

TK-630H(B)

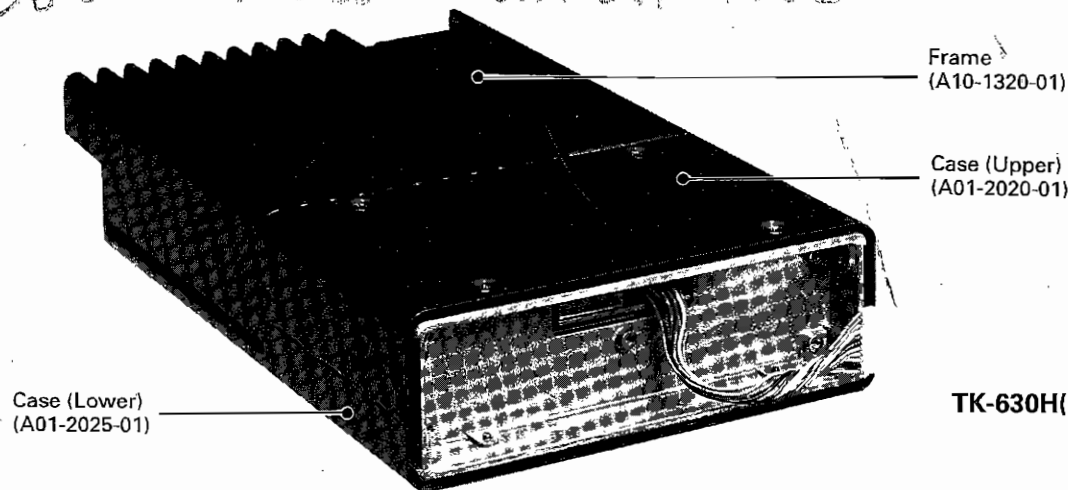
SERVICE MANUAL

REVISED

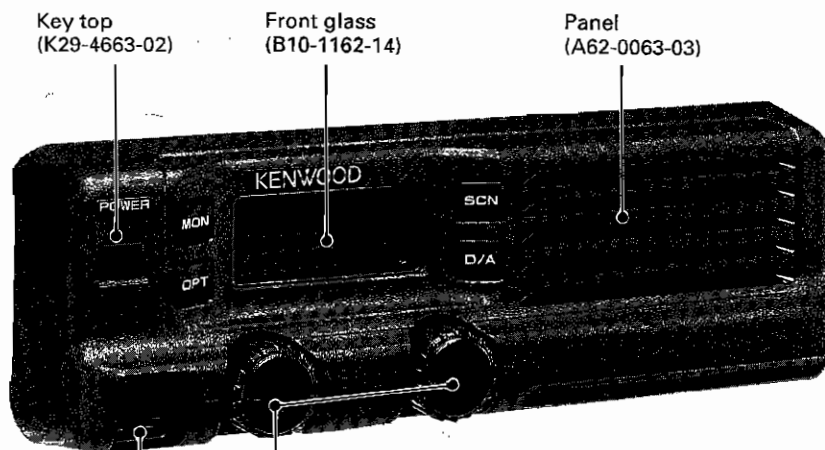
KENWOOD

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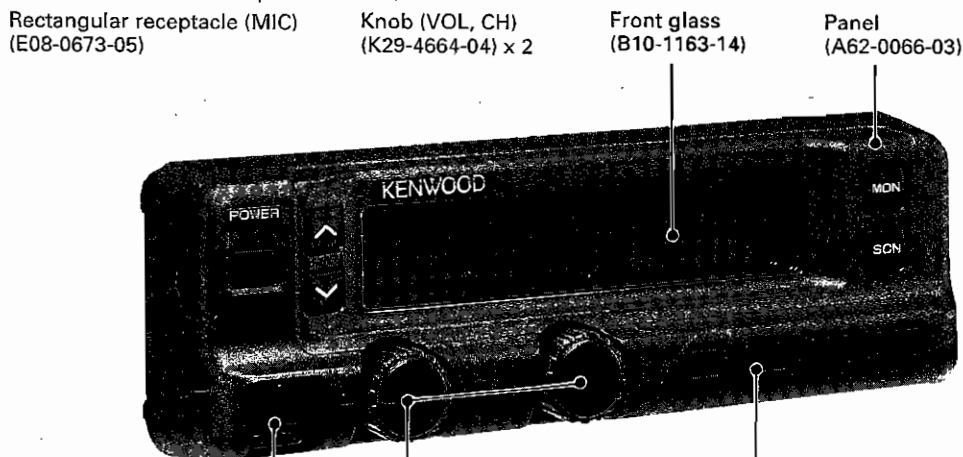
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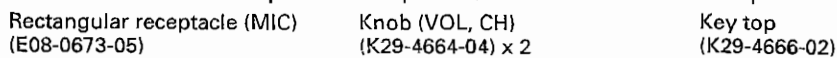
TK-630H(B)



KCH-3



KCH-4



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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.

FCC COMPLIANCE AND TYPE NUMBERS

Type acceptance number	Frequency range	Compliance
ALHTK-630H-1	29.7~37.0MHz	Parts 22, 74 and 90
ALHTK-630H-2	35.0~43.0MHz	Parts 22, 74 and 90
ALHTK-630H-3	41.0~50.0MHz	Parts 22, 74 and 90

Serial No. 411XXXXX has new features, so a revised service manual for the TK-630H(B) (B51-8151-10) is issued. Use it together with the previous service manual (B51-8151-00).

Main contents of new features

The following operating features in this service manual have been changed.

- 1-2. Scan start conditions (See page 9.)
- 1-7. The "off hook revert channel" has been renamed the revert channel", and "off hook scan = No" and "off hook scan = Yes" have been added. (See page 9.)
8. The home channel has been added. (See page 10.)
9. Squelch level adjustable function has been added. (See page 10.)

See the text for details.

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-630H 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 13.4V (1A). Insert a 1A fuse if you use the SB pin for external equipment.

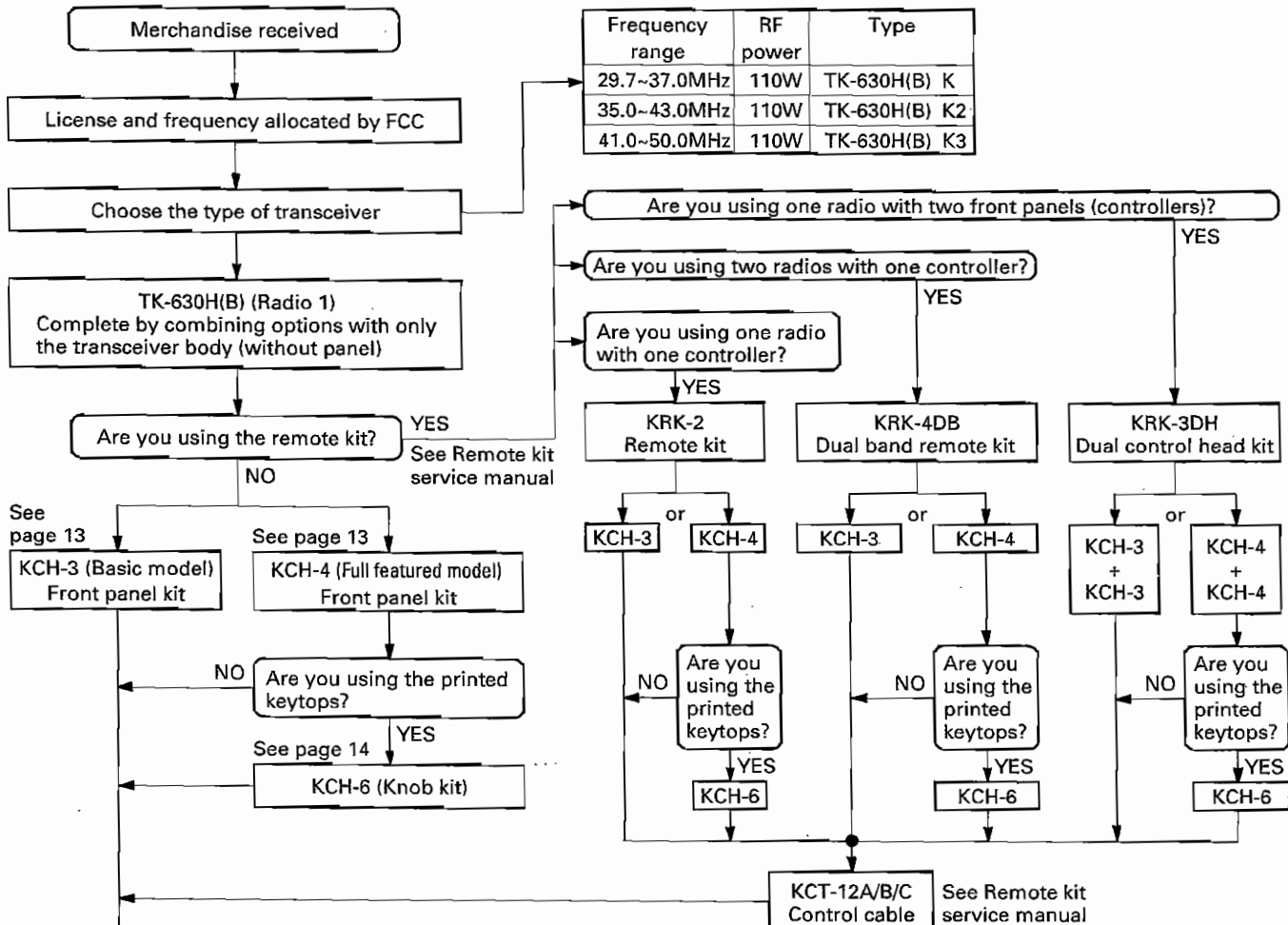
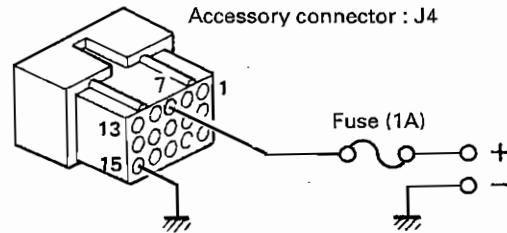
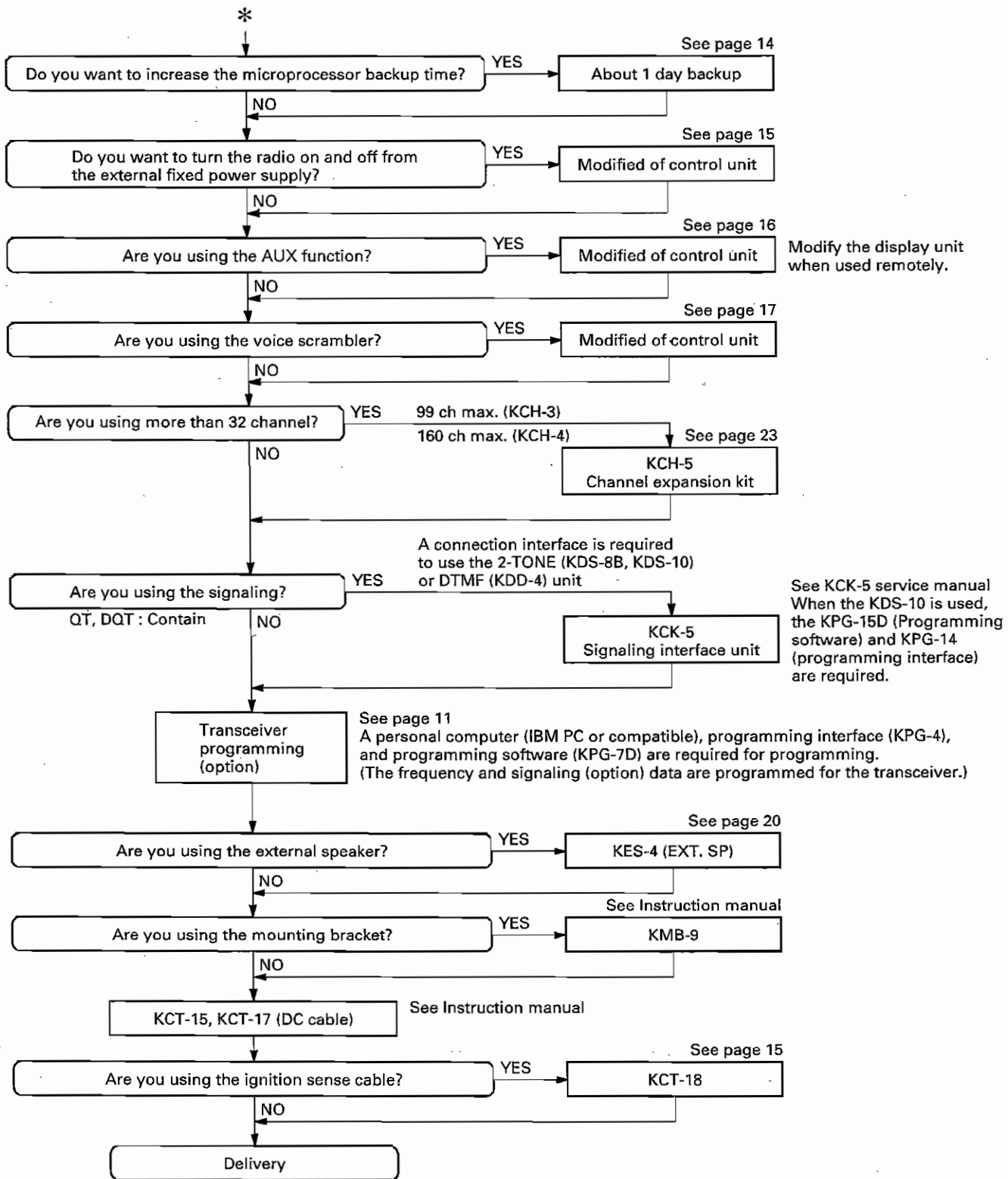


Table showing combinations of dual bands

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



TK-630H(B)

LIST OF OPTIONAL MODELS


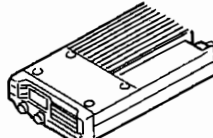

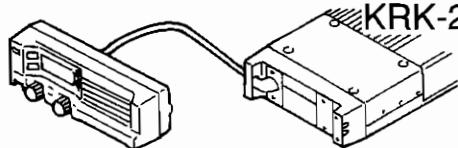
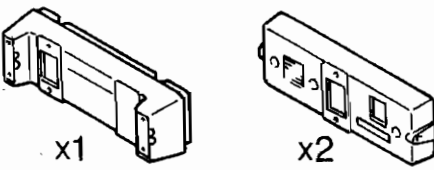
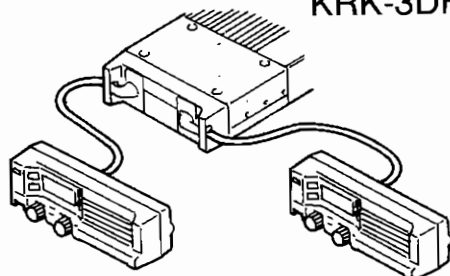
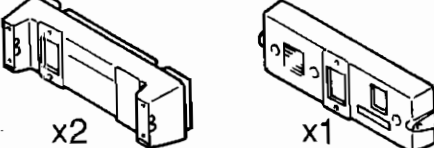
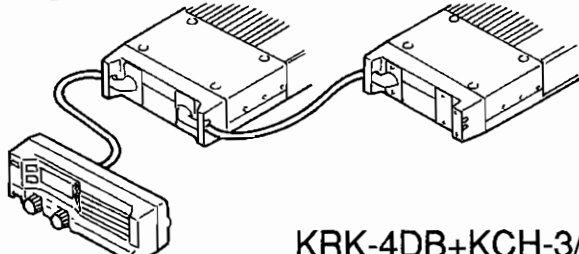
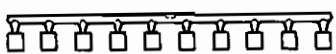
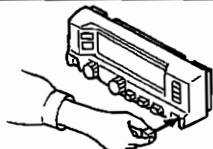

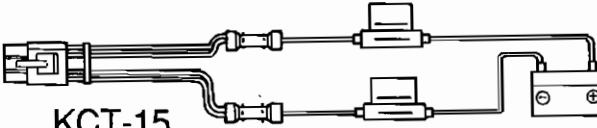
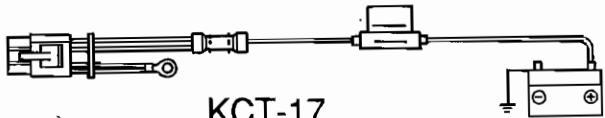
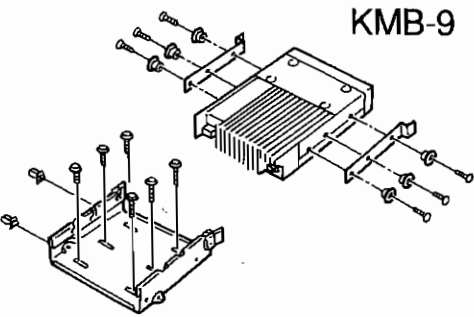
Model	Function description	Remarks
KCH-3	The front panel kit (controller) contains a speaker (5W/8Ω), and can display up to 99 alphanumeric characters if a KCH-5 is installed (normally, it displays 32 channels). The channel display and alphanumeric display show two characters.	See page 13
KCH-4	The front 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-15/17	KCT-15 : DC cable (10 feet) for TK-830H(B)/730H(B)/630H(B) (high-power) system dash mounting. KCT-17 : DC cable (23 feet; ground side : 3.3 feet) for TK-830H(B)/730H(B)/630H(B) (high-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
KMB-9	Mounting bracket for remote mount or dash mount. Key lock mount is provided.	See Instruction manual

Service Manual Parts List

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

TK-630H(B)

ACCESSORY & CONNECTION

ACCESSORY	CONNECTION
 <p>KCH-3 KCH-4</p>	
 <p>KRK-2</p>	 <p>KRK-2+KCH-3/4</p>
 <p>x1 x2</p> <p>KRK-3DH</p>	 <p>KRK-3DH+KCH-3/4</p>
 <p>x2 x1</p> <p>KRK-4DB</p>	 <p>KRK-4DB+KCH-3/4</p>
 <p>KCH-6</p>	 <p>KCH-6+KCH-4 only</p>
 <p>KCT-18</p>	
 <p>KCT-15</p>	 <p>KCT-17</p>
 <p>KMB-9</p>	

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.

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OPERATING FEATURES

1-8. Scan end

If you press and release the SCAN key when the **SCN** or **SCAN** indicator is on and the transceiver is not transmitting, the scan ends, the **SCN** or **SCAN** indicator goes off, and the transceiver switches to the selected channel automatically.

2. Alphanumeric Display

The programming software (KPG-7D) enables you to set the alphanumeric display (2 digits for the KCH-3; 12 digits for the KCH-4) as shown in Figure 1.

Display →	A	B	C	D	E	F	G	H	I
Key in →	A	B	C	D	E	F	G	H	I
	J	K	L	M	N	O	P	Q	R
	J	K	L	M	N	O	P	Q	R
	S	T	U	V	W	X	Y	Z	.
	S	T	U	V	W	X	Y	Z	.
	1	2	3	4	5	6	7	8	9
	1	2	3	4	5	6	7	8	9
	0	-	+	/	=	#	*	,	;
	0	-	+	/	=	#	*	,	;
	'			←	←	←	←	←	←
	'			←	←	←	←	←	←
	(←	←	←	←	←	←
	(←	←	←	←	←	←

All on Blank
Space →

Fig. 1

3. P.A (Public Address) Function

Available for a transceiver to which an optional public address speaker (KES-4) is connected via the accessory connector (J4).

The public address function amplifies the voice input from the microphone with a BTL-type audio amplifier with a 13W (4Ω) rated output, and outputs it from the public address speaker. The transceiver does not enter the transmit mode when this is done.

When you press and release the key set as the P.A switch by the programming software (KPG-7D), the KCH-3 (basic) shows P.A., and the KCH-4 (full featured) shows PUBLIC, ADRS, and the transceiver becomes ready to output your voice from the speaker. If you press PTT and talk into the microphone, your voice is output from the speaker. The volume of the public address speaker can be adjusted with the AF VR of the operation section (control head) that controls the PTT.

If dual band is used with the KRK-4DB (dual-band remote kit), the voice signal is output from the accessory connector (J4) of radio 1.

4. T.A (Talk Around) Function

The talk around function enables you to talk with the other party directly without using a repeater on the channel that has a repeater. This function makes the transmit frequency and signaling equal to the receive transmit frequency and signaling, and transmits data.

When you press and release the key set as the T.A switch by the programming software (KPG-7D), the **TA** indicator lights and the talk around function is enabled.

5. Time-out Timer Function

You can select 15 to 225 seconds (15-second units) or set this function off with the programming software (KPG-7D).

If you do not set the function off, and the time from the transceiver entering the transmit mode to returning to the receive mode exceeds the preset time, the transmission ends and a warning tone is output. The warning tone sounds until you release PTT.

When you release PTT, the timer is cleared.

6. Busy Channel Lockout Function

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

If you set it on, and there is no signaling or a signaling-unmatched signal is input in receive mode on the channel for which receive signaling is set, you cannot enter the transmit mode even if you press PTT, and a warning tone is output until you release PTT.

This function does not work while the **MON** indicator is lit.

7. Offhook Decode Enable Function

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

If you set it off, you cannot cancel signaling during offhook. This function only cancels signaling, and does not affect the offhook revert channel during scanning.

8. Home Channel

A home channel can be allocated to any key which you prefer. This function can be specified through the F.P.U. Pressing the key which is allocated for the home channel causes the radio to change immediately to the home channel.

9. Squelch Level Adjustable Function

Once activated through the F.P.U. SQL level can be adjustable from front panel key. Once a key (allocated for SQL ADJ) is pressed the radio goes into the SQL adjustable mode, and the L.C.D. indicates as follows ;

KCH-3 '1 ~ '15
KCH-4 CODE 1 ~ CODE 15

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 \square INTERCOM \square 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 :

• Preface

The TK-630H 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-630H 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-630H to the computer RS-232C serial port.

• Programming software description

The KPG-7D is the programming software for the TK-630H 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-630H and edited on the screen, and programmed data can be printed.

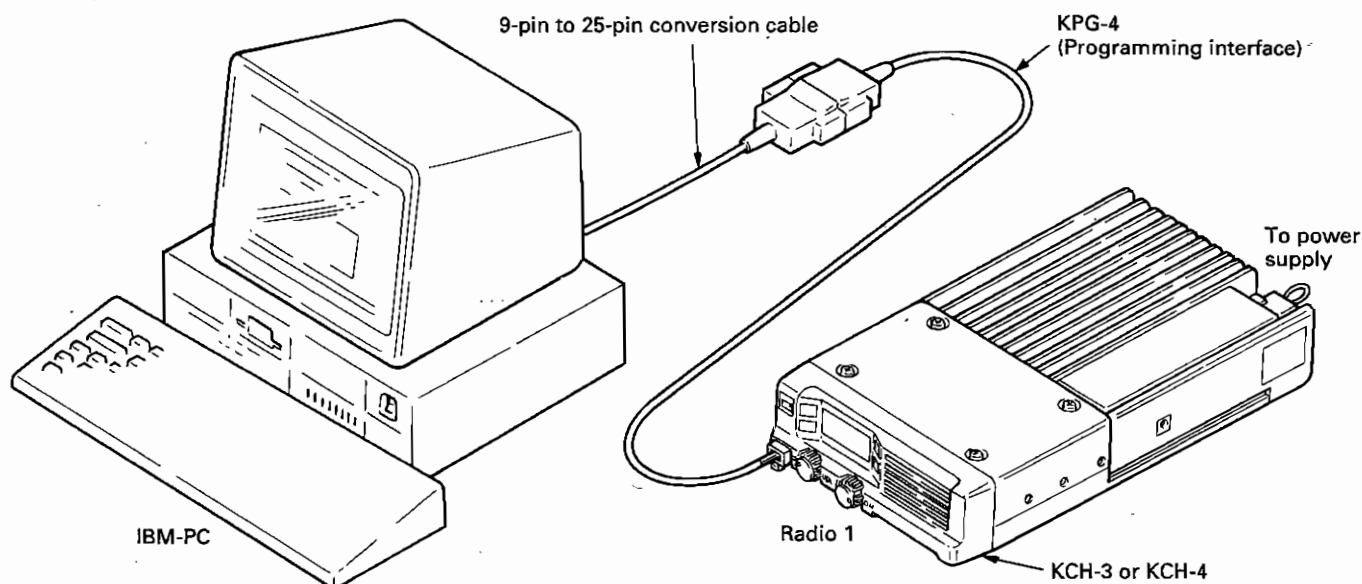


Fig. 2

TK-630H(B)

OPERATING FEATURES

• Program mode

After you finish preparatory, you can write data into the EEPROM of the radio (TK-630H).

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.

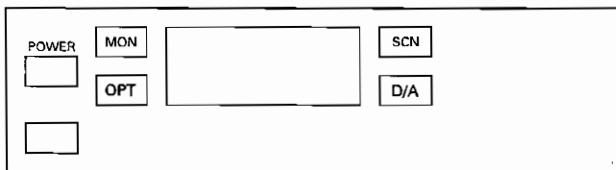


Fig. 3-a KCH-3 (basic) functions

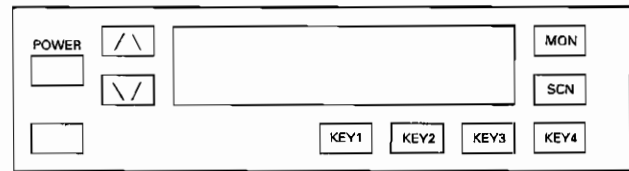


Fig. 3-b KCH-4 (full) functions

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.)

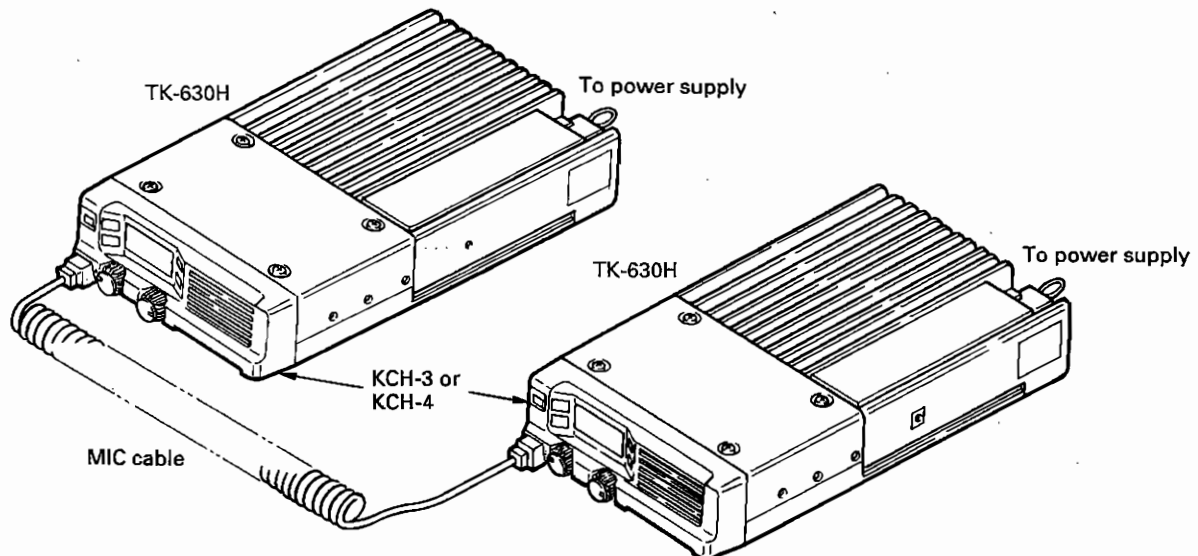


Fig. 4

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-630H

1. Remove the upper and lower halves of the case of the TK-630H. (Remove the four screws from the upper half and the six screws from the lower half.)
2. Connect the lead (W105) with a connector of the control unit (X57-3960 A/3) 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.

Note : The split legends (A/3 to C/3) of the control, TX-RX, and AF units shown in this manual are different from those silk-printed on the PC board. They are listed below.

Unit name	Service manual	PC board silk print
Control	X57-3960-XX A/3	X57-3960-XX A/4
TX-RX	X57-3960-XX B/3	X57-3960-XX B/4
AF	X57-3960-XX C/3	X57-3960-XX C/4

PC board split legend

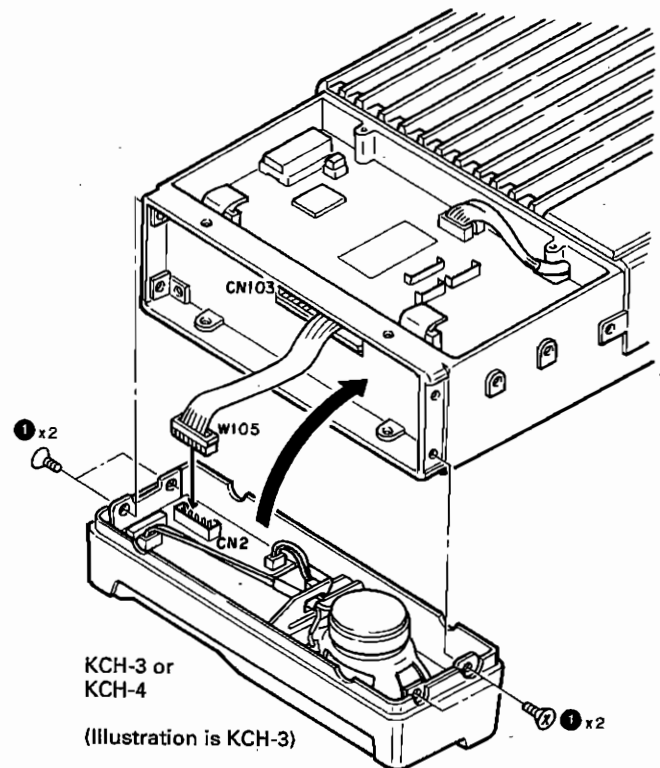


Fig. 1

INSTALLATION

5. 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)

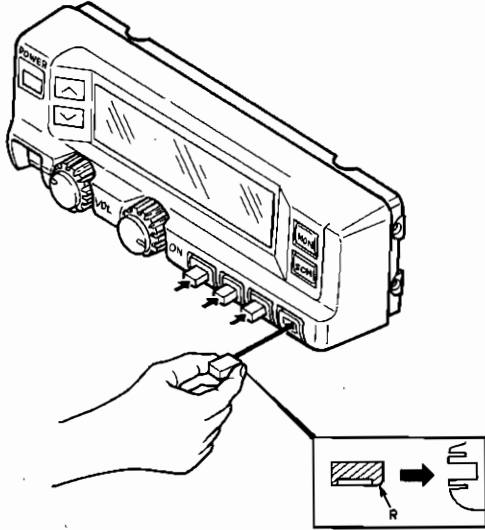


Fig. 2-a Knob insertion

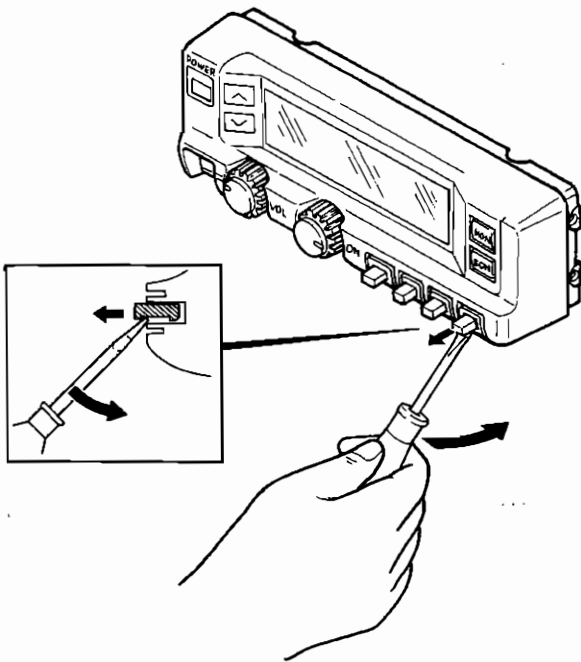


Fig. 2-b Knob removal

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 (X57-3960 A/3) from the chassis.
3. Add C217 to the control unit. (Pay attention to the polarity.) C217 : 0.047F (C90-2079-05)

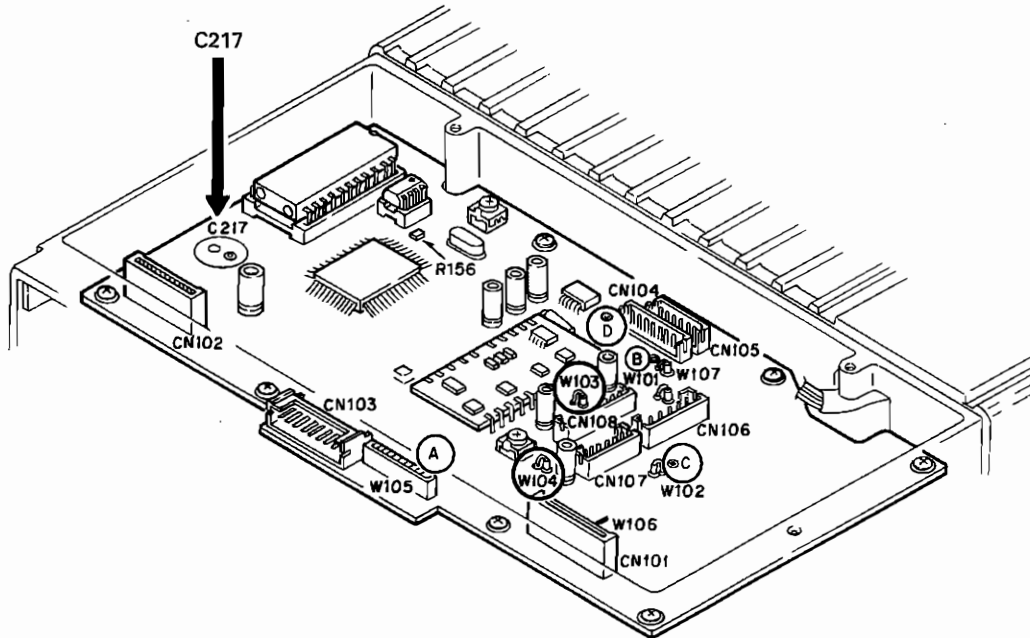


Fig. 3

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 (X57-3960 A/3) 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.

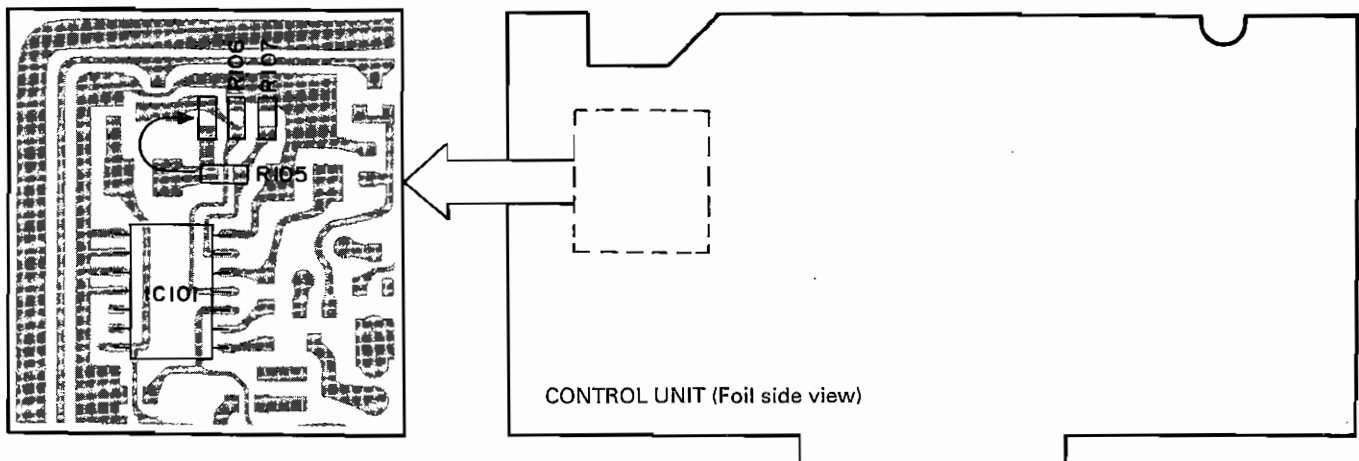


Fig. 4

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 (X57-3960 A/3) 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-630H as described in Section 5-2.

