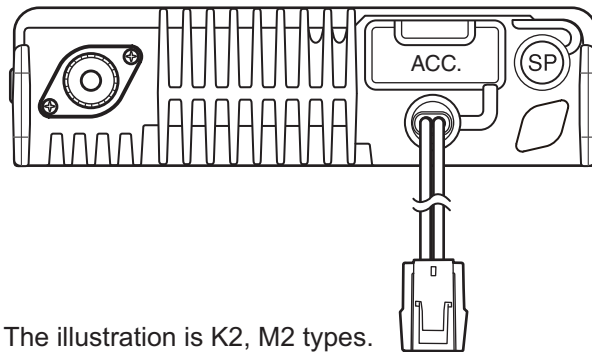
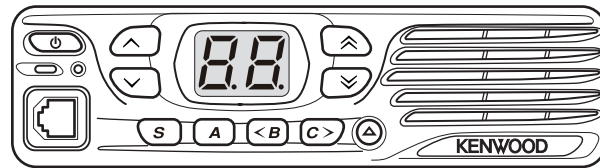


KENWOOD

SERVICE MANUAL

UHF DIGITAL TRANSCEIVER

TK-D840H, TK-D840H(U), TK-D840



The illustration is K2, M2 types.

TABLE OF CONTENTS

1	PRECAUTION.....	1-5
2	SPECIFIC SERVICE INSTRUCTIONS.....	1-5
3	DISASSEMBLY.....	1-23
4	ADJUSTMENT.....	1-26
5	TROUBLESHOOTING.....	1-51

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



This product uses Lead Free solder.

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

SPECIFICATION

(K2,M2 TYPE)

GENERAL		
Frequency Range		400~470MHz
Number of Channels		32 ch / 2 zones (Max. 16 ch/ zone)
Channel Spacing	Analog	25 / 12.5 kHz
	Digital	12.5 kHz
Operating Voltage		13.6V DC \pm 15%
Operating Temperature Range		-22°F ~ +140°F (-30°C ~ +60°C)
Frequency Stability		\pm 1.0ppm
Antenna Impedance		50 Ω
Dimensions (W x H x D) (Projections not included)	Radio only	6.29 x 1.69 x 4.82 in. (160 x 43 x 122.6 mm)
Weight (net)	Radio only	2.42 lbs (1.1 kg)
RECEIVER		
Sensitivity	Digital 1 % BER	0.45 μ V
	Digital 5 % BER	0.3 μ V
	Analog (12dB SINAD) @ 25 / 12.5 kHz	0.25 μ V
Selectivity	Analog @ 25 / 12.5 kHz	75 dB / 65 dB
Intermodulation Distortion	Analog	73 dB
Spurious Response	Analog	75 dB
Audio Distortion		Less than 5%
Audio Output		4 W / 4 Ω
TRANSMITTER		
RF Power Output		5W ~ 25W (TK-D840), 5W ~ 45W (TK-D840H)
Spurious Response		75 dB
FM Hum & Noise	Analog @ 25 / 12.5 kHz	45 / 40 dB
Audio Distortion		Less than 5%
Emission Designator		16K0F3E, 14K0F2D, 11K0F3E, 7K50F2D, 7K60FXE, 7K60FXD

Specifications shown are typical.

Analog 25 kHz is not included in the models sold in the USA or US territories.

Analog measurements accord with TIA 603. Digital measurements accord with EN 300 113.

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

SPECIFICATION

(E TYPE)

GENERAL		
Frequency Range		400~470MHz
Number of Channels		128 ch / 4 zones (Max. 32 ch/ zone)
Channel Spacing	Analogue	25 / 20 / 12.5 kHz
	Digital	12.5 kHz
Operating Voltage		13.2 V DC (10.8 - 15.6 V DC)
Operating Temperature Range		-30°C ~ +60°C
Frequency Stability		±1.0ppm
Antenna Impedance		50Ω
Dimensions (W x H x D) (Projections not included)	Radio only	160 x 43 x 122.6 mm
Weight (net)	Radio only	1.1 kg
RECEIVER		
Sensitivity	Digital 1 % BER	-1 dBμV (0.45μV)
	Digital 5 % BER	-4.5 dBμV (0.3μV)
	Analogue (20 dB SINAD) @ 25 / 20 / 12.5 kHz	-3 dB μV (0.35 μV) / -3 dB μV (0.35 μV) / -1 dB μV (0.45 μV)
Selectivity	Analogue @ 25 / 20 / 12.5 kHz	75dB / 73dB / 69dB
Intermodulation Distortion	Analogue	65 dB
Spurious Response	Analogue	75 dB
Audio Distortion		Less than 5%
Audio Output		4 W / 4 Ω
TRANSMITTER		
RF Power Output		5W ~ 25W
Spurious Response		<1 GHz ≤-36 dBm, 1 GHz - 4 GHz ≤-30 dBm
FM Hum & Noise	Analogue @ 25 / 20 / 12.5 kHz	45 / 45 / 40 dB
Audio Distortion		Less than 5%
Emission Designator		16K0F3E, 14K0F2D, 14K0F3E, 12K0F2D, 8K50F3E, 7K50F2D, 7K60FXE, 7K60FXD

Specifications shown are typical.

Analogue measurements accord with TIA 603, EN 300 086 & 219. Digital measurements accord with EN 300 113.

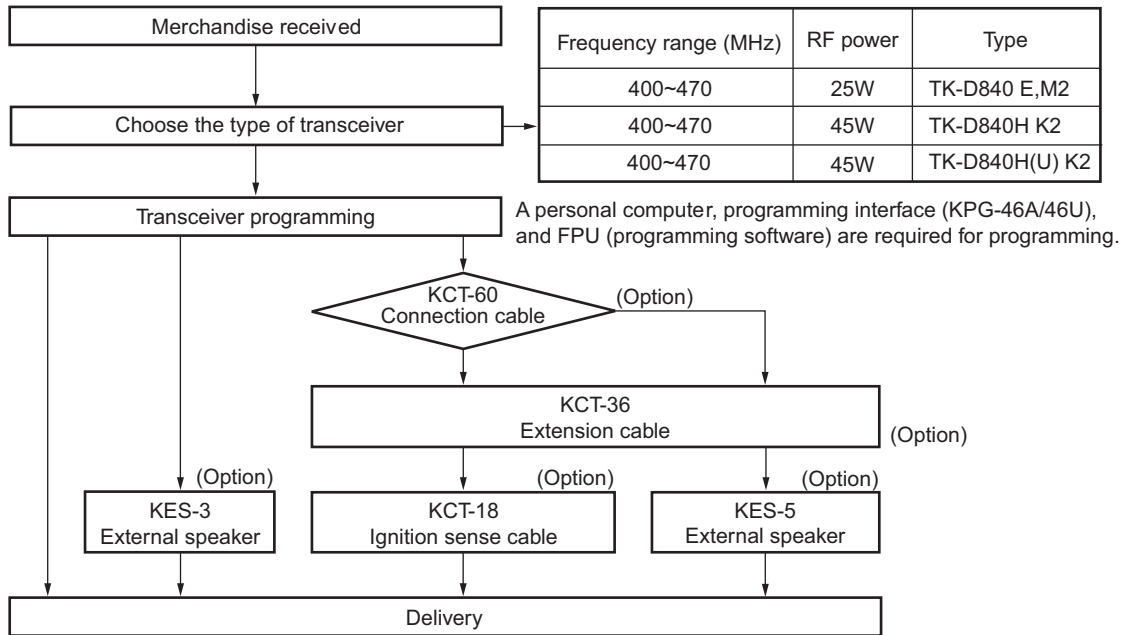
JVC KENWOOD Corporation reserves the right to change specifications without prior notice or obligation.

SECTION 1 PRECAUTION

This service manual does not describe PRECAUTION.

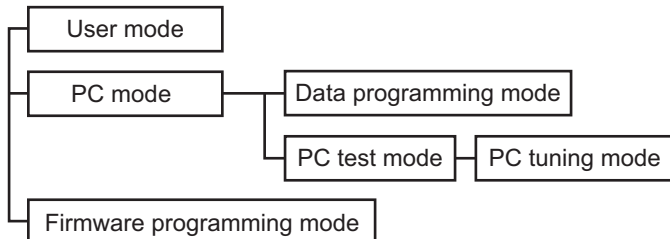
SECTION 2 SPECIFIC SERVICE INSTRUCTIONS

2.1 SYSTEM SET-UP



2.2 REALIGNMENT

2.2.1 Modes



2.2.2 How to Enter Each Mode

Mode	Function
User mode	Power ON
PC mode	Received commands from PC
Firmware programming mode	[A] + Power ON

Mode	Function
User mode	For normal use.
PC mode	Used for communication between the transceiver and PC (IBM compatible).
PC 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.
PC tuning mode	Used to tune the transceiver using the PC.
Firmware programming mode	Used to change the main program of the flash memory.

2.2.3 PC Mode

2.2.3.1 Preface

The transceiver is programmed using a personal computer, a programming interface (KPG-46A/46U) and FPU (programming software).

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

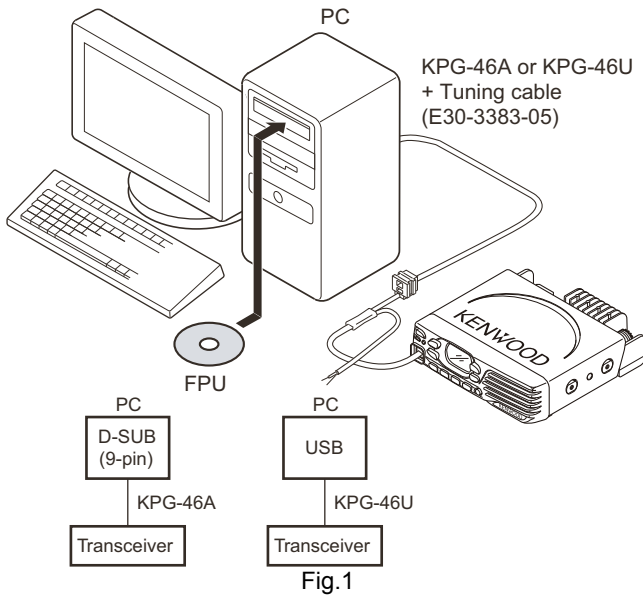


Fig.1

2.2.3.2 Connection procedure

- (1) Connect the transceiver to the computer using the interface cable.

Note:

You must install the KPG-46U driver in the computer to use the USB programming interface cable (KPG-46U).

- (2) When the Power is switched on, you can immediately enter user mode. When the PC sends a command, the transceiver enters PC mode, and "Pc" is displayed on the LED. When data is transmitting from the transceiver, the red LED lights. When data is receiving by the transceiver, the green LED lights.

Note:

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

2.2.3.3 KPG-46A description

(PC programming interface cable: Option)

The KPG-46A is required to interface the transceiver to the computer. It has a circuit in its D-sub connector (KPG-46A: 9-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-46A connects the 8-pin microphone connector of the transceiver to the RS-232C serial port of the computer.

2.2.3.4 KPG-46U description

(USB programming interface cable: Option)

The KPG-46U is a cable which connects to a USB port on a computer.

When using the KPG-46U, install the supplied CD (with driver software) in the computer. The KPG-46U driver runs under Windows XP, Vista, 7, 8 or 8.1.

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

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

(This URL may change without notice.)

2.2.3.5 Programming Software: KPG-166D (Ver. 2.00 or later) description

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

The data can be input to or read from the transceiver and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the transceiver.

2.2.4 Firmware Programming Mode

2.2.4.1 Preface

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

2.2.4.2 Connection procedure

Connect the transceiver to the personal computer using the interface cable (KPG-46A/46U). (Connection is the same as in the PC Mode.)

2.2.4.3 Programming

[Firmware upgrade in User Mode]

- (1) Start up the firmware programming software (Updater).
- (2) Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
- (3) Power On the transceiver in User mode. Then, the orange LED turns on and the 7-segment LED displays "PG" on transceiver.
- (4) Press "write" button in the window. When the transceiver starts to receive data, the orange LED turns to green.
- (5) If writing ends successfully, the green LED turns to red.

Note:

- It is not necessary to enable the Firmware Programming mode in the Programming software.
- Normally, write in the high-speed mode.

[Firmware upgrade in Firmware Programming Mode]

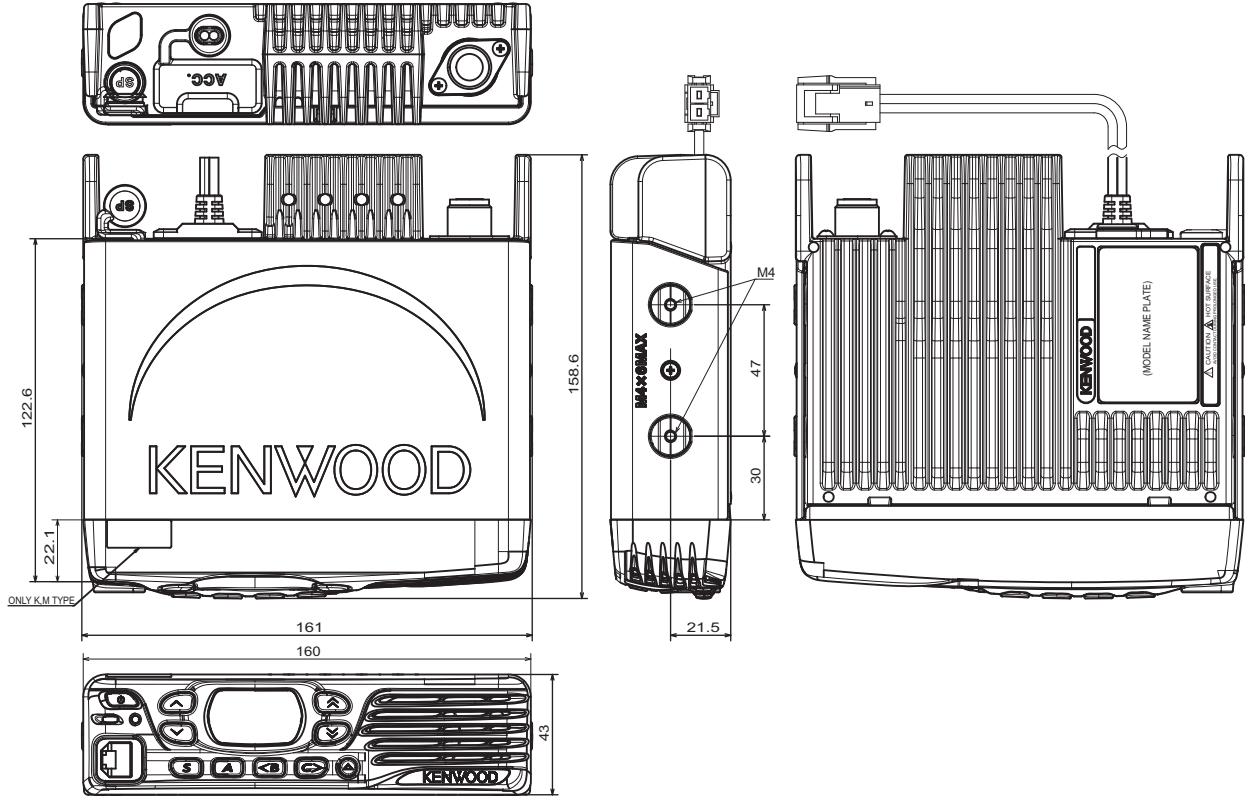
- (1) Start up the firmware programming software (Updater).
- (2) Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
- (3) Press and hold the [A] key while turning the transceiver power ON. Then, the orange LED turns on and the 7-segment LED displays "PG" on transceiver.
- (4) Press "write" button in the window. When the transceiver starts to receive data, the orange LED turns to green.
- (5) If writing ends successfully, the green LED turns to red.

Note:

- This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software.
- Normally, write in the high-speed mode.

2.3 INSTALLATION

External View



2.3.1 Connection Cable (KCT-60: Option)

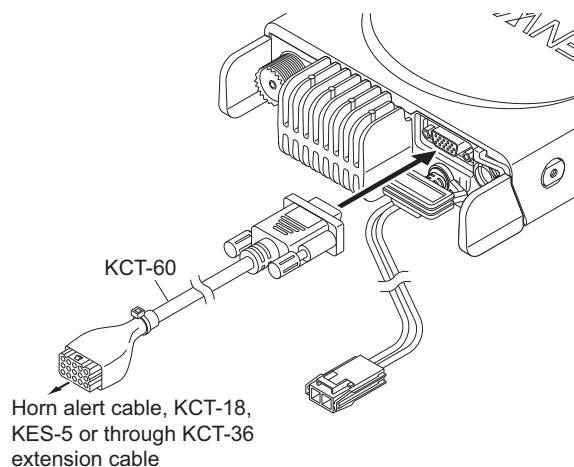
The KCT-60 connection cable kit is used to connect the transceiver to a Horn alert cable, KCT-18 (Ignition sense cable), KES-5 (External speaker), or through the KCT-36 extension cable.

2.3.1.1 Installing the KCT-60 (Connection cable) in the transceiver

- (1) Remove the ACC. cap on the rear of the transceiver.
- (2) Connect the D-sub connector of the KCT-60 to the D-sub 15-pin terminal of the transceiver.
- (3) Connect the 15-pin connector of the KCT-60 to a Horn alert cable, KCT-18, KES-5, or through a KCT-36 extension cable.

Note:

You must set up using the KPG-166D.



2.3.1.2 Terminal function

D-sub 15-pin Pin No.	Name	Molex 15-pin Pin No.
1	SB	1
2	IGN	2
3	PA or External SP	12
4	DETO	4
5	DATAI	5
6	FNC1	9
7	FNC2	11
8	FNC3	7
9	FNC4	6
10	FNC5	8
11	FNC6	10
12	5MS	NC
13	HR1	13
14	HR2	14
15	GND	3

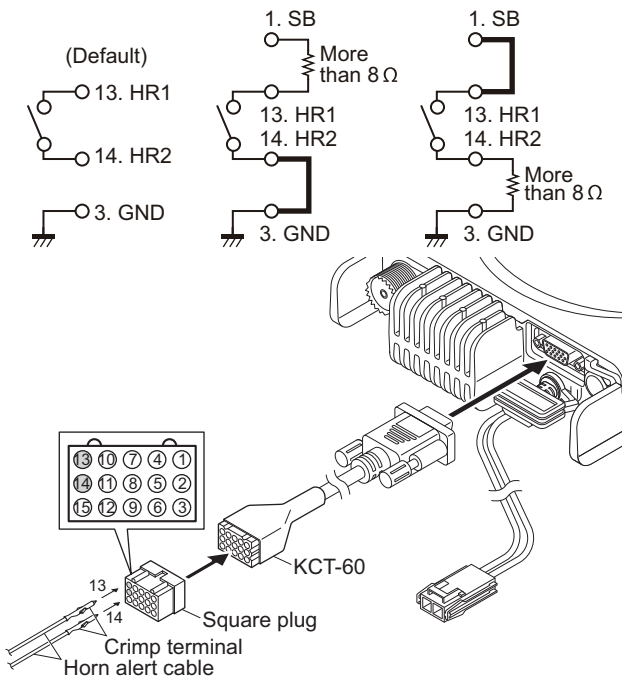
2.3.2 Horn Alert Function

The Horn alert function (max. 2A drive) is enabled by installing the KCT-60 in the transceiver.

2.3.2.1 Installation Procedure

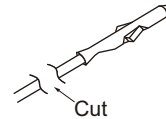
- (1) Remove the ACC. cap on the rear of the transceiver.
- (2) Connect the D-sub connector of the KCT-60 to the D-sub 15-pin terminal of the transceiver.
- (3) Insert the two crimp terminals of the Horn alert cable to pins 13 and 14 of the square plug.
- (4) Connect the square plug to the 15-pin connector of the KCT-60.
- (5) Connect the remaining two Horn alert cables to your car Horn alert signal control.

The internal FET switch can be controlled by turning the HA function on/off and by using a signaling decode output. The maximum current of HA is 2A. This FET switch is the open drain circuit. Therefore, a DC power supply is necessary to use the HR1. The voltage range is from 5V to 16V.

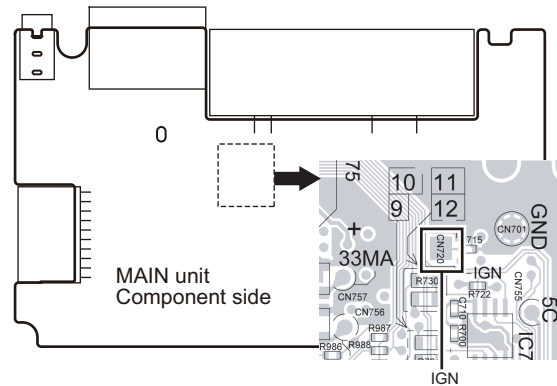


■Installation Procedure: Method A

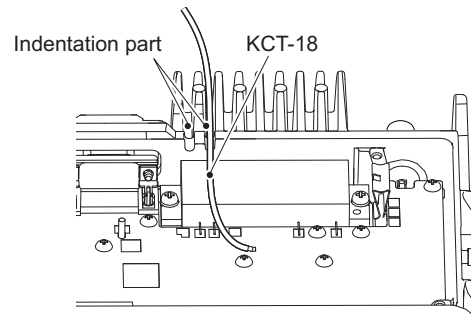
- (1) Remove the two screws on both the right and left sides of the transceiver, then remove the cabinet and top packing from the transceiver.
- (2) Cut the crimp terminal side of the KCT-18 using a pair of nippers or similar tool.



- (3) Solder the cable side cut in the above step 3 to the "IGN" pad on the MAIN unit.

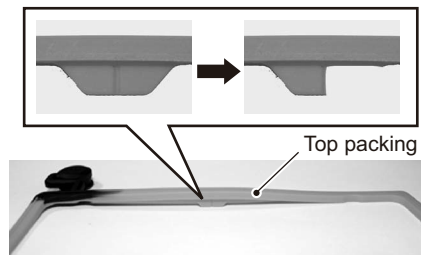


- (4) Dress the KCT-18 cable as shown in the figure. The KCT-18 cable needs to pass through one of two indentations located on the rear panel of the transceiver.



- (5) Cut off the projection of the top packing using a pair of nippers or similar tool.

If the KCT-18 cable is dressed to be routed through the indentations on the right side in step 5, the right side of the projection needs to be cut off. If the KCT-18 cable is dressed to be routed through the indentations on the left side, the left side of the projection needs to be cut off. Following is a figure presenting an example for when the right side of the projection is cut off.



- (6) Reinstall the top packing. Check the correct fitting of the top packing, then reinstall the cabinet and two screws for the right and left sides.

- (7) Connect the other side of the KCT-18 to the ignition line of the car.

2.3.3 Ignition Sense Cable (KCT-18: Option)

The KCT-18 is an optional cable for enabling the ignition function. The ignition function lets you turn the transceiver power on and off with the car ignition key.

2.3.3.1 Installing the KCT-18 (Ignition sense cable) in the transceiver

- (1) The KCT-18 can be installed in the transceiver by the following two methods (Method A, Method B).

Method A: The KCT-18 is soldered to the "IGN" pad on the MAIN unit.

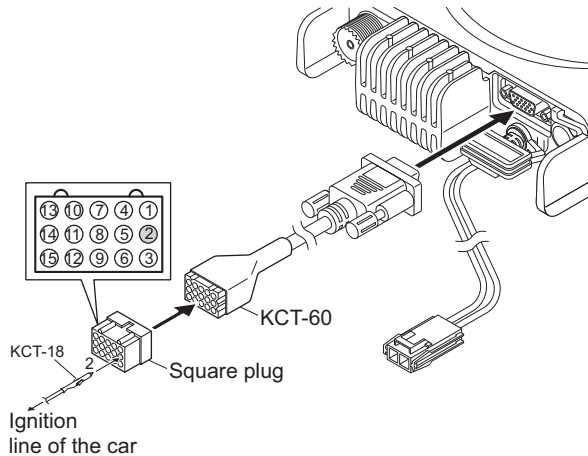
Method B: The KCT-18 is connected to the 15-pin connector of the KCT-60 connected to the transceiver.

Installation Procedure: Method B

- (1) Remove the ACC. cap on the rear of the transceiver.
- (2) Connect the D-sub connector of the KCT-60 to the D-sub 15-pin terminal of the transceiver.
- (3) Insert the crimp terminal side of the KCT-18 to pin 2 of the square plug.
- (4) Connect the square plug to the 15-pin connector of the KCT-60.
- (5) Connect the other side of the KCT-18 to the ignition line of the car.

Note:

You must set up using the KPG-166D.



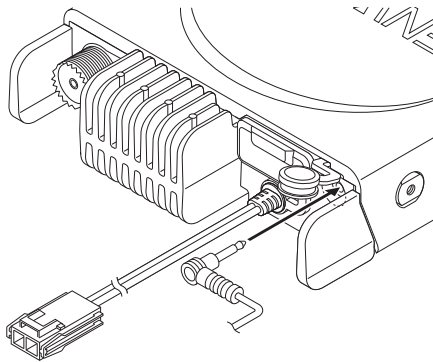
2.3.4 External Speaker (Option)

2.3.4.1 KES-3

The KES-3 is an external speaker for the 3.5-mm-diameter speaker jack.

Connection procedure

- (1) Remove the speaker-jack cap on the rear of the transceiver.
- (2) Connect the KES-3 to the 3.5-mm-diameter speaker jack on the rear of the transceiver.



2.3.4.2 KES-5

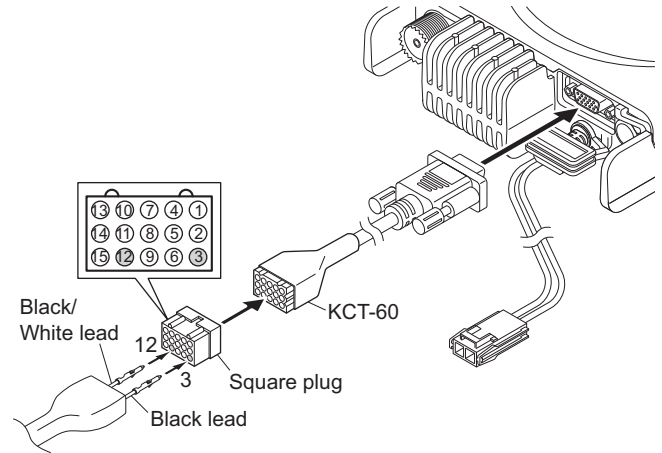
External speaker KES-5 can be installed for KCT-60.

