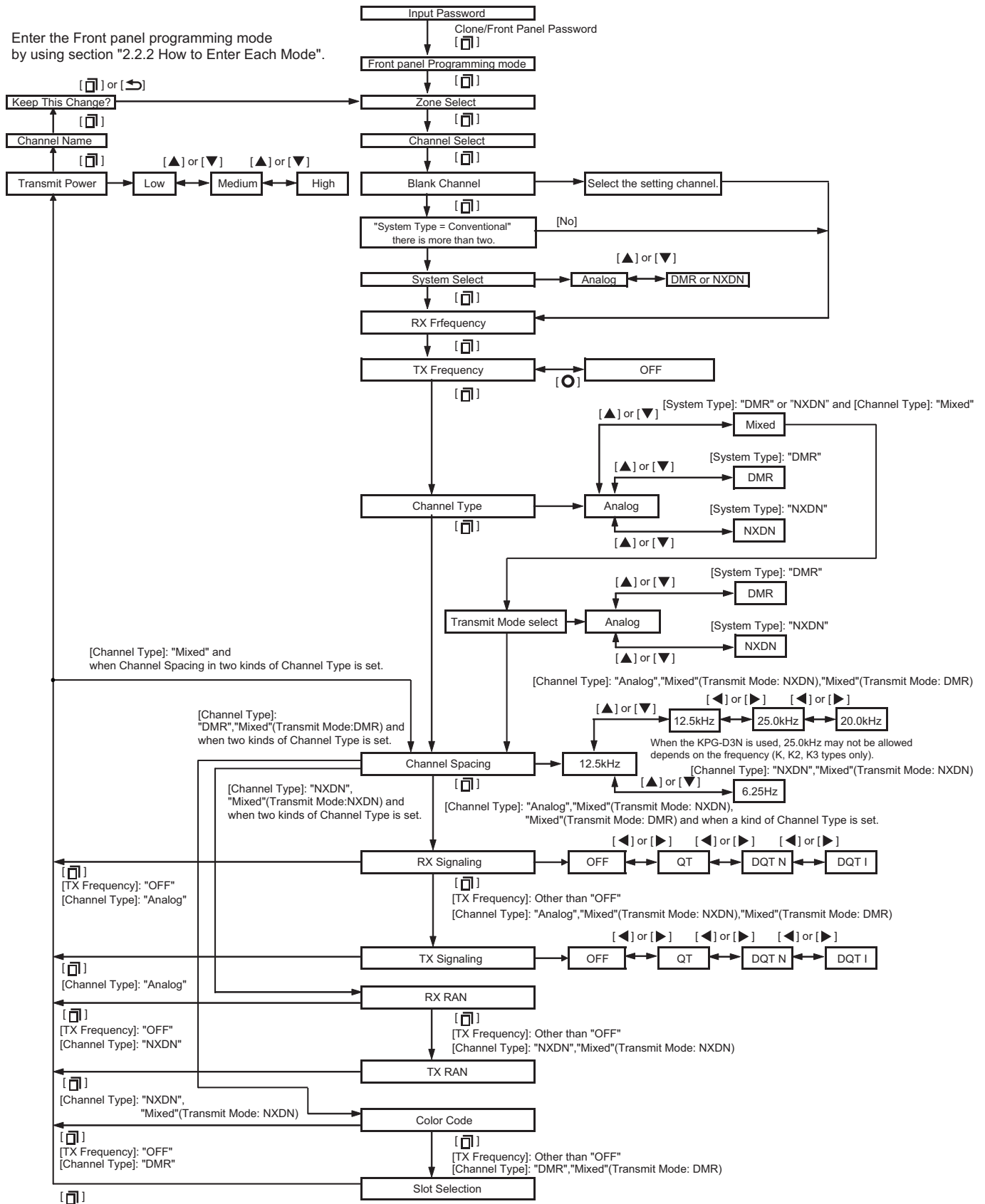
• **Direct enter mode**

Button\ Item	RX Frequency	TX Frequency	RX Signaling	TX Signaling	RX RAN	TX RAN	Color Code	Channel Name
[]	Decision							Character/Channel name decision
[↶]	Delete							
[○]	Unused							Input character switching
[⏏]	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] *8	Add a digit to the current number							
Keypad [*] *8	Decision							Input character switching
Keypad [#] *8	Delete/Back to the previous item							Delete

*8 K3, K6, E types only

• Front panel programming mode flow chart

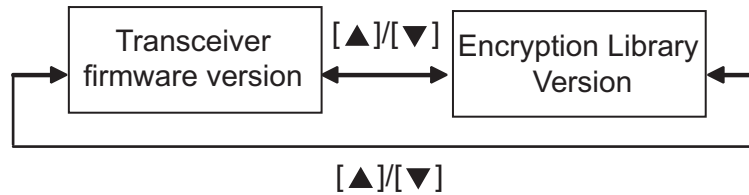
Enter the Front panel programming mode by using section "2.2.2 How to Enter Each Mode".



2.2.9 Transceiver Information Mode (K2, K3, E and E2 types only)

Use this function to confirm the transceiver firmware version, Encryption Library 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 [▼] buttons to select the confirmation items.



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

Note:

The Encryption Library Version will also display Radio Feature License (KWD-3004AE) as Inactive.

2.3 CIRCUIT DESCRIPTION

2.3.1 Overview

The NX-3220 is a VHF Analog FM & Digital Portable transceiver designed to operate in the frequency range of 136 to 174MHz. The NX-3320 is a UHF Analog FM & Digital Portable transceiver designed to operate in the frequency range of 400 to 520MHz. The unit consists of a transceiver IC, a transmitter, a digital control unit, and a power supply circuit.

2.3.2 Frequency Configuration

The receiver uses the direct conversion system. Incoming signals from the antenna are mixed with the local signal from the PLL circuit and converted to the baseband signal. The transmit signal frequency is generated by the VCO/PLL, and modulated by the signal from the DSP. It is then amplified and fed to the antenna.

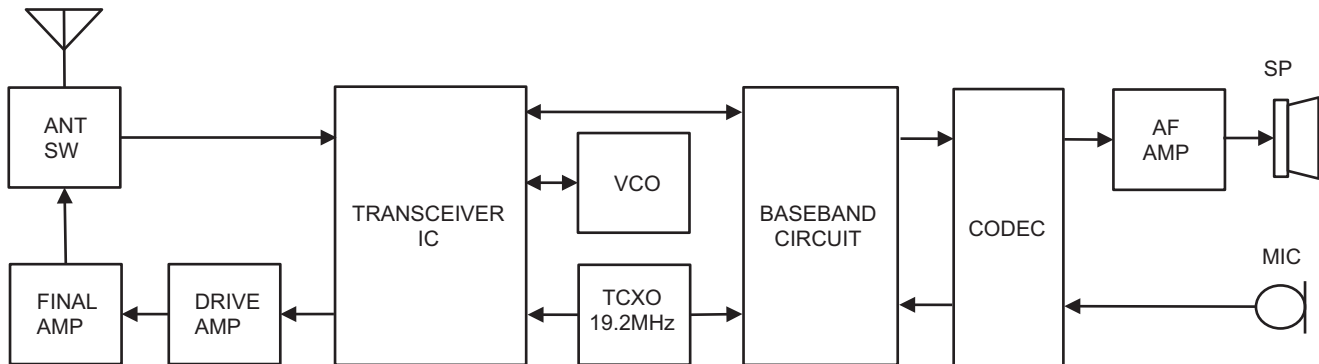


Fig.1 Frequency configuration

2.3.3 Receiver System

2.3.3.1 RF circuit

The receive signal from ANT SW (D201, D202, D203 and D205 (D205 is the NX3220 only.)) passes through the high-pass filter (L302, L307, L308, L312, L313, L314 and L315) to remove unwanted signals and amplified by a RF amplifier (incorporated in IC303). The signal is then fed to the mixer (incorporated in IC303) and converted to the baseband signal.

2.3.3.2 Baseband circuit

The baseband signal is then be fed into an ADC (incorporated in IC303), generates the I and Q data. This data is in the form of Serial Interface, and sent to the MPU/DSP (IC401).

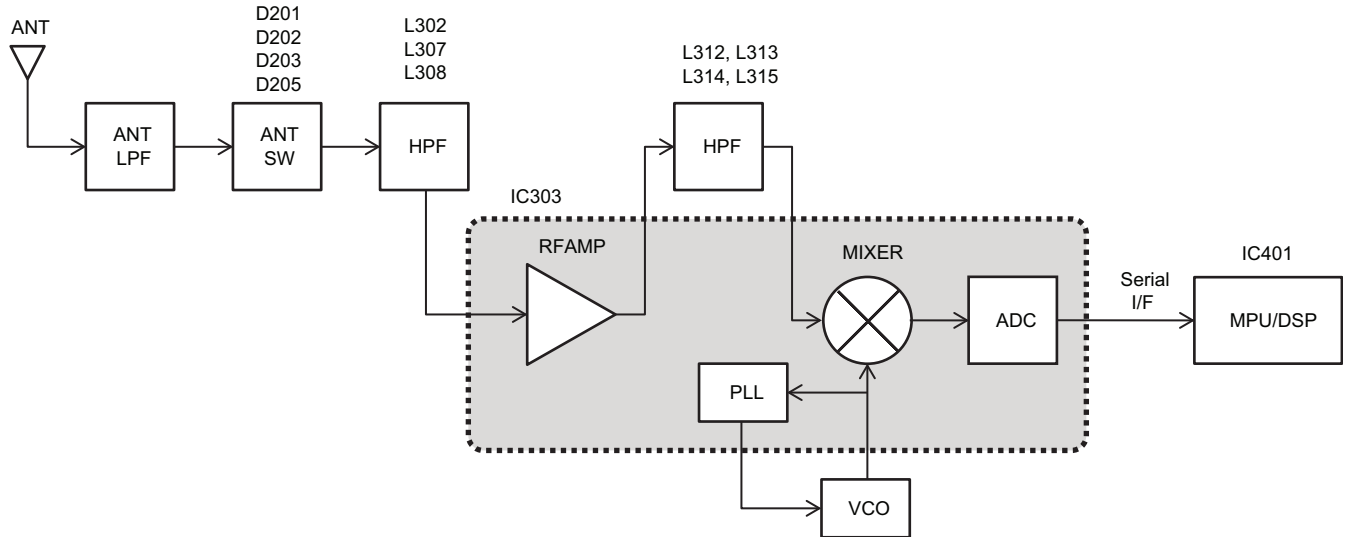


Fig.2 RF and Baseband circuit

2.3.3.3 Audio amplifier circuit

Audio processing (high-pass filter, low-pass filter, de-emphasized and so on) at Analog FM mode and decoding at Digital mode are processed by DSP. I2S signal from DSP is converted to audio signal at IC601. The signal goes to internal speaker through the internal Class-D amplifier or Jack connector for external speaker through the single-end audio power amplifier (IC650). Audio path inside the Codec IC is controlled by I2C.

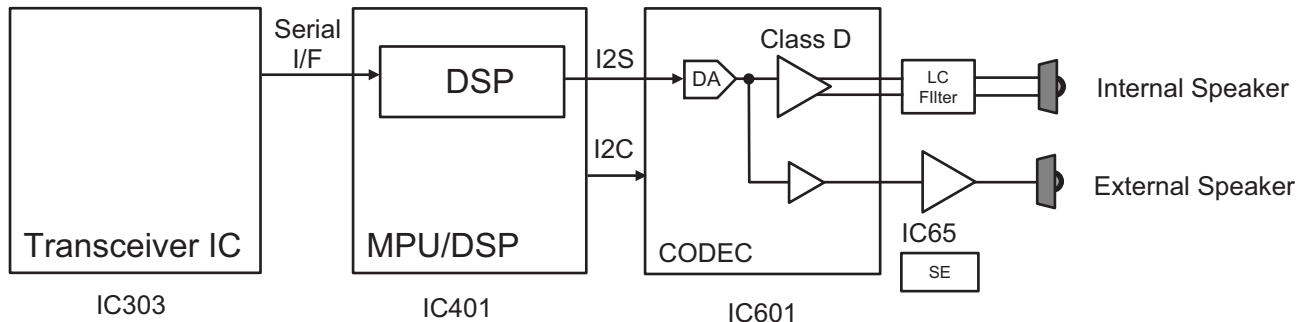


Fig.3 Audio amplifier circuit

2.3.4 Transmitter System

2.3.4.1 Audio Band Circuit

The signal from microphone is amplified and converted to digital signal by IC601, IC601 includes AGC function. Digital signal is transferred to IC401.

2.3.4.2 Baseband Circuit

The audio signal transferred from IC601 is processed at IC401.

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 in IC303. The DTMF and MSK baseband signals are also generated by IC401.

In Digital mode, the audio signal is converted to the 4-Level FSK baseband signal and is transferred to PLL Frequency Synthesizer block in IC303.

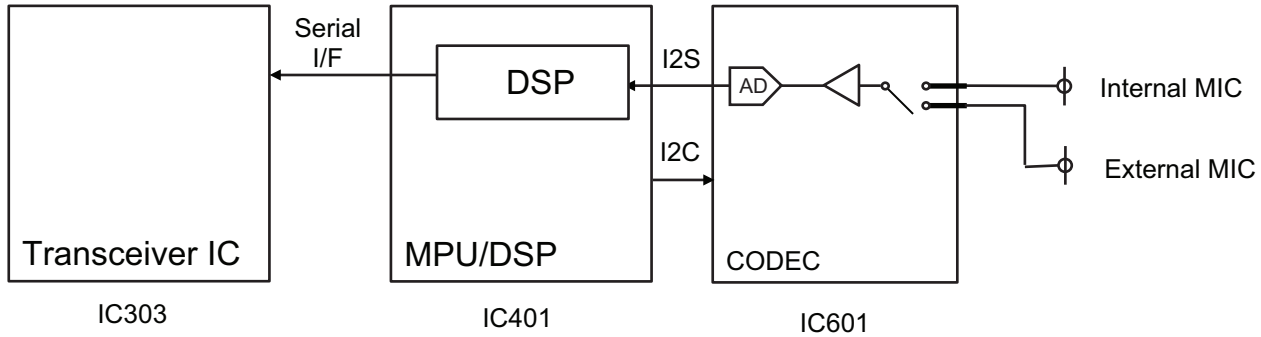


Fig.4 Audio and Baseband circuit

2.3.4.3 Drive and Final amplifier

The signal from the IC303 is amplified by pre-drive amplifier (IC202). The output of the pre-drive amplifier is amplified by the drive amplifier (Q201) and final amplifier (Q202) to 5W (1W when the power is low). IC202 is MMIC. Q201 and Q202 are MOS FET. The output of the final amplifier is then passed through the harmonic filter (LPF) and antenna switch (D201, D202 and D203) and applied to the antenna terminal.

2.3.4.4 APC circuit

The APC circuit always monitors the current flowing through the drive amplifier (Q201) and final amplifier (Q202). And APC keeps current constant.

The voltage drop at R248 and R250 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 Q201 and Q202 to keep the current constant. The change of power high/low is carried out by the change of the reference voltage.

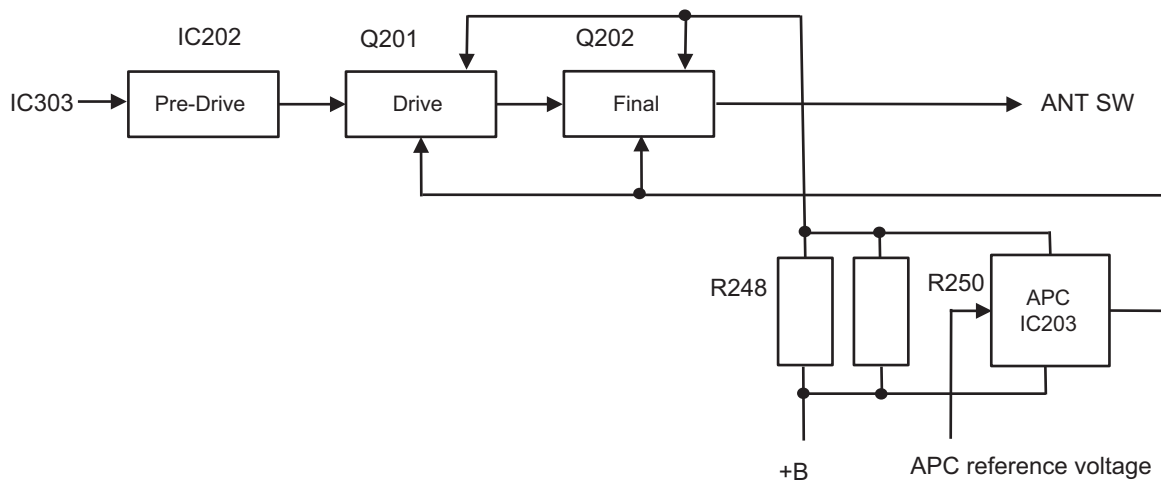


Fig.5 Drive and Final amplifier and APC circuit

2.3.5 PLL Frequency Synthesizer

2.3.5.1 TCXO (X401)

TCXO (X401) generates a reference frequency of 19.2MHz for the PLL frequency synthesizer. This reference signal is buffered by Q401. And it is distributed to PLL (IC303), IC401 and IC351.

The oscillation frequency is adjusted TCXO directly by controlled the D/A converter of FCNT.

2.3.5.2 VCO

• NX-3220

There is one VCO contain TX VCO and RX VCO.

The VCO (Q131) generates the carrier for the transmitter and the receiver. VCO oscillation frequency range is 272 to 348MHz. The transmit frequency range is same as receiver frequency range.

The local signal frequency range is also 272 to 348MHz.

The oscillation frequency is divided into two by IC 303 and it becomes the use frequency.

The VCO oscillation frequency is determined by voltage control terminals "CP" and "ASSIST".

The voltage control terminal "CP" is controlled by PLL (IC303). The voltage control terminal "ASSIST" is controlled by the control voltage from D/A converter (IC410).

For the modulation input terminal, "VCO_MOD" of PLL (IC303), the output frequency changes according to the applied voltage. This is used to modulate the VCO output.

• NX-3320

There are two VCO contain VCO_L and VCO_H.

The VCO_H (Q131) generates the carrier for the transmitter and the receiver. VCO oscillation frequency range is 920 to 1040MHz.

The transmit frequency range is same as receiver frequency range.

The local signal frequency range is also 920 to 1040MHz.

The VCO_L (Q151) generates the carrier for the transmitter and the receiver. VCO oscillation frequency range is 800 to 920MHz.

The transmit frequency range is same as receiver frequency range.

The local signal frequency range is also 800 to 920MHz.

The oscillation frequency is divided into two by IC 303 and it becomes the use frequency.

The VCO oscillation frequency is determined by voltage control terminals "CP" and "ASSIST".

The voltage control terminal "CP" is controlled by PLL (IC303). The voltage control terminal "ASSIST" is controlled by the control voltage from D/A converter (IC410).

For the modulation input terminal, "VCO_MOD" of PLL (IC303), the output frequency changes according to the applied voltage. This is used to modulate the VCO output.

2.3.5.3 PLL

PLL (IC303) compares the difference in phases of the VCO oscillation signal and the TCXO (X401) reference frequency. And it returns the difference voltage to the VCO CP 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 ASSIST Voltage from D/A converter (IC410) is used before control by the PLL (IC303) to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CP voltage does not change and is always stable at approx. 2.5V.

The desired frequency is set for the PLL (IC303) by the MPU/DSP (IC401) through the 3-line "/DCR_CS", "DCR_DO", "BCLK" serial bus for PLL. IC401 monitors through the "PLD", whether the PLL (IC303) is locked or not. If the VCO does not lock to desired frequency (unlock), the "PLD" logic is low.

2.3.6 Control Circuit

The control circuit consists of MPU/DSP (IC401) and its peripheral circuits. IC401 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.

2.3.6.1 MPU

The MPU/DSP (IC401) is 32bit RISC processor and Fixed/Floating-Point VLIW DSP, equipped with peripheral function.

This MPU operates at 288MHz (MAX) clock and 3.2V /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.

2.3.6.2 Memory Circuit

Memory circuit consists of the MPU/DSP (IC401) and the Mobile DDR (IC402), the flash memory (IC404). The flash memory has capacity of 512Mbit 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 512Mbit. The MPU copies the program to the Mobile DDR from Flash memory. And 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-D3/D3N), 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.

2.3.6.3 LCD

The LCD is controlled using parallel interface from MPU /DSP (IC401).

2.3.6.4 Button Detection Circuit

Buttons are detected using MPU/DSP (IC401).

2.3.6.5 Low Battery Warning

The battery voltage is divided using R65 and R66, it is detected by A/D converter (IC409).

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.

2.3.6.6 DSP

The DSP circuit consists of a MPU/DSP (IC401) and processes the baseband signal. The DSP operates at 288MHz (MAX) clock, the I/O section operates at 3.2V/1.8V and the core section operates at 1.2V.

The DSP carries out the following processes:

- 4Level 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 /5-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

2.3.7 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 (IC9, IC17, IC651, IC6, IC15), DC/DC converter (IC3), transistor (Q7 through the 0.5A fuse (F2)), transistor (Q650 through the 0.315A fuse (F650)), and voltage detector IC (IC1). Voltage detector (IC1) watches battery voltage. If the battery voltage is enough higher than 5.6V, detector outputs High. Then, IC9 (31BU) outputs 3.1V, and IC10 (12BU) outputs 1.2V.

When the VOL SW is turned on, SB1 becomes high (battery voltage). DC/DC (IC3) operates if both SB1 and output of detector are high. IC3 (38M) outputs 3.8V, and IC2 (12M) outputs 1.2V. Then, IC4 (18M) outputs 1.8V. Then, IC5 (32M) outputs 3.2V. Then, IC8 (18BT) outputs 1.8V. Then, IC7 (32BT) outputs 3.2V. Then, IC11 (32A) outputs 3.2V, and IC17 (50A) outputs 5.0V. Then, IC12 (18M_3) outputs 1.8V, and Q7 (53AF) is turned on. Voltage detector (IC403) watches IC3 (38M) output voltage. If the 38M output voltage is enough higher than 3.5V, detector outputs High.

As a result, MPU/DSP (IC401) operated.

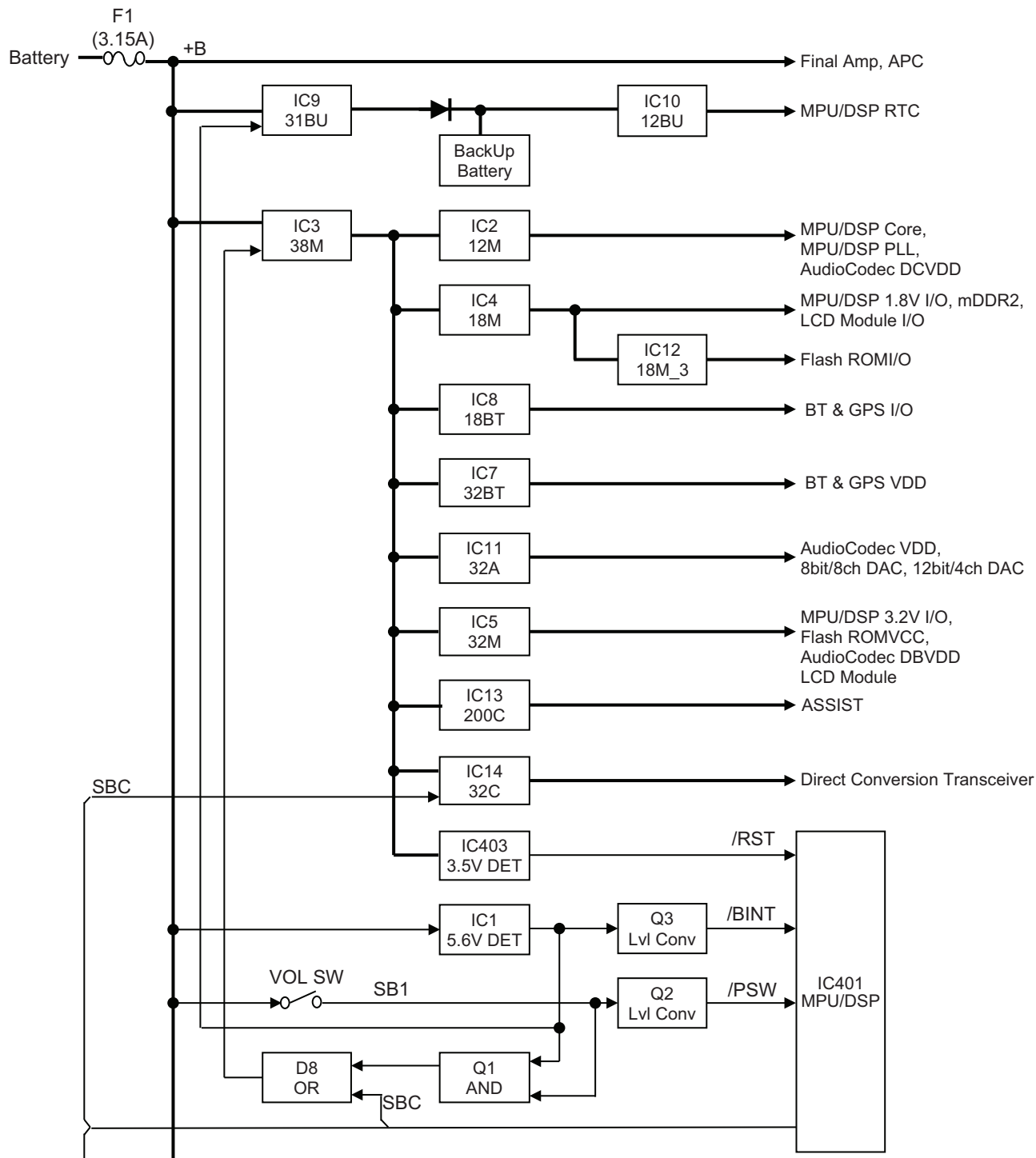
SBC signal becomes High after MPU/DSP (IC401) operates, and IC13 (200C), and IC14 (32C), and IC6 (50C), and Q4 (SB2) are turned on.

When 5VC signal becomes High, IC651 (50J) operates. When TXC signal becomes High, IC15 (50T) operates. IC15 (50T) is turned on in transmit mode. Switches are controlled by MPU/DSP (IC401).

When the VOL SW is turned off /PSW signal becomes Low. After detecting /PSW signal, MPU/DSP (IC401) changes SBC signal to Low.

38M is fed to IC13 (200C). IC13 (200C) is the DC/DC boost converter. IC13, D10, C50 consist of a voltage quadrupler.

The 200C circuit then outputs approximately +20VDC.



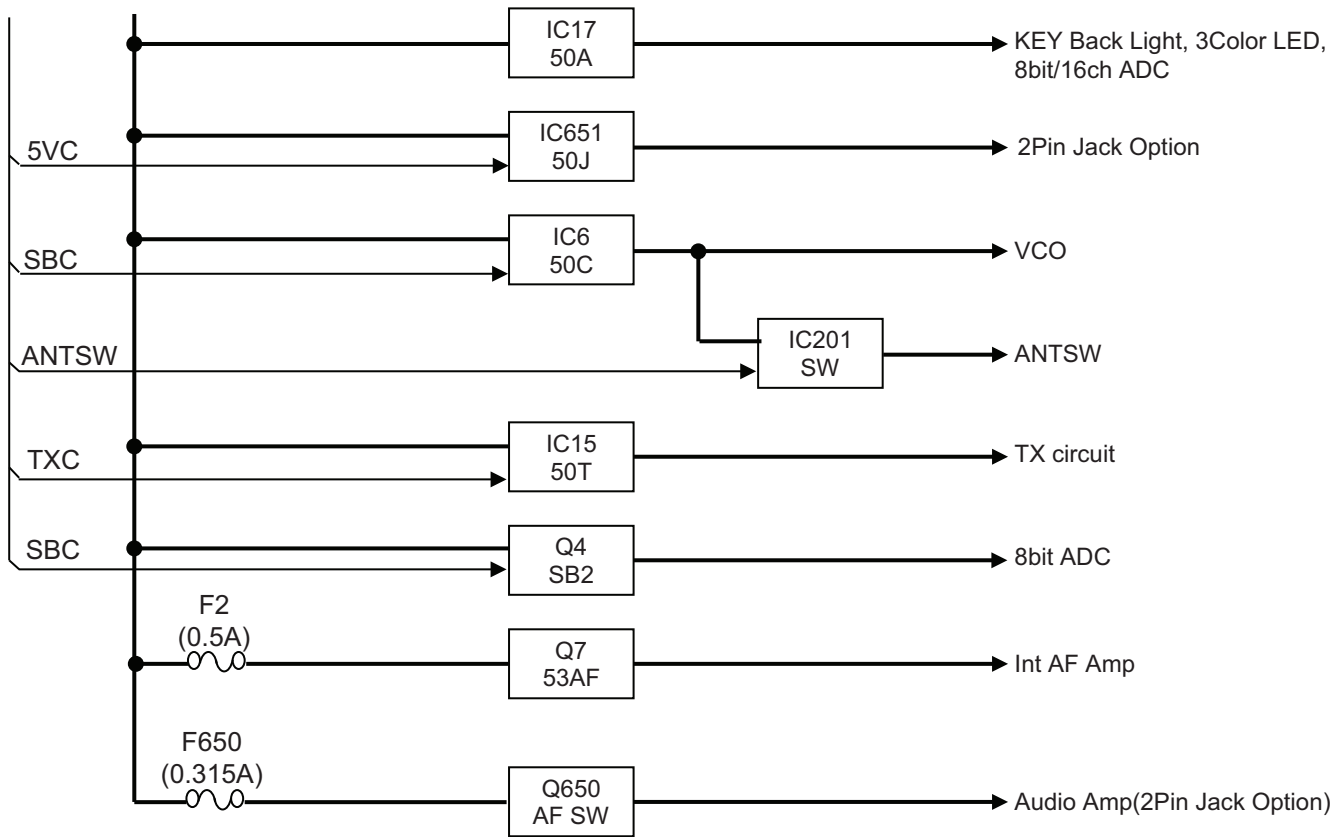


Fig.6 Power supply circuit

2.3.8 Signaling Circuit

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

Each signaling data signal of QT, DQT, DTMF, 2-tone and MSK is generated by IC401, superposed on a modulation signal and output to VCO and PLL.

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

The audio signal and signaling data (QT, DQT, DTMF, 2-tone and MSK) are separated by IC401. Next IC401 decode the signaling data.

2.3.9 Bluetooth/GPS Circuit

The main component of the Bluetooth/GPS circuit is Bluetooth /GPS IC (IC351).

The clocks of Bluetooth/GPS IC require 19.2MHz for core and 32.768kHz slow clock (X351) for UART. 19.2MHz clock (X401) is shared with MPU/DSP (IC401), and is supplied through the Clock buffer amplifier (Q401).

Bluetooth/GPS IC communicates to the MPU/DSP (IC401) on the HCI UART. Interface of UART & Digital audio (PCM) between the MPU/DSP (IC401) and the Bluetooth/GPS IC (IC351), have level conversion at the level conversion IC (IC352, IC353).

The Bluetooth/GPS IC is powered by 1.8V and 3.2V which are supplied from 2 discrete external regulators (IC8 and IC7). The input of these regulators is sourced from a switching regulator (IC3) which regulates the battery voltage to 3.8V.

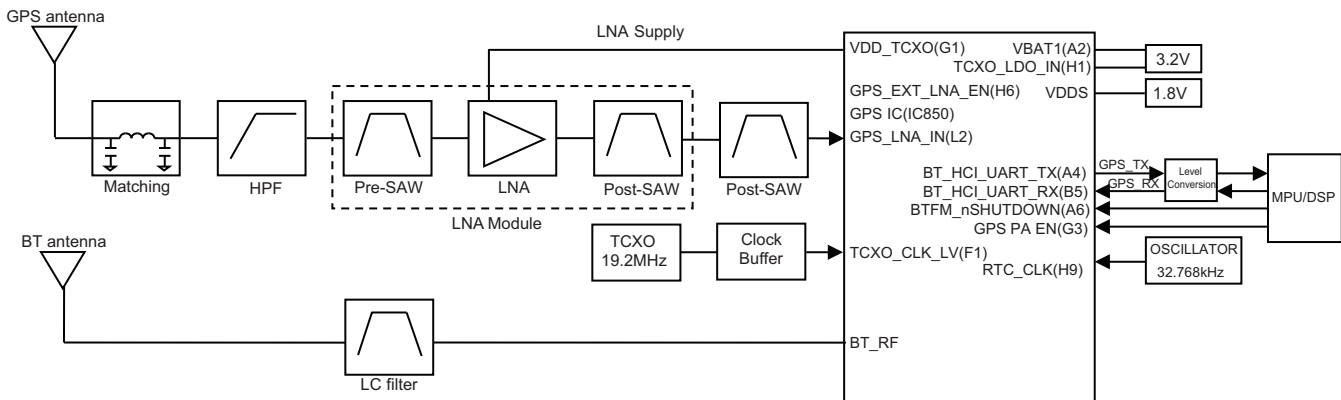


Fig.7 Bluetooth/GPS circuit

2.3.9.1 Bluetooth Circuit

TX/RX frequency is 2400-2483.5MHz (79ch Hopping, 2402-2480MHz, 1MHz step). Transmitting power is +0dBm at Bluetooth antenna input.

Bluetooth antenna is made of sheet metal, and connected to the Bluetooth / GPS IC (IC351) through the LC filter (L361).

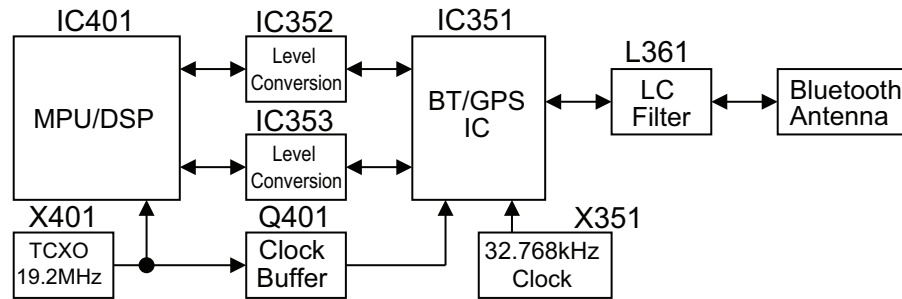


Fig.8 Bluetooth circuit

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 then OSLO is used

In EDR2 TX if power is >-12dBm then OSLO is used

In EDR3 TX if power is >-12dBm then OSLO is used

Otherwise 2X is used for TX as well.

2.3.9.2 GPS Circuit

The RF signal is received by the antenna matched by the matching circuit. The matching circuit consists of L173, C172 on DISPLAY Unit. And this signal applied to a high-pass filter. The filter consists of C175, C177, C179, L176 and L178 on DISPLAY Unit. The filtered RF signal is then applied to a LNA Module (A151).

The output of the LNA Module is fed into the SAW Filter (L359) after through the Attenuator comprised of R354, R355 and R356.

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

Frequency configuration for GPS is following:

Lo is GPS: 1571.324MHz

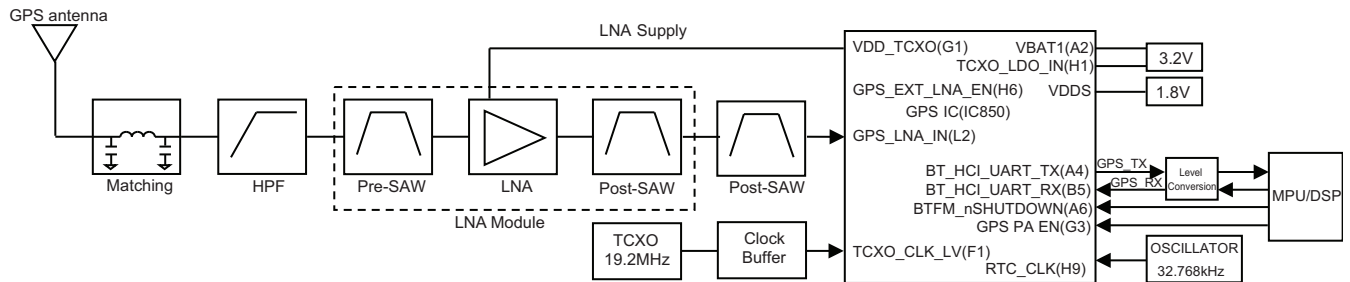


Fig.9 GPS circuit

2.4 COMPONENTS DESCRIPTION

2.4.1 TX-RX unit (XC1-178K-00,XC1-180K-00)

Ref. No.	Part Name	Use / Function
IC1	IC	Voltage detector
IC2	IC	DC/DC converter (12M)
IC3	IC	DC/DC converter (38M)
IC4	IC	DC/DC converter (18M)
IC5	IC	Voltage regulator (32M)
IC6	IC	Voltage regulator (50C)
IC7	IC	Voltage regulator (32BT)
IC8	IC	Voltage regulator (18BT)
IC9	IC	Voltage regulator (31BU)
IC10	IC	Voltage regulator (12BU)
IC11	IC	Voltage regulator (32A)
IC12	IC	Switch IC (18M_3)
IC13	IC	DC/DC converter (200C)
IC14	IC	Voltage regulator (32C)
IC15	IC	Voltage regulator (50T)
IC17	IC	Voltage regulator (50A)
IC18	IC	DC amplifier
IC101	IC	DC amplifier (Assist)
IC102	IC	DC amplifier (CV)
IC201	IC	DC amplifier (Antenna SW)
IC202	IC	MMIC (Pre-drive)
IC203	IC	DC amplifier (APC)
IC303	IC	Transceiver IC
IC351	IC	GPS/Bluetooth
IC352,353	IC	Level converter
IC401	IC	MPU/DSP
IC402	IC	SDRAM
IC403	IC	Voltage detector
IC404	IC	Flash memory
IC405	IC	AND gate (2 input)
IC406	IC	Motion sensor
IC409	IC	A/D converter
IC410	IC	D/A converter
IC601	IC	Codec
IC650	IC	Audio amplifier
IC651	IC	Voltage regulator (50J)
IC652	IC	Bus buffer (3 state)
IC654	IC	AND gate (2 input)
Q1	Transistor	38M control
Q2	FET	Detector (Power Switch)
Q3	FET	Detector (BINT)
Q4	FET	DC switch (SB2)
Q5	FET	18M control
Q6,7	Transistor	DC switch (Codec IC)

Ref. No.	Part Name	Use / Function
Q102	FET	DC switch (Assist)
Q103	FET	DC switch (VCO Buffer)
Q111,112	FET	DC switch (VCO)
Q113	Transistor	Ripple filter
Q114	FET	DC switch (VCO)
Q116	FET	DC switch (VCO)
Q131	FET(NX-3220), Transistor(NX-3320)	VCO
Q151	Transistor	VCO buffer(NX-3220), VCO(NX-3320)
Q181	Transistor	VCO buffer
Q201	FET	Drive amplifier
Q202	FET	RF final amplifier
Q203,204	Transistor	APC switch
Q205,206	FET	APC switch
Q207	Transistor	APC switch
Q351	FET	DC switch
Q401	Transistor	Clock buffer
Q402	Transistor	DC switch
Q650	Transistor	DC switch (Audio amplifier)
Q651,652	FET	Audio mute
Q653,654	Transistor	DC switch (Audio mute)
Q656	Transistor	DC switch (External PTT)
D1	Diode	Reverse protection
D8	Diode	38M control
D9	Diode	Back up battery charge
D10	Diode	DC/DC converter
D102	Zener diode	Over voltage protection
D111	Diode	Ripple filter
D131	Variable capacitance diode	VCO frequency control
D132-136	Variable capacitance diode	VCO frequency control
D151-155	VARI CAP D	VCO frequency control
D201-203	Diode	Antenna switch
D204	Zener diode	Over voltage protection
D205	Diode	Antenna switch
D206	Diode	Surge protection
D301,302	Diode	Excessive input protection
D303,304	Diode	Excessive input protection
D401,402	Diode	Reverse current protection
D403-407	Diode	Reverse current protection
D607-609	Diode	Surge protection
D620,621	Zener diode	Surge protection
D650	Diode	External speaker detector
D651,652	Zener diode	Over voltage protection
D653-655	Diode	Surge protection

2.4.2 Display unit (XC1-209K-XX)

Ref. No.	Part Name	Use / Function
A151	IC	GPS frontend module
IC201	IC	AND gate (2 input)
Q141	Transistor	DC switch (button backlight)
Q201	Transistor	DC switch (LCD)
Q221-223	Transistor	DC switch (TX/busy)
Q227-229	Transistor	DC switch (Light bar)
D111-120	LED	Button backlight
D132	LED	Button backlight
D141-144	Diode	Reverse current protection
D180,181	Diode	Excessive input protection
D201,202	LED	LCD backlight
D221	LED	TX/busy
D227	LED	Light bar

2.5 TERMINAL FUNCTION

2.5.1 TX-RX unit (XC1-178K-00, XC1-180K-00)

Pin No.	Name	I/O	Function
CN1			
1	NC	-	No connection
2	ENC0	I	Rotary switch input
3	ENC0	I	Rotary switch input
4	ENC1	I	Rotary switch input
5	GND	-	GND
6	ENC3	I	Rotary switch input
7	ENC2	I	Rotary switch input
8	+B	O	Power output after passing through the fuse
9	50A	O	DC 5.0V output
10	VOL	I	Volume level input
11	GND	-	GND
12	SB	I	Switched B input
13	NC	-	No connection
CN7			
1	/EMG	I	Emergency 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
CN402			
1	32LCD	O	DC 3.2V output
2	32LCD	O	DC 3.2V output
3	18M	O	DC 1.8V output
4	LCD_VSS	-	GND
5	LCD_/CS	O	LCD CS signal

Pin No.	Name	I/O	Function
6	LCD_A0	O	Data/Command control signal
7	LCD_E	O	LCD read signal
8	WR0_R/W	O	LCD write signal
9	LCD_/RST	O	LCD reset signal
10	LCD_DB0	I/O	LCD Data Bus 0
11	LCD_DB1	I/O	LCD Data Bus 1
12	LCD_DB2	I/O	LCD Data Bus 2
13	LCD_DB3	I/O	LCD Data Bus 3
14	LCD_DB4	I/O	LCD Data Bus 4
15	LCD_DB5	I/O	LCD Data Bus 5
16	LCD_DB6	I/O	LCD Data Bus 6
17	LCD_DB7	I/O	LCD Data Bus 7
18	LCD_BLC	O	LCD backlight control
19	GND	-	GND
20	GND	-	GND
21	ME	-	MIC GND
22	MIC	I	Main MIC input
23	50A	O	DC 5.0V output
24	50A	O	DC 5.0V output
25	/KEYI4	I	Key matrix input
26	/KEYI3	I	Key matrix input
27	/KEYI2	I	Key matrix input
28	/KEYI1	I	Key matrix input
29	/KEYI0	I	Key matrix input
30	KEYO3	O	Key matrix output
31	KEYO2	O	Key matrix output
32	KEYO1	O	Key matrix output
33	KEYO0	O	Key matrix output
34	LED_G	O	LED Green control
35	LED_B	O	LED Red control
36	LED_R	O	LED Blue control
37	LBC_G	O	Light Bar Green Control
38	LBC_R	O	Light Bar Red Control
39	LBC_B	O	Light Bar Blue Control
40	GND	-	GND
41	GND	-	GND
CN602			
1	SP-	O	BTL output for internal speaker -
2	SP+	O	BTL output for internal speaker +

2.5.2 Display unit (XC1-209K-XX A/2)

Pin No.	Name	I/O	Function
CN201			
1	NC	-	No connection
2	K-	-	Cathode for backlight(GND)
3	A+	O	Anode for backlight
4	VSS	-	GND

Pin No.	Name	I/O	Function
5	DB7	I/O	LCD Data Bus 7
6	DB6	I/O	LCD Data Bus 6
7	DB5	I/O	LCD Data Bus 5
8	DB4	I/O	LCD Data Bus 4
9	DB3	I/O	LCD Data Bus 3
10	DB2	I/O	LCD Data Bus 2
11	DB1	I/O	LCD Data Bus 1
12	DB0	I/O	LCD Data Bus 0
13	/RST	O	LCD reset signal
14	R/W	O	LCD write signal
15	E	O	LCD read signal
16	A0	O	Data/Command control signal
17	/CS0	O	LCD CS signal
18	VSS	-	GND
19	VDDI	O	LCD I/O Power Supply (DC 1.8V output)
20	VDDA	O	LCD Analog Power Supply (DC 3.2V output)
21	VB0+	-	LCD bias voltage.connect a Cap. to VB0-
22	VB1+	-	LCD bias voltage.connect a Cap. to VB1-
23	VB1-	-	LCD bias voltage.connect a Cap. to VB1+
24	VB0-	-	LCD bias voltage.connect a Cap. to VB0+
25	VLCD	O	Main LCD power supply.
CN202			
1	GND	-	GND
2	GND	-	GND
3	LBC_B	O	Light Bar Blue Control
4	LBC_R	O	Light Bar Red Control
5	LBC_G	O	Light Bar Green Control
6	LED_R	O	LED Blue control
7	LED_B	O	LED Red control
8	LED_G	O	LED Green congrol
9	KEYO0	O	Key matrix output
10	KEYO1	O	Key matrix output
11	KEYO2	O	Key matrix output
12	KEYO3	O	Key matrix output
13	/KEYI0	I	Key matrix input
14	/KEYI1	I	Key matrix input
15	/KEYI2	I	Key matrix input
16	/KEYI3	I	Key matrix input
17	/KEYI4	I	Key matrix input
18	50A	O	DC 5.0V output
19	50A	O	DC 5.0V output
20	MIC	I	Main MIC input

Pin No.	Name	I/O	Function
21	ME	-	MIC GND
22	GND	-	GND
23	GND	-	GND
24	LCD_BLC	O	LCD backlight control
25	LCD_DB7	I/O	LCD Data Bus 7
26	LCD_DB6	I/O	LCD Data Bus 6
27	LCD_DB5	I/O	LCD Data Bus 5
28	LCD_DB4	I/O	LCD Data Bus 4
29	LCD_DB3	I/O	LCD Data Bus 3
30	LCD_DB2	I/O	LCD Data Bus 2
31	LCD_DB1	I/O	LCD Data Bus 1
32	LCD_DB0	I/O	LCD Data Bus 0
33	LCD_/RST	O	LCD reset signal
34	WR0_R/W	O	LCD write siganl
35	WR1_E	O	LCD read signal
36	LCD_A0	O	Data/Command control signal
37	LCD_/CS	O	LCD CS signal
38	LCD_VSS	-	GND
39	18M	O	DC 1.8V output
40	32LCD	O	DC 3.2V output
41	32LCD	O	DC 3.2V output

2.5.3 Display unit (XC1-209K-XX B/2)

Pin No.	Name	I/O	Function
CN301			
1	/EMG	I	Emergency 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

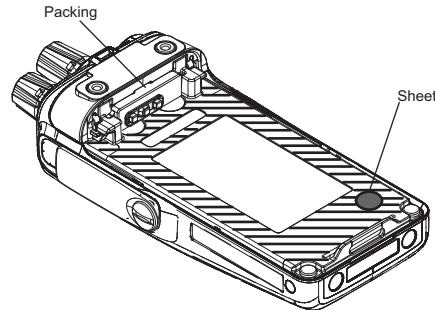
2.5.4 SP/MIC Connector Specification

Pin No.	Pin Name	I/O	Signal Type	Description	Rating and Condition				
					Parameter	Min	Typ	Max	Unit
1	PTT/RXD	I	Digital	PTT/RXD input Zin=47kohm	VIH	2.0	-	5.3	V
					VIL	0.0	-	0.8	V
					Baud Rate	-	-	1.1875	Mbps
2	MICI	I	Analog	External MIC input Zin=1.8kohm@1kHz	Audio Level	7.7	12.5	17.3	mV
					DC Bias		2.9		V
					Allowable Frequency	300	-	3000	Hz
					Input impedance	-	1.8	-	kohm
3	NC	-	-	-	-	-	-	-	-
4	OPTDET	I	Digital	External option detection Zin=74kohm					
5	50J	O	Power	DC 5V Output	Output Voltage	4.9	5	5.1	V
					Maximum Output Current	-	-	100	mA
6	AE	-	GND	Ground	Maximum Input Current			700	mA
7	TXD	O	Digital	TXD output Zout=47kohm	VOH(Io=-5mA)	4.1	-	5.1	V
					VOL(Io=5mA)	0.0	-	0.8	V
					Baud Rate	-	-	1.1875	Mbps
8	EXTSPDET	I	Digital	External speaker detection	VIH	2.5	-	5.3	V
					VIL	0.0	-	0.40	V
9	SPO	O	Analog	Internal Audio output	Maximum Output Power	-	-	1300	mW
					Standard Output Power	-	500	-	mW

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 black 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 the shaded area that the battery contacts shown in the figure. 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

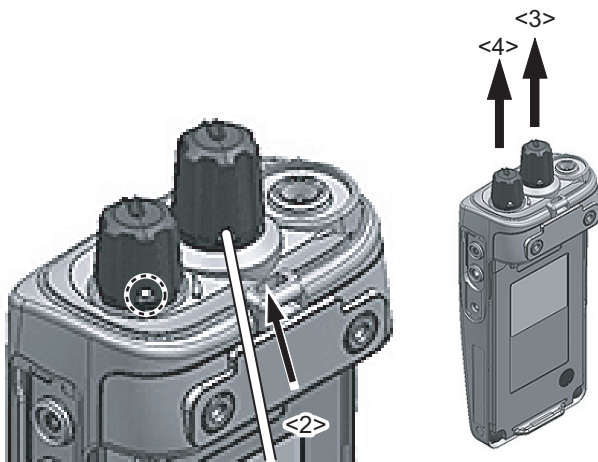
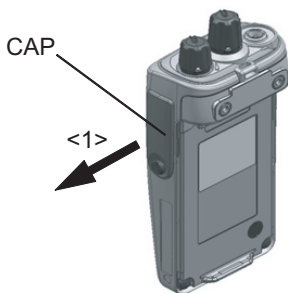
3.2.1 Removing the selector knob and volume knob

- (1) Remove the CAP in the direction of the arrow. <1>
- (2) Using a thin tool, insert it in the hole on the selector knob side and push the knob spring. <2>

Note:

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

- (3) Lift and remove the selector knob <3> while pushing the knob spring.
- (4) Repeat steps 2 and 3 for the volume knob, to remove the volume knob <4>.