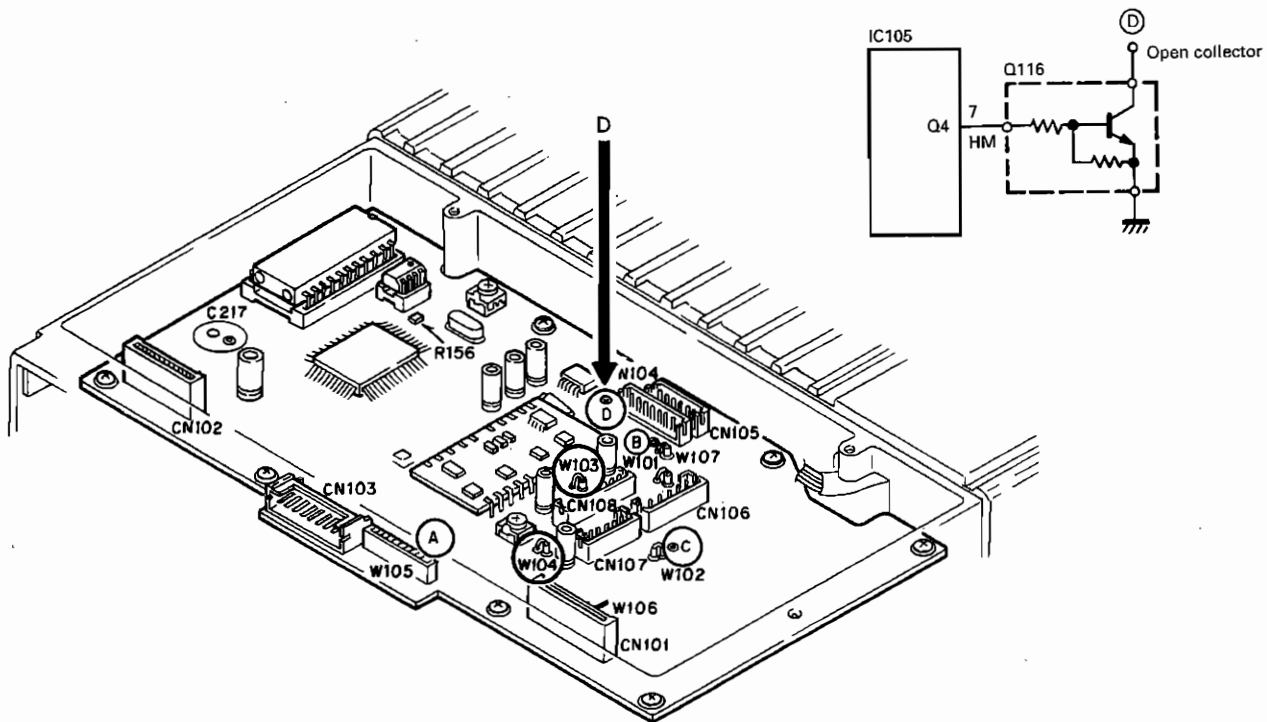


Fig. 5

INSTALLATION

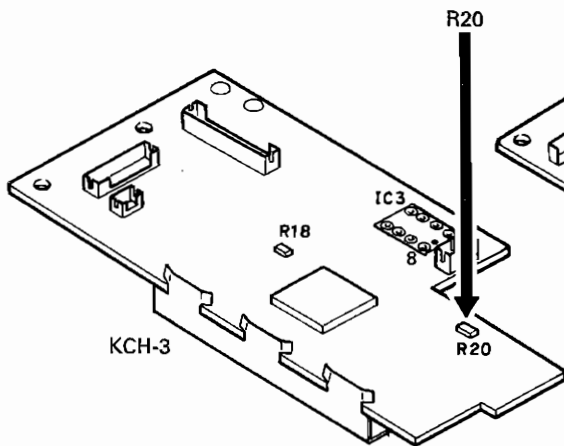


Fig. 6-a

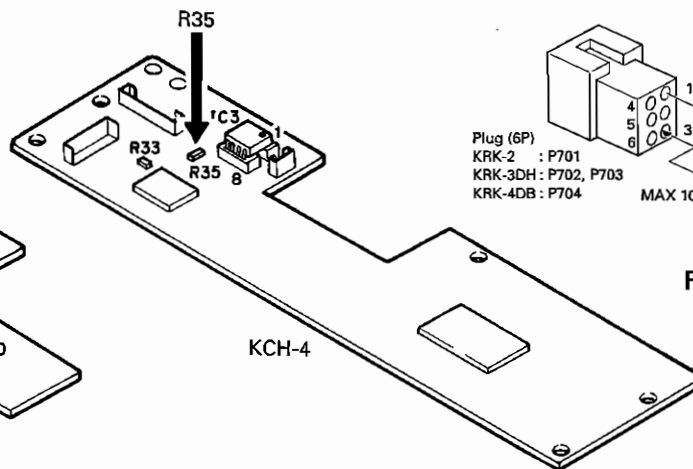


Fig. 6-b

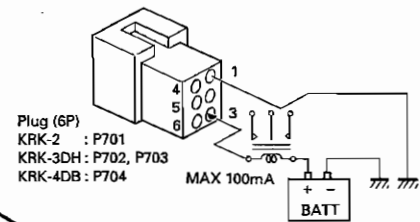


Fig. 6-c

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 (X57-3960 A/3) 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 "16" (KCH-3) or "CODE1" to "CODE16" (KCH-4) appears on the display. When you set codes, the port output is changed from 1 to 16 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-630H. (Four screws)
2. Cut W103 and W104 of the control unit (X57-3960 A/3).

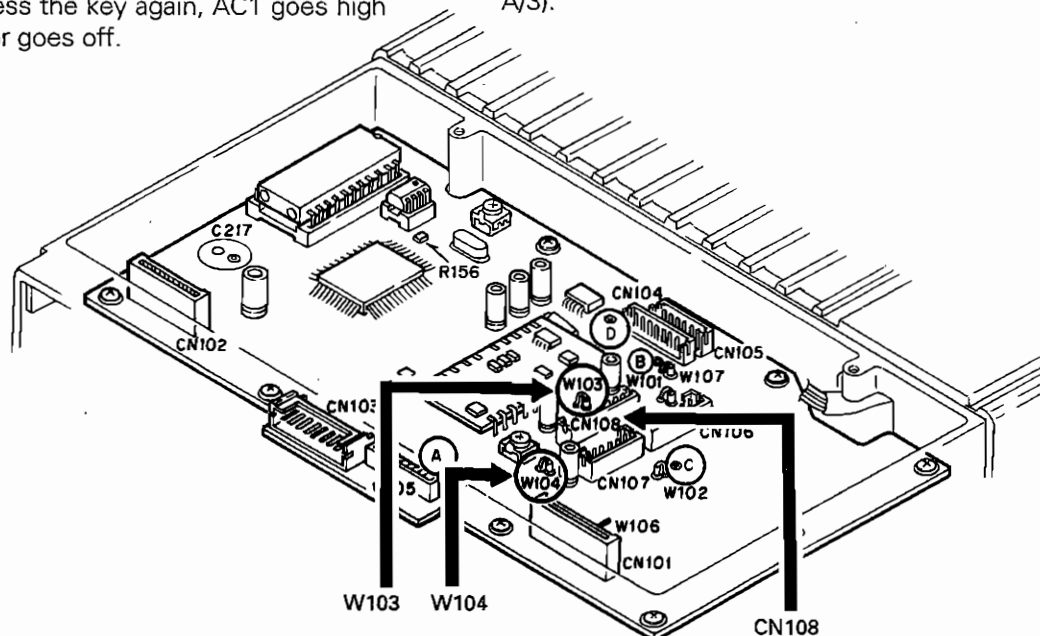


Fig. 7

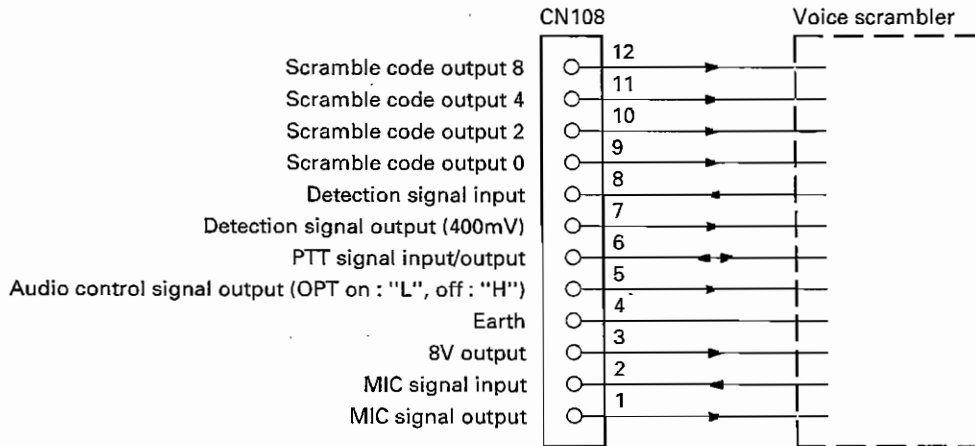
INSTALLATION

• Connection method

Connect control unit (X57-3960 A/3) 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-630H 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). (Fig. 8-a)
3. Remove the upper half of the radio case.
4. Cut W101 of the control unit (X57-3960 A/3) (Fig. 8-c), and reinstall the upper half of the radio case.

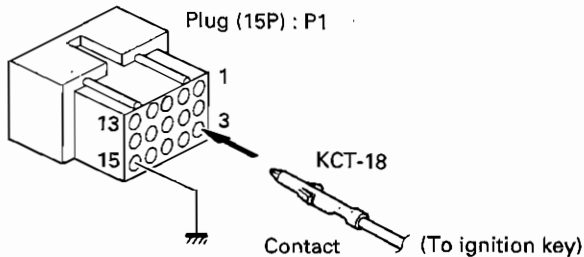


Fig. 8-a

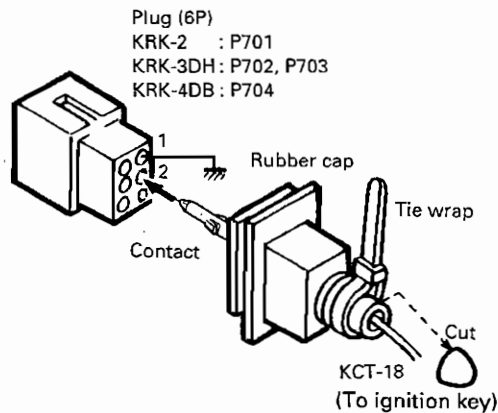


Fig. 8-b

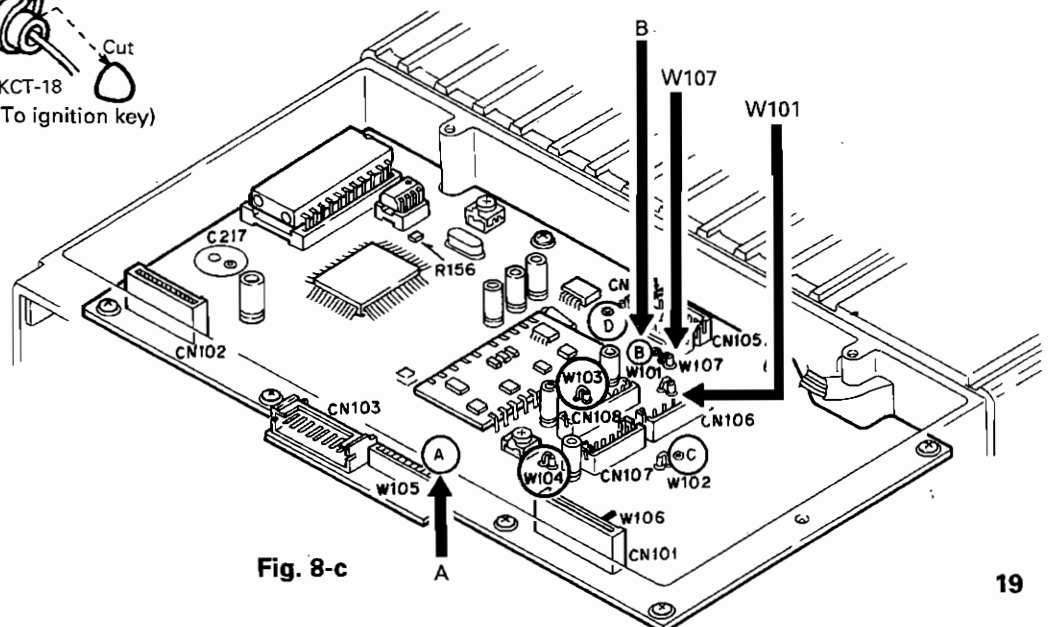


Fig. 8-c

• When you use the remote kit (KRK-2, KRK-3DH, or KRK-4DB) (Fig. 8-b)

If you use the accessory connector (15-pin : J4) on the rear panel of the radio, use the same procedure as above.

When you use the KRK-4DB, use the 15-pin accessory connector of radio 1.

If you use the accessory connector (6-pin) on the rear of the control head :

1. Remove the short plug from the accessory connector (6-pin) on the rear panel of the control head.
2. Cut off the end of the rubber cap (accessory), insert the KCT-18 into the cap, and insert it into pin 2 (SPR) of the short plug.
3. Install the short plug and rubber cap on the connector on the rear of the control head, then clamp the bottom of the rubber cap with the supplied tie wrap.
4. Remove the upper half of the radio case.
5. Cut W101 of the control unit (X57-3960 A/3). Insert jumpers into lands A and B, and solder them on the rear of the board. (If you use the KRK-4DB, modify only radio 1.)
6. Install the upper half of the radio case.

Note : If you use the KCT-18 with the KRK-4DB, use the 15-pin plug on the rear of radio 1, and the plug (6-pin) on the rear of the control head. You cannot use the 15-pin accessory connector on the rear of radio 2.

8-2. Horn alert function on/off with the ignition key

Modify as described in 8-1 above. Cut W107, not W101.

8-3. Backup when the ignition sense cable is used

If the car battery is connected, the microcomputer of this radio is always in backup state. (The RAM contents are retained regardless of whether the radio power is on or off.) If the radio is disconnected from the battery, the RAM contents are cleared in a short time.

INSTALLATION

9. External Speaker (KES-4)

The TK-630H 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-630H 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-630H

• 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.

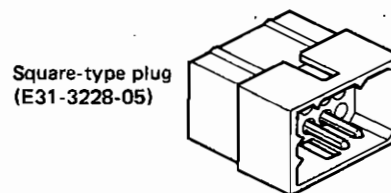


Fig. 9-a

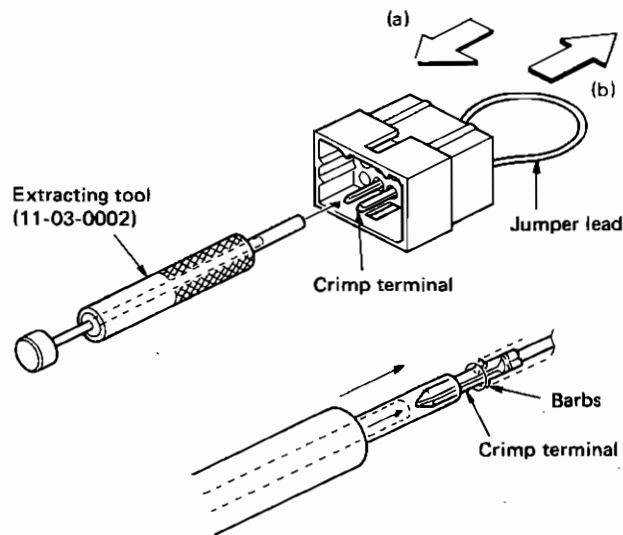


Fig. 9-b

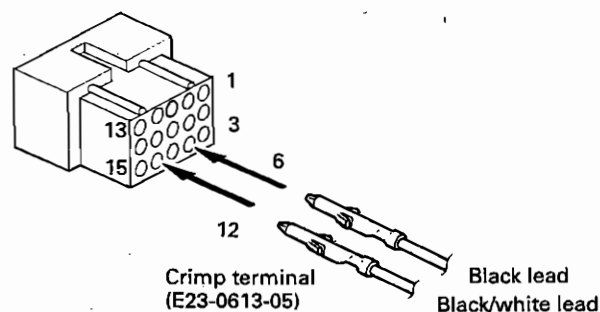


Fig. 9-c

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.

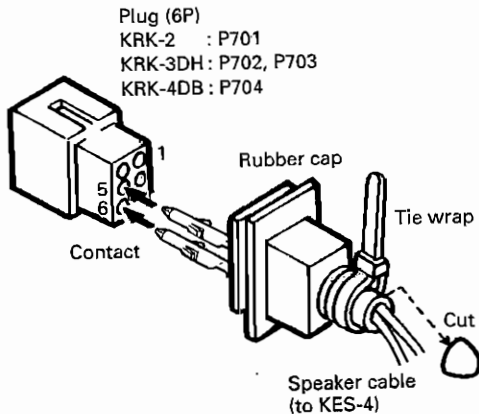


Fig. 10

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 (X57-3960 A/3)

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.

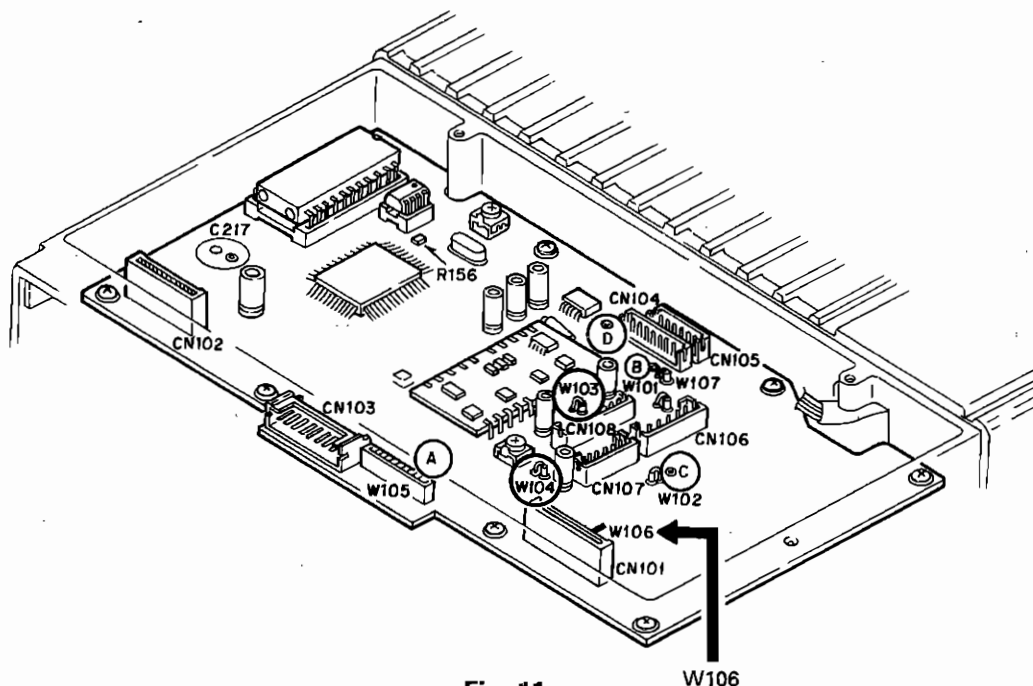


Fig. 11

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.

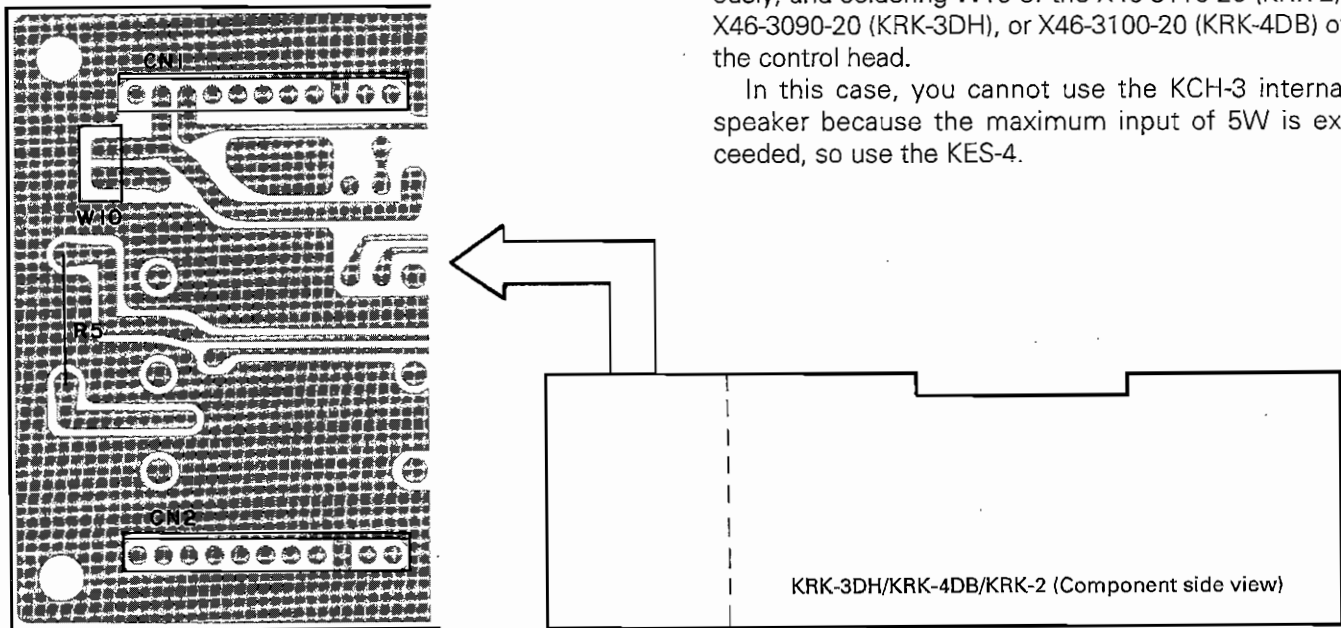


Fig. 12

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.

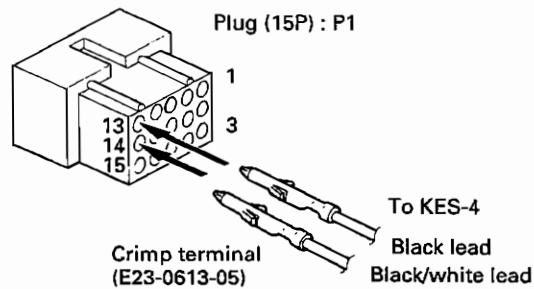


Fig. 13

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 (X57-3960 A/3) 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 (X57-3960 A/3) 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)

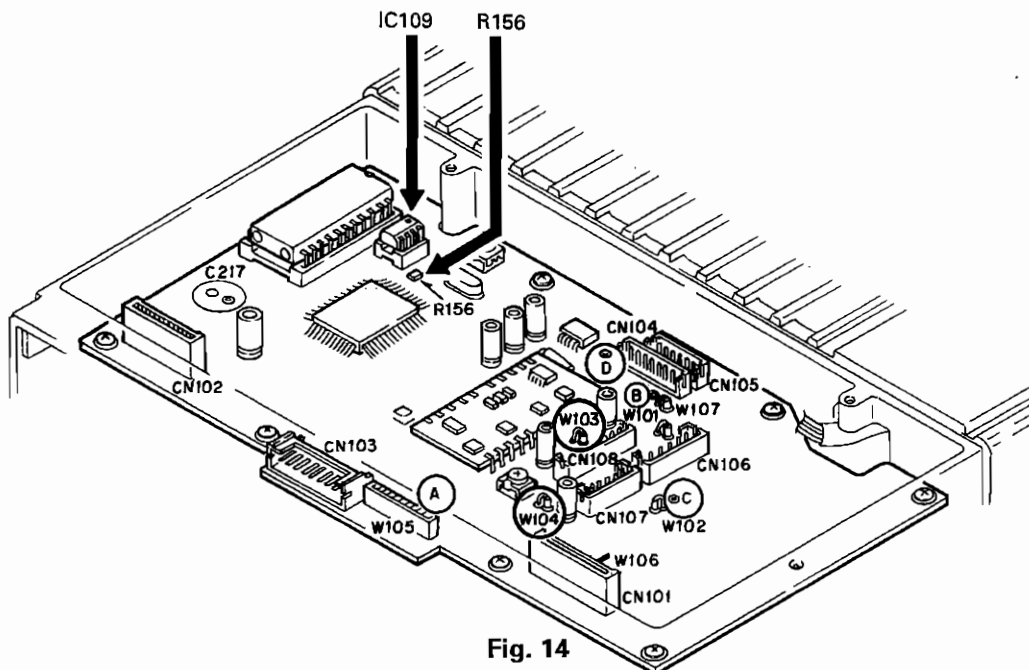


Fig. 14

INSTALLATION

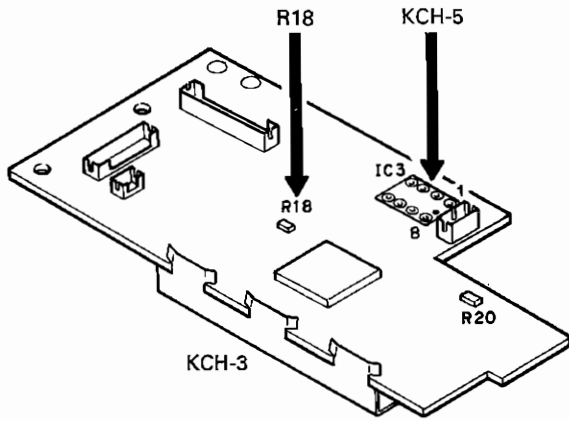


Fig. 15-a

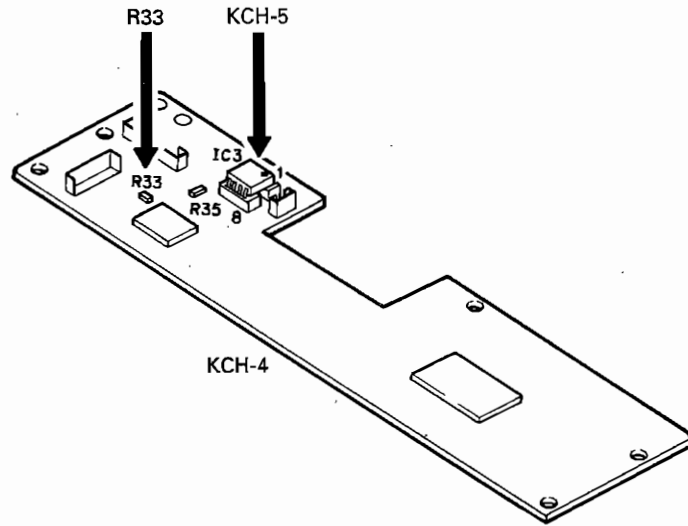


Fig. 15-b

11. 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 (X57-3960 A/3) 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 HORN ALERT (KCH-4) appears on the display, and the radio goes into standby. (The microphone must be onhook.)

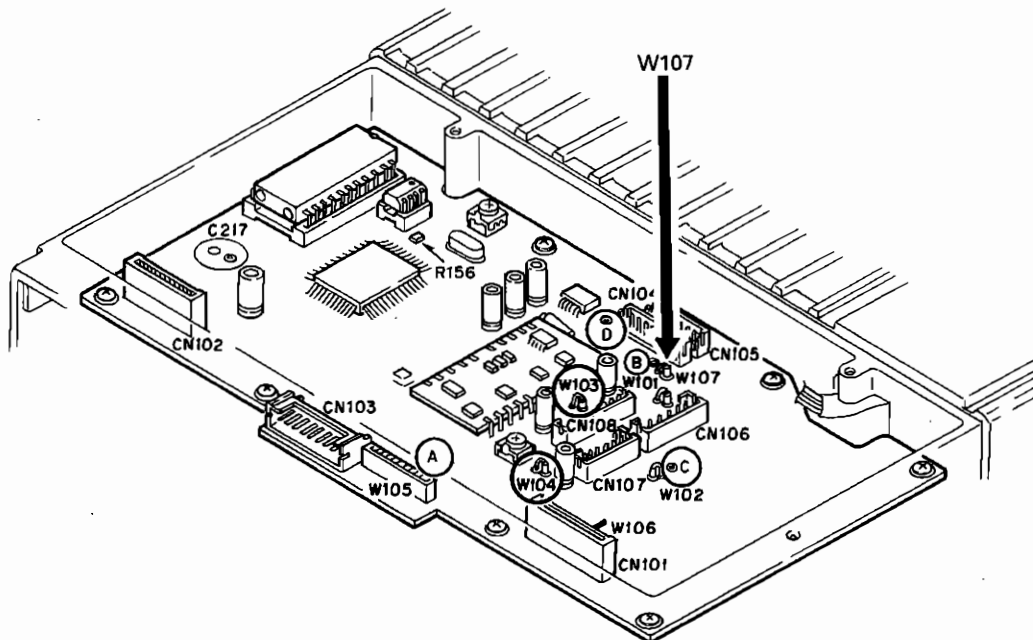


Fig. 17

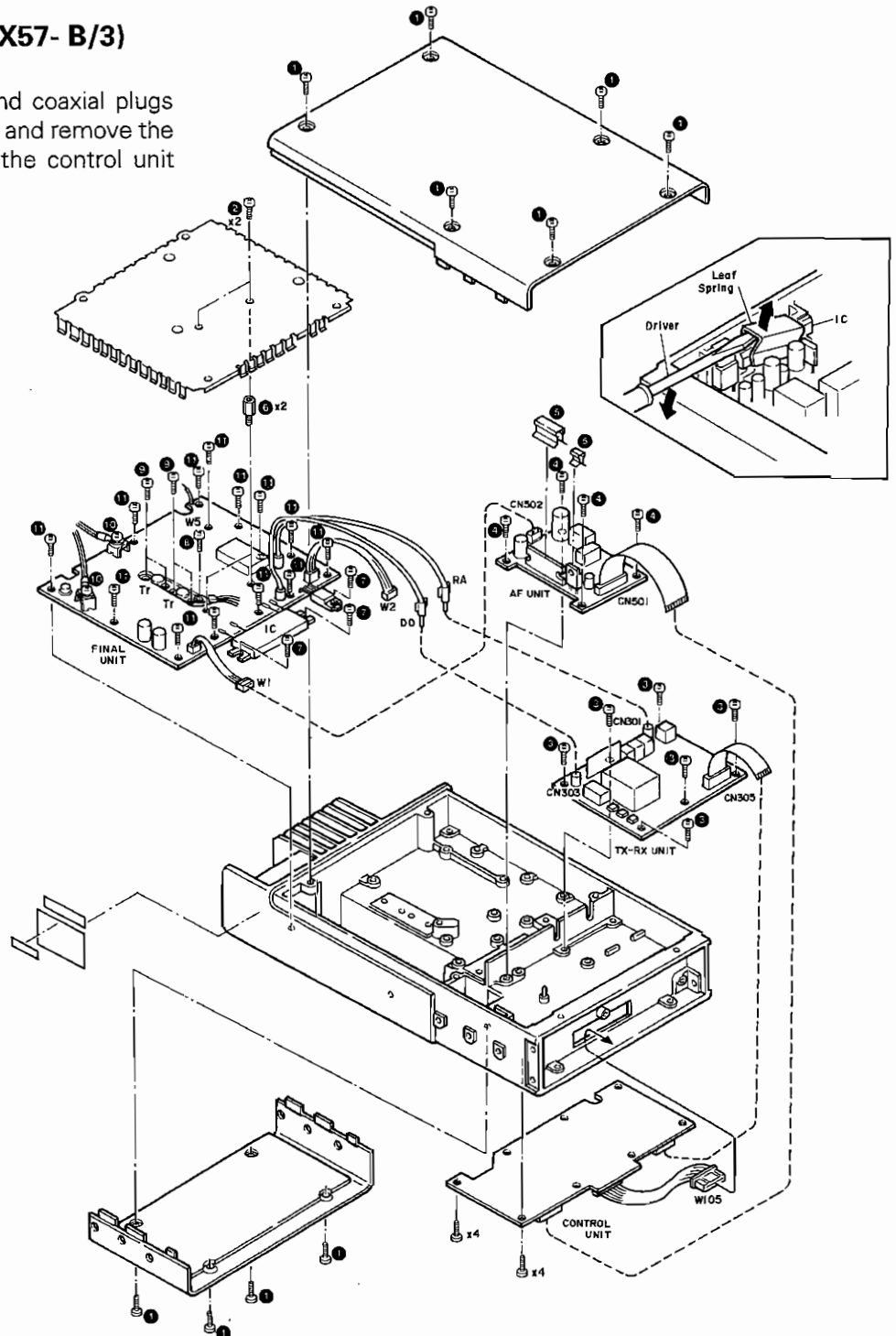
DISASSEMBLY FOR REPAIR

1. Removing the Case and Shield Cover

1. Remove the ten screws (❶), and remove the upper and lower halves of the case. (Remove the four screws holding the upper half and the six screws holding the lower half.)
2. Remove the two screws (❷), and remove the shield cover.

2. Removing the TX-RX Unit (X57- B/3)

1. Remove the seven screws (❸).
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).



TK-630H(B)

DISASSEMBLY FOR REPAIR

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

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 (X45-)

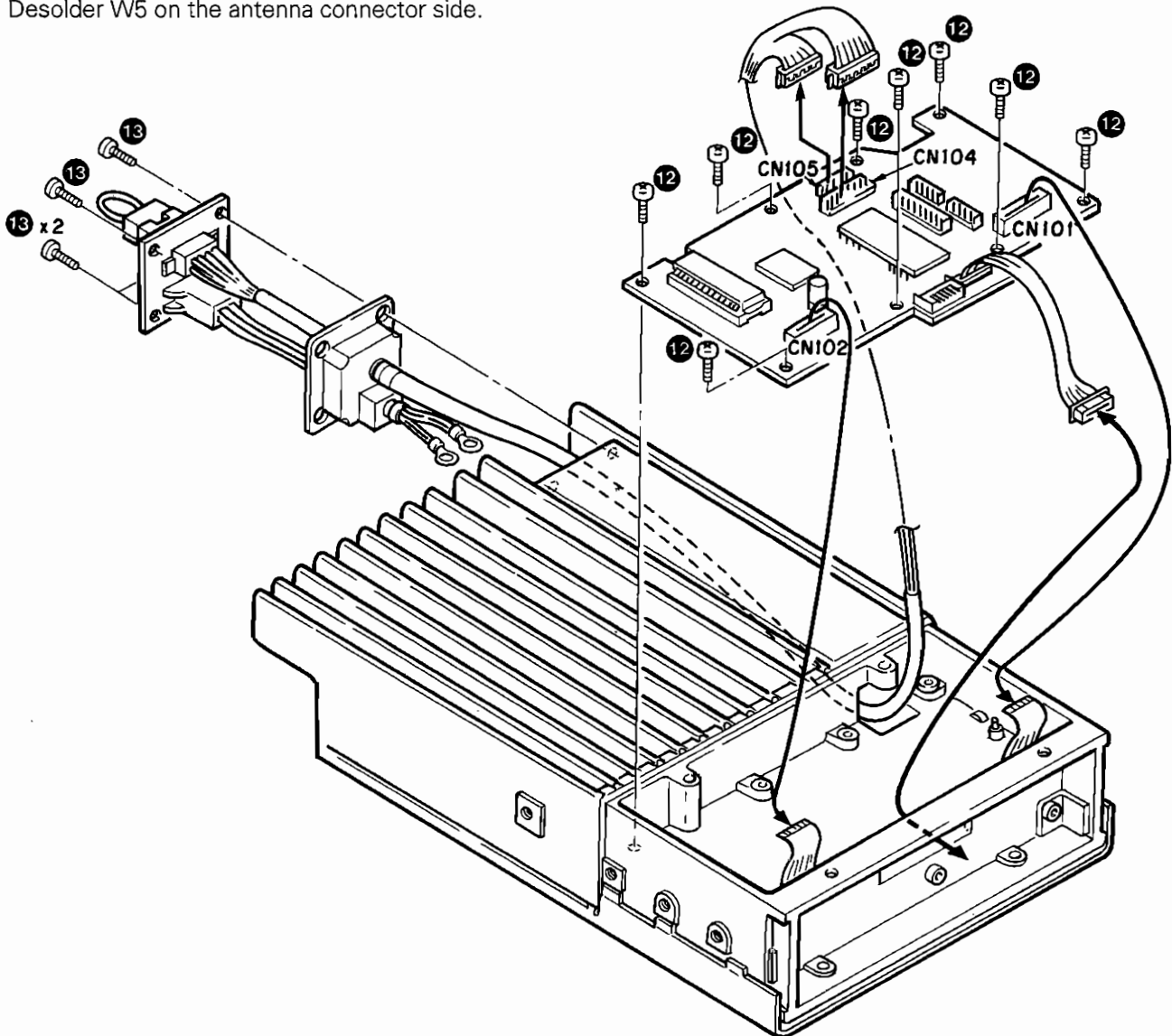
1. Remove the two hexagonal bosses (6).
2. Remove the three screws (7) holding the power module and transistor to the frame.
3. Remove the one screw (8) holding TH1.
4. Remove the four screws (9) holding the final transistor.
5. Remove the two screws (10) holding the lead terminal from ACC connector (6P) on the rear.
6. Remove the 13 screws (11) holding the PC board.
7. Desolder W5 on the antenna connector side.