Connection procedure

- (1) Remove the ACC. cap on the rear of the transceiver.
- (2) Connect the D-sub connector of the KCT-60 to the D-sub 15-pin terminal of the transceiver.
- (3) Insert the two crimp terminals of the KES-5 to pins 3 and 12 of the square plug.
- (4) Connect the square plug to the 15-pin connector of the KCT-60.

Note:

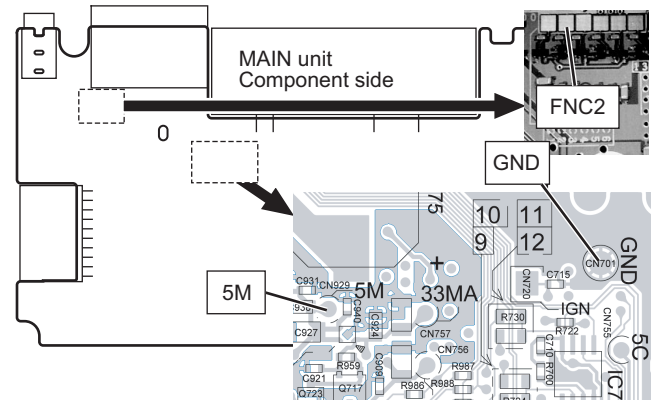
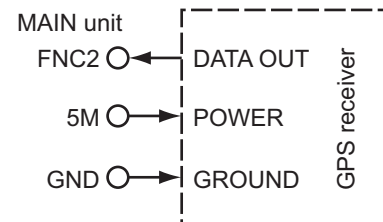
- You must set up using the KPG-166D.
Before the external speaker can be used, you must assign one of the keys as "External Speaker", using the KPG-166D.
- This also applicable to public address provide you must assign one of the keys as "Public Address", using the KPG-166D.



2.3.5 GPS Receiver Connection

2.3.5.1 Connecting the GPS receiver

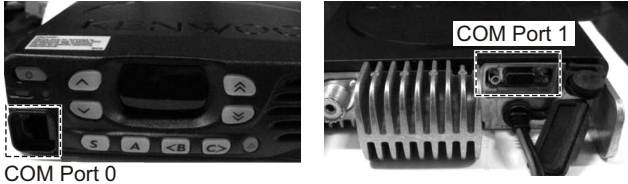
- (1) Soldering position



- (2) Refer to FNC2 (RXD) of "2.3.7 Changing Serial Port Level".

2.3.6 Extended Function: COM Port 0 and COM Port 1

Location of COM Port 0 and COM Port 1 of the transceiver is shown below.



You must configure the transceiver COM Port 0 and COM Port 1 using the KPG-166D.

When you set as "Data", the Function port 1 and 2 will be automatically fixed as Input ports.

The reason for this is because function port 1 (TXD) and 2 (RXD) share the same circuit path of TXD and RXD line.

2.3.7 Changing Serial Port Level

2.3.7.1 Change FNC1 (TXD) and FNC2 (RXD) of D-SUB 15-pin connector from TTL level to RS-232C level

FNC1 (TXD /6pin) and FNC2 (RXD /7pin) of D-SUB 15-pin connector are configured at the TTL level as the default value. But you can change these serial port level to RS-232C level through the RS-232C level converter IC (IC704) by configuring the port.

■FNC1 (TXD)

Remove the R761 chip jumper and solder the clip jumper to R767.

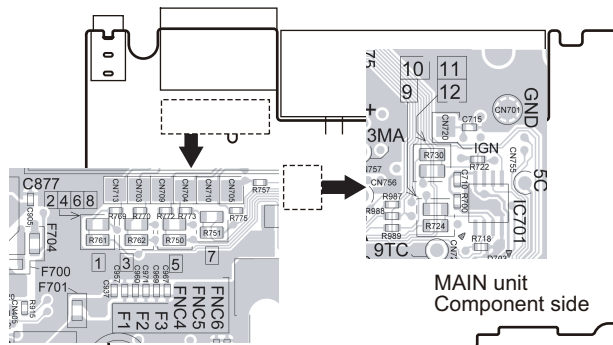
	TTL level	RS-232C level
R761[1] *1	0Ω chip jumper.	open
R767[2] *1	open	0Ω chip jumper.

■FNC2 (RXD)

Remove the R724 and R762 chip jumpers and solder the chip jumpers to R725 and R756.

	TTL level	RS-232C level
R724[9], R762[3] *1	0Ω chip jumper.	open
R725[10], R756[4] *1	open	0Ω chip jumper.

*1: The value in square bracket [] is the silk print number on the MAIN unit.

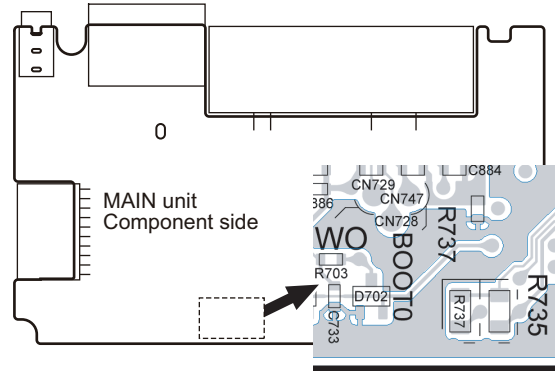


2.3.8 Changing of Signal Type

2.3.8.1 Change signal input of D-SUB connector from DI to MIC

The input (5pin) of D-SUB 15-pin connector is configured at the DI as the default value.

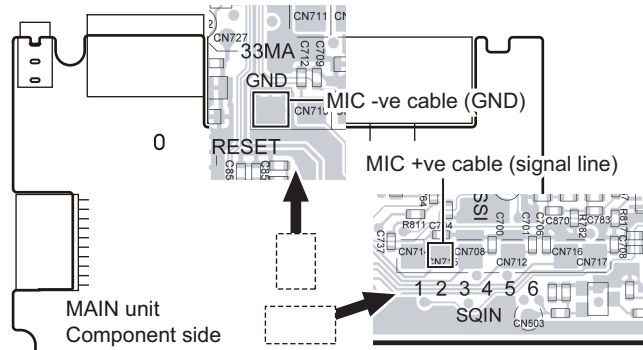
Remove the R737 chip jumper and solder the chip jumper to R735.



2.3.9 Emergency MIC

2.3.9.1 Installation Procedure

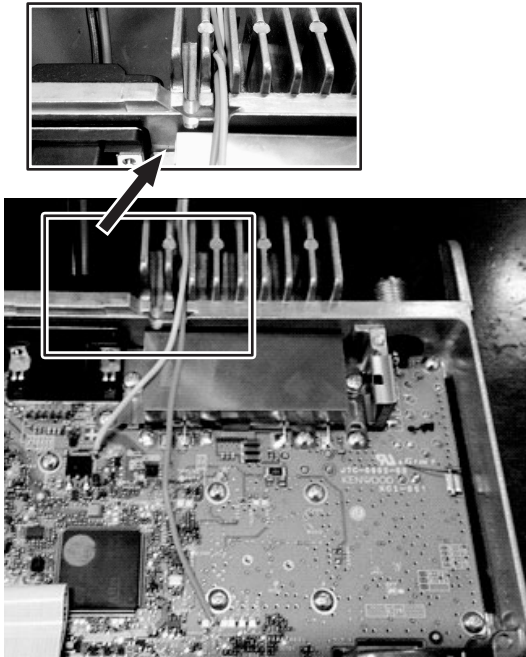
- Remove the two screws on both the right and left sides of the transceiver, then remove the cabinet and top packing from the transceiver.
- solder the MIC connection cable as below
 - solder the MIC +ve cable (signal line) to EMGMIC solder pad
 - solder the -ve cable (GND) to GND solder pad



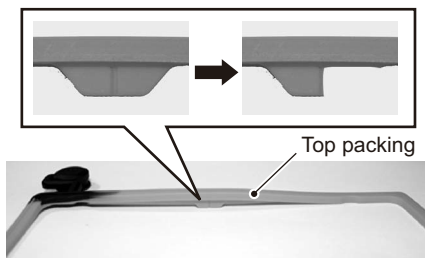
Note:

You must set up using the KPG-166D.

- (3) Dress the cable as shown in the figure. The cable needs to pass through one of two indentations located on the rear panel of the transceiver.



- (4) Cut off the projection of the top packing using a pair of nippers or similar tool.
If the cable is dressed to be routed through the indentations on the right side in step 4, the right side of the projection needs to be cut off.
If the cable is dressed to be routed through the indentations on the left side, the left side of the projection needs to be cut off.
Following is a figure presenting an example for when the right side of the projection is cut off.



- (5) Reinstall the top packing. Check the correct fitting of the top packing, then reinstall the cabinet and two screws for the right and left sides.

2.4 CIRCUIT DESCRIPTION

2.4.1 Frequency Configuration

The receiver utilizes double conversion. The first IF is 49.95MHz and the second IF is 450kHz. The first local oscillator signal is supplied from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies. Figure 1 shows the frequencies.

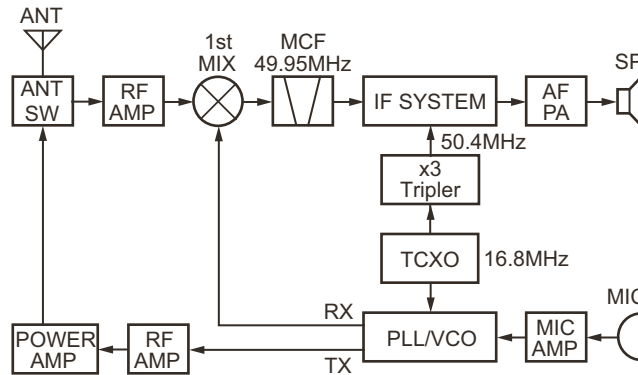


Fig.1 Frequency configuration

2.4.2 Receiver System

The receiver is double conversion superheterodyne.

The frequency configuration is shown in Figure 1.

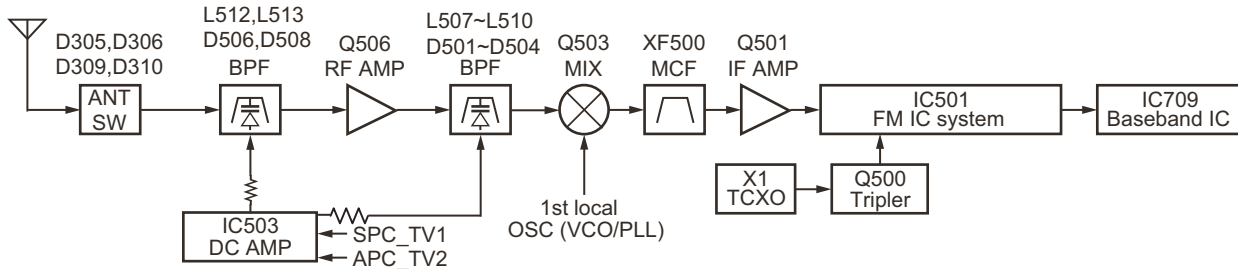


Fig.2 Receiver system

2.4.2.1 Front-end RF Amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q506) after passing through a transmit/receive switch circuit (D305, D306, D309 and D310), BPF (L512, L513, and varactor diodes : D506, D508).

After the signal is amplified (Q506), the signal is filtered by a BPF (L507, L508, L509, L510 and varactor diodes : D501, D502, D503, D504) to eliminate unwanted signals before it is passed to the first mixer.

The voltage of these diodes are controlled by the TV according to the channel frequency. (See Figure 2)

2.4.2.2 First Mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q503) to create a 49.95MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through one pair of monolithic crystal filter (MCF : XF500) to further remove spurious signals.

2.4.2.3 IF Amplifier Circuit

The first IF signal is amplified by Q501, and the enters IC501 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC501 to create a 450kHz second IF signal. The second IF signal is fed through a 450 kHz filter in IC501 to further eliminate unwanted signals before it is amplified and FM detected in IC501.

2.4.2.4 AF Signal System

The detection signal from FM IC (IC501) goes to the baseband IC (IC709) DISC input (pin 16) after pass through IC500 for characterizing the signal.

- **Analog signal**

The demodulated AF signal pass through IC709 with the signal processing and output at AUDIO (pin26) to the pre-AMP(IC711) before the Audio amplifier (IC719). The AF signal from IC719 switches between the internal speaker and speaker jack (J701) output.

- **DMR (Digital signal)**

The demodulated 4L-FSK signal obtained from IC501 is decoded in the baseband IC (IC709).

Decoded signal is fed into microprocessor (IC714) and converted to PCM audio signal, and return to baseband IC (IC709) for converting to audio signal.

This audio signal will output at AUDIO (pin26) to the pre-AMP before the Audio amplifier (IC719).

The AF signal from IC719 switches between the internal speaker and speaker jack (J701) output.

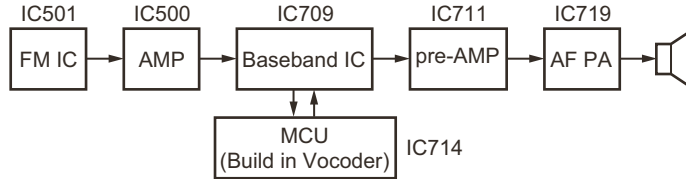


Fig.3 AF signal system

2.4.2.5 Squelch Circuit

Part of the AF signal goes a rectifier circuit to produce a DC voltage corresponding to the noise level after filtering and amplification. There are 2 Noise filters, use for analog wide 5k/ wide 4k mode and analog narrow/ DMR mode respectively. If W_/N is high, Analog wide 5k/ wide 4k noise filter is selected and vice-versa. The selection of different noise filter is by 3 transistor (Q509,Q510,Q511).

This DC voltage send to MCU (IC714) SQIN input pin.

The MCU controls squelch according to the voltage (SQIN) level.

The signal from the RSSI pin of IC501 is monitored. The electric field strength of the receive signal can be known before the SQIN voltage is input to the MCU, and the scan stop speed is improved.

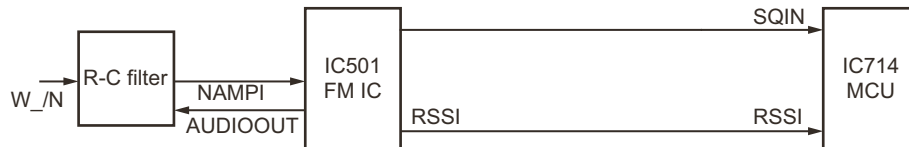


Fig.4 Squelch circuit

2.4.3 Transmitter System

2.4.3.1 Outline

The transmitter circuit produces and amplifies the desired frequency directly. It FM-modulates the carrier signal by means of a varicap diode.

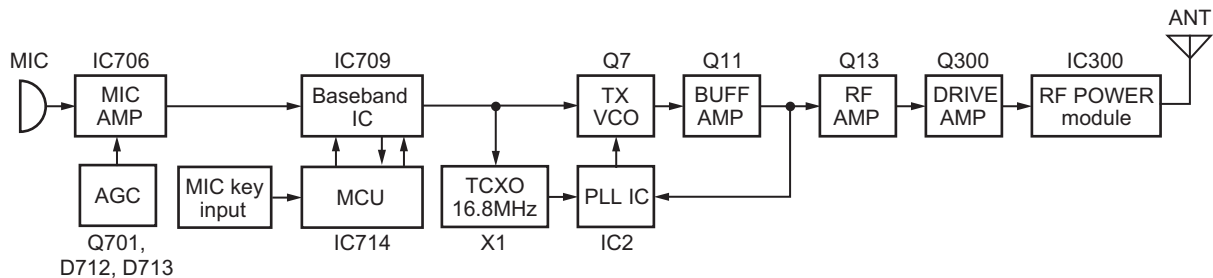


Fig.5 Transmitter system

2.4.3.2 Power Amplifier Circuit

The transmit output signal from the VCO passes through the transmission/reception selection diode (D16) and amplified by Q300. The amplified signal goes to the RF power module (IC300) through a low-pass filter.

The lowpass filter removes unwanted high-frequency harmonic components, and the resulting signal is goes the antenna terminal.

2.4.3.3 APC Circuit

The automatic transmission power control (APC) circuit detects part of a final amplifier output with a coupler circuit and applies a voltage to IC301.

IC301 compares the APC control voltage (APC_TV2) generated by the baseband IC (IC709) with the detection output voltage.

IC301 generates the voltage to control IC300 and stabilizes transmission output.

The APC circuit is configured to protect over current of Q300 and IC300 due to fluctuations of the load at the antenna end and to stabilize transmission output at voltage and temperature variations.

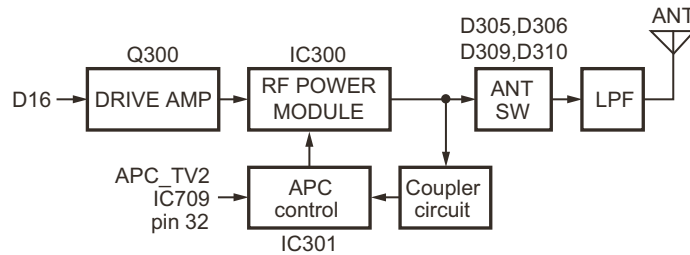


Fig.6 APC circuit and Power amplifier circuit

2.4.4 PLL Frequency Synthesizer

The PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission.

2.4.4.1 PLL Circuit

The frequency step of the PLL is 3.125, 5.0 or 6.25 kHz. A 16.8MHz reference signal is divided at IC2 by a fixed counter to produce the reference frequency.

The voltage controlled oscillator (VCO) feedback output is divided by a programmable counter in IC2.

The 2 signals are phase compared, filtered through a low pass filter and passed to VCO to control the oscillator frequency.

2.4.4.2 VCO Circuit

The operating frequency is generated by Q7 in transmit mode and Q5 in receive mode.

The oscillator frequency is controlled by applying the control voltage, which is obtained from the phase comparator, to varactor diodes (D5, D9, D10, D11 in transmit mode and D7, D12, D13, D14 in receive mode).

The TXRX pin is set "High" in receive mode causing turn on Q9. And TXRX pin is set "Low" in transmit mode causing turn on Q6.

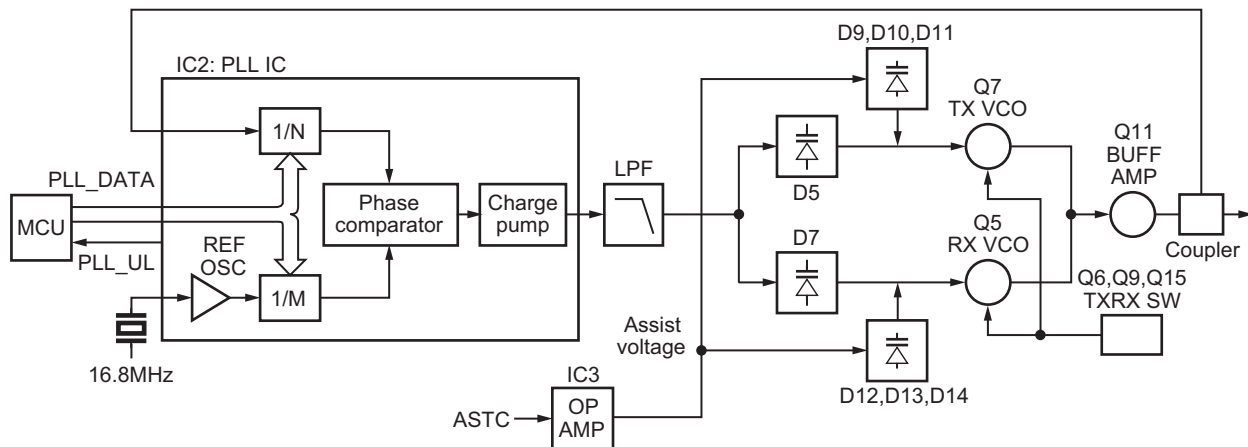


Fig.7 PLL and VCO circuit

2.4.4.3 Unlock Circuit

If low level appears at the "LD" pin of IC2, then PLL an unlock condition occurs.

It causes the voltage applied to the "PLL_UL" pin of the microprocessor to go low.

When the microprocessor detects this condition, the transmitter is disabled by ignoring the push-to-talk switch input signal.

2.4.5 Control Circuit

The MCU carries out the following tasks:

- (1) Controls the FM IC (IC501).
- (2) Controls the baseband IC (IC709).
- (3) Controls the PLL (IC2) & TX/RX outputs.
- (4) Controls IO expender through I2C level converter.
- (5) Controls the display unit.

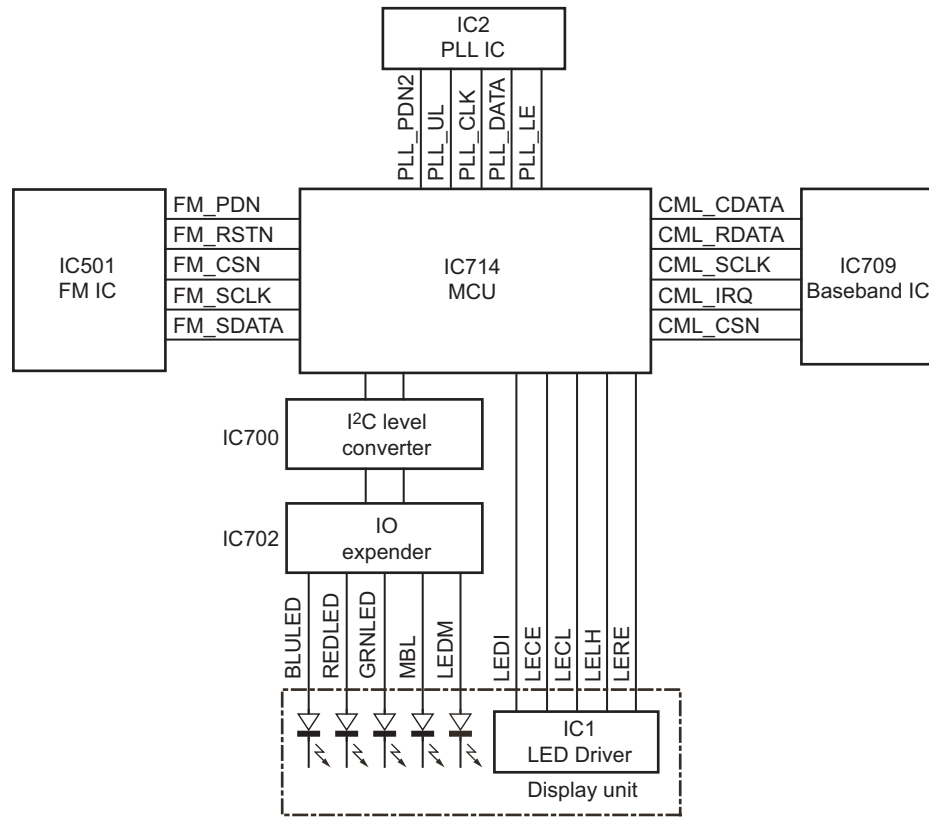


Fig.8 Control circuit

2.4.5.1 Memory Circuit

The transceiver has an 4M-bit Flash memory (IC729). The Flash memory contains adjustment data. The MCU (IC714) controls the Flash memory through three serial data lines.

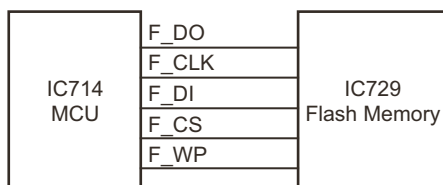


Fig.9 Memory circuit

2.4.5.2 Display Circuit

The MCU (IC714) controls the Display 7-segment LED and LEDs.

When power is on, the MCU will use the MBL line to control the key backlight LEDs.

When the transceiver is busy, the GLED line goes high, Q1 turns on and the green LED (D23) lights after Q4 turn on. In transmit mode, the RLED line goes high, Q2 and Q8 turns on and the red LED (D23) lights.

BLED will be set high when the function select (FPU setting) is on, Q6 turn on and the blue LED (D22) lights.

The dimmer function is controlled by the switch Q5. The LED driver (IC1) controls the functions of the 7-segment LED through the LEDI, LECE, LECL, LELH lines from the MCU.

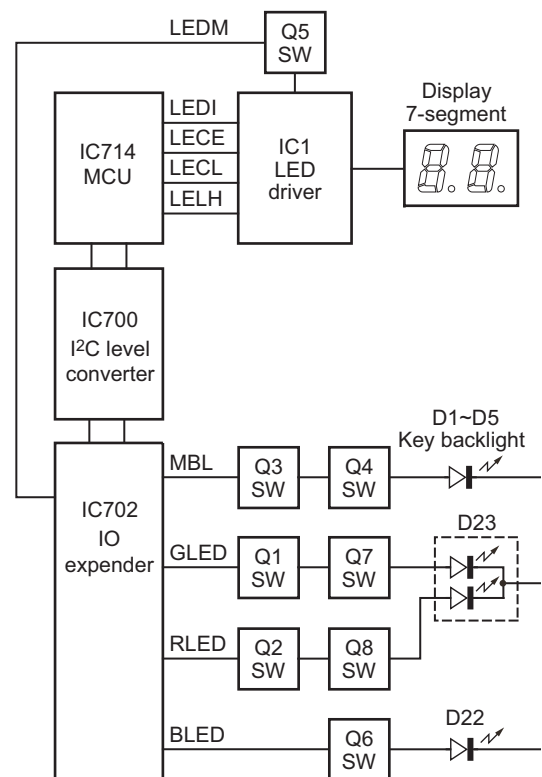


Fig.10 Display circuit

2.4.5.3 Key Matrix Circuit

The front panel has function keys. Each of them is connected to a cross point of a matrix of the KMI1 to KMO3 ports of the micro-processor.

The KMO1 to KMO3 ports are always high, while the KMI1 to KMI3 ports are always low.

The microprocessor monitors the status of the KMI1 to KMO3 ports. If the state of one of the ports changes, the microprocessor assumes that the key at the matrix point corresponding to that port has been pressed.

