VHF FM TRANSCEIVER

# TK-7180

## SERVICE MANUAL

KENWOOD

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# GENERAL

## INTRODUCTION

### SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of this publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions, which are issued as required.

## ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, and chassis. If the part number is not known, include the chassis or kit number of which it is a part and a sufficient description of the required component for proper identification.

## PERSONAL SAFETY

The following precautions are recommended for personal safety :

- DO NOT transmit if someone is within two feet (0.6 meter) of the antenna.
- DO NOT transmit until all RF connectors are secure and any open connectors are properly terminated.
- SHUT OFF this equipment when near electrical blasting caps or while in an explosive atmosphere.
- All equipment should be properly grounded before power-up for safe operation.
- This equipment should be serviced by only qualified technicians.

## PRE-INSTALLATION CONSIDERATIONS

### 1. UNPACKING

Unpack the radio from its shipping container and check for accessory items. If any item is missing, please contact KENWOOD immediately.

### 2. LICENSING REQUIREMENTS

Federal regulations require a station license for each radio installation (mobile or base) be obtained by the equipment owner. The licensee is responsible for ensuring transmitter power, frequency, and deviation are within the limits permitted by the station license.

Transmitter adjustments may be performed only by a licensed technician holding an FCC first, second or general class commercial radiotelephone operator's license. There is no license required to install or operate the radio.

### 3. PRE-INSTALLATION CHECKOUT

#### 3-1. Introduction

Each radio is adjusted and tested before shipment. However, it is recommended that receiver and transmitter operation be checked for proper operation before installation.

#### 3-2. Testing

The radio should be tested complete with all cabling and accessories as they will be connected in the final installation. Transmitter frequency, deviation, and power output should be checked, as should receiver sensitivity, squelch operation, and audio output. Signalling equipment operation should be verified.

### 4. PLANNING THE INSTALLATION

#### 4-1. General

Inspect the vehicle and determine how and where the radio antenna and accessories will be mounted.

Plan cable runs for protection against pinching or crushing wiring, and radio installation to prevent overheating.

#### 4-2. Antenna

The favored location for an antenna is in the center of a large, flat conductive area, usually at the roof center. The trunk lid is preferred, bond the trunk lid and vehicle chassis using ground straps to ensure the lid is at chassis ground.

#### 4-3. Radio

The universal mount bracket allows the radio to be mounted in a variety of ways. Be sure the mounting surface is adequate to support the radio's weight. Allow sufficient space around the radio for air cooling. Position the radio close enough to the vehicle operator to permit easy access to the controls when driving.

#### 4-4. DC Power and wiring

1. This radio may be installed in negative ground electrical systems only. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before installation to prevent wasted time and effort.
2. Connect the positive power lead directly to the vehicle battery positive terminal. Connecting the Positive lead to any other positive voltage source in the vehicle is not recommended.
3. Connect the ground lead directly to the battery negative terminal.
4. The cable provided with the radio is sufficient to handle the maximum radio current demand. If the cable must be extended, be sure the additional wire is sufficient for the current to be carried and length of the added lead.

### 5. INSTALLATION PLANNING – CONTROL STATIONS

#### 5-1. Antenna system

Control station. The antenna system selection depends on many factors and is beyond the scope of this manual. Your KENWOOD dealer can help you select an antenna system that will best serve your particular needs.

#### 5-2. Radio location

Select a convenient location for your control station radio which is as close as practical to the antenna cable entry point. Secondly, use your system's power supply (which supplies the voltage and current required for your system). Make sure sufficient air can flow around the radio and power supply to allow adequate cooling.

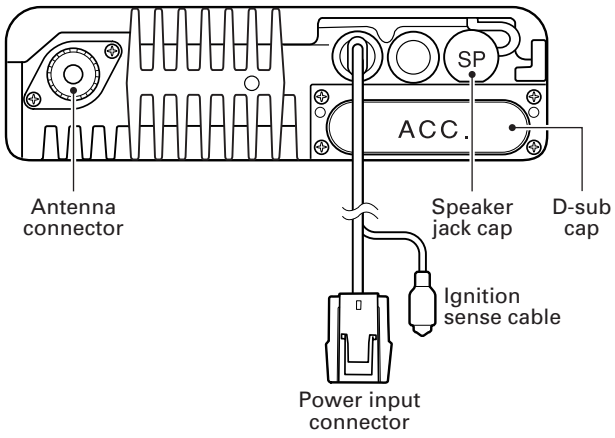
# GENERAL / SYSTEM SET-UP

## SERVICE

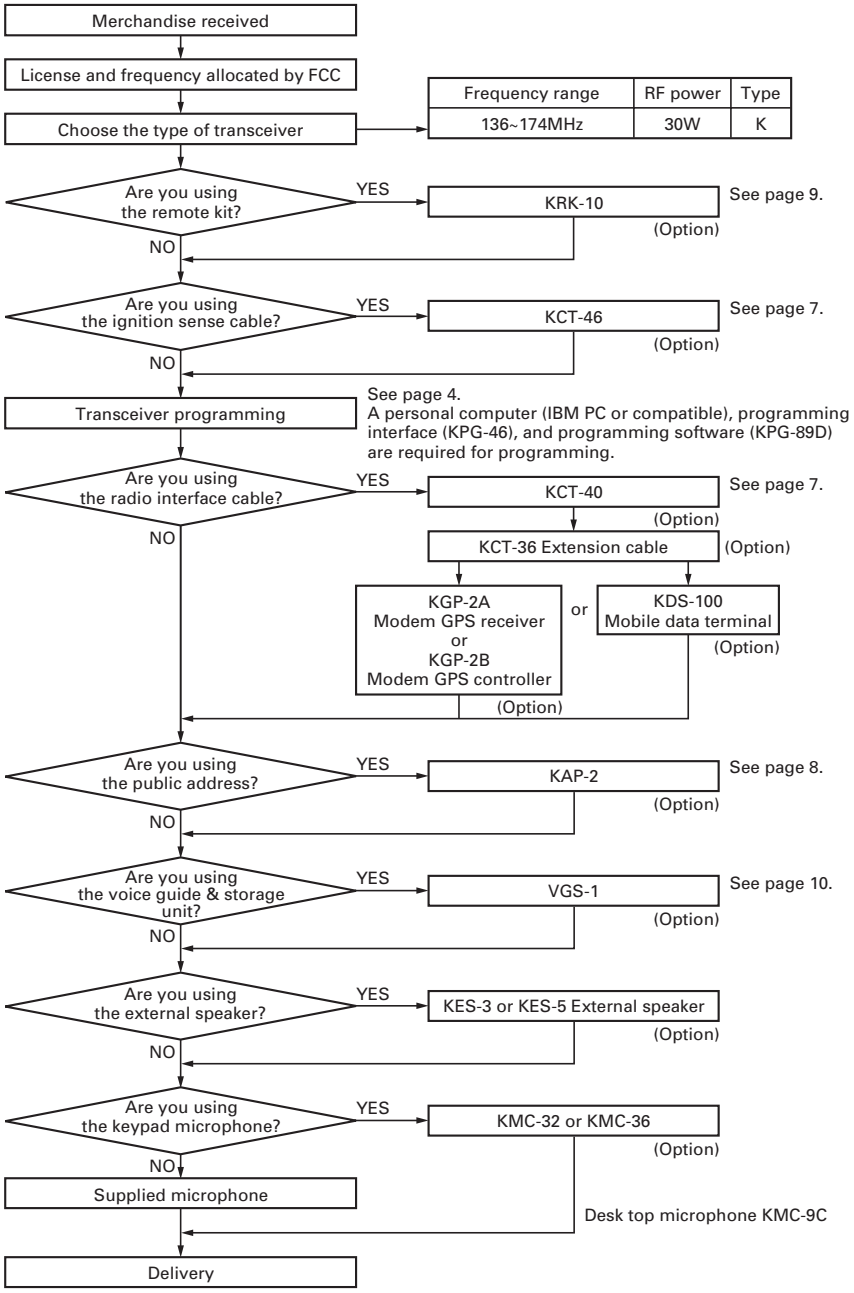
This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained in this manual.

## NOTE

- If you do not intend to use the speaker 3.5-mm jack and the D-sub 25-pin connector, fit the supplied speaker-jack cap and D-sub cap to stop dust and sand from getting in.
- If the transceiver is turned ON or OFF when the power-on/off status message is enabled, the transceiver sends the status.

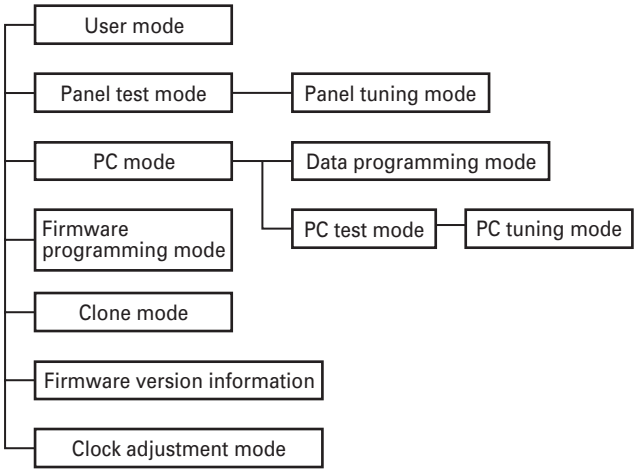



## *SYSTEM SET-UP*



# REALIGNMENT

## 1. Modes




| Mode | Function |
|---|---|
| User mode | For normal use. |
| Panel test mode | Used by the dealer to check the fundamental characteristics. |
| Panel tuning mode | Used by the dealer to tune the radio. |
| PC mode | Used for communication between the radio and PC (IBM compatible). |
| Data programming mode | Used to read and write frequency data and other features to and from the radio. |
| PC test mode | Used to check the radio using the PC. This feature is included in the FPU. See panel test. |
| PC tuning mode | Used to tune the radio using the PC. This feature is included in the FPU. See panel tuning. |
| Firmware programming mode | Used when changing the main program of the flash memory. |
| Clone mode | Used to transfer programming data from one radio to another. |
| Firmware version information | Used to confirm the internal firmware version. |
| Clock adjustment mode | Used to adjust date and time. |

## 2. How to Enter Each Mode

| Mode | Operation |
|---|---|
| User mode | Power ON |
| Panel test mode | [A] + Power ON |
| PC mode | Received commands from PC |
| Panel tuning mode | [Panel test mode] + [S] |
| Firmware programming mode | [S] + Power ON |
| Clone mode | [B] + Power ON |
| Firmware version information | [△] + Power ON |
| Clock adjustment mode | [C] + Power ON |

## 3. Panel Test Mode

Setting method refer to ADJUSTMENT.

## 4. Panel Tuning Mode

Setting method refer to ADJUSTMENT.

## 5. PC Mode

### 5-1. Preface

The transceiver is programmed by using a personal computer, programming interface (KPG-46) and programming software (KPG-89D).

The programming software can be used with an IBM PC or compatible. Figure 1 shows the setup of an IBM PC for programming.

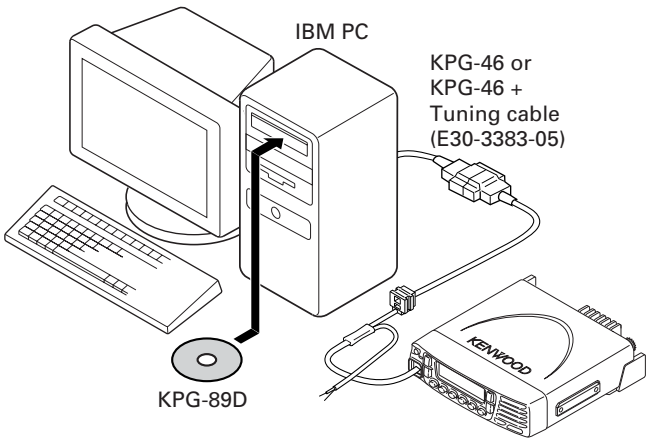



**Fig. 1**

# REALIGNMENT

### 5-2. Connection procedure

1. Connect the transceiver to the personal computer with the interface cable.
2. When the POWER switch on, user mode can be entered immediately. When PC sends command the radio enter PC mode, and "PROGRAM" is displayed on the LCD.
   When data transmitting from transceiver, the red LED is lights.
   When data receiving to transceiver, the green LED is lights.

**Note:**

- The data stored in the personal computer must match model type, when it is written into the flash memory.

### 5-3. KPG-46 description (PC programming interface cable: Option)

The KPG-46 is required to interface the transceiver to the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-46 connects the modular microphone jack of the transceiver to the computers RS-232C serial port.

### 5-4. Programming software KPG-89D description

The KPG-89D is the programming software for the transceiver supplied on a CD-ROM. This software runs under MS-Windows 98, ME, Windows 2000 or XP on an IBM-PC or compatible machine.

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.

## 6. Firmware Programming Mode

### 6-1. 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.)

### 6-2. Connection procedure

Connect the transceiver to the personal computer (IBM PC or compatible) with the interface cable (KPG-46). (Connection is the same as in the PC Mode.)

**Note :**

You can only program firmware from the 8-pin microphone connector on the front panel. Using the 25-pin logic interface on the rear panel will not work.

### 6-3. Programming

1. Start up the firmware programming software (Fpro.exe).
2. Set the communications speed (normally, 115200 bps) and communications port in the configuration item.
3. Set the firmware to be updated by File name item.
4. Turn the transceiver power ON with the [S] key held down. Then, the orange LED on the transceiver lights and "PROG 115200" is displayed.
5. Check the connection between the transceiver and the personal computer, and make sure that the transceiver is in the Program mode.
6. Press write button in the window. When the transceiver starts to receive data, the [PG] display is blinking.
7. If writing ends successfully, the checksum is calculated and a result is displayed.
8. If you want to continue programming other transceivers, repeat steps 4 to 7.

**Notes:**

- This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software.
- When programming the firmware, it is recommend to copy the data from the floppy disk to your hard disk before update the radio firmware.
  Directly copying from the floppy disk to the radio may not work because the access speed is too slow.

### 6-4. Function

1. If you press the [■] key while "PROG 115200" is displayed, the display changes to "PROG 19200" (The LED blinks green) to indicate that the write speed is low speed (19200 bps). If you press the [■] key again while "PROG 19200" is displayed, the display changes to "PROG 38400" (The LED lights red and orange alternatively). If you press the [■] key again while "PROG 38400" is displayed, the display changes to "PROG 57600" (The LED blinks orange). If you press the [■] key again while "PROG 57600" is displayed, the display returns to "PROG 115200" (The LED lights orange).
2. If you press the [⏢] key while "PROG 115200" is displayed, the checksum is calculated, and a result is displayed. If you press the [⏢] key again while the checksum is displayed, "PROG 115200" is redisplayed.

**Note:**

Normally, write in the high-speed mode.

## 7. Clone Mode

Programming data can be transferred from one radio to another by connecting them via their 8-pin microphone connectors. The operation is as follows (the transmit radio is the master and the receive radio is a slave).

1. Turn the master transceiver power ON with the [B] key held down. If the read authorization password is set to the transceiver, the transceiver displays "CLONE LOCK". If the password is not set, the transceiver displays "CLONE MODE".
2. When you enter the correct password, and "CLONE MODE" is displayed, the transceiver can be used as the cloning master. The following describes how to enter the password.

# REALIGNMENT

3. How to enter the password with the microphone keypad;
   If you press a key while "CLONE LOCK" is displayed, the number that was pressed is displayed on the transceiver. Each press of the key shifts the display in order to the left. When you enter the password and press the [✳] key, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.
   How to enter the password with the [⩓] and [⩔] keys;
   If the [⩓] and [⩔] keys is pressed while "CLONE LOCK" is displayed, numbers (0 to 9) are displayed flashing. When you press the [C] key, the currently selected number is determined. If you press the [S] key after entering the password in this procedure, "CLONE MODE" is displayed if the entered password is correct. If the password is incorrect, "CLONE LOCK" is redisplayed.
4. Power on the slave transceiver.
5. Connect the cloning cable (Part No. E30-3382-05) to the modular microphone jacks on the master and slave.
6. Press the [S] key on the master while the master displays "CLONE MODE". The data of the master is sent to the slave. While the slave is receiving the data, "PROGRAM" is displayed. When cloning of data is completed, the master displays "END", and the slave automatically operates in the User mode. The slave can then be operated by the same program as the master.
7. The other slave can be continuously cloned. When the [S] key on the master is pressed while the master displays "END", the master displays "CLONE MODE". Carry out the operation in step 4 to 6. Can not be cloned if the overwrite password is programmed to the slave.

**Note:**
Only the same models can be cloned together.

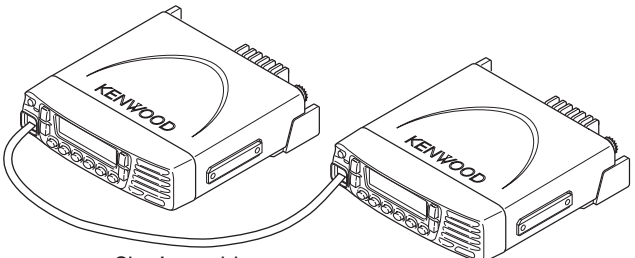


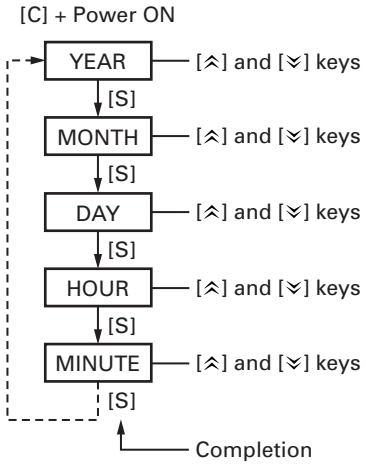

**Fig. 2**

## 8. Firmware Version Information

Turn the transceiver ON with the [⩓] key held down. Then, the version is displayed during holding the [⩓] key.

## 9. Clock Adjustment Mode

### 9-1. Flow chart of operation



# INSTALLATION

## 1. Ignition Sense Cable (KCT-46 : Option)

The KCT-46 is an optional cable for enabling the ignition function. The ignition function lets you turn the power to the transceiver on and off with the car ignition key.

### 1-1. Connecting the KCT-46 cable to the transceiver

1. Open the KCT-46 fuse holder and insert a mini blade fuse (3A). ( ① )
2. While holding a clear protective cover, remove the black cap at the end of the yellow cable (ignition sense cable) of the transceiver. ( ② )
3. Connect the plug of the KCT-46 to the yellow cable terminal of the transceiver. ( ③ )
4. Connect the other end of the KCT-46 to the ignition line of the car. ( ④ )

**Note :** You must setup using the KPG-89D.

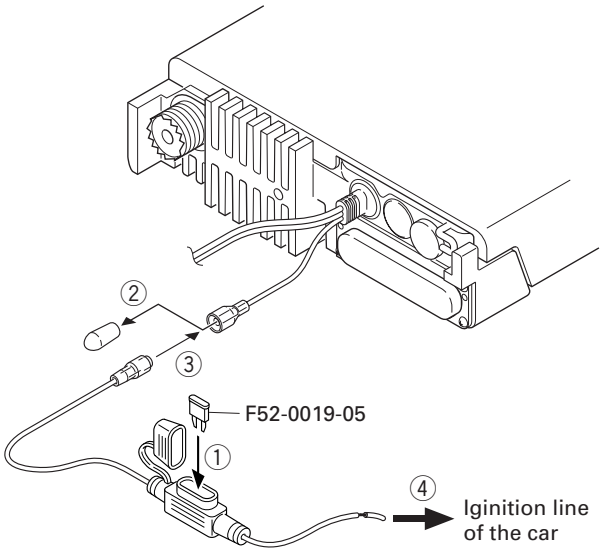



**Fig. 1**

## 2. Radio Interface Cable (KCT-40 : Option)

The KCT-40 connection cable kit is used to connect the TK-7180 transceiver to the KDS-100 (Mobile data terminal), KGP-2A (Modem GPS receiver), KGP-2B (Modem GPS controller) or through the KCT-36 extension cable.

### 2-1. Connecting the KCT-40 cable to the transceiver

1. Remove the D-sub cap on the rear of the transceiver. ( ① )
2. Connect the D-sub connector of the KCT-40 to the D-sub 25-pin terminal of the transceiver. ( ② )
3. Connect the 15-pin connector of the KCT-40 to a KDS-100, KGP-2A, KGP-2B or through a KCT-36 extension cable. ( ③ )

**Note :** You must setup using the KPG-89D.

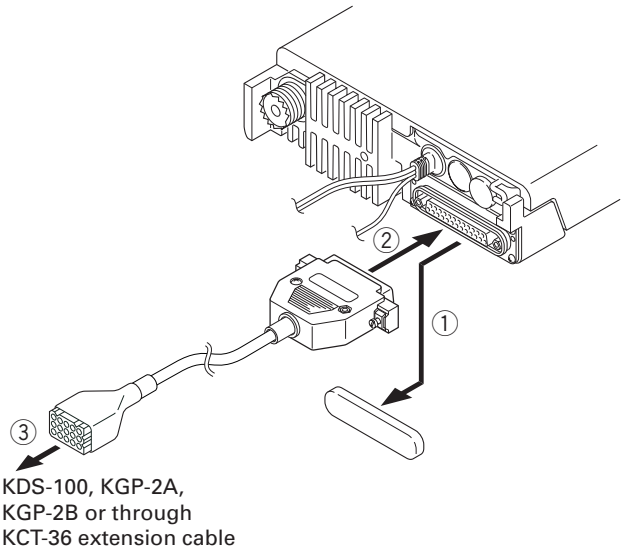



**Fig. 2**

### 2-2. Terminal function

| D-sub 25-pin Pin No. | TK-7180 Function | Molex 15-pin Pin No. | KDS-100 Function | KGP-2A/2B Function |
|---|---|---|---|---|
| 1 | - | - | - | - |
| 2 | - | - | - | - |
| 3 | - | - | - | - |
| 4 | - | - | - | - |
| 5 | DI | 5 | DO | DO |
| 6 | - | - | - | - |
| 7 | GND | 3 | GND | GND |
| 8 | AIO8 | 9 | TXS/LOK | TXS/LOK |
| 9 | TXD2 | 15 | RXD | RXD |
| 10 | RXD2 | 14 | TXD | TXD |
| 11 | - | - | - | - |
| 12 | AIO7 | 11 | MM | MM |
| 13 | AIO6 | 6 | PTT | PTT |
| 14 | SB | 1 | SB | SB |
| 15 | - | - | - | - |
| 16 | - | - | - | - |
| 17 | - | - | - | - |
| 18 | - | - | - | - |
| 19 | DEO | 4 | DI | DI |
| 20 | AIO5 | 8 | SQ | SQ |
| 21 | AIO4 | 10 | AM | AM |
| 22 | AIO3 | 13 | - | DISP OFF |
| 23 | AIO2 | 12 | - | - |
| 24 | AIO1 | 7 | DTC | DTC |
| 25 | - | - | - | - |

# INSTALLATION

## 3. Horn Alert/P.A. Relay Unit (KAP-2 : Option)

The Horn alert (max. 2A drive), Public address and External speaker function are enabled by installing the KAP-2 in the TK-7180 transceiver.

### 3-1. Installing the KAP-2 unit in the transceiver

1. Remove the cabinet, top packing and shielding plate of the transceiver.
2. Set the KAP-2 relay unit jumper pins according to the purpose of use.
3. Remove the 6-pin jumper connector inserted in the TX-RX unit (B/3) connector (CN428). ( ① )
4. Insert one side of the lead wire with connector (E37-1114-05) into the relay unit connector (CN3) ( ② ) and the other side into the TX-RX unit (B/3) connector (CN428) ( ③ ).
5. Place the relay unit at the position shown in Figure 3-2 and secure it to the chassis with a screw.
6. Remove the cap on the rear of the chassis by pushing it from the inside with your finger. ( ④ )
7. Pass the 6-pin connector of the cable (E37-1113-05) through the chassis hole ( ⑤ ) and insert the bush into the chassis hole.
8. Rotate the bush of the cable 90 degrees counterclockwise as viewed from the rear of the chassis. ( ⑥ )
9. Insert the 6-pin connector of the cable into the connector (CN2) of the KAP-2 relay unit. ( ⑦ )

**Note :** You must setup using the KPG-89D.

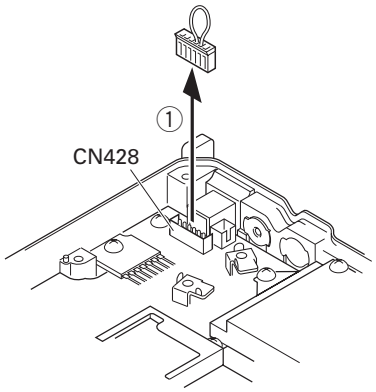



**Fig. 3-1**

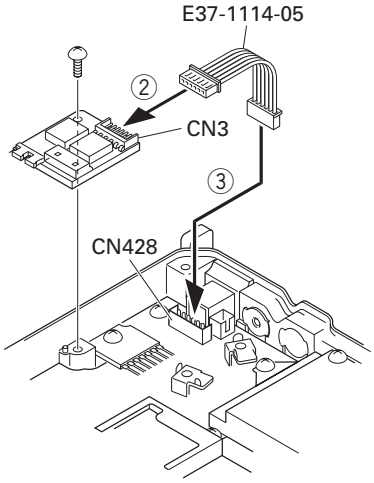



**Fig. 3-2**

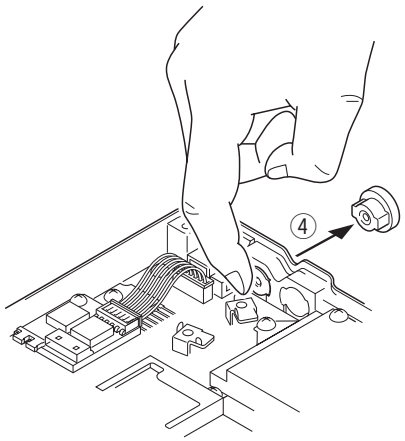



**Fig. 3-3**

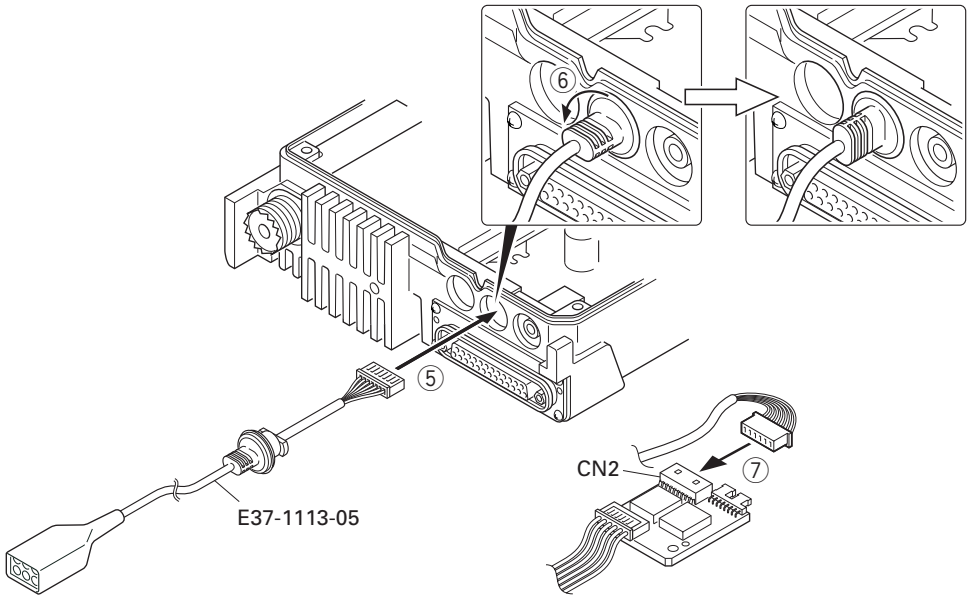



**Fig. 3-4**

# INSTALLATION

## 4. Control Head Remote Kit (KRK-10 : Option)

The KRK-10 remote kit is used to remotely operate a TK-7180 transceiver.

### 4-1. Installing the KRK-10 kit to the transceiver

1. Remove the front panel from the transceiver.
2. Install the KRK-10 main panel onto the transceiver.
3. Install the KRK-10 rear panel onto the front panel.
4. Connect the KRK-10 main panel to the rear panel with the cable.

#### ■ Remove the front panel from the transceiver

1. Lift the two tabs of the panel on the bottom of the transceiver with a flat-head screwdriver ( ① ) and remove the panel from the chassis ( ② ).
   **Note :** Confirm that the tabs of the speaker hardware fixture and holder is securely fitted in the front panel.
2. Remove the flat cable from the connector (CN902) of the display unit of the panel. ( ③ )
3. Fold the black line of the flat cable (in three parts) as shown in Figure 4-2. ( ④, ⑤, ⑥ )

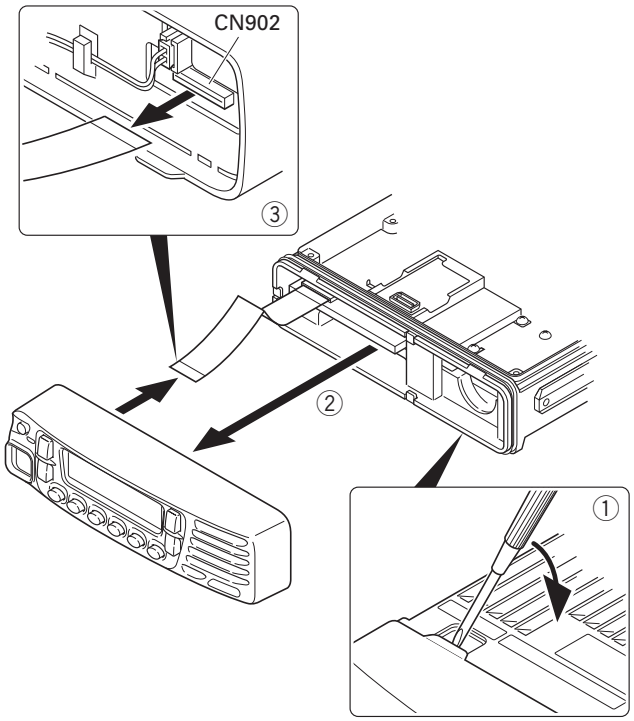



**Fig. 4-1**

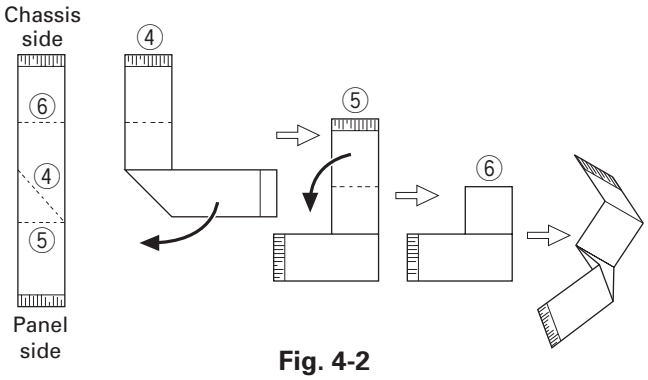



**Fig. 4-2**

#### ■ Install the KRK-10 main panel onto the transceiver

4. Insert the flat cable that was removed in step 2 above into the connector (CN1) of the interface unit (A/2) of the KRK-10 main panel (A62-1101-01). ( ⑦ )
   **Note :** The terminal side of the flat cable must face down when inserting the flat cable into the connector.
5. Fit the main panel with four tabs onto the front of the chassis. ( ⑧ )
   **Note :** When installing the main panel onto the front of the chassis, hold down the flat cable with your fingers to prevent it from being caught.

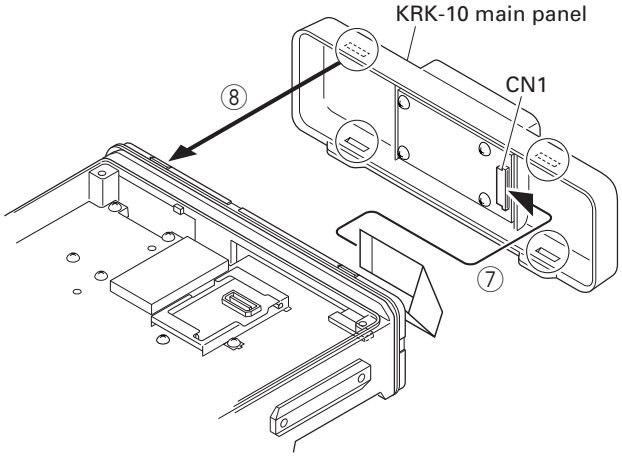



**Fig. 4-3**

#### ■ Install the KRK-10 rear panel onto the front panel

6. Insert the flat cable attached to the interface unit (B/2) of the KRK-10 rear panel (A82-0056-01) into the connector (CN902) of the display unit of the panel ( ⑨ ). (The flat cable has been pre-inserted in the connector (CN2) of the rear panel at the time of shipping.)
   **Note :** The terminal side of the flat cable must face down when inserting the flat cable into the connector.
7. Fit the four tabs of the rear panel into the front panel. ( ⑩ )

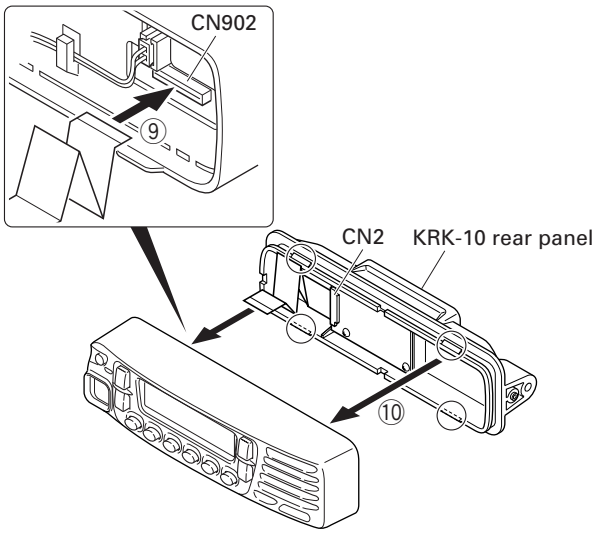



**Fig. 4-4**

# INSTALLATION

### ■ Connect the KRK-10 main panel to the rear panel with the cable

8. Insert one 14-pin connector of the cable (E30-7514-05) into the connector (CN3) of the interface unit (A/2) of the main panel. ( ⑪ )
9. Secure the cable bush on the main panel and fit the water-proof packing (orange) ( ⑫ ) securely over top.
10. Install the molded cover ( ⑬ ) over the connector on the main panel and secure it with two screws ( ⑭ ).
11. Insert the other 14-pin connector of the cable into the connector (CN4) of the interface unit (B/2) of the rear panel. ( ⑮ )
12. Secure the cable bush on the rear panel and fit the water-proof packing (orange) ( ⑯ ) securely over top.
13. Install the molded cover ( ⑰ ) over the connector on the rear panel and secure it with two screws ( ⑱ ).

**Note :** A cable can be connected from the left side as shown in the Figure 4-5 or from right side.
However, the 14-pin connector must be connected to correct direction.

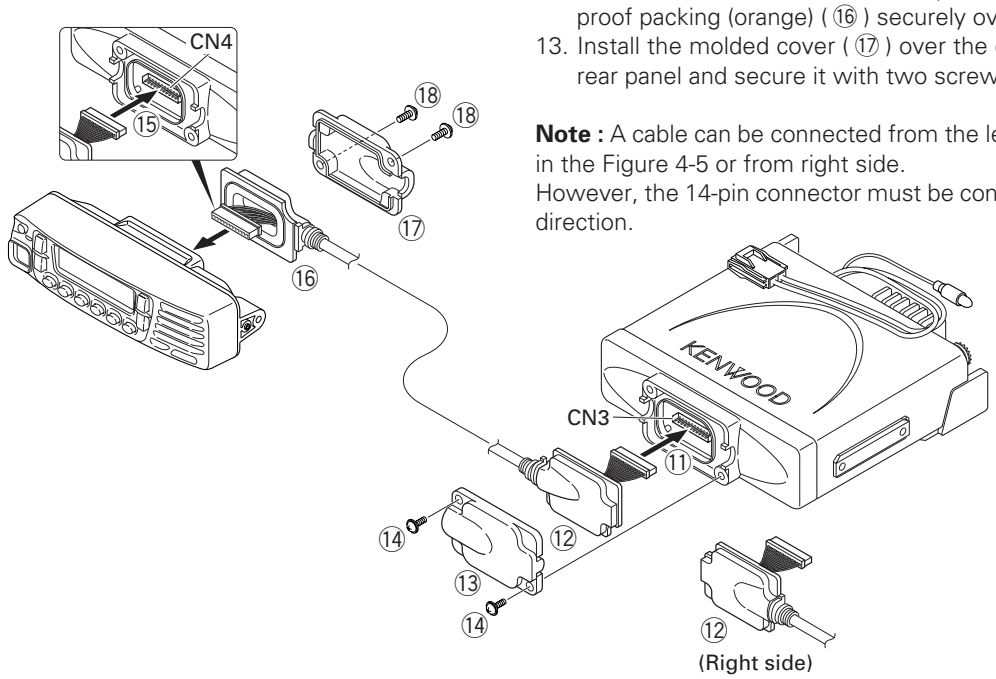



**Fig. 4-5**

## 5. Voice Guide & Storage Unit (VGS-1 : Option)

### 5-1. Installing the VGS-1 unit in the transceiver

1. Remove the cabinet, top packing and shielding plate of the transceiver.
2. Attach two cushions to VGS-1 as shown in Figure 5. ( ① )
   **Note :** Be sure not to cover the connector with the bottom cushion.
3. Insert the VGS-1 connector (CN1) into the TX-RX unit (B/3) connector (CN403). ( ② )

**Note :** You must setup using the KPG-89D.

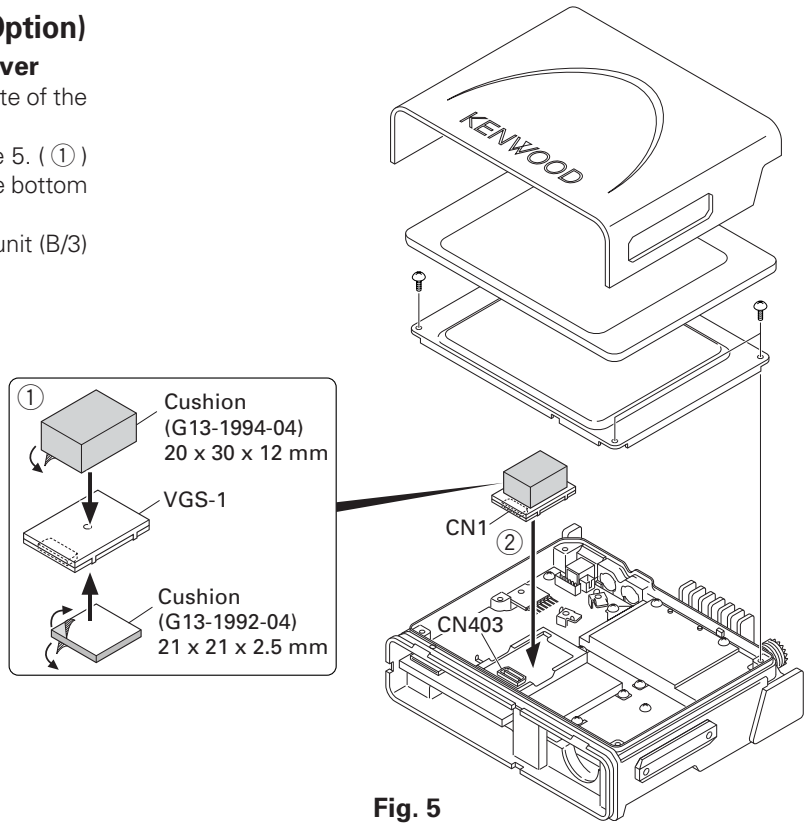



**Fig. 5**

# INSTALLATION

## 6. Voice Scrambler Board Connection

1. Remove the front panel from the transceiver.
2. Solder each lead of the scrambler board to a necessary location of each landing on the component side of the TX-RX unit (B/3).
3. Wrap the scrambler board in a cushion and install it on the front of the chassis as shown in Figure 7-2.

**Note :** You must setup using the KPG-89D.

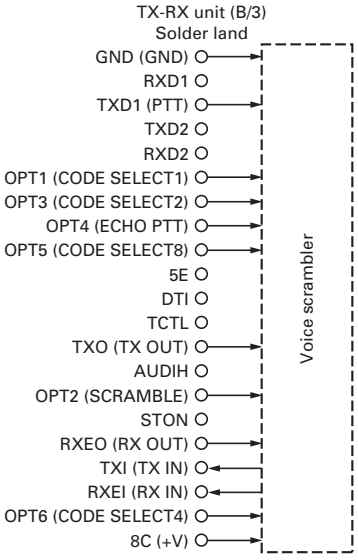



**Fig. 6**

## 7. ANI Board Connection

1. Remove the front panel from the transceiver.
2. Solder each lead of the scrambler board to a necessary location of each landing on the component side of the TX-RX unit (B/3).
3. Wrap the scrambler board in a cushion and install it on the front of the chassis as shown in Figure 7-2.

**Note :** You must setup using the KPG-89D.

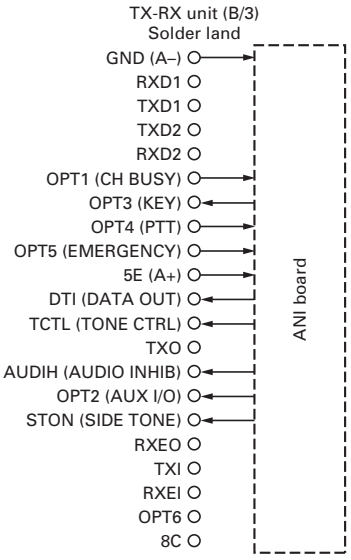



**Fig. 7-1**

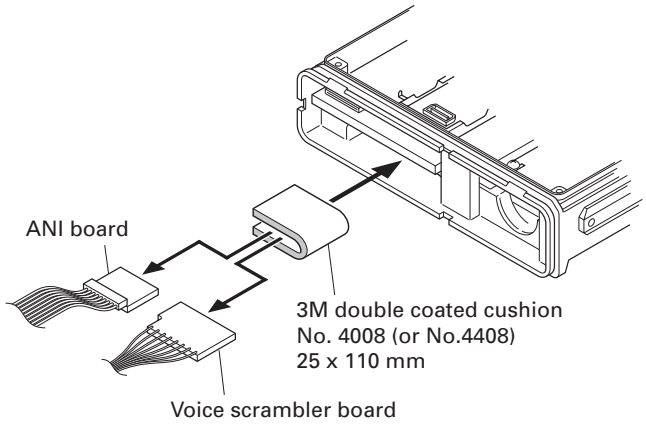



**Fig. 7-2**

## 8. GPS Receiver Connection

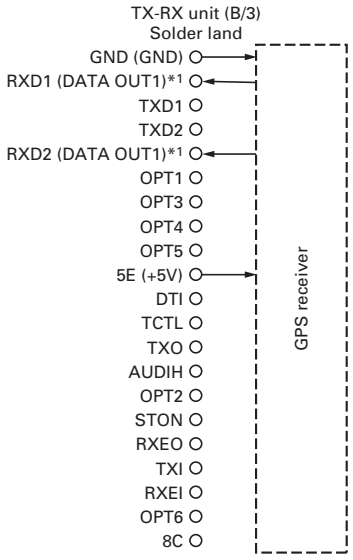
### 8-1. Installing the GPS receiver

1. Remove the cabinet, top packing and shielding plate of the transceiver.
2. Remove the front panel from the transceiver.
3. Attach two cushions to the top of the GPS receiver.
4. Attach the GPS receiver to the shield case with two cushions as shown in Figure 8-2.
5. Solder each lead of the GPS receiver to a necessary location of each landing on the component side of the TX-RX unit (B/3).
6. Place the GPS antenna cable in the hollow at the rear of the chassis. (Fig. 8-2 ①)

   **Note :** If the GPS receiver is installed, cut the base of the convex tab of the top packing with a pair of nippers, or similar tool. (Fig. 8-3 ②)

   If the convex tab of the top packing is cut off, the water proofing property is no longer guaranteed.

**Note :** You must setup using the KPG-89D.




*1 : Depending on the connected optional accessory, the DATA OUT1 may connect to either RXD1 or RXD2.