5. Removing the Control Unit (X57- A/3)

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

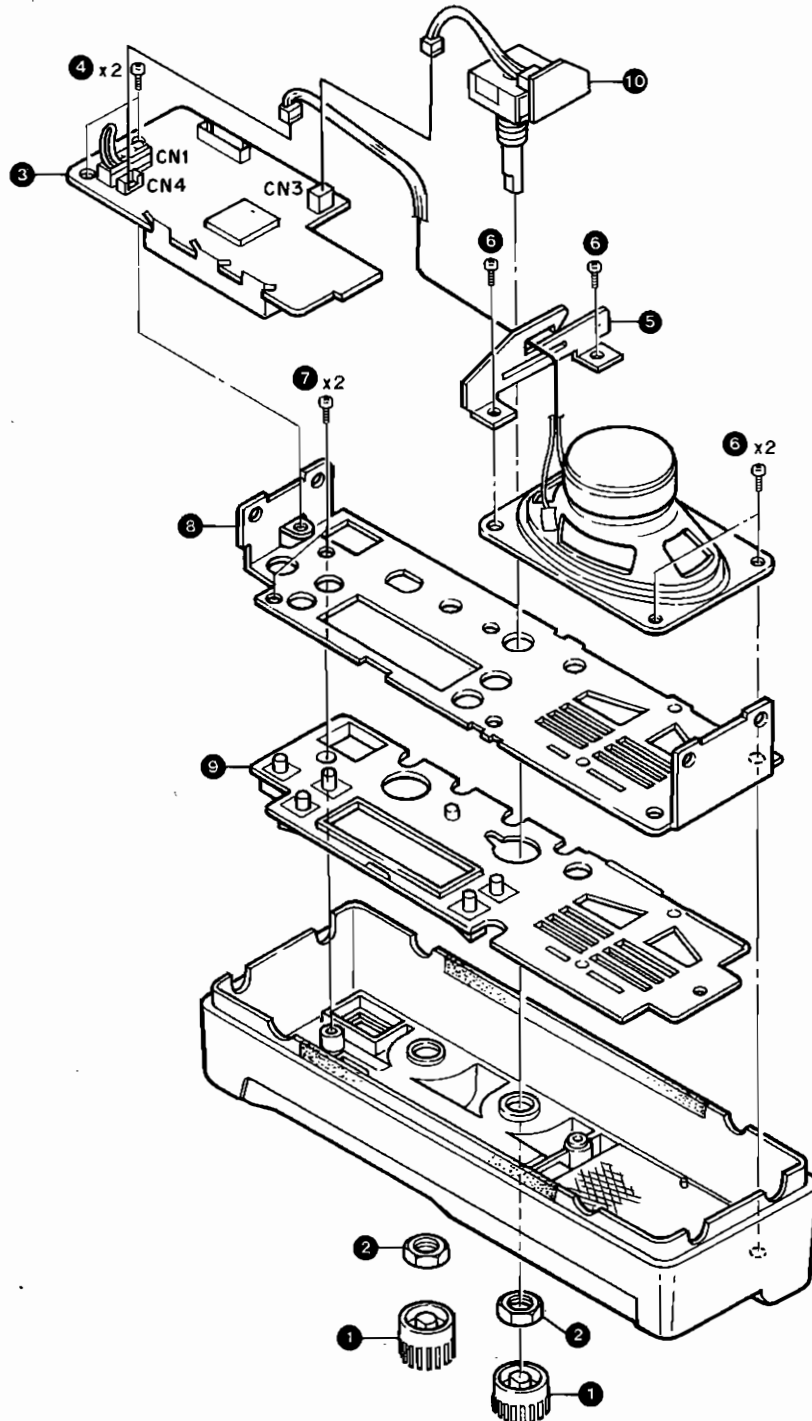
1. Confirm that the screw holding CN3 and the screw holding CN4 of the final unit (X45-) are removed, and that CN104 and CN105 of the control unit (X57- A/3) are disconnected. Remove the four screws on the rear (13).
2. Pull out the connector. (Take the connector terminals out through the opening in the frame.)



DISASSEMBLY FOR REPAIR

7. Disassembly of the KCH-3

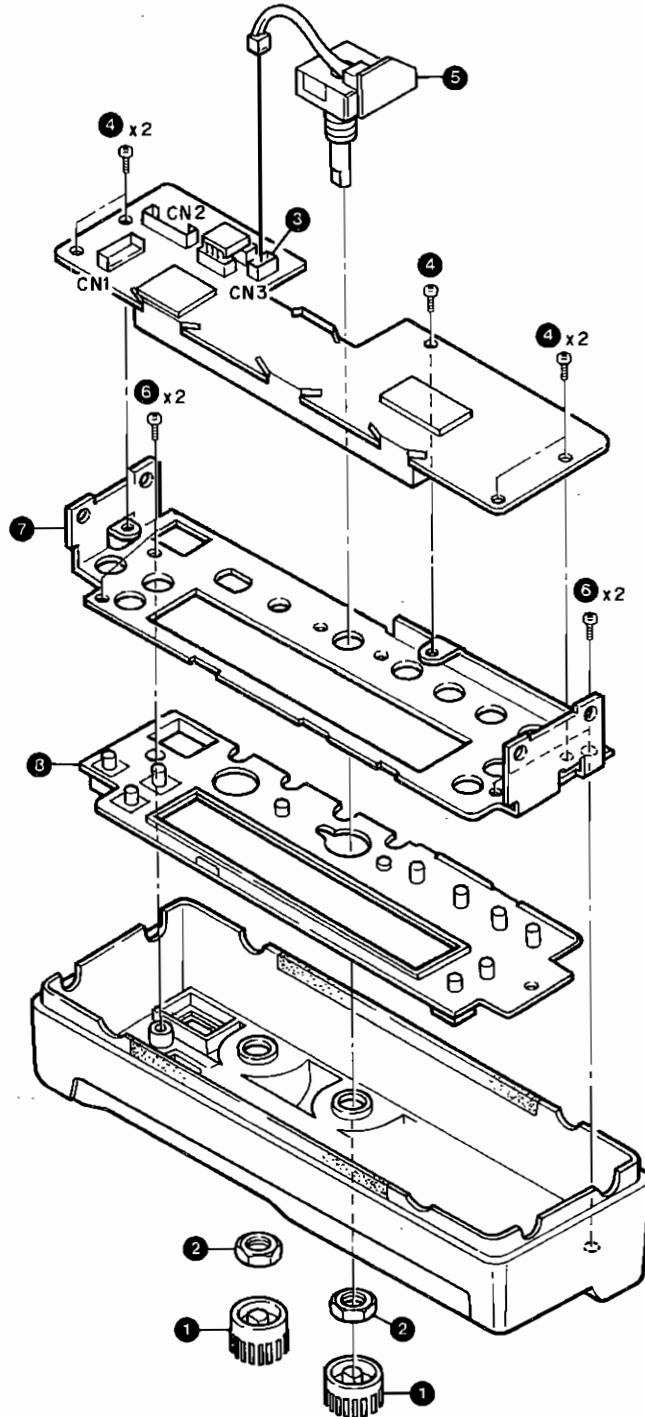
1. Pull out the VOL and CH knobs (1).
2. Remove the two hexagonal nuts (2).
3. Disconnect the two connectors (CN3 and CN4) (3) of the display unit (X54-3100 A/2), and remove the two screws (4). You can remove the channel encoder (10) and display unit.
4. Remove the four screws (6) holding the speaker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



DISASSEMBLY FOR REPAIR

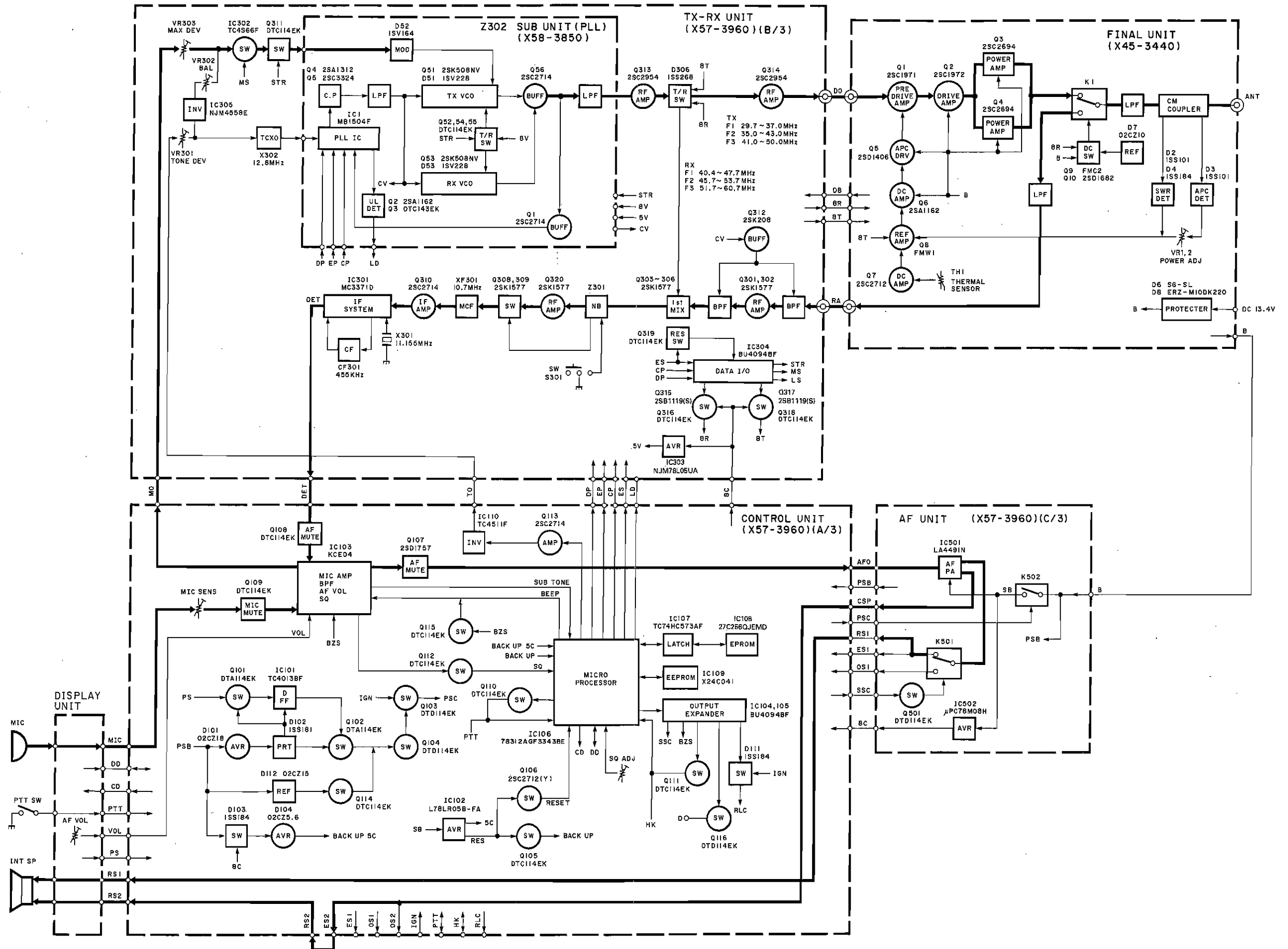
8. Disassembly of the KCH-4

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-630H(B) TK-630H(B)

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. Transmitter Circuit

The audio input from the microphone is attenuated by VR101 and input to MC1 of the audio HIC of IC103 (KCE04). 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 D52 in the VCO unit (Z302), and the VCO is directly modulated. The transmit signal output from the VCO (Z302) passes through switch D306, is amplified by Q314, and is applied to pre-drive amplifier Q1 and Q2.

The signal is power amplified by Q2, and the output of Q2 is divided into two signals; these are amplified by Q3 and Q4. The signals are mixed and the resulting signal is fed through transmit/receive switching relay K1 and the 7-pole low-pass filter to the antenna connector.

There is a line for detecting traveling and reflected waves prior to the transmit/receive switching relay. Traveling waves are detected by D3 and fed through the APC control (VR1, VR2) to differential amplifiers Q8, which compare the signal level with the reference voltage. The output is amplified by DC amplifier Q6 to control APC DC amplifier Q5. Q5 controls the power supply voltage for Q1, keeping the transmitter output constant.

To protect the transmitter power amplifier stages, there are two protection circuits, one protecting against abnormal antenna loading and the other, against overheating. If an abnormal antenna load is connected, the reflected wave level increases. Reflected waves are detected by D2 and the output level is fed to the differential amplifier, leading to the transmitter output power being reduced in the way already described. If an abnormally high temperature is detected by the thermistor (TH1), DC SW Q7 is made to reduce the reference voltage of the differential amplifier. This also leads to the transmitter output power being reduced.

Antenna switching is done by a relay (K1).

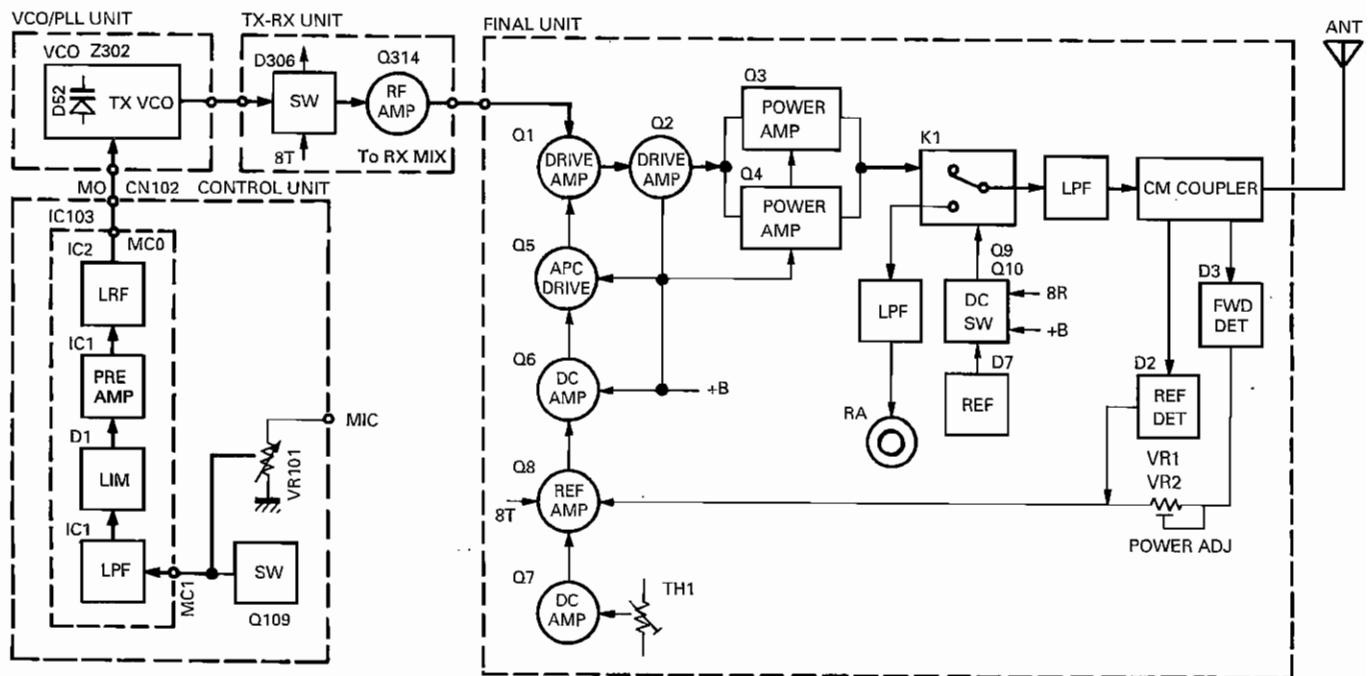


Fig. 1 Transmitter block diagram

CIRCUIT DESCRIPTION

2. Receiver Circuit

The incoming received signal from the antenna socket passes through the low-pass filter, the transmit/receive switching relay (K1), and the second low-pass filter, then is fed to CN301 in the TX-RX unit.

The signal passes through the band-pass filter in the TX-RX unit, is amplified by RF amplifier Q301 and Q302, then passes through the second band-pass filter (BPF). The BPF is interlocked with the PLL lock voltage, and changes the cut-off frequency according to the receive frequency.

After the signal has passed through the BPF, it enters RX first mixer Q303 to Q306. The local signal (received frequency + 10.7MHz) from the PLL (Z302) also enters the first mixer. The first mixer is a double-balanced type consisting of four FETs, which converts the receive signal to the 10.7MHz first IF signal.

The 10.7MHz IF signal passes through NB (noise blanker) unit Z301 and IF amplifier Q320, and enters NB gate Q308 and Q309. The pulse noise in the IF signal is detected by the NB unit, and removed by the NB gate. The IF signal passes through the monolithic crystal filter (XF301) and IF amplifier Q301, and enters FM IF system IC IC301.

The signal is heterodyned again to 455kHz, using the second local signal generated by the crystal oscillator (11.155MHz), at the second mixer in IC301. The second IF signal is filtered by CF301 (ceramic filter), amplified by limiting amplifiers IN IC301, and is detected as an FM signal.

The output signal from IC301 passes through IC103 (KCE04) in the control unit, goes to the audio unit, and, having been amplified, is output from the speaker.

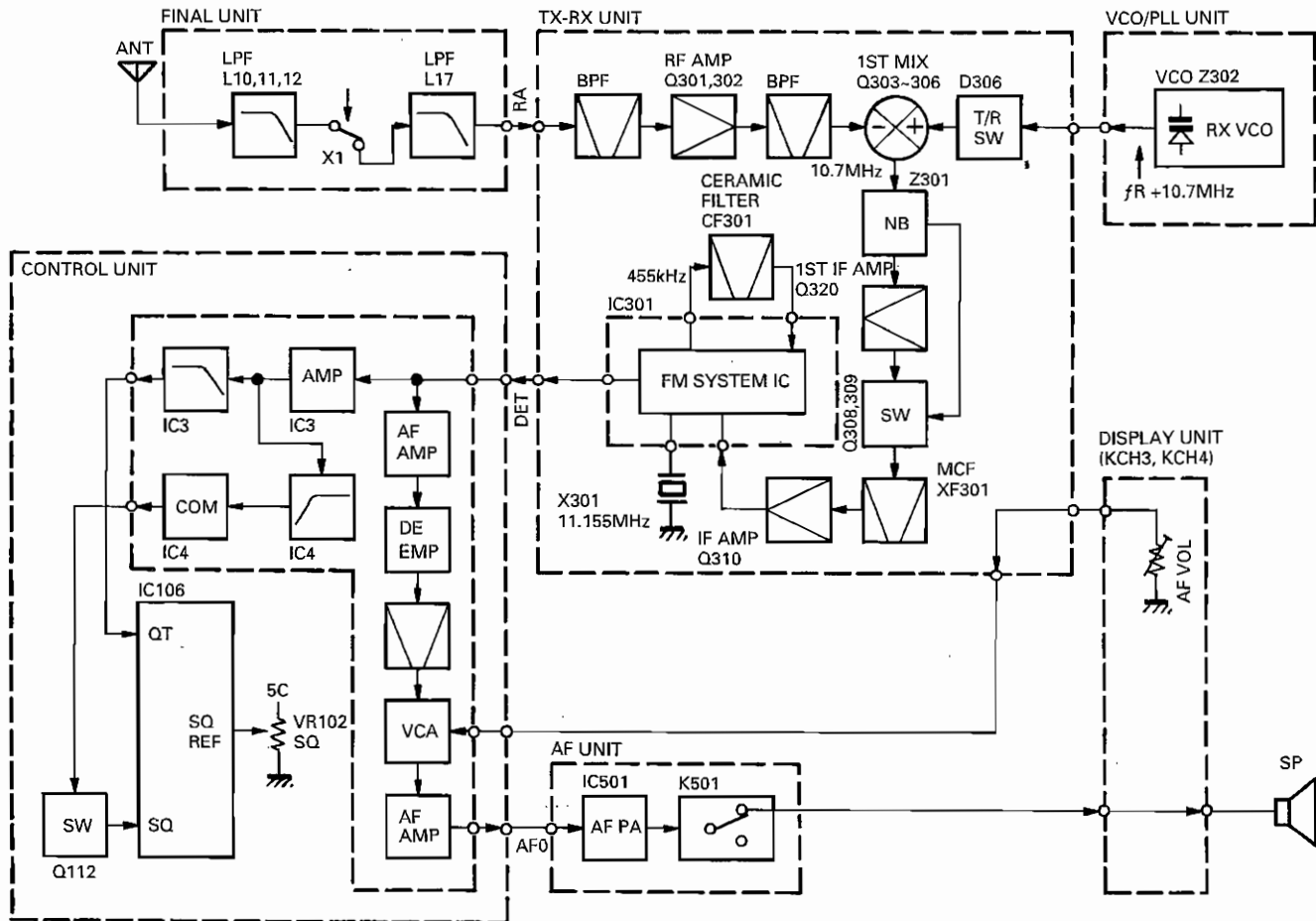


Fig. 2 Receiver block diagram

CIRCUIT DESCRIPTION

Item	Rating
Nominal center frequency	10.7MHz
Pass bandwidth	$\pm 7.5\text{kHz}$ or more at 6dB
Attenuation bandwidth	$\pm 22.5\text{kHz}$ or less at 60dB
Ripple	2.0dB or less
Insertion loss	3.0dB or less
Guaranteed attenuation	60dB or more within $\pm 1\text{MHz}$
Terminating impedance	$3\text{k}\Omega \pm 10\%$

Table 1 MCF (L71-0257-05) : TX-RX unit XF301

Item	Rating
Nominal center frequency	$455\text{kHz} \pm 1\text{kHz}$
6dB bandwidth	$\pm 6\text{kHz}$ or more (from 455kHz)
50dB bandwidth	$\pm 12\text{kHz}$ or less (from 455kHz)
Ripple (within $\pm 4\text{kHz}$ 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 (L72-0342-05) : TX-RX unit CF301

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 300 Hz 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 13.4V 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.

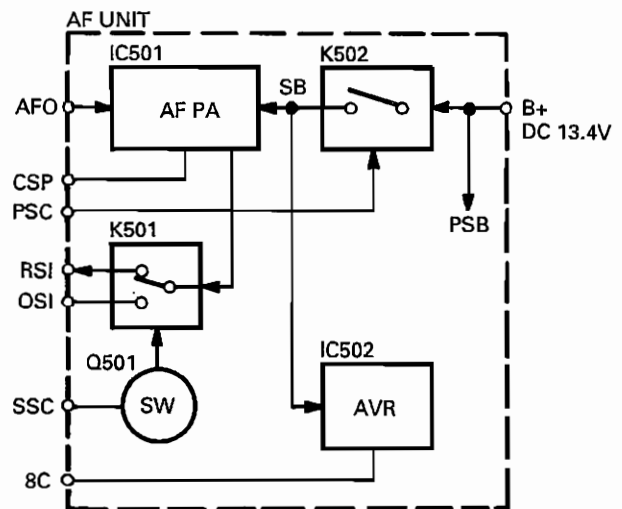


Fig. 3 Audio block diagram

CIRCUIT DESCRIPTION

5. VCO/PLL Unit (Z302)

The PLL generates the transmit signal and the first local oscillator receive signal. The RF signal generated by Q51 (TX) or Q53 (RX) in the VCO-unit is amplified by Q56, and the resulting signal is output to the TX-RX unit. TX and RX Q51 and Q53 are switched by turning the source line for Q51 and Q53 on and off. This is done by Q52, 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 Q56 of the VCO unit and amplifier Q1, 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 Q4 and Q5 (charge pump) and the low-pass filter of the lug lead to produce the control voltage for Q51/Q53 (VCO). This voltage is applied to D51 (TX) or D53 (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 Q2 and Q3, 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 D52, which is connected to Q51 of the VCO in the VCO unit, and the VCO is directly modulated.

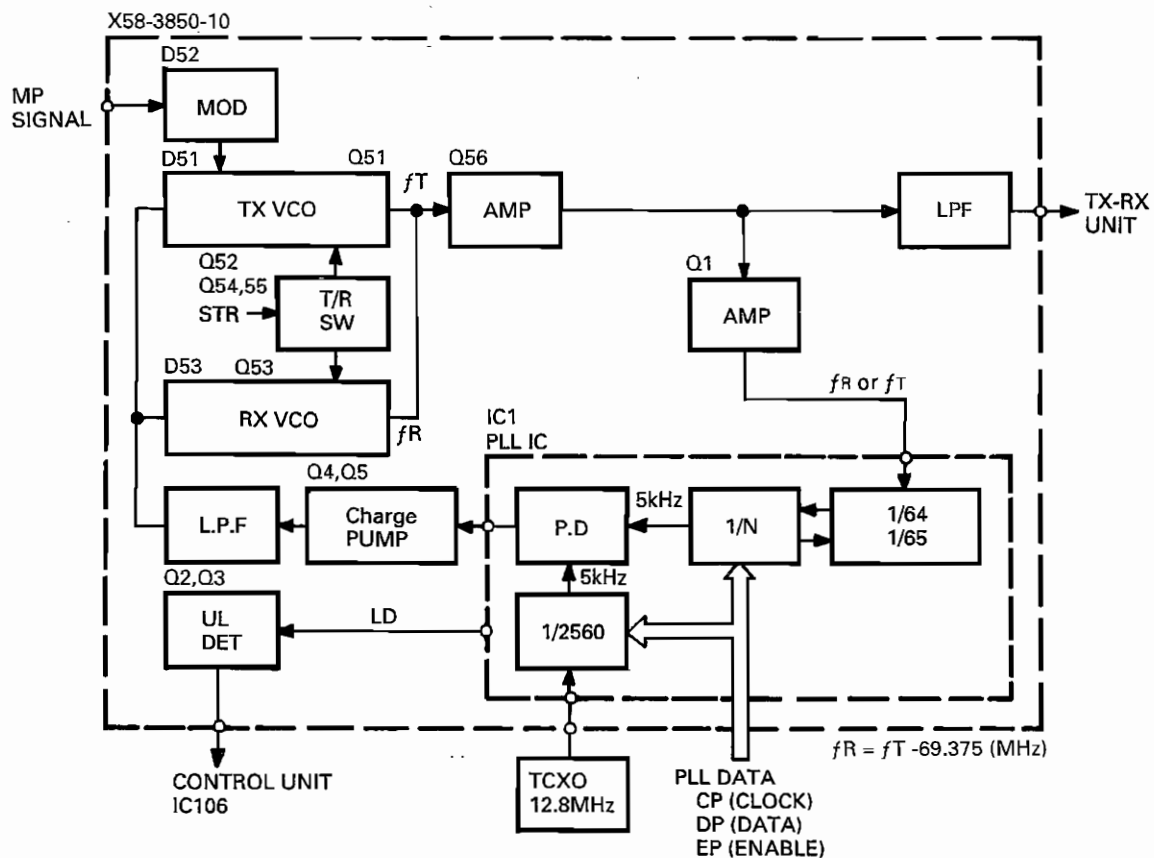


Fig. 4 VCO/PLL block diagram

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.

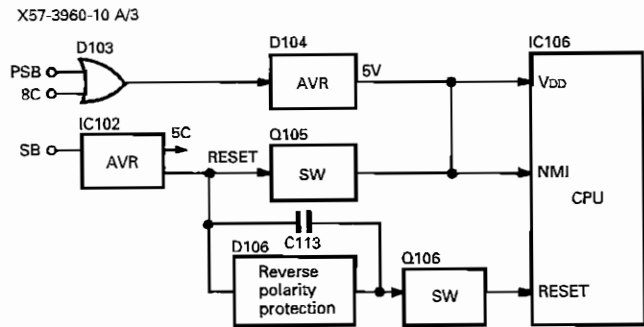


Fig. 5 CPU backup and reset

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.

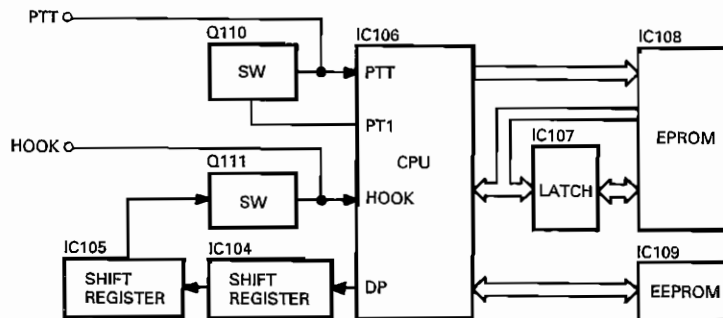


Fig. 6 Peripheral circuit of the CPU

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.

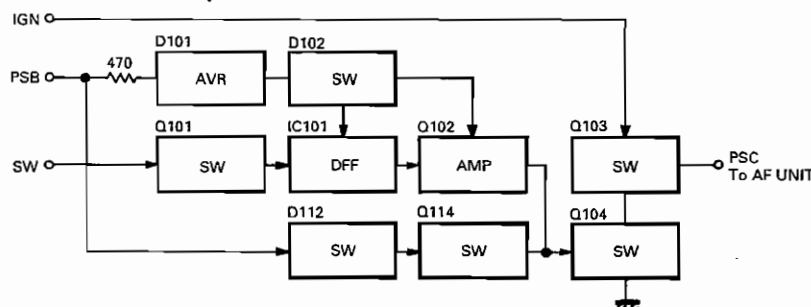


Fig. 7 Transceiver power supply relay control circuit

CIRCUIT DESCRIPTION

7. Display Unit

The optional display unit (front panel unit) for the TK-630H comes in two models : KCH-3 and KCH-4.

7-1. KCH-3

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.

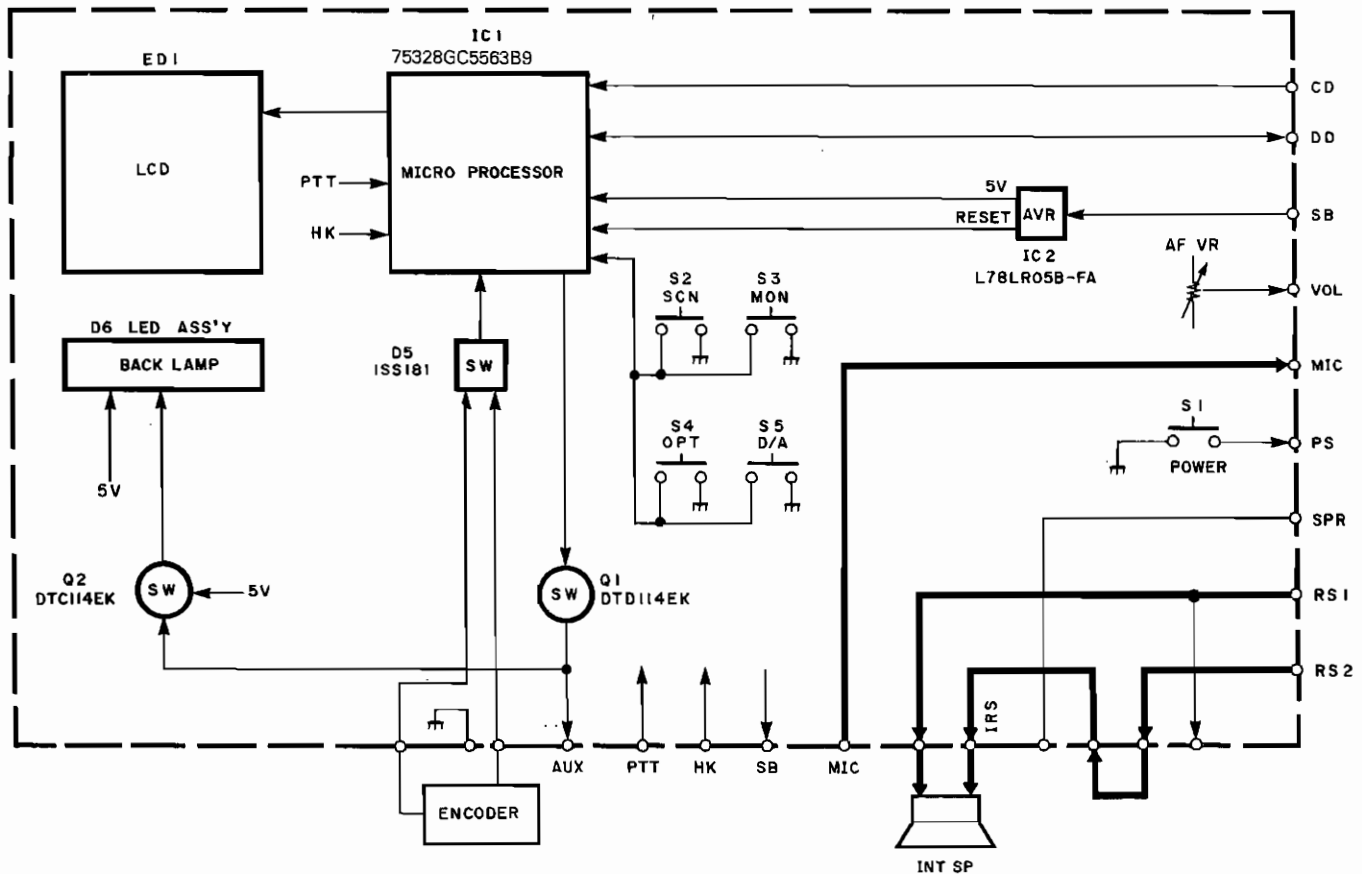


Fig. 8 KCH-3 block diagram

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.

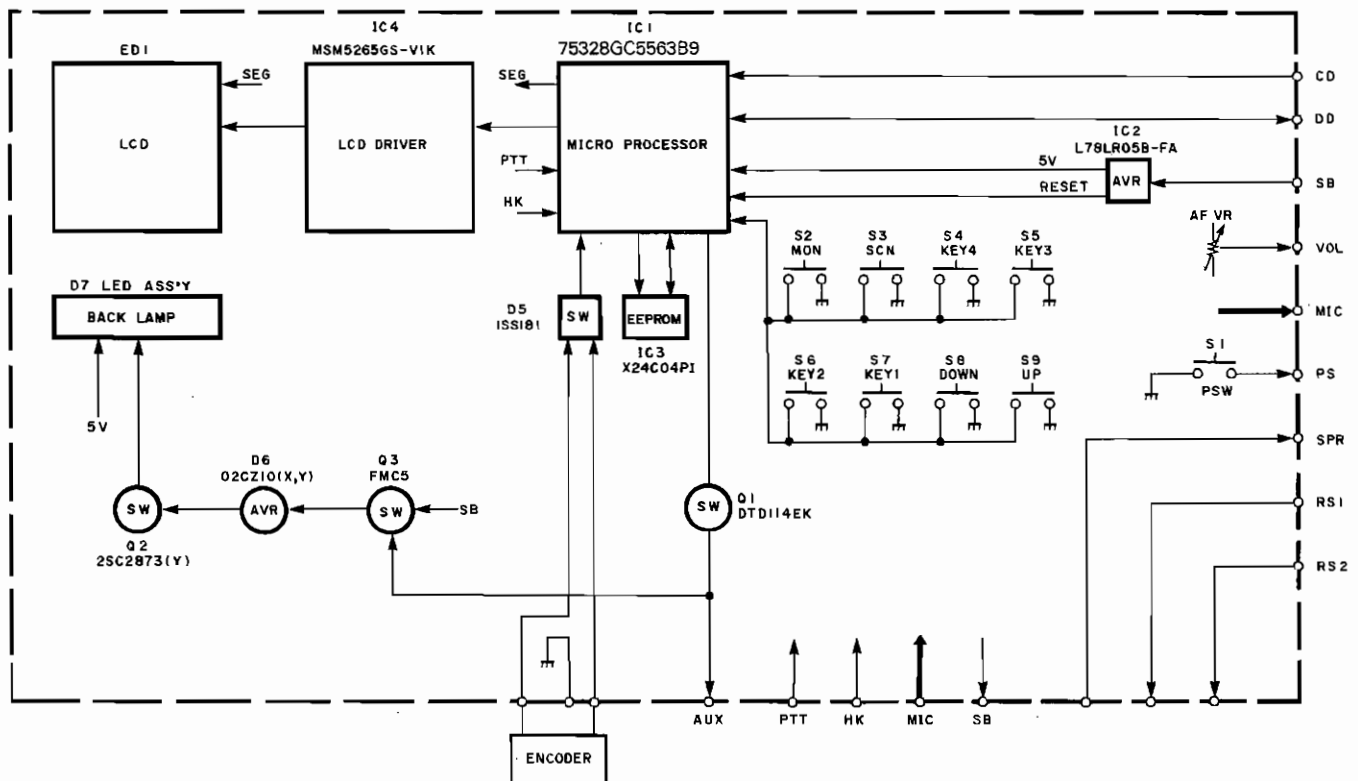


Fig. 9 KCH-4 block diagram

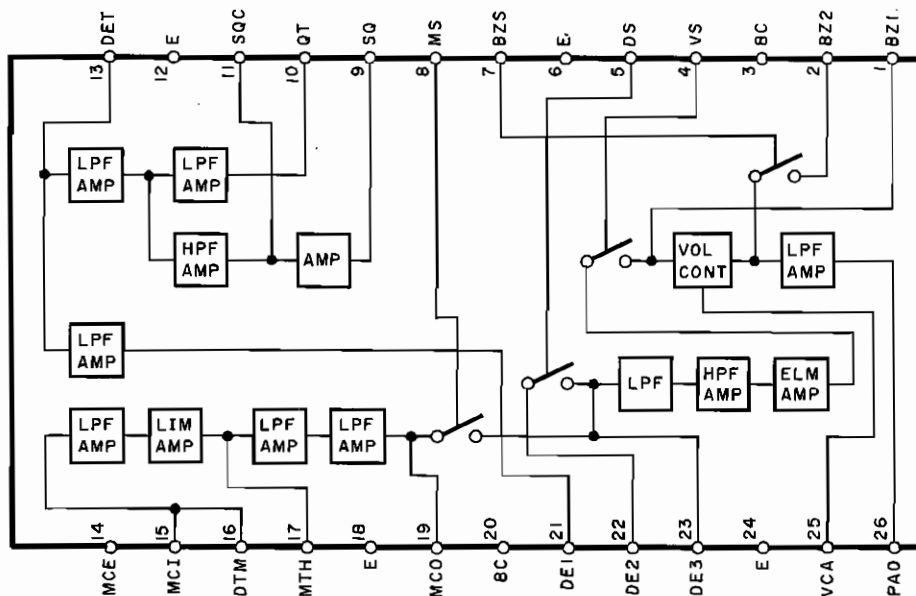
HIC : KCE04 (Control Unit IC103)

• Analog and peripheral switches

Function	CPU control signal								
	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)	●	●	●	●	○	○	●	●	●

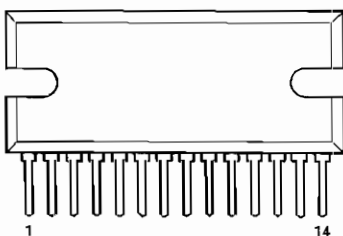
○ : ON, ● : OFF

• 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

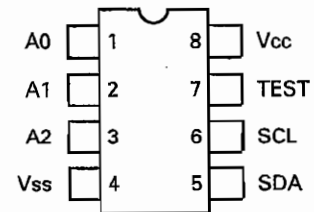
SEMICONDUCTOR DATA

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

• Terminal description

No.	Name	Description
1	A0	Address inputs
2	A1	The A0, A1 and A2 inputs are unused by the X24C16PI, however, they must be tied to Vss to insure proper device operation.
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 $+85^{\circ}\text{C}$, $V_{cc} = +5\text{V} \pm 10\%$, 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

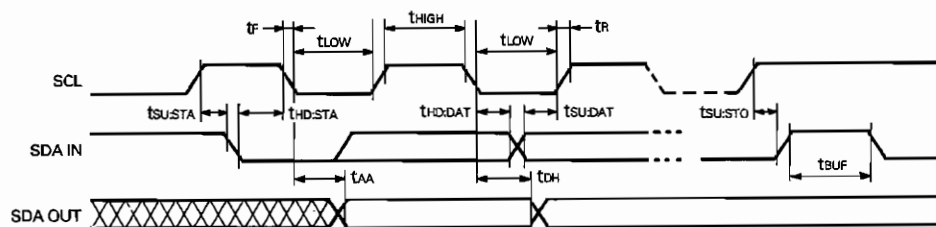
*1 : Typical values are for $T_a = 25^{\circ}\text{C}$ and nominal supply voltage.