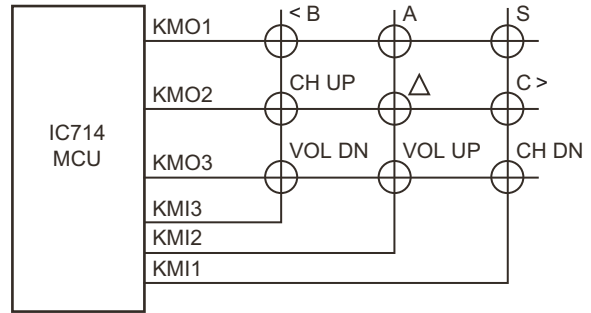


Fig.11 Key matrix circuit

2.4.6 Signaling Circuit

2.4.6.1 Encode

(1) Low-speed data (QT, DQT)

Low-speed data is output from pin 40 (LSDO) of the MCU (IC714).

The signal passes through a low-pass CR filter. The signal is mixed with the audio signal and goes to the VCO and TCXO (X1) modulation input after signal processing in the baseband IC (IC709).

(2) High-speed data (2-tone/5-tone)

High-speed data (HSD) is output from pin 41 (HSDO) of the MCU.

The signal passes through a low-pass CR filter. TX deviation making an adjustment by microprocessor is applied to the baseband IC (IC709).

The signal is mixed with the audio signal and goes to the VCO and TCXO.

The side tone is audio output of baseband IC(IC709) at the same time to audio power amplifier and then to the speaker.

(3) MSK / DTMF

MSK and DTMF signal is self generated by the baseband IC(IC709).

The TX deviation adjustment is done by the output gain of baseband IC(IC709), and is routed to the VCO.

When encoding MSK/DTMF, the microphone-input signal is muted.

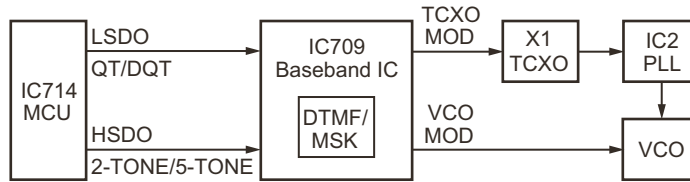


Fig.12 Encode

2.4.6.2 Decode

(1) Low-speed data (QT, DQT)

The demodulated signal from the FM IC (IC501) will input to baseband IC(IC709) to remove frequency above 300Hz.

The signal is input to pin 27(LSDI) of the MCU.

The MCU digitizes this signal, performs processing such as DC restoration, and decodes the signal.

(2) High-speed data (2-tone/5-tone)

The demodulated signal from the FM IC (IC501) is amplified by IC500 to remove frequency of 300Hz or below.

The MCU digitizes this signal and decodes the signal after receive the signal at pin 26(HSDI).

(3) MSK / DTMF

The demodulated signal from the FM IC(IC501) will input to baseband IC(IC709), then the baseband IC will decode and send the decode information to MCU by the data line.

The MCU then processes the decoded information.

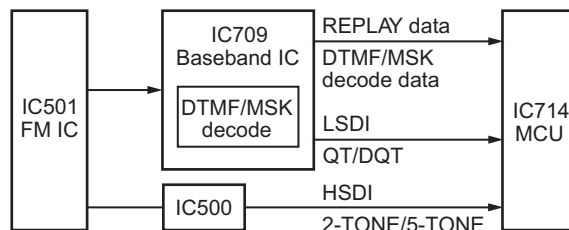


Fig.13 Decode

2.4.6.3 DMR Receiving

- For Digital Data Mode:
The demodulated signal from IC501 (Pin13) feed into baseband IC (Pin 16) for DMR decoding.
The decoded digital data will pass to MCU through C-BUS. MCU determines whether or not to output sound from speaker by checking if the data match.
- For Digital Voice Mode:
If the digital data match in MCU, the digital voice payload data will goes into Vocoder in MCU for conversion to PCM.
The PCM data will go to baseband IC through SPI input, where it will be converted to analog by DAC.
Analog voice will be filtered and finally send to audio amplifier.

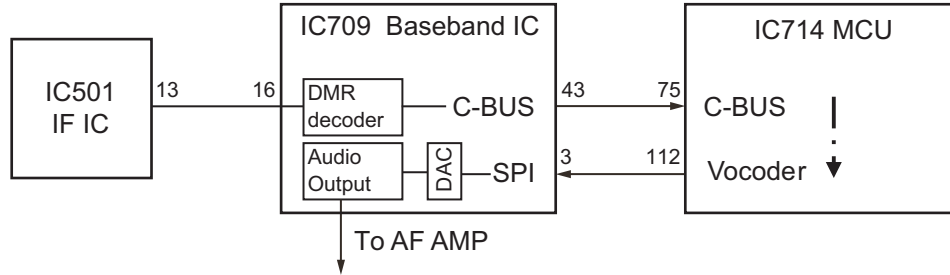


Fig.14 DMR receiver system

2.4.6.4 DMR Transmitting

- For Digital Data Mode:
The digital data will be generated by MCU, where it will be pass to baseband IC, through C-BUS for encoding process. The encoded data finally will transmit through TCXO and VCO modulation.
- For Digital Voice Mode:
The analog voice from mic will go to ADC (after audio filter) to convert to PCM data.
The PCM data will send to Vocoder through SPI output.
Vocoder will convert the PCM to DMR protocol, where it will be sent to baseband through C-BUS.
In baseband IC, the data will be encoded and finally transmit through TCXO and VCO modulation.

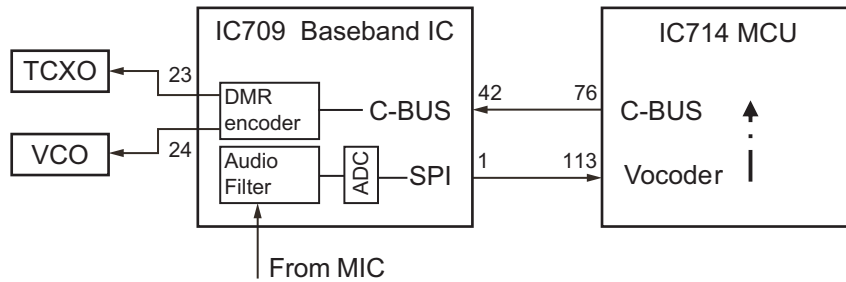


Fig.15 DMR transmit system

2.4.7 Power Supply Circuit

- When the power switch on the display unit is pressed, the power port on the display unit which is connected pin 116 (POWKEY), goes low, then pin90 (SBC) goes high, Q718 turns on, SB SW (Q719) turns on and power (SB) is supplied to the transceiver.
- When the DC power supplied to the transceiver, the voltage regulator IC (IC720 & IC718) and supply into the MCU VDD and reset voltage detect IC (IC723). IC723 will generate signal (RESET) into the reset terminal on the MCU (IC714) to carry out a power on reset.
- When the DC power voltage decreases from normal voltage, the INT voltage detector IC (IC722) will set to high on MCU port 141 (BATT_INT). If B line becomes less than about 8.5V, MCU will send the backup data to Flash memory (IC729) and go into STOP mode.

This circuit has an overvoltage protection circuit. If a DC voltage of 18V or higher is applied to the base of Q712, this voltage turns Q712 on and sets port 141 (BATT_INT) to low. As a result port 90 (SBC) is low, and turns Q718 and Q719 (SB) off.

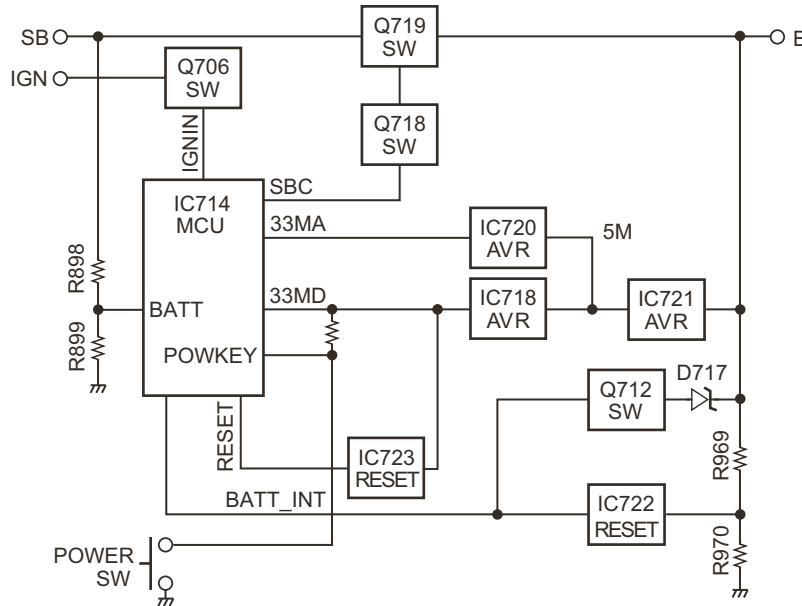


Fig.16 Power supply circuit

2.5 SEMICONDUCTOR DATA

2.5.1 MCU: 2F405ZGT6KGFA (MAIN unit IC714)

Pin No.	Port Name	I/O	Function
1	PLL_UL	I	PLL Unlock detect
2	FM_CSN	O	FM IC Chip select
3	FM_SCLK	O	FM IC Clock
4	FM_SDATA	I/O	FM IC Data In/Out
5	FM_RSTN	O	FM IC Hardware Reset
6	VBAT	-	33MD
7	FM_PDN	O	FM IC Power down
8	NC	O	No connection
9	NC	O	No connection
10	BSFT	O	Beat Shift
11	/H_L	O	TX Power Select
12	NC	O	No connection
13	NC	O	No connection
14	RSSI	I	RSSI input
15	SQIN	I	Squelch Input
16	VSS	-	GND
17	VDD	-	33MD
18	BEEP	O	Beep for Side Tone
19	FWD	I	Forward power Detect

Pin No.	Port Name	I/O	Function
20	REV	I	Reverse Power Detect
21	Ramp_Offset	O	Ramp offset Voltage
22	CVIN	I	CV voltage read
23	XIN	I	Crystal (19.2MHz)
24	NC	O	No connection
25	RESET	I	MCU Reset pin
26	HSDI	I	High-Speed Data Input
27	LSDI	I	Low-Speed Data Input
28	TEMP_1	I	Temperature 1
29	TEMP_2	I	Temperature 2
30	VDD	-	33MD
31	VSSA	-	GND
32	VREF+	-	33MA
33	VDDA	-	33MA
34	TEST_TX	O	
35	TEST_RX	I	
36	FNC_1	O	Function P1(TXD0)
37	FNC_2	I	Function P2(RXD0)
38	VSS	-	GND

Pin No.	Port Name	I/O	Function
39	VDD	-	33MD
40	LSDO	O	Low-Speed Data Output
41	HSDO	O	High-Speed Data Output
42	NC	O	No connection
43	TEMP_3	I	Temperature 3
44	NC	O	No connection
45	NC	O	No connection
46	BATT	I	BATT Voltage Detect
47	NC	O	No connection
48	BOOT1	I	Test Point to enable Bootloader
49	9RC	O	9R Control
50	5CC	O	5C Control
51	VSS	-	GND
52	VDD	-	33MD
53	PCBVER	I	PCB Version Check
54	SIM1	I	Shimuke Port 1
55	SIM2	I	Shimuke Port 2
56	TEST_1	I/O	
57	TEST_2	I/O	
58	HORN	O	Horn Alert
59	33BC	O	33B Control
60	/INT15P	I	I/O Expander Interrupt
61	VSS	-	GND
62	VDD	-	33MD
63	KMO1	O	Key Matrix Output 1
64	KMO2	O	Key Matrix Output 2
65	KMO3	O	Key Matrix Output 3
66	KMI1	I	Key Matrix Input 1
67	KMI2	I	Key Matrix Input 2
68	KMI3	I	Key Matrix Input 3
69	I2CCK	I/O	I/O Expander I2C Clock
70	I2CDT	I/O	I/O Expander I2C Data
71	VCAP_1	-	2.2uF
72	VDD	-	33MD
73	CML_SSOOUT	I	Audio Codec Chip Select
74	CML_EPSCLK	I	Audio Codec Clock
75	CML_EPSO	O	Audio Codec Data Out
76	CML_EPSI	I	Audio Codec Data In
77	S2GDT	O	No connection
78	G2SDT	I	No connection
79	NC	O	No connection
80	NC	O	No connection
81	NC	O	No connection
82	BUCNT1	O	PTT/TXD buffer control
83	VSS	-	GND

Pin No.	Port Name	I/O	Function
84	VDD	-	33MD
85	MKEYI	I	DTMF MIC key input
86	BUCNT2	O	DTMF MIC buffer control
87	PA	O	Public Address
88	IGNIN	I	Ignition Sense
89	SYSCLK2	I	System Clock 2
90	SBC	O	SB Control
91	PTT	I	PTT
92	HOOK	I	Hook
93	MKEYO	O	DTMF MIC Key Output
94	VSS	-	GND
95	VDD	-	33MD
96	CML_CDATA	O	C-Bus Command Data
97	CML_RDATA	I	C-Bus Command Reply Data
98	CML_SCLK	O	C-Bus Clock
99	CML_CSN	O	C-Bus Chip Select
100	SP_MUTE	O	Speaker Mute
101	TXD	O	Serial Data to Mic Jack
102	RXD	I	Serial Data from Mic Jack
103	TXRX	O	TX / RX Switch
104	AMP_SW	O	AF Amplifier
105	SWDIO	I/O	
106	VCAP2	-	2.2uF
107	VSS	-	GND
108	VDD	-	33MD
109	SWCLK	I/O	
110	F_CS	O	Flash Memory Chip Select
111	F_CLK	O	Flash Memory Clock
112	F_DI	I	Flash Memory Data In
113	F_DO	O	Flash Memory Data Out
114	F_WP	O	Flash Memory Write Protect
115	CML_IRQ	I	Baseband IC IRQ(CML_pin8)
116	POWKEY	I	Power Key Input
117	FNC_4	I	Function P4(CTS0)
118	FNC_3	O	Function P3(RTS0)
119	SCR_SW	O	SCR Switch
120	VSS	-	GND
121	VDD	-	33MD
122	33CC	O	33C Control
123	MIC1MUTE	O	MIC1 Mute Switch
124	MIC2MUTE	O	MIC2 Mute Switch
125	LEDI	O	LED Data
126	LECE	O	LED Enable
127	LECL	O	LED Clock
128	LELH	O	LED Latch

Pin No.	Port Name	I/O	Function
129	NC (LERE)	I	No connection
130	VSS	-	GND
131	VDD	-	33MD
132	PLL_PDN2	O	PLL IC Power Down
133	SWO	O	
134	SRST	O	
135	PLL_DATA	O	PLL IC Data
136	PLL_CLK	O	PLL IC Clock
137	PLL_LE	O	PLL IC Enable
138	BOOT_0		Test Point to enable Bootloader
139	ASTSW	O	Assist Speed-up Switch
140	W_N	O	Wide/Narrow Squelch Switch
141	BATT_INT	I	MSU stop
142	CML_RESET	O	Audio Codec Reset
143	Power On Reset	I	33MD
144	VDD	-	33MD

2.6 COMPONENTS DESCRIPTION

2.6.1 Display Unit (X54-3890-21)

Ref. No.	Part Name	Description
IC1	IC	LED driver
Q1, Q2	Transistor	TX/Busy indication LED switch
Q3, Q4	Transistor	KEY backlight control switch
Q5, Q9	Transistor	LED dimmer control switch
Q6	Transistor	Indication LED switch
Q7, Q8	Transistor	TX/Busy indication LED switch
D1~D5	LED	KEY backlight
D20	Diode	Voltage protection
D22	LED	Indication
D23	LED	TX/Busy indication
D33	Zener diode	Surge protection
D37	LED	LED display

2.6.2 MAIN Unit (XC1-1072-71)

Ref. No.	Part Name	Description
IC2	IC	PLL IC
IC3	IC	CV/Assist DC amplifier
IC301	IC	APC DC amplifier
IC500	IC	DETA/HSD amplifier
IC501	IC	FM IC
IC502	IC	Voltage regulator (33MS)
IC503	IC	RF BPF DC amplifier
IC700	IC	I2C level shifter
IC701	IC	3.3V level shifter (RXD0/CTS0)
IC702	IC	IO expander

Ref. No.	Part Name	Description
IC703	IC	5V level shifter (TXD0/RTS0)
IC704	IC	RS-232C driver
IC706	IC	MIC amp/VREF
IC707	IC	19.2MHz buffer
IC709	IC	Baseband IC
IC710	IC	Voltage regulator (33BD)
IC711	IC	SPC/AF amp
IC713	IC	19.2MHz amplifier
IC714	IC	MCU
IC717	IC	Voltage regulator (9C)
IC718	IC	Voltage regulator (33MD)
IC720	IC	Voltage regulator (33MA)
IC721	IC	Voltage regulator (5M)
IC722	IC	Voltage detection (INT)
IC723	IC	Voltage detection (RESET)
IC724	IC	5V level shifter (MKEY/PTT)
IC725	IC	3.3V level shifter (MKEY/HOOK)
IC726	IC	Voltage regulator (33C)
IC729	IC	Flash Memory
Q3, Q4	FET	Assist filter control switch
Q5	FET	RX VCO
Q6	FET	TX/RX VCO switch
Q7	FET	TX VCO
Q9	Transistor	TX/RX VCO switch
Q10	Transistor	Ripple filter
Q11	Transistor	VCO buffer amp
Q13	Transistor	VCO common amp1
Q15	Transistor	TX/RX VCO switch
Q300	FET	Drive amp
Q302	FET	DC switch (Drive Gate)
Q303	Transistor	DC switch control (Drive Gate)
Q304	Transistor	DC switch
Q306	FET	High/Low power switch
Q308	Transistor	DC switch control (ANT SW)
Q309	FET	DC switch (ANT SW)
Q500	Transistor	RX 2nd local amp
Q501	Transistor	1st IF amp
Q503	FET	Mixer
Q504	Transistor	Squelch charge switch
Q505	Transistor	Squelch charge control switch
Q506	Transistor	Front-end LNA
Q509~511	Transistor	Wide/Narrow switch
Q700	FET	MIC mute switch
Q701	Transistor	MIC mute switch
Q702	Transistor	Horn alert control switch

Ref. No.	Part Name	Description
Q703	FET	Horn alert switch
Q704	Transistor	DETO amp
Q705	FET	MOD2 switch
Q706	Transistor	Ignition sense control switch
Q707	Transistor	9R control switch
Q708	Transistor	9T control switch
Q709	Transistor	9R switch
Q710	Transistor	9T switch
Q711	Transistor	5C control switch
Q712, 713	Transistor	Overvoltage detect
Q714	FET	Speaker mute switch
Q715	FET	Scrambler switch
Q716	Transistor	5C switch
Q717	FET	33BA switch
Q718	Transistor	SB control switch
Q719	FET	SB switch
Q720	Transistor	AF amp switch
Q721	FET	5MS switch
Q722	Transistor	5MS control switch
Q723	Transistor	33BA control switch
Q725	Transistor	33LS switch
Q726	Transistor	33LS control switch
D5	Variable Capacitance Diode	TX VCO tune
D7	Variable Capacitance Diode	RX VCO tune
D9, 10	Variable Capacitance Diode	TX VCO tune
D11	Variable Capacitance Diode	TX VCO tune
D12~14	Variable Capacitance Diode	RX VCO tune
D15	Variable Capacitance Diode	Modulation Control (TX VCO)
D16, D17	Diode	TX/RX band switch
D300	Zener Diode	Voltage Protection
D304	Diode	Reverse power rectifier
D305, D306	Diode	ANT switch
D307, D308	Diode	Power rectifier
D309, D310	Diode	ANT switch
D501~D504	Variable Capacitance Diode	RF BPF tuning
D506	Variable Capacitance Diode	RF BPF tuning
D508	Variable Capacitance Diode	RF BPF tuning

Ref. No.	Part Name	Description
D510, D511	Diode	Voltage Protection
D700~D702	Diode	Surge protection
D703	Diode	Reverse current prevention
D704~D711	Diode	Surge protection
D712	Diode	Reverse Current Prevention
D713	Diode	MIC AGC detection
D717	Zener Diode	Voltage Protection
D718	Diode	Reverse Current Prevention
D720	Diode	Reverse Current Prevention
D721	Diode	Reverse Current Prevention
D722	Zener Diode	Voltage Protection
D723	Surge Absorber	Surge Protection
D724	Diode	Voltage Protection
D725, D726	Diode	Reverse Current Prevention

2.7 TERMINAL FUNCTION

2.7.1 Display unit (X54-3890-21)

Pin No.	Name	I/O	Function
CN1			
1	POWER	O	Detection output of power switch
2	MKEY	I/O	MIC data detection
3	PTT/TXD	I/O	PTT/PC serial data
4	HOOK/RXD	I/O	HOOK/PC serial data
5	ME	-	MIC ground
6	MIC	O	MIC signal output
7	GND	-	Ground
8	NC	-	-
9	LELH	I	LED latch input
10	LECL	I	LED clock input
11	LECE	I	LED enable input
12	LEDI	I	LED data input
13	5C	I	5V DC power supply
14	KMI3	O	Key matrix output 3
15	KMI2	O	Key matrix output 2
16	KMI1	O	Key matrix output 1
17	KMO3	I	Key matrix input 3
18	KMO2	I	Key matrix input 2
19	KMO1	I	Key matrix input 1
20	BLED	I	Blue LED control signal input
21	GLED	I	Green LED control signal input
22	RLED	I	Red LED control signal input
23	MBL	I	MIC backlight control signal input

Pin No.	Name	I/O	Function
24	LEDM	I	LED dimmer input
25	SP-	I	Speaker input -
26	SP-	I	Speaker input -
27	SP+	I	Speaker input +
28	SP+	I	Speaker input +
29	SB	I	Battery voltage DC supply
30	SB	I	Battery voltage DC supply
J1(MIC Jack)			
1	MBL	O	Backlight of Microphone
2	SB	O	Battery voltage DC supply
3	GND	-	Ground
4	PTT	I/O	PTT/ PC serial data from radio
5	ME	-	MIC ground
6	MIC	I	MIC signal input
7	HOOK	I	HOOK/ PC serial data to radio
8	DM	I/O	MIC data detection

2.7.2 Main unit (XC1-1072-71)

Pin No.	Name	I/O	Function
CN700			
1	SB	O	Battery voltage DC supply
2	SB	O	Battery voltage DC supply
3	SP-	O	Speaker input -
4	SP-	O	Speaker input -
5	SP+	O	Speaker input +
6	SP+	O	Speaker input +
7	LEDM	O	LED dimmer output
8	MBL	O	MIC backlight control signal output
9	REDLED	O	Red LED control signal output
10	GRNLED	O	Green LED control signal output
11	BLULED	O	Blue LED control signal output
12	KMO1	O	Key matrix output 1
13	KMO2	O	Key matrix output 2
14	KMO3	O	Key matrix output 3
15	KMI1	I	Key matrix input 1
16	KMI2	I	Key matrix input 2
17	KMI3	I	Key matrix input 3
18	5MS	O	5V DC power supply
19	LEDI	O	LED data output
20	LECE	O	LED enable output
21	LECL	O	LED clock output
22	LELH	O	LED latch output
23	LERE	O	LED reset output

Pin No.	Name	I/O	Function
24	GND	-	Ground
25	MIC	I	MIC signal input
26	ME	-	MIC ground
27	HOOK/RXD	I/O	HOOK/PC serial data
28	PTT/TXD	I/O	PTT/PC serial data
29	MKEY	I/O	MIC data detection
30	POWER	I	Detection input of power switch
J700 (D-SUB 15pin)			
1	SB	O	Battery voltage DC supply DC 13.6V±15%,1.0A max
2	ING	I	Ignition sens input,16.0V max
3	SP2	O	Speaker output
4	DETO	O	FM detector output, 500mVp-p
5	DATAI	I	External transmit signal input 200±50mVp-p
6	FNC1	I/O	Programable I/O (programmed by FPU) 1.0mA max.
7	FNC2	I/O	Programable I/O (programmed by FPU) 1.0mA max.
8	FNC3	I/O	Programable I/O (programmed by FPU) 1.0mA max.
9	FNC4	I/O	Programable I/O (programmed by FPU) 1.0mA max.
10	FNC5	I/O	Programable I/O (programmed by FPU) 1.0mA max.
11	FNC6	I/O	Programable I/O (programmed by FPU) 1.0mA max.
12	5MS	O	5V DC power supply, 100mA max
13	HR1	O	Horn alert signal output,16.0V/ 2.0A max.
14	HR2	O	Horn alert signal output,16.0V/ 2.0A max.
15	GND	-	Ground

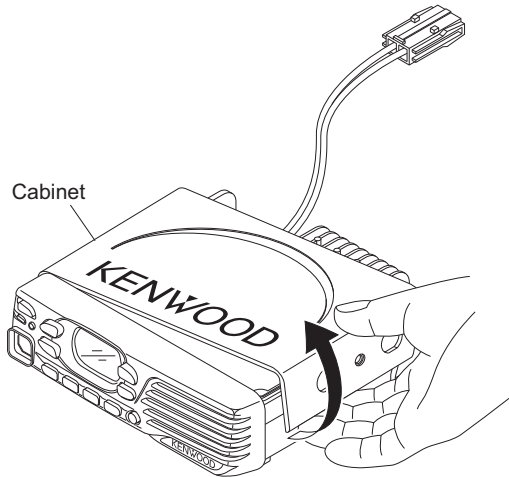
2.7.3 Function Port Assignment

	GPS (NMEA)	
	Name	I/O
FNC1	None	O
FNC2	GPS (NMEA Input)	I
FNC3	-	-
FNC4	-	-
FNC5	-	-
FNC6	-	-
FNC7	-	-
FNC8	-	-

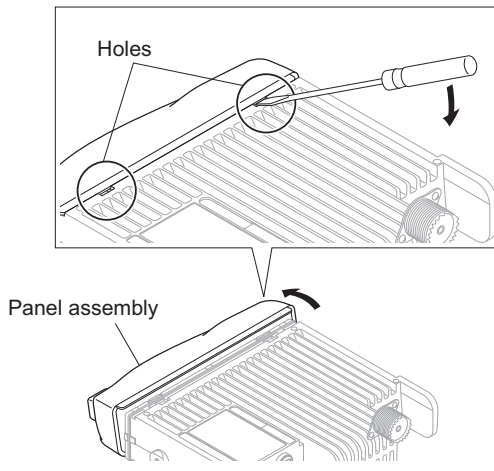
SECTION 3 DISASSEMBLY

3.1 Disassembly Procedure

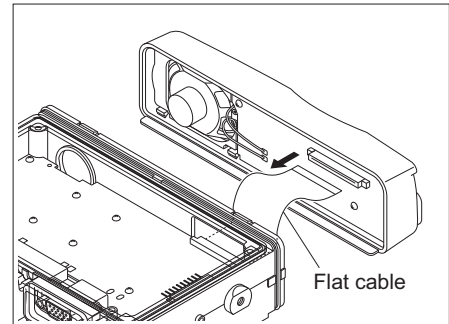
- (1) When removing the cabinet, first remove the two screws from the right and left with a phillips screwdriver. Then, hook your finger on the edge of the cabinet and pull it out until it is over the chassis protrusion. Remove the cabinet by prying the cabinet as shown below. Remove the shielding plate of the transceiver (E type only).