Note:

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

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

3.2.2 Removing the selector knob spring and volume knob spring

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

Note:

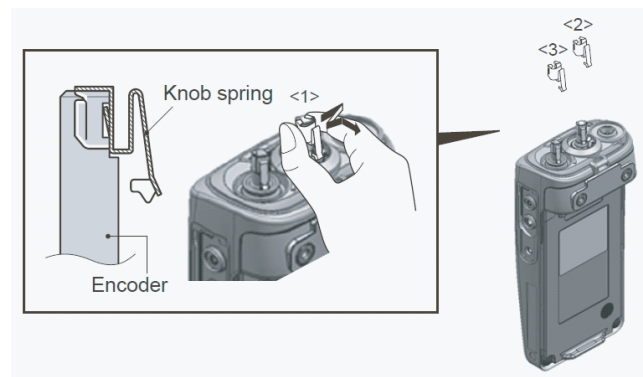
Do not grasp the knob spring tightly.

- (2) Remove the selector knob spring <2>.

Note:

Use minimal contact with your fingers on the knob spring.

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



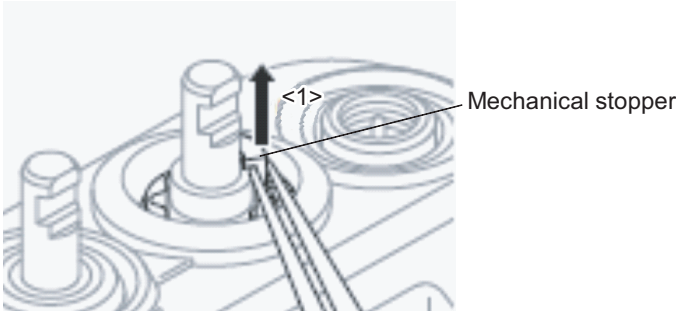
3.2.3 Removing the mechanical stopper (without LCD models only)

- (1) Pick up and lift the tab of a mechanical stopper using a pair of tweezers.

Note:

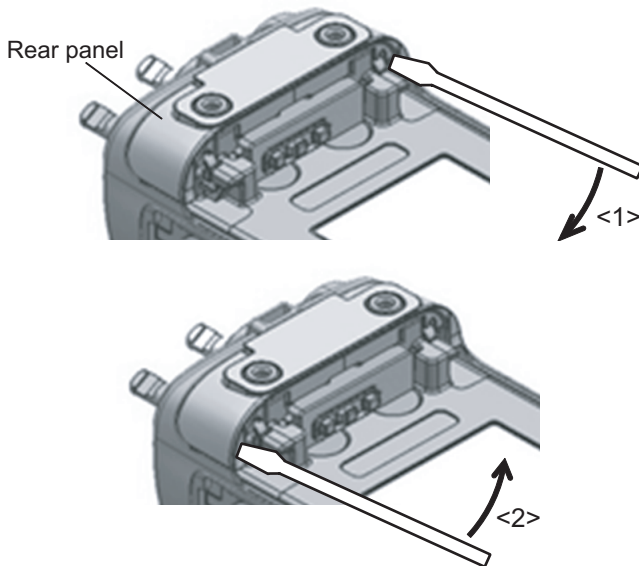
Take care not to damage the packing.

- (2) Remove the mechanical stopper. <1>



3.2.4 Removing the front case from the chassis

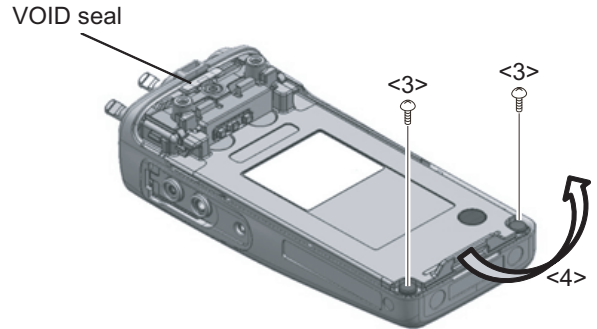
- (1) Remove the rear panel with a flat-head screwdriver. Insert the screwdriver between the rear panel (right side) and the chassis, push it in the direction of the arrow <1>, and remove the right side of the rear panel. Repeat the above action for the left side of the rear panel <2>.



- (2) Remove the two screws <3>.
- (3) Peel off the void seal.
- (4) Lift the base of the chassis and remove the chassis from the front case. <4>

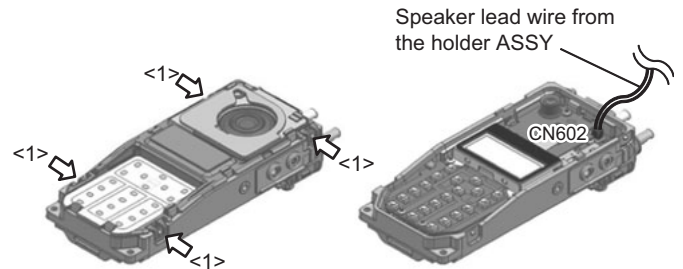
Note:

- Once the void seal is peeled off, it cannot be used again.
- When the chassis cannot be removed from the front case, remove by pushing in the button top with the finger.
- Regarding VOID, confirm the service policy of the NX-3220 and NX-3320 to KENWOOD (or authorized distributor).



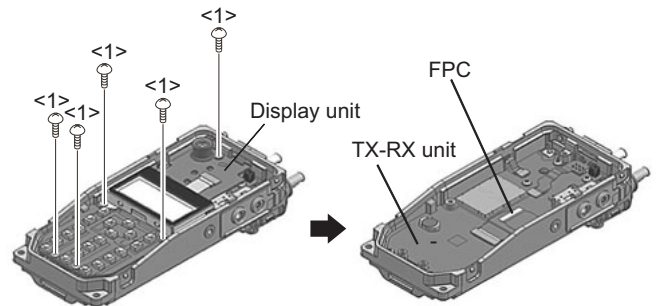
3.2.5 Remove the holder ASSY from the chassis

- (1) Remove the four tabs on the holder ASSY from the chassis. <1>
- (2) Lift up the holder ASSY, then remove the speaker lead wire from the connector (CN602).



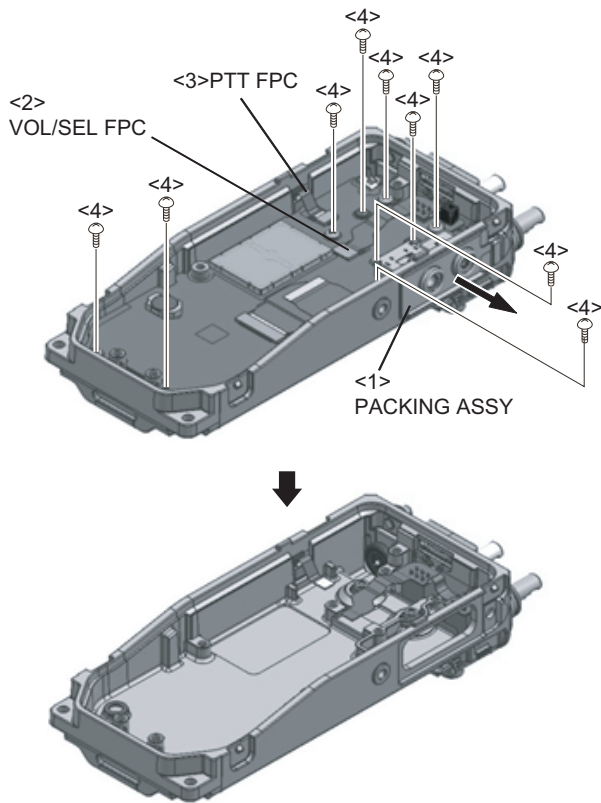
3.2.6 Removing the Display unit from the chassis

- (1) Remove the five screws <1>.
- (2) While lifting the Display unit, remove the FPC from the connector (CN202) of the Display unit.



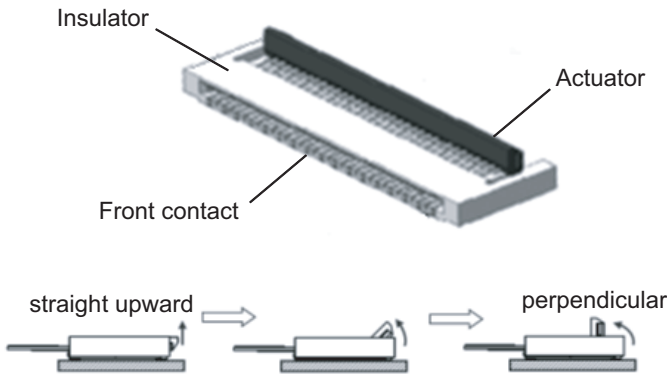
3.2.7 Removing the TX-RX unit from the chassis

- (1) Remove the following parts in numerical order.
 <1>PACKING ASSY <2>VOL/SEL FPC <3>PTT FPC
 <4> nine screws



Note:

The FPC is locked with an actuator.
 Raise the actuator straight upward, then make sure
 the actuator is perpendicular to the insulator.



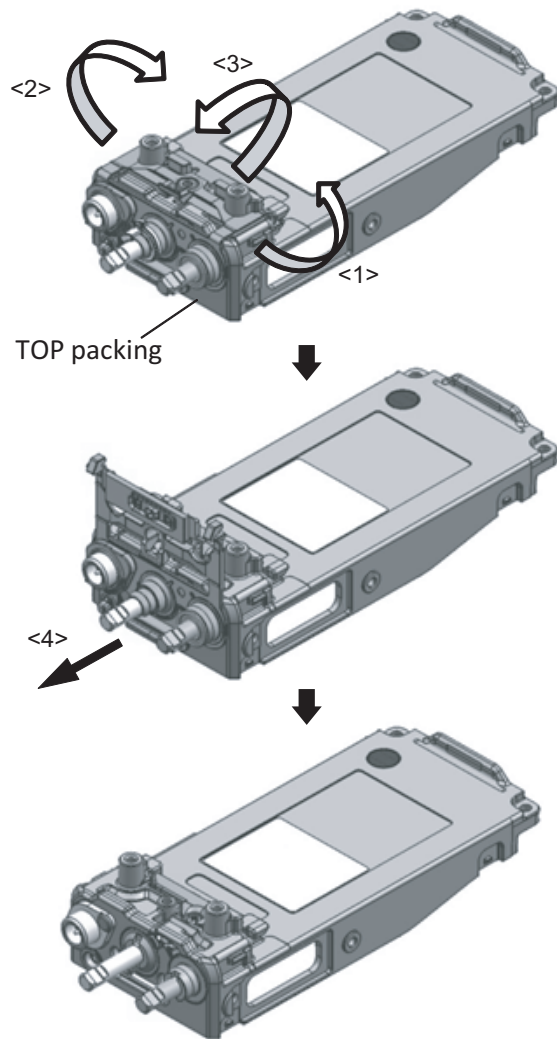
3.2.8 Removing the TOP packing

- (1) Pull the TOP packing to the left to remove the packing that
 is fit into the left groove of the chassis. <1>
 (2) Pull the TOP packing to the right to remove the packing that
 is fit into the right groove of the chassis. <2>
 (3) Pull the TOP packing to the center to remove the packing
 that is fit into the center groove of the chassis. <3>
 (4) Remove the TOP packing. <4>

Note:

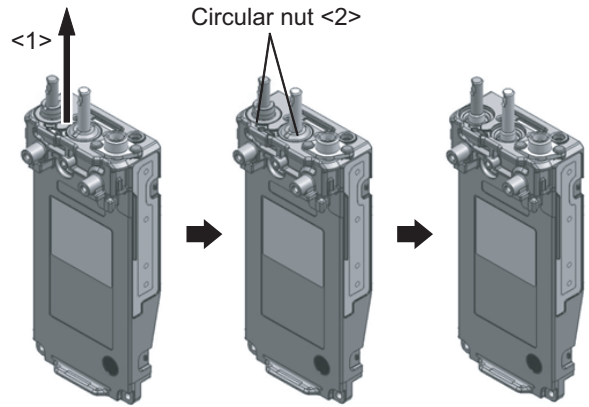
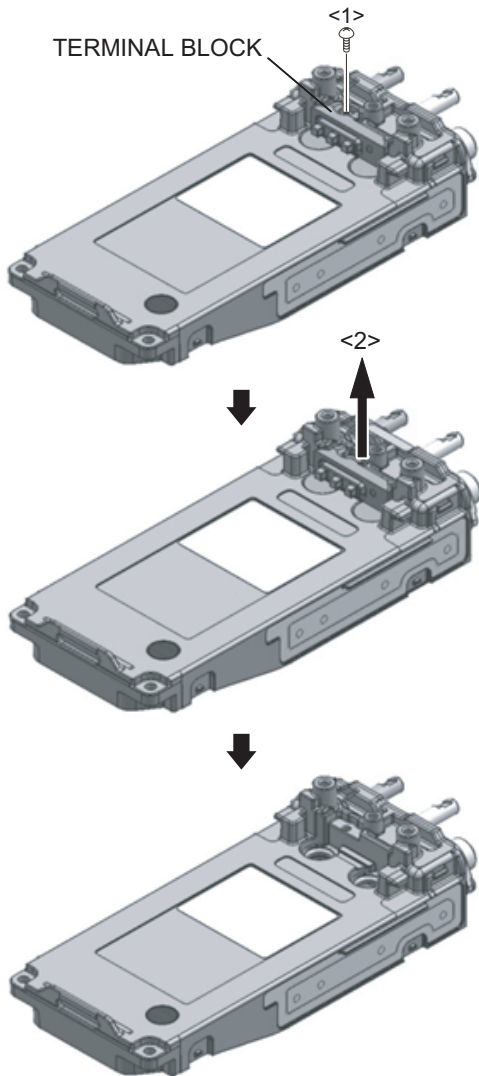
Remove the packing slowly, as the packing of the
 selector part might be upset when the TOP packing
 is removed.

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 TERMINAL BLOCK (with PACKING)

- (1) Remove the screw. <1>
- (2) Remove the TERMINAL BLOCK (with PACKING). <2>

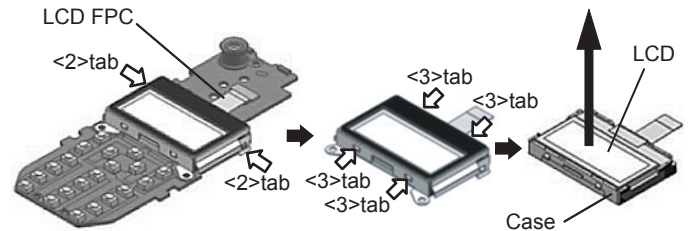


Note:

When reassembling, make sure the stopper and the circular nut are engaged.

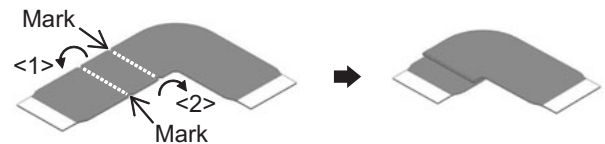
3.2.11 Removing the LCD from the Display unit

- (1) Remove the LCD FPC from the connector. <1>
- (2) Remove the Display ASSY fixed with two tabs. <2>
- (3) Remove the shielding case fixed with four tabs. <3>
- (4) Take the LCD out of the case.



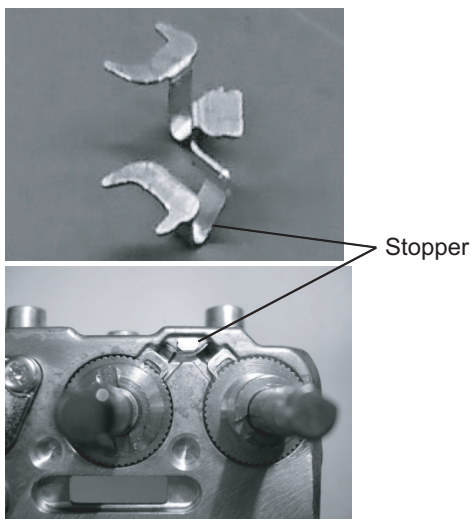
3.2.12 Forming the FPC (for connection of DISPLAY UNIT and TX-RX UNIT)

Bend the FPC twice along the mark. <1> <2>



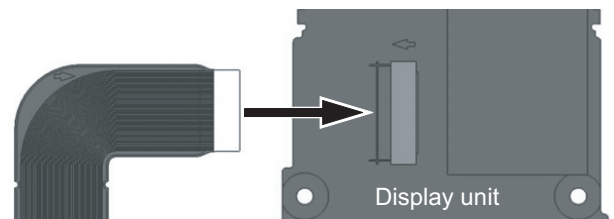
3.2.10 Removing the stopper of the selector circle nut and volume circle nut

- (1) Remove the stopper using a pair of tweezers. <1>
- (2) Remove the circular nut <2> using the nut wrench (W05-1123-00).



3.2.13 Insert direction for the FPC (for connection of DISPLAY UNIT and TX-RX UNIT)

Insert the FPC with the electrode surface downward.



3.3 Precautions for Reassembly

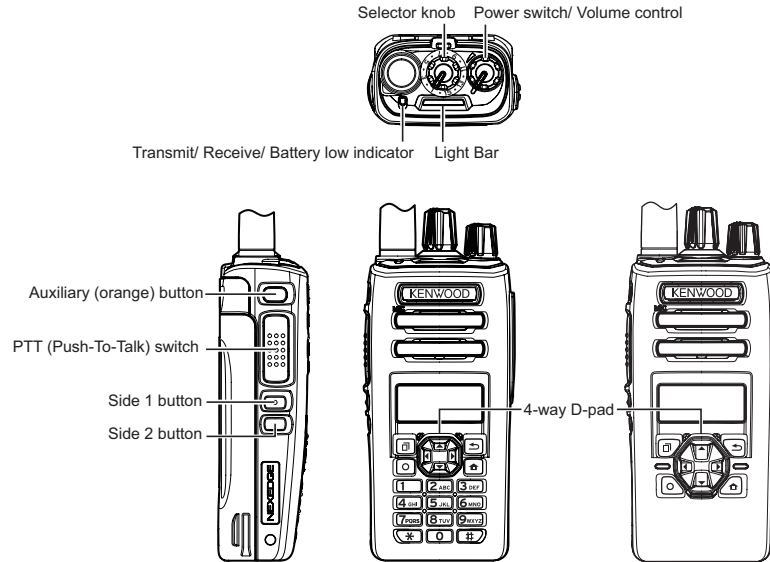
3.3.1 Assembly Information (Sheet/Cushion)

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.

Main Parts		Assembled Sheet/ Cushion	
Part Name	Part Number	Part Name	Part Number
CHASSIS	A1A-0105-00	SHEET	G1A-0063-00
		CUSHION	G1D-0204-00
		SHEET	G11-4440-04
		SHEET (PTT)	G1G-0075-00
		CUSHION (ANT)	G13-2220-04
CABINET ASSY (BASIC)	A0C-0177-00	STICKER (NEXEDGE)	B42-7417-04
		KENWOOD BADGE	B4D-0044-00
		FIBROUS SHEET	G1A-0053-00
CABINET ASSY (STANDARD)	A0C-0178-00	STICKER (NEXEDGE)	B42-7417-04
		KENWOOD BADGE	B4D-0044-00
		FIBROUS SHEET	G1A-0053-00
CABINET ASSY (FULL)	A0C-0179-00	STICKER (NEXEDGE)	B42-7417-04
		KENWOOD BADGE	B4D-0044-00
		FIBROUS SHEET	G1A-0053-00
HOLDER	J1K-0493-00	SHEET (MIC)	G1A-0057-00
		CUSHION (SP)	G1D-0203-00
		SHEET (BUTTON)	G1G-0076-00
		SHEET (SP)	G1G-0077-00
		SHEET (STD model only)	G1G-0080-00
		ANTENNA ELEMENT (GPS)	T9A-0058-00
		ANTENNA ELEMENT (BT)	T9A-0059-00
MOUNTING HARDWARE	J2B-0350-00	CUSHION	G1D-0205-00
		SHEET (LCD)	G1B-0300-00
HOLDER	J1K-0494-00	CUSHION	G1D-0231-00
ILLUMINATION GUIDE	B1B-0105-00	REFLECTION SHEET	B1B-0110-00
TX-RX UNIT (NX-3220 K2,K3)	XCA-029K-00	CUSHION	G1D-0272-00
TX-RX UNIT (NX-3220 E,E2)	XCA-029E-01		
TX-RX UNIT (NX-3320 K2,K3)	XCA-030K-00		
TX-RX UNIT (NX-3320 E,E2)	XCA-030E-01		

SECTION 4 ADJUSTMENT

4.1 NX-3220(K, K2, K3) TYPE 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 8ohm 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 (K2 and K3 types only)

4.2.1 Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [↵] button while turning the transceiver power ON or press the [☐] button 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 4-way D-pad and the last used signaling number are displayed. When it is activated for the first time, the signaling number is 1.

4.2.2 Button operation

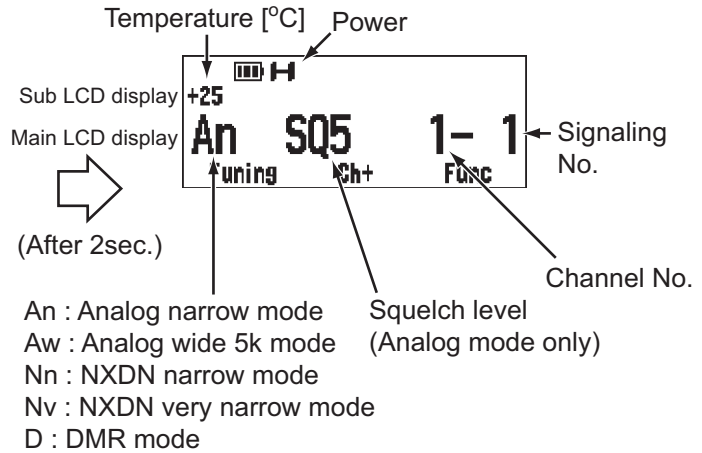
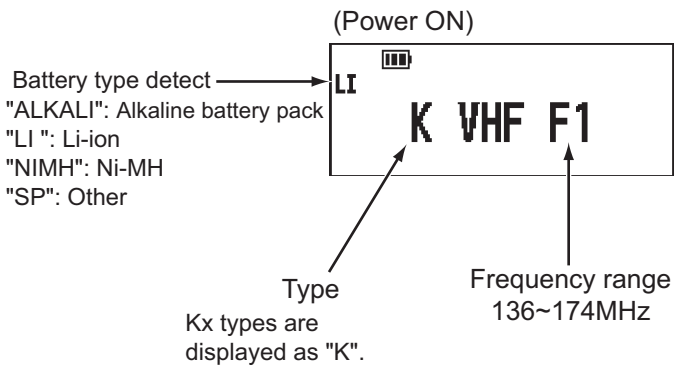
Button	"Func" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[▼]	Push: Test channel down Hold: Test channel down continuously	Channel No.
[◀]	Push: Squelch level up *1 Hold: Squelch off	Squelch level Squelch off: 🗣 icon appears
[▶]	Wide/Narrow/ Very Narrow	Wide: "w" Narrow: "n" Very Narrow: "v"
[Side1]	-	-
[Side2]	-	-
[☐]	Shift to panel tuning mode	-
[↵]	Function on	"Func" appears on the sub LCD display
[○]	-	-
[🏠]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[AUX (Orange)]	MSK 1200bps and 2400bps *1	2400bps: [✉] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [✖]	-	-

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

Button	"Func" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Function off	-
[▼]	Analog/NXDN/DMR	Analog: "A" NXDN: "N" DMR: "D"
[◀]	Function off	-
[▶]	Button/LCD check	The position of the selector knob, etc., appear.
[Side1]	Function off	-
[Side2]	Function off	-
[□]	High power/Medium power/Low power	High:[H] icon appears Medium:[M] icon appears Low:[L] icon appears
[↶]	Function off	-

Button	"Func" appears on the sub LCD display	
	Function	Display
[○]	Function off	-
[🏠]	Function off	-
[AUX (Orange)]	Compander On/Off	On: [📉] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

• 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	155.05000	155.10000
2	136.05000	136.10000
3	173.95000	173.90000
4	155.00000	155.00000
5	155.20000	155.20000
6	155.40000	155.40000
7~16	-	-

(2) Signaling

■ Analog Type 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)

4.3.3 5 or 9 reference level adjustments frequency

High Transmit Power, Medium Transmit Power, Low Transmit Power, Balance, Maximum Deviation, NXDN High Deviation, DMR High Deviation, QT Deviation, DQT Deviation, LTR Deviation, DTMF Deviation, Single Tone Deviation, MSK Deviation, CW ID Deviation, IQ Phase, RSSI Reference 1 DSP (Receive), RSSI Reference 2 RF IC (Receive), RSSI Reference 3 DSP (Standby), RSSI Reference 4 RF IC (Standby), Squelch Open, Squelch Tight, Low RSSI, High RSSI

Tuning point	Display	RX (MHz)	TX (MHz)
1	L1	136.05000	136.10000
2	L3	145.55000	145.60000
3	C2	155.05000	155.10000
4	H1	164.55000	164.60000
5	H3	173.95000	173.90000

VCO Assist

Tuning point	Display	RX (MHz)	TX (MHz)
1	L1	136.05000	136.10000
2	L2	140.80000	140.85000
3	L3	145.55000	145.60000
4	C1	150.30000	150.35000
5	C2	155.05000	155.10000
6	C3	159.80000	159.85000
7	H1	164.55000	164.60000
8	H2	169.30000	169.35000
9	H3	173.95000	173.90000

4.3.4 Adjustment item supplement

Adjustment Item	Description
LCD Contrast	The contrast of LCD display can be changed.
VCO Assist	The lock voltage of VCO is adjusted. This item must be adjusted before receiver and transmitter adjustment items.
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.
RTC Correction	Real Time Clock is adjusted. This item uses the internal clock. (Any measurement equipment is not required.)
High Transmit Power	High Transmit Power is adjusted.
Mid Transmit Power	Medium Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.

Adjustment Item	Description
Ramp Offset	Adjust this item to the optimal Ramp voltage.
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 (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.
High Deviation	NXDN/DMR high deviation is adjusted.
QT Deviation	QT deviation is adjusted.
DQT Deviation	DQT deviation is adjusted.
LTR Deviation	LTR deviation is adjusted.
DTMF Deviation	DTMF deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in "2-tone" and "5-tone" is adjusted.
MSK Deviation	MSK deviation is adjusted.
CW ID Deviation	CWID tone deviation is adjusted. CWID is used to inform the others who is transmitting on a 6.25-kHz spacing channel. (In FCC rule, Analog mode or CWID is required for each channel-spacing.)
Battery Warning	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.
IQ Phase	Correction of phase difference shift between I and Q.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Squelch Open	The squelch level at level "1" is adjusted.
Squelch Tight	The squelch level at level "9" is adjusted.
Low RSSI	RSSI display level " $\bar{\gamma}_{11}$ " is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)

4.3.5 Adjustment item and Display

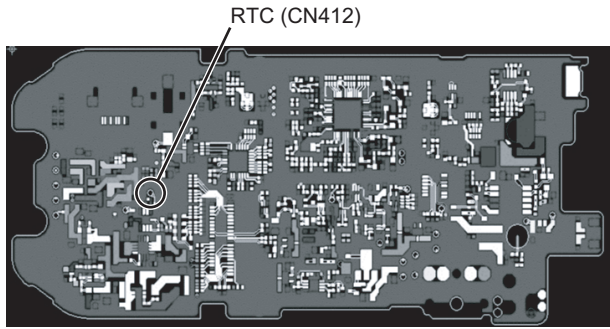
Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS *2	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
				Adjustment range						
1	LCD Contrast	CNTR	-	1 point ADJ						Common Section 2
				1~256						
2	VCO Assist	AST	(CV voltage)	-	-	9	-	-	-	Common Section 3
				1~4096						
3	RTC Correction	RTC	-	-						Common Section 5
				-2.00 ~ -0.01 ,0.00 ,+0.01 ~ +2.00						
4	High Transmit Power	H_PWR	-	-	-	5	-	-	-	Transmitter Section 2
				1~1024						
5	Medium Transmit Power	M_PWR	-	-	-	5	-	-	-	Transmitter Section 3
				1~1024						
6	Low Transmit Power	L_PWR	-	-	-	5	-	-	-	Transmitter Section 4
				1~1024						
7	Ramp Offset	RAMP	(ADC measurement value)	1 point ADJ						Transmitter Section 1
				1~1024						
8	Balance	BAL	(Encode frequency)	-	-	5	-	-	-	Transmitter Section 5
				1~1024						
9	Maximum Deviation	ADEV	-	5	5 *2	5	-	-	-	Transmitter Section 6
				1~1024						
10	NXDN High Deviation	NDEV	-	-	-	-	5	5	-	Transmitter Section 7
				1~1024						
11	DMR High Deviation	DDEV	-	-	-	-	-	-	5	Transmitter Section 8
				1~1024						
12	QT Deviation	QT	-	5	5 *2	5	-	-	-	Transmitter Section 9
				1~1024						
13	DQT Deviation	DQT	-	5	5 *2	5	-	-	-	Transmitter Section 10
				1~1024						
14	LTR Deviation	LTR	-	5	5 *2	5	-	-	-	Transmitter Section 11
				1~1024						
15	DTMF Deviation	DTMF	-	5	5 *2	5	-	-	-	Transmitter Section 12
				1~1024						
16	Single Tone Deviation	TONE	-	5	5 *2	5	-	-	-	Transmitter Section 13
				1~1024						
17	MSK Deviation	MSK	-	5	5 *2	5	-	-	-	Transmitter Section 14
				1~1024						
18	CW ID Deviation	CWID	-	-	-	5	-	-	-	Transmitter Section 15
				1~1024						
19	Battery Warning	BATT	(BATT measurement value)	1 point ADJ						Transmitter Section 16
				1~256						
20	IQ Phase	IQ	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 2
				1~63						
21	RSSI Reference 1 DSP (Receive)	RSSI1	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						

Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS *2	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
				Adjustment range						
22	RSSI Reference 2 RF IC(Receive)	RSSI2	(RSSI RF IC(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
23	RSSI Reference 3 DSP (Standby)	RSSI3	(RSSI DSP (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
24	RSSI Reference 4 RF IC (Standby)	RSSI4	(RSSI RF IC (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
25	Squelch Open	SQL	(ASQDET measurement value)	5	5 *2	5	5	5	5	Receive Section 4
				1~256						
26	Squelch Tight	SQLT	(ASQDET measurement value)	5	5 *2	5	-	-	-	Receive Section 5
				1~256						
27	Low RSSI	LRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 6
				1~256						
28	High RSSI	HRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 7
				1~256						

*2: Wide 4k can be set up only when the PC test mode is used.

4.4 Adjustment points

TX-RX UNIT (XC1-178)
Component Side



4.5 Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	100 to 900MHz Frequency modulation and external modulation -127dBm/0.1uV to greater than -20dBm/22.4mV
	When performing the Frequency adjustment, the following accuracy is necessary. • 0.003ppm Use a standard oscillator for adjustments, if necessary.	
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50ohm 100 to 900MHz Vicinity of 10W
3. Deviation Meter	Frequency Range	100 to 900MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	10mV to 10V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 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 Voltage Range	50Hz to 10kHz 1mV to 10V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. 8ohm Dummy Load		Approx. 8ohm, 3W
13. Regulated Power Supply		5V to 10V, approx. 3A, Useful if ammeter equipped

* The test equipment which is not used for adjustment is contained in this table.

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

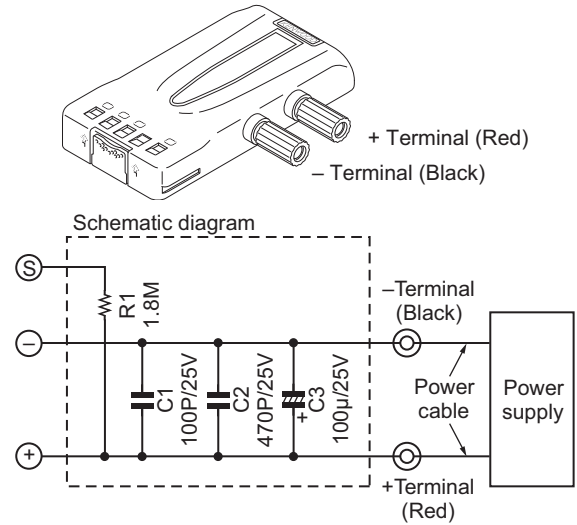
Battery Jig (W05-0909-00)

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.

When using the battery jig in user mode, the transceiver assumes that a lithium-ion battery pack is attached to the transceiver. In adjustment mode, battery type detection is not performed.

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.




4.6 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 Type: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter	Panel	ANT			Check an internal temperature of radio from 20°C to 33°C.	±0.5ppm ±77.5Hz@ 155.1MHz
2. High power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	4.0~6.0W 2.0A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Low power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.7~1.4W 1.0A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
4. MIC sensitivity check	1)CH-Sig: 1-1 AG: 1kHz PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM	Panel	ANT SP/MIC connector			Adjust AG input to get a standard MOD.	12.5mV ±5.8mV
5. Sensitivity check	1)CH-Sig: 1-1 SSG output Wide: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/ ±1.5kHz)	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 SSG output Wide: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	SSG AF VM Oscilloscope Distortion meter 8ohm Dummy load	Panel	ANT SP/MIC connector			Check	12dB SINAD or more

4.7 Common Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC voltage:7.5V 2) SSG standard modulation [Wide] MOD:1kHz,DEV:3kHz [Narrow] MOD:1kHz,DEV:1.5kHz								
2.LCD Contrast	1) Adj item [CNTR] Adjust:[****] Press [] button to store the adjustment value.	1) Adj item [LCD Contrast] Data: [****] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 126 (Reference value)	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. VCO Assist	1) Adj item: [AST] Adjust:[****] 2) Adj item: [L1]→ [L2]→ [L3]→ [C1]→ [C2]→ [C3]→ [H1]→ [H2]→ [H3]→ Adjust:[****] Press [O] button to store the adjustment value.	1) Adj item: [VCO Assist] 2) Adj item: [Low1],[Low2],[Low3], [Center1], [Center2], [Center3], [High1],[High2] [High3] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune] button. 2) Press [Apply] 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] button to store the adjustment value after all adjustment points have been adjusted.
4. Frequency	*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-D3/ D3N 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±10 digits. The value of "IF20" will become around "0" after the adjustment has finished. Remark: "Frequency" is adjusted under receiving condition with SSG.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. RTC Correciton	1) Adj item: [RTC] Adjust:[****] Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [RTC Correction] Data: [****] Press [Apply] button to store the adjustment value.	Frequency Counter	TX- RX	TEST POINT (CN412)				Remark: The adjustment value should input the display of a Frequency Counter.

4.8 Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High transmit power (Battery voltage : 7.5V)	1) Adj item: [H_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	5.0W	±0.1W 2.0A or less
2. Medium transmit power (Battery voltage : 7.5V)	1) Adj item: [M_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Medium Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	4.0W	±0.1W 2.0A or less
3. Low transmit power (Battery voltage : 7.5V)	1) Adj item: [L_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	1.0W	±0.1W 1.0A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Ramp Offset	1)Adj item: [RAMP] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Ramp Offset] Press [Autotune(TX Starts)] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune(TX starts)] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] 1) Set the adjustment value to "1". 2) Press [Transmit] button and increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "51".	
5. Balance	1) Adj item: [An BAL] Adjust:[****] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Balance] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] 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. [Panel tuning mode] PTT: ON While PTT:ON, press the [▲] button to change the 20Hz/2kHz. [PC test mode] PTT: Press [Transmit] button. While PTT:ON, click the check box "2kHz Sine Wave" to change the 20Hz/2kHz.	2kHz Tone deviation is within ± 1.0% of 20Hz tone deviation.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Maximum Deviation [Analog Wide]	1) Adj item: [Aw ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" 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
[Analog Narrow]	1) Adj item: [An ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" 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
7. NXDN High Deviation [NXDN Narrow]	1) Adj item: [Nn NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "498" for each adjustment point. Transmit at each adjustment point and check that the Analog 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

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: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Very Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 1311Hz and 1363Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	1311~1363Hz
8. DMR High Deviation	1) Adj item: [D DDEV] Adjust: [****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DMR High Deviation (DMR Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 2695Hz and 2803Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2695~2803Hz
9. QT Deviation [Analog Wide]	1) Adj item: [Aw QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 517 (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 Narrow]	1) Adj item: [An QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 517 (Reference value)	0.35kHz±0.05 kHz
10. DQT Deviation [Analog Wide]	1) Adj item: [Aw DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 415 (Reference value)	0.75kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 415 (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	
11. LTR Deviation [Analog Wide]	1) Adj item: [Aw LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 508 (Reference value)	1.00kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 496 (Reference value)	0.75kHz±0.05 kHz
12. DTMF Deviation [Analog Wide]	1) Adj item: [Aw DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 547 (Reference value)	2.50kHz±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: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 547 (Reference value)	1.25kHz±0.05 kHz
13. Single Tone Deviation [Analog Wide]	1) Adj item: [Aw TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 515 (Reference value)	3.00kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 514 (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	
14. MSK Deviation [Analog Wide]	1) Adj item: [Aw MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 505 (Reference value)	3.00kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 505 (Reference value)	1.50kHz±0.05 kHz
15. CWID Deviation [Analog Narrow]	1) Adj item: [An CWID] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [CWID Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 511 (Reference value)	1.10kHz±0.10 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. Battery Warning writing	1) Adj item: [BATT] Adjust:[****] BATT terminal voltage: 6.2V while transmitting.	1) Adj item: [Battery Warning] BATT terminal voltage: 6.2V while transmitting.	Power meter DVM	Panel	ANT BATT terminal			<p>[Panel tuning mode] PTT: ON Press [O] button to store the adjustment value.</p> <p>[PC test mode] 1) Press [Transmit] button. 2) Press [Acquire Monitored Value] button. 3) Press [Apply] button to store the adjustment value. Confirm that one predetermined numeric in the range 1 to 256 appears.</p>	
17. Battery Warning check	[Panel test mode] 1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting.	[Panel test mode] 1) Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting.						Check	The transceiver can transmit with causing the LED to blink.

4.8.1 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)", this signaling is composed of three elements [Balance, Maximum Deviation (Analog Wide) and QT Deviation (Analog Wide)]. Please adjust Balance and Maximum Deviation (Analog Wide) before adjusting QT Deviation (Analog Wide).

Mode	Signaling	Necessary adjustment and order		
		Wide	Narrow	Very Narrow
Analog	Audio	1. Balance adjust 2. Maximum Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow]	-
	QT	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. QT Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. QT Deviation [Analog Narrow]	-
	DQT	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. DQT Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DQT Deviation [Analog Narrow]	-
	LTR	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. LTR Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. LTR Deviation [Analog Narrow]	-
	DTMF	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. DTMF Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DTMF Deviation [Analog Narrow]	-
	2TONE	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. Single Tone Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [Analog Narrow]	-
	MSK (Fleet sync)	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. MSK Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. MSK Deviation [Analog Narrow]	-
NXDN	Audio	-	1. Balance adjust 2. NXDN High Deviation [NXDN Narrow]	1. Balance adjust 2. NXDN High Deviation [NXDN Very Narrow]
	CWID	-	-	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. CWID Deviation [Analog Narrow]
DMR	Audio	-	1. Balance adjust 2. DMR High Deviation	-

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

4.9 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 Type: Analog Signaling: 1 SSG output: -47dBm (1mV) (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load	Panel	ANT SP/MIC connector	Panel	Volume knob	Turn the Volume knob to obtain 0.63V AF output.	0.63V ±0.1V
2. IQ Phase	1) Adj item: [An IQ] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	1) Adj item: [IQ Phase] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	SSG	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[Panel tuning mode] After input signal from SSG, Increase or decrease the adjustment value so that the RSSI indicator level becomes minimum. [PC test mode] [Automatic Adjustment] After input signal from SSG, 1) Press [Autotune] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	
3. RSSI reference [DSP (Receive)]	1) Adj item: [An RSSI 1] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 1 DSP (Receive)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	

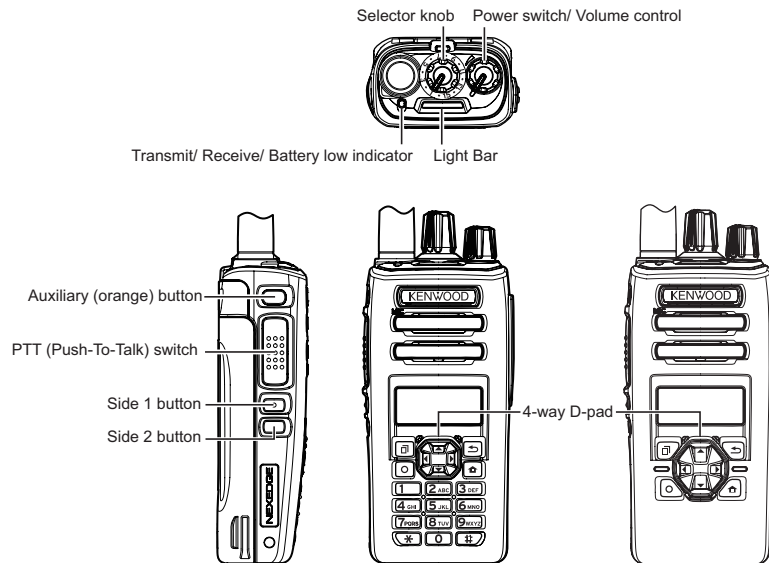
Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[RF IC (Receive)]	1) Adj item: [An RSSI 2] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 2 RF IC (Receive)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DSP (Standby)]	1) Adj item: [An RSSI 3] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 3 DSP (Standby)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[RF IC (Standby)]	1) Adj item: [An RSSI 4] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 4 RF IC (Standby)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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. Squelch Open [Analog Wide]	1) Adj item: [Aw SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Open (Analog Wide)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Open (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[NXDN Narrow]	1) Adj item: [Nn SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Very Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DMR]	1) Adj item: [D SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	1) Adj item: [Squelch Open (DMR)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
5. Squelch Tight [Analog Wide]	1) Adj item: [Aw SQLT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Tight (Analog Wide)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button 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 Narrow]	1) Adj item: [An SQLT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Tight (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
6. Low RSSI	1) Adj item: [An LRSSI] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
7. High RSSI	1) Adj item: [An HRSSI] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	

4.10 NX-3220(E, E2, E3) TYPE Controls



4.10.1 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 8ohm dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during checking/tuning.

4.11 Panel Test Mode (E and E2 types only)

4.11.1 Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [↵] button while turning the transceiver power ON or press the [□] button 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 4-way D-pad and the last used signaling number are displayed. When it is activated for the first time, the signaling number is 1.