*2 : SDA and SCL require pull up resistor.

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

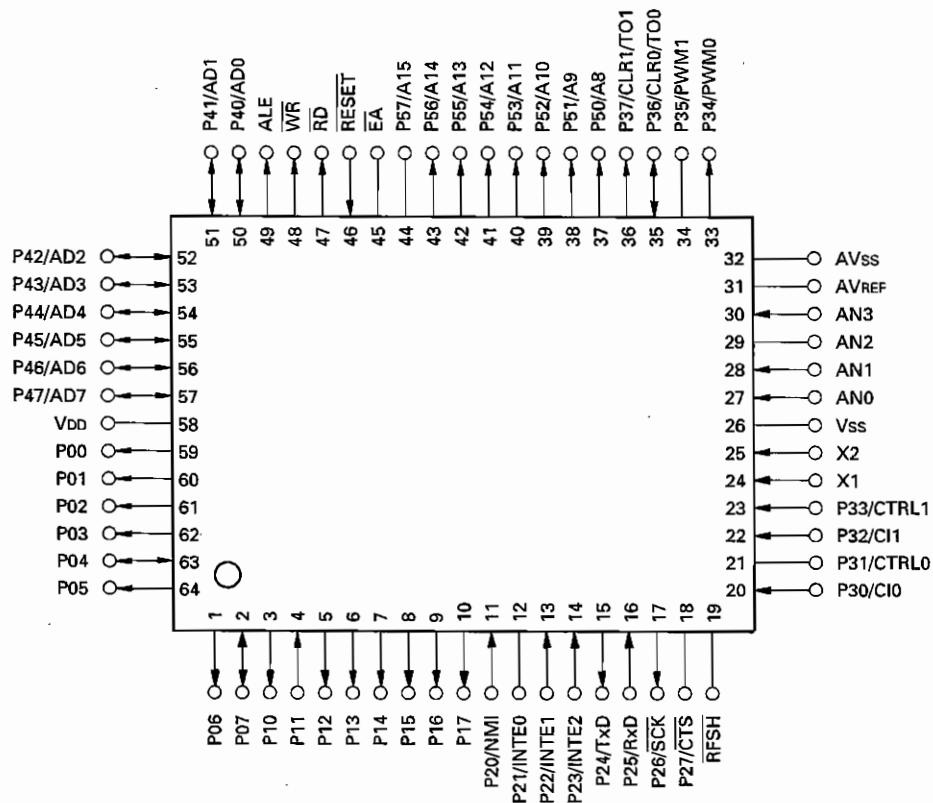
• Bus timing



SEMICONDUCTOR DATA

CPU : 78312AGF3343BE (Control Unit IC106)

• Terminal connection diagram



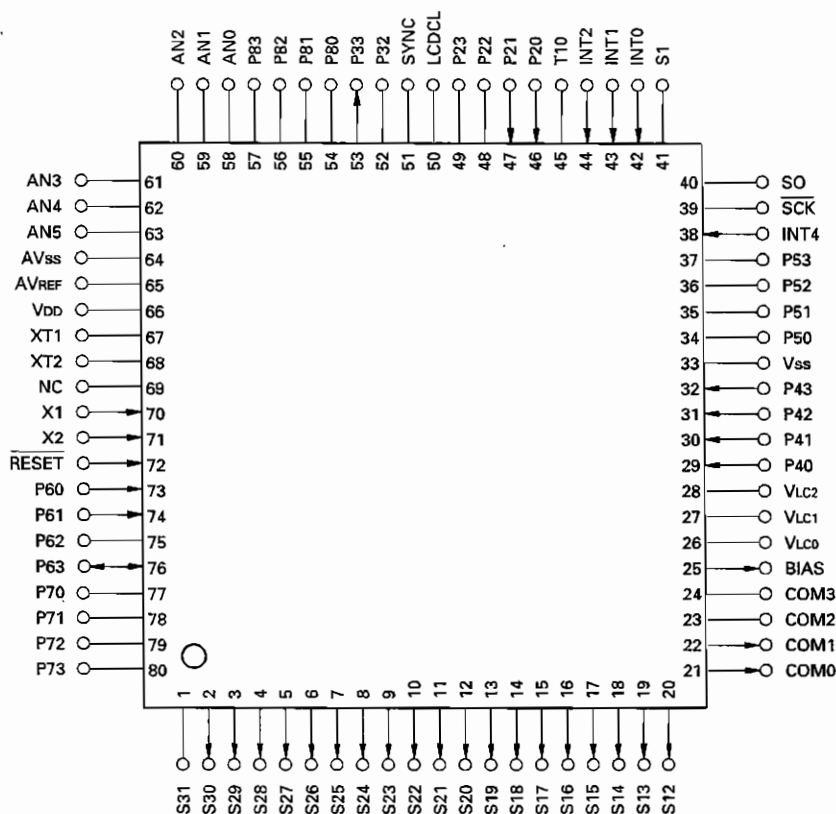
• Terminal function

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 (BU4094BF).	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 KCH-3 IC1)

• Terminal connection diagram



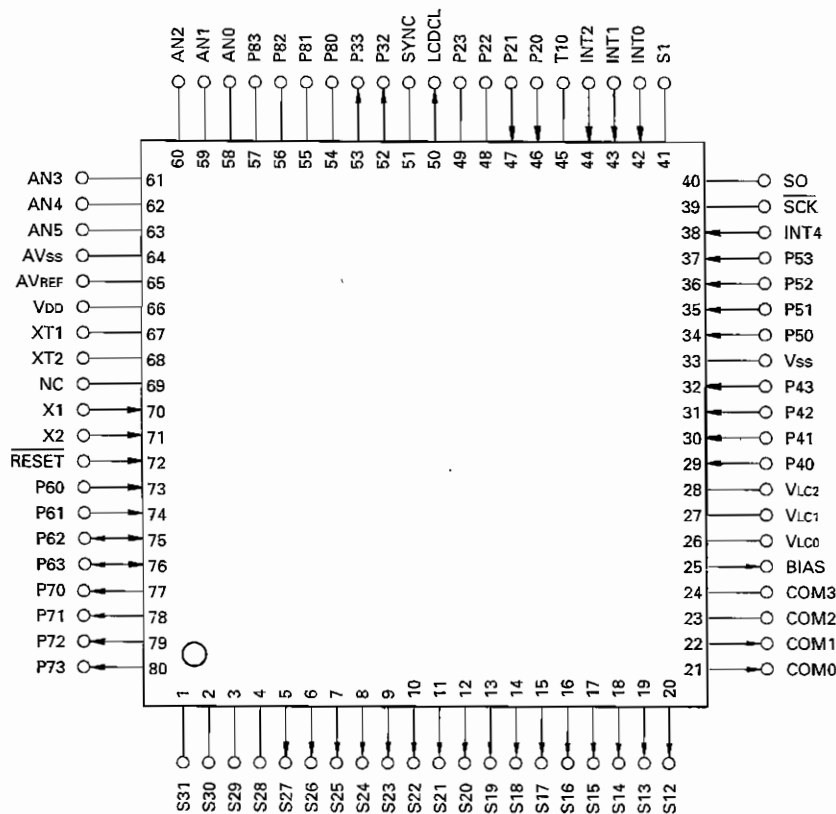
• Terminal function

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	I	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 KCH-4 IC1)

• Terminal connection diagram



• Terminal function

Pin No.	Pin name	I/O	Function	Pin No.	Pin name	I/O	Function
1~4	S31~S28	-	Open (not use).	47	P21	I	Encoder input.
5~20	S27~S12	O	LCD output (S1~S16).	48, 49	P22, P23	-	GND.
21	COM0	O	LCD COM0 output.	50	P30/LCDCL	O	CLOCK output (MSM5265GS).
22	COM1	O	LCD COM1 output.	51	P31	-	GND.
23, 24	COM2, COM3	-	Open (not use).	52	P32	O	EEPROM (X24C04PI) CLOCK output.
25	BIAS	O	LCD power supply voltage.	53	P33	O	Output for setting of AUX function.
26~28	VLC1~VLC2	-	LCD voltage level generator.	54~57	P80~P83	-	Open (not use).
29	P40	I	MON SW input.	58~63	AN0~AN5	-	GND.
30	P41	I	SCAN SW input.	64	AVss	-	GND.
31	P42	I	KEY4 SW input.	65~67		-	+5V.
32	P43	I	KEY3 SW input.	68	XT2	-	Open (not use).
33	Vss	-	GND.	69	NC (Vpp)	-	+5V.
34	P50	I	KEY2 SW input.	70	X1	I	System CLOCK input.
35	P51	I	KEY1 SW input.	71	X2	I	System CLOCK input.
36	P52	I	DOWN SW input.	72	RESET	I	System reset input.
37	P53	I	UP SW input.	73	P60/KR0	I	PTT SW input
38	P00/INT4	I	HOOK SW input.	74	P61/KR1	I	HOOK SW input.
39~41	P01~P03	-	GND.	75	P62/KR2	I/O	EEPROM (X24C04PI) serial data input/output.
42	P10/INT0	I	Encoder interrupt input.	76	P63/KR3	I/O	Internal interface input/output.
43	P11/INT1	I	PTT SW input.	77	P70/KR4	O	LCD driver (MSM5265GS) BLANK output.
44	P12/INT2	I	CLOCK input.	78	P71/KR5	O	LCD driver (MSM5265GS) DATA output.
45	P13/TI0	-	GND.	79	P72/KR6	O	LCD driver (MSM5265GS) CLOCK output.
46	P20/PT0	I	Encoder input.	80	P73/KR7	O	LCD driver (MSM5265GS) LOAD output.

DESCRIPTION OF COMPONENTS

FINAL UNIT (X45-3440-XX) -10 : K -11 : K2 -12 : K3

Ref. No.	Part No.	Use/Function	Operation/Condition
Q1	2SC1971	Pre-drive amplifier	
Q2	2SC1972	Drive amplifier	
Q3, 4	2SC2694	Power amplifier	Push-pull amplifier.
Q5	2SD1406(Y)	APC drive	
Q6	2SA1162(Y)	DC amplifier	APC controller.
Q7	2SC1712(Y)	DC amplifier	APC controller.
Q8	FMW1	DC amplifier	APC controller.
Q9	FMC2	TX/RX switching	ON when RX.
Q10	2SD1682(R,S)	TX/RX switching	ON when RX.
Q11	DTC114EK	DC switching	
D1	1SS184	Temperature compensation	
D2	1SS101	Reflected wave rectification	
D3	1SS101	Forward wave rectification	
D4	1SS184	Protector	
D5	1SS193	Protector	
D6	SG-5L(R)	Protection of reverse connection	
D7	02CZ10(X,Y)	Voltage reference	
D8	ERZ-M10DK220	Surge absorption	

CONTROL UNIT (X57-3960-XX) (A/3) -10 : K -11 : K2 -12 : K3

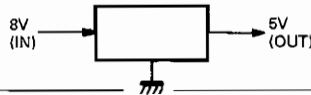
Ref. No.	Part No.	Use/Function	Operation/Condition
IC101	TC4013BF	D-FF	Phase difference detection.
IC102	L78LR05B-FA	AVR	
IC103	KCE04	MIC amplifier, AF, BPF, AF VOL	
IC104,105	BU4094BF or XRU4094BF	Shift register	
IC106	78312AGF3343BE	CPU	
IC107	TC74HC573AF	Latch	Separate from multiplexer address/data bus output.
IC108	27C256QJEMD	EPROM	
IC109	X24C04PI	EEPROM	
IC110	TC4S11F or SC14S11F	Inverter	
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.
Q113	2SC2714(Y)	DC amplifier	
Q114	DTC114EK	DC switch	ON when 24V input → Q104 off.
Q115	DTC114EK	Beep switch	
Q116	DTD114EK	DC switch	ON when AUX key on.

TK-630H(B)

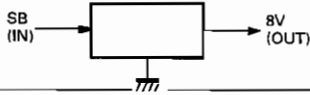
DESCRIPTION OF COMPONENTS

Ref. No.	Part No.	Use/Function	Operation/Condition
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	
D112	02CZ15(X,Y)	Voltage reference	

TX-RX UNIT (X57-3960-XX) (B/3) -10 : K -11 : K2 -12 : K3

Ref. No.	Part No.	Use/Function	Operation/Condition
IC301	MC3371D	IF system	1,2 : Oscillator (11.155MHz) 3 : Mixer output 4 : Vcc 5 : Limiter input 6,7 : Decoupling 8 : Quad input 9 : AF output 16 : Input (10.7MHz)
IC302	TC4S66F	MIC signal/TONE signal switch	
IC303	NJM78L05UA	Voltage regulator	
IC304	BU4094BF or XRU4094BF	Shift register	
IC305	NJM4558E	Inverter	
Q301, 302	2SK1577(1)	RX amplifier	
Q303~306	2SK1577(1),(3)	RX 1st mixer	
Q308, 309	2SK1577(1)	NB gate	
Q310	2SC2714(Y)	RX 1st IF amplifier	10.7MHz.
Q311	DTC114EK	MIC mute switch	ON when RX.
Q312	2SK208(Y)	DC amplifier	PLL lock voltage.
Q313	2SC2954	RF amplifier	Common VCO output.
Q314	2SC2954	RF amplifier	TX.
Q315	2SB1119(S)	DC switch	RX : 8V, TX : 0V.
Q316	DTC114EK	DC switch	ON when RX.
Q317	2SB1119(S)	DC switch	RX : 0V, TX : 8V.
Q318	DTC114EK	DC switch	ON when TX.
Q319	DTC114EK	DC switch	Reset (shift register BU4094BF).
Q320	2SK1577(1)	RX 1st IF amplifier	10.7MHz.
D301	1SS226	Protector	
D302~305	1SV228	BPF tuning	Vari-cap tuning.
D306	1SS268	TX/RX switch	Common VCO output.

AF UNIT (X57-3960-XX) (C/3) -10 : K -11 : K2 -12 : K3

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.

DESCRIPTION OF COMPONENTS

VCO/PLL UNIT (X58-3850-XX) -10 : K -11 : K2 -12 : K3

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)	Buffer amplifier	
Q2	2SA1162(Y)	Lock detect switch	"H" when lock.
Q3	DTC143EK	Lock detect switch	"H" when lock.
Q4	2SA1312(GR)	Charge pump	D/A converter.
Q5	2SC3324(G)	Charge pump	D/A converter.
Q51	2SK508NV(K52)	OSC	TX-VCO.
Q52	DTC114EK	TX/RX switching	
Q53	2SK508NV(K52)	OSC	RX-VCO.
Q54, 55	DTC114EK	TX/RX switching	
Q56	2SC2714(Y)	Buffer amplifier	
D51	1SV228	Vari-cap diode	Frequency controller (TX VCO).
D52	1SV164	Modulator	
D53	1SV228	Vari-cap diode	Frequency controller (RX VCO).

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

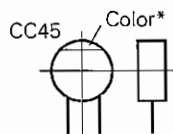
Ref. No.	Part No.	Use/Function	Operation/Condition
IC1	75328GC5563B9	CPU	
IC2	L78LR05B-FA	AVR	
IC3	X24C04PI	EEPROM	
IC4	MSM5265GS-V1K	LCD driver	
Q1	DTD114EK	LED or AUX switch	ON when AUX key on.
Q2	2SC2873(Y)	DC switch	
Q3	FMC5	LED switch	OFF when AUX key on.
D1~4	1SS226	Surge absorption	ON when 5V 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

CAPACITORS

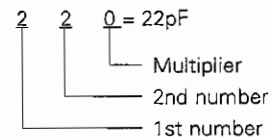
CC 45 TH 1H 220 J
1 2 3 4 5 6

- 1 = Type ... ceramic, electrolytic, etc. 4 = Voltage rating
2 = Shape ... round, square, ect. 5 = Value
3 = Temp. coefficient 6 = Tolerance



• Capacitor value

- 010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF



• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF -10 ~ +50 Less than 4.7μF -10 ~ +75

Less than 10pF

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word \ 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors (Refer to the table above except dimension)

(EX) CC 73 E SL 1H 000 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) CK 73 E E 1H 000 Z
1 2 3 4 5 6 7
(Chip) (B, F)

RESISTORS

• Chip resistor (Carbon)

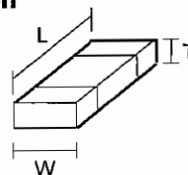
(EX) RD 73 E B 2B 000 J
1 2 3 4 5 6 7
(Chip) (B,F)

• Carbon resistor (Normal type)

(EX) RD 14 B B 2C 000 J
1 2 3 4 5 6 7

- 1 = Type ... ceramic, electrolytic, etc. 5 = Voltage rating
2 = Shape ... round, square, ect. 6 = Value
3 = Dimension 7 = Tolerance
4 = Temp. coefficient

Dimension



• Dimension (Chip capacitor)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25

• Dimension (Chip resistor)

Dimension code	L	W	T	Wattage
E	3.2 ± 0.2	1.6 ± 0.2	0.57	2B
F	2.0 ± 0.3	1.25 ± 0.2	0.45	2A

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
2A	1/10W	2E	1/4W	3A	1W
2B	1/8W	2H	1/2W	3D	2W
2C	1/6W				

PARTS LIST

× New Parts

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.

TK-630H(B)

FINAL UNIT (X45-3440-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
TK-630H(B)						
1	3B		A01-2020-01	CASE(UPPER)		
2	1A		A01-2025-01	CASE(LOWER)		
3	2B		A10-1320-01	FRAME		
5	3A		B42-3343-04	LABEL(S/NO)		
6	1G		B46-0409-30	WARRANTY CARD		
7	1G		B62-0069-00	INSTRUCTION MANUAL		
8	3A		B72-0300-04	MODEL NAME PLATE	K	
8	3A		B72-0301-04	MODEL NAME PLATE	K2	
8	3A		B72-0302-14	MODEL NAME PLATE	K3	
10	1H		E30-2036-05	GROUND LEAD WIRER		
11	2A, 1H		E31-3228-05	SHORT PLUG		
12	2B		E31-3301-05	CONNECTING WIRE(RA/DO)		
13	2B		E37-0153-05	FLEXIBLE PC BOARD(17P)		
14	2B		E37-0154-05	FLEXIBLE PC BOARD(13P)		
16	1H		F07-1336-05	COVER		
17	1A		F10-1488-02	SHIELDING PLATE(FINAL)		
22	2B		G02-0574-04	LEAF SPRING(AVR)		
23	2B		G02-0709-04	LEAF SPRING(AF.AMP)		
24	3B		G10-0707-14	NON-WOVEN FABRIC		
25	3B		G13-1354-04	CUSHION(IC108)		
26	1A		G53-0716-13	PACKING		
27	3B		G53-0732-03	PACKING		
29	1G		H02-0604-03	INNER PACKING CASE		
30	1H		H11-0815-04	POLYSTYRENE PLATE		
31	1H		H11-0853-04	POLYSTYRENE PLATE		
32	3G		H52-0203-04	ITEM CARTON BOX		
33	2H		H10-2731-01	POLYSTYRENE FOAMED FIXTURE		
34	2G		H12-1399-04	PACKING FIXTURE		
35	2G		H12-1410-04	PACKING FIXTURE		
36	2G		H12-1434-04	PACKING FIXTURE		
37	2H		H12-1442-04	PACKING FIXTURE		
38	1H		H25-0096-04	PROTECTION BAG		
39	1H		H25-0103-04	PROTECTION BAG		
40	1G		H25-0724-04	PROTECTION BAG		
41	1H		J61-0307-05	WIRER BAND		
42	1H		N99-0365-05	SCREW SET		
A	1B, 3B		N35-3008-45	BINDING HEAD MACHINE SCREW		
B	2B, 3B		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
44	1B		X45-3440-10	FINAL UNIT	K	
44	1B		X45-3440-11	FINAL UNIT	K2	
44	1B		X45-3440-12	FINAL UNIT	K3	
45	2B, 3B		X57-3960-10	TX-RX UNIT	K	
45	2B, 3B		X57-3960-11	TX-RX UNIT	K2	
45	2B, 3B		X57-3960-12	TX-RX UNIT	K3	
FINAL UNIT (X45-3440-XX) -10 : K -11 : K2 -12 : K3						
C2	-4		CK73FB1H472K	CHIP C	4700PF	K
C5			CK73FB1E104K	CHIP C	0.10UF	K
C6			CK73FB1H472K	CHIP C	4700PF	K
C7			CK73FB1E104K	CHIP C	0.10UF	K

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FINAL UNIT (X45-3440-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
C8			C90-2143-05	ELECTRO 47UF 25WV		
C10			CK73FB1H471K	CHIP C 470PF K	K	
C10			CK73FB1H331K	CHIP C 330PF K	K2	
C10			CC73FSL1H151J	CHIP C 150PF K	K3	
C11			CK45B1H472K	CERAMIC 4700PF K		
C12			CC45SL2H101J	CERAMIC 100PF J	K	
C12			CC45SL2H820J	CERAMIC 82PF J	K2, K3	
C13			CC45SL2H680J	CERAMIC 68PF J	K2, K3	
C14			CK73FB1H472K	CHIP C 4700PF K		
C15			CK73EB1E104K	CHIP C 0.10UF K		
C16			C90-2143-05	ELECTRO 47UF 25WV		
C17			CK73FB1H472K	CHIP C 4700PF K		
C18			CC45SL2H470J	CERAMIC 47PF J	K3	
C18			CC45SL2H680J	CERAMIC 68PF J	K2	
C18			CC45SL2H820J	CERAMIC 82PF J	K	
C19			CC45SL2H271J	CERAMIC 270PF J	K3	
C19			CC45SL2H391J	CERAMIC 390PF J	K2	
C19			CC45SL2H561J	CERAMIC 560PF J	K	
C20 , 21			CK45B1H472K	CERAMIC 4700PF K		
C22 , 23			CM73F2H101J	CHIP C 100PF J	K3	
C22 , 23			CM73F2H181J	CHIP C 180PF J	K	
C24			CM73F2H112J	CHIP C 1100PF J	K	
C24			CM73F2H561J	CHIP C 560PF J	K3	
C24			CM73F2H751J	CHIP C 750PF J	K2	
C25			CM73F2H120J	CHIP C 12PF J	K3	
C25			CM73F2H180J	CHIP C 18PF J	K2	
C25			CM73F2H330J	CHIP C 33PF J	K	
C26			CK73FB1H472K	CHIP C 4700PF K		
C27			CK73EB1E104K	CHIP C 0.10UF K		
C28			CK73FB1H472K	CHIP C 4700PF K		
C29			C90-2143-05	ELECTRO 47UF 25WV		
C30			CK73FB1H472K	CHIP C 4700PF K		
C31			CM73F2H620J	CHIP C 62PF J	K3	
C31			CM73F2H820J	CHIP C 82PF J	K, K2	
C32			CM73F2H040D	CHIP C 4.0PF D	K2	
C32			CM73F2H080D	CHIP C 8.0PF D	K, K3	
C33			CM73F2H101J	CHIP C 100PF J	K3	
C33			CM73F2H121J	CHIP C 120PF J	K2	
C33			CM73F2H151J	CHIP C 150PF J	K	
C34			CM73F2H220J	CHIP C 22PF J	K, K2	
C34			CM73F2H270J	CHIP C 27PF J	K3	
C35			CM73F2H101J	CHIP C 100PF J	K2	
C35			CM73F2H121J	CHIP C 120PF J	K	
C36			CM73F2H390J	CHIP C 39PF J	K2	
C36			CM73F2H470J	CHIP C 47PF J	K3	
C36			CM73F2H510J	CHIP C 51PF J	K	
C37			CM73F2H330J	CHIP C 33PF J	K3	
C37			CM73F2H430J	CHIP C 43PF J	K2	
C37			CM73F2H470J	CHIP C 47PF J	K	
C38			CM73F2H020C	CHIP C 2.0PF C		
C39			CC73FCH1H820J	CHIP C 82PF J		
C40			CM73F2H020C	CHIP C 2.0PF C		
C41			CC73FCH1H680J	CHIP C 68PF J		
C42 -52			CK73FB1H472K	CHIP C 4700PF K		
C53			C90-2020-05	ELECTRO 15UF 25WV		

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FINAL UNIT (X45-3440-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
C54			CK73FB1H102K	CHIP C 1000PF K		
C55			C90-2165-05	ELECTRO 10UF 50WV		
C56			CK73FB1H102K	CHIP C 1000PF K		
C57 ,58			CK73FB1H472K	CHIP C 4700PF K		
C59 ,60			C90-2155-05	ELECTRO 470UF 25WV		
C61 -64			CK73FB1H472K	CHIP C 4700PF K		
C65			CC73FSL1H101J	CHIP C 100PF J	K2	
C65			CC73FSL1H121J	CHIP C 120PF J	K3	
C65			CC73FSL1H151J	CHIP C 150PF J	K	
C66 ,67			CC73FCH1H330J	CHIP C 33PF J		
C68			CK73FB1H102K	CHIP C 1000PF K		
C69			C90-2146-05	ELECTRO 100UF 25WV		
C70			CM73F2H820J	CHIP C 82PF J	K3	
C71			CC73FSL1H101J	CHIP C 100PF J	K	
C72 ,73			CM73F2H121J	CHIP C 120PF J	K2, K3	
J2			E04-0167-05	RF COAXIAL CABLE RECEPTACLE		
CN1 ,2			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN3 ,4			E23-0491-15	TERMINAL		
W1			E37-0138-05	CONNECTING WIRE(3P)		
W2			E37-0139-05	CONNECTING WIRE(4P)		
W3			E37-0183-05	FINISHED WIRE		
W4	2A		R92-1061-05	JUMPER REST 0 OHM		
W5	2A		E37-0160-05	CONNECTING WIRE(2P)		
W6	2A		E37-0161-15	CONNECTING WIRE(15P)		
			G13-0635-04	FORMED PLATE		
			G13-1354-04	FORMED PLATE		
101	2A		G53-0715-03	PACKING		
			J61-0307-05	WIRE BAND		
102	2A		J21-4351-04	MOUNTING HARDWARE		
A2			J31-0531-04	COLLAR		
			L92-0125-05	CORE		
A1			L34-1376-15	COIL		
L2			L40-1092-48	SMALL FIXED INDUCTOR(1U)		
L3			L34-0908-05	COIL		
L4			L34-1039-05	COIL		
L5			L39-1211-15	COIL		
L6			L33-0666-05	CHOKE COIL		
L7			L39-1213-15	COIL		
L8			L39-1214-25	COIL	K	
L8			L39-1215-25	COIL	K3	
L8			L39-1239-05	COIL	K2	
L9			L33-0625-15	CHOKE COIL		
L10			L34-1150-05	COIL	K, K2	
L10			L34-1241-05	COIL	K3	
L11			L34-1151-05	COIL	K3	
L11			L34-1241-05	COIL	K, K2	
L12			L34-1256-05	COIL	K3	
L12			L34-1259-05	COIL	K, K2	
L13			L39-0447-05	COIL		
L14 ,15			L40-2201-48	SMALL FIXED INDUCTOR(22U)		
L16			L40-4792-48	SMALL FIXED INDUCTOR(4.7U)		
L17			L40-5672-48	SMALL FIXED INDUCTOR(56N)	K3	
L17			L40-6872-48	SMALL FIXED INDUCTOR(68N)	K, K2	

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FINAL UNIT (X45-3440-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
D	1B, 2B		N16-0040-41	WASHER		
E	1B		N09-2077-05	SCREW (M3X8)		
F	1B		N35-3006-46	BINDING HEAD MACHINE SCREW		
G	2A		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
			N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
			N35-4006-46	BRAZIER HEAD TAPTITE SCREW		
TH1			PTH9M04BC471TS	POSISTOR		
R1	,3		RK73FB2A271J	CHIP R 270 J 1/10W		K3
R1	,3		RK73FB2A151J	CHIP R 150 J 1/10W		K, K2
R2			RK73FB2A390J	CHIP R 39 J 1/10W		K, K2
R2			RK73FB2A180J	CHIP R 18 J 1/10W		K3
R3			RK73FB2A151J	CHIP R 150 J 1/10W		
R4			R92-1261-05	SILID 150 1/2W		
R5			R92-0685-05	CHIP R 22 J 1/2W		
R6			RS14DB3F101J	FL-PROOF RS 100 J 3W		
R7	,8		RS14DB3F4R7J	FL-PROOF RS 4.7 J 3W		
R9	,10		RS14DB3A4R7J	FL-PROOF RS 4.7 J 1W		
R11	-14		RS14DB3F221J	FL-PROOF RS 220 J 3W		
R15			RK73FB2A220J	CHIP R 22 J 1/10W		K2
R15			RK73FB2A270J	CHIP R 27 J 1/10W		K
R15			RK73FB2A330J	CHIP R 33 J 1/10W		K3
R16	,17		RK73FB2A270J	CHIP R 27 J 1/10W		
R18			RK73FB2A220J	CHIP R 22 J 1/10W		
R19			R92-0670-05	CHIP R 0 ØHM		
R20			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R21			RK73FB2A223J	CHIP R 22K J 1/10W		
R22			RK73FB2A471J	CHIP R 470 J 1/10W		
R23			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R24			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R25			RK73FB2A101J	CHIP R 100 J 1/10W		
R27			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R28			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R29			RK73FB2A103J	CHIP R 10K J 1/10W		
R31			RK73FB2A271J	CHIP R 270 J 1/10W		
R32			R92-0670-05	CHIP R 0 ØHM		
R33			RK73FB2A471J	CHIP R 470 J 1/10W		
R34			RS14DB3A220J	FL-PROOF RS 22 J 1W		
R101			R92-0670-05	CHIP R 0 ØHM		K
R102			R92-0670-05	CHIP R 0 ØHM		K2
R103			R92-0670-05	CHIP R 0 ØHM		K3
VR1			R12-3126-05	TRIM POT.(10K)		
VR2			R12-6423-05	TRIM POT.(10K)		
K1			S76-0409-05	RELAY		
D1			1SS184	DIODE		
D2	,3		1SS101	DIODE		
D4			1SS184	DIODE		
D5			1SS193	DIODE		
D6			SG-5L(R)			
D7			02CZ10(X, Y)	DIODE		
D8			ERZ-M10DK220	DIODE		
Q1			2SC1971	TRANSISTOR		
Q2	,4		2SC1972	TRANSISTOR		
Q3			2SC2694	TRANSISTOR		

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FINAL UNIT (X45-3440-XX)

TX-RX UNIT (X57-3960-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
Q5 Q6 Q7 Q8 Q9	1B		2SD1406(Y) 2SA1162(Y) 2SC2712(Y) FMW1 FMC2	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q10 Q11			2SD1682(R,S) DTC114EK	TRANSISTOR TRANSISTOR		
			212-0702-05	PLASTIC TUBE		
TX-RX UNIT (X57-3960-XX) -10 : K -11 : K2 -12 : K3						
C101 C102 C103 C104, 105 C106			CK73FB1E104K CE04EW1E470M CK73FB1H102K C92-0007-05 CK73FB1H102K	CHIP C 0.10UF K ELECTRO 47UF 25WV CHIP C 1000PF K CHIP TAN 2.2UF 10WV CHIP C 1000PF K		
C107 C108 C109 C110 C111			CE04EW1E100M CE04EW1E470M CK73FB1H102K C92-0003-05 C90-2032-05	ELECTRO 10UF 25WV ELECTRO 47UF 25WV CHIP C 1000PF K CHIP TAN 0.47UF 25WV ELECTRO 47UF 10WV		
C112 C113 C114 C115 C116			CK73FB1H102K CK73FB1E103K C92-0004-05 CK73FB1E104K CE04EW1C470M	CHIP C 1000PF K CHIP C 0.01UF K ELECTRO 1.0UF 16WV CHIP C 0.10UF K ELECTRO 47UF 16WV		
C117 C118 C119 C120 C121			CK73FB1H102K C92-0008-05 CK73EF1C105Z C92-0007-05 CK73FB1E104K	CHIP C 1000PF K CHIP TAN 3.3UF 16WV CHIP C 1.0UF Z CHIP TAN 2.2UF 10WV CHIP C 0.10UF K		
C122 C123 C124 C125 C126			CE04EW1C470M CK73FB1H102K CK73EF1C105Z CK73FB1E104K CK73FB1H102K	ELECTRO 47UF 16WV CHIP C 1000PF K CHIP C 1.0UF Z CHIP C 0.10UF K CHIP C 1000PF K		
C127, 128 C129 C130 C131 C132, 133			CK73FB1E103K CK73FB1H102K CE04EW1C101M CK73FB1H471K CK73FB1H102K	CHIP C 0.01UF K CHIP C 1000PF K ELECTRO 100UF 16WV CHIP C 470PF K CHIP C 1000PF K		
C134, 135 C136 C137 C138 C140			CC73FCH1H100D CK73FB1E104K CK73FB1E103K CK73FB1E104K CK73FB1H471K	CHIP C 10PF D CHIP C 0.10UF K CHIP C 0.01UF K CHIP C 0.10UF K CHIP C 470PF K		
C141-143 C144, 145 C147-149 C150 C151-154			CK73FB1E103K CK73FB1H102K CK73FB1H102K CC73FSL1H101J CK73FB1H102K	CHIP C 0.01UF K CHIP C 1000PF K CHIP C 1000PF K CHIP C 100PF J CHIP C 1000PF K		
C155-158 C159 C160 C161, 162 C164-166			CC73FSL1H101J CK73FB1H102K CC73FSL1H101J CK73FB1H102K CK73FB1H102K	CHIP C 100PF J CHIP C 1000PF K CHIP C 100PF J CHIP C 1000PF K CHIP C 1000PF K		

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TX-RX UNIT (X57-3960-XX)