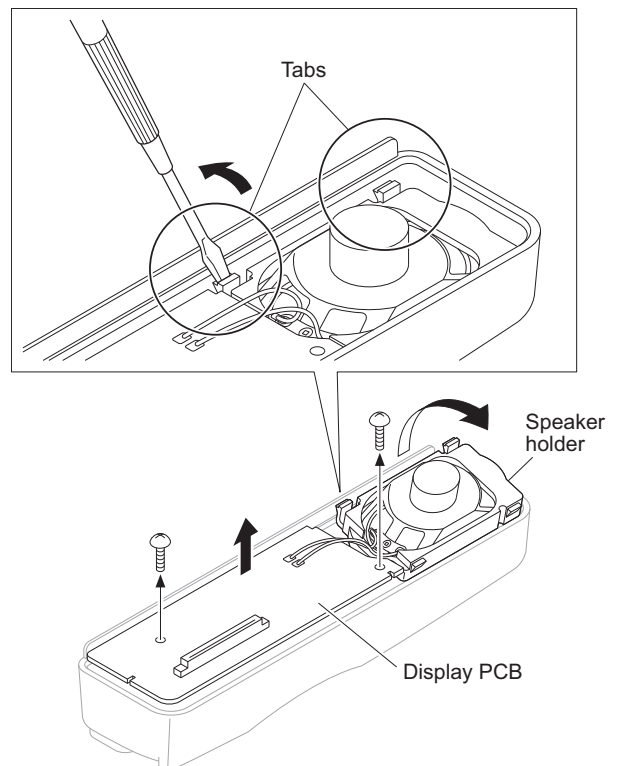
- (2) To remove the panel assembly, first turn the transceiver upside down. Then, insert a flat-head screwdriver into the holes of the chassis and tilt it in the direction as shown by the arrow.



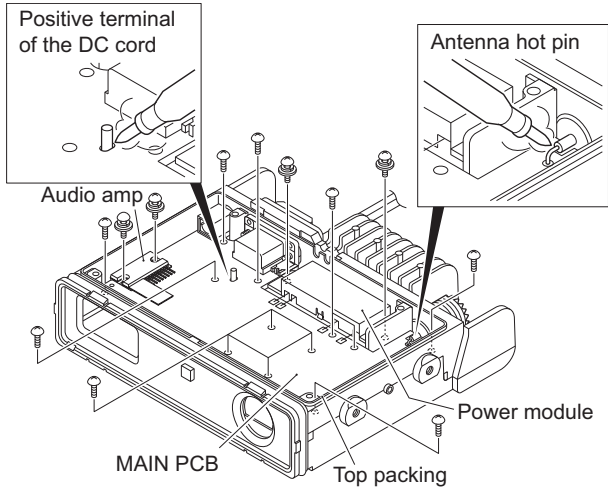
- (3) Disconnect the flat cable from connector of the panel assembly.



- (4) To remove the speaker holder, first remove the two screws from the display PCB using a phillips screwdriver. Then, insert a flat-head screwdriver under the tabs of the speaker holder and tilt it in the direction shown by the arrow. Remove the speaker from the front panel by turning it in the direction indicated, together with the speaker holder and display PCB.

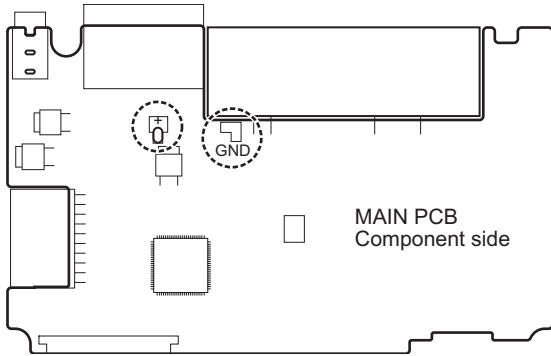


- (5) When removing the MAIN PCB, first remove the top packing. Then, remove the solder of the antenna hot pin and positive terminal of the DC cord. Remove the 17 screws from the MAIN PCB, power module, and audio amp.

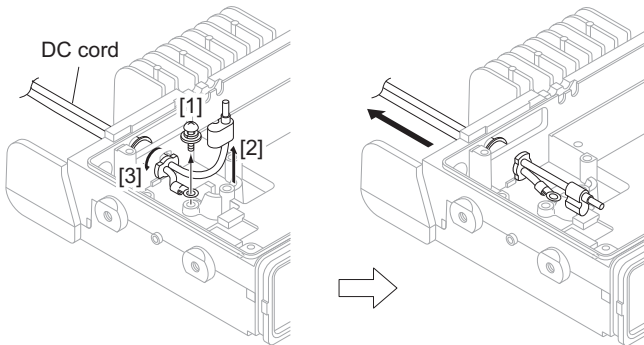


Note:

When you supply power to the MAIN PCB after removing the MAIN PCB from the chassis, solder the positive and ground terminals of the DC cord (Recommendation: E30-3448-25) to the + and GND terminals of the MAIN PCB.

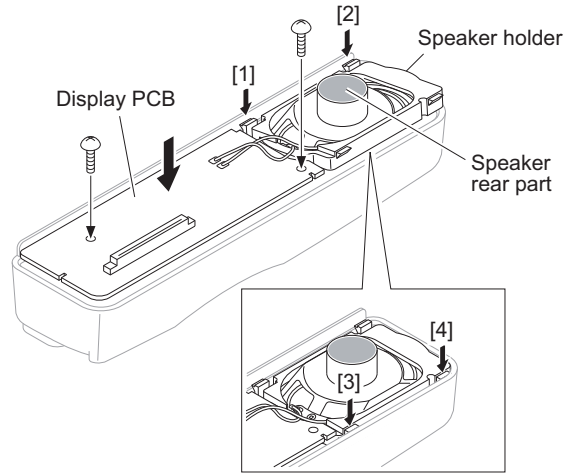


- (6) Pull it out behind the chassis by rotating the bush [3] of the DC cord 90 degrees in the direction of the arrow after the screw [1] in the negative terminal is removed, and the positive terminal [2] is removed from the chassis.

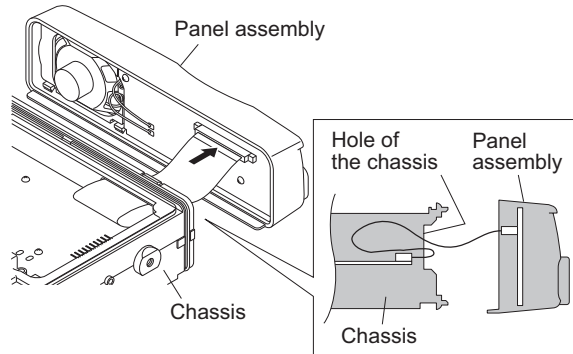


3.2 Precautions for Reassembly

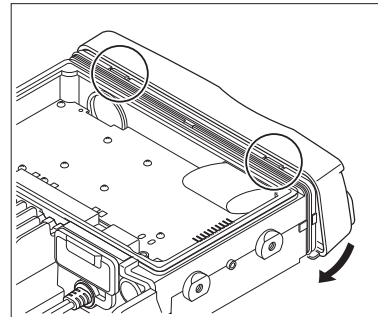
- (1) When mounting the speaker holder, while suppressing the speaker rear part (shaded area), fix the four tabs of the speaker holder into the hollows of the front panel in order ([1], [2], [3], and [4]). Then, tighten the two screws of the display PCB.



- (2) When mounting the panel assembly, pass the flat cable through the hole of the chassis as shown below then connect the flat cable to connector of the panel assembly.

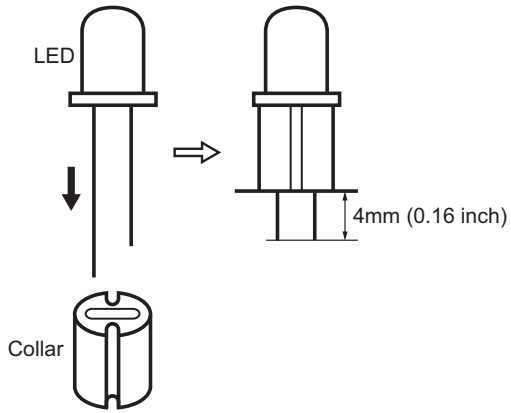


- (3) Fit the panel assembly into the two tabs of the chassis top side first. Then, fit the panel assembly into the two tabs of the chassis bottom side by turning the panel assembly.



3.3 Correspondence when replacing the LED (B30-2321-05)

When replacing the LED (B30-2321-05), cut the leg of the LED to 4mm (0.16 inch) after installing the Collar (J31-0565-15).



SECTION 4 ADJUSTMENT

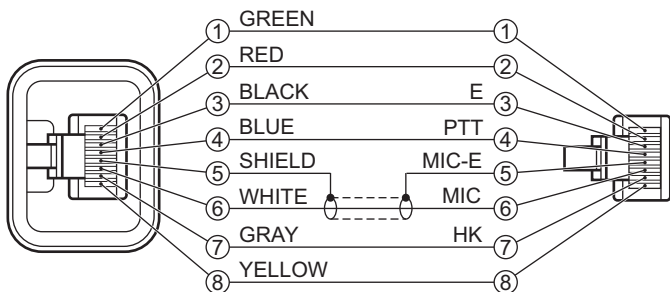
4.1 K2, M2 TYPE

Test Equipment Required for Alignment

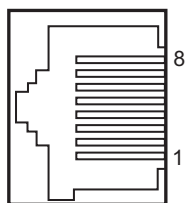
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	100 to 520MHz
	Modulation	Frequency modulation and external modulation
	Output	-127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	100 to 520MHz
	Measuring Range	Vicinity of 100W
3. Deviation Meter	Frequency Range	100 to 520MHz
4. Digital Volt Meter (DVM)	Measuring Range	10mV to 20V DC
	Input Impedance	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		20A
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. 4Ω Dummy Load		Approx. 4Ω, 10W
12. Regulated Power Supply		9V to 17V, approx. 20A Useful if ammeter equipped

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

■ Test cable for microphone input (E30-3360-28)



■ MIC connector (Front panel view)

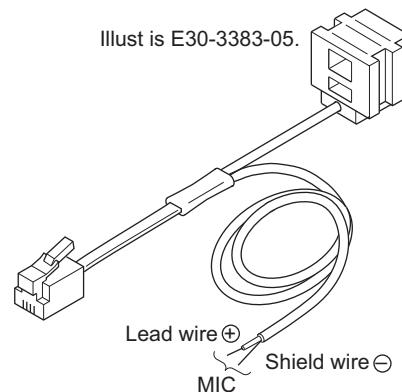


- 1 : MBL
- 2 : SB
- 3 : GND
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : DM

■ Tuning cable (E30-3383-05 or E30-7754-05)

Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used.

See "PC Mode" section for the connection.



4.2 Frequency and Signaling

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

■Test frequency

Channel No.	RX (MHz)	TX (MHz)
1	435.05000	435.10000
2	400.05000	400.10000
3	469.95000	469.90000
4	435.00000	435.00000
5	435.20000	435.20000
6	435.40000	435.40000
7~16	-	-

■Analog mode Signaling

Signaling No.	RX	TX
1	None	None
2	None	100Hz Square wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 254.1Hz	QT 254.1Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF Decode (CODE: 159D)	DTMF Encode (CODE: 159D)
10	None	DTMF Encode (CODE: 9)
11	Single Tone: 979.9Hz	Single Tone: 979.9Hz
12	None	Single Tone: 1000Hz
13	None	MSK PN9
14	MSK Decode	MSK Encode

■DMR mode signaling

No.	RX	TX
1	CC 00 Burst	CC 00 Burst
2	PN9 Continuous Pattern	PN9 Continuous Pattern
3	CC 00 Burst	Maximum Deviation Continuous Pattern
5	CC 00 Burst	0 Continuous Pattern
6	SYNC (Each slot) + PN9 Burst Pattern	SYNC (Each slot) + PN9 Burst Pattern

PN9:Pseudo-Random Pattern (for production only)

4.3 Preparations for Tuning the Transceiver

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

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

The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

■5 reference level adjustments frequency

Tuning point	RX (MHz)	TX (MHz)
Low	400.05000	400.10000
Low'	417.55000	417.60000
Center	435.05000	435.10000
High'	452.55000	452.60000
High	469.95000	469.90000

4.3.1 Adjustment item supplement

Adjustment Item	Description
Receive Assist	The lock voltage of VCO (Receive) is adjusted. This item must be adjusted before all adjustment items for receiver section are adjusted.
Transmit Assist	The lock voltage of VCO (Transmit) is adjusted. This item must be adjusted before all adjustment items for transmitter section are adjusted.
Frequency	The Transmit Frequency is adjusted.
Ramp Offset	Adjust this item to the optimal Ramp voltage.
High Transmit Power	High Transmit Power is adjusted.
Mid Transmit Power (K type only)	Mid Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Balance	The transmit audio 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 (DMR)	Maximum Deviation of DMR is adjusted.
Maximum Deviation (Analog Wide/ Narrow)	Maximum Deviation of Analog (Wide/ Narrow) is adjusted. This item must be adjusted before all adjustment items for tone deviations are adjusted.
QT Deviation	QT tone deviation is adjusted.
DQT Deviation	DQT tone deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in or "2-tone" is adjusted.
DTMF Deviation	DTMF tone deviation is adjusted.
MSK Deviation	MSK tone deviation is adjusted.
Sensitivity 1	Band-Pass Filter is adjusted. The performance of Receive Sensitivity is improved.
Sensitivity 2	Band-Pass Filter is adjusted. The performance of the interfering wave is improved.

Adjustment Item	Description
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Open Squelch	The squelch level at level "5" is adjusted.
Low RSSI	RSSI level is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)
Tight Squelch	The squelch level at level "9" is adjusted.

4.3.2 Adjustment item

Order	Adjustment item	Aw (Analog Wide)	An (Analog Narrow)	Dn (DMR)	Adjust item Number
		Adjustment range			
1	Receive Assist	5 point ADJ			Common Section 2
		1 ~ 1024			
2	Transmit Assist	5 point ADJ			Common Section 3
		1 ~ 1024			
3	Frequency	1 point ADJ			Common Section 4
		1 ~ 1024			
4	Ramp Offset	1 point ADJ			Transmitter Section 1
		1 ~ 512			
5	High Transmit Power	-	5	-	Transmitter Section 2
		1 ~ 1024			
6	Mid Transmit Power (K type only)	-	5	-	Transmitter Section 3
		1 ~ 1024			
7	Low Transmit Power	-	5	-	Transmitter Section 4
		1 ~ 1024			
8	Balance	-	5	-	Transmitter Section 5
		1 ~ 70			
9	Maximum Deviation (DMR)	-	-	5	Transmitter Section 6
		1 ~ 1024			
10	Maximum Deviation (Analog)	5	5	-	Transmitter Section 7
		1 ~ 1024			
11	QT Deviation	5	5	-	Transmitter Section 8
		1 ~ 1024			
12	DQT Deviation	5	5	-	Transmitter Section 9
		1 ~ 1024			
13	Single Tone Deviation	5	5	-	Transmitter Section 10
		1 ~ 1024			
14	Sensitivity 1	-	5	-	Receive Section 2
		1 ~ 1024			
15	Sensitivity 2	-	5	-	Receive Section 3
		1 ~ 1024			
16	RSSI Reference	-	5	-	Receive Section 4
		1 ~ 1024			
17	Open Squelch	5	5	5	Receive Section 5
		1 ~ 1024			

Order	Adjustment item	Aw (Analog Wide)	An (Analog Narrow)	Dn (DMR)	Adjust item Number
		Adjustment range			
18	Low RSSI	-	5	-	Receive Section 6
		1 ~ 1024			
19	High RSSI	-	5	-	Receive Section 7
		1 ~ 1024			
20	Tight Squelch	5	5	-	Receive Section 8
		1 ~ 1024			
21	DTMF Deviation	5	5	-	Transmitter Section 11
		1 ~ 1024			
22	MSK Deviation	5	5	-	Transmitter Section 12
		1 ~ 1024			

4.4 Radio check Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test- equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter		ANT			Check	435.099347~ 435.100653M Hz (±1.5ppm@ 435.1MHz)
2. High power check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	K: 40.0W~50.0W 13A or less M: 20.0W~30.0W 10A or less
	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	K: 40.0W~50.0W 13A or less M: 20.0W~30.0W 10A or less
	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	K: 40.0W~50.0W 13A or less M: 20.0W~30.0W 10A or less
2. Mid power check (K type only)	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less
	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less
	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Low power check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
4. MIC sensi- sitivity check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM		ANT SP/MIC connector			Adjust AG input to get a standard MOD.	Dev 1.5kHz at 5.0mV ±1.0mV
5. Sensitivity check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 SSG output Wide: -115dBm (0.40μV) (MOD: 1kHz/±3kHz) Narrow: -115dBm (0.40μV) (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope Distortion meter 4Ω Dummy load		ANT SP/MIC connector			Check	12dB SINAD or more


4.5 Common Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage:13.6V 2) SSG standard modulation [Wide 5k] MOD:1kHz,DEV:3kHz [Narrow] MOD:1kHz,DEV:1.5kHz							
2.Receive Assist	1) Adj item: [Receive Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.					[FPU] [<][>]	[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 approximate- ly 3 seconds after the adjustment value is changed.	2.4~2.6V Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted.

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Transmit Assist	1) Adj item: [Transmit Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.					FPU [<][>]	[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.	2.4~2.6V Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted.
4. Frequency	1) Adj item: [Frequency] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value. 2) Adj item: [Center]	f. counter		ANT		[FPU] [<][>]	435.100MHz	435.099950~435.100050MHz

4.6 Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Ramp Offset	1) Adj item: [Ramp Offset] 2) Adj item: [Center]					[FPU] [<][>]	Write the value as followings. 1 Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.	
2. High transmit power	1) Adj item: [High Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter		ANT		[FPU] [<][>]	K: 45.0W M: 25.0W	±1.0W K: 13A or less M: 10A or less Press [Apply] button to store the adjustment value whenever each adjustment points have been adjusted.
3. Mid transmit power (K type only)	1) Adj item: [Mid Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter		ANT		[FPU] [<][>]	25.0W	±1.0W 10A or less Press [Apply] button to store the adjustment value whenever each adjustment points have been adjusted.

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Low transmit power	1) Adj item: [Low Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter		ANT		[FPU] [<][>]	5.0W	±0.2W 7.0A or less Press [Apply] button to store the adjustment value whenever each adjustment points have been adjusted.
5. Balance 1 *1 *2	1) Adj item: [Balance] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value. [2kHz Sine Wave Check box]: Check while transmitting change to 2kHz.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	The Deviation of 20Hz frequency is fixed. Change the 2kHz adjustment value to become the same deviation of 20Hz within the specified range.	2kHz Tone deviation is within ±0.2dB of 20Hz tone deviation. Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
5. Balance 2 *1 *2	1) Adj item: [Balance] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value. [Square Wave Check box]: Check while transmitting change to Square Wave.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	Make the demodulation wave into square wave.	
<p>*1 : Refer to the "4.6.1 Necessary Deviation adjustment item for each signaling and mode" table. Balance adjustment is common with the adjustment of all signaling deviations. *2 :Only 1 Balance needs to be adjusted (either Balance 1 or Balance 2).</p>								
6. Maximum Deviation (DMR) *3	1) Adj item: [Maximum Deviation (DMR)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2749Hz	2695~2803Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. Maximum deviation (Analog) *3	1) Adj item: [Maximum Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2100Hz	2050~2150Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
	1) Adj item: [Maximum Deviation (Analog Wide)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	4200Hz	4150~4250Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
*3: Refer to the "4.6.1 Necessary Deviation adjustment item for each signaling and mode" table. Regarding Maximum Deviation (Analog), it is common with the adjustment of all analog signalings.								
8. QT Deviation *4	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.35kHz	0.35kHz ±0.05kHz
	1) Adj item: [QT Deviation(Analog Wide)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.75kHz	0.75kHz ±0.05kHz

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. DQT Deviation *4	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.35kHz	0.35kHz ±0.05kHz
	1) Adj item: [DQT Deviation(Analog Wide)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.75kHz	0.75kHz ±0.05kHz
10. Single Tone Deviation *4	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.50kHz	1.50kHz ±0.05kHz
	1) Adj item: [Single Tone Deviation (Analog Wide)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	3.00kHz	3.00kHz ±0.05kHz
*4: Refer to the "4.6.1 Necessary Deviation adjustment item for each signaling and mode" table.								
11. DTMF Deviation	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.25kHz	1.25kHz ±0.05kHz
	1) Adj item: [DTMF Deviation (Analog Wide)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2.50kHz	2.50kHz ±0.05kHz

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. MSK Deviation	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.50kHz	1.50kHz ±0.05kHz
	1) Adj item: [MSK Deviation (Analog Wide)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	3.00kHz	3.00kHz ±0.05kHz

4.6.1 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
Analog	Audio	1. Balance 2. Maximum Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow]
	QT	1. Balance 2. Maximum Deviation [Analog Wide] 3. QT Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. QT Deviation [Analog Narrow]
	DQT	1. Balance 2. Maximum Deviation [Analog Wide] 3. DQT Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. DQT Deviation [Analog Narrow]
	2TONE	1. Balance 2. Maximum Deviation [Analog Wide] 3. Single Tone Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [Analog Narrow]
	DTMF	1. Balance 2. Maximum Deviation [Analog Wide] 3. DTMF Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. DTMF Deviation [Analog Narrow]
	MSK	1. Balance 2. Maximum Deviation [Analog Wide] 3. MSK Deviation [Analog Wide]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. MSK Deviation [Analog Narrow]
DMR	Audio	-	1. Balance 2. Maximum Deviation [DMR]

- 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/Analog Narrow) is common with all the analog signaling deviations. If Balance and Maximum Deviation (Analog Wide/Analog Narrow) (Transmitter Section 7) have already adjusted, please skip Step2 and adjust from Step3.

4.7 Receiver Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 Wide 5k/Narrow: Narrow Beat Shift: Uncheck Compander: Uncheck SSG output:-47dBm (1mV) (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connec- tor		[FPU] [<][>]	Volume Up/Down key to obtain 1.41V AF output. (0.5W@4ohm Load)	1.4V±0.1V
2. Sensitivity 1 (SENS1)	1) Adj item: [Sensitivity 1] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value. SSG output:-100dBm(2.24µV) (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connec- tor		[FPU] [<][>]	Press the "Auto Tuning" [Start] button, or decrease the adjustment value from the preset value to get the maximum RSSI level. Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted. Preset value Low : 320 Low' : 400 Center : 500 High' : 640 High : 800	RSSI Peak Caution: Perform the adjustment of "3. Sensitivity 2" before performing this adjustment.
3. Sensitivity 2 (SENS2)	1) Adj item: [Sensitivity 2] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.	SSG DVM AF VM Dummy load		ANT SP/MIC connec- tor		[FPU] [<][>]	Write Preset value. (Fixed value) Low : 300 Low' : 430 Center : 590 High' : 720 High : 860	
4.* RSSI Reference	1) Adj item: [RSSI Reference (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -3dB (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connec- tor		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because RSSI Reference (Analog Wide 5k and DMR) is adjusted by adjusting RSSI Reference (Analog Narrow), it is not necessary to adjust RSSI Reference (Analog Wide 5k and DMR).
5. Open Squelch (DMR)	1) Adj item:[Open Squelch (DMR)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Reference SSG output: 12dB SINAD level@Analog Narrow -3dB (CW (without modulation))	SSG Distortion meter Oscilloscope		ANT SP/MIC connec- tor		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	

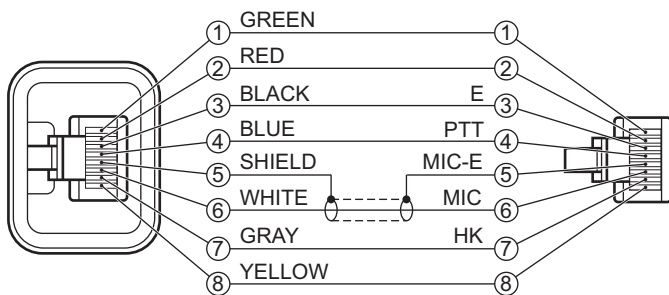
Item	Condition	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Open Squelch (Analog Narrow)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level -1dB (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
5. Open Squelch (Analog Wide 5k)	1) Adj item: [Open Squelch (Analog Wide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level -1dB (MOD:1kHz/±3.0kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
6.* Low RSSI	1) Adj item:[Low RSSI (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output :-118dBm (0.28uV) (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because Low RSSI at -118dBm (Analog Wide 5k and DMR) is adjusted by adjusting Low RSSI at -118dBm (Analog Narrow), it is not necessary to adjust Low RSSI at -118dBm (Analog Wide 5k and DMR).
7.* High RSSI	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output : -80dBm (22.4uV) (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because High RSSI at -80dBm (Analog Wide 5k and DMR) is adjusted by adjusting High RSSI at -80dBm (Analog Narrow), it is not necessary to adjust High RSSI at -80dBm (Analog Wide 5k and DMR).
8. Tight Squelch (Analog Narrow)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level +3dB (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
8. Tight Squelch (Analog Wide 5k)	1) Adj item: [Open Squelch (Analog Wide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level +3dB (MOD:1kHz/±3.0kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	

4.8 E TYPE
Test Equipment Required for Alignment

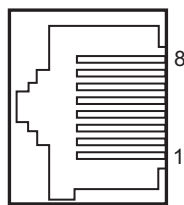
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	100 to 520MHz
	Modulation	Frequency modulation and external modulation
	Output	-127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	100 to 520MHz
	Measuring Range	Vicinity of 100W
3. Deviation Meter	Frequency Range	100 to 520MHz
4. Digital Volt Meter (DVM)	Measuring Range	10mV to 20V DC
	Input Impedance	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		20A
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. 4Ω Dummy Load		Approx. 4Ω, 10W
12. Regulated Power Supply		9V to 17V, approx. 20A Useful if ammeter equipped

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

■ **Test cable for microphone input (E30-3360-28)**



■ **MIC connector (Front panel view)**

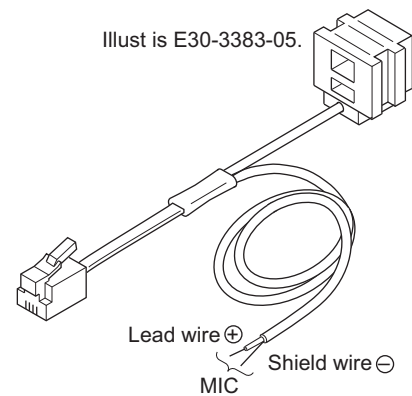


- 1 : MBL
- 2 : SB
- 3 : GND
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : DM

■ **Tuning cable (E30-3383-05 or E30-7754-05)**

Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used.