**Fig. 8-1**

# INSTALLATION

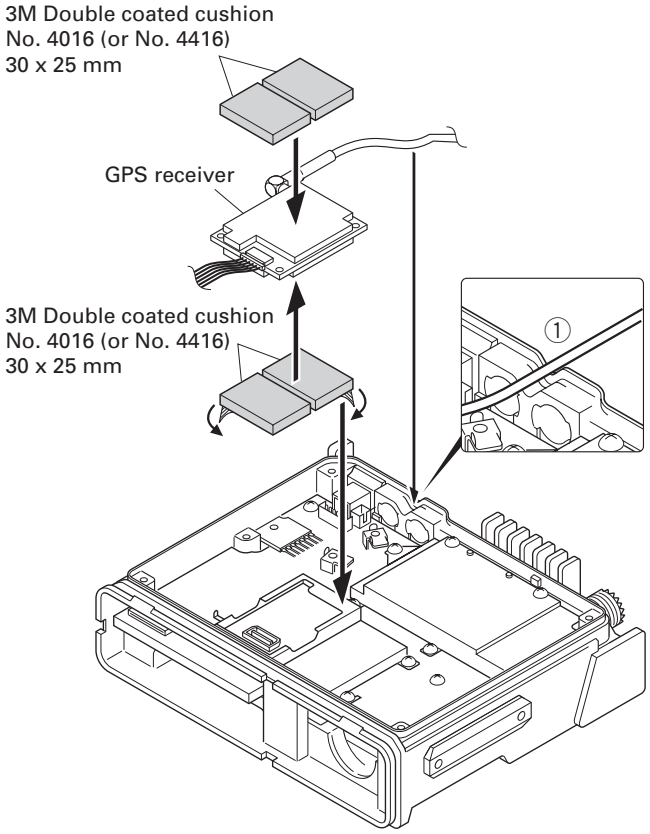



**Fig. 8-2**

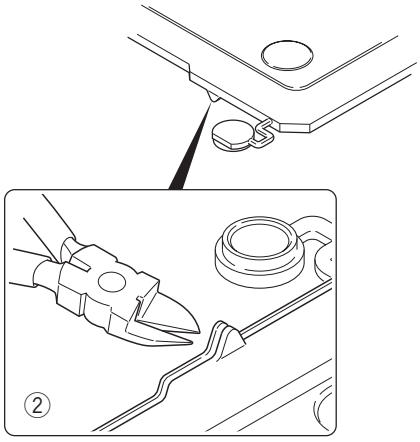



**Fig. 8-3**

### 8-2. Installing the GPS receiver together with the VGS-1

1. Remove the cabinet, top packing and shielding plate of the transceiver.
2. Remove the front panel from the transceiver.
3. Attach a cushion to the bottom of the VGS-1 as shown in Figure 8-5.
   **Note :** Be sure not to cover the connector with the cushion.
4. Insert the VGS-1 connector (CN1) into the TX-RX unit (B/3) connector (CN403).
5. Perform step 3 to 6 of "8-1. Installing the GPS receiver" described on page 11.

**Note :** You must setup using the KPG-89D.

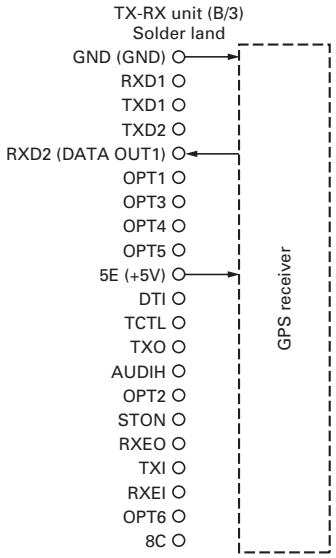



**Fig. 8-4**

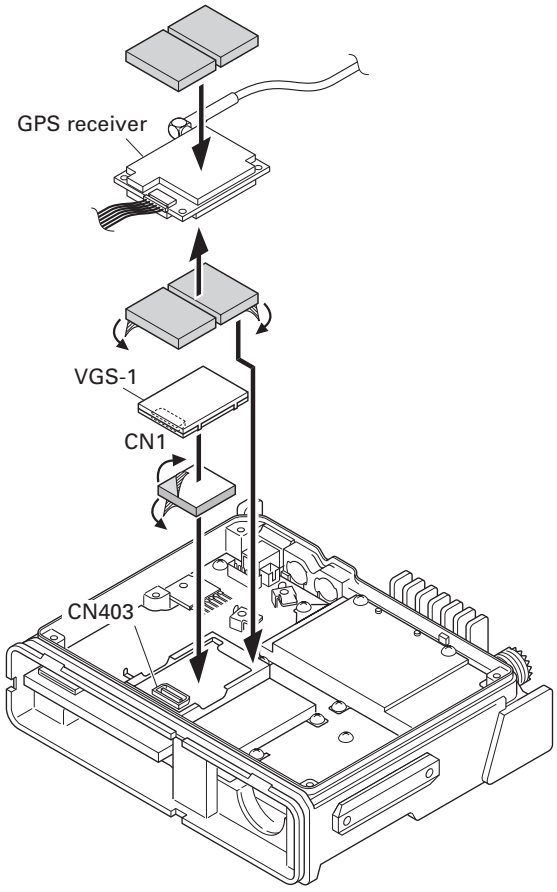



**Fig. 8-5**

# DISASSEMBLY FOR REPAIR

## 1. Precautions on Disassembly

### ■ TX-RX PCB (TX-RX unit B/3) Disassembly

1. Remove all screws and antenna terminals on the TX-RX PCB.
2. Rotate the bush of the power supply cable 90 degrees counterclockwise as viewed from the rear of the chassis ( ① ) and remove the power supply cable from the chassis ( ② ).
3. When the speaker phone jack is pushed up, using your finger, from the rear of the chassis ( ③ ), the TX-RX PCB is removed from the chassis.
   **Note :** The TX-RX PCB and D-sub PCB (TX-RX unit A/3) are connected with a flat cable. Remove them carefully.
4. Turn the TX-RX PCB over and remove the flat cable from the connector (CN427). ( ④ )
5. Remove the TX-RX PCB from the chassis.

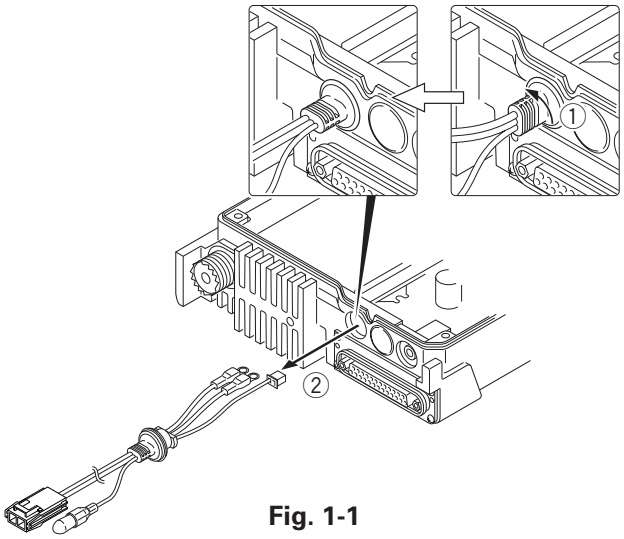



**Fig. 1-1**

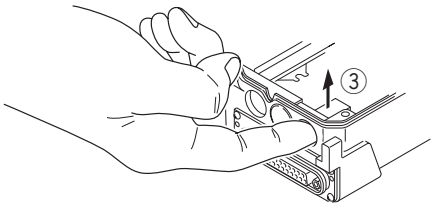



**Fig. 1-2**

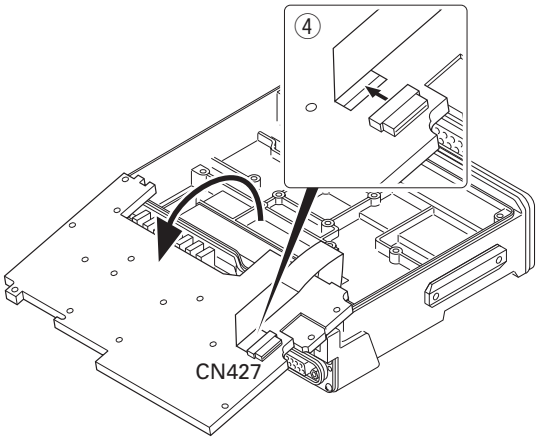



**Fig. 1-3**

### ■ Removing the speaker hardware fixture (J21-8481-03) and holder (J19-5468-03)

1. Remove the speaker lead from the holder hook. ( ① )
2. Remove the speaker connector from the display unit connector (CN901). ( ② )
3. When removing the speaker hardware fixture, insert a flat-head screwdriver at the position shown in Figure 2-1 and tilt it in the direction shown by the arrow. ( ③ )
4. To remove the holder, insert a flat-head screwdriver into tab of the holder and tilt it in the direction shown by the arrow. ( ④ )

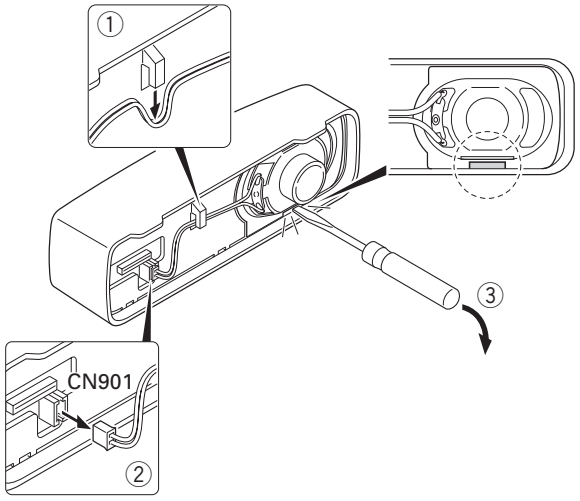



**Fig. 2-1**

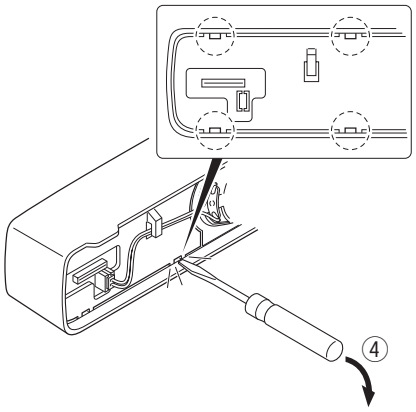



**Fig. 2-2**

# DISASSEMBLY FOR REPAIR

## 2. Precautions on Reassembly

### ■ TX-RX PCB (TX-RX unit B/3) Reassembly

1. With the TX-RX PCB turned over, insert the flat cable from the D-sub PCB (TX-RX unit A/3) into the connector (CN427) on the TX-RX PCB.
2. Place the TX-RX PCB at its original position, tilt the TX-RX PCB and install the chassis as shown in Figure 3.

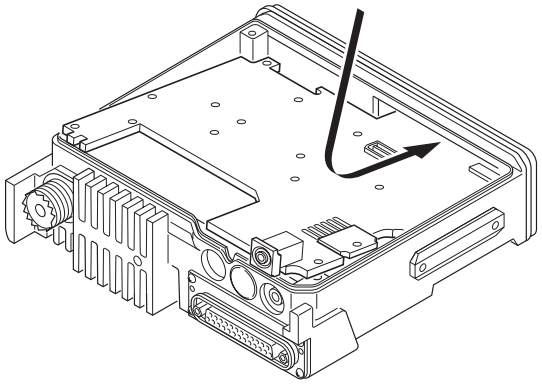


**Fig. 3**

### ■ Securing the Audio IC (IC417) with screws

The screws for the audio IC are 8mm screws. These are longer than the other screws, so take care not to confuse them.

### ■ FINAL shield case (F10-2489-03) installation procedure

1. Place the shield case on the final section of the TX-RX unit (B/3).
2. The shield case is installed on the positioning boss of the chassis by pushing down on "PUSH2" (on the shield case) while pushing "PUSH1" (stamped on two parts on the shield case) to the right.

### ■ Power supply cable installation procedure

1. Pass the power supply cable through the chassis hole ( ① ) as shown in Figure 4-1 and insert the bush into the chassis hole.
2. Rotate the bush of the power supply cable 90 degrees clockwise as viewed from the rear of the chassis. ( ② )
3. Align the ignition sense connector (yellow) of the power supply cable around the chemical capacitor (C801) and connect it to the TX-RX unit (B/3) connector (CN804).
4. Align the + (positive) terminal of the power supply cable (red) as shown in Figure 4-2 and fix it to the terminal strip with a screw.
5. Align the – (negative) terminal of the power supply cable (black) as shown in Figure 4-2 and fix it to the terminal strip with a screw.

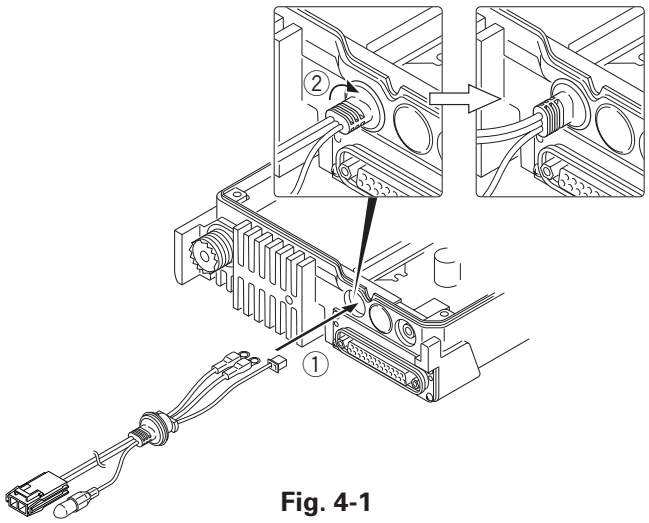



**Fig. 4-1**

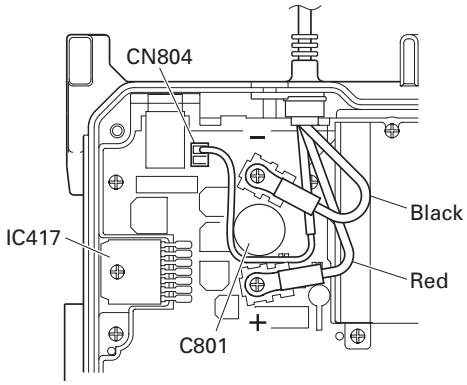



**Fig. 4-2**

### ■ Top packing installation procedure

1. Place the top packing over the shielding plate.
2. Fit the convex tab of the top packing into the hollow of the chassis. ( ① )
3. Fit the chassis into the groove of the top packing. ( ② ) Verify that the top packing is in close contact with the chassis.

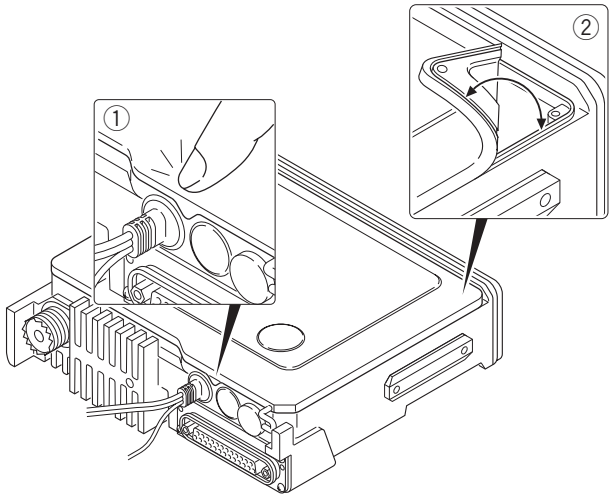



**Fig. 5**

# DISASSEMBLY FOR REPAIR

## ■ D-sub cap installation procedure

To improve water resistance, fit the D-sub cap into the D-sub terminal hardware fixture of the transceiver in the following order:

1. Fit the left side ( ① ) of the D-sub cap into the hardware fixture.
2. Fit the right side ( ② ) of the D-sub cap into the hardware fixture.
3. Fit the center ( ③ ) of the D-sub cap into the hardware fixture.
   Verify that the D-sub cap is in close contact with the hardware fixture.

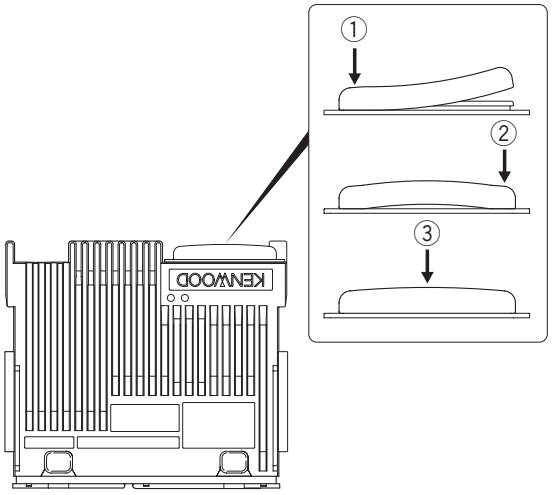



**Fig. 6**

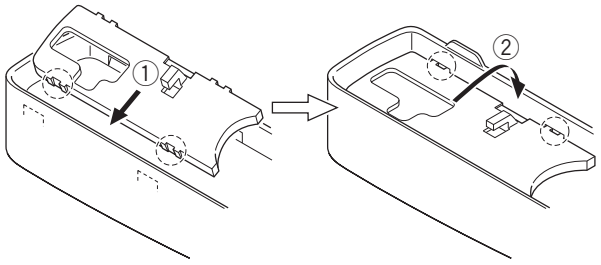



**Fig. 7-1**

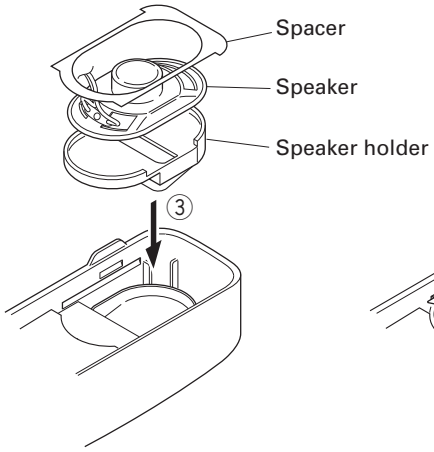



**Fig. 7-2**

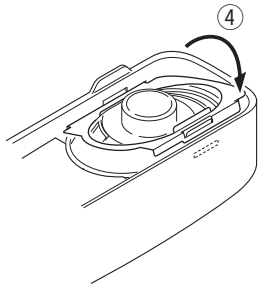



**Fig. 7-3**

## ■ Installing the holder (J19-5468-03) and speaker hardware fixture (J21-8481-03)

1. Insert two tabs of the holder (J19-5468-03) into the hollows in the top of the panel. ( ① )
2. Push the two tabs of the holder in on the opposite side of those in step 1 above and fit them into the hollow in the bottom of the panel. ( ② )
   **Note :** Push in the holder until it snaps in place.
3. Install the speaker holder onto the panel. ( ③ )
   **Note :** To improve water resistance, fit the panel into the groove of the holder.
4. Place the speaker into the speaker holder.
   **Note :** The speaker must not ride on the holder rib.
5. Place the spacer on the speaker.
6. Insert the hardware fixture (J21-8481-03) into the hollow of the panel as shown in Figure 7-3, then push two parts of the hardware fixture and fit it into the hollow of the top of the panel. (Fig. 7-3 ④ )
   **Note :** Push in the hardware fixture until it snaps in place.
7. Insert the speaker connector into the display unit connector (CN901).
8. Place the speaker lead on the holder hook.

# CIRCUIT DESCRIPTION

## 1. Outline

The TK-7180 is a VHF/FM transceiver designed to operate in the frequency range of 136 to 174MHz. Transmission output power is 30 watts. The maximum channel capacity is 512.

The unit consists of receiver, transmitter, phase-locked loop (PLL) frequency synthesizer, and control circuits.

## 2. Receiver Circuit

The receiver is double conversion superheterodyne, designed to operate in the frequency range of 136MHz to 174MHz.

The receiver circuit consists of the following : 2-1 front-end circuit, 2-2 first mixer, 2-3 IF amplifier circuit, 2-4 audio amplifier circuit, and 2-5 squelch circuit.

### 2-1. Front-end Circuit

The front-end circuit consists of former BPF (D11), RF amplifier Q103, and latter BPF (D103, D104, D105 and D106). The BPF covers frequency ranges 136 to 174MHz.

The latter BPF (D103, D104, D105 and D106) attenuates the unwanted signals, and sends only the necessary signal to the first mixer.

### 2-2. First Mixer

The signal from the BPF is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer DBM (IC171) to become a 44.85MHz first intermediate frequency (IF) signal. The first IF signal is fed through a monolithic crystal filter (XF171) to further remove spurious signals.

### 2-3. IF Amplifier

The first IF signal is amplified by Q171 and Q172, and then enters IC172 (FM system IC). The signal is heterodyned again with a second local oscillator signal (44.395MHz) with in IC172 to become a 455kHz second IF signal. The second IF signal is fed through a 455kHz ceramic filters (CF172; Wide, CF171; Narrow) to further eliminate unwanted signal, and the quadrature detection circuit FM-detects the signal to produce a base-band signal and output it from pin 9.

### 2-4. Audio Amplifier

The demodulated audio signal from IC172 goes to IC415 through the AF amplifier (IC412) and IC413. The audio signal goes to an electronic volume (IC410) and is amplified to drive a loudspeaker by an audio power amplifier (IC417). The audio output can be provided to external 4Ω speaker through the speaker jack output (J401) on the rear panel. Q419 is a mute switch.

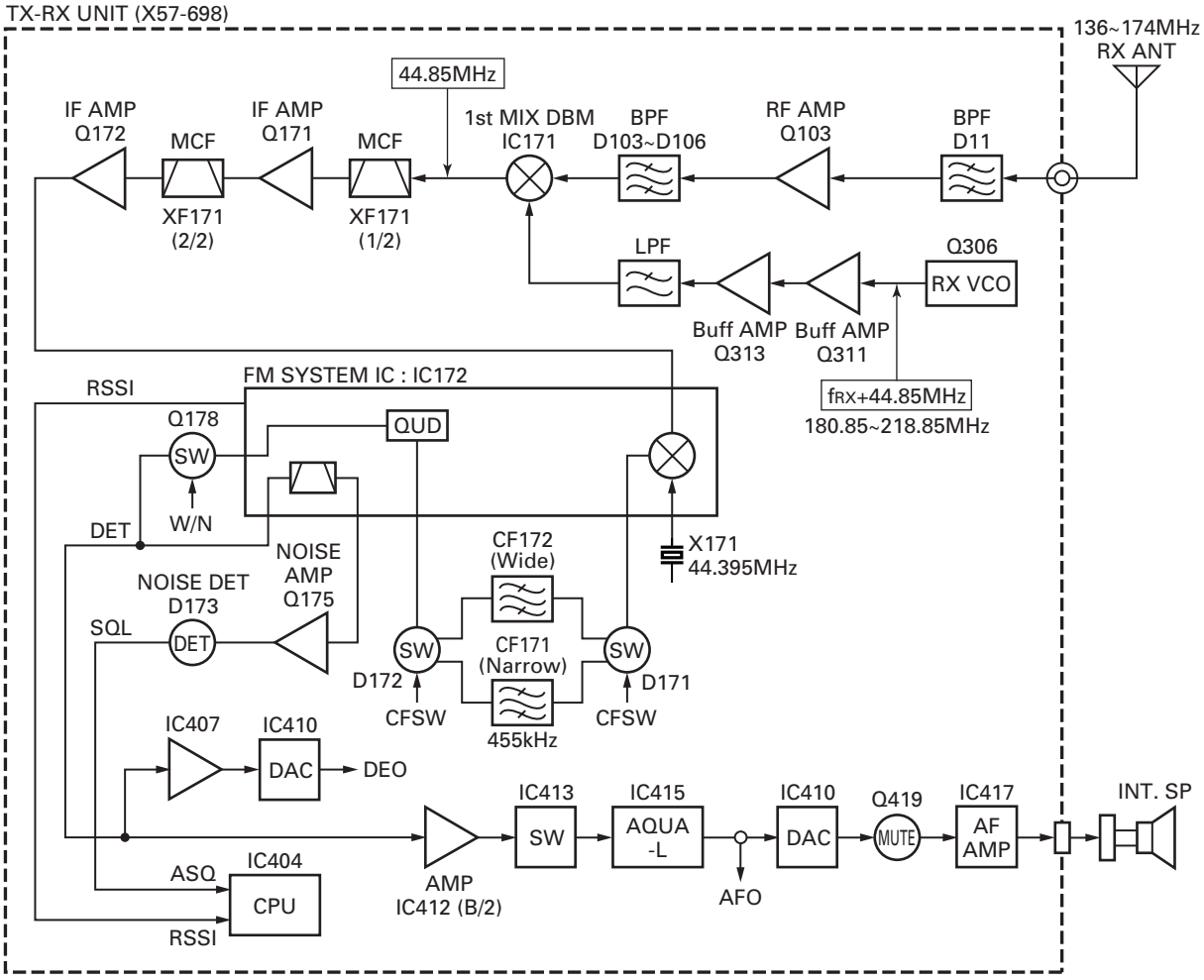



**Fig. 1 Receiver circuit**

# CIRCUIT DESCRIPTION

### 2-5. Squelch Circuit

The output signal from IC172 enters FM IC again, then passed through a band-pass filter.

The noise component output from IC172 is amplified by Q175 and rectified by D173 to produce a DC Voltage corresponding to the noise level. The DC voltage is sent to the analog port of the CPU (IC404).

IC172 outputs a DC voltage (RSSI) corresponding to the input of the IF amplifier.

## 3. Transmitter Circuit

The transmitter circuit consists of the following circuits : 3-1 microphone circuit, 3-2 modulation level adjustment circuit, 3-3 driver and final power amplifier circuit, and 3-4 automatic power control circuit.

### 3-1. Microphone Circuit

The audio signal from the microphone goes into TX-RX unit (X57-698) from the display unit (X54-348) and passes through the mute switch (Q416). The audio signal is amplified by the microphone amplifier (IC414) and is input into the TXIN terminal of the audio processor (IC415) after passing through the multiplexer (IC413).

The input audio signal is output from the MOD terminal of the audio processor (IC415) and is amplified by the audio frequency amplifier (IC412) after passing through the electric volume (IC410).

### 3-2. Modulation Level Adjustment Circuit

The audio signal amplified by the audio frequency amplifier (IC412) is added to the low speed data LSD passed through the low pass filter (IC409). The combined signals is supplied to the VCO (voltage controlled oscillator) and the VCXO (voltage controlled crystal oscillator) X301, respectively.

### 3-3. Driver and Final Power Amplifier Circuit

The transmit signal obtained from the TX VCO buffer amplifier Q311, is amplified to approximately +17dBm by the driver amplifiers Q313, Q1 and Q2. This amplified signal is passed to the power amplifier module (power module) IC1, which consists of a MOS-FET amplifier and is capable of transmission output power.

### 3-4. Automatic Power Control Circuit

The automatic transmission power control (APC) circuit stabilizes the transmitter output power at a predetermined level by detecting the power module output with a diodes D6, D7 and D8. Diodes D6, D7 and D8 apply a voltage to DC amplifier IC72 (A/2). IC72 (B/2) compares the APC control voltage (PC) generated by microprocessor IC404 and DC amplifier IC71 (A/2, B/2) with the detection output voltage from IC72 (A/2) to control the Vgg pin of IC1, and stabilizes transmission output.

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

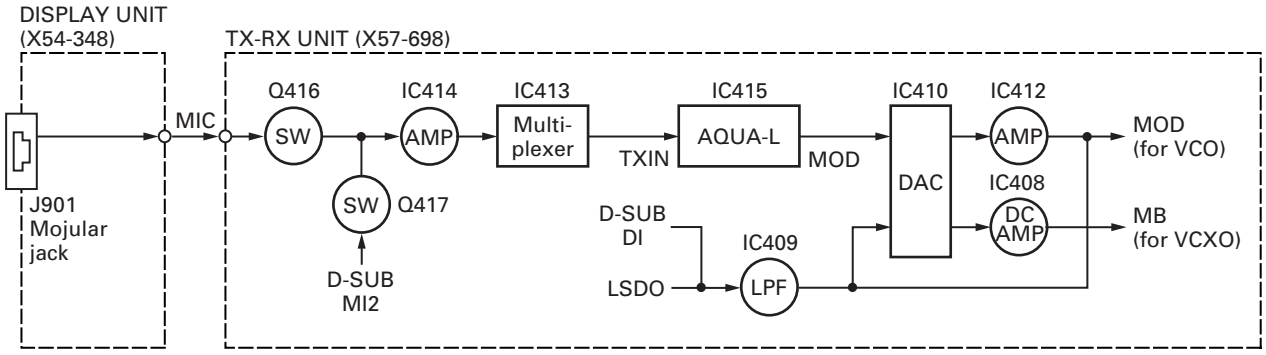



**Fig. 2 Microphone and modultion level adjustment circuit**

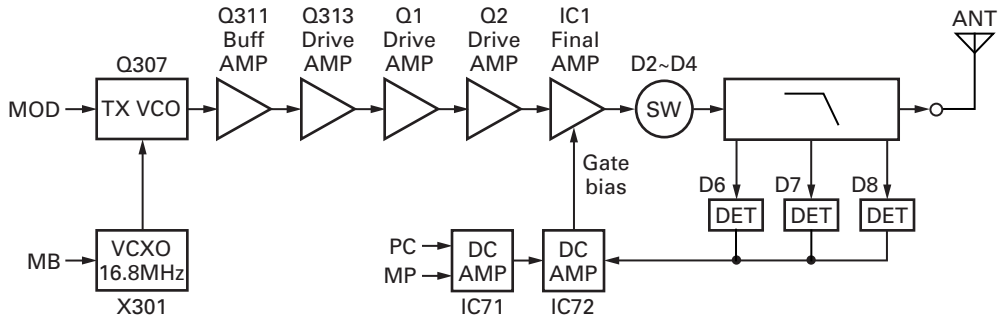



**Fig. 3 Drive and Final power amplifier and automatic power control circuit**

# CIRCUIT DESCRIPTION

## 4. Frequency Synthesizer Unit

### 4-1. Frequency Synthesizer

The frequency synthesizer consists of the TCXO (X301), VCO, PLL IC (IC301) and buffer amplifiers.

The TCXO generates 16.8MHz. The frequency stability is 2.5ppm within the temperature range of –30 to +60°C. The frequency tuning and modulation of the TCXO are done to apply a voltage to pin 1 of the TCXO. The output of the TCXO is applied to pin 8 of the PLL IC.

The VCO consists of 2VCO and covers a dual range of the 180.85~218.85MHz and the 136~174MHz. The VCO generates 180.85~218.85MHz for providing to the first local signal in receive. The operating frequency is generated by Q307 in transmit mode and Q306 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator (IC301) to the variable capacitor diodes (D306, D308, D310 and D311 in transmit mode and D307, D309, D312 and D313 in receive mode).

The T/R pin of IC404 goes "high" in receive mode causing Q307 and Q309 to turn off, and Q306, Q308 and Q310 turn on. The T/R pin goes "low" in transmit mode.

The outputs from Q306 and Q307 are amplified by buffer amplifier (Q311) and doubled by Q301 and then sent to PLL IC.

The PLL IC consists of a prescaler, reference divider, phase comparator, charge pump (The frequency step of the PLL circuit is 10, 12.5 or 15kHz). The input signal from the pins 8 and 5 of the PLL IC is divided down to the 10, 12.5 or 15kHz and compared at phase comparator. The phase comparator output signal is fed into a low-pass filter (Q302, Q303 and Q304) before being applied to the VCO as a frequency control voltage. This low-pass filter's power is supplied by the DC/DC converter (IC251 and Q251). The DC signal is applied to the CV of the VCO and locked to keep the VCO frequency constant.

PLL data is output from DT (pin 112), PCK (pin 82) and PLE (pin 81) of the microprocessor (IC404). The data are input to the PLL IC when the channel is changed or when transmission is changed to reception and vice versa. A PLL lock condition is always monitored by the pin 80 (UL) of the microprocessor. When the PLL is unlocked, the UL goes low.

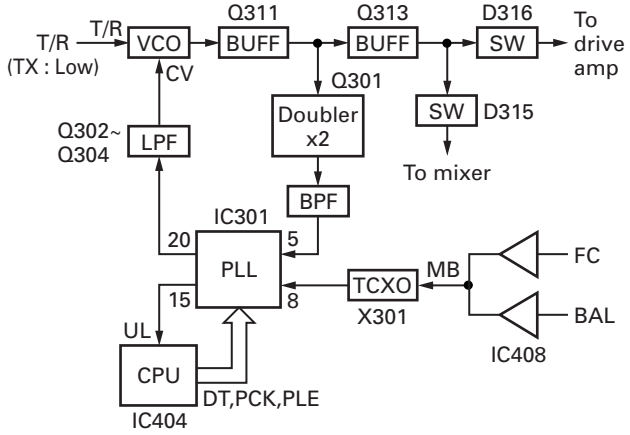



**Fig. 4 PLL block diagram**

## 5. Control Circuit

The block diagram of the control circuit is shown in Figure 5.

The CPU (IC404) is a 16-bit microcomputer that contains a 256k-byte Mask ROM and a 20k-byte RAM. This CPU is connected with an external 512k-byte Flash ROM (IC405) and operates in memory expansion mode.

The Firmware Program is stored in the Flash ROM and the user data and adjustment data are stored in the EEPROM (IC401). The CPU and Flash ROM are connected with an 8 bit bus and the EEPROM and RTC IC (IC402) are connected with a I2C bus (*1). The RTC IC (IC402) has a clock function and is controlled by the CPU (IC404).

Serial communication with a PC is performed through two paths: through the 232C Level converter IC (IC416) and through the Display Unit Panel CPU (IC902). The 8 bit Shift Register (IC403) is used as an 8-port Extended Output Port. IC410 is an 8 bit-8ch D/A converter. The channels are set as follows:

Ch1 : Modulation balance
Ch2 : Deviation Factor
Ch3 : Max Power Level
Ch4 : Reception tuning circuit
Ch5 : Deviation Factor
Ch6 : Speaker volume
Ch7 : VCXO control voltage
Ch8 : DEO output level

*1: I2C bus is a registered trademark of PHILIPS of the Netherlands.

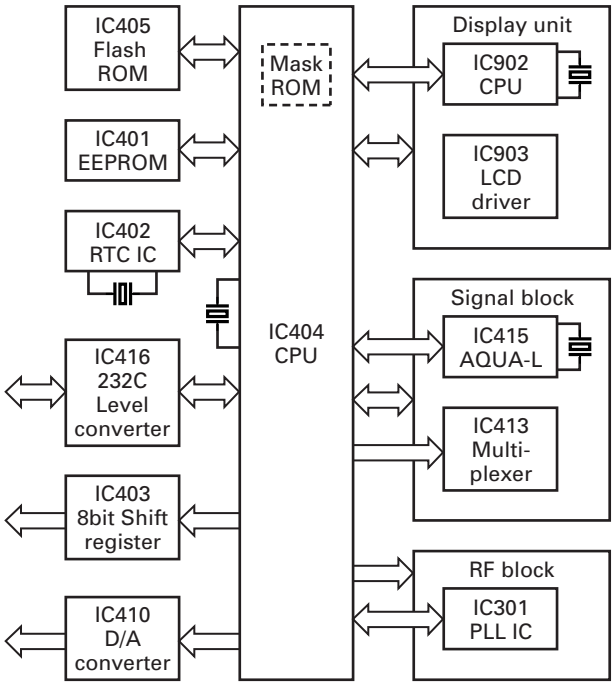



**Fig. 5 Control circuit block diagram**

# CIRCUIT DESCRIPTION

## 6. Power Supply Circuit

The block diagram of the power supply circuit is shown in Figure 6.

Power is always supplied from +B to the circuit (5M, +B) that is always started and the circuits (SB, 8C, 5E, 8T, 8R, 5C, 5R) controlled by the CPU (IC404). When +B is supplied to the transceiver, Q801, D805 and IC805, regulate the voltage (5M) which is supplied to the circuit around the CPU. The CPU starts.

When the CPU detects that the +B voltage is higher than the voltage prescribed by IC802, the transceiver power (SB) is turned ON by controlling the SBC signal (Low: transceiver power OFF, High: transceiver power ON).

The CPU controls the TXC signal (Low: Transmission system power OFF, High: Transmission system power ON) during transmission to supply power (8T) to the transmission circuit. The CPU controls the RXC signal (Low: Reception system power OFF, High: Reception system power ON) during reception to supply power (8R, 5R) to the reception circuit.

When the CPU detects the PSW (Power Switch) signal, IGN (Ignition Sense) signal or INT signal, it controls the SBC signal and turns the transceiver power (SB) OFF.

If +B is not provided to the transceiver, power is supplied to only the RTC IC (IC402) through the secondary battery connected with CN401 to back up the clock.

## 7. Display Circuit

The display unit consists of the Panel CPU (IC902), the LCD driver (IC903), the TX/BUSY LED, the KEY detection, the Backlight and the Microphone jack circuits.

The Panel CPU is a 16-bit microcomputer that contains a 64k-byte Mask ROM and a 2k-byte RAM.

The Panel CPU performs serial communication with the Main CPU (IC404) on the TX-RX unit (B/3) and the Panel CPU detects keys and sends data communication contents through the MIC Jack to the Main CPU. The Panel CPU receives commands from the Main CPU and controls the display system.

The LCD operates with 1/9 duty under the LCD driver (IC903) control. The LCD and KEY Backlights are controlled by Q909. The display brightness of the LCD Backlight can be changed.

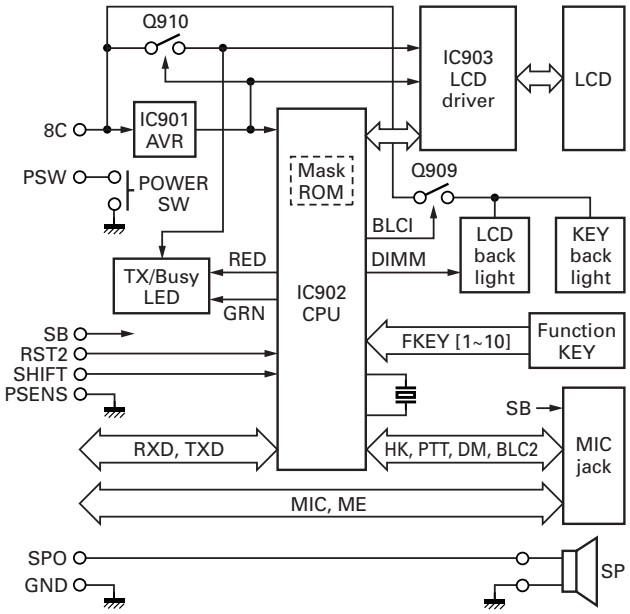



**Fig. 7 Display circuit**

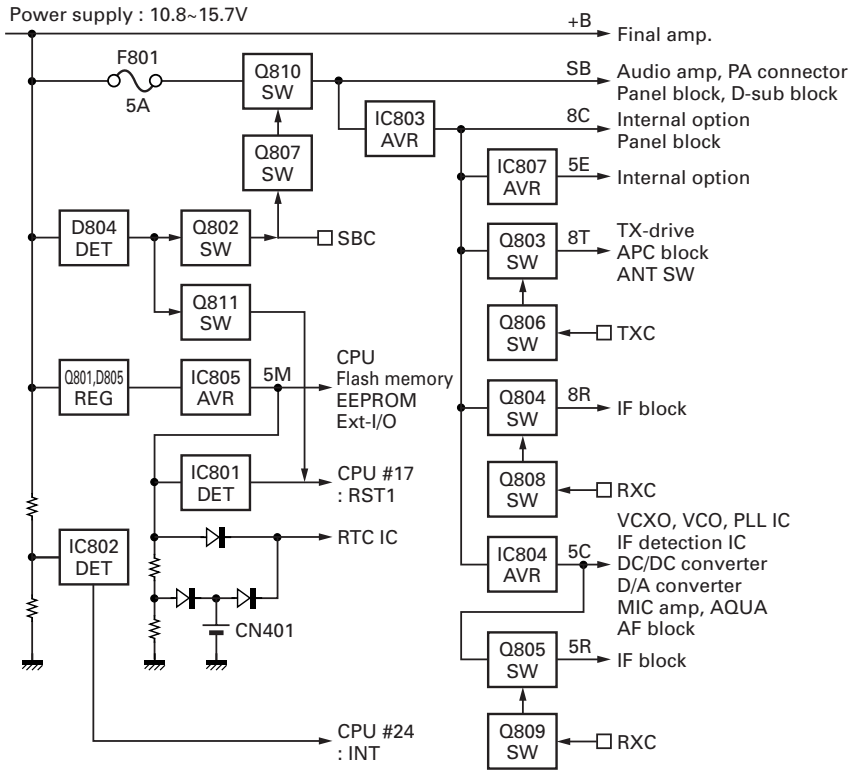



**Fig. 6 Power supply circuit**

# SEMICONDUCTOR DATA

## Microprocesser : 30625MGP-169GP (TX-RX unit IC404)

| Pin No. | Port Name | I/O | Function |
|---|---|---|---|
| 1 | VREF | - | +5V |
| 2 | AVCC | - | +5V |
| 3 | SBC | O | Switched B control |
| 4 | RXC | O | RX control |
| 5 | TXC | O | TX control |
| 6 | PC | O | TX APC adjust |
| 7 | HSDO | O | High speed data output |
| 8 | STSW | O | Side tone switch |
| 9 | RTCL/EEPCL | O | RTC/EEPROM clock |
| 10 | HSDIN | I | High speed data input |
| 11 | NC | - | Non-connection |
| 12 | RTDT/EEPDAT | I/O | RTC/EEPROM data |
| 13 | BYTE | - | +5V |
| 14 | CNVSS | - | DGND (Vss) |
| 15 | DMUTE | O | Det mute |
| 16 | AM2 | O | Audio mute 2 |
| 17 | RST | I | Reset |
| 18 | Xout | O | 11.0592MHz clock output |
| 19 | DGND | - | DGND (Vss) |
| 20 | Xin | I | 11.0592MHz clock input |
| 21 | VCC1 | - | +5V |
| 22 | NMI | - | +5V |
| 23 | PSW | I | Power switch input |
| 24 | INT | I | BATT voltage INT |
| 25 | INTRA | I | RTC INT |
| 26 | SHIFT/MODEL | I/O | Beat shift/Model select |
| 27 | BEEP | O | Beep output |
| 28 | SPSTB | O | Shift register strobe |
| 29 | SOE | O | Shift register output enable |
| 30 | AIO5 | I/O | AUX I/O 5 |
| 31 | AIO9 | I/O | AUX I/O 9 |
| 32 | DSTB | O | D/A converter LD |
| 33 | LSDO | O | Low speed data output |
| 34 | RXD2 | I | RXD2 |
| 35 | TXD2 | O | TXD2 |
| 36 | TXD1 | O | TXD1/PTT (Scrambler board) |
| 37 | Vcc1 | - | +5V |
| 38 | RXD1 | I | RXD1 |
| 39 | DGND | - | DGND (Vss) |
| 40 | MM1 | O | MIC mute 1 |
| 41 | PSENS | I | Panel sense |
| 42 | TXD | O | TXD |
| 43 | RXD | I | RXD |
| 44 | AFDAT | O | BB TDATA and DTRCLK |
| 45 | AFDIO | I/O | BB DI/O |
| 46 | AFDIR | O | BB DIR |
| 47 | DTRLOAD | O | BB DTMF enable |
| 48 | AFSTD | I | BB STD |

| Pin No. | Port Name | I/O | Function |
|---|---|---|---|
| 49 | LSW | O | BB LIM switch |
| 50 | RDY | - | +5V |
| 51 | NC | - | Non-connection |
| 52 | HOLD | - | +5V |
| 53 | NC | - | Non-connection |
| 54~57 | AIO4~AIO1 | I/O | AUX I/O 4~1 |
| 58 | NC | - | Non-connection |
| 59 | RD | O | Read (RD) |
| 60 | NC | - | Non-connection |
| 61 | WR | O | Write (WR) |
| 62~64 | AIO8~AIO6 | I/O | AUX I/O 8~6 |
| 65,66 | NC | - | Non-connection |
| 67 | RST2 | O | Display μ-com reset |
| 68 | CS0 | O | Chip select 0 |
| 69 | NC | - | Non-connection |
| 70~79 | A18~A9 | O | Address bus 18~9 |
| 80 | UL | I | PLL unlock |
| 81 | PLE | O | PLL enable |
| 82 | PCK | O | PLL clock |
| 83 | NC | - | Non-connection |
| 84 | OPT6 | I/O | Option boad I/F 6 |
| 85 | VCC2 | - | +5V |
| 86 | A8 | O | Address bus 8 |
| 87 | DGND | - | DGND (Vss) |
| 88~95 | A7~A0 | O | Address bus 7~0 |
| 96 | IGN | I | Ignition sense |
| 97 | AFRTM | I | BB RDF/FD |
| 98 | TCLK/DTRDO | I | BB TCLK and DTRDO |
| 99 | MM2 | O | MIC mute2 |
| 100 | T/R | O | TX/RX switch |
| 101 | AM1 | O | Audio mute 1 |
| 102 | EMTON | O | EM tone switch |
| 103 | NC | - | Non-connection |
| 104~111 | D7~D0 | I/O | Data bus 7~0 |
| 112 | DT | O | Serial data |
| 113 | CK | O | Serial clock |
| 114 | W/N | O | Wide/Narrow switch |
| 115~117 | OPT 1~OPT 3 | I/O | Option boad I/F 1~3 |
| 118,119 | OPT 4, OPT 5 | O | Option boad I/F 4, 5 |
| 120 | H/L | O | High/Low power switch |
| 121 | THP | I | TX thermal input |
| 122,123 | NC | - | Non-connection |
| 124 | ASQ | I | RX analog SQ. input |
| 125 | RSSI | I | RX RSSI input |
| 126 | NC | - | Non-connection |
| 127 | AGND | - | AGND (Vss) |
| 128 | LSDIN | I | Low speed data input |