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C167, 168			CC73FSL1H101J	CHIP C 100PF J		
C169-173			CK73FB1H102K	CHIP C 1000PF K		
C183			CK73FB1H102K	CHIP C 1000PF K		
C185-193			CK73FB1H102K	CHIP C 1000PF K		
C195, 196			CC73FSL1H101J	CHIP C 100PF J		
C197			CK73FB1E103K	CHIP C 0.01UF K		
C198, 199			CC73FSL1H101J	CHIP C 100PF J		
C200-206			CK73FB1H102K	CHIP C 1000PF K		
C207-209			CC73FSL1H101J	CHIP C 100PF J		
C210			CK73FB1H102K	CHIP C 1000PF K		
C211			CC73FSL1H101J	CHIP C 100PF J		
C212-216			CK73FB1H102K	CHIP C 1000PF K		
C218			C92-0543-05	ELECTRO 3.3UF 10WV		
C219			CC73FCH1H020C	CHIP C 2.0PF C		
C301			CC73FCH1H150J	CHIP C 15PF J		
C303-306			CK73FB1E103K	CHIP C 0.01UF K		
C307			CC73FCH1H040C	CHIP C 4PF C	K3	
C308			CK73FB1E103K	CHIP C 0.01UF K		
C309			CC73FCH1H020C	CHIP C 2.0PF C		
C310			CC73FCH1H040C	CHIP C 4PF C	K, K2	
C310			CC73FCH1H080D	CHIP C 8PF D	K3	
C311			CK73FB1E103K	CHIP C 0.01UF K		
C312			CC73FCH1H020C	CHIP C 2.0PF C		
C313			CC73FCH1H020C	CHIP C 2.0PF C	K2	
C313			CC73FCH1H030C	CHIP C 3PF C	K	
C313			CC73FCH1H080D	CHIP C 8PF D	K3	
C314			CC73FCH1H680J	CHIP C 68PF J		
C315-319			CK73FB1E103K	CHIP C 0.01UF K		
C322			CK73FB1E103K	CHIP C 0.01UF K		
C323			CC73FCH1H050C	CHIP C 5PF C		
C324			CK73FB1H102K	CHIP C 1000PF K		
C325, 326			CK73FB1E103K	CHIP C 0.01UF K		
C327			CC73FCH1H560J	CHIP C 56PF J		
C328			CC73FCH1H820J	CHIP C 82PF J		
C329, 330			CK73FB1E103K	CHIP C 0.01UF K		
C331			C92-0009-05	CHIP TAN 4.7UF 10WV		
C332			CK73FB1E103K	CHIP C 0.01UF K		
C333, 334			CK73FB1E104K	CHIP C 0.10UF K		
C335			CK73FB1H102K	CHIP C 1000PF K		
C336			CK73FB1E103K	CHIP C 0.01UF K		
C337, 338			CC73FCH1H470J	CHIP C 47PF J		
C339, 340			C92-0009-05	CHIP TAN 4.7UF 10WV		
C341, 342			CK73FB1H471K	CHIP C 470PF K		
C343			CK73FB1H471K	CHIP C 470PF K	K3	
C344			CK73FB1H471K	CHIP C 470PF K		
C345			CK73FB1H102K	CHIP C 1000PF K		
C346			CK73FB1H471K	CHIP C 470PF K		
C347			CE04EW1C470M	ELECTRO 47UF 16WV		
C348			CK73FB1H102K	CHIP C 1000PF K		
C349			CK73FB1E103K	CHIP C 0.01UF K		
C350			CK73FB1H102K	CHIP C 1000PF K		
C351, 352			CK73FB1E103K	CHIP C 0.01UF K		
C353			CK73FB1H102K	CHIP C 1000PF K		
C354			CC73FSL1H101J	CHIP C 100PF J		
C355-357			CK73FB1E103K	CHIP C 0.01UF K		

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TX-RX UNIT (X57-3960-XX)

Ref. No. 参照番号	Address 位. 置	New Parts 新	Parts No. 部 品 番 号	Description 部 品 名 / 規 格	Desti- nation 仕 向	Re- marks 備考
C359			CC73PSL1H101J	CHIP C 100PF J		
C360-362			CK73FB1E103K	CHIP C 0.01UF K		
C363			C90-2032-05	ELECTRO 47UF 10WV		
C364			CE04EW1C470M	ELECTRO 47UF 16WV		
C365			CK73FB1H102K	CHIP C 1000PF K		
C366			CK73FB1E103K	CHIP C 0.01UF K		
C367-369			CK73FB1H471K	CHIP C 470PF K		
C370, 371			CK73FB1H102K	CHIP C 1000PF K		
C372			CK73FB1H471K	CHIP C 470PF K		
C373			CK73FB1H102K	CHIP C 1000PF K		
C374			CK73FB1E103K	CHIP C 0.01UF K		
C375-377			CK73FB1H102K	CHIP C 1000PF K		
C378			CK73FB1E103K	CHIP C 0.01UF K		
C379			CK73FB1E104K	CHIP C 0.10UF K		
C380			CK73FB1E103K	CHIP C 0.01UF K		
C381			CK73FB1H102K	CHIP C 1000PF K	K, K2	
C501-504			CK73FB1H102K	CHIP C 1000PF K		
C509			CE04EW1H0R1M	ELECTRO 0.1UF 50WV		
C510			CK73FB1E103K	CHIP C 0.01UF K		
C511			C90-2024-05	ELECTRO 47UF 6.3WV		
C512			CE04EW1C101M	ELECTRO 100UF 16WV		
C513			CE04LW1C221M	ELECTRO 220UF 16WV		
C514			C90-2024-05	ELECTRO 47UF 6.3WV		
C515, 516			CE04LW1C221M	ELECTRO 220UF 16WV		
C517, 518			C092FM1H104K	MYLAR 0.10UF K		
C519, 520			CK73FB1H102K	CHIP C 1000PF K		
C521-523			CK73FB1E103K	CHIP C 0.01UF K		
C525			CK73FB1E104K	CHIP C 0.1UF K		
CN101			E02-2010-05	TRANSISTOR SOCKET(IC109)		
CN102			E02-2015-05	TRANSISTOR SOCKET(IC108)		
CN103			E40-5491-05	PIN CONNECTOR(17P)		
			E40-5470-05	PIN CONNECTOR(13P)		
			E40-3269-05	PIN CONNECTOR(11P)		
CN104			E40-3243-05	PIN CONNECTOR(8P)		
CN105			E40-3242-05	PIN CONNECTOR(7P)		
CN106			E40-3253-05	PIN CONNECTOR(9P)		
CN107			E40-3251-05	PIN CONNECTOR(7P)		
CN108			E40-3256-05	PIN CONNECTOR(12P)		
CN301			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN302			E40-5470-05	PIN CONNECTOR(13P)		
CN303			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN304			E40-3239-05	PIN CONNECTOR(4P)		
CN305			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN306			E40-5492-05	PIN CONNECTOR(15P)		
CN501			E40-5491-05	PIN CONNECTOR(17P)		
CN502			E40-3238-05	PIN CONNECTOR(3P)		
W101-104			R92-1061-05	JUMPER REST 0 OHM		
W105			E37-0158-05	CONNECTING WIRE(11P)		
W107			R92-1061-05	JUMPER REST 0 OHM		
CF301			L72-0342-05	CERAMIC FILTER(CFV455F)		
L301, 302			L34-4296-05	COIL	K, K2	
L301, 302			L34-4297-05	COIL	K3	
L303			L40-1001-48	SMALL FIXED INDUCTOR(10U)		
L304, 305			L34-4296-05	COIL	K, K2	

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TX-RX UNIT (X57-3960-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
L304, 305 L306 L307 L308 L309			L34-4297-05 L19-0324-05 L39-0454-05 L34-4216-05 L40-6892-48	COIL TRANSFORMER COIL COIL SMALL FIXED INDUCTOR(6.8U)	K3	
L310 L311 L312 L313 L314			L30-0534-05 L40-2201-48 L30-0534-05 L30-0503-05 L40-3982-48	COIL SMALL FIXED INDUCTOR(22U) IFT IFT SMALL FIXED INDUCTOR(39U)		
L315 L316 L317 L318 L319			L40-5695-48 L40-2211-48 L40-4701-48 L40-3382-48 L40-4701-48	SMALL FIXED INDUCTOR(5.6U) SMALL FIXED INDUCTOR(220U) SMALL FIXED INDUCTOR(47U) SMALL FIXED INDUCTOR(33U) SMALL FIXED INDUCTOR(47U)		
X101 X301 X302 XF301			L77-1374-05 L77-1294-05 L77-1466-15 L71-0257-05	CRYSTAL RESONATOR(12MZ) CRYSTAL RESONATOR(11.155MHZ) CRYSTAL RESONATOR(12.8MHZ) CRYSTAL FILTER(10.7MHZ)		
R101 R102, 103 R104 R105 R106-108			RK73FB2A471J RK73FB2A473J RK73FB2A105J R92-0670-05 RK73FB2A104J	CHIP R 470 J 1/10W CHIP R 47K J 1/10W CHIP R 1.0M J 1/10W CHIP R 0 OHM CHIP R 100K J 1/10W		
R109 R110, 111 R112 R113 R114, 115			RK73FB2A103J RK73FB2A472J RK73FB2A223J RK73FB2A101J RK73FB2A271J	CHIP R 10K J 1/10W CHIP R 4.7K J 1/10W CHIP R 22K J 1/10W CHIP R 100 J 1/10W CHIP R 270 J 1/10W		
R116 R117 R118 R119 R120			RK73FB2A223J RK73FB2A104J RK73FB2A103J RK73FB2A473J RK73FB2A222J	CHIP R 22K J 1/10W CHIP R 100K J 1/10W CHIP R 10K J 1/10W CHIP R 47K J 1/10W CHIP R 2.2K J 1/10W		
R121 R122 R123 R124, 125 R126			RK73FB2A562J RK73FB2A103J RK73FB2A183J RK73FB2A104J RK73FB2A183J	CHIP R 5.6K J 1/10W CHIP R 10K J 1/10W CHIP R 18K J 1/10W CHIP R 100K J 1/10W CHIP R 18K J 1/10W		
R127 R128 R129 R130, 131 R132			RK73FB2A223J RK73FB2A102J RK73FB2A104J RK73FB2A102J RK73FB2A103J	CHIP R 22K J 1/10W CHIP R 1.0K J 1/10W CHIP R 100K J 1/10W CHIP R 1.0K J 1/10W CHIP R 10K J 1/10W		
R133 R134 R135-137 R138 R139-142			RK73FB2A224J RK73FB2A101J RK73FB2A473J RK73FB2A333J RK73FB2A473J	CHIP R 220K J 1/10W CHIP R 100 J 1/10W CHIP R 47K J 1/10W CHIP R 33K J 1/10W CHIP R 47K J 1/10W		
R143, 144 R145-148 R149 R150 R151, 152			RK73FB2A102J RK73FB2A473J RK73FB2A223J R92-0670-05 RK73FB2A682J	CHIP R 1.0K J 1/10W CHIP R 47K J 1/10W CHIP R 22K J 1/10W CHIP R 0 OHM CHIP R 6.8K J 1/10W		

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TX-RX UNIT (X57-3960-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
R153			RK73FB2A223J	CHIP R 22K J 1/10W		
R154			RK73FB2A473J	CHIP R 47K J 1/10W		
R155			RK73FB2A104J	CHIP R 100K J 1/10W		
R156			R92-0670-05	CHIP R 0 OHM		
R157			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R159			RK73FB2A473J	CHIP R 47K J 1/10W		
R160			RK73FB2A104J	CHIP R 100K J 1/10W		
R161, 162			RK73FB2A473J	CHIP R 47K J 1/10W		
R165			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R166			RK73FB2A103J	CHIP R 10K J 1/10W		
R167-169			RK73FB2A473J	CHIP R 47K J 1/10W		
R171			RK73FB2A103J	CHIP R 10K J 1/10W		
R172			RK73FB2A101J	CHIP R 100 J 1/10W		
R173			RK73FB2A220J	CHIP R 22 J 1/10W		
R301			RK73FB2A104J	CHIP R 100K J 1/10W		
R302			RK73FB2A680J	CHIP R 68 J 1/10W		
R303			RK73FB2A104J	CHIP R 100K J 1/10W		
R304, 305			RK73FB2A103J	CHIP R 10K J 1/10W		
R306			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R307			RK73FB2A103J	CHIP R 10K J 1/10W		
R308			RK73FB2A101J	CHIP R 100 J 1/10W		
R309			R92-0670-05	CHIP R 0 OHM		
R310, 311			RK73FB2A271J	CHIP R 270 J 1/10W	K, K2	
R310, 311			RK73FB2A561J	CHIP R 560 J 1/10W	K3	
R312, 313			RK73FB2A103J	CHIP R 10K J 1/10W		
R314-317			RK73FB2A100J	CHIP R 10 J 1/10W		
R318			RK73FB2A103J	CHIP R 10K J 1/10W		
R319			RK73FB2A473J	CHIP R 47K J 1/10W		
R320			RK73FB2A101J	CHIP R 100 J 1/10W		
R321			RK73FB2A822J	CHIP R 8.2K J 1/10W		
R322			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R323			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R324			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R325			RK73FB2A103J	CHIP R 10K J 1/10W		
R326			RK73FB2A334J	CHIP R 330K J 1/10W		
R327			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R328			RK73FB2A101J	CHIP R 100 J 1/10W		
R329			RK73FB2A223J	CHIP R 22K J 1/10W		
R330, 331			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R332			RK73FB2A221J	CHIP R 220 J 1/10W		
R333			RK73FB2A273J	CHIP R 27K J 1/10W		
R334, 335			RK73FB2A103J	CHIP R 10K J 1/10W		
R336			RK73FB2A473J	CHIP R 47K J 1/10W		
R337			RK73FB2A394J	CHIP R 390K J 1/10W		
R338-340			RK73FB2A104J	CHIP R 100K J 1/10W		
R341			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R342			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R343			RK73FB2A104J	CHIP R 100K J 1/10W		
R344			RK73FB2A471J	CHIP R 470 J 1/10W		
R345			RK73FB2A560J	CHIP R 56 J 1/10W		
R346			RK73FB2A471J	CHIP R 470 J 1/10W		
R347			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R348			RK73FB2A6R8J	CHIP R 6.8 J 1/10W		
R349			RK73FB2A330J	CHIP R 33 J 1/10W		
R350-352			RK73FB2A102J	CHIP R 1.0K J 1/10W		

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TX-RX UNIT (X57-3960-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R353			RK73FB2A561J	CHIP R 560 J 1/10W		
R354			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R355			RK73FB2A271J	CHIP R 270 J 1/10W	K, K2	
R355			RK73FB2A391J	CHIP R 390 J 1/10W	K3	
R356			RK73FB2A100J	CHIP R 10 J 1/10W		
R357			RK73FB2A473J	CHIP R 47K J 1/10W		
R358			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R359			RK73FB2A473J	CHIP R 47K J 1/10W		
R360			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R361-364			RK73FB2A473J	CHIP R 47K J 1/10W		
R365			RK73FB2A101J	CHIP R 100 J 1/10W		
R366			RK73FB2A561J	CHIP R 560 J 1/10W		
R367			RK73FB2A151J	CHIP R 150 J 1/10W		
R368			RK73FB2A220J	CHIP R 22 J 1/10W		
R369			RK73FB2A221J	CHIP R 220 J 1/10W		
R370			R92-0670-05	CHIP R 0 0HM		
R371, 372			RK73FB2A103J	CHIP R 10K J 1/10W		
R373			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R401			R92-0670-05	CHIP R 0 0HM	K	
R402			R92-0670-05	CHIP R 0 0HM	K2	
R403			R92-0670-05	CHIP R 0 0HM	K3	
R501			RK73FB2A473J	CHIP R 47K J 1/10W		
R502			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R503			RK73FB2A103J	CHIP R 10K J 1/10W		
R504			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R505, 506			RK73FB2A2R2J	CHIP R 2.2 J 1/10W		
R507			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R508-510			RS14DB3F150J	FL-PROOF RS 15 J 3W		
VR101			R12-6738-05	TRIMMING POT.(4.7K)		
VR102			R12-6744-05	TRIMMING POT.(47K)		
VR301, 302			R12-6748-05	TRIMMING POT.(220K)		
VR303			R12-6742-05	TRIMMING POT.(22K)		
K501			S51-1420-05	RELAY(SP)		
K502			S76-0401-05	RELAY(POWER)		
S301			S31-1411-05	SLIDE SWITCH(NB ON/OFF)		
D101			02CZ18(X, Y)	DIODE		
D102			1SS181	DIODE		
D103			1SS184	DIODE		
D104			02CZ5.6(X, Y)	DIODE		
D105, 106			1SS184	DIODE		
D107-110			1SS226	DIODE		
D111			1SS184	DIODE		
D112			02CZ15(X, Y)	DIODE		
D301			1SS226	DIODE		
D302-305			1SV228	DIODE		
D306			1SS268	DIODE		
D501, 502			1SS193	DIODE		
D503			1SS184	DIODE		
IC101			TC4013BF	IC(D FLIP-FLAP X2)		
IC102			L78LR05B-FA	RESONATOR		
IC103			KCE04	IC		
IC104, 105			BU4094BF	IC(SHIFT/STORE REGISTER)		
IC104, 105			XRU4094BF	IC(SHIFT/STORE REGISTER)		
IC106			78312AGF3343BE	IC		

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TX-RX UNIT (X57-3960-XX)

VCO/PLL UNIT (X58-3850-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
IC107 IC108 IC109 IC110 IC110			TC74HC573AF 27C256QJEMD X24C04PI TC4S11F SC14S11F	IC(LATCH) IC IC IC(2 INPUT NAND GATE) IC(2 INPUT NAND GATE)		
IC301 IC302 IC303 IC304 IC304			MC3371D TC4S66F NJM78L05UA BU4094BF XRU4094BF	IC IC(BILATERAL SWITCH) IC(AVR/+5V) IC(SHIFT/STORE REGISTER) IC(SHIFT/STORE REGISTER)		
IC305 IC501 IC502 Q101-104 Q105			NJM4558E LA4491N UPC78M08H DTA114EK DTC114EK	IC(OP AMP) IC(AF POWER AMP) IC(VOLTAGE REGULATOR/ +8V) DIGITAL TRANSISTOR DIGITAL TRANSISTOR		
Q106 Q107 Q108-112 Q113 Q114, 115			2SC2712(Y) 2SD1757K DTC114EK 2SC2714(Y) DTC114EK	TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR		
Q116 Q301, 302 Q303-306 Q303-306 Q308, 309			DTD114EK 2SK1577(1) 2SK1577(1) 2SK1577(3) 2SK1577(1)	DIGITAL TRANSISTOR FET FET FET FET	K, K2 K3	
Q310 Q311 Q312 Q313, 314 Q315			2SC2714(Y) DTC114EK 2SK208(Y) 2SC2954 2SB1119(S)	TRANSISTOR DIGITAL TRANSISTOR FET TRANSISTOR TRANSISTOR		
Q316 Q317 Q318, 319 Q320 Q501			DTC114EK 2SB1119(S) DTC114EK 2SK1577(1) DTD114EK	DIGITAL TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR FET DIGITAL TRANSISTOR		
TH101 TH301			157-203-55009 157-102-53003	THERMISTER(20K) THERMISTER(1K)		
Z301 Z302 Z302 Z302			X58-3860-10 X58-3850-10 X58-3850-11 X58-3850-12	NB UNIT VCO/PLL UNIT VCO/PLL UNIT VCO/PLL UNIT	K K2 K3	
			212-6010-05	PLASTIC TUBE		
VCO/PLL UNIT (X58-3850-XX) -10 : K -11 : K2 -12 : K3						
C1 C2 ,3 C4 C5 C6			C92-0004-05 CK73FB1E103K CK73FB1H102K CC73FCH1H680J CC73FSL1H101J	ELECTRO CHIP C CHIP C CHIP C CHIP C	1.0UF 16WV 0.01UF K 1000PF K 68PF J 100PF J	
C7 C8 ,9 C10 C11 C12			CC73FCH1H680J CK73FB1H102K CK73FB1H102K CK73FB1E103K CC73FSL1H101J	CHIP C CHIP C CHIP C CHIP C CHIP C	68PF J 1000PF K 1000PF K 0.01UF K 100PF J	K, K2

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VCO/PLL UNIT (X58-3850-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C13			CC73FCH1H470J	CHIP C 47PF J		
C14			CK73FB1H102K	CHIP C 1000PF K		
C15 ,16			C92-0004-05	ELECTRO 1.0UF 16WV		
C17			CK73FB1H102K	CHIP C 1000PF K		
C18			CK73FB1H471K	CHIP C 470PF K		
C19			C92-0004-05	ELECTRO 1.0UF 16WV		
C20			CK73FB1H102K	CHIP C 1000PF K		
C21			C92-0002-05	CHIP TAN 0.22UF 35WV		
C22			C92-0543-05	CHIP TAN 3.3UF 10WV		
C23			C92-0003-05	CHIP TAN 0.47UF 25WV		
C24			CK73FB1E104K	CHIP C 0.10UF K		
C25			CK73FB1E103K	CHIP C 0.01UF K	K, K2	
C51			CK73FB1E103K	CHIP C 0.01UF K		
C52			CC73FCH1H020C	CHIP C 2.0PF C		
C53			CC73FCH1H020C	CHIP C 2.0PF C	K	
C53			CC73FCH1H040C	CHIP C 4PF C	K3	
C53			CC73FCH1H060D	CHIP C 6PF D	K2	
C54			CC73FCH1H470J	CHIP C 47PF J		
C55			CC73FCH1H220J	CHIP C 22PF J		
C56			CC73FCH1H560J	CHIP C 56PF J	K2, K3	
C56			CC73FCH1H820J	CHIP C 82PF J	K	
C57			CK73FB1E103K	CHIP C 0.01UF K		
C58			C92-0004-05	ELECTRO 1.0UF 16WV		
C59			CK73FB1H102K	CHIP C 1000PF K		
C60			CK73FB1E103K	CHIP C 0.01UF K		
C61			CK73FB1H102K	CHIP C 1000PF K		
C62			CK73FB1E103K	CHIP C 0.01UF K		
C63			CK73FB1H471K	CHIP C 470PF K		
C64			CK73FB1E103K	CHIP C 0.01UF K		
C65			CC73FCH1H070D	CHIP C 7PF D	K3	
C65			CC73FCH1H150J	CHIP C 15PF J	K2	
C65			CC73FCH1H180J	CHIP C 18PF J	K	
C66			CC73FCH1H470J	CHIP C 47PF J		
C67			CC73FCH1H220J	CHIP C 22PF J		
C68			CC73FCH1H560J	CHIP C 56PF J		
C69			CK73FB1E103K	CHIP C 0.01UF K		
C70			CK73FB1H102K	CHIP C 1000PF K		
C71			CK73FB1E103K	CHIP C 0.01UF K		
TC51, 52			C05-0371-05	TRIM CAP 10PF		
CN1			E40-5493-05	PIN CONNECTOR(15P)		
CN51			E40-5494-05	PIN CONNECTOR(7P)		
			F10-1480-03	SHIELDING PLATE		
L1 ,2			L40-2282-48	SMALL FIXED INDUCTOR(220N)		
L51			L40-6892-48	SMALL FIXED INDUCTOR(6.8U)		
L52			L34-4290-05	COIL(TX.VCO)	K	
L52			L34-4291-05	COIL(TX.VCO)	K2	
L52			L34-4292-05	COIL(TX.VCO)	K3	
L53			L40-6892-48	SMALL FIXED INDUCTOR(6.8U)		
L54			L34-4293-05	COIL(RX.VCO)	K2	
L54			L34-4294-05	COIL(RX.VCO)	K	
L54			L34-4295-05	COIL(RX.VCO)	K3	
L55			L40-1092-48	SMALL FIXED INDUCTOR(1U)		
R1			RK73FB2A330J	CHIP R 33 J 1/10W		

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VCO/PLL UNIT (X58-3850-XX)

NB UNIT (X58-3860-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
R2			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R3			RK73FB2A223J	CHIP R 22K J 1/10W		
R4			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R5			R92-0670-05	CHIP R 0 0HM		
R6			RK73FB2A223J	CHIP R 22K J 1/10W		
R8 , 9			RK73FB2A330J	CHIP R 33 J 1/10W		
R10			RK73FB2A333J	CHIP R 33K J 1/10W		
R11			RK73FB2A104J	CHIP R 100K J 1/10W		
R12			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R13			RK73FB2A101J	CHIP R 100 J 1/10W		
R14			RK73FB2A123J	CHIP R 12K J 1/10W		
R15			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R16			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R17			RK73FB2A473J	CHIP R 47K J 1/10W		
R18 , 19			R92-0670-05	CHIP R 0 0HM		
R20 , 21			RK73FB2A221J	CHIP R 220 J 1/10W		
R22			RK73FB2A561J	CHIP R 560 J 1/10W		
R23			RK73FB2A221J	CHIP R 220 J 1/10W		
R24			RK73FB2A103J	CHIP R 10K J 1/10W		
R25 , 26			R92-0670-05	CHIP R 0 0HM		
R51			RK73FB2A330J	CHIP R 33 J 1/10W		
R52 , 53			RK73FB2A103J	CHIP R 10K J 1/10W		
R54			RK73FB2A221J	CHIP R 220 J 1/10W	K2, K3	
R54			RK73FB2A271J	CHIP R 270 J 1/10W	K	
R55			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R56			RK73FB2A273J	CHIP R 27K J 1/10W		
R57			RK73FB2A471J	CHIP R 470 J 1/10W		
R58			RK73FB2A122J	CHIP R 1.2K J 1/10W	K	
R58			RK73FB2A152J	CHIP R 1.5K J 1/10W	K2	
R58			RK73FB2A222J	CHIP R 2.2K J 1/10W	K3	
R59			RK73FB2A104J	CHIP R 100K J 1/10W		
R60			RK73FB2A154J	CHIP R 150K J 1/10W		
R61			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R62			RK73FB2A103J	CHIP R 10K J 1/10W		
R63			RK73FB2A221J	CHIP R 220 J 1/10W	K2, K3	
R63			RK73FB2A271J	CHIP R 270 J 1/10W	K	
R64			RK73FB2A102J	CHIP R 1.0K J 1/10W		
D51			1SV228	DIODE		
D52			1SV164	DIODE		
D53			1SV228	DIODE		
IC1			MB1504PF	IC		
Q1			2SC2714(Y)	TRANSISTOR		
Q2			2SA1162(Y)	TRANSISTOR		
Q3			DTC143EK	DIGITAL TRANSISTOR		
Q4			2SA1312(GR)	TRANSISTOR		
Q5			2SC3324(G)	TRANSISTOR		
Q51			2SK508NV(K52)	FET		
Q52			DTC114EK	DIGITAL TRANSISTOR		
Q53			2SK508NV(K52)	FET		
Q54 , 55			DTC114EK	DIGITAL TRANSISTOR		
Q56			2SC2714(Y)	TRANSISTOR		
NB UNIT (X58-3860-10)						
C1			CK73FB1E103K	CHIP C 0.01UF K		
C2 , 3			C92-0543-05	CHIP TAN 3.3UF 10WV		

L:Scandinavia

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M:Other Areas

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PARTS LIST

× New Parts

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Telle ohne Parts No. werden nicht geliefert.

NB UNIT (X58-3860-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
C4			CC73FCH1H680J	CHIP C 68PF J		
C5			CK73FB1E104K	CHIP C 0.10UF K		
C6 ,7			CK73FB1E103K	CHIP C 0.01UF K		
C8			CC73FCH1H220J	CHIP C 22PF J		
C9			CC73FCH1H470J	CHIP C 47PF J		
C10			CK73FB1E103K	CHIP C 0.01UF K		
C11			CK73FB1E104K	CHIP C 0.10UF K		
C12			CC73FCH1H220J	CHIP C 22PF J		
C13 ,14			CK73FB1H102K	CHIP C 1000PF K		
C15 ,16			CK73FB1E103K	CHIP C 0.01UF K		
C17			C92-0543-05	CHIP TAN 3.3UF 10WV		
C18			CK73FB1E104K	CHIP C 0.10UF K		
C19			CK73FB1H102K	CHIP C 1000PF K		
C20			CC73FCH1H820J	CHIP C 82PF J		
C21			CC73FSL1H221J	CHIP C 220PF J		
C22 -24			CK73FB1E103K	CHIP C 0.01UF K		
C25			CC73FSL1H221J	CHIP C 220PF J		
C51			CC73FCH1H390J	CHIP C 39PF J		
C52			CC73FSL1H101J	CHIP C 100PF J		
C53			CC73FSL1H331J	CHIP C 330PF J		
C54 ,55			CC73FSL1H221J	CHIP C 220PF J		
C56			CC73FSL1H331J	CHIP C 330PF J		
C57			CC73FSL1H181J	CHIP C 180PF J		
C58 ,59			CC73FSL1H271J	CHIP C 270PF J		
C60			CC73FSL1H331J	CHIP C 330PF J		
C61			CC73FSL1H181J	CHIP C 180PF J		
C62 ,63			CC73FSL1H221J	CHIP C 220PF J		
C64			CC73FSL1H331J	CHIP C 330PF J		
C65			CC73FSL1H101J	CHIP C 100PF J		
C66			CC73FCH1H390J	CHIP C 39PF J		
CN51,52			B40-0411-05	PIN CONNECTOR(4P)		
			F11-1122-24	SHIELDING CASE		
L1			L40-1001-48	SMALL FIXED INDUCTOR(10U)		
L2			L40-5695-48	SMALL FIXED INDUCTOR(5.6U)		
L3			L40-1011-48	SMALL FIXED INDUCTOR(100U)		
L4			L40-5695-48	SMALL FIXED INDUCTOR(5.6U)		
L51			L40-2782-48	SMALL FIXED INDUCTOR(27U)		
L52			L40-6882-48	SMALL FIXED INDUCTOR(68U)		
L53			L40-1092-48	SMALL FIXED INDUCTOR(1U)		
L54 -57			L40-1292-48	SMALL FIXED INDUCTOR(1.2U)		
L58			L40-1092-48	SMALL FIXED INDUCTOR(1U)		
L59			L40-6882-48	SMALL FIXED INDUCTOR(68U)		
L60			L40-2782-48	SMALL FIXED INDUCTOR(27U)		
R1			R92-0670-05	CHIP R 0 OHM		
R2			RK73FB2A333J	CHIP R 33K J 1/10W		
R3			RK73FB2A104J	CHIP R 100K J 1/10W		
R4			RK73FB2A103J	CHIP R 10K J 1/10W		
R5			RK73FB2A104J	CHIP R 100K J 1/10W		
R6			RK73FB2A471J	CHIP R 470 J 1/10W		
R7			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R8			RK73FB2A101J	CHIP R 100 J 1/10W		
R9			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R10			RK73FB2A330J	CHIP R 33 J 1/10W		

L:Scandinavia

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PARTS LIST

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NB UNIT (X58-3860-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R11			RK73FB2A273J	CHIP R 27K J 1/10W		
R12 ,13			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R14			RK73FB2A563J	CHIP R 56K J 1/10W		
R15			RK73FB2A104J	CHIP R 100K J 1/10W		
R16			RK73FB2A684J	CHIP R 680K J 1/10W		
R17			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R18			RK73FB2A223J	CHIP R 22K J 1/10W		
R19			RK73FB2A103J	CHIP R 10K J 1/10W		
R20			RK73FB2A151J	CHIP R 150 J 1/10W		
R21			RK73FB2A104J	CHIP R 100K J 1/10W		
R22			RK73FB2A334J	CHIP R 330K J 1/10W		
R23			RK73FB2A684J	CHIP R 680K J 1/10W		
R24			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R26			RK73FB2A223J	CHIP R 22K J 1/10W		
R27			RK73FB2A101J	CHIP R 100 J 1/10W		
R28			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R29			RK73FB2A103J	CHIP R 10K J 1/10W		
R30 ,31			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R32			RK73FB2A101J	CHIP R 100 J 1/10W		
D2			1SS184	DIODE		
IC1			MC1350D	IC		
Q1			3SK131(M)	FET		
Q2			2SA1162(Y)	TRANSISTOR		
Q3 -6			2SC2712(Y)	TRANSISTOR		
Q7			2SA1162(Y)	TRANSISTOR		

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KCH-3

DISPLAY UNIT (X54-3100-20)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
KCH-3						
201	2C		A22-0776-02	SUB PANEL		
202	1C		A62-0063-03	PANEL		
			A62-0064-13	PANEL ASSY		
205	2C		B10-1162-14	FRONT GLASS		
			B42-3317-04	LABEL(S/NO)		
			E37-0157-05	CONNECTING WIRE		
			E37-0159-05	CONNECTING WIRE		
211	1C		G09-0405-05	SPRING		
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		N99-0364-05	SCREW SET		
227	3D		T07-0247-05	LOUDSPEAKER(FULLRANGE)		
229	3C		X54-3100-20	DISPLAY UNIT		
			212-3302-05	PLASTIC TUBE		
DISPLAY UNIT (X54-3100-20)						
D6			B38-0322-05	LED ASSY		
ED1			B38-0353-05	LCD		
C1 -4			CC73FSL1H101J	CHIP C 100PF K		
C5			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		
CN1			E29-0497-04	CONNECTOR		
CN2			E40-3241-05	PIN CONNECTOR(6P)		
CN3			E40-3255-05	PIN CONNECTOR(11P)		
CN4			E40-3247-05	PIN CONNECTOR(3P)		
			E40-3237-05	PIN CONNECTOR(2P)		
J1			E08-0673-05	RECTANGULAR RECEPTACLE(MIC)		
W1			E37-0118-05	CONNECTING WIRE		

L:Scandinavia

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DISPLAY UNIT (X54-3100-20)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
			G13-0656-04	CUSHION		
			J21-4343-04	MOUNTING HARDWARE		
X1			L78-0043-05	RESONATOR(4.19MHZ)		
R1 ,2			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R3			RK73FB2A681J	CHIP R 680 J 1/10W		
R4			RK73FB2A821J	CHIP R 820 J 1/10W		
R5			RK73FB2A561J	CHIP R 560 J 1/10W		
R6			R92-1281-05	FIXED RESISTOR 4.7		
R7			RK73FB2A820J	CHIP R 82 J 1/10W		
R8 -13			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R14			RK73FB2A473J	CHIP R 47K J 1/10W		
R15 ,16			RK73FB2A101J	CHIP R 100 J 1/10W		
R17			RK73FB2A181J	CHIP R 180 J 1/10W		
R18			R92-0670-05	CHIP R 0 OHM		
R19			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R20			R92-0670-05	CHIP R 0 OHM		
VR1			R05-3457-05	POTENTIOMETER(10)		
S1			S40-1420-05	PUSH SWITCH		
S2 -5			S70-0410-15	TACT SWITCH		
S10			W02-0393-05	ENCORDER		
D1 -4			1SS226	DIODE		
D5			1SS181	DIODE		
IC1			75328GC5563B9	IC		
IC2			L78LR05B-FA	IC		
Q1			DTD114EK	DIGITAL TRANSISTOR		
Q2			DTC114EK	DIGITAL TRANSISTOR		

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KCH-4

DISPLAY UNIT (X54-3110-20)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
KCH-4						
301	2E		A22-0777-02	SUB PANEL		
302	1E		A62-0066-03 A62-0067-13	PANEL PANEL ASSY		
305	2F		B10-1163-14 B42-3317-04	FRONT GLASS LABEL (S/NO)		
308	1E		G09-0405-05	SPRING		
310	2L		H10-2725-02	POLYSTYRENE FOAMED FIXTURE		
311	1K		H11-0847-04	POLYSTYRENE PLATE		
312	1L		H13-0854-04	PACKING FIXTURE		
313	2L		H25-0029-04	PROTECTION BAG		
314	2L		H25-0096-04	PROTECTION BAG		
315	2K		H25-0103-04	PROTECTION BAG		
316	3K		H52-0109-04	ITEM CARTON BOX		
318	1E		K29-4664-04	KNOB(VOL,CH)		
319	2E		K29-4666-02	KEY TOP		
320	2L		K29-4704-04 K29-4893-04	KNOB ASSY KNOB(HC,SGL)		
K	3E, 3F		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
L	3E, 3F		N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
322	2L		N99-0364-05	SCREW SET		
324	3E, 3F		X54-3110-20	DISPLAY UNIT		
DISPLAY UNIT (X54-3110-20)						
D7			B38-0352-05	LED ASSY		
ED1			B38-0354-05	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			C92-0038-05	ELECTRO 22UF 16WV		
C30			CK73FB1H102K	CHIP C 1000PF K		
C31			CK73FB1E103K	CHIP C 0.01UF K		
C32 -37			CC73FSL1H101J	CHIP C 100PF J		
CN1			E02-2010-05	IC SOCKET		
CN2			E29-0496-04	CONNECTOR		
CN3			E40-3241-05	PIN CONNECTOR(6P)		
			E40-3255-05	PIN CONNECTOR(11P)		
			E40-3247-05	PIN CONNECTOR(3P)		
J1			E08-0673-05	RECTANGULAR RECEPTACLE(MIC)		
W1			E37-0118-05	CONNECTING WIRE		
			G13-1353-04	CUSHION		
			J21-4342-04	MOUNTING HARDWARE		
X1			L78-0043-05	RESONATOR(4.19MHZ)		

L:Scandinavia

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DISPLAY UNIT (X54-3110-20)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
R1	,2		RK73FB2A102J	CHIP R 1.0K J 1/10W		
R3			RK73FB2A681J	CHIP R 680 J 1/10W		
R4			RK73FB2A821J	CHIP R 820 J 1/10W		
R5			RK73FB2A561J	CHIP R 560 J 1/10W		
R6			R92-1281-05	FIXED RESISTOR 4.7 J 1/2W		
R7			RK73FB2A821J	CHIP R 820 J 1/10W		
R8	-13		RK73FB2A102J	CHIP R 1.0K J 1/10W		
R14			RK73FB2A473J	CHIP R 47K J 1/10W		
R15	,16		R92-1280-05	FIXED RESISTOR 390 J 1/2W		
R17	,18		RK73FB2A181J	CHIP R 180 J 1/10W		
R19	,20		RK73FB2A152J	CHIP R 1.5K J 1/10W		
R21	,22		RK73FB2B471J	CHIP R 470 J 1/8W		
R23	-26		RK73FB2A102J	CHIP R 1.0K J 1/10W		
R27	,28		RK73FB2A473J	CHIP R 47K J 1/10W		
R29	-32		RK73FB2A101J	CHIP R 100 J 1/10W		
R33			R92-0670-05	CHIP R 0 0HM		
R34			RK73FB2A103J	CHIP R 10K J 1/10W		
R35			R92-0670-05	CHIP R 0 0HM		
R36			RK73FB2A473J	CHIP R 47K J 1/10W		
VR1			R05-3457-05	POTENTIOMETER(10K)		
S1			S40-1420-05	PUSH SWITCH		
S2	-9		S70-0410-15	TACT SWITCH		
S10			W02-0393-05	ENCORDER		
D1	-4		1SS226	DIODE		
D5			1SS181	DIODE		
D6			02CZ10(X,Y)	DIODE		
IC1			75328GC5563B9	IC		
IC2			L78LR05B-FA	IC		
IC3			X24C04PI	IC		
IC4			MSM5265GS-V1K	IC(LCD DRIVER)		
Q1			DTD114EK	DIGITAL TRANSISTOR		
Q2			2SC2873(Y)	TRANSISTOR		
Q3			PMCS	TRANSISTOR		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)

T:England

E:Europe

Y:AAFES(Europe)

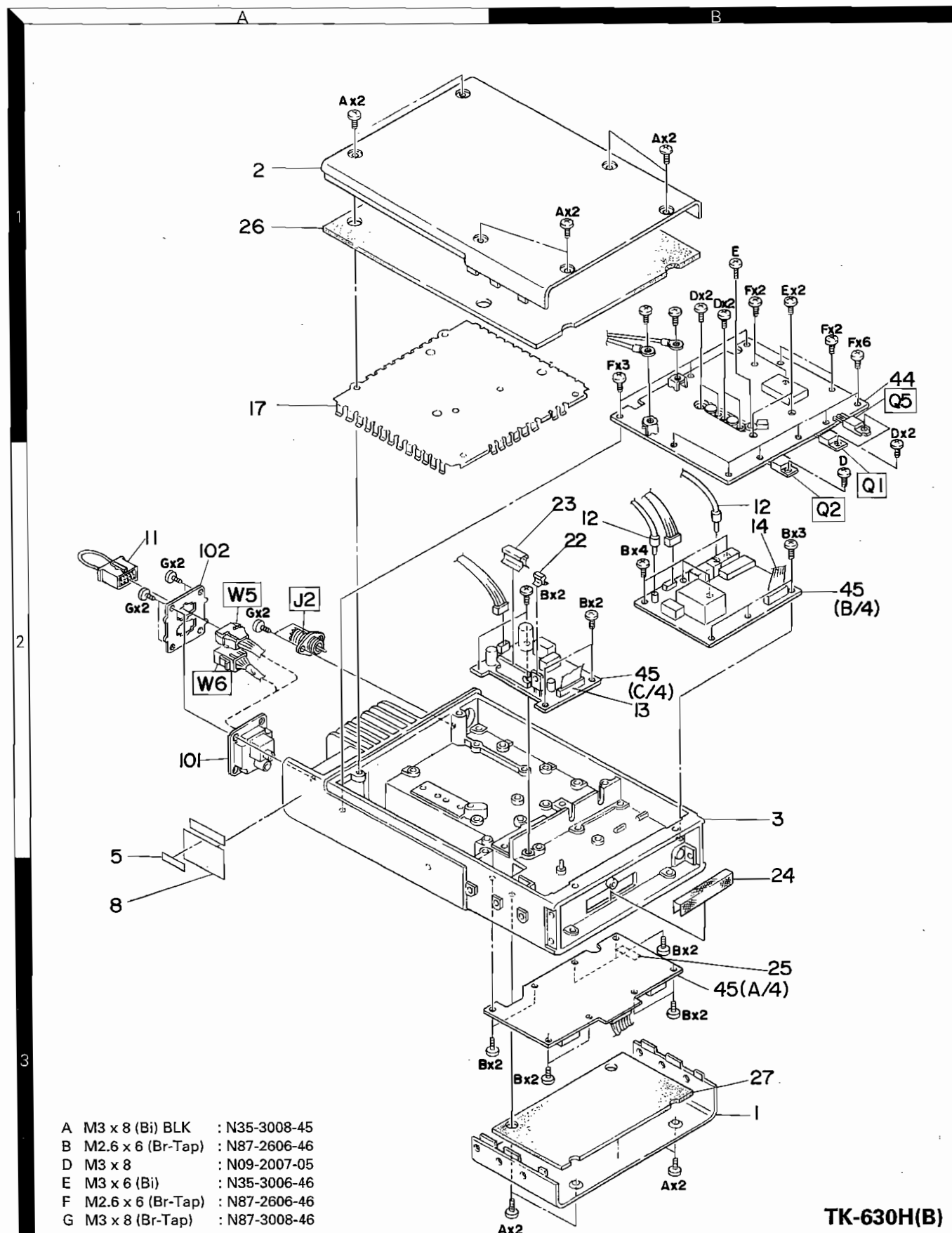
X:Australia

M:Other Areas

△ indicates safety critical components.