See "PC Mode" section for the connection.



4.9 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.

■Test frequency

Channel No.	RX (MHz)	TX (MHz)
1	435.05000	435.10000
2	400.05000	400.10000
3	469.95000	469.90000
4	435.00000	435.00000
5	435.20000	435.20000
6	435.40000	435.40000
7~16	-	-

■Analog mode signaling

No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	QT 67.0 Hz	QT 67.0 Hz
4	QT 151.4 Hz	QT 151.4 Hz
5	QT 210.7 Hz	QT 210.7 Hz
6	QT 254.1 Hz	QT 254.1 Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF Decode (CODE: 159D)	DTMF Encode (CODE: 159D)
10	None	DTMF Encode (CODE: 9)
11	Single Tone: 979.9Hz	Single Tone: 979.9Hz
12	None	Single Tone: 1000Hz
13	None	MSK PN9
14	MSK Decode	MSK Encode

■DMR mode signaling

No.	RX	TX
1	CC 00 Burst	CC 00 Burst
2	PN9 Continuous Pattern	PN9 Continuous Pattern
3	CC 00 Burst	Maximum Deviation Continuous Pattern
5	CC 00 Burst	0 Continuous Pattern
6	SYNC (Each slot) + PN9 Burst Pattern	SYNC (Each slot) + PN9 Burst Pattern

PN9:Pseudo-Random Pattern (for production only)

4.10 Preparations for Tuning the Transceiver

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

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

The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

■5 reference level adjustments frequency

Tuning point	RX (MHz)	TX (MHz)
Low	400.05000	400.10000
Low'	417.55000	417.60000
Center	435.05000	435.10000
High'	452.55000	452.60000
High	469.95000	469.90000

4.10.1 Adjustment item supplement

Adjustment Item	Description
Receive Assist	The lock voltage of VCO (Receive) is adjusted. This item must be adjusted before all adjustment items for receiver section are adjusted.
Transmit Assist	The lock voltage of VCO (Transmit) is adjusted. This item must be adjusted before all adjustment items for transmitter section are adjusted.
Frequency	The Transmit Frequency is adjusted.
Ramp Offset	Adjust this item to the optimal Ramp voltage.
High Transmit Power	High Transmit Power is adjusted.
Low Transmit Power	Low Transmit Power is adjusted.
Balance	The transmit audio 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 (DMR)	Maximum Deviation of DMR is adjusted.
Maximum Deviation (Analog Wide 5k/ Wide 4k/ Narrow)	Maximum Deviation of Analog (Wide 5k/ Wide 4k/Narrow) is adjusted. This item must be adjusted before all adjustment items for tone deviations are adjusted.
QT Deviation	QT tone deviation is adjusted.
DQT Deviation	DQT tone deviation is adjusted.
Single Tone Deviation	The deviation of Single Tone used in or "5-tone" is adjusted.
DTMF Deviation	DTMF tone deviation is adjusted.
MSK Deviation	MSK tone deviation is adjusted.
Sensitivity 1	Band-Pass Filter is adjusted. The performance of Receive Sensitivity is improved.
Sensitivity 2	Band-Pass Filter is adjusted. The performance of the interfering wave is improved.
RSSI Reference	The minimum RSSI level for scan stop is adjusted.
Open Squelch	The squelch level at level "5" is adjusted.

Adjustment Item	Description
Low RSSI	RSSI level is adjusted.
High RSSI	Both "Low RSSI" and "High RSSI" must be adjusted. (The curve data of RSSI level is applied.)
Tight Squelch	The squelch level at level "9" is adjusted.

4.10.2 Adjustment item

Order	Adjustment item	Aw (Analog Wide 5k)	As (Analog Wide 4k)	An (Analog Narrow)	Dn (DMR)	Adjust item Number
		Adjustment range				
1	Receive Assist	5 point ADJ				Common Section 2
		1 ~ 1024				
2	Transmit Assist	5 point ADJ				Common Section 3
		1 ~ 1024				
3	Frequency	1 point ADJ				Common Section 4
		1 ~ 1024				
4	Ramp Offset	1 point ADJ				Transmitter Section 1
		1 ~ 512				
5	High Transmit Power	-	-	5	-	Transmitter Section 2
		1 ~ 1024				
6	Low Transmit Power	-	-	5	-	Transmitter Section 3
		1 ~ 1024				
7	Balance	-	-	5	-	Transmitter Section 4
		1 ~ 70				
8	Maximum Deviation (DMR)	-	-	-	5	Transmitter Section 5
		1 ~ 1024				
9	Maximum Deviation (Analog)	5	5	5	-	Transmitter Section 6
		1 ~ 1024				
10	QT Deviation	5	5	5	-	Transmitter Section 7
		1 ~ 1024				
11	DQT Deviation	5	5	5	-	Transmitter Section 8
		1 ~ 1024				
12	Single Tone Deviation	5	5	5	-	Transmitter Section 9
		1 ~ 1024				
13	Sensitivity 1	-	-	5	-	Receive Section 2
		1 ~ 1024				
14	Sensitivity 2	-	-	5	-	Receive Section 3
		1 ~ 1024				
15	RSSI Reference	-	-	5	-	Receive Section 4
		1 ~ 1024				
16	Open Squelch	5	5	5	5	Receive Section 5
		1 ~ 1024				
17	Low RSSI	-	-	5	-	Receive Section 6
		1 ~ 1024				
18	High RSSI	-	-	5	-	Receive Section 7
		1 ~ 1024				
19	Tight Squelch	5	5	5	-	Receive Section 8
		1 ~ 1024				

Order	Adjustment item	Aw (Analog Wide 5k)	As (Analog Wide 4k)	An (Analog Narrow)	Dn (DMR)	Adjust item Number
		Adjustment range				
20	DTMF Deviation	5	5	5	-	Transmitter Section 10
		1 ~ 1024				
21	MSK Deviation	5	5	5	-	Transmitter Section 11
		1 ~ 1024				

4.11 Radio check Section


Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test- equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	f. counter		ANT			Check	435.099347~ 435.100653M Hz (±1.5ppm@ 435.1MHz)
2. High power check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less
	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less
	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	20.0W~30.0W 10A or less
3. Low power check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
	2)Test Channel Channel: 2 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
	3)Test Channel Channel: 3 Test Signaling Mode: Analog Signaling: 1 PTT: Press [Transmit] button.	Power meter Ammeter		ANT			Check	3.5W~6.5W 7.0A or less
4. MIC sensitivity check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 AG: 1kHz PTT: Press [Transmit] button.	Deviation meter Oscilloscope AG AF VM		ANT SP/MIC connector			Adjust AG input to get a standard MOD.	Dev 1.5kHz at 5.0mV ±1.0mV

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Sensitivity check	1)Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 SSG output Wide 5k: -115dBm (0.40μV) (MOD: 1kHz/±3kHz) Wide 4k: -115dBm (0.40μV) (MOD: 1kHz/±2.4kHz) Narrow: -115dBm (0.40μV) (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscope Distortion meter 4Ω Dummy load		ANT SP/MIC connector			Check	12dB SINAD or more

4.12 Common Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage:13.2V 2) SSG standard modulation [Wide 5k] MOD:1kHz,DEV:3kHz [Wide 4k] MOD:1kHz,DEV:2.4kHz [Narrow] MOD:1kHz,DEV:1.5kHz							
2. Receive Assist	1) Adj item: [Receive Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.					[FPU] [<][>]	[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.	2.4~2.6V Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted.
3. Transmit Assist	1) Adj item: [Transmit Assist] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.					FPU [<][>]	[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.	2.4~2.6V Press [Apply All] button to store the adjustment value after all adjustment point have been adjusted.
4. Frequency	1) Adj item: [Frequency] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value. 2) Adj item: [Center]	f. counter		ANT		[FPU] [<][>]	435.100MHz	435.099950~435.100050MHz

4.13 Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Ramp Offset	1) Adj item: [Ramp Offset] 2) Adj item: [Center]					[FPU] [<][>]	Write the value as followings. 1 Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.	
2. High transmit power	1) Adj item: [High Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter		ANT		[FPU] [<][>]	25.0W	±1.0W 10A or less Press [Apply] button to store the adjustment value whenever each adjustment points have been adjusted.
3. Low transmit power	1) Adj item: [Low Transmit Power] 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Power meter Ammeter		ANT		[FPU] [<][>]	5.0W	±0.2W 7.0A or less Press [Apply] button to store the adjustment value whenever each adjustment points have been adjusted.
4. Balance 1 *1 *2	1) Adj item: [Balance] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value. [2kHz Sine Wave Check box]: Check while transmitting change to 2kHz.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	The Deviation of 20Hz frequency is fixed. Change the 2kHz adjustment value to become the same deviation of 20Hz within the specified range.	2kHz Tone deviation is within ±0.2dB of 20Hz tone deviation. Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
4. Balance 2 *1 *2	1) Adj item: [Balance] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value. [Square Wave Check box]: Check while transmitting change to Square Wave.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	Make the demodulation wave into square wave.	
<p>*1 : Refer to the "4.13.1 Necessary Deviation adjustment item for each signaling and mode" table. Balance adjustment is common with the adjustment of all signaling deviations. *2 : Only 1 Balance needs to be adjusted (either Balance 1 or Balance 2).</p>								
5. Maximum Deviation (DMR) *3	1) Adj item: [Maximum Deviation (DMR)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2749Hz	2695~2803Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Maximum deviation (Analog) *3	1) Adj item: [Maximum Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2100Hz	2050~2150Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
	1)Adj item: [Maximum Deviation (Analog Wide 4k)] Deviation meter LPF : 15kHz HPF : OFF 2)Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	3360Hz	3310~3410Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
	1) Adj item: [Maximum Deviation (Analog Wide 5k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply All] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	4200Hz	4150~4250Hz Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted.
*3: Refer to the "4.13.1 Necessary Deviation adjustment item for each signaling and mode" table. Regarding Maximum Deviation (Analog), it is common with the adjustment of all analog signalings.								
7. QT Deviation *4	1) Adj item: [QT Deviation (Analog Narrow)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.35kHz	0.35kHz ±0.05kHz
	1) Adj item: [QT Deviation (Analog Wide 4k)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.60kHz	0.60kHz ±0.05kHz
	1) Adj item: [QT Deviation (Analog Wide 5k)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.75kHz	0.75kHz ±0.05kHz

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
8. DQT Deviation *4	1) Adj item: [DQT Deviation (Analog Narrow)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.35kHz	0.35kHz ±0.05kHz
	1) Adj item: [DQT Deviation (Analog Wide 4k)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.60kHz	0.60kHz ±0.05kHz
	1) Adj item: [DQT Deviation (Analog Wide 5k)] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	0.75kHz	0.75kHz ±0.05kHz
9. Single Tone Deviation *4	1) Adj item: [Single Tone Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.50kHz	1.50kHz ±0.05kHz
	1) Adj item: [Single Tone Deviation (Analog Wide 4k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2.40kHz	2.40kHz ±0.05kHz
	1) Adj item: [Single Tone Deviation (Analog Wide 5k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	3.00kHz	3.00kHz ±0.05kHz
*4: Refer to the "4.13.1 Necessary Deviation adjustment item for each signaling and mode" table.								

Item	Condition	Measurement			Adjustment			Specifications /Remarks
	PC test mode	Test-equipment	Unit	Terminal	Unit	Parts	Method	
10. DTMF Deviation	1) Adj item: [DTMF Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.25kHz	1.25kHz ±0.05kHz
	1) Adj item: [DTMF Deviation (Analog Wide 4k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2.00kHz	2.00kHz ±0.05kHz
	1) Adj item: [DTMF Deviation (Analog Wide 5k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2.50kHz	2.50kHz ±0.05kHz
11. MSK Deviation	1) Adj item: [MSK Deviation (Analog Narrow)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	1.50kHz	1.50kHz ±0.05kHz
	1) Adj item: [MSK Deviation (Analog Wide 4k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	2.40kHz	2.40kHz ±0.05kHz
	1) Adj item: [MSK Deviation (Analog Wide 5k)] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item: [Low], [Low'], [Center], [High'], [High] PTT: Press [Transmit] button. Press [Apply] button to store the adjustment value.	Deviation meter Oscilloscope		ANT		[FPU] [<][>]	3.00kHz	3.00kHz ±0.05kHz

4.13.1 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
Analog	Audio	1. Balance 2. Maximum Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow]
	QT	1. Balance 2. Maximum Deviation [Analog Wide 5k] 3. QT Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k] 3. QT Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. QT Deviation [Analog Narrow]
	DQT	1. Balance 2. Maximum Deviation [Analog Wide 5k] 3. DQT Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k] 3. DQT Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. DQT Deviation [Analog Narrow]
	5TONE	1. Balance 2. Maximum Deviation [Analog Wide 5k] 3. Single Tone Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k] 3. Single Tone Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. Single Tone Deviation [Analog Narrow]
	DTMF	1. Balance 2. Maximum Deviation [Analog Wide 5k] 3. DTMF Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k] 3. DTMF Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. DTMF Deviation [Analog Narrow]
	MSK	1. Balance 2. Maximum Deviation [Analog Wide 5k] 3. MSK Deviation [Analog Wide 5k]	1. Balance 2. Maximum Deviation [Analog Wide 4k] 3. MSK Deviation [Analog Wide 4k]	1. Balance 2. Maximum Deviation [Analog Narrow] 3. MSK Deviation [Analog Narrow]
DMR	Audio	-	-	1. Balance 2. Maximum Deviation [DMR]

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

4.14 Receiver Section

Item	Condition	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	1) Test Channel Channel: 1 Test Signaling Mode: Analog Signaling: 1 Wide 5k/Wide 4k/ Narrow: Narrow Beat Shift: Uncheck Compander: Uncheck SSG output:-47dBm (1mV) (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connec- tor		[FPU] [<][>]	Volume Up/Down key to obtain 1.41V AF output. (0.5W@4ohm Load)	1.41V±0.1V

Item	Condition	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. Sensitivity 1 (SENS1)	1) Adj item: [Sensitivity 1] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value. SSG output:-118dBm(0.28μV) (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connector		[FPU] [<][>]	Press the "Auto Tuning" [Start] button, or decrease the adjustment value from the preset value to get the maximum RSSI level. Press [Apply All] button to store the adjustment value after all adjustment points have been adjusted. Preset value Low : 320 Low' : 400 Center : 500 High' : 640 High : 800	RSSI Peak Caution: Perform the adjustment of "3. Sensitivity 2" before performing this adjustment.
3. Sensitivity 2 (SENS2)	1) Adj item: [Sensitivity 2] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Press [Apply All] button to store the adjustment value.	SSG DVM AF VM Dummy load		ANT SP/MIC connector		[FPU] [<][>]	Write Preset value. (Fixed value) Low : 300 Low' : 430 Center : 590 High' : 720 High : 860	
4.* RSSI Reference	1) Adj item: [RSSI Reference (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -3dB (MOD:1kHz/±1.5kHz)	SSG DVM AF VM Dummy load		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because RSSI Reference (Analog Wide 5k, Analog Wide 4k and DMR) is adjusted by adjusting RSSI Reference (Analog Narrow), it is not necessary to adjust RSSI Reference (Analog Wide 5k, Analog Wide 4k and DMR).
5. Open Squelch (DMR)	1) Adj item:[Open Squelch (DMR)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] Reference SSG output: 12dB SINAD level@Analog Narrow -3dB (CW (without modulation))	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
5. Open Squelch (Analog Narrow)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -1dB (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
5. Open Squelch (Analog Wide 4k)	1) Adj item: [Open Squelch (Analog Semi Wide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output: 12dB SINAD level -1dB (MOD:1kHz/±2.4kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	

Item	Condition	Measurement			Adjustment			Specifications /Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Open Squelch (Analog Wide 5k)	1) Adj item: [Open Squelch (Analog Wide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level -1dB (MOD:1kHz/±3.0kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
6.* Low RSSI	1) Adj item:[Low RSSI (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output :-118dBm (0.28uV) (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because Low RSSI at -118dBm (Analog Wide 5k, Wide 4k and DMR) is adjusted by adjusting Low RSSI at -118dBm (Analog Narrow), it is not necessary to adjust Low RSSI at -118dBm (Analog Wide 5k, Wide 4k and DMR).
7.* High RSSI	1) Adj item: [High RSSI (Analog Narrow)] 2) Adj item: [Low], [Low'], [Center], [High'], [High] SSG output : -80dBm (22.4uV) (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	*: Because High RSSI at -80dBm (Analog Wide 5k, Wide 4k and DMR) is adjusted by adjusting High RSSI at -80dBm (Analog Narrow), it is not necessary to adjust High RSSI at -80dBm (Analog Wide 5k, Wide 4k and DMR).
8. Tight Squelch (Analog Narrow)	1) Adj item: [Open Squelch (Analog Narrow)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level +3dB (MOD:1kHz/±1.5kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
8. Tight Squelch (Analog Wide 4k)	1) Adj item: [Open Squelch (Analog SemiWide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level +3dB (MOD:1kHz/±2.4kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	
8. Tight Squelch (Analog Wide 5k)	1) Adj item: [Open Squelch (Analog Wide)] 2) Adj item:[Low], [Low'], [Center], [High'], [High] SSG output:12dB SINAD level +3dB (MOD:1kHz/±3.0kHz)	SSG Distortion meter Oscilloscope		ANT SP/MIC connector		[FPU] [<][>]	After input signal from SSG, press [Apply] button to store the adjustment value.	

SECTION 5 TROUBLESHOOTING

5.1 Replacing MAIN Unit

■MAIN unit Information

Model Name	Original Main unit Number	Service Unit Number (XCA-***)
TK-D840H K2	XC1-1072-71	XCA-004E-00S (Main Unit Number: XC1-1072-73)
TK-D840HU K2	XC1-1072-71	XCA-004E-00S (Main Unit Number: XC1-1072-73)
TK-D840 M2	XC1-1072-71	XCA-004E-00S (Main Unit Number: XC1-1072-73)
TK-D840 E	XC1-1072-71	XCA-004E-00S (Main Unit Number: XC1-1072-73)

■Supplied Accessories of "Service Main unit"

Item (Including Parts Number)	Quantity
Main Unit (XC1-107)	1

■"Service Main unit" Data

The following data is written on the service Main unit:

Data Type	Description
Firmware	TK-D740/D840 Firmware.
FPU Data (PC programming mode)	XC1-107(TK-D840) E type data.
KENWOOD ESN	Model Name: TK-D840 Type: E

■After Changing the PCB

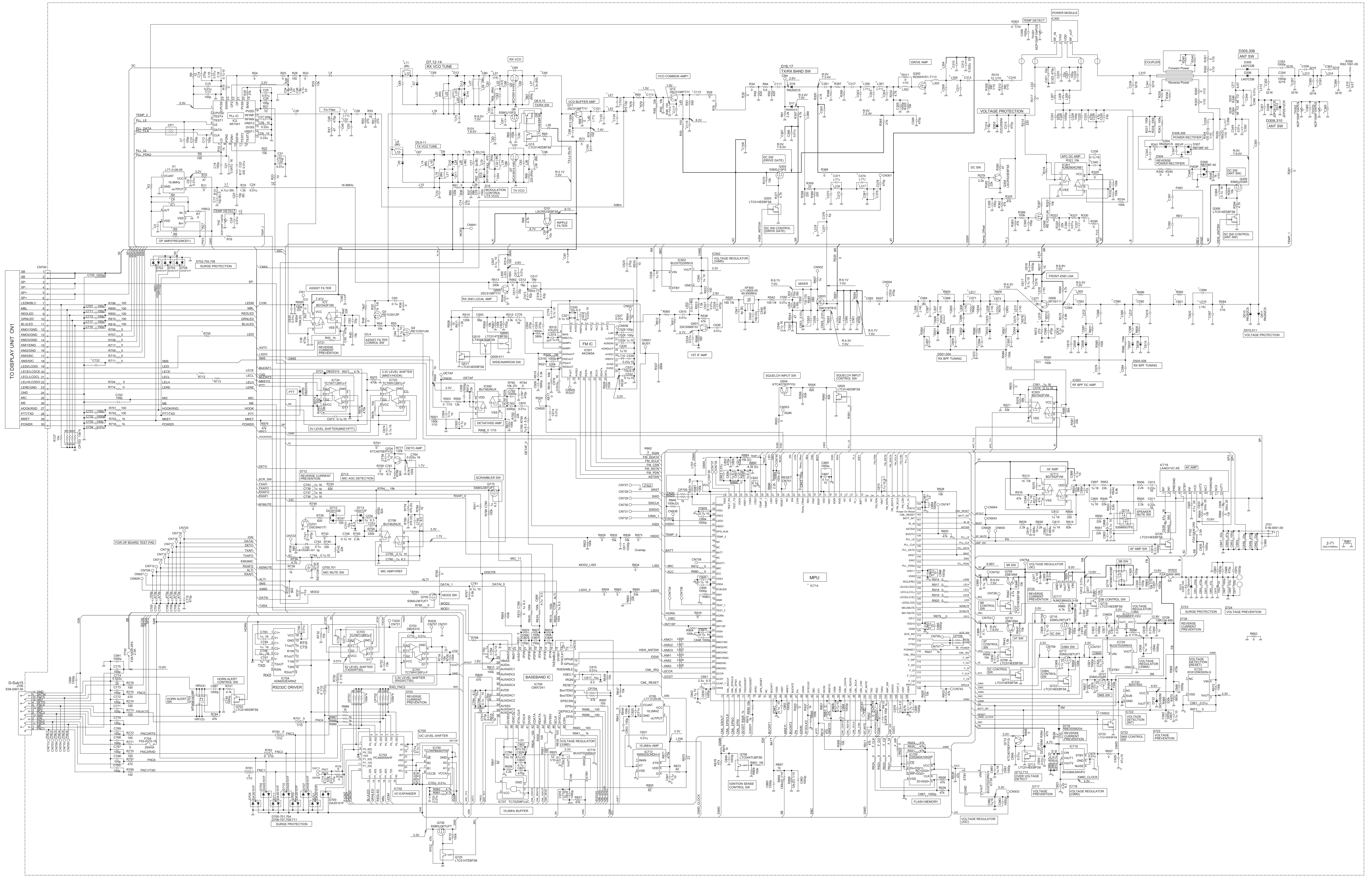
- (1) Using the KPG-166D, select your desired item (Model Name and Frequency) from the Model> Product Information menu, then use Program> Write Data to the Transceiver to write the FPU data (PC Programming mode). When writing to the transceiver, a Warning Message, corresponding to the item selected, appears. Click [OK] to continue writing the data.
- (2) Enter Program> Test Mode, then adjust the various adjustment data (PC Test Mode) as described in the "SECTION 4 ADJUSTMENT"
- (3) If necessary, write the FPU data used by the customer with the KPG-166D.

Note:

- When a new printed circuit board is used, the KENWOOD ESN changes, as does the Transceiver Information display of the KPG-166D, but this does not have any effect on the operation of the transceiver.
- If changing to the original ESN, please contact our service center.

