

TK-730(G)/(GB)

SERVICE MANUAL

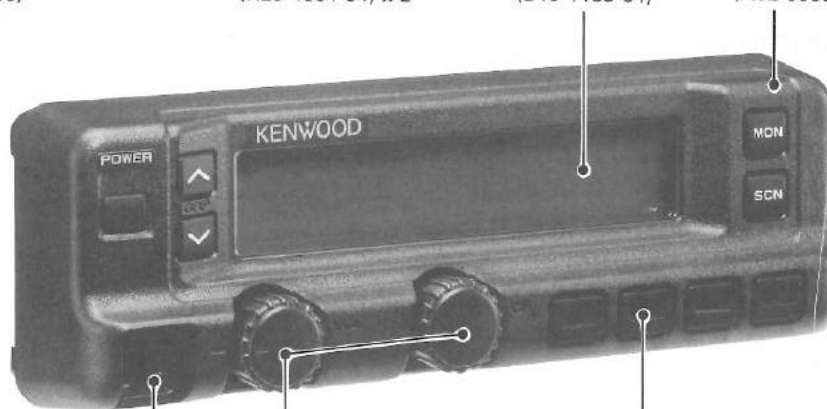
KENWOOD

© 1996-6 PRINTED IN JAPAN
B51-8338-00 (N) 1211Frame
(A10-1318-01)Key top
(K29-4663-02)Front glass
(B10-1162-14)Case (Upper)
(A01-2020-01)**Photo is TK-730(G).
Display unit is not
supplied for TK-730(GB).**

TK-730(G)

Case (Lower)
(A01-2021-01)Rectangular receptacle (MIC)
(E08-0673-05)Knob (VOL, CH)
(K29-4664-04) x 2Panel
(A62-0063-03)Key top
(K29-4663-02)Front glass
(B10-1162-04)Panel
(A62-0063-03)

KCH-3

Rectangular receptacle (MIC)
(E08-0673-05)Knob (VOL, CH)
(K29-4664-04) x 2Front glass
(B10-1163-04)Panel
(A62-0066-03)

KCH-4

Rectangular receptacle (MIC)
(E08-0673-05)Knob (VOL, CH)
(K29-4664-04) x 2Key top
(K29-4666-02)

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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 the publication data. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions. These 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, or 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.

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

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

TYPE NUMBERS

Type acceptance number	Frequency range
ALHTK-730G-1	150~174MHz
ALHTK-730G-2	136~156MHz

GENERAL

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. QT 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.

CAUTION

If DC power is to be controlled by the vehicle ignition switch, a switching relay should be used to switch the positive power lead. The vehicle ignition switch then controls DC to the relay coil.

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.

SERVICE

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

SYSTEM SET-UP

Before Reading About System Set-up

The TK-730(GB) is a transceiver main unit (without a panel or speaker) that you complete by adding options.

See the list of options for the options available (page 7). The options are classified into four types according to operation and function.

1. Install the front panel kit (controller) directly on a radio to operate it. (Form : Radio + KCH-3/4)
2. Remotely control one radio with one controller. (Form : Radio + KRK-2 + KCH-3/4 + KCT-12A/B/C)
3. Remotely control two radios with one controller. (Form : Radios (two) + KRK-4DB + KCH-3/4 + KCT-12A/B/C)
4. Remotely control one radio with two controllers. (Form : Radio + KRK-3DH + KCH-3/4 (two) + KCT-12A/B/C (two))

If you use the KCH-4, an external speaker (KES-4) is required because the radio does not contain a speaker. The basic configurations are illustrated in system set-up.

Note : When you modify your radio as described in system set-up, take the following precaution. The rating of pin 7 (SB) of the accessory connector (J4) on the rear of the radio is 13.6V (1A). Insert a 1A fuse if you use the SB pin for external equipment.

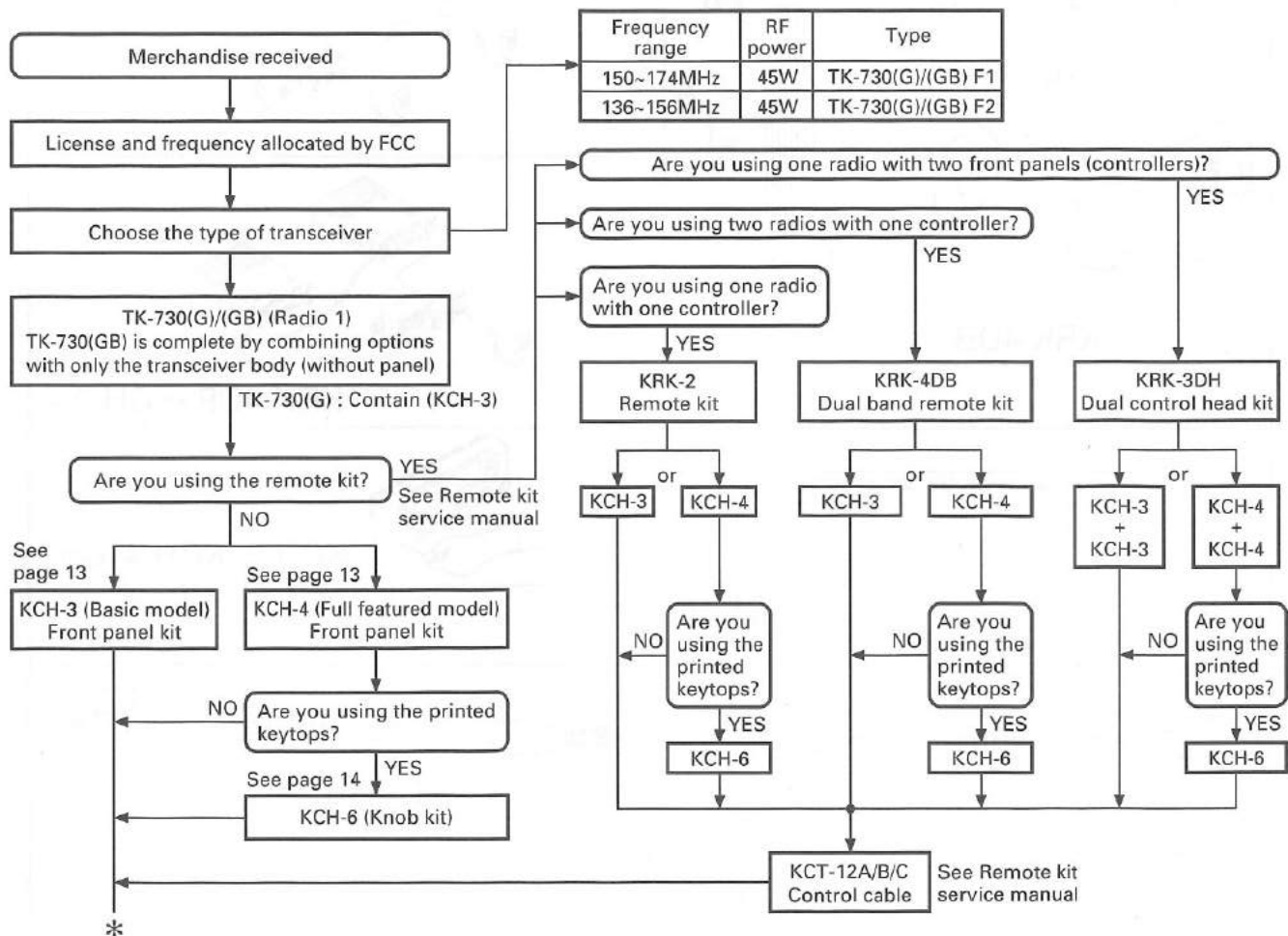
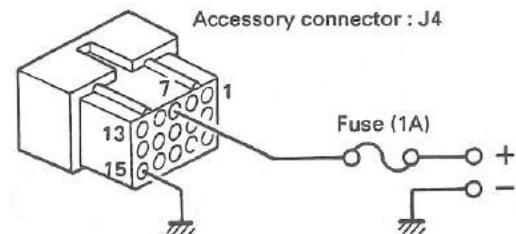
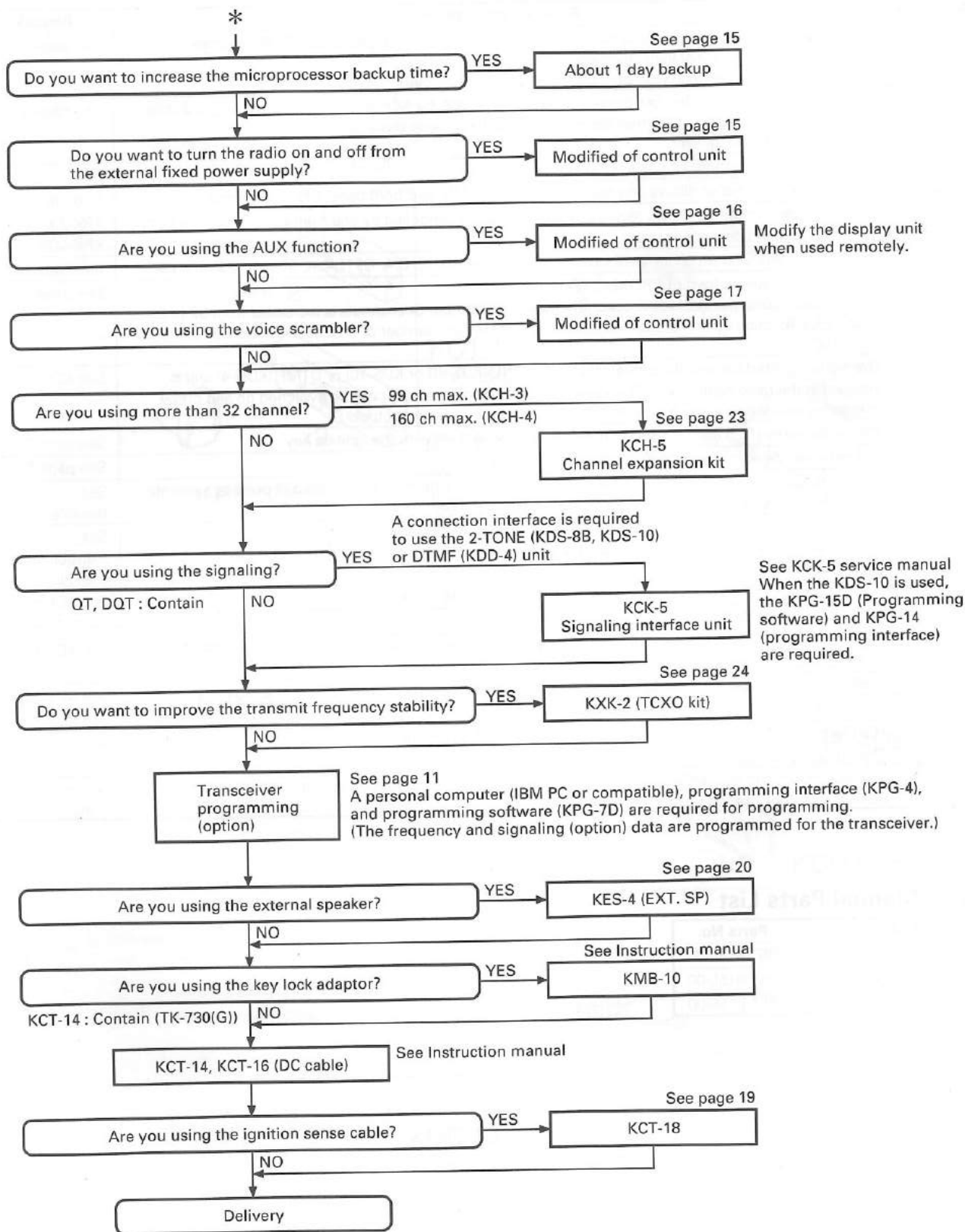


Table showing combinations of dual bands

Radio 1 \ Radio 2	TK-830 series	TK-730 series	TK-630H(B)
TK-830 series	X	○	○
TK-730 series	○	X	○
TK-630H(B)	○	○	X

○ : Can be combined, X : Cannot be combined

SYSTEM SET-UP



LIST OF OPTIONAL MODELS

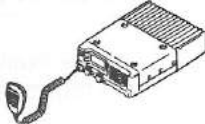
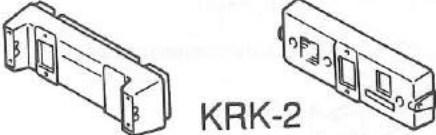
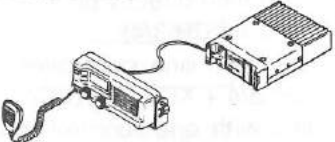
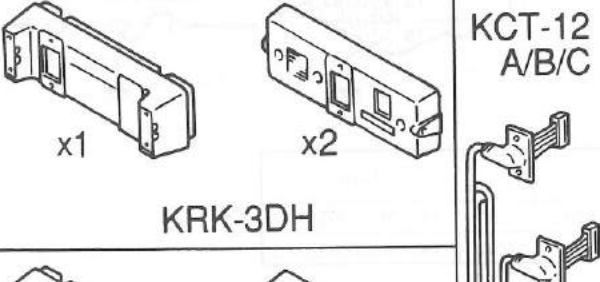
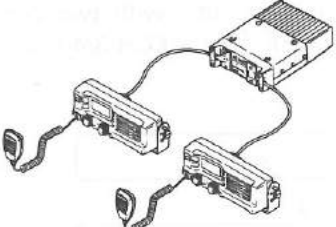
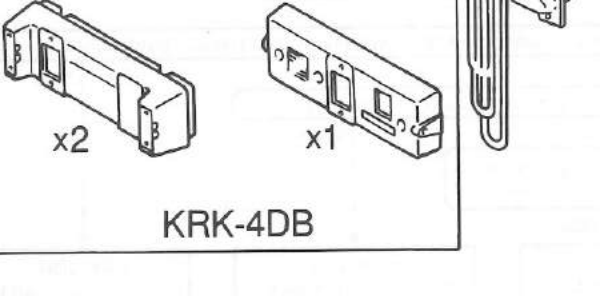
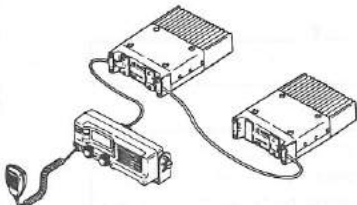
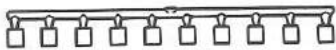
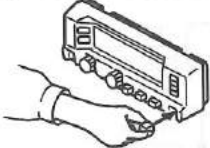
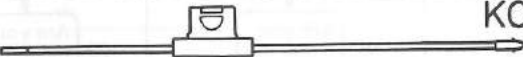
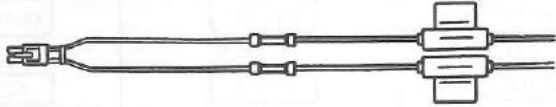
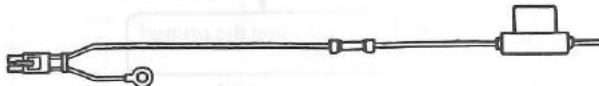
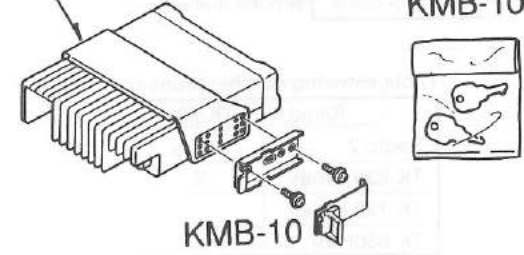
Model	Function description	Remarks
KCH-3	The front panel kit (controller) contains a speaker (5W/8Ω), and can display up to 99 alphanumeric characters if a KCH-5 is installed (normally, it displays 32 channels). The channel display and alphanumeric display show two characters. Contain (TK-730(G))	See page 13
KCH-4	The front panel kit (controller) can display up to 160 channels if a KCH-5 is installed (normally, it displays 32 channels). It has a large LCD that can display 12 alphanumeric characters. It does not contain a speaker.	See page 13
KRK-2	This single-control remote kit has a removable front panel.	See
KRK-3DH	This dual-control head kit allows one radio to be controlled by two front panel kits (controllers).	Remote kit
KRK-4DB	This dual-band remote kit allows two radios (1 and 2) to be controlled by one front panel kit (controller). It allows two-band dual priority scan.	KRK-2/KRK-3DH KRK-4DB
KCH-6	KCH-4 keytop set. One set contains 12 keytops (PA, TA, HA, AN, IC, D/A, OPT, AUX, SP, HC, SQL and blank).	See page 14
KCH-5	Channel expansion kit (two EEPROMs : X24C16PI). When a basic controller (KCH-3) is used, the maximum number of channels is increased from 32 to 99. When a full-function controller (KCH-4) is used, the maximum number of channels is increased from 32 to 160.	See page 23
KCK-5	The signaling interface unit for connecting the 2-TONE (KDS-8B or KDS-10) or DTMF (KDD-4) unit is installed in the radio control unit. The externally connected equipment can be switched on and off by energizing and deenergizing the relay in the KCK-5 by the signaling output.	See KCK-5
KCT-18	The sense cable (10.5 feet) is used to turn the radio on and off with the ignition key.	See page 19
KES-4	The external speaker has a maximum input of 20W/4Ω.	See page 20
KCT-12A /12B/12C	The control cable is used to connect the radio and the control head when the radio is used as a remote mount. KCT-12A : 8 feet, KCT-12B : 17 feet, KCT-12C : 25 feet	See Remote kit
KCT-14/16	KCT-14 : DC cable (10 feet) for TK-830/730 series, (mid-power) system dash mounting. KCT-15 : DC cable (23 feet; ground side : 3.3 feet) for TK-830/730 series, (mid-power) system remote mounting.	See Instruction manual
KDS-8B	2-TONE decoder. The tone frequency can be in the range 288 to 1433Hz.	See KCK-5
KDD-4	Code memory (EEPROM). (DTMF decoder)	See KCK-5
KDS-10	2-TONE frequency memory (EEPROM). The tone frequency can be set in the range 282.2 to 3487.0Hz in 0.1Hz steps.	See KDS-10
KPG-15D	Programming disk used to program the KDS-10 (2-TONE decoder).	See KDS-10
KPG-14	Programming interface used for the KDS-10.	See KDS-10
KXX-2	TCXO kit (12.8MHz ± 2ppm). Replace it with X302 of the radio TX-RX unit. This kit cannot be used for the TK-630H(B).	See page 24
KMB-10	Key-lock mount can be installed on the KMB-5 mounting bracket for the medium-power model to prevent unauthorized removal.	See Instruction manual

Service Manual Parts List

Model	Parts No.
KRK-2/KRK-3DH/KRK-4DB	B51-8154-00
KCK-5	B51-8155-00
KDS-10	B51-8156-00

TK-730(G)/(GB)

ACCESSORY & CONNECTION

ACCESSORY	CONNECTION
 KCH-3 KCH-4	
 KRK-2	 KRK-2+KCH-3/4
 x1 x2 KRK-3DH KCT-12 A/B/C	 KRK-3DH+KCH-3/4
 x2 x1 KRK-4DB	 KRK-4DB+KCH-3/4
 KCH-6	 KCH-6+KCH-4 only
 KCT-18	
 KCT-14	 KCT-16
 KMB-5 KMB-10 KMB-10	

OPERATING FEATURES

1. Scan Operating

1-1. Scan types according to operation section (control head: KCH-3/4)

1. When you use the KCH-3 (basic), you can scan all the channels that can be selected with the channel selector.
2. When you use the KCH-4 (full featured), you can select one of the following two scan types using the programming software (KPG-7D).
 - 2-1. Single group scan : You can scan all the channels in the displayed group that can be selected with the channel selector.
 - 2-2. Multi-group scan : You can scan all the channels that can be selected with the group UP/DOWN key and the channel selector.

1-2. Scan start conditions

One or more non-priority channels must be added to all the channels that can be scanned. The transceiver must be in normal receive mode (PTT off, and microphone onhook. However, if OFF HOOK SCAN = YES, the scan starts whether the microphone is onhook or offhook.). When you press and release the SCAN key, the scan starts. The **[SCAN]** indicator lights when you use the KCH-3 (basic), and the **[SCAN]** indicator lights when you use the KCH-4 (full featured).

1-3. Scan stop conditions

The scan stops temporarily if the following conditions are satisfied :

1. A carrier is detected (the **[BUSY]** indicator lights) on channels for which receive signaling is not set by the programming software (KPG-7D) or when the **[MON]** indicator lights.
2. A carrier is detected, then signaling matches on channels for which receive signaling is set by the programming software.

1-4. Scan channel types

1. Priority channel 1 is the most important channel for the scan, and always detects a signal during scan and when the scan stops temporarily.
2. Priority channel 2 is the next most important channel for the scan, and always detects a signal during scan and when the scan stops temporarily at a channel other than priority channel 1.
3. Non-priority channels detect a signal during scan. For the channels that can be selected with the group or channel selector when the scan does not occur, ▼ (CH ADD) lights for the KCH-3 (basic), and ▼ (GR ADD) and ▼ (CH ADD) light for the KCH-4 (full featured).

1-5. Priority channel setting

Priority channels 1 and 2 can be set as follows with the programming software (KPG-7D) :

1. Specify priority channels 1 and 2 as fixed priority channels.
2. Make selected channels priority channels.
3. Operator selectable; specify the initial channel before the operator changes it.

1-6. Scan types according to the number of priority channels

1. When no priority channels are set : Only the non-priority channels are scanned. If a non-priority channel stops temporarily, it stops until there is no signal on that channel.
2. When one priority channel is set : Either priority channel 1 or 2 is scanned. If a non-priority channel stops temporarily, a priority channel signal is detected at certain intervals. If a priority channel stops temporarily, it stops until there is no signal on the priority channel.
3. When two priority channels are set : The non-priority channel, priority channel 1 and 2 are scanned. If a non-priority channel stops temporarily, priority channel 1 and 2 signals are detected at certain intervals. If priority channel 2 stops temporarily, the priority channel 1 signal is detected at certain intervals. If priority channel 1 stops temporarily, it stops until there is no signal on priority channel 1.

1-7. Revert channel

The revert channel is used to transmit during scanning and set by the programming software (KPG-7D).

1. Priority 1 *
2. Priority 2 *
3. Selected channel : Channel displayed immediately before you operate the SCAN switch under the above scan start conditions.
4. Last-used channel : Channel at which the transceiver user pressed PTT just before he set the transceiver offhook.
5. Last call channel : Channel at which the user canceled the AF mute, except beep and alert, just before he set the transceiver offhook.

There are two cases for moving to the revert channel according to the setting.

(1) Off hook scan = No

Move to the revert channel when the microphone is set offhook.

(2) Off hook scan = Yes

Move to the revert channel by the PTT is pressed, regardless whether the microphone is onhook or offhook.

* If priority channel 1 or 2 is not set by the programming software (KPG-7D) or if the transceiver user deletes (the ▼ indicator lights), the channel shifts to the selected channel, last-used channel, or last call channel, and stops temporarily.

TK-730(G)/(GB)

OPERATING FEATURES

10. Dual Head Special Function (When the KRK-3DH is Used)

See the KRK-3DH service manual for the assembly method.

10-1. Intercom function

The intercom function enables you to make conversation between control head 1 and control head 2. The transceiver does not enter the transmit mode when you use this function. You can talk in simplex mode.

When you press and release the key set as the IC (intercom) key by the programming software (KPG-7D), the KCH-3 (basic) shows IC, and the KCH-4 (full featured) shows **INTERCOM** to indicate that you can talk. If you press PTT and talk into the microphone, your voice is output from the speaker of the other control head. The speaker volume can be adjusted with the AF VR on the other operation section (panel).

10-2. Transmit audio monitor function

You can set this function on and off with the programming software (KPG-7D).

If you set it off, and you press PTT on control head 1 or 2, your voice is transmitted when you talk into the microphone, but it is not output from the speaker of control head 2 or 1 to prevent howling.

If you set it on, your voice is transmitted and output from the speaker of the other control head. The contents of the transmission are heard, and you can understand what is being said.

11. Data Writing Method

11-1. PC programming method

• Preparation

Install optional front panel kit KCH-3 or KCH-4 (see Installation 1), and do as follows :

KCH-3 : Contain (TK-730(G))

• Preface

The TK-730(G)/(GB) transceiver is programmed by using a personal computer, programming interface (KPG-4), and programming software (KPG-7D).

The programming software can be used with an IBM PC or compatible. Figure 2 shows the setup of an IBM PC for programming.

• KPG-4 description

(P.C. programming interface cable : Option)

The KPG-4 is required to interface the TK-730(G)/(GB) 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-4 connects the front panel modular microphone connector of the TK-730(G)/(GB) to the computer RS-232C serial port.

• Programming software description

The KPG-7D is the programming software for the TK-730(G)/(GB) supplied on a 5.25" and 3.5" floppy disk.

This software runs under MS-DOS (Version 3.1 or later) on an IBM-PC/XT, AT, or PS2, or compatible. Data can be input to or read from the TK-730(G)/(GB) and edited on the screen, and programmed data can be printed.

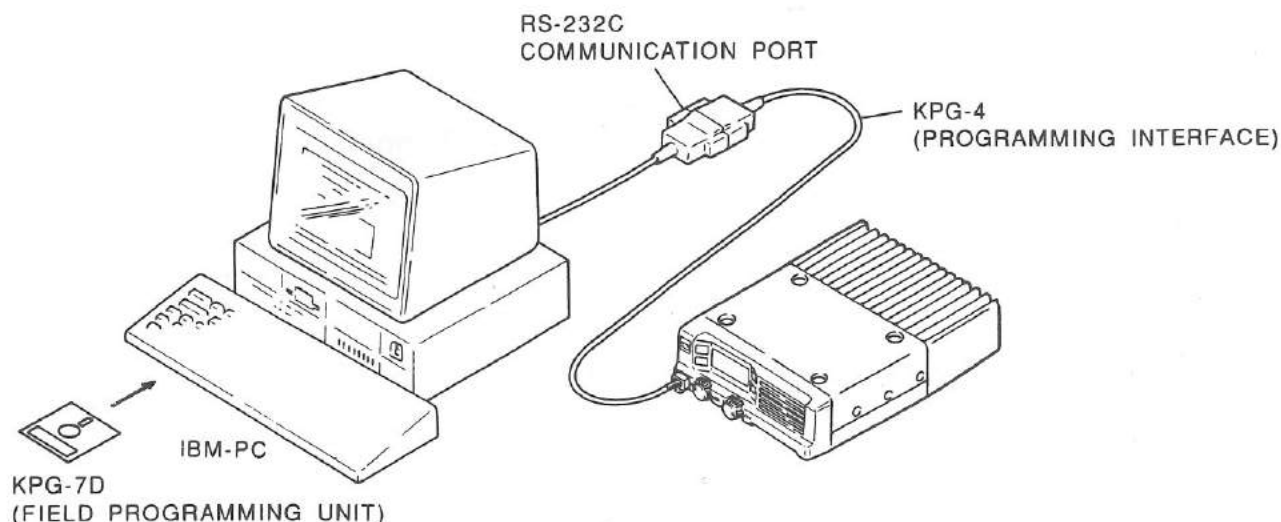


Fig. 2

TK-730(G)/(GB)

OPERATING FEATURES

• Program mode

After you finish preparatory, you can write data into the EEPROM of the radio (TK-730(G)/(GB)).

The KCH-3 can associate the optional functions with the four switches (MON, SCN, OPT (KEY1), and D/A (KEY2)) using the PC program.

The KCH-4 can associate the optional functions with the six switches (MON, SCN, KEY1 to KEY4).

For example, you can assign a function to KEY1 as follows when you assign functions to the KCH-3/4 switches (MON, SCN, KEY1 to KEY4) :

Note : See page 13 for the LCD readout and error messages.

1. Hold down the KEY1 key (until "PG" (basic) or "PROGRAM" (full featured) appears), and switch the radio on. (See Figure 3-a and 3-b.)
2. "PG" (KCH-3) or "PROGRAM" (KCH-4) appears on the display. Release the KEY1 key.
3. Transfer the data stored in the PC. The data is written into the EEPROM of the radio.

Notes :

If dual control is used (KRK-3DH is used), use the HEADER of HEAD1. ("TO CONTROL HEAD1" is shown on the rear of the KRK-3DH.)

If dual band is used (KRK-4DB is used), supply power to radios 1 and 2.

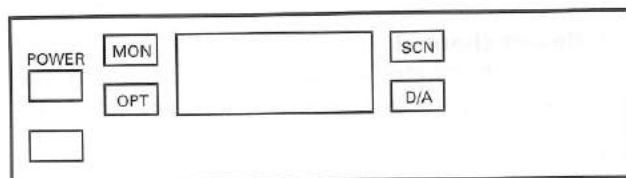


Fig. 3-a KCH-3 (basic) functions

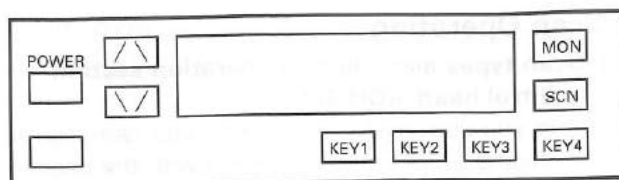


Fig. 3-b KCH-4 (full) functions

11-2. Writing by the clone function

Programming data can be transferred from one radio to another by connecting them at their microphone connectors. (The two radios must be of the same model to use this function.) The operation is as follows (the transmit radio is the master unit and the receive radio is a slave unit) :

1. Hold down the KEY1 key (until "PG" (KCH-3) or "PROGRAM" (KCH-4) appears), and switch the master and slave units on. (See Figure 3-a and 3-b.)
2. Connect the master and slave units with a microphone cable. (See Figure 4.)
3. Hold down the **MON** key on the master unit. Hold it down until "CL" (KCH-3) or "CLONE" (KCH-4) appears on the display.
4. Press the **SCN** key.
5. The display shows "MAX → 3 → 2 → 1 → EN" (KCH-3) or "MAX → 3K → 2K → 1K → END" (KCH-4). When EN or END appears, writing is complete.

Notes :

See page 13 for the LCD read out and error messages. If dual control is used (KRK-3DH is used), use the HEADER of HEAD1 for cloning. ("TO CONTROL HEAD1" is shown on the rear of the KRK-3DH.)

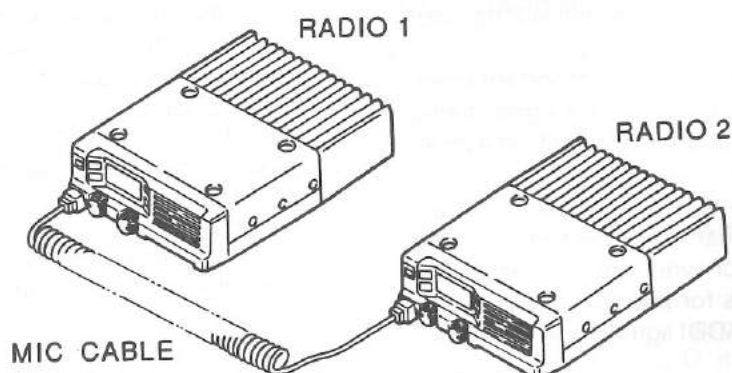


Fig. 4

OPERATING FEATURES / INSTALLATION

11-3. LCD readout examples (program mode)

Status	When KCH-3 is used	When KCH-4 is used
Program mode readout	PG	__PROGRAM__
Clone master unit readout	CL	__CLONE__
Data transfer readout (remaining quantity readout)	20 _1	__WAIT__32K_ __WAIT__1K_
Data transfer start readout	EX	__EXECUTION__
Data transfer end readout	EN	__END__
Error message (*1)	ER	__ERROR__
Error message (*2)	E1	CH_OFFLINE__
Error message (*3)	E2	__MISMATCH__
Error message (*4)	E3	CAN'T_WRITE__

Readout examples in program mode

• Description of error messages

(*2, *3, and *4 are displayed only on the master unit during cloning.)

*1 : ER (ERROR)

PC programming error readout
Slave unit error readout during cloning

*2 : E1 (CH OFFLINE)

Master unit error readout during cloning ; The data line is not connected. (Cable connector error, broken cable, etc.)

*3 : E2 (MISMATCH)

Master unit error readout during cloning ; The model name is different.

*4 : E3 (CAN'T WRITE)

Master unit error readout during cloning ; Cannot write due to a cause not given by 2 and 3 (defective EEPROM, etc.)

1. Front Panel Kit (KCH-3, KCH-4)

1-1. Connection with TK-730(GB)

1. Remove the upper and lower halves of the case of the TK-730(GB). (Remove the four screws from the upper half and the four screws from the lower half.)
2. Connect the lead (W105) with a connector of the control unit (X57-5050 A/4) to CN2 of the KCH-3 or KCH-4.
3. Install the KCH-3 or KCH-4 on the radio using the screws (N32-3006-46) (1) supplied with the front panel kit. Take care not to get the lead between the KCH-3 or KCH-4 and an edge of the case. (You can install the panel upside down if necessary to install the radio.)
4. Reinstall the upper and lower halves of the case.
5. Connection the short plug (P1) for the accessory connector (15-pin, J4) on the rear of the radio.

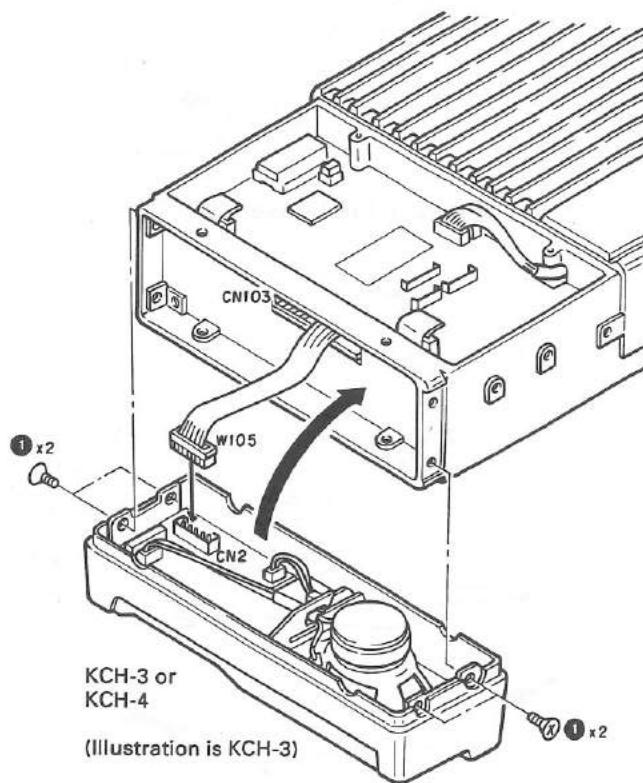


Fig. 1

INSTALLATION

6. Insert the supplied knobs (with no functions printed) or optional KCH-6 (knobs with functions printed) into KEY1 to KEY4 of the KCH-4. Insert the knobs with their dents facing downward. (Fig. 2-a)

Note : To remove a knob, insert a screwdriver into the dent of the knob from underneath. (Fig. 2-b)

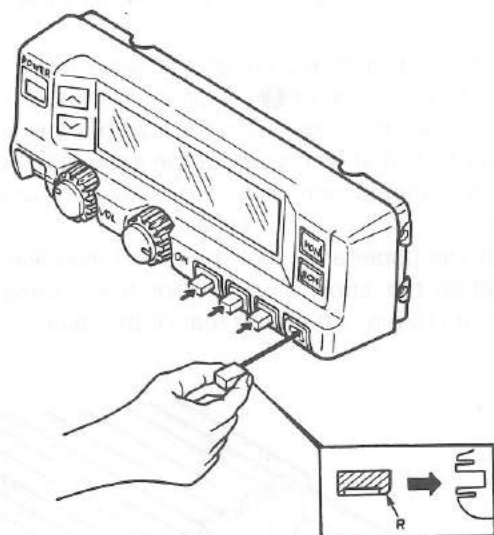


Fig. 2-a Knob insertion

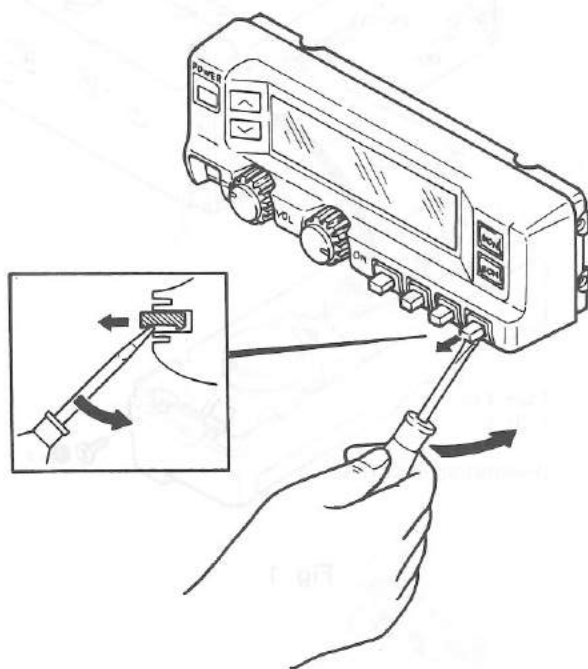


Fig. 2-b Knob removal

1-2. Remote kit connection

See the service manuals for the KRK-2, KRK-3DH, and KRK-4DB.

2. KCH-6 (Optional Knob for the KCH-4)

When a function is set by the programming software (KPG-7D), the key legend can be changed by inserting the KCH-6 knob into KEY1 to KEY4 of the KCH-4. The KCH-6 contains a set of 12 knobs : PA, HA, TA, IC, AN, SP, D/A, OPT, AUX, HC, SQL, and blank.

2-1. Installation method

See Item 5 above. (Fig. 2)

3. Modification for Changing the Microcomputer Backup Time

3-1. Mobile operation

When this radio is connected to a car battery, the microcomputer is always backed up. (The RAM contents are retained regardless of whether you turn the radio power switch on or off.) If you disconnect the battery from the radio, the RAM contents disappear in a short time.

3-2. Fixed operation

If the power switch of the fixed power supply connected to the radio is on, the microcomputer is always backed up regardless of whether you turn the radio power switch on or off. If the power switch of the fixed power supply is off, the RAM contents disappear in a short time.

INSTALLATION

3-3. Backup function modification

The minimum backup time when the radio power is off can be changed to one day by making the following modification :

1. Remove the upper half of the radio case.
2. Remove the control unit (X57-5050 A/4) from the chassis.
3. Add C217 to the control unit. (Pay attention to the polarity.) C217 : 0.047F (C90-2079-05)

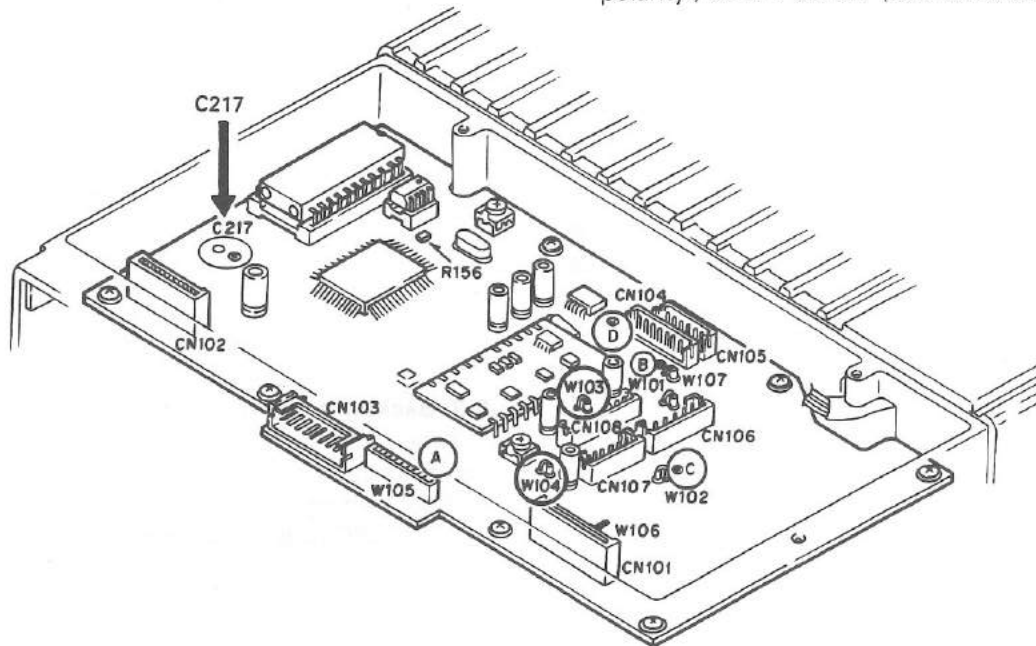


Fig. 3

4. Radio Power On/Off Function with the External Fixed Power Supply (Fixed Operation)

If you modify the radio as follows, the radio power can be turned on by turning on the power switch of the power supply, even if the radio power switch is off. If the radio power switch is turned off, and the power is switched off, then on again immediately, this function does not work ; switch the radio power on.

4-1. Modification method

1. Remove the upper half of the radio case.
2. Remove the control unit (X57-5050 A/4) from the chassis. See the rear of the PC board.
3. Remove R105 (R92-0670-05) from the control unit, and install it on the pattern next to R106.

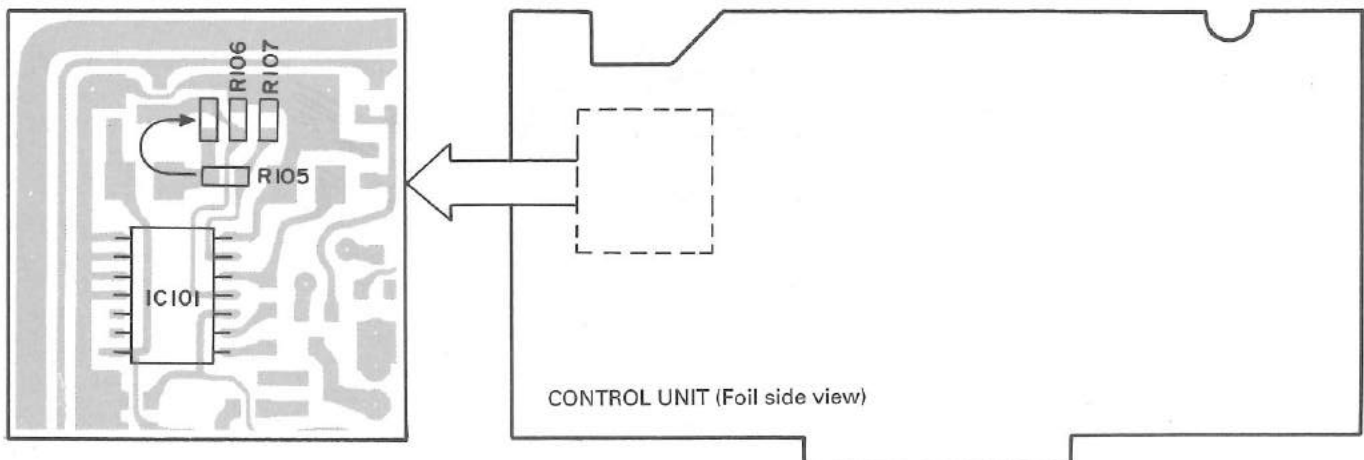


Fig. 4

INSTALLATION

5. Auxiliary Function

The programming software (KPG-7D) enables you to assign an auxiliary function to the AUX key. When you press the AUX key, "••" lights on the KCH-3, and "AUX" lights on the KCH-4, and the auxiliary function turns on.

When you press the AUX key again, "••" or "AUX" goes off, and the auxiliary function turns off. When you set the AUX key on, the display backlight (LED) goes off; when you set the AUX key off, the display backlight (LED) goes on.

The auxiliary function can be assigned to the OPT key using the programming software (KPG-7D). If this is done, "OPT" appears, and the OPT key works like the AUX key.

5-1. Radio modification

The control unit of the radio has a pattern marked with a D, and contains switching transistor Q116, which drives pattern D. The control unit (X57-5050 A/4) IC105 pin 7 goes high when the AUX key is turned on, and low when the AUX key is turned off. So when the AUX key is turned on and off, Q116 output D (max. 100mA) turns on and off. Connect D to a desired port.

5-2. Modification method if remote kit (KRK-2, KRK-3DH, or KRK-4DB) is used

If you use a remote kit and modify it as follows, you can turn pin 3 (AUX) of the accessory connector (6-pin) on the rear of the control head on and off by turning the AUX key on and off. You can use pin 3 to control external equipment.