TK-630H(B)

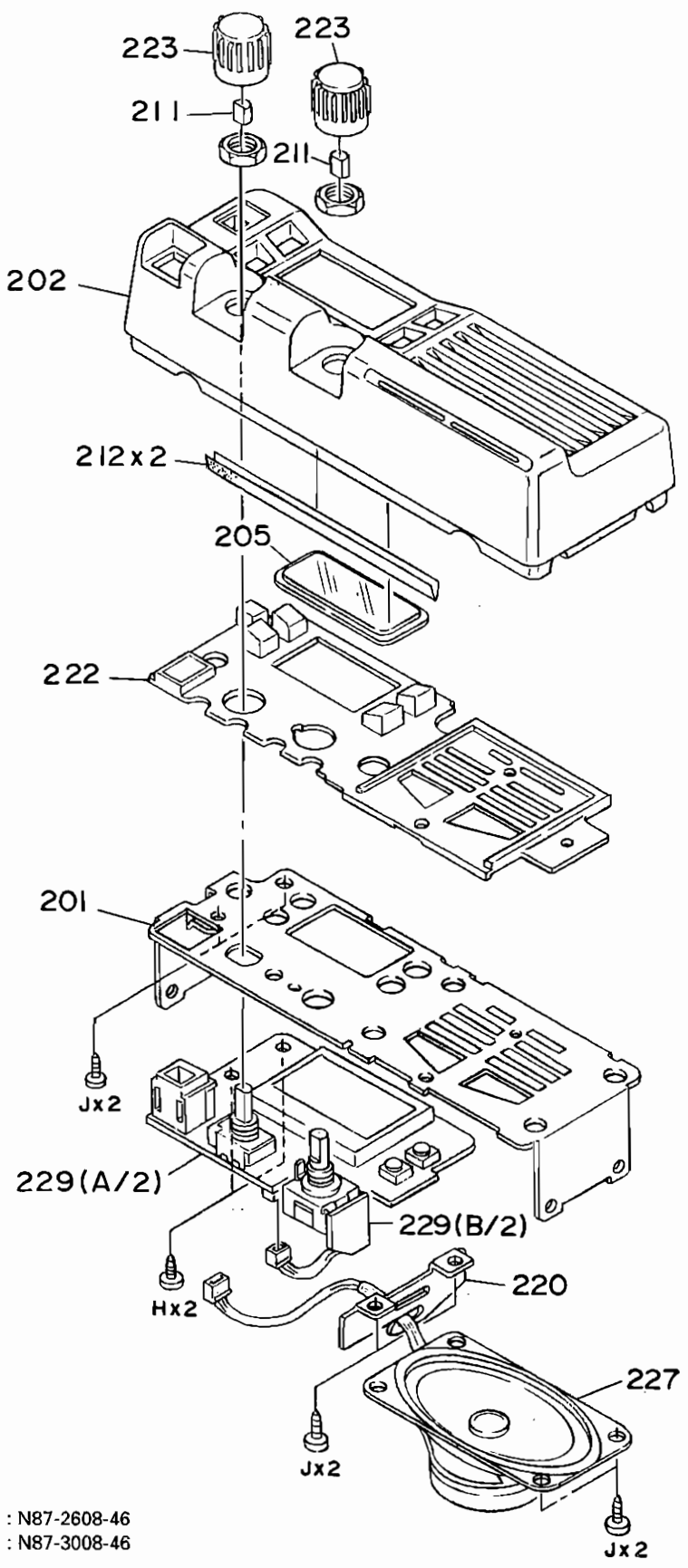
EXPLODED VIEW



- A M3 x 8 (Bi) BLK : N35-3008-45
- B M2.6 x 6 (Br-Tap) : N87-2606-46
- D M3 x 8 : N09-2007-05
- E M3 x 6 (Bi) : N35-3006-46
- F M2.6 x 6 (Br-Tap) : N87-2606-46
- G M3 x 8 (Br-Tap) : N87-3008-46

TK-630H(B)

EXPLODED VIEW

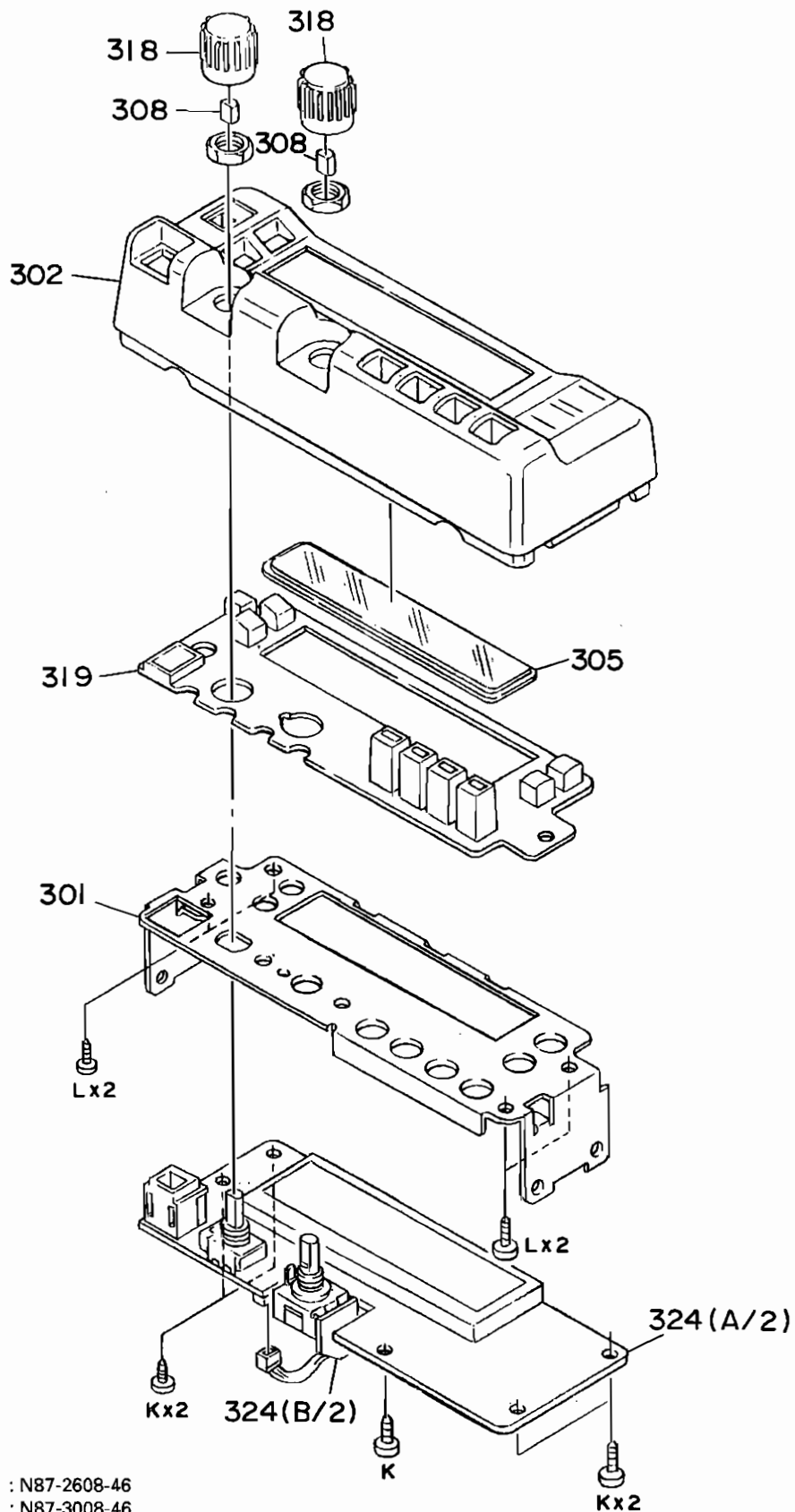


H M2.6 x 8 (Br-Tap) : N87-2608-46
J M3 x 8 (Br-Tap) : N87-3008-46

KCH-3

TK-630H(B)

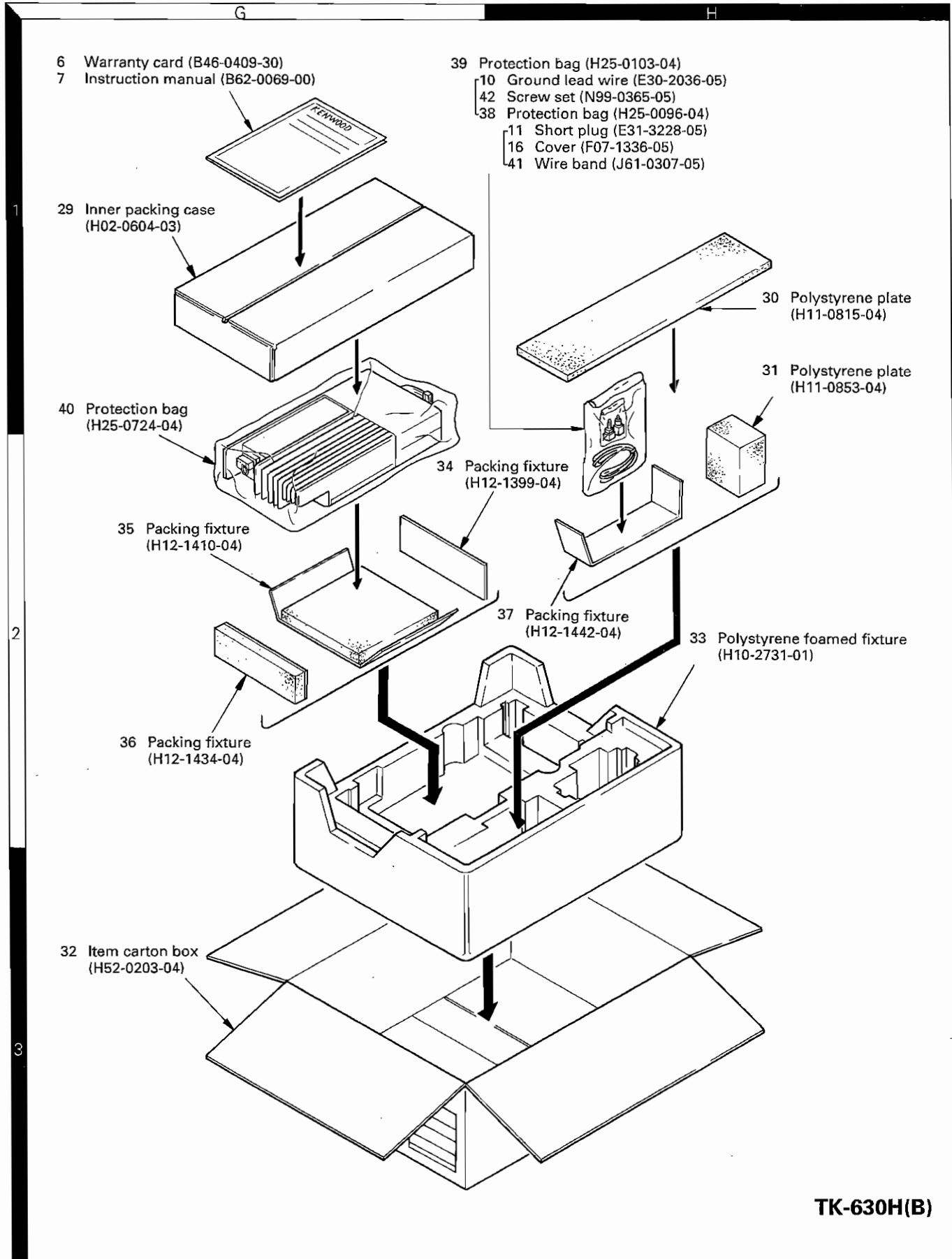
EXPLODED VIEW



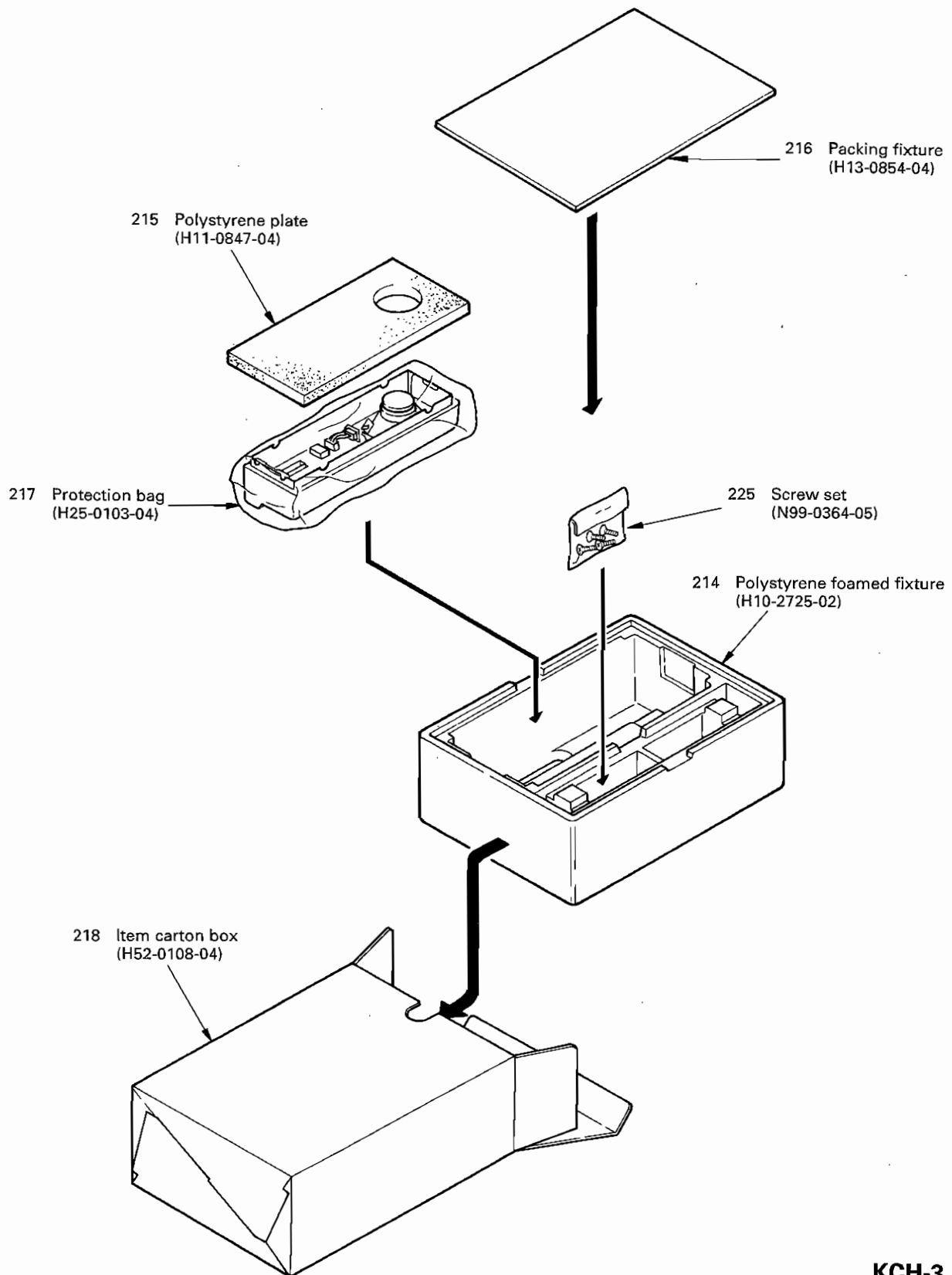
K M2.6 x 8 (Br-Tap) : N87-2608-46
L M3 x 8 (Br-Tap) : N87-3008-46

KCH-4

PACKING

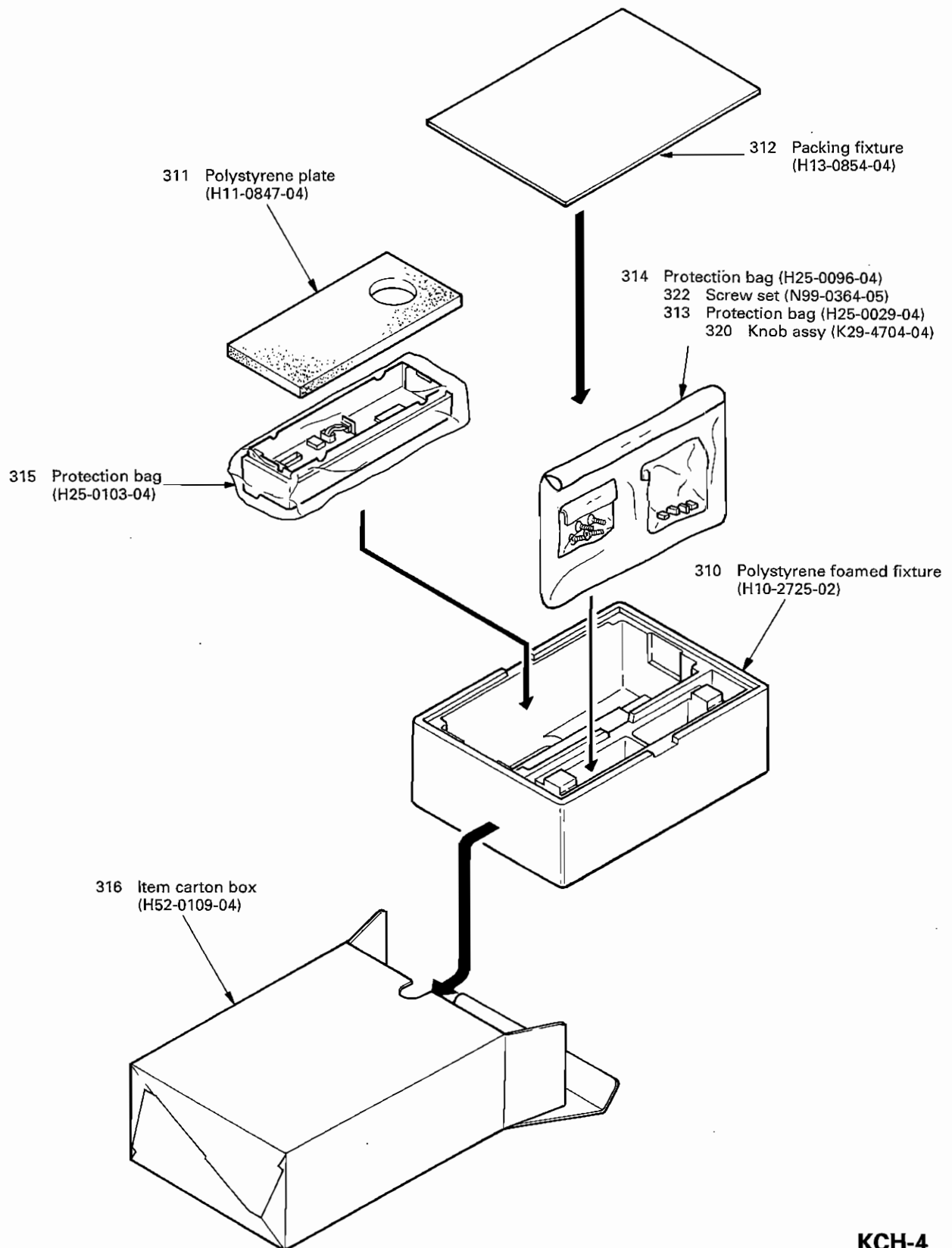


PACKING



KCH-3

PACKING



KCH-4

ADJUSTMENT

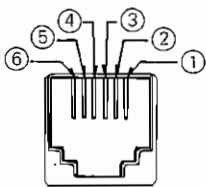
Test Equipment Required for Alignment

No.	Test Equipment	Major Specifications
1	Standard Signal Generator (SSG)	Frequency Range: 100MHz or more. Modulation: Frequency modulation and external modulation. Output: 0.1 μ V to greater than 1mV.
2	Power Meter	Input Impedance: 50 Ω . Operation Frequency: 100MHz or more. Measurement Capability: Vicinity of 200W.
3	Deviation Meter	Frequency Range: 100MHz or more.
4	Digital Volt Meter (DVM)	Measuring Range: 1 to 20V DC. Accuracy: High input impedance for minimum circuit loading.
5	Oscilloscope	DC through 30MHz.
6	High Sensitivity Frequency Counter	Frequency Range: 10Hz to 100MHz. Frequency Stability: 0.2ppm or less.
7	Ammeter	30A.
8	AF Volt Meter (AFVTVM)	Frequency Range: 50Hz to 10kHz. Voltage Range: 3mV to 3V.
9	Audio Generator (AG)	Frequency Range: 50Hz to 5kHz or more. Output: 0 to 1V.
10	Distortion Meter	Capability: 3% or less at 1kHz. Input Level: 50mV to 10Vrms.
11	Voltmeter	Measuring Range: 10 to 1.5V DC or less. Input Impedance: 50k Ω /V or greater.
12	4 Ω Dummy Load	Approx. 4 Ω , 30W.
13	Regulated Power Supply	13.4V, approx. 30A (adjustable from 9 to 17 V). Useful if ammeter equipped.
14	Pulse Generator	Output: 0.5Vp-p/50 Ω or more.

Caution

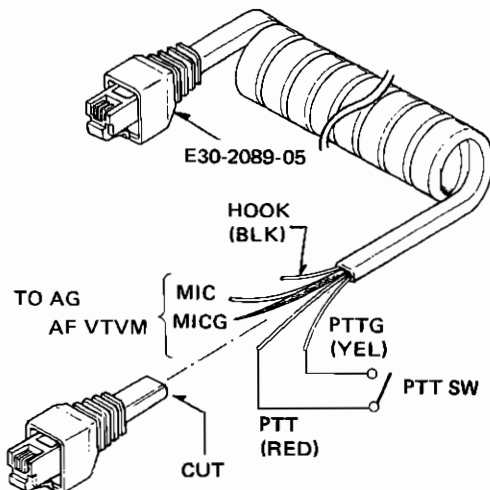
Since the RX AF output is a BTL output, there is a DC component. Isolate this with a capacitor or transformer as shown in the figure.

MIC connector front view

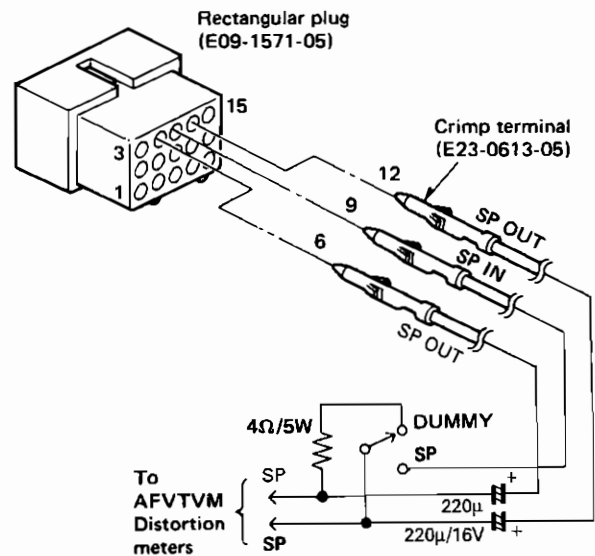


- ① SB
- ② PTTG
- ③ PTT
- ④ MICG
- ⑤ MIC
- ⑥ HOOK

● The following test cables are recommended.



Test cable for Microphone input

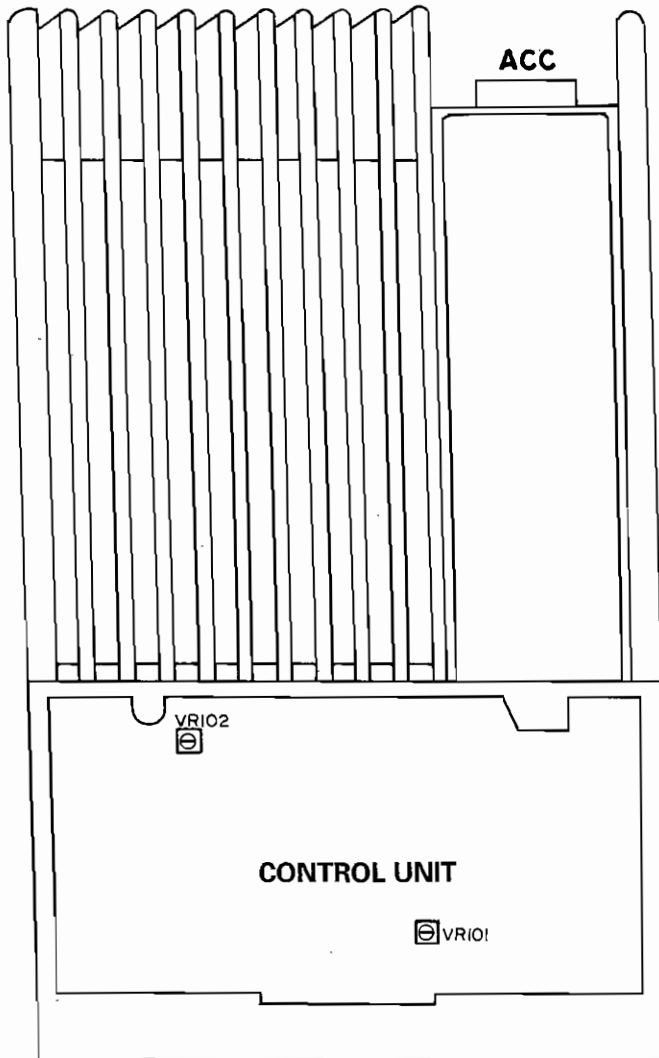


Test cable for Speaker output

ADJUSTMENT

Adjustment Points

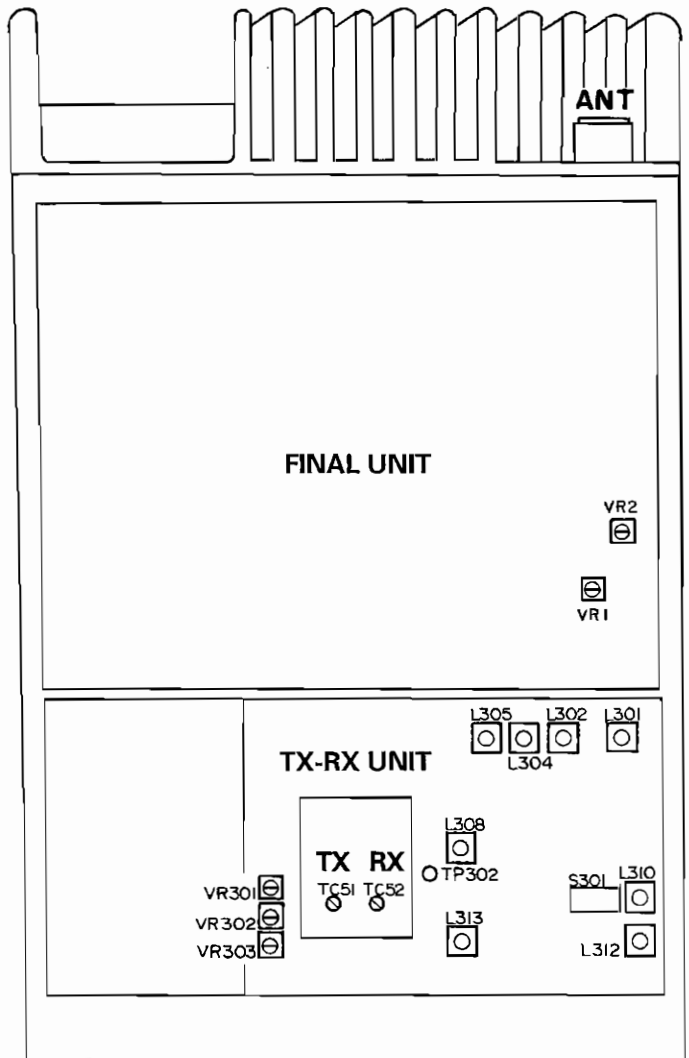
- Upper side



CONTROL UNIT

VR101 : MIC sensitivity
VR102 : Squelch

- Lower side



TX-RX UNIT

L301, 302, 304, 305, 308 : BPF
L308, 310, 312, 313 : Distortion
VR301 : QT
VR302 : DQT
VR303 : Maximum deviation

VCO/PLL

TC51, 52 : PLL lock voltage

FINAL UNIT

VR1, 2 : Power (APC)

TK-630H(B)

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

		K	K2	K3			K	K2	K3
CH1	fTX1 (MHz)	33.300	39.000	45.500	CH7	fTX7 (MHz)	33.300	39.000	45.500
	fRX1 (MHz)	33.340	39.040	45.540		fRX7 (MHz)	33.300	39.000	45.500
	TONE	-	-	-		TONE	QT 210.7Hz	QT 210.7Hz	QT 210.7Hz
CH2	fTX2 (MHz)	29.700	35.000	41.000	CH8	fTX8 (MHz)	33.240	38.900	45.400
	fRX2 (MHz)	29.740	35.040	41.040		fRX8 (MHz)	33.240	38.900	45.400
	TONE	-	-	-		TONE	-	-	-
CH3	fTX3 (MHz)	36.980	42.980	49.980	CH9	fTX9 (MHz)	31.600	37.500	43.240
	fRX3 (MHz)	36.940	42.940	49.940		fRX9 (MHz)	31.600	37.500	43.240
	TONE	-	-	-		TONE	QT 131.2Hz	QT 131.2Hz	QT 131.2Hz
CH4	fTX4 (MHz)	33.300	39.000	45.500	CH10	fTX10 (MHz)	31.600	37.500	43.240
	fRX4 (MHz)	33.300	39.000	45.500		fRX10 (MHz)	31.600	37.500	43.240
	TONE	DQT 754N	DQT 754N	DQT 754N		TONE	DQT 023N	DQT 023N	DQT 023N
CH5	fTX5 (MHz)	33.300	39.000	45.500	CH11	fTX11 (MHz)	31.600	37.500	43.240
	fRX5 (MHz)	33.300	39.000	45.500		fRX11 (MHz)	31.600	37.500	43.240
	TONE	QT 151.4Hz	QT 151.4Hz	QT 151.4Hz		TONE	QT 100Hz	QT 100Hz	QT 100Hz
CH6	fTX6 (MHz)	33.300	39.000	45.500	CH12	fTX12 (MHz)	31.600	37.500	43.240
	fRX6 (MHz)	33.300	39.000	45.500		fRX12 (MHz)	31.600	37.500	43.240
	TONE	QT 67.0Hz	QT 67.0Hz	QT 67.0Hz		TONE	DQT 444N	DQT 444N	DQT 444N


The set frequency is subject to change without prior notice.

If sensitivity suppression occurs due to internal beat with the operating frequency (30, 36, 42, and 48MHz), remove R150 (0Ω) in the control unit (X57-3960-XX A/3).