# SEMICONDUCTOR DATA

## Microprocesser : 30302M8-8Z7GP (Display unit IC902)

| Pin No. | Port Name | I/O | Function |
|---|---|---|---|
| 1~4 | NC | - | Non-connection |
| 5 | SHIFT | O | Beat shift |
| 6 | BYTE | - | +5V |
| 7 | CNVSS | - | GND |
| 8,9 | NC | - | Non-connection |
| 10 | RST | I | Reset |
| 11 | Xout | O | 14.7456MHz clock output |
| 12 | GND | - | GND |
| 13 | Xin | I | 14.7456MHz clock input |
| 14 | VCC | - | +5V |
| 15 | NMI | - | +5V |
| 16 | BLC2 | O | MIC backlight control |
| 17 | BLC1 | O | Key & LCD backlight control |
| 18 | DIMM | O | Dimmer control |
| 19 | LEDG | O | LED green |
| 20 | LEDR | O | LED red |
| 21 | NC | - | Non-connection |
| 22 | LCDCK | O | LCD serial clock |
| 23 | LCDDT | O | LCD serial data |
| 24 | LCDCS | O | LCD chip select |
| 25 | LCDRST | O | LCD reset |
| 26 | NC | - | Non-connection |
| 27 | RXD2 | I | RXD2 (Main μ-com) |
| 28 | TXD2 | O | TXD2 (Main μ-com) |
| 29 | PTT/TXD | I/O | PTT/TXD (COM0) |
| 30 | NC | - | Non-connection |
| 31 | DM | O | MIC DM |
| 32,33 | NC | - | Non-connection |
| 34 | HK/RXD | I | HOOK/RXD (COM0) |
| 35~44 | NC | - | Non-connection |
| 45 | TP1 | I | LCD check |
| 46~59 | NC | - | Non-connection |
| 60 | VCC | - | +5V |
| 61 | NC | - | Non-connection |
| 62 | VSS | - | GND |
| 63~70 | NC | - | Non-connection |
| 71~82 | S22~S11 | I | Non-connection |
| 83 | S10 | I | Front panel key (R down [⩛]) |
| 84 | S9 | I | Front panel key (R up [⩚]) |
| 85 | S8 | I | Front panel key (■) |
| 86 | S7 | I | Front panel key (C) |
| 87 | S6 | I | Front panel key (B) |
| 88 | S5 | I | Front panel key (A) |
| 89 | S4 | I | Front panel key (S) |
| 90 | S3 | I | Front panel key (⩓) |
| 91 | S2 | I | Front panel key (L down [⩛]) |
| 92 | S1 | I | Front panel key (L up [⩚]) |
| 93 | NC | - | Non-connection |
| 94 | AVSS | - | GND |
| 95 | NC | - | Non-connection |
| 96 | VREF | - | +5V |
| 97 | AVCC | - | +5V |
| 98~100 | NC | - | Non-connection |

## Shift Register : BU4094BCFV (TX-RX unit IC403)

| Pin No. | Port Name | I/O | Function |
|---|---|---|---|
| 1 | STRB | I | Storage enable input |
| 2 | DATA | I | Serial data input |
| 3 | CLK | I | Serial clock input |
| 4 | Q1 | O | AUX output 1 |
| 5 | Q2 | O | Public address |
| 6 | Q3 | O | Horn alert |
| 7 | Q4 | O | Scrambler switch |
| 8 | Vss | - | |
| 9 | Qs | O | |
| 10 | Q's | O | |
| 11 | Q8 | O | Ceramic filter switch |
| 12 | Q7 | O | Non-connection |
| 13 | Q6 | O | AUX output 2 |
| 14 | Q5 | O | Gate switch |
| 15 | OE | I | Output enable |
| 16 | VDD | - | |

# COMPONENTS DESCRIPTION

## Display unit (X54-3480-10)

| Ref. No. | Part Name | Description |
|---|---|---|
| IC901 | IC | Voltage regulator/ 5V |
| IC902 | IC | Microprocessor |
| IC903 | IC | LCD driver |
| Q901,902 | Transistor | HOOK switch |
| Q904 | Transistor | TX indication LED switch |
| Q905 | Transistor | BUSY indication LED switch |
| Q906 | Transistor | Dimmer switch control |
| Q907 | Transistor | Dimmer switch |
| Q909 | Transistor | Backlight control switch |
| Q910 | Transistor | 8C switch |
| Q911 | Transistor | 8C switch control |
| Q913 | Transistor | Backlight control |
| D901,902 | Zener diode | Voltage protection |
| D903 | Varistor | Current limitter |
| D904~906 | Diode | Surge protection |
| D907 | LED | TX/Busy indication |
| D909~920 | LED | LCD backlight |
| D921~930 | LED | KEY backlight |

## TX-RX unit (X57-6980-10)

| Ref. No. | Part Name | Description |
|---|---|---|
| IC1 | IC | Power module |
| IC71,72 | IC | DC amp for TX APC |
| IC171 | IC | RX 1st mixer |
| IC172 | IC | FM IF system IC |
| IC251 | IC | DC-DC converter |
| IC301 | IC | PLL system IC |
| IC302 | IC | PLL CP switch |
| IC401 | IC | EEPROM |
| IC402 | IC | RTC processor |
| IC403 | IC | Shift register |
| IC404 | IC | Microprocessor |
| IC405 | IC | Flash memory |
| IC406 | IC | HSD BPF/HSD compalator |
| IC407 | IC | DET amp/Data LPF (DB-25) |
| IC408 | IC | LSD buffer amp/VCXO bias amp |
| IC409 | IC | LSD LPF/Voltage DC-reference |
| IC410 | IC | D/A converter |
| IC411 | IC | RF BPF tuning voltage DC amp |
| IC412 | IC | Modulation LPF/DET amp |
| IC413 | IC | AF switch IC |
| IC414 | IC | MIC amp |
| IC415 | IC | AQUA-L |
| IC416 | IC | Level converter IC (RS-232C) |
| IC417 | IC | Audio IC |
| IC801 | IC | Voltage detector (CPU reset) |
| IC802 | IC | Voltage detector (INT) |
| IC803 | IC | Voltage regulator/ 8V |
| IC804,805 | IC | Voltage regulator/ 5V |
| IC807 | IC | Voltage regulator/ 5V |
| Q1 | Transistor | TX pre-driver |
| Q2 | Transistor | TX driver |
| Q3 | Transistor | TX gate switch |
| Q72 | FET | High/Low power switch |
| Q73 | Transistor | High/Low power switch |
| Q103 | Transistor | Front-end LNA |
| Q171,172 | Transistor | IF amp |
| Q173,174 | Transistor | W/N CF switch control |
| Q175 | Transistor | Noise amp |
| Q176 | FET | DET mute switch |
| Q177 | Transistor | W/N CF switch control |
| Q178 | Transistor | W/N discrete switch |
| Q180 | Transistor | W/N CF switch control |
| Q251 | Transistor | Ripple filter |
| Q301 | Transistor | PLL f-in doubler amp |
| Q302~304 | Transistor | PLL LPF |
| Q305 | Transistor | PLL f-in filter switch control |
| Q306,307 | FET | TX/RX VCO |
| Q308~310 | Transistor | TX/RX VCO switch |
| Q311 | Transistor | VCO buffer amp |
| Q312 | Transistor | Ripple filter |
| Q313 | Transistor | VCO buffer amp |
| Q314 | Transistor | PLL f-in filter switch control |
| Q402 | Transistor | Beat shift switch |
| Q403 | FET | AF switch (Voice) |
| Q405 | Transistor | AQUA control switch |
| Q406 | FET | AF switch (LSD) |
| Q409 | Transistor | AF mute switch |

# COMPONENTS DESCRIPTION

| Ref. No. | Part Name | Description |
|---|---|---|
| Q410,411 | Transistor | MIC AGC |
| Q412 | FET | AF mute switch |
| Q413,414 | FET | AF switch |
| Q415 | FET | AF switch (Voice) |
| Q416,417 | FET | MIC mute switch |
| Q418 | Transistor | AF mute control switch |
| Q419 | Transistor | AF mute switch |
| Q421 | Transistor | MIC mute switch |
| Q701,702 | Transistor | Inverter switch |
| Q801 | Transistor | Voltage regulator/ 8.5V |
| Q802 | Transistor | SB control switch |
| Q803 | Transistor | 8T switch |
| Q804 | Transistor | 8R switch |
| Q805 | Transistor | 5R switch |
| Q806 | Transistor | 8T control switch |
| Q807 | Transistor | SB control switch |
| Q808 | Transistor | 8R control switch |
| Q809 | Transistor | 5R control switch |
| Q810 | FET | SB switch |
| Q811 | Transistor | CPU reset switch |
| Q812 | Transistor | Ignition sense control switch |
| D1 | Zener diode | Voltage protection |
| D2~4 | Diode | ANT switch |
| D6~8 | Diode | RF detector |
| D11 | Variable capacitance diode | RF BPF tuning |
| D103~106 | Variable capacitance diode | RF BPF tuning |
| D171,172 | Diode | W/N CF switch |

| Ref. No. | Part Name | Description |
|---|---|---|
| D173 | Diode | SQ noise amp detector |
| D174 | Diode | DET mute switch control |
| D251 | Diode | Reverse voltage protection |
| D301,302 | Diode | PLL f-in filter switch |
| D304,305 | Diode | PLL f-in filter switch |
| D306~313 | Variable capacitance diode | Frequency control for TX/RX VCO |
| D314 | Variable capacitance diode | Modulation control for TX VCO |
| D315,316 | Diode | TX/RX band switch |
| D402~404 | Diode | RTC battery control |
| D405,406 | Zener diode | Voltage protection |
| D407 | Diode | DC detector |
| D408,409 | Diode | MIC amp AGC detector |
| D412~414 | Diode | Surge protect |
| D416 | Diode | AF mute control |
| D417,418 | Diode | Isolator |
| D419,420 | Diode | MIC mute control |
| D421~423 | Diode | Voltage protection |
| D701 | Zener diode | Voltage protection |
| D702,703 | Diode | Voltage protection |
| D704~708 | Diode | Surge protect |
| D709,710 | Zener diode | Voltage protection |
| D711~713 | Diode | Surge protect |
| D714 | Zener diode | Voltage protection |
| D801 | Surge absorber | Voltage protection |
| D802 | Diode | DC reverse connection protect |
| D804,805 | Zener diode | Voltage protection |

# TK-7180

## PARTS LIST

✻ New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

**L** : Scandinavia **K** : USA **P** : Canada
**Y** : PX (Far East, Hawaii) **T** : England **E** : Europe
**Y** : AAFES (Europe) **X** : Australia **M** : Other Areas

**TK-7180 (Y51-5020-10)**
**DISPLAY UNIT (X54-3480-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| **TK-7180** | | | | | |
| 1 | 1B | ✻ | A01-2194-11 | CABINET | |
| 2 | 3A | ✻ | A62-1094-23 | PANEL ASSY | |
| 4 | 2A | ✻ | B09-0681-03 | CAP (KAP-2) | |
| 5 | 1D | ✻ | B62-1766-10 | INSTRUCTION MANUAL | |
| 7 | 2B | | E04-0167-05 | RF COAXIAL PECEPTACLE (M) | |
| 8 | 2B | ✻ | E30-7520-05 | DC CORD (PIG TAIL) | |
| 9 | 2C | ✻ | E30-7523-05 | DC CORD ASSY (WATER-PROOF) | |
| 10 | 2A | ✻ | E37-1110-05 | FLAT CABLE (30P/D-SUB) | |
| 11 | 1A | ✻ | E37-1118-05 | LEAD WIRE WITH CONNECTOR (SHORT CABLE) | |
| 12 | 2A | ✻ | E37-1120-05 | FLAT CABLE (30P/TX-RX) | |
| 13 | 3B | ✻ | E37-1124-05 | LEAD WIRE WITH CONNECTOR (2P/SP) | |
| 15 | 2B | ✻ | F10-2488-02 | SHIELDING PLATE (CHASSIS) | |
| 16 | 1A | ✻ | F10-2489-03 | SHIELDING CASE (FINAL) | |
| 17 | 1A | ✻ | F10-2490-03 | SHIELDING CASE (VCO) | |
| 18 | 1C | | F52-0024-05 | FUSE (BLADE) 15A/32V | |
| 20 | 3B | ✻ | G10-1342-04 | FIBROUS SHEET (BIRITSUKI) | |
| 21 | 2A | ✻ | G11-4290-04 | RUBBER SHEET (CHASSIS) | |
| 22 | 1B | ✻ | G11-4343-04 | SHEET | |
| 23 | 1A | | G13-2018-04 | CUSHION | |
| 24 | 2B | ✻ | G13-2047-04 | CUSHION (DC SCREW) | |
| 25 | 1B | ✻ | G53-1613-01 | PACKING (SHIELD PLATE) | |
| 26 | 3A | ✻ | G53-1614-23 | PACKING (CHASSIS) | |
| 27 | 1A | ✻ | G53-1616-03 | PACKING (PHONE JACK) | |
| 28 | 2B | ✻ | G53-1626-03 | PACKING (D-SUB OUTER) | |
| 29 | 2B | ✻ | G53-1643-04 | PACKING (DC CORD) | |
| 30 | 2B | ✻ | G53-1645-03 | PACKING (D-SUB INNER) | |
| 31 | 2A | ✻ | G53-1662-04 | PACKING (O RING) | |
| 32 | 2C | ✻ | H02-0624-03 | INNER PACKING CASE | |
| 33 | 2D | ✻ | H12-3170-01 | PACKING FIXTURE (LOWER) | |
| 34 | 1D | ✻ | H12-3171-03 | PACKING FIXTURE (UPPER) | |
| 36 | 2D | | H25-2352-04 | PROTECTION BAG (250/350/0.07) | |
| 37 | 3D | ✻ | H52-2052-02 | ITEM CARTON CASE | |
| 39 | 1C | | J19-1584-05 | HOLDER (ACCESSORY) | |
| 40 | 3B | ✻ | J19-5464-13 | HOLDER (SP) | |
| 41 | 3B | ✻ | J19-5468-02 | HOLDER (PANEL) | |
| 42 | 2B | ✻ | J21-8479-02 | HARDWARE FIXTURE (D-SUB) | |
| 43 | 3B | ✻ | J21-8481-03 | HARDWARE FIXTURE (SP) | |
| 44 | 2C | | J29-0662-03 | BRACKET (ACCESSORY) | |
| 45 | 3B | ✻ | J30-1289-04 | SPACER (SP) | |
| 47 | 3A | ✻ | K29-9312-21 | KEY TOP | |
| A | 2B | | N09-2409-05 | HEXAGON HEAD SCREW (D-SUB) | |
| B | 1A,2A | ✻ | N67-3008-48 | PAN HEAD SEMS SCREW W (FINAL IC) | |
| C | 1A,2A,2B | ✻ | N87-2606-48 | BRAZIER HEAD TAPTITE SCREW (ANT,PCB) | |
| D | 1A | | N87-2608-46 | BRAZIER HEAD TAPTITE SCREW (AUDIO IC) | |
| 49 | 2C | ✻ | N99-2039-05 | SCREW SET (ACCESSORY) | |
| 51 | 3B | ✻ | T07-0750-05 | SPEAKER | |
| 52 | 1C | ✻ | T91-0639-05 | MICROPHONE (ACCESSORY) | |
| 54 | 2A | | W09-0971-05 | LITHIUM CELL | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| **DISPLAY UNIT (X54-3480-10)** | | | | | |
| 101 | 3B | ✻ | B11-1825-04 | FILTER (LCD) | |
| 102 | 3B | ✻ | B38-0888-05 | LCD | |
| D907 | | | B30-2151-05 | LED (R/G) | |
| D909-920 | | ✻ | B30-2281-05 | LED (Y) | |
| D921-930 | | ✻ | B30-2282-05 | LED (Y) | |
| C904 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C906 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C907,908 | | | CK73HB1H102K | CHIP C 1000PF K | |
| C909-911 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C912,913 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C914 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C915 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C916,917 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C918 | | | C92-0628-05 | CHIP-TAN 10UF 10WV | |
| C920 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C921 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C922 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C924,925 | | | CC73GCH1H100D | CHIP C 10PF D | |
| C926-928 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C930 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C931 | | | C92-0784-05 | CHIP-TAN 4.7UF 10WV | |
| C932-934 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C935 | | | CK73GB1H471K | CHIP C 470PF K | |
| C936 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C937 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C938 | | | CK73GB1H102K | CHIP C 1000PF K | |
| 103 | 3B | ✻ | E29-1202-04 | INTER CONNECTOR (LCD) | |
| CN901 | | | E40-5704-05 | PIN ASSY | |
| CN902 | | ✻ | E40-6372-05 | FLAT CABLE CONNECTOR | |
| J901 | 3B | | E08-0877-05 | MODULAR JACK | |
| 104 | 3B | ✻ | G11-4342-04 | SHEET | |
| 105 | 3B | ✻ | J19-5467-03 | HOLDER (LCD) | |
| 106 | 3B | ✻ | J21-8470-03 | HARDWARE FIXTURE (LCD) | |
| - | | ✻ | J31-0551-05 | COLLAR | |
| L901,902 | | | L40-1095-85 | SMALL FIXED INDUCTOR (1.0UH) | |
| L903-907 | | | L92-0140-05 | FERRITE CHIP | |
| L908,909 | | | L92-0163-05 | BEADS CORE | |
| X901 | | ✻ | L77-1956-05 | CRYSTAL RESONATOR (14.7456MHZ) | |
| CP901-911 | | | RK75HA1J101J | CHIP-COM 100 J 1/16W | |
| R901 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R903 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R904 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R905 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R907 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R909-911 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R913-916 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R917 | | | RK73FB2A471J | CHIP R 470 J 1/10W | |
| R918 | | | RK73FB2A271J | CHIP R 270 J 1/10W | |
| R919 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R920 | | | R92-1368-05 | CHIP R 0 OHM | |
| R925 | | | RK73HB1J471J | CHIP R 470 J 1/16W | |
| R926 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |

# PARTS LIST

**DISPLAY UNIT (X54-3480-10)**
**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R927-935 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R936 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R939 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R940 | | | RK73HB1J101J | CHIP R 100 J 1/16W | |
| R941 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R942 | | | RK73EB2B470J | CHIP R 47 J 1/8W | |
| R943 | | | RK73EB2B101J | CHIP R 100 J 1/8W | |
| R944 | | | R92-1368-05 | CHIP R 0 OHM | |
| R945 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R947-950 | | | RK73FB2A101J | CHIP R 100 J 1/10W | |
| R951,952 | | | RK73FB2A391J | CHIP R 390 J 1/10W | |
| R953,954 | | | RK73FB2A821J | CHIP R 820 J 1/10W | |
| R955-958 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R959 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R962,963 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R967 | | | RK73HB1J271J | CHIP R 270 J 1/16W | |
| R969 | | | R92-1368-05 | CHIP R 0 OHM | |
| R970 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R971 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| D901,902 | | | 02DZ18(X,Y) | ZENER DIODE | |
| D903 | | | MINISMDC020 | VARISTOR | |
| D904-906 | | | DA204U | DIODE | |
| IC901 | | | TA78L05F | MOS IC | |
| IC902 | | ✻ | 30302M8-8Z7GP | MCU | |
| IC903 | | ✻ | LC75810T-8726 | MOS IC | |
| Q901,902 | | | DTC144EE | DIGITAL TRANSISTOR | |
| Q904-906 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q907 | | | 2SC2873(Y) | TRANSISTOR | |
| Q909,910 | | ✻ | 12A02CH | TRANSISTOR | |
| Q911 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q913 | | | DTC114EE | DIGITAL TRANSISTOR | |
| TH901 | | ✻ | S1R103J440H | THERMISTOR | |

## TX-RX UNIT (X57-6980-10)

| | | | | | |
|---|---|---|---|---|---|
| C1 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C2-5 | | | CK73GB1H471K | CHIP C 470PF K | |
| C6 | | | C92-0585-05 | CHIP-TAN 4.7UF 16WV | |
| C7,8 | | | CK73GB1H471K | CHIP C 470PF K | |
| C9 | | | CC73GCH1H330J | CHIP C 33PF J | |
| C10 | | | CK73GB1H471K | CHIP C 470PF K | |
| C13-15 | | | CK73GB1H471K | CHIP C 470PF K | |
| C16 | | | CC73GCH1H560J | CHIP C 56PF J | |
| C17 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C18 | | | CK73GB1H471K | CHIP C 470PF K | |
| C19 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C20 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C21 | | | CK73FB1H471K | CHIP C 470PF K | |
| C22 | | | CK73GB1H471K | CHIP C 470PF K | |
| C23 | | | CC73FCH1H270J | CHIP C 27PF J | |
| C24 | | | C92-0606-05 | CHIP-TAN 4.7UF 10WV | |
| C26 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C27 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C28 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C29-31 | | | CK73GB1H471K | CHIP C 470PF K | |
| C32 | | ✻ | C92-0834-05 | ELECTRO 47UF 25WV | |
| C33-35 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C38-40 | | | CK73GB1H471K | CHIP C 470PF K | |
| C43 | | | CC73FCH1H180J | CHIP C 18PF J | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| C44 | | | C93-0573-05 | CHIP C 120PF J | |
| C45 | | | CM73F2H430J | CHIP C 43PF J | |
| C47 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| C48 | | | CC73GCH1H020B | CHIP C 2.0PF B | |
| C49 | | | CK73GB1H471K | CHIP C 470PF K | |
| C50 | | | CM73F2H470J | CHIP C 47PF J | |
| C51 | | | CK73GB1H471K | CHIP C 470PF K | |
| C53 | | | CM73F2H390J | CHIP C 39PF J | |
| C55 | | | C93-0565-05 | CHIP C 27PF J | |
| C57 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| C58 | | | CC73GCH1H1R5B | CHIP C 1.5PF B | |
| C59 | | | CK73GB1H471K | CHIP C 470PF K | |
| C60 | | | C93-0564-05 | CHIP C 22PF J | |
| C61 | | | CK73GB1H471K | CHIP C 470PF K | |
| C63 | | | CC73GCH1H270J | CHIP C 27PF J | |
| C64 | | | CC73GCH1H100D | CHIP C 10PF D | |
| C65 | | | CC73GCH1H270J | CHIP C 27PF J | |
| C73 | | | CK73GB1H821K | CHIP C 820PF K | |
| C74 | | | CK73GB1H471K | CHIP C 470PF K | |
| C75 | | | CK73GB1H821K | CHIP C 820PF K | |
| C76,77 | | | CK73GB1H471K | CHIP C 470PF K | |
| C79,80 | | | CK73GB1H471K | CHIP C 470PF K | |
| C82 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| C83 | | | CC73GCH1H030B | CHIP C 3.0PF B | |
| C84 | | | CK73GB1H471K | CHIP C 470PF K | |
| C102 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C108 | | | CC73GCH1H270J | CHIP C 27PF J | |
| C109 | | | CC73GCH1H150J | CHIP C 15PF J | |
| C110 | | | CC73GCH1H820J | CHIP C 82PF J | |
| C111 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C112 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C113 | | | CC73GCH1H100D | CHIP C 10PF D | |
| C115 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C116 | | | CC73GCH1H150J | CHIP C 15PF J | |
| C119,120 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C123 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C124 | | | CC73GCH1H070D | CHIP C 7.0PF D | |
| C125-127 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C128 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C129 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C130 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C131,132 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C133 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C134 | | | CC73GCH1H100D | CHIP C 10PF D | |
| C135 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C136 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C137 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C138 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C139,140 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C141 | | | CC73GCH1H120J | CHIP C 12PF J | |
| C142 | | | CC73GCH1H330J | CHIP C 33PF J | |
| C144 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C145 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C146 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C149 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C150 | | | CC73GCH1H090D | CHIP C 9.0PF D | |
| C171 | | | CC73GCH1H150J | CHIP C 15PF J | |
| C172 | | | CC73GCH1H2R5C | CHIP C 2.5PF C | |
| C173 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C174 | | | CC73GCH1H070D | CHIP C 7.0PF D | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C175 | | | CC73GCH1H120J | CHIP C | 12PF | J | |
| C176-178 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C181 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C182,183 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C184 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C185 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C186 | | | CC73GCH1H330J | CHIP C | 33PF | J | |
| C187 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C188,189 | | | CC73GCH1H040B | CHIP C | 4.0PF | B | |
| C190 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C192-194 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C195 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C196,197 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C198 | | | CC73GCH1H680J | CHIP C | 68PF | J | |
| C199 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C200,201 | | | CC73GCH1H040B | CHIP C | 4.0PF | B | |
| C202 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C204-206 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C207 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C208,209 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C210 | | | CC73GCH1H680J | CHIP C | 68PF | J | |
| C211 | | | CC73GCH1H100D | CHIP C | 10PF | D | |
| C212 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C213 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C214 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C215 | | | CC73GCH1H180J | CHIP C | 18PF | J | |
| C216 | | | CC73GCH1H150J | CHIP C | 15PF | J | |
| C217 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C218 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C219 | | | CK73FB1C105K | CHIP C | 1.0UF | K | |
| C220,221 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C222 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C223 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C224,225 | | | CC73GCH1H271J | CHIP C | 270PF | J | |
| C226,227 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C228 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C229 | | | CK73GB1C333K | CHIP C | 0.033UF | K | |
| C230 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C231 | | | CC73GCH1H820J | CHIP C | 82PF | J | |
| C232,233 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C234 | | | CK73FB1C224K | CHIP C | 0.22UF | K | |
| C235 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C236 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C237 | | | C92-0712-05 | CHIP-TAN | 22UF | 6.3WV | |
| C238 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C239,240 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C241 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C251,252 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C253 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C255 | | | C92-0694-05 | CHIP-TAN | 10UF | 16WV | |
| C256 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C257 | | | C92-0519-05 | CHIP-TAN | 1.0UF | 25WV | |
| C258 | | | C92-0516-05 | CHIP-TAN | 4.7UF | 16WV | |
| C259 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C299 | | | C92-0713-05 | CHIP-TAN | 10UF | 6.3WV | |
| C301 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C303 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C304 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C305 | | | C92-0507-05 | CHIP-TAN | 4.7UF | 6.3WV | |
| C307-309 | | | CK73GB1H102K | CHIP C | 1000PF | K | |

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C311 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C312 | | | C92-0001-05 | CHIP C | 0.1UF | 35WV | |
| C313 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C314 | | | CK73FB1E683K | CHIP C | 0.068UF | K | |
| C315-317 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C318 | | | C92-0657-05 | CHIP-TAN | 2.2UF | 20WV | |
| C319 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C320 | | | C92-0657-05 | CHIP-TAN | 2.2UF | 20WV | |
| C321 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C322 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C323 | | | CC73GCH1H330J | CHIP C | 33PF | J | |
| C324 | | | CC73GCH1H120J | CHIP C | 12PF | J | |
| C325 | | | CC73GCH1H3R5B | CHIP C | 3.5PF | B | |
| C326 | | | CC73GCH1H020B | CHIP C | 2.0PF | B | |
| C327 | | | CK73FB1E224K | CHIP C | 0.22UF | K | |
| C331 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C332,333 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C334 | | | CC73GCH1H150J | CHIP C | 15PF | J | |
| C335 | | | CK73GB1C223K | CHIP C | 0.022UF | K | |
| C336 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C337 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C338 | | | C92-0001-05 | CHIP C | 0.1UF | 35WV | |
| C339 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C340 | | | CC73GCH1H270J | CHIP C | 27PF | J | |
| C342 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C343 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C346,347 | | | CC73GCH1H680G | CHIP C | 68PF | G | |
| C350 | | | CC73GCH1H470G | CHIP C | 47PF | G | |
| C352 | | | CC73GCH1H150G | CHIP C | 15PF | G | |
| C353 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C354 | | | CC73GCH1H560G | CHIP C | 56PF | G | |
| C355 | | | CC73GCH1H150G | CHIP C | 15PF | G | |
| C356 | | | CC73GCH1HR75B | CHIP C | 0.75PF | B | |
| C357 | | | CC73GCH1H150G | CHIP C | 15PF | G | |
| C358 | | | CC73GCH1H100C | CHIP C | 10PF | C | |
| C359 | | | CC73GCH1H090B | CHIP C | 9.0PF | B | |
| C360 | | | CC73GCH1H150G | CHIP C | 15PF | G | |
| C361-363 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C364,365 | | | CC73GCH1H010B | CHIP C | 1.0PF | B | |
| C367-369 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C370 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C371 | | | C92-0560-05 | CHIP-TAN | 10UF | 6.3WV | |
| C372 | | | CC73GCH1H150J | CHIP C | 15PF | J | |
| C373-378 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C379 | | | CC73GCH1H150J | CHIP C | 15PF | J | |
| C380 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C381 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C382 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C383 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C384 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C385 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C387,388 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C390-392 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C393 | | | CC73GCH1H270J | CHIP C | 27PF | J | |
| C394 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C395 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C396,397 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C400 | | | CK73FB1A105K | CHIP C | 1.0UF | K | |
| C403 | | | CK73HB1A104K | CHIP C | 0.10UF | K | |
| C404 | | | CC73HCH1H050C | CHIP C | 5.0PF | C | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C406 | | | CC73GCH1H0R3B | CHIP C | 0.3PF | B | |
| C407 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C408,409 | | | CC73HCH1H150G | CHIP C | 15PF | G | |
| C410-412 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C413 | | | CC73GCH1H102J | CHIP C | 1000PF | J | |
| C420,421 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C422 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C423 | | | CK73FF1C105Z | CHIP C | 1.0UF | Z | |
| C424 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C425-428 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C429 | | | CK73GB1A105K | CHIP C | 1.0UF | K | |
| C430,431 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C432 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C433 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C434 | | | CK73GB1H561K | CHIP C | 560PF | K | |
| C435 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C436,437 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C438 | | | CK73GB1E103K | CHIP C | 0.010UF | K | |
| C439 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C440 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C441 | | | CK73FB0J106K | CHIP C | 10UF | K | |
| C442 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C443 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C444 | | | CC73GCH1H390J | CHIP C | 39PF | J | |
| C445 | | | CC73GCH1H150J | CHIP C | 15PF | J | |
| C446 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C447 | | | CK73HB1A333K | CHIP C | 0.033UF | K | |
| C448 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C450 | | | CK73FB0J106K | CHIP C | 10UF | K | |
| C451 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C452 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C453 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C454 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C455 | | | C92-0589-05 | CHIP-TAN | 47UF | 6.3WV | |
| C457 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C459 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C460-463 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C464 | | | CK73HB1A333K | CHIP C | 0.033UF | K | |
| C465 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C467,468 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C469 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C470 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C472 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C475 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C476 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C477 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C478 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C479,480 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C481 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C482 | | | CK73FB1A475K | CHIP C | 4.7UF | K | |
| C483 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C484 | | | CK73FB1A475K | CHIP C | 4.7UF | K | |
| C485 | | | CK73FB1A105K | CHIP C | 1.0UF | K | |
| C487 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C488 | | | CC73GCH1H120G | CHIP C | 12PF | G | |
| C489 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C490 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C491,492 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C493 | | | CK73FB1A475K | CHIP C | 4.7UF | K | |
| C495 | | | CC73GCH1H181J | CHIP C | 180PF | J | |
| C496 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C497 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C498 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C499 | | | CK73GB1H821K | CHIP C | 820PF | K | |
| C500 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C501 | | | CC73GCH1H220J | CHIP C | 22PF | J | |
| C502 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C503 | | | CC73GCH1H680J | CHIP C | 68PF | J | |
| C504 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C505,506 | | | CK73GB1A105K | CHIP C | 1.0UF | K | |
| C507 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C511 | | | CK73GB1C683K | CHIP C | 0.068UF | K | |
| C512,513 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C514 | | | CC73GCH1H820J | CHIP C | 82PF | J | |
| C515,516 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C517 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C518 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C519,520 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C524 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C525,526 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C528 | | | CK73GB1H222K | CHIP C | 2200PF | K | |
| C529 | | | CC73GCH1H470J | CHIP C | 47PF | J | |
| C530 | | | CK73FB0J106K | CHIP C | 10UF | K | |
| C531 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C532 | | | CK73GB1E123K | CHIP C | 0.012UF | K | |
| C533 | | | CK73GB1E153K | CHIP C | 0.015UF | K | |
| C534 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C535 | | | CK73GB1C683K | CHIP C | 0.068UF | K | |
| C536,537 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C538 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C539,540 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C541 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C542 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C543,544 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C545 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C546 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C547-549 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C550 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C551-553 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C554 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C555-557 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C558 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C559 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C560,561 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C562-565 | | | C92-0519-05 | CHIP-TAN | 1.0UF | 25WV | |
| C566 | | | CK73FB1C105K | CHIP C | 1.0UF | K | |
| C567 | | | CC73HCH1H101J | CHIP C | 100PF | J | |
| C568 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C570 | | | CK73FB1C105K | CHIP C | 1.0UF | K | |
| C572,573 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C574 | | | C92-0672-05 | ELECTRO | 22UF | 16WV | |
| C575 | | ✻ | C92-0834-05 | ELECTRO | 47UF | 25WV | |
| C576 | | ✻ | C92-0836-05 | ELECTRO | 330UF | 16WV | |
| C577 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C578 | | ✻ | C92-0834-05 | ELECTRO | 47UF | 25WV | |
| C579 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C580 | | ✻ | C92-0834-05 | ELECTRO | 47UF | 25WV | |
| C581,582 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C583 | | | CK73GB1H471K | CHIP C | 470PF | K | |
| C584 | | | CC73GCH1H220J | CHIP C | 22PF | J | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | | | Destination |
|---|---|---|---|---|---|---|---|
| C585-587 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C588 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C591 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C592,593 | | | CC73GCH1H070D | CHIP C | 7.0PF | D | |
| C594 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C595 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C701 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C702-704 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C705-711 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C712 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C713 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C714,715 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C716,717 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C718-720 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C721 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C722,723 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C801 | | | C92-0777-05 | ELECTRO | 1000UF | 25WV | |
| C802 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C803 | | | CK73GB1E473J | CHIP C | 0.047UF | J | |
| C804 | | | CC73GCH1H471J | CHIP C | 470PF | J | |
| C805 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C806 | | | CC73GCH1H101J | CHIP C | 100PF | J | |
| C807 | | | CK73GB1E473J | CHIP C | 0.047UF | J | |
| C808 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C809 | | | CC73GCH1H471J | CHIP C | 470PF | J | |
| C810 | | | CK73GB1E473J | CHIP C | 0.047UF | J | |
| C811,812 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C813,814 | | | CC73GCH1H471J | CHIP C | 470PF | J | |
| C815 | | | C92-0585-05 | CHIP-TAN | 4.7UF | 16WV | |
| C816 | | | C92-0628-05 | CHIP-TAN | 10UF | 10WV | |
| C817 | | | CC73GCH1H471J | CHIP C | 470PF | J | |
| C818 | | | CK73GB1H472K | CHIP C | 4700PF | K | |
| C819,820 | | | CK73GB1C104K | CHIP C | 0.10UF | K | |
| C821 | | | C92-0585-05 | CHIP-TAN | 4.7UF | 16WV | |
| C822 | | | CC73GCH1H471J | CHIP C | 470PF | J | |
| C823 | | | CK73HB1H102K | CHIP C | 1000PF | K | |
| C824 | | | CK73GB1H103K | CHIP C | 0.010UF | K | |
| C829 | | | CK73GB1H102K | CHIP C | 1000PF | K | |
| C831,832 | | | C92-0585-05 | CHIP-TAN | 4.7UF | 16WV | |
| TC301,302 | | | C05-0396-05 | CERAMIC TRIMMER CAP (8PF) | | | |
| CN200-203 | | | E23-1081-05 | TERMINAL | | | |
| CN301,302 | | ✻ | E40-6404-05 | PIN ASSY | | | |
| CN328-330 | | | E23-1081-05 | TERMINAL | | | |
| CN403 | | ✻ | E40-6361-05 | PIN ASSY | | | |
| CN427 | | ✻ | E40-6371-05 | FLAT CABLE CONNECTOR | | | |
| CN428 | | ✻ | E40-6373-05 | PIN ASSY | | | |
| CN429 | | ✻ | E40-6412-05 | FLAT CABLE CONNECTOR | | | |
| CN701 | | ✻ | E40-6371-05 | FLAT CABLE CONNECTOR | | | |
| CN802,803 | | ✻ | E23-1260-04 | TERMINAL | | | |
| CN804 | | | E40-3246-05 | PIN ASSY | | | |
| CN815 | | | E23-1081-05 | TERMINAL | | | |
| J401 | | | E11-0425-05 | 3.5D PHONE JACK (3P) | | | |
| J701 | | | E58-0494-05 | SUB SOCKET (D) | | | |
| F401 | | ✻ | F53-0352-05 | FUSE (2A) | | | |
| F801 | | | F53-0278-05 | FUSE (5A) | | | |
| CN401 | | | J19-5386-05 | HOLDER | | | |
| CD171 | | | L79-1701-05 | TUNING COIL | | | |
| CF171 | | | L72-0986-05 | CERAMIC FILTER | | | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| CF172 | | | L72-0998-05 | CERAMIC FILTER | |
| L1 | | | L40-8275-92 | SMALL FIXED INDUCTOR (82NH) | |
| L2 | | | L92-0140-05 | FERRITE CHIP | |
| L3 | | | L40-6875-92 | SMALL FIXED INDUCTOR (68NH) | |
| L4 | | | L92-0140-05 | FERRITE CHIP | |
| L5,6 | | | L92-0179-05 | FERRITE CHIP | |
| L7 | | | L34-4638-05 | AIR-CORE COIL | |
| L8 | | ✻ | L34-4744-05 | AIR-CORE COIL | |
| L9-12 | | ✻ | L34-4742-05 | AIR-CORE COIL | |
| L13 | | | L34-4482-05 | AIR-CORE COIL | |
| L14 | | | L40-3375-92 | SMALL FIXED INDUCTOR (33NH) | |
| L103 | | | L41-1085-14 | SMALL FIXED INDUCTOR | |
| L104 | | | L41-6878-14 | SMALL FIXED INDUCTOR | |
| L105 | | | L41-3978-14 | SMALL FIXED INDUCTOR | |
| L106 | | | L41-2778-14 | SMALL FIXED INDUCTOR | |
| L108 | | | L92-0140-05 | FERRITE CHIP | |
| L109 | | ✻ | L41-8275-14 | SMALL FIXED INDUCTOR | |
| L110-113 | | | L34-4566-05 | AIR-CORE COIL | |
| L114 | | | L40-2275-92 | SMALL FIXED INDUCTOR (22NH) | |
| L171 | | | L41-2778-14 | SMALL FIXED INDUCTOR | |
| L172 | | | L41-2278-14 | SMALL FIXED INDUCTOR | |
| L173,174 | | | L39-1421-05 | TOROIDAL COIL | |
| L175 | | | L92-0140-05 | FERRITE CHIP | |
| L176 | | | L39-1421-05 | TOROIDAL COIL | |
| L177 | | ✻ | L41-2785-14 | SMALL FIXED INDUCTOR | |
| L178,179 | | ✻ | L41-3988-14 | SMALL FIXED INDUCTOR | |
| L180 | | | L40-6875-92 | SMALL FIXED INDUCTOR (68NH) | |
| L181 | | | L40-1001-86 | SMALL FIXED INDUCTOR (10UH) | |
| L182 | | | L40-1085-92 | SMALL FIXED INDUCTOR (100NH) | |
| L183,184 | | ✻ | L41-3988-14 | SMALL FIXED INDUCTOR | |
| L185 | | | L40-6875-92 | SMALL FIXED INDUCTOR (68NH) | |
| L186 | | | L40-1001-86 | SMALL FIXED INDUCTOR (10UH) | |
| L187 | | | L40-1085-92 | SMALL FIXED INDUCTOR (100NH) | |
| L188 | | | L40-8281-86 | SMALL FIXED INDUCTOR (0.82UH) | |
| L189 | | | L40-1091-86 | SMALL FIXED INDUCTOR (1.0UH) | |
| L251 | | ✻ | L33-1468-05 | SMALL FIXED INDUCTOR | |
| L301 | | | L40-5695-85 | SMALL FIXED INDUCTOR (5.6UH) | |
| L302 | | | L92-0140-05 | FERRITE CHIP | |
| L303 | | | L41-8268-14 | SMALL FIXED INDUCTOR | |
| L304 | | | L41-6868-14 | SMALL FIXED INDUCTOR | |
| L305,306 | | | L41-6878-14 | SMALL FIXED INDUCTOR | |
| L307 | | | L41-6868-14 | SMALL FIXED INDUCTOR | |
| L308 | | | L41-1078-14 | SMALL FIXED INDUCTOR | |
| L309 | | | L40-3395-85 | SMALL FIXED INDUCTOR (3.3UH) | |
| L310 | | | L40-2795-85 | SMALL FIXED INDUCTOR (2.7UH) | |
| L311 | | | L40-3395-85 | SMALL FIXED INDUCTOR (3.3UH) | |
| L312 | | | L40-2795-85 | SMALL FIXED INDUCTOR (2.7UH) | |
| L313 | | | L34-4610-05 | AIR-CORE COIL | |
| L314 | | | L34-4612-05 | AIR-CORE COIL | |
| L315 | | | L40-2795-85 | SMALL FIXED INDUCTOR (2.7UH) | |
| L316 | | | L40-3395-85 | SMALL FIXED INDUCTOR (3.3UH) | |
| L317 | | | L40-2795-85 | SMALL FIXED INDUCTOR (2.7UH) | |
| L318,319 | | | L40-8275-92 | SMALL FIXED INDUCTOR (82NH) | |
| L320 | | | L40-3975-92 | SMALL FIXED INDUCTOR (39NH) | |
| L321 | | | L92-0140-05 | FERRITE CHIP | |
| L401,402 | | | L92-0138-05 | FERRITE CHIP | |
| L403-407 | | | L92-0140-05 | FERRITE CHIP | |
| L408 | | | L92-0138-05 | FERRITE CHIP | |
| L409 | | | L92-0140-05 | FERRITE CHIP | |
| L410,411 | | | L92-0179-05 | FERRITE CHIP | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| L701,702 | | | L92-0140-05 | FERRITE CHIP | |
| X171 | | | L77-1762-05 | CRYSTAL RESONATOR (44.395MHZ) | |
| X301 | | | L77-1952-05 | TCXO (16.8MHZ) | |
| X401 | | | L77-1802-05 | CRYSTAL RESONATOR (32768HZ) | |
| X403 | | | L77-1965-05 | CRYSTAL RESONATOR (3.6864MHZ) | |
| X404 | | | L77-1950-05 | CRYSTAL RESONATOR (11.0592MHZ) | |
| XF171 | | * | L71-0618-05 | MCF (44.85M) | |
| CP401 | | | R90-0740-05 | MULTIPLE RESISTOR | |
| CP402-417 | | | RK75HA1J102J | CHIP-COM 1.0K J 1/16W | |
| R1 | | | RK73GB1J271J | CHIP R 270 J 1/16W | |
| R2 | | | RK73GB1J180J | CHIP R 18 J 1/16W | |
| R3 | | | RK73GB1J271J | CHIP R 270 J 1/16W | |
| R4 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R5 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R6 | | | RK73GB1J181J | CHIP R 180 J 1/16W | |
| R7 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R8 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R9 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| R10 | | | RK73GB1J272J | CHIP R 2.7K J 1/16W | |
| R11 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| R12 | | | RK73GB1J150J | CHIP R 15 J 1/16W | |
| R13 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R14 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R15 | | | RK73FB2A221J | CHIP R 220 J 1/10W | |
| R16,17 | | | RK73FB2A470J | CHIP R 47 J 1/10W | |
| R18 | | | RK73FB2A221J | CHIP R 220 J 1/10W | |
| R19 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R21 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| R22 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R23 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R25 | | | R92-1214-05 | CHIP R 120 J 1/2W | |
| R26 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R27 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| R28 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | |
| R30 | | | R92-1061-05 | JUMPER REST 0 OHM | |
| R31 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R33 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R38 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R71 | | | RK73GB1J563J | CHIP R 56K J 1/16W | |
| R72 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R75 | | | RK73GB1J393J | CHIP R 39K J 1/16W | |
| R76-78 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R79 | | | RK73GB1J184J | CHIP R 180K J 1/16W | |
| R81,82 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R84,85 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R86 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R87,88 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R89 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R90 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R109 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R111 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R115 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R116 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R117 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R119 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R120 | | | RK73GB1J120J | CHIP R 12 J 1/16W | |
| R121-124 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R125 | | | RK73GB1J181J | CHIP R 180 J 1/16W | |
| R126 | | | RK73GB1J330J | CHIP R 33 J 1/16W | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R127 | | | RK73GB1J181J | CHIP R 180 J 1/16W | |
| R129 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R130,131 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R132 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R171 | | | RK73GB1J821J | CHIP R 820 J 1/16W | |
| R172 | | | RK73GB1J5R6J | CHIP R 5.6 J 1/16W | |
| R173 | | | RK73GB1J821J | CHIP R 820 J 1/16W | |
| R174 | | | RK73GB1J680J | CHIP R 68 J 1/16W | |
| R175 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R176 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| R177 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R178 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R179 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R180 | | | RK73GB1J821J | CHIP R 820 J 1/16W | |
| R181 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R182 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R183 | | | RK73GB1J680J | CHIP R 68 J 1/16W | |
| R184 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R185 | | | RK73GB1J821J | CHIP R 820 J 1/16W | |
| R186 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R187 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R188 | | | RK73GB1J680J | CHIP R 68 J 1/16W | |
| R189 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R190 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R191,192 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R193 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R194,195 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R196 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R197,198 | | | RK73GB1J334J | CHIP R 330K J 1/16W | |
| R199 | | | RK73GB1J560J | CHIP R 56 J 1/16W | |
| R200 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R202 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R203 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R204 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R205 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R206 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R207 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R208 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| R209 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R210 | | | RK73GB1J272J | CHIP R 2.7K J 1/16W | |
| R212 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R217 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R221 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R222 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R251 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R252 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R253 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R254,255 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R256 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| R257 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R258 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| R300 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R301,302 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R303 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| R304 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| R305 | | | RK73GB1J560J | CHIP R 56 J 1/16W | |
| R306 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R307 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R308 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| R309 | | | RK73GB1J181J | CHIP R 180 J 1/16W | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R310 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R311,312 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R313 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R314,315 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R316 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R317 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R318 | | ✻ | R92-2157-05 | METAL-R 1.2K J 1/4W | |
| R319 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| R320 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R321 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R322 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R323 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R324 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R325 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R326 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | |
| R327 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R328 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R329 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R330 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R331 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R332 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R333-335 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R336 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R337,338 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R339 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R340 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R341 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R342 | | | RK73GB1J181J | CHIP R 180 J 1/16W | |
| R343 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R344-346 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R347 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R348 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R349 | | | RK73GB1J273J | CHIP R 27K J 1/16W | |
| R350 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R351 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R352 | | | RK73GB1J330J | CHIP R 33 J 1/16W | |
| R353 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R354 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R355 | | | RK73GB1J271J | CHIP R 270 J 1/16W | |
| R356,357 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R358 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | |
| R359 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R360,361 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R362 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R365,366 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R367 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R368 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R369 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R370 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R375 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R376 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R377 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R379,380 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R401 | | ✻ | RK73HH1J362D | CHIP R 3.6K D 1/16W | |
| R402 | | | RK73HH1J512D | CHIP R 5.1K D 1/16W | |
| R403 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R405,406 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R407 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R410 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R411,412 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R414 | | | RK73HB1J103J | CHIP R 10K J 1/16W | |
| R418,419 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R420 | | | RK73HB1J334J | CHIP R 330K J 1/16W | |
| R421,422 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R423 | | | R92-1368-05 | CHIP R 0 OHM | |
| R424-427 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R428 | | | R92-1368-05 | CHIP R 0 OHM | |
| R429,430 | | | RK73HB1J471J | CHIP R 470 J 1/16W | |
| R431 | | | R92-1368-05 | CHIP R 0 OHM | |
| R432 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R434 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R435 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R437 | | | R92-1368-05 | CHIP R 0 OHM | |
| R439 | | | R92-1368-05 | CHIP R 0 OHM | |
| R440-444 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R445,446 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R447 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R448 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R449 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R450 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R451 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R452 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R453 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R454 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R455,456 | | | RK73HB1J471J | CHIP R 470 J 1/16W | |
| R457 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R458,459 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R461 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R465 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R466,467 | | | R92-1368-05 | CHIP R 0 OHM | |
| R468 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R469 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R470 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R471,472 | | | RK73HB1J102J | CHIP R 1.0K J 1/16W | |
| R473 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R474-476 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R477,478 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R481 | | | RK73HB1J474J | CHIP R 470K J 1/16W | |
| R482 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R483-486 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R487 | | | RK73GB1J185J | CHIP R 1.8M J 1/16W | |
| R488,489 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R490 | | | RK73GB1J184J | CHIP R 180K J 1/16W | |
| R491 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R492 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| R493 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | |
| R494,495 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R496 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R497 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R498 | | | RK73GB1J274J | CHIP R 270K J 1/16W | |
| R499 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R500 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R501 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R502 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R503 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R504 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R505 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R506 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R507 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R508 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |

# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R509 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R511 | | | RK73HB1J152J | CHIP R 1.5K J 1/16W | |
| R512 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R513 | | | RK73GB1J564J | CHIP R 560K J 1/16W | |
| R514 | | | RK73GB1J183J | CHIP R 18K J 1/16W | |
| R515 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R517 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R519 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R520 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R521 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R522 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R523 | | | RK73GB1J564J | CHIP R 560K J 1/16W | |
| R524 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R525 | | | RK73HB1J152J | CHIP R 1.5K J 1/16W | |
| R526 | | | RK73GB1J274J | CHIP R 270K J 1/16W | |
| R527 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| R528 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R529 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| R530 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| R531 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R532 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R533 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R534 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R535 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R536 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R539 | | | RK73GB1J393J | CHIP R 39K J 1/16W | |
| R540 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R541,542 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R545 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R548 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| R550 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R552 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R553 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R554 | | | RK73GB1J563J | CHIP R 56K J 1/16W | |
| R555 | | | RK73GB1J123J | CHIP R 12K J 1/16W | |
| R556 | | | RK73GB1J563J | CHIP R 56K J 1/16W | |
| R557 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R558 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R559 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R560 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R563 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R565 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R566 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | |
| R567 | | | RK73GB1J394J | CHIP R 390K J 1/16W | |
| R568 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| R569 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R570 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R571 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| R572 | | | R92-1368-05 | CHIP R 0 OHM | |
| R573 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R574,575 | | | R92-1368-05 | CHIP R 0 OHM | |
| R576 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R577,578 | | | R92-1368-05 | CHIP R 0 OHM | |
| R579 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R580,581 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R582 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | |
| R583,584 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R585 | | | RK73GB1J184J | CHIP R 180K J 1/16W | |
| R586 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R587 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R588 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R589,590 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R591 | | | R92-1368-05 | CHIP R 0 OHM | |
| R592 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R594 | | | RK73GB1J681J | CHIP R 680 J 1/16W | |
| R595 | | | RK73GB1J274J | CHIP R 270K J 1/16W | |
| R596 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R597 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | |
| R598 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R599 | | | RK73GB1J184J | CHIP R 180K J 1/16W | |
| R600 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R601 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R602 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | |
| R603,604 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R606 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R607 | | | RK73GB1J274J | CHIP R 270K J 1/16W | |
| R608 | | | RK73GB1J184J | CHIP R 180K J 1/16W | |
| R609 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R610 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R611 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R612,613 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R614 | | | R92-1368-05 | CHIP R 0 OHM | |
| R615,616 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R617 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R618 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R619 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R620 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R621,622 | | | R92-0670-05 | CHIP R 0 OHM | |
| R623,624 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R625 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R629,630 | | | R92-0670-05 | CHIP R 0 OHM | |
| R632 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R633 | | | R92-0670-05 | CHIP R 0 OHM | |
| R636 | | | R92-0670-05 | CHIP R 0 OHM | |
| R641,642 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R643 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R644 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R645 | | | RK73GB1J562J | CHIP R 5.6K J 1/16W | |
| R648 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R651 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R652 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| R653 | | | RK73GB1J2R2J | CHIP R 2.2 J 1/16W | |
| R654 | | | R92-0670-05 | CHIP R 0 OHM | |
| R655 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R657 | | | RK73HB1J472J | CHIP R 4.7K J 1/16W | |
| R658-662 | | | R92-1368-05 | CHIP R 0 OHM | |
| R663,664 | | | RK73HB1J105J | CHIP R 1.0M J 1/16W | |
| R665 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R666 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R667 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R669-671 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R701-705 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R706-710 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R711-713 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R714-720 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R801 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R802 | | | RK73GB1J334J | CHIP R 330K J 1/16W | |
| R803 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R805 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R806,807 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |

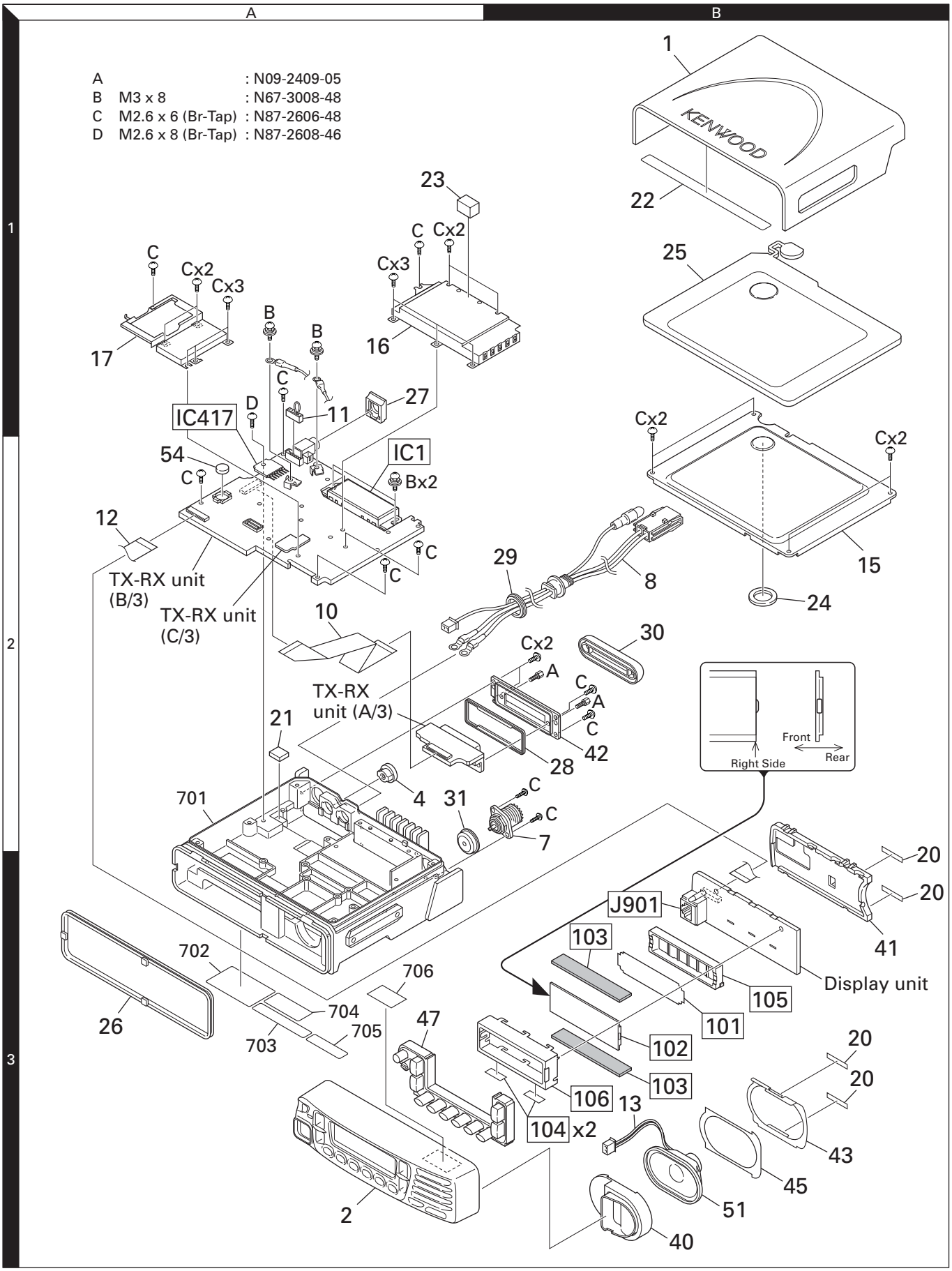
# PARTS LIST

**TX-RX UNIT (X57-6980-10)**

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| R808,809 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R811,812 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R813 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R814 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R815 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R816 | | | RK73HB1J473J | CHIP R 47K J 1/16W | |
| R819 | | | RK73GB1J563J | CHIP R 56K J 1/16W | |
| R820 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R821 | | | RK73HB1J105J | CHIP R 1.0M J 1/16W | |
| R822 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| D1 | | | 02DZ5.6(X,Y) | ZENER DIODE | |
| D2 | | | XB15A709 | DIODE | |
| D3,4 | | | XB15A407A2GB | DIODE | |
| D6-8 | | | HSM88AS | DIODE | |
| D11 | | | 1SV283 | VARIABLE CAPACITANCE DIODE | |
| D103-106 | | | 1SV283 | VARIABLE CAPACITANCE DIODE | |
| D171,172 | | | DAN235E | DIODE | |
| D173 | | | RB706F-40 | DIODE | |
| D174 | | | MA2S111 | DIODE | |
| D251 | | | 1SS388 | DIODE | |
| D301,302 | | | MA2S077 | DIODE | |
| D304,305 | | | MA2S077 | DIODE | |
| D306-313 | | ✻ | BB664 | VARIABLE CAPACITANCE DIODE | |
| D314 | | | 1SV278 | VARIABLE CAPACITANCE DIODE | |
| D315,316 | | | HVC131 | DIODE | |
| D402-404 | | | 1SS388 | DIODE | |
| D405 | | | EMZ6.8N | ZENER DIODE | |
| D406 | | | 02DZ5.1(Y) | ZENER DIODE | |
| D407 | | | RB706F-40 | DIODE | |
| D408,409 | | | MA742 | DIODE | |
| D412-414 | | | DA204U | DIODE | |
| D416 | | | DAN202U | DIODE | |
| D417-423 | | | 1SS388 | DIODE | |
| D701 | | | 02DZ18(X,Y) | ZENER DIODE | |
| D702,703 | | | 1SS355 | DIODE | |
| D704-708 | | | DA204U | DIODE | |
| D709,710 | | | 02DZ18(X,Y) | ZENER DIODE | |
| D711-713 | | | DA204U | DIODE | |
| D714 | | | 02DZ18(X,Y) | ZENER DIODE | |
| D801 | | | 22ZR-10D | SURGE ABSORBER | |
| D802 | | | DSA3A1 | DIODE | |
| D804 | | | 02DZ18(X,Y) | ZENER DIODE | |
| D805 | | | 02CZ9.1(X,Y) | ZENER DIODE | |
| IC1 | 2A | ✻ | RA30H1317M-23 | MOS IC | |
| IC71,72 | | | TA75W01FU | MOS IC | |
| IC171 | | ✻ | SPM5001 | MOS IC | |
| IC172 | | | TA31136FN | MOS IC | |
| IC251 | | ✻ | MAX5026EUT+T | MOS IC | |
| IC301 | | | ADF4111BCP7 | MOS IC | |
| IC302 | | | TC7S66FU | MOS IC | |
| IC401 | | | AT24256N10SI27 | ROM IC | |
| IC402 | | | RV5C386A | MOS IC | |
| IC403 | | | BU4094BCFV | MOS IC | |
| IC404 | | | 30625MGP-169GP | MPU | |
| IC405 | | | AT29C040A-90TI | ROM IC | |
| IC406-409 | | | TC75W51FU | MOS IC | |
| IC410 | | | M62364FP | MOS IC | |
| IC411 | | | LMC7101BIM5 | MOS IC | |
| IC412 | | | TC75W51FU | MOS IC | |
| IC413 | | ✻ | TC7MZ4053FK | MOS IC | |

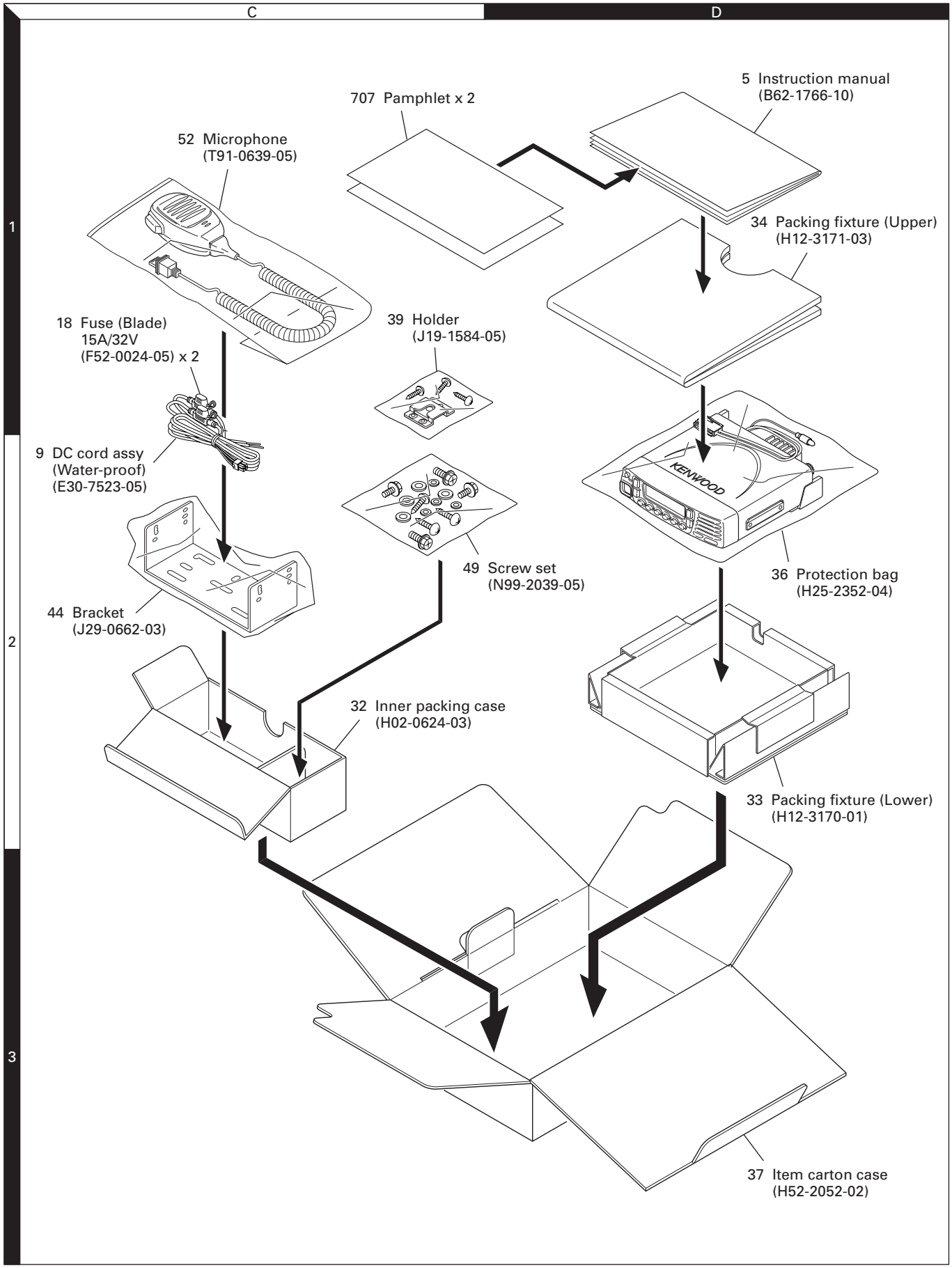
| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---|---|---|---|---|
| IC414 | | | TC75W51FU | MOS IC | |
| IC415 | | ✻ | AQUA-L | MOS IC | |
| IC416 | | | ADM202EARN | MOS IC | |
| IC417 | 2A | ✻ | TA7252AP | ANALOG IC | |
| IC801 | | | S-80942CNNBG9C | MOS IC | |
| IC802 | | | XC61CN5002NR | MOS IC | |
| IC803 | | | TA7808F | ANALOG IC | |
| IC804 | | | TA7805F | MOS IC | |
| IC805 | | | NJM78L05UA | BI-POLAR IC | |
| IC807 | | ✻ | XC6201P502PR | MOS IC | |
| Q1 | | | 2SC5108(Y) | TRANSISTOR | |
| Q2 | | | 2SC5192 | TRANSISTOR | |
| Q3 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q72 | | | 2SK1824 | FET | |
| Q73 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q103 | | | 2SC3357 | TRANSISTOR | |
| Q171,172 | | | 2SC5108(Y) | TRANSISTOR | |
| Q173 | | | DTA114EE | DIGITAL TRANSISTOR | |
| Q174 | | | DTC144EE | DIGITAL TRANSISTOR | |
| Q175 | | | 2SC4617(Q) | TRANSISTOR | |
| Q176 | | | 2SK1824 | FET | |
| Q177 | | | DTC144EE | DIGITAL TRANSISTOR | |
| Q178 | | | DTA144EE | DIGITAL TRANSISTOR | |
| Q180 | | | DTC144EE | DIGITAL TRANSISTOR | |
| Q251 | | | 2SC4617(S) | TRANSISTOR | |
| Q301 | | | 2SC5108(Y) | TRANSISTOR | |
| Q302-304 | | | 2SC4116(BL) | TRANSISTOR | |
| Q305 | | | DTC144EE | DIGITAL TRANSISTOR | |
| Q306,307 | | | 2SK508NV(K52) | FET | |
| Q308,309 | | | 2SC4116(GR) | TRANSISTOR | |
| Q310 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q311 | | | 2SC5108(Y) | TRANSISTOR | |
| Q312 | | | 2SC4617(S) | TRANSISTOR | |
| Q313 | | | 2SC5108(Y) | TRANSISTOR | |
| Q314 | | | DTA144EE | DIGITAL TRANSISTOR | |
| Q402 | | | DTC114YE | DIGITAL TRANSISTOR | |
| Q405 | | | DTA114EE | DIGITAL TRANSISTOR | |
| Q406 | | | HN1J02FU | FET | |
| Q409 | | | DTC363EU | DIGITAL TRANSISTOR | |
| Q410 | | | 2SC4116(Y) | TRANSISTOR | |
| Q411 | | | 2SA1586(Y,GR) | TRANSISTOR | |
| Q412 | | | 2SK1824 | FET | |
| Q413,414 | | | 2SJ243 | FET | |
| Q415 | | | HN1L02FU | FET | |
| Q416,417 | | | 2SJ243 | FET | |
| Q418 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q419 | | | DTC363EU | DIGITAL TRANSISTOR | |
| Q421 | | | DTA144EE | DIGITAL TRANSISTOR | |
| Q701,702 | | | 2SD2114K(W) | TRANSISTOR | |
| Q801 | | | 2SC2873(Y) | TRANSISTOR | |
| Q802 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q803-805 | | ✻ | 12A02CH | TRANSISTOR | |
| Q806-809 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q810 | | ✻ | 2SJ645 | FET | |
| Q811 | | | DTC114EE | DIGITAL TRANSISTOR | |
| Q812 | | | DTC114TE | DIGITAL TRANSISTOR | |
| TH1 | | | S1R104J475H | THERMISTOR | |
| TH171 | | ✻ | S1R473J475H | THERMISTOR | |

# EXPLODED VIEW




**Parts with the exploded numbers larger than 700 are not supplied.**

# PACKING

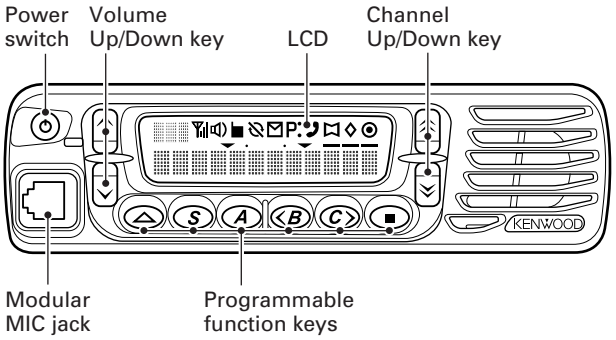





**Parts with the exploded numbers larger than 700 are not supplied.**

# ADJUSTMENT

## Controls




## Panel Test Mode

### ■ Test mode operation features

This transceiver has a test mode. ***To enter test mode, press [A] key and turn power on. Hold [A] key until frequency version appears on LCD.*** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

### ■ Key operation

| Key | "FNC" not appears | |
|---|---|---|
| | Function | Display |
| [S] | Shifts to Panel tuning mode | - |
| [A] | Function on | "FNC" appears |
| [B] | MSK 1200bps and 2400bps | 2400bps : ✉ icon appears |
| [C] | Test signaling CH up | Signaling No. |
| [≪]/[≫] | Test frequency CH up/down | Channel No. |
| [∧]/[∨] | Volume up/down | - |
| [⏶] | Squelch on/off | 🔊 |
| [■] | Narrow/Wide 4k/Wide 5k | Narrow : "n",<br>Wide 4k : "s",<br>Wide 5k : "w" |
| **Microphone key** | | |
| [PTT] | Transmit | - |
| [0] to [9] and [A], [B], [C], [D], [#], [✳] | Use as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was presses is sent. | - |

| Key | "FNC" appears | |
|---|---|---|
| | Function | Display |
| [S] | High power / Low power | Low : ⚐ icon appears |
| [A] | Function off | - |
| [B] | Compander on/off | On : 📞 icon appears |
| [C] | Beat shift on/off | On : ◈ icon appears |
| [≪]/[≫] | Function off | - |
| [∧]/[∨] | Function off | - |
| [⏶] | Squelch level 0 | On : P• icon appears |
| [■] | LCD all lights | LCD all point appears |
| **Microphone key** | | |
| [PTT] | Transmit | - |
| [0] to [9] and [A], [B], [C], [D], [#], [✳] | Function off | - |

**Notes :**

- If a [S], [A], [B], [C] key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.
- The "Wide 4k" can not use, please skip it.

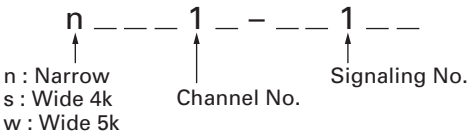
### • LED indicator

Red LED Lights during transmission.
Green LED Lights when there is carrier.

### • Sub LCD indicator

"FNC" Appears at function on.

### • LCD display in panel test mode




### ■ Frequency and Signaling

The set 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

| CH | RX (MHz) | TX (MHz) |
|---|---|---|
| 1 | 155.05000 | 155.10000 |
| 2 | 136.05000 | 136.10000 |
| 3 | 173.95000 | 173.90000 |
| 4 | 155.00000 | 155.00000 |
| 5 | 155.20000 | 155.20000 |
| 6 | 155.40000 | 155.40000 |
| 7 | 177.95000 | 177.90000 |
| 8~16 | - | - |

# ADJUSTMENT

**• Test signaling**

| No. | RX | TX |
|---|---|---|
| 1 | None | None |
| 2 | None | 100Hz Square Wave |
| 3 | LTR Data :<br>AREA=0, GOTO=12<br>HOME=12<br>ID=47, FREE=25 | LTR Data :<br>AREA=0, GOTO=12<br>HOME=12<br>ID=47, FREE=25 |
| 4 | QT : 67.0Hz | QT : 67.0Hz |
| 5 | QT : 151.4Hz | QT : 151.4Hz |
| 6 | QT : 210.7Hz | QT : 210.7Hz |
| 7 | QT : 254.1Hz | QT : 254.1Hz |
| 8 | DQT : D023N | DQT : D023N |
| 9 | DQT : D754I | DQT : D754I |
| 10 | DTMF : 159D | DTMF : 159D |
| 11 | None | DTMF Code 9 |
| 12 | 2-tone :<br>A : 304.7Hz<br>B : 3106.0Hz | 2-tone :<br>A : 304.7Hz<br>B : 3106.0Hz |
| 13 | Single Tone : 979.9Hz | Single Tone : 979.9Hz |
| 14 | None | Single Tone : 1000Hz |
| 15 | 5-tone (CCIR 12345) | 5-tone (CCIR 12345) |
| 16 | None | MSK |
| 17 | MSK :<br>Preamble : 0xAAAA<br>Sync : 0x23EB<br>Data : 0x230960C6AAAA<br>CRC : 0xC4D7 | MSK :<br>Preamble : 0xAAAA<br>Sync : 0x23EB<br>Data : 0x230960C6AAAA<br>CRC : 0xC4D7 |

**Note :** The "5-tone signaling" can not use, please skip it.

## Panel Tuning Mode

### ■ Preparations for tuning the transceiver

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

Whenever the transmitter is turned, 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.

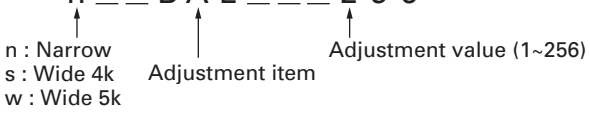
### ■ Transceiver tuning (To place transceiver in tuning mode)

Press [S] key, now in tuning mode. Use [B] key to write tuning data through tuning modes, and [≪]/[≫] to adjust tuning requirements (1 to 256 appeares on LCD).

Use [C] key to select the adjustment item through tuning modes. Use [A] key to adjust 3 or 5 reference level adjustments, and use [■] key to switch between Wide 5k/Wide 4k/ Narrow.

Channel appears on LCD. Set channel according to tuning requirements.

**• LCD display in panel tuning mode**




### ■ Key operation

| Key | Function | |
|---|---|---|
| | Push | Hold (1 second) |
| [S] | End of panel tuning mode | - |
| [A] | To enter 3 or 5 reference level adjustments | - |
| [B] | Writes the adjustment value | - |
| [C] | Go to next adjustment item | Back to last adjustment item |
| [≪]/[≫] | Adjustment value up/down | Continuation up/down |
| [∧]/[∨] | Volume level up/down | Continuation up/down |
| [⏠] | Squelch on/off | - |
| [■] | Selects Narrow, Wide 4k, Wide 5k | - |

### ■ 3 or 5 reference level adjustments frequency

| Tuning point | RX (MHz) | TX (MHz) |
|---|---|---|
| Low | 136.05000 | 136.10000 |
| Low' | 145.55000 | 145.60000 |
| Center | 155.05000 | 155.10000 |
| High' | 164.55000 | 164.60000 |
| High | 173.95000 | 173.90000 |

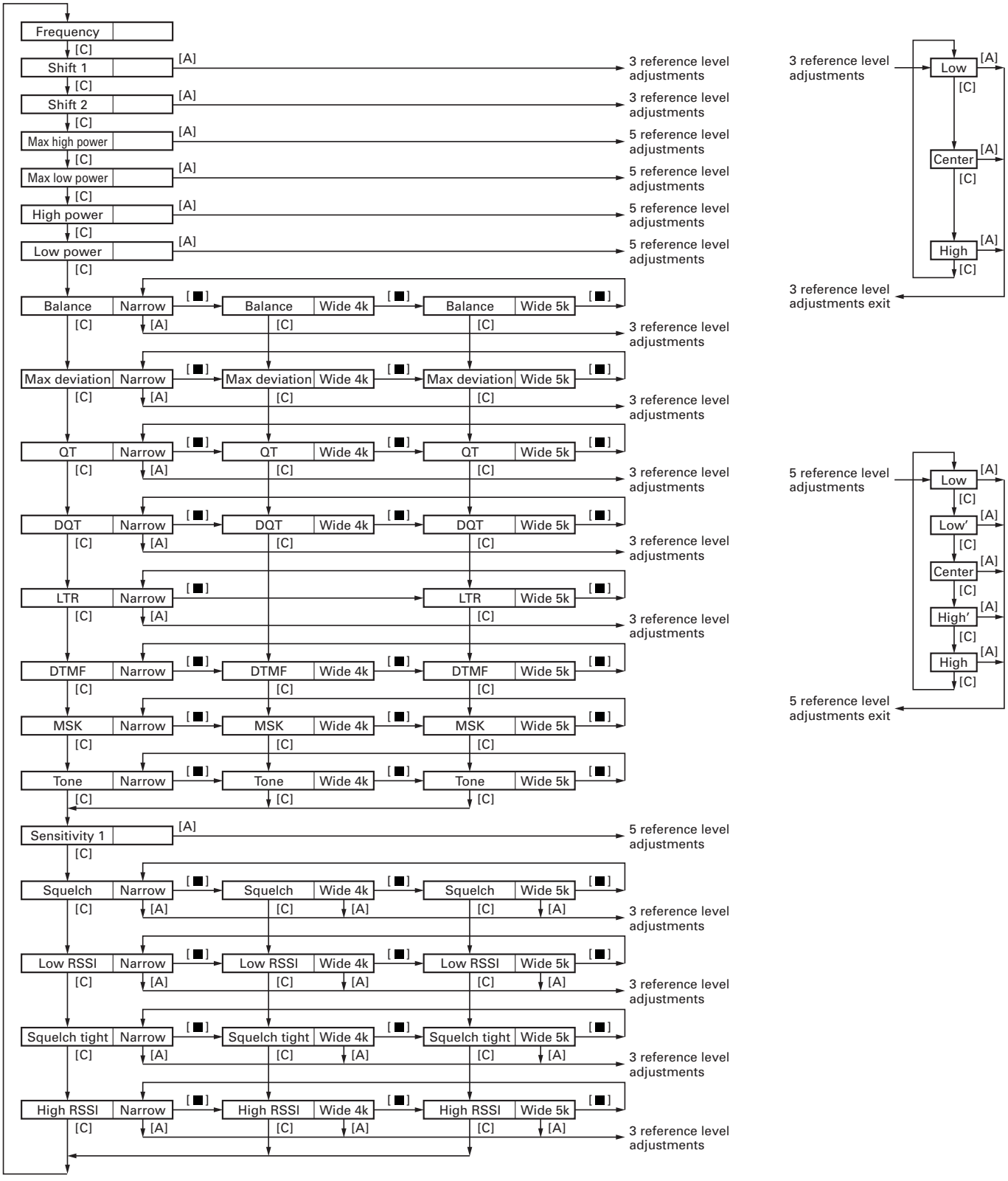
### ■ Adjustment item and Display (✳✳✳ : 1~256)

| Order | Adjustment item | Display |
|---|---|---|
| 1 | Frequency | FREQ ✳✳✳ |
| 2 | Shift 1 | SHFT1 ✳✳✳ |
| 3 | Shift 2 | SHFT2 ✳✳✳ |
| 4 | Max high power | MHPWR ✳✳✳ |
| 5 | Max low power | MLPWR ✳✳✳ |
| 6 | High power | HPWR ✳✳✳ |
| 7 | Low power | LPWR ✳✳✳ |
| 8 | Balance | BAL ✳✳✳ |
| 9 | Max deviation | DEV ✳✳✳ |
| 10 | QT | QT ✳✳✳ |
| 11 | DQT | DQT ✳✳✳ |
| 12 | LTR | LTR ✳✳✳ |
| 13 | DTMF | DTMF ✳✳✳ |
| 14 | MSK | MSK ✳✳✳ |
| 15 | Tone | TONE ✳✳✳ |
| 16 | Sensitivity 1 | SENS1 ✳✳✳ |
| 17 | Squelch | SQL ✳✳✳ |
| 18 | Low RSSI | LRSSI ✳✳✳ |
| 19 | Squelch tight | SQLT ✳✳✳ |
| 20 | High RSSI | HRSSI ✳✳✳ |

# ADJUSTMENT

## ■ Flow chart

**Note :** The "Wide 4k" can not use, please skip it.

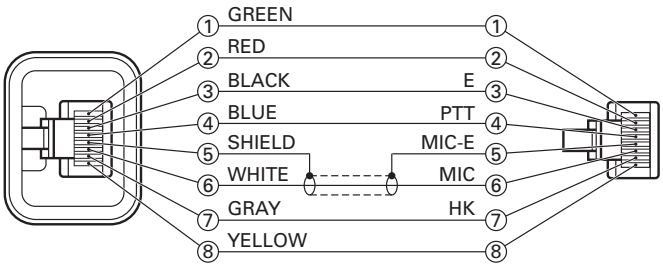


# ADJUSTMENT

## Test Equipment Required for Alignment

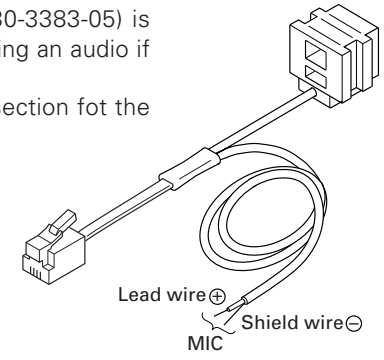
| Test Equipment | Major Specifications | |
|---|---|---|
| 1. Standard Signal Generator (SSG) | Frequency Range | 136 to 174MHz |
| | Modulation | Frequency modulation and external modulation |
| | Output | 0.1μV to greater than 1mV |
| 2. Power Meter | Input Impedance | 50Ω |
| | Operation Frequency | 136 to 174MHz or more |
| | Measurement Capability | Vicinity of 50W |
| 3. Deviation Meter | Frequency Range | 136 to 174MHz |
| 4. Digital Volt Meter (DVM) | Measuring Range | 1 to 20V DC |
| | Accuracy | High input impedance for minimum circuit loading |
| 5. Oscilloscope | | DC through 30MHz |
| 6. High Sensitivity Frequency Counter | Frequency Range | 10Hz to 600MHz |
| | Frequency Stability | 0.2ppm or less |
| 7. Ammeter | | 13A or more |
| 8. AF Volt Meter (AF VTVM) | Frequency Range | 50Hz to 10kHz |
| | Voltage Range | 3mV to 3V |
| 9. Audio Generator (AG) | Frequency Range | 50Hz to 5kHz |
| | Output | 0 to 1V |
| 10. Distortion Meter | Capability | 3% or less at 1kHz |
| | Input Level | 50mV to 10Vrms |
| 11. Voltmeter | Measuring Range | 10 to 1.5V DC or less |
| | Input Impedance | 50kΩ/V or greater |
| 12. 4Ω Dummy Load | | Approx. 4Ω, 20W |
| 13. Regulated Power Supply | | 13.6V, approx. 20A (adjustable from 9 to 20V) |
| | | Useful if ammeter requipped |

### Test cable for microphone input (E30-3360-08)

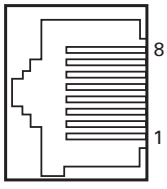



### Tuning cable (E30-3383-05)

Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used.
See "PC Mode" section fot the connection.



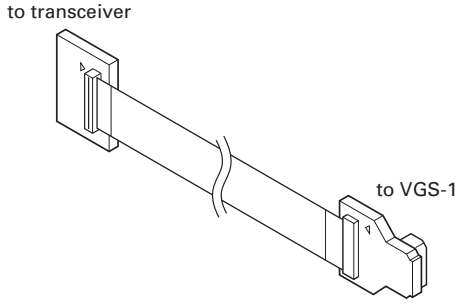

### MIC connector (Front panel view)




1 : BLC
2 : +B
3 : GND
4 : PTT/TXD (PC serial data from radio)
5 : MICE
6 : MIC
7 : HOOK/RXD (PC serial data to radio)
8 : DM

### Check Jig for the VGS-1

KENWOOD part : W05-1127-00



# ADJUSTMENT

## Common Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. Setting | 1) Power supply voltage<br>DC power supply terminal : 13.6V<br>2) SSG standard modulation<br>[Wide 5k] MOD : 1kHz, DEV : 3kHz<br>[Wide 4k] MOD : 1kHz, DEV : 2.4kHz<br>[Narrow] MOD : 1kHz, DEV : 1.5kHz | | | | | | | |
| 2. VCO lock voltage<br>• RX | **[Panel test mode]**<br>1) CH-Sig : 3-1 | Power meter | Rear panel | ANT | TX-RX (B/3) | TC301 | 8.1V | ±0.1V |
| | 2) CH-Sig : 2-1 | DVM | TX-RX (B/3) | CV | | | Check | 2.0V±0.5V |
| • TX | **[Panel tuning mode] LPWR***<br>3) CH-Sig : 3-1<br>PTT : ON | | | | TX-RX (B/3) | TC302 | 8.1V | ±0.1V |
| | 4) CH-Sig : 2-1<br>PTT : ON | | | | | | Check | 2.0V±0.5V |

* TX can be continued on unlock condition in panel tuning mode.

## Transmitter Section (K market model skips adjustment of Wide 4k)

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. Frequency adjust | 1) Adj item : [FREQ]<br>Adjust : [✳✳✳]<br>PTT : ON | f. counter | Rear panel | ANT | Front panel | [⩓],[⩔] | Center frequency ±50Hz | Note : After replacing the VCXO (X301) align frequency. |
| 2. Frequency shift 1 adjust | 1) Adj item : [SHFT1]<br>Adjust : [✳✳✳]<br>2) Adj item : [L SHFT1] → [C SHFT1] → [H SHFT1]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | [L SHFT1]<br>Low frequency+1.25kHz<br>[C SHFT1]<br>Center frequency+1.25kHz<br>[H SHFT1]<br>High frequency+1.25kHz | ±50Hz |
| 3. Frequency shift 2 adjust | 1) Adj item : [SHFT2]<br>Adjust : [✳✳✳]<br>2) Adj item : [L SHFT2] → [C SHFT2] → [H SHFT2]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | [L SHFT2]<br>Low frequency+2.5kHz<br>[C SHFT2]<br>Center frequency+2.5kHz<br>[H SHFT2]<br>High frequency+2.5kHz | ±50Hz |
| 4. Max high power adjust | 1) Adj item : [MHPWR]<br>Adjust : [✳✳✳]<br>2) Adj item : [L MHPWR] → [L' MHPWR] → [C MHPWR]→ [H' MHPWR] → [H MHPWR]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter | | | | | 33W | ±3W |

# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 5. Max low power adjust | 1) Adj item : [MLPWR]<br>Adjust : [✳✳✳]<br>2) Adj item : [L MLPWR] →<br>[L' MLPWR] → [C MLPWR]→<br>[H' MLPWR] → [H MLPWR]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter | Rear panel | ANT | Front panel | [⩓],[⩔] | 15W | ±1W |
| 6. High power adjust | 1) Adj item : [HPWR]<br>Adjust : [✳✳✳]<br>2) Adj item : [L HPWR] →<br>[L' HPWR] → [C HPWR] →<br>[H' HPWR] → [H HPWR]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter<br>Ammeter | | | | | 30W | ±1W<br>9A or less |
| 7. High power check | **[Panel test mode]**<br>1) CH-Sig : 1-1<br>PTT : ON | | | | | | Check | 25~35W<br>9A or less |
| | 2) CH-Sig : 2-1<br>PTT : ON | | | | | | | |
| | 3) CH-Sig : 3-1<br>PTT : ON | | | | | | | |
| 8. Low power adjust | 1) Adj item : [LPWR]<br>Adjust : [✳✳✳]<br>2) Adj item : [L LPWR] →<br>[L' LPWR] → [C LPWR] →<br>[H' LPWR] → [H LPWR]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | Front panel | [⩓],[⩔] | 5.0W | ±0.5W<br>5A or less |
| 9. Low power check | **[Panel test mode]**<br>1) CH-Sig : 1-1<br>Set low power (Push [S])<br>PTT : ON | | | | | | Check | 3.5~6.5W<br>5A or less |
| | 2) CH-Sig : 2-1<br>PTT : ON | | | | | | | |
| | 3) CH-Sig : 3-1<br>PTT : ON | | | | | | | |
| 10. DQT balance adjust<br>• Narrow | 1) Adj item : [n BAL]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 3kHz<br>HPF : OFF<br>2) Adj item : [nL BAL] →<br>[nC BAL] → [nH BAL]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter<br>Deviation meter<br>Oscilloscope<br>AG<br>AF VTVM | Rear panel<br>Front panel | ANT<br>Modular MIC jack | Front panel | [⩓],[⩔] | Make the demodulation waves into square waves. |  |
| • Wide 4k | 3) Adj item : [s BAL]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | | |
| • Wide 5k | 4) Adj item : [w BAL]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | | |

# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 11. Max DEV adjust<br>• Narrow | 1) Adj item : [n DEV]<br>Adjust : [✳✳✳]<br>AG : 1kHz/50mV at MIC terminal<br>Deviation meter filter<br>LPF : 15kHz<br>HPF : OFF<br>2) Adj item : [nL DEV] → [nC DEV] → [nH DEV]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter<br>Deviation meter<br>Oscilloscope<br>AG<br>AF VTVM | Rear panel<br>Front panel | ANT<br>Modular MIC jack | Front panel | [⩓],[⩔] | 2.10kHz<br>(According to the larger +, –) | ±0.10kHz |
| • Wide 4k | 3) Adj item : [s DEV]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 3.30kHz<br>(According to the larger +, –) | ±0.10kHz |
| • Wide 5k | 4) Adj item : [w DEV]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 4.20kHz<br>(According to the larger +, –) | ±0.10kHz |
| 12. MIC sensitivity check (Wide 5k only) | **[Panel test mode]**<br>1) CH-Sig : 1-1<br>AG : 1kHz/5mV at MIC terminal<br>PTT : ON | | | | | | Check | 2.5~3.5kHz |
| 13. QT deviation adjust<br>• Narrow | 1) Adj item : [n QT]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 3kHz<br>HPF : OFF<br>2) Adj item : [nL QT] → [nC QT] → [nH QT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | Front panel | [⩓],[⩔] | 0.35kHz | ±0.05kHz |
| • Wide 4k | 3) Adj item : [s QT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 0.60kHz | ±0.10kHz |
| • Wide 5k | 4) Adj item : [w QT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 0.75kHz | ±0.10kHz |
| 14. DQT deviation adjust<br>• Narrow | 1) Adj item : [n DQT]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 3kHz<br>HPF : OFF<br>2) Adj item : [nL DQT] → [nC DQT] → [nH DQT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 0.35kHz | ±0.05kHz |
| • Wide 4k | 3) Adj item : [s DQT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 0.60kHz | ±0.10kHz |
| • Wide 5k | 4) Adj item : [w DQT]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 0.75kHz | ±0.10kHz |

# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 15. LTR deviation adjust<br>• Narrow | 1) Adj item : [n LTR]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 3kHz<br>HPF : OFF<br>2) Adj item : [nL LTR] → [nC LTR] → [nH LTR]<br>Adjust : [✳✳✳]<br>PTT : ON | Power meter<br>Deviation meter<br>Oscilloscope<br>AG<br>AF VTVM | Rear panel<br>Front panel | ANT<br>Modular MIC jack | Front panel | [⩓],[⩔] | 0.75kHz | ±0.10kHz |
| • Wide | 3) Adj item : [w LTR]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 1.00kHz | ±0.10kHz |
| 16. DTMF deviation adjust<br>• Narrow | 1) Adj item : [n DTMF]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 15kHz<br>HPF : OFF<br>PTT : ON | | | | | | 1.5kHz | ±0.1kHz |
| • Wide 4k | 2) Adj item : [s DTMF]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 2.4kHz | ±0.1kHz |
| • Wide 5k | 3) Adj item : [w DTMF]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 3.0kHz | ±0.1kHz |
| 17. MSK deviation adjust<br>• Narrow | 1) Adj item : [n MSK]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 15kHz<br>HPF : OFF<br>PTT : ON | | | | | | 1.5kHz | ±0.1kHz |
| • Wide 4k | 2) Adj item : [s MSK]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 2.4kHz | ±0.1kHz |
| • Wide 5k | 3) Adj item : [w MSK]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 3.0kHz | ±0.1kHz |
| 18. TONE deviation adjust<br>• Narrow | 1) Adj item : [n TONE]<br>Adjust : [✳✳✳]<br>Deviation meter filter<br>LPF : 15kHz<br>HPF : OFF<br>PTT : ON | | | | | | 1.5kHz | ±0.1kHz |
| • Wide 4k | 2) Adj item : [s TONE]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 2.4kHz | ±0.1kHz |
| • Wide 5k | 3) Adj item : [w TONE]<br>Adjust : [✳✳✳]<br>PTT : ON | | | | | | 3.0kHz | ±0.1kHz |