1. If you use the KCH-3 (basic control head), remove R20 from the display unit (X54-3100 A/2) with a soldering iron. (Fig. 6-a)
2. If you use the KCH-4 (full-featured control head), remove R35 from the display unit (X54-3110 A/2) with a soldering iron. (Fig. 6-b)
3. You can control external equipment by connecting it to pin 3 (AUX) of the plug (6-pin : P703/P704) of the accessory connector (6-pin) on the rear of the control head. (Fig. 6-c)

5-3. Backlight on/off function

When you set the auxiliary function, the backlight on/off function is also set. To set the auxiliary function without setting the backlight on/off function, modify the TK-730(G)/(GB) as described in Section 5-2.

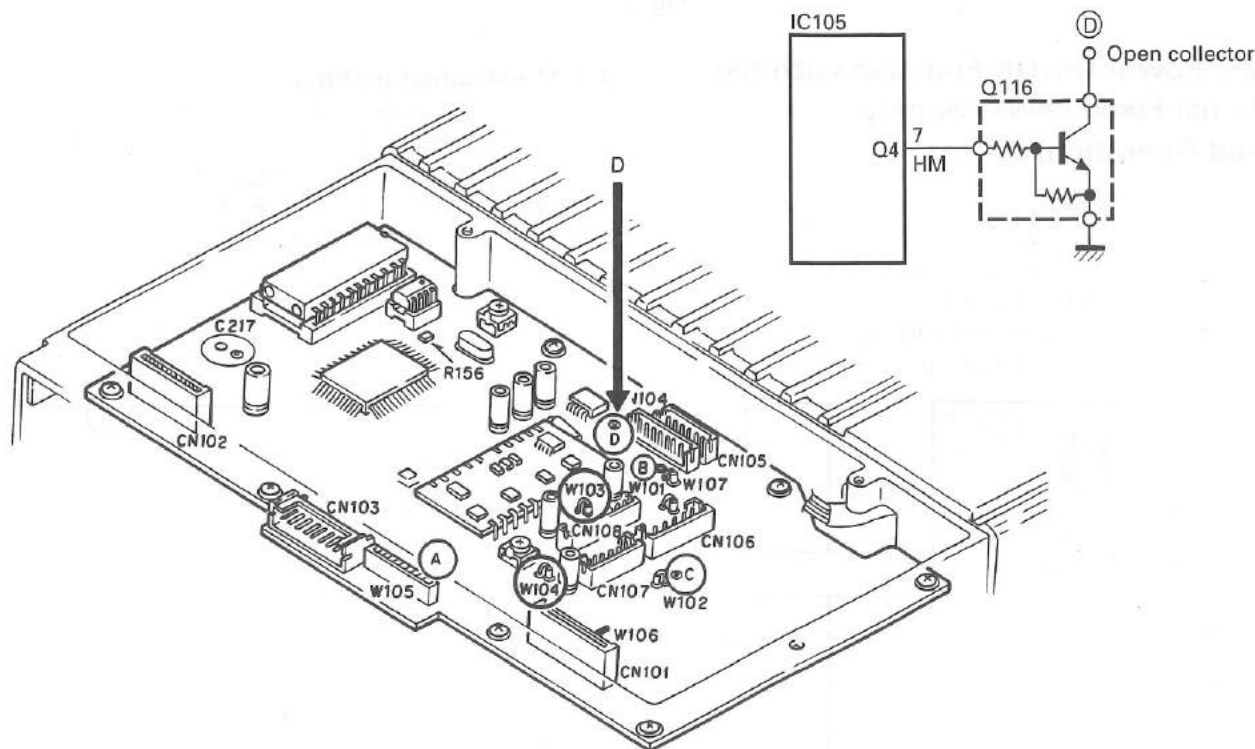


Fig. 5

INSTALLATION

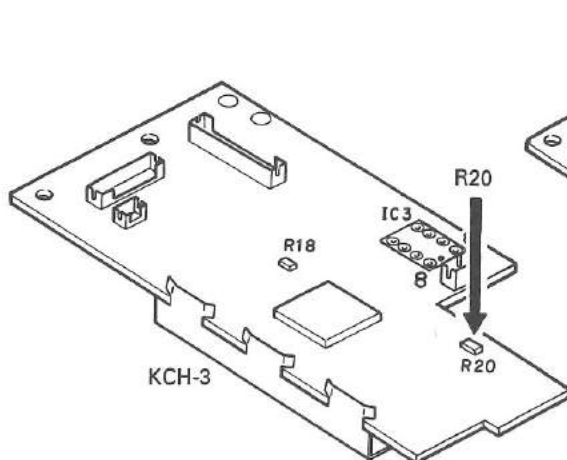


Fig. 6-a

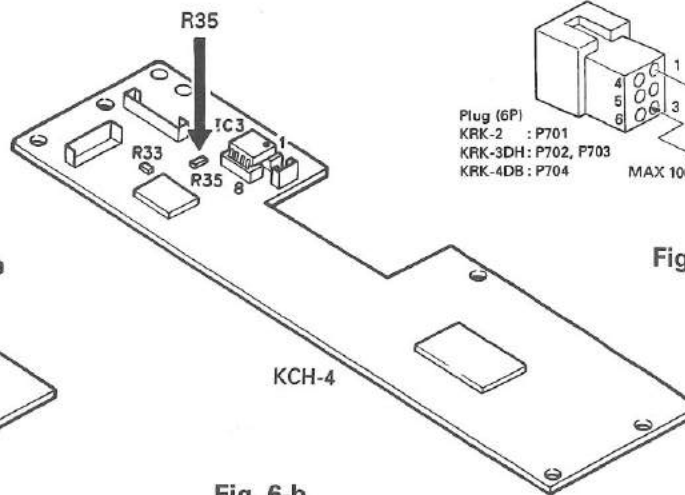


Fig. 6-b

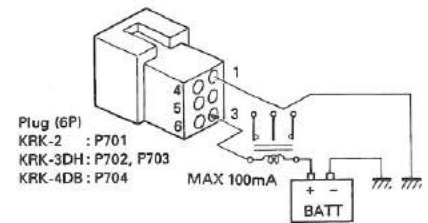


Fig. 6-c

6. OPTION (Scrambler) Function

This function is available when you assign it to the OPT key with the programming software (KPG-7D). When you press the OPT key, the "OPT" indicator lights, and the OPTION (Scrambler) function turns on. When you press the key again, the "OPT" indicator goes off, and the OPTION (Scrambler) function turns off.

The OPTION (Scrambler) function can be assigned to the AUX key using the programming software (KPG-7D). If this is done, "••" (KCH-3), "AUX" (KCH-4) appears, and the AUX key works like the OPT key.

Normally, the OPTION (Scrambler) function operates the port of connector CN108 of the control unit (X57-5050 A/4) as follows :

6-1. AC1 (pin 5)

AC1 is normally high (OPT : Off). When you press the OPT key, AC1 goes low, and the "OPT" indicator lights. When you press the key again, AC1 goes high and the "OPT" indicator goes off.

6-2. Ports 0, 2, 4, and 8 (pins 9 to 12)

Data stored in the RAM is output as the initial data. It is 0000 when the microcomputer is reset.

If you hold down the SCN key and press the OPT key, you enter the code setting mode, and "1" to "8" (KCH-3) or "CODE1" to "CODE8" (KCH-4) appears on the display. When you set codes, the port output is changed from 1 to 8 by changing the display from 0 to F with the encoder. If you hold down the OPT key again, the code setting mode is terminated, and the set code for the port remain unchanged.

6-3. Voice scrambler connection example

• Modification method

1. Remove the upper half of the case of the TK-730(G)/(GB). (Four screws)
2. Cut W103 and W104 of the control unit (X57-5050 A/4).

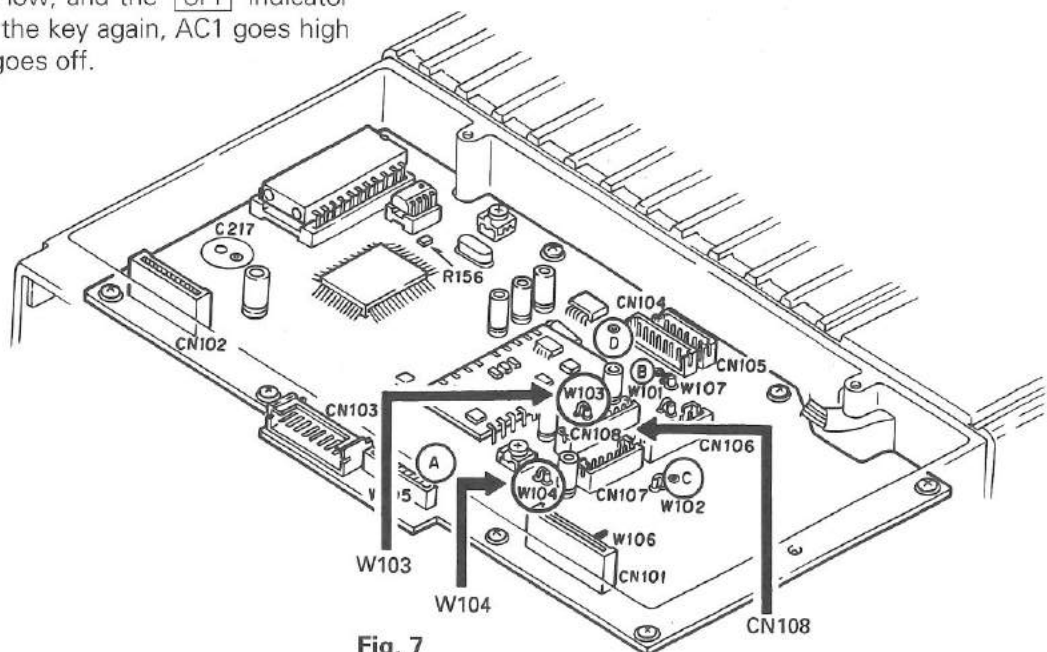


Fig. 7

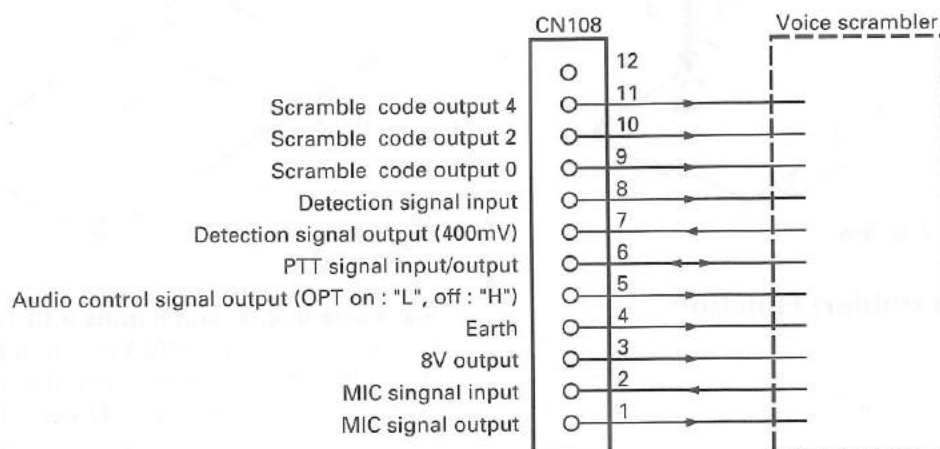
INSTALLATION

• Connection method

Connect control unit (X57-5050 A/4) CN108 and the voice scrambler as follows :

• Operation method

1. When you press the OPT key, the scrambler is activated and scrambles. The "OPT" indicator lights.
2. When you press the OPT key again, the scrambler is deactivated and the "OPT" indicator goes off.
3. Set the scrambler code with the encoder as described in Section 6-2.



7. Operator Selectable Tones/Codes Function

This function is available when you assign it to the OPT key with the programming software (KPG-7D). When you press the OPT key, the "OPT" indicator lights, and the operator selectable tones/codes function turns on. When you press the key again, the "OPT" indicator goes off, and the operator selectable tones/codes function turns off.

The operator selectable tones/codes function can be assigned to the AUX key using the programming software (KPG-7D). If this done, "•" (KCH-3), "AUX" (KCH-4) appears, and the AUX key works like the OPT key.

7-1. Setting the operator selectable tones/codes

When you assign the operator selectable tones/codes function to the OPT key using the programming software (KPG-7D), you should use the programming software to set a maximum of 16 operator selectable tones/codes in addition to the operator selectable tones/codes for each channel.

Code	Decode	Encode
1	67.0	100.0
2	D023N	D754I
⋮	⋮	⋮
15	D754I	250.3
16	150.7	D023N

7-2. Operation method

1. You can select operator selectable tones/codes from 16 codes as follows to replace the operator selectable tones/codes for each channel. Hold down the SCN key and press the OPT key in channel display mode to enter code selection mode. Select from 1 to 16 with the channel selector. The display shows the following :
KCH-3 : '1 to '16
KCH-4 : CODE1 to CODE16
To return to channel display mode, press the OPT key.
2. To use the tone/code selected from the 16 codes, press the OPT key in channel display mode with that code. The signaling of the channel operates as the selected tone/code, and the "OPT" indicator lights. When you press the OPT key again, the "OPT" indicator goes off, and the signaling of the displayed channel returns to the original condition (the signaling set for each channel by the programming software).
3. The operator selectable tones/codes function can be also assigned to the AUX key using the programming software. In this case, the "AUX" indicator lights.

INSTALLATION

8. Ignition Sense Cable (KCT-18)

The KCT-18 is an optional cable used to implement the ignition function. This function allows you to turn the radio power on and off using the ignition key of the car. You can disable the horn alert function during driving with the ignition key. (To use the horn alert function, the optional KCK-5 (interface unit) and KDD-4 (DTMF decoder) or KDS-8B or KDS-10 (two-tone decoder) are required.

8-1. Modification to switch the power on and off with the ignition key

• When you use the TK-730 series and KCH-3 or KCH-4

1. Remove the short plug (P1) from the accessory connector (15-pin : J4) on the rear of the radio.
2. Insert the KCT-18 contact into pin 3 (IGN).
3. Remove the upper half of the radio case.
4. Cut W101 of the control unit (X57-5050 A/4) (Fig. 8-c), and reinstall the upper half of the radio case.

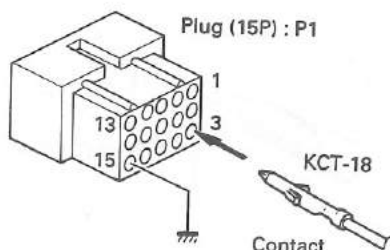


Fig. 8-a

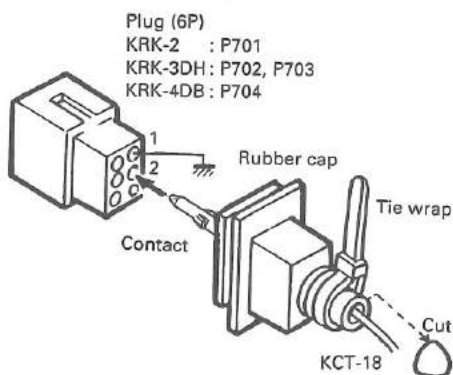
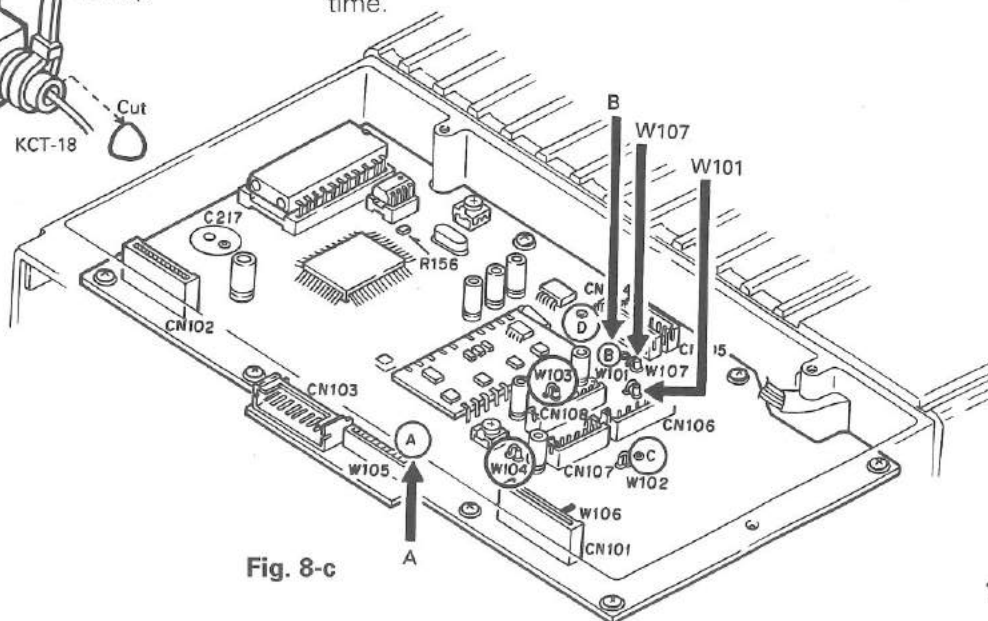


Fig. 8-b



INSTALLATION

9. External Speaker (KES-4)

The TK-730 series speaker output is as follows :

1. The KCH-3 contains a speaker (5W/8Ω).
2. The KCH-4 does not contain a speaker.
3. The external speaker output from the accessory connector (15-pin) on the rear of the radio is 13W/4Ω. Use external speaker KES-4.
4. If you use a remote kit (KRK-2, KRK-3DH, KRK-4DB), the external speaker output from the accessory connector (6-pin) on the rear of the control head is 5W/4Ω. Use external speaker KSP-1A or KES-4. You can use the KSP-1A only when you short pins 9 and 12 of the accessory connector (15-pin) on the rear of the radio and do not increase the speaker output (see page 22).

Note : The TK-730 series does not have a ground because it uses a BTL audio amplifier. Do not connect leads to the ground.

9-1. Connection for the KES-4 with the TK-730 series

• When taking the AF output from the accessory connector (15-pin) on the rear of the radio

The following tools are required for changing the connector.

Extracting tool

The following extracting tool is recommended :
Molex Inc. Order No. : 11-03-0002

1. Remove the connector with jumper from the external speaker connector on the rear panel of the radio. (Fig. 9-a)

Note : Save the jumper, which is required when the radio is used without the external speaker.

2. Remove the terminals with the jumper from the connector housing holes number 9 and 12 using the extracting tool.

Removing the jumper lead (Fig. 9-b)

- 1) Insert the extracting tool (11-03-0002) into the connector while pushing the jumper lead in the direction of (a).
- 2) Push the extracting tool into collapse the barbs of the crimp terminal.
- 3) Pull out the lead while continuing to push the extracting tool in the direction (b).
3. Reinsert the terminal with the black and white stripe lead into hole number 12, and the terminal with the black lead into hole number 6. (fig. 9-c)
4. Attach the connector to the external speaker connector on the radio.

Note : Relationship between accessory connector (15-pin) connection and speaker output
When pins 9 and 12 are shorted ; The 5W internal speaker is used.

When pins 9 and 12 are open and output is from pins 6 and 12 ; The 20W external speaker (KES-4) is used.

Square-type plug
(E31-3228-05)

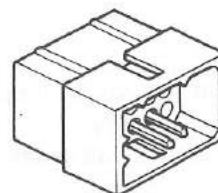


Fig. 9-a

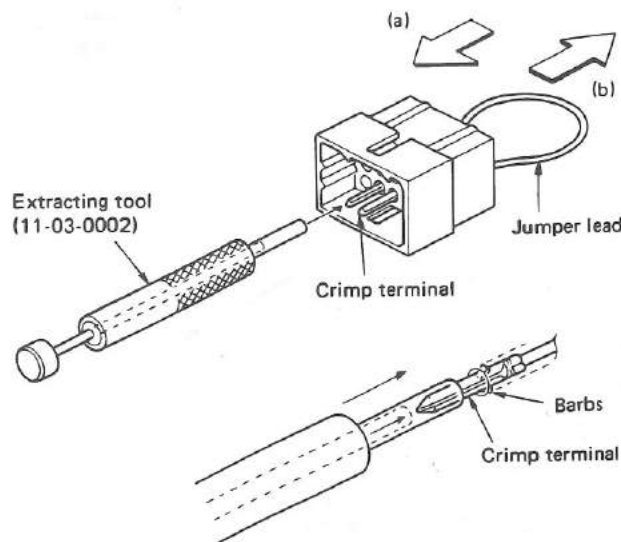


Fig. 9-b

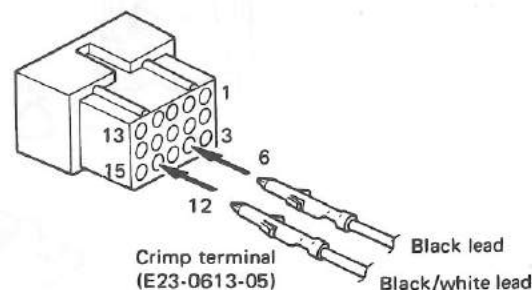


Fig. 9-c

INSTALLATION

9-2. Connection for the KES-4 with the remote kit (KRK-2, KRK-3DH, or KRK-4DB) (When output is from the 6-pin accessory connector on the rear of the control head : remote operation)

• Modification of plug (6-pin)

1. Remove the short plug from the accessory connector (6-pin) on the rear of the control head.
2. Remove the cables from pins 4 and 5 with the extracting tool. (Remove them as described in Section 9-1.)
3. Cut off the end of the rubber cap, insert the KES-4 speaker cable into the cap, and insert it into pins 5 and 6.
4. Install the plug and rubber cap on the accessory connector on the rear of the control head, then clamp the bottom of the rubber cap with the supplied tie wrap.

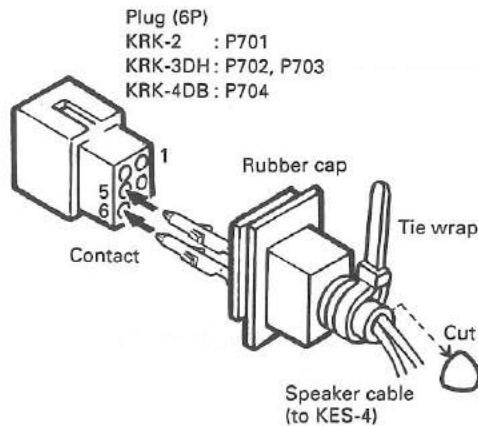


Fig. 10

Notes :

1. Since the output from the accessory connector (6-pin) is 5W, you can use the KSP-1A (speaker).
2. Relationship between accessory connector (6-pin) connection and speaker output
When pins 4 and 5 are shorted ; The 5W internal speaker is used (KCH-3 only).
When pins 4 and 5 are open and output is from pins 5 and 6 ; The 5W external speaker is used.

• Modification of the control unit (X57-5050 A/4)

Modify the radio connected with a remote kit as follows :

Remove the upper half of the case of the radio, and solder (short) W106 of the control unit. If you do not, the control head speaker output will deteriorate. If the radio is restored to the basic model (the remote kit is removed), open W106, otherwise the maximum head speaker input will be exceeded.

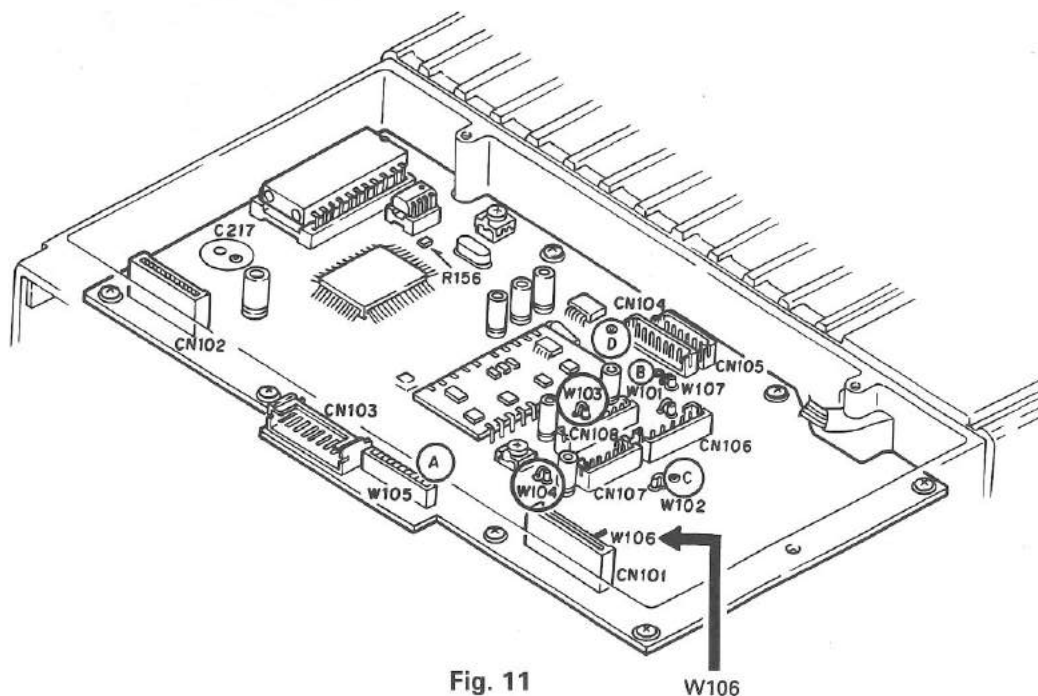
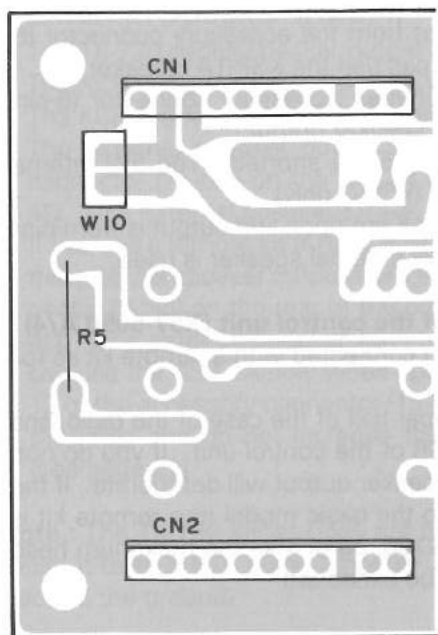


Fig. 11

INSTALLATION



• Modification to increase the control head speaker output (from 5 to 10W)

You can increase the speaker output to 10W by shorting W106 of the control unit as described previously, and soldering W10 of the X46-3110-20 (KRK-2), X46-3090-20 (KRK-3DH), or X46-3100-20 (KRK-4DB) of the control head.

In this case, you cannot use the KCH-3 internal speaker because the maximum input of 5W is exceeded, so use the KES-4.

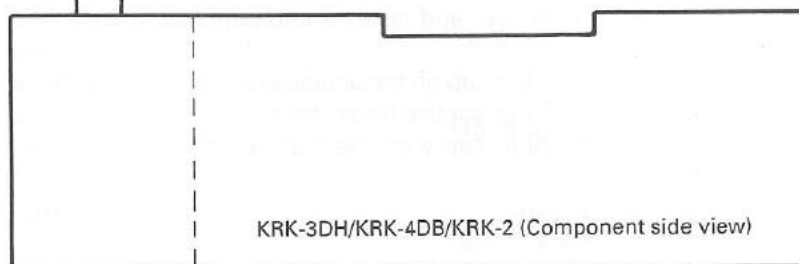


Fig. 12

9-3. Use as public address speaker

1. Remove the short plug (P1) from the 15-pin accessory connector (J4) on the rear of the radio. (Remove the jumpers as described in Section 9-1.)
2. Insert the KES-4 speaker leads into pins 13 and 14 of P1.
3. If you remove jumper shorting pins 9 and 12, the 20W PA (public address) voice signal is output from pins 13 and 14. (Only when the PA or SP switch is on)
4. If you use the radio with pins 9 and 12 shorted, the internal speaker is available (when the KCH-3 is used). The KCH-4 does not contain a speaker.

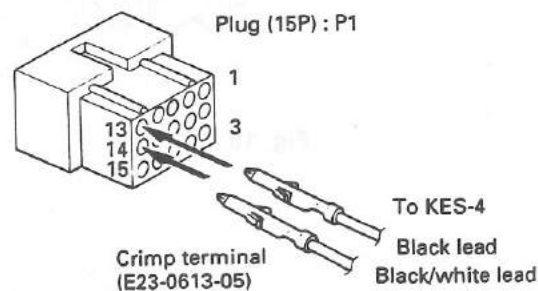


Fig. 13

Note :

Relationship between accessory connector (15-pin) connection and speaker output

When pins 9 and 12 are shorted ; The 5W internal speaker is used (KES-3 only).

When pins 9 and 12 are open and output is from pins 13 and 14 ; The 20W external speaker is used.

INSTALLATION

10. Channel Expansion Kit (KCH-5)

This optional kit increases the number of channels and AN (alphanumeric) channels of the radio.

10-1. System configuration

- *32B : Basic control head (32 ch)
- 99B : Basic control head (99 ch)
- 32A : Basic + Alphanumeric (32 ch)
- 99A : Basic + Alphanumeric (99 ch)
- *32F : Full featured control head (32 ch)
- 160F : Full featured control head (160 ch)
- * : Factory setting

10-2. System modification

• KCH-3 (basic control head) is used

1. 99B (basic control head : 99 channels)
Modify the radio with the basic control head (32 channels) so that it supports a 99-channel display.
1) Remove the upper half of the radio case.
2) Remove IC109 from the control unit (X57-5050 A/4) and install the KCH-5 EEPROM (X24C16PI) by soldering. (Fig. 14)
Note : Install it in the correct direction. Check the mark on the IC (KCH-5), and insert it.
3) Remove R156 (R92-0670-05) of the control unit. (Fig. 14)
2. 32A (basic + alphanumeric display : 32 channels)
Modify the radio with the basic control head (32 channels) so that it supports a 32-channel alphanumeric display.
1) Install the KCH-5 EEPROM in IC3 of the KCH-3 display unit (X54-3100-20 A/2) by soldering.
Note : Install it in the correct direction. Check the mark on the IC (KCH-5), and insert it. (Fig. 15-a)

- 2) Remove R18 (R92-0670-05) of the display unit. (Fig. 15-a)

3. 99A (basic + alphanumeric display : 99 channels)
Modify the radio with the basic control head (32 channels) so that it supports a 99-channel and alphanumeric display.

- 1) Install the KCH-5 EEPROM in the control unit by soldering, and remove R156. Remove R18 of the display unit.

• KCH-4 (full-feature control head) is used

1. 160F (Full-featured control head : 160 channels)
Modify the radio with the basic control head (32 channels) so that it supports a 160-channel and alphanumeric display.
1) Remove the upper half of the radio case.
2) Remove IC109 (X24C04PI) of the control unit (X57-5050 A/4) from the socket, and install the KCH-5 (X24C16PI). (Fig. 14)
Note : Install the IC in the correct direction. Check the mark on the IC (KCH-5), and insert it.
3) Remove R156 (R92-0670-05) of the control unit. (Fig. 14)
4) Remove IC3 (X24C04PI) of the KCH-4 display unit (X54-3110-20 A/2) from the socket, and install the KCH-5 (X24C16PI). (Fig. 15-b)
Note : Install the IC in the correct direction. Check the mark on the IC (KCH-5), and insert it.
5) Remove R33 (R92-0670-05) of the display unit. (Fig. 15-b)

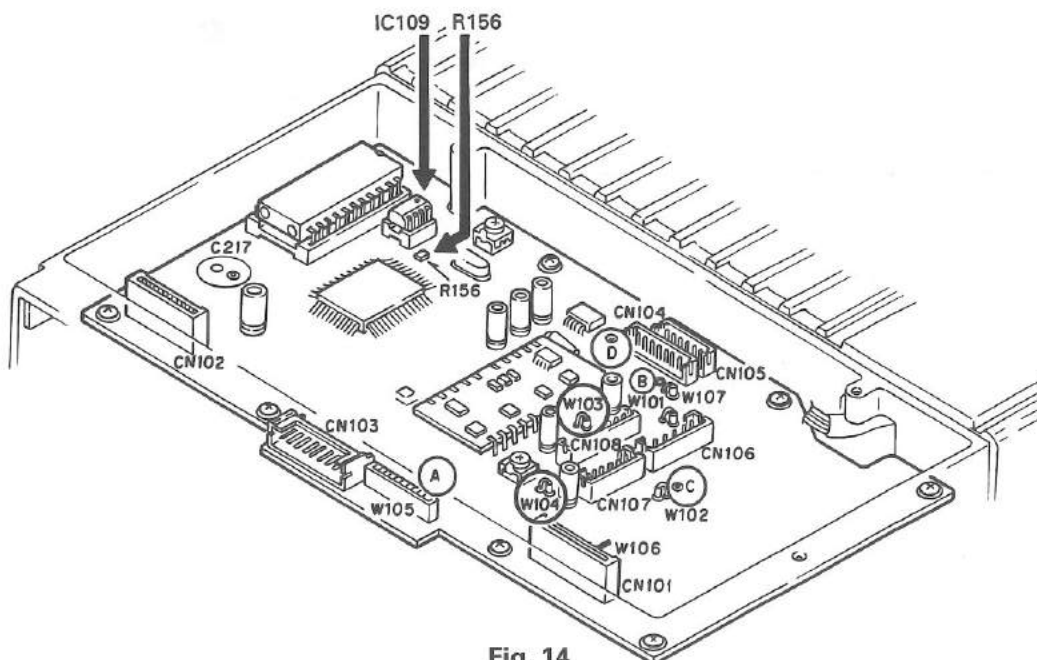


Fig. 14

INSTALLATION

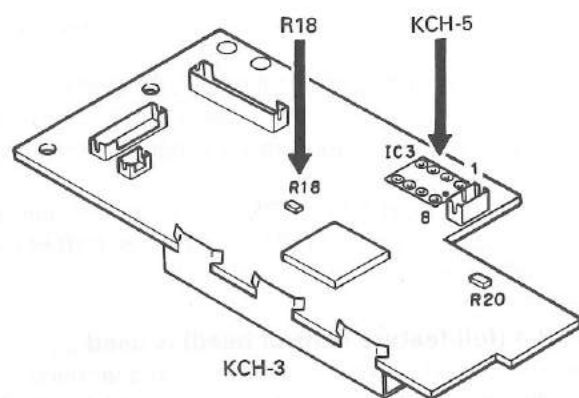


Fig. 15-a

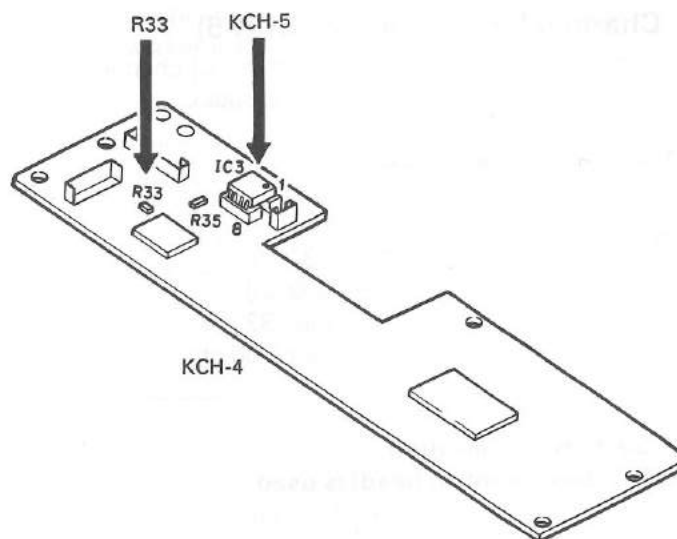


Fig. 15-b

11. KXK-2 (TCXO Kit, 12.8MHz $\pm$ 2ppm)

The KXK-2 is an optional temperature-compensated crystal oscillator. If you replace X302 of the TX-RX unit of the radio with the KXK-2, the transmit frequency stability improves.

11-1. Rating

Item	Rating	Condition
Frequency deviation	$\pm 8 \times 10^{-6}$ or more	Input voltage (VC) : 2Vp-p (1Hz to 3kHz) Power supply voltage : 5 V DC
Temperature characteristics	$\pm 2 \times 10^{-6}$ or less, -30 to +70°C	Power supply voltage : ± 5 V Load : 1k Ω , 10pF Input voltage (VC) : Based on the rated frequency when off
Power variation characteristics	$\pm 0.2 \times 10^{-6}$ or less	5V DC ($\pm 10\%$)

11-2. Radio modification

1. Remove the lower half of the radio case. (Four screws)
2. Remove the flat cable of CN305 on the TX-RX unit (X57-5050 B/4) from above. Remove coaxial plugs CN301 and CN303, and connector CN304 (1).
3. Remove the seven screws (2) holding the TX-RX unit, and remove the TX-RX unit.
4. Remove X302 (L77-1466-05) from the unit with a soldering iron (3).
5. Insert the KXK-2 into the X302 land from above, solder the four leads (4), and cut them.

Note : Install the KXK-2 in the correct direction. When installing it, check the adjusting hole position, as shown in the illustration. You do not need to adjust the frequency because it has been factory adjusted.

6. Install the TX-RX unit in the radio by reversing the order of removal.

INSTALLATION

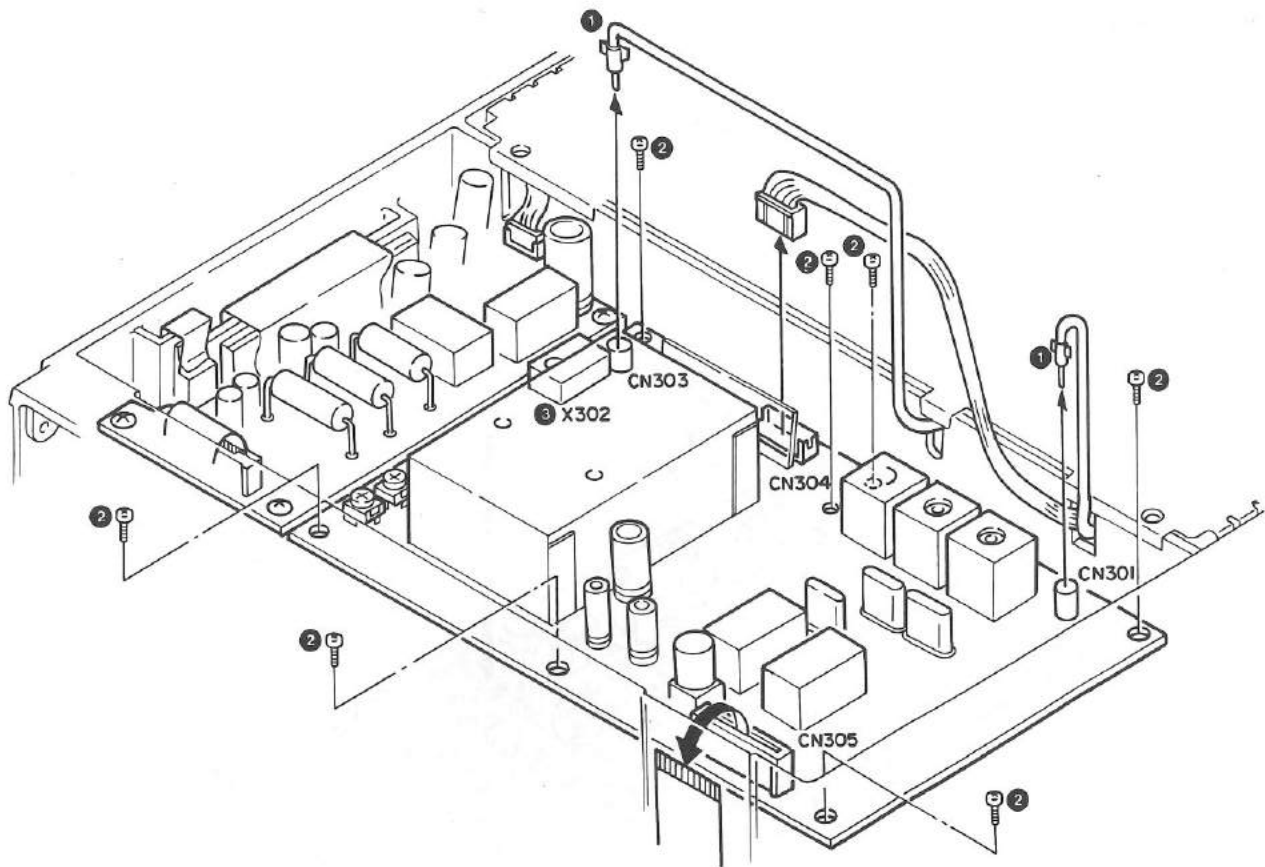


Fig. 16-a

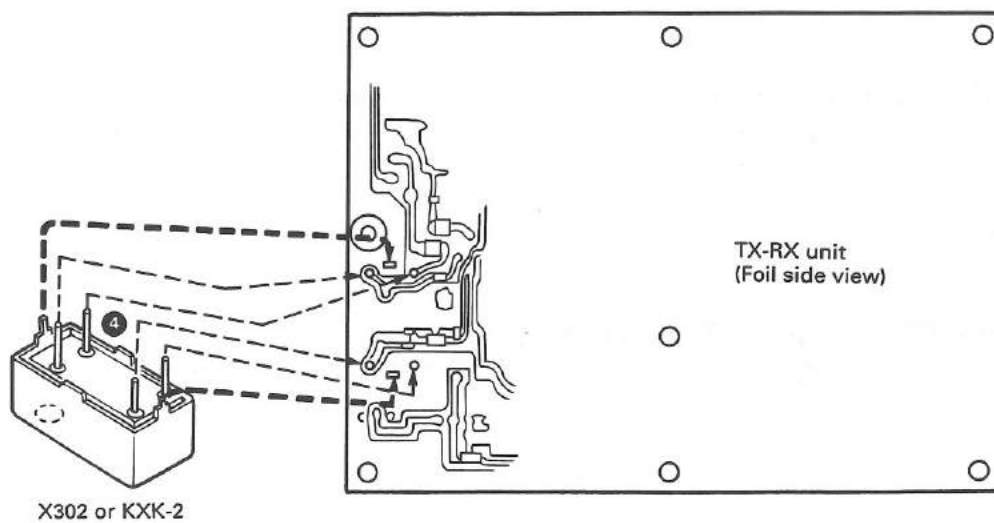


Fig. 16-b

INSTALLATION / DISASSEMBLY FOR REPAIR

12. Horn Alert Function

The horn alert function is available for a transceiver to which the optional KCK-5 (interface kit) and KDD-4 (DTMF decoder), KDS-8B (two-tone decoder), or KDS-10 (two-tone decoder) have been added and for which jumper W107 in the control unit (X57-5050 A/4) has been cut. (For the installation method, see the KCK-5 service manual.)

1. The horn alert function controls external equipment by energizing the relay of the interface unit (KCK-5) for a certain time after the above optional decoder detects matching of the call signal.
2. If you set OTHER SIGNALING to "Y" with the programming software (KPG-7D) for a channel, and you press and release the key set as the H.A key, HA (KCH-3) or $\square$ HORN $\square$ ALERT (KCH-4) appears on the display, and the radio goes into standby. (The microphone must be onhook.)

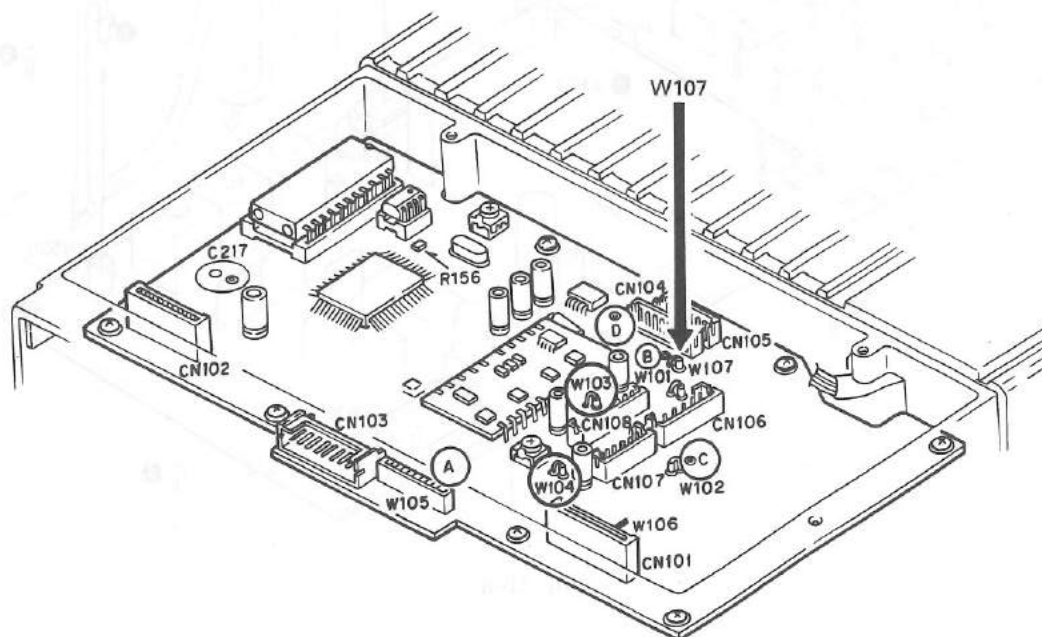


Fig. 17

1. Removing the Case and Shield Cover

1. Remove the eight screws (1), and remove the upper and lower halves of the case. (Remove the four screws holding the upper half and the four screws holding the lower half.)
2. Remove the shield cover.