4.11.2 Button operation

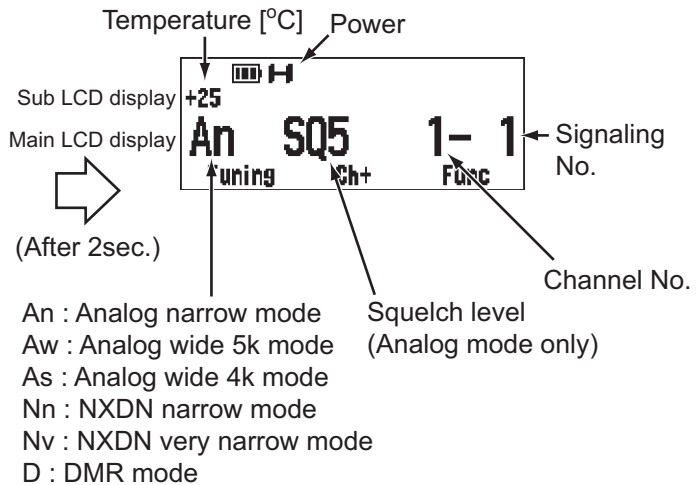
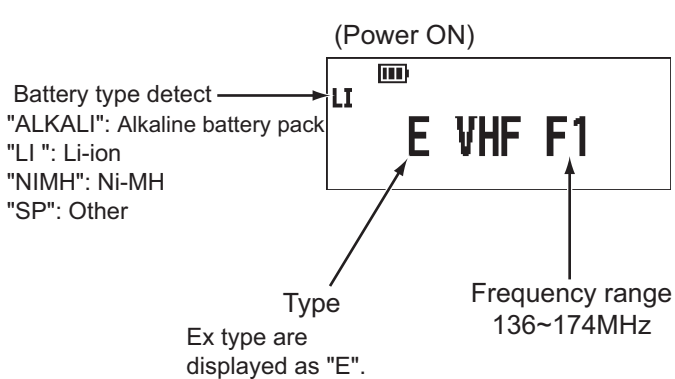
Button	"Func" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[▼]	Push: Test channel down Hold: Test channel down continuously	Channel No.
[◀]	Push: Squelch level up *1 Hold: Squelch off	Squelch level Squelch off: 📢 icon appears
[▶]	Wide 5k/Wide 4k/Narrow/ Very Narrow	Wide 5k: "w" Wide 4k: "s" Narrow: "n" Very Narrow: "v"
[Side1]	-	-
[Side2]	-	-
[□]	Shift to panel tuning mode	-
[↵]	Function on	"Func" appears on the sub LCD display
[○]	-	-
[🏠]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[AUX (Orange)]	MSK 1200bps and 2400bps *1	2400bps: [✉] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [✖]	-	-

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

Button	"Func" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Function off	-
[▼]	Analog/NXDN/DMR	Analog: "A" NXDN: "N" DMR: "D"
[◀]	Function off	-
[▶]	Button/LCD check	The position of the selector knob, etc., appear.
[Side1]	Function off	-
[Side2]	Function off	-
[□]	High power/Medium power/Low power	High:[H] icon appears Medium:[M] icon appears Low:[L] icon appears
[↶]	Function off	-

Button	"Func" appears on the sub LCD display	
	Function	Display
[○]	Function off	-
[🏠]	Function off	-
[AUX (Orange)]	Compander On/Off	On: [📶] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

• LCD display in panel test mode



4.11.3 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	155.05000	155.10000
2	136.05000	136.10000
3	173.95000	173.90000
4	155.00000	155.00000
5	155.20000	155.20000
6	155.40000	155.40000
7~16	-	-

(2) Signaling

■ Analog Type 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)

No.	RX	TX
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

■NXDN Type 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

■DMR Type Signaling

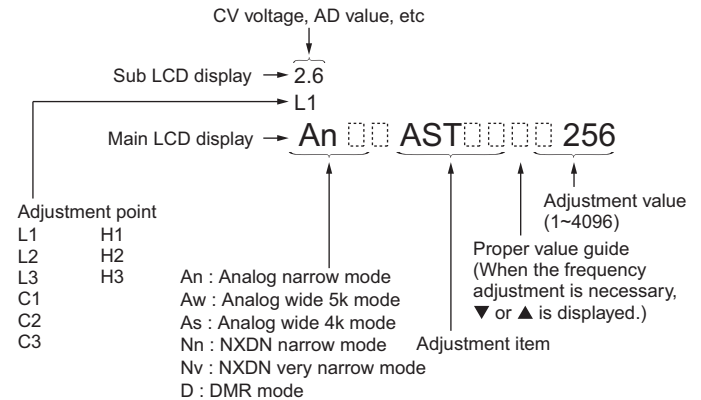
No.	RX	TX
1	CC 00 Burst	CC 00 Burst
2	PN9	PN9
3	CC 00 Burst	Maximum Deviation Pattern
4	CC 00 Burst	1/3 Deviation Pattern
5	CC 00 Burst	0 Continuous Pattern
6	SYNC (Each Slot) + PN9 Burst Pattern	SYNC (Each Slot) + PN9 Burst Pattern
7	SYNC (Super Frame) + PN9 Burst Pattern	SYNC (Super Frame) + PN9 Burst Pattern
8	CC 00 Burst	0 Burst Pattern
9	Tone Pattern	Tone Test Burst Pattern
10	Silence Pattern	Silence Burst Pattern
11	Audio Test Pattern	Audio Test Burst Pattern
12	Vocoder Loop	None

4.12 Panel Tuning Mode (E and E2 types only)









4.12.1 Transceiver tuning (To enter tuning mode)

To enter tuning mode, press the [] button while the transceiver is in test mode. Use the [] button to write tuning data through tuning modes, and the []/[] button to adjust tuning requirements (1 to 4096 appears on the LCD). Use the [] button to select the adjustment item through tuning modes. Use the [] button to adjust 5, 9 or 17 reference level adjustments, and use the [] button to switch between Wide/Narrow.

- LCD display in panel tuning mode



4.12.2 Button operation

Button	Function	
	Push	Hold (1 second)
[Selector]	-	-
[]	Adjustment value up	Continuation up
[]	Adjustment value down	Continuation down
[]	Auto adjustment start	Output tone pattern change of balance adjustment (A change is possible only during balance adjustment.)
[]	Wide 5k/Wide 4k/Narrow/NXDN/DMR	-
[Side1]	-	-
[Side2]	-	-
[]	Shift to panel test mode	-
[]	To enter 5 or 9 reference level adjustments	-
[]	Writes the adjustment value	-
[]	Go to next adjustment item	Back to last adjustment item (At the time of 5 or 9 point adjustment: Adjustment point change)
[AUX (Orange)]	-	-
[PTT]	Transmit	-
[0] to [9] and [#],[*]	-	-

4.12.3 5 or 9 reference level adjustments frequency

High Transmit Power, Medium Transmit Power, Low Transmit Power, Balance, Maximum Deviation, NXDN High Deviation, DMR High Deviation, QT Deviation, DQT Deviation, LTR Deviation, DTMF Deviation, Single Tone Deviation, MSK Deviation, CW ID Deviation, IQ Phase, RSSI Reference 1 DSP (Receive), RSSI Reference 2 RF IC (Receive), RSSI Reference 3 DSP (Standby), RSSI Reference 4 RF IC (Standby), Squelch Open, Squelch Tight, Low RSSI, High RSSI

Tuning point	Display	RX (MHz)	TX (MHz)
1	L1	136.05000	136.10000
2	L3	145.55000	145.60000
3	C2	155.05000	155.10000
4	H1	164.55000	164.60000
5	H3	173.95000	173.90000

VCO Assist

Tuning point	Display	RX (MHz)	TX (MHz)
1	L1	136.05000	136.10000
2	L2	140.80000	140.85000
3	L3	145.55000	145.60000
4	C1	150.30000	150.35000
5	C2	155.05000	155.10000
6	C3	159.80000	159.85000
7	H1	164.55000	164.60000
8	H2	169.30000	169.35000
9	H3	173.95000	173.90000

4.12.4 Adjustment item supplement

Adjustment Item	Description
LCD Contrast	The contrast of LCD display can be changed.
VCO Assist	The lock voltage of VCO is adjusted. This item must be adjusted before receiver and transmitter adjustment items.
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.
RTC Correction	Real Time Clock is adjusted. This item uses the internal clock. (Any measurement equipment is not required.)
High Transmit Power	High Transmit Power is adjusted.
Mid Transmit Power	Medium Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.

Adjustment Item	Description
Ramp Offset	Adjust this item to the optimal Ramp voltage.
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 (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.
High Deviation	NXDN/DMR high deviation is adjusted.
QT Deviation	QT deviation is adjusted.
DQT Deviation	DQT deviation is adjusted.
LTR Deviation	LTR deviation is adjusted.
DTMF Deviation	DTMF deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in "2-tone" and "5-tone" is adjusted.
MSK Deviation	MSK deviation is adjusted.
CW ID Deviation	CWID tone deviation is adjusted. CWID is used to inform the others who is transmitting on a 6.25-kHz spacing channel. (In FCC rule, Analog mode or CWID is required for each channel-spacing.)
Battery Warning	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.
IQ Phase	Correction of phase difference shift between I and Q.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Squelch Open	The squelch level at level "1" is adjusted.
Squelch Tight	The squelch level at level "9" is adjusted.
Low RSSI	RSSI display level " $\bar{\gamma}_{11}$ " is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)

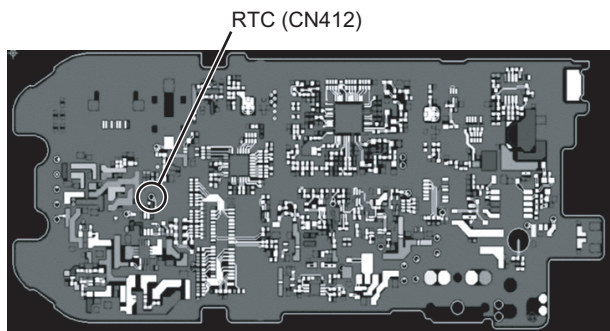
4.12.5 Adjustment item and Display

Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
				Adjustment range						
1	LCD Contrast	CNTR	-	1 point ADJ						Common Section 2
				1~256						
2	VCO Assist	AST	(CV voltage)	-	-	9	-	-	-	Common Section 3
				1~4096						
3	RTC Correction	RTC	-	-						Common Section 5
				-2.00 ~ -0.01 ,0.00 ,+0.01 ~ +2.00						
4	High Transmit Power	H_PWR	-	-	-	5	-	-	-	Transmitter Section 2
				1~1024						
5	Medium Transmit Power	M_PWR	-	-	-	5	-	-	-	Transmitter Section 3
				1~1024						
6	Low Transmit Power	L_PWR	-	-	-	5	-	-	-	Transmitter Section 4
				1~1024						
7	Ramp Offset	RAMP	(ADC measurement value)	1 point ADJ						Transmitter Section 1
				1~1024						
8	Balance	BAL	(Encode frequency)	-	-	5	-	-	-	Transmitter Section 5
				1~1024						
9	Maximum Deviation	ADEV	-	5	5	5	-	-	-	Transmitter Section 6
				1~1024						
10	NXDN High Deviation	NDEV	-	-	-	-	5	5	-	Transmitter Section 7
				1~1024						
11	DMR High Deviation	DDEV	-	-	-	-	-	-	5	Transmitter Section 8
				1~1024						
12	QT Deviation	QT	-	5	5	5	-	-	-	Transmitter Section 9
				1~1024						
13	DQT Deviation	DQT	-	5	5	5	-	-	-	Transmitter Section 10
				1~1024						
14	LTR Deviation	LTR	-	5	5	5	-	-	-	Transmitter Section 11
				1~1024						
15	DTMF Deviation	DTMF	-	5	5	5	-	-	-	Transmitter Section 12
				1~1024						
16	Single Tone Deviation	TONE	-	5	5	5	-	-	-	Transmitter Section 13
				1~1024						
17	MSK Deviation	MSK	-	5	5	5	-	-	-	Transmitter Section 14
				1~1024						
18	CW ID Deviation	CWID	-	-	-	5	-	-	-	Transmitter Section 15
				1~1024						
19	Battery Warning	BATT	(BATT measurement value)	1 point ADJ						Transmitter Section 16
				1~256						
20	IQ Phase	IQ	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 2
				1~63						
21	RSSI Reference 1 DSP (Receive)	RSSI1	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						

Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
				Adjustment range						
22	RSSI Reference 2 RF IC(Receive)	RSSI2	(RSSI RF IC(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
23	RSSI Reference 3 DSP (Standby)	RSSI3	(RSSI DSP (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
24	RSSI Reference 4 RF IC (Standby)	RSSI4	(RSSI RF IC (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
25	Squelch Open	SQL	(ASQDET measurement value)	5	5	5	5	5	5	Receive Section 4
				1~256						
26	Squelch Tight	SQLT	(ASQDET measurement value)	5	5	5	-	-	-	Receive Section 5
				1~256						
27	Low RSSI	LRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 6
				1~256						
28	High RSSI	HRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 7
				1~256						

4.13 Adjustment points

TX-RX UNIT (XC1-178)
Component Side



4.14 Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	100 to 900MHz Frequency modulation and external modulation -127dBm/0.1uV to greater than -20dBm/22.4mV
	When performing the Frequency adjustment, the following accuracy is necessary. • 0.003ppm Use a standard oscillator for adjustments, if necessary.	
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50ohm 100 to 900MHz Vicinity of 10W
3. Deviation Meter	Frequency Range	100 to 900MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	10mV to 10V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 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 Voltage Range	50Hz to 10kHz 1mV to 10V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. 8ohm Dummy Load		Approx. 8ohm, 3W
13. Regulated Power Supply		5V to 10V, approx. 3A, Useful if ammeter equipped

* The test equipment which is not used for adjustment is contained in this table.

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

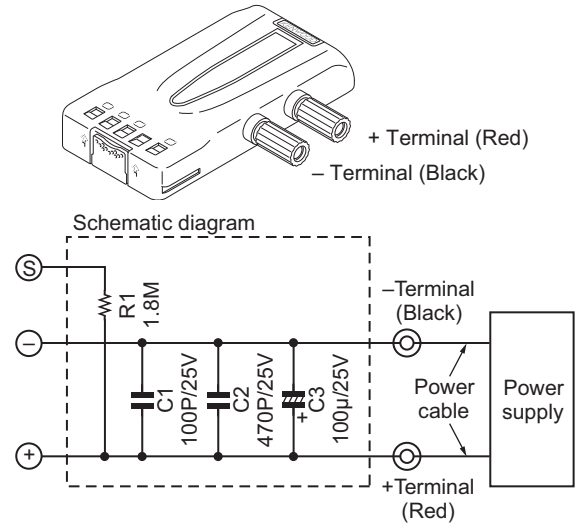
Battery Jig (W05-0909-00)

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.

When using the battery jig in user mode, the transceiver assumes that a lithium-ion battery pack is attached to the transceiver. In adjustment mode, battery type detection is not performed.

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.



4.15 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 Type: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter	Panel	ANT			Check an internal temperature of radio from 20°C to 33°C.	±0.5ppm ±77.5Hz@ 155.1MHz
2. High power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	4.0~6.0W 2.0A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Low power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.7~1.4W 1.0A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
4. MIC sensitivity check	1)CH-Sig: 1-1 AG: 1kHz PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM	Panel	ANT SP/MIC connector			Adjust AG input to get a standard MOD.	12.5mV ±5.8mV
5. Sensitivity check	1)CH-Sig: 1-1 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: 1 Test Signaling Type: 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 VM Oscilloscope Distortion meter 8ohm Dummy load	Panel	ANT SP/MIC connector			Check	12dB SINAD or more

4.16 Common Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC 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								
2.LCD Contrast	1) Adj item [CNTR] Adjust:[****] Press [O] button to store the adjustment value.	1) Adj item [LCD Contrast] Data: [****] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 126 (Reference value)	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. VCO Assist	1) Adj item: [AST] Adjust:[****] 2) Adj item: [L1]→ [L2]→ [L3]→ [C1]→ [C2]→ [C3]→ [H1]→ [H2]→ [H3]→ Adjust:[****] Press [O] button to store the adjustment value.	1) Adj item: [VCO Assist] 2) Adj item: [Low1],[Low2],[Low3], [Center1], [Center2], [Center3], [High1],[High2] [High3] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune] button. 2) Press [Apply] 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] button to store the adjustment value after all adjustment points have been adjusted.
4. Frequency	*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-D3/ D3N 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±10 digits. The value of "IF20" will become around "0" after the adjustment has finished. Remark: "Frequency" is adjusted under receiving condition with SSG.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. RTC Correciton	1) Adj item: [RTC] Adjust:[****] Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [RTC Correction] Data: [****] Press [Apply] button to store the adjustment value.	Frequency Counter	TX- RX	TEST POINT (CN412)				Remark: The adjustment value should input the display of a Frequency Counter.

4.17 Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High transmit power (Battery voltage : 7.5V)	1) Adj item: [H_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	5.0W	±0.1W 2.0A or less
2. Medium transmit power (Battery voltage : 7.5V)	1) Adj item: [M_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Medium Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	4.0W	±0.1W 2.0A or less
3. Low transmit power (Battery voltage : 7.5V)	1) Adj item: [L_PWR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	1.0W	±0.1W 1.0A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Ramp Offset	1)Adj item: [RAMP] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Ramp Offset] Press [Autotune(TX Starts)] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune(TX starts)] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] 1) Set the adjustment value to "1". 2) Press [Transmit] button and increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "51".	
5. Balance	1) Adj item: [An BAL] Adjust:[****] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Balance] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] 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. [Panel tuning mode] PTT: ON While PTT:ON, press the[◀] button to change the 20Hz/ 2kHz. [PC test mode] PTT: Press [Transmit] button. While PTT:ON, click the check box "2kHz Sine Wave" to change the 20Hz/2kHz.	2kHz Tone deviation is within ± 1.0% of 20Hz tone deviation.

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Maximum Deviation [Analog Wide 5k]	1) Adj item: [Aw ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" 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
[Analog Wide 4k]	1) Adj item: [As ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [OK] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" 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
[Analog Narrow]	1) Adj item: [An ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" 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

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. NXDN High Deviation [NXDN Narrow]	1) Adj item: [Nn NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "498" for each adjustment point. Transmit at each adjustment point and check that the Analog 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
[NXDN Very Narrow]	1) Adj item: [Nv NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Very Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 1311Hz and 1363Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	1311~1363Hz
8. DMR High Deviation	1) Adj item: [D DDEV] Adjust: [****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DMR High Deviation (DMR Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "497" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 2695Hz and 2803Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2695~2803Hz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. QT Deviation [Analog Wide 5k]	1) Adj item: [Aw QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 517 (Reference value)	0.75kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 517 (Reference value)	0.60kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 517 (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	
10. DQT Deviation [Analog Wide 5k]	1) Adj item: [Aw DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 415 (Reference value)	0.75kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 415 (Reference value)	0.60kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 415 (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	
11. LTR Deviation [Analog Wide 5k]	1) Adj item: [Aw LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 508 (Reference value)	1.00kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 496 (Reference value)	0.90kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 496 (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	
12. DTMF Deviation [Analog Wide 5k]	1) Adj item: [Aw DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 547 (Reference value)	2.50kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 547 (Reference value)	2.00kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 547 (Reference value)	1.25kHz±0.05 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
13. Single Tone Deviation [Analog Wide 5k]	1) Adj item: [Aw TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 515 (Reference value)	3.00kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 515 (Reference value)	2.40kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 514 (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	
14. MSK Deviation [Analog Wide 5k]	1) Adj item: [Aw MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 505 (Reference value)	3.00kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 505 (Reference value)	2.40kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 505 (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	
15. CWID Deviation [Analog Narrow]	1) Adj item: [An CWID] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [CWID Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 511 (Reference value)	1.10kHz±0.10 kHz
16. Battery Warning writing	1) Adj item: [BATT] Adjust:[****] BATT terminal voltage: 6.2V while transmitting.	1) Adj item: [Battery Warning] BATT terminal voltage: 6.2V while transmitting.	Power meter DVM	Panel	ANT BATT terminal			[Panel tuning mode] PTT: ON Press [<input type="radio"/>] button to store the adjustment value. [PC test mode] 1) Press [Transmit] button. 2) Press [Acquire Monitored Value] button. 3) Press [Apply] button to store the adjustment value. Confirm that one predetermined numeric in the range 1 to 256 appears.	
17. Battery Warning check	[Panel test mode] 1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting.	[Panel test mode] 1) Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting.						Check	The transceiver can transmit with causing the LED to blink.

4.17.1 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 [Analog Narrow]	-
	5STONE	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. Single Tone Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. Single Tone Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [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]	-
NXDN	Audio	-	-	1. Balance adjust 2. NXDN High Deviation [NXDN Narrow]	1. Balance adjust 2. NXDN High Deviation [NXDN Very Narrow]
	CWID	-	-	-	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. CWID Deviation [Analog Narrow]
DMR	Audio	-	-	1. Balance adjust 2. DMR High Deviation	-

- Balance is common with all the above deviation adjustments. If Balance (Transmitter Section 5) 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 6) have already adjusted, please skip Step2 and adjust from Step3.

4.18 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 Type: Analog Signaling: 1 SSG output: -47dBm (1mV) (MOD:1kHz/ ±1.5kHz)	SSG DVM AF VM Dummy load	Panel	ANT SP/MIC connector	Panel	Volume knob	Turn the Volume knob to obtain 0.63V AF output.	0.63V ±0.1V
2. IQ Phase	1) Adj item: [An IQ] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	1) Adj item: [IQ Phase] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	SSG	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[Panel tuning mode] After input signal from SSG, Increase or decrease the adjustment value so that the RSSI indicator level becomes minimum. [PC test mode] [Automatic Adjustment] After input signal from SSG, 1) Press [Autotune] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	
3. RSSI reference [DSP (Receive)]	1) Adj item: [An RSSI 1] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 1 DSP (Receive)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[RF IC (Receive)]	1) Adj item: [An RSSI 2] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 2 RF IC (Receive)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DSP (Standby)]	1) Adj item: [An RSSI 3] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 3 DSP (Standby)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[RF IC (Standby)]	1) Adj item: [An RSSI 4] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 4 RF IC (Standby)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	

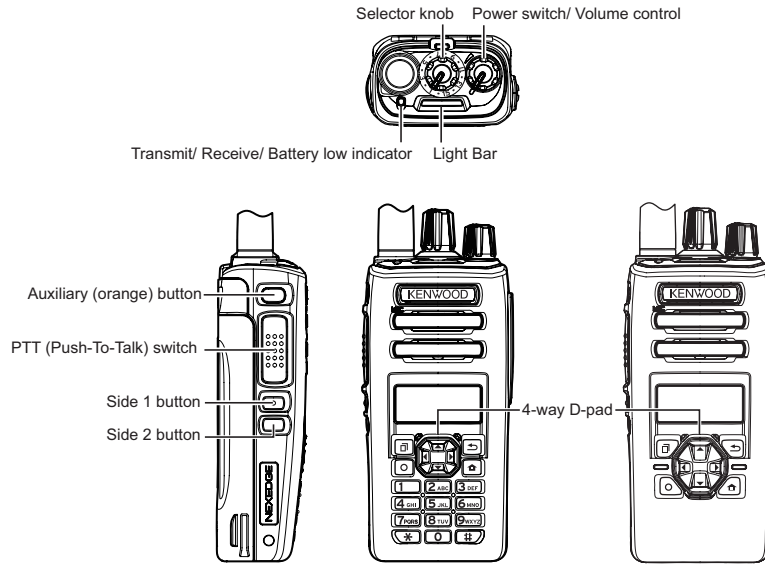
Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Squelch Open [Analog Wide 5k]	1) Adj item: [Aw SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Open (Analog Wide 5k)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±2.4kHz)	1) Adj item: [Squelch Open (Analog Wide 4k)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±2.4kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Open (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[NXDN Narrow]	1) Adj item: [Nn SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Very Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DMR]	1) Adj item: [D SQL] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	1) Adj item: [Squelch Open (DMR)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
5. Squelch Tight [Analog Wide 5k]	1) Adj item: [Aw SQLT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Tight (Analog Wide 5k)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As SQLT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±2.4kHz)	1) Adj item: [Squelch Tight (Analog Wide 4k)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±2.4kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button 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 SQLT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Tight (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
6. Low RSSI	1) Adj item: [An LRSSI] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
7. High RSSI	1) Adj item: [An HRSSI] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [C2]→ [H1]→ [H3] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low3]→ [Center2]→ [High1]→ [High3] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	

4.19 NX-3320(K, K2, K3) TYPE Controls



4.19.1 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 8ohm dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during checking/tuning.

4.20 Panel Test Mode (K2 and K3 types only)

4.20.1 Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [↵] button while turning the transceiver power ON or press the [☐] button 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 4-way D-pad and the last used signaling number are displayed. When it is activated for the first time, the signaling number is 1.

4.20.2 Button operation

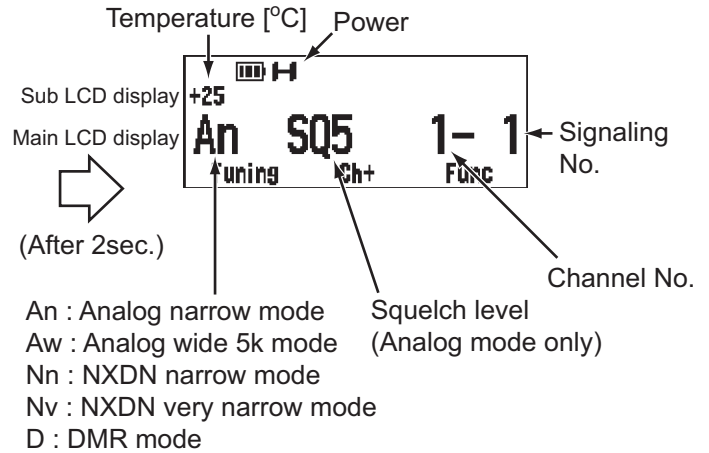
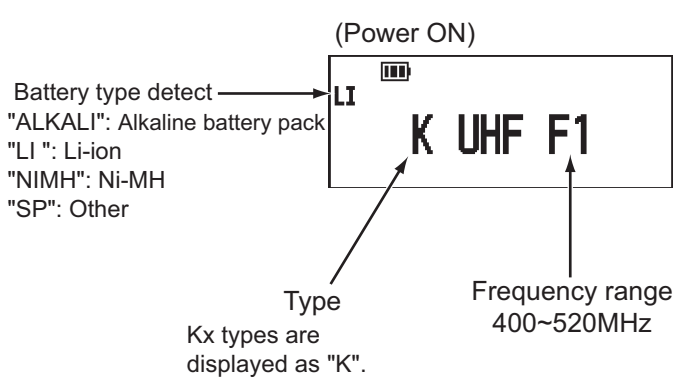
Button	"Func" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[▼]	Push: Test channel down Hold: Test channel down continuously	Channel No.
[◀]	Push: Squelch level up *1 Hold: Squelch off	Squelch level Squelch off: 📢 icon appears
[▶]	Wide/Narrow/ Very Narrow	Wide: "w" Narrow: "n" Very Narrow: "v"
[Side1]	-	-
[Side2]	-	-
[☐]	Shift to panel tuning mode	-
[↵]	Function on	"Func" appears on the sub LCD display
[○]	-	-
[🏠]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[AUX (Orange)]	MSK 1200bps and 2400bps *1	2400bps: [✉] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [*]	-	-

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

Button	"Func" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Function off	-
[▼]	Analog/NXDN/DMR	Analog: "A" NXDN: "N" DMR: "D"
[◀]	Function off	-
[▶]	Button/LCD check	The position of the selector knob, etc., appear.
[Side1]	Function off	-
[Side2]	Function off	-
[🔊]	High power/Medium power/Low power	High:[H] icon appears Medium:[M] icon appears Low:[L] icon appears
[↵]	Function off	-

Button	"Func" appears on the sub LCD display	
	Function	Display
[○]	Function off	-
[🏠]	Function off	-
[AUX (Orange)]	Compander On/Off	On: [📶] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

• LCD display in panel test mode



4.20.3 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	K,K2,K3	
	RX (MHz)	TX (MHz)
1	460.05000	460.10000
2	400.05000	400.10000
3	519.95000	519.90000
4	460.00000	460.00000
5	460.20000	460.20000
6	460.40000	460.40000
7~16	-	-

(2) Test signaling

■Analog Type 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)

4.21.3 5, 9 or 17 reference level adjustments frequency

High Transmit Power, Medium Transmit Power, Low Transmit Power, IQ Phase, RSSI Reference 1 DSP (Receive), RSSI Reference 2 RF IC (Receive), RSSI Reference 3 DSP (Standby), RSSI Reference 4 RF IC (Standby), Squelch Open, Squelch Tight, Low RSSI, High RSSI

Tuning point	Display	K,K2,K3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L5	430.05000	430.10000
3	C3	460.05000	460.10000
4	H2	490.05000	490.10000
5	H6	519.95000	519.90000

Balance, Maximum Deviation , NXDN High Deviation, DMR High Deviation, QT Deviation, DQT Deviation, LTR Deviation, DTMF Deviation, Single Tone Deviation, MSK Deviation, CW ID Deviation

Tuning point	Display	K,K2,K3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L3	415.05000	415.10000
3	L5	430.05000	430.10000
4	C1	445.05000	445.10000
5	C3	460.05000	460.10000
6	C5	475.05000	475.10000
7	H2	490.05000	490.10000
8	H4	505.05000	505.10000
9	H6	519.95000	519.90000

VCO Assist

Tuning point	Display	K,K2,K3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L2	407.55000	407.60000
3	L3	415.05000	415.10000
4	L4	422.55000	422.60000
5	L5	430.05000	430.10000
6	L6	437.55000	437.60000
7	C1	445.05000	445.10000
8	C2	452.55000	452.60000
9	C3	460.05000	460.10000
10	C4	467.55000	467.60000
11	C5	475.05000	475.10000
12	H1	482.55000	482.60000
13	H2	490.05000	490.10000
14	H3	497.55000	497.60000
15	H4	505.05000	505.10000
16	H5	512.55000	512.60000
17	H6	519.95000	519.90000

4.21.4 Adjustment item supplement

Adjustment Item	Description
LCD Contrast	The contrast of LCD display can be changed.
VCO Assist	The lock voltage of VCO is adjusted. This item must be adjusted before receiver and transmitter adjustment items.
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.
RTC Correction	Real Time Clock is adjusted. This item uses the internal clock. (Any measurement equipment is not required.)
High Transmit Power	High Transmit Power is adjusted.
Mid Transmit Power	Medium Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Ramp Offset	Adjust this item to the optimal Ramp voltage.
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 (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.
High Deviation	NXDN/DMR high deviation is adjusted.
QT Deviation	QT deviation is adjusted.
DQT Deviation	DQT deviation is adjusted.
LTR Deviation	LTR deviation is adjusted.
DTMF Deviation	DTMF deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in "2-tone" and "5-tone" is adjusted.
MSK Deviation	MSK deviation is adjusted.
CW ID Deviation	CWID tone deviation is adjusted. CWID is used to inform the others who is transmitting on a 6.25-kHz spacing channel. (In FCC rule, Analog mode or CWID is required for each channel-spacing.)
Battery Warning	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.

Adjustment Item	Description
IQ Phase	Correction of phase difference shift between I and Q.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Squelch Open	The squelch level at level "1" is adjusted.
Squelch Tight	The squelch level at level "9" is adjusted.
Low RSSI	RSSI display level " $\bar{\Gamma}_{ }$ " is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)

4.21.5 Adjustment item and Display

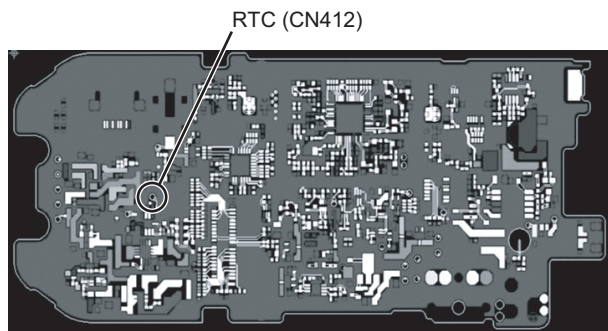
Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS *2	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
Adjustment range										
1	LCD Contrast	CNTR	-	1 point ADJ						Common Section 2
				1~256						
2	VCO Assist	AST	(CV voltage)	-	-	17	-	-	-	Common Section 3
				1~4096						
3	RTC Correction	RTC	-	-						Common Section 5
				-2.00 ~ -0.01 , 0.00 , +0.01 ~ +2.00						
4	High Transmit Power	H_PWR	-	-	-	5	-	-	-	Transmitter Section 2
				1~1024						
5	Medium Transmit Power	M_PWR	-	-	-	5	-	-	-	Transmitter Section 3
				1~1024						
6	Low Transmit Power	L_PWR	-	-	-	5	-	-	-	Transmitter Section 4
				1~1024						
7	Ramp Offset	RAMP	(ADC measurement value)	1 point ADJ						Transmitter Section 1
				1~1024						
8	Balance	BAL	(Encode frequency)	-	-	9	-	-	-	Transmitter Section 5
				1~1024						
9	Maximum Deviation	ADEV	-	9	9 *2	9	-	-	-	Transmitter Section 6
				1~1024						
10	NXDN High Deviation	NDEV	-	-	-	-	9	9	-	Transmitter Section 7
				1~1024						
11	DMR High Deviation	DDEV	-	-	-	-	-	-	9	Transmitter Section 8
				1~1024						
12	QT Deviation	QT	-	9	9 *2	9	-	-	-	Transmitter Section 9
				1~1024						
13	DQT Deviation	DQT	-	9	9 *2	9	-	-	-	Transmitter Section 10
				1~1024						
14	LTR Deviation	LTR	-	9	9 *2	9	-	-	-	Transmitter Section 11
				1~1024						
15	DTMF Deviation	DTMF	-	9	9 *2	9	-	-	-	Transmitter Section 12
				1~1024						
16	Single Tone Deviation	TONE	-	9	9 *2	9	-	-	-	Transmitter Section 13
				1~1024						

Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS *2	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
				Adjustment range						
17	MSK Deviation	MSK	-	9	9 *2	9	-	-	-	Transmitter Section 14
				1~1024						
18	CW ID Deviation	CWID	-	-	-	9	-	-	-	Transmitter Section 15
				1~1024						
19	Battery Warning	BATT	(BATT measurement value)	1 point ADJ						Transmitter Section 16
				1~256						
20	IQ Phase	IQ	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 2
				1~63						
21	RSSI Reference 1 DSP (Receive)	RSSI1	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
22	RSSI Reference 2 RF IC(Receive)	RSSI2	(RSSI RF IC(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
23	RSSI Reference 3 DSP (Standby)	RSSI3	(RSSI DSP (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
24	RSSI Reference 4 RF IC (Standby)	RSSI4	(RSSI RF IC (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
25	Squelch Open	SQL	(ASQDET measurement value)	5	5 *2	5	5	5	5	Receive Section 4
				1~256						
26	Squelch Tight	SQLT	(ASQDET measurement value)	5	5 *2	5	-	-	-	Receive Section 5
				1~256						
27	Low RSSI	LRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 6
				1~256						
28	High RSSI	HRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 7
				1~256						

*2: Wide 4k can be set up only when the PC test mode is used.

4.22 Adjustment points

TX-RX UNIT (XC1-180)
Component Side



4.23 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	50ohm
	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. 8ohm Dummy Load		Approx. 8ohm, 3W
13. Regulated Power Supply		5V to 10V, approx. 3A, Useful if ammeter equipped

* The test equipment which is not used for adjustment is contained in this table.

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

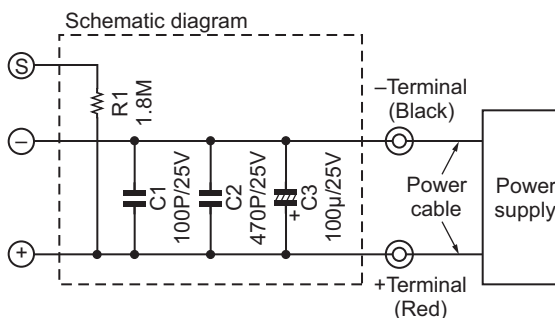
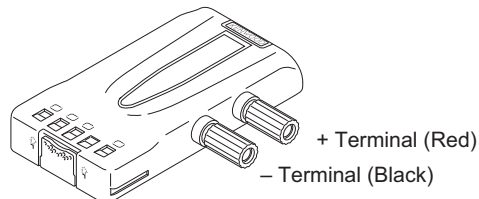
Battery Jig (W05-0909-00)

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.

When using the battery jig in user mode, the transceiver assumes that a lithium-ion battery pack is attached to the transceiver. In adjustment mode, battery type detection is not performed.

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.



4.24 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 Type: 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 +/-115.0Hz @460.1MHz
2. High power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	4.0~6.0W 2.3A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Low power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.7~1.4W 1.1A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
4. MIC sensitivity check	1)CH-Sig: 1-1 AG: 1kHz PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM	Panel	ANT SP/MIC connector			Adjust AG input to get a standard MOD.	12.5mV ±5.8mV
5. Sensitivity check	1)CH-Sig: 1-1 SSG output Wide: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/ ±1.5kHz)	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 SSG output Wide: -117dBm (0.32μV) (MOD: 1kHz/±3kHz) Narrow: -117dBm (0.32μV) (MOD: 1kHz/±1.5kHz)	SSG AF VM Oscilloscope Distortion meter 8ohm Dummy load	Panel	ANT SP/MIC connector			Check	12dB SINAD or more

4.25 Common Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC voltage:7.5V 2) SSG standard modulation [Wide] MOD:1kHz,DEV:3kHz [Narrow] MOD:1kHz,DEV:1.5kHz								
2.LCD Contrast	1) Adj item [CNTR] Adjust:[****] Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item [LCD Contrast] Data: [****] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 126 (Reference value)	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. VCO Assist	<p>1) Adj item: [AST] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L2]→ [L3]→ [L4]→ [L5]→ [L6]→ [C1]→ [C2]→ [C3 RxOL:L]→ [C4]→ [C5]→ [H1]→ [H2]→ [H3]→ [H4]→ [H5]→ [H6]→ [C3 RxOL:H (Long press the [▶] button)]</p> <p>Adjust:[****] Press [○] button to store the adjustment value.</p>	<p>1) Adj item: [VCO Assist]</p> <p>2) Adj item: [Low1],[Low2],[Low3],[Low4],[Low5],[Low6] [Center1],[Center2],[Center3],[Center4],[Center5],[High1],[High2],[High3],[High4],[High5],[High6] [Overlap]</p> <p>Press [Apply] button to store the adjustment value.</p>				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	<p>[PC test mode] [Automatic Adjustment] 1) Press [Autotune] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished.</p> <p>[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.</p> <p>Note: Confirm the VCO lock voltage approximately 3 seconds after the adjustment value is changed.</p>	<p>2.5V±0.1V</p> <p>[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.</p> <p>[Manual Adjustment] Press [Apply] button to store the adjustment value after all adjustment points have been adjusted.</p>
4. Frequency	<p>*The Frequency adjustment can be performed only in PC test mode.</p>	<p>1) Adj item: [Frequency] SSG output: -20dBm (22.4mV) (CW (without modulation))</p> <p>Caution: Perform the frequency adjustment under the following conditions.</p> <ul style="list-style-type: none"> 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-D3/ D3N and the LCD of the transceiver.) Use an accuracy of 0.001ppm for the SSG. (Use a standard oscillator if necessary.) 	SSG	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	<p>[PC test mode] Press [Start] button of "Auto Tuning". Press [Apply] button to store the adjustment value after the automatic adjustment has finished.</p>	<p>[PC test mode] "IF20" value = Within 0±30 digits. The value of "IF20" will become around "0" after the adjustment has finished.</p> <p>Remark: "Frequency" is adjusted under receiving condition with SSG.</p>

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. RTC Correction	1) Adj item: [RTC] Adjust:[****] Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [RTC Correction] Data: [****] Press [Apply] button to store the adjustment value.	Frequency Counter	TX-RX	TEST POINT (CN412)				Remark: The adjustment value should input the display of a Frequency Counter.

4.26 Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High transmit power (Battery voltage : 7.5V)	1) Adj item: [H_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	5.0W	±0.1W 2.3A or less
2. Medium transmit power (Battery voltage : 7.5V)	1) Adj item: [M_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Medium Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	4.0W	±0.1W 2.3A or less
3. Low transmit power (Battery voltage : 7.5V)	1) Adj item: [L_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	1.0W	±0.1W 1.1A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Ramp Offset	1)Adj item: [RAMP] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Ramp Offset] Press [Autotune(TX Starts)] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune(TX starts)] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] 1) Set the adjustment value to "1". 2) Press [Transmit] button and increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "31".	
5. Balance	1) Adj item: [An BAL] Adjust:[****] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Balance] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-] [Panel tuning mode] PTT:ON While PTT:ON, press the [◀] button to change the 20Hz/2kHz. [PC test mode] PTT: Press [Transmit] button. While PTT:ON, click the check box "2kHz Sine Wave" to change the 20Hz/2kHz.	2kHz Tone deviation is within ± 1.0% of 20Hz tone deviation.	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Maximum Deviation [Analog Wide]	1) Adj item: [Aw ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "490" 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
[Analog Narrow]	1) Adj item: [An ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "490" 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

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. NXDN High Deviation [NXDN Narrow]	1) Adj item: [Nn NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog 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
[NXDN Very Narrow]	1) Adj item: [Nv NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Very Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 1311Hz and 1363Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	1311~1363Hz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
8. DMR High Deviation	1) Adj item: [D DDEV] Adjust: [****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DMR High Deviation (DMR Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 2695Hz and 2803Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2695~2803Hz
9. QT Deviation [Analog Wide]	1) Adj item: [Aw QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 540 (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 Narrow]	1) Adj item: [An QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 540 (Reference value)	0.35kHz±0.05 kHz
10. DQT Deviation [Analog Wide]	1) Adj item: [Aw DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 440 (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 Narrow]	1) Adj item: [An DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 440 (Reference value)	0.35kHz±0.05 kHz
11. LTR Deviation [Analog Wide]	1) Adj item: [Aw LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 530 (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 Narrow]	1) Adj item: [An LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 530 (Reference value)	0.75kHz±0.05 kHz
12. DTMF Deviation [Analog Wide]	1) Adj item: [Aw DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 545 (Reference value)	2.50kHz±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: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 545 (Reference value)	1.25kHz±0.05 kHz
13. Single Tone Deviation [Analog Wide]	1) Adj item: [Aw TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 520 (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 Narrow]	1) Adj item: [An TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 520 (Reference value)	1.50kHz±0.05 kHz
14. MSK Deviation [Analog Wide]	1) Adj item: [Aw MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 510 (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 Narrow]	1) Adj item: [An MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 510 (Reference value)	1.50kHz±0.05 kHz
15. CWID Deviation [Analog Narrow]	1) Adj item: [An CWID] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [CWID Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 500 (Reference value)	1.10kHz±0.10 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. Battery Warning writing	1) Adj item: [BATT] Adjust:[****] BATT terminal voltage: 6.2V while transmitting.	1) Adj item: [Battery Warning] BATT terminal voltage: 6.2V while transmitting.	Power meter DVM	Panel	ANT BATT terminal			<p>[Panel tuning mode] PTT: ON Press [] button to store the adjustment value.</p> <p>[PC test mode] 1) Press [Transmit] button. 2) Press [Acquire Monitored Value] button. 3) Press [Apply] button to store the adjustment value. Confirm that one predetermined numeric in the range 1 to 256 appears.</p>	
17. Battery Warning check	[Panel test mode] 1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting.	[Panel test mode] 1) Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting.						Check	The transceiver can transmit with causing the LED to blink.

4.26.1 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)", this signaling is composed of three elements [Balance, Maximum Deviation (Analog Wide) and QT Deviation (Analog Wide)]. Please adjust Balance and Maximum Deviation (Analog Wide) before adjusting QT Deviation (Analog Wide).

Mode	Signaling	Necessary adjustment and order		
		Wide	Narrow	Very Narrow
Analog	Audio	1. Balance adjust 2. Maximum Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow]	-
	QT	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. QT Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. QT Deviation [Analog Narrow]	-
	DQT	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. DQT Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DQT Deviation [Analog Narrow]	-
	LTR	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. LTR Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. LTR Deviation [Analog Narrow]	-
	DTMF	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. DTMF Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. DTMF Deviation [Analog Narrow]	-
	2TONE	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. Single Tone Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [Analog Narrow]	-
	MSK (Fleet sync)	1. Balance adjust 2. Maximum Deviation [Analog Wide] 3. MSK Deviation [Analog Wide]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. MSK Deviation [Analog Narrow]	-
NXDN	Audio	-	1. Balance adjust 2. NXDN High Deviation [NXDN Narrow]	1. Balance adjust 2. NXDN High Deviation [NXDN Very Narrow]
	CWID	-	-	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. CWID Deviation [Analog Narrow]
DMR	Audio	-	1. Balance adjust 2. DMR High Deviation	-

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

4.27 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 Type: Analog Signaling: 1 SSG output: -47dBm (1mV) (MOD:1kHz/ ±1.5kHz)	SSG DVM AF VM Dummy load	Panel	ANT SP/MIC connector	Panel	Volume knob	Turn the Volume knob to obtain 0.63V AF output.	0.63V ±0.1V
2. IQ Phase	1) Adj item: [An IQ] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	1) Adj item: [IQ Phase] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500μV) (MOD:OFF)	SSG	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[Panel tuning mode] After input signal from SSG, Increase or decrease the adjustment value so that the RSSI indicator level becomes minimum. [PC test mode] [Automatic Adjustment] After input signal from SSG, 1) Press [Autotune] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	
3. RSSI reference [DSP (Receive)]	1) Adj item: [An RSSI 1] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 1 DSP (Receive)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.		

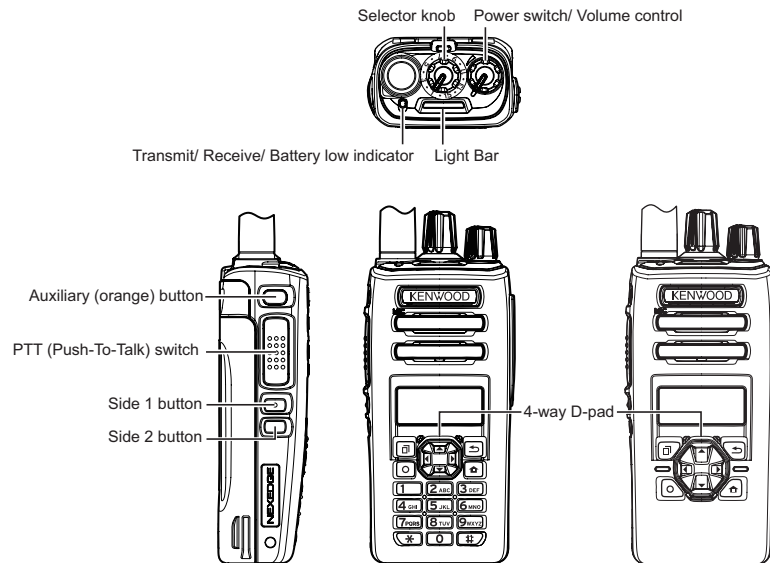
Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
[RF IC (Receive)]	1) Adj item: [An RSSI 2] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 2 RF IC (Receive)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DSP (Standby)]	1) Adj item: [An RSSI 3] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 3 DSP (Standby)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[RF IC (Standby)]	1) Adj item: [An RSSI 4] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 4 RF IC (Standby)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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. Squelch Open [Analog Wide]	1) Adj item: [Aw SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Open (Analog Wide)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Open (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[NXDN Narrow]	1) Adj item: [Nn SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Very Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DMR]	1) Adj item: [D SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	1) Adj item: [Squelch Open (DMR)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
5. Squelch Tight [Analog Wide]	1) Adj item: [Aw SQLT] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	1) Adj item: [Squelch Tight (Analog Wide)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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 Narrow]	1) Adj item: [An SQLT] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Squelch Tight (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
6. Low RSSI	1) Adj item: [An LRSSI] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: -118dBm (0.28μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
7. High RSSI	1) Adj item: [An HRSSI] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	

4.28 NX-3320(E, E2, E3) TYPE Controls



4.28.1 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 8ohm dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during checking/tuning.

4.29 Panel Test Mode (E and E2 types only)

4.29.1 Test mode operation features

This transceiver has a test mode. To enter test mode, press and hold the [↵] button while turning the transceiver power ON or press the [☐] button 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 4-way D-pad and the last used signaling number are displayed. When it is activated for the first time, the signaling number is 1.