# ADJUSTMENT

## Receiver Section (K market model skips adjustment of Wide 4k)

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. Sensitivity adjust | 1) Adj item : [SENS1]<br>Adjust : [✳✳✳]<br>2) Adj item : [L SENS1] →<br>[L' SENS1] → [C SENS1] →<br>[H' SENS1] → [H SENS1]<br>Adjust : [✳✳✳] | SSG<br><br>AF VTVM<br>Oscilloscope | Rear panel | ANT<br><br>EXT. SP | Front panel | [⩓],[⩔] | Enter the following adjustment values to the transceiver by pressing [⩓] and [⩔] keys.<br>[L SENS1] : 60<br>[L' SENS1] : 88<br>[C SENS1] : 109<br>[H' SENS1] : 159<br>[H SENS1] : 192<br>After setting the adjustment value, press [B] key.<br>The adjustment value will be stored in memory. | Note : After replacing the EEPROM (IC401) aline sensitivity. |
| 2. Sensitivity check | **[Panel test mode]**<br>1) CH-Sig : 1-1<br>SSG output<br>Wide 5k : –116dBm (0.35μV)<br>(MOD : 1kHz/±3kHz)<br>Narrow : –116dBm (0.35μV)<br>(MOD : 1kHz/±1.5kHz) | | | | | | Check | 12dB SINAD or more |
| 3. Squelch (Preset) adjust<br>• Narrow | 1) Adj item : [n SQL]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±1.5kHz) | | | | | | After input signal from SSG, press [B] key. That numeric will be stored in memory. | After adjusting SQL, check SQL open/close.<br>SSG 12dB SINAD level + 4dB : Open<br>SSG 12dB SINAD level – 6dB : Close<br>[nC SQL] MOD 1kHz/±1.5kHz<br>[sC SQL] MOD 1kHz/±2.4kHz<br>[wC SQL] MOD 1kHz/±3.0kHz |
| | 2) Adj item : [nL SQL] →<br>[nC SQL] → [nH SQL]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 4k | 3) Adj item : [s SQL]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±2.4kHz) | | | | | | | |
| | 4) Adj item : [sL SQL] →<br>[sC SQL] → [sH SQL]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 5k | 5) Adj item : [w SQL]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±3.0kHz) | | | | | | | |
| | 6) Adj item : [wL SQL] →<br>[wC SQL] → [wH SQL]<br>Adjust : [✳✳✳] | | | | | | | |

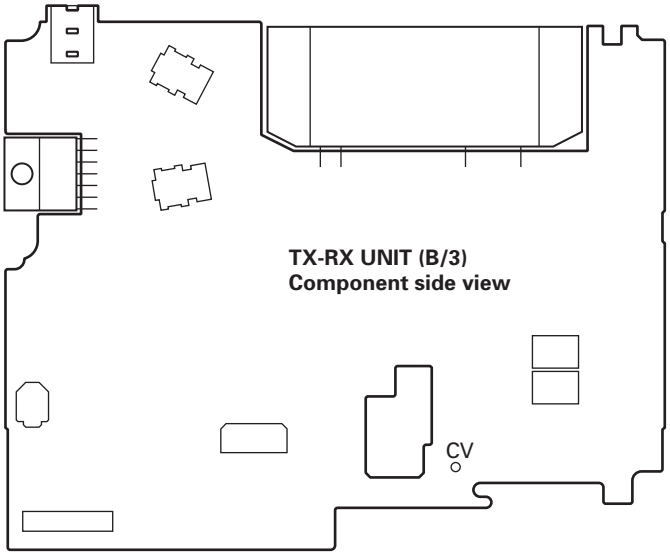
# ADJUSTMENT

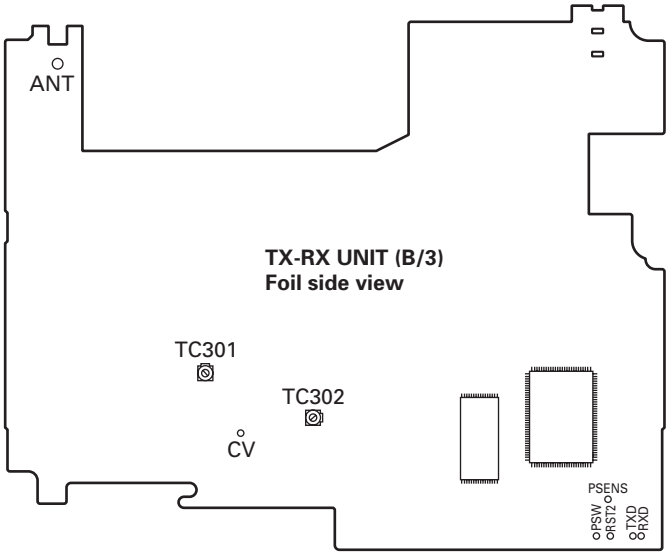
| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 4. Low RSSI adjust<br>• Narrow | 1) Adj item : [n LRSSI]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±1.5kHz) | SSG<br><br>AF VTVM<br>Oscilloscope | Rear panel | ANT<br><br>EXT. SP | | | After input signal from SSG, press [B] key. That numeric will be stored in memory. | The following erroneous performance may occur if any irregular RSSI adjustment, such as pressing the [B] key assigned for determination when it is the ANT OPEN state, is performed.<br>• The antenna bar (▼ıl) cannot appear correctly.<br>• Scan does not stop. |
| | 2) Adj item : [nL LRSSI] → [nC LRSSI] → [nH LRSSI]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 4k | 3) Adj item : [s LRSSI]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±2.4kHz) | | | | | | | |
| | 4) Adj item : [sL LRSSI] → [sC LRSSI] → [sH LRSSI]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 5k | 5) Adj item : [w LRSSI]<br>Adjust : [✳✳✳]<br>SSG output : 12dB SINAD level<br>(MOD : 1kHz/±3.0kHz) | | | | | | | |
| | 6) Adj item : [wL LRSSI] → [wC LRSSI] → [wH LRSSI]<br>Adjust : [✳✳✳] | | | | | | | |
| 5. Squelch (Tight) adjust<br>• Narrow | 1) Adj item : [n SQLT]<br>Adjust : [✳✳✳]<br>SSG output<br>: 12dB SINAD+5dB level<br>(MOD : 1kHz/±1.5kHz) | | | | | | After input signal from SSG, press [B] key. That numeric will be stored in memory. | After adjusting SQL, check SQL open/close.<br>SSG 12dB SINAD level +10dB<br>: Open<br>SSG 12dB SINAD level<br>: Close<br>[nC SQLT] MOD 1kHz/±1.5kHz<br>[sC SQLT] MOD 1kHz/±2.4kHz<br>[wC SQLT] MOD 1kHz/±3.0kHz |
| | 2) Adj item : [nL SQLT] → [nC SQLT] → [nH SQLT]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 4k | 3) Adj item : [s SQLT]<br>Adjust : [✳✳✳]<br>SSG output<br>: 12dB SINAD+5dB level<br>(MOD : 1kHz/±2.4kHz) | | | | | | | |
| | 4) Adj item : [sL SQLT] → [sC SQLT] → [sH SQLT]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 5k | 5) Adj item : [w SQLT]<br>Adjust : [✳✳✳]<br>SSG output<br>: 12dB SINAD+5dB level<br>(MOD : 1kHz/±3.0kHz) | | | | | | | |
| | 6) Adj item : [wL SQLT] → [wC SQLT] → [wH SQLT]<br>Adjust : [✳✳✳] | | | | | | | |

# ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---|---|---|---|---|---|---|---|---|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 6. High RSSI adjust<br>• Narrow | 1) Adj item : [n HRSSI]<br>Adjust : [✳✳✳]<br>SSG output : –70dBm<br>(MOD : 1kHz/±1.5kHz) | SSG<br><br>AF VTVM<br>Oscilloscope | Rear panel | ANT<br><br>EXT. SP | | | After input signal from SSG, press [B] key. That numeric will be stored in memory. | The following erroneous performance may occur if any irregular RSSI adjustment, such as pressing the [B] key assigned for determination when it is the ANT OPEN state, is performed.<br>• The antenna bar (▮▮) cannot appear correctly.<br>• Scan does not stop. |
| | 2) Adj item : [nL HRSSI] → [nC HRSSI] → [nH HRSSI]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 4k | 3) Adj item : [s HRSSI]<br>Adjust : [✳✳✳]<br>SSG output : –70dBm<br>(MOD : 1kHz/±2.4kHz) | | | | | | | |
| | 4) Adj item : [sL HRSSI] → [sC HRSSI] → [sH HRSSI]<br>Adjust : [✳✳✳] | | | | | | | |
| • Wide 5k | 5) Adj item : [w HRSSI]<br>Adjust : [✳✳✳]<br>SSG output : –70dBm<br>(MOD : 1kHz/±3.0kHz) | | | | | | | |
| | 6) Adj item : [wL HRSSI] → [wC HRSSI] → [wH HRSSI]<br>Adjust : [✳✳✳] | | | | | | | |

## Adjustment Points



# TERMINAL FUNCTION

## Display unit (X54-3480-10)

| Pin No. | Name | Description |
|---|---|---|
| **CN901 (to internal speaker)** | | |
| 1 | GND | Ground. |
| 2 | SPO | Speaker output. |
| **CN902 (to TX-RX unit B/3 CN429)** | | |
| 1 | SPO | Speaker input. |
| 2 | SPO | Speaker input. |
| 3 | SPO | Speaker input. |
| 4 | SPO | Speaker input. |
| 5 | SPO | Speaker input. |
| 6 | SPO | Speaker input. |
| 7 | GND | Ground. |
| 8 | 8C | 8V input. |
| 9 | SB | Power input of switched power supply. |
| 10 | SB | Power input of switched power supply. |
| 11 | NC | Non-connenction. |
| 12 | PSW | Detection signal output of power switch. |
| 13 | GND | Ground. |
| 14 | GND | Ground. |
| 15 | MIC | MIC signal output. |
| 16 | ME | MIC ground. |
| 17 | GND | Ground. |
| 18 | PSENS | Detection signal output of display unit. |
| 19 | RST2 | Reset signal input. |
| 20 | GND | Ground. |
| 21 | GND | Ground. |
| 22 | GND | Ground. |
| 23 | NC | Non-connenction. |
| 24 | SHIFT/MODEL | Control signal input of beat-shift function. |
| 25 | NC | Non-connenction. |
| 26 | 5C | 5V output. |
| 27 | TXD | Serial data signal input. |
| 28 | RXD | Serial data signal output. |
| 29 | GND | Ground. |
| 30 | GND | Ground. |
| **J901 (MIC jack)** | | |
| 1 | BLC | MIC backlight control. |
| 2 | SB | DC 13.6V±15%, 200mA typ. |
| 3 | E | Ground. |
| 4 | PTT/TXD | PTT : PTT input, TXD : Serial data output. |
| 5 | ME | MIC ground. |
| 6 | MIC | MIC signal input. |
| 7 | HOOK/RXD | HOOK : Hook detection, RXD : Serial data input. |
| 8 | DM | MIC data detection. |

## TX-RX unit (X57-6980-10) (A/3)

| Pin No. | Name | Description |
|---|---|---|
| **CN701 (to TX-RX unit B/3 CN427)** | | |
| 1 | AUXIO6 | AUX input/output 6. |
| 2 | AUXIO7 | AUX input/output 7. |
| 3 | AUXIO1 | AUX input/output 1. |
| 4 | AUXIO2 | AUX input/output 2. |
| 5 | RXD2 | Serial data output 2. |
| 6 | AUXIO3 | AUX input/output 3. |
| 7 | TXD2 | Serial data input 2. |
| 8 | AUXIO4 | AUX input/output 4. |
| 9 | AUXIO8 | AUX input/output 8. |
| 10 | AUXIO5 | AUX input/output 5. |
| 11 | AUXIO9 | AUX input/output 9. |
| 12 | AUXO1 | AUX input 1. |
| 13 | TXD1 | Serial data input 1. |
| 14 | AUXO2 | AUX input 2. |
| 15 | RXD1 | Serial data output 1. |
| 16 | GND | Ground. |
| 17 | ME | MIC ground. |
| 18 | MI2 | External MIC output. |
| 19 | DEO | Detected signal input. |
| 20 | GND | Ground. |
| 21 | 5C | 5V. |
| 22 | DI | Data signal output. |
| 23 | AFO | RX filtered audio input. |
| 24 | SB | Power input after power switch. |
| 25 | SB | Power input after power switch. |
| 26 | SB | Power input after power switch. |
| 27 | SB | Power input after power switch. |
| 28 | SB | Power input after power switch. |
| 29 | SB | Power input after power switch. |
| 30 | NC | Non-connenction. |

# TERMINAL FUNCTION

| Pin No. | Name | Description |
|---|---|---|
| **J701 (ACC 25-pin)** | | |
| 1 | NC | Non-connenction. |
| 2 | RXD1 | Serial data input 1. RS-232C level.<br>Input voltage range : ±30V max.<br>L≤0.4V, H≥2.4V, Zi≥5kΩ |
| 3 | TXD1 | Serial data output 1. RS-232C level.<br>L≤–5V, H≥5V/3kΩ load, Zo≤2kΩ |
| 4 | AUXI/O9 | AUX input/output 9.<br>Active low with 47kΩ pull-up to 5V |
| 5 | DI | Data signal input.<br>Data input level adjustable (2.0Vp-p typ.) |
| 6 | MI2 | External MIC input. DC-coupled |
| 7 | GND | Ground. |
| 8 | AUXI/O8 | AUX input/output 8. Same as AUXI/O9 |
| 9 | TXD2 | Serial data output 2. TTL level.<br>L≤0.7V, H≥4.2V/25kΩ load, Zo≤1kΩ |
| 10 | RXD2 | Serial data input 2. TTL level.<br>Input voltage range : +5/0V max.<br>L≤0.8V, H≥4.2V |
| 11 | GND | Ground. |
| 12 | AUXI/O7 | AUX input/output 7. Same as AUXI/O9 |
| 13 | AUXI/O6 | AUX input/output 6. Same as AUXI/O9 |
| 14 | SB | Power output after power switch.<br>DC13.6V±15%, 2.0A max. |
| 15 | AUXO2 | AUX output 2. Open collector (500mA max.)<br>(Default none) L≤0.3V |
| 16 | AUXO1 | AUX Output 1. Same as AUXO2 |
| 17 | AFO | RX filtered audio output (DC-coupled).<br>AF low level output.<br>Wide : 700mVp-p typ.<br>Narrow : 700mVp-p typ. (Standard modulation) |
| 18 | GND | Ground. |
| 19 | DEO | Detected signal output (DC-coupled).<br>AF output level adjustable (740mVp-p typ.) |
| 20 | AUXI/O5 | AUX input/output 5. Same as AUXI/O9 |
| 21 | AUXI/O4 | AUX input/output 4. Same as AUXI/O9 |
| 22 | AUXI/O3 | AUX input/output 3. Same as AUXI/O9 |
| 23 | AUXI/O2 | AUX input/output 2. Same as AUXI/O9 |
| 24 | AUXI/O1 | AUX input/output 1. Same as AUXI/O9 |
| 25 | ME | MIC ground. |

## TX-RX unit (X57-6980-10) (B/3)

| Pin No. | Name | Description |
|---|---|---|
| **CN301 (to TX-RX unit C/3)** | | |
| 1 | REF | Reference signal otput to the PLL IC. |
| 2 | Fin | Complementary signal output to the PLL IC. |
| 3 | CPGND | Ground. |
| 4 | 5C | 5V output. |
| 5 | GND | Ground |
| 6 | CP | Signal input from charge pump block in the PLL IC. |
| **CN302 (to TX-RX unit C/3)** | | |
| 1 | UL | Control signal input form the PLL IC. |
| 2 | PLE | Control signal output to the PLL IC. |
| 3 | DT | Control signal output to the PLL IC. |
| 4 | PCK | Control signal output to the PLL IC. |
| 5 | GND | Ground. |
| 6 | DGND | Ground. |
| **CN403 (to VGS-1)** | | |
| 1 | OPT1 | VGS busy signal input. Option boad I/F 1.<br>Output : L≤0.45V, H≥4.7V/25kΩ load<br>Input : L≤1.0V, H≥4.0V, Input voltage : 0V~5.0V |
| 2 | OPT3 | VGS playback signal input. Option boad I/F 3.<br>Output : L≤0.45V, H≥4.7V/25kΩ load<br>Input : L≤1.0V, H≥4.0V, Input voltage : 0V~5.0V |
| 3 | RXD1 | Serial data input.<br>Input : L≤1.0V, H≥4.0V, Input voltage : 0V~5.0V |
| 4 | TXD1 | Serial data output / PTT singanl output (SC20-460).<br>Output : L≤0.45V, H≥4.7V/25kΩ load |
| 5 | CLK | Serial clock output. |
| 6 | OPT4 | VGS enable output. Option boad I/F 4.<br>Output : L≤0.45V, H≥4.7V/25kΩ load |
| 7 | USEL | UART speed select output. L : 19200bps fixed |
| 8 | OPT5 | VGS reset signal output. Option boad I/F 5.<br>Output : L≤0.45V, H≥4.7V/25kΩ load |
| 9 | DGND | Ground. |
| 10 | AGND | Ground. |
| 11 | AO | VGS audio input. Zin≥10kΩ, 1Vp-p max,<br>Input Voltage : 0V~5.0V |
| 12 | AI | VGS audio output. Zo≥10kΩ |
| 13 | AGND | Ground. |
| 14 | 5E | 5V power supply output. 78mA max |
| 15 | STON | Side tone input. 1kHz, 5Vp-p |

# TERMINAL FUNCTION

| Pin No. | Name | Description |
|---|---|---|
| 16 | DTI | Data signal input.<br>Zin≥22kΩ, 600±200mVp-p |
| 17 | TCTL | Speaker mute signal input.<br>Input : L≤1.0V, H≥4.0V, Input voltage : 0V~5.0V |
| 18 | NC | Non-connection. |
| 19 | AUDIH | MIC mute signal input. |
| 20 | OPT2 | Option boad I/F 2.<br>Output : L≤0.45V, H≥4.7V/25kΩ load<br>Input : L≤1.0V, H≥4.0V, Input voltage : 0V~5.0V |
| 21 | TXO | MIC signal output (AC coupled) before pre-emphasis. Zo>2.2kΩ, 130±50mVp-p typ. |
| 22 | RXEO | Audio signal output (DC coupled) after de-emphasis. Zo>30kΩ, 1±0.3Vp-p typ. |
| 23 | RXEI | Audio signal input (DC coupled) after de-emphasis. Zin>15kΩ, 1±0.3Vp-p typ. |
| 24 | TXI | MIC signal input (AC coupled) before pre-emphasis. Zin>22kΩ, 500±50mVp-p typ. |
| 25 | OPT6 | Option boad I/F 6.<br>Output : L≤0.45V, H≥4.7V/25kΩ load |
| 26 | 8C | Power input after power switch.<br>8.0V typ, 100mA max |
| **CN427 (to TX-RX unit A/3 CN701)** | | |
| 1 | NC | Non-connenction. |
| 2 | SB | Power output after power switch. |
| 3 | SB | Power output after power switch. |
| 4 | SB | Power output after power switch. |
| 5 | SB | Power output after power switch. |
| 6 | SB | Power output after power switch. |
| 7 | SB | Power output after power switch. |
| 8 | AFO | RX filtered audio output. |
| 9 | DI | Data signal input. |
| 10 | 5C | 5V. |
| 11 | GND | Ground. |
| 12 | DEO | Detected signal output. |
| 13 | MI2 | External MIC input. |
| 14 | ME | MIC ground. |
| 15 | GND | Ground. |
| 16 | RXD1 | Serial data input 1. |
| 17 | AUXO2 | AUX output 2. |
| 18 | TXD1 | Serial data output 1. |

| Pin No. | Name | Description |
|---|---|---|
| 19 | AUXO1 | AUX output 1. |
| 20 | AUXIO9 | AUX input/output 9. |
| 21 | AUXIO5 | AUX input/output 5. |
| 22 | AUXIO8 | AUX input/output 8. |
| 23 | AUXIO4 | AUX input/output 4. |
| 24 | TXD2 | Serial data output 2. |
| 25 | AUXIO3 | AUX input/output 3. |
| 26 | RXD2 | Serial data input 2. |
| 27 | AUXIO2 | AUX input/output 2. |
| 28 | AUXIO1 | AUX input/output 1. |
| 29 | AUXIO7 | AUX input/output 7. |
| 30 | AUXIO6 | AUX input/output 6. |
| **CN428** | | |
| 1 | SB | Power output of switched power supply. |
| 2 | SPI | Speaker output. |
| 3 | SPO | Speaker input. |
| 4 | PA | Control signal output of PA function. |
| 5 | HOR | Control signal output of Horn alert function. |
| 6 | GND | Ground. |
| **CN429 (to Display unit CN902)** | | |
| 1 | (DM) | Reserve. |
| 2 | GND | Ground. |
| 3 | RXD | Serial data signal input. |
| 4 | TXD | Serial data signal output. |
| 5 | NC | Non-connenction. |
| 6 | 5C | 5V output. |
| 7 | SHIFT/MODEL | Control signal output of beat-shift function. |
| 8 | (CLK) | Reserve. |
| 9 | (LCDDO) | Reserve. |
| 10 | (LCDDI) | Reserve. |
| 11 | (LCDRST) | Reserve. |
| 12 | RST2 | Reset signal output. |
| 13 | PSENS | Detection signal input of display unit. |
| 14 | GND | Ground. |
| 15 | ME | MIC ground. |
| 16 | MIC | MIC signal input. |
| 17 | GND | Ground. |
| 18 | GND | Ground. |
| 19 | PSW | Detection signal input of power switch. |
| 20 | NC | Non-connenction. |

# TERMINAL FUNCTION

| Pin No. | Name | Description |
|---|---|---|
| 21 | SB | Power output of switched power supply. |
| 22 | SB | Power output of switched power supply. |
| 23 | 8C | 8V output. |
| 24 | GND | Ground. |
| 25 | SPO | Speaker output. |
| 26 | SPO | Speaker output. |
| 27 | SPO | Speaker output. |
| 28 | SPO | Speaker output. |
| 29 | SPO | Speaker output. |
| 30 | SPO | Speaker output. |
| **CN804** | | |
| 1 | IGN | Ignition sense input. |
| 2 | GND | Ground. |

## Solder Land

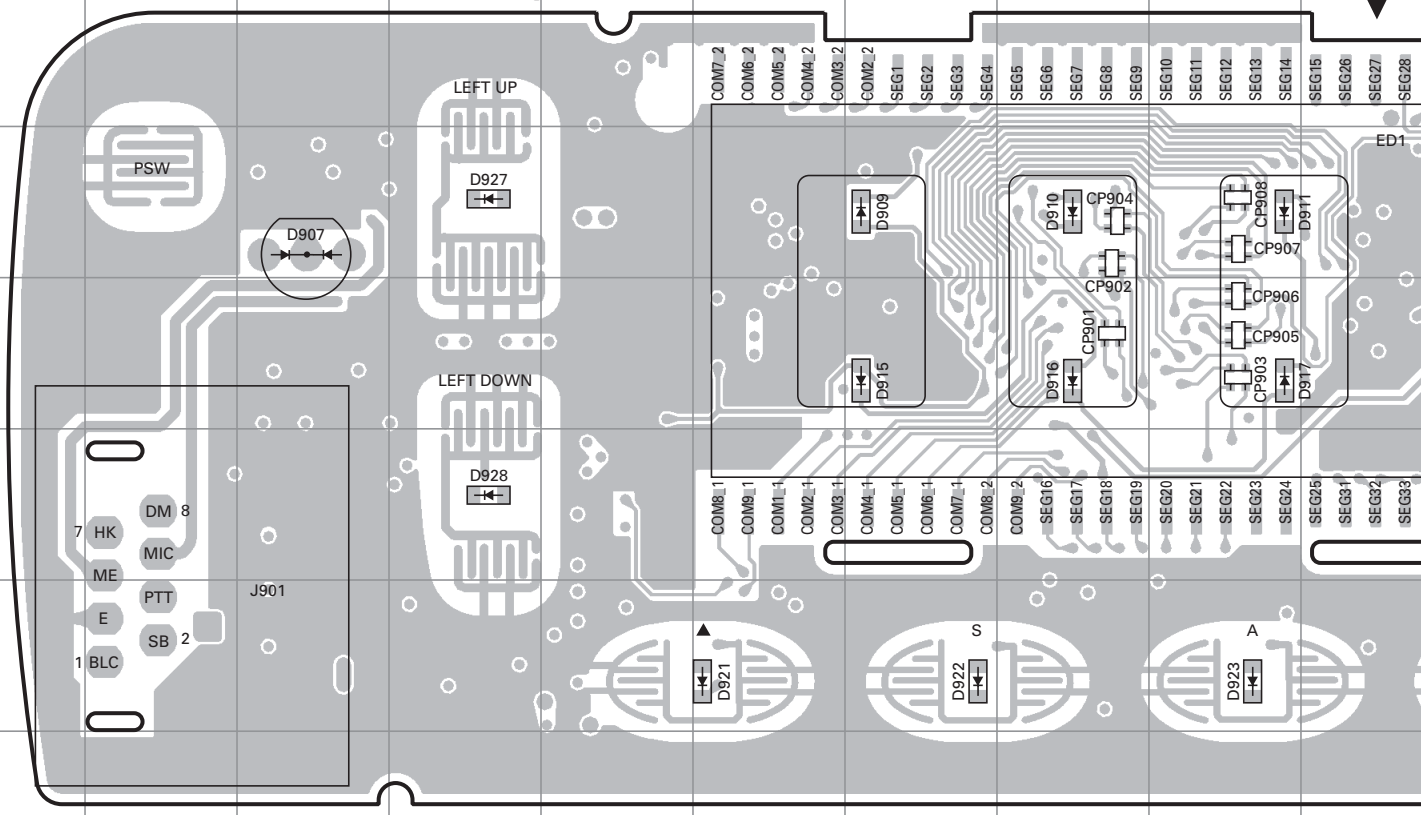
| Name | Description |
|---|---|
| **to ANI board** | |
| GND (A–) | Ground. |
| OPT1<br>(CH BUSY) | TX sens signal output. Conv. L : TX, H : Not TX<br>LTR L : Link complete, H : Not link complete<br>L≤0.45V, H≥4.7V/25kΩ load |
| OPT3<br>(KEY) | TX control signal input. Active low.<br>L≤1.0V, H≥ : 4.0V, Input voltage 0V~5.0V |
| OPT4<br>(PTT) | PTT signal output. L : TX, H : Not TX<br>L≤0.45V, H≥4.7V/25kΩ load |
| OPT5<br>(EMERGENCY) | Emergency signal output.<br>L : Emergency function is operated,<br>H : Emergency function is not operated<br>L≤0.45V, H≥4.7V/25kΩ load |
| 5E (A+) | 5V power supply (78mA max.). |
| DTI<br>(DATA OUT) | Data signal input. Zin>22kΩ, 600±200mVp-p<br>(Standard modulation) |
| TCTL<br>(TONE CTRL) | Speaker mute signal input. H : Unmute<br>L≤0.8V, H≥4.2V, Input voltage : 0V~5.0V |
| AUDIH<br>(AUDIO INHIB) | MIC mute signal input. L : Mute |
| OPT2<br>(AUX I/O) | Emergency signal input. Active low.<br>L≤1.0V, H≥ : 4.0V, Input voltage 0V~5.0V |
| STON<br>(SIDE TONE) | Side tone input. 1kHz, 5Vp-p |

| Name | Description |
|---|---|
| **to Scrambler board** | |
| GND (GND) | Ground. |
| TXD1<br>(PTT) | PTT signal output. L : TX, H : Not TX<br>L≤0.45V, H≥4.7V/25kΩ load<br>(PTT signal input) Actiive low.<br>L≤1.0V, H≥4.0V, Inut voltage : 0V~5.0V |
| OPT1 (DODE<br>SELECT1) | Scramble code signal output 1.<br>L≤0.45V, H≥4.7V/25kΩ load |
| OPT3 (CODE<br>SELECT2) | Scramble code signal output 2.<br>L≤0.45V, H≥4.7V/25kΩ load |
| OPT4<br>(ECHO PTT) | Echo PTT signal output. L : TX, H : Not TX<br>L≤0.45V, H≥4.7V/25kΩ load |
| OPT5 (CODE<br>SELECT8) | Scramble code signal output 4.<br>L≤0.45V, H≥4.7V/25kΩ load |
| TXO<br>(TX OUT) | MIC signal output (AC coupled) before<br>pre-enphasis. Zo>2.2kΩ, 130±50mVp-p typ.<br>(Standard modulation) |
| OPT2<br>(SCRAMBLE) | Scrambler control signal output.<br>L : ON, H : OFF. L≤0.45V, H≥4.7V/25kΩ load |
| RXEO<br>(RX OUT) | Audio signal output (DC coupled) after<br>de-enphasis. Zo>30kΩ, 1±0.3Vp-p typ.<br>(Standard modulation) |
| TXI<br>(TX IN) | MIC signal input (AC coupled) before<br>pre-enphasis. Zin>2.2kΩ, 130±50mVp-p typ.<br>(Standard modulation) |
| RXEI<br>(RX IN) | Audio signal input (DC coupled) after<br>de-enphasis. Zin>15kΩ, 1±0.3Vp-p typ.<br>(Standard modulation) |
| OPT6 (CODE<br>SELECT4) | Scramble code signal output 3.<br>L≤0.45V, H≥4.7V/25kΩ load |
| 8C (+V) | 8V AVR output. 8.0V typ, 100mA max. |
| **to GPS receiver** | |
| GND (GND) | Ground. |
| RXD1*1<br>(DATA OUT1) | Data output. |
| RXD2*1<br>(DATA OUT1) | Data output. |
| 5E (+5V) | 5V |

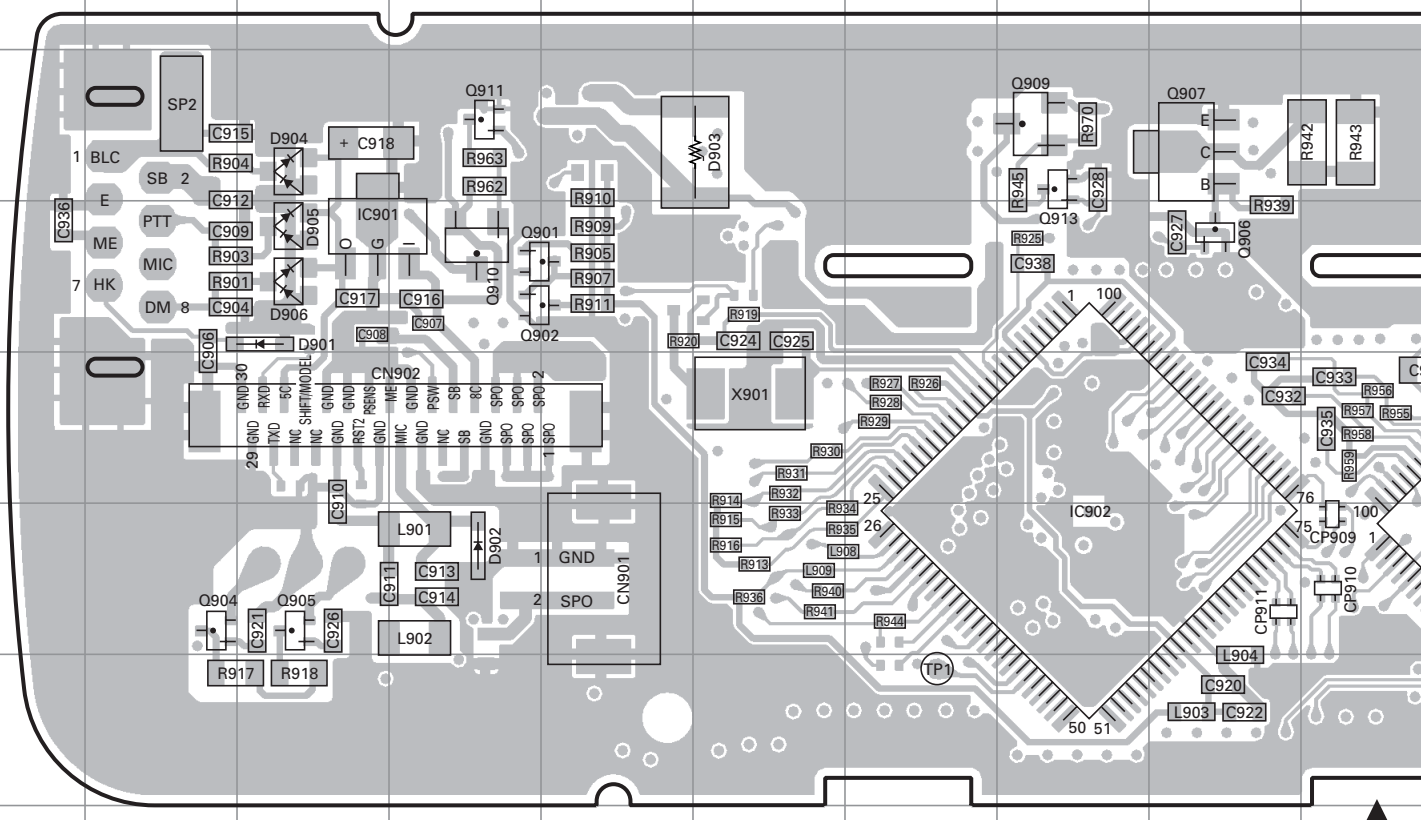
*1 : Depending on the connected optional accessory, the DATA OUT1 may connect to either RXD1 or RXD2.

# TK-7180 PC BOARD

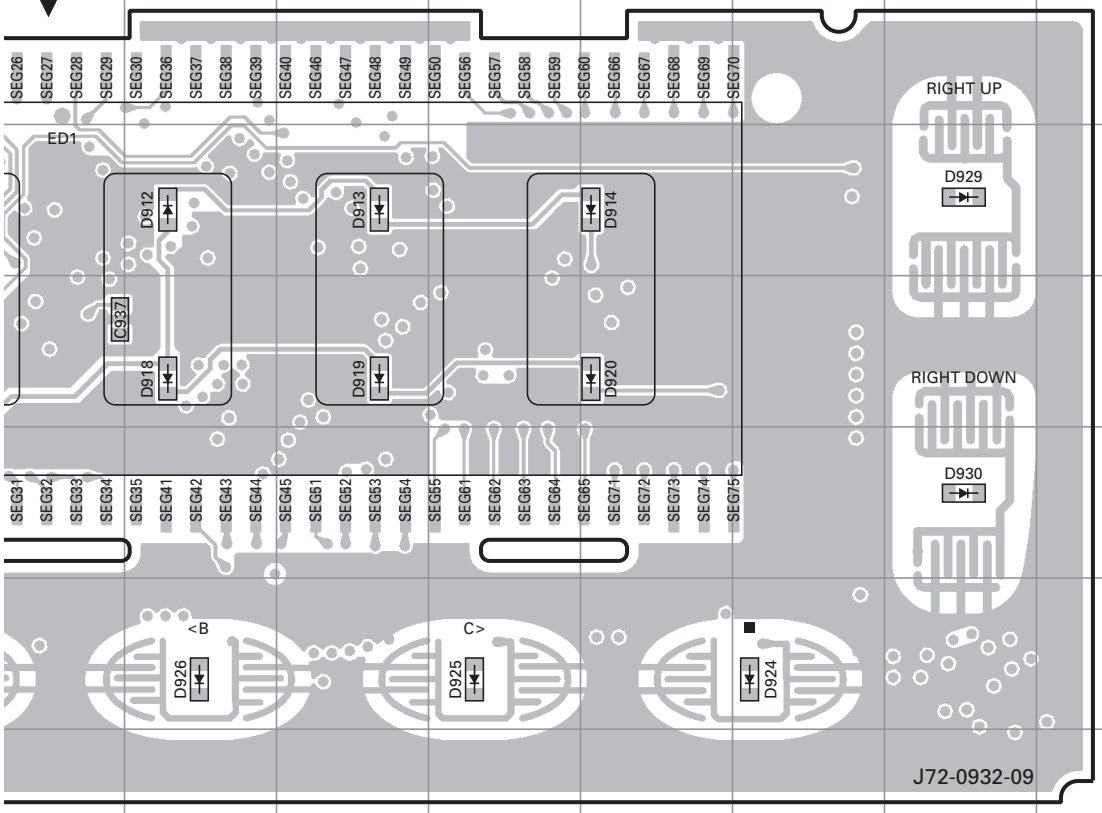
## DISPLAY UNIT (X54-3480-10) Component side view (J72-0932-09)



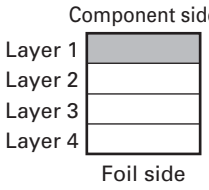

## DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)



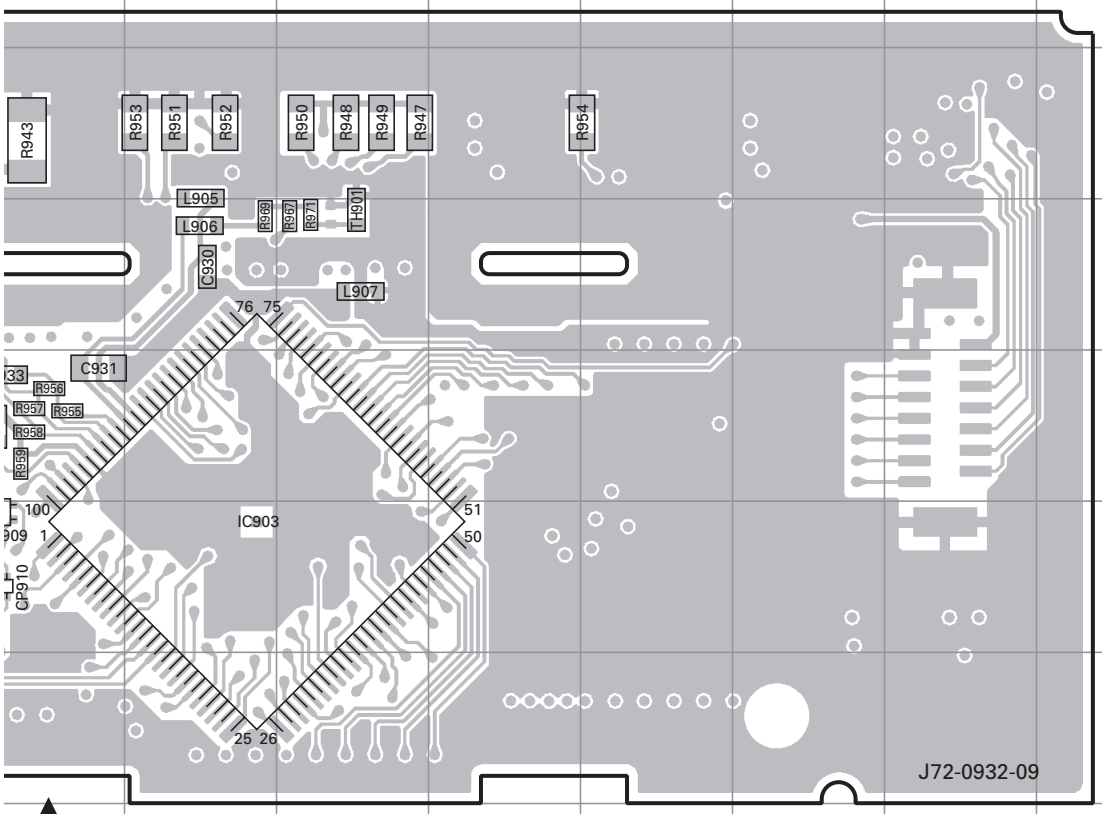
## DISPLAY UNIT (X54-3480-10) Component side view (J72-0932-09)



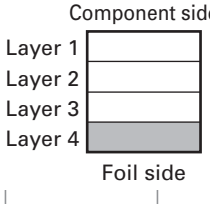

| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| D907 | 3C | D920 | 4N |
| D909 | 3G | D921 | 6F |
| D910 | 3H | D922 | 6G |
| D911 | 3I | D923 | 6I |
| D912 | 3K | D924 | 6O |
| D913 | 3L | D925 | 6M |
| D914 | 3N | D926 | 6K |
| D915 | 4G | D927 | 3D |
| D916 | 4H | D928 | 5D |
| D917 | 4I | D929 | 3P |
| D918 | 4K | D930 | 5P |
| D919 | 4L | | |




## DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)




| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC901 | 10C | Q910 | 10D |
| IC902 | 12H | Q911 | 9D |
| IC903 | 12K | Q913 | 9H |
| Q901 | 10D | D901 | 10C |
| Q902 | 10D | D902 | 12D |
| Q904 | 12B | D903 | 9F |
| Q905 | 12C | D904 | 9C |
| Q906 | 10I | D905 | 10C |
| Q907 | 9I | D906 | 10C |
| Q909 | 9H | | |

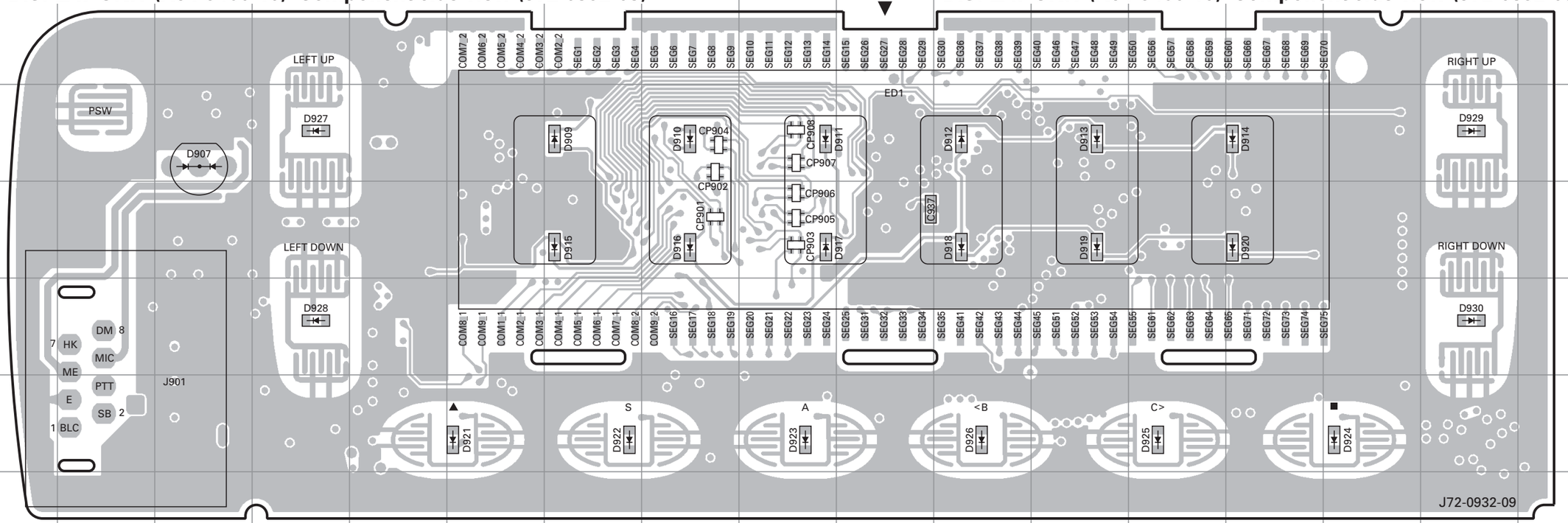


# TK-7180 PC BOARD

PC BOARD TK-7180

## DISPLAY UNIT (X54-3480-10) Component side view (J72-0932-09)

DISPLAY UNIT (X54-3480-10) Component side view (J72-0932-09)

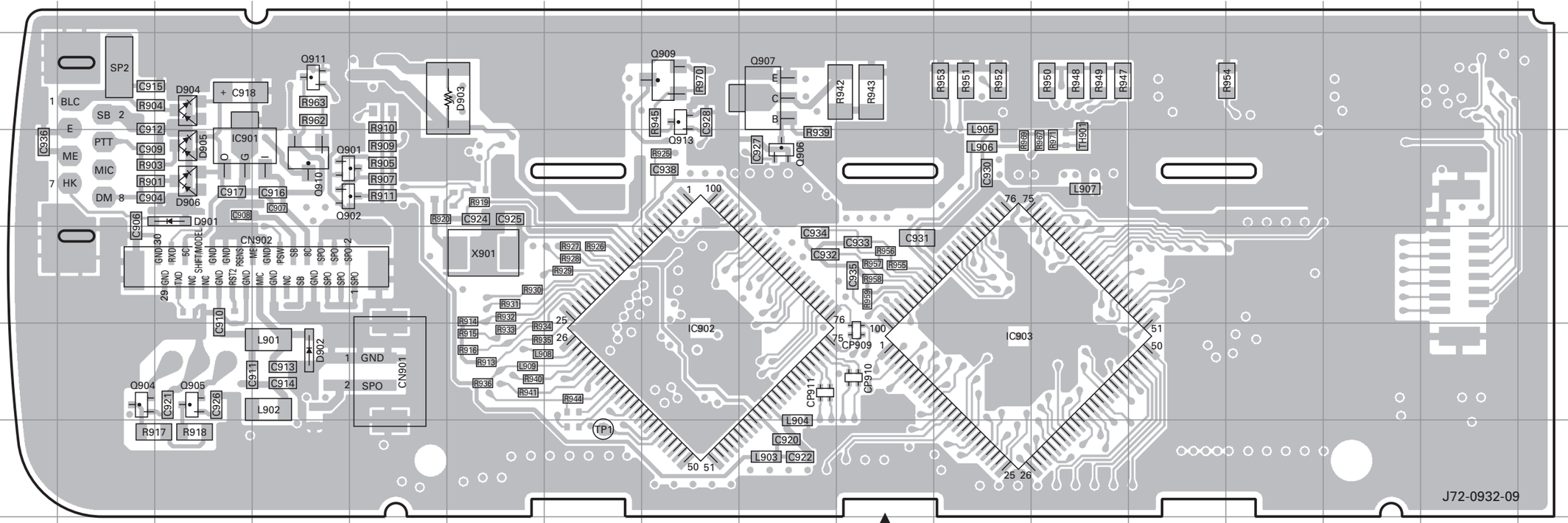



| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| D907 | 3C | D920 | 4N |
| D909 | 3G | D921 | 6F |
| D910 | 3H | D922 | 6G |
| D911 | 3I | D923 | 6I |
| D912 | 3K | D924 | 6O |
| D913 | 3L | D925 | 6M |
| D914 | 3N | D926 | 6K |
| D915 | 4G | D927 | 3D |
| D916 | 4H | D928 | 5D |
| D917 | 4I | D929 | 3P |
| D918 | 4K | D930 | 5P |
| D919 | 4L | | |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

## DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)

DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)

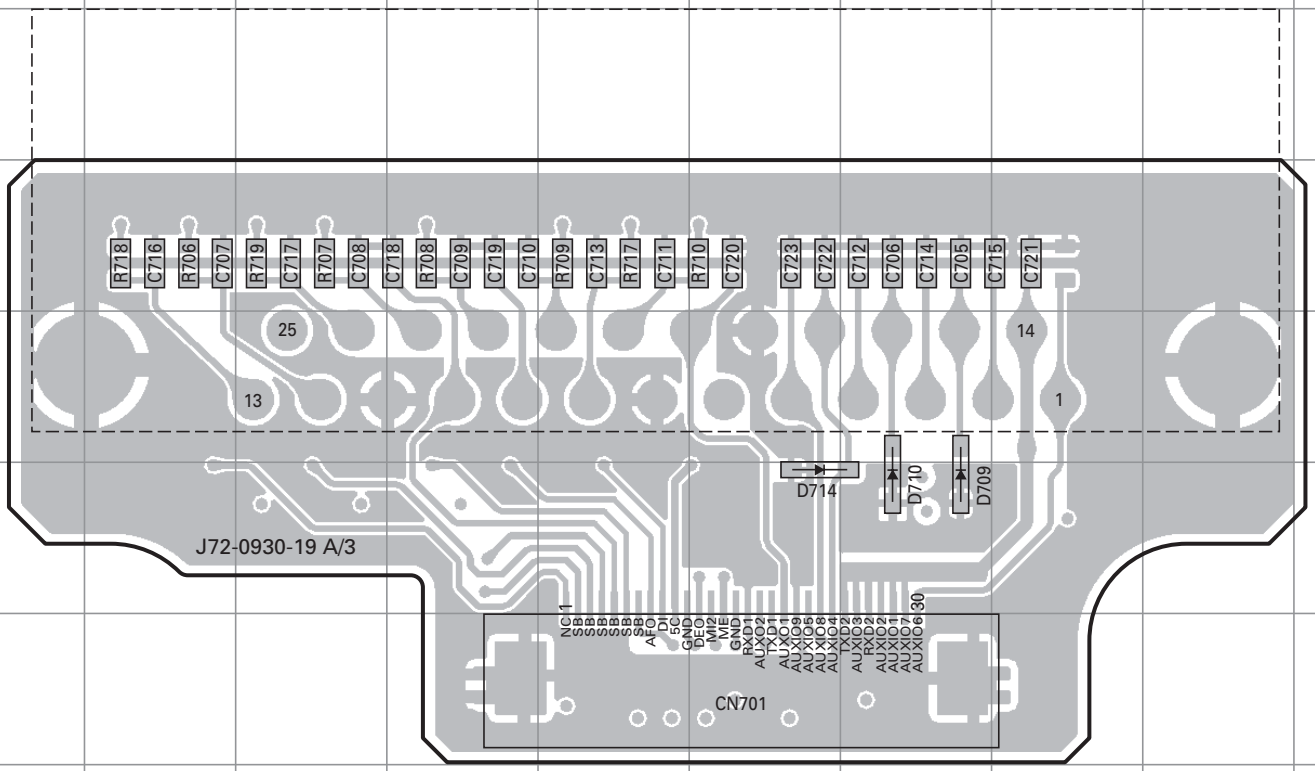



| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC901 | 10C | Q910 | 10D |
| IC902 | 12H | Q911 | 9D |
| IC903 | 12K | Q913 | 9H |
| Q901 | 10D | D901 | 10C |
| Q902 | 10D | D902 | 12D |
| Q904 | 12B | D903 | 9F |
| Q905 | 12C | D904 | 9C |
| Q906 | 10I | D905 | 10C |
| Q907 | 9I | D906 | 10C |
| Q909 | 9H | | |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

# TK-7180 PC BOARD

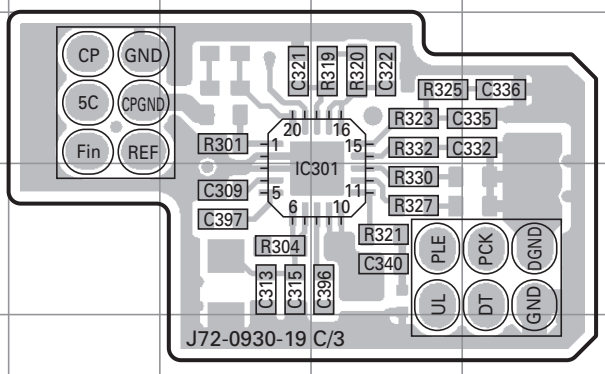
## TX-RX UNIT (X57-6980-10) (A/3) Component side view (J72-0930-19 A/3)




| Ref. No. | Address |
|---|---|
| D709 | 6G |
| D710 | 6G |
| D714 | 6F |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

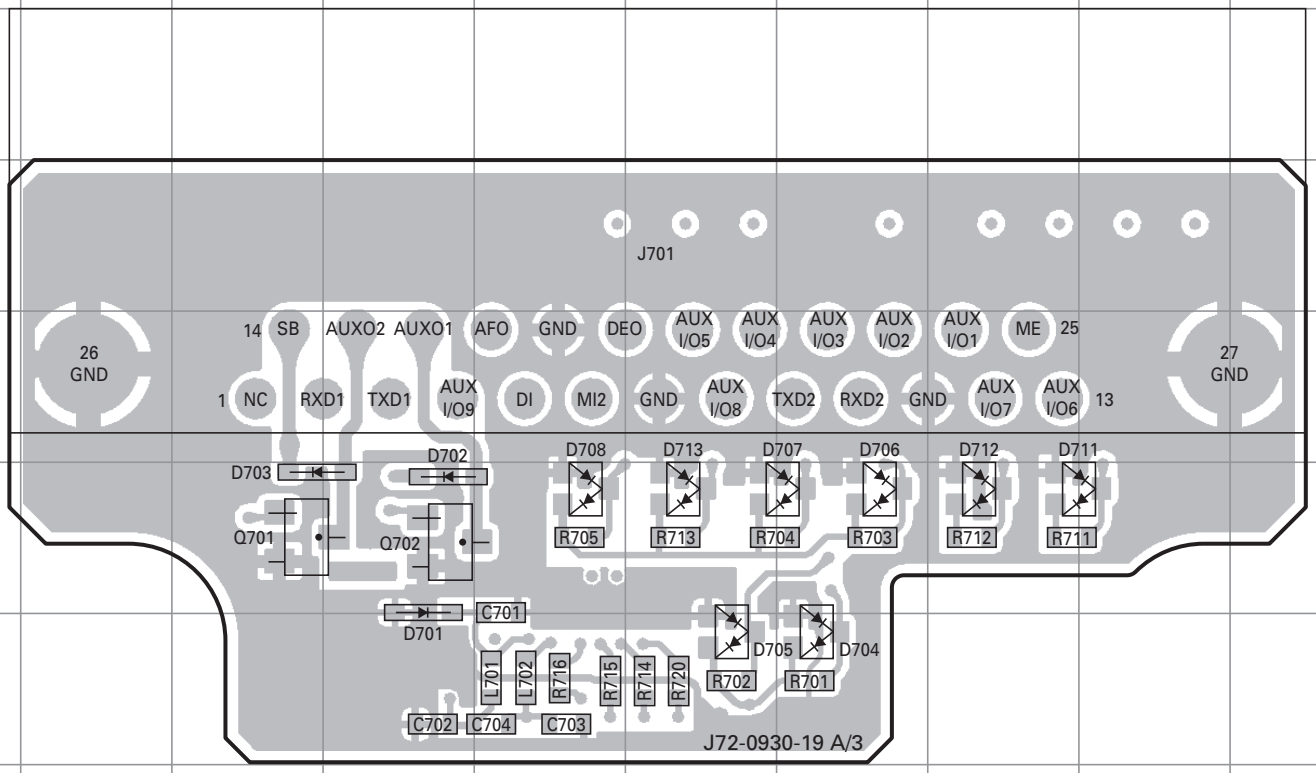
## TX-RX UNIT (X57-6980-10) (C/3)
## Component side view (J72-0930-19 C/3)



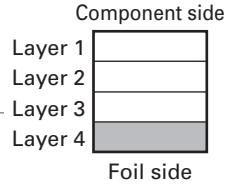

| Ref. No. | Address |
|---|---|
| IC301 | 12E |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

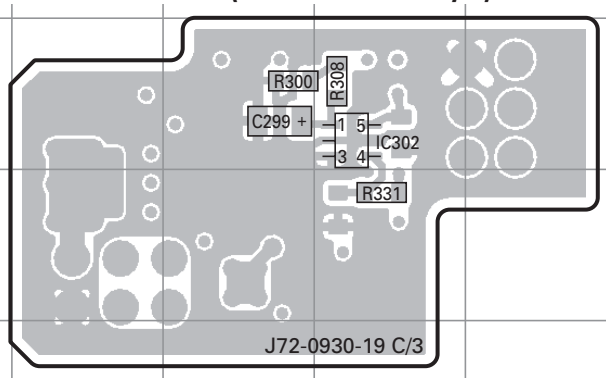
## TX-RX UNIT (X57-6980-10) (A/3) Foil side view (J72-0930-19 A/3)



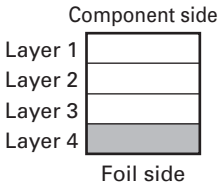

| Ref. No. | Address | Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|---|---|
| Q701 | 6C | D704 | 7G | D711 | 6H |
| Q702 | 6D | D705 | 7F | D712 | 6H |
| D701 | 7D | D706 | 6G | D713 | 6F |
| D702 | 6D | D707 | 6G | | |
| D703 | 6C | D708 | 6E | | |




## TX-RX UNIT (X57-6980-10) (C/3) Foil side view (J72-0930-19 C/3)

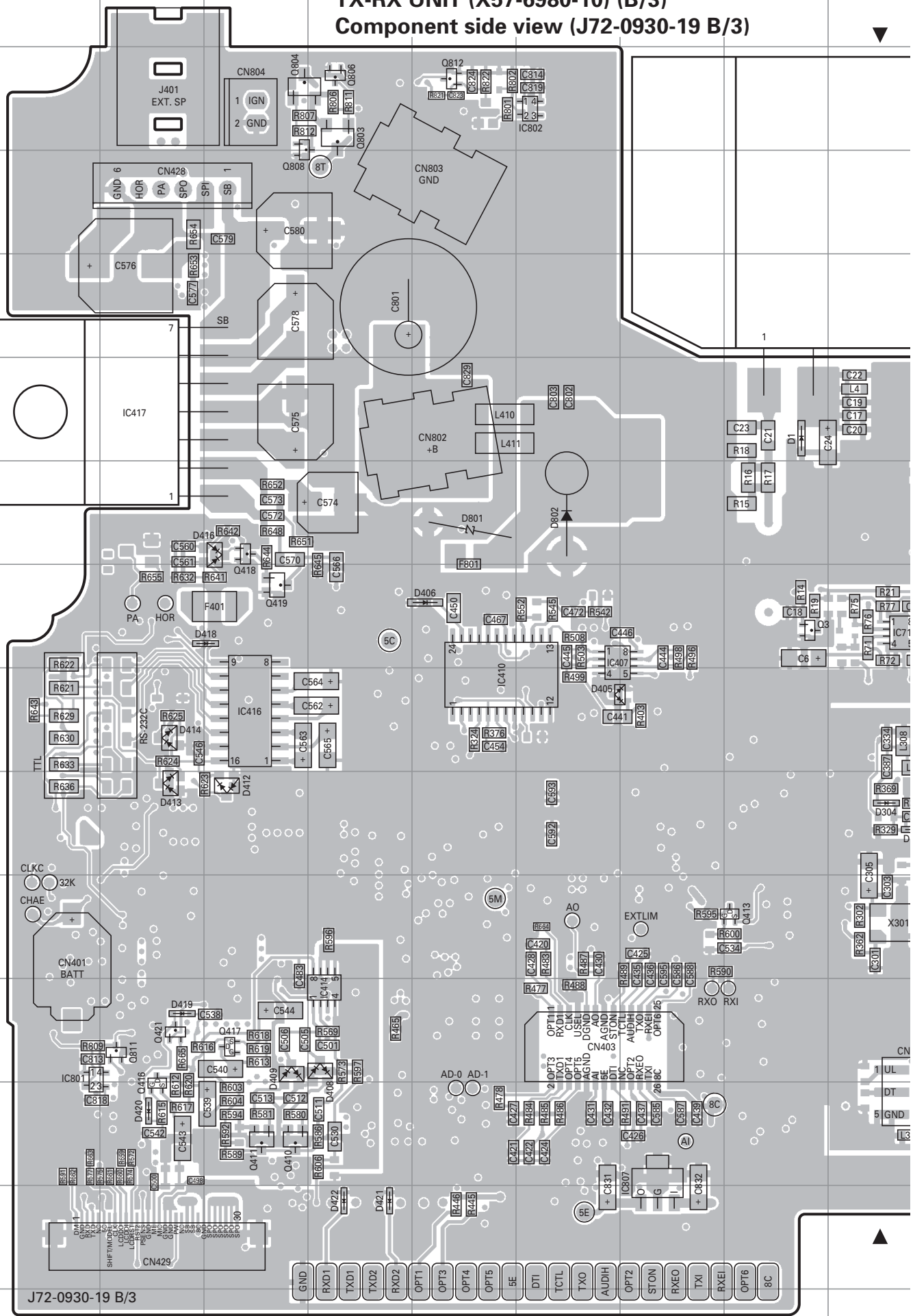



| Ref. No. | Address |
|---|---|
| IC302 | 11E |



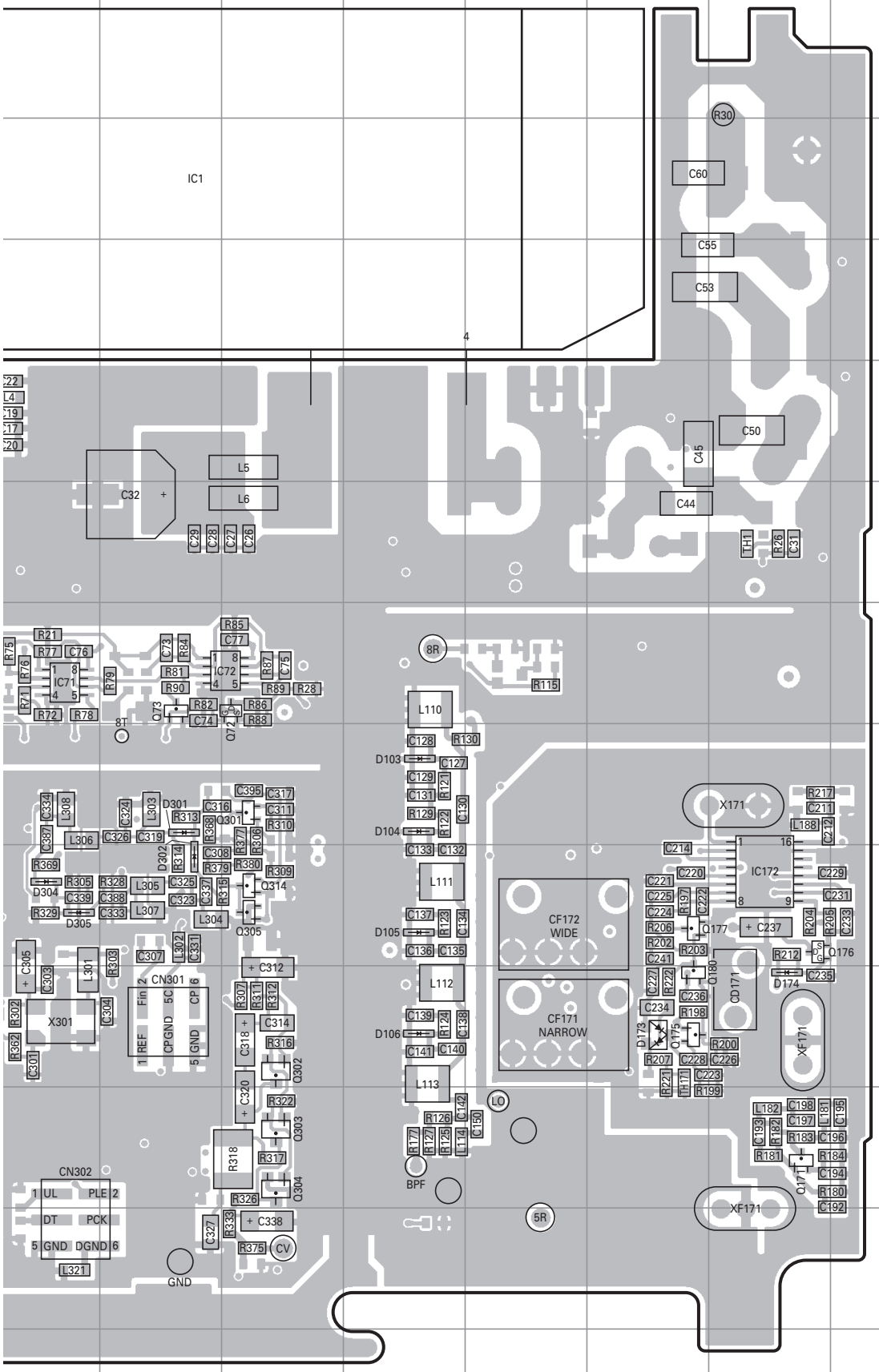
# TK-7180 PC BOARD

## TX-RX UNIT (X57-6980-10) (B/3)
## Component side view (J72-0930-19 B/3)




J72-0930-19 B/3

## TX-RX UNIT (X57-6980-10) (B/3)
## Component side view (J72-0930-19 B/3)




| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC1 | 3K | Q421 | 11C |
| IC71 | 7J | Q803 | 2E |
| IC72 | 7L | Q804 | 2D |
| IC172 | 9P | Q806 | 2E |
| IC407 | 7G | Q808 | 3D |
| IC410 | 8F | Q811 | 11C |
| IC414 | 11E | Q812 | 2F |
| IC416 | 8D | D1 | 5I |
| IC417 | 5C | D103 | 8M |
| IC801 | 11B | D104 | 8M |
| IC802 | 2G | D105 | 9M |
| IC807 | 12H | D106 | 10M |
| Q3 | 7I | D173 | 10O |
| Q72 | 7L | D174 | 10P |
| Q73 | 7K | D301 | 8K |
| Q171 | 11P | D302 | 9K |
| Q175 | 10O | D304 | 9J |
| Q176 | 9P | D305 | 9J |
| Q177 | 9O | D405 | 8G |
| Q180 | 10O | D406 | 7F |
| Q301 | 8L | D408 | 11E |
| Q302 | 10L | D409 | 11D |
| Q303 | 11L | D412 | 9D |
| Q304 | 11L | D413 | 9C |
| Q305 | 9L | D414 | 8C |
| Q314 | 9L | D416 | 6D |
| Q410 | 12D | D418 | 7D |
| Q411 | 12D | D419 | 11C |
| Q413 | 10I | D420 | 12C |
| Q416 | 12C | D421 | 13E |
| Q417 | 11D | D422 | 13E |
| Q418 | 6D | D801 | 6F |
| Q419 | 7D | D802 | 6G |

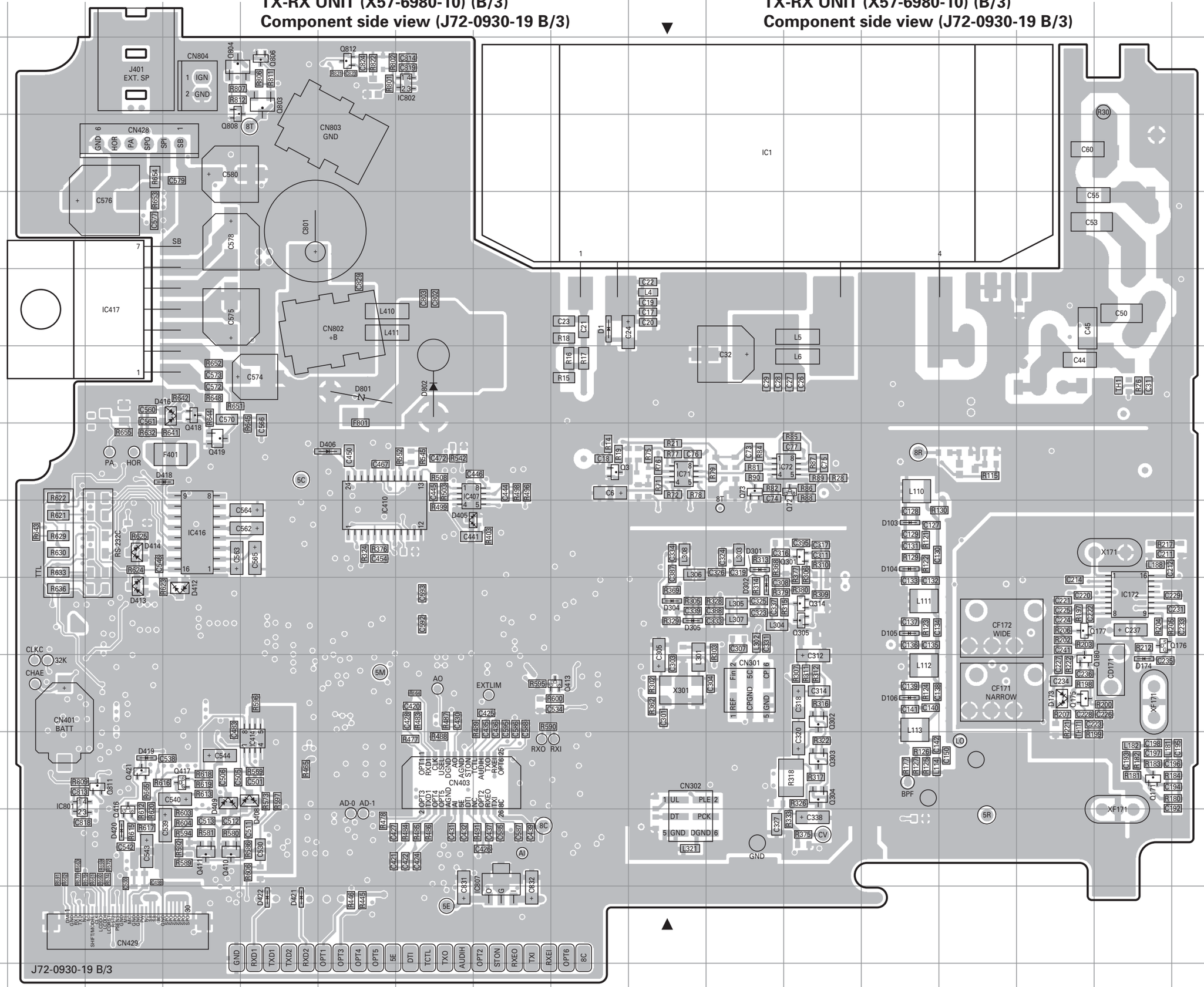
Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

# TK-7180 PC BOARD

## TX-RX UNIT (X57-6980-10) (B/3)
Component side view (J72-0930-19 B/3)


# PC BOARD TK-7180

TX-RX UNIT (X57-6980-10) (B/3)
Component side view (J72-0930-19 B/3)

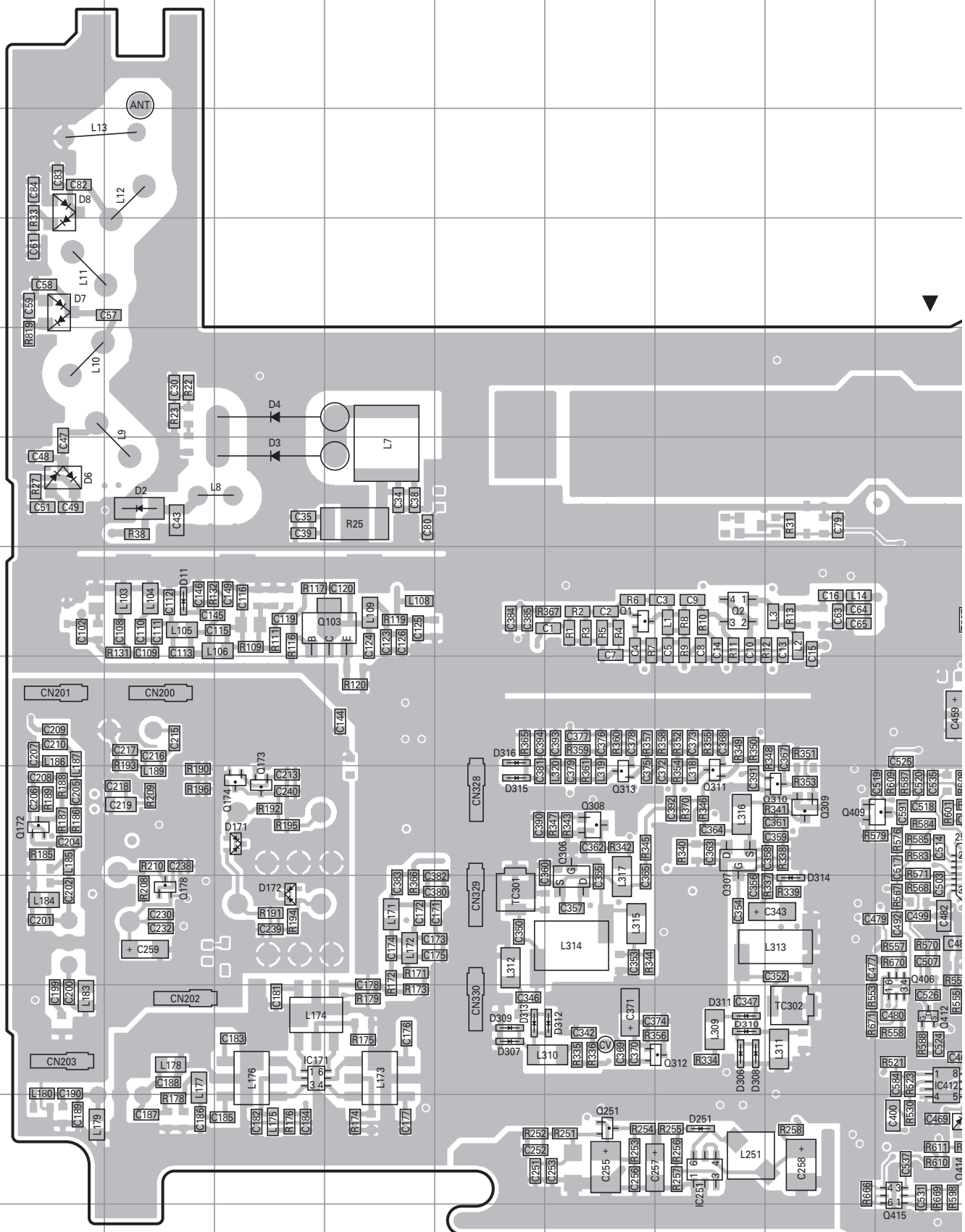




| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC1 | 3K | Q421 | 11C |
| IC71 | 7J | Q803 | 2E |
| IC72 | 7L | Q804 | 2D |
| IC172 | 9P | Q806 | 2E |
| IC407 | 7G | Q808 | 3D |
| IC410 | 8F | Q811 | 11C |
| IC414 | 11E | Q812 | 2F |
| IC416 | 8D | D1 | 5I |
| IC417 | 5C | D103 | 8M |
| IC801 | 11B | D104 | 8M |
| IC802 | 2G | D105 | 9M |
| IC807 | 12H | D106 | 10M |
| Q3 | 7I | D173 | 10O |
| Q72 | 7L | D174 | 10P |
| Q73 | 7K | D301 | 8K |
| Q171 | 11P | D302 | 9K |
| Q175 | 10O | D304 | 9J |
| Q176 | 9P | D305 | 9J |
| Q177 | 9O | D405 | 8G |
| Q180 | 10O | D406 | 7F |
| Q301 | 8L | D408 | 11E |
| Q302 | 10L | D409 | 11D |
| Q303 | 11L | D412 | 9D |
| Q304 | 11L | D413 | 9C |
| Q305 | 9L | D414 | 8C |
| Q314 | 9L | D416 | 6D |
| Q410 | 12D | D418 | 7D |
| Q411 | 12D | D419 | 11C |
| Q413 | 10I | D420 | 12C |
| Q416 | 12C | D421 | 13E |
| Q417 | 11D | D422 | 13E |
| Q418 | 6D | D801 | 6F |
| Q419 | 7D | D802 | 6G |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

# TK-7180 PC BOARD

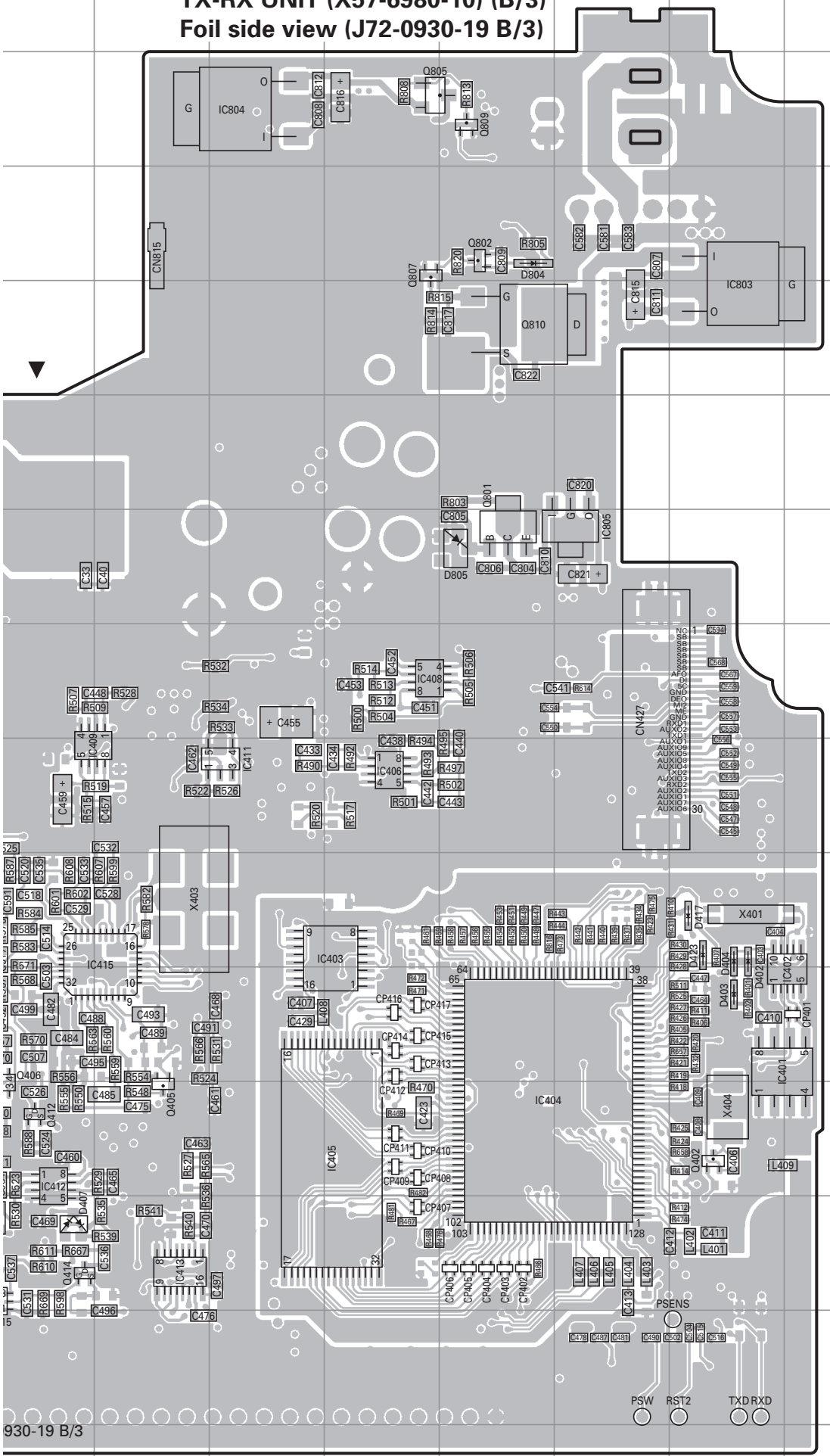
**TX-RX UNIT (X57-6980-10) (B/3)**
**Foil side view (J72-0930-19 B/3)**






J72-0930-19 B

## TX-RX UNIT (X57-6980-10) (B/3)
## Foil side view (J72-0930-19 B/3)




| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC171 | 11D | Q414 | 12J |
| IC251 | 12H | Q415 | 12J |
| IC401 | 10P | Q801 | 6N |
| IC402 | 10Q | Q802 | 3N |
| IC403 | 9M | Q805 | 2M |
| IC404 | 11N | Q807 | 3M |
| IC405 | 11M | Q809 | 2N |
| IC406 | 8M | Q810 | 4N |
| IC408 | 7M | D2 | 6C |
| IC409 | 8J | D3 | 6D |
| IC411 | 8L | D4 | 5D |
| IC412 | 11J | D6 | 6B |
| IC413 | 12K | D7 | 4B |
| IC415 | 9K | D8 | 3B |
| IC803 | 4P | D11 | 7C |
| IC804 | 2L | D171 | 9D |
| IC805 | 6O | D172 | 10D |
| Q1 | 7G | D251 | 12H |
| Q2 | 7H | D306 | 11H |
| Q103 | 7E | D307 | 11F |
| Q172 | 9B | D308 | 11H |
| Q173 | 9D | D309 | 11F |
| Q174 | 9D | D310 | 11H |
| Q178 | 10C | D311 | 11H |
| Q251 | 12G | D312 | 11G |
| Q306 | 10G | D313 | 11F |
| Q307 | 9H | D314 | 10I |
| Q308 | 9G | D315 | 9F |
| Q309 | 9I | D316 | 8F |
| Q310 | 9I | D402 | 9P |
| Q311 | 9H | D403 | 10P |
| Q312 | 11H | D404 | 9P |
| Q313 | 9G | D407 | 12J |
| Q402 | 11P | D417 | 9P |
| Q405 | 11K | D423 | 9P |
| Q406 | 11J | D804 | 3N |
| Q409 | 9J | D805 | 6N |
| Q412 | 11J | | |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

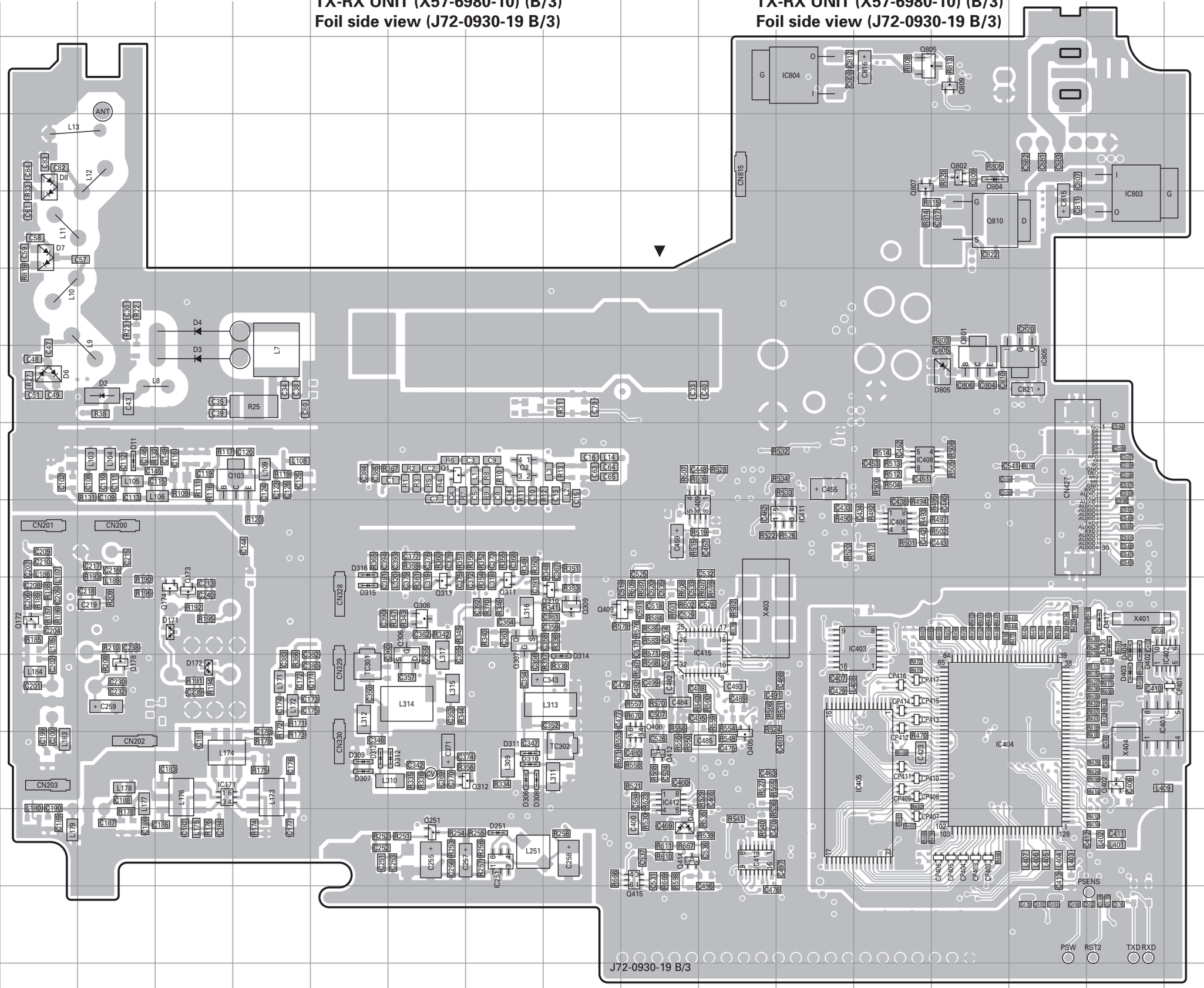
930-19 B/3

# TK-7180 PC BOARD

TX-RX UNIT (X57-6980-10) (B/3)
Foil side view (J72-0930-19 B/3)

TX-RX UNIT (X57-6980-10) (B/3)
Foil side view (J72-0930-19 B/3)

PC BOARD TK-7180

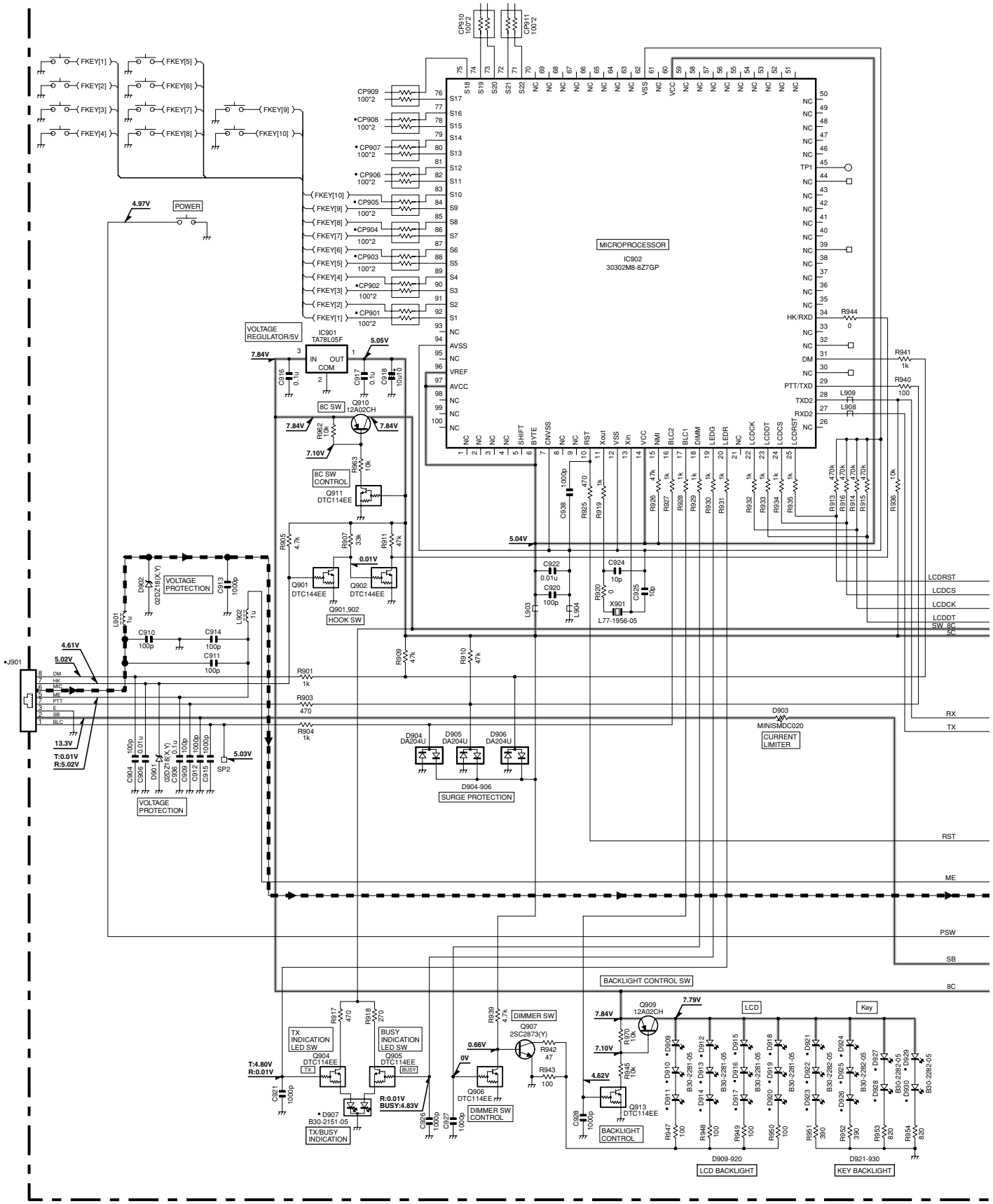



| Ref. No. | Address | Ref. No. | Address |
|---|---|---|---|
| IC171 | 11D | Q414 | 12J |
| IC251 | 12H | Q415 | 12J |
| IC401 | 10P | Q801 | 6N |
| IC402 | 10Q | Q802 | 3N |
| IC403 | 9M | Q805 | 2M |
| IC404 | 11N | Q807 | 3M |
| IC405 | 11M | Q809 | 2N |
| IC406 | 8M | Q810 | 4N |
| IC408 | 7M | D2 | 6C |
| IC409 | 8J | D3 | 6D |
| IC411 | 8L | D4 | 5D |
| IC412 | 11J | D6 | 6B |
| IC413 | 12K | D7 | 4B |
| IC415 | 9K | D8 | 3B |
| IC803 | 4P | D11 | 7C |
| IC804 | 2L | D171 | 9D |
| IC805 | 6O | D172 | 10D |
| Q1 | 7G | D251 | 12H |
| Q2 | 7H | D306 | 11H |
| Q103 | 7E | D307 | 11F |
| Q172 | 9B | D308 | 11H |
| Q173 | 9D | D309 | 11F |
| Q174 | 9D | D310 | 11H |
| Q178 | 10C | D311 | 11H |
| Q251 | 12G | D312 | 11G |
| Q306 | 10G | D313 | 11F |
| Q307 | 9H | D314 | 10I |
| Q308 | 9G | D315 | 9F |
| Q309 | 9I | D316 | 8F |
| Q310 | 9I | D402 | 9P |
| Q311 | 9H | D403 | 10P |
| Q312 | 11H | D404 | 9P |
| Q313 | 9G | D407 | 12J |
| Q402 | 11P | D417 | 9P |
| Q405 | 11K | D423 | 9P |
| Q406 | 11J | D804 | 3N |
| Q409 | 9J | D805 | 6N |
| Q412 | 11J | | |