2. Removing the TX-RX Unit (X57-5050 B/4)

1. Remove the seven screws (2).
2. Remove the connector (CN304) and coaxial plugs (CN301, CN303) from the final unit, and remove the flat cable (CN305) upwards from the control unit (CN102).

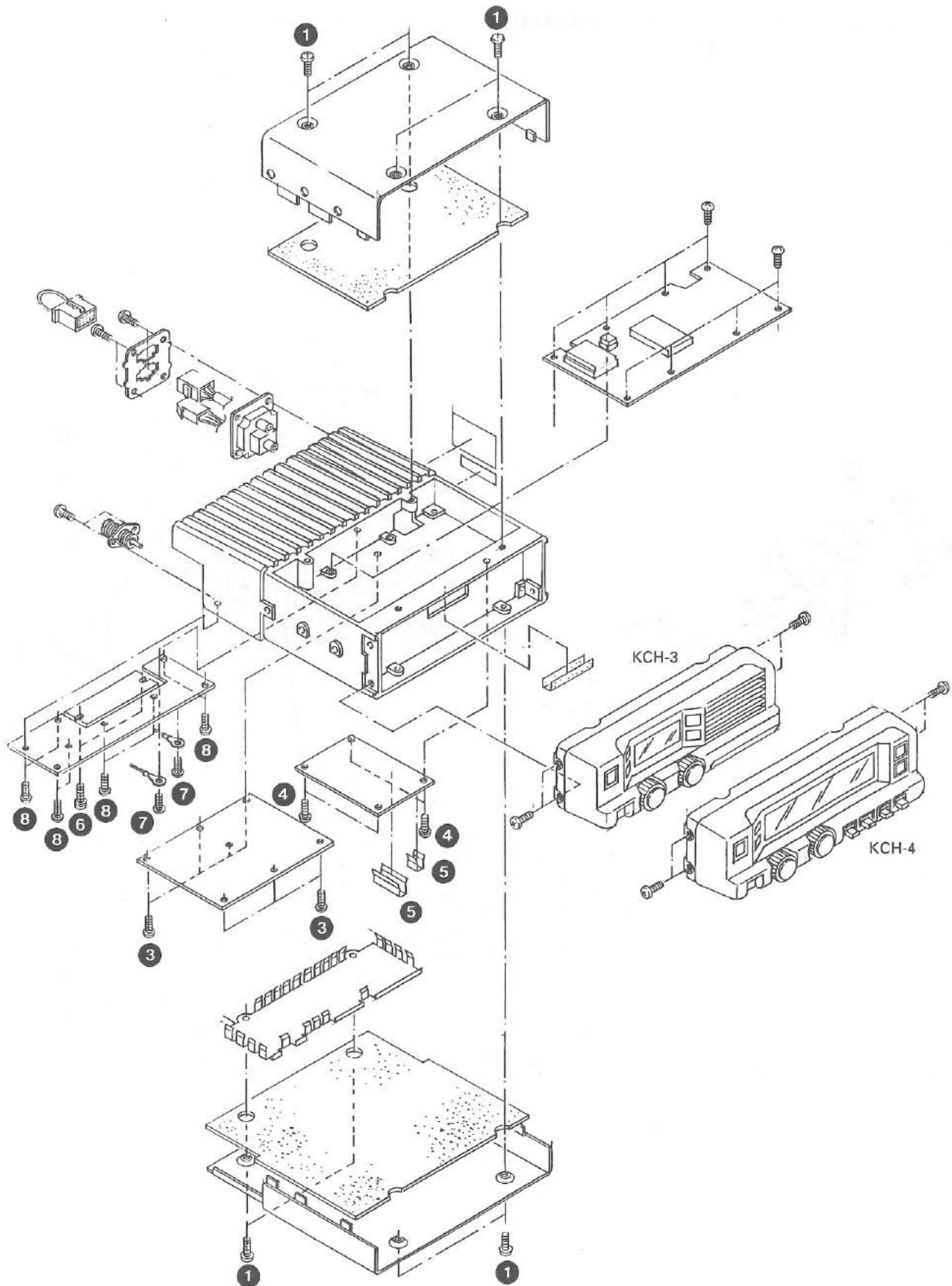
3. Removing the AF Unit (X57-5050 C/4)

1. Remove the four screws (4).
2. With a screwdriver, remove the two leaf springs (5) holding the IC to the frame.
3. Remove the connector (CN502) from the final unit (W1), and remove the flat cable (CN501) upwards from the control unit (CN101).

4. Removing the Final Unit (X57-5050 D/4)

1. Remove the two screws (6) holding the power module to the frame.
2. Remove the two screws (7) holding the lead terminal from ACC connector (6P) on the rear.
3. Remove the eight screws (8) holding the PC board.
4. Desolder W4 on the antenna connector side.

DISASSEMBLY FOR REPAIR



TK-730(G)/(GB)

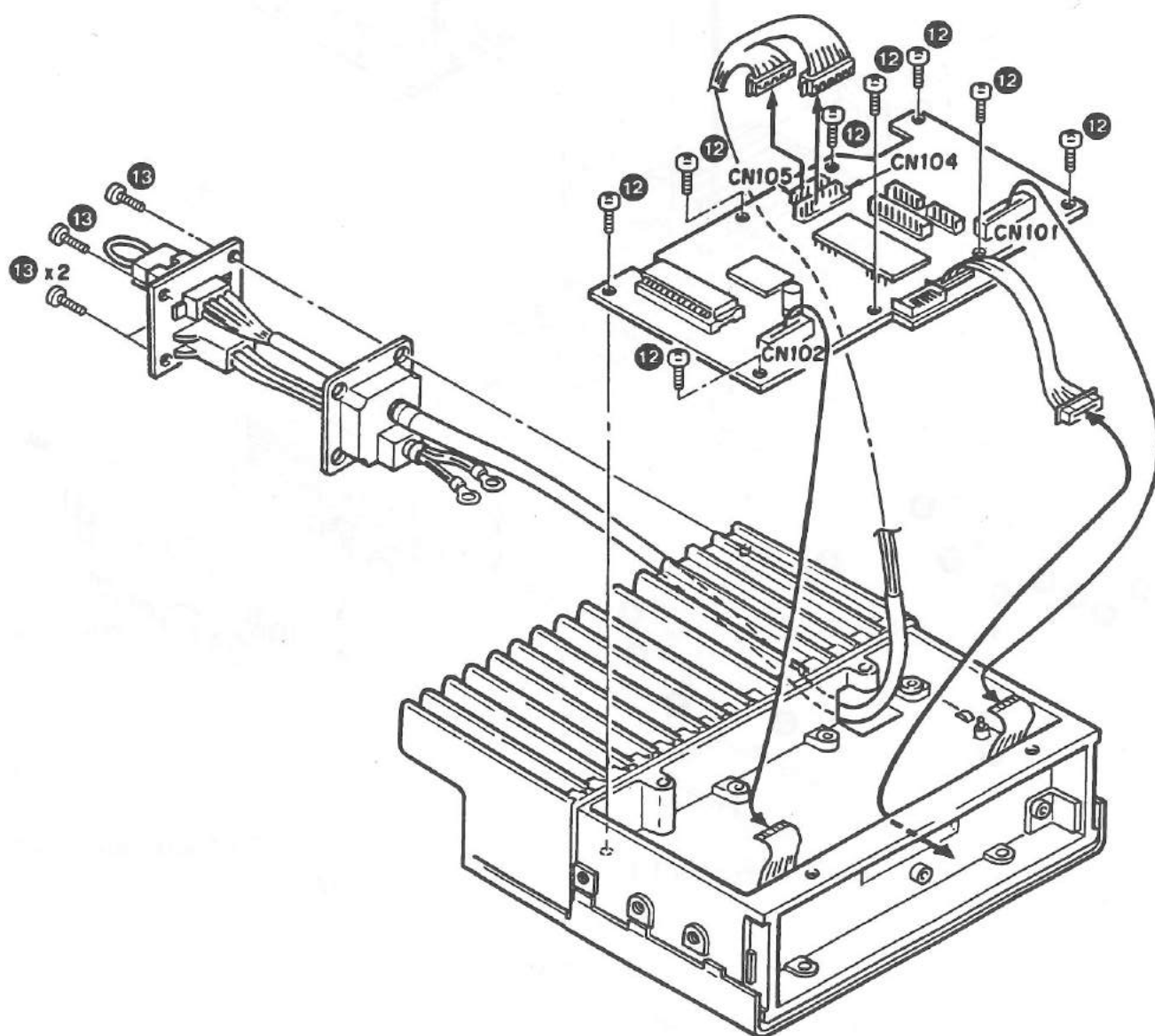
DISASSEMBLY FOR REPAIR

5. Removing the Control Unit (X57-5050 A/4)

1. Remove the eight screws (12).
2. Remove flat cables CN101 and CN102.
3. Remove the two connectors (CN104 and CN105) from ACC connector (15P) on the rear.

6. Removing the Accessory Connector (ACC 15P, ACC 6P) on the Rear

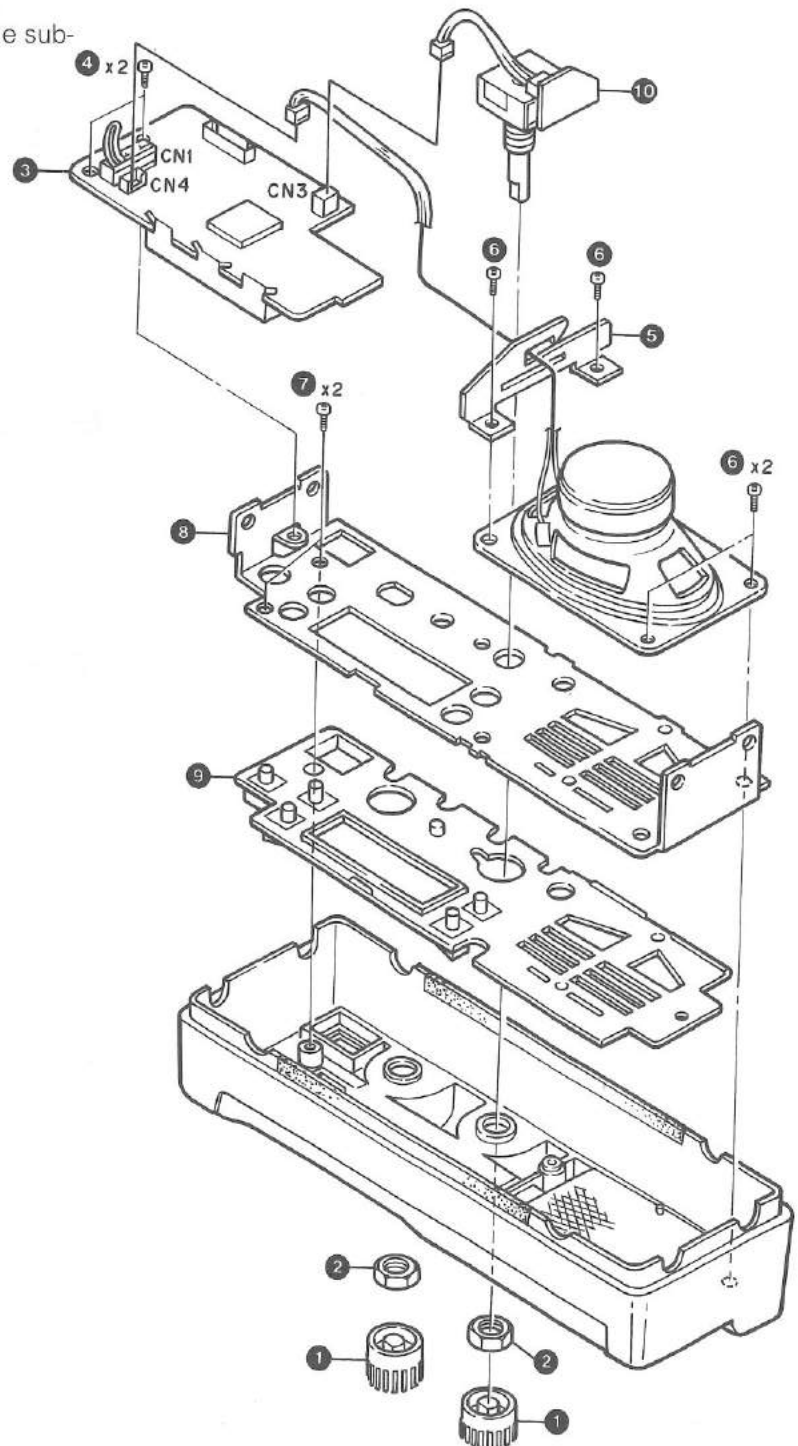
1. Confirm that the screw holding CN3 and the screw holding CN4 of the final unit (X57-5050 D/4) are removed, and that CN104 and CN105 of the control unit (X57-5050 A/4) are disconnected. Remove the four screws on the rear (13).
2. Pull out the connector. (Take the connector terminals out through the opening in the frame.)



DISASSEMBLY FOR REPAIR

7. Disassembly of the Display Unit (X54-3100) : KCH-3

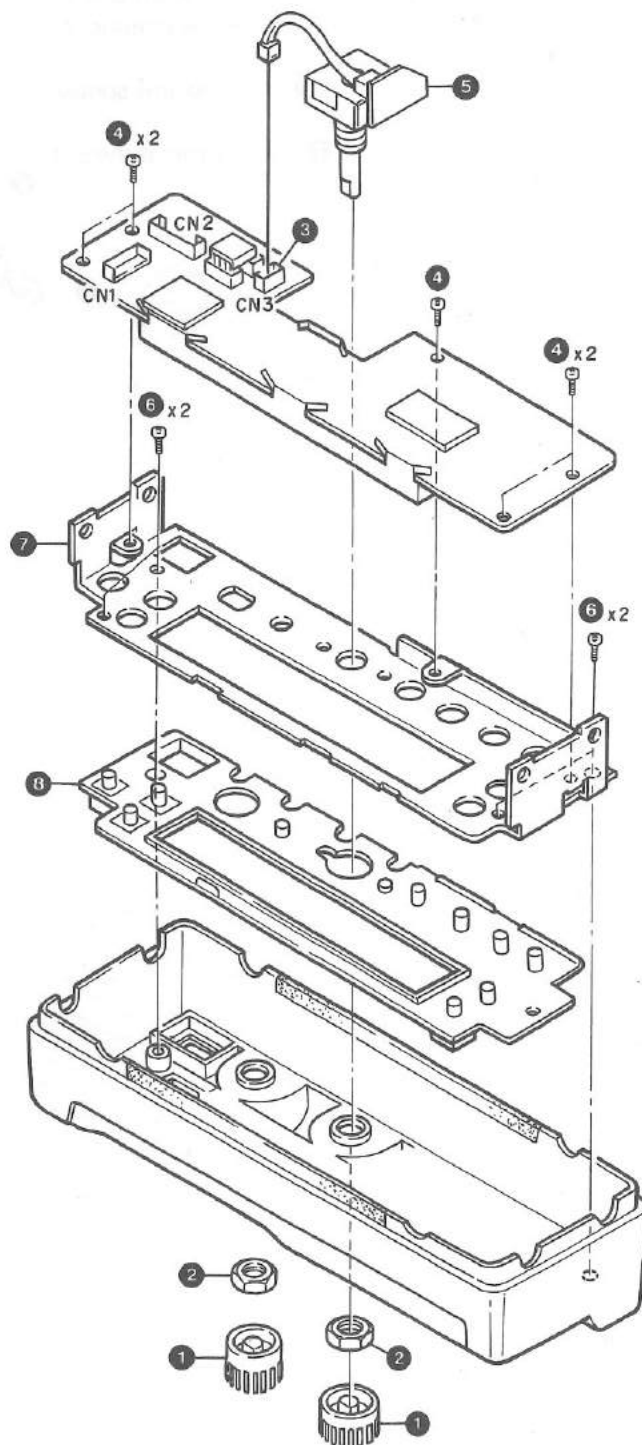
1. Pull out the VOL and CH knobs (1).
2. Remove the two hexagonal nuts (2).
3. Disconnect the two connectors (CN3 and CN4) (3) of the display unit (X54-3100 A/2), and remove the two screws (4). You can remove the channel encoder (10) and display unit.
4. Remove the four screws (6) holding the speaker and PC board fitting (5).
5. Remove the two screws (7), and remove the sub-panel (8) and keytop (9).



DISASSEMBLY FOR REPAIR

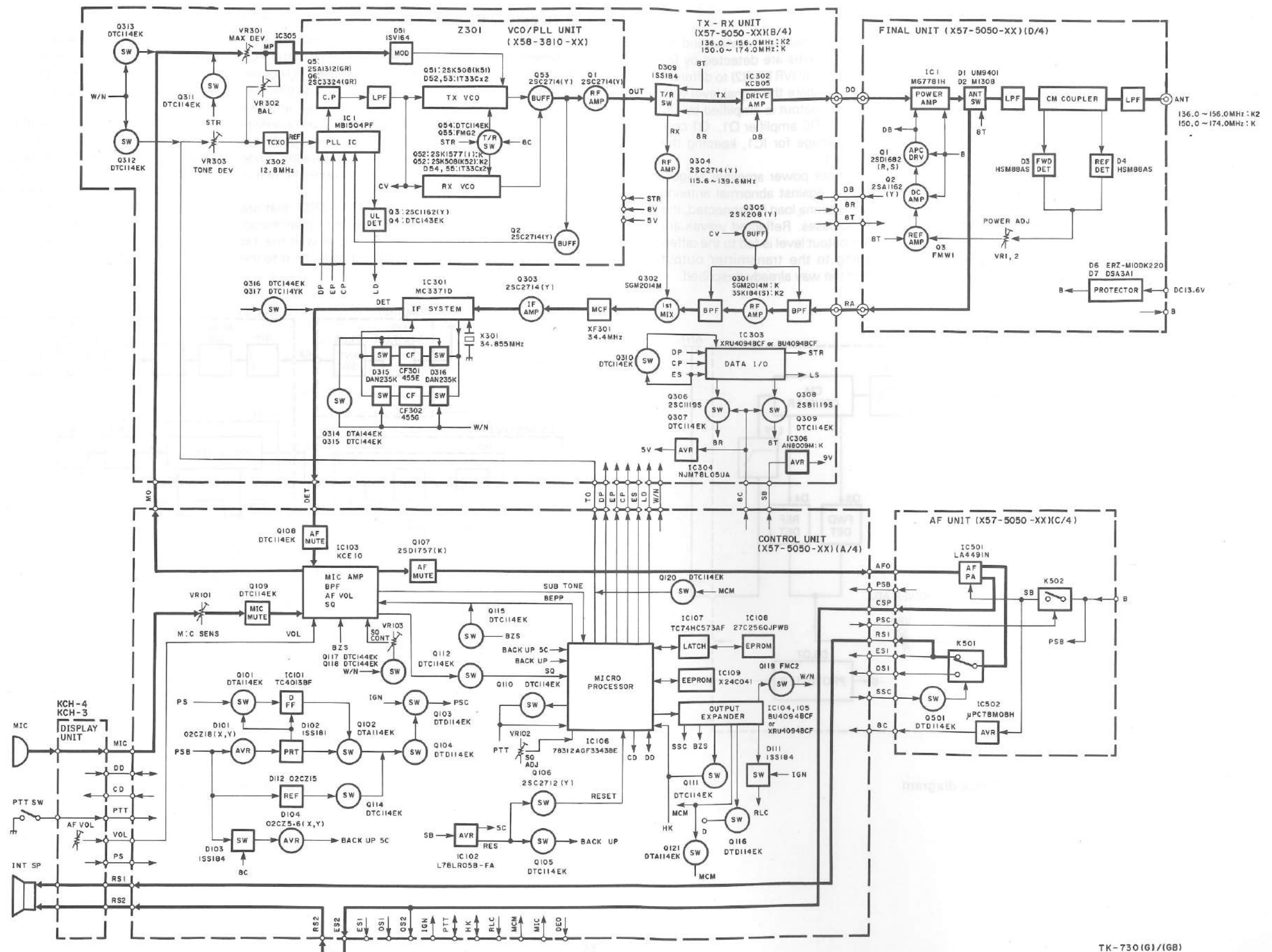
8. Disassembly of the Display Unit (X54-3110) : KCH-4

1. Pull out the VOL and CH knobs (1).
2. Remove the two hexagonal nuts (2).
3. Disconnect the connector (CN3) (3) of the display unit (X54-3110 A/2), and remove the five screws (4). You can remove the channel encoder (5) and display unit.
4. Remove the four screws (6), and remove the sub-panel (7) and keytop (8).



TK-730(G)/(GB) TK-730(G)/(GB)

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. Transmitter Circuit

The audio input from the microphone is attenuated by VR101 and input to MCI of the audio HIC of IC103 (KCE10). It passes through the active low-pass filter in IC1, limiter D1, the pre-emphasis circuit in IC1, and the active low-pass filter in IC2, which are part of IC103, and is output from the MCO terminal to the CN102 MO terminal. Q109 is used as a microphone mute switch.

The signal from the MO terminal goes to D51 in the VCO unit (Z301), and the VCO is directly modulated. The transmit signal output from the VCO (Z301) passes through switch D309, is amplified by pre-drive hybrid IC IC302, and is applied to drive hybrid IC IC1.

The signal is power amplified by IC1, and the output of IC1 is fed through transmit/receive switching diode D1, D2, low-pass filter, and CM coupler to the antenna connector.

CM coupler is a line for detecting traveling and reflected waves. Travelling waves are detected by D3 and fed through the APC control (VR1, VR2) to differential amplifiers Q3, which compare the signal level with the reference voltage. The output is amplified by DC amplifier Q2 to control APC DC amplifier Q1. Q1 controls the power supply voltage for IC1, keeping the transmitter output constant.

To protect the transmitter power amplifier stages, there is protection circuit, against abnormal antenna loading. If an abnormal antenna load is connected, the reflected wave level increases. Reflected waves are detected by D4 and the output level is fed to the differential amplifier, leading to the transmitter output power being reduced in the way already described.

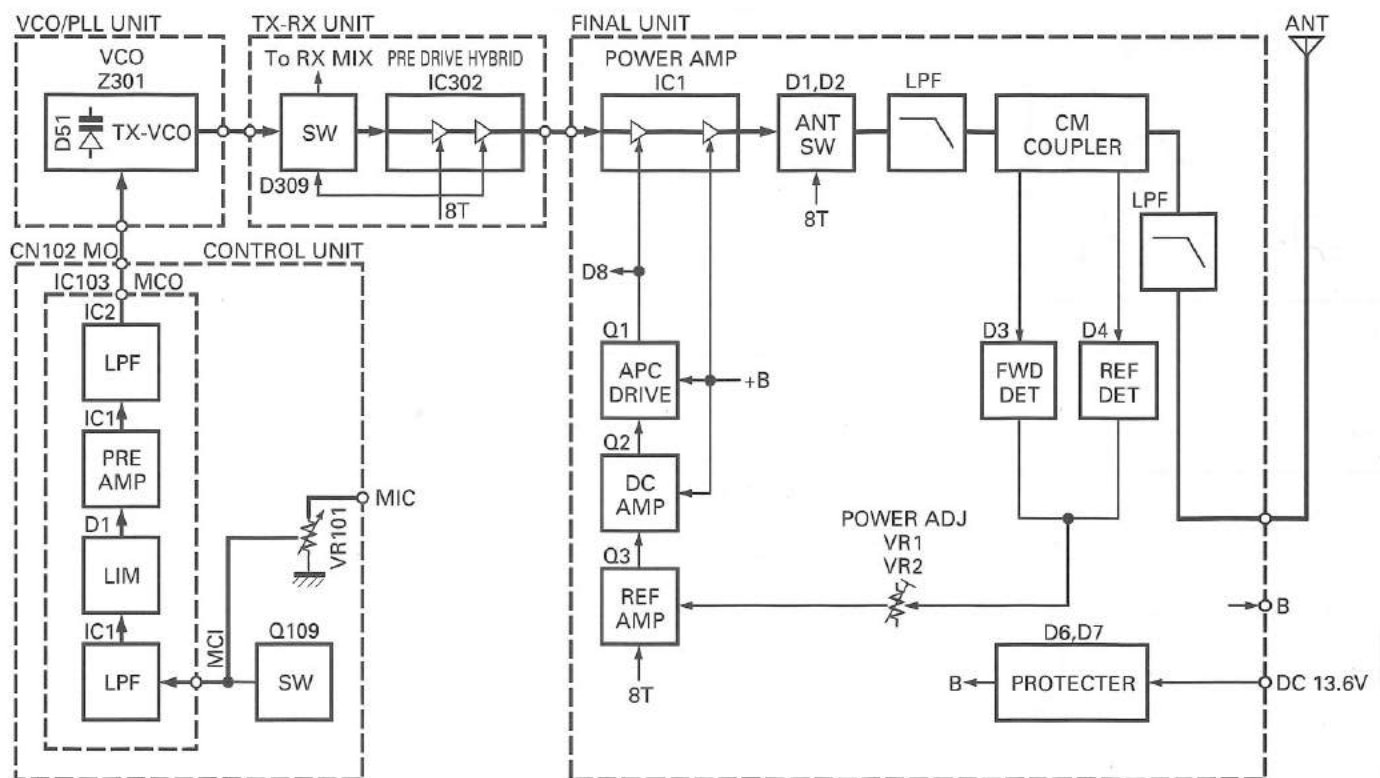


Fig. 1 Transmitter block diagram

CIRCUIT DESCRIPTION

2. Receiver Circuit

Incoming signals from the antenna pass through a low-pass filter in the final unit of the transmitter system, and are switched to the front-end of the receiver system via a receive/transmit switching diode (D1, D2).

The signal are then passed through an antenna matching coil, where the high-frequency components are amplified by a GaAs FET (Q301). The signals are then fed into bandpass filter that uses varactor diode tuning to reject unwanted signal components, and is fed to the 1st mixer.

The 1st mixer uses the GaAs FET (Q302) that are used in the RF stage to obtain better two-signal characteristics. The 1st mixer mixes the signal with the 1st local oscillator frequency (Z301) and converts it to the 1st IF (34.4MHz).

The signal then passes through two monolithic crystal filters (XF301) to remove unnecessary near-by frequency components. The signal from the XF301 is used as the 1st IF signal.

The 1st IF signal is amplified (Q303) and fed into IC301 in the FM IF IC. The IF signal is then mixed with the 2nd local oscillator frequency of 34.855MHz to generate the 2nd IF of 455kHz. The 455kHz signal is then passed through a ceramic filter (CF301; Wide, CF302; Narrow) and fed back into IC301 for additional amplification. The output signal from the IC301 is then fed into a power amplifier via the IC103 (KCE10) on the control unit to the speaker.

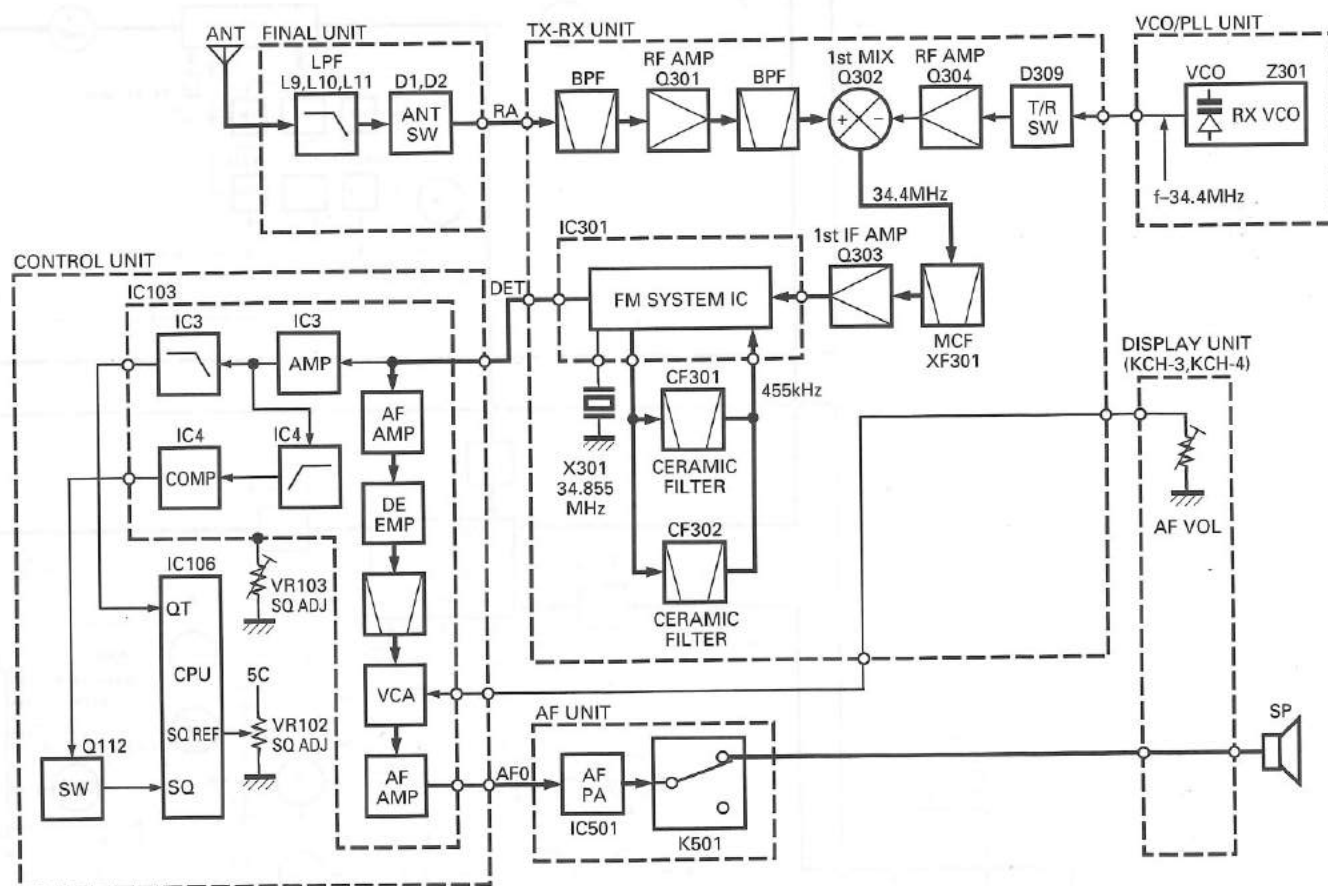


Fig. 2 Receiver block diagram

Note : Internal beat interference exists at both 138.500MHz and 139.420MHz. To eliminate the interference, replace the TX-RX unit (X57-5050-XX) (B/4) crystal oscillator X301 with a different component.

X301: L77-1415-05 (34.855MHz) → L77-1497-05 (33.945MHz)

DQT code (+, -) : Reverse

CIRCUIT DESCRIPTION

Item	Rating
Nominal center frequency	34.4MHz
Pass bandwidth	$\pm 5.0\text{kHz} \sim 7.0\text{kHz}$ or more at 3dB
Attenuation bandwidth	$\pm 1.85\text{kHz}$ or less at 40dB
Ripple	1.0dB or less
Insertion loss	3dB or less
Guaranteed attenuation	80dB or more within $\pm 1\text{MHz}$ (Spurious : 40dB or more)
Terminating impedance	$560\Omega/3.5\text{pF}$

Table 1 MCF (L71-0475-05) : TX-RX unit XF301

Item	Rating
Nominal center frequency	455kHz
6dB bandwidth	$\pm 8.0\text{kHz}$ or more (from 455kHz)
60dB bandwidth	$\pm 16.0\text{kHz}$ or less (from 455kHz)
Ripple (within $\pm 5.5\text{kHz}$ of 455kHz)	3dB or less
Insertion loss	6dB or less
Guaranteed attenuation (within $\pm 100\text{kHz}$ of 455kHz)	50dB or more
I/O matching impedance	$1.5\text{k}\Omega$

Table 2 Ceramic filter (L72-0359-05) : TX-RX unit CF301

Item	Rating
Nominal center frequency	455kHz
6dB bandwidth	$\pm 4.0\text{kHz}$ or more (from 455kHz)
60dB bandwidth	$\pm 10.0\text{kHz}$ or less (from 455kHz)
Ripple (within $\pm 3.0\text{kHz}$ of 455kHz)	3dB or less
Insertion loss	6dB or less
Guaranteed attenuation (within $\pm 100\text{kHz}$ of 455kHz)	50dB or more
I/O matching impedance	$1.5\text{k}\Omega$

Table 3 Ceramic filter (L72-0360-05) : TX-RX unit CF302

3. Squelch Circuit

3-1. Squelch

The signal from the detector is input to the IC103 audio HIC. It is amplified by IC3, and passes through IC4 (high-pass filter), and pulses are output by IC4 (comparator). The pulse level is shifted by Q112, and is input to the pulse count port of IC106 (CPU). The CPU compares the number of pulses with the voltage of the A/D conversion port of the SQREF to detect squelch.

3-2. QT/DQT

The signal from the detector is input to the IC103 audio HIC. It is amplified by IC3 (1/2), and only the signal components below 300Hz are output from IC103 by IC3 2/2 (low-pass filter). This signal is input to the analog input port (QT) of IC106 (CPU), and is digitized by the CPU. Digital signal processing is performed by the digital filter, and QT/DQT is detected.

4. Audio Circuit

The AF unit consists of IC501 (audio power amplifier), K502 (power on/off relay), K501 (speaker switching relay), and IC502 (8V AVR).

The audio signal output from IC103 of the control unit passes through the AFO terminal, is amplified by power amplifier IC501 to the rated output, passes through K501, and is output from the RS1 terminal to drive the speaker.

Power on/off relay K502 is operated by PSC (low at power on) from the control unit to turn the transceiver power on and off.

The 13.6V DC voltage is regulated to 8V by the 8V AVR (IC502).

Speaker output switching relay K501 changes the signal output destination when Q501 is turned on by SSC (normally low). When public address output is performed or a receive signal is output to the public address speaker (the PA or SP key is on), SSC goes high, and is output from the OS1 terminal.

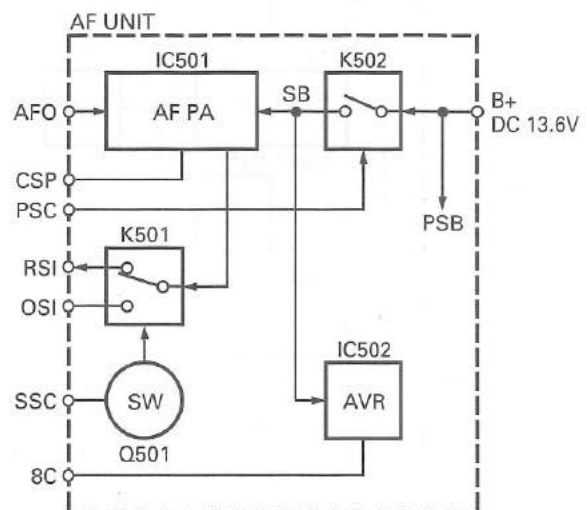


Fig. 3 Audio block diagram

CIRCUIT DESCRIPTION

5. VCO/PLL Unit (Z301)

The PLL generates the transmit signal and the first local oscillator receive signal. The RF signal generated by Q51 (TX) or Q52 (RX) in the VCO unit is amplified by Q53 and Q1 (PLL unit), and the resulting signal is output to the TX-RX unit. TX and RX Q51 and Q52 are switched by turning the source line for Q51 and Q52 on and off. This is done by Q54 and Q55 using the control signal (STR) generated by the serial-to-parallel converter in the TX-RX unit. The RF signal passes through Q53 of the VCO unit and amplifier Q2, and is input to IC1 (PLL IC : MB1504PF). The 12.8MHz PLL reference signal generated by the TCXO (X302) in the TX-RX unit is also input to IC1.

Both signals are divided according to the division data from the control unit to produce a 5kHz signal. The phases are compared, and a phase difference signal is output and passes through Q5 and Q6 (charge pump) and the low-pass filter of the lug lead to produce the control voltage for Q51/Q52 (VCO). This voltage is applied to D52 and D53 (TX) or D54 and D55 (RX) in the VCO unit to control the frequency. If the PLL is unlocked, the IC1 lock detect signal (LD) is converted to a DC signal by Q3 and Q4, and is sent to the microcomputer (IC106) of the control unit. The microcomputer determines that the PLL has been unlocked, and stops signal transmission. It outputs a beep as a warning.

The modulation signal (MP) passing through the VR in the TX-RX unit goes to D51, which is connected to Q51 of the VCO in the VCO unit, and the VCO is directly modulated.

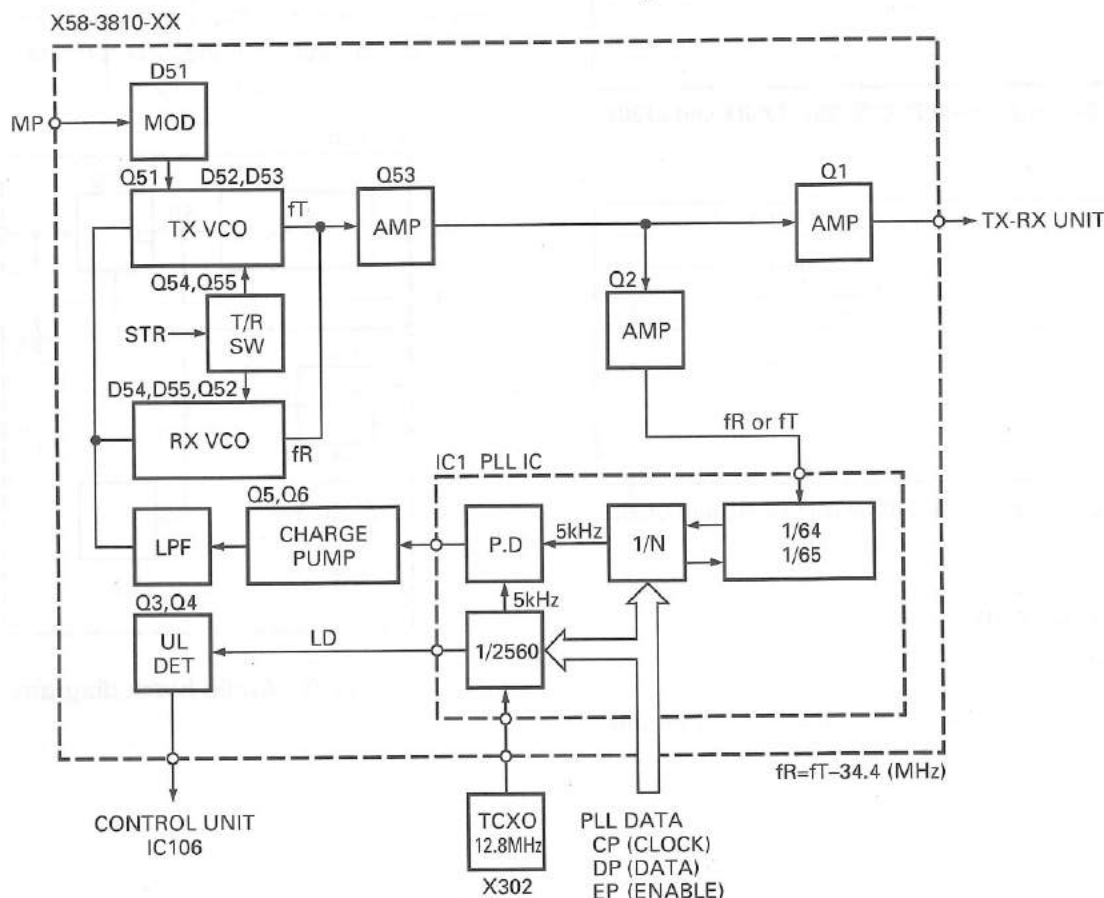


Fig. 4 VCO/PLL block diagram

CIRCUIT DESCRIPTION

6. Control Circuit

6-1. CPU backup and reset

When the CPU is backed up (8C=0V, SB=0V), the PSB voltage passes through a diode OR switch (D103), and is made into a constant voltage of 5V (AVR) by a zener diode (D104) to supply power to the VDD pin of the CPU (IC106). Q105 and Q106 are off, and Reset and NMI (backup interrupt) are high (5V).

When the power switch is turned on, 8C and SB go high. SB is supplied to IC102, and when the output voltage becomes 4.8V, reset delay capacitor C113 is charged. When charging ends, a high signal is output to the IC106 Reset pin.

Q105 turns on and NMI goes low. Q106 is turned on momentarily by reverse polarity diode D106 and pulse generation capacitor C113, and the CPU Reset pin goes low, resetting the CPU.

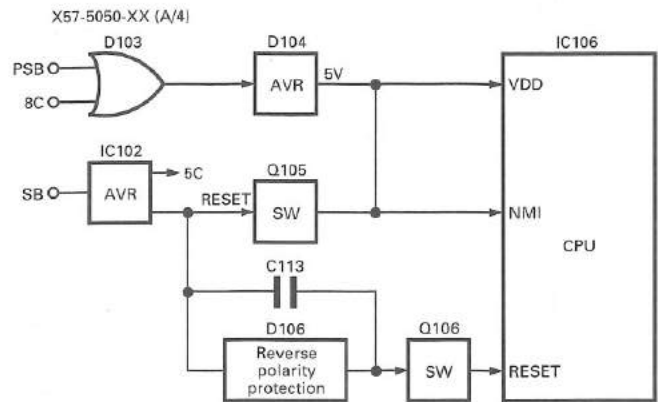


Fig. 5 CPU backup and reset

6-2. Peripheral circuits of the CPU

The transceiver system and channel data is stored in IC109. The PTT and HOOK signals are converted to serial data and sent to the CPU (IC106) from the display unit (KCH-3 or KCH-4). The serial data signal output

from the CPU is sent to the display unit, and data is displayed on the LCD by the LCD driver.

Q110 and Q111 are switching transistors that turn the CPU output on and off.

IC104 and IC105 are used as IC106 expansion ports.

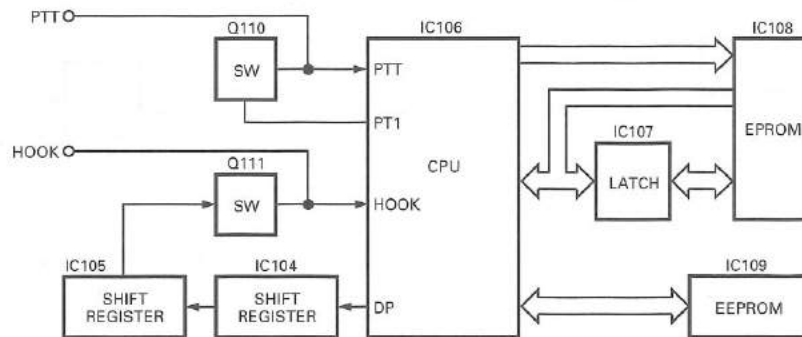


Fig. 6 Peripheral circuit of the CPU

6-3. Transceiver power supply relay (K502: AF unit) control circuit

The voltage is always applied from PSB. The voltage is used to protect IC101 (D/FF) by D101. Pulses from which chattering has been eliminated by Q101 are input to the IC101 clock line. These clock pulses reverse the output. The reversed output drives Q104

via Q102. Since Q103 ANDs Q104, relay K502 cannot be activated unless a voltage is applied to IGN.

If zener diode D112 is connected to PSB, and 24V is supplied to the radio by mistake, Q114 turns on, Q104 turns off, and PSC goes high; The power is forced to be turned off.