MEMO

SCHEMATIC DIAGRAM
■ MAIN UNIT (1/2) (XC1-1072-71)



■ MAIN UNIT (2/2) (XC1-1072-71)

	D5	D7	D9	D10	D11	D12	D13	D14	D501	D502	D503	D504	D505	D506	D507	D508	IC1	IC714	L7	L9	L10	L11	L12	L14	L16	L19	L20	L21	L22	L23	L24	L25	L26	L27	L29	L30	L31	L32	L33
2-71	BBY58-02V	BBY57-02V	BBY57-02V	BBY58-02V	BBY58-02V	BBY57-02V	BBY58-02V	BBY58-02V	BB565-02V	BB565-02V	BB565-02V	BB565-02V	-	BBY56-02V	-	BBY56-02V	-	2F405ZGT6KGF	15n	-	270n	-	270n	-	270n	-	-	220n	220n	220n	220n	-	-	220n	-	18n	27n	-	270n

	L34	L36	L38	L40	L41	L42	L45	L300	L301	L302	L303	L304	L305	L316	L317	L319	L505	L506	L507	L508	L509	L510	L511	L512	L513	L515	L516	L519	R2	R4	R5	R6	R16	R26	R27	R36	R47	R64	R67	R78	R79	R80	R311
2-71	220n	270n	-	33n	27n	27n	27n	6.8n	6.8n	-	39n	18n	22n	18n	18n	39n	5.6n	22n	33n	33n	33n	33n	-	LR792DD32NSJ	LR792DD32NSJ	10n	22n	-	10k	330k	-	180k	100k	1.5k	18k	82k	2.2M	560	220	270	270	18	0

	R318	R327	R335	R336	R340	R344	R387	R397	R398	R399	R550	R551	R552	R554	R555	R564	R565	R567	R573	R578	R579	R582	R592	R593	R599	R600	R601	R605	R606	R611	R612	R653	R654
2-71	100k	5.6k	180	180	120	150	-	0	-	-	820	100k	220k	150k	270k	100k	12	100k	0	-	-	-	0	-	-	-	-	-	470	470	-	-	

	R705	R712	R713	R783	R798	R963	R980	R981	R982	R983	C3	C6	C35	C40	C46	C49	C51	C52	C58	C65	C67	C69	C70	C73	C75	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C95	C96	C99	C100	C101	C102
2-71	0	0	0	68k	3.9k	-	-	0	-	-	-	-	270p	470p	100p	8p	3p	8p	470p	470p	82p	150p	470p	470p	330p	0.5p	270p	2p	470p	470p	100p	100p	4p	470p	4p	6p	470p	7p	5p	5p	0.5p	0.5p	470p	470p	5p	12p

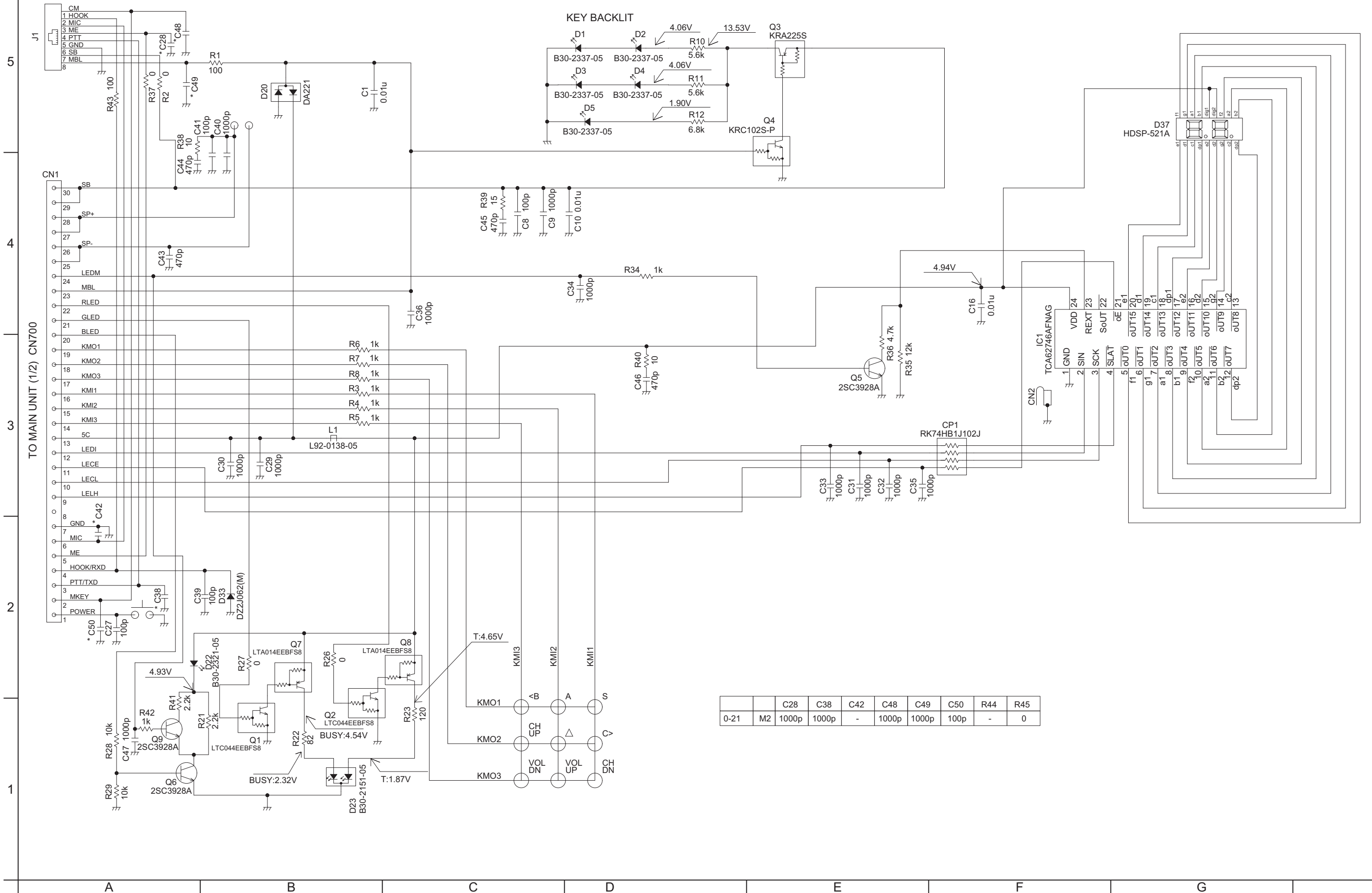
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2-71	6p	6p	470p	470p	5p	470p	470p	22p	470p	470p	7p	9p	12p	10p	470p	-	47p	4.7u	470p	12p	470p	100p	3p	470p	470p	2.4p	-	470p	470p	470p	470p	4p	3p	7p	18p	4p	1.5p	7p	-	470p	1.5p	4p	470p	470p	470p	6p	1p

	C372	C374	C375	C377	C381	C391	C392	C393	C551	C555	C558	C560	C561	C562	C564	C566	C567	C568	C570	C571	C572
2-71	12p	2p	-	470p	8p	470p	470p	470p	7p	-	470p	470p	470p	470p	1.5p	15p	5p	8p	10p	4p	470p

	C573	C575	C576	C577	C578	C582	C584	C585	C587	C588	C590	C592	C593	C594	C595	C596	C597	C599	C600	C601	C603	C604	C605	C606	C607	C608	C614	C615	C619	CT22	C753	C955	C956
2-71	5p	10p	470p	7p	470p	4p	470p	10p	18p	4p	1.5p	6p	470p	470p	10p	10p	-	5p	4p	-	9p	5p	10p	470p	470p	15p	-	-	-	100p	68p	470p	470p

	L310	L312	L313	L314
2-71	L34-1039-05	L34-1039-05	L34-1113-05	L34-1113-05

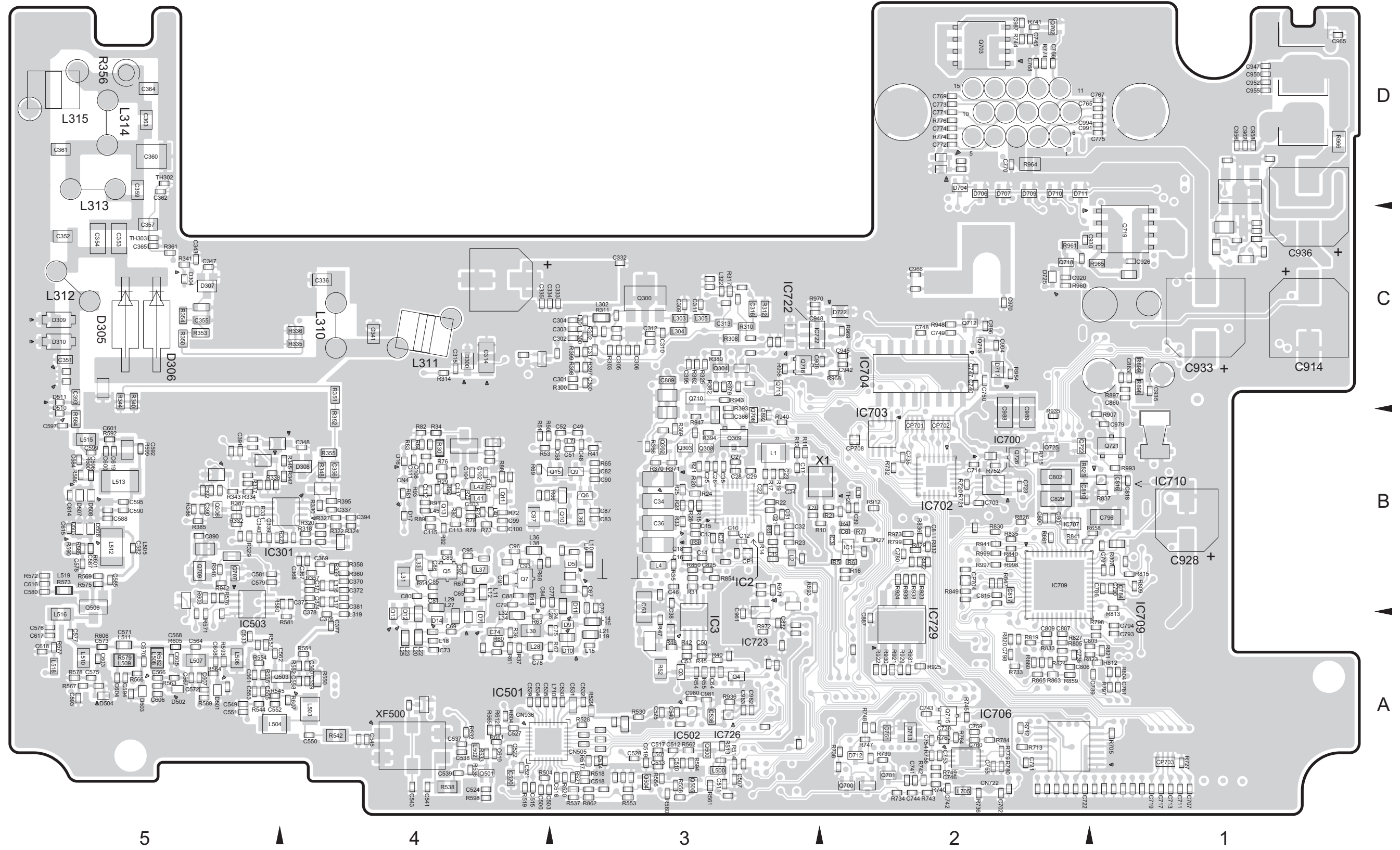
■ DISPLAY UNIT (X54-3890-21)



	C28	C38	C42	C48	C49	C50	R44	R45	
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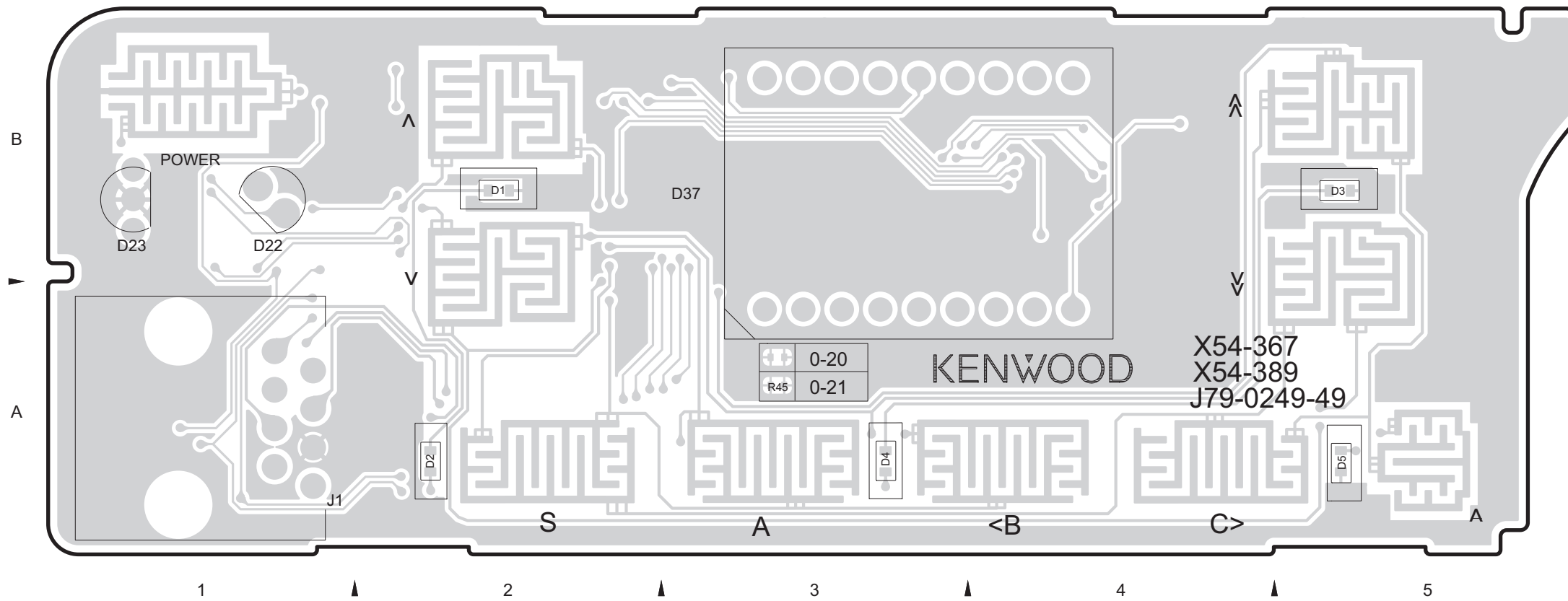
■ MAIN UNIT (XC1-1072-71)

--- Foil side view (J7C-0131-00) ---

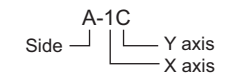


■ DISPLAY UNIT (X54-3890-21)

--- Component side view (J79-0249-49) ---

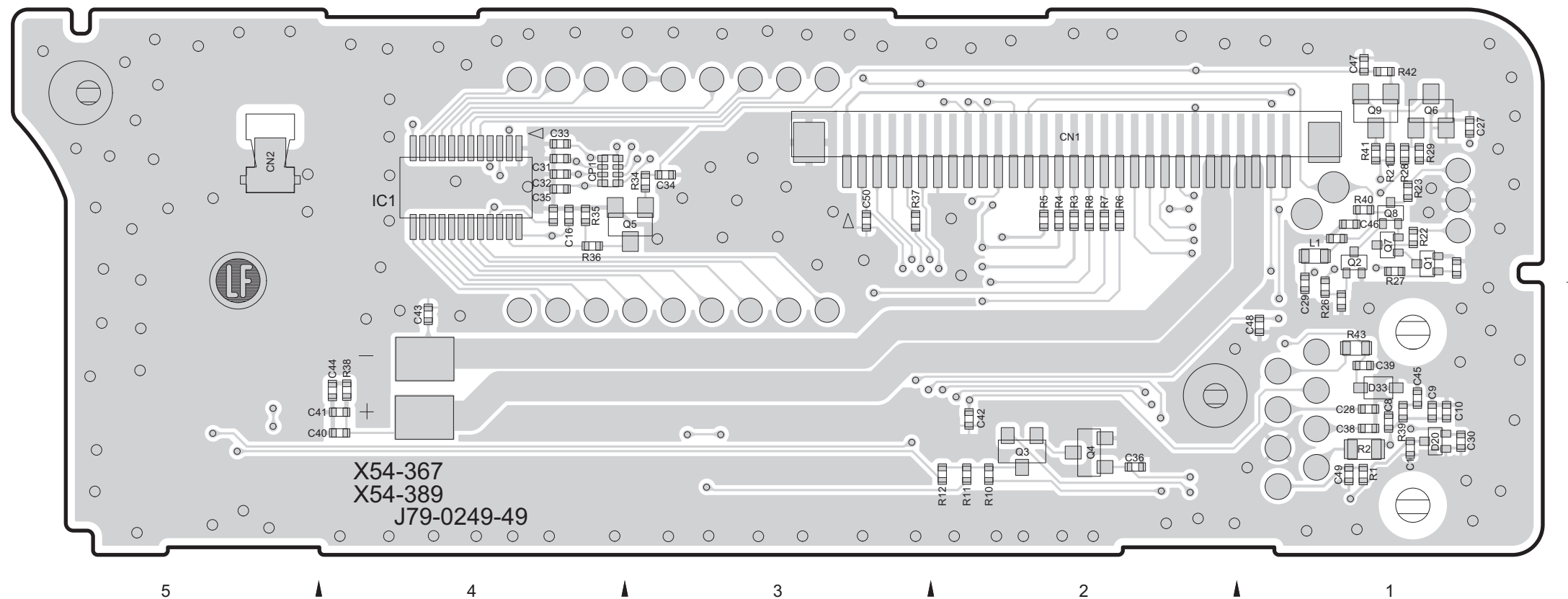


● ADDRESS TABLE OF BOARD PARTS
Each address may have an address error by one interval.



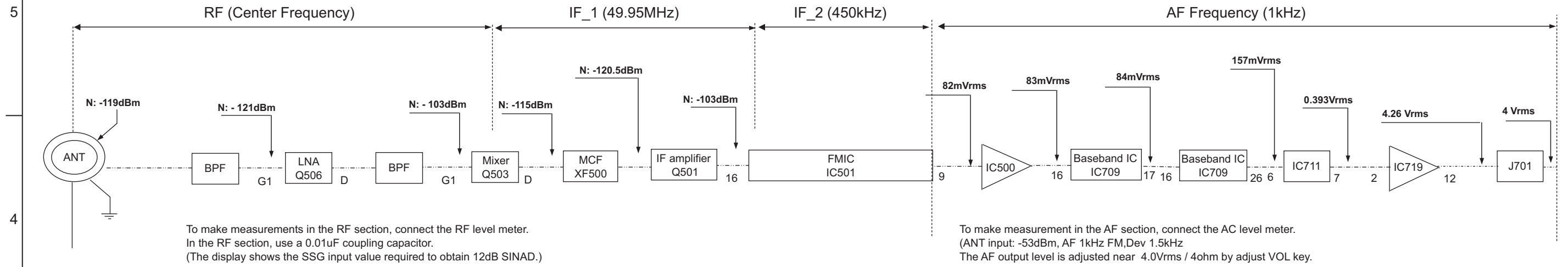
REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
IC		R11	B- 2A	C32	B- 4B
IC1	B- 4B	R12	B- 2A	C33	B- 4B
		R21	B- 1B	C34	B- 3B
TRANSISTOR					
Q1	B- 1B	R22	B- 1B	C35	B- 4B
Q2	B- 1B	R23	B- 1B	C36	B- 2A
Q3	B- 2A	R26	B- 1A	C38	B- 1A
Q4	B- 2A	R27	B- 1B	C39	B- 1A
Q5	B- 3B	R28	B- 1B	C40	B- 4A
Q6	B- 1B	R29	B- 1B	C41	B- 4A
Q7	B- 1B	R34	B- 3B	C42	B- 2A
Q8	B- 1B	R35	B- 4B	C43	B- 4A
Q9	B- 1B	R36	B- 4B	C44	B- 4A
		R37	B- 3B	C45	B- 1A
		R38	B- 4A	C46	B- 1B
DIODE					
D20	B- 1A	R39	B- 1A	C47	B- 1B
D22	B- 1B	R40	B- 1B	C48	B- 1A
D23	B- 1B	R41	B- 1B	C49	B- 1A
D33	B- 1A	R42	B- 1B	C50	B- 3B
D37	A- 3B	R43	B- 1A		
		CAPACITOR		OTHER	
RESISTOR					
R1	B- 1A	C1	B- 1A	CN1	B- 2B
R2	B- 1A	C8	B- 1A	CN2	B- 5B
R3	B- 2B	C9	B- 1A	CP1	B- 4B
R4	B- 2B	C10	B- 1A	J1	A- 1A
R5	B- 2B	C16	B- 4B	L1	B- 1B
R6	B- 2B	C17	B- 1B		
R7	B- 2B	C27	B- 1A		
R8	B- 2B	C28	B- 1A		
R9	B- 2B	C29	B- 1A		
R10	B- 2A	C30	B- 1A		
		C31	B- 4B		

--- Foil side view (J79-0249-49) ---

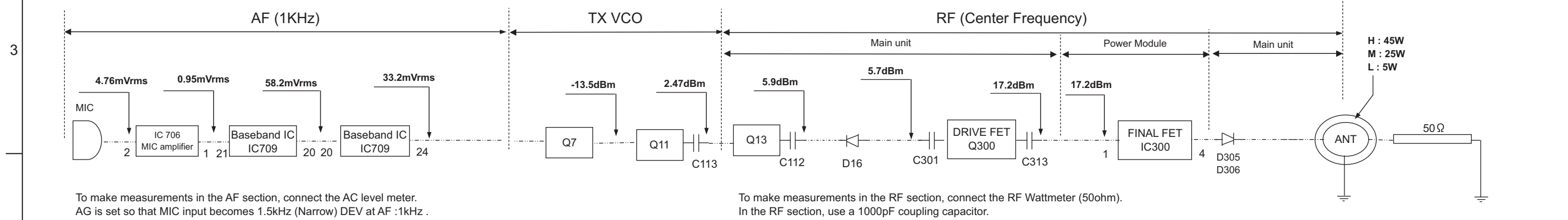


LEVEL DIAGRAM

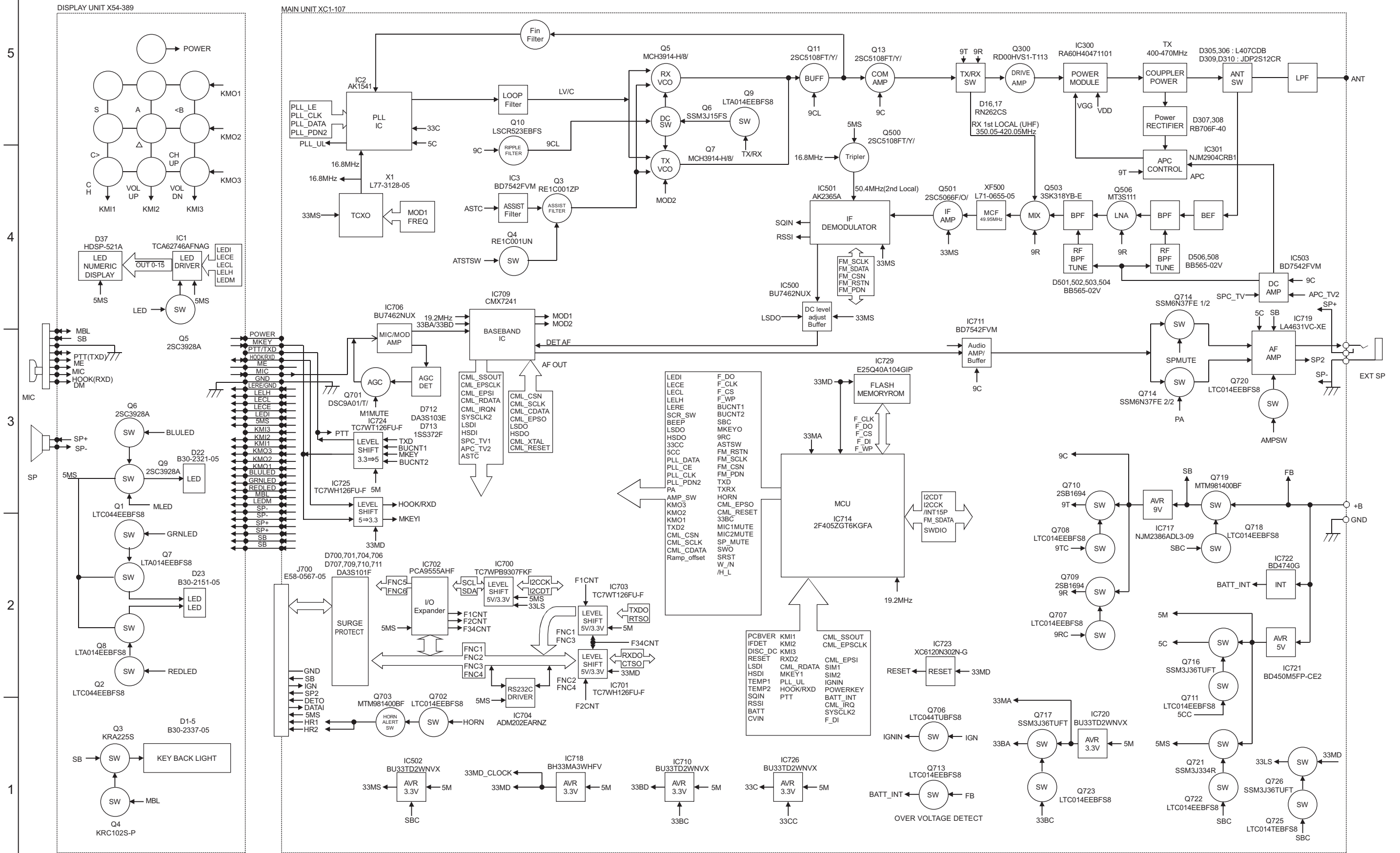
Receiver Section



Transmitter Section



BLOCK DIAGRAM



MEMO

PARTS LIST

[TK-D840H,TK-D840H(U),TK-D840]

* 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.

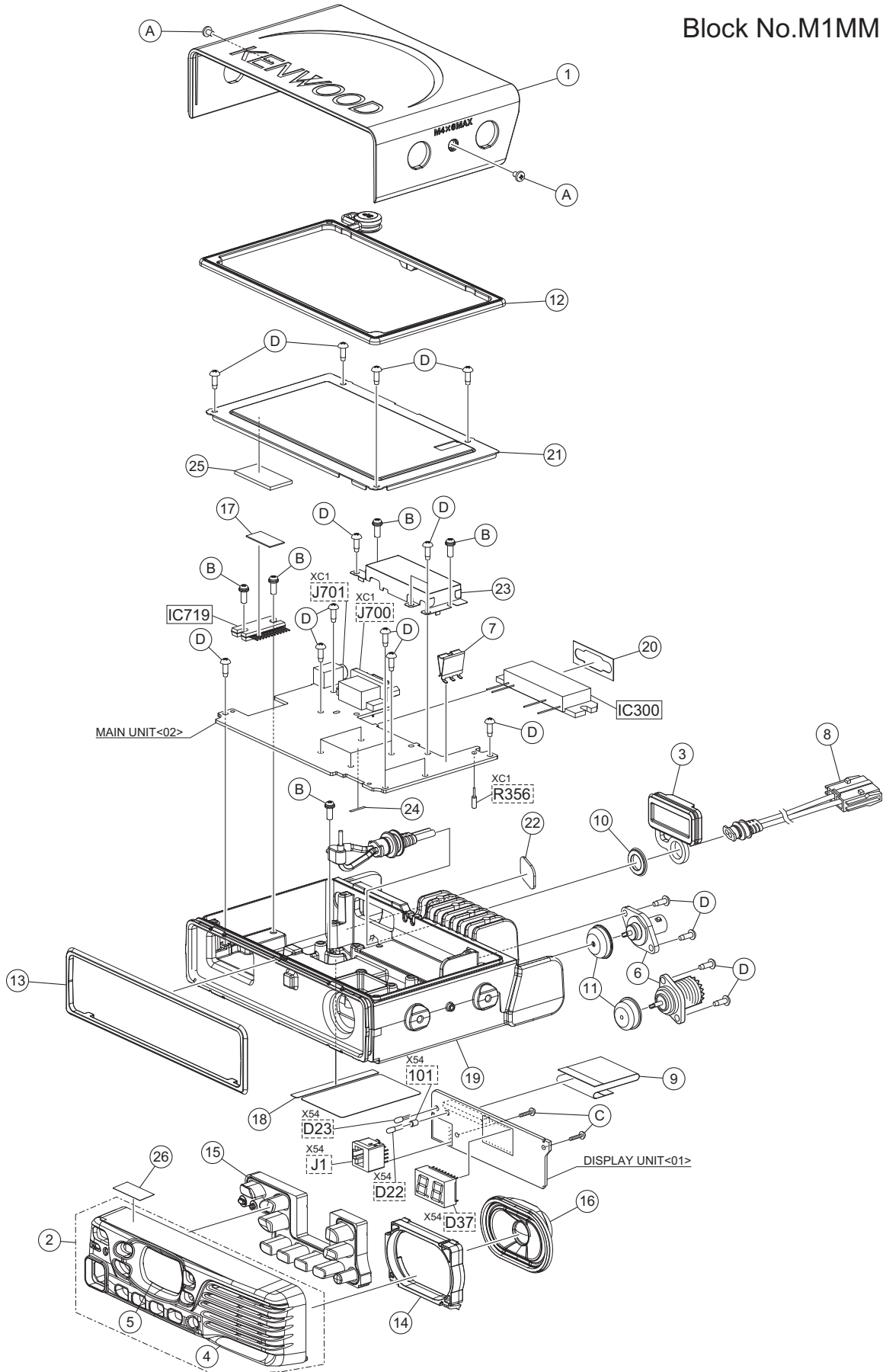
* (x_) in a description column shows the number of the used part.