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

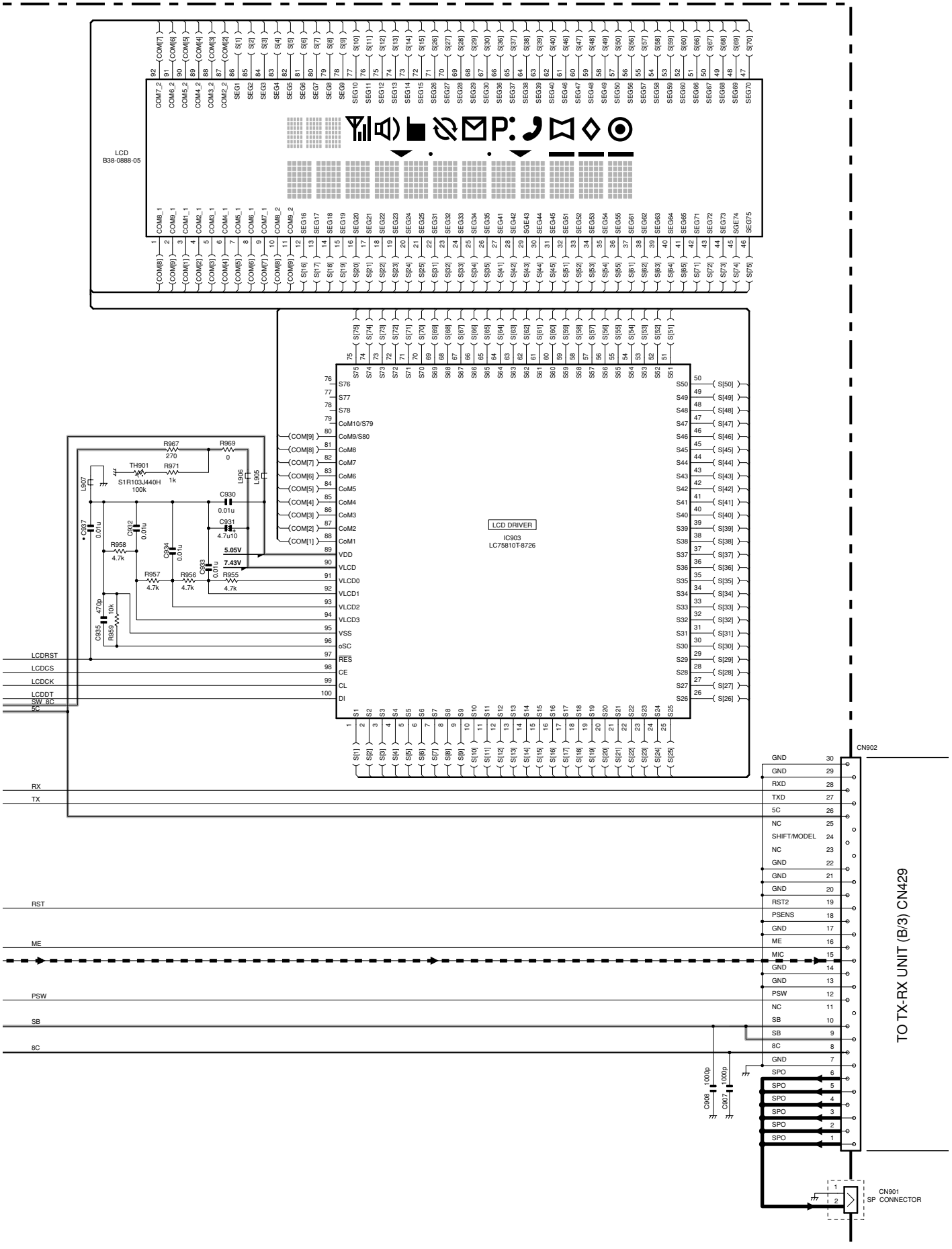
# TK-7180 SCHEMATIC DIAGRAM

DISPLAY UNIT (X54-3480-10)



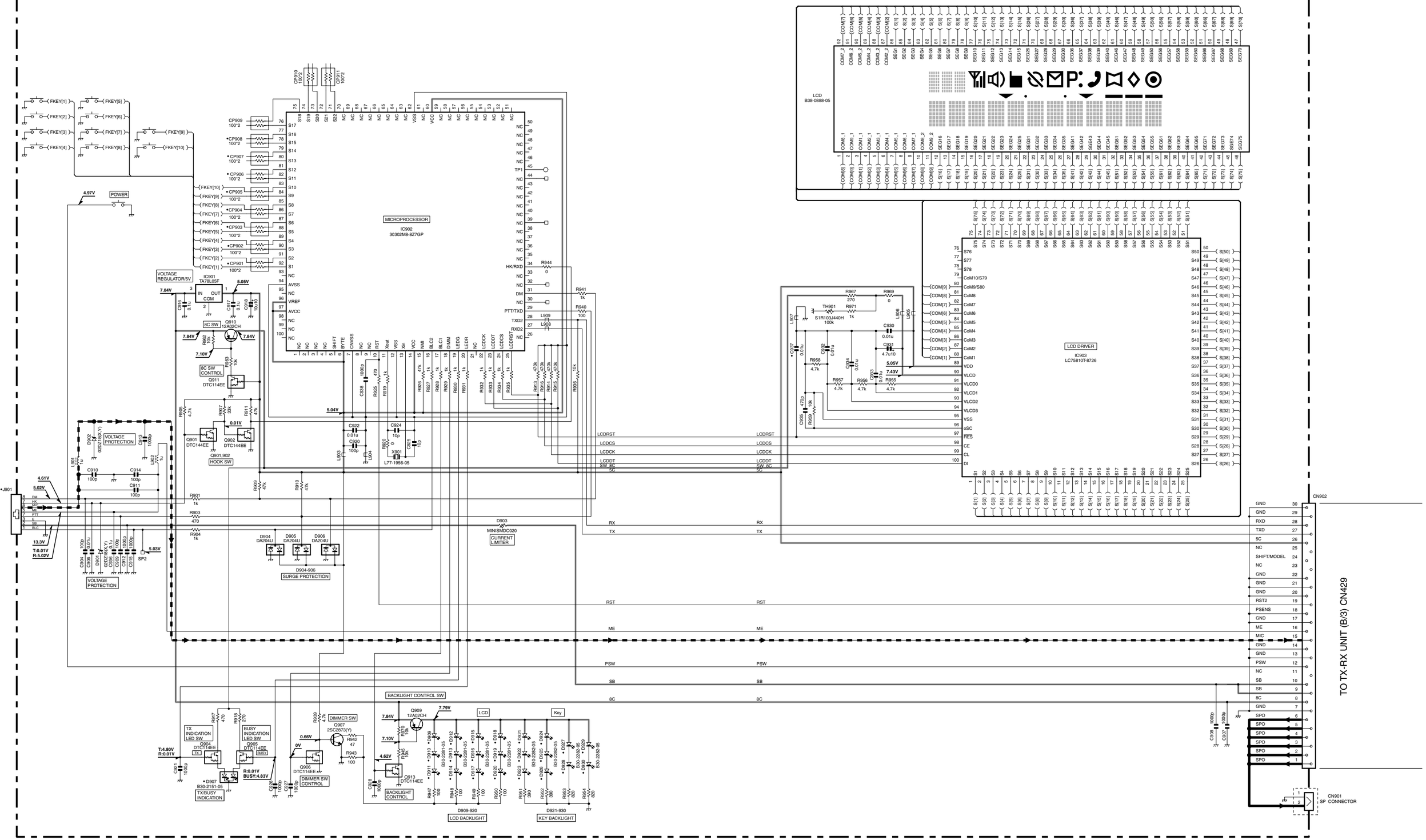
# SCHEMATIC DIAGRAM TK-7180

DISPLAY UNIT (X54-3480-10)

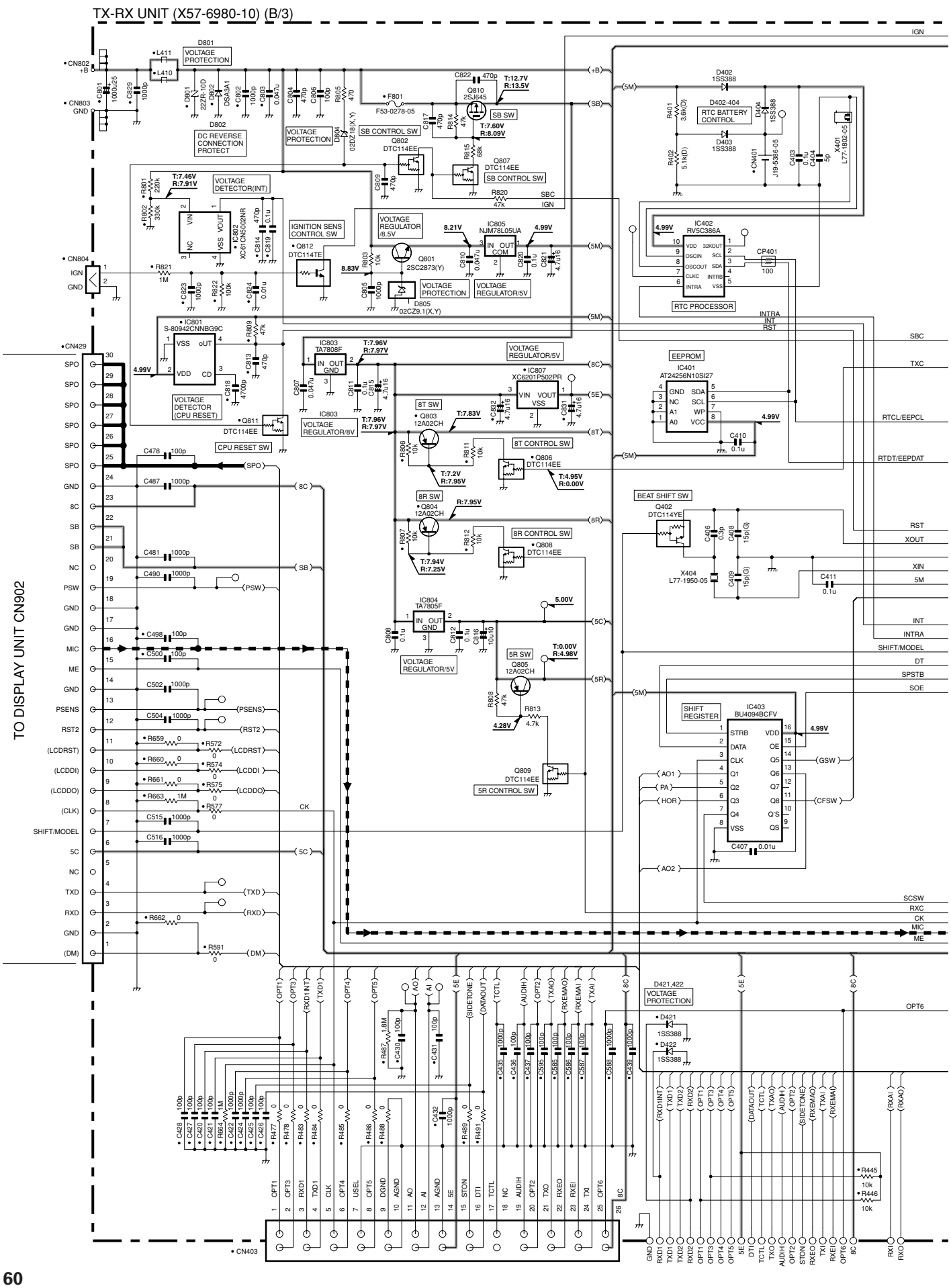



**Note : The components marked with a dot (•) are parts of layer 1.**

DISPLAY UNIT (X54-3480-10)

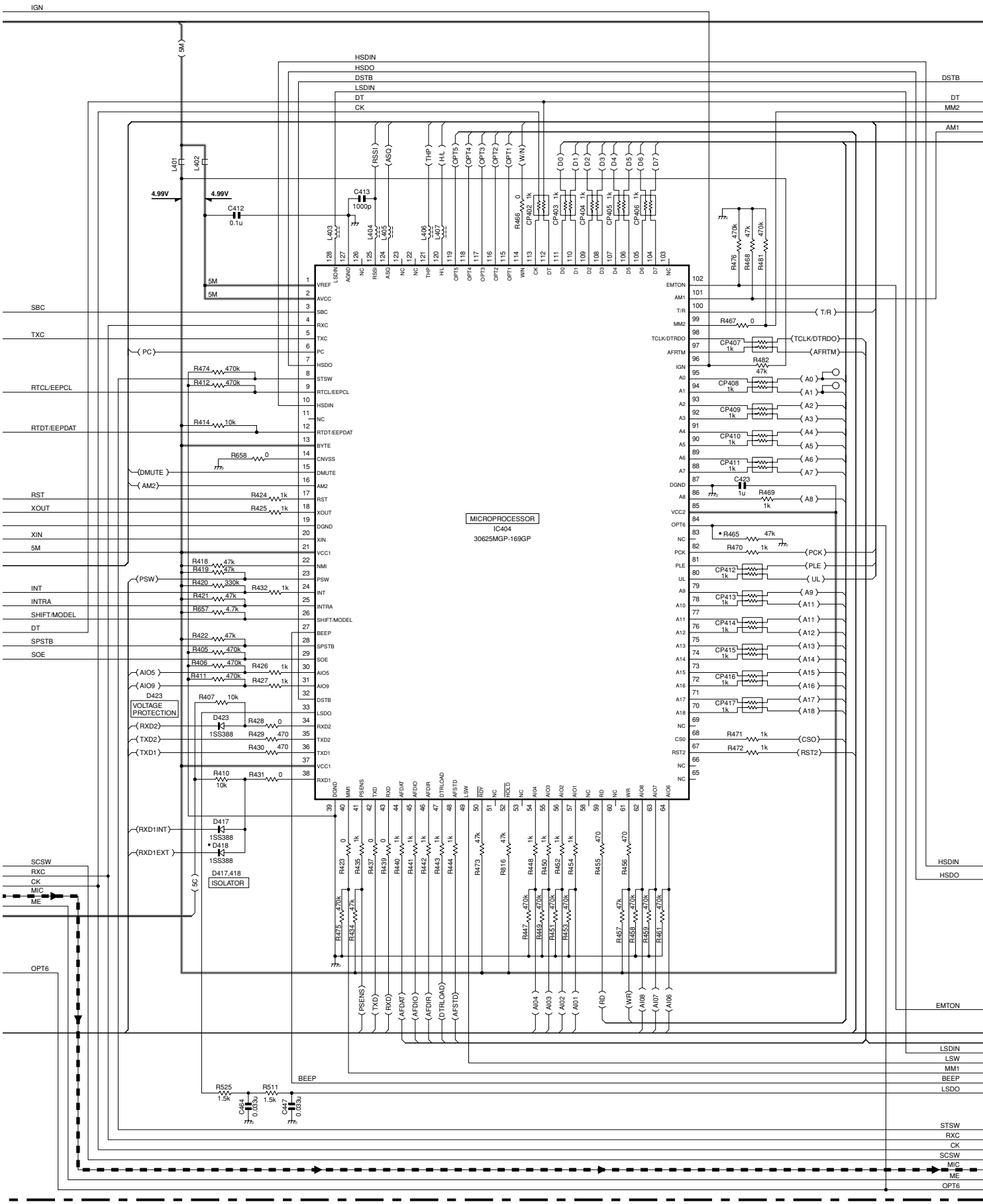


# TK-7180 SCHEMATIC DIAGRAM



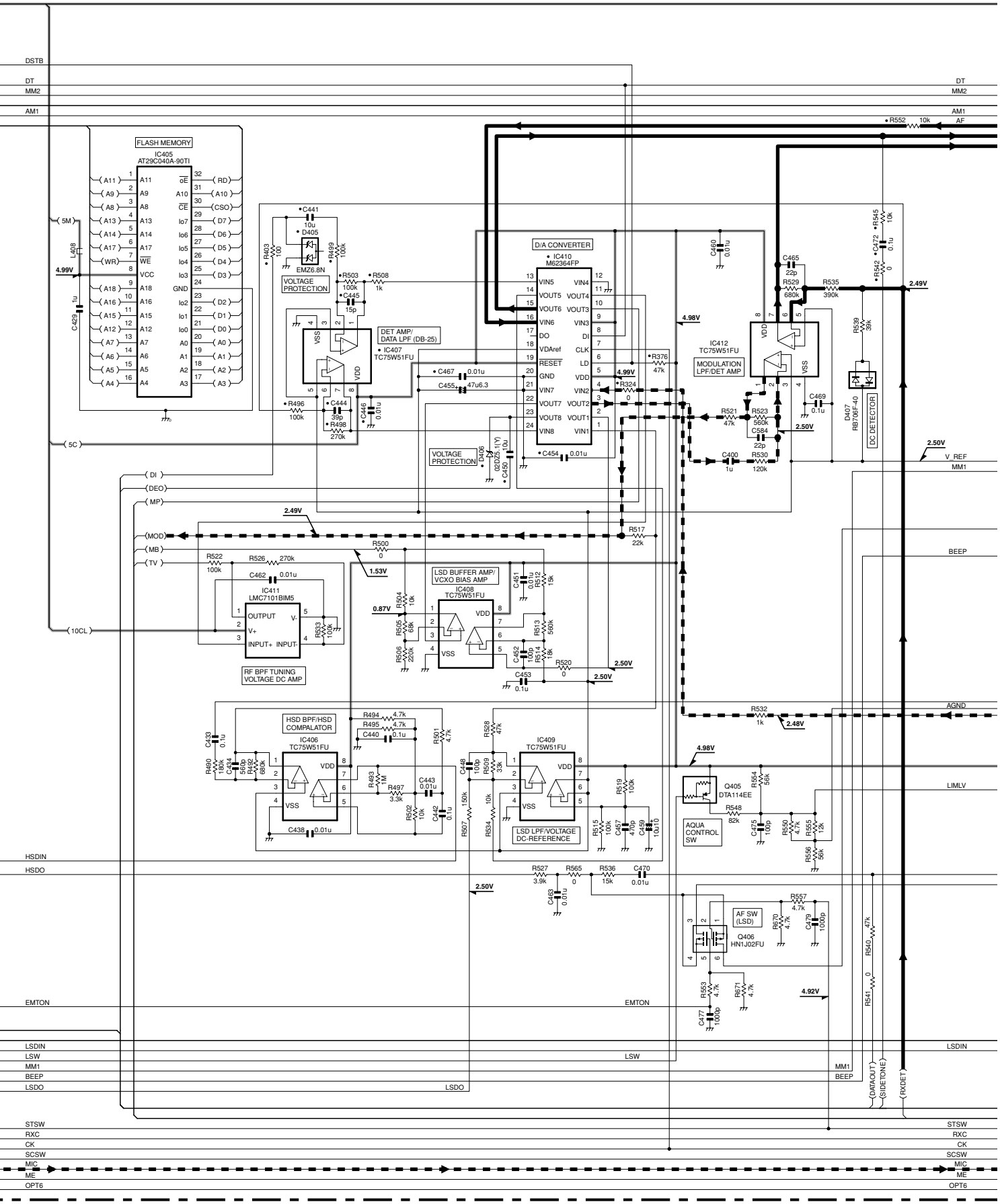
# SCHEMATIC DIAGRAM TK-7180

TX-RX UNIT (X57-6980-10) (B/3)



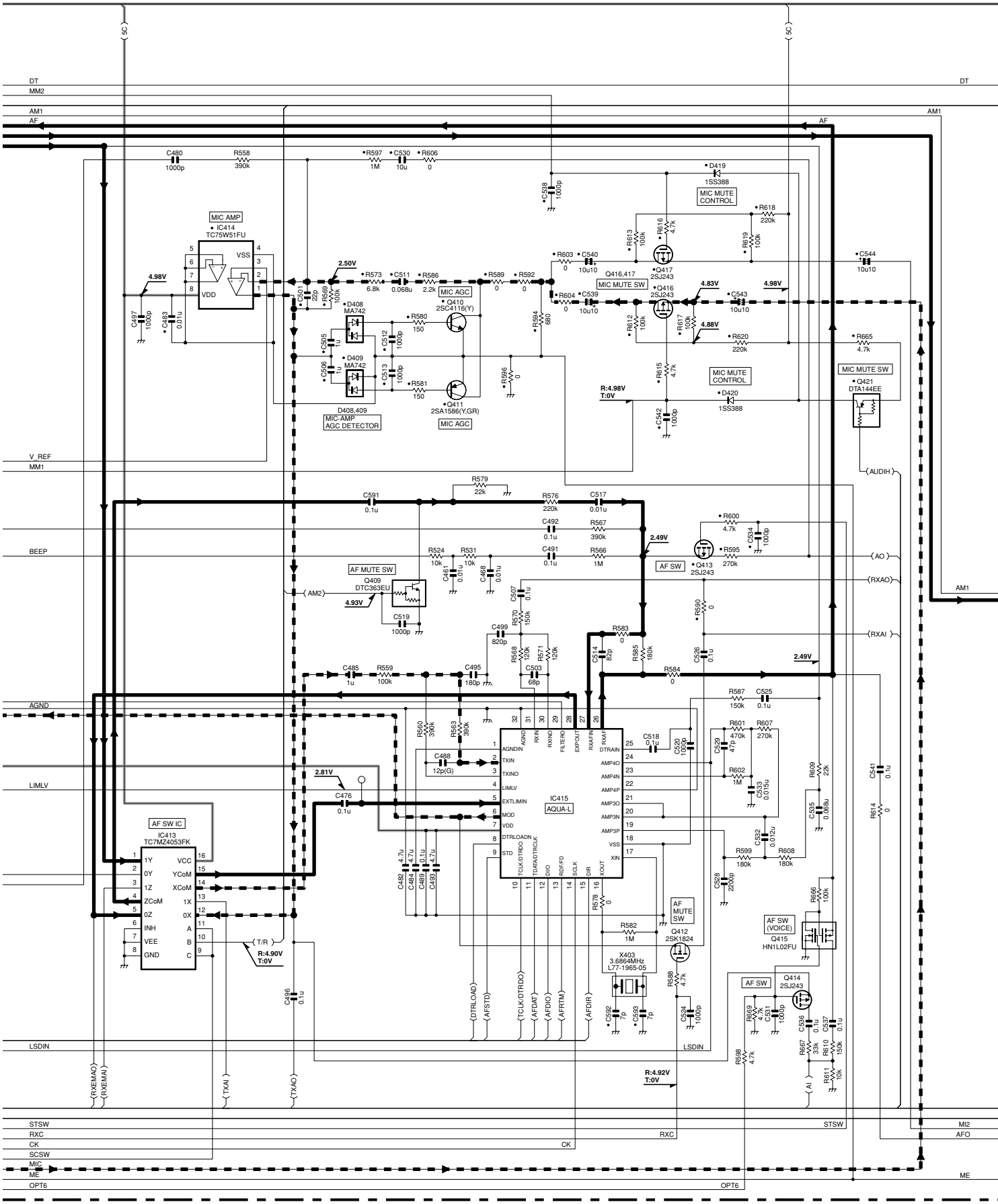
# TK-7180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6980-10) (B/3)



# SCHEMATIC DIAGRAM TK-7180

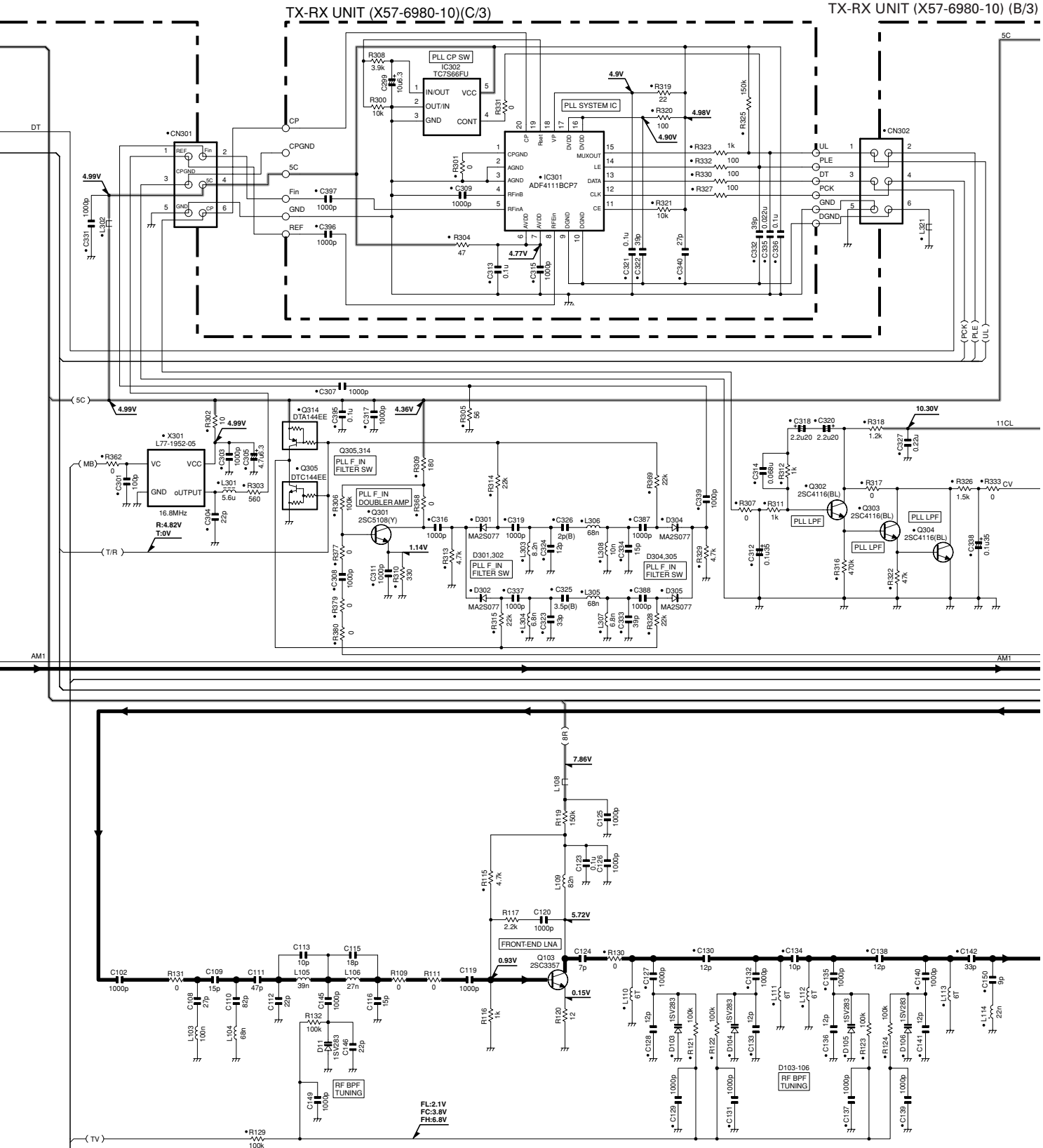
TX-RX UNIT (X57-6980-10) (B/3)



# TK-7180 SCHEMATIC DIAGRAM

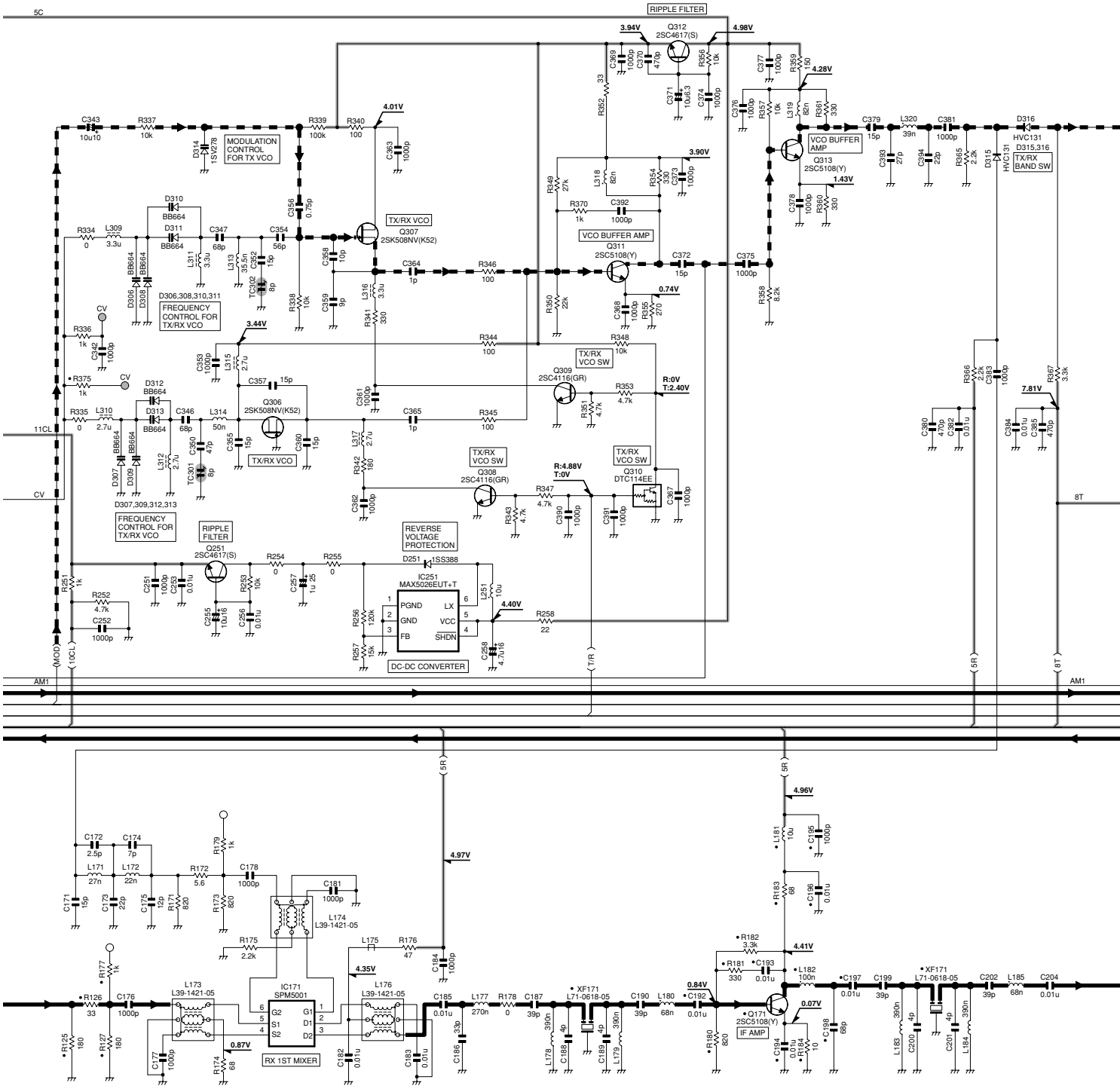
TX-RX UNIT (X57-6980-10)(C/3)

TX-RX UNIT (X57-6980-10) (B/3)



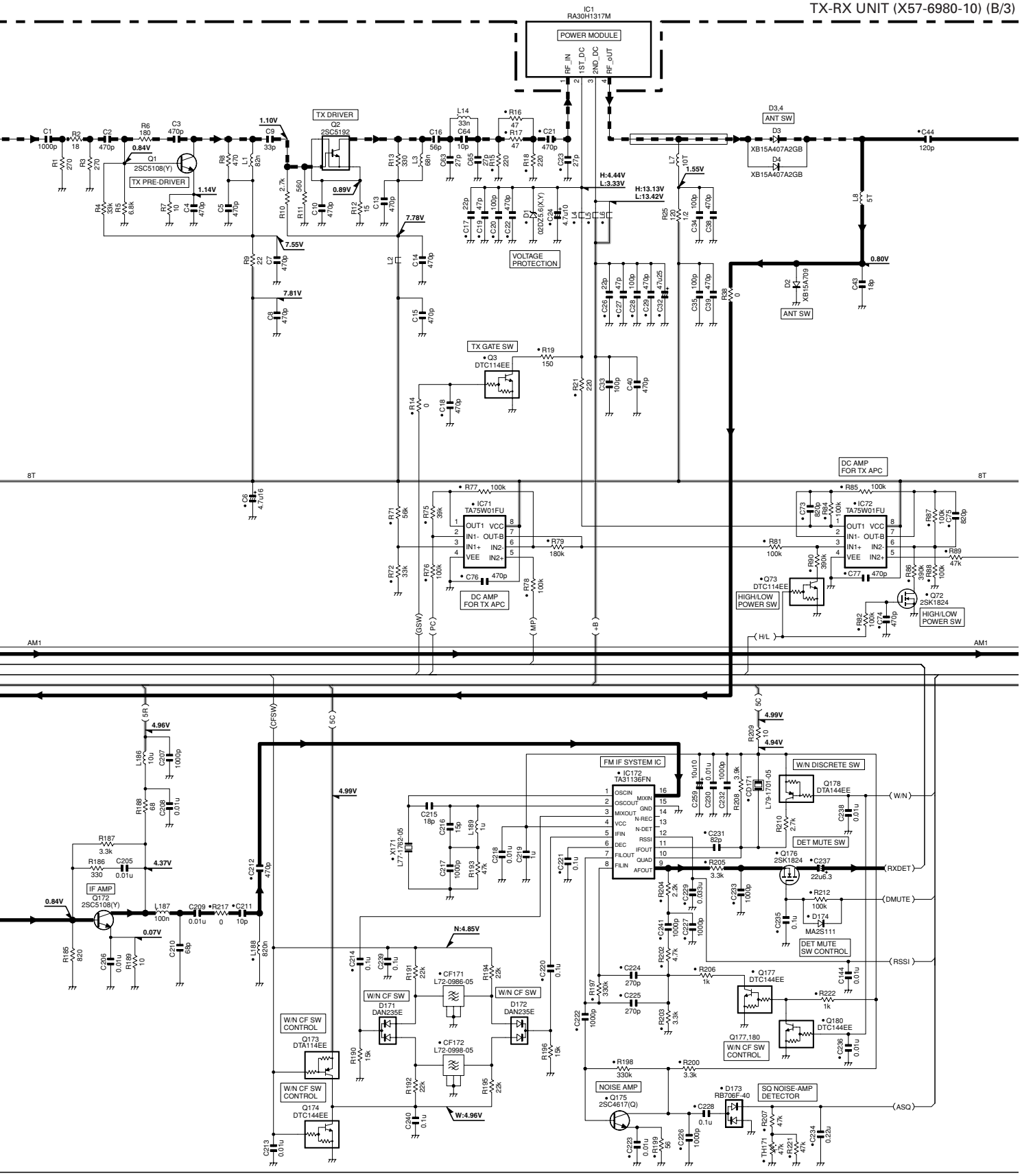
# SCHEMATIC DIAGRAM TK-7180

TX-RX UNIT (X57-6980-10) (B/3)



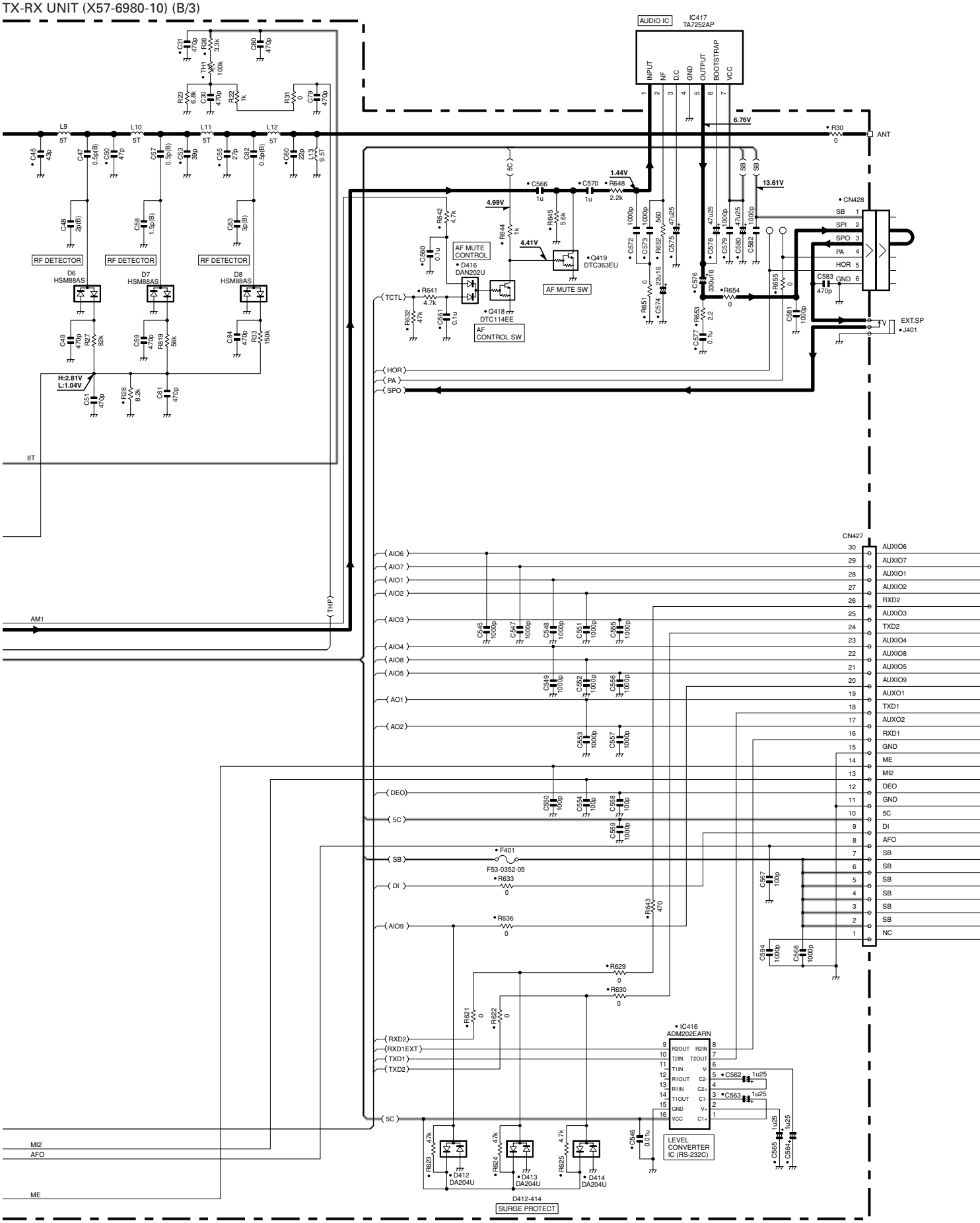
# TK-7180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6980-10) (B/3)



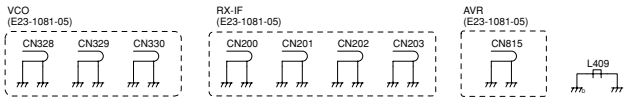
# SCHEMATIC DIAGRAM TK-7180

TX-RX UNIT (X57-6980-10) (B/3)

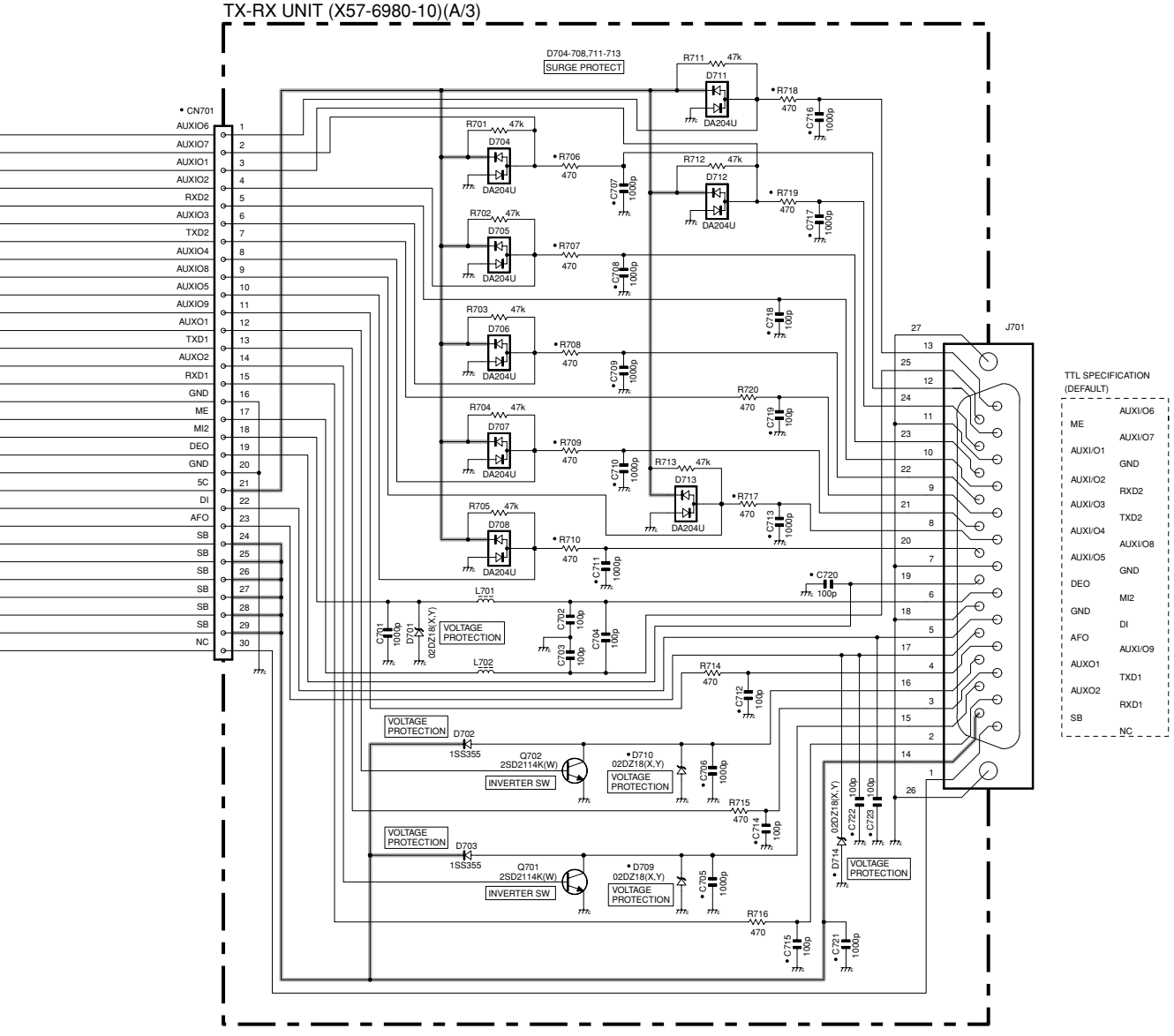


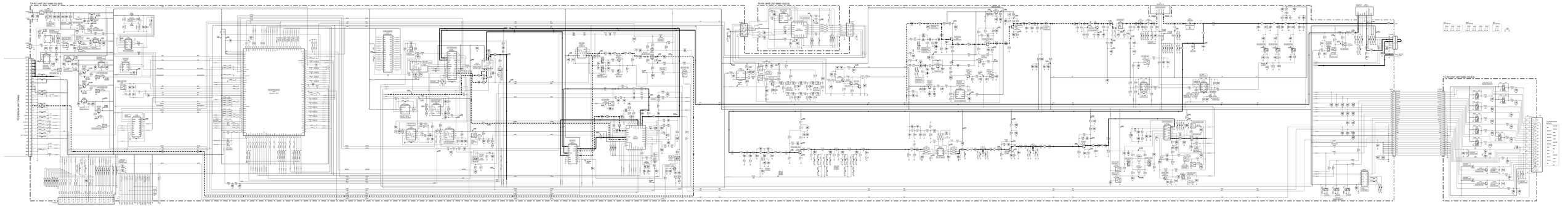
# TK-7180 SCHEMATIC DIAGRAM

**Note : The components marked with a dot (•) are parts of layer 1.**

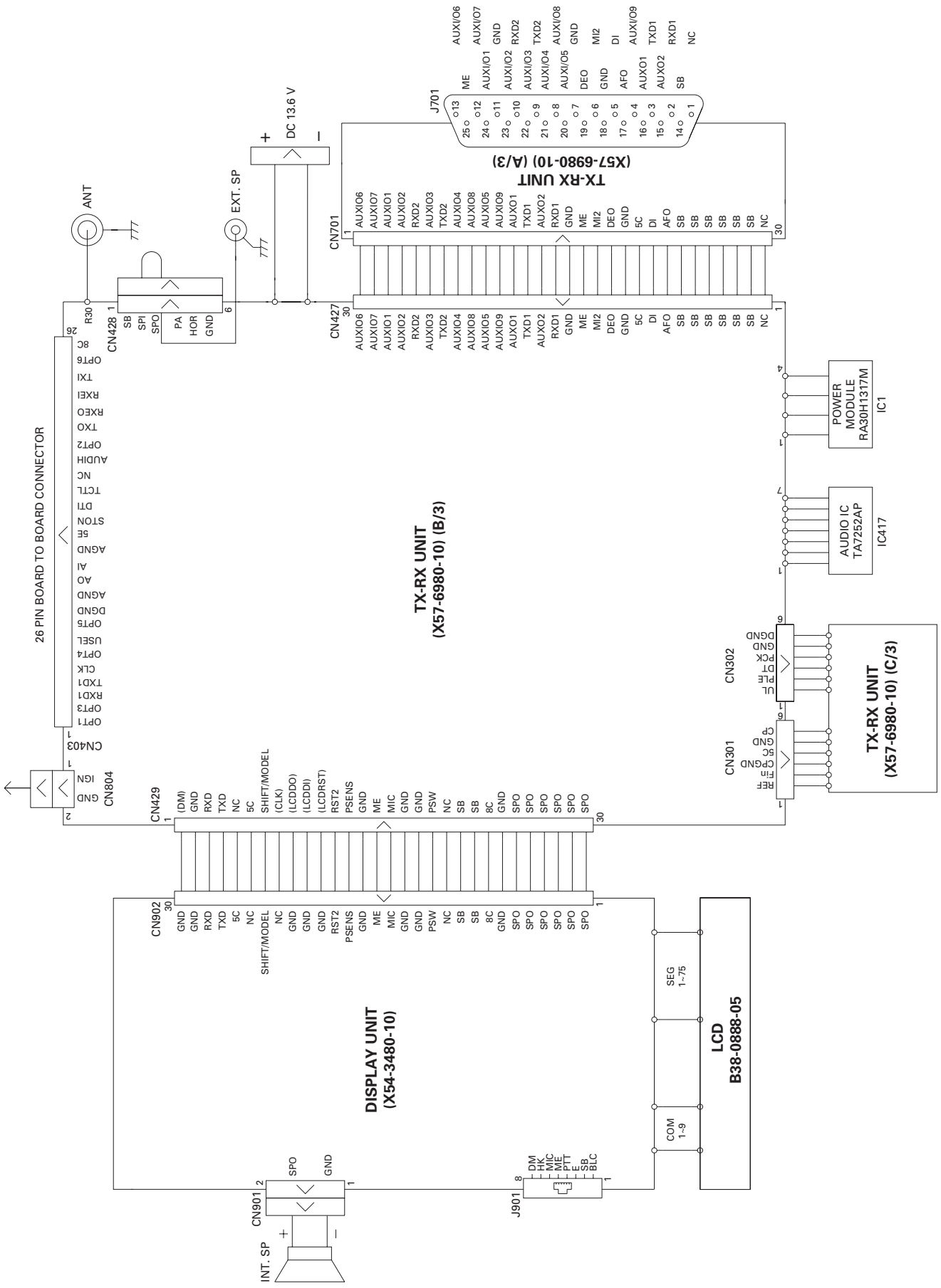



TX-RX UNIT (X57-6980-10)(A/3)