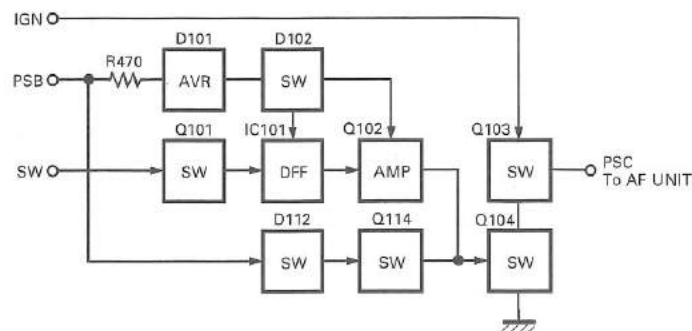


Fig. 7 Transceiver power supply relay control circuit

CIRCUIT DESCRIPTION

7. Display Unit

The optional display unit (front panel unit) for the TK-730(GB) comes in two models : KCH-3 and KCH-4.

7-1. KCH-3 (Contain : TK-730(G))

This display unit consists of a CPU (IC1) containing the LCD driver, a reset AVR (IC2), and other components.

• Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC1) by interrupt processing by D5 (diode OR), are converted to a serial data signal, and are sent to the control unit.

• Power supply

Power is supplied to the CPU and backlight lamp (D6, LED assembly) by converting SB from the control unit to 5V by IC2. The CPU (IC1) is reset by the reset output from IC2 when the power is switched on.

• CPU (containing LCD driver)

The on/off signals of keys other than the power switch, and the PTT and HOOK signals, are converted to serial data and sent to the control unit. Data is displayed on the 13-segment, 2-digit LCD by the built-in LCD driver using the serial data signal from the control unit.

• LED (LCD backlight) on/off

When the AUX key is turned on, Q1 turns on, Q2 turns off, and the LED is turned off by the output from the CPU (IC1). Q1 turns the AUX output on and off if the AUX key is not used to turn the LED on and off.

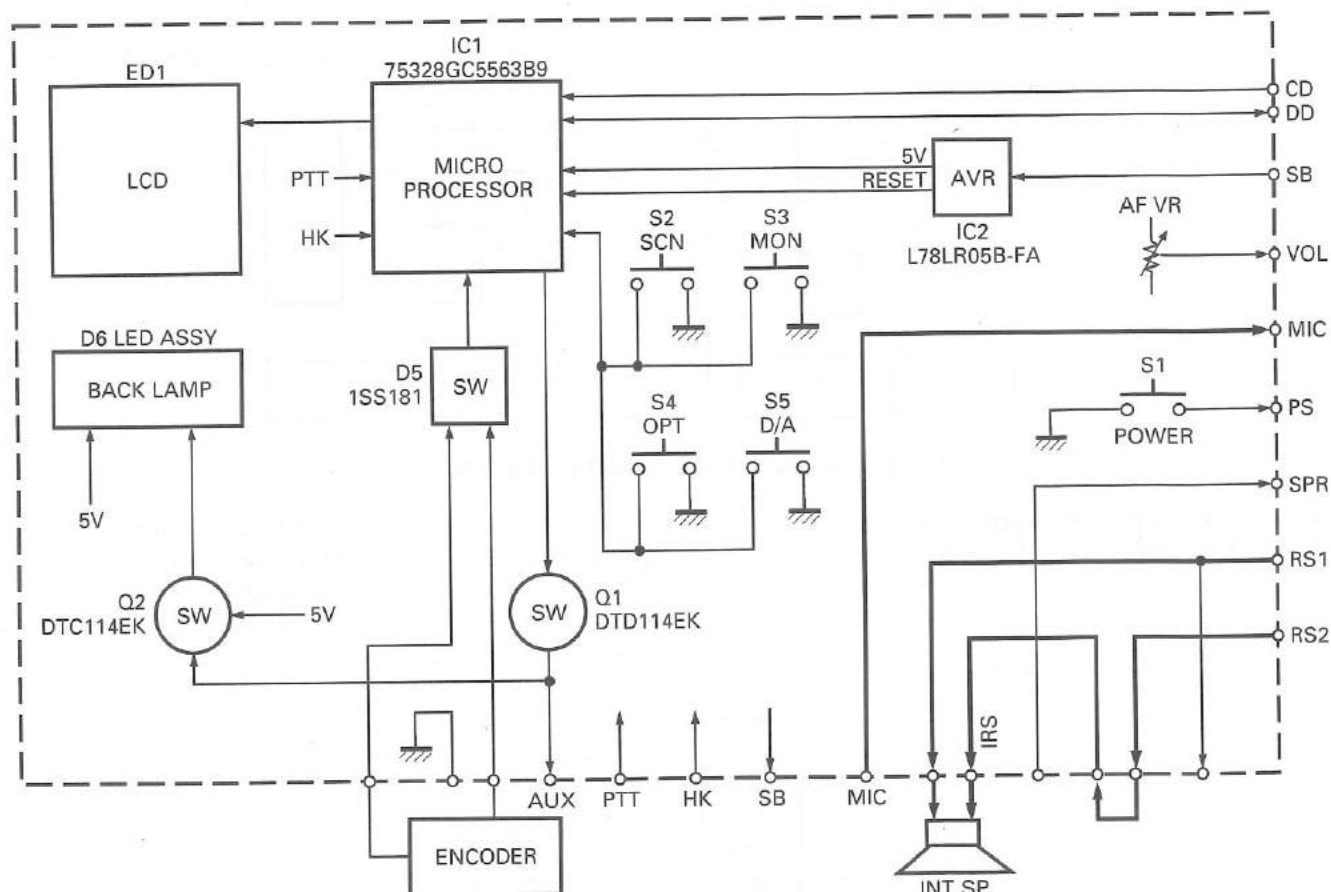


Fig. 8 KCH-3 block diagram

CIRCUIT DESCRIPTION

7-2. KCH-4

This display unit (front panel unit) consists of a CPU (IC1) containing the LCD driver, a reset AVR (IC2), an EEPROM (IC3), an LCD driver (IC4), and other components.

• Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC1) by interrupt processing by D5 (diode OR), are converted to a serial data signal, and are sent to the control unit.

• Power supply

Power is supplied to the CPU (IC1) and backlight lamp (D7, LED assembly) by converting SB from the control unit to 5V by IC2. The CPU (IC1) is reset by the reset output from IC2 when the power is switched on.

• CPU (containing LCD driver)

The on/off signals of keys other than the power switch, and the PTT and HOOK signals, are converted to serial data signals and sent to the control unit. The display data stored in IC3 is displayed on the 13-segment, 12-digit LCD by the built-in LCD driver using the serial data signal from the control unit.

• LED (LCD backlight) on/off

When the AUX key is turned on, Q1 turns on; Q3, which supplies SB to Q2 and D6 of the LED constant-voltage circuit, outputs 0V; and the LED goes off. Q1 turns the AUX output on and off if the AUX key is not used to turn the LED on and off.

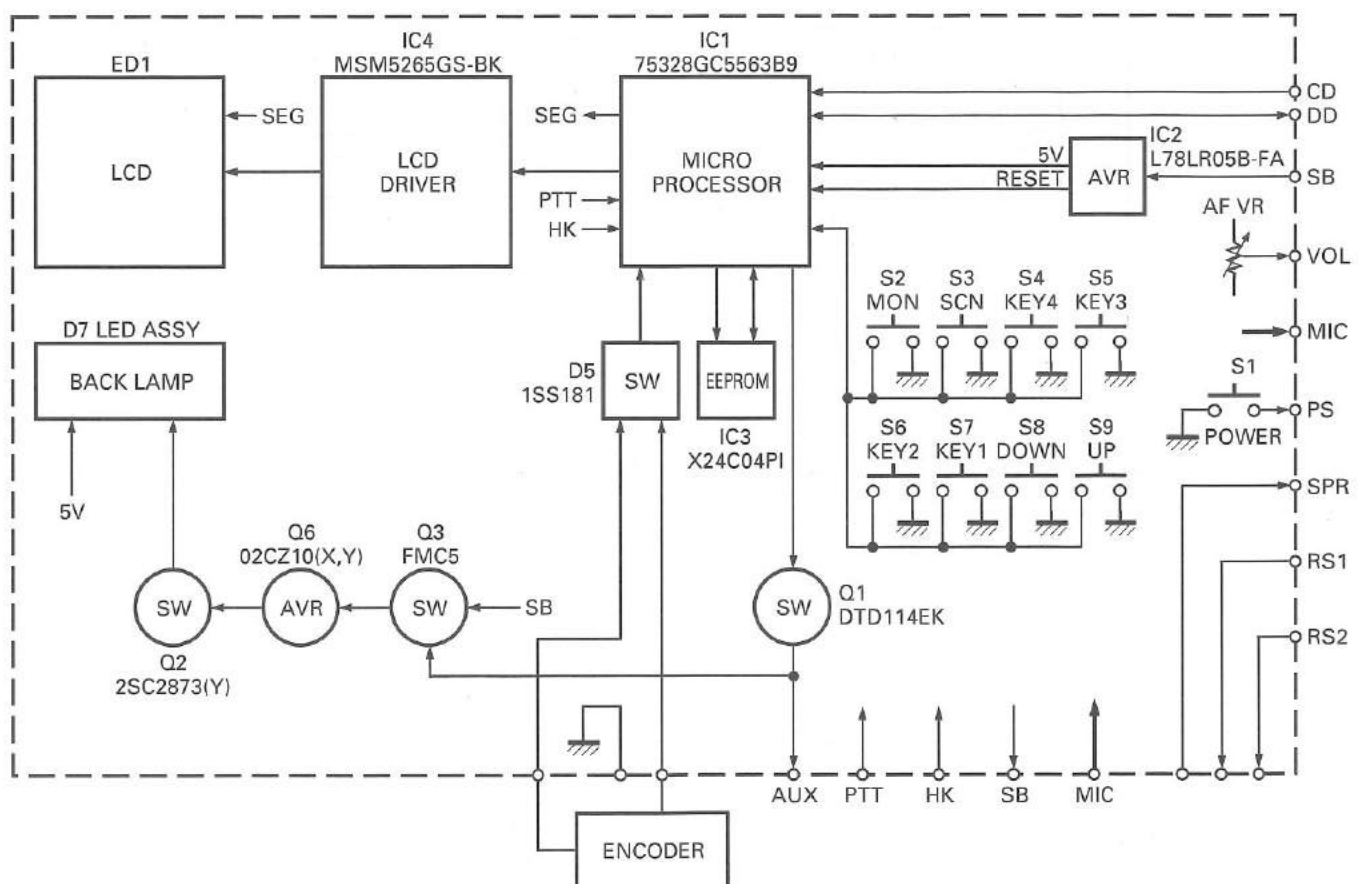


Fig. 9 KCH-4 block diagram

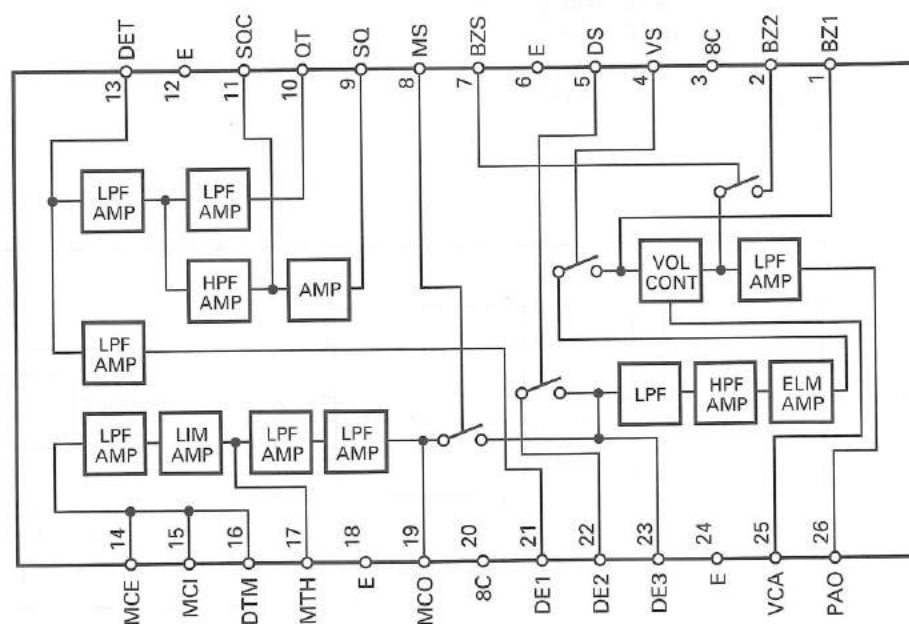
HIC : KCE10 (Control unit IC103)

• Analog and peripheral switches

	CPU control signal								
Function	VS	DS	BZS	MS	Q107	Q108	Q109	W103	W104
Audio output	○	○	●	●	●	●	○	○	○
Microphone input	●	●	●	●	●	●	●	○	○
Public address	○	●	●	○	●	○	●	○	○
Inter communication (H1→H2)	●	●	●	○	●	○	●	○	○
Beep output (H1)	●	●	○	●	●	○	●	○	○
Voice scramble (RX)	○	○	●	●	●	●	○	●	●
Voice scramble (TX)	●	●	●	●	○	○	●	●	●

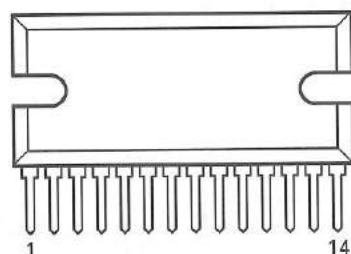
○ : ON, ● : OFF

• Block diagram



Audio Power Amplifier : LA4491N (AF unit IC501)

• Terminal connection diagram



• Electrical characteristics

Item	Symbol	Condition	Rating			Unit
			MIN	TYP	MAX	
DC current	I _{CC}	V _{IN} =0	40	80	160	mA
Output power	P _O	T.H.D.=10%	16	19	—	W
Distortion	T.H.D	P _O =1W	—	0.06	0.3	%
Voltage gain	V _G		38	40	42	dB
Noise output voltage	V _{NO}	R _G =10kΩ	—	160	320	μV

T_a=25°C, V_{CC}=13.2V, f=1kHz, R_L=4Ω

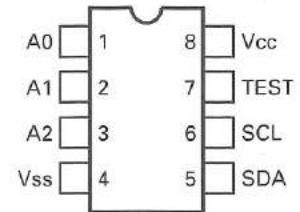
SEMICONDUCTOR DATA

EEPROM : X24C16PI (Channel Expansion Kit KCH-5 : Option)

• Terminal description

No.	Name	Description
1	A0	Address inputs The A0, A1 and A2 inputs are unused by the X24C16PI, however, they must be tied to Vss to insure proper device operation.
2	A1	
3	A2	
4	Vss	Vss
5	SDA	Serial data SDA is a bidirectional pin used to transfer data into and out of the device. It is an open drain output and may be wire-ORed with any number of open drain or open collector outputs.
6	SCL	Serial clock The SCL input is used to clock all data into and out of the device.
7	TEST	Test input → to Vss
8	Vcc	Vcc

• Terminal connection diagram

• Operating characteristics $T_a = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{cc} = +5V \pm 10\%$, unless otherwise specified.

Item	Symbol	Condition	Rating			Unit
			Min	Typ *1	Max	
Power supply current	I_{cc}	$f_{SCL} = 100\text{kHz}$	—	2.0	3.0	mA
Standby current *2	I_{sb}	$V_{IN} = \text{GND or } V_{cc}$	—	60	100	μA
Input leakage current	I_{li}	$V_{IN} = \text{GND to } V_{cc}$	—	0.1	10	μA
Output leakage current	I_{lo}	$V_{OUT} = \text{GND to } V_{cc}$	—	0.1	10	μA
Input low voltage	V_{IL}		-1.0	—	$V_{cc} \times 0.3$	V
Input high voltage	V_{IH}		$V_{cc} \times 0.7$	—	$V_{cc} + 0.5$	V
Output low voltage	V_{OL}	$I_{oL} = 3\text{mA}$	—	—	0.4	V

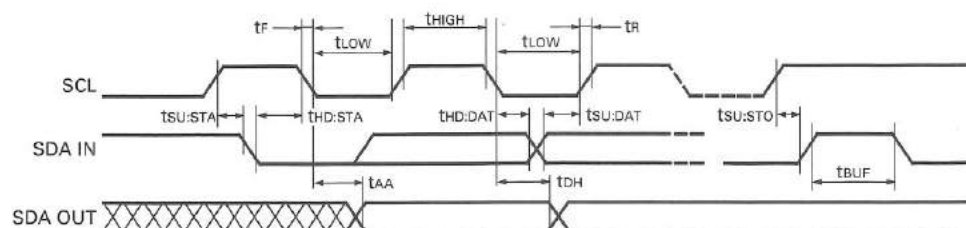
*1 : Typical values are for $T_a = 25^\circ\text{C}$ and nominal supply voltage.

*2 : SDA and SCL require pull up resistor.

• Read & write cycle limits $T_a = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{cc} = +5V \pm 10\%$, unless otherwise specified.

Item	Symbol	Min	Max	Unit
SCL clock frequency	f_{SCL}	0	100	kHz
Noise suppression time constant at SCL, SDA inputs	T_i	—	100	ns
SCL low to SDA data out valid	t_{AA}	0.3	3.5	μs
Time the bus must be free before a new transmission can start	t_{BUF}	4.7	—	μs
Start condition hold time	$t_{HD:STA}$	4.0	—	μs
Clock low period	t_{LOW}	4.7	—	μs
Clock high period	t_{HIGH}	4.0	—	μs
Start condition setup time (for a repeated start condition)	$t_{SU:STA}$	4.7	—	μs
Data in hold time	$t_{HD:DAT}$	0	—	μs
Data in setup time	$t_{SU:DAT}$	250	—	ns
SDA and SCL rise time	t_R	—	1	μs
SDA and SCL fall time	t_F	—	300	ns
Stop condition setup time	$t_{SU:STO}$	4.7	—	μs
Data out hold time	t_{DH}	300	—	ns

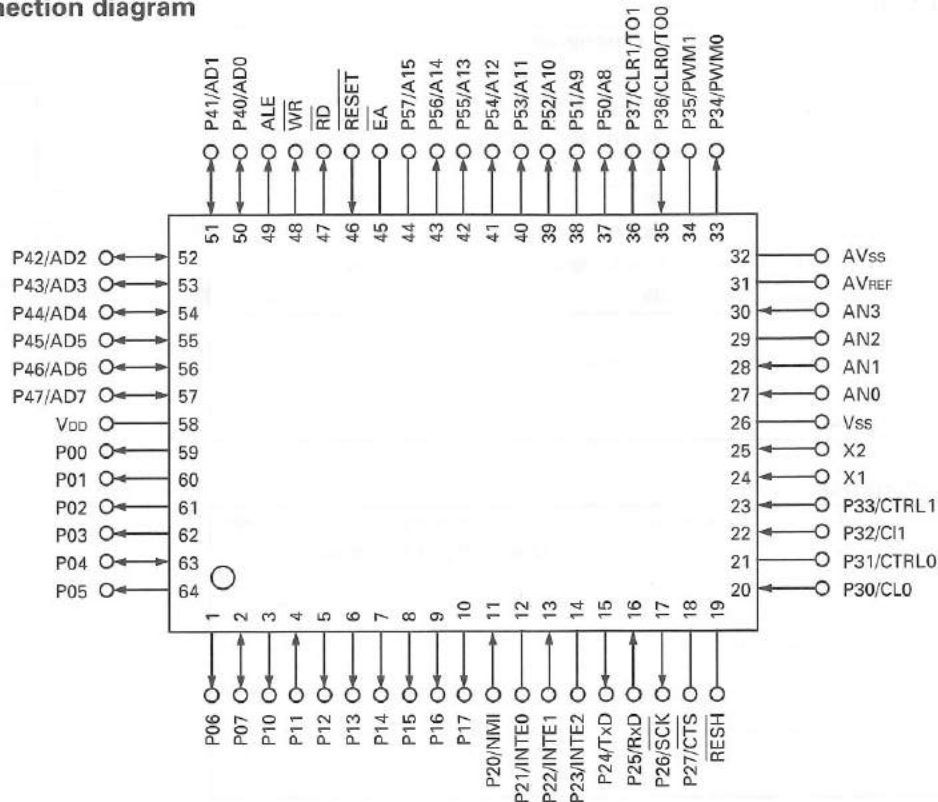
• Bus timing



SEMICONDUCTOR DATA

CPU : 78312AGF3343BE (Control Unit IC106)

• Terminal connection diagram



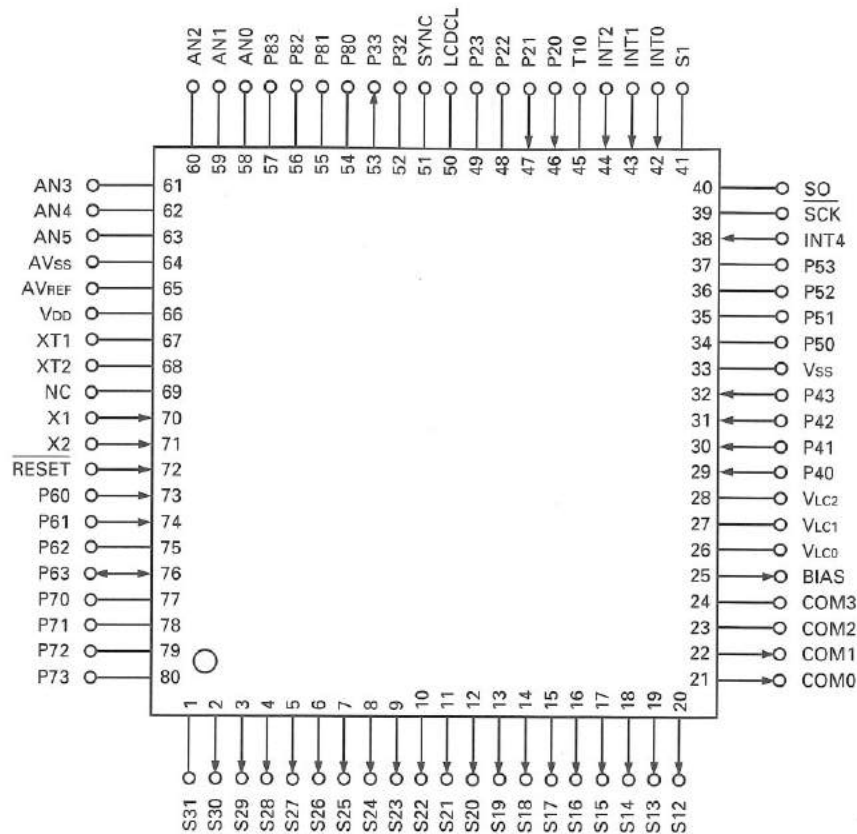
• Terminal function

Pin No.	Pin name	I/O	Function	Pin No.	Pin name	I/O	Function
1	P06	O	STROBE output.	27	AN0	I	ANALOG input (QT. DET).
2	P07	I/O	Serial data input/output (DISPLAY 2).	28	AN1	I	Not use.
3	P10	O	CLOCK output (DISPLAY 2).	29	AN2	-	GND.
4	P11	I	Dead beet disable input.	30	AN3	I	NOISE SQ REFERENCE input.
5, 6	P12, P13	O	Five-tone data rewrite output.	31	AVREF	-	+5V.
7	P14	O	Control STROBE output (BU4094BCF).	32	AVss	-	GND
8	P15	O	AC1 (SCRAMBLER) output.	33	P34/PWM0	O	PWM output, TONE output.
9	P16	O	PTT SW output.	34	P35/PWM1	-	Open (not use).
10	P17	O	Beep output (HEAD 1).	35	P36/CLR0/TO0	I/O	EEPROM (X24C04PI) serial data input/output.
11	P20/NMI	I	Backup interrupt input.	36	P37/CLR1/TO1	O	EEPROM (X24C04PI) CLOCK output.
12	P21/INTE0	-	Open (not use).	37~43	A8~A14	O	Address output.
13	P22/INTE1	I	PTT SW input.	44	P57/A15	-	Open (not use).
14	P23/INTE2	I	HOOK SW input.	45	EA	-	+5V.
15	P24/TXD	O	Serial data output (RADIO 1, 2).	46	RESET	I	System reset input.
16	P25/RXD	I	Serial data input (RADIO 1, 2).	47	RD	O	EPROM read strobe output.
17	P26/SCK	O	Beep output (HEAD 2).	48	WR	O	Open (not use).
18	P27/CTS	-	GND.	49	ALE	O	Latch enable output.
19	RFSH	-	Not use.	50~57	AD0~AD7	I/O	Address output, DATA input.
20	P30/CI0	I	Noise pulse input.	58	VDD	-	+5V.
21	P31/CTRL0	-	Not use.	59	P00	O	PLL ENABLE output.
22	P32/CI1	I	Unlock signal input.	60	P01	O	TX/RX STROBE output.
23	P33/CTRL1	I	AC2 (optional matching signal) input.	61	P02	O	CLOCK output.
24	X1	I	CLOCK input.	62	P03	O	Serial data output.
25	X2	I	CLOCK input.	63	P04	I/O	CLOCK input/output (DISPLAY 1).
26	Vss	-	GND.	64	P05	O	Serial data output (DISPLAY 1).

SEMICONDUCTOR DATA

CPU, LCD Driver : 75328GC5563B9 (Display Unit X54-3100 : KCH-3 IC1)

• Terminal connection diagram



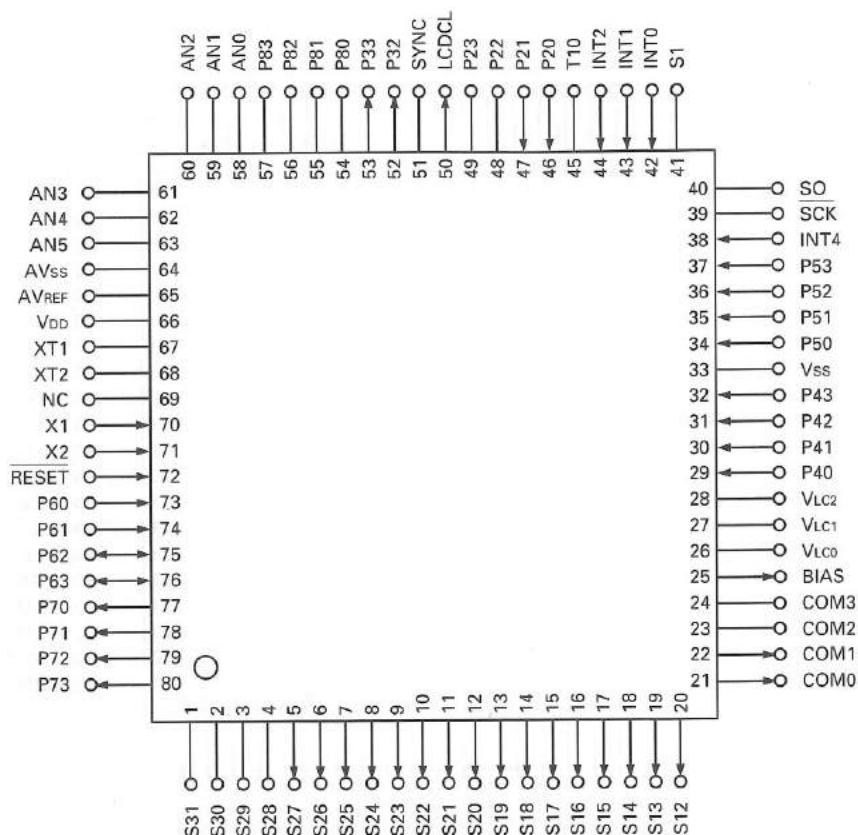
• Terminal function

Pin No.	Pin name	I/O	Function	Pin No.	Pin name	I/O	Function
1	S31/BP7	-	Open (not use).	46	P20/PT0	I	Encoder input.
2~20	S30~S12	O	LCD output (S1~S19).	47	P21	I	Encoder input.
21	COM0	O	LCD COM1 output.	48	P22/PCL	-	+5V.
22	COM1	O	LCD COM0 output.	49	P23/BUZ	-	GND.
23, 24	COM2, COM3	-	Open (not use).	50~52	P30~P32	-	Open (not use).
25	BIAS	O	LCD power supply voltage.	53	P33	O	Output for setting of AUX function.
26~28	VLC0~VLC2	-	LCD voltage level generator.	54~57	P80~P83	-	Open (not use).
29	P40	I	SCAN SW input.	58~63	AN1~AN5	-	GND.
30	P41	I	MON SW input.	64	AVss	-	GND.
31	P42	I	OPT SW input.	65~67		-	+5V.
32	P43	I	D/A SW input.	68	XT2	-	Open (not use).
33	Vss	-	GND.	69	NC (VPP)	-	+5V.
34~37	P50~P53	-	Open (not use).	70, 71	X1, X2	^	System CLOCK input.
38	P00/INT4	I	HOOK SW input.	72	RESET	I	System reset input.
39~41	P01~P03	-	GND.	73	P60/KR0	I	PTT SW input.
42	P10/INT0	I	Encoder interrupt input.	74	P61/KR1	I	HOOK SW input.
43	P11/INT1	I	PTT SW input.	75	P62/KR2	-	Open (not use).
44	P12/INT2	I	CLOCK input.	76	P63/KR3	I/O	Internal interface input/output.
45	P13/TI0	-	GND.	77~80	P70~P73	-	Open (not use).

SEMICONDUCTOR DATA

CPU : 75328GC5563B9 (Display Unit X54-3110 : KCH-4 IC1)

• Terminal connection diagram



DESCRIPTION OF COMPONENTS

FINAL UNIT (X57-5050-XX) (D/4) -11 : K -12 : K2

Ref. No.	Part No.	Use/Function	Operation/Condition
IC1	M67781H	Power amplifier	For F1.
	M67781L		For F2.
Q1	2SD1722(R,S)	APC driver	
Q2	2SA1162(Y)	DC amplifier	APC controller.
Q3	FMW1	DC amplifier	APC controller.
D1	UM9401	TX/RX switching	
D2	MI308	TX/RX switching	
D3	HSM88AS	Forward wave rectification	
D4	HSM88AS	Reflected wave rectification	
D6	ERZ-M10DK220	Surge absorption	
D7	DSA3A1	Protection of reverse connection	

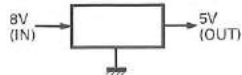
CONTROL UNIT (X57-5050-XX) (A/4) -11 : K -12 : K2

Ref. No.	Part No.	Use/Function	Operation/Condition
IC101	TC4013BF	D-FF	Phase difference detection.
IC102	L78LR05B-FA	AVR	
IC103	KCE10	MIC amplifier, AF BPF, AF VOL, SQ	
IC104,105	XRU4094BCF	Shift register	Or BU4094BCF.
IC106	78312AGF3343BE	CPU	
IC107	TC74HC573AF	Latch	Separate from multiplexer address/data bus output.
IC108	27C256QJPWA	EPROM	
IC109	X24C04PI	EEPROM	
Q101	DTA114EK	DC switch	ON when the power switch is held down.
Q102	DTA114EK	DC switch	ON when the power switch on.
Q103,104	DTD114EK	DC switch	ON when the power switch on.
Q105	DTC114EK	DC switch	Reset (IC106) when the power switch off.
Q106	2SC2712(Y)	DC switch	Reset (IC106) when the power switch off.
Q107	2SD1757K	Muting switch	OFF when busy.
Q108	DTC114EK	Muting switch	OFF when RX.
Q109	DTC114EK	Muting switch	OFF when PTT switch on.
Q110	DTC114EK	PTT switch	ON when PTT switch on.
Q111	DTC114EK	HOOK switch	ON when on hook.
Q112	DTC114EK	SQ level shifter	8V → 5V.
Q114	DTC114EK	DC switch	ON when 24V input → Q104 off.
Q115	DTC114EK	Beep switch	
Q116	DTD114EK	DC switch	ON when AUX key on.
Q117,118	DTC144EK	SQ control switch	
Q119	FMC2	Wide/Narrow switch	"H" : Narrow, "L" : Wide
Q120	DTC114EK	QT/DQT muting switch	
Q121	DTA114EK	MIC muting switch	
D101	02CZ18(X,Y)	Voltage reference	
D102	1SS181	Reverse current prevention	
D103	1SS184	DC switch	
D104	02CZ5.6(X,Y)	Voltage reference	
D105	1SS184	Reverse current prevention	
D106	1SS184	DC switch	
D107~110	1SS226	Surge absorption	ON when 5V or more and 0V or less.
D111	1SS184	DC switch	

DESCRIPTION OF COMPONENTS

Ref. No.	Part No.	Use/Function	Operation/Condition
D112	02CZ15(X,Y)	Voltage reference	
D113	D1F20	Reverse current prevention	
D114	1SS196	DC switch	
D115	1SS184	SP muting switch	
D116	1SS184	MIC muting switch	
D117	1SS196	Reverse current prevention	

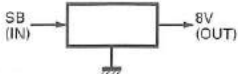
TX-RX UNIT (X57-5050-XX) (B/4) -11 : K -12 : K2

Ref. No.	Part No.	Use/Function	Operation/Condition
IC301	MC3371D	IF system	1,2 : Oscillator (34.855MHz) 3 : Mixer output 4 : Vcc 5 : Limiter input 6,7 : Decoupling 8 : Quad input 9 : AF output 16 : Input (34.4MHz)
IC302	KCB05	Drive amplifier	
IC303	XRU4094BCF	Shift register	Or BU4094BCF.
IC304	NJM78L05UA	Voltage regulator	
IC305	BU4S66F	Analog switch	Or TC4S66F.
IC306	AN8009M	Voltage regulator	F1 only. 
Q301	SGM2014M	RF amplifier	For F1.
	3SK184(S)		For F2.
Q302	SGM2014M	RX 1st mixer	
Q303	2SC2714(Y)	RX 1st IF amplifier	34.4MHz.
Q304	2SC2714(Y)	RF amplifier	(RX frequency - 34.4) MHz.
Q305	2SK208(Y)	DC amplifier	PLL lock voltage.
Q306	2SB1119S	DC switch	RX : 8V, TX : 0V.
Q307	DTC114EK	DC switch	ON when RX.
Q308	2SB1119S	DC switch	RX : 0V, TX : 8V.
Q309	DTC114EK	DC switch	ON when TX.
Q310	DTC114EK	DC switch	Reset (shift register XRU4094BCF).
Q311	DTC114EK	MIC mute switch	ON when RX.
Q312,313	DTC114EK	DC switch	ON when narrow.
Q314	DTA114EK	DC switch	ON when wide.
Q315	DTC144EK	DC switch	ON when narrow.
Q316	DTC144EK	DC switch	ON when narrow.
Q317	DTC114YK	DC switch	ON when wide.
D301	1SS226	Protector	
D302	1SV164	BPF tuning	Vari-cap tuning. (F2)
D303	1SV166	BPF tuning	Vari-cap tuning.
D304	1SV164	BPF tuning	Vari-cap tuning. (F1)
D305	1SV166	BPF tuning	Vari-cap tuning. (F2)
D306	1SV164	BPF tuning	Vari-cap tuning.
D307	1SV164	BPF tuning	Vari-cap tuning. (F2)
D308	1SV164	BPF tuning	Vari-cap tuning. (F1)
	1SV166		Vari-cap tuning. (F2)
D309	1SS184	RF switch	Common VCO output.
D310	1SV164	1st OSC tuning	Vari-cap tuning.
D311	1SV166	1st OSC tuning	Vari-cap tuning.

DESCRIPTION OF COMPONENTS

Ref. No.	Part No.	Use/Function	Operation/Condition
D312	1T33C	BPF tuning	Vari-cap tuning. (F2)
D313	1SV214	BPF tuning	Vari-cap tuning. (F1)
D314	1T33C	BPF tuning	Vari-cap tuning. (F1)
D315,316	DAN235K	RF switch	

AF UNIT (X57-5050-XX) (C/4) -11 : K -12 : K2

Ref. No.	Part No.	Use/Function	Operation/Condition
IC501	LA4491N	Audio power amplifier	
IC502	μPC78M08H	AVR	
Q501	DTD114EK	Speaker switch	ON when PA SP switch on.
D501,502	1SS193	Reverse current prevention	
D503	1SS184	Protector	ON when the power switch off.

VCO/PLL (X58-3810-XX) -10 : K -11 : K2

Ref. No.	Part No.	Use/Function	Operation/Condition
IC1	MB1504PF	PLL system	1 : TCXO input 4 : 5V 7 : LD ("H" when lock) 8 : VCO output 9 (CLK), 10 (DAT), 11 (LE) : PLL data input 15 (P), 16 (R) : Charge pump output
Q1	2SC2714(Y)	RF amplifier	
Q2	2SC2714(Y)	Buffer amplifier	
Q3	2SA1162(Y)	Lock detect switch	"H" when lock.
Q4	DTC143EK	Lock detect switch	"H" when lock.
Q5	2SA1312(GR)	Charge pump	D/A converter.
Q6	2SC3324(G)	Charge pump	D/A converter.
Q51	2SK508NV(K52)	OSC	TX-VCO.
Q52	2SK1577(1)	OSC	RX-VCO. (F1)
	2SK508NV(K52)		RX-VCO. (F2)
Q53	2SC2714(Y)	Buffer amplifier	
Q54	DTC114EK	TX/RX switching	
Q55	FMG2	TX/RX switching	
D1	MA77		
D2	1SS356	DC switch	
D51	1SV164	Modulator	
D52,53	1T33C	Vari-cap diode	Frequency controller (TX-VCO).
D54,55	1T33C	Vari-cap diode	Frequency controller (RX-VCO).

TK-730(G)/(GB)

DESCRIPTION OF COMPONENTS

DISPLAY UNIT (X54-3100-20) : KCH-3

Ref. No.	Part No.	Use/Function	Operation/Condition
IC1	75328GC5563B9	CPU, LCD driver	
IC2	L78LR05B-FA	AVR	
Q1	DTD114EK	LED or AUX switch	ON when AUX key on.
Q2	DTC114EK	DC switch	OFF when AUX key on.
D1~4	1SS226	Surge absorption	ON when 5V or more and 0V or less.
D5	1SS181	Encoder interrupt	
D6	B38-0322-05	LED assy	LCD back light.
ED1	B38-0353-05	LCD	

DISPLAY UNIT (X54-3110-20) : KCH-4

Ref. No.	Part No.	Use/Function	Operation/Condition
IC1	75328GC5563B9	CPU	
IC2	L78LR05B-FA	AVR	
IC3	X24C04PI	EEPROM	
IC4	MSM5265GSBK	LCD driver	
Q1	DTD114EK	LED or AUX switch	ON when AUX key on.
Q2	2SC2873(Y)	DC switch	
Q3	FMC5	LED switch	OFF when AUX key on.
D1~4	1SS226	Surge absorption	ON when 5V or more and 0V or less.
D5	1SS181	Encoder interrupt	
D6	02CZ10(X,Y)	Voltage reference	
D7	B38-0352-05	LED assy	LCD back light.
ED1	B38-0354-05	LCD	

PARTS LIST

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

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

TK-730(G)/(GB)

TX-RX UNIT (X57-5050-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
TK-730(G)/(GB)						
1	1A		A01-2020-01	CASE (UPPER)		
2	3A		A01-2021-01	CASE (LOWER)		
3	2B		A10-1318-01	FRAME		
-			A22-0776-02	SUB PANEL		G
-			A62-0063-03	PANEL		G
-			A62-0064-13	PANEL ASSY		G
-			B10-1162-14	FRONT GLASS		G
5	2A		B42-3343-04	LABEL (S/NO)		
5	2A		B72-1120-14	MODEL NAME PLATE (F1)	K	
5	2A		B72-1121-04	MODEL NAME PLATE (F2)	K2	
6	1H		B46-0470-00	WARRANTY CARD		
7	1H		B62-0069-10	INSTRUCTION MANUAL		
8	2A		E04-0167-05	RF COAXIAL CABLE		
9	2G		E30-2036-05	GROUND LEAD WIRE		
10	1G		E30-3068-05	DC CABLE ASSY		G
11	1A,2G		E31-3228-05	SHORT PLUG (ACC)		
-			E31-3269-05	CONNECTING WIRE (RA/DO)		
12	1A		E37-0152-15	FLEXIBLE PC BOARD (2P)		
-			E37-0153-05	FLEXIBLE PC BOARD (17P)		
-			E37-0154-05	FLEXIBLE PC BOARD (13P)		
13	1A		E37-0155-05	CONNECTING WIRE (15P)		
-			E37-0157-05	CONNECTING WIRE		G
-			E37-0159-05	CONNECTING WIRE		G
14	2G		F05-1537-05	FUSE (15A)		G
15	2G		F07-1336-05	COVER		
16	3A		F10-1479-03	SHIELDING PLATE (FINAL)		
-			F20-1116-04	INSULATING SHEET (APC)		
17	2A		G02-0574-04	LEAF SPRING (AVR)		
-			G02-0576-14	LEAF SPRING (APC)		
18	2A		G02-0709-04	LEAF SPRING (AF-AMP)		
19	2B		G10-0707-14	NON-WOVEN FABRIC		
-			G53-0509-04	PACKING		G
20	2A		G53-0712-03	PACKING		
21	1A		G53-0713-13	PACKING (CASE/UPPER)		
22	3A		G53-0714-03	PACKING (CASE/LOWER)		
23	1H		H10-2575-04	POLYSTYRENE FOAMED FIXTURE		
24	2G		H10-2710-02	POLYSTYRENE FOAMED FIXTURE		
25	2G		H12-1399-04	PACKING FIXTURE		
26	1G		H12-1403-04	PACKING FIXTURE		
-			H12-1434-04	PACKING FIXTURE		GB
-			H25-0029-04	PROTECTION BAG		G
-			H25-0096-04	PROTECTION BAG		
27	2G		H25-0103-04	PROTECTION BAG (125X250)		
28	1H		H25-0194-04	PROTECTION BAG (RADIO)		
29	3G		H52-0080-04	ITEM CARTON BOX		
30	2G		J19-1376-15	HOLDER		G
-			J21-4340-04	MOUNTING HARD WARE		G
31	1A		J21-4341-04	MOUNTING HARD WARE		
32	2G		J29-0422-13	BRACKET		G
33	2G		J61-0307-05	WIRE BAND		
-			K29-4663-02	KEY TOP		G
-			K29-4664-04	KNOB (VOL,CH)		G
TX-RX UNIT (X57-5050-XX) -11 : K -12 : K2						
A	2B		N32-3006-46	FLAT HEAD MACHINE SCREW		
B	2A		N35-3006-46	BINDING HEAD MACHINE SCREW		
C	1A,3A		N35-3008-45	BINDING HEAD MACHINE SCREW		
D	2A		N67-3008-46	SCREW (IC1)		
E	1B,2A		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
-			N87-2608-05	BRAZIER HEAD TAPTITE SCREW		G
G	1A,2A		N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
35	2G		N99-0321-05	SCREW SET		G
35	2G		N99-0365-05	SCREW SET		GB
-	3D		T07-0247-05	SPEAKER		G
36	1G		T91-0362-15	MICROPHONE		G
-			Z12-3302-05	PLASTIC TUBU		G
C1			CE04EW1E470M	ELECTRO	47UF	25WV
C2			CK73FB1H104K	CHIP C	0.10UF	K
C3,4			CK73FB1H102K	CHIP C	1000PF	K
C5			CE04EW1E470M	ELECTRO	47UF	25WV
C6			CC45SL2H100D	CERAMIC	10PF	D
C7			CC45SL2H050C	CERAMIC	5.0PF	C
C7			CC45SL2H010C	CERAMIC	1PF	C
C8			CC45SL2H070D	CERAMIC	7.0PF	D
C8			CC45SL2H180D	CERAMIC	18PF	D
C9,10			CK73FB1H102K	CHIP C	1000PF	K
C11			CC73FCH1H100D	CHIP C	10PF	D
C11			CC73FCH1H150J	CHIP C	15PF	J
C12			CK45B2H102K	CERAMIC	1000PF	K
C13-15			CC45SL2H150J	CERAMIC	15PF	J
C13-15			CC45SL2H180J	CERAMIC	18PF	J
C16			CC45SL2H180J	CERAMIC	18PF	J
C16			CC45SL2H270J	CERAMIC	27PF	J
C17			CC73FCH1H0R5C	CHIP C	0.5PF	C
C23			CK73FB1H102K	CHIP C	1000PF	K
C24			CC73FCH1H220J	CHIP C	22PF	J
C25			CC45SL2H150J	CERAMIC	15PF	J
C25			CC45SL2H180J	CERAMIC	18PF	J
C26			CC45SL2H020C	CERAMIC	2.0PF	C
C26			CC45SL2H060D	CERAMIC	6.0PF	D
C27			CC45SL2H150J	CERAMIC	15PF	J
C27			CC45SL2H180J	CERAMIC	18PF	J
C28,29			CK73FB1H102K	CHIP C	1000PF	K
C30			CE04EW1E101M	ELECTRO	100UF	25WV
C31			C90-2021-05	ELECTRO	10UF	25WV
C32-34			CK73FB1H102K	CHIP C	1000PF	K
C35			CK73FB1H102K	CHIP C	1000PF	K
C36			C90-2165-05	ELECTRO	10UF	50WV
C37-39			CK73FB1H102K	CHIP C	1000PF	K
C40-41			CE04EW1E471M	ELECTRO	470UF	25WV
C42			CK73FB1H102K	CHIP C	1000PF	K
C43			CC73FCH1H100D	CHIP C	10PF	D
C101			CK73FB1E104K	CHIP C	0.10UF	K
C102			CE04EW1E470M	ELECTRO	47UF	25WV
C103			CK73FB1H102K	CHIP C	1000PF	K
C104,105			C92-0007-05	CHIP-TAN	2.2UF	20WV
C106			CK73FB1H102K	CHIP C	1000PF	K
C108			CE04EW1E470M	ELECTRO	47UF	25WV