4.29.2 Button operation

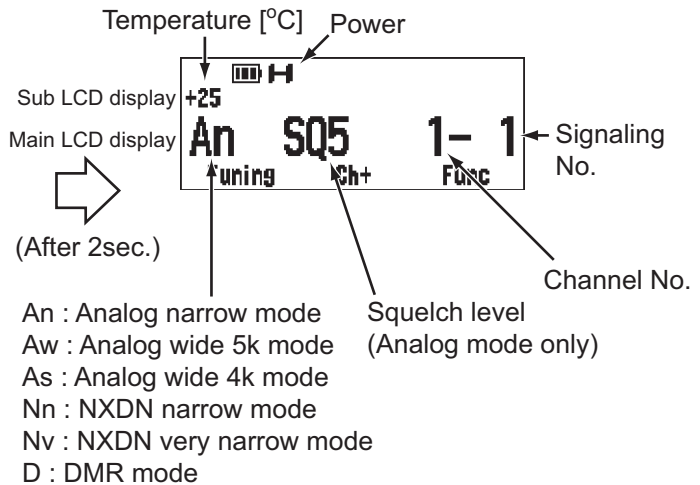
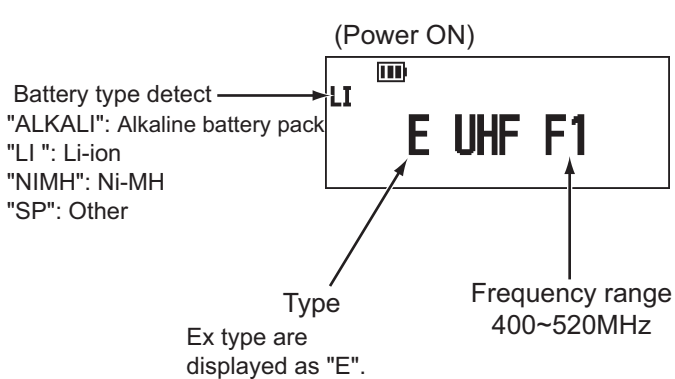
Button	"Func" not appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Push: Test channel up Hold: Test channel up continuously	Channel No.
[▼]	Push: Test channel down Hold: Test channel down continuously	Channel No.
[◀]	Push: Squelch level up *1 Hold: Squelch off	Squelch level Squelch off: 📢 icon appears
[▶]	Wide 5k/Wide 4k/Narrow/ Very Narrow	Wide 5k: "w" Wide 4k: "s" Narrow: "n" Very Narrow: "v"
[Side1]	-	-
[Side2]	-	-
[☐]	Shift to panel tuning mode	-
[↵]	Function on	"Func" appears on the sub LCD display
[○]	-	-
[🏠]	Push: Test signaling up Hold: Test signaling up continuously	Signaling No.
[AUX (Orange)]	MSK 1200bps and 2400bps *1	2400bps: [✉] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [✖]	-	-

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

Button	"Func" appears on the sub LCD display	
	Function	Display
[Selector]	-	-
[▲]	Function off	-
[▼]	Analog/NXDN/DMR	Analog: "A" NXDN: "N" DMR: "D"
[◀]	Function off	-
[▶]	Button/LCD check	The position of the selector knob, etc., appear.
[Side1]	Function off	-
[Side2]	Function off	-
[□]	High power/Medium power/Low power	High:[H] icon appears Medium:[M] icon appears Low:[L] icon appears
[↶]	Function off	-

Button	"Func" appears on the sub LCD display	
	Function	Display
[○]	Function off	-
[🏠]	Function off	-
[AUX (Orange)]	Compander On/Off	On: [📶] icon appears
[PTT]	Transmit	-
[0] to [9] and [#], [*]	Function off	-

• LCD display in panel test mode



4.29.3 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	E,E2,E3	
	RX (MHz)	TX (MHz)
1	460.05000	460.10000
2	400.05000	400.10000
3	519.95000	519.90000
4	460.00000	460.00000
5	460.20000	460.20000
6	460.40000	460.40000
7~16	-	-

(2) Signaling

■ Analog Type 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)

No.	RX	TX
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

■NXDN Type 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

■DMR Type Signaling

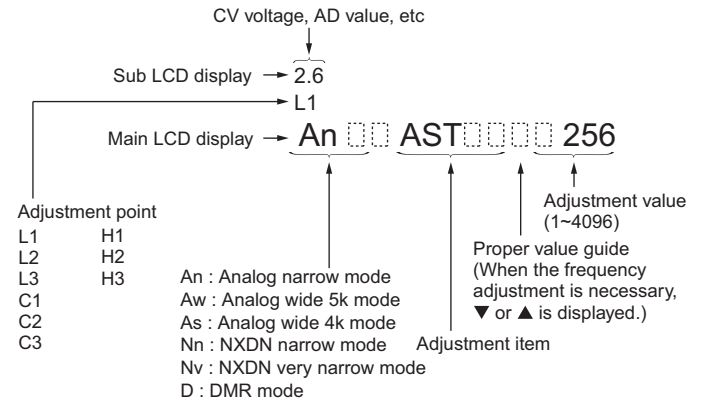
No.	RX	TX
1	CC 00 Burst	CC 00 Burst
2	PN9	PN9
3	CC 00 Burst	Maximum Deviation Pattern
4	CC 00 Burst	1/3 Deviation Pattern
5	CC 00 Burst	0 Continuous Pattern
6	SYNC (Each Slot) + PN9 Burst Pattern	SYNC (Each Slot) + PN9 Burst Pattern
7	SYNC (Super Frame) + PN9 Burst Pattern	SYNC (Super Frame) + PN9 Burst Pattern
8	CC 00 Burst	0 Burst Pattern
9	Tone Pattern	Tone Test Burst Pattern
10	Silence Pattern	Silence Burst Pattern
11	Audio Test Pattern	Audio Test Burst Pattern
12	Vocoder Loop	None

4.30 Panel Tuning Mode (E and E2 types only)









4.30.1 Transceiver tuning (To enter tuning mode)

To enter tuning mode, press the [] button while the transceiver is in test mode. Use the [] button to write tuning data through tuning modes, and the []/[] button to adjust tuning requirements (1 to 4096 appears on the LCD). Use the [] button to select the adjustment item through tuning modes. Use the [] button to adjust 5, 9 or 17 reference level adjustments, and use the [] button to switch between Wide/Narrow.

- LCD display in panel tuning mode



4.30.2 Button operation

Button	Function	
	Push	Hold (1 second)
[Selector]	-	-
[]	Adjustment value up	Continuation up
[]	Adjustment value down	Continuation down
[]	Auto adjustment start	Output tone pattern change of balance adjustment (A change is possible only during balance adjustment.)
[]	Wide 5k/Wide 4k/Narrow/NXDN/DMR	-
[Side1]	-	-
[Side2]	-	-
[]	Shift to panel test mode	-
[]	To enter 5 or 9 reference level adjustments	-
[]	Writes the adjustment value	-
[]	Go to next adjustment item	Back to last adjustment item (At the time of 5, 9 or 17 point adjustment: Adjustment point change)
[AUX (Orange)]	-	-
[PTT]	Transmit	-
[0] to [9] and [#],[*]	-	-

4.30.3 5, 9 or 17 reference level adjustments frequency

High Transmit Power, Medium Transmit Power, Low Transmit Power, IQ Phase, RSSI Reference 1 DSP (Receive), RSSI Reference 2 RF IC (Receive), RSSI Reference 3 DSP (Standby), RSSI Reference 4 RF IC (Standby), Squelch Open, Squelch Tight, Low RSSI, High RSSI

Tuning point	Display	E,E2,E3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L5	430.05000	430.10000
3	C3	460.05000	460.10000
4	H2	490.05000	490.10000
5	H6	519.95000	519.90000

Balance, Maximum Deviation, NXDN High Deviation, DMR High Deviation, QT Deviation, DQT Deviation, LTR Deviation, DTMF Deviation, Single Tone Deviation, MSK Deviation, CW ID Deviation

Tuning point	Display	E,E2,E3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L3	415.05000	415.10000
3	L5	430.05000	430.10000
4	C1	445.05000	445.10000
5	C3	460.05000	460.10000
6	C5	475.05000	475.10000
7	H2	490.05000	490.10000
8	H4	505.05000	505.10000
9	H6	519.95000	519.90000

VCO Assist

Tuning point	Display	E,E2,E3	
		RX (MHz)	TX (MHz)
1	L1	400.05000	400.10000
2	L2	407.55000	407.60000
3	L3	415.05000	415.10000
4	L4	422.55000	422.60000
5	L5	430.05000	430.10000
6	L6	437.55000	437.60000
7	C1	445.05000	445.10000
8	C2	452.55000	452.60000
9	C3	460.05000	460.10000
10	C4	467.55000	467.60000
11	C5	475.05000	475.10000
12	H1	482.55000	482.60000
13	H2	490.05000	490.10000
14	H3	497.55000	497.60000
15	H4	505.05000	505.10000
16	H5	512.55000	512.60000
17	H6	519.95000	519.90000

4.30.4 Adjustment item supplement

Adjustment Item	Description
LCD Contrast	The contrast of LCD display can be changed.
VCO Assist	The lock voltage of VCO is adjusted. This item must be adjusted before receiver and transmitter adjustment items.
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.
RTC Correction	Real Time Clock is adjusted. This item uses the internal clock. (Any measurement equipment is not required.)
High Transmit Power	High Transmit Power is adjusted.
Mid Transmit Power	Medium Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Ramp Offset	Adjust this item to the optimal Ramp voltage.
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 (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.
High Deviation	NXDN/DMR high deviation is adjusted.
QT Deviation	QT deviation is adjusted.
DQT Deviation	DQT deviation is adjusted.
LTR Deviation	LTR deviation is adjusted.
DTMF Deviation	DTMF deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in "2-tone" and "5-tone" is adjusted.
MSK Deviation	MSK deviation is adjusted.
CW ID Deviation	CWID tone deviation is adjusted. CWID is used to inform the others who is transmitting on a 6.25-kHz spacing channel. (In FCC rule, Analog mode or CWID is required for each channel-spacing.)
Battery Warning	Battery Warning Level (LED blinking level) is adjusted. Battery Warning Level minus 0.4V is the transmission inhibited level.

Adjustment Item	Description
IQ Phase	Correction of phase difference shift between I and Q.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Squelch Open	The squelch level at level "1" is adjusted.
Squelch Tight	The squelch level at level "9" is adjusted.
Low RSSI	RSSI display level " $\bar{\gamma}_{ll}$ " is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)

4.30.5 Adjustment item and Display

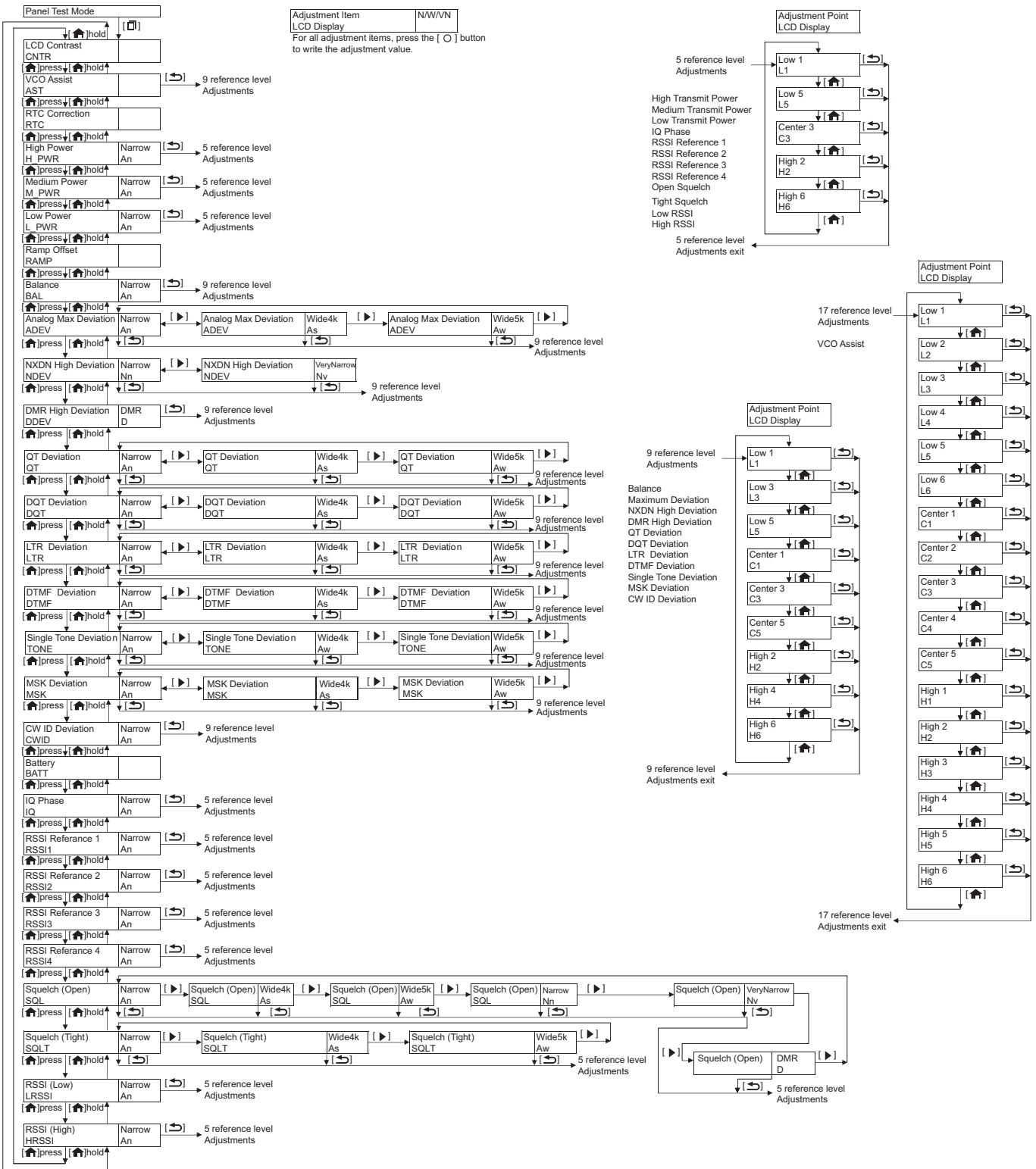
Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS	AN	Nn	Nv	D	Adjust item Number		
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)		Adjustment range	
1	LCD Contrast	CNTR	-	1 point ADJ						-	-	Common Section 2
				1~256								
2	VCO Assist	AST	(CV voltage)	-	-	17	-	-	-	Common Section 3		
				1~4096								
3	RTC Correction	RTC	-	-						Common Section 5		
				-2.00 ~ -0.01 , 0.00 , +0.01 ~ +2.00								
4	High Transmit Power	H_PWR	-	-	-	5	-	-	-	Transmitter Section 2		
				1~1024								
5	Medium Transmit Power	M_PWR	-	-	-	5	-	-	-	Transmitter Section 3		
				1~1024								
6	Low Transmit Power	L_PWR	-	-	-	5	-	-	-	Transmitter Section 4		
				1~1024								
7	Ramp Offset	RAMP	(ADC measurement value)	1 point ADJ						Transmitter Section 1		
				1~1024								
8	Balance	BAL	(Encode frequency)	-	-	9	-	-	-	Transmitter Section 5		
				1~1024								
9	Maximum Deviation	ADEV	-	9	9	9	-	-	-	Transmitter Section 6		
				1~1024								
10	NXDN High Deviation	NDEV	-	-	-	-	9	9	-	Transmitter Section 7		
				1~1024								
11	DMR High Deviation	DDEV	-	-	-	-	-	-	9	Transmitter Section 8		
				1~1024								
12	QT Deviation	QT	-	9	9	9	-	-	-	Transmitter Section 9		
				1~1024								
13	DQT Deviation	DQT	-	9	9	9	-	-	-	Transmitter Section 10		
				1~1024								
14	LTR Deviation	LTR	-	9	9	9	-	-	-	Transmitter Section 11		
				1~1024								
15	DTMF Deviation	DTMF	-	9	9	9	-	-	-	Transmitter Section 12		
				1~1024								
16	Single Tone Deviation	TONE	-	9	9	9	-	-	-	Transmitter Section 13		
				1~1024								

Order	Adjustment item	Main LCD display	Sub LCD display	AW	AS	AN	Nn	Nv	D	Adjust item Number
				(Analog Wide 5k)	(Analog Wide 4k)	(Analog Narrow)	(NXDN Narrow)	(NXDN Very Narrow)	(DMR)	
Adjustment range										
17	MSK Deviation	MSK	-	9	9	9	-	-	-	Transmitter Section 14
				1~1024						
18	CW ID Deviation	CWID	-	-	-	9	-	-	-	Transmitter Section 15
				1~1024						
19	Battery Warning	BATT	(BATT measurement value)	1 point ADJ						Transmitter Section 16
				1~256						
20	IQ Phase	IQ	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 2
				1~63						
21	RSSI Reference 1 DSP (Receive)	RSSI1	(RSSI DSP(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
22	RSSI Reference 2 RF IC(Receive)	RSSI2	(RSSI RF IC(Receive) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
23	RSSI Reference 3 DSP (Standby)	RSSI3	(RSSI DSP (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
24	RSSI Reference 4 RF IC (Standby)	RSSI4	(RSSI RF IC (Standby) measurement value)	-	-	5	-	-	-	Receive Section 3
				1~256						
25	Squelch Open	SQL	(ASQDET measurement value)	5	5	5	5	5	5	Receive Section 4
				1~256						
26	Squelch Tight	SQLT	(ASQDET measurement value)	5	5	5	-	-	-	Receive Section 5
				1~256						
27	Low RSSI	LRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 6
				1~256						
28	High RSSI	HRSSI	(RSSI DSP (Receive) measurement value)	-	-	5	-	-	-	Receive Section 7
				1~256						

4.30.6 Panel tuning mode flow chart

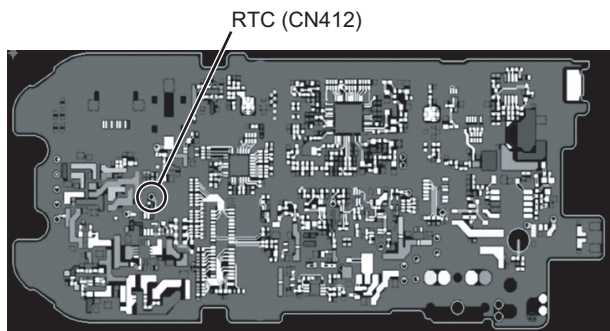
Note:

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



4.31 Adjustment points

TX-RX UNIT (XC1-180)
Component Side



4.32 Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	100 to 900MHz Frequency modulation and external modulation -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 Operation Frequency Measurement Capability	50ohm 100 to 900MHz Vicinity of 10W
3. Deviation Meter	Frequency Range	100 to 900MHz
4. Digital Volt Meter (DVM)	Measuring Range Input Impedance	10mV to 10V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 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 Voltage Range	50Hz to 10kHz 1mV to 10V
9. Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. 8ohm Dummy Load		Approx. 8ohm, 3W
13. Regulated Power Supply		5V to 10V, approx. 3A, Useful if ammeter equipped

* The test equipment which is not used for adjustment is contained in this table.

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

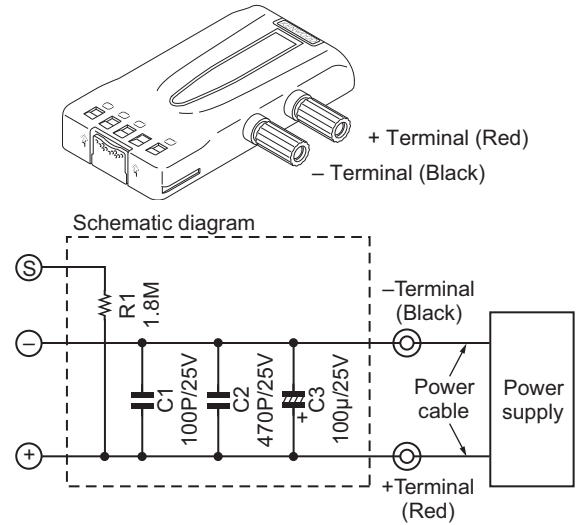
Battery Jig (W05-0909-00)

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.

When using the battery jig in user mode, the transceiver assumes that a lithium-ion battery pack is attached to the transceiver. In adjustment mode, battery type detection is not performed.

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.



4.33 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 Type: 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 +/-115.0Hz @460.1MHz
2. High power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	4.0~6.0W 2.3A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel test mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Low power check (Battery voltage: 7.5V)	1)CH-Sig: 1-1 PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter	Panel	ANT			Check	0.7~1.4W 1.1A or less
	2)CH-Sig: 2-1 PTT: ON	2)Test Channel Channel: 2 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
	3)CH-Sig: 3-1 PTT: ON	3)Test Channel Channel: 3 Test Signaling Type: Analog Signaling: 1 PTT: Press [Transmit] button.							
4. MIC sensitivity check	1)CH-Sig: 1-1 AG: 1kHz PTT: ON	1)Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM	Panel	ANT SP/MIC connector			Adjust AG input to get a standard MOD.	12.5mV ±5.8mV
5. Sensitivity check	1)CH-Sig: 1-1 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: 1 Test Signaling Type: 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 VM Oscilloscope Distortion meter 8ohm Dummy load	Panel	ANT SP/MIC connector			Check	12dB SINAD or more

4.34 Common Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC 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								
2.LCD Contrast	1) Adj item [CNTR] Adjust:[****] Press [O] button to store the adjustment value.	1) Adj item [LCD Contrast] Data: [****] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 126 (Reference value)	
3. VCO Assist	1) Adj item: [AST] Adjust:[****] 2) Adj item: [L1]→ [L2]→ [L3]→ [L4]→ [L5]→ [L6]→ [C1]→ [C2]→ [C3 RxOL:L]→ [C4]→ [C5]→ [H1]→ [H2]→ [H3]→ [H4]→ [H5]→ [H6]→ [C3 RxOL:H (Long press the [▶] button)] Adjust:[****] PTT: ON Press [O] button to store the adjustment value.	1) Adj item: [VCO Assist] 2) Adj item: [Low1],[Low2],[Low3],[Low4],[Low5],[Low6] [Center1],[Center2],[Center3],[Center4],[Center5],[High1],[High2],[High3],[High4],[High5],[High6] [Overlap] Press [Apply] button to store the adjustment value.				Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-] [PC test mode] [Automatic Adjustment] 1) Press [Autotune] button. 2) Press [Apply] 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] 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	
4. Frequency	*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-D3/D3N and the LCD of the transceiver.) • Use an accuracy of 0.001ppm 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 Correciton	1) Adj item: [RTC] Adjust:[****] Press [○] button to store the adjustment value.	1) Adj item: [RTC Correction] Data: [****] Press [Apply] button to store the adjustment value.	Frequency Counter	TX-RX	TEST POINT (CN412)				Remark: The adjustment value should input the display of a Frequency Counter.

4.35 Transmitter Section

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. High transmit power (Battery voltage : 7.5V)	1) Adj item: [H_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [High Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	5.0W	±0.1W 2.3A or less

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Medium transmit power (Battery voltage : 7.5V)	1) Adj item: [M_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Medium Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	4.0W	±0.1W 2.3A or less
3. Low transmit power (Battery voltage : 7.5V)	1) Adj item: [L_PWR] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Low Transmit Power] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	1.0W	±0.1W 1.1A or less
4. Ramp Offset	1)Adj item: [RAMP] Adjust:[****] PTT : ON Press [<input type="radio"/>] button to store the adjustment value.	1) Adj item: [Ramp Offset] Press [Autotune(TX Starts)] button. Press [Apply] button to store the adjustment value.	Power meter Ammeter	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[PC test mode] [Automatic Adjustment] 1) Press [Autotune(TX starts)] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished. [Manual Adjustment] 1) Set the adjustment value to "1". 2) Press [Transmit] button and increase the adjustment value slowly while monitoring the offset monitor value. 3) Set the adjustment value when the offset monitor value exceed "31".	

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Balance	1) Adj item: [An BAL] Adjust:[****] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Balance] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] 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. [Panel tuning mode] PTT:ON While PTT:ON, press the [◀] button to change the 20Hz/ 2kHz. [PC test mode] PTT: Press [Transmit] button. While PTT:ON, click the check box "2kHz Sine Wave" to change the 20Hz/2kHz.	2kHz Tone deviation is within ± 1.0% of 20Hz tone deviation.
6. Maximum Deviation [Analog Wide 5k]	1) Adj item: [Aw ADEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Maxmum Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "490" 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

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 ADEV] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.</p>	<p>1) Adj item: [Maxmum Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	<p>Write fixed value “490” 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</p> <p>[Panel tuning mode] PTT: ON</p> <p>[PC test mode] PTT: Press [Transmit] button</p>	3310~3410Hz
[Analog Narrow]	<p>1) Adj item: [An ADEV] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.</p>	<p>1) Adj item: [Maxmum Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	<p>Write fixed value “490” 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</p> <p>[Panel tuning mode] PTT: ON</p> <p>[PC test mode] PTT: Press [Transmit] button</p>	2050~2150Hz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. NXDN High Deviation [NXDN Narrow]	1) Adj item: [Nn NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog 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
[NXDN Very Narrow]	1) Adj item: [Nv NDEV] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [NXDN High Deviation (NXDN Very Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 1311Hz and 1363Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	1311~1363Hz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
8. DMR High Deviation	1) Adj item: [D DDEV] Adjust: [****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DMR High Deviation (DMR Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write fixed value "500" for each adjustment point. Transmit at each adjustment point and check that the Analog deviation is between 2695Hz and 2803Hz. Deviation meter LPF: 3kHz HPF: OFF [Panel tuning mode] PTT: ON [PC test mode] PTT: Press [Transmit] button	2695~2803Hz
9. QT Deviation [Analog Wide 5k]	1) Adj item: [Aw QT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [QT Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 540 (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: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button 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: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 540 (Reference value)	0.60kHz±0.05 kHz
[Analog Narrow]	<p>1) Adj item: [An QT] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button 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: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 540 (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	
10. DQT Deviation [Analog Wide 5k]	1) Adj item: [Aw DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 440 (Reference value)	0.75kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DQT] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 440 (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: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 440 (Reference value)	0.35kHz±0.05 kHz
11. LTR Deviation [Analog Wide 5k]	1) Adj item: [Aw LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide 5k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 530 (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: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Wide 4k)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 530 (Reference value)	0.90kHz±0.05 kHz
[Analog Narrow]	1) Adj item: [An LTR] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [LTR Deviation (Analog Narrow)] Deviation meter LPF: 3kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 530 (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	
12. DTMF Deviation [Analog Wide 5k]	1) Adj item: [Aw DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 545 (Reference value)	2.50kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As DTMF] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 545 (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: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 545 (Reference value)	1.25kHz±0.05 kHz
13. Single Tone Deviation [Analog Wide 5k]	1) Adj item: [Aw TONE] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [Single Tone Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 520 (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 TONE] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.</p>	<p>1) Adj item: [Single Tone Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 520 (Reference value)	2.40kHz±0.05 kHz
[Analog Narrow]	<p>1) Adj item: [An TONE] Adjust:[****]</p> <p>2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.</p>	<p>1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF</p> <p>2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.</p>	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 520 (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	
14. MSK Deviation [Analog Wide 5k]	1) Adj item: [Aw MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide 5k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 510 (Reference value)	3.00kHz±0.05 kHz
[Analog Wide 4k]	1) Adj item: [As MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Wide 4k)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 510 (Reference value)	2.40kHz±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 MSK] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 510 (Reference value)	1.50kHz±0.05 kHz
15. CWID Deviation [Analog Narrow]	1) Adj item: [An CWID] Adjust:[****] 2) Adj item: [L1]→ [L3]→ [L5]→ [C1]→ [C3 TxOL:L]→ [C5]→ [H2]→ [H4]→ [H6]→ [C3 TxOL:H (Long press the [▶] button)] Adjust:[****] PTT : ON Press [○] button to store the adjustment value.	1) Adj item: [CWID Deviation (Analog Narrow)] Deviation meter LPF: 15kHz HPF: OFF 2) Adj item: [Low1]→ [Low3]→ [Low5]→ [Center1]→ [Center3]→ [Center5]→ [High2]→ [High4]→ [High6]→ [Overlap] Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope	Panel	ANT	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	Write the value as followings. 500 (Reference value)	1.10kHz±0.10 kHz

Item	Condition		Measurement			Adjustment			Specifications /Remarks
	Panel tuning mode	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
16. Battery Warning writing	1) Adj item: [BATT] Adjust:[****] BATT terminal voltage: 6.2V while transmitting.	1) Adj item: [Battery Warning] BATT terminal voltage: 6.2V while transmitting.	Power meter DVM	Panel	ANT BATT terminal			<p>[Panel tuning mode] PTT: ON Press [] button to store the adjustment value.</p> <p>[PC test mode] 1) Press [Transmit] button. 2) Press [Acquire Monitored Value] button. 3) Press [Apply] button to store the adjustment value. Confirm that one predetermined numeric in the range 1 to 256 appears.</p>	
17. Battery Warning check	<p>[Panel test mode]</p> <p>1) CH-Sig: 1-1 BATT terminal voltage: 6.0V while transmitting.</p>	<p>[Panel test mode]</p> <p>1) Test Channel Channel: 1 Test Signaling Type: Analog Signaling: 1 BATT terminal voltage: 6.0V while transmitting.</p>						Check	The transceiver can transmit with causing the LED to blink.

4.35.1 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 [Analog Narrow]	-
	5TONE	1. Balance adjust 2. Maximum Deviation [Analog Wide 5k] 3. Single Tone Deviation [Analog Wide 5k]	1. Balance adjust 2. Maximum Deviation [Analog Wide 4k] 3. Single Tone Deviation [Analog Wide 4k]	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [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]	-
NXDN	Audio	-	-	1. Balance adjust 2. NXDN High Deviation [NXDN Narrow]	1. Balance adjust 2. NXDN High Deviation [NXDN Very Narrow]
	CWID	-	-	-	1. Balance adjust 2. Maximum Deviation [Analog Narrow] 3. CWID Deviation [Analog Narrow]
DMR	Audio	-	-	1. Balance adjust 2. DMR High Deviation	-

- Balance is common with all the above deviation adjustments. If Balance (Transmitter Section 5) 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 6) have already adjusted, please skip Step2 and adjust from Step3.

4.36 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 Type: Analog Signaling: 1 SSG output: -47dBm (1mV) (MOD:1kHz/ ±1.5kHz)	SSG DVM AF VM Dummy load	Panel	ANT SP/MIC connector	Panel	Volume knob	Turn the Volume knob to obtain 0.63V AF output.	0.63V ±0.1V
2. IQ Phase	1) Adj item: [An IQ] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500µV) (MOD:OFF)	1) Adj item: [IQ Phase] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: Freq: Tune Freq +8kHz level: -53dBm (500µV) (MOD:OFF)	SSG	Panel	ANT SP/MIC connector	Panel	[Panel tuning mode] [▲], [▼] [PC test mode] [+], [-]	[Panel tuning mode] After input signal from SSG, Increase or decrease the adjustment value so that the RSSI indicator level becomes minimum. [PC test mode] [Automatic Adjustment] After input signal from SSG, 1) Press [Autotune] button. 2) Press [Apply] button to store the adjustment value after the automatic adjustment has finished.	
3. RSSI reference [DSP (Receive)]	1) Adj item: [An RSSI 1] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow) 1 DSP (Receive)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[RF IC (Receive)]	1) Adj item: [An RSSI 2] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow 2 RF IC (Receive))] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DSP (Standby)]	1) Adj item: [An RSSI 3] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow 3 DSP (Standby))] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[RF IC (Standby)]	1) Adj item: [An RSSI 4] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [RSSI Reference (Analog Narrow 4 RF IC (Standby))] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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. Squelch Open [Analog Wide 5k]	1) Adj item: [Aw SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±3kHz)	1) Adj item: [Squelch Open (Analog Wide 5k)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±2.4kHz)	1) Adj item: [Squelch Open (Analog Wide 4k)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±2.4kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[Analog Narrow]	1) Adj item: [An SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [Squelch Open (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [○] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
[NXDN Narrow]	1) Adj item: [Nn SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -5dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[NXDN Very Narrow]	1) Adj item: [Nv SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	1) Adj item: [Squelch Open (NXDN Very Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -2dB (MOD: 400Hz/ ±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
[DMR]	1) Adj item: [D SQL] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	1) Adj item: [Squelch Open (DMR)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level at Analog Narrow -4dB (MOD: 400Hz/ ±1.8kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
5. Squelch Tight [Analog Wide 5k]	1) Adj item: [Aw SQLT] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±3kHz)	1) Adj item: [Squelch Tight (Analog Wide 5k)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±3kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, press [Apply] button to store the adjustment value.	
[Analog Wide 4k]	1) Adj item: [As SQLT] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±2.4kHz)	1) Adj item: [Squelch Tight (Analog Wide 4k)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±2.4kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button 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 SQLT] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±1.5kHz)	1) Adj item: [Squelch Tight (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: 12dB SINAD level +6dB (MOD: 1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) Press [Apply] button to store the adjustment value.	
6. Low RSSI	1) Adj item: [An LRSSI] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz)	1) Adj item: [Low RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: -118dBm (0.28μV) (MOD: 1kHz/±1.5kHz)	SSG	Panel	ANT Ext. SP connector	Panel		[Panel tuning mode] After input signal from SSG, press [<input type="radio"/>] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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	
7. High RSSI adjust	1) Adj item: [An HRSSI] Adjust:[****] 2) Adj item: [L1]→ [L5]→ [C3]→ [H2]→ [H6] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low1]→ [Low5]→ [Center3]→ [High2]→ [High6] SSG output: -80dBm (22.4μV) (MOD: 1kHz/ ±1.5kHz)	SSG	Panel	ANT SP/MIC connector	Panel		[Panel tuning mode] After input signal from SSG, press [O] button to store the adjustment value. [PC test mode] After input signal from SSG, 1) Press [Acquire Monitored Value] button. 2) 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(C401), mobile DDR(IC402), Flash Memory(IC404)

- Checking battery voltage

Points to be checked voltage	Normal voltage
+B CN3	6~9V

Fail

The BGA parts are not broken.
If the CN3 is less than 6V, charge the battery.

Pass

- Checking power supply voltage

Points to be checked	Normal voltage
12M C32	1.2V
18M C24	1.8V
32M IC5(1pin)	3.2V
18M_3 IC12(1pin)	1.8V

Power supply of each device is connected through the coil.
[MPU/DSP]
12M: L404, L405, L406
18M: L407, L408
32M: R452

[mobile DDR]
18M: L409

[Flash Memory]
32M: R451
18M_3: L410

Fail

Checking for an abnormal point
12M has an abnormal voltage.
[MPU/DSP]
Remove L404 and L405 and L406 to check the voltage of the 12M.
If the voltage becomes normal, the MPU/DSP is broken.

18M has an abnormal voltage.
[MPU/DSP]
Remove L407 and L408 to check the voltage of the 18M.
If the voltage becomes normal, the MPU/DSP is broken.

[mobile DDR]
Remove L409 to check the voltage of the 18M.
If the voltage becomes normal, the mobile DDR is broken.

32M has an abnormal voltage.
[MPU/DSP]
Remove R452 to check the voltage of the 32M.
If the voltage becomes normal, the MPU/DSP is broken.

[Flash memory]
Remove R451 to check the voltage of the 32M.
If the voltage becomes normal, Flash Memory is broken.

18M_3 has an abnormal voltage.
[Flash memory]
Remove L410 to check the voltage of the 18M_3.
If the voltage becomes normal, Flash Memory is broken.

If the voltage is not corrected, there is a problem other than the BGA parts.

Pass

- Checking the clock

Points to be checked	Normal voltage
(1.2V)	1.2V(peak-to-peak)
19.2MHz	19.2MHz

MPU/DSP side R410

Fail

Pass

- Checking the Reset/Control signal

Points to be checked	Normal voltage
/RST IC403 (4 pin)	1.8V
/BINT Q3 (6 pin)	3.2V
/PSW Q2 (3 pin)	3.2V

Fail

The BGA parts are not broken.

Pass

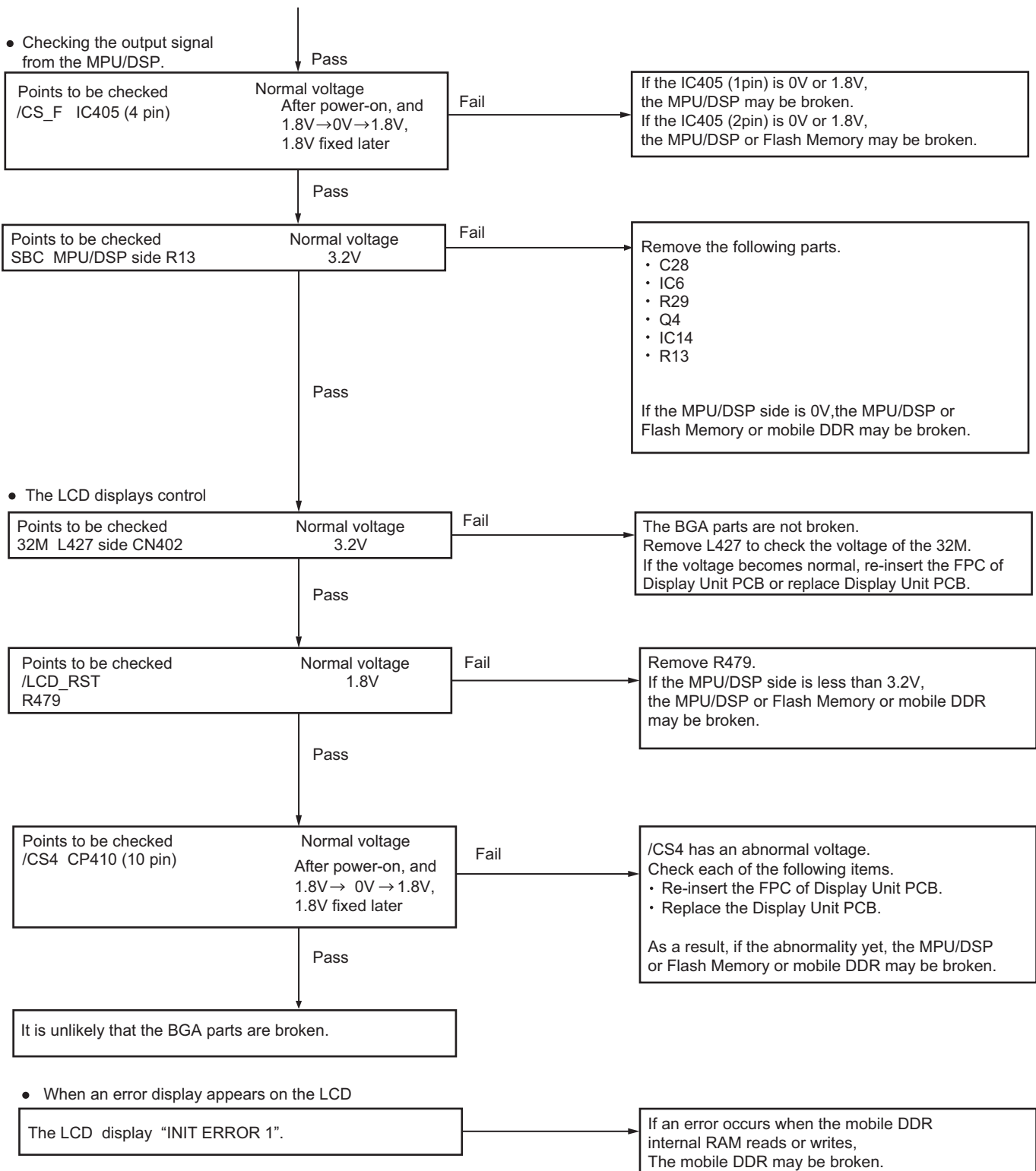
Points to be checked	Normal voltage
/FRST	1.8V

Flash memory side D402

Fail

If the /FRST is always 0V, the MPU/DSP is broken.
Remove D402 to check the voltage of Flash Memory side R445.
If the voltage becomes abnormal, Flash Memory is broken.

Pass



■ 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) LCD_RST	: LCD reset signal	LOW → Reset
8) /CS4	: LCD controller chip select signal	LOW → Active

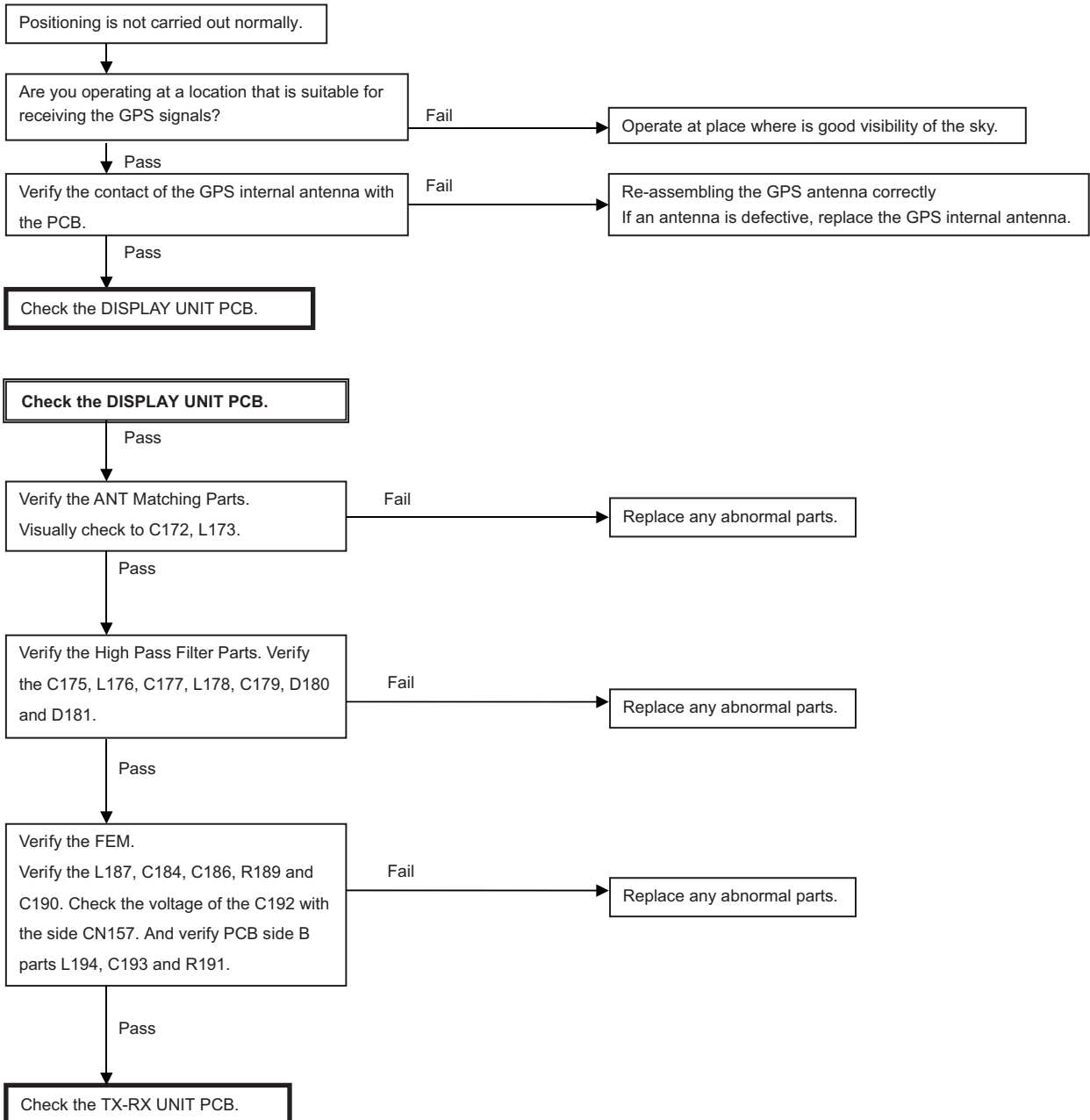
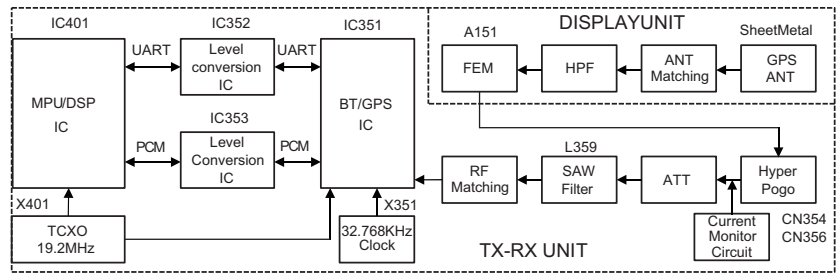
5.2 Failure diagnosis of the GPS section

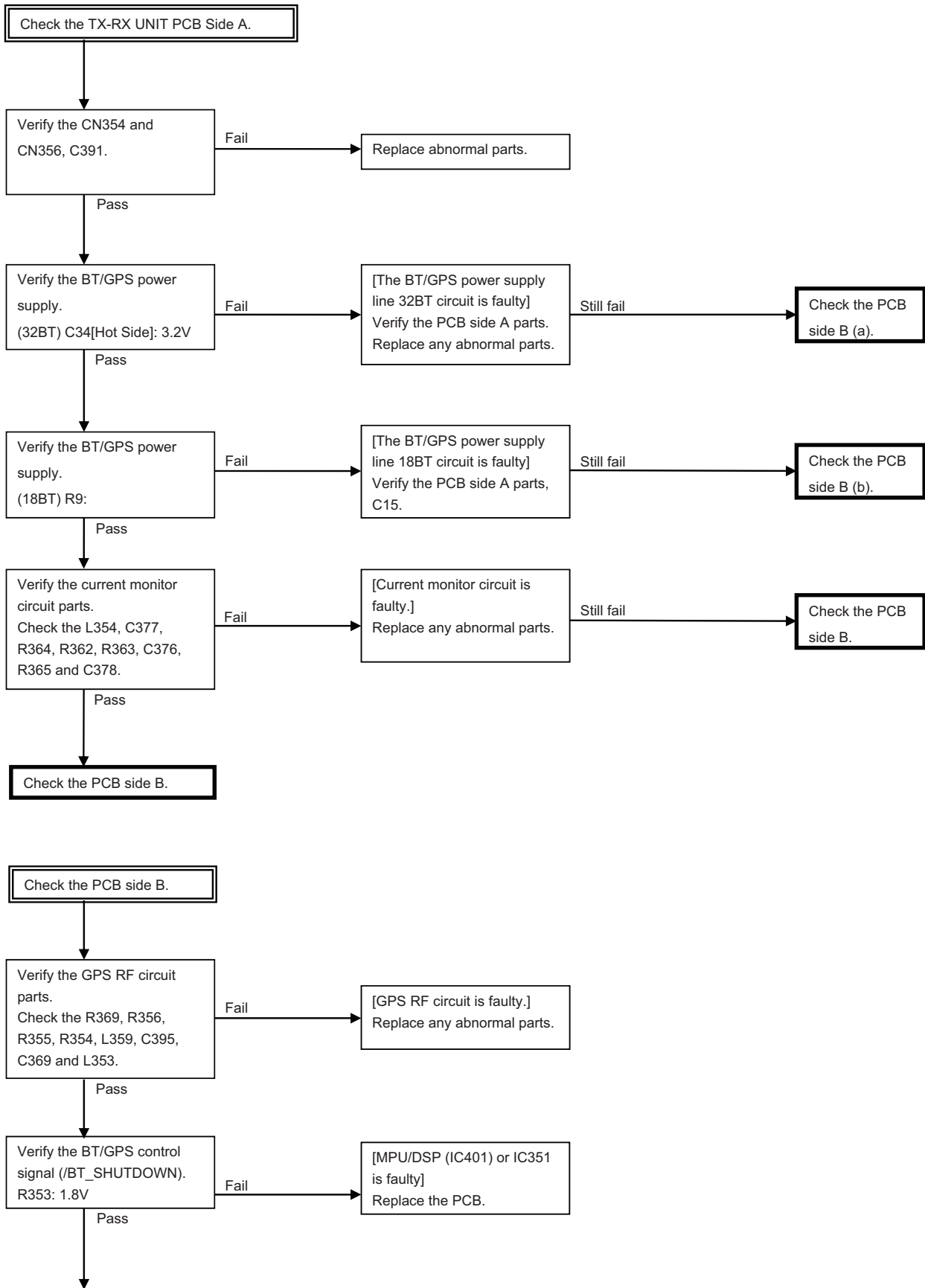
Overview:

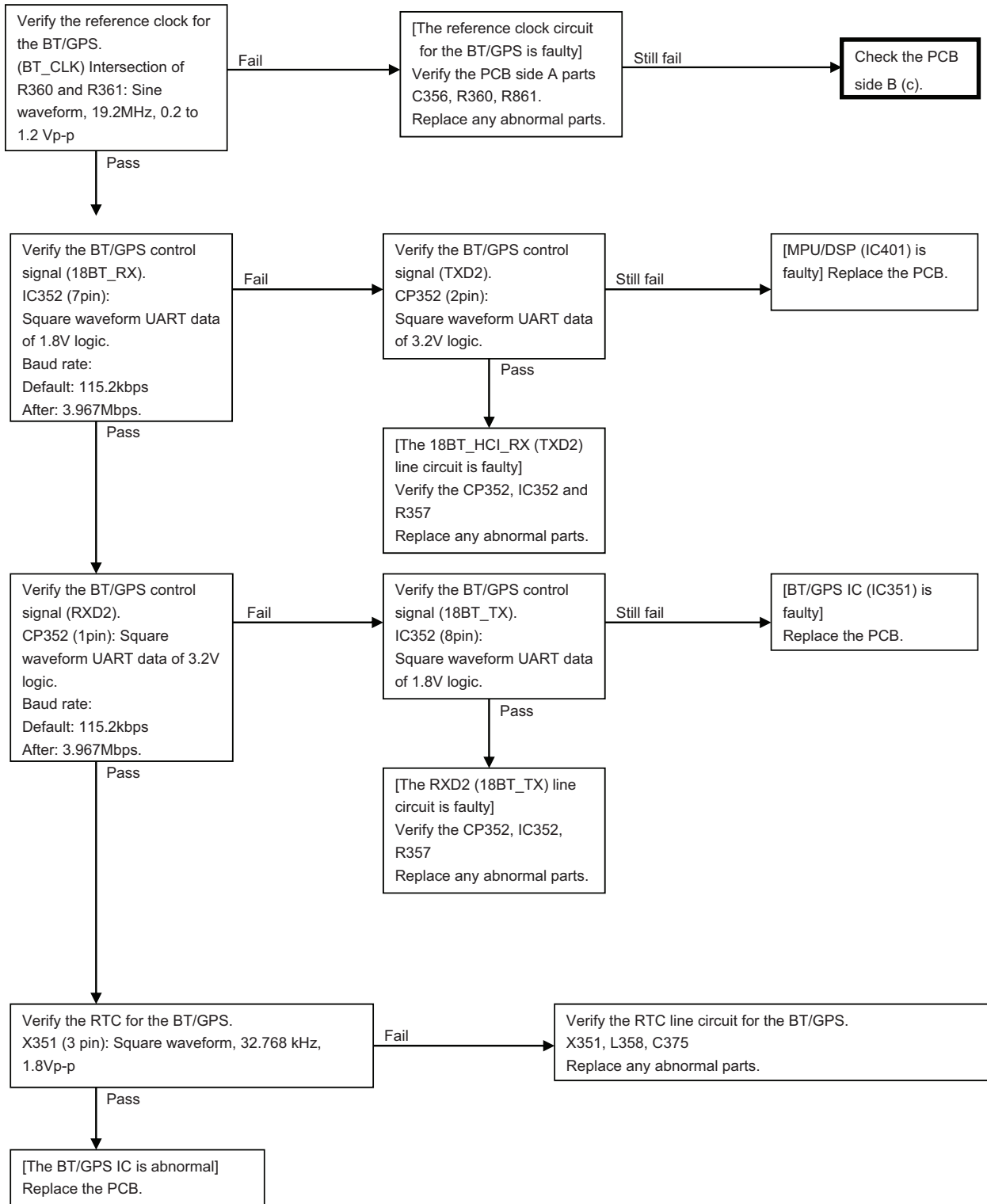
When the GPS function does not operate, use this flowchart to determine the problem.