Alignment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Connect the front panel (KCH-4) to the TK-630H(B). 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) Final unit VR1 and VR2 : 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	TP302	TX-RX (Z302)	TC52	6.5V ADJ. <i>4.5-6.5</i>	±0.1V
	TC51					6.5V ADJ.	±0.1V	
	3) CH : CH2 Receive						Check	1.7V or more.
	4) CH : CH2 Transmit (PTT : ON)							1.3V or more.
3. Transmit frequency check	1) CH : CH1 ANT : Power meter PTT : ON	Power meter f. counter	Rear panel	ANT			Check	frx1 ± 50Hz K frx1 ± 60Hz K2 frx1 ± 70Hz K3
4. Power adjustment (APC)	1) CH : CH1 PTT : ON	Power meter Ammeter	Rear panel	ANT	Final	VR2	120W ADJ.	±3W
						VR1	MAX CCW. 115W ADJ.	45W or less. ±5W, 20A or less.
	2) CH : CH2, CH3 PTT : ON						Check	115W ± 11W 20A or less.
5. DQT	1) CH : CH4 Deviation meter filter HPF : OFF LPF : 3kHz De-emphasis : 750µs AG : 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 : 750µs AG : OFF PTT : ON						VR301	±0.75kHz
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 : 750µs PTT : ON	Power meter Deviation meter AF VTVM AG Oscilloscope	Rear panel	ANT	TX-RX	VR303	±4.2kHz Adjust one more than the other by switching between -P and +P. <i>4.6</i>	±100Hz <i>100µV</i> <i>2V</i> <i>SWAN</i>
8. MIC sensitivity adjustment	1) CH : CH1 Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : 750µs (P-P)/2 AG : 1kHz/5mV PTT : ON						CONT	VR101

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
9. Distortion adjustment	1) CH : CH1 SSG frequency : frx1 Output : 500 μ V/-53dBm MOD : 1kHz DEV : \pm 3kHz AF : 1.4V/4 Ω	SSG AF VTVM Distortion meter Oscilloscope 4 Ω dummy load	Rear panel	ANT ACC (EXT.SP)	TX-RX	L310 L312 L308	Adjust for minimum distortion.	Distortion : 3% or less	
						L308 L313	Turn core CCW to one turn. Adjust for maximum AF output.		
10. BPF adjustment	1) CH : CH2 SSG frequency : frx2 Output : 0.5 μ V/-113dBm MOD : 1kHz DEV : \pm 3kHz	SSG AF VTVM Distortion meter Oscilloscope	Rear panel	ANT ACC (EXT.SP)	TX-RX	L301 L302 L304 L305 L308	Adjust for maximum SINAD		
11. Sensitivity adjustment	1) CH : CH1-CH3 SSG frequency : frx1-frx3 Output : 0.25 μ V/-119dBm MOD : 1kHz DEV : \pm 3kHz AF : 1.4V/4 Ω								Check
12. NB	1) CH : CH3 SSG frequency : frx3 Output : 0.8 μ V/-109dBm Pulse generator Output : 0.5Vp-p/50 Ω Cycle : 2 μ sec Pulse width : 10ms NB switch (S301) : ON	SSG Pulse generator Distortion meter Oscilloscope AF VTVM	Rear panel	ANT			Check	SINAD 12dB or more.	
13. Squelch adjustment	1) CH : CH1 SSG frequency : frx1 Output : Value when 3dB is subtracted from the sensitivity value of 12dB SINAD. MOD : 1kHz DEV : \pm 3kHz	SSG Distortion meter Oscilloscope	Rear panel	ANT	CONT	VR102	Set to threshold point.		
	2) SSG output : 8dB SINAD							Check	Squelch open
	3) SSG output : OFF								

TERMINAL FUNCTIONS

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
FINAL UNIT (X45-3440-XX)				
CN1 To TX-RX unit	1	RA	O	Receiver signal output, coaxial connector.
CN2 To TX-RX unit	1	DO	I	Transmission signal input, coaxial connector. (200mW)
CN3	1	B	I	Power supply input. (13.4V ±15%)
CN4	1	E	-	Earth.
W1 To AF unit	1	E	-	Earth.
	2	B	O	Power supply output. (13.4V ±15%)
	3	B	O	Power supply output. (13.4V ±15%)
W2 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.
CONTROL UNIT (X57-3960-XX) (A/3)				
CN101 To AF unit	1	8C	I	Common 8V. (8V ± 5%)
	2	SB	I	Power input after power switch. (13.4V ± 15%)
	3	SB	I	Power input after power switch. (13.4V ± 15%)
	4	SB	I	Power input after power switch. (13.4V ± 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	NC	-	Not use.
	13	NC	-	Not use.
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.
	8	RXD	I	RX DATA input for HEAD 2.

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	9	BZ2	O	Beep output for HEAD 2.
	10	5C	O	Common 5V. (5V ± 5%)
	11	DE3	O	Detection signal output for HEAD 2.
CN104 To ACC connector	1	MIC	I/O	MIC signal input/output.
	2	ME	-	MIC earth.
	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.
	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. (13.4V/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	O	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	4	O	SCRAMBLE code output.
	12	8	O	SCRAMBLE code output.
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. (13.4V ± 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).
	7	DD	I/O	DATA signal input/output for display unit (option).
	8	VOL	I	Electronic volume control signal input.
	9	E	-	Earth.

TERMINAL FUNCTIONS

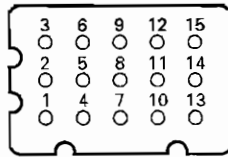
Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	10	MIC	I	MIC signal input.
	11	ME	-	MIC earth.
TX-RX UNIT (X57-3960-XX) (B/3)				
CN301 To final unit	1	RA	I	Receiver signal input, coaxial connector.
CN302 To control unit	1	DP	I	DATA input for PLL.
	2	EP	I	ENABLE input for PLL.
	3	CP	I	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	NC	-	Not use.
	13	NC	-	Not use.
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.
CN306 To VCO/PLL unit	1	REF	O	TCXD 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%)
AF UNIT (X57-3960-XX) (C/3)				
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.
	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. (13.4V ± 15%)

Connector No.	Terminal No.	Terminal Name	I/O	Terminal Function
	15	SB	O	Power output after power switch. (13.4V ± 15%)
	16	SB	O	Power output after power switch. (13.4V ± 15%)
	17	8C	O	Common 8V. (8V ± 5%)
CN502 To final unit	1	E	-	Earth.
	2	B	I	Power supply input. (13.4V ± 15%)
	3	B	I	Power supply input. (13.4V ± 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. (RS2 ↔ 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. (13.4V)
	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 FUNCTIONS

1. Functions of Pins Used During System Set-up

1-1. 15-pin ACC terminal



- 1 pin : HK (MIC Hook Signal Input/Output)
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.
- 2 pin : ME (MIC Earth)
Use this MIC earth pin if the ACC terminal MIC is used.
- 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)
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.
- 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 13.4V (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. (B51-8155-10)
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 (X57-3960-XX) (A/3)

• 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)

TK-630H(B)

TERMINAL FUNCTIONS

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.

• 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

} AF signal input/output pins when scrambler is connected

9 pin : 0

10 pin : 2

11 pin : 4

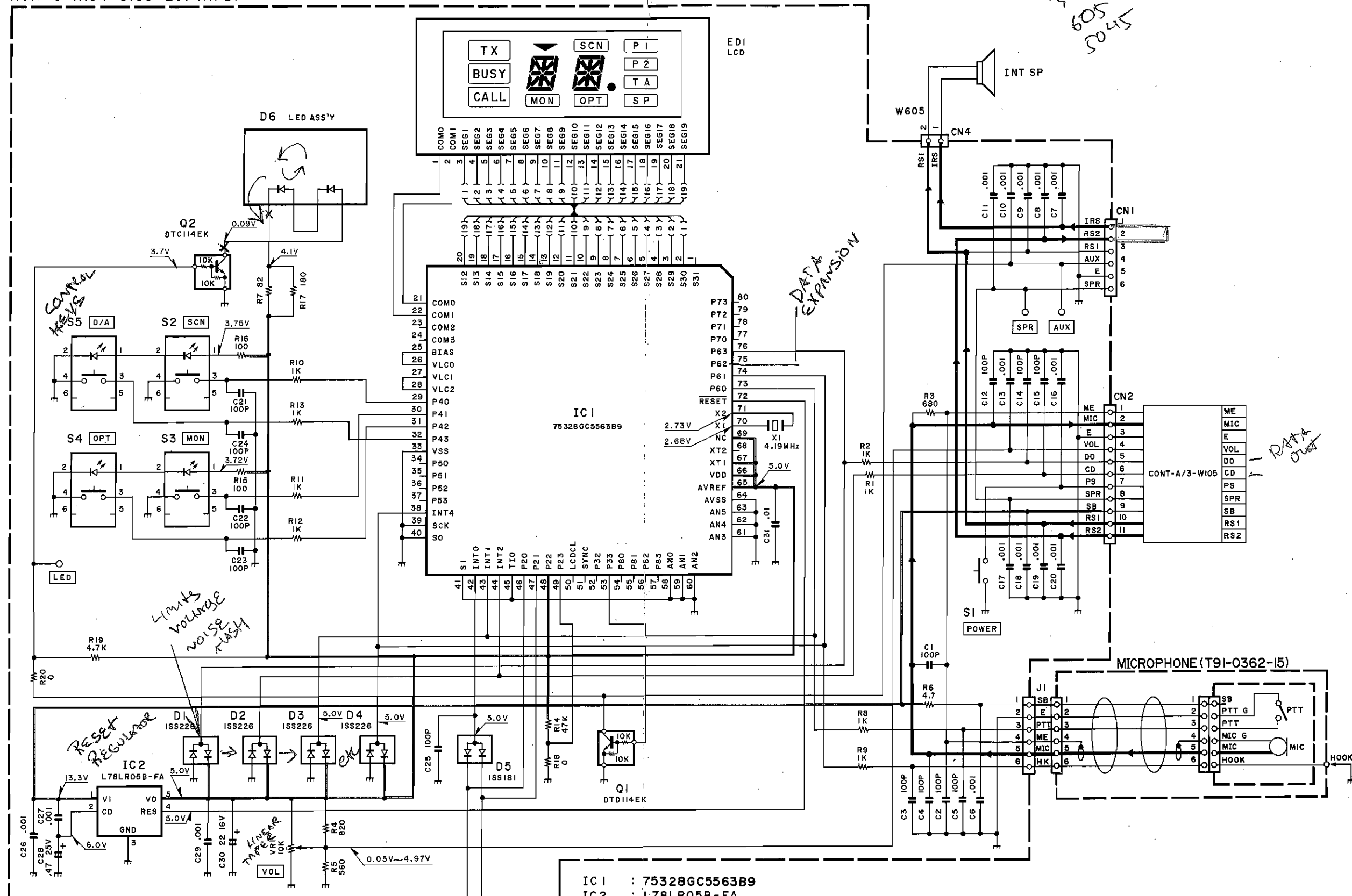
12 pin : 8

} Scrambler code output.

} See the optional (scrambler) function (page 18).

TK-630H(B) CIRCUIT DIAGRAM

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



*KENWOOD
BBS
3/10
605
5045*

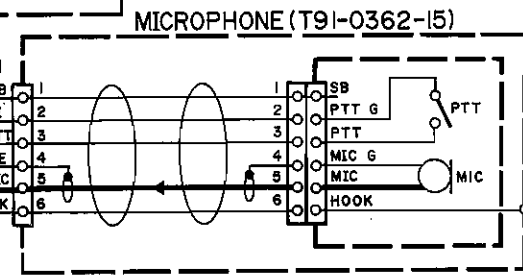
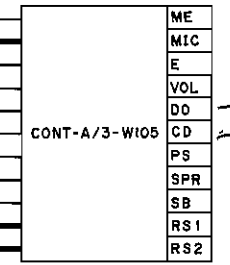
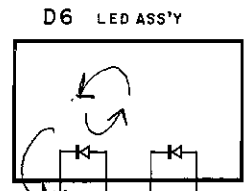
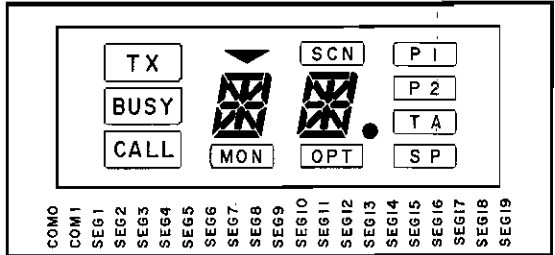
DATA EXPANSION

*CONTROL
KEYS*

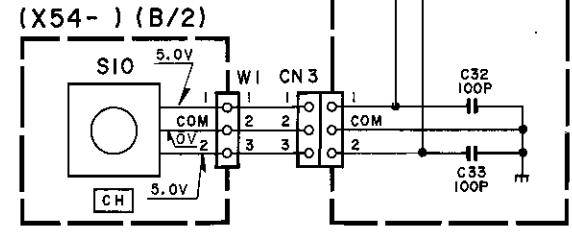
*Limits
voltage
noise
RASH*

*Reset
REGULATOR*

*Pulse
TYPE
GIMMEL
SEL*

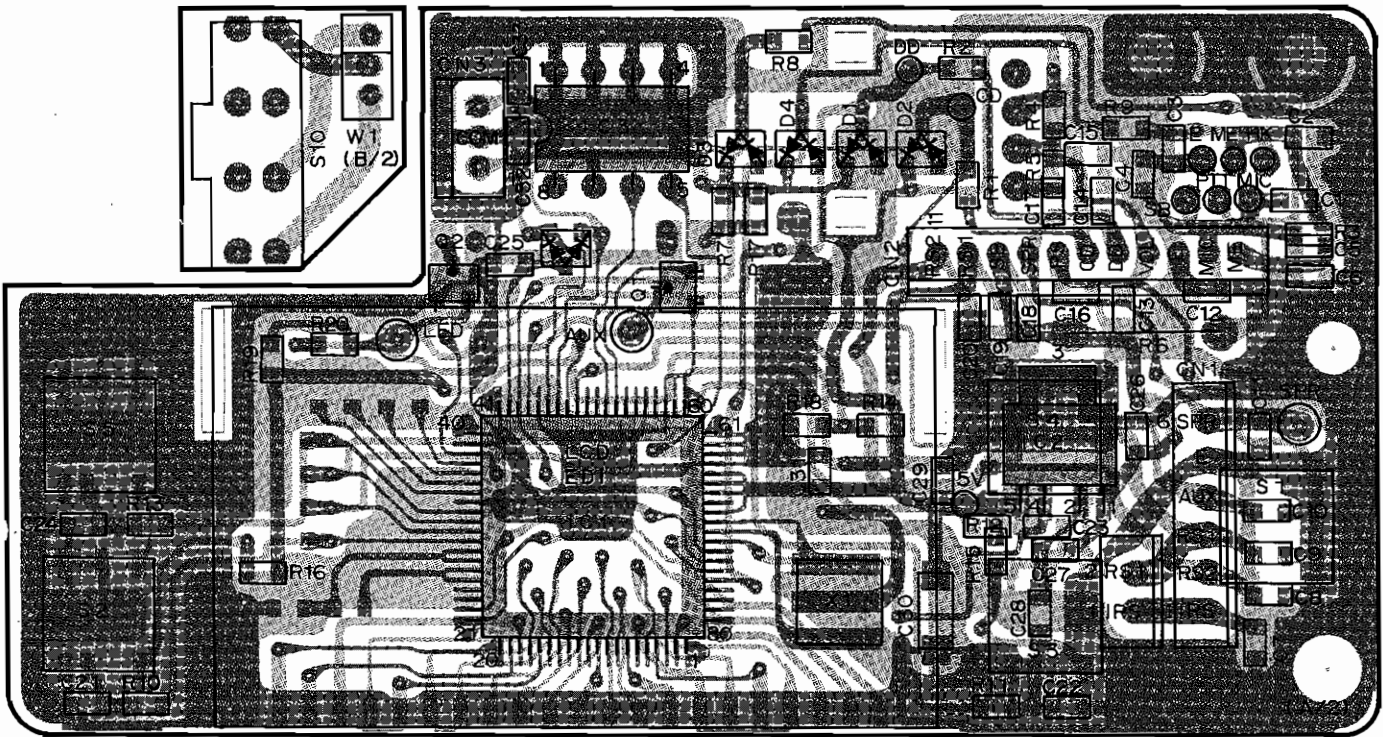


- IC 1 : 75328GC5563B9
- IC 2 : L78LR05B-FA
- Q1 : DTD114EK
- Q2 : DTC114EK
- D1~4 : ISS226
- D5 : ISS181

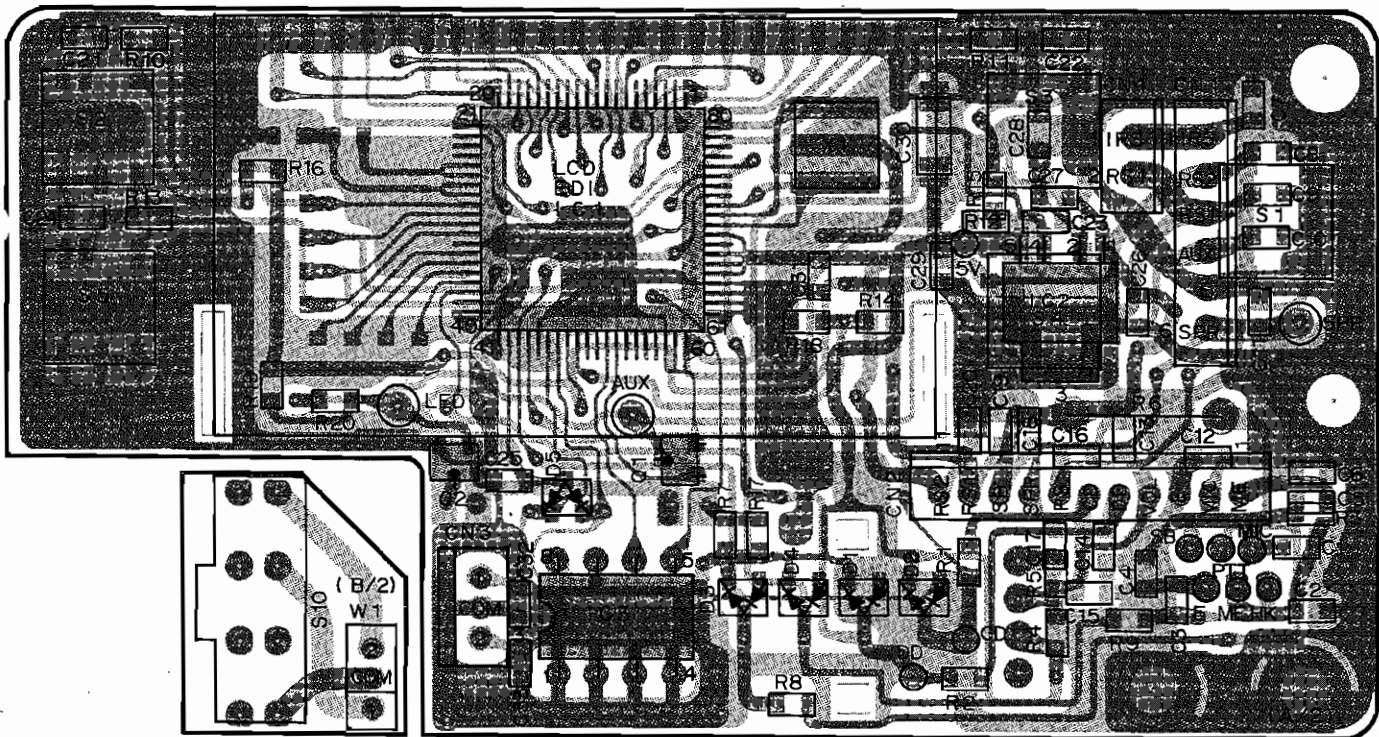


PC BOARD VIEWS TK-630H(B)

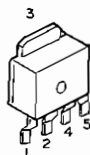
DISPLAY UNIT (X54-3100-20) : KCH-3 Component side view



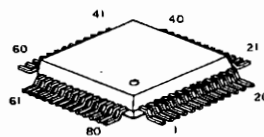
DISPLAY UNIT (X54-3100-20) : KCH-3 Foil side view



L78LR05B-FA



75328GC5563B9



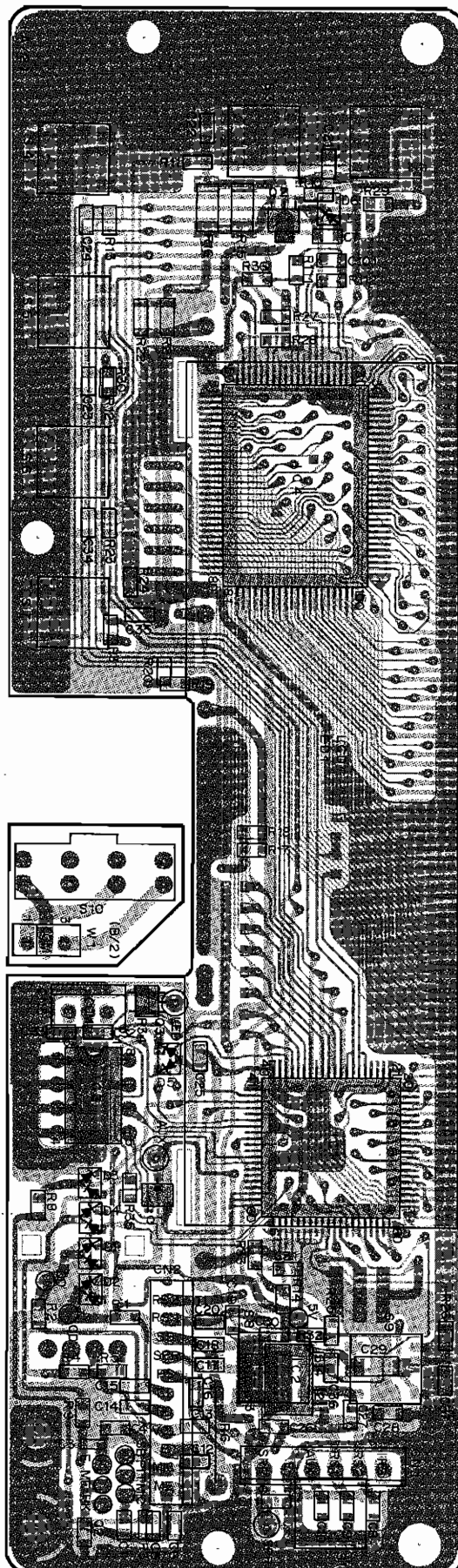
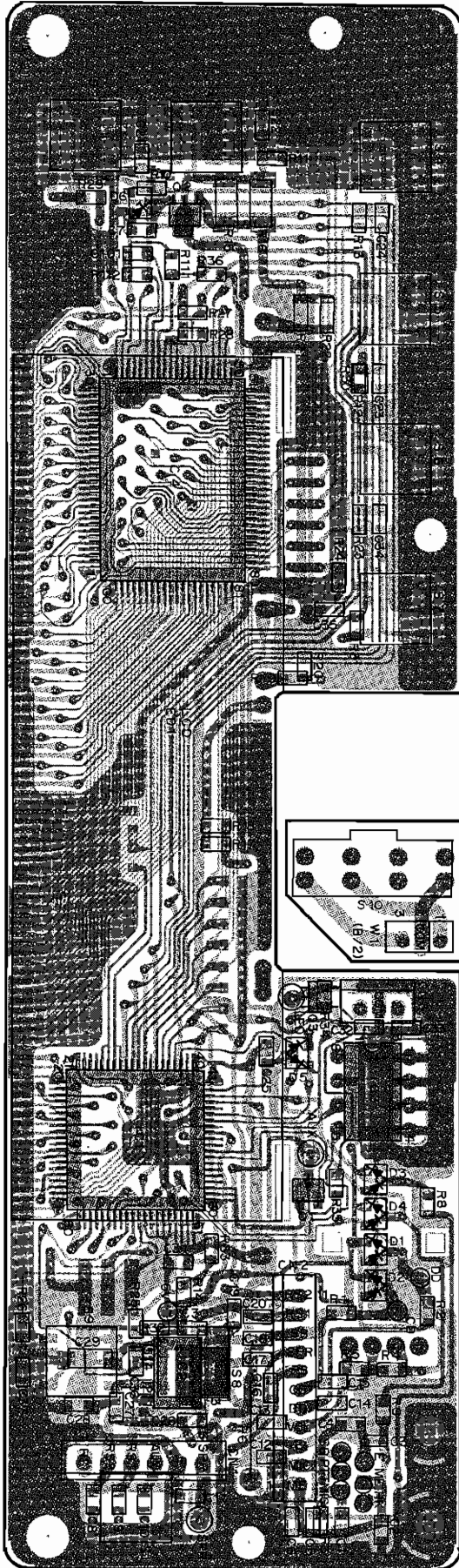
DTC114EK
DTD114EK



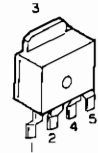
TK-630H(B) PC BOARD VIEWS

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

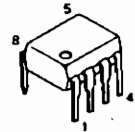
DISPLAY UNIT (X54-3110-20) : KCH-4
Foil side view



L78LR05B-FA



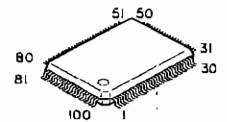
X24C04PI



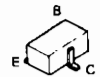
2SC2873



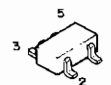
MSM5265GS-V1K



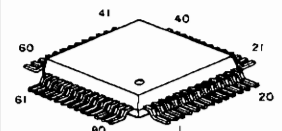
DTD114EK



FMC5

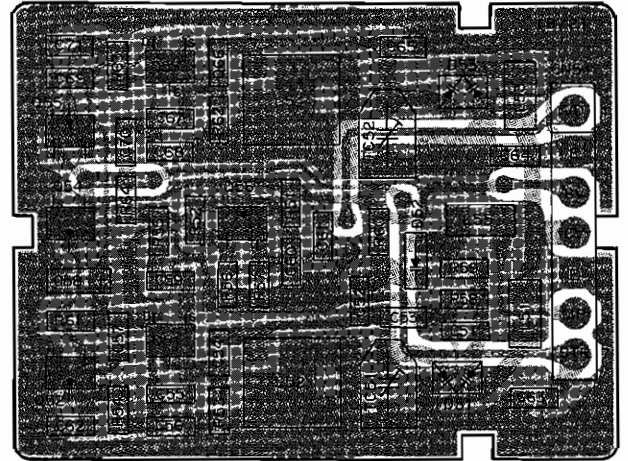
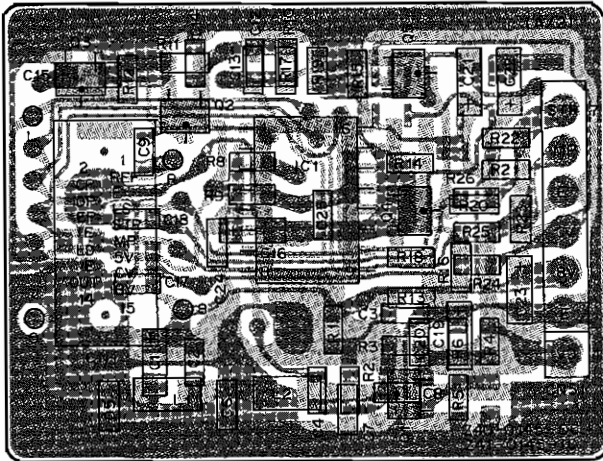


75328GC5563B9

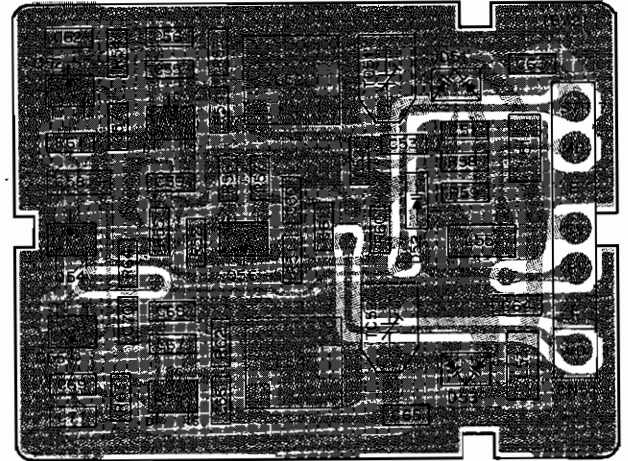
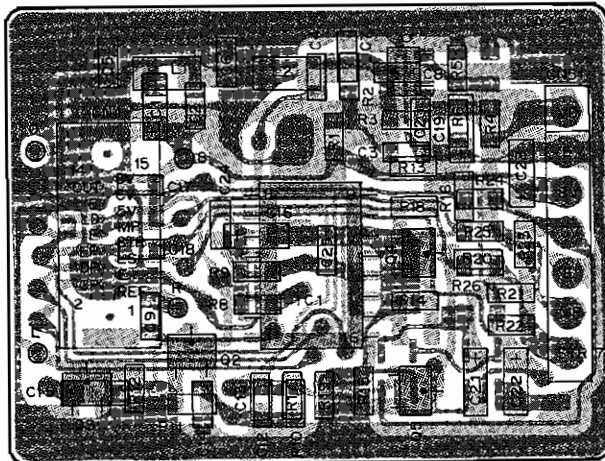


TK-630H(B) PC BOARD VIEWS

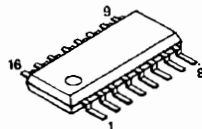
VCO/PLL UNIT (X58-3850-XX) -10 : K -11 : K2 -12 : K3 Component side view



VCO/PLL UNIT (X58-3850-XX) -10 : K -11 : K2 -12 : K3 Foil side view



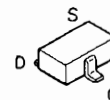
MB1504PF



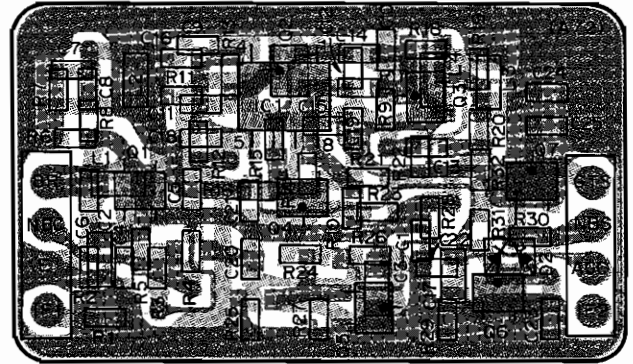
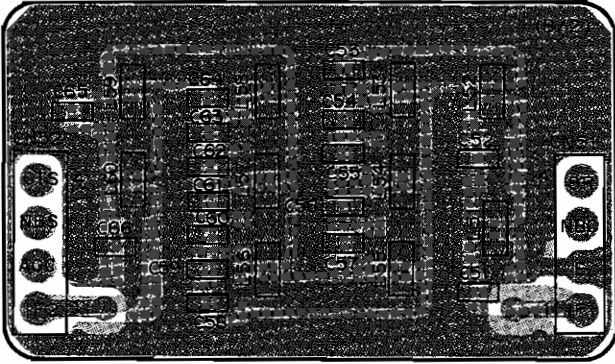
DTC114EK
DTC143EK
2SA1162
2SA1312
2SC2714
2SC3324



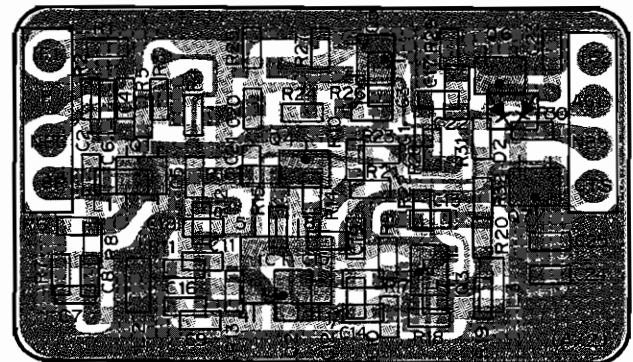
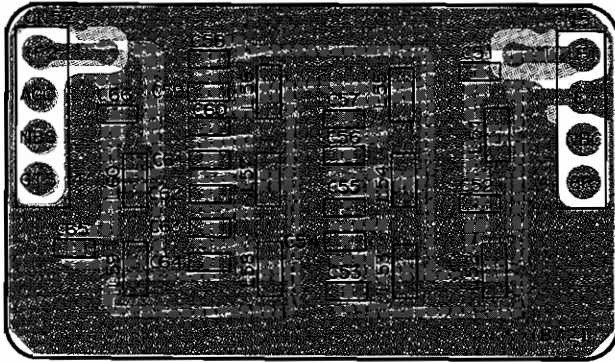
2SK508NV



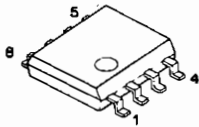
NB UNIT (X58-3860-10) Component side view



NB UNIT (X58-3860-10) Foil side view



MC1350D



3SK131

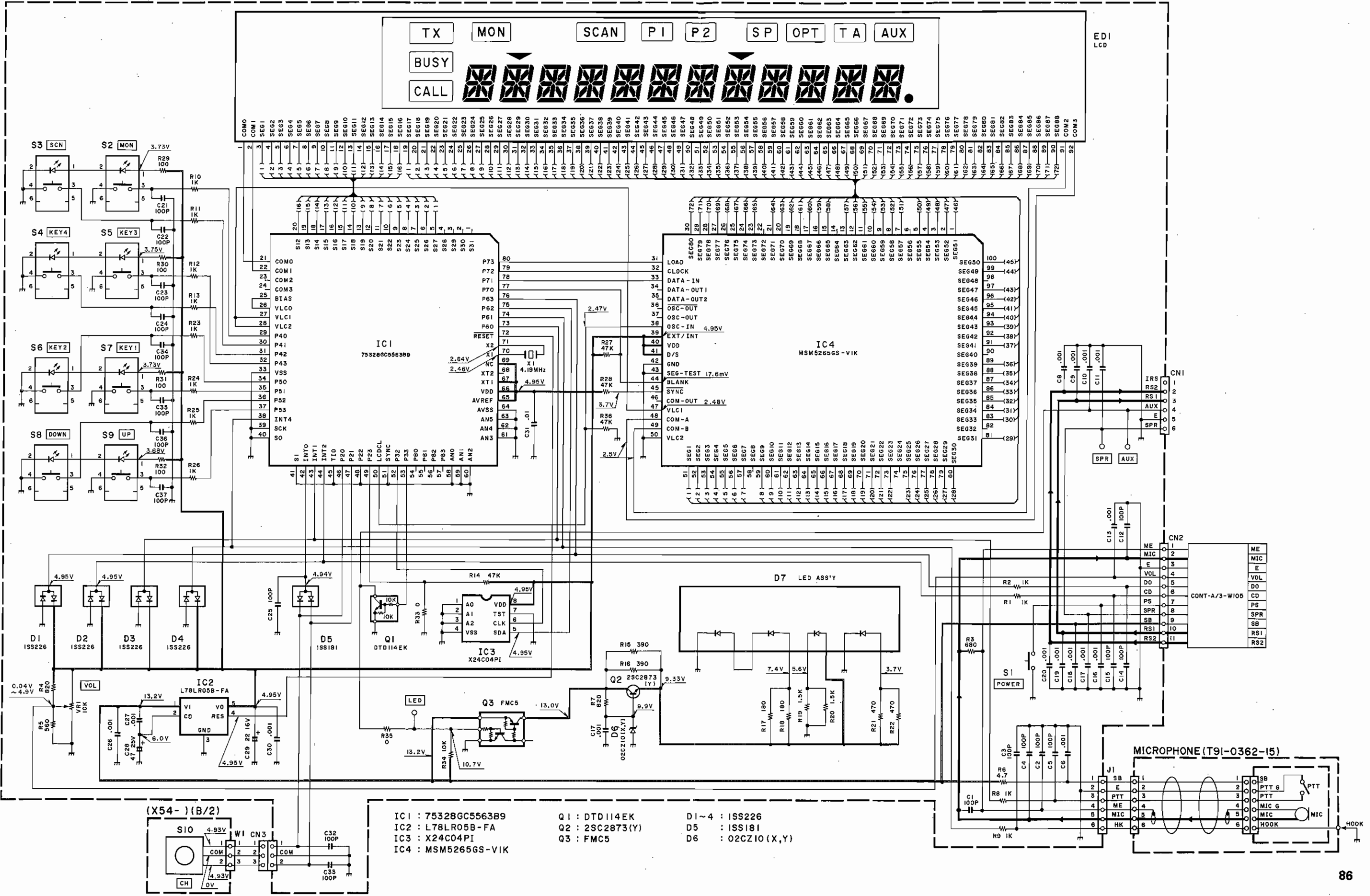


2SA1162
2SC2712



CIRCUIT DIAGRAM TK-630H(B)

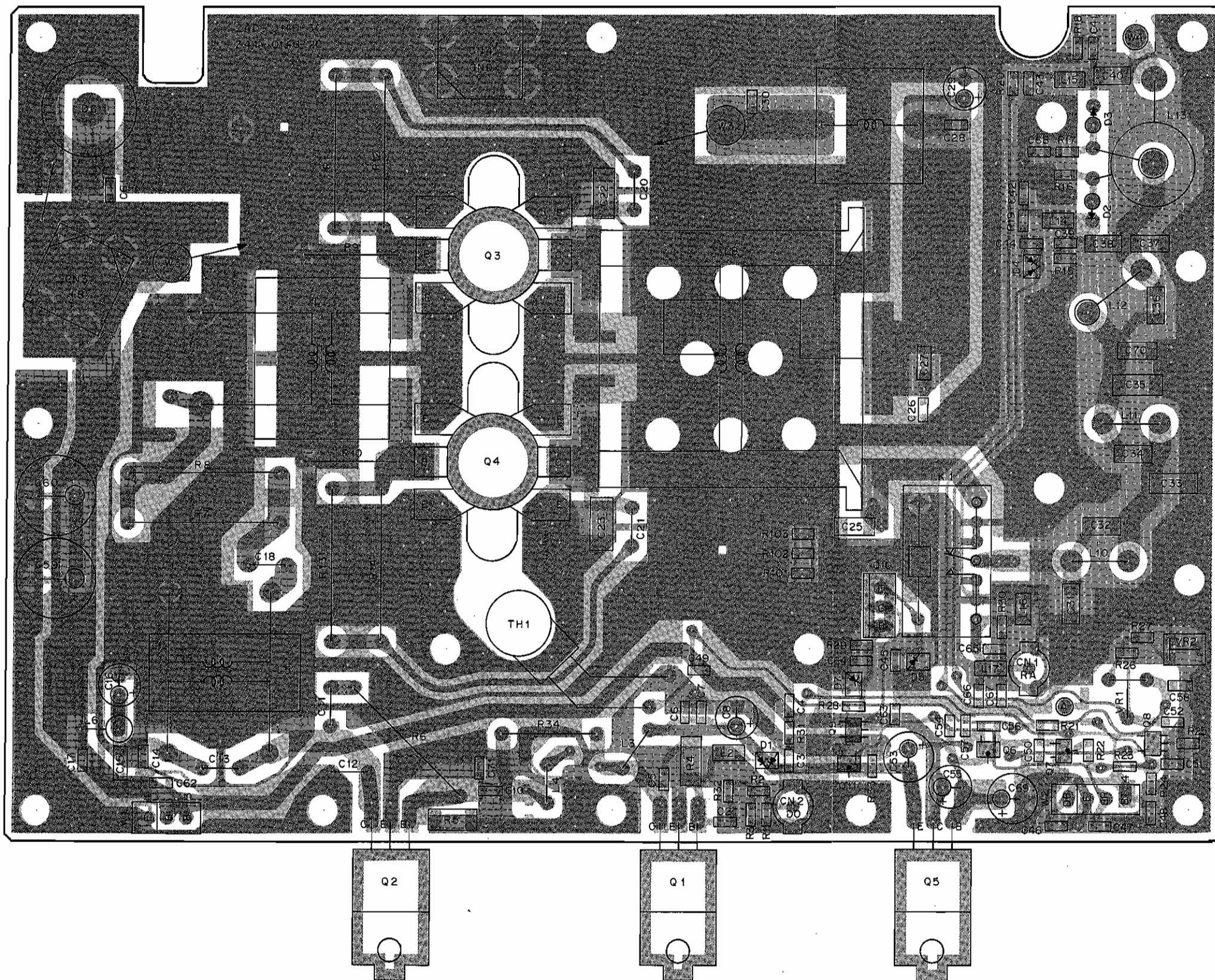
KCH-4 (X54-3110-20) (A/2)