G : TK-730(G) K

GB : TK-730(GB) K,K2

PARTS LIST

TX-RX UNIT (X57-5050-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks	Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
C109			CK73FB1H102K	CHIP C 1000PF K			C310			CC73FCH1H040C	CHIP C 4.0PF C	K2	
C110			C92-0003-05	CHIP-TAN 0.47UF 25WV			C311			CC73FCH1H010C	CHIP C 1.0PF C		
C111			CE04EW1C470M	ELECTRO 47UF 16WV			C312			CK73FB1H102K	CHIP C 1000PF K		
C112			CK73FB1H102K	CHIP C 1000PF K			C313			CC73FCH1H150J	CHIP C 15PF J	K2	
C113			CK73FB1E103K	CHIP C 0.010UF K			C313			CC73FCH1H180J	CHIP C 18PF J	K	
C114			C92-0004-05	CHIP-TAN 1.0UF 16WV			C314			CC73FCH1H180J	CHIP C 18PF J		
C115			CK73FB1E104K	CHIP C 0.10UF K			C315			CK73FB1E103K	CHIP C 0.010UF K		
C116			CE04EW1C470M	ELECTRO 47UF 16WV			C316,317			CK73FB1H102K	CHIP C 1000PF K		
C117			CK73FB1H102K	CHIP C 1000PF K			C318			CK73FB1E103K	CHIP C 0.010UF K		
C118			C92-0008-05	CHIP-TAN 3.3UF 16WV			C319			CC73FCH1H150J	CHIP C 15PF J		
C119			CK73EF1C105Z	CHIP C 1.0UF Z			C320,321			CK73FB1H102K	CHIP C 1000PF K		
C120			C92-0007-05	CHIP-TAN 2.2UF 20WV			C322			CC73FCH1H390J	CHIP C 39PF J		
C121			C92-0003-05	CHIP-TAN 0.47UF 25WV			C323,324			CK73FB1E104K	CHIP C 0.10UF K		
C122			CE04EW1C470M	ELECTRO 47UF 16WV			C325			C92-0009-05	CHIP-TAN 4.7UF 10WV		
C123			CK73FB1H102K	CHIP C 1000PF K			C326			CK73FB1E103K	CHIP C 0.010UF K		
C124			CK73EF1C105Z	CHIP C 1.0UF Z			C327			CK73FB1H102K	CHIP C 1000PF K		
C125			CK73FF1C105Z	CHIP C 1.0UF Z			C328			C92-0009-05	CHIP-TAN 4.7UF 10WV		
C126			CK73FB1H102K	CHIP C 1000PF K			C329,330			CK73FB1H102K	CHIP C 1000PF K		
C127,128			CK73FB1E103K	CHIP C 0.010UF K			C331,332			CC73FCH1H220J	CHIP C 22PF J		
C129			CK73FB1H102K	CHIP C 1000PF K			C333,334			CC73FSL1H101J	CHIP C 100PF J		
C130			CE04EW1A221M	ELECTRO 220UF 10WV			C335			CK73FB1H102K	CHIP C 1000PF K		
C131			CK73FB1H471K	CHIP C 470PF K			C336			CC73FSL1H101J	CHIP C 100PF J		
C132,133			CK73FB1H102K	CHIP C 1000PF K			C337			CK73FB1H102K	CHIP C 1000PF K		
C134,135			CC73FCH1H100D	CHIP C 10PF D			C339-342			CK73FB1H102K	CHIP C 1000PF K		
C136			CK73FB1E104K	CHIP C 0.10UF K			C343			C92-0007-05	CHIP-TAN 2.2UF 20WV		
C137-138			CK73FB1E103K	CHIP C 0.010UF K			C344			CE04LW1C221M	ELECTRO 220UF 16WV		
C139			CK73FB1E104K	CHIP C 0.10UF K			C345-347			CK73FB1H102K	CHIP C 1000PF K		
C140			CK73FB1H471K	CHIP C 470PF K			C348			CC73FCH1H150J	CHIP C 15PF J		
C141-143			CK73FB1E103K	CHIP C 0.010UF K			C350-352			CK73FB1H102K	CHIP C 1000PF K		
C144,145			CK73FB1H102K	CHIP C 1000PF K			C353			CC73FCH1H100D	CHIP C 10PF D	K2	
C147-149			CK73FB1H102K	CHIP C 1000PF K			C353			CC73FCH1H180J	CHIP C 18PF J	K	
C150			CC73FSL1H101J	CHIP C 100PF J			C354			CC73FCH1H120J	CHIP C 12PF J		
C151-154			CK73FB1H102K	CHIP C 1000PF K			C355,356			CK73FB1H102K	CHIP C 1000PF K		
C155-158			CC73FSL1H101J	CHIP C 100PF J			C357			CC73FCH1H0R5C	CHIP C 0.5PF C	K	
C159			CK73FB1H102K	CHIP C 1000PF K			C357			CC73FCH1H010C	CHIP C 1PF C	K2	
C160			CC73FSL1H101J	CHIP C 100PF J			C358-363			CK73FB1H102K	CHIP C 1000PF K		
C161,162			CK73FB1H102K	CHIP C 1000PF K			C364			CE04EW1C470M	ELECTRO 47UF 16WV		
C164-166			CK73FB1H102K	CHIP C 1000PF K			C365-367			CK73FB1H102K	CHIP C 1000PF K		
C167,168			CC73FSL1H101J	CHIP C 100PF J			C368			CE04EW1C101M	ELECTRO 100UF 16WV		
C169-173			CK73FB1H102K	CHIP C 1000PF K			C369			CK73FB1E103K	CHIP C 0.010UF K		
C183			CK73FB1H102K	CHIP C 1000PF K			C370			CK73FB1H102K	CHIP C 1000PF K		
C185-193			CK73FB1H102K	CHIP C 1000PF K			C371			CK73FB1E103K	CHIP C 0.010UF K		
C195,196			CC73FSL1H101J	CHIP C 100PF J			C372			CK73FB1H102K	CHIP C 1000PF K		
C197			CK73FB1E103K	CHIP C 0.010UF K			C373			CC73FCH1H470J	CHIP C 47PF J		
C198,199			CC73FSL1H101J	CHIP C 100PF J			C374			CK73FB1H102K	CHIP C 1000PF K		
C200-206			CK73FB1H102K	CHIP C 1000PF K			C375			CC73FCH1H180J	CHIP C 18PF J	K	
C207-209			CC73FSL1H101J	CHIP C 100PF J			C376			CC73FCH1H180J	CHIP C 18PF J	K2	
C210			CK73FB1H102K	CHIP C 1000PF K			C378			CC73FCH1H390J	CHIP C 39PF J	K	
C211			CC73FSL1H101J	CHIP C 100PF J			C379,380			CK73FB1H102K	CHIP C 1000PF K	K	
C212-216			CK73FB1H102K	CHIP C 1000PF K			C381			C92-0008-05	CHIP-TAN 3.3UF 16WV	K	
C220			CK73FB1E103K	CHIP C 0.01UF K			C382			C92-0003-05	CHIP-TAN 0.47UF 25WV		
C301			CC73FCH1H030C	CHIP C 3.0PF C	K		C383,384			CK73FB1H102K	CHIP C 1000PF K		
C301			CC73FCH1H050C	CHIP C 5.0PF C	K2		C385,386			CK73FB1E104K	CHIP C 0.10UF K		
C302-305			CK73FB1H102K	CHIP C 1000PF K			C387			C92-0003-05	CHIP-TAN 0.47UF 25WV		
C306			CK73FB1E103K	CHIP C 0.010UF K			C388			CC73FCH1H060D	CHIP C 6PF D		
C307			CC73FCH1H220J	CHIP C 22PF J	K2		C389			CK73FB1E104K	CHIP C 0.10UF K	K	
C307			CC73FCH1H330J	CHIP C 33PF J	K		C501-504			CK73FB1H102K	CHIP C 1000PF K		
C308			CC73FCH1H0R5C	CHIP C 0.5PF C			C509			CE04EW1H0R1M	ELECTRO 0.1UF 50WV		
C309			CK73FB1E103K	CHIP C 0.010UF K			C510			CK73FB1E103K	CHIP C 0.010UF K		
C310			CC73FCH1H020C	CHIP C 2.0PF C	K		C511			C90-2024-05	ELECTRO 47UF 6.3WV		

PARTS LIST

TX-RX UNIT (X57-5050-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks	Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
C512			CE04EW1C101M	ELECTRO 100UF 16VV			R3			RK73FB2A682J	CHIP R 6.8K J 1/10W		
C513			CE04LW1C221M	ELECTRO 220UF 16VV			R4,5			RK73FB2A102J	CHIP R 1.0K J 1/10W		
C514			C90-2024-05	ELECTRO 47UF 6.3VV			R6			RK73FB2A333J	CHIP R 33K J 1/10W		
C515,516			CE04LW1C221M	ELECTRO 220UF 16VV			R8			RK73FB2A470J	CHIP R 47 J 1/10W		
C517,518			CQ92FM1H104K	MYLAR 0.10UF K			R9			RK73FB2A102J	CHIP R 1.0K J 1/10W	K	
C519,520			CK73FB1H102K	CHIP C 1000PF K			R9			RK73FB2A471J	CHIP R 470 J 1/10W	K2	
C521-523			CK73FB1E103K	CHIP C 0.010UF K			R10			R92-0670-05	CHIP R 0 OHM		
C525			CK73FB1E104K	CHIP C 0.1UF K			R101			RK73FB2A471J	CHIP R 470 J 1/10W		
-			E02-2010-05	TRANSISTOR SOCKET (8P)			R102,103			RK73FB2A473J	CHIP R 47K J 1/10W		
-			E02-2015-05	TRANSISTOR SOCKET (28P)			R104			RK73FB2A105J	CHIP R 1.0M J 1/10W		
CN1,2			E04-0154-05	RF COAXIAL CABLE RECEPTACLE			R105			R92-0670-05	CHIP R 0 OHM		
CN3			E23-0902-05	TERMINAL (+B)			R106-108			RK73FB2A104J	CHIP R 100K J 1/10W		
CN101			E40-5491-05	PIN CONNECTOR (17P)			R109			RK73FB2A103J	CHIP R 10K J 1/10W		
CN102			E40-5470-05	PIN CONNECTOR (13P)			R110			RK73FB2A472J	CHIP R 4.7K J 1/10W		
CN103			E40-3269-05	PIN CONNECTOR (11P)			R111			RK73FB2A103J	CHIP R 10K J 1/10W		
CN104			E40-3243-05	PIN CONNECTOR (8P)			R112			RK73FB2A223J	CHIP R 22K J 1/10W		
CN105			E40-3242-05	PIN CONNECTOR (7P)			R113			RK73FB2A101J	CHIP R 100 J 1/10W		
CN106			E40-3253-05	PIN CONNECTOR (9P)			R114,115			RK73FB2A271J	CHIP R 270 J 1/10W		
CN107			E40-3251-05	PIN CONNECTOR (7P)			R116			RK73FB2A223J	CHIP R 22K J 1/10W		
CN108			E40-3256-05	PIN CONNECTOR (12P)			R117			RK73FB2A104J	CHIP R 100K J 1/10W		
CN301			E04-0154-05	RF COAXIAL CABLE RECEPTACLE			R118			RK73FB2A103J	CHIP R 10K J 1/10W		
CN302			E40-5492-05	PIN CONNECTOR (Z301,15P)			R119			RK73FB2A473J	CHIP R 47K J 1/10W		
CN303			E04-0154-05	RF COAXIAL CABLE RECEPTACLE			R120			RK73FB2A222J	CHIP R 2.2K J 1/10W		
CN304			E40-3239-05	PIN CONNECTOR (4P)			R121			RK73FB2A562J	CHIP R 5.6K J 1/10W		
CN305			E40-5470-05	PIN CONNECTOR (13P)			R122			RK73FB2A103J	CHIP R 10K J 1/10W		
CN501			E40-5491-05	PIN CONNECTOR (17P)			R123			RK73FB2A183J	CHIP R 18K J 1/10W		
CN502			E40-3238-05	PIN CONNECTOR (3P)			R124			RK73FB2A682J	CHIP R 6.8K J 1/10W		
W1			E37-0117-05	CONNECTING WIRE (3P)			R125			RK73FB2A104J	CHIP R 100K J 1/10W		
W2			E37-0277-05	FINISHED WIRE (+B)			R126			RK73FB2A183J	CHIP R 18K J 1/10W		
W3			E37-0116-05	CONNECTING WIRE (3P)			R127			RK73FB2A223J	CHIP R 22K J 1/10W		
W105			E37-0158-05	CONNECTING WIRE (11P)			R128			RK73FB2A102J	CHIP R 1.0K J 1/10W		
W108			E37-0669-05	JUMPER WIRE	K		R129			RK73FB2A104J	CHIP R 100K J 1/10W		
-			J30-0545-05	SPACER			R130,131			RK73FB2A102J	CHIP R 1.0K J 1/10W		
CF301			L72-0359-05	CERAMIC FILTER (455E)			R132			RK73FB2A103J	CHIP R 10K J 1/10W		
CF302			L72-0360-05	CERAMIC FILTER (455G)			R133			RK73FB2A224J	CHIP R 220K J 1/10W		
L1			L34-1185-05	COIL			R134			RK73FB2A101J	CHIP R 100 J 1/10W		
L2			L34-0908-05	COIL			R135-137			RK73FB2A473J	CHIP R 47K J 1/10W		
L3			L34-0894-05	COIL			R138			RK73FB2A333J	CHIP R 33K J 1/10W		
L4,5			L34-0452-05	COIL			R139-142			RK73FB2A473J	CHIP R 47K J 1/10W		
L6			L34-0908-05	COIL			R143,144			RK73FB2A102J	CHIP R 1.0K J 1/10W		
L7			L34-0742-05	COIL			R145-148			RK73FB2A473J	CHIP R 47K J 1/10W		
L8			L40-1285-48	SMALL FIXED INDUCTOR (120nH)			R149			RK73FB2A223J	CHIP R 22K J 1/10W		
L9			L33-0666-05	COIL			R150			R92-0670-05	CHIP R 0 OHM		
L301-304			L34-4080-05	COIL			R151,152			RK73FB2A682J	CHIP R 6.8K J 1/10W		
L305			L34-4191-05	COIL			R153			RK73FB2A223J	CHIP R 22K J 1/10W		
L306			L40-1095-48	SMALL FIXED INDUCTOR (10UH)			R154			RK73FB2A473J	CHIP R 47K J 1/10W		
L307			L30-0503-05	IFT			R155			RK73FB2A104J	CHIP R 100K J 1/10W		
L308			L40-1005-48	SMALL FIXED INDUCTOR (10UH)			R156			R92-0670-05	CHIP R 0 OHM		
L309			L40-2211-81	SMALL FIXED INDUCTOR (220UH)	K2		R157			RK73FB2A473J	CHIP R 47K J 1/10W		
L310			L40-2782-48	SMALL FIXED INDUCTOR (270nH)	K		R158			RK73FB2A272J	CHIP R 2.7K J 1/10W		
L310			L40-3382-48	SMALL FIXED INDUCTOR (330nH)	K2		R159			R92-0670-05	CHIP R 0 OHM		
L311			L34-0956-05	COIL			R160			RK73FB2A104J	CHIP R 100K J 1/10W		
L312			L40-4711-12	SMALL FIXED INDUCTOR	K		R161,162			RK73FB2A473J	CHIP R 47K J 1/10W		
X101			L77-1374-05	CRYSTAL RESONATOR (12MHz)			R166			RK73FB2A103J	CHIP R 10K J 1/10W		
X301			L77-1415-25	CRYSTAL RESONATOR (34.855MHz)			R167-169			RK73FB2A473J	CHIP R 47K J 1/10W		
X302			L77-1466-05	CRYSTAL RESONATOR (12.8MHz) VCXO			R170			RK73FB2A220J	CHIP R 22 J 1/10W		
XF301			L71-0475-05	CRYSTAL FILTER (34.4MHz) MCF			R173			RK73FB2A473J	CHIP R 47K J 1/10W		
R1			R92-1214-05	CHIP R 120 J 1/2W			R174			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R2			RK73FB2A470J	CHIP R 47 J 1/10W			R175			RK73FB2A472J	CHIP R 4.7K J 1/10W		
							R176			RK73FB2A473J	CHIP R 47K J 1/10W		

PARTS LIST

TX-RX UNIT (X57-5050-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks	Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
R178			R92-0670-05	CHIP R 0 OHM	K		R375			RK73FB2A333J	CHIP R 33K J 1/10W		
R301			RK73FB2A473J	CHIP R 47K J 1/10W			R376			RK73FB2A473J	CHIP R 47K J 1/10W		
R302			RK73FB2A104J	CHIP R 100K J 1/10W			R501			RK73FB2A473J	CHIP R 47K J 1/10W		
R303			RK73FB2A104J	CHIP R 100K J 1/10W			R502			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R304			RK73FB2A470J	CHIP R 47 J 1/10W			R503			RK73FB2A103J	CHIP R 10K J 1/10W		
R305			RK73FB2A103J	CHIP R 10K J 1/10W			R504			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R306			RK73FB2A101J	CHIP R 100 J 1/10W			R505,506			RK73FB2A2R2J	CHIP R 2.2 J 1/10W		
R307-311			RK73FB2A473J	CHIP R 47K J 1/10W			R507			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R312			RK73FB2A101J	CHIP R 100 J 1/10W			R508-510			RS14DB3F150J	FL-PROOFS 15 J 3W		
R313			R92-0670-05	CHIP R 0 OHM			VR1			R12-6748-05	TRIM POT. (220K)		
R314			RK73FB2A222J	CHIP R 2.2K J 1/10W			VR2			R12-6427-05	TRIM POT. (47K)		
R315			RK73FB2A101J	CHIP R 100 J 1/10W			VR101			R12-6738-05	TRIM POT. (4.7K)		
R316			RK73FB2A471J	CHIP R 470 J 1/10W			VR102			R12-6744-05	TRIM POT. (47K)		
R317			RK73FB2A223J	CHIP R 22K J 1/10W			VR103			R32-0656-05	TRIM POT. (20K)		
R318			RK73FB2A472J	CHIP R 4.7K J 1/10W			VR301			R12-6742-05	TRIM POT. (22K)		
R319			RK73FB2A473J	CHIP R 47K J 1/10W			VR302,303			R12-6748-05	TRIM POT. (220K)		
R320			RK73FB2A223J	CHIP R 22K J 1/10W			W4			R92-1061-05	JUMPER REST 0 OHM		
R321			RK73FB2A332J	CHIP R 3.3K J 1/10W			W101-104			R92-1061-05	JUMPER REST 0 OHM		
R322			RK73FB2A392J	CHIP R 3.9K J 1/10W			W107			R92-1061-05	JUMPER REST 0 OHM		
R323			RK73FB2A101J	CHIP R 100 J 1/10W			K501			S51-1420-05	RELAY (SP)		
R324			RK73FB2A100J	CHIP R 10 J 1/10W			K502			S76-0401-05	RELAY (PWR)		
R325			RK73FB2A682J	CHIP R 6.8K J 1/10W			D1			UM9401	DIODE		
R326			RK73FB2A105J	CHIP R 1.0M J 1/10W			D2			MI308	DIODE		
R327			RK73FB2A471J	CHIP R 470 J 1/10W	K2		D3,4			HSM88AS	DIODE		
R328			RK73FB2A104J	CHIP R 100K J 1/10W			D6			ERZ-M10DK220	SERGE ABSORBER		
R329,330			RK73FB2A102J	CHIP R 1.0K J 1/10W			D7			DSA3A1	SURGE ABSORBER		
R331			RK73FB2A103J	CHIP R 10K J 1/10W			D101			02CZ18(X,Y)	ZENER DIODE		
R332			RK73FB2A223J	CHIP R 22K J 1/10W			D102			1SS181	DIODE		
R333			RK73FB2A271J	CHIP R 270 J 1/10W			D103			1SS184	DIODE		
R334			RK73FB2A101J	CHIP R 100 J 1/10W			D104			02CZ5.6(X,Y)	ZENER DIODE		
R335-337			RK73FB2A473J	CHIP R 47K J 1/10W			D105,106			1SS184	DIODE		
R338			RK73FB2A104J	CHIP R 100K J 1/10W			D107-110			1SS226	DIODE		
R339			RK73FB2A182J	CHIP R 1.8K J 1/10W			D111			1SS184	DIODE		
R340			RK73FB2A100J	CHIP R 10 J 1/10W			D112			02CZ15(X,Y)	ZENER DIODE		
R341			R92-0670-05	CHIP R 0 OHM			D113			D1F20	DIODE		
R342			RK73FB2A473J	CHIP R 47K J 1/10W			D114			1SS196	DIODE		
R343			RK73FB2A102J	CHIP R 1.0K J 1/10W			D115,116			1SS184	DIODE		
R344			RK73FB2A473J	CHIP R 47K J 1/10W			D117			1SS196	DIODE		
R345,346			RK73FB2A103J	CHIP R 10K J 1/10W			D301			1SS226	DIODE		
R347			R92-1211-05	CHIP R 5.6 J 1/2W			D302			1SV164	VARI-CAP DIODE	K2	
R348-350			RK73FB2A102J	CHIP R 1.0K J 1/10W			D303			1SV166	VARI-CAP DIODE		
R351			RK73FB2A223J	CHIP R 22K J 1/10W			D304			1SV164	VARI-CAP DIODE	K	
R352			RK73FB2A472J	CHIP R 4.7K J 1/10W	K2		D305			1SV166	VARI-CAP DIODE	K2	
R352			RK73FB2A682J	CHIP R 6.8K J 1/10W	K		D306			1SV164	VARI-CAP DIODE		
R353,354			RK73FB2A473J	CHIP R 47K J 1/10W			D307			1SV164	VARI-CAP DIODE	K2	
R355			RK73FB2A472J	CHIP R 4.7K J 1/10W			D308			1SV164	VARI-CAP DIODE	K	
R356			RK73FB2A473J	CHIP R 47K J 1/10W			D308			1SV166	VARI-CAP DIODE	K2	
R357			RK73FB2A472J	CHIP R 4.7K J 1/10W			D309			1SS184	DIODE		
R359			R92-0670-05	CHIP R 0 OHM			D310			1SV164	VARI-CAP DIODE		
R360			RK73FB2A473J	CHIP R 47K J 1/10W			D311			1SV166	VARI-CAP DIODE		
R361			RK73FB2A102J	CHIP R 1.0K J 1/10W			D312			1T33C	VARI-CAP DIODE	K2	
R362			R92-0670-05	CHIP R 0 OHM	K2		D313			1SV214	VARI-CAP DIODE	K	
R363			RK73FB2A473J	CHIP R 47K J 1/10W			D314			1T33C	VARI-CAP DIODE	K	
R364			RK73FB2A471J	CHIP R 470 J 1/10W	K		D315,316			DAN235K	DIODE		
R365,366			RK73FB2A102J	CHIP R 1.0K J 1/10W			D501,502			1SS193	DIODE		
R367			RK73FB2A333J	CHIP R 33K J 1/10W			D503			1SS184	DIODE		
R368			RK73FB2A821J	CHIP R 820 J 1/10W			IC1	2A		M67781H	IC (POWER MODULE)	K	
R369			RK73FB2A153J	CHIP R 15K J 1/10W			IC1	2A		M67781L	IC (POWER MODULE)	K2	
R370-373			RK73FB2A223J	CHIP R 22K J 1/10W			IC101			TC4013BF	IC (D FLIP-FLOP X2)		
R374			RK73FB2A153J	CHIP R 15K J 1/10W			IC102			L78L05B-FA	IC (VOLTAGE REGULATOR)		

PARTS LIST

TX-RX UNIT (X57-5050-XX)
VCO/PLL (X58-3810-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks	Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
IC103			KCE1D	IC (AF FILTER/MIC AMP/SWITCH)			C5			CC73FCH1H220J	CHIP C 22PF J		
IC104,105			XRU4094BCF	IC (8bit SHIFT/STOREREGISTER)			C6			CC73FCH1H100D	CHIP C 10PF D		
IC104,105			BU4094BCF	IC (8bit SHIFT/STOREREGISTER)			C7-9			CK73FB1H102K	CHIP C 1000PF K		
IC106			78312AGF3343BE	IC (CPU)			C10			CC73FCH1H100D	CHIP C 10PF D		
IC107			TC74HC573AF	IC (8bit LATCH)			C11			CK73FB1H102K	CHIP C 1000PF K		
IC108			27C256QJPWA	IC (EPROM)			C12			C92-0004-05	CHIP-TAN 1.0UF 16WV		
IC109			X24C04PI	IC (EEPROM)			C13			CK73FB1H102K	CHIP C 1000PF K		
IC301			MC3371D	IC (FM IF)			C14			CC73FCH1H470J	CHIP C 47PF J		
IC302			KC805	IC (DRIVER)			C15			CC73FSL1H101J	CHIP C 100PF J		
IC303			XRU4094BCF	IC (8bit SHIFT/STOREREGISTER)			C16			CK73FB1H102K	CHIP C 1000PF K		
IC303			BU4094BCF	IC (8bit SHIFT/STOREREGISTER)			C17,18			C92-0004-05	CHIP-TAN 1.0UF 16WV		
IC304			NJM78L05UA	IC (VOLTAGE REGULATOR/+5V)			C19			CK73FB1H102K	CHIP C 1000PF K		
IC305			BU4566	IC (BILATERAL SWITCH)			C20			C92-0504-05	CHIP-TAN 0.68UF 20WV		
IC305			TC4566F	IC (BILATERAL SWITCH)			C21			C92-0543-05	CHIP-TAN 3.3UF 10WV		
IC306			AN8009M	IC (VOLTAGE REGULATOR)	K		C22			C92-0504-05	CHIP-TAN 0.68UF 20WV		
IC501			LA4491N	IC (AF POWER AMP)			C23,24			CK73FB1H102K	CHIP C 1000PF K		
IC502			UPC78M08H	IC (VOLTAGE REGULATOR/+8V)			C25			CK73FB1H471K	CHIP C 470PF K		
Q1			2SD1722(R,S)	TRANSISTOR			C26			CC73FCH1H070D	CHIP C 7.0PF C	K	
Q2			2SA1162(Y)	TRANSISTOR			C26			CC73FCH1H110J	CHIP C 11PF C	K2	
Q3			FMW1	TRANSISTOR			C27,28			CC73FCH1H150J	CHIP C 15PF C		
Q101,102			DTA114EK	DIGITAL TRANSISTOR			C51			CK73FB1H102K	CHIP C 1000PF K		
Q103,104			DTD114EK	DIGITAL TRANSISTOR			C52			CC73FCH1H0R5C	CHIP C 0.5PF C		
Q105			DTC114EK	DIGITAL TRANSISTOR			C53			CC73FCH1H020C	CHIP C 2.0PF C	K2	
Q106			2SC2712(Y)	TRANSISTOR			C53			CC73FCH1H040C	CHIP C 4.0PF C	K	
Q107			2SD1757K	TRANSISTOR			C54			CK73FB1H102K	CHIP C 1000PF K		
Q108-112			DTC114EK	DIGITAL TRANSISTOR			C55			CC73FCH1H470J	CHIP C 47PF J		
Q114,115			DTC114EK	DIGITAL TRANSISTOR			C56			CC73FCH1H070D	CHIP C 7.0PF D	K2	
Q116			DTD114EK	DIGITAL TRANSISTOR			C56			CC73FCH1H120J	CHIP C 12PF J	K	
Q117,118			DTC114EK	DIGITAL TRANSISTOR			C57			CC73FCH1H180J	CHIP C 18PF J	K2	
Q119			FMC2	TRANSISTOR			C57			CC73FCH1H180J	CHIP C 18PF J	K	
Q120			DTC114EK	DIGITAL TRANSISTOR			C58			CC73FCH1H030C	CHIP C 3.0PF C		
Q121			DTA114EK	DIGITAL TRANSISTOR			C59			CK73FB1H102K	CHIP C 1000PF K		
Q301			3SK184(S)	FET	K2		C61			CC73FCH1H040C	CHIP C 4.0PF C	K	
Q301			SGM2014M	FET	K		C61			CC73FCH1H080D	CHIP C 8.0PF D	K2	
Q302			SGM2014M	FET			C62			CC73FCH1H330J	CHIP C 33PF J	K2	
Q303,304			2SC2714(Y)	TRANSISTOR			C62			CC73FCH1H220J	CHIP C 22PF J	K	
Q305			2SK208(Y)	FET			C63			CC73FCH1H150J	CHIP C 15PF J	K2	
Q306			2SB1119(S)	TRANSISTOR			C63			CC73FCH1H120J	CHIP C 12PF J	K	
Q307			DTC114EK	DIGITAL TRANSISTOR			C64			CC73FCH1H180J	CHIP C 18PF J	K2	
Q308			2SB1119(S)	TRANSISTOR			C64			CC73FCH1H270J	CHIP C 27PF J	K	
Q309-313			DTC114EK	DIGITAL TRANSISTOR			C65			CC73FCH1H030C	CHIP C 3.0PF C		
Q314			DTA114EK	DIGITAL TRANSISTOR			C66,67			CK73FB1H102K	CHIP C 1000PF K		
Q315,316			DTC114EK	DIGITAL TRANSISTOR			C68			C92-0004-05	CHIP-TAN 1.0UF 16WV		
Q317			DTC114YK	DIGITAL TRANSISTOR			C69-71			CK73FB1H102K	CHIP C 1000PF K		
Q501			DTD114EK	DIGITAL TRANSISTOR			C72			CC73FCH1H220J	CHIP C 22PF J		
TH101			157-203-55009	THERMISTOR (20K)			C73			CK73FB1H102K	CHIP C 1000PF K		
TH301			157-102-53003	THERMISTOR (1K)			C74			CK73FB1H821K	CHIP C 820PF K	K2	
Z301			X58-3810-10	VCO/PLL UNIT	K		C74			CK73FB1H561K	CHIP C 560PF K	K	
Z301			X58-3810-11	VCO/PLL UNIT	K2		C75			CC73FSL1H101J	CHIP C 100PF J		
			212-6010-05	PLASTIC TUBE			C76			CK73FB1H102K	CHIP C 1000PF K		
VCO/PLL (X58-3810-XX) -10 : K -11 : K2							TC51			C05-0369-05	TRIM CAP. (6PF)	K2	
C1			C92-0004-05	CHIP-TAN 1.0UF 16WV			TC51			C05-0371-05	TRIM CAP. (10PF)	K	
C2-4			CK73FB1H102K	CHIP C 1000PF K			CN1			E40-5493-05	PIN CONNECTOR (15P)		
							CN51			E40-5494-05	PIN CONNECTOR (7P)		
										F10-1480-03	SHIELDING PLATE		
L1				L40-1082-48	SMALL FIXED INDUCTOR (0.10UH)								
L2				L40-3971-35	SMALL FIXED INDUCTOR (39NH)	K							
L2				L40-4771-35	SMALL FIXED INDUCTOR (47NH)	K2							
L51				L40-1001-81	SMALL FIXED INDUCTOR (10UH)								

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PARTS LIST

VCO/PLL (X58-3810-XX)

KCH-3

DISPLAY UNIT (X54-3100-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
L52			L34-2369-05	COIL (TX/VCO)	K	
L52			L34-2370-05	COIL (TX/VCO)	K2	
L53			L40-1001-48	SMALL FIXED INDUCTOR (10UH)	K	
L54			L34-2371-05	COIL (RX/VCO)	K	
L54			L34-2372-05	COIL (RX/VCO)	K2	
L55			L40-1082-48	SMALL FIXED INDUCTOR (0.10UH)		
L56			L92-0131-05	CHIP COIL		
R1,2			RK73FB2A221J	CHIP R 220 J 1/10W		
R3			RK73FB2A330J	CHIP R 33 J 1/10W		
R4			RK73FB2A103J	CHIP R 10K J 1/10W		
R5			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R6			RK73FB2A330J	CHIP R 33 J 1/10W		
R7			RK73FB2A471J	CHIP R 470 J 1/10W		
R8			RK73FB2A101J	CHIP R 100 J 1/10W		
R9			RK73FB2A103J	CHIP R 10K J 1/10W		
R10			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R11,12			RK73FB2A330J	CHIP R 33 J 1/10W		
R13			RK73FB2A333J	CHIP R 33K J 1/10W		
R14			RK73FB2A104J	CHIP R 100K J 1/10W		
R15			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R16			RK73FB2A123J	CHIP R 12K J 1/10W		
R17			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R18			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R19			RK73FB2A473J	CHIP R 47K J 1/10W		
R20			RK73FB2A330J	CHIP R 33 J 1/10W		
R22,23			RK73FB2A221J	CHIP R 220 J 1/10W		
R24			RK73FB2A681J	CHIP R 680 J 1/10W		
R25			RK73FB2A101J	CHIP R 100 J 1/10W		
R26			RK73FB2A103J	CHIP R 10K J 1/10W		
R27-30			R92-0670-05	CHIP R 0 OHM		
R31			RK73FB2A104J	CHIP R 100K J 1/10W		
R32			RK73FB2A101J	CHIP R 100 J 1/10W	K2	
R32			RK73FB2A121J	CHIP R 120 J 1/10W	K	
R33			RK73FB2A271J	CHIP R 270 J 1/10W		
R51			RK73FB2A473J	CHIP R 47K J 1/10W		
R52			RK73FB2A101J	CHIP R 100 J 1/10W		
R53			RK73FB2A473J	CHIP R 47K J 1/10W		
R54			RK73FB2A271J	CHIP R 270 J 1/10W		
R55			RK73FB2A330J	CHIP R 33 J 1/10W		
R57			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R58			RK73FB2A271J	CHIP R 270 J 1/10W	K2	
R58			RK73FB2A681J	CHIP R 680 J 1/10W	K	
R59			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R60			RK73FB2A103J	CHIP R 10K J 1/10W		
R61			RK73FB2A221J	CHIP R 220 J 1/10W		
R62			RK73FB2A331J	CHIP R 330 J 1/10W		
R63			RK73FB2A330J	CHIP R 33 J 1/10W		
R64			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R65			RK73FB2A104J	CHIP R 100K J 1/10W		
R66			RK73FB2A153J	CHIP R 15K J 1/10W		
D1			MA77	DIODE		
D2			1SS356	DIODE		
D51			1SV164	VARI-CAP DIODE		
D52-55			1T33C	VARI-CAP DIODE		
ICI			MB1504PF	IC (PLL FREQUENCY SYNTHESIZER)		
Q1,2			2SC2714(Y)	TRANSISTOR		
Q3			2SA1162(Y)	TRANSISTOR		
Q4			DTC143EK	DIGITAL TRANSISTOR		
Q5			2SA1312(GB)	TRANSISTOR		
Q6			2SC3324(G)	TRANSISTOR		

Ref. No.	Address	New parts	Parts No.	Description	Destination	Remarks
Q51			2SK508NV(K52)	FET	K	
Q52			2SK1577(1)	FET	K2	
Q52			2SK508NV(K52)	FET		
Q53			2SC2714(Y)	TRANSISTOR		
Q54			DTC114EK	DIGITAL TRANSISTOR		
Q55			FMG2	TRANSISTOR		
KCH-3						
201	2C		A22-0776-02	SUB PANEL		
202	1C		A62-0063-03	PANEL		
-			A62-0064-13	PANEL ASSY		
205	2C		B10-1162-04	FRONT GLASS		
-			B42-3317-04	LABEL (S/NO)		
-			E37-0157-05	CONNECTING WIRE		
-			E37-0159-05	CONNECTING WIRE		
212	1C		G53-0509-04	PACKING		
214	2J		H10-2725-02	POLYSTYRENE FOAMED FIXTURE		
215	1I		H11-0847-04	POLYSTYRENE PLATE		
216	1J		H13-0854-04	PACKING FIXTURE		
217	2I		H25-0103-04	PROTECTION BAG		
218	3I		H52-0108-04	ITEM CARTON BOX		
220	3D		J21-4340-04	MOUNTING HARDWARE		
222	2C		K29-4663-02	KEY TOP		
223	1C		K29-4664-04	KNOB (VOL, CH)		
H	3C		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
J	3C,3D		N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
225	2J		N98-0364-05	SCREW SET		
227	3D		T07-0247-05	LOUDSPEAKER (FULLRANGE)		
229	3C		X54-3100-20	DISPLAY UNIT		
-			212-3303-05	PLASTIC TUBE		
DISPLAY UNIT (X54-3100-20)						
D6			B38-0322-05	LED ASSY		
ED1			B38-0353-05	LCD		
C1-5			CC73FSL1H101J	CHIP C 100PF J		
C6-11			CK73FB1H102K	CHIP C 1000PF K		
C12			CC73FSL1H101J	CHIP C 100PF J		
C13			CK73FB1H102K	CHIP C 1000PF K		
C14,15			CC73FSL1H101J	CHIP C 100PF J		
C16-20			CK73FB1H102K	CHIP C 1000PF K		
C21-25			CC73FSL1H101J	CHIP C 100PF J		
C26,27			CK73FB1H102K	CHIP C 1000PF K		
C28			C92-0003-05	CHIP-TAN 0.47UF 25WV		
C29			CK73FB1H102K	CHIP C 1000PF K		
C30			C92-0038-05	ELECTRO 22UF 16WV		
C31			CK73FB1E103K	CHIP C 0.01UF K		
C32,33			CC73FSL1H101J	CHIP C 100PF J		
-			E29-0497-04	CONNECTOR		
CN1			E40-3241-05	PIN CONNECTOR (6P)		
CN2			E40-3255-05	PIN CONNECTOR (11P)		
CN3			E40-3247-05	PIN CONNECTOR (3P)		
CN4			E40-3237-05	PIN CONNECTOR (2P)		
J1			E08-0673-05	RECTANGULAR RECEPTACLE (MIC)		
W1			E37-0118-05	CONNECTING WIRE		

PARTS LIST

DISPLAY UNIT (X54-3100-20)

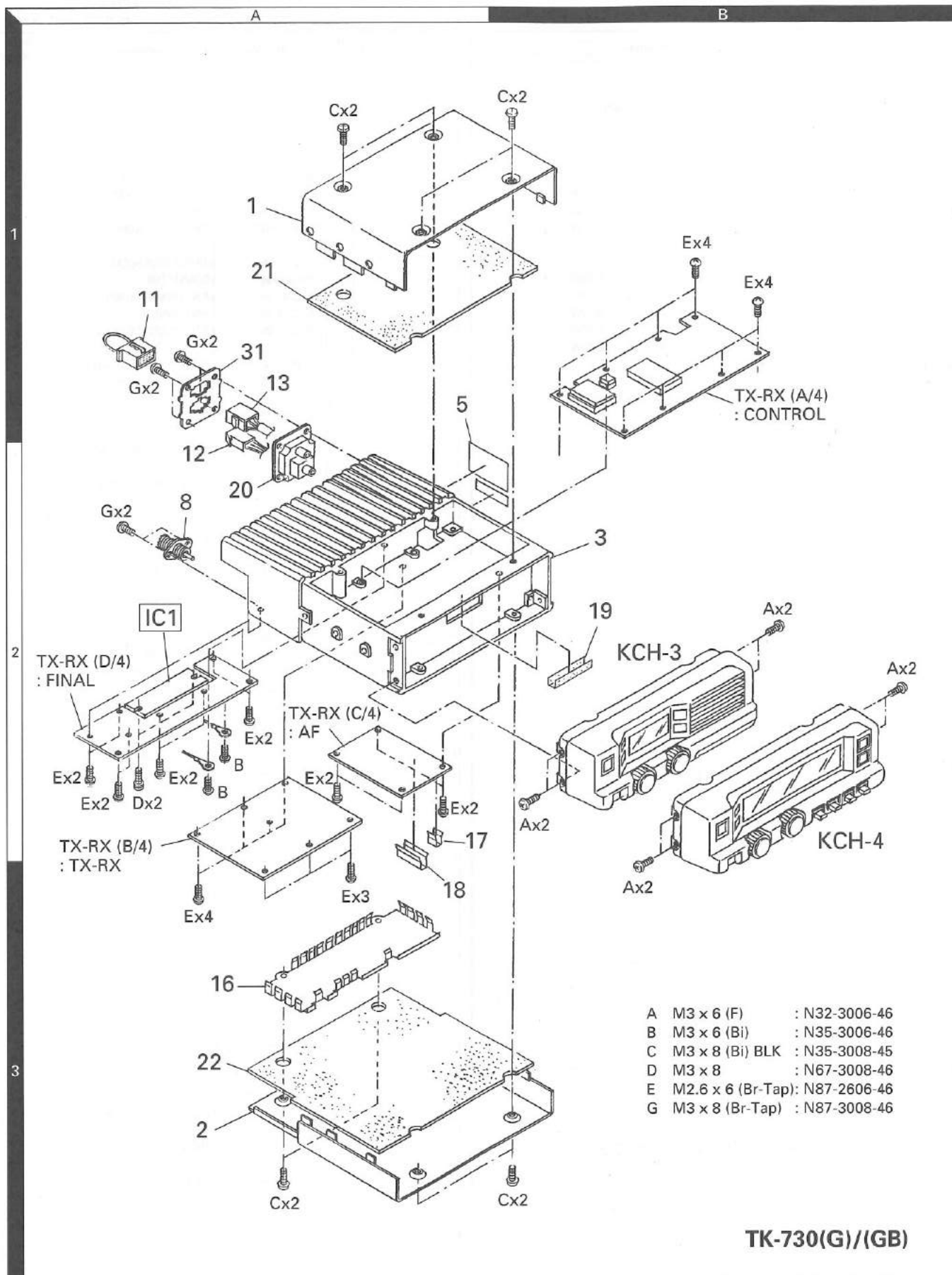
KCH-4

DISPLAY UNIT (X54-3110-20)