- Contents -

Exploded view of general assembly and parts list	3-2
Electrical parts list	3-4
Packing materials and accessories parts list	3-12

Exploded view of general assembly and parts list

Block No.M1MM



General assembly

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

△ Symbol No.	Part No.	Part Name	Description	Local
1	A02-4073-31	PLASTIC CABINET		
2	A6C-0027-00	PANEL ASSEMBLY		
3	B09-0732-03	CAP	D-SUB	
4	B4D-0037-00	KENWOOD BADGE	PICASUS	
5	-----	FRONT GLASS		
6	E04-0167-15	C.RECEPTACLE-M	M TYPE	D840_M2,D840H_K2,D840HU_K2
6	E04-0454-15	C.RECEPTACLE-BN	BNC	D840_E
7	E23-1346-04	GROUND TERMINAL	CLIP	
8	E30-7684-25	DC CORD	PIG BLADE	
9	E37-1461-05	FLAT CABLE	30P	
10	G53-1643-04	PACKING	PIG O-RING	
11	G53-1662-04	PACKING	ANT M	D840_M2,D840H_K2,D840HU_K2
11	G53-1675-04	PACKING	ANT BNC	D840_E
12	G53-1819-21	PACKING	CHASSIS	
13	G53-1820-03	PACKING	PANEL	
14	J19-5528-03	HOLDER		
15	K29-9448-01	KEY TOP		
16	T07-0785-15	SPEAKER	6W	
17	G10-1365-04	FIBROUS SHEET	AMP	
18	B41-1837-04	CAUTION STICKER	HOT SURFACE	
19	A1A-0055-00	CHASSIS		
20	G11-4611-04	SHEET	D-SUB	
21	F1B-0010-00	SHIELDING COVER	TOP COVER	D840_E
22	G11-4578-04	SHEET	WITHOUT GPS	
23	F10-3183-03	SHIELDING CASE	P-MODULE	
24	F1C-0063-00	CONDUCT SHEET	PCB-B	
25	G1D-0164-00	CUSHION	S-COVER	D840_E
26	B4B-0008-00	CAUTION STICKER	FCC PANEL	D840_M2,D840H_K2,D840HU_K2
A	N35-2604-43	BI.HEAD M.SCREW	CABINET(x2)	
B	N67-3010-48	P.H.SEMS SCREW	PM,AMP,DC/(x5)	
C	N80-2008-48	P.HEAD T.SCREW	DISP PCB(x2)	
D	N87-2608-48	BR.HEAD T.SCREW	PCB,ANT(x15)	D840_M2,D840H_K2,D840HU_K2
D	N87-2608-48	BR.HEAD T.SCREW	PCB,ANT(x19)	D840_E
-	X54-3890-21	DISPLAY UNIT		
-	XCA-004E-00S	MAIN UNIT	SERVICE UNIT	

Electrical parts list

DISPLAY UNIT

X54-3890-21

		Block No. [0][1]	
△ Symbol No.	Part No.	Part Name	Description Local
IC1	TC62D748CFNAG	IC	
Q1	LTC044EEBFS8	DIGI TRANSISTOR	
Q2	LTC044EEBFS8	DIGI TRANSISTOR	
Q3	KRA225S	TRANSISTOR	
Q4	KRC102S-P	TRANSISTOR	
Q5	2SC3928A	TRANSISTOR	
Q6	2SC3928A	TRANSISTOR	
Q7	LTA014EEBFS8	DIGI TRANSISTOR	
Q8	LTA014EEBFS8	DIGI TRANSISTOR	
Q9	2SC3928A	TRANSISTOR	
D1	B30-2337-05	LED	
D2	B30-2337-05	LED	
D3	B30-2337-05	LED	
D4	B30-2337-05	LED	
D5	B30-2337-05	LED	
D20	DA221	DIODE ARRAY	
D22	B30-2321-05	LED	
D23	B30-2151-05	LED	
D33	DZ2J062(M)	ZENER DIODE	
D37	HDSP-521A	LED	
C1	CK73HBB1E103K	C CAPACITOR	0.01uF 25V K
C8	CC73HCH1H101J	C CAPACITOR	100pF 50V J
C9	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C10	CK73HBB1E103K	C CAPACITOR	0.01uF 25V K
C16	CK73HBB1E103K	C CAPACITOR	0.01uF 25V K
C27	CC73HCH1H101J	C CAPACITOR	100pF 50V J
C28	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C29	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C30	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C31	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C32	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C33	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C34	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C35	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C36	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C38	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C39	CC73HCH1H101J	C CAPACITOR	100pF 50V J
C40	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C41	CC73HCH1H101J	C CAPACITOR	100pF 50V J
C43	CK73HBB1H471K	C CAPACITOR	470pF 50V K
C44	CK73HBB1H471K	C CAPACITOR	470pF 50V K
C45	CK73HBB1H471K	C CAPACITOR	470pF 50V K
C46	CK73HBB1H471K	C CAPACITOR	470pF 50V K
C47	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C48	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C49	CK73HBB1H102K	C CAPACITOR	1000pF 50V K
C50	CC73HCH1H101J	C CAPACITOR	100pF 50V J
R1	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J
R2	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J
R3	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R4	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R5	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R6	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R7	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R8	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R10	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J
R11	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J
R12	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J
R21	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J
R22	RK73HB1J820J	MG RESISTOR	82Ω 1/16W J
R23	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J
R26	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J
R27	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J
R28	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J
R29	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J
R34	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R35	RK73HB1J123J	MG RESISTOR	12kΩ 1/16W J

△ Symbol No.	Part No.	Part Name	Description Local
R36	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J
R37	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J
R38	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J
R39	RK73HB1J150J	MG RESISTOR	15Ω 1/16W J
R40	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J
R41	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J
R42	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J
R43	RK73GB2A101J	MG RESISTOR	100Ω 1/10W J
R45	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J
L1	LB73G0BD-005	CHIP FERRITE	
CN1	E40-6851-05	F.C.CONNECTOR	
CN2	E23-1262-05	TERMINAL	
CP1	RK74HB1J102J	NET RESISTOR	1kΩ 1/16W J
J1	E58-0535-05	MODULAR JACK	
101	J31-0565-15	COLLAR	

MAIN UNIT

XC1-1072-71

		Block No. [0][2]	
△ Symbol No.	Part No.	Part Name	Description Local
IC2	AK1541	IC	
IC3	BD7542FVM	IC	
IC300	RA60H40471101	IC	
IC301	NJM2904CRB1	IC	
IC500	BU7462NUX	IC	
IC501	AK2365A	IC	
IC502	BU33TD2WNVX	IC	
IC503	BD7542FVM	IC	
IC700	TC7WBP9307FKF	IC	
IC701	TC7WH126FU-F	IC	
IC702	PCA9555AHF	IC	
IC703	TC7WT126FU-F	IC	
IC704	ADM202EARNZ	IC	
IC706	BU7462NUX	IC	
IC707	TC7SZ08FUJC	IC	
IC709	CMX7241	IC	
IC710	BU33TD2WNVX	IC	
IC711	BD7542FVM	IC	
IC713	SM5023CNDH-G	IC	
IC714	2F405ZGT6KGFA	IC	
IC717	NJM2386ADL3-09	IC	
IC718	BH33MA3WHFV	IC	
IC719	LA4631VC-XE	IC	
IC720	BU33TD2WNVX	IC	
IC721	BD450M5FP-CE2	IC	
IC722	BD4740G	IC	
IC723	XC6120N302N-G	IC	
IC724	TC7WT126FU-F	IC	
IC725	TC7WH126FU-F	IC	
IC726	BU33TD2WNVX	IC	
IC729	E25Q40A104GIP	IC	
Q3	RE1C001ZP	FET	
Q4	RE1C001UN	FET	
Q5	MCH3914-H/8/	FET	
Q6	SSM3J15FS	FET	
Q7	MCH3914-H/8/	FET	
Q9	LTA014EEBFS8	DIGI TRANSISTOR	
Q10	LSCR523EBFS8	TRANSISTOR	
Q11	2SC5108FT/Y/	TRANSISTOR	
Q13	2SC5108FT/Y/	TRANSISTOR	
Q15	LTC014EEBFS8	DIGI TRANSISTOR	
Q300	RD00HVS1-T113	FET	
Q302	SSM3J15FS	FET	
Q303	LTC014EEBFS8	DIGI TRANSISTOR	
Q304	LSCR523EBFS8	TRANSISTOR	
Q306	RE1C001UN	FET	
Q308	LTC014EEBFS8	DIGI TRANSISTOR	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
Q309	SSM3J334R	FET			D717	DZ2J180M	ZENER DIODE		
Q500	2SC5108F/Y/	TRANSISTOR			D718	RBE05SM20A	DIODE		
Q501	2SC5066F/O/	TRANSISTOR			D720	DB2S310	SCHOTTKY DIODE		
Q503	3SK318YB-E	FET			D721	DB2S310	SCHOTTKY DIODE		
Q504	KTC4075EP/YG/	TRANSISTOR			D722	DZ2J082M	ZENER DIODE		
Q505	LTC014EEBFS8	DIGI TRANSISTOR			D723	22ZR-10D	SURGE ABSORBER		
Q506	MT3S111	TRANSISTOR			D724	DSA3A1	DIODE		
Q509	LTC014TEBFS8	DIGI TRANSISTOR			D725	RB520SM-30	DIODE		
Q510	LTA044TEBFS8	TRANSISTOR			D726	1SR154-400	DIODE		
Q511	LTC014EEBFS8	DIGI TRANSISTOR							
Q700	RE1C001UN	FET			C7	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q701	DSC9A01/T/	TRANSISTOR			C9	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q702	LTC014EEBFS8	DIGI TRANSISTOR			C10	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q703	MTM981400BF	FET			C12	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q704	KTC4075EP/YG/	TRANSISTOR			C13	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q705	SSM3J36TUFT	FET			C14	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
Q706	LTC044TUBFS8	DIGI TRANSISTOR			C15	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q707	LTC014EEBFS8	DIGI TRANSISTOR			C16	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q708	LTC014EEBFS8	DIGI TRANSISTOR			C17	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
Q709	2SB1694	TRANSISTOR			C18	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
Q710	2SB1694	TRANSISTOR			C19	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q711	LTC014EEBFS8	DIGI TRANSISTOR			C21	CK73HBB1C473K	C CAPACITOR	0.047uF 16V K	
Q712	KTC4075EP/YG/	TRANSISTOR			C22	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q713	LTC014EEBFS8	DIGI TRANSISTOR			C23	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
Q714	SSM6N37FE	FET			C24	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q715	SSM3J36TUFT	FET			C25	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q716	SSM3J36TUFT	FET			C26	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q717	SSM3J36TUFT	FET			C27	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
Q718	LTC014EEBFS8	DIGI TRANSISTOR			C28	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q719	MTM981400BF	FET			C29	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
Q720	LTC014EEBFS8	DIGI TRANSISTOR			C31	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
Q721	SSM3J334R	FET			C32	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
Q722	LTC014EEBFS8	DIGI TRANSISTOR			C34	CS77AAV1D1R5M	TA E CAPACITOR	1.5uF 20V M	
Q723	LTC014EEBFS8	DIGI TRANSISTOR			C35	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
Q725	LTC014TEBFS8	DIGI TRANSISTOR			C36	CS77AAV1V0R1M	TA E CAPACITOR	0.1uF 35V M	
Q726	SSM3J36TUFT	FET			C38	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
					C39	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
D5	BBY58-02V	VARI CAP DIODE			C40	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D7	BBY57-02V	VARI CAP DIODE			C46	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
D9	BBY57-02V	VARI CAP DIODE			C48	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D10	BBY58-02V	VARI CAP DIODE			C49	CC73HCH1H080B	C CAPACITOR	8pF 50V B	
D11	BBY58-02V	VARI CAP DIODE			C50	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D12	BBY57-02V	VARI CAP DIODE			C51	CC73HCH1H030B	C CAPACITOR	3pF 50V B	
D13	BBY58-02V	VARI CAP DIODE			C52	CC73HCH1H080B	C CAPACITOR	8pF 50V B	
D14	BBY58-02V	VARI CAP DIODE			C53	CC73HCH1H330J	C CAPACITOR	33pF 50V J	
D15	BBY57-02V	VARI CAP DIODE			C58	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D16	RN262CS	DIODE			C63	CC730AD1H104J	C CAPACITOR	0.1uF 50V J	
D17	RN262CS	DIODE			C64	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
D300	DZ2J056M	ZENER DIODE			C65	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D304	RN262CS	DIODE			C67	CC73HCH1H820J	C CAPACITOR	82pF 50V J	
D305	L407CDB	DIODE			C69	CC73HCH1H151J	C CAPACITOR	150pF 50V J	
D306	L407CDB	DIODE			C70	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D307	RB706F-40	DIODE			C73	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D308	RB706F-40	DIODE			C74	CK73GBOJ106K	C CAPACITOR	10uF 6.3V K	
D309	JDP2S12CR	DIODE			C75	CC73HCH1H331J	C CAPACITOR	330pF 50V J	
D310	JDP2S12CR	DIODE			C77	CC73HCH1H020B	C CAPACITOR	2pF 50V B	
D501	BB565-02V	VARI CAP DIODE			C78	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
D502	BB565-02V	VARI CAP DIODE			C79	CC73HCH1H0R5B	C CAPACITOR	0.5pF 50V B	
D503	BB565-02V	VARI CAP DIODE			C80	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
D504	BB565-02V	VARI CAP DIODE			C81	CC73HCH1H020B	C CAPACITOR	2pF 50V B	
D506	BB565-02V	VARI CAP DIODE			C82	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D508	BB565-02V	VARI CAP DIODE			C83	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D510	RN262CS	DIODE			C84	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
D511	RN262CS	DIODE			C85	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
D700	DA3S101F	DIODE ARRAY			C86	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
D701	DA3S101F	DIODE ARRAY			C87	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D702	DA3S101F	DIODE ARRAY			C88	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
D703	DB2S310	SCHOTTKY DIODE			C89	CC73HCH1H060B	C CAPACITOR	6pF 50V B	
D704	DA3S101F	DIODE ARRAY			C90	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D705	DA3S101F	DIODE ARRAY			C91	CC73HCH1H070B	C CAPACITOR	7pF 50V B	
D706	DA3S101F	DIODE ARRAY			C92	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
D707	DA3S101F	DIODE ARRAY			C93	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
D708	DA3S101F	DIODE ARRAY			C95	CC73HCH1H0R5B	C CAPACITOR	0.5pF 50V B	
D709	DA3S101F	DIODE ARRAY			C96	CC73HCH1H0R3B	C CAPACITOR	0.3pF 50V B	
D710	DA3S101F	DIODE ARRAY			C97	CS77PBQ1C100M	TA E CAPACITOR	10uF 16V M	
D711	DA3S101F	DIODE ARRAY			C99	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D712	DA3S103E	DIODE ARRAY			C100	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
D713	1SS372F	SCHOTTKY DIODE			C101	CC73HCH1H050B	C CAPACITOR	5pF 50V B	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C102	CC73HCH1H120G	C CAPACITOR	12pF 50V G		C394	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C103	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C395	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C104	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C500	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
C108	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C502	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C111	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C503	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
C112	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C504	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C113	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C505	CC73HCH1H560J	C CAPACITOR	56pF 50V J	
C115	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C506	CK73HBB1H152K	C CAPACITOR	1500pF 50V K	
C117	CC73HCH1H220G	C CAPACITOR	22pF 50V G		C507	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C300	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C508	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C301	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C509	CK73HB1H182K	C CAPACITOR	1800pF 50V K	
C302	CC73HCH1H070B	C CAPACITOR	7pF 50V B		C510	CC73HCH1H330J	C CAPACITOR	33pF 50V J	
C303	CC73HCH1H090B	C CAPACITOR	9pF 50V B		C511	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C304	CC73HCH1H120G	C CAPACITOR	12pF 50V G		C512	CC73HCH1H180J	C CAPACITOR	18pF 50V J	
C305	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C513	CC73HCH1H820J	C CAPACITOR	82pF 50V J	
C306	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C514	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C309	CC73HCH1H100B	C CAPACITOR	10pF 50V B		C515	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C310	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C516	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C312	CK73HBB1E223K	C CAPACITOR	0.022uF 25V K		C517	CC73HCH1H390J	C CAPACITOR	39pF 50V J	
C313	CC73GCH1H470J	C CAPACITOR	47pF 50V J		C518	CK73HBB1C333K	C CAPACITOR	0.033uF 16V K	
C314	CS77MA1A4R7M	TA E CAPACITOR	4.7uF 10V M		C519	CC73HCH1H820J	C CAPACITOR	82pF 50V J	
C315	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C520	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
C316	CK73GB1H471K	C CAPACITOR	470pF 50V K		C521	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C317	CC73HCH1H120G	C CAPACITOR	12pF 50V G		C522	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C321	CC73HCH1H220J	C CAPACITOR	22pF 50V J		C524	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C322	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C525	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
C323	CC73HCH1H221J	C CAPACITOR	220pF 50V J		C527	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C325	CC73HCH1H220J	C CAPACITOR	22pF 50V J		C528	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C326	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C529	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C327	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C530	CK73HB1A224K	C CAPACITOR	0.22uF 10V K	
C328	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C531	CK73GB0J106K	C CAPACITOR	10uF 6.3V K	
C330	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C532	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C332	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C533	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C333	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C534	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C334	CC73HCH1H470J	C CAPACITOR	47pF 50V J		C535	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C335	CC73HCH1H220J	C CAPACITOR	22pF 50V J		C536	CK73GBB1A105K	C CAPACITOR	1uF 10V K	
C336	C93-1842-05	C CAPACITOR	3pF 250V		C537	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C337	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C538	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C339	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		C539	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C340	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C540	CK73HB1A105K	C CAPACITOR	1uF 10V K	
C341	C93-1840-05	C CAPACITOR	2.4pF 250V		C541	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C344	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C543	CC73HCH1H180G	C CAPACITOR	18pF 50V G	
C346	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C545	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C347	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C549	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K	
C348	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C550	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C349	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C551	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C350	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C552	CC73HCH1H120G	C CAPACITOR	12pF 50V G	
C351	CC73GCH1H040B	C CAPACITOR	4pF 50V B		C553	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C352	C93-1842-05	C CAPACITOR	3pF 250V		C555	CC73HCH1H070B	C CAPACITOR	7pF 50V B	
C353	C93-1900-05	C CAPACITOR	1000pF 630V		C559	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C354	C93-1900-05	C CAPACITOR	1000pF 630V		C560	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C355	CC73GCH1H070B	C CAPACITOR	7pF 50V B		C561	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C356	CC73GCH1H180J	C CAPACITOR	18pF 50V J		C562	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C357	C93-1846-05	C CAPACITOR	4pF 250V		C564	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C358	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C566	CC73HCH1H150G	C CAPACITOR	15pF 50V G	
C359	C93-1835-05	C CAPACITOR	1.5pF 250V		C567	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
C360	CM73F2H070D	MICA CAPACITOR	7pF 500V D		C568	CC73HCH1H080B	C CAPACITOR	8pF 50V B	
C362	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C570	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C363	C93-1835-05	C CAPACITOR	1.5pF 250V		C571	CC73GCH1H040B	C CAPACITOR	4pF 50V B	
C364	C93-1846-05	C CAPACITOR	4pF 250V		C572	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C365	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C573	CC73HCH1H050B	C CAPACITOR	5pF 50V B	
C366	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		C575	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C367	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C576	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C368	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C577	CC73HCH1H070B	C CAPACITOR	7pF 50V B	
C369	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C578	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C370	CC73HCH1H060B	C CAPACITOR	6pF 50V B		C579	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K	
C371	CC73HCH1H010B	C CAPACITOR	1pF 50V B		C580	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C372	CC73HCH1H120G	C CAPACITOR	12pF 50V G		C581	CK73HB1C105K	C CAPACITOR	1.0uF 16V K	
C374	CC73HCH1H020B	C CAPACITOR	2pF 50V B		C582	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C376	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C584	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C377	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C585	CC73HCH1H100B	C CAPACITOR	10pF 50V B	
C378	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C587	CC73HCH1H180G	C CAPACITOR	18pF 50V G	
C381	CC73HCH1H080B	C CAPACITOR	8pF 50V B		C588	CC73HCH1H040B	C CAPACITOR	4pF 50V B	
C384	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C590	CC73HCH1H1R5B	C CAPACITOR	1.5pF 50V B	
C390	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C592	CC73HCH1H060B	C CAPACITOR	6pF 50V B	
C391	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C593	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C392	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C594	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C393	CK73GB1H471K	C CAPACITOR	470pF 50V K		C595	CC73HCH1H100B	C CAPACITOR	10pF 50V B	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C596	CC73HCH1H100B	C CAPACITOR	10pF 50V B		C781	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C599	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C782	CK73HBB1H332K	C CAPACITOR	3300pF 50V K	
C600	CC73HCH1H040B	C CAPACITOR	4pF 50V B		C783	CK73HBB1H332K	C CAPACITOR	3300pF 50V K	
C603	CC73HCH1H090B	C CAPACITOR	9pF 50V B		C784	CK73GBOJ106K	C CAPACITOR	10uF 6.3V K	
C604	CC73HCH1H050B	C CAPACITOR	5pF 50V B		C785	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C605	CC73HCH1H100B	C CAPACITOR	10pF 50V B		C786	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C606	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C787	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C607	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C789	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C608	CC73HCH1H150G	C CAPACITOR	15pF 50V G		C790	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C610	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C791	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C616	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C793	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C617	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		C794	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C618	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C796	CK73EXR1A106K	C CAPACITOR	10uF 10V K	
C700	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C798	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C701	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C800	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K	
C702	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C801	CC73HCH1H471J	C CAPACITOR	470pF 50V J	
C703	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C802	CK73EXR1A476K	C CAPACITOR	47uF 10V K	
C704	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C803	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C705	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C805	CK73HBB1A683K	C CAPACITOR	0.068uF 10V K	
C706	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C806	CK73HBOJ475M	C CAPACITOR	4.7uF 6.3V M	
C707	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C807	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C708	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C809	CC73HCH1H271J	C CAPACITOR	270pF 50V J	
C709	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C810	CK73GBOJ106K	C CAPACITOR	10uF 6.3V K	
C710	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C811	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C711	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C812	CK73HB1C105K	C CAPACITOR	1.0uF 16V K	
C712	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C813	CK73HB1C105K	C CAPACITOR	1.0uF 16V K	
C713	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C815	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C714	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C816	CK73GBB1A105K	C CAPACITOR	1uF 10V K	
C715	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C817	CK73GBOJ106K	C CAPACITOR	10uF 6.3V K	
C716	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C818	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C717	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C819	CK73HBB1A683K	C CAPACITOR	0.068uF 10V K	
C718	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C820	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C719	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C825	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C721	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C829	CK73EXR1A476K	C CAPACITOR	47uF 10V K	
C722	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C831	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C723	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C832	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C731	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C841	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C732	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C842	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C733	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C843	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C734	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C844	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C735	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C845	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C736	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C846	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C737	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C847	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C738	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C848	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C740	CK73HB1H103K	C CAPACITOR	10000pF 50V K		C849	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C741	CK73HBB1H471K	C CAPACITOR	470pF 50V K		C850	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C742	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		C851	CK73HBOJ225K	C CAPACITOR	2.2uF 6.3V K	
C743	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C852	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C744	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C853	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C745	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		C855	CK73HBB1H471K	C CAPACITOR	470pF 50V K	
C746	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C856	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C747	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C857	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C748	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C858	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K	
C749	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C860	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C750	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		C861	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C751	CK73GBOJ106K	C CAPACITOR	10uF 6.3V K		C862	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C753	CC73HCH1H680J	C CAPACITOR	68pF 50V J		C863	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C754	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K		C865	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C755	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K		C867	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C758	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C868	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C759	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C869	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C760	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K		C870	CK73HB1H103K	C CAPACITOR	10000pF 50V K	
C761	CK73GXR0J475K	C CAPACITOR	4.7uF 6.3V K		C874	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C764	CK73HBB1C333K	C CAPACITOR	0.033uF 16V K		C876	CC73HCH1H101J	C CAPACITOR	100pF 50V J	
C765	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C877	CE32CB1C470M	E CAPACITOR	47uF 16V M	
C766	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C878	CK73HBOJ225K	C CAPACITOR	2.2uF 6.3V K	
C767	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C879	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C768	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C880	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C769	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C881	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C770	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C882	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C771	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C883	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K	
C772	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C884	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C773	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C885	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C774	CK73HBB1E223K	C CAPACITOR	0.022uF 25V K		C886	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C775	CC73HCH1H101J	C CAPACITOR	100pF 50V J		C887	CK73HBB1H102K	C CAPACITOR	1000pF 50V K	
C776	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		C889	CK73GBB1H104K	C CAPACITOR	0.1uF 50V K	
C779	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		C890	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K	
C780	CK73HXR0J105K	C CAPACITOR	1uF 6.3V K		C892	CK73HB1H103K	C CAPACITOR	10000pF 50V K	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
C894	CC73HCH1H470J	C CAPACITOR	47pF 50V J		R4	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J	
C896	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R6	RK73HB1J184J	MG RESISTOR	180kΩ 1/16W J	
C897	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		R7	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C898	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R8	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
C899	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		R9	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
C900	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		R10	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
C902	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R11	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C904	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R13	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C905	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R14	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
C908	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R15	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C909	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R16	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
C910	CK73HBB1C104K	C CAPACITOR	0.1uF 16V K		R17	RK73HB1J331J	MG RESISTOR	330Ω 1/16W J	
C911	CK73GBB1C224K	C CAPACITOR	0.22uF 16V K		R19	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J	
C912	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R20	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J	
C913	CK73GBB1C224K	C CAPACITOR	0.22uF 16V K		R21	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
C914	CE32DT1E331M	E CAPACITOR	330uF 25V M		R22	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C916	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R23	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
C920	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R24	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C921	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R25	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C922	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R26	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J	
C923	CK73HB0J225K	C CAPACITOR	2.2uF 6.3V K		R27	RK73HB1J183J	MG RESISTOR	18kΩ 1/16W J	
C924	CK73GBB1A105K	C CAPACITOR	1uF 10V K		R28	RK73HB1J151J	MG RESISTOR	150Ω 1/16W J	
C925	CK73FXR1E475K	C CAPACITOR	4.7uF 25V K		R29	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C926	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R30	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
C927	CK73FB1C106K	C CAPACITOR	10uF 16V K		R31	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C928	CE32CL1C470M	E CAPACITOR	47uF 16V M		R33	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C929	CK73EXR1A476K	C CAPACITOR	47uF 10V K		R34	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C930	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R35	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C931	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R36	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J	
C933	CE32DT1E331M	E CAPACITOR	330uF 25V M		R37	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J	
C935	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R39	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C936	CE32DT1E331M	E CAPACITOR	330uF 25V M		R40	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
C937	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R41	RK73HB1J470J	MG RESISTOR	47kΩ 1/16W J	
C938	CK73GBB1A105K	C CAPACITOR	1uF 10V K		R42	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J	
C939	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R45	RK73HB1J153J	MG RESISTOR	15kΩ 1/16W J	
C940	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R47	RK73HB1J225J	MG RESISTOR	22MΩ 1/16W J	
C942	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R48	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C943	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R50	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
C944	CK73GB1H105K	C CAPACITOR	1uF 50V K		R51	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
C945	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R52	RK73FB2B102J	MG RESISTOR	1kΩ 1/8W J	
C947	CC73HCH1H220J	C CAPACITOR	22pF 50V J		R53	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J	
C948	CK73HBB1H332K	C CAPACITOR	3300pF 50V K		R54	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C950	CC73HCH1H470J	C CAPACITOR	47pF 50V J		R55	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C951	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R60	RK73HB1J124J	MG RESISTOR	120kΩ 1/16W J	
C952	CC73HCH1H101J	C CAPACITOR	100pF 50V J		R61	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C953	CC73FCH1H101J	C CAPACITOR	100pF 50V J		R62	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
C954	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R63	RN73H0AJ471D	MF RESISTOR	470Ω D	
C955	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R64	RN73H0AJ561D	MF RESISTOR	560Ω D	
C956	CC73HCH1H220J	C CAPACITOR	22pF 50V J		R65	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
C957	CC73HCH1H220J	C CAPACITOR	22pF 50V J		R66	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
C958	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R67	RN73H0AJ221D	MF RESISTOR	220Ω D	
C960	CC73HCH1H470J	C CAPACITOR	47pF 50V J		R68	RN73H0AJ221D	MF RESISTOR	220Ω D	
C961	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R69	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
C962	CC73HCH1H220J	C CAPACITOR	22pF 50V J		R72	RK73HB1J154J	MG RESISTOR	150kΩ 1/16W J	
C963	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R73	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C965	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R74	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
C966	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R75	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
C967	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R76	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C969	CK73HBB1H471K	C CAPACITOR	470pF 50V K		R78	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
C970	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R79	RK73HB1J271J	MG RESISTOR	270Ω 1/16W J	
C971	CC73HCH1H221J	C CAPACITOR	220pF 50V J		R80	RK73HB1J180J	MG RESISTOR	18Ω 1/16W J	
C973	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R81	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
C974	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R82	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J	
C975	CE32DT1E331M	E CAPACITOR	330uF 25V M		R83	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J	
C976	CK73HB1H103K	C CAPACITOR	10000pF 50V K		R84	RK73HB1J5R6J	MG RESISTOR	5.6Ω 1/16W J	
C977	CK73GB1H105K	C CAPACITOR	1uF 50V K		R88	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
C979	CK73HBB1A104K	C CAPACITOR	0.1uF 10V K		R89	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J	
C980	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		R90	RK73HB1J121J	MG RESISTOR	120Ω 1/16W J	
C981	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R91	RK73HB1J561J	MG RESISTOR	560Ω 1/16W J	
C982	CK73HB1C105K	C CAPACITOR	1.0uF 16V K		R92	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C983	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R93	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
C987	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R300	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
C988	CK73EXR1A476K	C CAPACITOR	47uF 10V K		R302	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
C989	CK73EXR1A476K	C CAPACITOR	47uF 10V K		R303	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
C991	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R308	RK73GB2A391J	MG RESISTOR	390Ω 1/10W J	
C994	CK73HBB1H102K	C CAPACITOR	1000pF 50V K		R310	RK73GB2A120J	MG RESISTOR	12Ω 1/10W J	
					R311	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R2	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R312	RK73GB2A391J	MG RESISTOR	390Ω 1/10W J	