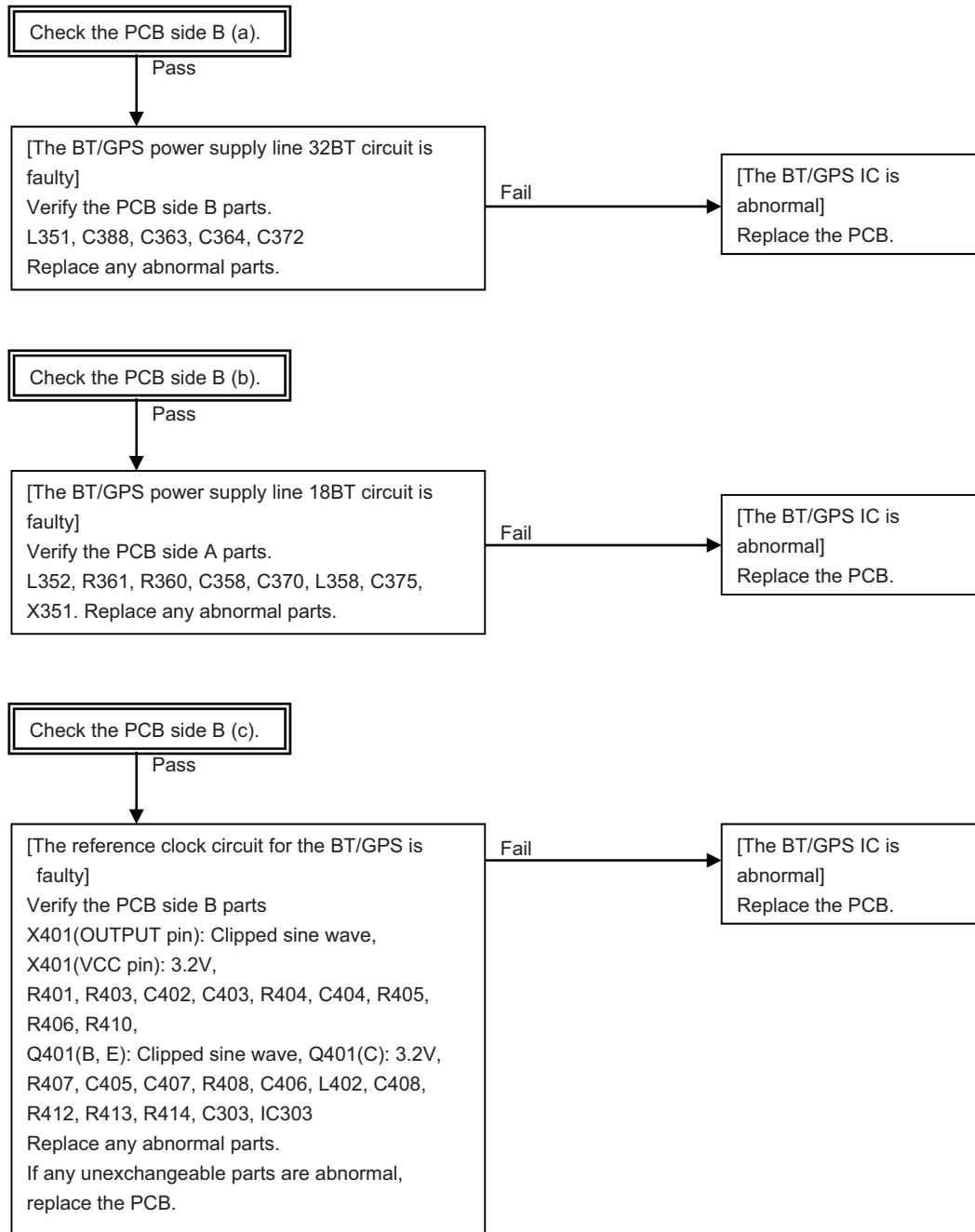
Major parts for a GPS circuit

- GPS antenna (Connect on CN152, CN153)
- Front End Module (A151)
- SAW Filter (L359)
- Bluetooth/GPS IC (IC351)
- Level conversion IC (IC352, IC353)
- TCXO 19.2MHz (X401)
- 32.768 kHz clock (X351)
- 32BT Regulator (IC8)
- 18BT Regulator (IC7)
- MPU/DSP IC (IC401)









Descriptions of signal names

- (1) 32BT: BT/GPS IC 3.2V 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

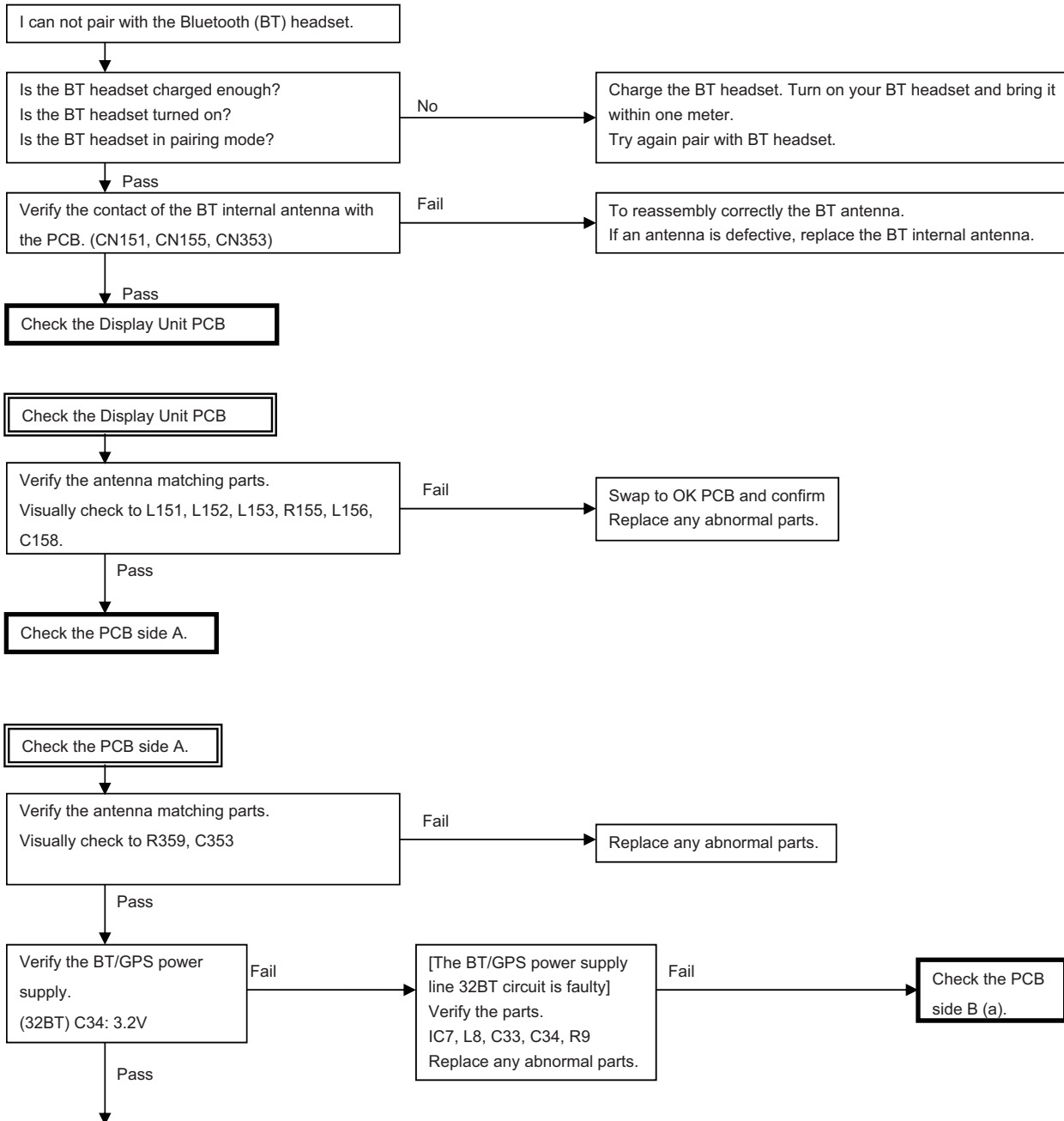
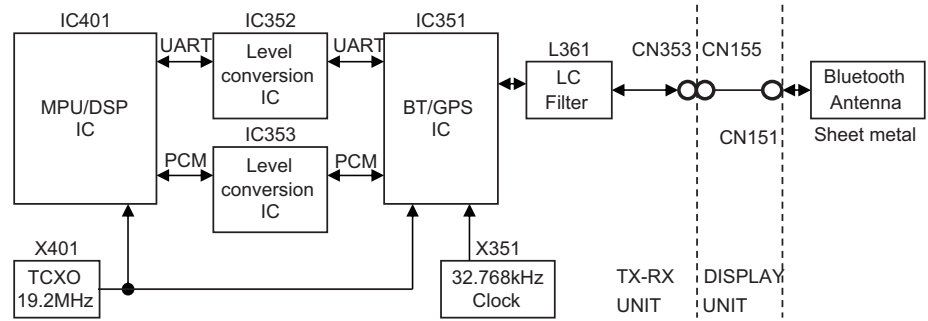
5.3 Failure diagnosis of the Bluetooth section

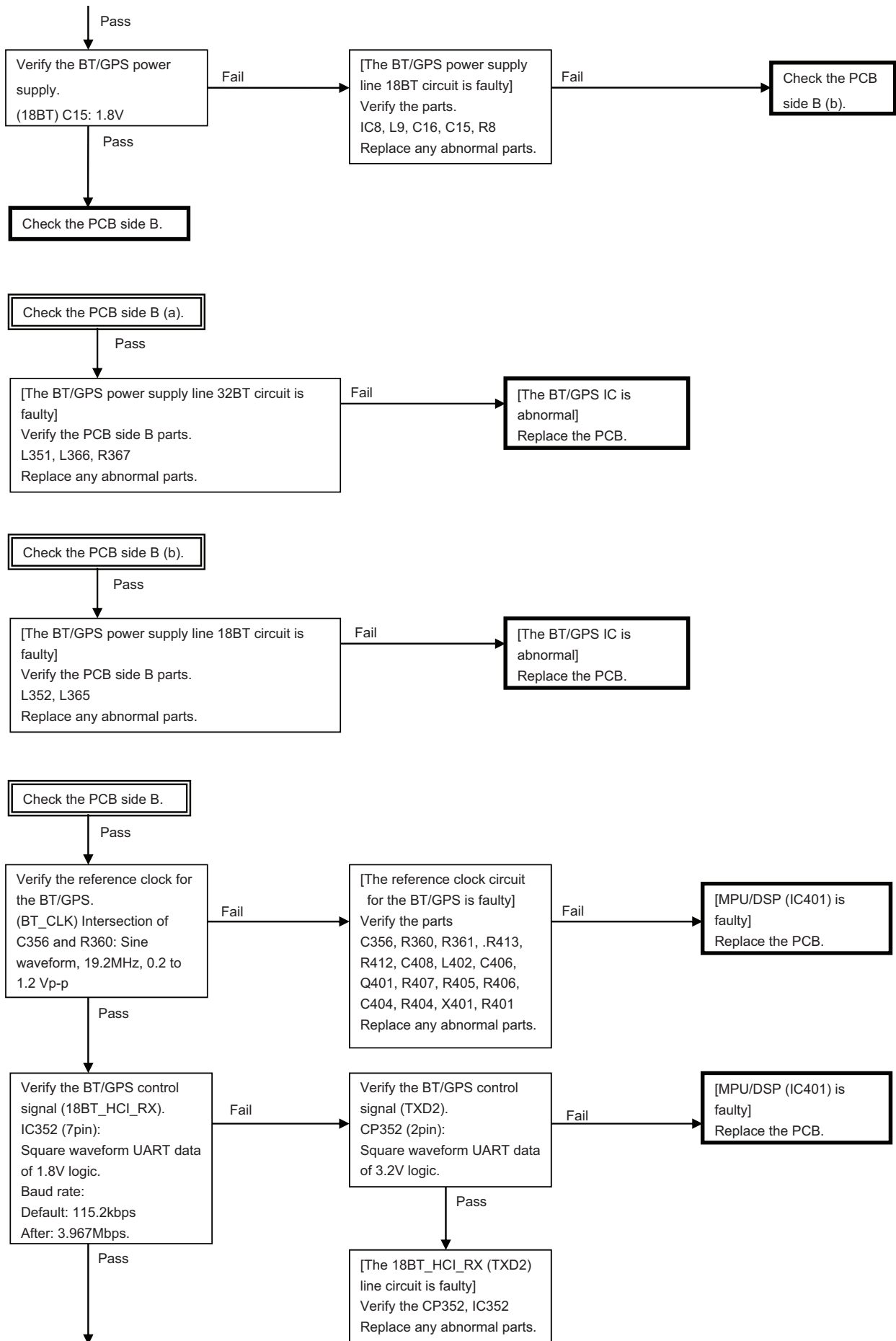
Overview:

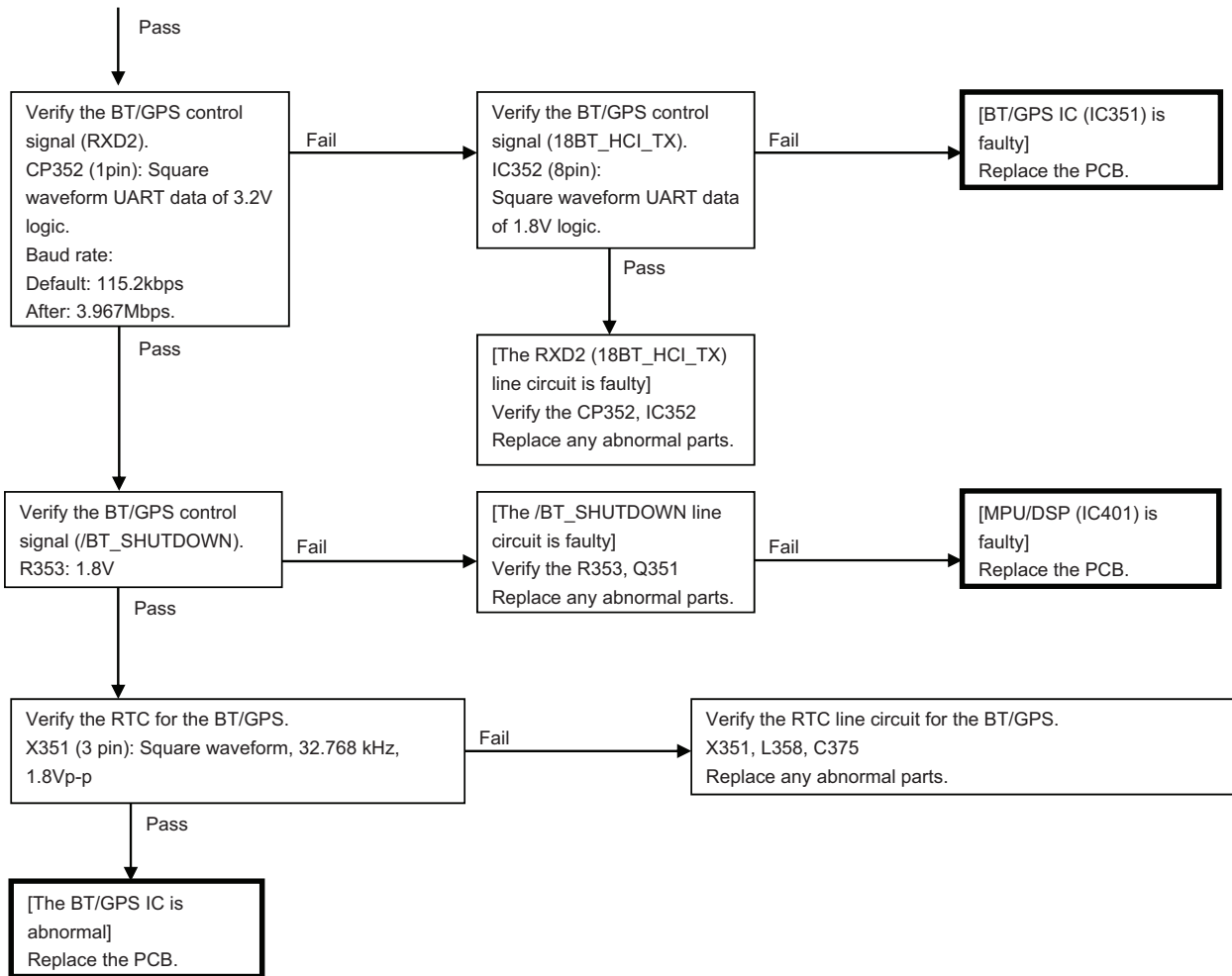
When the Bluetooth function does not operate, use this flowchart to determine the problem.

Major parts for a Bluetooth circuit

- Bluetooth antenna (Sheet metal)
- LC filter (L351)
- Bluetooth/GPS IC (IC351)
- Level conversion IC (IC352, IC353)
- TCXO 19.2MHz (X401)
- 32.768 kHz clock (X351)
- 32BT Regulator (IC7)
- 18BT Regulator (IC8)
- MPU/DSP IC (IC401)







Descriptions of signal names

- (1) 32BT: BT/GPS IC 3.2V 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 Failure diagnosis of the VCO section (NX-3220)

[Overview]

The VCO circuit is mounted inside the BLS. BLS stands for "Board Level Shield".

This BLS has no lid and provides high shielding performance. Because BLS is difficult to solder, components inside the BLS can't be soldered.

When there is a problem with the VCO circuit, the VCO can't be repaired.

If the VCO function doesn't work, use this flow chart to identify the problem.

The following is explained about failure diagnosis of VCO circuit inside a BLS<E101>.

[About a BLS]

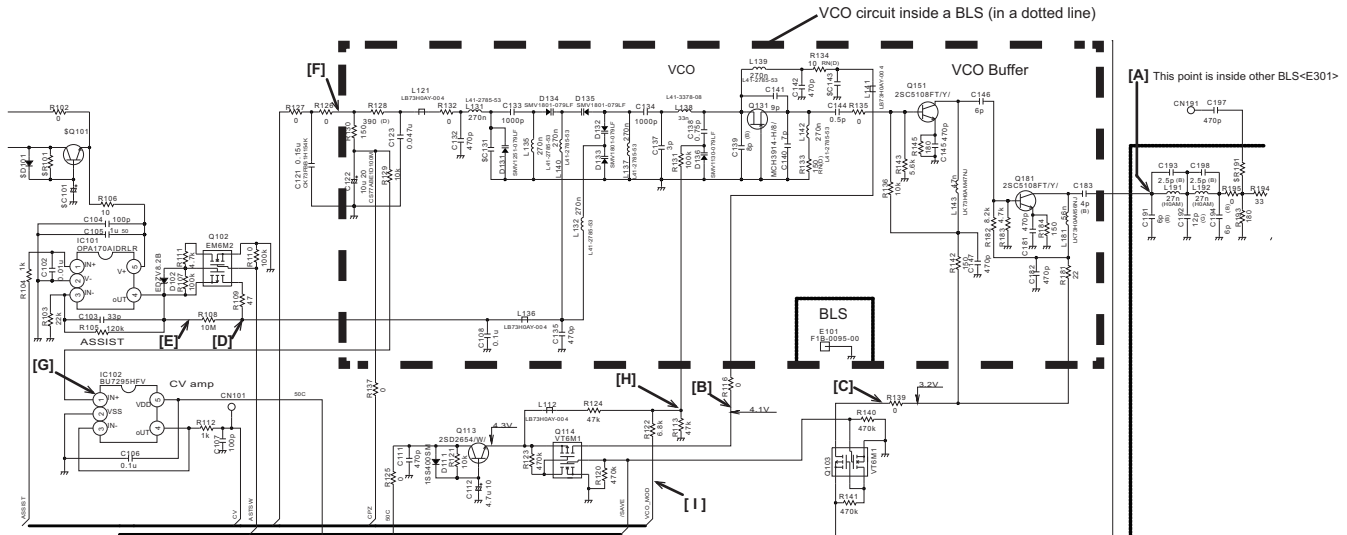
BLS is shielding case

BLS for VCO area is integrated type and can not be removed

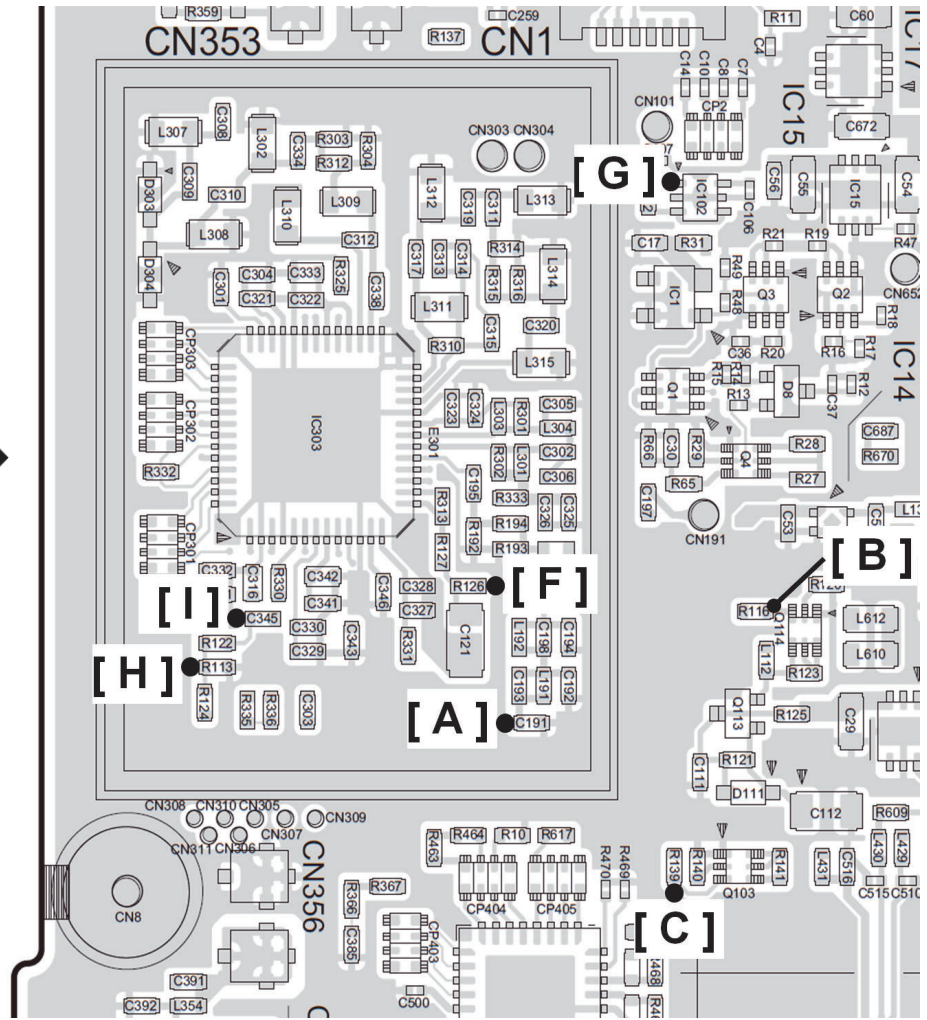
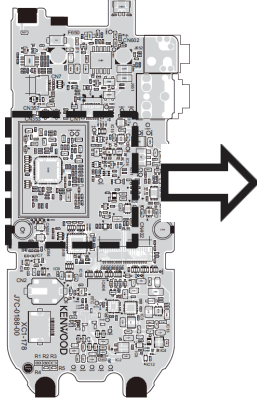
[Prediction problem related to the VCO circuit]

- PLL Unlock
 - <Radio state>
 - Unlock beep
 - VCO Assist voltage tuning is impossible
 - <The cause>
 - VCO control voltage is abnormal
 - VCO Assist voltage is abnormal
 - VCO power supply is abnormal
 - VCO signal output circuit is abnormal

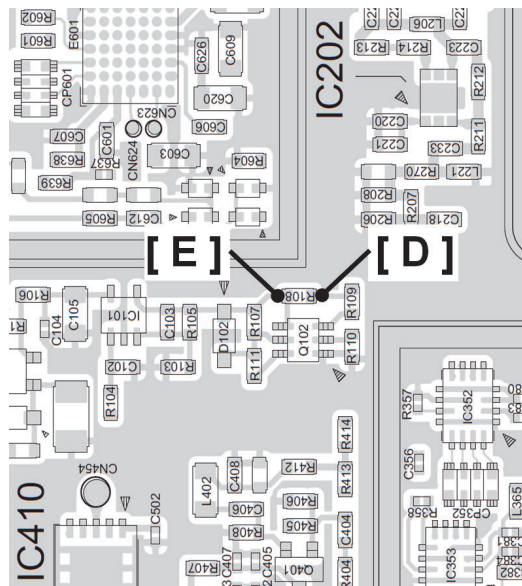
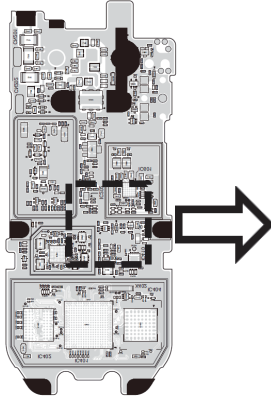
[VCO circuit inside a BLS<E101>]



[A SIDE]

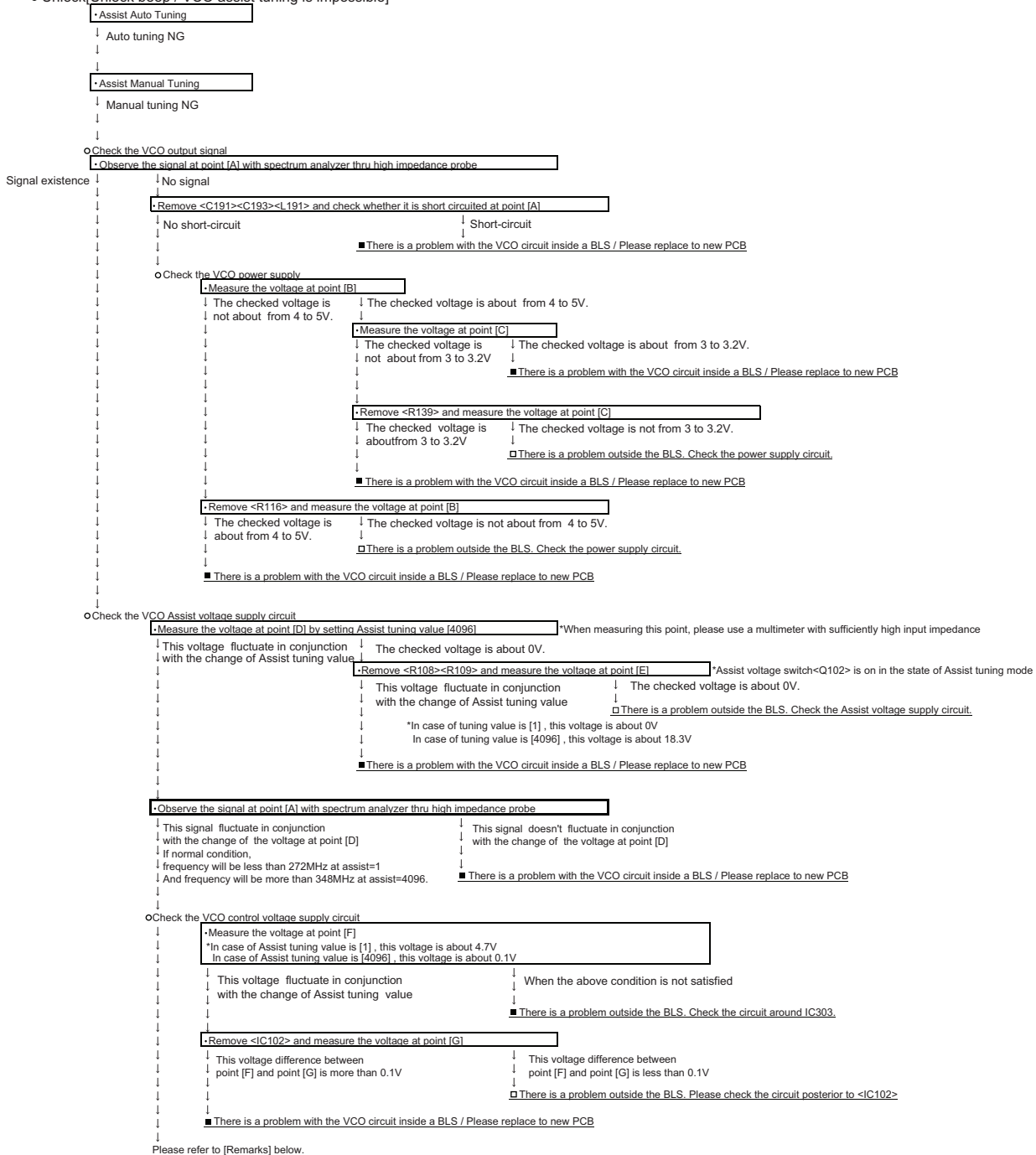


[B SIDE]

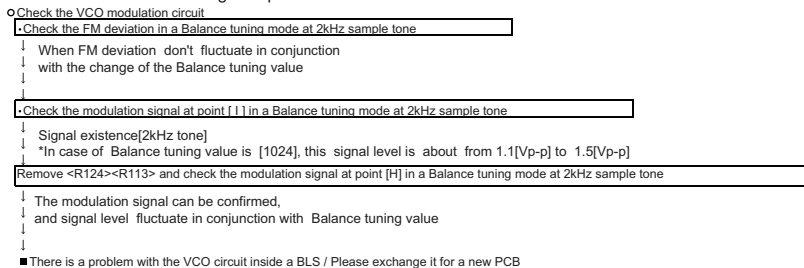


[Inspection procedure]

● Unlock[Unlock beep / VCO assist tuning is impossible]



● Modulation trouble / Balance tuning is impossible



[Remarks]

The following things are assumed as causes of trouble besides the above

- PLL data is abnormal
- VCO/PLL lock judgment is abnormal[<IC401>OMAP]

5.5 Failure diagnosis of the VCO section (NX-3320)

[Overview]

The VCO circuit is mounted inside the BLS. BLS stands for "Board Level Shield".

This BLS has no lid and provides high shielding performance. Because BLS is difficult to solder, components inside the BLS can't be soldered.

When there is a problem with the VCO circuit, the VCO can't be repaired.

If the VCO function doesn't work, use this flow chart to identify the problem.

The following is explained about failure diagnosis of VCO circuit inside a BLS<E101>.

[About a BLS]

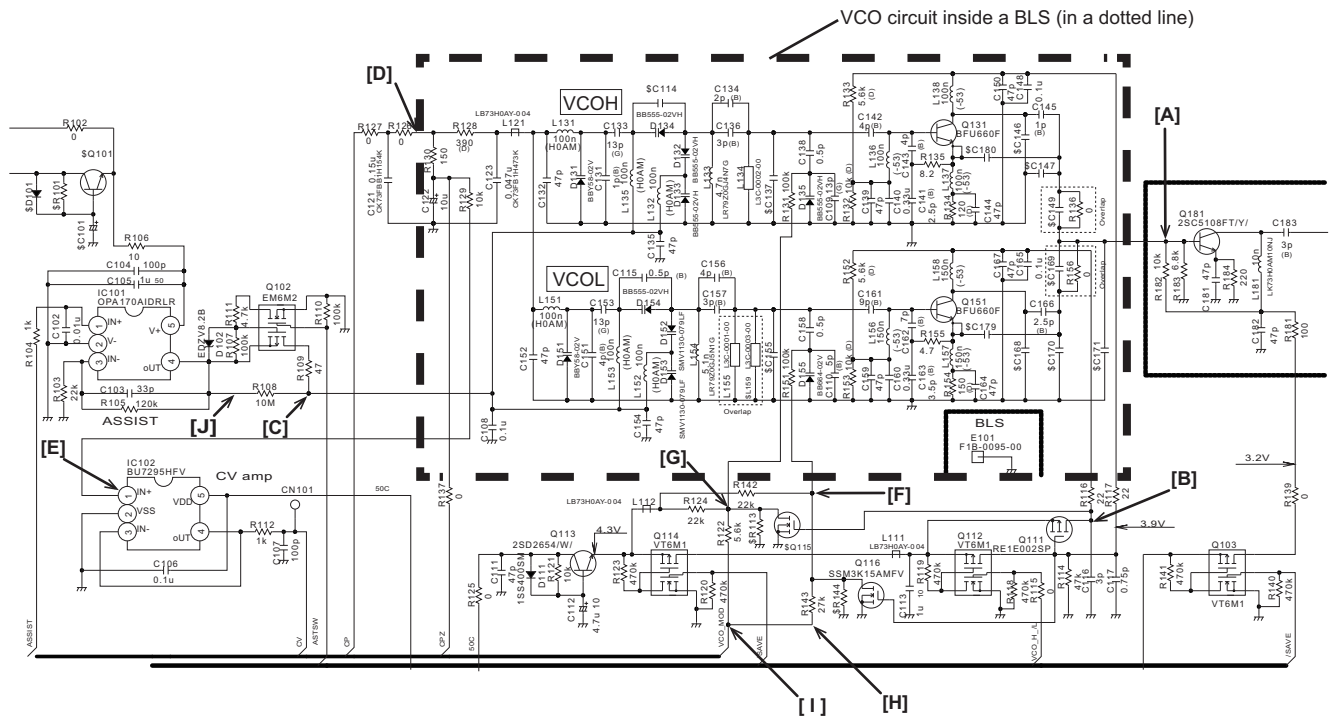
BLS is shielding case

BLS for VCO area is integrated type and can not be removed

[Prediction problem related to the VCO circuit]

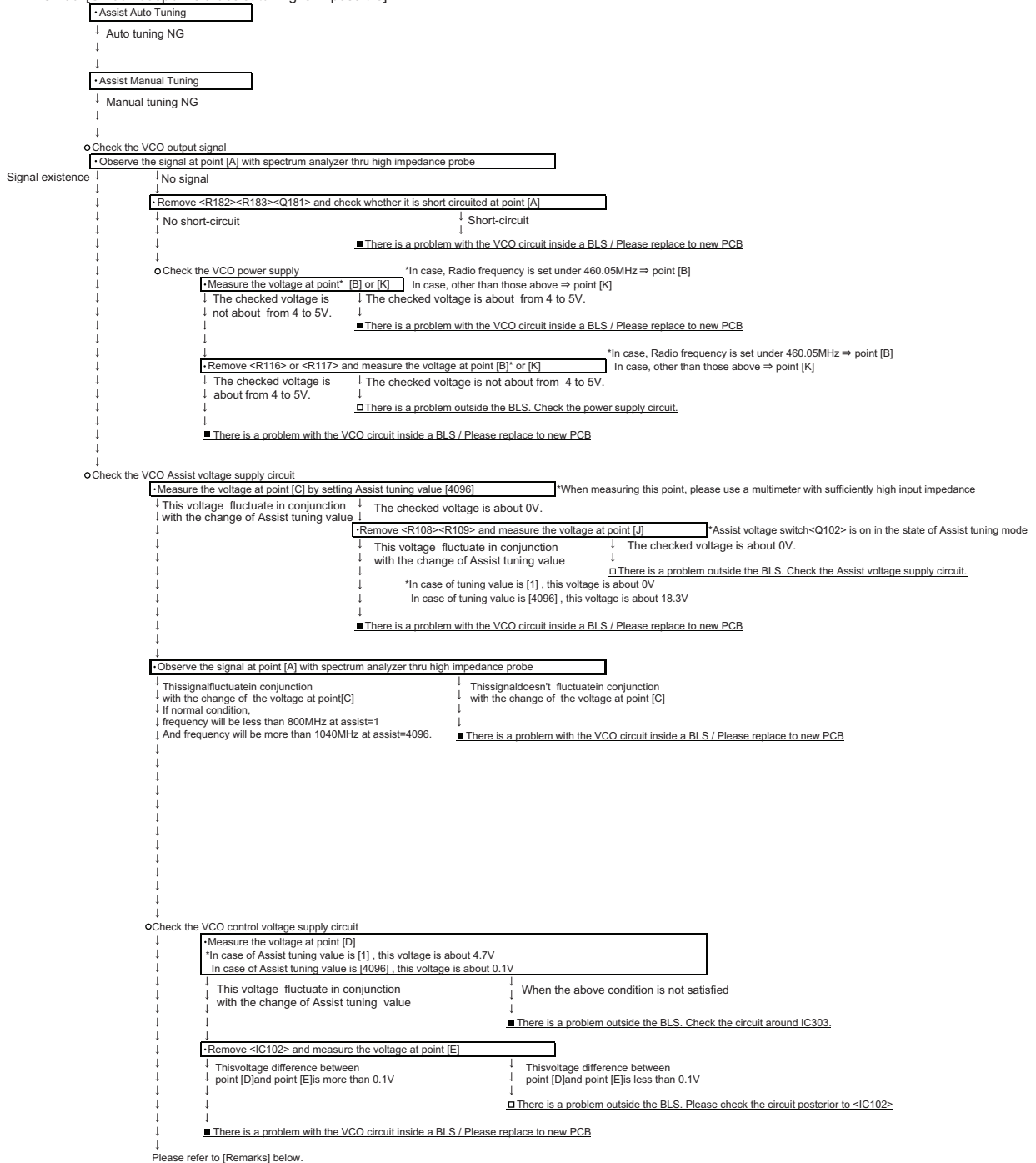
- PLL Unlock
 - <Radio state>
 - Unlock beep
 - VCO Assist voltage tuning is impossible
- <The cause>
- VCO control voltage is abnormal
- VCO Assist voltage is abnormal
- VCO power supply is abnormal
- VCO signal output circuit is abnormal

[VCO circuit inside a BLS<E101>]

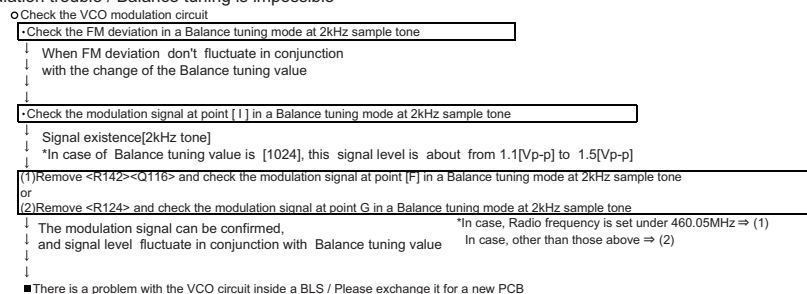


[Inspection procedure]

- Unlock [Unlock beep / VCO assist tuning is impossible]



- Modulation trouble / Balance tuning is impossible



[Remarks]

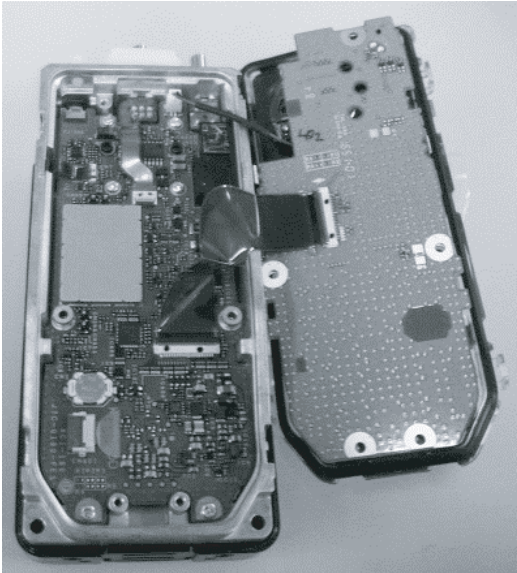
The following things are assumed as causes of trouble besides the above

- PLL data is abnormal
- VCO/PLL lock judgment is abnormal [IC401] OMAP]

5.6 Operating Method of Enforced Firmware Overwriting Mode

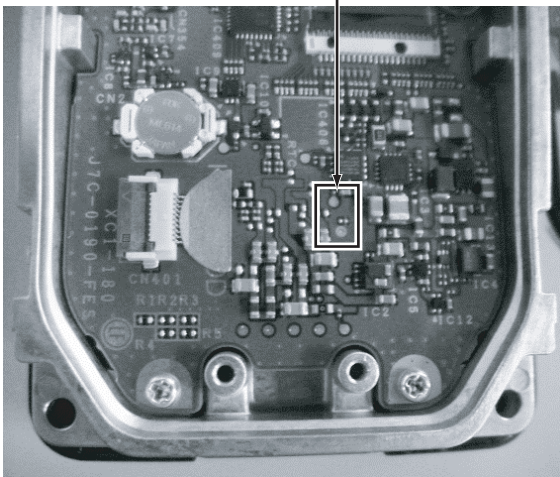
Enforced firmware overwriting mode is a mode to forcibly overwrite the transceiver firmware when the operations as instructed in Section 2.2.2 "How to Enter Each Mode" does not allow the transceiver to enter the firmware programming mode, for instance, when the transceiver fails to start up due to the transceiver failure.

- (1) Prepare the followings:
 - Transceiver (NX-3220 or NX-3320)
 - Battery (KNB-55L, KNB-56N or KNB-57L)
 - Programming interface cable (KPG-22U)
- (2) Disassemble the transceiver to the condition shown in the figure.



- (3) Connect a transceiver, battery and programming interface cable (KPG-22U).
- (4) While FLDM terminal has a short-circuit with GND terminal on the PCB, turn its power ON.

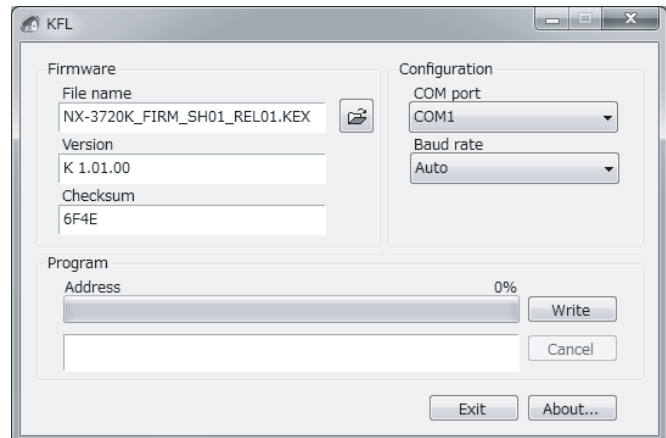
Upper: FLDM terminal
Lower: GND terminal



- (5) Upon startup of FLDM loader, "FIRMWARE PROG" appears on an LCD screen.
- (6) Start KFL up, select the desired firmware you wish to overwrite, select the COM port number and baud rate, and then click the "Write" button.