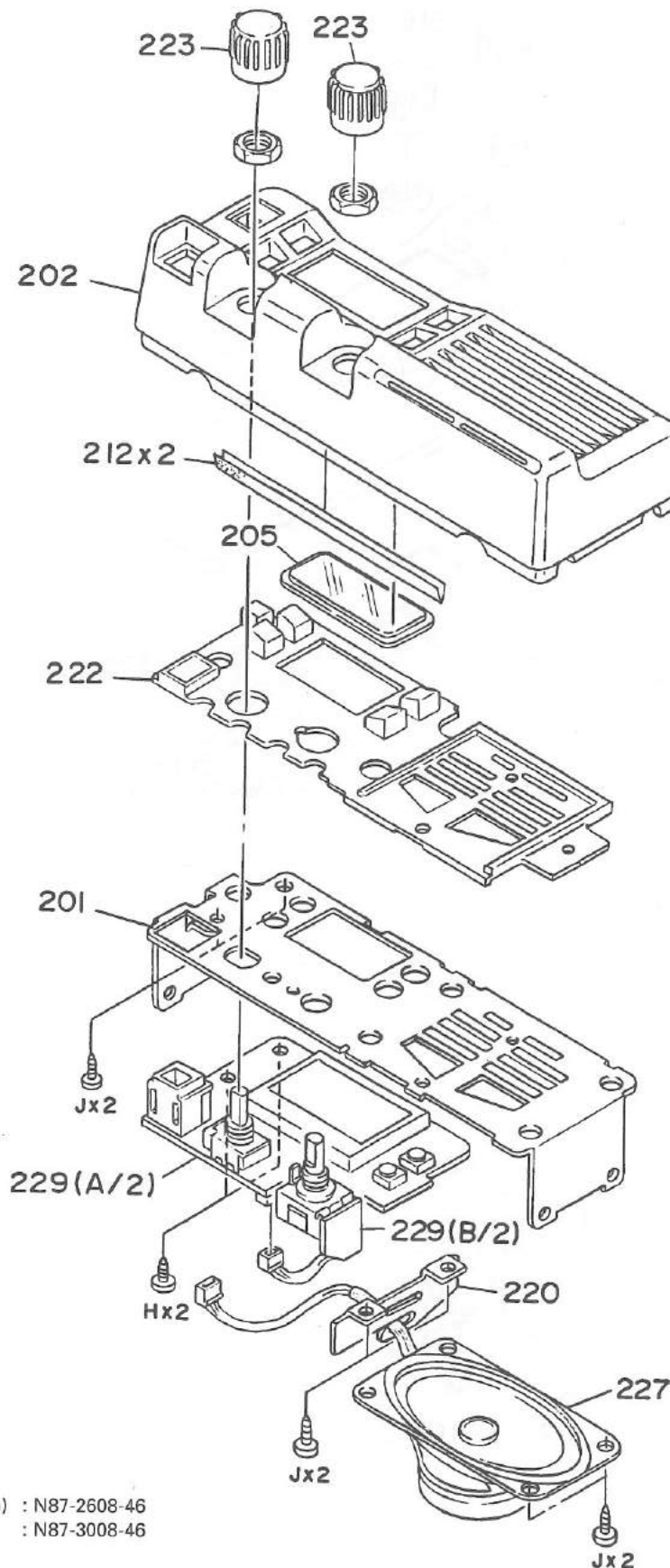
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-			G13-0656-04	CUSHION			C14,15			CC73FSL1H101J	CHIP C 100PF J		
-			J21-4343-04	MOUNTING HARDWARE			C16-20			CK73FB1H102K	CHIP C 1000PF K		
X1			L78-0043-05	RESONATOR (4.19MHZ)			C21-25			CC73FSL1H101J	CHIP C 100PF J		
R1,2			RK73FB2A102J	CHIP R 1.0K J 1/10W			C26,27			CK73FB1H102K	CHIP C 1000PF K		
R3			RK73FB2A681J	CHIP R 680 J 1/10W			C28			C92-0003-05	CHIP-TAN 0.47UF 25WV		
R4			RK73FB2A821J	CHIP R 820 J 1/10W			C29			C92-0038-05	ELECTRO 22UF 16WV		
R5			RK73FB2A561J	CHIP R 560 J 1/10W			C30			CK73FB1H102K	CHIP C 1000PF K		
R6			R92-1281-05	FIXED RESISTOR 4.7			C31			CK73FB1E103K	CHIP C 0.01UF K		
R7			RK73FB2A820J	CHIP R 82 J 1/10W			C32-37			CC73FSL1H101J	CHIP C 100PF J		
R8-13			RK73FB2A102J	CHIP R 1.0K J 1/10W			-			E02-2010-05	TRANSISTOR SOCKET		
R14			RK73FB2A473J	CHIP R 47K J 1/10W			-			E29-0496-04	CONNECTOR		
R15,16			RK73FB2A101J	CHIP R 100 J 1/10W			CN1			E40-3241-05	PIN CONNECTOR (6P)		
R17			RK73FB2A181J	CHIP R 180 J 1/10W			CN2			E40-3255-05	PIN CONNECTOR (11P)		
R18			R92-0670-05	CHIP R 0 OHM			CN3			E40-3247-05	PIN CONNECTOR (3P)		
R19			RK73FB2A472J	CHIP R 4.7K J 1/10W			J1			E08-0673-05	RECTANGULAR RECEPTACLE (MIC)		
R20			R92-0670-05	CHIP R 0 OHM			W1			E37-0118-05	CONNECTING WIRE		
VR1			R31-0607-05	POTENTIOMETER (10KD)			-			G13-1353-04	CUSHION		
S1			S40-1420-05	PUSH SWITCH			-			J21-4342-04	MOUNTING HARDWARE		
S2-5			S70-0410-15	TACT SWITCH			X1			L78-0043-05	RSONATOR (4.19MHZ)		
D1-4			1SS226	DIODE			R1,2			RK73FB2A102J	CHIP R 1.0K J 1/10W		
D5			1SS181	DIODE			R3			RK73FB2A681J	CHIP R 680 J 1/10W		
IC1			75328GC5563B9	IC			R4			RK73FB2A821J	CHIP R 820 J 1/10W		
IC2			L78LR05B-FA	IC			R5			RK73FB2A561J	CHIP R 560 J 1/10W		
Q1			DTD114EK	DIGITAL TRANSISTOR			R6			R92-1281-05	FIXED RESISTOR 4.7		
Q2			DTIC114EK	DIGITAL TRANSISTOR			R7			RK73FB2A821J	CHIP R 820 J 1/10W		
S10			W02-0393-05	ENCODER			R8-13			RK73FB2A102J	CHIP R 1.0K J 1/10W		
KCH-4							R14			RK73FB2A473J	CHIP R 47K J 1/10W		
301	2E		A22-0777-02	SUB PANEL			R15,16			R92-1280-05	FIXED RESISTOR 390		
302	1E		A62-0066-03	PANEL			R17,18			RK73FB2A181J	CHIP R 180 J 1/10W		
-			A62-0067-13	PANEL ASSY			R19,20			RK73FB2A152J	CHIP R 1.5K J 1/10W		
305	2F		B10-1163-04	FRONT GLASS			R21,22			RK73EB2B471J	CHIP R 470 J 1/8W		
-			B42-3317-04	LABEL (S/NO)			R23-26			RK73FB2A102J	CHIP R 1.0K J 1/10W		
310	2L		H10-2725-02	POLYSTYRENE FOAMED FIXTURE			R27,28			RK73FB2A473J	CHIP R 47K J 1/10W		
311	1K		H11-0847-04	POLYSTYRENE PLATE			R29-32			RK73FB2A101J	CHIP R 100 J 1/10W		
312	1L		H13-0854-04	PACKING FIXTURE			R33			R92-0670-05	CHIP R 0 OHM		
313	2L		H25-0029-04	PROTECTION BAG			R34			RK73FB2A103J	CHIP R 10K J 1/10W		
314	2L		H25-0096-04	PROTECTION BAG			R35			R92-0670-05	CHIP R 0 OHM		
315	2K		H25-0103-04	PROTECTION BAG			R36			RK73FB2A473J	CHIP R 47K J 1/10W		
316	3K		H52-0109-04	ITEM CARTON BOX			VR1			R31-0607-05	POTENTIOMETER (10KD)		
318	1E		K29-4664-04	KNOB (VOL. CH)			S1			S40-1420-05	PUSH SWITCH		
319	2E		K29-4666-02	KEY TOP			S2-9			S70-0410-05	TACT SWITCH		
320	2L		K29-4704-04	KNOB ASSY			D1-4			1SS226	DIODE		
K	3E, 3F		N87-2608-46	BRAZIER HEAD TAPTITE SCREW			D5			1SS181	DIODE		
L	3E, 3F		N87-3008-46	BRAZIER HEAD TAPTITE SCREW			D6			02C210(X,Y)	DIODE		
322	2L		N99-0364-05	SCREW SET			IC1			75328GC5563B9	IC		
324	3E, 3F		X54-3110-20	DISPLAY UNIT			IC2			L78LR05B-FA	IC		
DISPLAY UNIT (X54-3110-20)							IC3			X24CD4PI	IC		
D7			B38-0352-05	LED ASSY			IC4			MSM5265GS-BK	IC (LCD DRIVER)		
ED1			B38-0354-05	LCD			Q1			DTD114EK	DIGITAL TRANSISTOR		
C1-5			CC73FSL1H101J	CHIP C 100PF J			Q2			2SC2873(Y)	TRANSISTOR		
C6-11			CK73FB1H102K	CHIP C 1000PF K			Q3			FMC5	TRANSISTOR		
C12			CC73FSL1H101J	CHIP C 100PF J			S10			W02-0393-05	ENCODER		
C13			CK73FB1H102K	CHIP C 1000PF K									

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EXPLODED VIEW



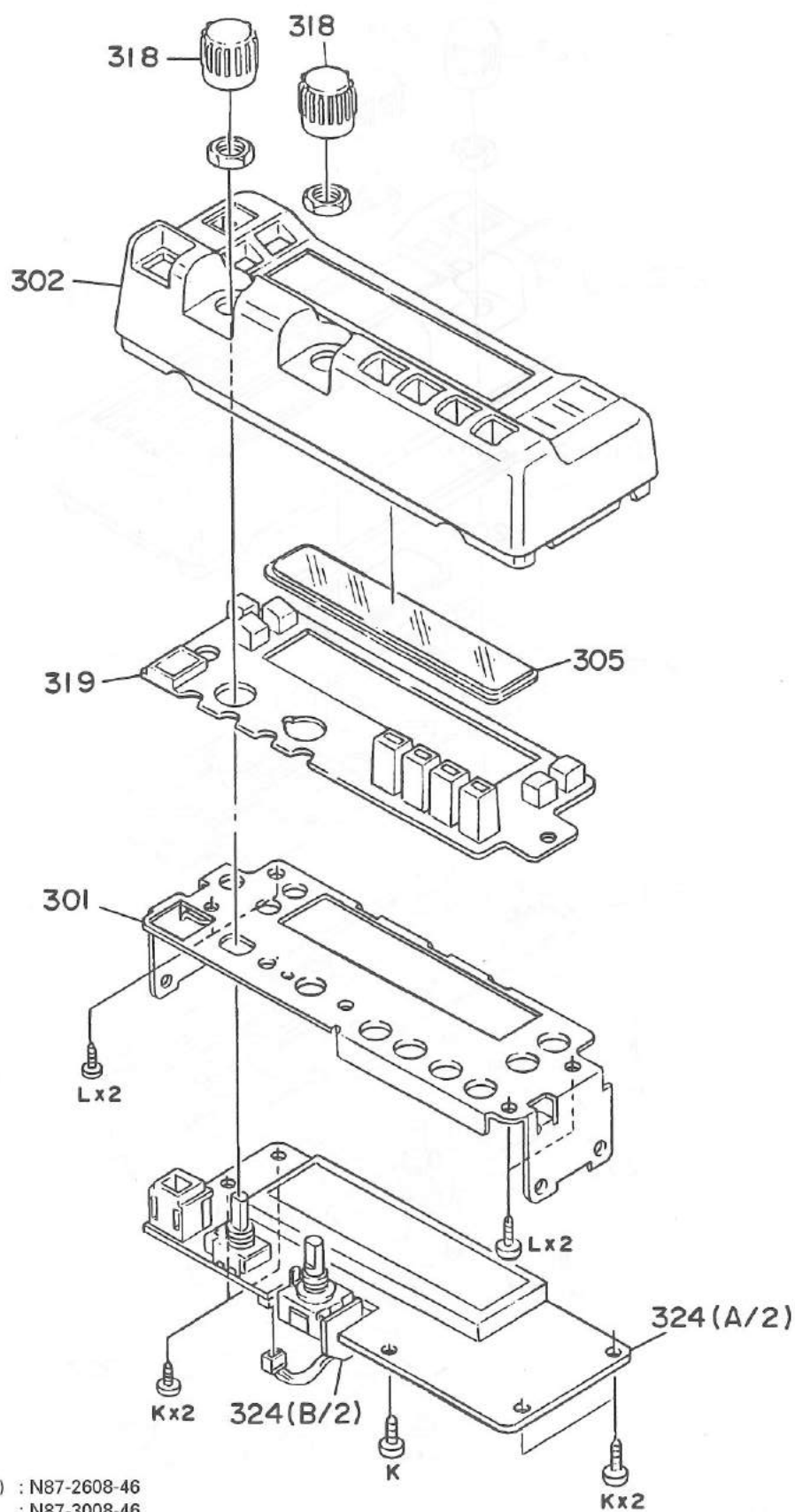
EXPLODED VIEW



H M2.6 x 8 (Br-Tap) : N87-2608-46
J M3 x 8 (Br-Tap) : N87-3008-46

KCH-3

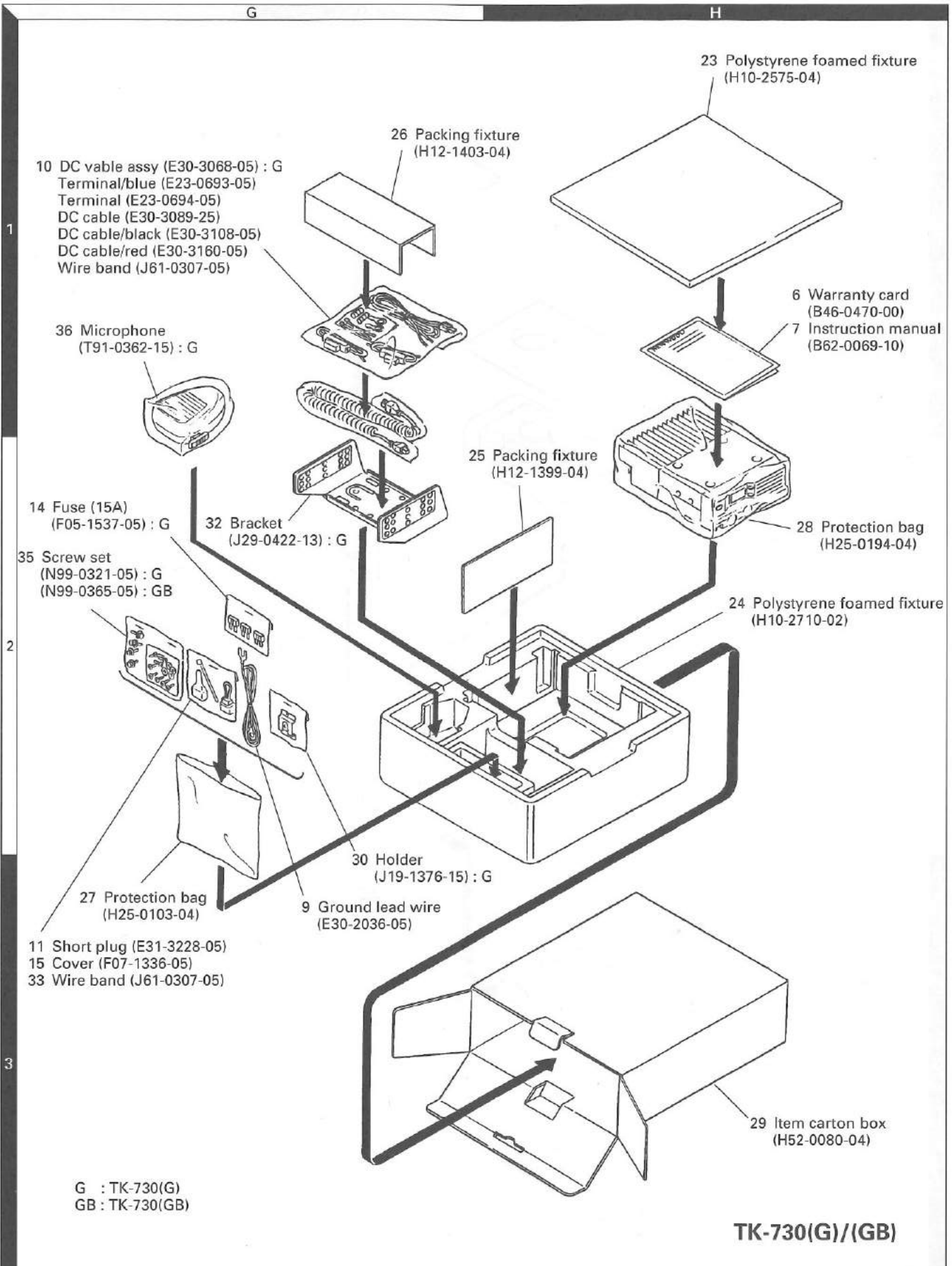
EXPLODED VIEW



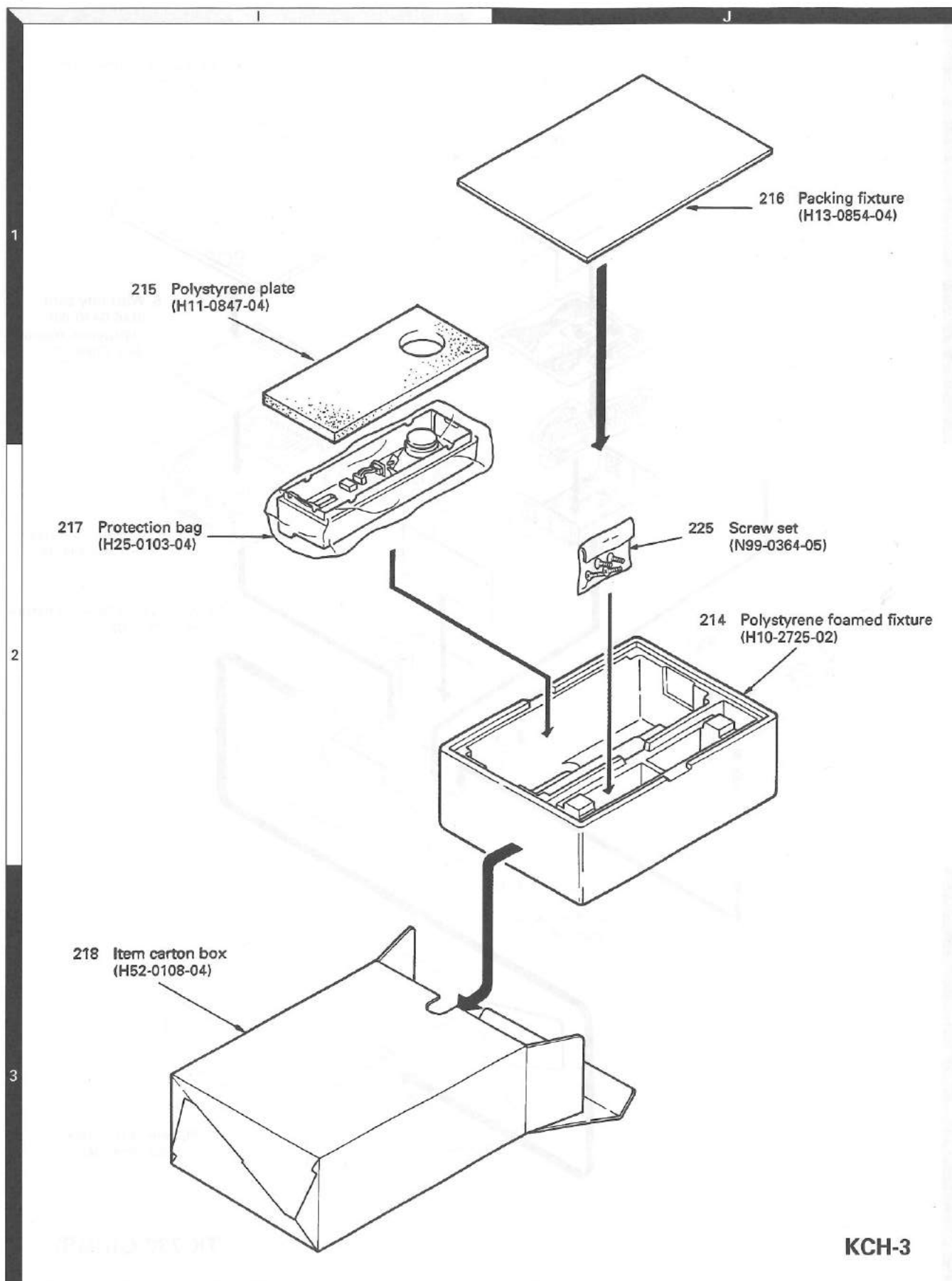
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KCH-4

PACKING

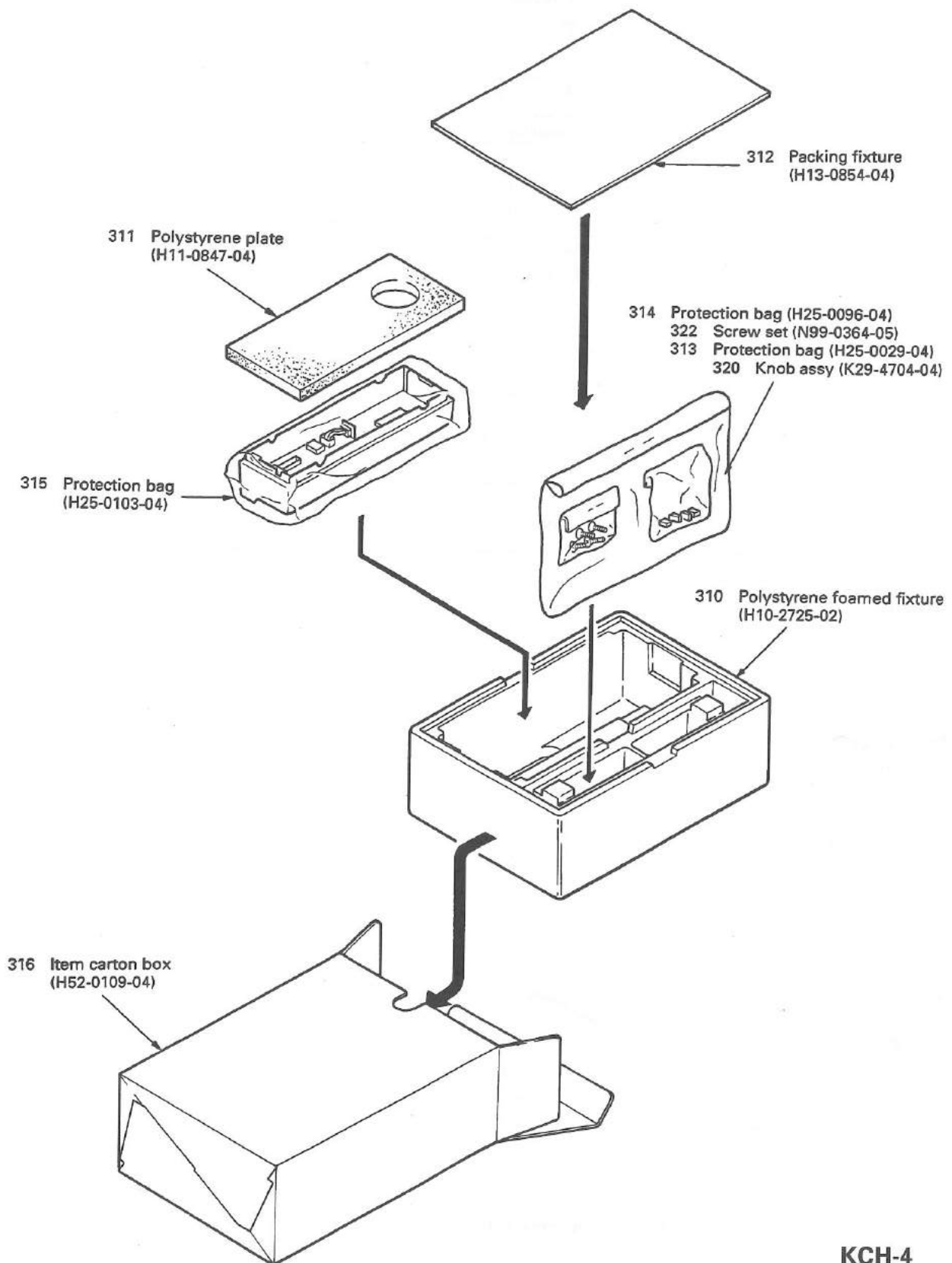


PACKING



KCH-3

PACKING



KCH-4

ADJUSTMENT

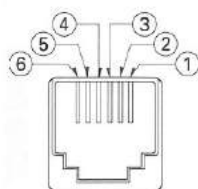
Test Equipment Required for Alignment

No.	Test Equipment	Major Specifications	
1	Standard Signal Generator (SSG)	Frequency Range Modulation Output	100 to 174MHz. Frequency modulation and external modulation. 0.1 μ V to greater than 1mV.
2	Power Meter	Input Impedance Operation Frequency Measurement Capability	50 Ω . 100 to 174MHz or more. Vicinity of 100W.
3	Deviation Meter	Frequency Range	100 to 174MHz.
4	Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 20V DC. High input impedance for minimum circuit loading.
5	Oscilloscope		DC through 30MHz.
6	High sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 200MHz. 0.2ppm or less.
7	Ammeter		15A.
8	AF Volt Meter (AFVTVM)	Frequency Range Voltage Range	50Hz to 10kHz. 3mV to 3V.
9	Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more. 0 to 1V.
10	Distortion Meter	Capability Input Level	3% or less at 1kHz. 50mV to 10Vrms.
11	Voltmeter	Measuring Range Input Impedance	10 to 1.5V DC or less. 50k Ω /V or greater.
12	4 Ω Dummy Load		Approx. 4 Ω 30W.
13	Regulated Power Supply		13.6V, approx. 15A (Adjustable from 9 to 17V). Useful if ammeter equipped.

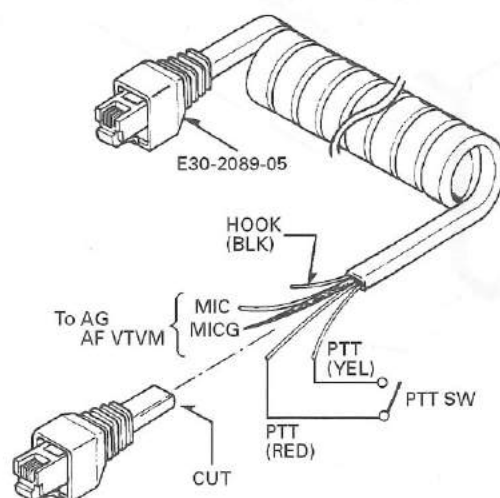
Caution

Since the RX AF output is a BTL output, there is a DC Component. Isolate this with a capacitor or transformer as shown in the figure.

MIC connector (Front view)

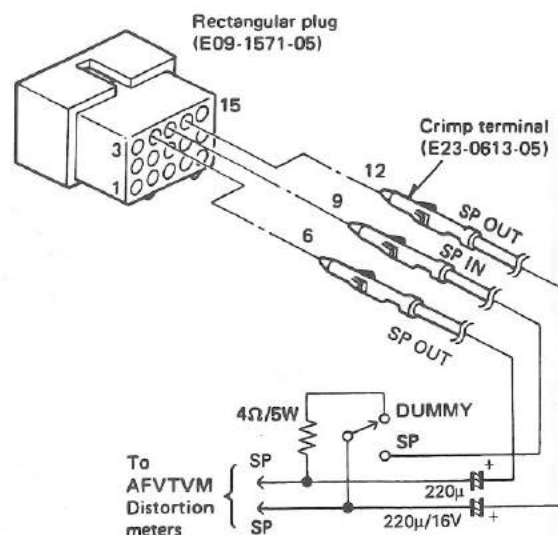


- ① SB
- ② PTTG
- ③ PTT
- ④ MICG
- ⑤ MIC
- ⑥ HOOK



Test cable for microphone input

- The following test cable is recommended.

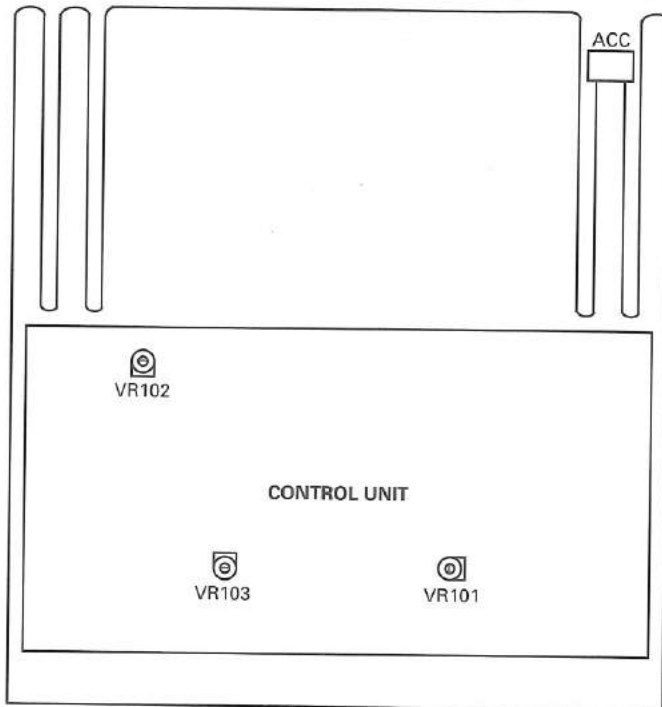


Test cable for speaker output

ADJUSTMENT

Adjustment Points

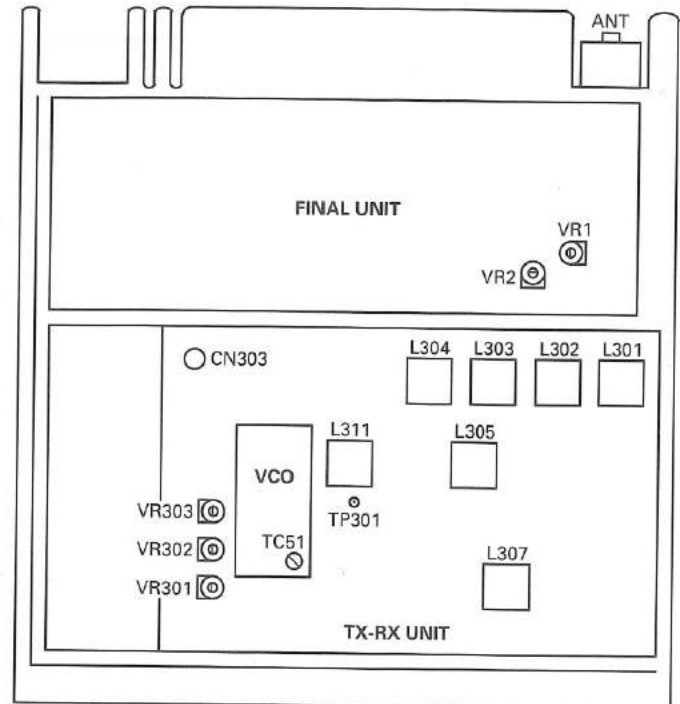
• Upper side



CONTROL UNIT

VR101 : MIC sensitivity
 VR102 : Squelch ADJ
 VR103 : Squelch CONT

• Lower side



FINAL UNIT

VR1, 2 : Power (APC)

TX-RX UNIT

L301~304, 311 : BPF
 L305, 307 : Distoton
 VR301 : Maximum deviation
 VR302 : DQT balance
 VR303 : QT

VCO/PLL

TC51 : PLL lock voltage

ADJUSTMENT

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

Test mode

		F1 (K)	F2 (K2)	MOD	DEC/ENC
CH1	fTX1 (MHz)	162.000	146.020	Wide	-
	fRX1 (MHz)	162.060	146.080		
CH2	fTX2 (MHz)	150.000	136.000	Wide	-
	fRX2 (MHz)	150.060	136.060		
CH3	fTX3 (MHz)	173.970	155.980	Wide	-
	fRX3 (MHz)	173.940	155.920		
CH4	fTX4 (MHz)	162.000	146.020	Wide	DQT 754
	fRX4 (MHz)	162.000	146.020		
CH5	fTX5 (MHz)	162.000	146.020	Wide	QT 151.4
	fRX5 (MHz)	162.000	146.020		
CH6	fTX6 (MHz)	162.000	146.020	Wide	QT 67.0
	fRX6 (MHz)	162.000	146.020		
CH7	fTX7 (MHz)	162.000	146.020	Wide	QT 210.7
	fRX7 (MHz)	162.000	146.020		
CH8	fTX8 (MHz)	161.010	145.300	Wide	-
	fRX8 (MHz)	161.010	145.300		

		F1 (K)	F2 (K2)	MOD	DEC/ENC
CH9	fTX9 (MHz)	154.980	140.980	Wide	QT 131.2
	fRX9 (MHz)	154.980	140.980		
CH10	fTX10 (MHz)	154.980	140.980	Wide	DQT 023
	fRX10 (MHz)	154.980	140.980		
CH11	fTX11 (MHz)	154.980	140.980	Wide	QT 100
	fRX11 (MHz)	154.980	140.980		
CH12	fTX12 (MHz)	154.980	140.980	Wide	DQT 444
	fRX12 (MHz)	154.980	140.980		
CH13	fTX13 (MHz)	161.010	145.300	Narrow	-
	fRX13 (MHz)	161.010	145.300		
CH14	fTX14 (MHz)	162.000	146.020	Narrow	QT 151.4
	fRX14 (MHz)	162.000	146.020		
CH15	fTX15 (MHz)	162.000	146.020	Narrow	-
	fRX15 (MHz)	162.060	146.080		
CH16	fTX16 (MHz)	150.000	136.000	Narrow	-
	fRX16 (MHz)	150.060	136.060		

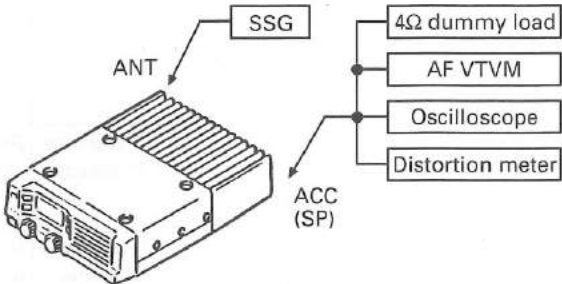
Alignment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Connect the front panel (KCH4) to the TK-730(G)/(GB). 2) Front panel VR : MIN 3) Write in frequency designed with EEPROM writer. 4) Connect the power cable to the rear panel. 5) TX-RX unit VR301 and VR303 : Center 6) TX-RX unit VR1 and VR2 : MAX CW 7) Power SW : ON							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
2. PLL lock voltage	1) CH : CH3 Receive	DVM	TX-RX	TP301	TX-RX	TC51 (Z301)	7.5V ADJ. K 6.7V ADJ. K2	±0.05V
	2) CH : CH3 Transmit (PTT : ON)						Check	7.5V or less K 6.5V or less K2
	3) CH : CH2 Receive							2.1~2.6V K 1.8~2.3V K2
	4) CH : CH2 Transmit (PTT : ON)							1.5V or more
3. Transmit frequency check	1) CH : CH1 ANT : Power meter PTT : ON	Power meter f. counter	Rear panel	ANT			Check	fTx1 ± 700Hz
4. Power adjustment (APC)	1) CH : CH1 PTT : ON	Power meter Ammter	Rear panel	ANT	Final	VR2	MAX CW	45W or more
							45W ADJ.	±2W, 10.2A or less
						VR1	MAX CCW	5W, 10.2A or less
							MAX CW	
5. DQT balance	1) CH : CH4 Deviation meter filter HPF : OFF LPF : 3kHz De-emphasis : OFF PTT : ON	Power meter Deviation meter Oscilloscope	Rear panel	ANT	TX-RX	VR302	Make the demodulation waveform neat.	
6. QT	1) CH : CH5 Deviation meter filter HPF : 50Hz LPF : 3kHz De-emphasis : OFF PTT : ON						VR303	±0.75kHz
								Check
							2) CH : CH6, CH7	
7. Maximum deviation adjustment	1) CH : CH1 Connect AG to the MIC terminal. AG : 1kHz/50mV Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF PTT : ON	Power meter Deviation meter AF VTVM AG Oscilloscope	Rear panel	ANT	TX-RX	VR301	±4.0kHz K ±4.2kHz K2 Adjust one more than the other by switching between -P and +P.	±100Hz
	2) CH : CH15 (Narrow)						Check	1.8~2.2kHz K 1.7~2.1kHz K2
	8. MIC sensitivity adjustment				1) CH : CH1 Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF AG : 1kHz/5mV PTT : ON			
2) CH : CH15 (Narrow)				Check	1.25~1.75kHz			

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. Distortion adjustment	1) CH : CH2 SSG frequency : f _{rx2} SSG output : 500μV/54dBμ/-53dBm SSG MOD : 1kHz SSG DEV : ±3kHz AF : 1.4V/4Ω	SSG AF VTVM Distortion meter Oscilloscope 4Ω dummy load	Rear panel	ANT ACC (EXT.SP)	TX-RX	L305	Adjust for minimum distortion.	Distortion : 3% or less
						L307	Adjust for maximum AF output.	
								
10. BPF adjustment	1) CH : CH2 SSG frequency : f _{rx2} SSG output : 0.22μV/-13dBμ/-120dBm SSG MOD : 1kHz SSG DEV : ±3kHz	SSG Distortion meter Oscilloscope AF VTVM	Rear panel	ANT ACC (EXT.SP)	TX-RX	L311 L304 ↓ L303 ↓ L302 ↓ L301	Adjust for maximum SINAD.	
						L302	Turn the core counterclockwise (12dB SINAD).	
11. Sensitivity adjustment	1) CH : CH1~ CH3 CH15 (Narrow) SSG frequency : f _{rx1} ~f _{rx3} ,f _{rx5} SSG outut : 0.25μV/-12dBμ/-119dBm SSG MOD : 1kHz SSG DEV : ±3kHz (CH1~CH3) ±1.5kHz (CH15) AF : 1.4V/4Ω						Check	SINAD 12dB or more
12. Squelch adjustment	1) CH : CH2 SSG frequency : f _{rx2} SSG output : Value when 3dB is subtracted from the sensitivity value of 12dB SINAD. SSG MOD : 1kHz SSG DEV : ±3kHz	SSG Distortion meter Oscilloscope	Rear panel	ANT ACC (EXT.SP)	CONT	VR103	Set to threshold point.	SINAD 8dB or less
						Check	Squelch close 0.6A or less	
	3) CH : CH16 (Narrow) SSG frequency : f _{rx16} SSG output : Value when 3dB is subtracted from the sensitivity value of 12dB SINAD. SSG MOD : 1kHz SSG DEV : ±1.5kHz				CONT	VR102	Set to threshold point.	SINAD 8dB or less
	4) SSG output : OFF						Check	Squelch close

TERMINAL FUNCTION

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
FINAL UNIT (X57-5050-XX) (D/4)				
CN1 To TX-RX unit	1	DO	I	Transmission signal input, coaxial connector.
CN2 To TX-RX unit	1	RA	O	Receiver signal output, coaxial connector.
CN3	1	B	I	Power supply input. (13.6V±15%)
W1 To TX-RX unit	1	DB	O	Transmission drive control voltage output. (APC)
	2	E	-	Earth.
	3	8R	I	8V input during reception.
	4	8T	I	8V input during transmission.
W3 To AF unit	1	E	-	Earth.
	2	B	O	Power supply output. (13.6V±15%)
	3	B	O	Power supply output. (13.6V±15%)
CONTROL UNIT (X57-5050-XX) (A/4)				
CN101 To AF unit	1	8C	O	Common 8V. (8V±5%)
	2	SB	I	Power input after power switch. (13.6V±15%)
	3	SB	I	Power input after power switch. (13.6V±15%)
	4	SB	I	Power input after power switch. (13.6V±15%)
	5	PSB	I	Power input. (unswitched)
	6	PSC	O	Controls power switch relay. (Power SW ON : "L", OFF : "H")
	7	AFO	O	Audio output.
	8	SSC	O	Controls SPEAKER select relay.
	9	E	-	Earth.
	10	E	-	Earth.
	11	RS1	I	Input for remote speaker 1. (BTL 4W)
	12	CSP	I	Input for common speaker. (BTL 13W)
	13	CSP	I	Input for common speaker. (BTL 13W)
	14	ES1	I	Input for external speaker A (BTL 13W)
	15	ES1	I	Input for external speaker A (BTL 13W)
	16	OS1	I	Input for external speaker B (BTL 13W)
	17	OS1	I	Input for external speaker B (BTL 13W)
CN102 To TX-RX unit	1	DP	O	DATA output for PLL.
	2	EP	O	ENABLE output for PLL.
	3	CP	O	CLOCK output for PLL.
	4	LD	I	LOCK detect input for PLL. "H" : LOCK, "L" : UNLOCK
	5	TO	O	TONE signal output.
	6	ES	O	ENABLE output for shift register.
	7	MO	O	Modulation signal output.
	8	8C	O	Common 8V. (8V±5%)
	9	E	-	Earth.
	10	8C	O	Common 8V. (8V±5%)
	11	DET	I	Detection signal input.
	12	W/N	O	Wide/narrow signal output.
	13	SB	O	Power output after power switch (F1). (13.6V±15%)
CN103 To control cable	1	E	-	Earth.
	2	DP	O	DATA output for PLL.
	3	CP	O	CLOCK output for PLL.
	4	EI	O	ENABLE interface output.
	5	DD2	I/O	DATA input/output for HEAD 2.
	6	CD2	O	CLOCK output for HEAD 2.
	7	TXD	O	TX DATA output for HEAD 1.

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	8	RXD	I	RX DATA input for HEAD 2.
	9	BZ2	O	Beep output for HEAD 2.
	10	5C	O	Common 5V. (5V±5%)
	11	DE3	O	Detection signal output for HEAD2.
CN104 To ACC connector	1	MIC	I/O	MIC signal input/output or Data audio input (Jumper selected).
	2	MCM	I	MIC/QT/DQT mute input or MIC mute input (Jumper selected).
	3	DEO	O	Detection signal output.
	4	E	-	Earth.
	5	HN1	O	Horn alert signal output.
	6	HN2	O	Horn alert signal output.
	7	IGN	I	Ignition input.
	8	OS1	O	Input for external speaker B. (BTL 13W)
CN105 To ACC connector	1	PTT	I/O	PTT signal input/output.
	2	HK	I/O	MIC HOOK signal input/output or Speaker mute input (Jumper selected).
	3	RS2	I	Output for remote speaker. (BTL 4W)
	4	ES1	O	Output for external speaker A. (BTL 13W)
	5	SB	O	Power output after power switch. (13.6V/1A)
	6	ES2	O	Output for external speaker A. (BTL 13W)
	7	OS2	O	Output for external speaker B. (BTL 13W)
CN106 To signaling (option)	1	AC2	I	Audio control signal input by the signaling (option).
	2	PTT	I/O	PTT signal input/output for signaling (option).
	3	DEO	O	Detection signal output.
	4	E	-	Earth.
	5	RST	O	RESET signal output for signaling (option).
	6	RLC	O	Controls Horn alert relay. ("L" : Horn alert switch ON)
	7	ALT	I	ALERT signal input for signaling (option).
	8	HN1	I	Horn alert signal input.
	9	HN2	I	Horn alert signal input.
CN107 To signaling (option)	1	MCM	I/O	MIC MUTE signal input/output.
	2	DTM	I	DTMF (option) signal input.
	3	MCO	I	MIC signal input.
	4	8C	O	Common 8V. (8V±5%)
	5	DBD	I	DEAD BEAT DISABLE input.
	6	DT3	I	Five-tone data rewrite output.
	7	CK3	O	Five-tone data rewrite output.
CN108 To voice scramble	1	MIC	O	MIC signal output.
	2	MCO	I	MIC signal input
	3	8C	O	Common 8V. (8V±5%)
	4	E	-	Earth.
	5	AC1	O	Audio control signal output. OPT SW ON : "L", OFF : "H"
	6	PTT	I/O	PTT signal input/output.
	7	DEO	O	Detection signal output.
	8	DE2	I	Detection signal input.
	9	0	O	SCRAMBLE code output.
	10	2	O	SCRAMBLE code output.
	11	5	O	SCRAMBLE code output.
	12	8	-	Not use.
W105 To remote head	1	RS2	O	Output for remote speaker. (BTL 4W)
	2	RS1	O	Output for remote speaker 1. (BTL 4W)
	3	SB	O	Power output after power switch. (13.6V±15%)
	4	SPR	I	SPARE reserved input terminal.
	5	PS	I	Power switch control signal input.
	6	CD	O	CLOCK output to the display unit (option).