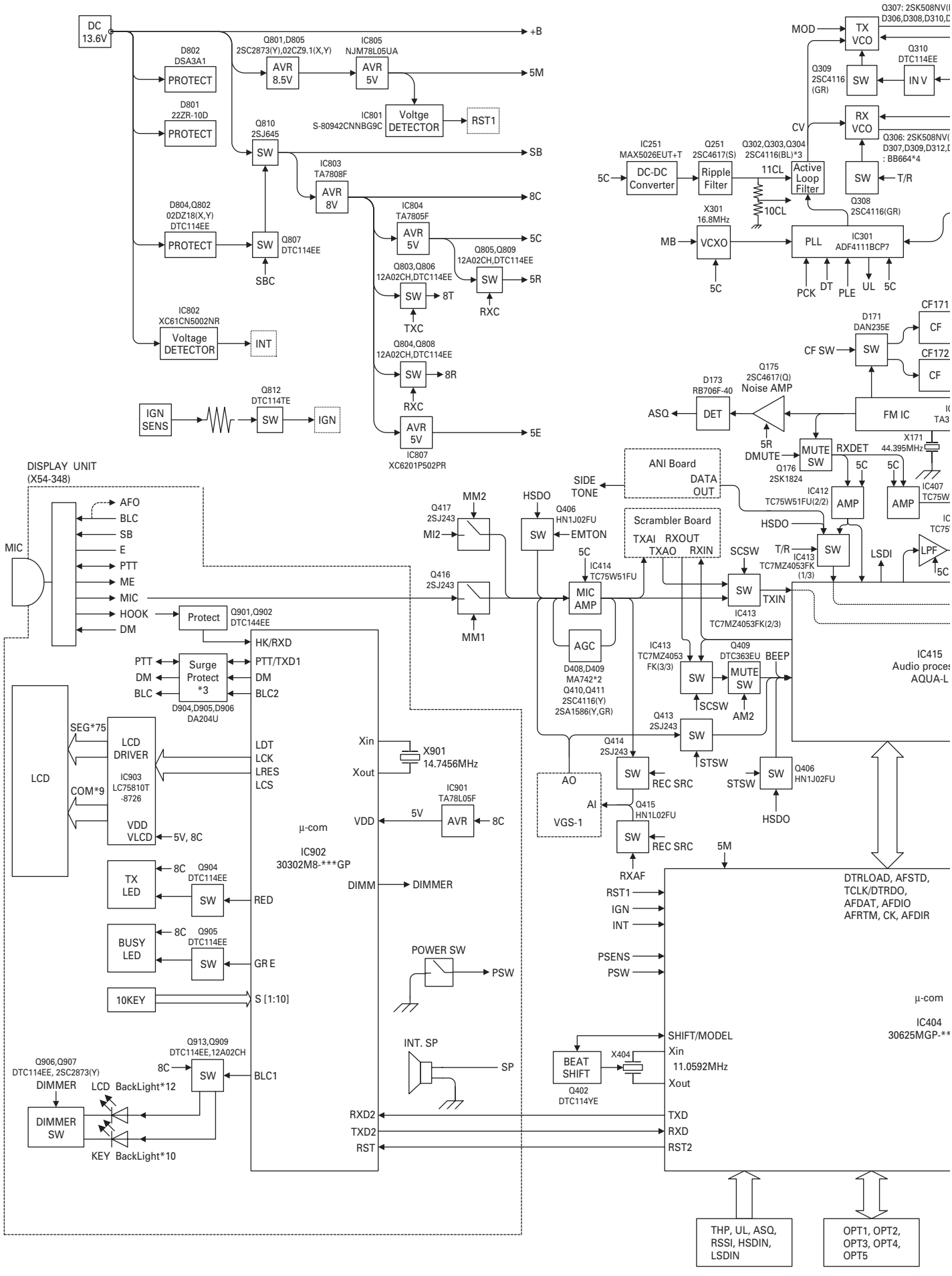


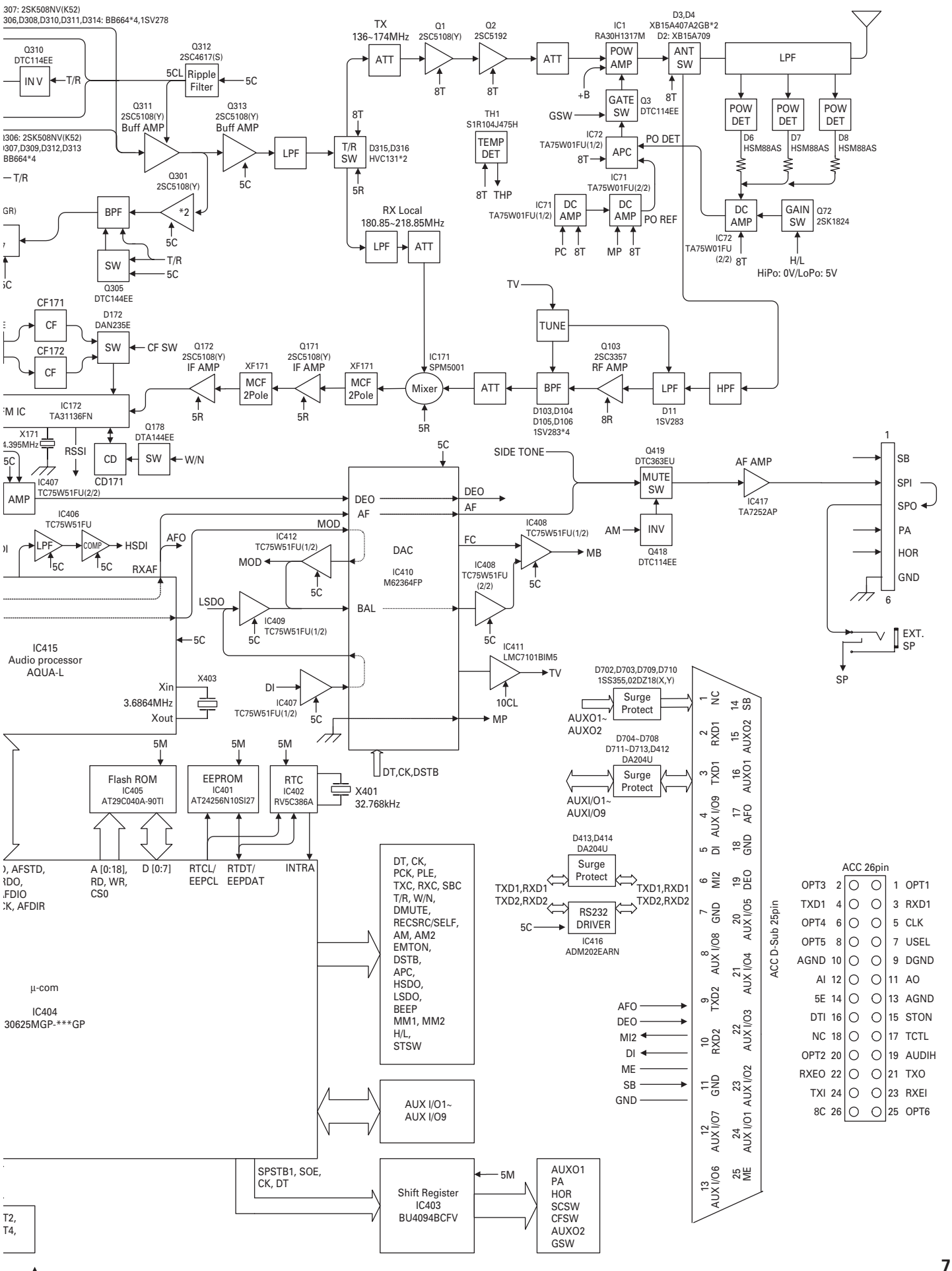


# INTERCONNECTION DIAGRAM



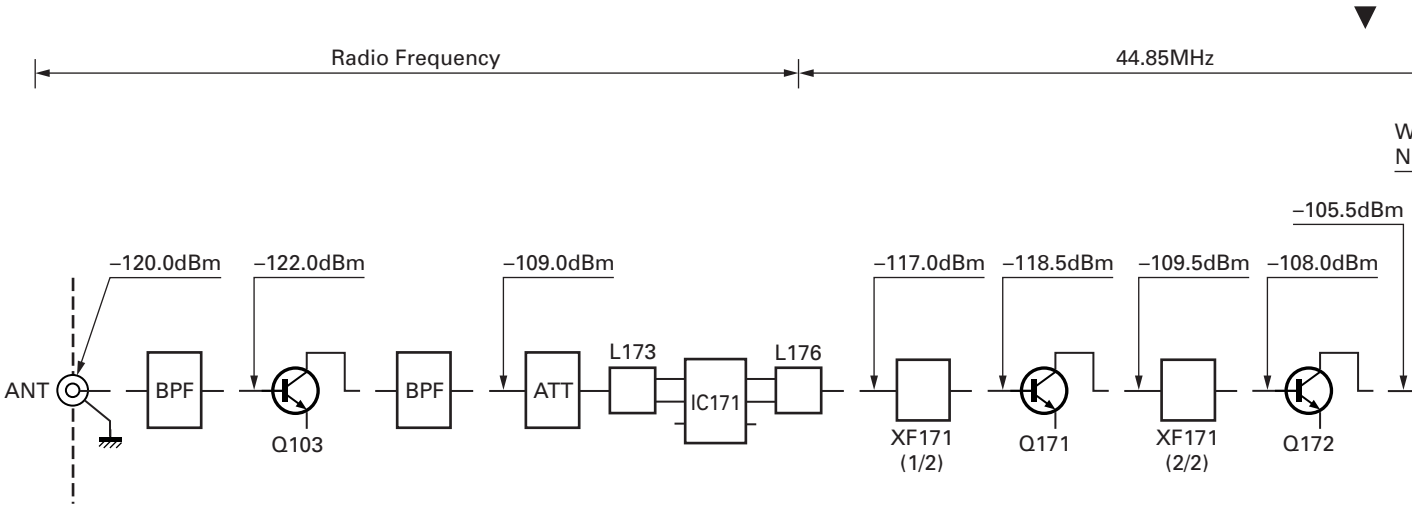
# TK-7180 BLOCK DIAGRAM




TX 136~174MHz
RX Local 180.85~218.85MHz
Q310 DTC114EE
Q312 2SC4617(S)
Ripple Filter
Q311 2SC5108(Y) Buff AMP
Q313 2SC5108(Y) Buff AMP
Q301 2SC5108(Y)
Q1 2SC5108(Y)
Q2 2SC5192
IC1 RA30H1317M
D3,D4 XB15A407A2GB*2 D2: XB15A709
TH1 S1R104J475H
TEMP DET
IC72 TA75W01FU(1/2)
IC71 TA75W01FU(1/2)
IC71 TA75W01FU(2/2)
IC72 TA75W01FU (2/2)
D6 HSM88AS
D7 HSM88AS
D8 HSM88AS
Q72 2SK1824
HiPo: 0V/LoPo: 5V
D315,D316 HVC131*2
Q305 DTC144EE
CF171
CF172
D172 DAN235E
CF SW
Q172 2SC5108(Y) IF AMP
Q171 2SC5108(Y) IF AMP
XF171
MCF 2Pole
IC171 SPM5001
Mixer
Q103 2SC3357 RF AMP
D103,D104 D105,D106 1SV283*4
D11 1SV283
IC172 TA31136FN
X171 14.395MHz
RSSI
Q178 DTA144EE
CD171
W/N
IC407 TC75W51FU(2/2)
IC406 TC75W51FU
HSDI
AFO
RXAF
IC412 TC75W51FU(1/2)
IC409 TC75W51FU(1/2)
IC408 TC75W51FU(1/2)
IC408 TC75W51FU (2/2)
DAC
IC410 M62364FP
LSDO
BAL
FC
MB
SIDE TONE
Q419 DTC363EU
MUTE SW
AF AMP
IC417 TA7252AP
AM
INV
Q418 DTC114EE
SB
SPI
SPO
PA
HOR
GND
EXT. SP
SP
IC415 Audio processor AQUA-L
X403 3.6864MHz
IC411 LMC7101BIM5
10CL
D702,D703,D709,D710 1SS355,02DZ18(X,Y)
Surge Protect
AUXO1~ AUXO2
D704~D708 D711~D713,D412 DA204U
AUXI/O1~ AUXI/O9
D413,D414 DA204U
RS232 DRIVER
IC416 ADM202EARN
TXD1,RXD1
TXD2,RXD2
Flash ROM IC405 AT29C040A-90TI
EEPROM IC401 AT24256N10SI27
RTC IC402 RV5C386A
X401 32.768kHz
DT,CK,DSTB
A [0:18], RD, WR, CS0
D [0:7]
RTCL/ EEPCL
RTDT/ EEPDAT
INTRA
µ-com
IC404 30625MGP-***GP
DT, CK, PCK, PLE, TXC, RXC, SBC T/R, W/N, DMUTE, RECSRC/SELF, AM, AM2 EMTON, DSTB, APC, HSDO, LSDO, BEEP MM1, MM2 H/L, STSW
AUX I/O1~ AUX I/O9
SPSTB1, SOE, CK, DT
Shift Register IC403 BU4094BCFV
AUXO1 PA HOR SCSW CFSW AUXO2 GSW
ACC 26pin
ACC D-Sub 25pin
OPT3 OPT1
TXD1 RXD1
OPT4 CLK
OPT5 USEL
AGND DGND
AI AO
5E AGND
DTI STON
NC TCTL
OPT2 AUDIH
RXEO TXO
TXI RXEI
8C OPT6

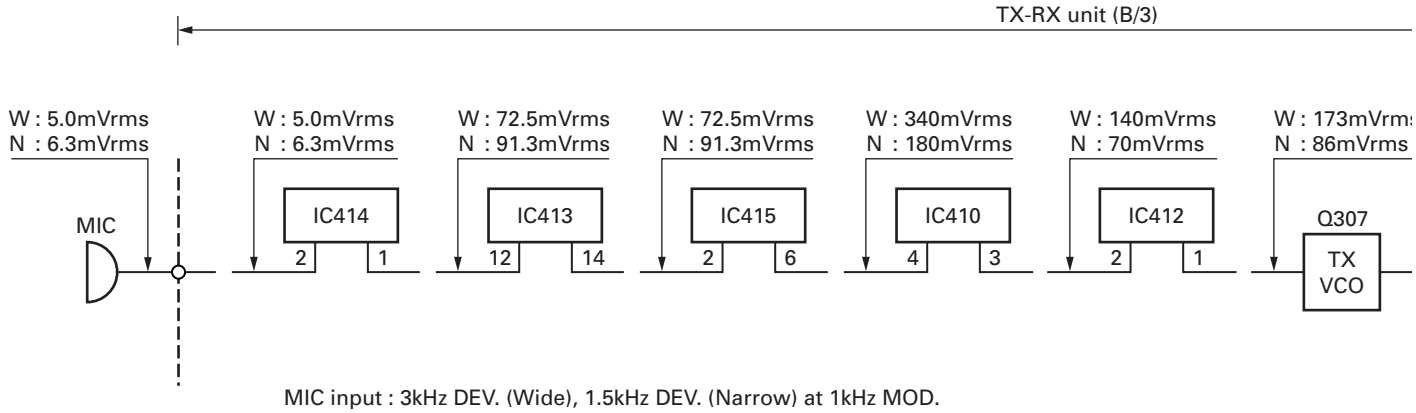
# LEVEL DIAGRAM

## Receiver Section



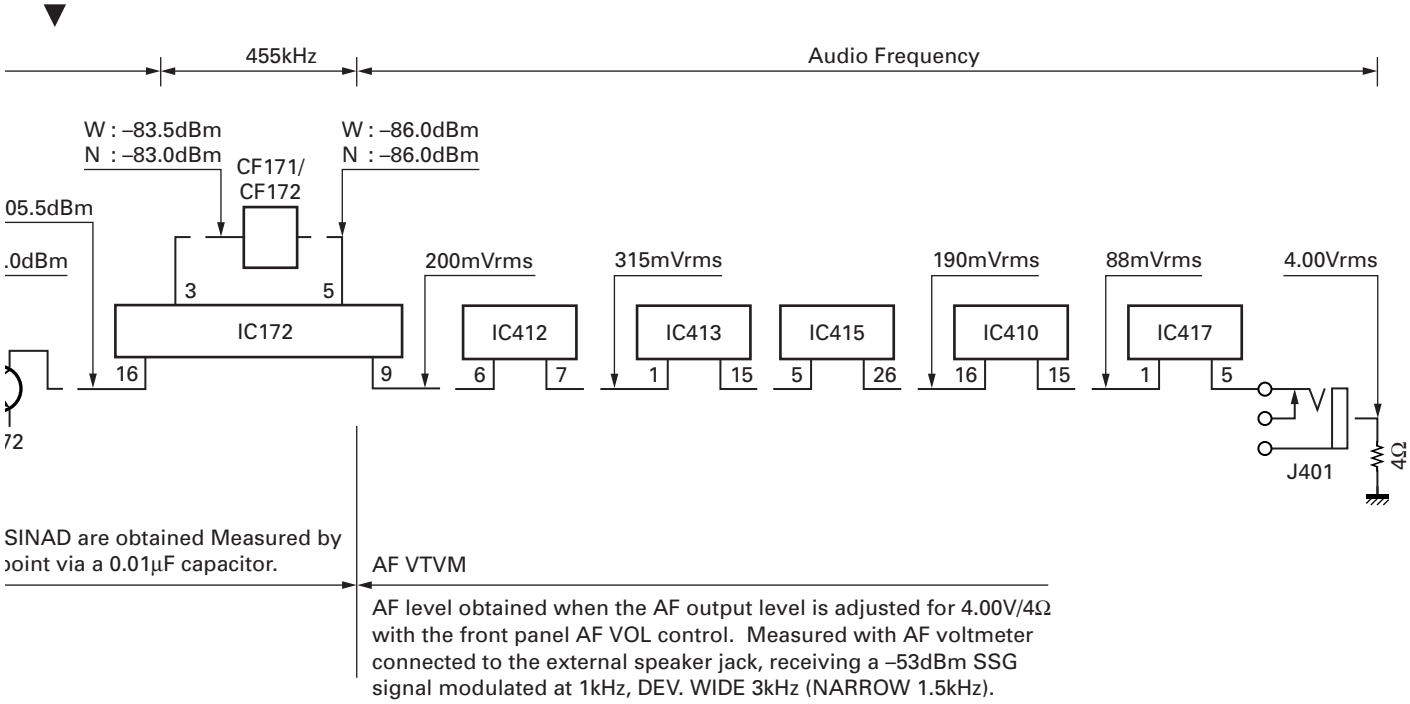

SG input level for 12dB SINAD ar
connecting SG to each point via a

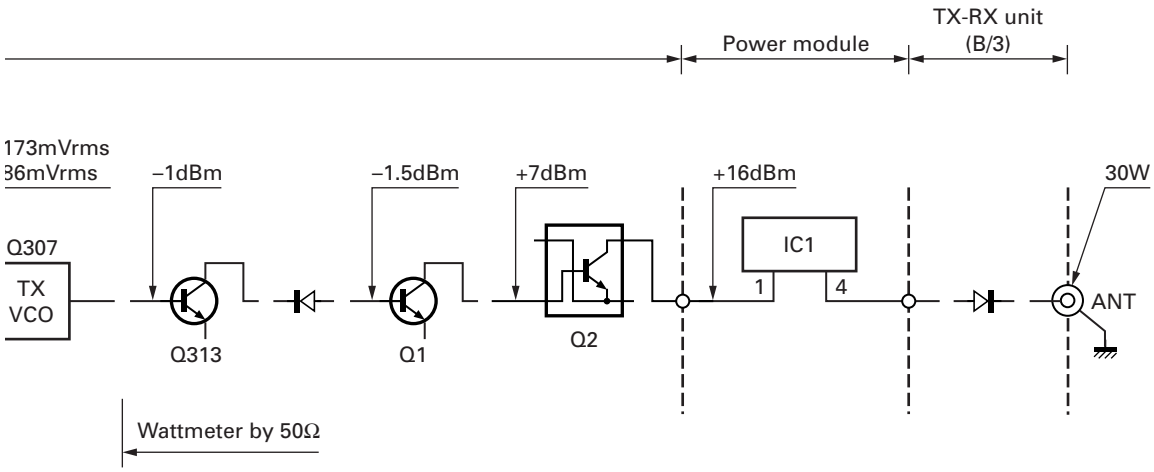
## Transmitter Section




MIC input : 3kHz DEV. (Wide), 1.5kHz DEV. (Narrow) at 1kHz MOD.
Transmitting frequency : Center frequency

# LEVEL DIAGRAM



# OPTIONAL ACCESSORIES: KRK-10 (Control Head Remote Kit: 23ft/7m)

## ■ External View



## ■ Components Description

| Ref. No. | Part Name | Description |
|---|---|---|
| IC1,2 | IC | Buffer amp |
| D2 | Varistor | Current limiter |
| D3~6 | Diode | Surge protect |
| D9~11 | Diode | Surge protect |
| D12~20 | Varistor | Surge protect |

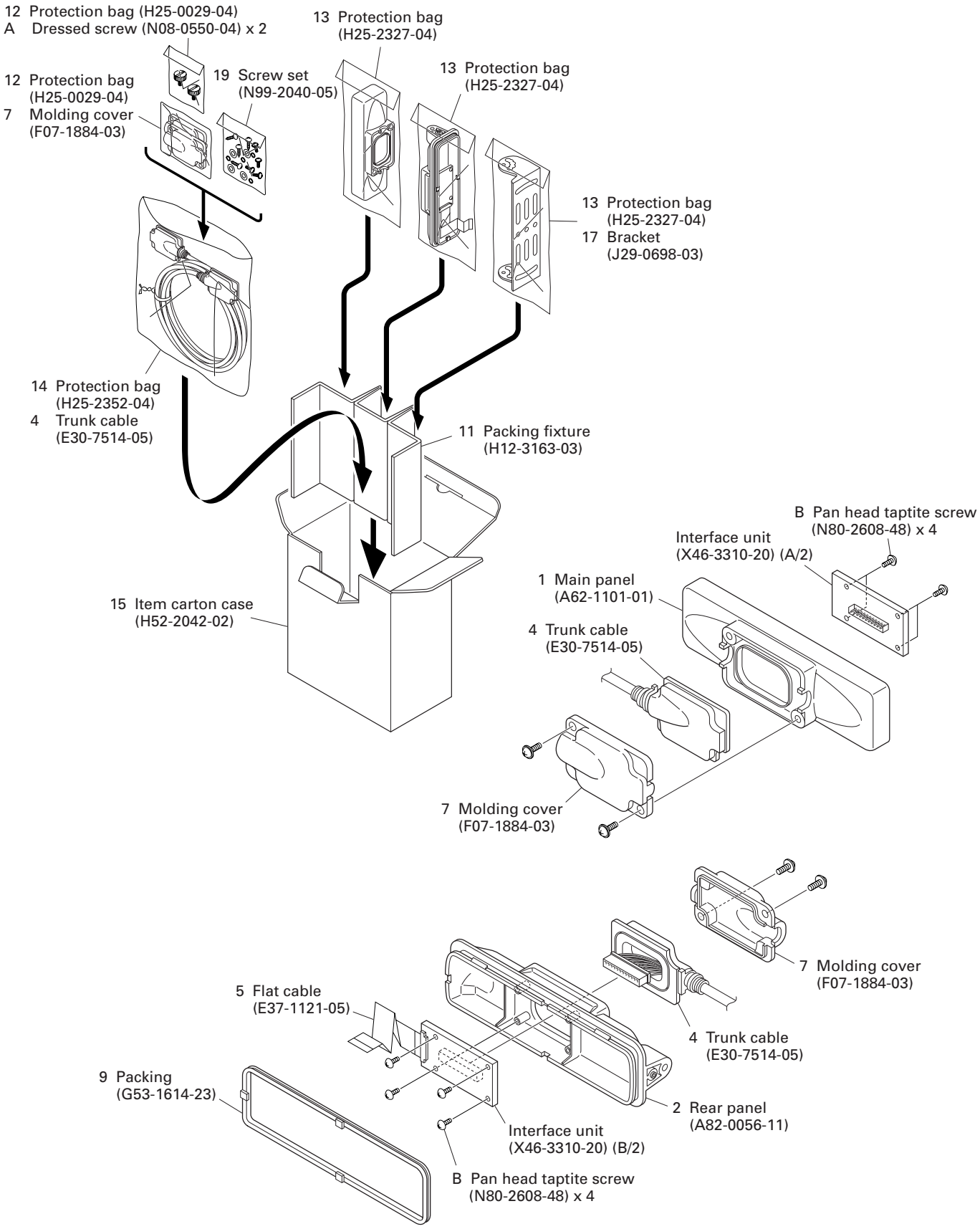
## ■ Parts List

✻ : New Parts

| Ref. No. | Address | New parts | Parts No. | Description |
|---|---|---|---|---|
| **KRK-10** | | | | |
| 1 | | ✻ | A62-1101-01 | MAIN PANEL |
| 2 | | ✻ | A82-0056-11 | REAR PANEL |
| 4 | | ✻ | E30-7514-05 | TRUNK CABLE |
| 5 | | ✻ | E37-1121-05 | FLAT CABLE |
| 7 | | ✻ | F07-1884-03 | MOLDING COVER |
| 9 | | ✻ | G53-1614-23 | PACKING |
| 11 | | ✻ | H12-3163-03 | PACKING FIXTURE |
| 12 | | | H25-0029-04 | PROTECTION BAG (60/110/0.07) |
| 13 | | | H25-2327-04 | PROTECTION BAG (100/250/0.07) |
| 14 | | | H25-2352-04 | PROTECTION BAG (250/350/0.07) |
| 15 | | ✻ | H52-2042-02 | ITEM CARTON CASE |
| 17 | | | J29-0698-03 | BRACKET |
| A | | | N08-0550-04 | DRESSED SCREW |
| B | | ✻ | N80-2608-48 | PAN HEAD TAPTITE SCREW |
| 19 | | ✻ | N99-2040-05 | SCREW SET |
| **INTERFACE UNIT (X46-3310-20)** | | | | |
| C14 | | | CK73GB1H102K | CHIP C 1000PF K |
| C41 | | | CK73GB1H102K | CHIP C 1000PF K |
| CN1 | | | E40-6371-05 | FLAT CABLE CONNECTOR |
| CN2 | | | E40-6412-05 | FLAT CABLE CONNECTOR |
| CN3,4 | | | E40-6377-05 | PIN ASSY |
| L2,3 | | | L40-1091-86 | SMALL FIXED INDUCTOR (1.0UH) |
| L5,6 | | | L40-1091-86 | SMALL FIXED INDUCTOR (1.0UH) |
| R1 | | | RK73GB1J473J | CHIP R 47K J 1/16W |
| D2 | | | MINISMDM075/24 | VARISTOR |
| D3-6 | | | DA204U | DIODE |
| D9-11 | | | DA204U | DIODE |
| D12-20 | | ✻ | AVRM1608080MAA | VARISTOR |
| IC1,2 | | | TC7WT125FU | MOS IC |

# OPTIONAL ACCESSORIES: KRK-10 (Control Head Remote Kit: 23ft/7m)

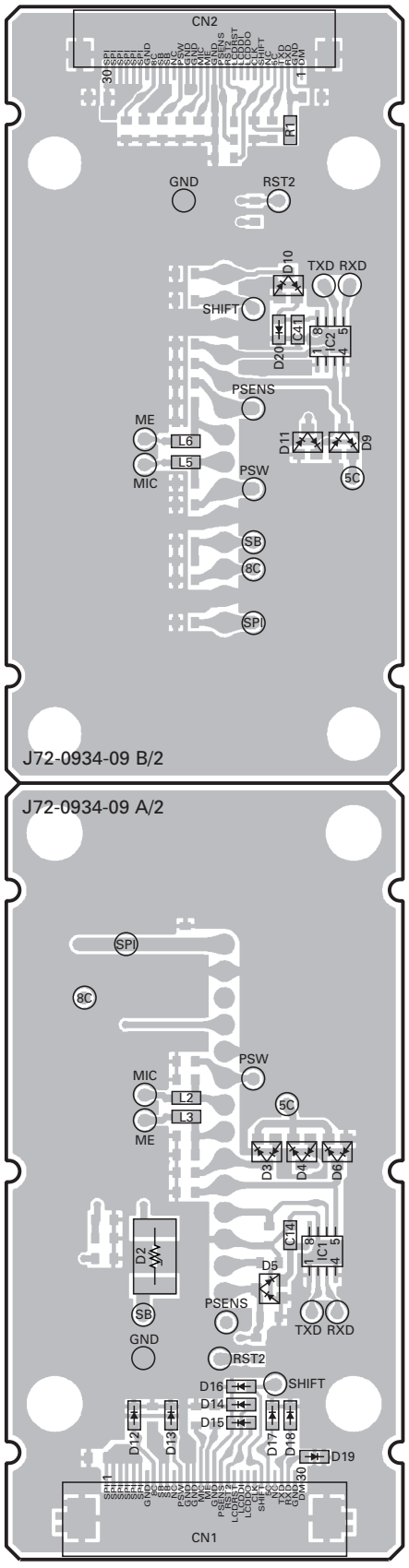
## ■ Exploded View and Packing



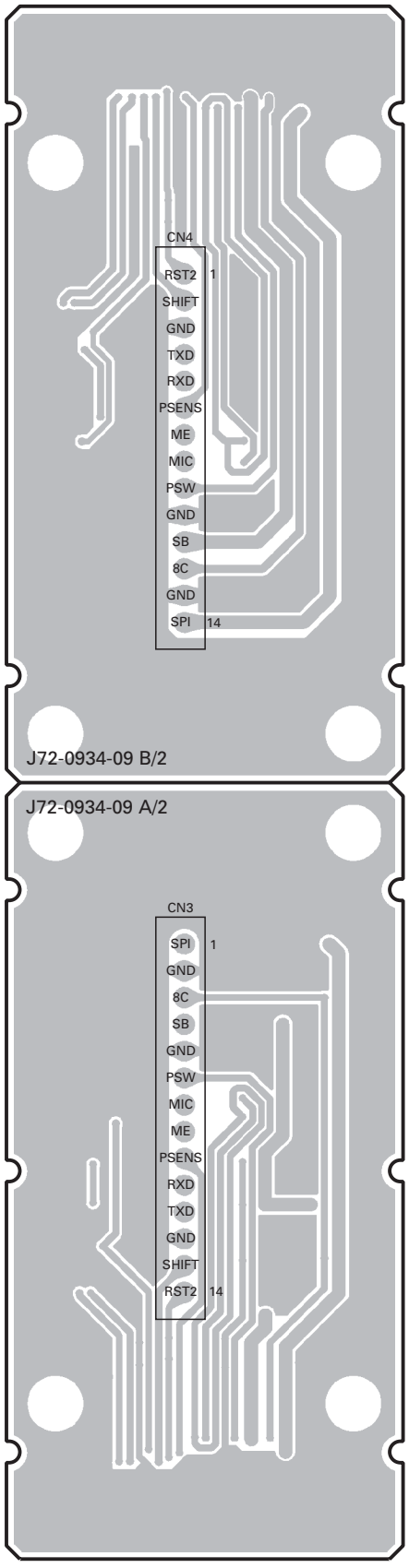
# OPTIONAL ACCESSORIES: KRK-10 (Control Head Remote Kit: 23ft/7m)

## ■ PC Board

### INTERFACE UNIT (X46-3310-20)
### Component side view (J72-0934-09)




### INTERFACE UNIT (X46-3310-20)
### Foil side view (J72-0934-09)



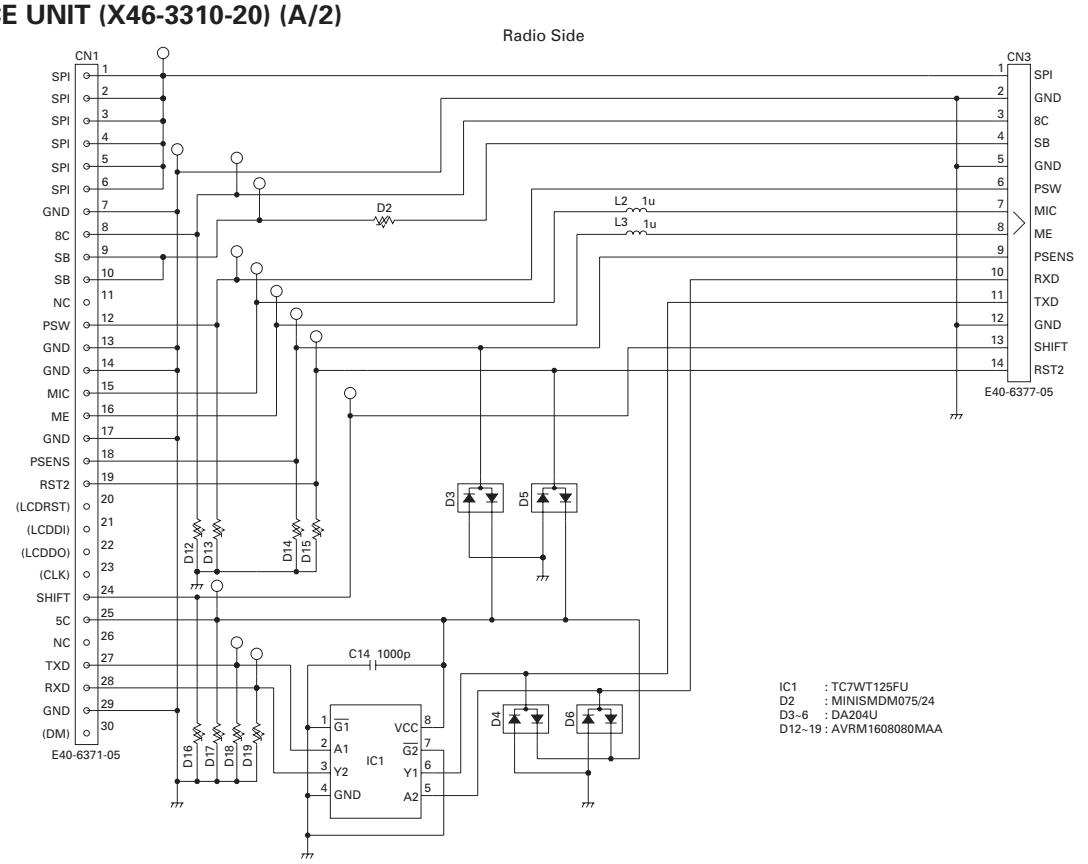

Component side
Layer 1
Layer 2
Foil side

Component side
Layer 1
Layer 2
Foil side

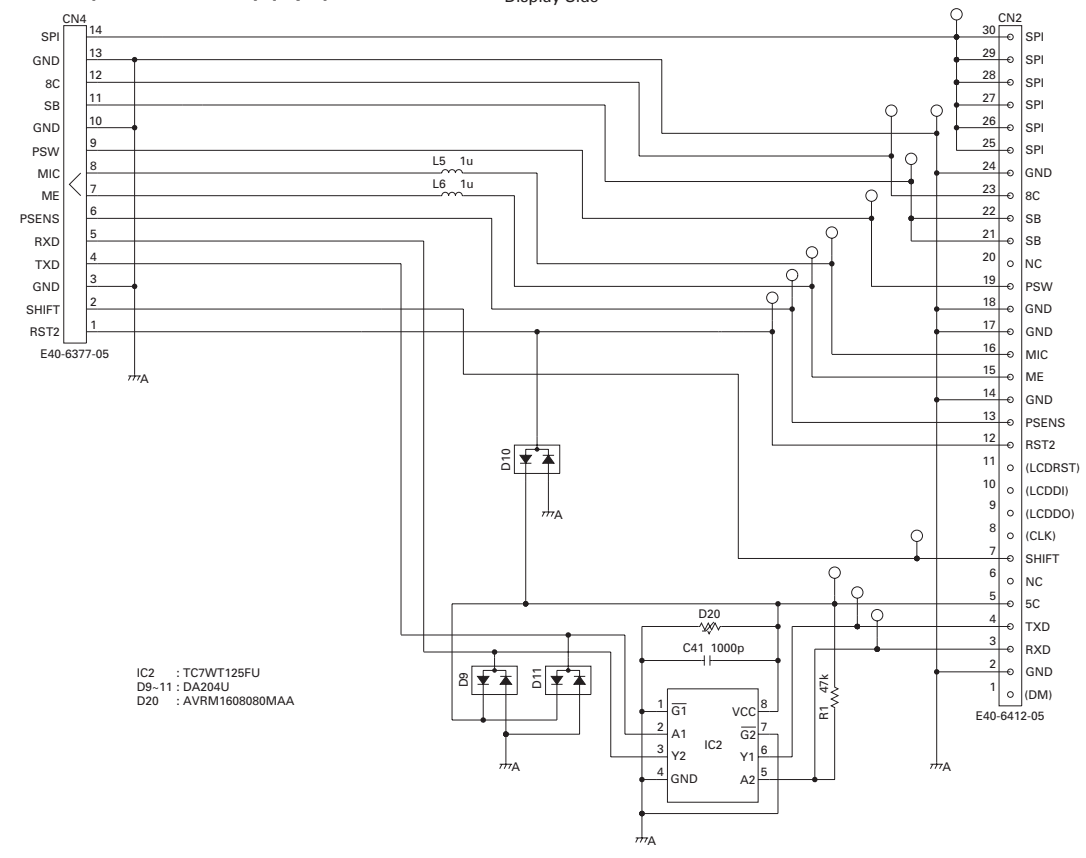
# OPTIONAL ACCESSORIES: KRK-10 (Control Head Remote Kit: 23ft/7m)

## ■ Schematic Diagram

### INTERFACE UNIT (X46-3310-20) (A/2)




### INTERFACE UNIT (X46-3310-20) (B/2)



# OPTIONAL ACCESSORIES: KRK-10 (Control Head Remote Kit: 23ft/7m)

## ■ Terminal Function

| Pin No. | Name | Description |
|---|---|---|
| **CN1 (Radio side)** | | |
| 1 | SPI | Speaker input. |
| 2 | SPI | Speaker input. |
| 3 | SPI | Speaker input. |
| 4 | SPI | Speaker input. |
| 5 | SPI | Speaker input. |
| 6 | SPI | Speaker input. |
| 7 | GND | Ground. |
| 8 | 8C | 8V input. |
| 9 | SB | Power input of switched power supply. |
| 10 | SB | Power input of switched power supply. |
| 11 | NC | - |
| 12 | PSW | Detection signal output of Power switch. |
| 13 | GND | Ground. |
| 14 | GND | Ground. |
| 15 | MIC | MIC signal output. |
| 16 | ME | MIC ground. |
| 17 | GND | Ground. |
| 18 | PSENS | Detection signal output of Display unit. |
| 19 | RST2 | Reset signal input. |
| 20 | (LCDRST) | Reserve. |
| 21 | (LCDDI) | Reserve. |
| 22 | (LCDDO) | Reserve. |
| 23 | (CLK) | Reserve. |
| 24 | SHIFT | Control signal input of Beat-Shift function. |
| 25 | 5C | 5V input. |
| 26 | NC | - |
| 27 | TXD | Serial data signal input. |
| 28 | RXD | Serial data signal output. |
| 29 | GND | Ground. |
| 30 | (DM) | Reserve. |
| **CN2 (Display side)** | | |
| 1 | (DM) | Reserve. |
| 2 | GND | Ground. |
| 3 | RXD | Serial data signal input. |
| 4 | TXD | Serial data signal output. |
| 5 | 5C | 5V input. |
| 6 | NC | - |
| 7 | SHIFT | Control signal output of Beet-Shift function. |
| 8 | (CLK) | Reserve. |
| 9 | (LCDDO) | Reserve. |
| 10 | (LCDDI) | Reserve. |
| 11 | (LCDRST) | Reserve. |
| 12 | RST2 | Reset signal output. |
| 13 | PSENS | Detection signal input of Display unit. |
| 14 | GND | Ground. |

| Pin No. | Name | Description |
|---|---|---|
| 15 | ME | MIC ground. |
| 16 | MIC | MIC signal input. |
| 17 | GND | Ground. |
| 18 | GND | Ground. |
| 19 | PSW | Detection signal input of Power switch. |
| 20 | NC | - |
| 21 | SB | Power output of switched power supply. |
| 22 | SB | Power output of switched power supply. |
| 23 | 8C | 8V output. |
| 24 | GND | Ground. |
| 25 | SPI | Speaker output. |
| 26 | SPI | Speaker output. |
| 27 | SPI | Speaker output. |
| 28 | SPI | Speaker output. |
| 29 | SPI | Speaker output. |
| 30 | SPI | Speaker output. |
| **CN3 (Radio side)** | | |
| 1 | SPI | Speaker output. |
| 2 | GND | Ground. |
| 3 | 8C | 8V output. |
| 4 | SB | Power output of switched power supply. |
| 5 | GND | Ground. |
| 6 | PSW | Detection signal input of Power switch. |
| 7 | MIC | MIC signal input. |
| 8 | ME | MIC ground. |
| 9 | PSENS | Detection signal input of Display unit. |
| 10 | RXD | Serial data signal input. |
| 11 | TXD | Serial data signal output. |
| 12 | GND | Ground. |
| 13 | SHIFT | Control signal output of Beat-Shift function. |
| 14 | RST2 | Reset signal output. |
| **CN4 (Display side)** | | |
| 1 | RST2 | Reset signal input. |
| 2 | SHIFT | Control signal input of Beat-Shift function. |
| 3 | GND | Ground. |
| 4 | TXD | Serial data signal input. |
| 5 | RXD | Serial data signal output. |
| 6 | PSENS | Detection signal output of Display unit. |
| 7 | ME | MIC ground. |
| 8 | MIC | MIC signal output. |
| 9 | PSW | Detection signal output of Power switch. |
| 10 | GND | Ground. |
| 11 | SB | Power input of switched power supply. |
| 12 | 8C | 8V input. |
| 13 | GND | Ground. |
| 14 | SPI | Speaker input. |

# OPTIONAL ACCESSORIES

### KAP-2 (Horn Alert/P.A. Relay Unit)

■ External View



### KMC-35 (Microphone)

■ External View



### KMC-36 (Keypad Microphone)

■ External View



### KCT-40 (Radio Interface Cable)

■ External View



### KCT-46 (Ignition Sense Cable)

■ External View



# TK-7180

## SPECIFICATIONS

### GENERAL

| | |
|---|---|
| Frequency range | 136~174MHz |
| Number of channels | Zone : Max. 128 per radio Ch/GID : Max. 250 per zone (Max. 512 [Conv. Ch's + GID's] total per radio) |
| Channel spacing | Wide : 25, 30kHz Narrow : 12.5, 15kHz |
| Operating voltage | 13.6V DC ±15% |
| Current drain | |
| Standby | 0.4A |
| Receive | 1.0A |
| Transmit | 9.0A |
| Duty cycle | Transmit : 20% |
| Operating temperature range | –22°F~+140°F (–30°C~+60°C) |
| Frequency stability | ±0.00025% (–22°F~+140°F) |
| Antenna impedance | 50Ω |
| Channel frequency spread | 38MHz |
| Dimensions (W x H x D) (Projections not included) | 6-5/16 x 1-3/4 x 6-3/16 in. (160 x 45 x 157 mm) |
| Weight (net) | 3.31lbs. (1.5kg) |

### RECEIVER (Measurements made per EIA/TIA-603)

| | |
|---|---|
| Sensitivity (12dB SINAD) | Wide : 0.25μV Narrow : 0.28μV |
| Selectivity | Wide : 80dB Narrow : 70dB |
| Intermodulation distortion | W/N : 75dB (±50, 100kHz) |
| Spurious response | 90dB |
| Audio output (4Ω impedance) | 4W with less than 5% distortion |

### TRANSMITTER (Measurements made per EIA/TIA-603)

| | |
|---|---|
| RF power output | 30 to 1W |
| Spurious response | 70dB |
| Type of emission | Wide : 16K0F3E Narrow : 11K0F3E |
| FM hum & noise | Wide : 50dB Narrow : 45dB |
| Audio distortion | W/N : 3% |
| Microphone impedance | 600Ω |


KENWOOD CORPORATION
2967-3, Ishikawa-machi, Hachioji-shi, Tokyo, 192-8525 Japan

KENWOOD U.S.A. CORPORATION
P.O. BOX 22745, 2201 East Dominguez Street, Long Beach, CA 90801-5745, U.S.A.

KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

KENWOOD ELECTRONICS DEUTSCHLAND GMBH
Rembrücker Str. 15, 63150 Heusenstamm, Germany

KENWOOD ELECTRONICS BELGIUM N.V.
Leuvensesteenweg 248 J, 1800 Vilvoorde, Belgium

KENWOOD ELECTRONICS FRANCE S.A.
13, Boulevard Ney, 75018 Paris, France

KENWOOD ELECTRONICS U.K. LIMITED
KENWOOD House, Dwight Road, Watford, Herts., WD18 9EB United Kingdom

KENWOOD ELECTRONICS EUROPE B.V.
Amsterdamseweg 37, 1422 AC Uithoorn, The Netherlands

KENWOOD ELECTRONICS ITALIA S.p.A.
Via G. Sirtori, 7/9 20129 Milano, Italy

KENWOOD IBERICA S.A.
Bolivia, 239-08020 Barcelona, Spain

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(A.C.N. 001 499 074)
16 Giffnock Avenue, Centrecourt Estate, North Ryde, N.S.W. 2113 Australia

KENWOOD ELECTRONICS (HONG KONG) LTD.
Unit 3712-3724, Level 37, Tower one Metroplaza, 223 Hing Fong Road, Kwai Fong, N.T., Hong Kong

KENWOOD ELECTRONICS SINGAPORE PTE LTD.
1 Genting Lane #07-00 Kenwood Building, Singapore 349544



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