Note:

Configuring "Auto" for baud rate automatically apply the maximal speed of baud rate allowed for a programming cable connected to the selected COM port number.
Upon start of overwriting on the transceiver, "LOADING" appears on an LCD screen.



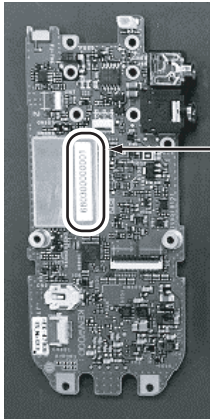
- (7) Upon completion of the firmware overwriting, "CHECKSUM xxxx" appears on an LCD screen.

5.7 Replacing TX-RX Unit

■TX-RX unit information

Model Name	Original TX-RX unit Number	For Service TX-RX unit Number
NX-3220 (K,K2,K3)	XC1-178K-00	XCA-029K-00
NX-3220 (E,E2,E3)	XC1-178K-00	XCA-029E-01
NX-3320 (K,K2,K3)	XC1-180K-00	XCA-030K-00
NX-3320 (E,E2,E3)	XC1-180K-00	XCA-030E-01

■Method of confirming “Original TX-RX unit” and “Service TX-RX unit”



The following marking seals are affixed on the shield cover of the service TX-RX unit (XCA-029K-00/XCA-029E-01/XCA-030K-00/XCA-030E-01).

Model Name	Marking seal
NX-3220 (K,K2,K3)	XCA-029K-00
NX-3220 (E,E2,E3)	XCA-029E-01
NX-3320 (K,K2,K3)	XCA-030K-00
NX-3320 (E,E2,E3)	XCA-030E-01

■Supplied Accessories of “Service TX-RX unit”

Item (Including Parts Number)	Quantity
TX-RX Unit (XC1-178, XC1-180)	1
KENWOOD ESN/ NXDN ESN/ Product Number/ MPT ESN Label	1

■“Service TX-RX unit” Data

The following data is written on the service unit:

Data Type	Description
KENWOOD ESN	Model name: [XC1-178/XC1-180] NX-3220S1 (K, E) Type:K, K2, K3, E, E2, E3 The same number as the KENWOOD ESN label is written.
NXDN ESN/ MPT ESN/ Product number	The same number as the NXDN ESN/ MPT ESN/ Product Number label is written.

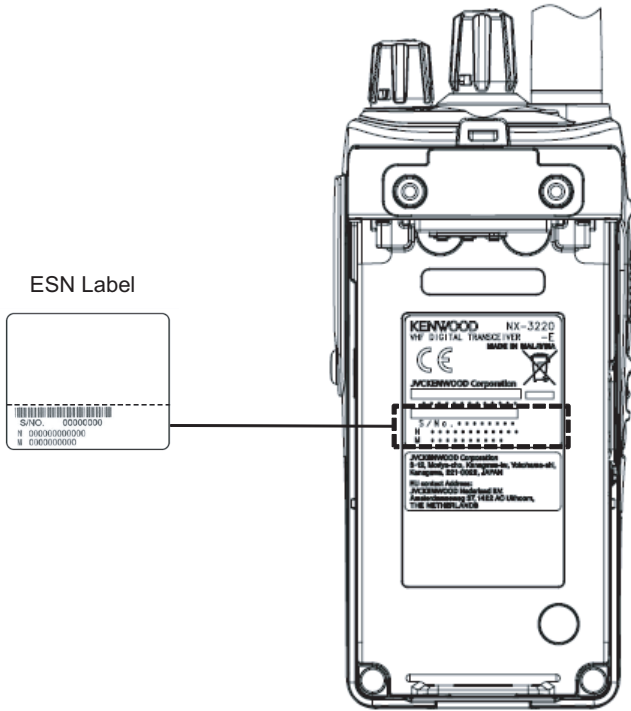
■After Changing the PCB

- After changing the printed circuit board, write the up-to-date Firmware following the instructions in the “2.2 REALIGNMENT - 2.2.6 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.
- Using the KPG-D3/D3N, select your desired item (Model Name) from the Radio Configuration> Product Information menu, then use Read/ Write > Write Configuration 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.
- Tools > Test/Tuning, then adjust the various adjustment data (PC Test Mode) as described in the "SECTION 4 ADJUSTMENT".
- Attach the new labels corresponding to the new printed circuit board. (Refer to the images below for label placement.)
- If necessary, write the FPU data used by the customer with the KPG-D3/D3N.

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-D3/D3N, but this does not have any effect on the operation of the transceiver.
- If changing to the original ESN, please contact our service center.
- KPG-D3N can't be used for E, E2, E3 types.

■ ESN Label Layout



Note:

Cut a ESN Label at dotted line.

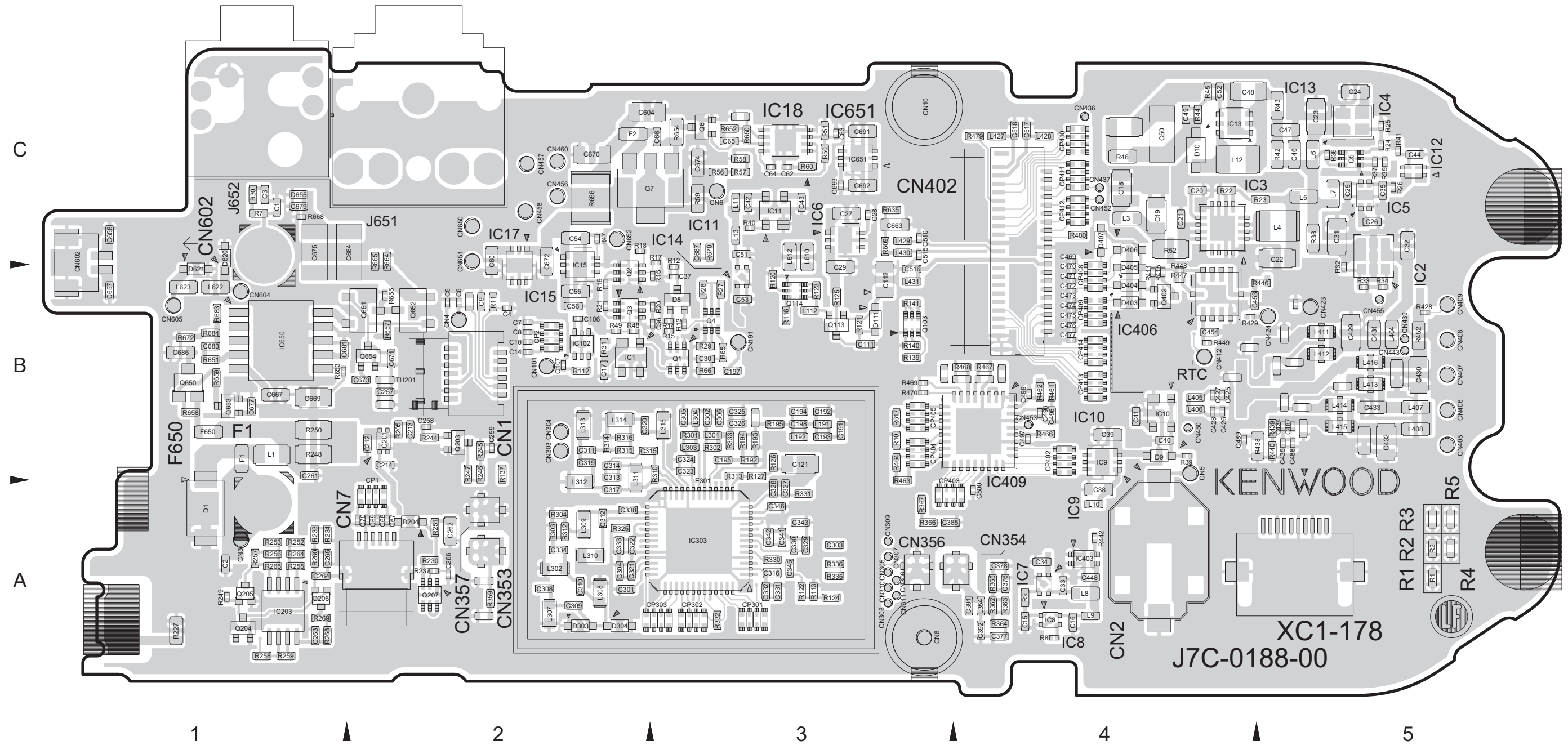
PRECAUTIONS ON SCHEMATIC DIAGRAMS

- * Due to the improvement in performance, some part numbers shown in the circuit diagrams may not agree with those indicated in the Parts List.
- * The parts numbers, values and rated voltage etc. in the Schematic Diagrams are for reference only.
- * Since the circuit diagrams are standard ones, the circuits and circuit constants may be subject to change for improvement without any notice.
- * The parts of the symbol with " * " may vary depending on model. Refer to the parts list for details.
- * The parts of the symbol with " \$ " are unmounted parts.

PRINTED CIRCUIT BOARD

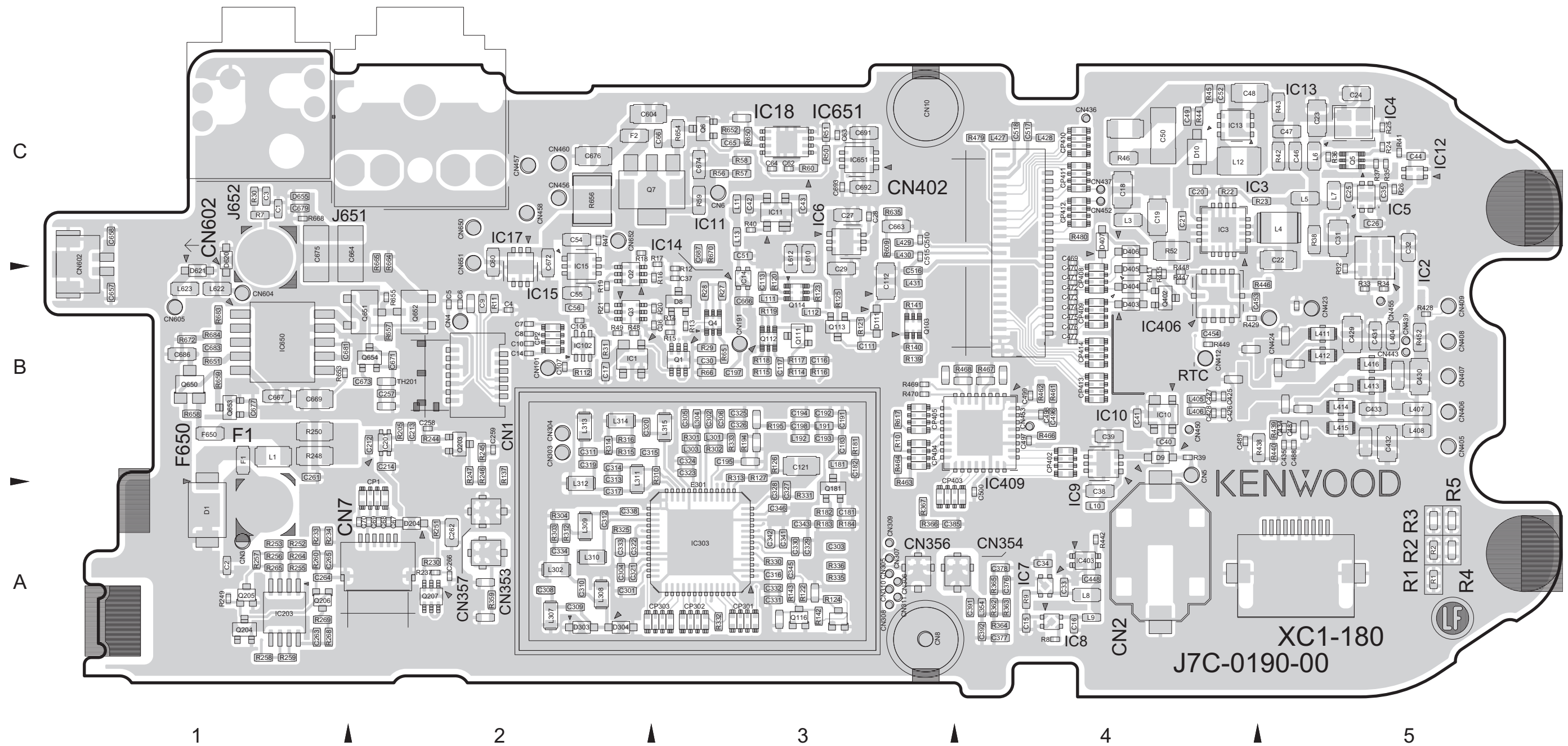
■ TX-RX UNIT (XC1-178K-00 (NX-3220))

--- Component side view (J7C-0188-00) ---



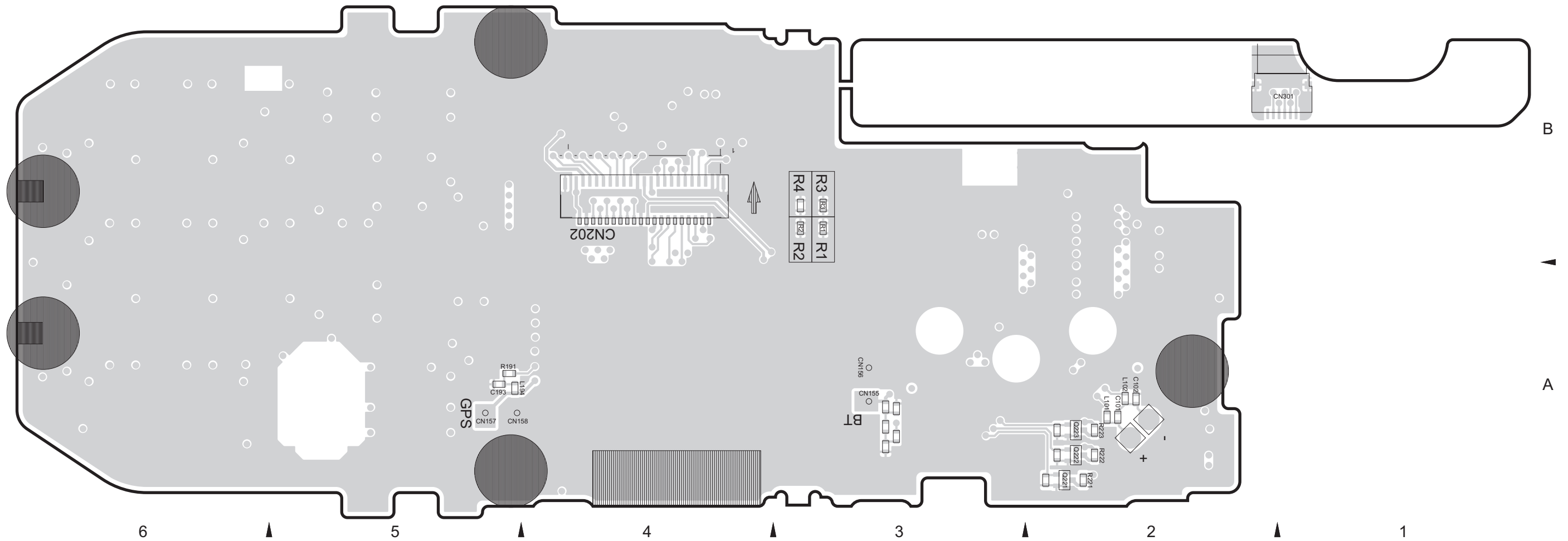
■ TX-RX UNIT (XC1-180K-00 (NX-3320))

--- Component side view (J7C-0190-00) ---



■ DISPLAY UNIT (XC1-209K-00 (NX-3220(K,E3),NX-3320(K,E3)), XC1-209K-01 (NX-3220(K2,E2),NX-3320(K2,E2)), XC1-209K-02 (NX-3220(K3,E),NX-3320(K3,E)))

--- Foil side view (J7C-0217-10) ---



● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.



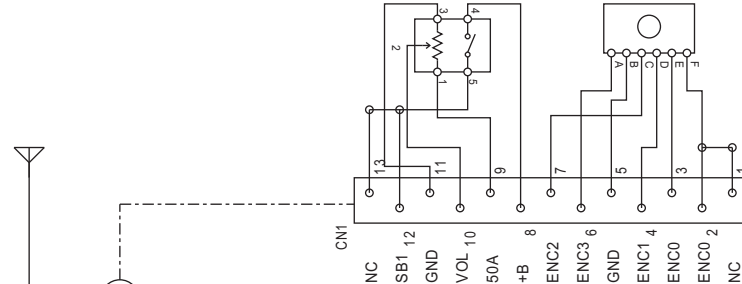
REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
TRANSISTOR					
Q221	B- 2A	R222	B- 2A	CN157	B- 5A
Q222	B- 2A	R223	B- 2A	CN158	B- 5A
Q223	B- 2A	CAPACITOR			
RESISTOR					
R1	B- 3B	C101	B- 2A	CN301	B- 1B
R2	B- 3B	C102	B- 2A	L101	B- 2A
R3	B- 3B	C193	B- 5A	L102	B- 2A
R191	B- 5A	OTHER			
R221	B- 2A	CN155	B- 3A	L194	B- 5A
		CN156	B- 3A		

INTERCONNECTION DIAGRAM

5
4
3
2
1

Power SW/
AF Vol

CHANNEL
SELECTOR



Bluetooth

MIC

MIC101

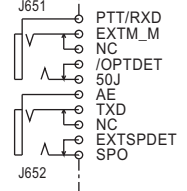
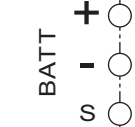
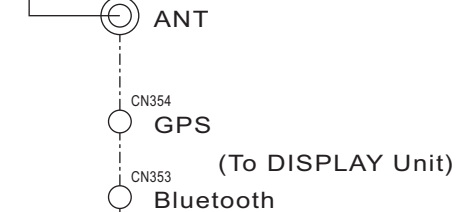
INTM_M

Bluetooth

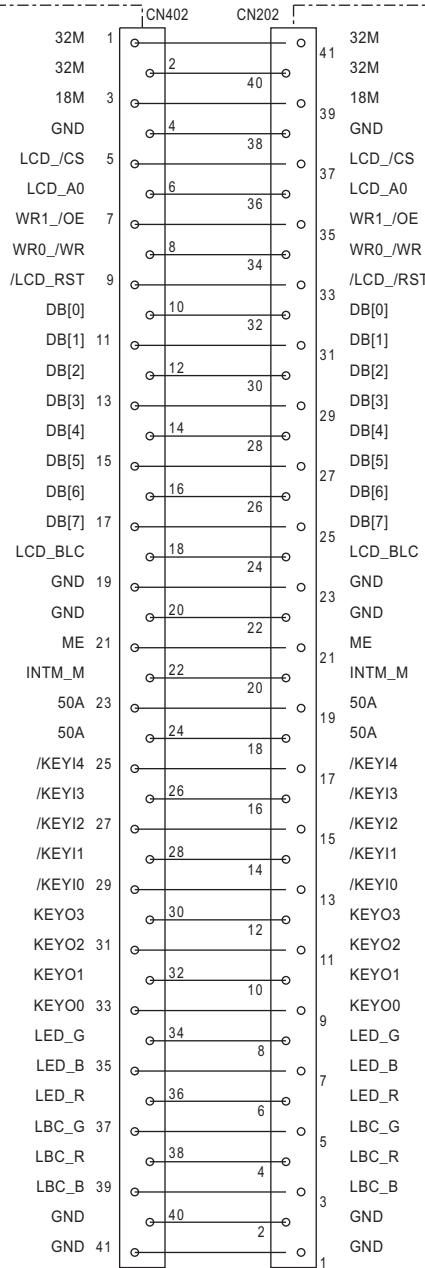
GPS

GND

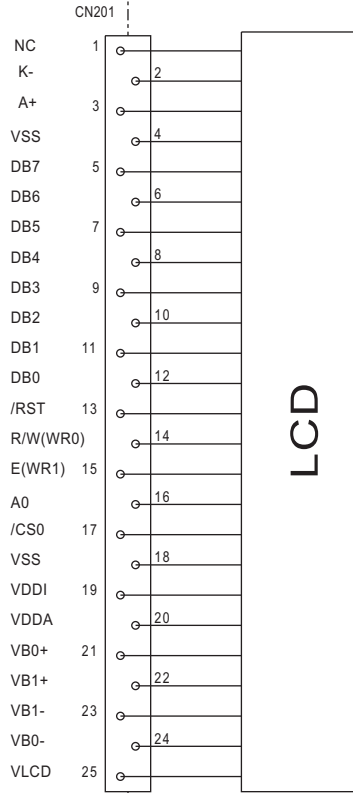
GPS



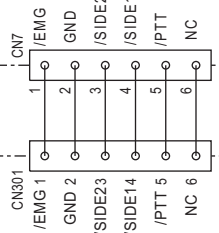
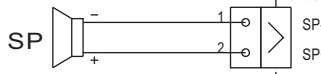
TX-RX Unit
XC1-178(NX-3220)
XC1-180(NX-3320)



DISPLAY Unit
XC1-209 A/2



LCD



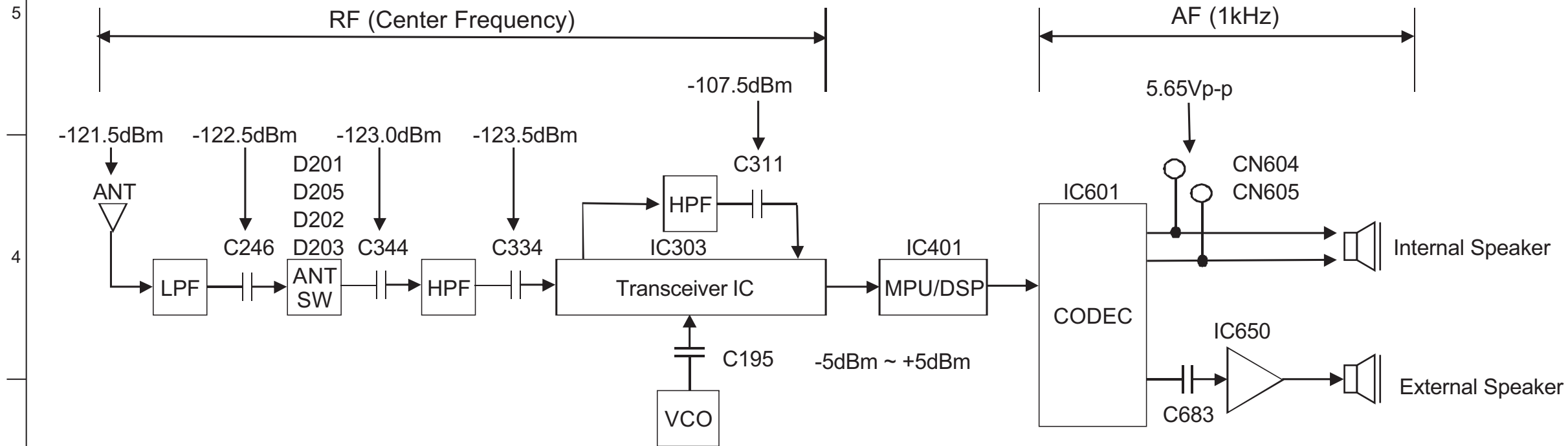
DISPLAY Unit
XC1-209 B/2

A B C D E F G

LEVEL DIAGRAM

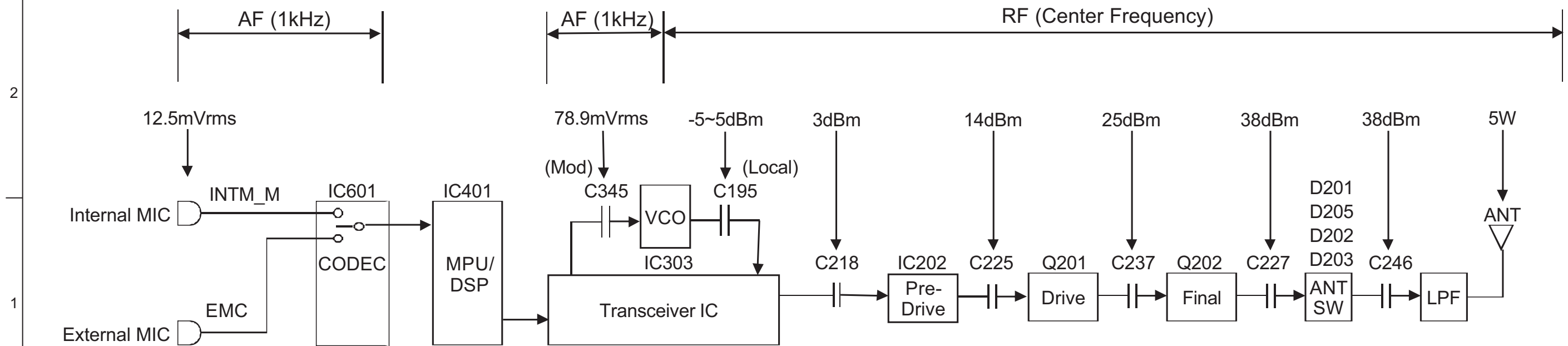
■ NX-3220

Receiver Section



To make measurements in the AF section, connect the AC level meter.
 (ANT input: -53dBm, 1kHz FM, 3kHz DEV (Wide). SP output: 500mW@8ohm Load)
 In the RF section, use 470pF coupling capacitor.
 (The display shows the SSG input value required to obtain 12dB SINAD.)

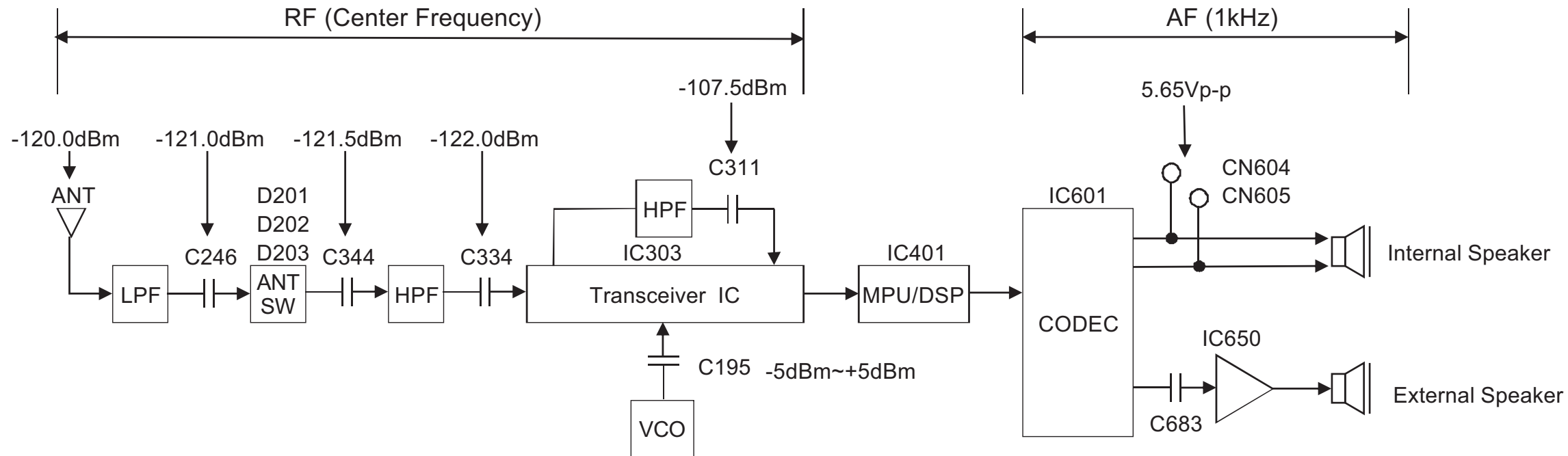
Transmitter Section



* Transmit frequency : 155MHz

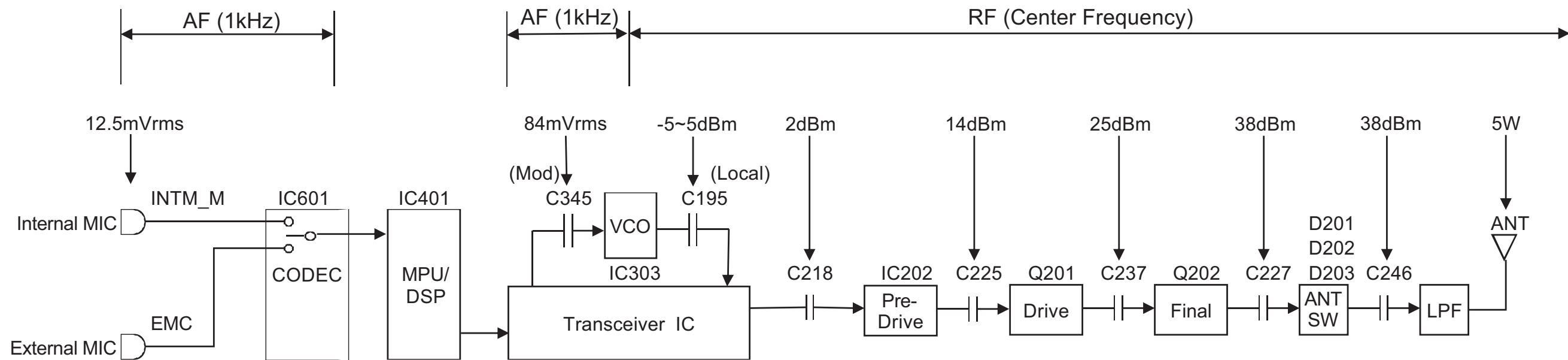
■ NX-3320

Receiver Section



To make measurements in the AF section, connect the AC level meter.
 (ANT input: -53dBm, 1kHz FM, 3kHz DEV (Wide). SP output: 500mW@8ohm Load)
 In the RF section, use 470pF coupling capacitor.
 (The display shows the SSG input value required to obtain 12dB SINAD.)

Transmitter Section

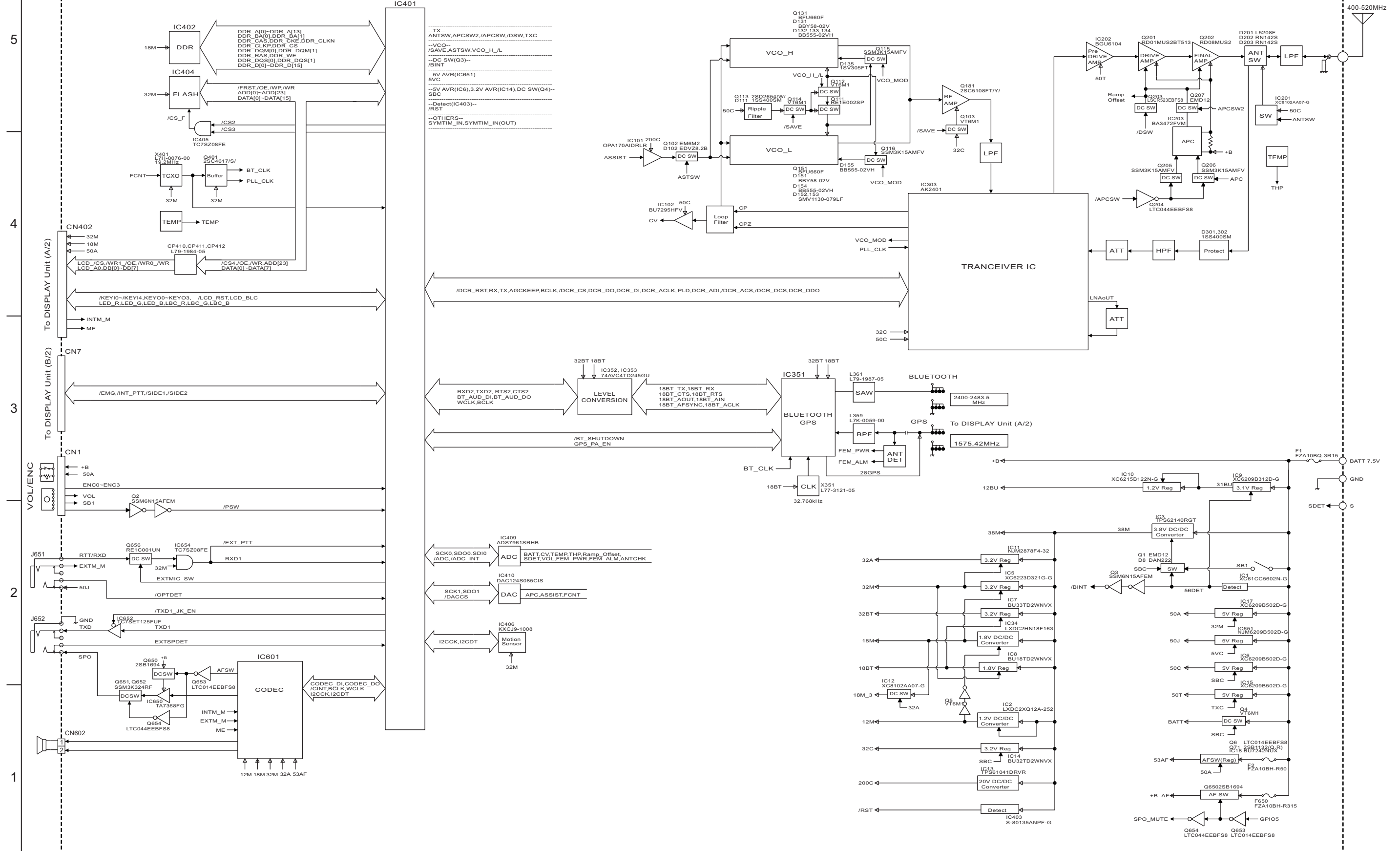


* Transmit frequency : 485MHz

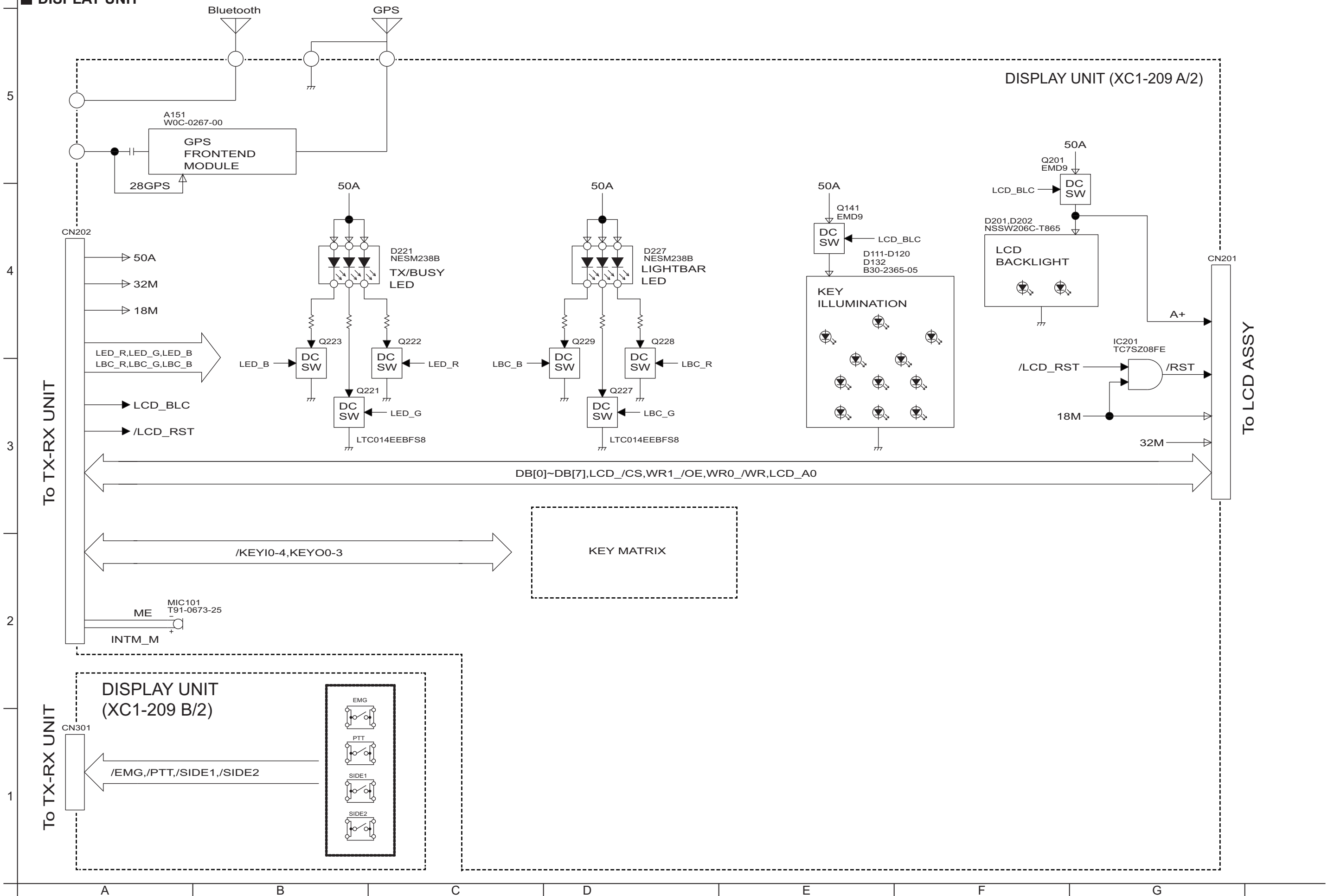
TX-RX UNIT (NX-3320)

TX-RX UNIT (XC1-180)

IC401



DISPLAY UNIT



SCHEMATIC DIAGRAM

■ DISPLAY UNIT (XC1-209K-00 (NX-3220(K,E3),NX-3320(K,E3)), XC1-209K-01 (NX-3220(K2,E2),NX-3320(K2,E2)), XC1-209K-02 (NX-3220(K3,E),NX-3320(K3,E)))

5

4

3

2

1

DISPLAY UNIT (A/2)

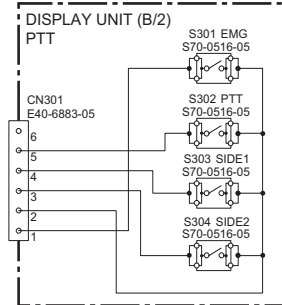
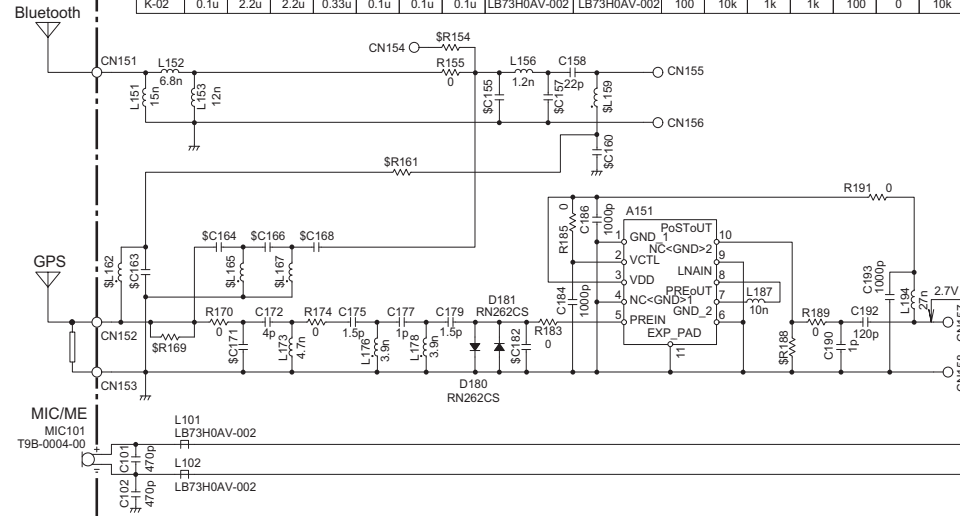
KEYPAD

	C141 - C144	R111, R114, R116	R112, R113, R115, R117	R118, R120, R121	R122, R123	R132, R141	R142 - R143	R145, R146	R147, R148	CP141	D111 - D114, D115, D117	D118 - D120	D132	D141 - D144	Q141	S111 - S113, S119, S121	S114 - S118, S122, S130	S131 - S132	
K-00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
K-01	470p	1k	560	560	0	1k	4.7k	-	100	100	RK74HB1J101J	B30-2365-05	-	B30-2365-05	RB521SM-30	EMD9	S70-0901-05	-	S70-0901-05
K-02	470p	1k	560	1k	1.2k	0	4.7k	100	100	100	RK74HB1J101J	B30-2365-05	B30-2365-05	-	RB521SM-30	EMD9	S70-0901-05	S70-0901-05	-

LCD

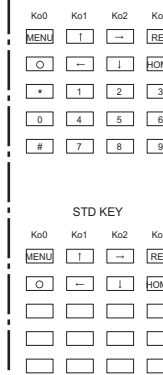
	C201	C202	C203	C204	C205	C206	C207	L201	L202	R201	R203	R204	R205	R206	R207	R208	R209	CN201	CP201 - CP203	D201 - D202	IC201	Q201	
K-00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K-01	0.1u	2.2u	2.2u	0.33u	0.1u	0.1u	0.1u	LB73H0AV-002	LB73H0AV-002	100	10k	1k	1k	100	0	10k	0	EC720BP-0325A	RK74HB1J101J	NSSW206C-T865	TC7SZ08FE	EMD9	
K-02	0.1u	2.2u	2.2u	0.33u	0.1u	0.1u	0.1u	LB73H0AV-002	LB73H0AV-002	100	10k	1k	1k	100	0	10k	-	EC720BP-0325A	RK74HB1J101J	NSSW206C-T865	TC7SZ08FE	EMD9	

	R1	R2	R3	R4
	RKEY	12KEY	GPS/RT	RESERVE
K-00	0	0	0	0
K-01	0	0	0	0
K-02	0	0	0	0

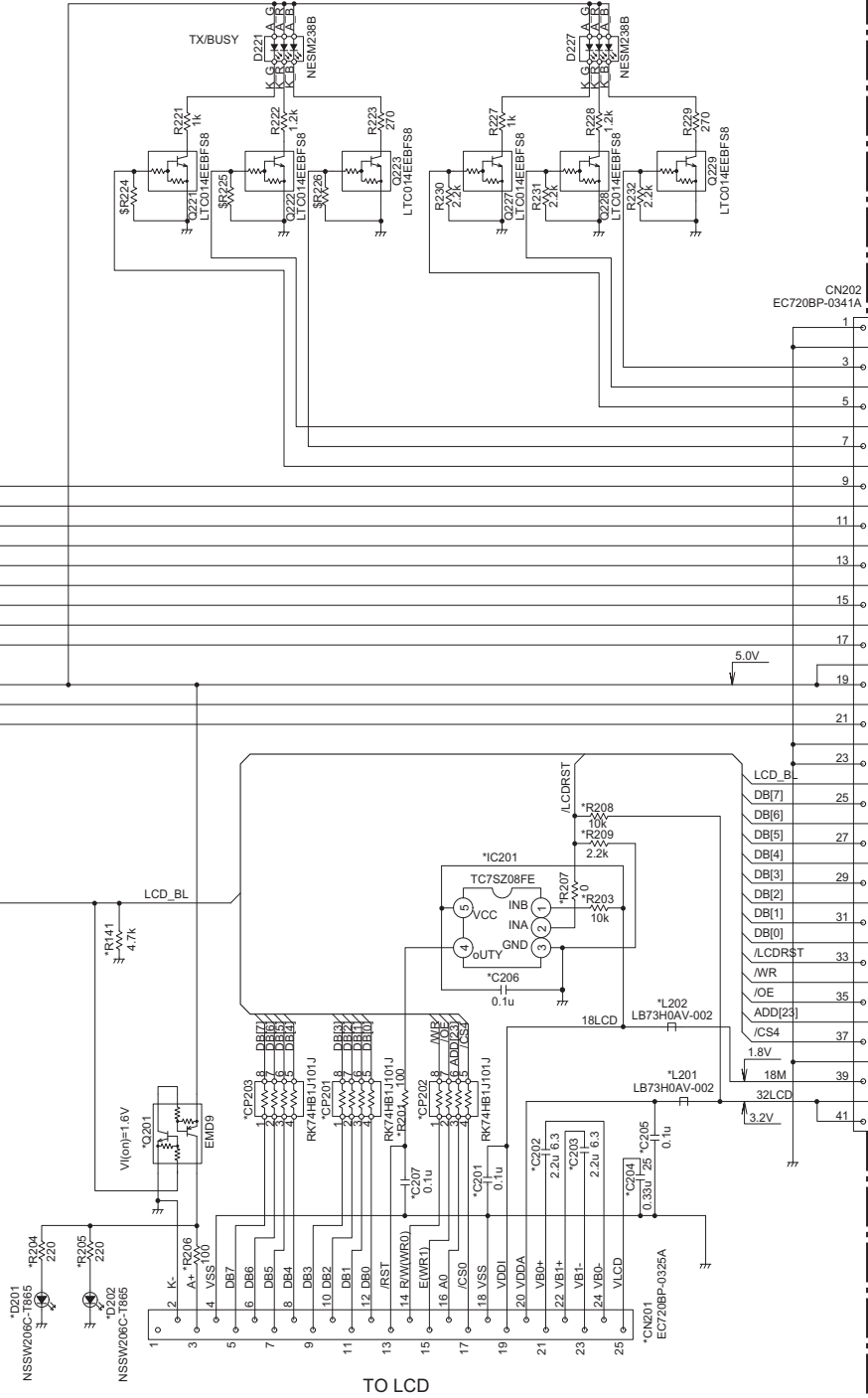
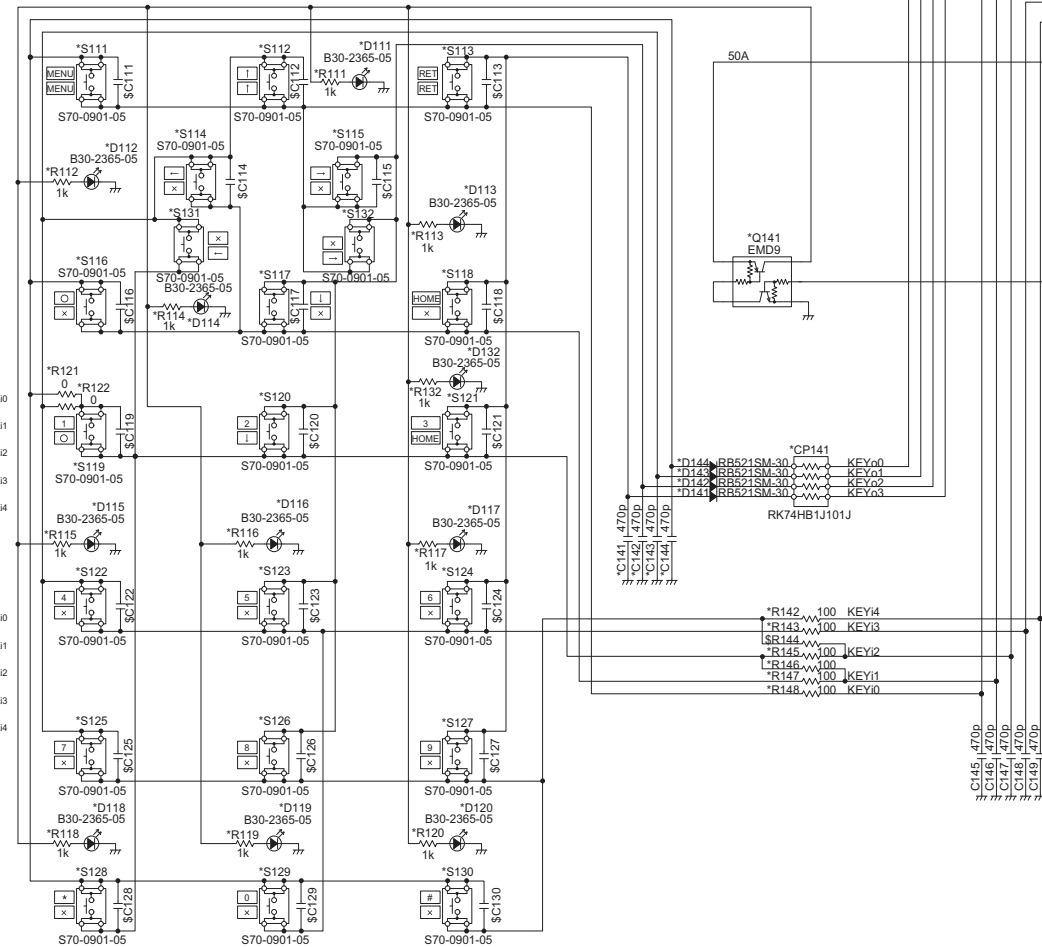