TERMINAL FUNCTION

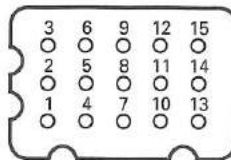
Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	7	DD	I/O	DATA signal input/output for display unit (option).
	8	VOL	I	Electronic volume control signal input.
	9	E	-	Earth.
	10	MIC	I	MIC signal input.
	11	ME	-	MIC earth.
TX-RX UNIT (X57-5050-XX) (B/4)				
CN301 To final unit	1	RA	I	Receiver signal input, coaxial connector.
CN302 To VCO/PLL unit	1	REF	O	TCXO 12.8MHz output for COM PLL IC.
	2	CP	O	CLOCK signal output for COM PLL IC.
	3	E	-	Earth.
	4	DP	O	DATA signal output for COM PLL IC.
	5	LS	O	PLL LPF select signal output.
	6	EP	O	PLL ENABLE signal output for COM PLL IC.
	7	STR	O	Standby RX. (RX : "H", TX : "L")
	8	E	-	Earth.
	9	MP	O	MODULATION signal output.
	10	LD	I	LOCK detect input. (LOCK : "H", UNLOCK : "L")
	11	5V	O	5V AVR.
	12	E	-	Earth.
	13	CV	I	PLL LOCK voltage input.
	14	OUT	I	VCO signal input.
	15	8V	O	Common 8V. (8V±5%)
CN303 To final unit	1	DO	O	Transmission drive output, coaxial connector. (200mW)
CN304 To final unit	1	DB	I	Transmission drive control voltage input. (APC)
	2	E	-	Earth.
	3	8R	O	8V output during reception.
	4	8T	O	8V output during transmission.
CN305 To control unit	1	DP	I	DATA input for PLL.
	2	EP	I	ENABLE input for PLL.
	3	CP	I	CLOCK input for PLL.
	4	LD	O	LOCK detect output for PLL. (LOCK : "H", UNLOCK : "L")
	5	TO	I	TONE signal input.
	6	ES	I	ENABLE input for shift register.
	7	MO	I	Modulation signal input.
	8	8C	I	Common 8V. (8V±5%)
	9	E	-	Earth.
	10	8C	I	Common 8V. (8V±5%)
	11	DET	O	Detection signal output.
	12	W/N	I	Wide/narrow signal input.
	13	SB	I	Power input after power switch (F1). (13.6V±15%)
AF UNIT (X57-5050-XX) (C/4)				
CN501 To control unit	1	OS1	O	Output for external speaker B. (BTL 13W)
	2	OS1	O	Output for external speaker B. (BTL 13W)
	3	ES1	O	Output for external speaker A. (BTL 13W)
	4	ES1	O	Output for external speaker A. (BTL 13W)
	5	CSP	O	Output for common speaker. (BTL 13W)
	6	CSP	O	Output for common speaker. (BTL 13W)
	7	RS1	O	Output for remote speaker. (BTL 4W)
	8	E	-	Earth.
	9	E	-	Earth.
	10	SSC	I	Controls SPEAKER select relay.

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	11	AFO	I	Audio input.
	12	PSC	I	Controls power switch relay. (Power SW ON : "L", OFF : "H")
	13	PSB	O	Power output. (unswitched)
	14	SB	O	Power output after power switch. (13.6V±15%)
	15	SB	O	Power output after power switch. (13.6V±15%)
	16	SB	O	Power output after power switch. (13.6V±15%)
	17	8C	O	Common 8V. (8V±5%)
CN502 To final unit	1	E	-	Earth.
	2	B	I	Power supply input. (13.6V±15%)
	3	B	I	Power supply input. (13.6V±15%)
DISPLAY UNIT (X54-31XX-20) (A/2) 3100 : KCH-3, 3110 : KCH-4 (OPTION)				
CN1 To head ACC connector	1	IRS	I	Internal speaker input. (RS↔IRS)
	2	RS2	O	Output for remote speaker. (BTL 4W)
	3	RS1	O	Output for external speaker. (RS1↔RS2)
	4	AUX	O	AUX signal output. (space)
	5	E	-	Earth.
	6	SPR	I	SPARE reserved input terminal.
CN2 To control unit	1	ME	-	MIC earth.
	2	MIC	O	MIC signal output.
	3	E	-	Earth.
	4	VOL	O	Electronic volume control signal output.
	5	DD	I/O	DATA signal input/output.
	6	CD	I	CLOCK output.
	7	PS	O	Power switch control signal output.
	8	SPR	O	SPARE reserved output terminal.
	9	SB	I	Power output after power switch. (13.6V)
	10	RS1	I	Input for remote speaker. (BTL 4W)
	11	RS2	I	Input for remote speaker. (BTL 4W)
CN3 To encoder	1	EN1	I	Encoder pulse input.
	2	E	-	Earth.
	3	EN2	I	Encoder pulse input.
CN4 To speaker	1	IRS	O	Internal speaker input.
	2	RS1	O	Internal speaker input.

TERMINAL FUNCTION

1. Functions of Pins Used During System Set-up

1-1. 15-pin ACC terminal



1 pin : HK (MIC Hook Signal Input/Output or Speaker Mute Input)

This normally functions the same as for the transceiver MIC HOOK (microphone). High (5V) : Offhook; Low : Onhook.

Since the MIC HOOK can be controlled by using this pin as an input pin, the hook operation need not be performed from the microphone. Set this pin to low to automatically perform the onhook operation.

Jumper selected TX "Voice" or "Data audio" input. Wire (E-F) should be connected between the points E (control unit) and F (TX-RX unit) to inject the data directly into the modulator.

R177 (0Ω)	Wire (E-F)	Function
Yes	No	External mic input (filtered) : Default
No	Yes	Data input (not filtered)

2 pin : MCM (MIC Mute Input)

Jumper selected TX "MIC" or "MIC+QT/DQT" mute input.

R178 (0Ω)	Function (Active low)
Yes	MIC and QT/DQT mute input : Default
No	MIC mute input

3 pin : IGN (Ignition Input)

If you use this pin, see the KCT-18 section (page 19) of this service manual.

4 pin : DEO (Detect Signal Output)

The transceiver detection output (400mV/47kΩ) is present.

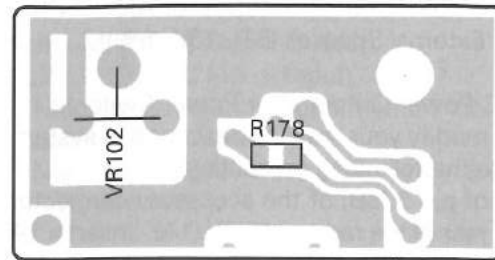
5 pin : MIC (MIC Signal Input/Output or Data Audio Input)

Same as the transceiver MIC input because this pin is directly connected to the transceiver MIC input. 5mV/3kHz dev. (600Ω) modulation is gained on input.

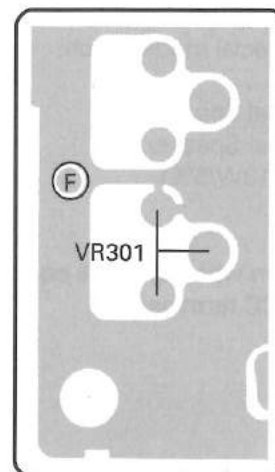
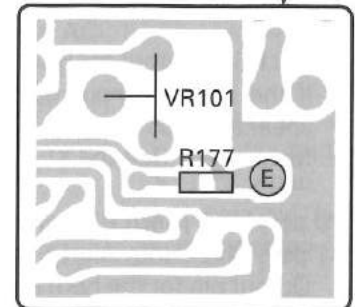
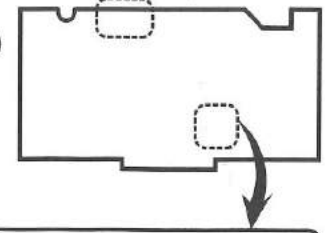
The input from the transceiver panel is output as it is.

Jumper selected "Hook" or "Speaker mute" input.

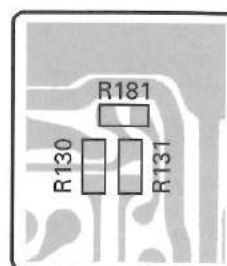
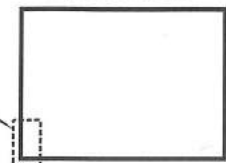
R131 (1kΩ)	R181 (0Ω)	Function (Active low)
Yes	No	Hook input : Default
No	Yes	Speaker mute input



Control unit
(X57-5050-XX) (A/4)
Component side



TX-RX unit
(X57-5050-XX) (B/4)
Component side



Control unit
(X57-5050-XX) (A/4)
Foil side

TERMINAL FUNCTION

6 pin : ES1 (Output for External Speaker A)
12 pin : ES2 (Output for External Speaker A)
Output for External Speaker (BTL 13W/5%)

7 pin : SB (DC Power Output after Power Switch)
When you modify your radio as described in system set-up, take the following precaution.
The rating of pin 7 (SB) of the accessory connector (J4) on the rear of the radio is 13.6V (1A). Insert a 1A fuse if you use the SB pin for external equipment.

8 pin : PTT (PTT Signal Input/Output)
Normally functions the same as the transceiver PTT (microphone). It is high (5V) when the PTT is off and low when the PTT is on, to control the external PTT. Since the PTT can be controlled by using this terminal as an input pin, the microphone PTT operation is not required. Set this pin to low to perform the PTT operation.

9 pin : RS2 (Output for Remote Speaker)
If the speaker input is not applied to this remote speaker input pin, the front panel speaker is non-functional. (See the KES-4 section (page 20).)

10 pin : HN1 (Horn Alert Signal Output 1)

11 pin : HN2 (Horn Alert Signal Output 2)

Output pin for the horn alert relay when the KCK-5 is connected (rating: 24V DC/1A). See the KCK-5 service manual. (B51-8155-00)

If you do not use the KCK-5, another function could be output to this pin after special modification.

13 pin : OS1 (Output for External Speaker B)

14 pin : OS2 (Output for External Speaker B)

PA speaker output pin (BTL 13W/5%)

15 pin : E (Earth)

Use this pin as the ground pin when external equipment is connected to the ACC terminal.

1-2. Control unit (X57-5050-XX) (A/4)

• CN106 to signaling

1 pin : AC2 (Audio Control 2)

External audio control pin for optional signaling. Normally high (5V). When it is switched to low by external control, such as optional signaling, audio muting is canceled and the **CALL** indicator flashes. Note that the audio muting is not canceled unless the SQ on the main unit is also canceled.

2 pin : PTT (PTT Signal Input/Output)

Same as pin 8 of the 15-pin ACC terminal.

3 pin : DEO (Detect Signal Output)

Same as pin 4 of the 15-pin ACC terminal.

4 pin : E (Earth)

5 pin : RST (Reset)

Reset pin for optional signaling.

Normally high. A reset pulse is output in synchronization with the PTT, HOOK, MON SW, and channel encoder operation.

6 pin : RLC (Relay Control)

Relay control pin for horn alert (KCK-5).

Normally high. It switches to low when the horn alert is turned on by selecting the **HA** switch.

7 pin : ALT (Alert)

Normally unused. An alert signal for optional custom signaling can be input to this pin.

8 pin : HN1 (Horn Alert Signal Input)

9 pin : HN2 (Horn Alert Signal Input)

Output pin for horn alert relay when the KCK-5 is connected.

TERMINAL FUNCTION

• CN107 to signaling

- 1 pin : MCM (MIC Mute Signal Input/Output)
MIC mute signal pin. High : MIC mute; Low : Unmute.
- 2 pin : DTM (DTM Signal Input)
DTMF external modulation input pin.
380mV/1kHz dev.
1.2V/3kHz dev.
- 3 pin : MCO (MIC Signal Input/Output)
Normally functions the same as pin 5 of the 15-pin ACC terminal. If the transceiver is modified to connect a scramble unit, scrambled MIC modulation is output.
- 4 pin : 8C (Common 8V)
8V AVR output pin ($8V \pm 10\%$).
- 5 pin : DBD (Dead Beat Disable)
Transmit inhibit signal input pin.
Normally high (5V). When it switches to low, transmission is inhibited. When the optional KDD-4 is connected, the DBD operation is available.
- 6 pin : DT3 (DATA 3)
- 7 pin : CK3 (CLOCK 3)
Unused pin; Do not connect anything to this pin. Otherwise, the radio may malfunction.

• CN108 to voice scramble

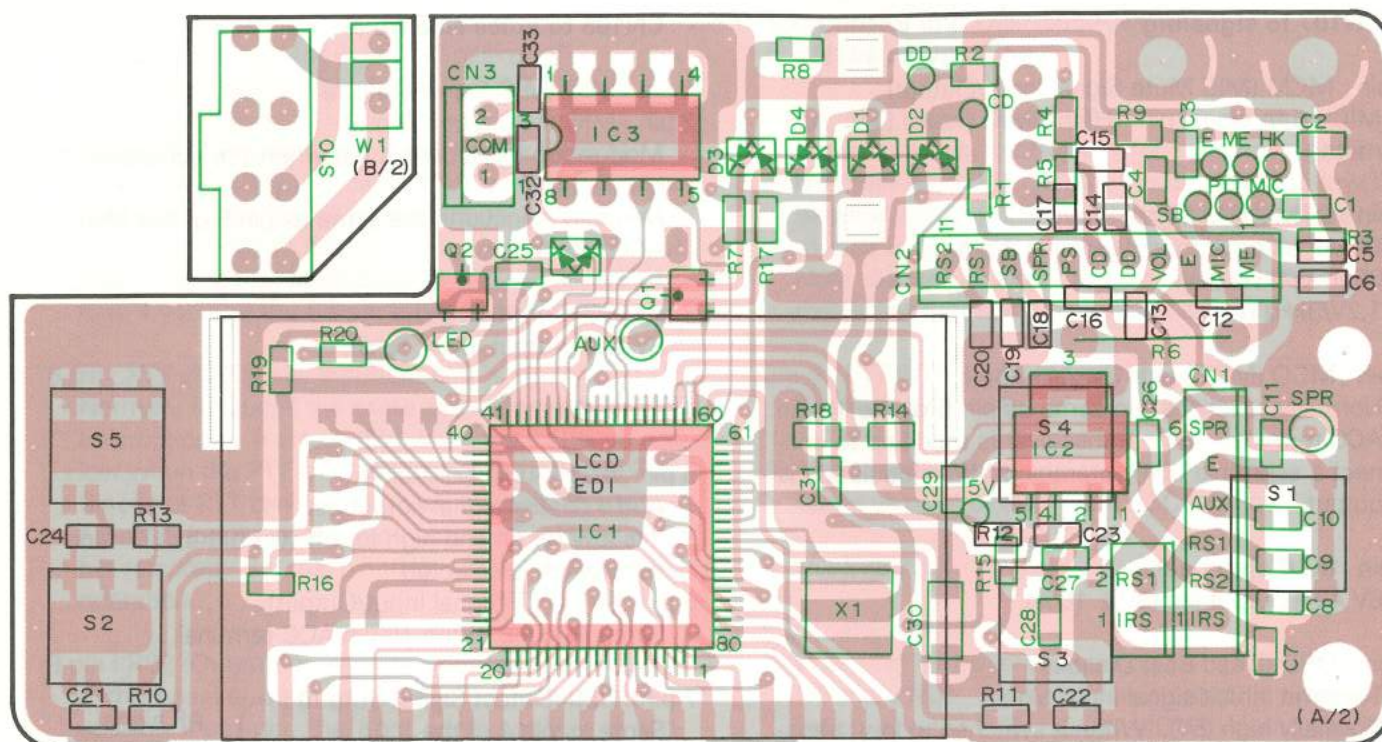
- 1 pin : MIO (MIC Signal Output)
- 2 pin : MIO (MIC Signal Input)
Modulation input/output pin when the scrambler is connected.
Normally, functions the same as pin 5 of the 15-pin ACC terminal.
- 3 pin : 8C (Common 8V)
8V AVR output ($8V \pm 10\%$).
- 4 pin : E (Earth)
- 5 pin : AC1 (Audio Control 1)
Audio control signal output pin.
It is low for on and high for off when the OPT function switch is selected.
- 6 pin : PTT (PTT Signal Input/Output)
Same as pin 8 of the 15-pin ACC terminal.
- 7 pin : DE0 (Detect Signal Output)
Same as pin 4 of the 15-pin ACC terminal.
- 8 pin : DE2 (Detect Signal Input)
AF BPF input pin
- 9 pin : 0
- 10 pin : 2
- 11 pin : 4

} AF signal input/output pins when scrambler is connected.

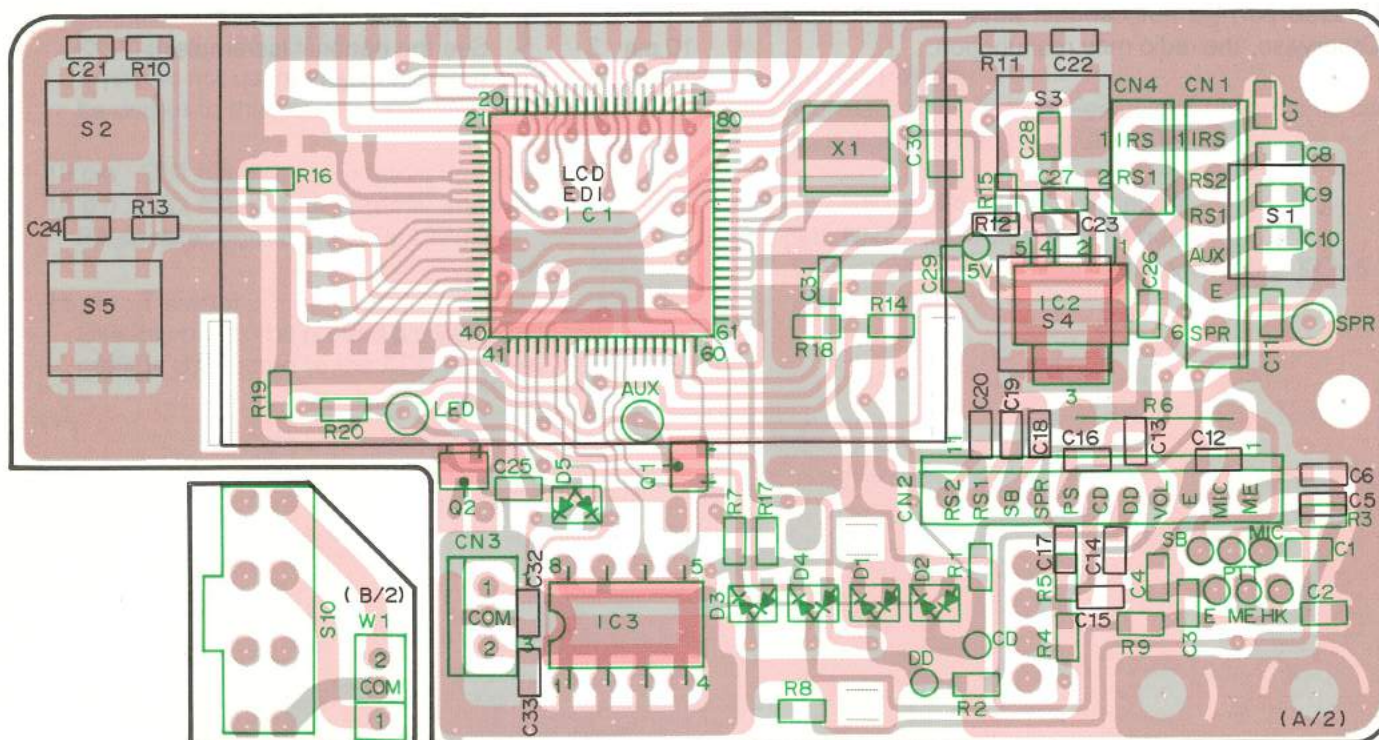
} Scrambler code output.
See the optional (scrambler) function (page 18).

TK-730(G)/(GB) PC BOARD VIEWS

DISPLAY UNIT (X54-3100-20) : KCH-3 Component side view



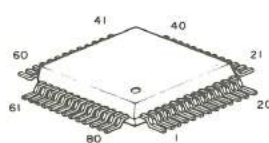
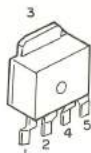
DISPLAY UNIT (X54-3100-20) : KCH-3 Foil side view



L78LR05B-FA

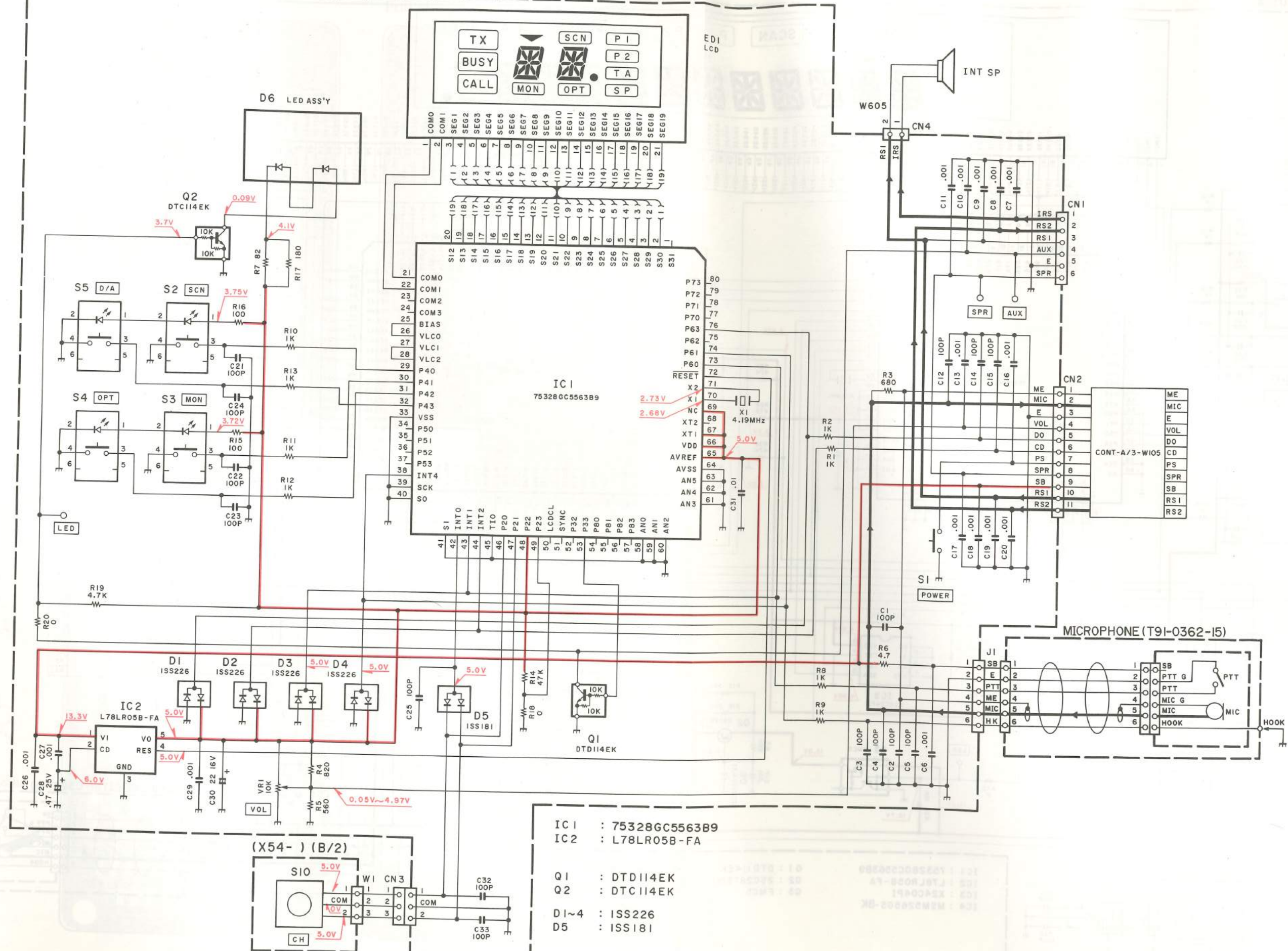
75328GC5563B9

DTC114EK
DTD114EK



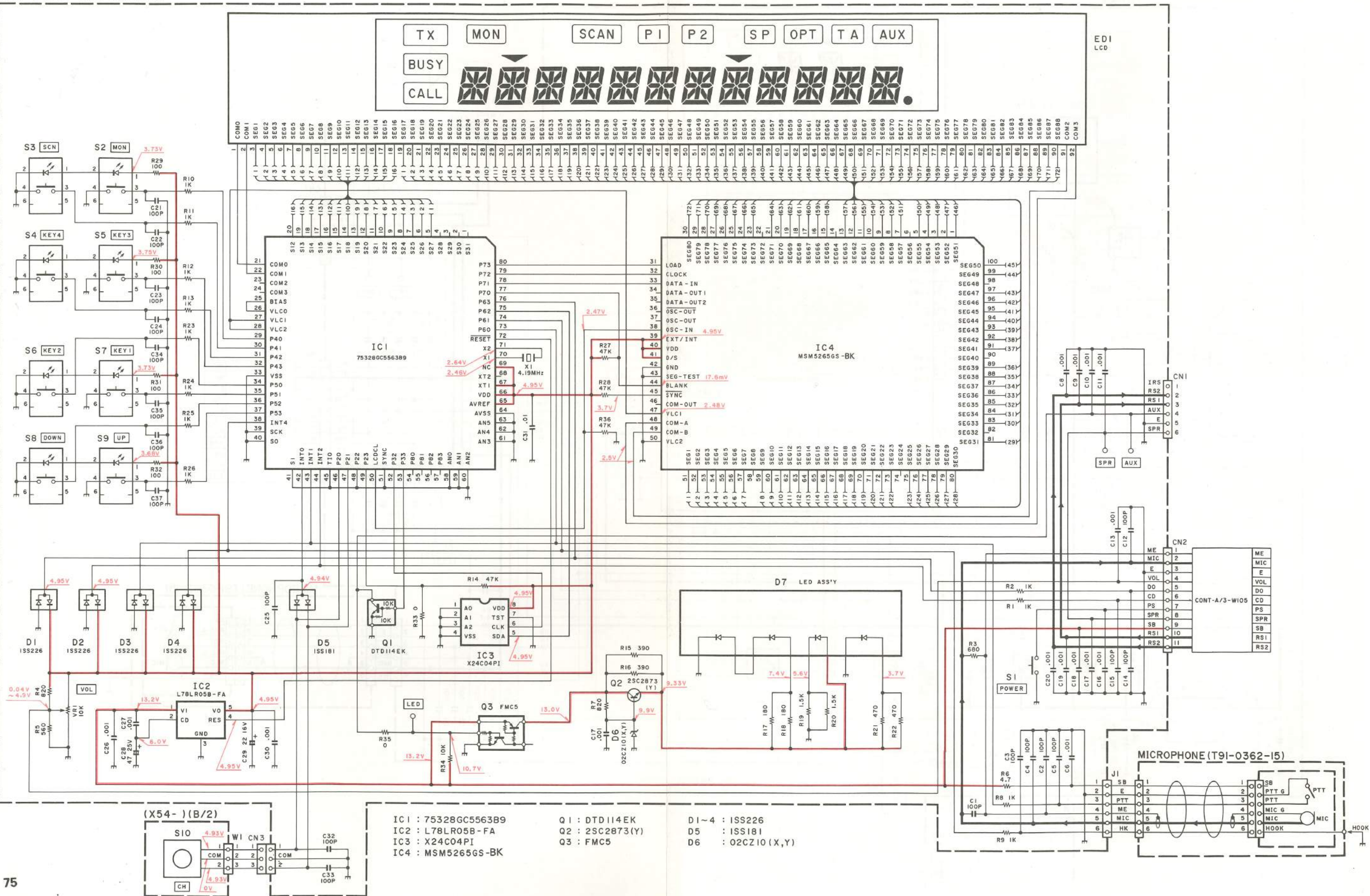
CIRCUIT DIAGRAM TK-730(G)/(GB)

KCH-3 (X54-3100-20) (A/2)



TK-730(G)/(GB) CIRCUIT DIAGRAM

KCH-4 (X54-3110-20)(A/2)

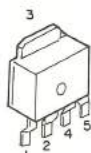


PC BOARD VIEWS TK-730(G)/(GB)

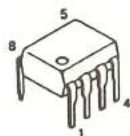
DISPLAY UNIT (X54-3110-20) : KCH-4
Component side view

DISPLAY UNIT (X54-3110-20) : KCH-4
Foil side view

L78LR05B-FA



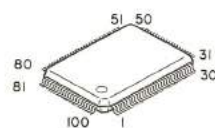
X24C04PI



2SC2873



MSM5265GS-BK



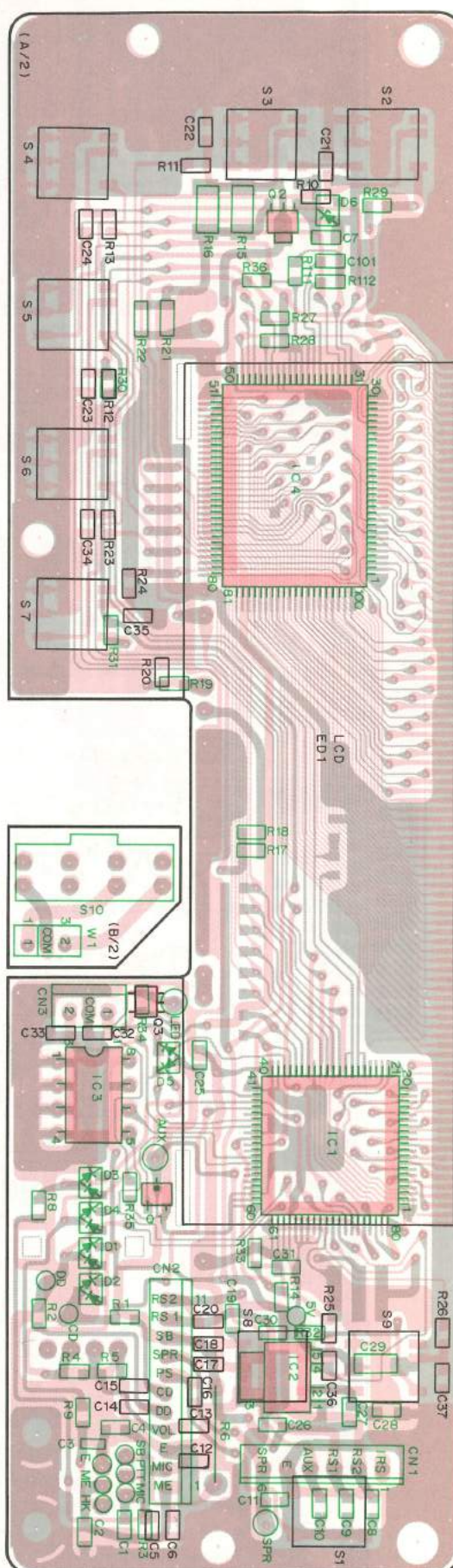
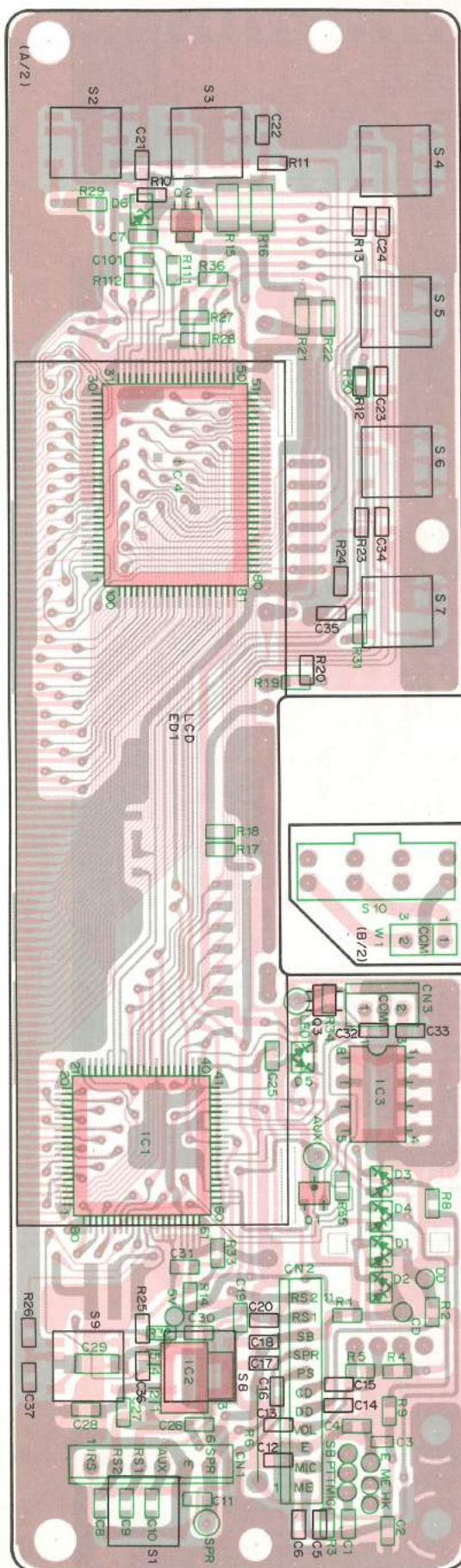
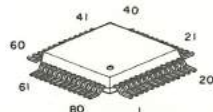
DTD114EK



FMC5

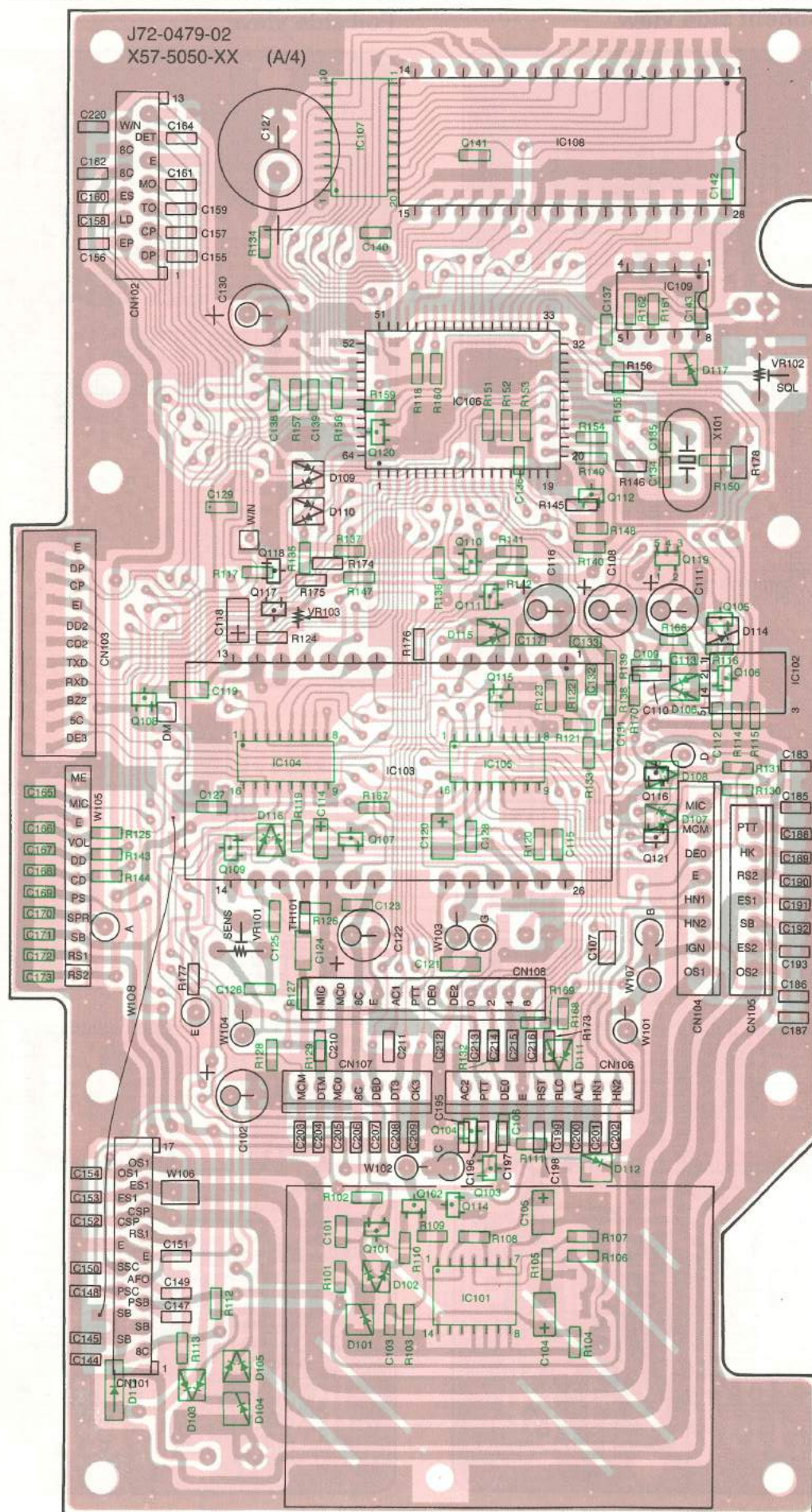


75328GC5563B9



TK-730(G)/(GB) PC BOARD VIEW

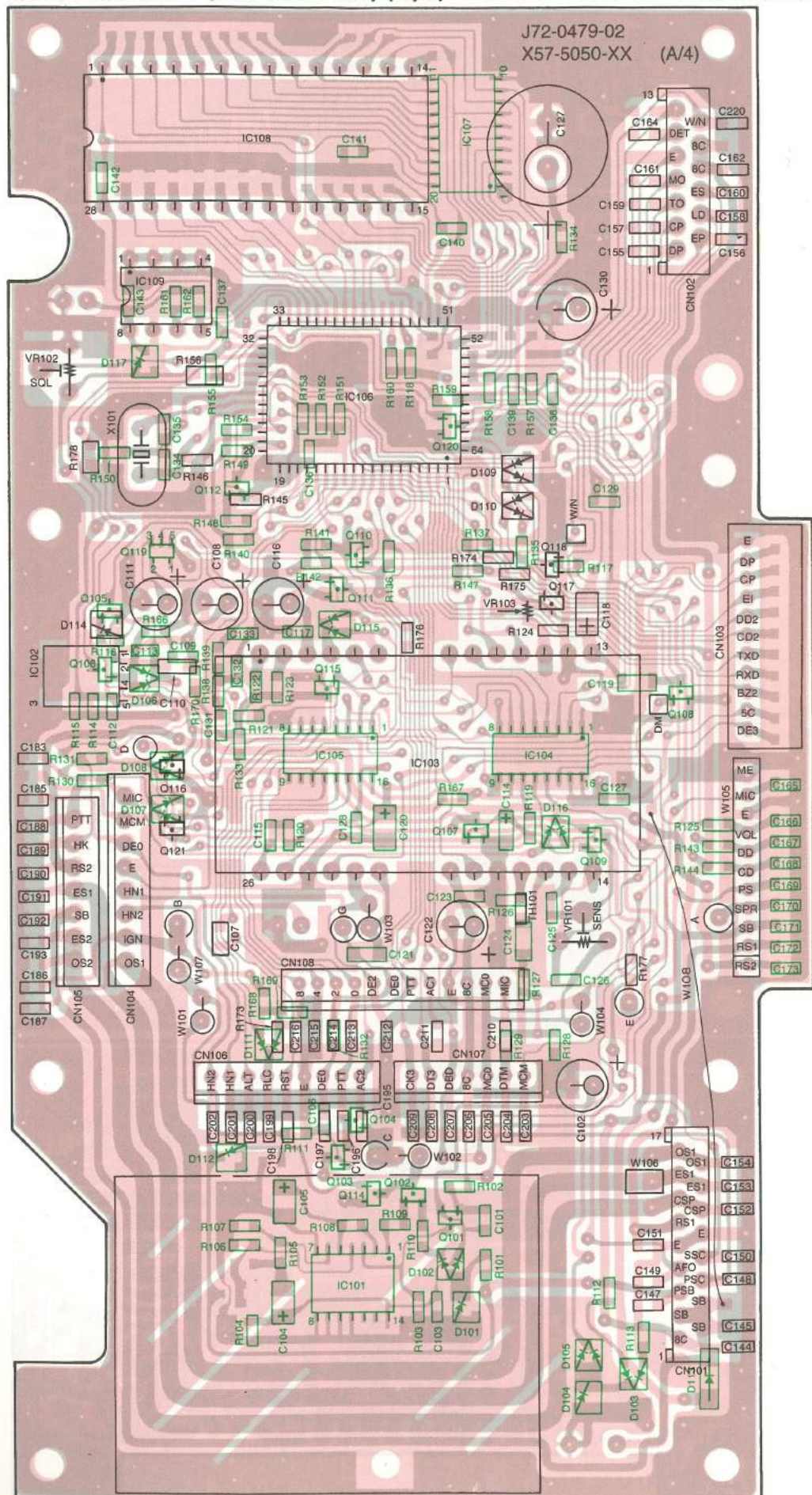
CONTROL UNIT (X57-5050-XX) (A/4) -11 : K -12 : K2 Component side view



 Component side
 Foil side

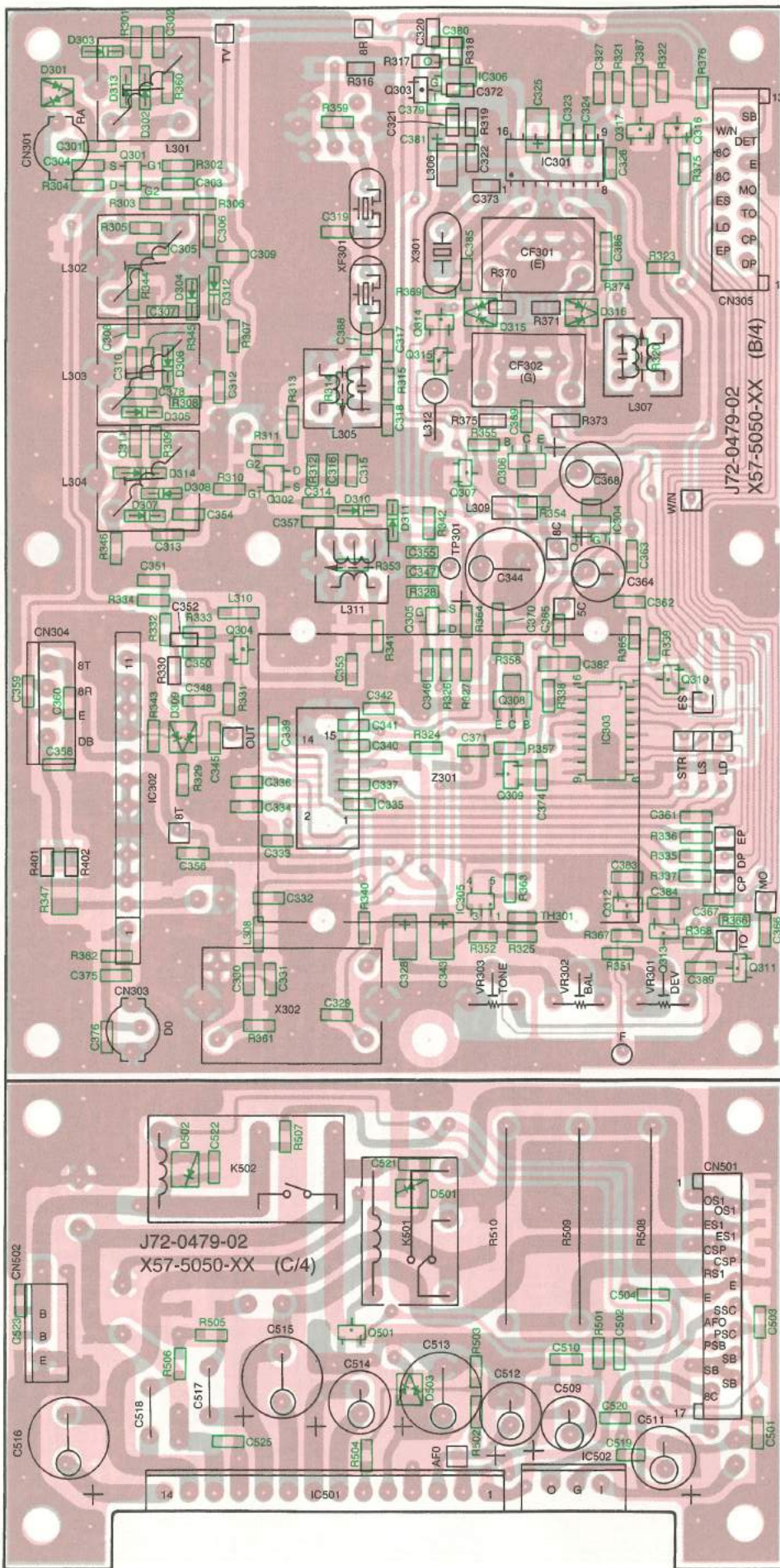
TK-730(G)/(GB)