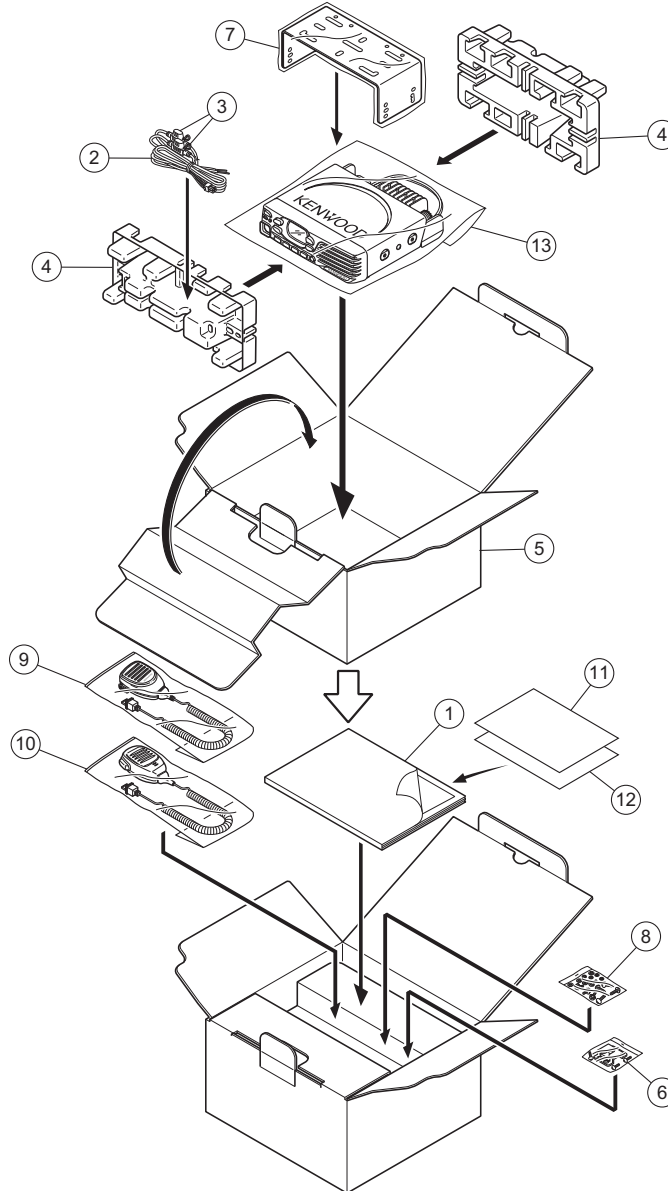
△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R313	RK73FB2B102J	MG RESISTOR	1kΩ 1/8W J		R530	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R314	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R532	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R316	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R533	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J	
R317	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R535	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R318	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R536	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R320	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R537	RK73HB1J684J	MG RESISTOR	680kΩ 1/16W J	
R321	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R538	RK73FB2B181J	MG RESISTOR	180Ω 1/8W J	
R322	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R542	RK73FB2B101J	MG RESISTOR	100Ω 1/8W J	
R324	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R544	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J	
R325	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R545	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J	
R327	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J		R550	RK73GB2A821J	MG RESISTOR	820Ω 1/10W J	
R329	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R551	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R330	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R552	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J	
R331	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R553	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R332	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R554	RK73HB1J154J	MG RESISTOR	150kΩ 1/16W J	
R334	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R555	RK73HB1J274J	MG RESISTOR	270kΩ 1/16W J	
R335	RK73GH2A181D	MG RESISTOR	180Ω 1/10W D		R556	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J	
R336	RK73GH2A181D	MG RESISTOR	180Ω 1/10W D		R557	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R337	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R558	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J	
R338	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R560	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J	
R340	RK73GH2A121D	MG RESISTOR	120Ω 1/10W D		R561	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R341	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R562	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R342	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R563	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R343	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R564	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R344	RK73GH2A151D	MG RESISTOR	150Ω 1/10W D		R565	RK73HB1J120J	MG RESISTOR	12Ω 1/16W J	
R345	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R566	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R346	RK73PB2H560J	MG RESISTOR	56Ω 1/2W J		R567	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R348	RK73GB2A102J	MG RESISTOR	1kΩ 1/10W J		R569	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J	
R350	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R571	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J	
R351	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R572	RK73HB1J271J	MG RESISTOR	270kΩ 1/16W J	
R352	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R573	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R353	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R575	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J	
R354	RK73GH2A121D	MG RESISTOR	120Ω 1/10W D		R576	RK73HB1J563J	MG RESISTOR	56kΩ 1/16W J	
R355	RK73GH2A181D	MG RESISTOR	180Ω 1/10W D		R577	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J	
R356	R92-1061-05	C RESISTOR	0.008Ω		R580	RK73HB1J563J	MG RESISTOR	56kΩ 1/16W J	
R357	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R581	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J	
R358	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R584	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R359	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J		R585	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R360	RK73HB1J221J	MG RESISTOR	220Ω 1/16W J		R586	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R361	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R587	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R362	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R588	RK73HB1J183J	MG RESISTOR	18kΩ 1/16W J	
R363	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R589	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R364	RK73PB2H560J	MG RESISTOR	56Ω 1/2W J		R590	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R366	RK73HB1J273J	MG RESISTOR	27kΩ 1/16W J		R592	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R369	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R594	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R370	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R598	RK73HB1J181J	MG RESISTOR	180Ω 1/16W J	
R371	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R603	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R373	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R604	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R375	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R607	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R379	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R611	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R380	RK73HB1J470J	MG RESISTOR	47Ω 1/16W J		R612	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J	
R382	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R652	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R385	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R656	RK73GB2A2R2J	MG RESISTOR	2.2Ω 1/10W J	
R386	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R657	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R393	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R658	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R394	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R660	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J	
R395	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R661	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R397	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R662	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R500	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R700	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R501	RK73GB2A104J	MG RESISTOR	100kΩ 1/10W J		R701	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R503	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R702	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R504	RK73HB1J564J	MG RESISTOR	560kΩ 1/16W J		R703	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R508	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R704	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R509	RK73HB1J123J	MG RESISTOR	12kΩ 1/16W J		R705	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R510	RK73HB1J124J	MG RESISTOR	120kΩ 1/16W J		R706	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R511	RK73HB1J122J	MG RESISTOR	1.2kΩ 1/16W J		R707	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R512	RK73HB1J123J	MG RESISTOR	12kΩ 1/16W J		R708	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R513	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J		R709	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R514	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R710	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R515	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J		R711	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R516	RK73HB1J332J	MG RESISTOR	3.3kΩ 1/16W J		R712	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R517	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R713	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R518	RK73HB1J563J	MG RESISTOR	56kΩ 1/16W J		R714	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R519	RK73HH1J473D	MG RESISTOR	47kΩ 1/16W D		R715	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R520	RK73HB1J105J	MG RESISTOR	1MΩ 1/16W J		R716	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R521	RK73HB1J224J	MG RESISTOR	220kΩ 1/16W J		R717	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R528	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R718	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R529	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R720	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R721	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J		R821	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R722	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R822	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R724	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R823	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R727	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R824	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R728	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R825	RK73GB2A100J	MG RESISTOR	10Ω 1/10W J	
R729	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R826	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R730	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R827	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R732	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		R829	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R733	RK73HB1J561J	MG RESISTOR	560Ω 1/16W J		R830	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R734	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R832	RK73HB1J153J	MG RESISTOR	15kΩ 1/16W J	
R736	RK73HB1J681J	MG RESISTOR	680Ω 1/16W J		R833	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R737	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R834	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R738	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R835	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R739	RK73HB1J821J	MG RESISTOR	820Ω 1/16W J		R836	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R740	RK73HB1J222J	MG RESISTOR	22kΩ 1/16W J		R837	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R741	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		R838	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R742	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R839	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R743	RK73HB1J222J	MG RESISTOR	22kΩ 1/16W J		R840	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J	
R744	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R841	RK73HB1J820J	MG RESISTOR	82Ω 1/16W J	
R745	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J		R843	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R747	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R844	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R748	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R846	RK73HB1J104D	MG RESISTOR	100kΩ 1/16W D	
R749	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		R847	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R750	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R848	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J	
R751	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R849	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R752	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		R850	RK73HB1J184D	MG RESISTOR	180kΩ 1/16W D	
R757	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R854	RK73HB1J104D	MG RESISTOR	100kΩ 1/16W D	
R758	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J		R855	RK73HB1J820J	MG RESISTOR	82Ω 1/16W J	
R760	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J		R859	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R761	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R862	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R762	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R863	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R764	RK73HB1J183J	MG RESISTOR	18kΩ 1/16W J		R865	RK73HB1J333J	MG RESISTOR	33kΩ 1/16W J	
R765	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		R870	RK73HB1J220J	MG RESISTOR	22Ω 1/16W J	
R768	RK73HB1J561J	MG RESISTOR	560Ω 1/16W J		R871	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J	
R769	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R872	RK73HB1J820J	MG RESISTOR	82Ω 1/16W J	
R770	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R874	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R771	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R875	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R772	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R876	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R773	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R879	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R774	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R880	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R775	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R882	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R776	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R887	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R777	RK73HB1J124J	MG RESISTOR	120kΩ 1/16W J		R888	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R779	RK73HB1J473D	MG RESISTOR	47kΩ 1/16W D		R889	RK73HB1J153D	MG RESISTOR	15kΩ 1/16W D	
R780	RK73HB1J473D	MG RESISTOR	47kΩ 1/16W D		R890	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R781	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R891	RK73HB1J105J	MG RESISTOR	1MΩ 1/16W J	
R782	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R892	RK73HB1J822D	MG RESISTOR	8.2kΩ 1/16W D	
R783	RK73HB1J683J	MG RESISTOR	68kΩ 1/16W J		R893	RK73HB1J104D	MG RESISTOR	100kΩ 1/16W D	
R784	RK73HB1J100J	MG RESISTOR	10Ω 1/16W J		R895	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R785	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R896	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J	
R787	RK73HB1J824J	MG RESISTOR	820kΩ 1/16W J		R897	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R790	RK73HB1J103D	MG RESISTOR	10kΩ 1/16W D		R898	RK73GH2A134D	MG RESISTOR	130kΩ 1/10W D	
R791	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R899	RK73GH2A123D	MG RESISTOR	12kΩ 1/10W D	
R792	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R900	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R794	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R901	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R795	RK73HB1J822J	MG RESISTOR	8.2kΩ 1/16W J		R902	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R796	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R903	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R797	RK73HB1J562J	MG RESISTOR	5.6kΩ 1/16W J		R904	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J	
R798	RK73HB1J392J	MG RESISTOR	3.9kΩ 1/16W J		R906	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R799	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R907	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R800	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R910	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R802	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R911	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J	
R803	RK73HB1J563J	MG RESISTOR	56kΩ 1/16W J		R912	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R804	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R913	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R805	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R914	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R806	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		R915	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	
R807	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R916	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R809	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		R917	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R810	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R918	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R811	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R919	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R812	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		R920	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R813	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R921	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R814	RK73HB1J823J	MG RESISTOR	82kΩ 1/16W J		R922	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R815	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		R923	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R816	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		R924	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R817	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R925	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J	
R819	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R926	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J	
R820	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		R927	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J	

△ Symbol No.	Part No.	Part Name	Description	Local	△ Symbol No.	Part No.	Part Name	Description	Local
R928	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L30	L41-1878-14	CHIP INDUCTOR		
R929	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L31	L41-2778-14	CHIP INDUCTOR		
R930	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L33	L41-2785-53	CHIP INDUCTOR		
R931	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L34	L41-2285-53	CHIP INDUCTOR		
R933	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L36	L41-2785-53	CHIP INDUCTOR		
R935	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L37	LK73G0AQ3R3K	M.CHIP INDUCTOR	3.3uH	
R936	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L39	LB73G0BV-001	CHIP FERRITE		
R937	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L40	LK73H0AM33NJ	M.CHIP INDUCTOR	33nH	
R938	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L41	L41-2775-53	CHIP INDUCTOR		
R939	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L42	L41-2775-53	CHIP INDUCTOR		
R940	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L45	LK73H0AM27NJ	M.CHIP INDUCTOR	27nH	
R941	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L300	LK73H0AM6N8J	M.CHIP INDUCTOR	6.8nH	
R942	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		L301	LK73H0AM6N8J	M.CHIP INDUCTOR	6.8nH	
R943	RK73HB1J152J	MG RESISTOR	1.5kΩ 1/16W J		L303	L41-3975-53	CHIP INDUCTOR		
R944	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J		L304	L41-1875-53	CHIP INDUCTOR		
R946	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L305	L41-2275-53	CHIP INDUCTOR		
R947	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L307	LB73Z0AF-001	CHIP FERRITE		
R948	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L308	LB73Z0AF-001	CHIP FERRITE		
R949	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L309	LB73Z0AF-001	CHIP FERRITE		
R950	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L310	L34-1039-05	AIR CORE COIL		
R951	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L311	L34-4667-05	AIR CORE COIL		
R952	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L312	L34-1039-05	AIR CORE COIL		
R953	RK73HB1J682J	MG RESISTOR	6.8kΩ 1/16W J		L313	L34-1113-05	AIR CORE COIL		
R954	RK73HB1J471J	MG RESISTOR	470Ω 1/16W J		L314	L34-1113-05	AIR CORE COIL		
R955	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		L315	L34-4667-05	AIR CORE COIL		
R956	RK73HB1J222J	MG RESISTOR	2.2kΩ 1/16W J		L316	LK73H0AM18NJ	M.CHIP INDUCTOR	18nH	
R957	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L317	LK73H0AM18NJ	M.CHIP INDUCTOR	18nH	
R958	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		L319	LK73H0AM39NJ	M.CHIP INDUCTOR	39nH	
R959	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		L322	LB73H0AV-003	CHIP FERRITE		
R960	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		L500	L41-1885-53	CHIP INDUCTOR		
R961	RK73GB2A103J	MG RESISTOR	10kΩ 1/10W J		L501	LK73H0AMR10J	M.CHIP INDUCTOR	0.1uH	
R962	RK73HB1J391J	MG RESISTOR	390Ω 1/16W J		L502	LK73G0AQ2R2K	M.CHIP INDUCTOR	2.2uH	
R964	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J		L503	LR77Z0AER27J	CHIP INDUCTOR	0.27uH	
R965	RK73GB2A103J	MG RESISTOR	10kΩ 1/10W J		L504	LR77Z0AER56J	CHIP INDUCTOR	0.56uH	
R966	RK73FB2B000J	MG RESISTOR	0Ω 1/8W J		L506	L41-2278-14	CHIP INDUCTOR		
R968	RK73HB1J334J	MG RESISTOR	330kΩ 1/16W J		L507	L41-3378-14	CHIP INDUCTOR		
R969	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		L508	L41-3378-14	CHIP INDUCTOR		
R970	RK73HB1J564J	MG RESISTOR	560kΩ 1/16W J		L509	L41-3378-14	CHIP INDUCTOR		
R971	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L510	L41-3378-14	CHIP INDUCTOR		
R972	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		L512	LR79Z0DD32N5J	CHIP INDUCTOR	32.5nH	
R973	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L513	LR79Z0DD32N5J	CHIP INDUCTOR	32.5nH	
R974	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		L515	L41-1078-14	CHIP INDUCTOR		
R975	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		L516	L41-2278-14	CHIP INDUCTOR		
R976	RK73HB1J473J	MG RESISTOR	47kΩ 1/16W J		L518	LB73G0BD-005	CHIP FERRITE		
R977	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		L705	LB73G0BV-001	CHIP FERRITE		
R978	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L706	LB73H0AV-003	CHIP FERRITE		
R979	RK73HB1J223J	MG RESISTOR	22kΩ 1/16W J		L707	LB73H0AV-003	CHIP FERRITE		
R981	RK73HB1J000J	MG RESISTOR	0Ω 1/16W J		L710	LB73H0AV-001	CHIP FERRITE		
R985	RK73HB1J103J	MG RESISTOR	10kΩ 1/16W J		L800	LB73H0AV-003	CHIP FERRITE		
R986	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L801	LB73H0AV-003	CHIP FERRITE		
R987	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L802	LB73H0AV-003	CHIP FERRITE		
R988	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L803	LB73H0AV-003	CHIP FERRITE		
R989	RK73HB1J102J	MG RESISTOR	1kΩ 1/16W J		L804	LB73H0AV-003	CHIP FERRITE		
R990	RK73HB1J474J	MG RESISTOR	470kΩ 1/16W J		L805	LB73H0AV-003	CHIP FERRITE		
R991	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J						
R992	RK73HB1J472J	MG RESISTOR	4.7kΩ 1/16W J		CN700	E40-6847-05	F.C.CONNECTOR		
R993	RK73HB1J104J	MG RESISTOR	100kΩ 1/16W J		CP1	RK74HA1J101J	NET RESISTOR	100Ω 1/16W J	
R996	RK73GB2A000J	MG RESISTOR	0Ω 1/10W J		CP701	RK74HB1J104J	NET RESISTOR	100kΩ 1/16W J	
R997	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		CP702	RK74HB1J104J	NET RESISTOR	100kΩ 1/16W J	
R998	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		CP703	RK74HB1J103J	NET RESISTOR	10kΩ 1/16W J	
R999	RK73HB1J101J	MG RESISTOR	100Ω 1/16W J		CP704	RK74HA1J473J	NET RESISTOR	47kΩ 1/16W J	
L1	LR77Z0AE4R7J	CHIP INDUCTOR	4.7uH		CP705	RK74HA1J102J	NET RESISTOR	1kΩ 1/16W J	
L2	LB73G0BJ-001	CHIP FERRITE			CP708	RK74HA1J102J	NET RESISTOR	1kΩ 1/16W J	
L3	LB73H0AV-003	CHIP FERRITE			F700	FZA10AW-2R5	FUSE (CC)	2.5A	
L4	LB73G0BV-001	CHIP FERRITE			F701	FZA10AW-5R0	FUSE (CC)	5A	
L7	LK73H0AM15NJ	M.CHIP INDUCTOR	15nH		F702	FZA10AW-2R5	FUSE (CC)	2.5A	
L10	L41-2785-53	CHIP INDUCTOR			F704	F53-0315-15	FUSE		
L12	L41-2785-53	CHIP INDUCTOR			J700	E58-0567-05	SUB SOCKET D		
L15	LB73H0AV-003	CHIP FERRITE			J701	E1B-0001-00	3.5D PHONE JACK		
L16	L41-2285-53	CHIP INDUCTOR			TH2	NCP15WF104F0S	N THERMISTOR		
L18	LB73H0AV-003	CHIP FERRITE			TH301	NCP15WF104F0S	N THERMISTOR		
L21	L41-2285-53	CHIP INDUCTOR			TH302	NCP15WF104F0S	N THERMISTOR		
L22	L41-2285-53	CHIP INDUCTOR			TH303	NCP15WF104F0S	N THERMISTOR		
L23	L41-2285-53	CHIP INDUCTOR			X1	L77-3128-05	TCXO		
L24	L41-2285-53	CHIP INDUCTOR			X700	L77-3129-05	TCXO		
L27	L41-2285-53	CHIP INDUCTOR			XF500	L71-0655-05	MCF		
L28	LB73G0BV-001	CHIP FERRITE							

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	B5A-0923-00	INST.MANUAL	A5,P24	D840_M2
1	B5A-0921-00	INST.MANUAL	A5,P112	D840_E
1	B5A-0922-00	INST.MANUAL	A5,P40	D840H_K2,D840HU_K2
2	E30-7523-65	DC CORD ASSEMBLY	ACC BLADE	
3	FZB10AU-100	FUSE	BLADE(x2)	D840_M2,D840_E
3	FZB10AU-150	FUSE	BLADE(x2)	D840H_K2,D840HU_K2
4	H12-3178-05	PACKING FIXTURE	(x2)	
5	H52-2674-22	ITEM CARTON		
6	J19-1584-15	HOLDER	ACC FOR MIC	D840H_K2,D840HU_K2
7	J29-0726-03	BRACKET	ACC	
8	N99-2039-05	SCREW SET	ACC	
9	T91-0624-75	MICROPHONE	ACC KMC-30	D840H_K2
10	T91-0639-75	MICROPHONE	ACC KMC-35	D840HU_K2
11	-----	PAMPHLET	HOT SURFACE	
12	-----	PAMPHLET	FCC, 40cm	D840_M2,D840H_K2,D840HU_K2
12	-----	PAMPHLET	ROHS2	D840_E
13	-----	PROTECTION BAG	RADIO	

MEMO



KENWOOD

JVC KENWOOD Corporation
Communications Systems Business Unit

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