TO TX-RX UNIT
XC1-178(NX-3220)
XC1-180(NX-3320)
CN7

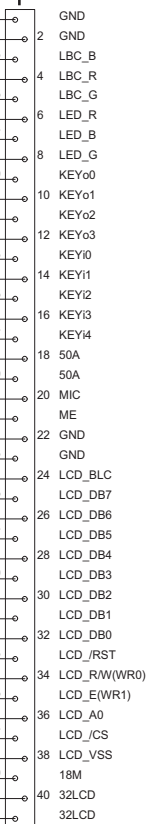
FULL KEY



STD KEY



TO TX-RX UNIT
XC1-178(NX-3220)
XC1-180(NX-3320)
CN402



TO LCD

A

B

C

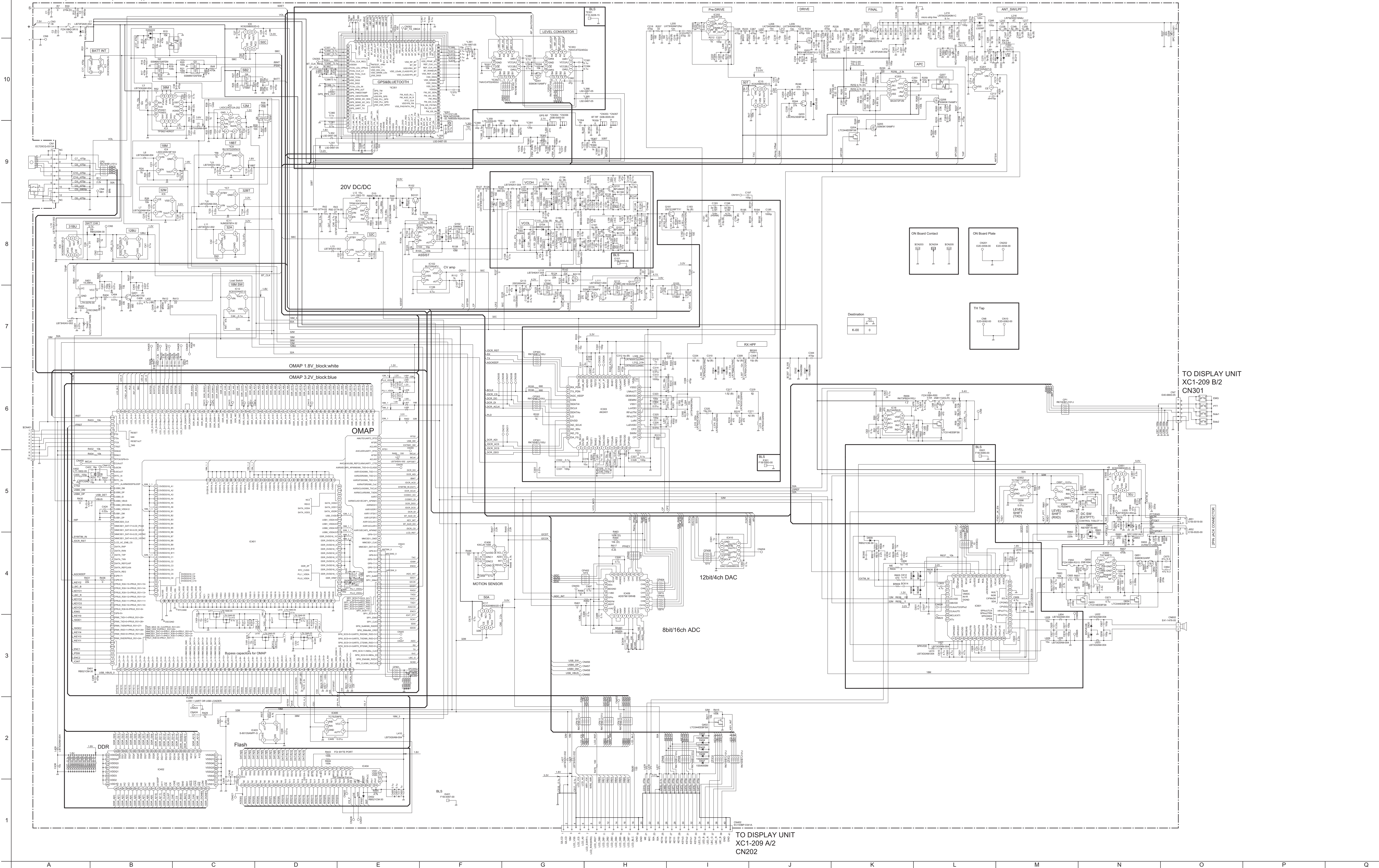
D

E

F

G

TX-RX UNIT (XC1-180K-00 (NX-3320))



TO DISPLAY UNIT
XC1-209 B/2
CN301

TO DISPLAY UNIT
XC1-209 A/2
CN202

PARTS LIST

[NX-3220,NX-3320]

* SAFETY PRECAUTION

Parts identified by the \triangle 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	3-19

General assembly

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

△ Symbol No.	Part No.	Part Name	Description	Local
2	A0C-0177-00	P.CABINET ASSY	BASIC 2PIN	3220K,3220E3,3320K,3320E3
2	A0C-0178-00	P.CABINET ASSY	STD 2PIN	3220K2,3220E2,3320K2,3320E2
2	A0C-0179-00	P.CABINET ASSY	FULL 2PIN	3220K3,3220E,3320K3,3320E
3	A8A-0050-00	REAR PANEL		
4	A1A-0105-00	CHASSIS	2PIN	
6	B3H-0062-00	LCD ASSY		3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
7	B4B-0006-00	CAUTION STICKER	FCC	3220K,3220K2,3220K3,3320K,3320K2,3320K3
7	B4C-0545-10	STANDARD LABEL	ADDRESS	3220E,3220E2,3220E3,3320E,3320E2,3320E3
8	B42-7417-04	STICKER	NEXEDGE	
9	B4D-0044-00	KENWOOD BADGE		
10	D32-0454-04	STOPPER	CH KNOB	3220K,3220E3,3320K,3320E3
11	D3C-0003-00	STOPPER	NUT	
12	E04-0467-15	C.RECEPTACLE-SM	SMA	
13	E2D-0083-00	TERMINAL	ANT	
14	E3K-0275-00	LEAD.WIRE W.C.	SP	
16	E7C-0018-00	TERMINAL BLOCK	BATT	
18	F10-3227-05	SHIELDING COVER	BLS/GPS	
19	F1B-0084-00	SHIELDING COVER	BLS/AK2401	
20	F1B-0086-00	SHIELDING COVER	BLS/CODEC	
21	F1B-0088-00	SHIELDING COVER	BLS/OMAP	
22	B1B-0105-00	ILL.GUIDE	LCD	
23	J2B-0350-10	MOUNTING	LCD	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
24	G0K-0012-00	KNOB SPRING	(x2)	
25	B1B-0110-00	REF.SHEET	LCD	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
26	B1B-0138-00	FILTER	LCD	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
28	G1A-0057-00	FIBROUS SHEET	ECM	
29	G1A-0063-00	FIBROUS SHEET	AIR LEAK GORE	
30	G1A-0053-00	FIBROUS SHEET	SP	
31	G1G-0075-00	SHEET	PTT	
32	G1G-0076-00	SHEET	KEY	
33	G1G-0077-00	SHEET	SP/BT/GPS	
34	G1B-0266-00	RUBBER SHEET	SP	
35	G1G-0080-00	SHEET	KEY 4DIRECTIONS	3220K2,3220E2,3320K2,3320E2
36	G1B-0240-00	SEAL	VOID	
37	G11-4090-14	SHEET	FINAL	
38	G11-4440-04	SHEET	LEAK COVER	
39	G1D-0203-00	CUSHION	SP/ECM	
40	G1D-0204-00	CUSHION	AIR LEAK	
41	G1D-0205-00	CUSHION	LCD(x2)	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
43	G13-2102-34	CONDUCT CUSHION	BLS COVER	3320K,3320K2,3320K3,3320E,3320E2,3320E3
44	G13-2220-04	CUSHION	ANT	
45	G1B-0300-00	SHEET	LCD	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
46	G1D-0272-00	CUSHION	TX-RX PCB	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2
49	G53-1792-04	PACKING	O RING-NUT(x2)	
50	G53-2211-04	O RING	VOL/CH(x2)	
51	G5D-0133-00	PACKING	ANT	
52	G5D-0121-00	PACKING	HOLDER	
53	G5D-0122-00	PACKING	ECM	
54	G5D-0120-00	PACKING	TOP	
55	G5D-0128-00	PACKING	TER.BLOCK/RING(x2)	
57	G5D-0124-00	PACKING	2PIN	
60	J1K-0493-00	HOLDER	SP/LCD/KEY	
61	J1K-0494-10	HOLDER		
62	K2K-0248-00	KEY TOP	FULL	3220K3,3220E,3320K3,3320E
62	K2K-0247-00	KEY TOP	STD	3220K2,3220E2,3320K2,3320E2
64	J87-0027-15	FPC(LEAD FREE)	PTT	
65	J8C-0020-00	FLEX P.BOARD	VOL/ROSW	
66	J8C-0022-00	FLEX P.BOARD	KEY-MAIN	
67	K2K-0249-00	KNOB	VOL	
68	K2K-0250-00	KNOB	ROSW	
70	K2K-0251-00	KNOB	PTT	
71	K2K-0252-00	BUTTON KNOB	PTT	
72	S6A-0004-00	ROTARY SWITCH		
73	T0H-0025-10	SPEAKER	D28	
74	T9A-0058-00	ANTENNA ELEMENT	GPS	
75	T9A-0059-00	ANTENNA ELEMENT	BT	
77	W09-0971-05	LITHIUM CELL		
78	R31-0692-15	V RESISTOR		
79	J2B-0366-00	REINFORCE MOUNT		
A	N09-6554-05	PAN HEAD SCREW	SMA(x2)	
B	N79-2080-43	P.HEAD T.SCREW	(x2)	
C	N09-6646-05	SPECIAL SCREW	CASE(x2)	
D	N14-1011-00	CIRCULAR NUT	VOL	
E	N14-1012-00	CIRCULAR NUT	ROSW	
F	N83-2005-48	P.HEAD T.SCREW	UNIT(x11)	
G	N84-2004-43	P.HEAD T.SCREW	TER.BLOCK (+,-)(x2)	
-	XCA-029K-00	TX-RX UNIT	SERVICE UNIT	3220K,3220K2,3220K3
-	XCA-029E-01	TX-RX UNIT	SERVICE UNIT	3220E,3220E2,3220E3
-	XCA-030K-00	TX-RX UNIT	SERVICE UNIT	3320K,3320K2,3320K3

△ Symbol No.	Part No.	Part Name	Description	Local
-	XCA-030E-01	TX-RX UNIT	SERVICE UNIT	3320E,3320E2,3320E3
-	XC1-209K-00	DISPLAY UNIT	BASIC	3220K,3220E3,3320K,3320E3
-	XC1-209K-01	DISPLAY UNIT	STD	3220K2,3220E2,3320K2,3320E2
-	XC1-209K-02	DISPLAY UNIT	FULL	3220K3,3220E,3320K3,3320E

Electrical parts list

TX-RX UNIT

XC1-178K-00 (NX-3220(K),NX-3220(K2),NX-3220(K3),NX-3220(E),NX-3220(E2),NX-3220(E3))

***Note : 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
IC1	XC61CC5602N-G	IC		
IC2	LXDC2XQ12A-252	IC		
IC3	TPS62140RGT	IC		
IC4	LXDC2HN18F163	IC		
IC5	-----	IC	*Note	
IC6	XC6209B502D-G	IC		
IC7	-----	IC	*Note	
IC8	BU18TD2WNVX	IC		
IC9	XC6209B312D-G	IC		
IC10	XC6215B122N-G	IC		
IC11	NJM2878F4-32	IC		
IC12	XC8102AA07-G	IC		
IC13	TPS61041DRVR	IC		
IC14	-----	IC	*Note	
IC15	XC6209B502D-G	IC		
IC17	XC6209B502D-G	IC		
IC18	BU7442NUX	IC		
IC101	OPA170AIDRLR	IC		
IC102	BU7295HFV	IC		
IC201	XC8102AA07-G	IC		
IC202	BGU6104	IC		
IC203	BA3472FVM	IC		
IC303	-----	IC	*Note	
IC351	-----	IC	*Note	
IC352	74AVC4TD245GU	IC		
IC353	74AVC4TD245GU	IC		
IC401	-----	IC	*Note	
IC402	-----	IC	*Note	
IC403	S-80135ANPF-G	IC		
IC404	-----	IC	*Note	
IC405	TC7SZ08FE	IC		
IC406	KXCJ9-1008	IC		
IC409	ADS7961SRHB	IC		
IC410	DAC124S085CIS	IC		
IC601	-----	IC	*Note	
IC650	TA7368FG	IC		
IC651	XC6209B502D-G	IC		
IC652	TC7SET125FUF	IC		
IC654	TC7SZ08FE	IC		
Q1	EMD12	DIGI TRANSISTOR		
Q2	SSM6N15AFEM	DUAL FET		
Q3	SSM6N15AFEM	DUAL FET		
Q4	VT6M1	FET		
Q5	VT6M1	FET		
Q6	LTC014EEBFS8	DIGI TRANSISTOR		
Q7	2SB1132(Q,R)	TRANSISTOR		
Q102	EM6M2	FET		
Q103	VT6M1	FET		
Q113	2SD2654/W/	TRANSISTOR		
Q114	VT6M1	FET		
Q131	MCH3914-H/8/	FET		
Q151	2SC5108FT/Y/	TRANSISTOR		
Q181	2SC5108FT/Y/	TRANSISTOR		
Q201	RD01MUS2BT513	FET		
Q202	RD07MUS2BT514	FET		
Q203	LSCR523EBFS8	TRANSISTOR		
Q204	LTC044EEBFS8	DIGI TRANSISTOR		
Q205	SSM3K15AMFV	FET		
Q206	SSM3K15AMFV	FET		
Q207	EMD12	DIGI TRANSISTOR		
Q351	SSM3K15AMFV	FET		
Q401	2SC4617/S/	TRANSISTOR		
Q402	LTC044EEBFS8	DIGI TRANSISTOR		
Q650	2SB1694	TRANSISTOR		
Q651	SSM3K324RF	FET		

△ Symbol No.	Part No.	Part Name	Description	Local
Q652	SSM3K324RF	FET		
Q653	LTC014EEBFS8	DIGI TRANSISTOR		
Q654	LTC044EEBFS8	DIGI TRANSISTOR		
Q656	RE1C001UN	DIGI TRANSISTOR		
D1	RR1LAM4S	DIODE		
D8	DAN222	DIODE ARRAY		
D9	RB520SM-30	DIODE		
D10	RB561VM-40	SCHOTTKY DIODE		
D102	EDZV8.2B	ZENER DIODE		
D111	1SS400SM	DIODE		
D131	SMV1251-079LF	VARI CAP DIODE		
D132	SMV1801-079LF	VARI CAP DIODE		
D133	SMV1801-079LF	VARI CAP DIODE		
D134	SMV1801-079LF	VARI CAP DIODE		
D135	SMV1801-079LF	VARI CAP DIODE		
D136	SMV1130-079LF	VARI CAP DIODE		
D201	RN142S	DIODE		
D202	RN142S	DIODE		
D203	RN142S	DIODE		
D204	EDZV5.6B	ZENER DIODE		
D205	RN142S	DIODE		
D301	1SS400SM	DIODE		
D302	1SS400SM	DIODE		
D303	1SS390	DIODE		
D304	1SS390	DIODE		
D401	RB521CM-30	DIODE		
D402	RB521CM-30	DIODE		
D403	1SS400SM	DIODE		
D404	1SS400SM	DIODE		
D405	1SS400SM	DIODE		
D406	1SS400SM	DIODE		
D407	1SS400SM	DIODE		
D609	RB521CM-30	DIODE		
D620	EDZV6.8B	ZENER DIODE		
D621	EDZV6.8B	ZENER DIODE		
D650	RB706F-40-MC	DIODE		
D651	EDZV6.8B	ZENER DIODE		
D652	EDZV6.8B	ZENER DIODE		
D653	SPC10501A01	VARISTOR		
D654	SPC10501A01	VARISTOR		
D655	AVRM10120MAAB	VARISTOR		
C1	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C2	CC73HCH1H220G	C CAPACITOR	22pF 50V G	
C3	CK73HBB1H682K	C CAPACITOR	6800pF 50V K	
C4	C93-1967-05	C CAPACITOR	470pF 50V	
C5	C93-1967-05	C CAPACITOR	470pF 50V	
C6	C93-1967-05	C CAPACITOR	470pF 50V	
C7	C93-1967-05	C CAPACITOR	470pF 50V	
C8	C93-1967-05	C CAPACITOR	470pF 50V	
C9	CK73HBB1H682K	C CAPACITOR	6800pF 50V K	
C10	C93-1967-05	C CAPACITOR	470pF 50V	
C14	C93-1967-05	C CAPACITOR	470pF 50V	
C15	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C16	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C17	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C18	CK73FB1C106K	C CAPACITOR	10uF 16V K	
C19	CK73FB1C106K	C CAPACITOR	10uF 16V K	
C20	CK73HBB1H332K	C CAPACITOR	3300pF 50V K	
C21	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C22	CK73FXR0J226M	C CAPACITOR	22uF 6.3V M	
C23	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C24	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
C25	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
C26	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
C27	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
C28	C93-1967-05	C CAPACITOR	470pF 50V	
C29	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C30	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C31	CK73FB1C106K	C CAPACITOR	10uF 16V K	
C32	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
C33	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C34	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C35	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C36	C93-1967-05	C CAPACITOR	470pF 50V	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C37	C93-1967-05	C CAPACITOR	470pF 50V		C221	CK73HB1E473K	C CAPACITOR	0.047uF 25V K	
C38	CK73GB1E104K	C CAPACITOR	0.1uF 25V K		C222	CK73HBB1H472K	C CAPACITOR	4700pF 50V K	
C39	CK73GB1E105K	C CAPACITOR	1uF 25V K		C223	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C40	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C224	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C41	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C225	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C42	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C226	CC73GCH1H100B	C CAPACITOR	10pF 50V B	
C43	CK73HB1A474K	C CAPACITOR	0.47uF 10V K		C227	CC73GCH1H391J	C CAPACITOR	390pF 50V J	
C44	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C228	CC73GCH1H060B	C CAPACITOR	6pF 50V B	
C46	CK73GB1A335K	C CAPACITOR	3.3uF 10V K		C233	CC73HCH1H680J	C CAPACITOR	68pF 50V J	
C47	CK73GB1A335K	C CAPACITOR	3.3uF 10V K		C234	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C48	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K		C235	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C49	CK73HBB1H681K	C CAPACITOR	680pF 50V K		C237	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C50	CK730JM1H684K	C CAPACITOR	0.68uF 50V K		C238	CC73GCH1H151J	C CAPACITOR	150pF 50V J	
C51	CK73HB1A224K	C CAPACITOR	0.22uF 10V K		C239	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C52	CK73HBB1H681K	C CAPACITOR	680pF 50V K		C240	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C53	CK73HB1A224K	C CAPACITOR	0.22uF 10V K		C241	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C54	CK73GB1E104K	C CAPACITOR	0.1uF 25V K		C246	CC73GCH1H102J	C CAPACITOR	1000pF 50V J	
C55	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K		C247	CC73GCH1H180G	C CAPACITOR	18pF 50V G	
C56	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C248	CC73GCH1H090B	C CAPACITOR	9pF 50V B	
C60	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K		C249	CC73GCH1H150G	C CAPACITOR	15pF 50V G	
C62	C93-1959-05	C CAPACITOR	0.1uF 16V		C250	CC73GCH1H040B	C CAPACITOR	4pF 50V B	
C63	C93-1959-05	C CAPACITOR	0.1uF 16V		C251	CC73GCH1H080B	C CAPACITOR	8pF 50V B	
C64	C93-1959-05	C CAPACITOR	0.1uF 16V		C252	CC73HCH1H270G	C CAPACITOR	27pF 50V G	
C65	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C253	CC73HCH1H180J	C CAPACITOR	18pF 50V J	
C66	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C255	CC73GCH1H030B	C CAPACITOR	3pF 50V B	
C67	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C257	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C68	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C258	C93-1969-05	C CAPACITOR	1000pF 50V	
C69	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C259	C93-1969-05	C CAPACITOR	1000pF 50V	
C70	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C260	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C102	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C261	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C103	CC73HCH1H330G	C CAPACITOR	33pF 50V G		C262	CK73GB1C563K	C CAPACITOR	0.056uF 16V K	
C104	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C263	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C105	CK73GB1H105K	C CAPACITOR	1uF 50V K		C264	CK73HB1H822K	C CAPACITOR	8200pF 50V K	
C106	C93-1959-05	C CAPACITOR	0.1uF 16V		C265	CK73HB1H822K	C CAPACITOR	8200pF 50V K	
C107	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C266	C93-1969-05	C CAPACITOR	1000pF 50V	
C108	CC730AD1H104J	C CAPACITOR	0.1uF 50V J		C269	CC73GCH1H180G	C CAPACITOR	18pF 50V G	
C111	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C301	CK73HB0J225K	C CAPACITOR	2.2uF 6.3V K	
C112	CS77BP1A4R7M	TA E CAPACITOR	4.7uF 10V M		C302	CC73HCH1H030B	C CAPACITOR	3pF 50V B	
C121	CK73FBB1H154K	C CAPACITOR	0.15uF 50V K		C303	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C122	CS77ABE1D100M	TA E CAPACITOR	10uF 20V M		C304	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C123	CK73FB1H473K	C CAPACITOR	0.047uF 50V K		C305	CC73HCH1H020B	C CAPACITOR	2pF 50V B	
C132	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C306	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C133	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C307	CC73HCH1H030B	C CAPACITOR	3pF 50V B	
C134	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C308	CC73HCH1H270J	C CAPACITOR	27pF 50V J	
C135	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C309	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C137	CC73HCH1H030B	C CAPACITOR	3pF 50V B		C310	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C138	CC73HCH1HR75B	C CAPACITOR	0.75pF 50V B		C311	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C139	CC73HCH1H080B	C CAPACITOR	8pF 50V B		C312	CC73HCH1H120G	C CAPACITOR	12pF 50V G	
C140	CC73HCH1H070B	C CAPACITOR	7pF 50V B		C313	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C141	CC73HCH1H090B	C CAPACITOR	9pF 50V B		C314	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C142	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C315	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C144	CC73HCH1HOR5B	C CAPACITOR	0.5pF 50V B		C316	CK730BS0J106M	C CAPACITOR	10uF 6.3V M	
C145	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C317	CC73HCH1H030B	C CAPACITOR	3pF 50V B	
C146	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C319	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C147	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C320	CC73HCH1H390G	C CAPACITOR	39pF 50V G	
C181	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C321	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C182	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C322	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C183	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C323	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C191	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C324	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C192	CC73HCH1H120G	C CAPACITOR	12pF 50V G		C325	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C193	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C326	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C194	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C327	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C195	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C328	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C197	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C329	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C198	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C330	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C202	CC73GCH1H120G	C CAPACITOR	12pF 50V G		C331	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C203	CC73GCH1H020B	C CAPACITOR	2pF 50V B		C332	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C204	CC73GCH1H090B	C CAPACITOR	9pF 50V B		C333	CK730BS0J106M	C CAPACITOR	10uF 6.3V M	
C205	CC73GCH1H150G	C CAPACITOR	15pF 50V G		C334	CC73HCH1H390G	C CAPACITOR	39pF 50V G	
C206	CC73GCH1H470G	C CAPACITOR	47pF 50V G		C338	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C207	CC73GCH1H220G	C CAPACITOR	22pF 50V G		C341	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C209	CC73HCH1H150G	C CAPACITOR	15pF 50V G		C342	CK730BS0J106M	C CAPACITOR	10uF 6.3V M	
C211	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C343	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
C212	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C344	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C213	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C345	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C214	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C346	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C218	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C354	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C220	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C356	C93-1953-05	C CAPACITOR	0.01uF 25V	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C357	CK73HB1A105K	C CAPACITOR	1uF 10V K		C456	C93-1967-05	C CAPACITOR	470pF 50V	
C358	C93-1959-05	C CAPACITOR	0.1uF 16V		C457	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C359	C93-1959-05	C CAPACITOR	0.1uF 16V		C458	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C360	C93-1959-05	C CAPACITOR	0.1uF 16V		C459	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C361	C93-1959-05	C CAPACITOR	0.1uF 16V		C469	C93-1967-05	C CAPACITOR	470pF 50V	
C363	CC73HCH1H180G	C CAPACITOR	18pF 50V G		C470	C93-1967-05	C CAPACITOR	470pF 50V	
C364	CK73HB1A105K	C CAPACITOR	1uF 10V K		C471	C93-1967-05	C CAPACITOR	470pF 50V	
C365	CK73HB1A105K	C CAPACITOR	1uF 10V K		C472	C93-1967-05	C CAPACITOR	470pF 50V	
C366	C93-1959-05	C CAPACITOR	0.1uF 16V		C473	C93-1967-05	C CAPACITOR	470pF 50V	
C367	C93-1959-05	C CAPACITOR	0.1uF 16V		C474	C93-1967-05	C CAPACITOR	470pF 50V	
C368	C93-1959-05	C CAPACITOR	0.1uF 16V		C475	C93-1967-05	C CAPACITOR	470pF 50V	
C369	CC73HCH1H220G	C CAPACITOR	22pF 50V G		C476	C93-1967-05	C CAPACITOR	470pF 50V	
C370	CK73HB1A105K	C CAPACITOR	1uF 10V K		C477	C93-1967-05	C CAPACITOR	470pF 50V	
C371	C93-1959-05	C CAPACITOR	0.1uF 16V		C480	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C372	C93-1959-05	C CAPACITOR	0.1uF 16V		C481	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C373	C93-1959-05	C CAPACITOR	0.1uF 16V		C482	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C374	C93-1959-05	C CAPACITOR	0.1uF 16V		C483	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C375	C93-1959-05	C CAPACITOR	0.1uF 16V		C484	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C376	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C485	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C377	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C486	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C378	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C487	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C379	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C488	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C380	C93-1959-05	C CAPACITOR	0.1uF 16V		C489	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C381	C93-1959-05	C CAPACITOR	0.1uF 16V		C496	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C382	CC73HCH1H470J	C CAPACITOR	47pF 50V J		C497	C93-1959-05	C CAPACITOR	0.1uF 16V	
C383	C93-1959-05	C CAPACITOR	0.1uF 16V		C498	C93-1959-05	C CAPACITOR	0.1uF 16V	
C384	C93-1959-05	C CAPACITOR	0.1uF 16V		C499	C93-1959-05	C CAPACITOR	0.1uF 16V	
C385	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C500	C93-1959-05	C CAPACITOR	0.1uF 16V	
C386	C93-1959-05	C CAPACITOR	0.1uF 16V		C501	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C387	C93-1959-05	C CAPACITOR	0.1uF 16V		C502	C93-1959-05	C CAPACITOR	0.1uF 16V	
C388	CK73HB1A105K	C CAPACITOR	1uF 10V K		C510	C93-1967-05	C CAPACITOR	470pF 50V	
C389	CC73HCH1H100B	C CAPACITOR	10pF 50V B		C515	C93-1967-05	C CAPACITOR	470pF 50V	
C391	CC73HCH1H121J	C CAPACITOR	120pF 50V J		C516	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C392	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C517	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C395	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C518	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C401	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C601	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C402	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C602	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C403	C93-1953-05	C CAPACITOR	0.01uF 25V		C603	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C404	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C604	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C405	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C606	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C406	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C607	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C407	C93-1953-05	C CAPACITOR	0.01uF 25V		C608	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C408	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C609	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C421	C93-1959-05	C CAPACITOR	0.1uF 16V		C610	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C422	CC73HCH1H180G	C CAPACITOR	18pF 50V G		C612	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C423	CC73HCH1H150G	C CAPACITOR	15pF 50V G		C615	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C424	CK73HB1A224K	C CAPACITOR	0.22uF 10V K		C617	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C425	C93-1959-05	C CAPACITOR	0.1uF 16V		C618	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C426	C93-1959-05	C CAPACITOR	0.1uF 16V		C620	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C427	C93-1959-05	C CAPACITOR	0.1uF 16V		C621	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C428	C93-1959-05	C CAPACITOR	0.1uF 16V		C622	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C429	CK73FB1C106K	C CAPACITOR	10uF 16V K		C625	CK73HB1A334K	C CAPACITOR	0.33uF 10V K	
C430	CK73FB1C106K	C CAPACITOR	10uF 16V K		C626	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C431	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K		C627	CK73HB1A334K	C CAPACITOR	0.33uF 10V K	
C432	CK73FB1C106K	C CAPACITOR	10uF 16V K		C657	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C433	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K		C658	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C434	C93-1959-05	C CAPACITOR	0.1uF 16V		C659	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C435	C93-1959-05	C CAPACITOR	0.1uF 16V		C663	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C436	CK73FB1C106K	C CAPACITOR	10uF 16V K		C664	CK73EXR0J476M	C CAPACITOR	47uF 6.3V M	
C437	C93-1959-05	C CAPACITOR	0.1uF 16V		C667	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C438	C93-1959-05	C CAPACITOR	0.1uF 16V		C669	CK73FXR0J226M	C CAPACITOR	22uF 6.3V M	
C439	C93-1959-05	C CAPACITOR	0.1uF 16V		C671	CK73HBB1C683K	C CAPACITOR	0.068uF 16V K	
C440	C93-1959-05	C CAPACITOR	0.1uF 16V		C672	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
C441	C93-1959-05	C CAPACITOR	0.1uF 16V		C673	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C442	C93-1959-05	C CAPACITOR	0.1uF 16V		C674	CK73GB1E105K	C CAPACITOR	1uF 25V K	
C443	C93-1959-05	C CAPACITOR	0.1uF 16V		C675	CK73EXR0J476M	C CAPACITOR	47uF 6.3V M	
C444	C93-1959-05	C CAPACITOR	0.1uF 16V		C676	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C445	CK73HB1A105K	C CAPACITOR	1uF 10V K		C677	CC73HCH1H221J	C CAPACITOR	220pF 50V J	
C446	C93-1959-05	C CAPACITOR	0.1uF 16V		C679	CC73HCH1H221J	C CAPACITOR	220pF 50V J	
C447	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C681	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C448	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C683	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C449	C93-1953-05	C CAPACITOR	0.01uF 25V		C684	CC73HCH1H221J	C CAPACITOR	220pF 50V J	
C450	C93-1959-05	C CAPACITOR	0.1uF 16V		C686	CK73GB1E105K	C CAPACITOR	1uF 25V K	
C451	C93-1959-05	C CAPACITOR	0.1uF 16V		C687	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C452	CK73HB1A105K	C CAPACITOR	1uF 10V K		C688	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C453	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C689	CC73HCH1H470J	C CAPACITOR	47pF 50V J	
C454	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C690	CC73HCH1H221J	C CAPACITOR	220pF 50V J	
C455	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C691	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C692	CK73GB1E104K	C CAPACITOR	0.1uF 25V K		R125	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C693	C93-1967-05	C CAPACITOR	470pF 50V		R126	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C695	C93-1967-05	C CAPACITOR	470pF 50V		R127	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C697	C93-1953-05	C CAPACITOR	0.01uF 25V		R128	RK73HH1J391D	MG RESISTOR	390Ω 1/16W D	
C698	C93-1953-05	C CAPACITOR	0.01uF 25V		R129	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R1	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R130	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R7	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R131	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R8	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R132	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R9	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R133	RN73HH1J151D	MG RESISTOR	150Ω 0.063W D	
R10	RK73HH1J184D	MG RESISTOR	180kΩ 1/16W D		R134	RN73HH1J100D	MF RESISTOR	10Ω 0.063W D	
R11	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R135	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R12	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R136	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R13	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R137	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R14	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R139	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R15	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R140	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R16	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R141	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R17	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R142	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R18	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R143	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J	
R19	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R145	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R20	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R181	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R21	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R182	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J	
R22	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D		R183	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
R23	RK73HH1J683D	MG RESISTOR	68kΩ 1/16W D		R184	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R24	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R192	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R25	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R193	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R26	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R194	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R27	RK73HB1J274J	MG RESISTOR	270kΩ 1/16W J		R195	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R28	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J		R201	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R29	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R202	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R30	RK73HH1J274D	MG RESISTOR	270kΩ 1/16W D		R204	R92-3785-05	MG RESISTOR	120Ω 0.25W	
R31	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R205	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R32	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R206	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R33	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R207	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J	
R34	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R208	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R35	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R209	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J	
R36	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R210	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J	
R37	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R211	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R38	RZ73G0BK2R7J	RESISTOR	2.7Ω 0.25W J		R212	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R39	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R213	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R40	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R214	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R41	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R215	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J	
R42	R92-3774-05	MG RESISTOR	27Ω 0.25W		R216	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
R43	R92-3774-05	MG RESISTOR	27Ω 0.25W		R218	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R44	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R219	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R45	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J		R220	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R46	RK73GB2A220J	MG RESISTOR	22Ω 1/10W J		R222	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J	
R47	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R223	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R48	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R227	RK73GB2A823J	MG RESISTOR	82kΩ 1/10W J	
R49	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R228	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R50	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R230	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J	
R51	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R233	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J	
R52	RK73FB2B1R0J	MG RESISTOR	1Ω 1/8W J		R234	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R56	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J		R237	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J	
R57	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D		R244	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R58	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R245	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R59	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R246	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R60	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R247	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
R65	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R248	R92-3756-05	MG RESISTOR	0.22Ω 1/3W	
R66	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R249	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R102	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R250	R92-3756-05	MG RESISTOR	0.22Ω 1/3W	
R103	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R251	RK73HB1J270J	MG RESISTOR	27Ω 1/16W J	
R104	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R252	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R105	RK73HB1J124J	MG RESISTOR	120kΩ 1/16W J		R253	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D	
R106	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R255	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D	
R107	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R256	RK73HH1J682D	MG RESISTOR	6.8kΩ 1/16W D	
R108	RK73HB1J106J	MG RESISTOR	10MΩ 1/16W J		R257	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J	
R109	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J		R258	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J	
R110	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R259	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J	
R111	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R260	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J	
R112	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R264	RK73HH1J682D	MG RESISTOR	6.8kΩ 1/16W D	
R113	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R265	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D	
R116	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R267	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R120	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R268	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R121	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R269	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R122	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J		R270	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R123	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R271	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R124	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R272	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
					R273	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R301	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R448	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J	
R302	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R449	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J	
R303	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J		R450	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J	
R304	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J		R451	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R310	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J		R452	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R312	RK73HB1J5R6J	MG RESISTOR	5.6Ω 1/16W J		R461	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R313	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R462	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R314	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J		R463	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R315	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J		R464	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R316	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J		R466	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R325	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R467	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R330	RK73HH1J273D	MG RESISTOR	27kΩ 1/16W D		R468	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R331	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R469	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R332	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R470	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R333	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R479	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R335	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R480	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R336	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R601	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R351	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R602	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R352	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R604	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R353	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R605	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R354	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J		R608	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R355	RK73HB1J390J	MG RESISTOR	39Ω 1/16W J		R609	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R356	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J		R610	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R357	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R617	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J	
R358	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R635	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R359	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R636	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R360	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R637	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R361	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R638	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R362	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R639	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R363	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R650	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J	
R364	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R651	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J	
R365	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R652	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R366	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R653	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R367	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R654	RK73GB2A471J	MG RESISTOR	470Ω 1/10W J	
R369	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R655	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R401	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R656	RK73PB2H1R2J	MG RESISTOR	1.2Ω 1/2W J	
R402	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R657	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R403	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R658	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R404	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R659	RK73HB1J561J	MG RESISTOR	560Ω 1/16W J	
R405	RK73HB1J153J	MG RESISTOR	15kΩ 1/16W J		R661	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R406	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J		R663	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R407	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R664	RK73HB1J274J	MG RESISTOR	270kΩ 1/16W J	
R408	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R665	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J	
R410	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R667	RK73JB1H224J	MG RESISTOR	220kΩ 1/20W J	
R411	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R668	RK73JB1H681J	MG RESISTOR	680Ω 1/20W J	
R412	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R670	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R413	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R672	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R414	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R676	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R415	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R678	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R419	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R680	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R420	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R681	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R421	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R682	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J	
R422	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R683	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R423	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R684	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R424	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R685	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R425	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		L1	LB73F0AW-002	CHIP FERRITE		
R426	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		L3	LB73G0AM-004	CHIP FERRITE		
R427	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		L4	LR73Z0AY2R2M	CHIP INDUCTOR		
R428	RK73JB1H220J	MG RESISTOR	22Ω 1/20W J		L5	LB73G0AM-004	CHIP FERRITE		
R429	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		L6	LB73G0AM-004	CHIP FERRITE		
R430	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L7	LB73G0AM-004	CHIP FERRITE		
R431	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L8	LB73G0AM-004	CHIP FERRITE		
R432	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		L9	LB73H0AV-002	CHIP FERRITE		
R433	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		L10	LB73H0AV-002	CHIP FERRITE		
R434	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		L11	LB73H0AV-002	CHIP FERRITE		
R435	RK73JB1H105J	MG RESISTOR	1MΩ 1/20W J		L12	L41-1502-70	CHIP INDUCTOR		
R436	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L13	LB73H0AV-002	CHIP FERRITE		
R437	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L112	LB73H0AY-004	CHIP FERRITE		
R438	RK73GH2A49R9D	MG RESISTOR	49.9Ω 1/10W D		L121	LB73H0AY-004	CHIP FERRITE		
R439	RK73HH1J102D	MG RESISTOR	1kΩ 1/16W D		L131	L41-2785-53	CHIP INDUCTOR		
R440	RK73HH1J102D	MG RESISTOR	1kΩ 1/16W D		L132	L41-2785-53	CHIP INDUCTOR		
R441	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		L135	L41-2785-53	CHIP INDUCTOR		
R442	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J		L136	LB73H0AY-004	CHIP FERRITE		
R443	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		L137	L41-2785-53	CHIP INDUCTOR		
R444	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		L138	L41-3378-08	CHIP INDUCTOR		
R445	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J		L139	L41-2785-53	CHIP INDUCTOR		
R446	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		L140	L41-2785-53	CHIP INDUCTOR		
R447	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J						

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
L141	LB73H0AY-004	CHIP FERRITE			CN1	EC720CQ-0313A	FFC FPC CONNECTOR		
L142	L41-2785-53	CHIP INDUCTOR			CN2	J19-5386-05	HOLDER		
L143	LK73H0AM47NJ	M.CHIP INDUCTOR	47nH		CN7	E40-6883-05	F.C.CONNECTOR		
L181	LK73H0AM56NJ	M.CHIP INDUCTOR	56nH		CN8	-----	TERMINAL	*Note	
L191	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH		CN10	-----	TERMINAL	*Note	
L192	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH		CN201	E2D-0058-00	TERMINAL		
L201	LR79Z0DC45N5J	CHIP INDUCTOR	45.5nH		CN202	E2D-0058-00	TERMINAL		
L203	LR73Z0AE2R2J	CHIP INDUCTOR	2.2uH		CN203	E2D-0022-00	TERMINAL		
L206	LK73H0AMR27J	M.CHIP INDUCTOR			CN353	G0B-0005-00	EARTH SPRING		
L209	LK73H0AM56NJ	M.CHIP INDUCTOR	56nH		CN354	G0B-0005-00	EARTH SPRING		
L210	LR79Z0DC22NJ	CHIP INDUCTOR	22nH		CN356	G0B-0005-00	EARTH SPRING		
L211	LB73F0AW-002	CHIP FERRITE			CN357	G0B-0005-00	EARTH SPRING		
L213	LR79Z0DC27N9J	CHIP INDUCTOR	27.9nH		CN402	EC720BP-0341A	FFC FPC CONNECTOR		
L214	LB73F0AW-002	CHIP FERRITE			CN602	E41-1476-05	PIN ASSY		
L215	LR79Z0DD43N6J	CHIP INDUCTOR	43.6nH		CP1	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L216	LR79Z0DD43N6J	CHIP INDUCTOR	43.6nH		CP2	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L217	LR79Z0DD43N6J	CHIP INDUCTOR	43.6nH		CP301	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L218	LR79Z0CA68NJ	CHIP INDUCTOR			CP302	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L219	LR79Z0DC16N7J	CHIP INDUCTOR	16.7nH		CP303	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L220	LR79Z0DD12N2J	CHIP INDUCTOR	12.2nH		CP351	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L221	LK73H0AM56NJ	M.CHIP INDUCTOR	56nH		CP352	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L222	L41-8265-53	CHIP INDUCTOR			CP401	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L223	L41-6865-53	CHIP INDUCTOR			CP402	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L301	LK73H0AM33NJ	M.CHIP INDUCTOR	33nH		CP403	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L302	LR79G0CQ47NG	CHIP INDUCTOR			CP404	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L303	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH		CP405	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L304	LK73H0AM33NJ	M.CHIP INDUCTOR	33nH		CP406	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L305	LR79G0CQR18G	CHIP INDUCTOR			CP408	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L307	LR79G0CQ56NG	CHIP INDUCTOR			CP409	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L308	LR79G0CQ47NG	CHIP INDUCTOR			CP410	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L309	LR79G0CQ82NG	CHIP INDUCTOR			CP411	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L310	LR79G0CQ8N2C	CHIP INDUCTOR			CP412	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L311	LR79G0CQR22G	CHIP INDUCTOR			CP413	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L312	LR79G0CQR15G	CHIP INDUCTOR			CP414	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L313	LR79G0CQ82NG	CHIP INDUCTOR			CP601	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L314	LR79G0CQ82NG	CHIP INDUCTOR			E101	-----	SHIELDING CASE	*Note	
L315	LR79G0CQR33G	CHIP INDUCTOR			E301	-----	SHIELDING CASE	*Note	
L351	L92-0487-05	CHIP FERRITE			E351	F10-3228-15	SHIELDING CASE		
L352	L92-0487-05	CHIP FERRITE			E401	-----	SHIELDING CASE	*Note	
L353	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH		E601	-----	SHIELDING CASE	*Note	
L354	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH		F1	FZA10BQ-3R15	FUSE (CC)		
L358	L92-0487-05	CHIP FERRITE			F2	FZA10BH-R50	FUSE (CC)	0.5A	
L359	L7K-0059-00	FILTER			F650	FZA10BH-R315	FUSE (CC)	0.315A	
L361	L79-1987-05	FILTER			J651	E1B-0019-00	3.5D PHONE JACK		
L365	L92-0487-05	CHIP FERRITE			J652	E1B-0020-00	2.5D PHONE JACK		
L366	L92-0487-05	CHIP FERRITE			TH201	NCU15WF104F6S	N THERMISTOR		
L401	LB73H0AV-002	CHIP FERRITE			TH401	NCU15WF104F6S	N THERMISTOR		
L402	LK73G0AQ4R7K	M.CHIP INDUCTOR	4.7uH		X351	L77-3121-05	QUARTZ CRYSTAL		
L404	LB73G0AM-004	CHIP FERRITE			X401	L7H-0076-00	TCXO		
L405	L92-1101-05	CHIP FERRITE			X402	L77-1802-05	QUARTZ CRYSTAL		
L406	L92-1101-05	CHIP FERRITE							
L407	LB73G0AM-004	CHIP FERRITE							
L408	LB73G0AM-004	CHIP FERRITE							
L409	LB73G0AM-004	CHIP FERRITE							
L410	LB73G0AM-004	CHIP FERRITE							
L411	L79-1946-05	FILTER							
L412	L79-1946-05	FILTER							
L413	L79-1946-05	FILTER							
L414	L79-1946-05	FILTER							
L415	L79-1946-05	FILTER							
L416	L79-1946-05	FILTER							
L417	LB73H0AV-002	CHIP FERRITE							
L427	LB73H0AV-002	CHIP FERRITE							
L428	LB73H0AV-002	CHIP FERRITE							
L429	LB73H0AV-002	CHIP FERRITE							
L430	LB73H0AV-002	CHIP FERRITE							
L431	LB73H0AV-002	CHIP FERRITE							
L601	LB73G0AM-004	CHIP FERRITE							
L604	LB73G0AM-004	CHIP FERRITE							
L605	LB73G0AM-004	CHIP FERRITE							
L608	LR73Z0AY100M	CHIP INDUCTOR							
L609	LR73Z0AY100M	CHIP INDUCTOR							
L610	LB73G0AM-004	CHIP FERRITE							
L612	LB73G0AM-004	CHIP FERRITE							
L613	LB73G0AM-004	CHIP FERRITE							
L622	LB73G0AM-004	CHIP FERRITE							
L623	LB73G0AM-004	CHIP FERRITE							
L635	LB73H0AV-002	CHIP FERRITE							

△ Symbol No.	Part No.	Part Name	Description	Local
IC1	XC61CC5602N-G	IC		
IC2	LXDC2XQ12A-252	IC		
IC3	TPS62140RGT	IC		
IC4	LXDC2HN18F163	IC		
IC5	-----	IC		*Note
IC6	XC6209B502D-G	IC		
IC7	-----	IC		*Note
IC8	BU18TD2WNVX	IC		
IC9	XC6209B312D-G	IC		
IC10	XC6215B122N-G	IC		
IC11	NJM2878F4-32	IC		

TX-RX UNIT

XC1-180K-00 (NX-3320(K),NX-3320(K2),NX-3320(K3),NX-3320(E),NX-3320(E2),NX-3320(E3))

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

Block No. [0][2]