CONTROL UNIT (X57-5050-XX) (A/4) -11 : K -12 : K2 Foil side view



 Component side
 Foil side

TX-RX, AF UNIT (X57-5050-XX) (B,C/4) -11 : K -12 : K2 Component side view

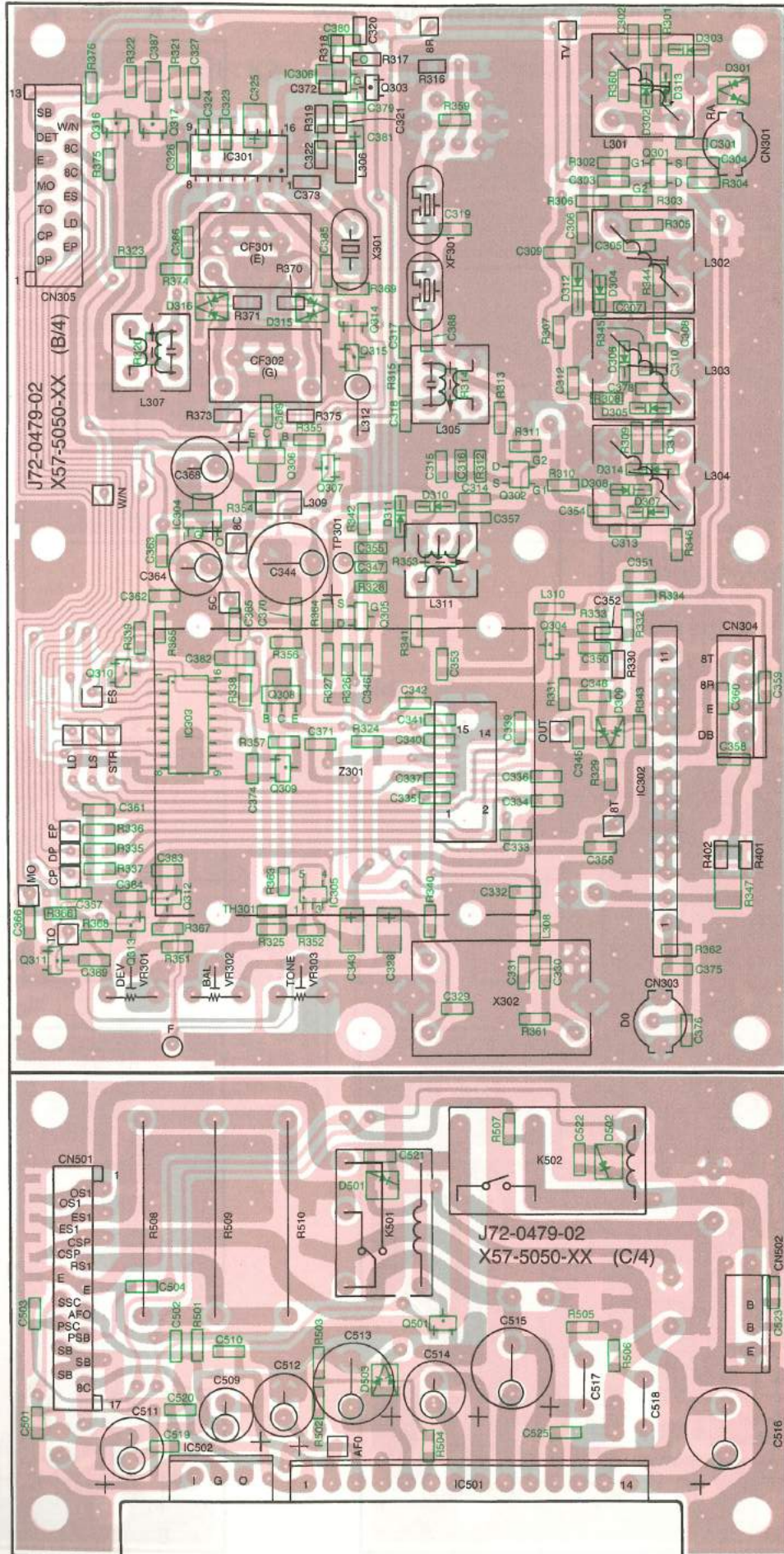


 Component side
 Foil side

PC BOARD VIEWS

TK-730(G)/(GB)

TX-RX, AF UNIT (X57-5050-XX) (B,C/4) -11: K -12: K2 Foil side view

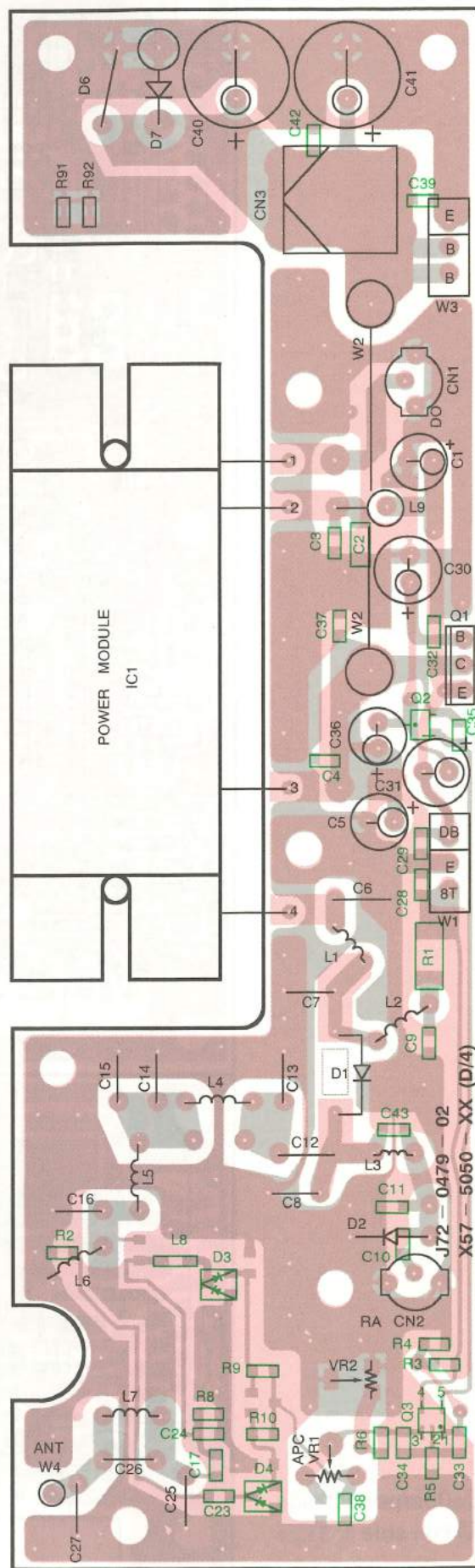
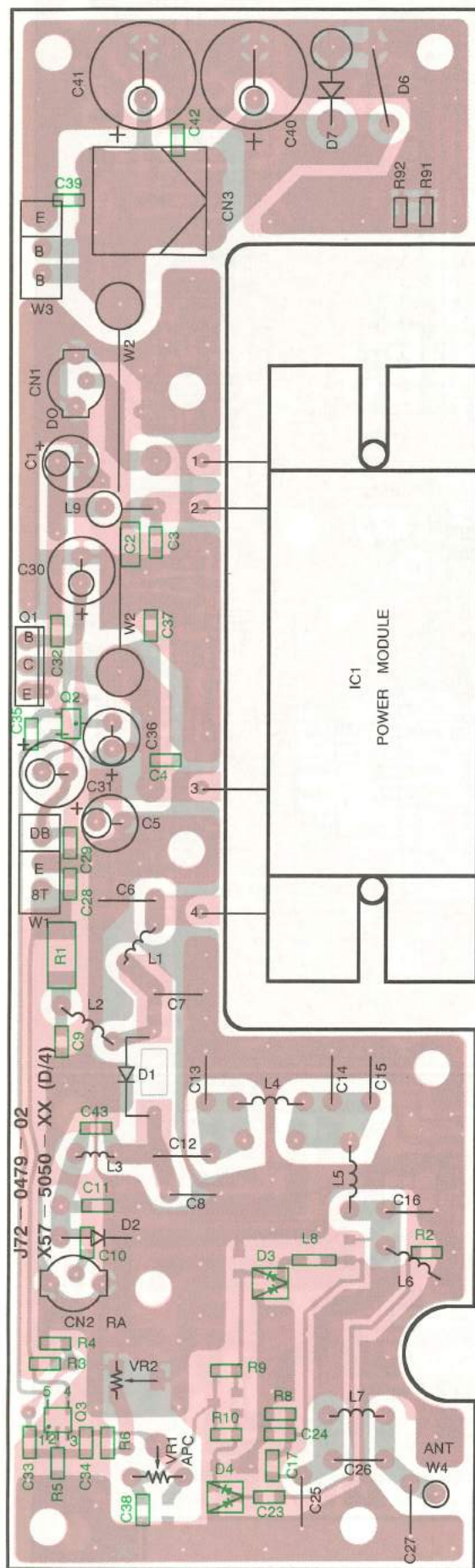


TK-730(G)/(GB) PC BOARD VIEWS

Component side
Foil side

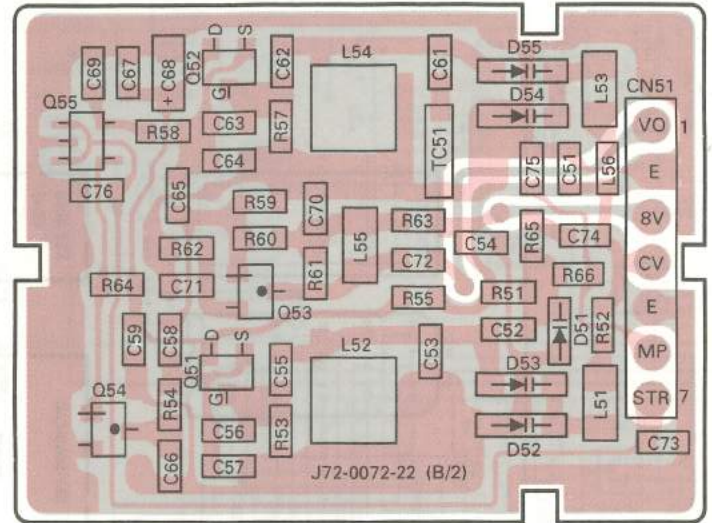
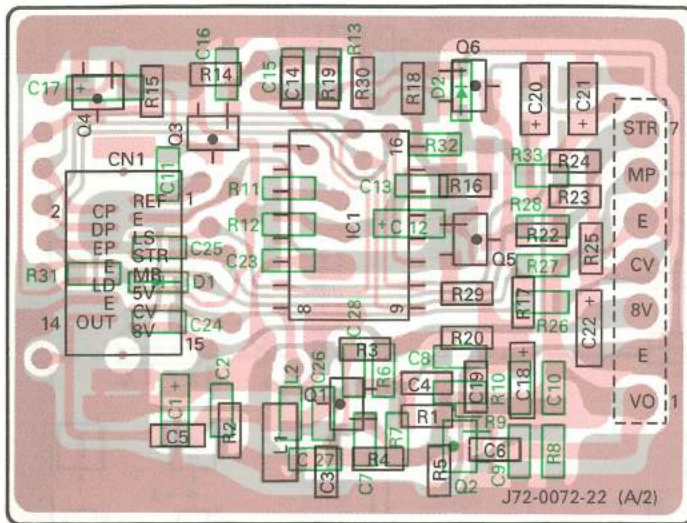
FINAL UNIT (X57-5050-XX) (D/4)
-11 : K -12 : K2 Component side view

FINAL UNIT (X57-5050-XX) (D/4)
-11 : K -12 : K2 Foil side view

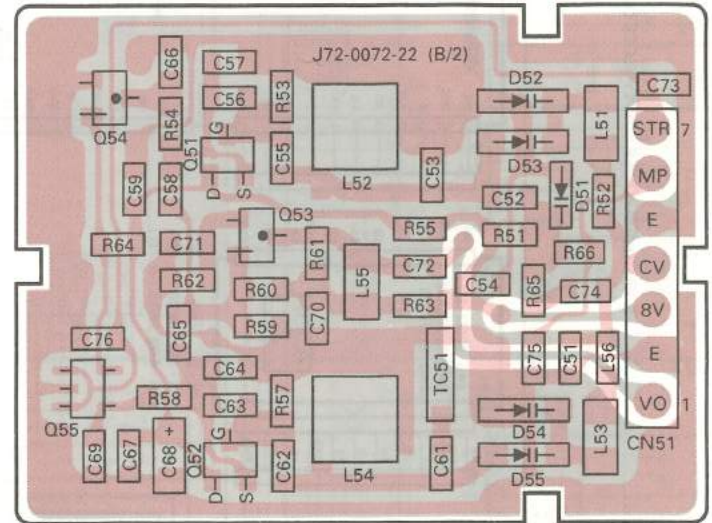
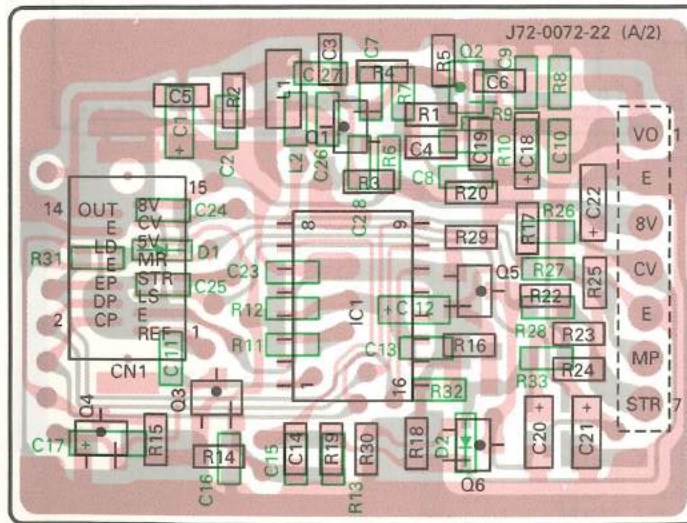


PC BOARD VIEWS TK-730(G)/(GB)

VCO/PLL (X58-3810-XX) -10 : K -11 : K2 Component side view



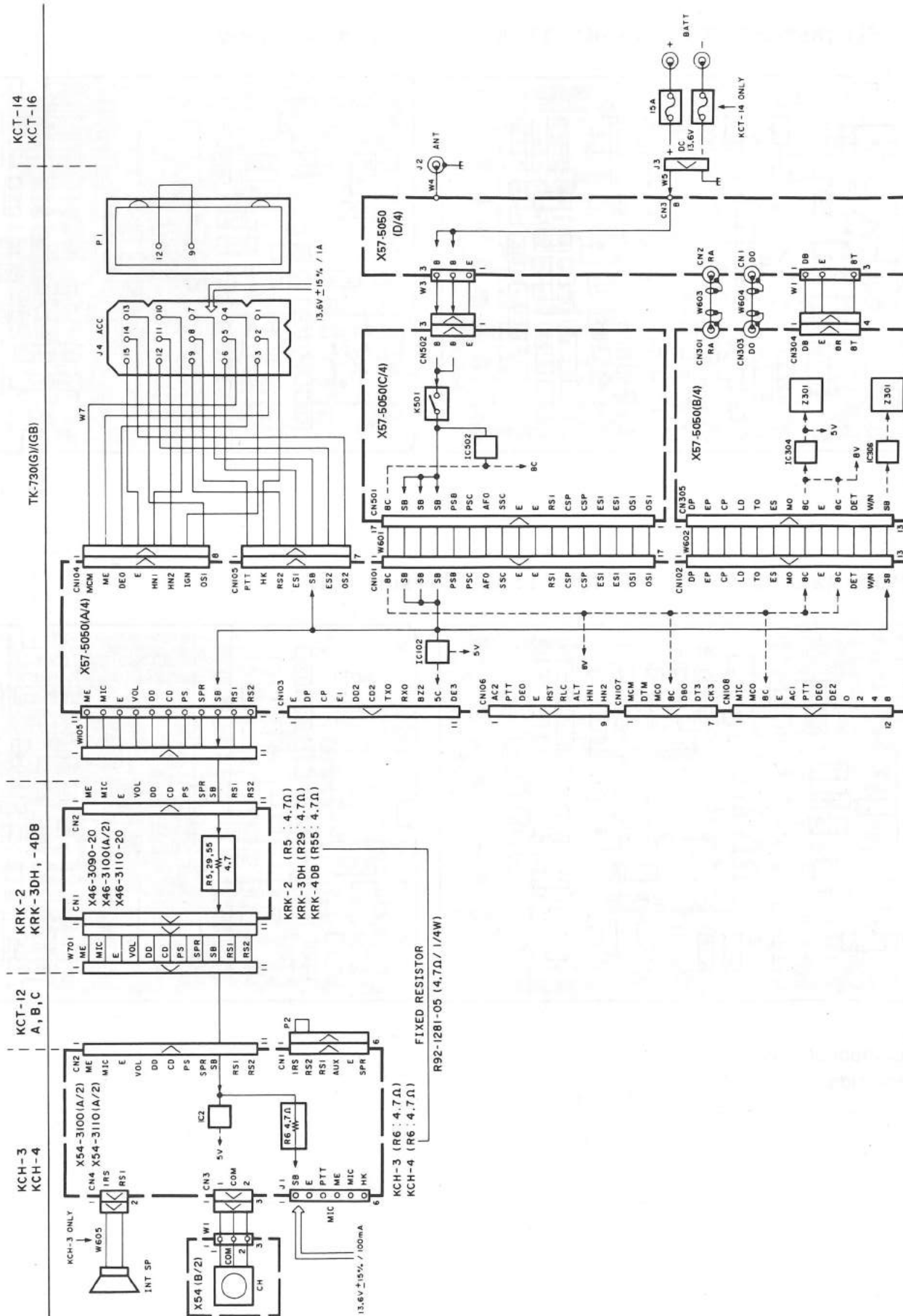
VCO/PLL (X58-3810-XX) -10 : K -11 : K2 Foil side view



Component side
Foil side

WIRING

TK-730(G)/(GB) POWER SUPPLY BLOCK DIAGRAM

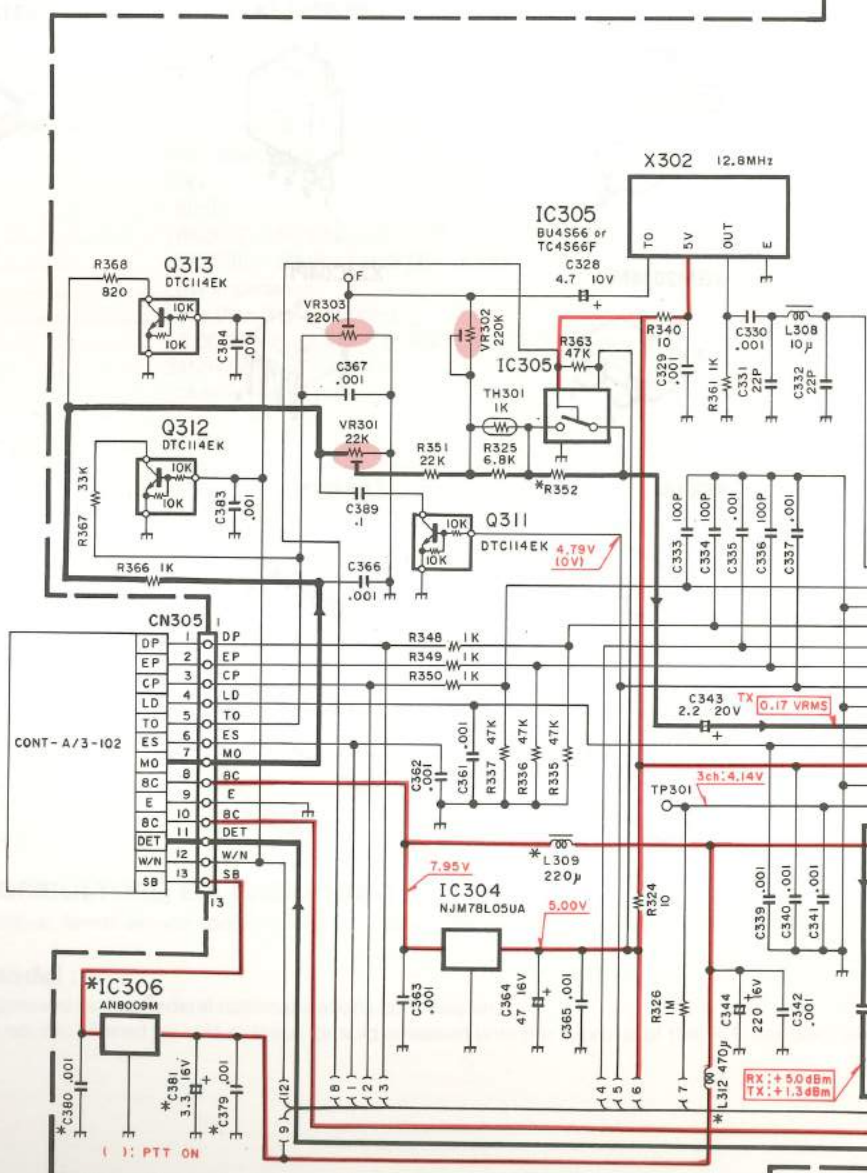
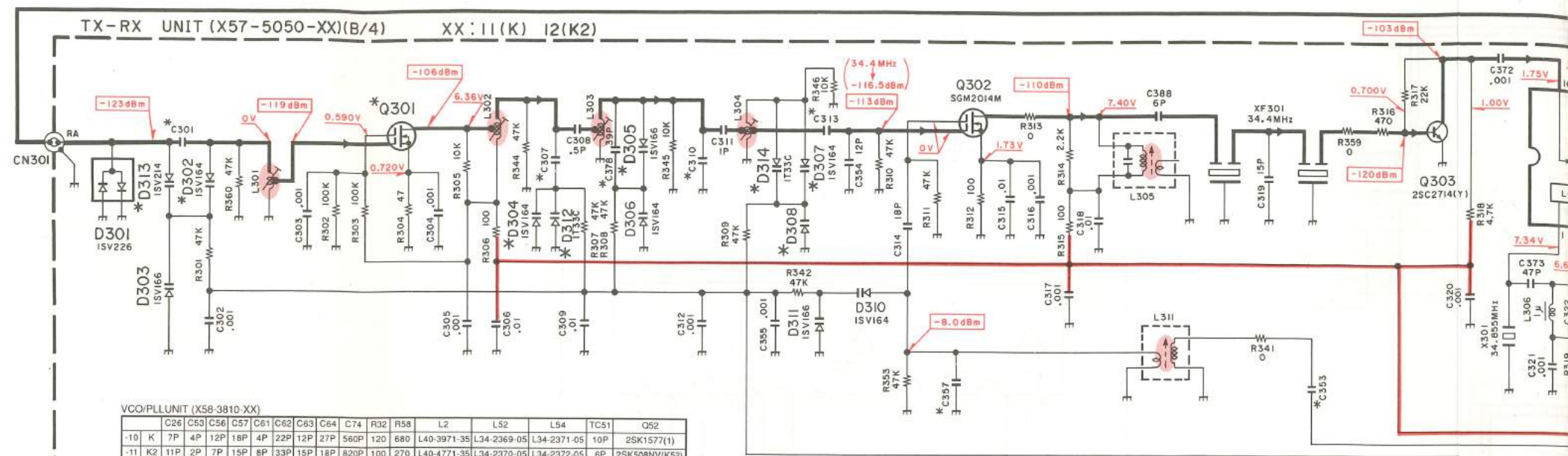


TX-RX UNIT (X57-5050-XX)

	C301	C307	C310	C313	C353	C357	C375	C376	R327	R352	R364
-11 K	3P	33P	2P	18P	18P	0.5P	YES	NO	NO	6.8K	YES
-12 K2	5P	22P	4P	15P	10P	1P	NO	YES	YES	4.7K	NO

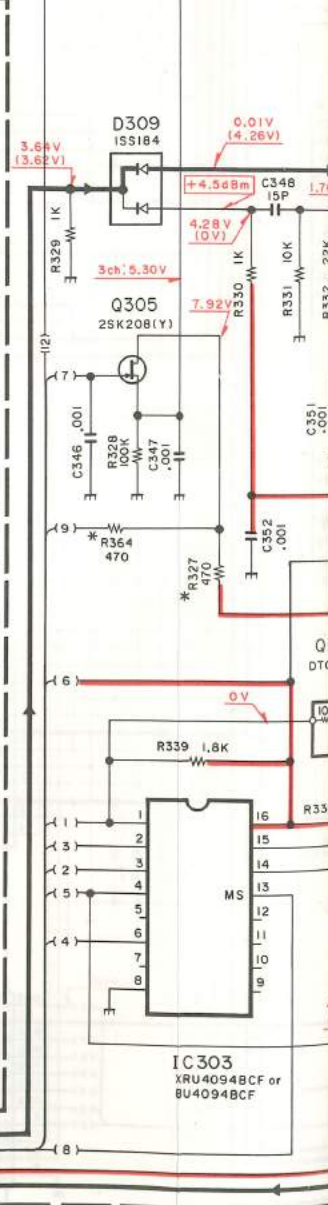
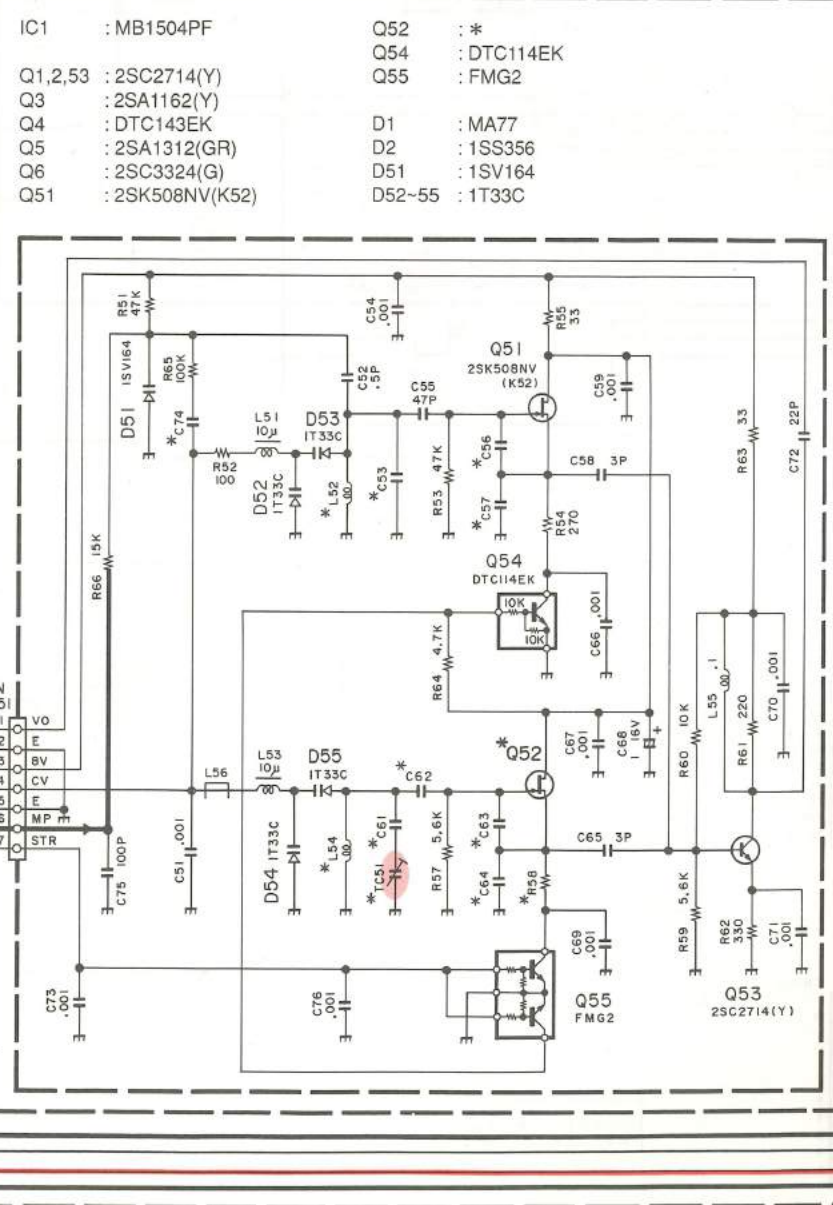
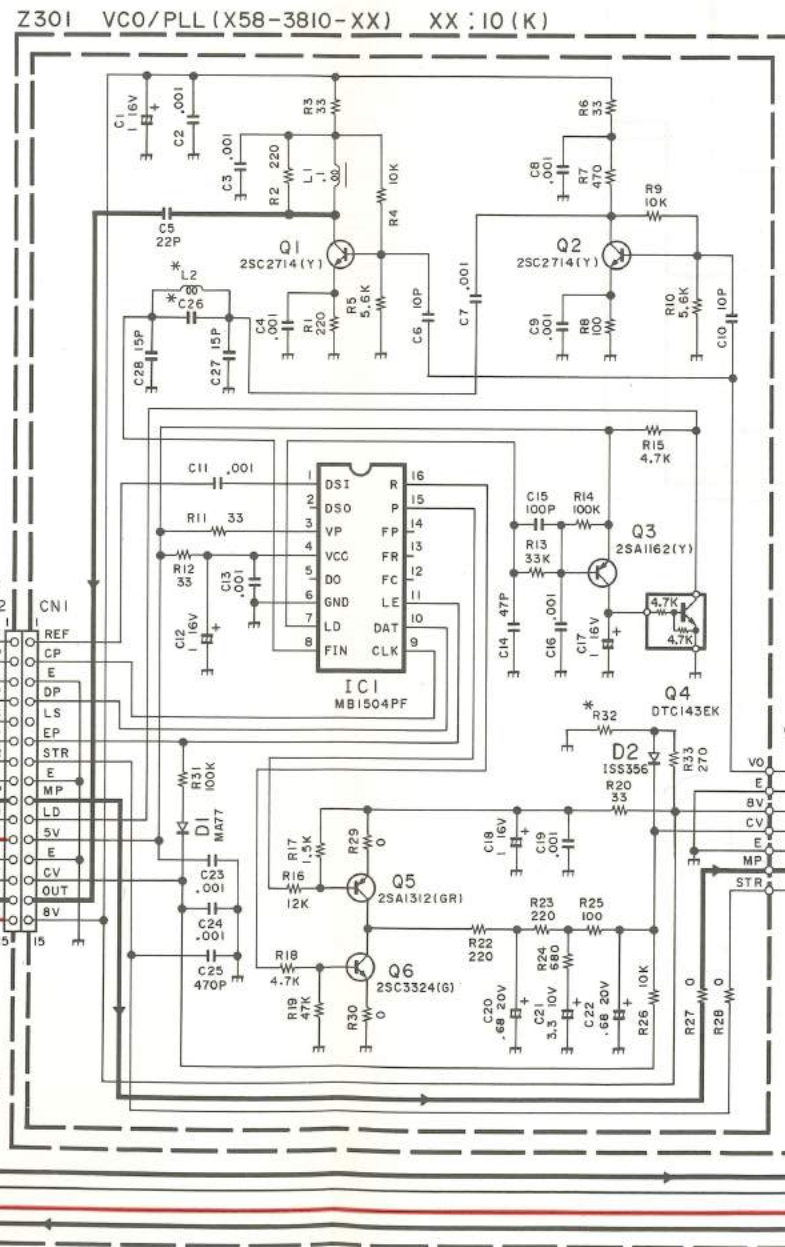
	L309	L310	L312	D302,305,307,312	D304	D308	D301	IC306	Z301
-11 K	NO	270n	YES	NO	YES	1SV164	SGM2014M	YES	X58-3810-10
-12 K2	YES	330n	NO	YES	NO	1SV166	3SK184(S)	NO	X58-3810-11

- IC301 : MC3371D
 IC302 : KCB05
 IC303 : XRU4094BCF or BU4094BCF
 IC304 : NJM78L05UA
 IC305 : BU4S66 or TC4S66F
 IC306 : AN8009M
- Q301 : *
 Q302 : SGM2014M
 Q303,304 : 2SC2714(Y)
 Q305 : 2SK208(Y)
 Q306,308 : 2SB1119(S)
 Q307,309-313 : DTC114EK
 Q314 : DTA144EK
 Q315,316 : DTC144EK
 Q317 : DTC114YK
- D301 : 1SS226
 D302,304,306,307,310 : 1SV164
 D303,305,311 : 1SV166
 D308 : *
 D309 : 1SS184
 D312,314 : 1T33C
 D313 : 1SV214
 D315,316 : DAN235K

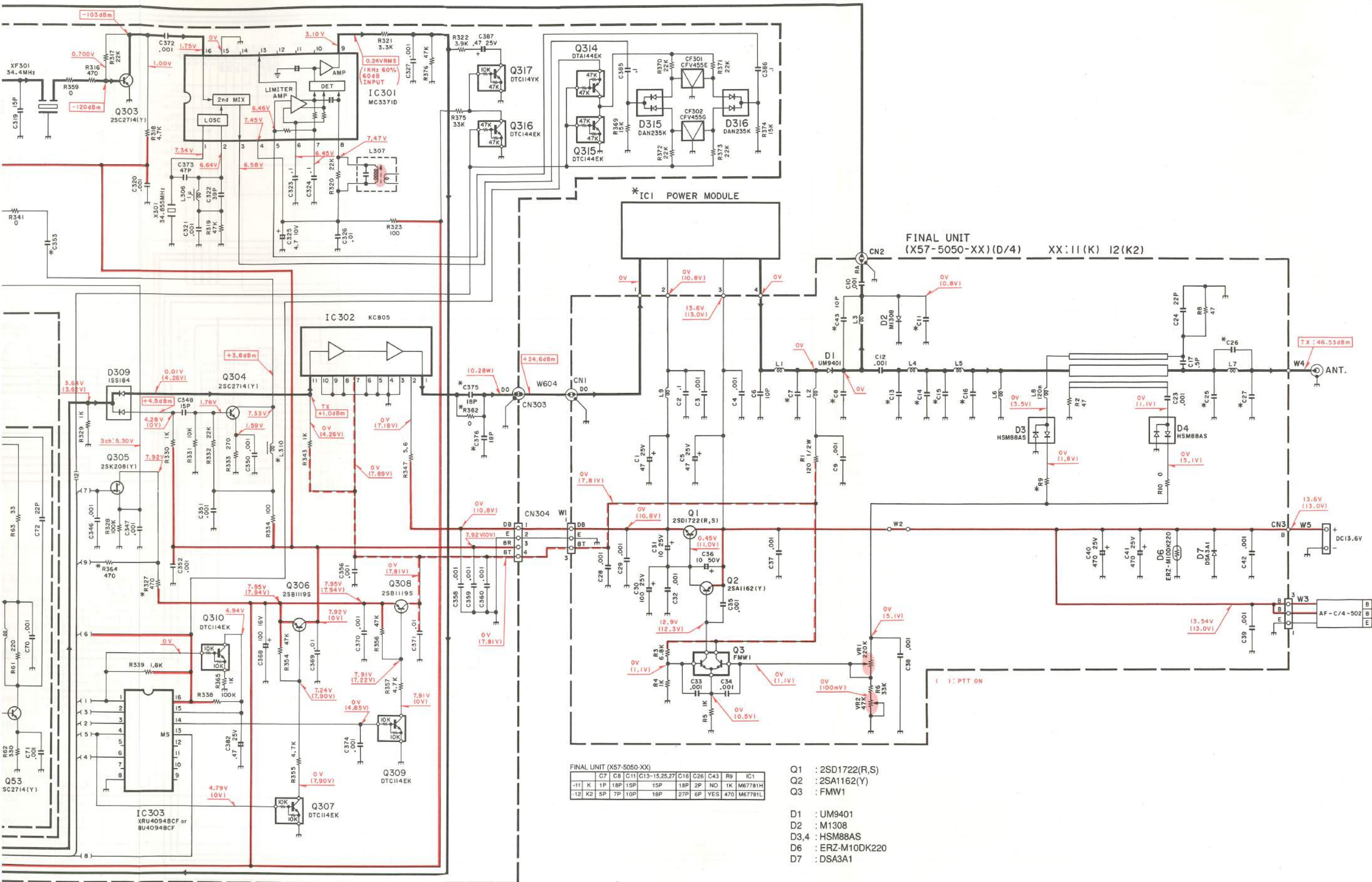


VCO/PLL UNIT (X58-3810-XX)

	C26	C33	C56	C57	C61	C62	C63	C64	C74	R32	R58	L2	L52	L54	TC51	Q52
-10 K	7P	4P	12P	18P	4P	22P	12P	27P	560P	120	880	L40-3971-35	L34-2369-05	L34-2371-05	10P	2SK1577(1)
-11 K2	11P	2P	7P	15P	8P	33P	15P	18P	820P	100	270	L40-4771-35	L34-2370-05	L34-2372-05	6P	2SK508NV(K52)



CIRCUIT DIAGRAM TK-730(G)/(GB)



TK-730(G)/(GB) SCHEMATIC DIAGRAM

- IC101 : TC4013BF
 IC102 : L78LR05B-FA
 IC103 : KCE10
 IC104, 105 : XRU4094BCF or BU4094BCF
 IC106 : 78312AGF3343BE
 IC107 : TC74HC573AF
 IC108 : 27C256QJPWA
 IC109 : X24C04PI

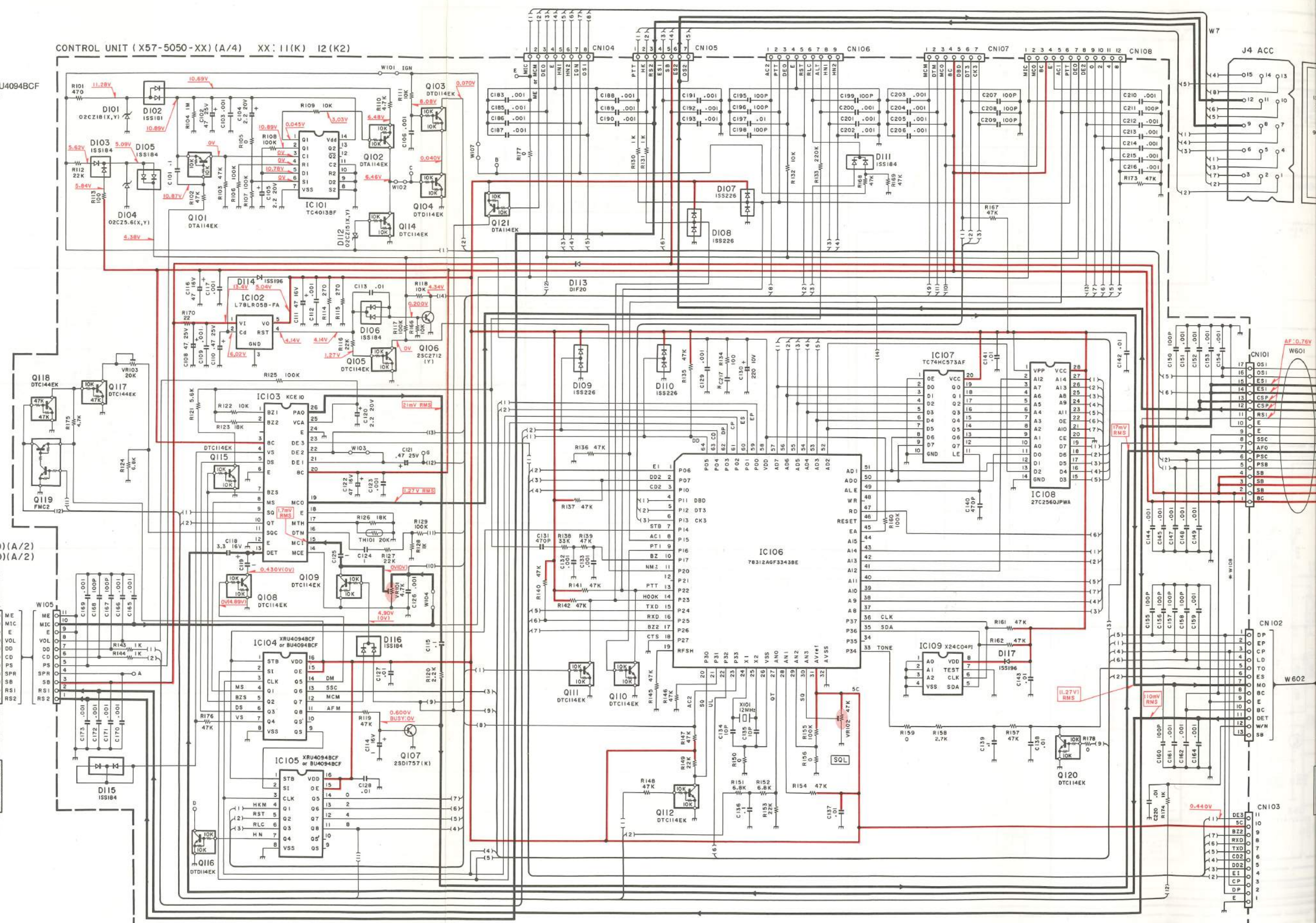
- Q101, 102, 121 : DTA114EK
 Q103, 104, 116 : DTD114EK
 Q105, 108~112, 114, 115, 120 : DTC114EK
 Q106 : 2SC2712(Y)
 Q107 : 2SD1757(K)
 Q117 : DTC144EK
 Q118 : DTC144EK
 Q119 : FMC2

- D101 : 02CZ18(X,Y)
 D102 : 1SS181
 D103, 105, 106, 111, 115, 116 : 1SS184
 D104 : 02CZ5.6(X,Y)
 D107~110 : 1SS226
 D112 : 02CZ15(X,Y)
 D114, 117 : 1SS196
 D113 : D1F20

KCH-3 (X54-3100-20) (A/2)
 KCH-4 (X54-3110-20) (A/2)

(X54-)(B/2)

CONTROL UNIT (X57-5050-XX) (A/4) XX: 11(K) 12(K2)



SPECIFICATIONS

GENERAL

Frequency Range	150 to 174MHz 136 to 156MHz
Number of Channel	32 semi-duplex channels (KCH-3 basic front panel model modifiable to 99 channels with KCH-5, KCH-4 full featured front panel model modifiable to 160 channels with KCH-5)
Channel Spacing	30kHz, 25kHz (Wide) / 15kHz, 12.5kHz (Narrow)
Input Voltage	13.6V DC negative ground
Current Drain	0.6A on standby 2.2A on receive (at 13W) 11A on transmit
Duty Cycle	Transmitter 20%
Temperature Range	-30°C to +60°C (-22°F to +140°F)
Dimensions & Weight	7.05' (179mm) W x 2.36' (60mm) H x 8.98" (228mm) D, 5.95lbs (2.7kg) : with KCH-3 or KCH-4

RECEIVER (Measurements made per EIA standard EIA-204-D)

RF Input Impedance	50Ω
Sensitivity (EIA 12dB SINAD)	0.25μV
Modulation Acceptance	±7kHz
Selectivity	-85dB (Wide) / -75dB (Narrow)
Intermodulation	-80dB (Wide) / -70dB (Narrow)
Spurious and Image Rejection	-90dB
Audio Power Output	13W at 4Ω less than 5% distortion
Frequency Stability	±0.0005% from -30°C to +60°C (±0.0002% option)
Channel Frequency Spread	24MHz (150 to 174MHz) 20MHz (136 to 156MHz)

TRANSMITTER (Measurements made per EIA standard EIA-152-C)

RF Power Output	45W adjustable to 5W
RF Output Impedance	50Ω
Spurious and Harmonics	-80dB
Modulation	16K0F3E, 16K0F1D, 15K0F2D / 11K0F3E, 11K0F1D, 10K0F2D
FM Noise	16K0F3E : -53dB / 11K0F3E : -47dB
Microphone impedance	Low impedance
Audio Distortion	Less than 3% at 1000Hz
Frequency Stability	±0.0005% from -30°C to +60°C (±0.0002% option)
Channel Frequency Spread	24MHz (150 to 174MHz) 20MHz (136 to 156MHz)

APPLICABLE (MIL-STD)

	MIL810-C	MIL810-D
Low Pressure	500.1/Procedure 1	500.2/Procedure 1
High Temperature	501.1/Procedure 1,2	501.2/Procedure 1,2
Low Temperature	502.1/Procedure 1	502.2/Procedure 1,2
Temperature Shock	503.1/Procedure 1	503.2/Procedure 1
Solar Radiation	505.1/Procedure 1	505.2/Procedure 1
Rain	506.1/Procedure 2	506.2/Procedure 2
Humidity	507.1/Procedure 2	507.2/Procedure 2
Salt Fog	509.1/Procedure 1	509.2/Procedure 1
Dust	510.1/Procedure 1	510.2/Procedure 1
Vibration	514.2/Procedure 8,10	514.3/Procedure 1
Shock	516.2/Procedure 1,2,3,5	516.3/Procedure 1,3,4,5,6

DEPARTMENT OF AGRICULTURE, EIA (VIBRATION)

Meets department of agriculture, forest service specifications for VIBRATION, referencing EIA standard EIA-152C and EIA-204D.

TK-730 series 45W model :

This device has not been approved by the Federal communications commission.

This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

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