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
IC12	XC8102AA07-G	IC			D155	BB664-02V	VARI CAP DIODE		
IC13	TPS61041DRVR	IC			D201	L5208F	DIODE		
IC14	-----	IC	*Note		D202	RN142S	DIODE		
IC15	XC6209B502D-G	IC			D203	RN142S	DIODE		
IC17	XC6209B502D-G	IC			D204	EDZV5.6B	ZENER DIODE		
IC18	BU7442NUX	IC			D206	SPC10501A01	VARISTOR		
IC101	OPA170AIDRLR	IC			D301	1SS400SM	DIODE		
IC102	BU7295HFV	IC			D302	1SS400SM	DIODE		
IC201	XC8102AA07-G	IC			D303	1SS390	DIODE		
IC202	BGU6104	IC			D304	1SS390	DIODE		
IC203	BA3472FVM	IC			D401	RB521CM-30	DIODE		
IC303	-----	IC	*Note		D402	RB521CM-30	DIODE		
IC351	-----	IC	*Note		D403	1SS400SM	DIODE		
IC352	74AVC4TD245GU	IC			D404	1SS400SM	DIODE		
IC353	74AVC4TD245GU	IC			D405	1SS400SM	DIODE		
IC401	-----	IC	*Note		D406	1SS400SM	DIODE		
IC402	-----	IC	*Note		D407	1SS400SM	DIODE		
IC403	S-80135ANPF-G	IC			D609	RB521CM-30	DIODE		
IC404	-----	IC	*Note		D620	EDZV6.8B	ZENER DIODE		
IC405	TC7SZ08FE	IC			D621	EDZV6.8B	ZENER DIODE		
IC406	KXCJ9-1008	IC			D650	RB706F-40-MC	DIODE		
IC409	ADS7961SRHB	IC			D651	EDZV6.8B	ZENER DIODE		
IC410	DAC124S085CIS	IC			D652	EDZV6.8B	ZENER DIODE		
IC601	-----	IC	*Note		D653	SPC10501A01	VARISTOR		
IC650	TA7368FG	IC			D654	SPC10501A01	VARISTOR		
IC651	XC6209B502D-G	IC			D655	AVRM10120MAAB	VARISTOR		
IC652	TC7SET125FUF	IC							
IC654	TC7SZ08FE	IC			C1	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
					C2	CC73HCH1H220G	C CAPACITOR	22pF 50V G	
Q1	EMD12	DIGI TRANSISTOR			C3	CK73HBB1H682K	C CAPACITOR	6800pF 50V K	
Q2	SSM6N15AFEM	DUAL FET			C4	C93-1967-05	C CAPACITOR	470pF 50V	
Q3	SSM6N15AFEM	DUAL FET			C5	C93-1967-05	C CAPACITOR	470pF 50V	
Q4	VT6M1	FET			C6	C93-1967-05	C CAPACITOR	470pF 50V	
Q5	VT6M1	FET			C7	C93-1967-05	C CAPACITOR	470pF 50V	
Q6	LTC014EEBFS8	DIGI TRANSISTOR			C8	C93-1967-05	C CAPACITOR	470pF 50V	
Q7	2SB1132(Q,R)	TRANSISTOR			C9	CK73HBB1H682K	C CAPACITOR	6800pF 50V K	
Q102	EM6M2	FET			C10	C93-1967-05	C CAPACITOR	470pF 50V	
Q103	VT6M1	FET			C14	C93-1967-05	C CAPACITOR	470pF 50V	
Q111	RE1E002SP	FET			C15	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q112	VT6M1	FET			C16	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q113	2SD2654/W/	TRANSISTOR			C17	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
Q114	VT6M1	FET			C18	CK73FB1C106K	C CAPACITOR	10uF 16V K	
Q116	SSM3K15AMFV	FET			C19	CK73FB1C106K	C CAPACITOR	10uF 16V K	
Q131	BFU660F	TRANSISTOR			C20	CK73HBB1H332K	C CAPACITOR	3300pF 50V K	
Q151	BFU660F	TRANSISTOR			C21	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
Q181	2SC5108FT/Y/	TRANSISTOR			C22	CK73FXR0J226M	C CAPACITOR	22uF 6.3V M	
Q201	RD01MUS2BT513	FET			C23	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
Q202	RD08MUS2T514	FET			C24	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
Q203	LSCR523EBFS8	TRANSISTOR			C25	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
Q204	LTC044EEBFS8	DIGI TRANSISTOR			C26	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
Q205	SSM3K15AMFV	FET			C27	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
Q206	SSM3K15AMFV	FET			C28	C93-1967-05	C CAPACITOR	470pF 50V	
Q207	EMD12	DIGI TRANSISTOR			C29	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
Q351	SSM3K15AMFV	FET			C30	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
Q401	2SC4617/S/	TRANSISTOR			C31	CK73FB1C106K	C CAPACITOR	10uF 16V K	
Q402	LTC044EEBFS8	DIGI TRANSISTOR			C32	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
Q650	2SB1694	TRANSISTOR			C33	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q651	SSM3K324RF	FET			C34	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q652	SSM3K324RF	FET			C35	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
Q653	LTC014EEBFS8	DIGI TRANSISTOR			C36	C93-1967-05	C CAPACITOR	470pF 50V	
Q654	LTC044EEBFS8	DIGI TRANSISTOR			C37	C93-1967-05	C CAPACITOR	470pF 50V	
Q656	RE1C001UN	DIGI TRANSISTOR			C38	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
					C39	CK73GB1E105K	C CAPACITOR	1uF 25V K	
D1	RR1LAM4S	DIODE			C40	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
D8	DAN222	DIODE ARRAY			C41	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
D9	RB520SM-30	DIODE			C42	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
D10	RB561VM-40	SCHOTTKY DIODE			C43	CK73HB1A474K	C CAPACITOR	0.47uF 10V K	
D102	EDZV8.2B	ZENER DIODE			C44	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
D111	1SS400SM	DIODE			C46	CK73GB1A335K	C CAPACITOR	3.3uF 10V K	
D131	BBY58-02V	VARI CAP DIODE			C47	CK73GB1A335K	C CAPACITOR	3.3uF 10V K	
D132	BB555-02VH	VARI CAP DIODE			C48	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
D133	BB555-02VH	VARI CAP DIODE			C49	CK73HBB1H681K	C CAPACITOR	680pF 50V K	
D134	BB555-02VH	VARI CAP DIODE			C50	CK730JM1H684K	C CAPACITOR	0.68uF 50V K	
D135	BB555-02VH	VARI CAP DIODE			C51	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
D151	BBY58-02V	VARI CAP DIODE			C52	CK73HBB1H681K	C CAPACITOR	680pF 50V K	
D152	SMV1130-079LF	VARI CAP DIODE			C54	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
D153	SMV1130-079LF	VARI CAP DIODE			C55	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
D154	BB555-02VH	VARI CAP DIODE			C56	CK73HBB1H471K	C CAPACITOR	470pF 50V K	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C60	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K		C216	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C62	C93-1959-05	C CAPACITOR	0.1uF 16V		C217	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C63	C93-1959-05	C CAPACITOR	0.1uF 16V		C218	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C64	C93-1959-05	C CAPACITOR	0.1uF 16V		C219	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C65	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C220	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C66	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C221	CK73HB1E473K	C CAPACITOR	0.047uF 25V K	
C67	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C222	CK73HBB1H472K	C CAPACITOR	4700pF 50V K	
C68	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C223	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C69	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C224	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C70	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C225	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C102	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C226	C93-0947-05	C CAPACITOR	33pF 50V	
C103	CC73HCH1H330G	C CAPACITOR	33pF 50V G		C227	CC73GCH1H101J	C CAPACITOR	100pF 50V J	
C104	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C228	CC73GCH1H010B	C CAPACITOR	1pF 50V B	
C105	CK73GB1H105K	C CAPACITOR	1uF 50V K		C229	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
C106	C93-1959-05	C CAPACITOR	0.1uF 16V		C230	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C107	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C231	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C108	CC730AD1H104J	C CAPACITOR	0.1uF 50V J		C232	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C109	CC73HCH1H130G	C CAPACITOR	13pF 50V G		C233	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C110	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C234	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C111	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C235	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C112	CS77BP1A4R7M	TA E CAPACITOR	4.7uF 10V M		C236	C93-0979-05	C CAPACITOR	4.7pF 50V	
C113	CK73HB1A105K	C CAPACITOR	1uF 10V K		C237	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C115	CC73HCH1HOR5B	C CAPACITOR	0.5pF 50V B		C239	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C116	CC73HCH1H030B	C CAPACITOR	3pF 50V B		C240	CC73HCH1H151J	C CAPACITOR	150pF 50V J	
C117	CC73HCH1HR75B	C CAPACITOR	0.75pF 50V B		C241	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C121	CK73FBB1H154K	C CAPACITOR	0.15uF 50V K		C243	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C122	CS77ABE1D100M	TA E CAPACITOR	10uF 20V M		C244	C93-0941-05	C CAPACITOR	18pF 50V	
C123	CK73FB1H473K	C CAPACITOR	0.047uF 50V K		C245	C93-0941-05	C CAPACITOR	18pF 50V	
C131	CC73HCH1H010B	C CAPACITOR	1pF 50V B		C246	CC73GCH1H101J	C CAPACITOR	100pF 50V J	
C132	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C247	CC73GCH1H070B	C CAPACITOR	7pF 50V B	
C133	CC73HCH1H130G	C CAPACITOR	13pF 50V G		C248	CC73GCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C134	CC73HCH1H020B	C CAPACITOR	2pF 50V B		C249	CC73GCH1H070B	C CAPACITOR	7pF 50V B	
C135	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C250	CC73GCH1H010B	C CAPACITOR	1pF 50V B	
C136	CC73HCH1H030B	C CAPACITOR	3pF 50V B		C251	CC73GCH1H040B	C CAPACITOR	4pF 50V B	
C138	CC73HCH1HOR5B	C CAPACITOR	0.5pF 50V B		C252	CC73HCH1H180G	C CAPACITOR	18pF 50V G	
C139	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C253	CC73HCH1H220G	C CAPACITOR	22pF 50V G	
C140	CK73HB1A334K	C CAPACITOR	0.33uF 10V K		C255	C93-0935-05	C CAPACITOR	10pF 50V	
C141	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C257	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C142	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C258	C93-1967-05	C CAPACITOR	470pF 50V	
C143	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C259	C93-1967-05	C CAPACITOR	470pF 50V	
C144	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C261	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C145	CC73HCH1H010B	C CAPACITOR	1pF 50V B		C262	CK73GB1C563K	C CAPACITOR	0.056uF 16V K	
C148	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C263	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C150	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C264	CK73HB1H822K	C CAPACITOR	8200pF 50V K	
C151	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C265	CK73HB1H822K	C CAPACITOR	8200pF 50V K	
C152	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C266	C93-1967-05	C CAPACITOR	470pF 50V	
C153	CC73HCH1H130G	C CAPACITOR	13pF 50V G		C267	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C154	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C268	CC73HCH1H390G	C CAPACITOR	39pF 50V G	
C156	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C270	CC73GCH1H030B	C CAPACITOR	3pF 50V B	
C157	CC73HCH1H030B	C CAPACITOR	3pF 50V B		C301	CK73HB0J225K	C CAPACITOR	2.2uF 6.3V K	
C158	CC73HCH1HOR5B	C CAPACITOR	0.5pF 50V B		C302	CC73HCH1H030B	C CAPACITOR	3pF 50V B	
C159	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C303	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C160	CK73HB1A334K	C CAPACITOR	0.33uF 10V K		C304	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C161	CC73HCH1H090B	C CAPACITOR	9pF 50V B		C305	CC73HCH1H020B	C CAPACITOR	2pF 50V B	
C162	CC73HCH1H070B	C CAPACITOR	7pF 50V B		C306	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C163	CC73HCH1H3R5B	C CAPACITOR	3.5pF 50V B		C308	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C164	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C309	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
C165	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C310	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
C166	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C311	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C167	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C312	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C181	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C313	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C182	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C314	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C183	CC73HCH1H030B	C CAPACITOR	3pF 50V B		C315	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C191	CC73HCH1H020B	C CAPACITOR	2pF 50V B		C316	CK730BS0J106M	C CAPACITOR	10uF 6.3V M	
C192	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C317	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C193	CC73HCH1H020B	C CAPACITOR	2pF 50V B		C319	CC73HCH1H060B	C CAPACITOR	6pF 50V B	
C194	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B		C320	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C195	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C321	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C197	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C322	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C198	CC73HCH1H020B	C CAPACITOR	2pF 50V B		C323	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C203	C93-0871-05	C CAPACITOR	1.0pF 100V		C324	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C208	CC73GCH1H030B	C CAPACITOR	3pF 50V B		C325	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C209	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C326	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C211	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C327	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C212	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C328	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C213	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C329	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C214	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C330	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C215	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C331	CC73HCH1H101J	C CAPACITOR	100pF 50V J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C332	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		C444	C93-1959-05	C CAPACITOR	0.1uF 16V	
C333	CK730BS0J106M	C CAPACITOR	10uF 6.3V M		C445	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C334	CC73HCH1H080B	C CAPACITOR	8pF 50V B		C446	C93-1959-05	C CAPACITOR	0.1uF 16V	
C338	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C447	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C341	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C448	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C342	CK730BS0J106M	C CAPACITOR	10uF 6.3V M		C449	C93-1953-05	C CAPACITOR	0.01uF 25V	
C343	CK73HB1A474K	C CAPACITOR	0.47uF 10V K		C450	C93-1959-05	C CAPACITOR	0.1uF 16V	
C344	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C451	C93-1959-05	C CAPACITOR	0.1uF 16V	
C345	CK73HB1A105K	C CAPACITOR	1uF 10V K		C452	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C346	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C453	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C354	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C454	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C356	C93-1953-05	C CAPACITOR	0.01uF 25V		C455	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C357	CK73HB1A105K	C CAPACITOR	1uF 10V K		C456	C93-1967-05	C CAPACITOR	470pF 50V	
C358	C93-1959-05	C CAPACITOR	0.1uF 16V		C457	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C359	C93-1959-05	C CAPACITOR	0.1uF 16V		C458	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C360	C93-1959-05	C CAPACITOR	0.1uF 16V		C459	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C361	C93-1959-05	C CAPACITOR	0.1uF 16V		C469	C93-1967-05	C CAPACITOR	470pF 50V	
C363	CC73HCH1H180G	C CAPACITOR	18pF 50V G		C470	C93-1967-05	C CAPACITOR	470pF 50V	
C364	CK73HB1A105K	C CAPACITOR	1uF 10V K		C471	C93-1967-05	C CAPACITOR	470pF 50V	
C365	CK73HB1A105K	C CAPACITOR	1uF 10V K		C472	C93-1967-05	C CAPACITOR	470pF 50V	
C366	C93-1959-05	C CAPACITOR	0.1uF 16V		C473	C93-1967-05	C CAPACITOR	470pF 50V	
C367	C93-1959-05	C CAPACITOR	0.1uF 16V		C474	C93-1967-05	C CAPACITOR	470pF 50V	
C368	C93-1959-05	C CAPACITOR	0.1uF 16V		C475	C93-1967-05	C CAPACITOR	470pF 50V	
C369	CC73HCH1H220G	C CAPACITOR	22pF 50V G		C476	C93-1967-05	C CAPACITOR	470pF 50V	
C370	CK73HB1A105K	C CAPACITOR	1uF 10V K		C477	C93-1967-05	C CAPACITOR	470pF 50V	
C371	C93-1959-05	C CAPACITOR	0.1uF 16V		C480	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C372	C93-1959-05	C CAPACITOR	0.1uF 16V		C481	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C373	C93-1959-05	C CAPACITOR	0.1uF 16V		C482	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C374	C93-1959-05	C CAPACITOR	0.1uF 16V		C483	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C375	C93-1959-05	C CAPACITOR	0.1uF 16V		C484	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C376	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C485	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C377	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C486	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C378	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C487	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C379	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C488	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C380	C93-1959-05	C CAPACITOR	0.1uF 16V		C489	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C381	C93-1959-05	C CAPACITOR	0.1uF 16V		C496	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C382	CC73HCH1H470G	C CAPACITOR	47pF 50V G		C497	C93-1959-05	C CAPACITOR	0.1uF 16V	
C383	C93-1959-05	C CAPACITOR	0.1uF 16V		C498	C93-1959-05	C CAPACITOR	0.1uF 16V	
C384	C93-1959-05	C CAPACITOR	0.1uF 16V		C499	C93-1959-05	C CAPACITOR	0.1uF 16V	
C385	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C500	C93-1959-05	C CAPACITOR	0.1uF 16V	
C386	C93-1959-05	C CAPACITOR	0.1uF 16V		C501	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C387	C93-1959-05	C CAPACITOR	0.1uF 16V		C502	C93-1959-05	C CAPACITOR	0.1uF 16V	
C388	CK73HB1A105K	C CAPACITOR	1uF 10V K		C510	C93-1967-05	C CAPACITOR	470pF 50V	
C389	CC73HCH1H100B	C CAPACITOR	10pF 50V B		C515	C93-1967-05	C CAPACITOR	470pF 50V	
C391	CC73HCH1H121J	C CAPACITOR	120pF 50V J		C516	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C392	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C517	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C395	CC73HCH1H2R5B	C CAPACITOR	2.5pF 50V B		C518	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C401	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C601	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C402	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C602	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C403	C93-1953-05	C CAPACITOR	0.01uF 25V		C603	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C404	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C604	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C405	CC73JCH1H101J	C CAPACITOR	100pF 50V J		C606	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C406	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C607	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C407	C93-1953-05	C CAPACITOR	0.01uF 25V		C608	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C408	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C609	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C421	C93-1959-05	C CAPACITOR	0.1uF 16V		C610	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C422	CC73HCH1H180G	C CAPACITOR	18pF 50V G		C612	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C423	CC73HCH1H150G	C CAPACITOR	15pF 50V G		C615	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K	
C424	CK73HB1A224K	C CAPACITOR	0.22uF 10V K		C617	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C425	C93-1959-05	C CAPACITOR	0.1uF 16V		C618	CC73JCH1H101J	C CAPACITOR	100pF 50V J	
C426	C93-1959-05	C CAPACITOR	0.1uF 16V		C620	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C427	C93-1959-05	C CAPACITOR	0.1uF 16V		C621	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C428	C93-1959-05	C CAPACITOR	0.1uF 16V		C622	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C429	CK73FB1C106K	C CAPACITOR	10uF 16V K		C625	CK73HB1A334K	C CAPACITOR	0.33uF 10V K	
C430	CK73FB1C106K	C CAPACITOR	10uF 16V K		C626	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C431	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K		C627	CK73HB1A334K	C CAPACITOR	0.33uF 10V K	
C432	CK73FB1C106K	C CAPACITOR	10uF 16V K		C657	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C433	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K		C658	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C434	C93-1959-05	C CAPACITOR	0.1uF 16V		C659	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C435	C93-1959-05	C CAPACITOR	0.1uF 16V		C663	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K	
C436	CK73FB1C106K	C CAPACITOR	10uF 16V K		C664	CK73EXR0J476M	C CAPACITOR	47uF 6.3V M	
C437	C93-1959-05	C CAPACITOR	0.1uF 16V		C666	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C438	C93-1959-05	C CAPACITOR	0.1uF 16V		C667	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K	
C439	C93-1959-05	C CAPACITOR	0.1uF 16V		C669	CK73FXR0J226M	C CAPACITOR	22uF 6.3V M	
C440	C93-1959-05	C CAPACITOR	0.1uF 16V		C671	CK73HBB1C683K	C CAPACITOR	0.068uF 16V K	
C441	C93-1959-05	C CAPACITOR	0.1uF 16V		C672	CK73GB1E104K	C CAPACITOR	0.1uF 25V K	
C442	C93-1959-05	C CAPACITOR	0.1uF 16V		C673	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	
C443	C93-1959-05	C CAPACITOR	0.1uF 16V		C674	CK73GB1E105K	C CAPACITOR	1uF 25V K	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C675	CK73EXR0J476M	C CAPACITOR	47uF 6.3V M		R107	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
C676	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K		R108	RK73HB1J106J	MG RESISTOR	10MΩ 1/16W J	
C677	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R109	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
C679	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R110	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
C681	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R111	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
C683	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		R112	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
C684	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R114	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
C686	CK73GB1E105K	C CAPACITOR	1uF 25V K		R115	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C687	CK73HB1E104K	C CAPACITOR	0.10uF 25V K		R116	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C688	CK73HB1A105K	C CAPACITOR	1uF 10V K		R117	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
C689	CC73HCH1H470G	C CAPACITOR	47pF 50V G		R118	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
C690	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R119	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
C691	CK73GXR1C225K	C CAPACITOR	2.2uF 16V K		R120	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
C692	CK73GB1E104K	C CAPACITOR	0.1uF 25V K		R121	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C693	C93-1967-05	C CAPACITOR	470pF 50V		R122	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J	
C695	C93-1967-05	C CAPACITOR	470pF 50V		R123	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
C697	C93-1953-05	C CAPACITOR	0.01uF 25V		R124	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J	
C698	C93-1953-05	C CAPACITOR	0.01uF 25V		R125	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R1	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R126	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R7	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R127	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R8	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R128	RK73HB1J391D	MG RESISTOR	390Ω 1/16W D	
R9	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R129	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R10	RK73HH1J184D	MG RESISTOR	180kΩ 1/16W D		R130	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
R11	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R131	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R12	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R132	RN73HH1J103D	MF RESISTOR	10kΩ 0.063W D	
R13	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R133	RN73HH1J562D	MF RESISTOR	5.6kΩ 0.063W D	
R14	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R134	RN73H0AJ121D	MF RESISTOR	120Ω D	
R15	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R135	RK73HB1J8R2J	MG RESISTOR	8.2Ω 1/16W J	
R16	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R136	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R17	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R137	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R18	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R139	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R19	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R140	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R20	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R141	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R21	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R142	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J	
R22	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D		R143	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R23	RK73HH1J683D	MG RESISTOR	68kΩ 1/16W D		R151	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R24	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R152	RN73HH1J562D	MF RESISTOR	5.6kΩ 0.063W D	
R25	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R153	RN73HH1J103D	MF RESISTOR	10kΩ 0.063W D	
R26	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R154	RN73HH1J151D	MG RESISTOR	150Ω 0.063W D	
R27	RK73HB1J274J	MG RESISTOR	270kΩ 1/16W J		R155	RK73HB1J4R7J	MG RESISTOR	4.7Ω 1/16W J	
R28	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J		R156	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R29	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R181	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R30	RK73HH1J274D	MG RESISTOR	270kΩ 1/16W D		R182	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R31	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R183	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J	
R32	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R184	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J	
R33	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R194	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R34	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R195	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R35	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R204	R92-3785-05	MG RESISTOR	120Ω 0.25W	
R36	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R205	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R37	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R206	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R38	RZ73G0BK2R7J	RESISTOR	2.7Ω 0.25W J		R207	RK73HB1J330J	MG RESISTOR	33Ω 1/16W J	
R39	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R208	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R40	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		R209	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R41	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R210	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J	
R42	R92-3774-05	MG RESISTOR	27Ω 0.25W		R211	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R43	R92-3774-05	MG RESISTOR	27Ω 0.25W		R212	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R44	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		R213	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
R45	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J		R214	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J	
R46	RK73GB2A220J	MG RESISTOR	22Ω 1/10W J		R215	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J	
R47	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R216	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
R48	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R218	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J	
R49	RK73JB1H474J	MG RESISTOR	470kΩ 1/20W J		R219	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R50	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R221	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R51	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R222	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J	
R52	RK73FB2B1R0J	MG RESISTOR	1Ω 1/8W J		R223	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R56	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J		R224	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R57	RK73HH1J183D	MG RESISTOR	18kΩ 1/16W D		R225	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R58	RK73HH1J223D	MG RESISTOR	22kΩ 1/16W D		R227	RK73GB2A823J	MG RESISTOR	82kΩ 1/10W J	
R59	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R228	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R60	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R230	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J	
R65	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R233	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J	
R66	RK73HH1J474D	MG RESISTOR	470kΩ 1/16W D		R234	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R102	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R237	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J	
R103	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R244	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R104	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R245	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R105	RK73HB1J124J	MG RESISTOR	120kΩ 1/16W J		R246	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R106	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R247	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
					R248	R92-3756-05	MG RESISTOR	0.22Ω 1/3W	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R249	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R430	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R250	R92-3756-05	MG RESISTOR	0.22Ω 1/3W		R431	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J	
R251	RK73HB1J270J	MG RESISTOR	27Ω 1/16W J		R432	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R252	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R433	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R253	RK73HH1J472D	MG RESISTOR	4.7kΩ 1/16W D		R434	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R255	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		R435	RK73JB1H105J	MG RESISTOR	1MΩ 1/20W J	
R256	RK73HH1J682D	MG RESISTOR	6.8kΩ 1/16W D		R436	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R257	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R437	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R258	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J		R438	RK73GH2A49R9D	MG RESISTOR	49.9Ω 1/10W D	
R259	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J		R439	RK73HH1J102D	MG RESISTOR	1kΩ 1/16W D	
R260	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J		R440	RK73HH1J102D	MG RESISTOR	1kΩ 1/16W D	
R264	RK73HH1J682D	MG RESISTOR	6.8kΩ 1/16W D		R441	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J	
R265	RK73HH1J393D	MG RESISTOR	39kΩ 1/16W D		R442	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J	
R266	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R443	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J	
R267	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R444	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J	
R268	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R445	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J	
R269	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R446	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R270	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R447	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J	
R301	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R448	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J	
R302	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R449	RK73JB1H472J	MG RESISTOR	4.7kΩ 1/20W J	
R303	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J		R450	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J	
R304	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J		R451	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R310	RK73HB1J391J	MG RESISTOR	390Ω 1/16W J		R452	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R312	RK73HB1J5R6J	MG RESISTOR	5.6Ω 1/16W J		R461	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R313	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R462	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R314	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R463	RK73HH1J104D	MG RESISTOR	100kΩ 1/16W D	
R315	RK73HB1J120J	MG RESISTOR	12Ω 1/16W J		R464	RK73HH1J103D	MG RESISTOR	10kΩ 1/16W D	
R316	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R466	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R325	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R467	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R330	RK73HH1J273D	MG RESISTOR	27kΩ 1/16W D		R468	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R331	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R469	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R332	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R470	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R333	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R479	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R335	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R480	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R336	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R601	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R351	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R602	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R352	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R604	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R353	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J		R605	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R354	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J		R608	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R355	RK73HB1J390J	MG RESISTOR	39Ω 1/16W J		R609	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R356	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J		R610	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R357	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R617	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J	
R358	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R635	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R359	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R636	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R360	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R637	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R361	RK73JB1H473J	MG RESISTOR	47kΩ 1/20W J		R638	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R362	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R639	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R363	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R650	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J	
R364	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R651	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J	
R365	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R652	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R366	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R653	RK73JB1H101J	MG RESISTOR	100Ω 1/20W J	
R367	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R654	RK73GB2A471J	MG RESISTOR	470Ω 1/10W J	
R369	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R655	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J	
R401	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R656	RK73PB2H1R2J	MG RESISTOR	1.2Ω 1/2W J	
R402	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R657	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R403	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R658	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R404	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R659	RK73HB1J561J	MG RESISTOR	560Ω 1/16W J	
R405	RK73HB1J153J	MG RESISTOR	15kΩ 1/16W J		R661	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R406	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J		R663	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R407	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R664	RK73HB1J274J	MG RESISTOR	270kΩ 1/16W J	
R408	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R665	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J	
R410	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R667	RK73JB1H224J	MG RESISTOR	220kΩ 1/20W J	
R411	RK73JB1H103J	MG RESISTOR	10kΩ 1/20W J		R668	RK73JB1H681J	MG RESISTOR	680Ω 1/20W J	
R412	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R670	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R413	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R672	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R414	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R676	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
R415	RK73JB1H104J	MG RESISTOR	100kΩ 1/20W J		R678	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R419	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R680	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R420	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R681	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R421	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R682	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J	
R422	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R683	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R423	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R684	RK73HB1J272J	MG RESISTOR	2.7kΩ 1/16W J	
R424	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		R685	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R425	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J						
R426	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		L1	LB73F0AW-002	CHIP FERRITE		
R427	RK73JB1H222J	MG RESISTOR	2.2kΩ 1/20W J		L3	LB73G0AM-004	CHIP FERRITE		
R428	RK73JB1H220J	MG RESISTOR	22Ω 1/20W J		L4	LR73Z0AY2R2M	CHIP INDUCTOR		
R429	RK73JB1H102J	MG RESISTOR	1kΩ 1/20W J		L5	LB73G0AM-004	CHIP FERRITE		

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
L6	LB73G0AM-004	CHIP FERRITE			L410	LB73G0AM-004	CHIP FERRITE		
L7	LB73G0AM-004	CHIP FERRITE			L411	L79-1946-05	FILTER		
L8	LB73G0AM-004	CHIP FERRITE			L412	L79-1946-05	FILTER		
L9	LB73H0AV-002	CHIP FERRITE			L413	L79-1946-05	FILTER		
L10	LB73H0AV-002	CHIP FERRITE			L414	L79-1946-05	FILTER		
L11	LB73H0AV-002	CHIP FERRITE			L415	L79-1946-05	FILTER		
L12	L41-1502-70	CHIP INDUCTOR			L416	L79-1946-05	FILTER		
L13	LB73H0AV-002	CHIP FERRITE			L417	LB73H0AV-002	CHIP FERRITE		
L111	LB73H0AY-004	CHIP FERRITE			L427	LB73H0AV-002	CHIP FERRITE		
L112	LB73H0AY-004	CHIP FERRITE			L428	LB73H0AV-002	CHIP FERRITE		
L121	LB73H0AY-004	CHIP FERRITE			L429	LB73H0AV-002	CHIP FERRITE		
L131	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L430	LB73H0AV-002	CHIP FERRITE		
L132	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L431	LB73H0AV-002	CHIP FERRITE		
L133	LR79Z0GJ4N7G	CHIP INDUCTOR			L601	LB73G0AM-004	CHIP FERRITE		
L134	L3C-0002-00	OSC-COIL			L604	LB73G0AM-004	CHIP FERRITE		
L135	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L605	LB73G0AM-004	CHIP FERRITE		
L136	L41-1085-53	CHIP INDUCTOR			L608	LR73Z0AY100M	CHIP INDUCTOR		
L137	L41-1085-53	CHIP INDUCTOR			L609	LR73Z0AY100M	CHIP INDUCTOR		
L138	L41-1085-53	CHIP INDUCTOR			L610	LB73G0AM-004	CHIP FERRITE		
L151	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L612	LB73G0AM-004	CHIP FERRITE		
L152	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L613	LB73G0AM-004	CHIP FERRITE		
L153	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH		L622	LB73G0AM-004	CHIP FERRITE		
L154	LR79Z0GJ5N1G	CHIP INDUCTOR			L623	LB73G0AM-004	CHIP FERRITE		
L155	L3C-0001-00	OSC-COIL			L635	LB73H0AV-002	CHIP FERRITE		
L156	L41-1585-53	CHIP INDUCTOR			CN1	EC720CQ-0313A	FFC FPC CONNECTOR		
L157	L41-1585-53	CHIP INDUCTOR			CN2	J19-5386-05	HOLDER		
L158	L41-1585-53	CHIP INDUCTOR			CN7	E40-6883-05	F.C.CONNECTOR		
L181	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH		CN8	-----	TERMINAL		*Note
L191	LK73H0AM5N6S	M.CHIP INDUCTOR	5.6nH		CN10	-----	TERMINAL		*Note
L192	LK73H0AM4N7S	M.CHIP INDUCTOR	4.7nH		CN201	E2D-0058-00	TERMINAL		
L201	LR79Z0DD21N9J	CHIP INDUCTOR	21.9nH		CN202	E2D-0058-00	TERMINAL		
L202	LR79G0CQ3N9C	CHIP INDUCTOR			CN353	G0B-0005-00	EARTH SPRING		
L203	LR79Z0CAR22J	CHIP INDUCTOR	0.22uH		CN354	G0B-0005-00	EARTH SPRING		
L204	LR79G0GKR12G	CHIP INDUCTOR			CN356	G0B-0005-00	EARTH SPRING		
L205	LK73H0AM12NJ	M.CHIP INDUCTOR	12nH		CN357	G0B-0005-00	EARTH SPRING		
L206	LK73H0AMR12J	M.CHIP INDUCTOR	0.12uH		CN357	G0B-0005-00	EARTH SPRING		
L207	LK73H0AM15NJ	M.CHIP INDUCTOR	15nH		CN402	EC720BP-0341A	FFC FPC CONNECTOR		
L208	LK73H0AM15NJ	M.CHIP INDUCTOR	15nH		CN602	E41-1476-05	PIN ASSY		
L209	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH		CP1	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L210	LR79G0GK9N1C	CHIP INDUCTOR			CP2	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L211	LB73G0AM-004	CHIP FERRITE			CP301	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L212	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH		CP302	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L213	LR79Z0DC45N5J	CHIP INDUCTOR	45.5nH		CP303	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L214	LB73F0AW-002	CHIP FERRITE			CP351	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L215	LR79Z0DD16N9J	CHIP INDUCTOR	16.9nH		CP352	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L216	LR79Z0DD16N9J	CHIP INDUCTOR	16.9nH		CP401	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L217	LR79Z0DD16N9J	CHIP INDUCTOR	16.9nH		CP402	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L218	LR79Z0CA39NG	CHIP INDUCTOR	39nH		CP403	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L301	LK73H0AM33NJ	M.CHIP INDUCTOR	33nH		CP404	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L302	LR79G0CQ10NG	CHIP INDUCTOR			CP405	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L303	LK73H0AMR27J	M.CHIP INDUCTOR			CP406	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L304	LK73H0AM33NJ	M.CHIP INDUCTOR	33nH		CP408	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L307	LR79G0CQ12NG	CHIP INDUCTOR			CP409	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L308	LR79G0CQ7N5C	CHIP INDUCTOR			CP410	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L309	LR79G0CQ22NG	CHIP INDUCTOR	22nH		CP411	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L310	LR79G0CQ3N9C	CHIP INDUCTOR			CP412	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L311	LR79G0CQ39NG	CHIP INDUCTOR			CP413	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L312	LR79G0CQ39NG	CHIP INDUCTOR			CP414	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	
L313	LR79G0CQ39NG	CHIP INDUCTOR			CP601	RK74HB1J100J	NET RESISTOR	10Ω 1/16W J	
L314	LR79G0CQ22NG	CHIP INDUCTOR	22nH		E101	-----	SHIELDING CASE		*Note
L315	LR79G0CQR22G	CHIP INDUCTOR			E301	-----	SHIELDING CASE		*Note
L351	L92-0487-05	CHIP FERRITE			E351	F10-3228-15	SHIELDING CASE		
L352	L92-0487-05	CHIP FERRITE			E401	-----	SHIELDING CASE		*Note
L353	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH		E601	-----	SHIELDING CASE		*Note
L354	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH		F1	FZA10BQ-3R15	FUSE (CC)		
L358	L92-0487-05	CHIP FERRITE			F2	FZA10BH-R50	FUSE (CC)	0.5A	
L359	L7K-0059-00	FILTER			F650	FZA10BH-R315	FUSE (CC)	0.315A	
L361	L79-1987-05	FILTER			J651	E1B-0019-00	3.5D PHONE JACK		
L365	L92-0487-05	CHIP FERRITE			J652	E1B-0020-00	2.5D PHONE JACK		
L366	L92-0487-05	CHIP FERRITE			TH201	NCU15WF104F6S	N THERMISTOR		
L401	LB73H0AV-002	CHIP FERRITE			TH401	NCU15WF104F6S	N THERMISTOR		
L402	LK73G0AQ4R7K	M.CHIP INDUCTOR	4.7uH		X351	L77-3121-05	QUARTZ CRYSTAL		
L404	LB73G0AM-004	CHIP FERRITE			X401	L7H-0076-00	TCXO		
L405	L92-1101-05	CHIP FERRITE			X402	L77-1802-05	QUARTZ CRYSTAL		
L406	L92-1101-05	CHIP FERRITE							
L407	LB73G0AM-004	CHIP FERRITE							
L408	LB73G0AM-004	CHIP FERRITE							
L409	LB73G0AM-004	CHIP FERRITE							

DISPLAY UNIT

**XC1-209K-00 (NX-3220(K),NX-3220(E3),
NX-3320(K),NX-3320(E3))**

**XC1-209K-01 (NX-3220(K2),NX-3220(E2),
NX-3320(K2),NX-3320(E2))**

**XC1-209K-02 (NX-3220(K3),NX-3220(E),
NX-3320(K3),NX-3320(E))**

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

Block No. [0][3]

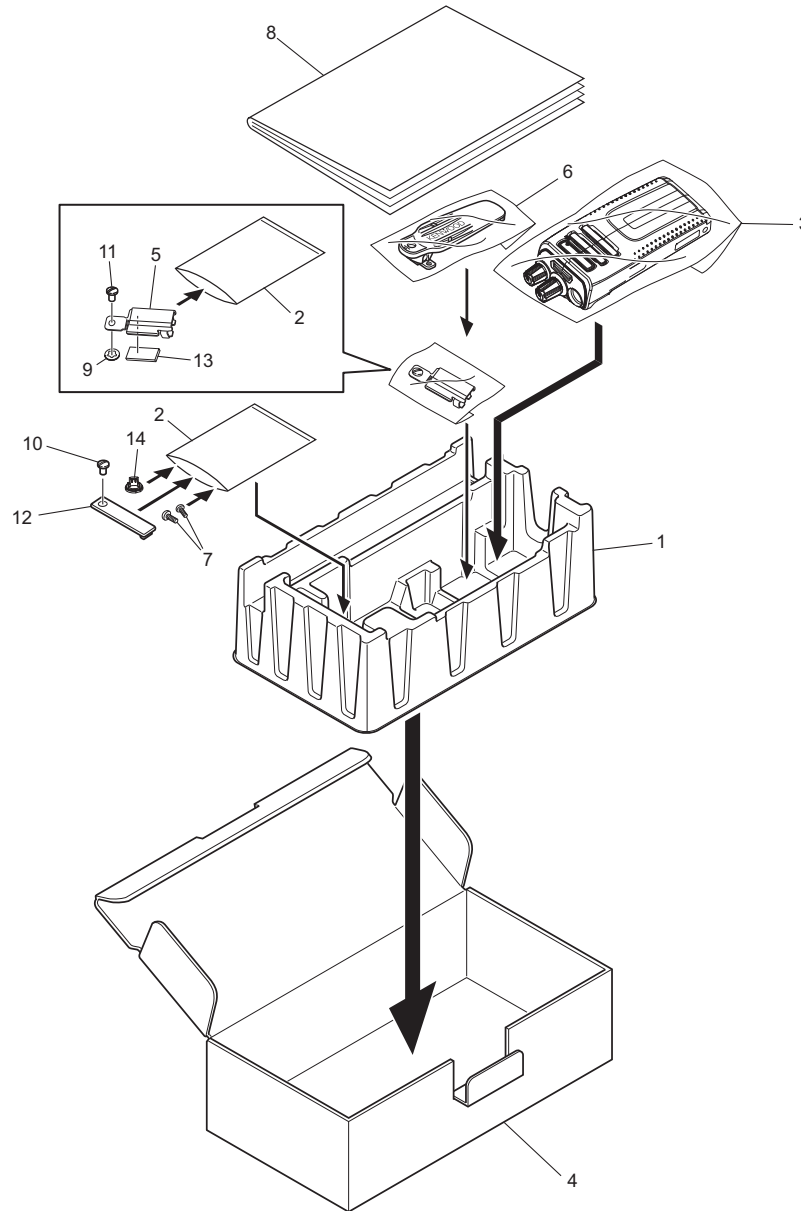
△ Symbol No.	Part No.	Part Name	Description	Local
IC201	TC7SZ08FE	IC		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
Q141	EMD9	DIGI TRANSISTOR		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
Q201	EMD9	DIGI TRANSISTOR		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
Q221	LTC014EEBFS8	DIGI TRANSISTOR		
Q222	LTC014EEBFS8	DIGI TRANSISTOR		
Q223	LTC014EEBFS8	DIGI TRANSISTOR		
Q227	LTC014EEBFS8	DIGI TRANSISTOR		
Q228	LTC014EEBFS8	DIGI TRANSISTOR		
Q229	LTC014EEBFS8	DIGI TRANSISTOR		
D111	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D112	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D113	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D114	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D115	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D116	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D117	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D118	B30-2365-05	LED		3220K3, 3220E, 3320K3, 3320E
D119	B30-2365-05	LED		3220K3, 3220E, 3320K3, 3320E
D120	B30-2365-05	LED		3220K2, 3220E2, 3320K2, 3320E2
D132	B30-2365-05	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D141	RB521SM-30	DIODE		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D142	RB521SM-30	DIODE		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D143	RB521SM-30	DIODE		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D144	RB521SM-30	DIODE		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D180	RN262CS	DIODE		
D181	RN262CS	DIODE		
D201	NSSW206C-T865	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D202	NSSW206C-T865	LED		3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
D221	NESM238B	LED		
D227	NESM238B	LED		
C101	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C102	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C141	CK73HBB1H471K	C CAPACITOR	470pF 50V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C142	CK73HBB1H471K	C CAPACITOR	470pF 50V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C143	CK73HBB1H471K	C CAPACITOR	470pF 50V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C144	CK73HBB1H471K	C CAPACITOR	470pF 50V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C145	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C146	CK73HBB1H471K	C CAPACITOR	470pF 50V K	

△ Symbol No.	Part No.	Part Name	Description	Local
C147	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C148	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C149	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C158	CC73HCH1H220J	C CAPACITOR	22pF 50V J	
C172	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C175	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C177	CC73HCH1H010B	C CAPACITOR	1pF 50V B	
C179	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C184	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C186	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C190	CC73HCH1H010B	C CAPACITOR	1pF 50V B	
C192	CC73HCH1H121J	C CAPACITOR	120pF 50V J	
C193	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C201	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C202	CK73HB0J225K	C CAPACITOR	2.2uF 6.3V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C203	CK73HB0J225K	C CAPACITOR	2.2uF 6.3V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C204	CK73HB1E334K	C CAPACITOR	0.33uF 25V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C205	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C206	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
C207	CK73HB1E104K	C CAPACITOR	0.10uF 25V K	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R1	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R2	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R3	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R111	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R112	RK73HB1J561J	MG RESISTOR	560kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R113	RK73HB1J561J	MG RESISTOR	560kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R114	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R115	RK73HB1J561J	MG RESISTOR	560kΩ 1/16W J	3220K2, 3220E2, 3320K2, 3320E2
R115	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K3, 3220E, 3320K3, 3320E
R116	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R117	RK73HB1J561J	MG RESISTOR	560kΩ 1/16W J	3220K2, 3220E2, 3320K2, 3320E2
R117	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K3, 3220E, 3320K3, 3320E
R118	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	3220K3, 3220E, 3320K3, 3320E
R119	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	3220K3, 3220E, 3320K3, 3320E
R120	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	3220K3, 3220E, 3320K3, 3320E
R121	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	3220K2, 3220E2, 3320K2, 3320E2
R122	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R132	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	3220K2, 3220E2, 3320K2, 3320E2
R141	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R142	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R143	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R145	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R146	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K2, 3220E2, 3320K2, 3320E2
R147	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K3, 3220E, 3320K3, 3320E
R148	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R155	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R170	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R174	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R183	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R185	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R189	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R191	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R201	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R203	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R204	RK73GB2A221J	MG RESISTOR	220Ω 1/10W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R205	RK73GB2A221J	MG RESISTOR	220Ω 1/10W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2
R206	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	3220K2, 3220K3, 3220E, 3220E2, 3320K2, 3320K3, 3320E, 3320E2

Symbol No.	Part No.	Part Name	Description	Local
R207	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
R208	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
R209	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	3220K,3220E3,3320K,3320E3
R221	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R222	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R223	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R227	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R228	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
R229	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
R230	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R231	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R232	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
L101	LB73H0AV-002	CHIP FERRITE		
L102	LB73H0AV-002	CHIP FERRITE		
L151	LK73H0AM15NJ	M.CHIP INDUCTOR	15nH	
L152	LK73H0AM6N8J	M.CHIP INDUCTOR	6.8nH	
L153	LK73H0AM12NJ	M.CHIP INDUCTOR	12nH	
L156	LK73H0AM1N2S	M.CHIP INDUCTOR		
L173	LK73H0AM4N7S	M.CHIP INDUCTOR	4.7nH	
L176	LK73H0BJ3N9S	M.CHIP INDUCTOR		
L178	LK73H0BJ3N9S	M.CHIP INDUCTOR		
L187	LK73H0AM10NJ	M.CHIP INDUCTOR	10nH	
L194	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH	
L201	LB73H0AV-002	CHIP FERRITE		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
L202	LB73H0AV-002	CHIP FERRITE		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
A151	-----	CIRCUIT MODULE	*Note	
CN201	EC720BP-0325A	FFC FPC CONNECTOR		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
CN202	EC720BP-0341A	FFC FPC CONNECTOR		
CN301	E40-6883-05	F.C.CONNECTOR		
CP141	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
CP201	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
CP202	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
CP203	RK74HB1J101J	NET RESISTOR	100Ω 1/16W J	3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
MIC101	T9B-0004-00	MIC ELEMENT		
S111	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S112	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S113	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S114	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S115	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S116	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S117	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S118	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S119	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S120	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S121	S70-0901-05	TACTILE PUSH SW		3220K2,3220K3,3220E,3220E2, 3320K2,3320K3,3320E,3320E2
S122	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S123	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S124	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S125	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S126	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S127	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S128	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S129	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S130	S70-0901-05	TACTILE PUSH SW		3220K3,3220E,3320K3,3320E
S131	S70-0901-05	TACTILE PUSH SW		3220K2,3220E2,3320K2,3320E2
S132	S70-0901-05	TACTILE PUSH SW		3220K2,3220E2,3320K2,3320E2
S301	S70-0516-05	TACTILE PUSH SW		
S302	S70-0516-05	TACTILE PUSH SW		
S303	S70-0516-05	TACTILE PUSH SW		
S304	S70-0516-05	TACTILE PUSH SW		

Packing materials and accessories parts list

Block No.M2MM



Packing and accessories

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

△ Symbol No.	Part No.	Part Name	Description	Local
1	H1C-0175-00	PACKING FIXTURE		
2	-----	PROTECTION BAG	ACC/CAP(x2)	
3	-----	PROTECTION BAG	RADIO	
4	H5A-1304-00	ITEM CARTON		
5	J1K-0494-00	HOLDER	ACC-2PIN PLUG	
6	J29-0730-05	HOOK	ACC-KBH-11	
7	N09-6585-15	SPECIAL SCREW	ACC-HOOK(x2)	
8	B5A-2071-00	INST.MANUAL	ACC-3 LANG	3220K,3220K2,3220K3,3320K,3320K2,3320K3
8	B5A-2072-00	INST.MANUAL	ACC-9 LANG	3220E,3220E2,3220E3,3320E,3320E2,3320E3
9	N1Y-0037-00	INS.WASHER	ACC-2PIN/HOLDER	
10	N0Y-0017-00	DRESSED SCREW	ACC-2PIN/CAP	
11	N0Y-0018-00	DRESSED SCREW	ACC-2PIN/HOLDER	
12	B0K-0077-00	CAP	2PIN	
13	G1D-0231-00	CUSHION		
14	D32-0454-04	STOPPER	CH KNOB	3220K2,3220K3,3220E,3220E2,3320K2,3320K3,3320E,3320E2



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