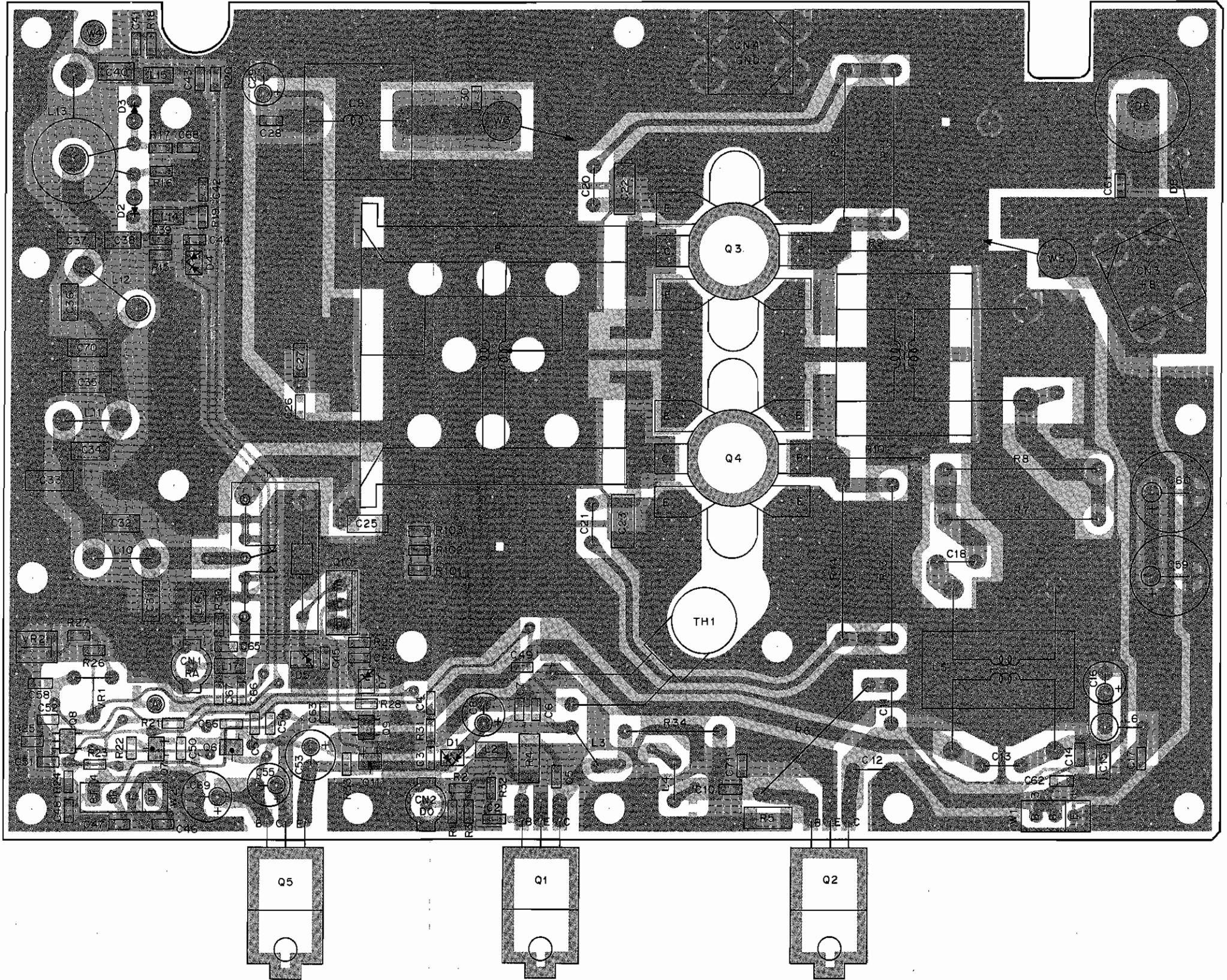
(X54-) (B/2)

- IC1 : 75328GC556389
- IC2 : L78LR05B-FA
- IC3 : X24C04PI
- IC4 : MSM52656S-VIK
- Q1 : DTD114EK
- Q2 : 2SC2873(Y)
- Q3 : FMC5
- D1~4 : ISS226
- D5 : ISS181
- D6 : 02CZ10(X,Y)

FINAL UNIT (X45-3440-XX) -10 : K -11 : K2 -12 : K3 Component side view

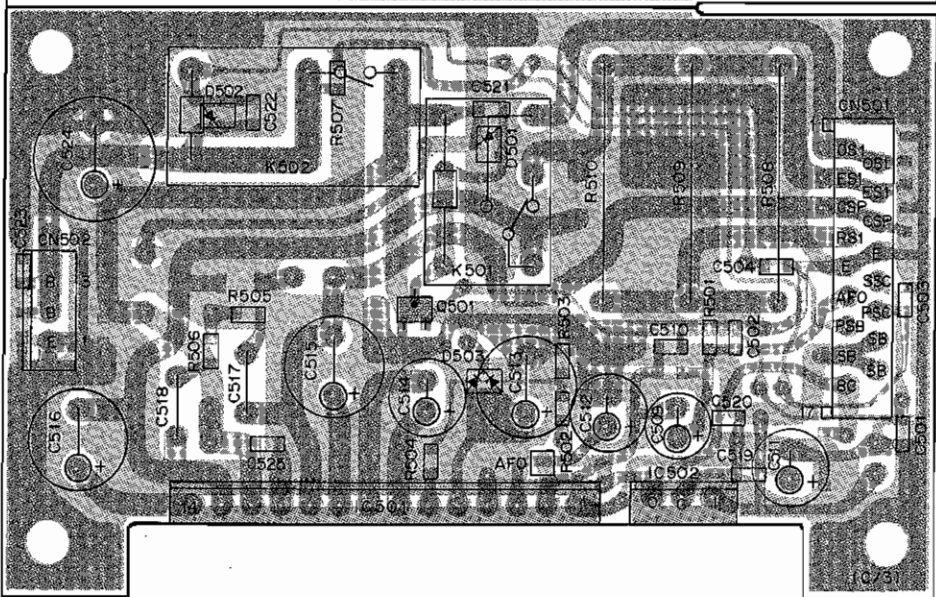
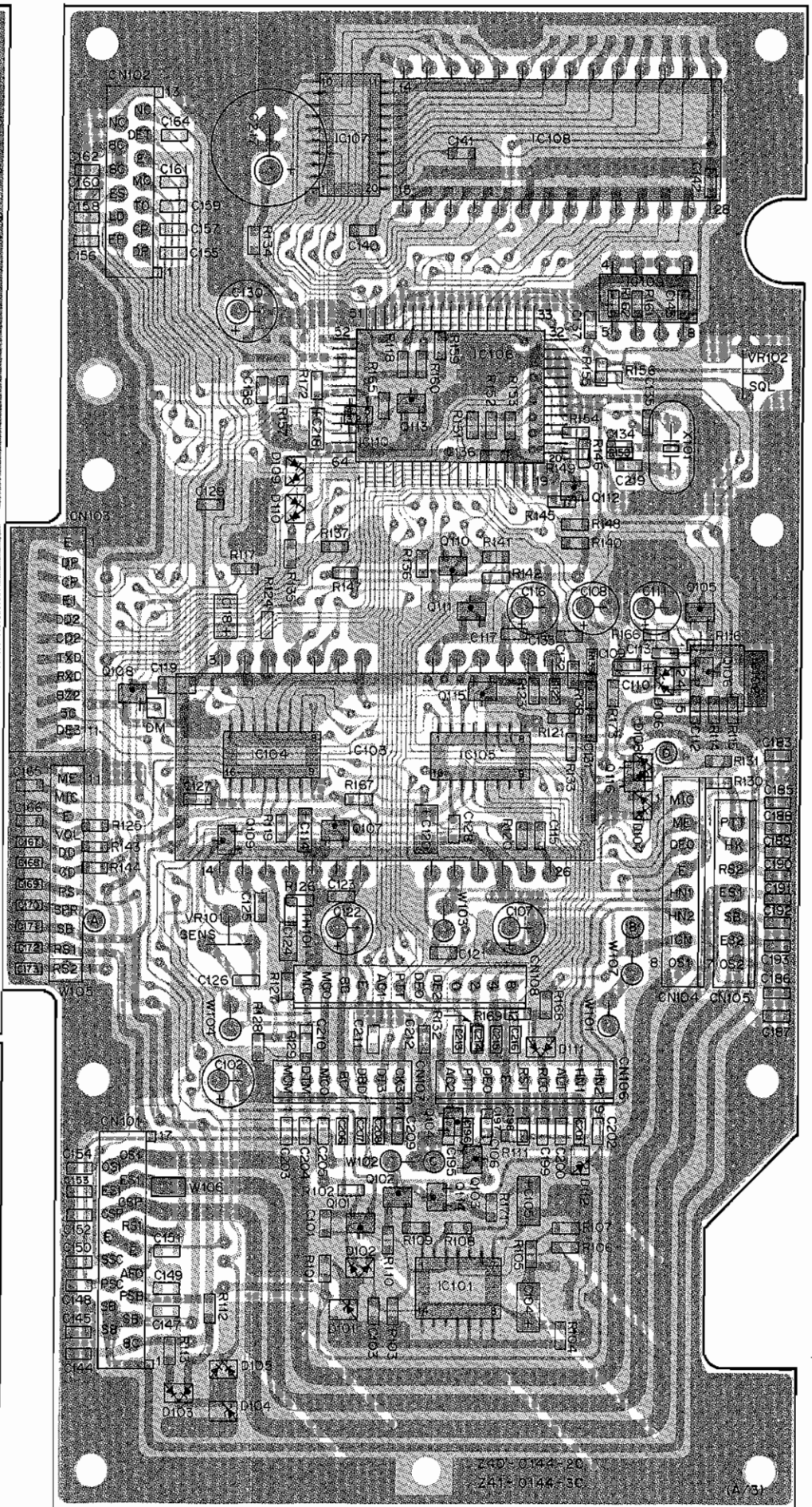
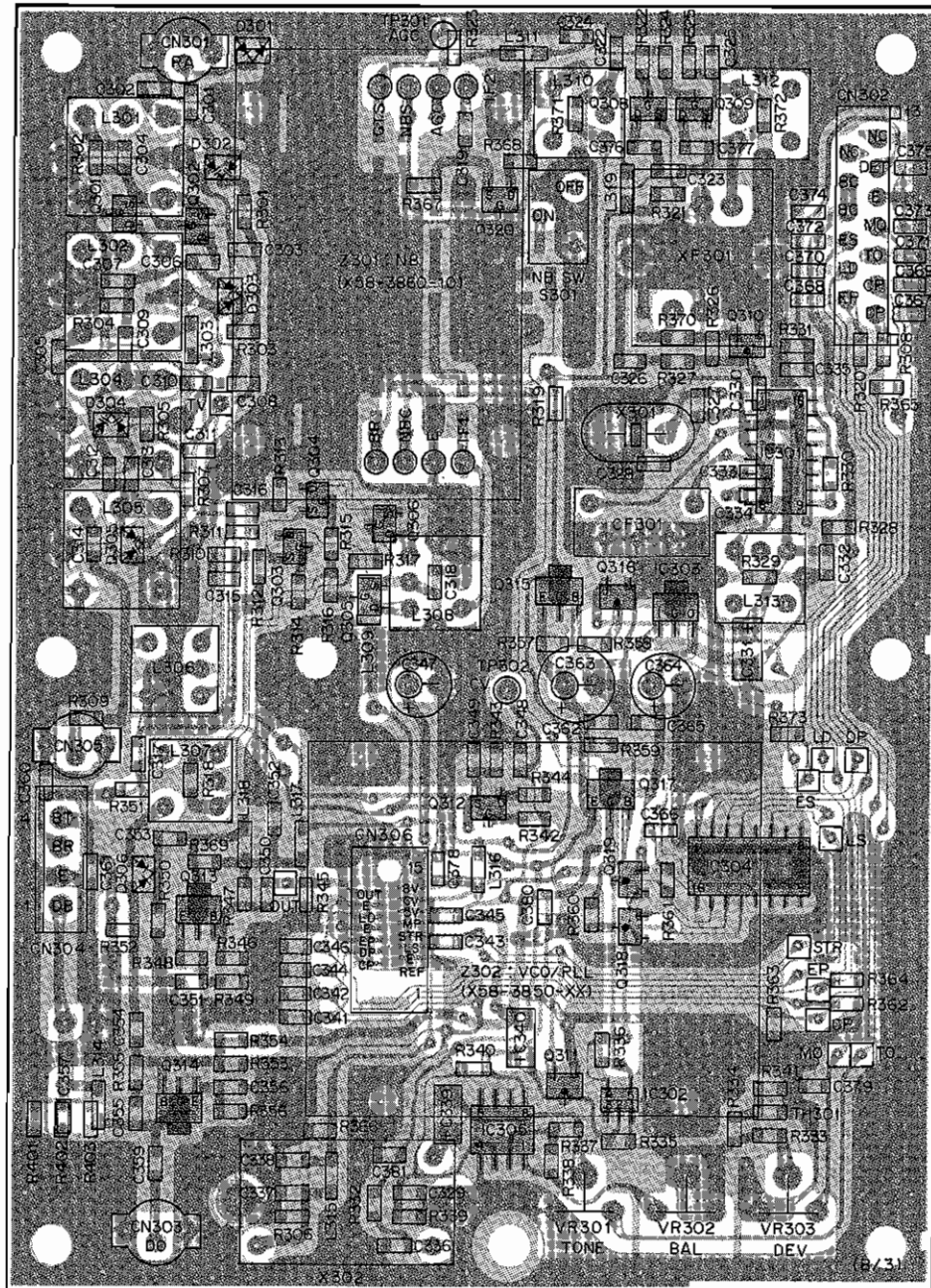


FINAL UNIT (X45-3440-XX) -10 : K -11 : K2 -12 : K3 Foil side view

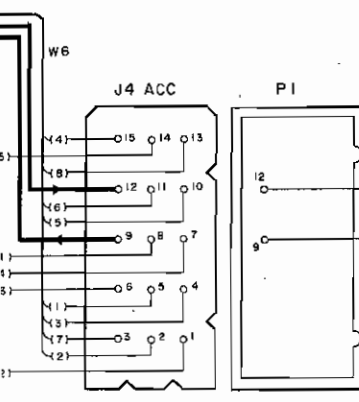


TK-630H(B) PC BOARD VIEWS

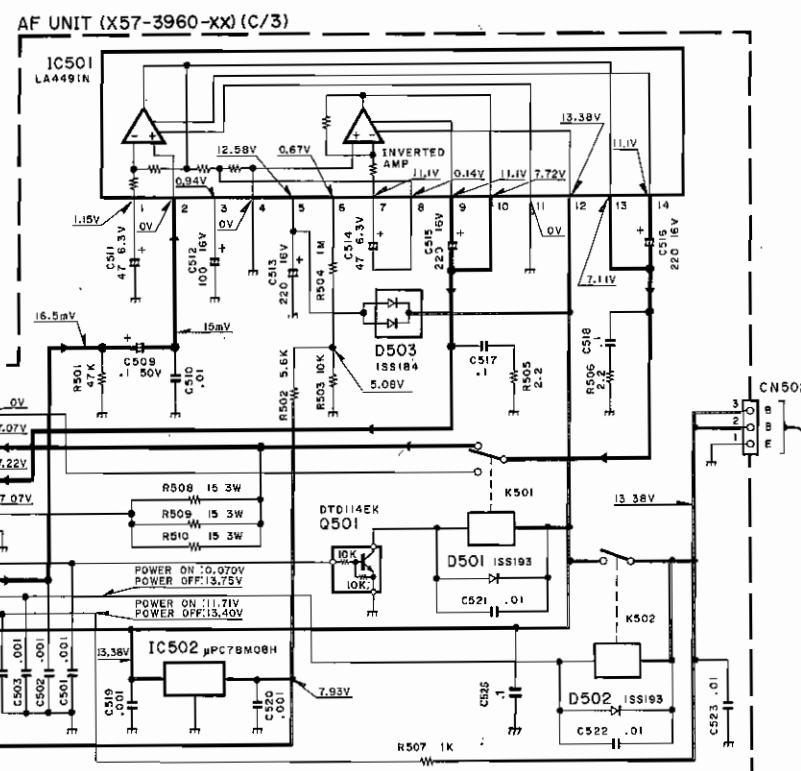
TX-RX UNIT (X57-3960-XX) -10 : K -11 : K2 -12 : K3 Component side view



BCD output

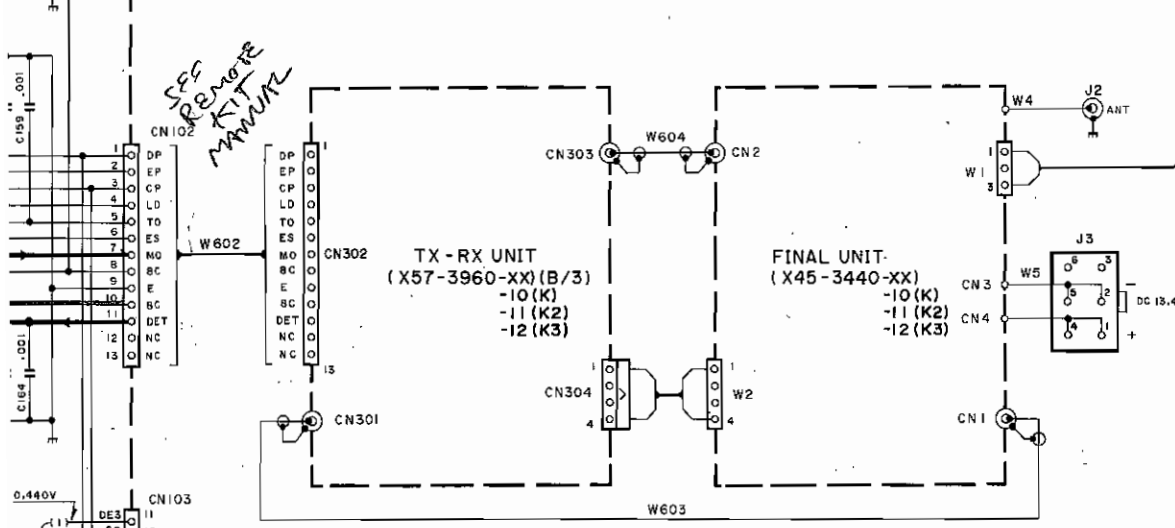


AF UNIT
 IC501 : LA4491N
 IC502 : μ PC78M08H
 Q501 : DTD114EK
 D501,502 : 1SS193
 D503 : 1SS184



SPEAKER CONTROL LINE

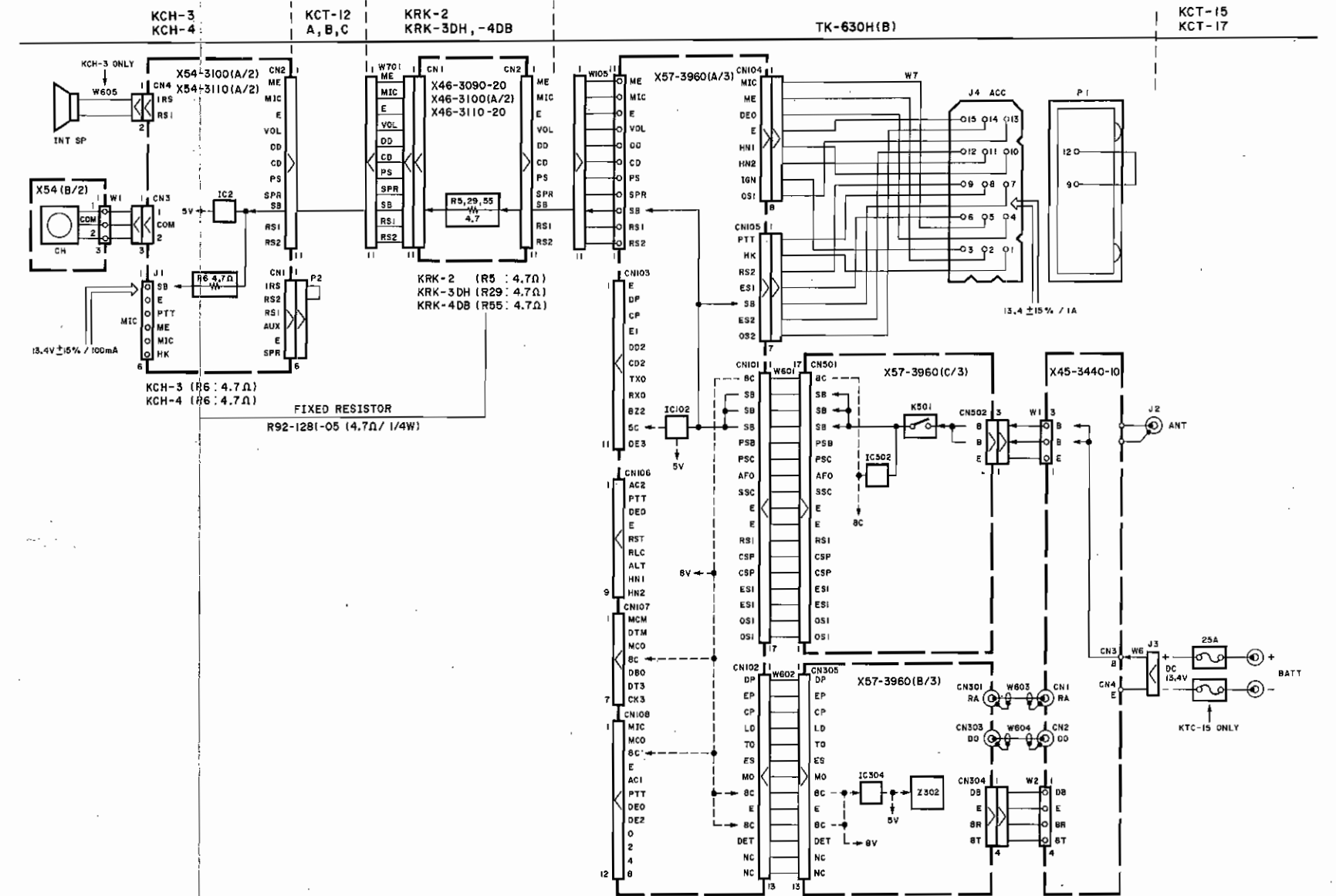
SEE REMOTE KIT MANUAL



OUT IN Dual Board

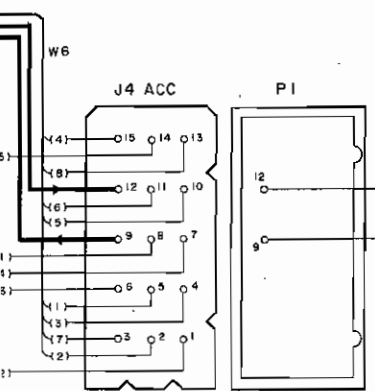
TK-630H

TK-630H(B) POWER SUPPLY BLOCK DIAGRAM

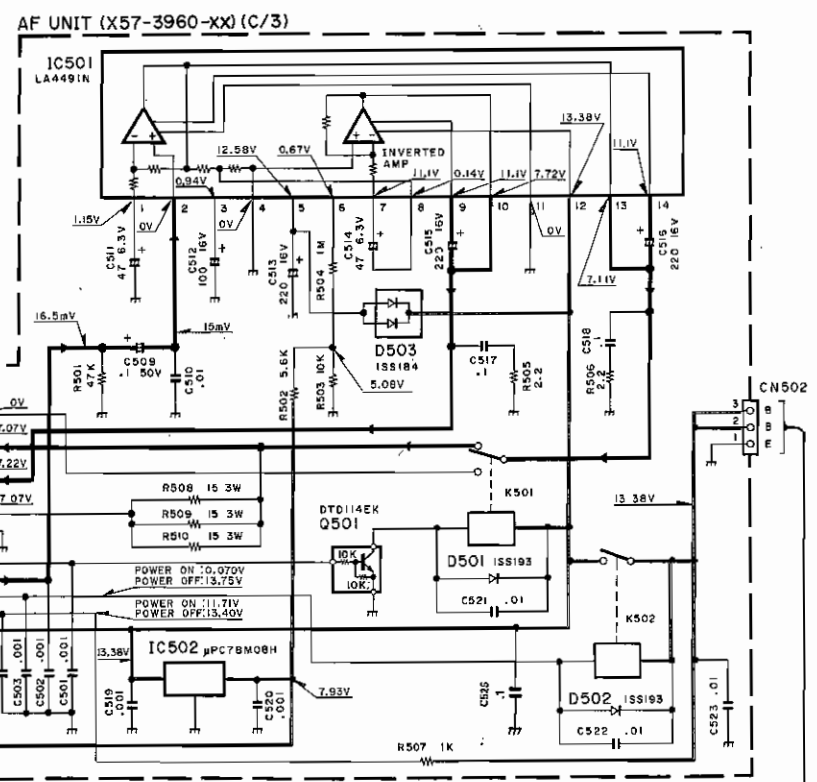


- | | | | | | | |
|--------------------|----------------|---------------------|----------------|---|-------------|-------------|
| 2SB119S
2SC2954 | TC4013BF | BU4094BF
MC3371D | 78312AGF3343BE | TC74HC573AF | LA4491N | NJM78L05UA |
| NJM4558E | μ PC78M08H | 2SK1577
2SK208 | X24C04PI | 2SA1162
2SC2712
2SC2714
2SD1757K
DTA114EK
DTC114EK
DTD114EK | 27C256QJEMD | L78LR05B-FA |
| TC4S11F
TC4S66F | 2SD1682 | 2SD1406 | FMC2
FMW1 | 2SC1971
2SC1972 | 2SC2694 | |

BCD output

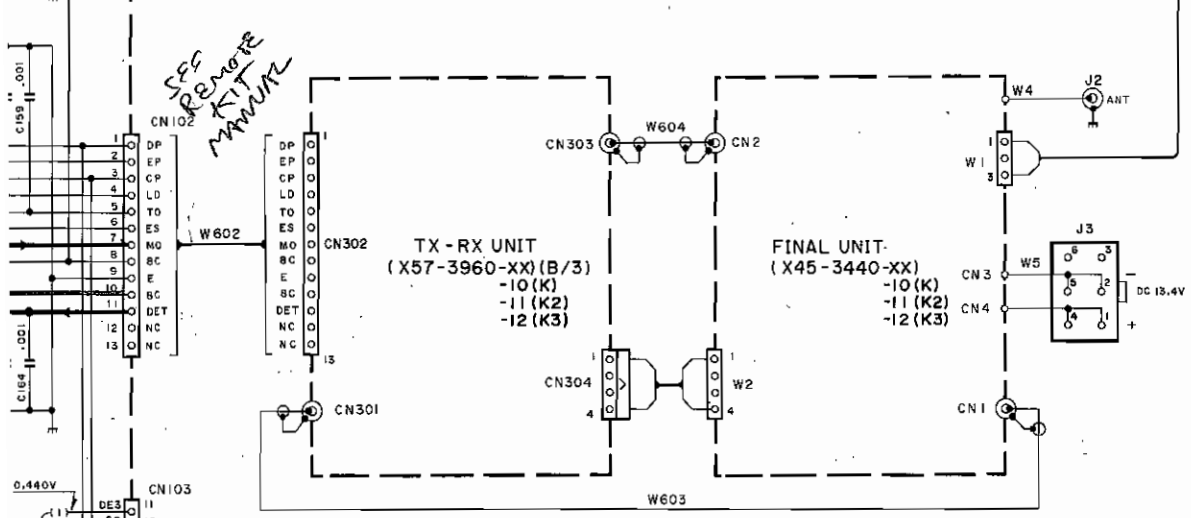


AF UNIT
 IC501 : LA4491N
 IC502 : μ PC78M08H
 Q501 : DTD114EK
 D501,502 : 1SS193
 D503 : 1SS184



SPEAKER CONTROL LINE

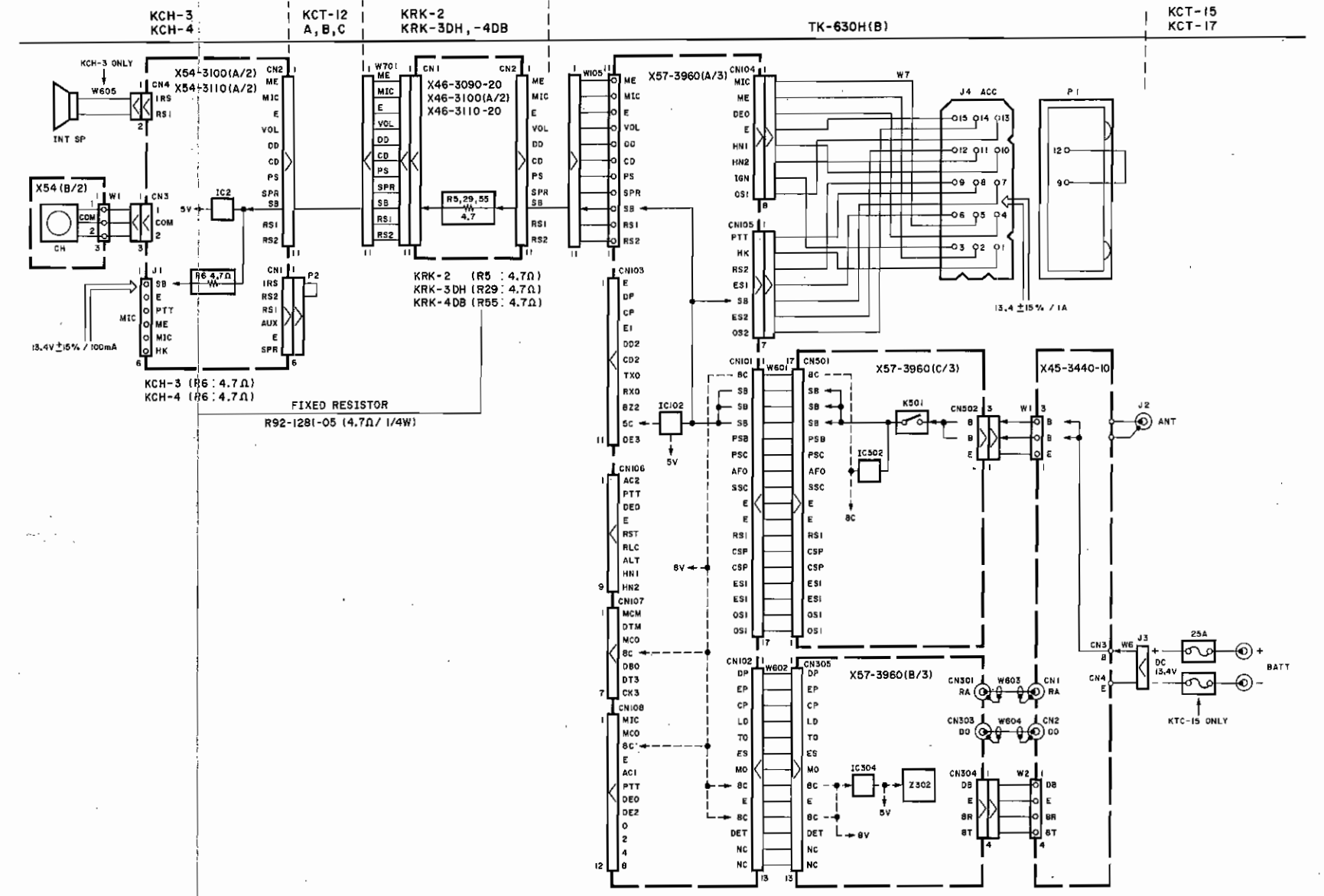
RF REMOTE KIT MANUAL



OUT IN Dual Board

TK-630H

TK-630H(B) POWER SUPPLY BLOCK DIAGRAM



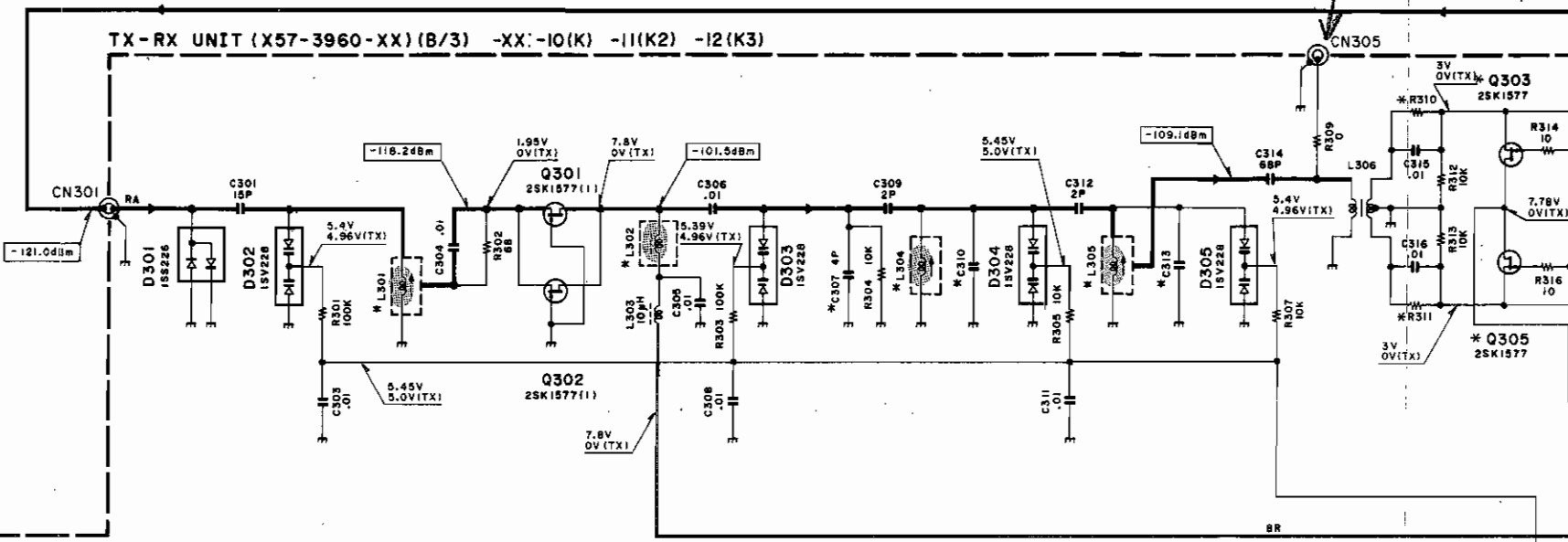
- | | | | | | | |
|--------------------|----------------|---------------------|----------------|---|-------------|-------------|
| 2SB119S
2SC2954 | TC4013BF | BU4094BF
MC3371D | 78312AGF3343BE | TC74HC573AF | LA4491N | NJM78L05UA |
| NJM4558E | μ PC78M08H | 2SK1577
2SK208 | X24C04PI | 2SA1162
2SC2712
2SC2714
2SD1757K
DTA114EK
DTC114EK
DTD114EK | 27C256QJEMD | L78LR05B-FA |
| TC4S11F
TC4S66F | 2SD1682 | 2SD1406 | FMC2
FMW1 | 2SC1971
2SC1972 | 2SC2694 | |

Double Balance

TX-RX UNIT
 IC301 : MC3371D
 IC302 : TC4S66F
 IC303 : NJM78L05UA
 IC304 : BU4094BF
 IC305 : NJM4558E

Q301-306,308,309 : 2SK1577
 Q311,316,318,319 : DTC114EK
 Q312 : 2SK208(Y)
 Q313,314 : 2SC2954
 Q315,317 : 2SB1119(S)
 Q320 : 2SK1577(I)
 Q310 : 2SC2714(Y)
 D301 : 1S5226
 D302-305 : 1SV228
 D306 : 1S5268

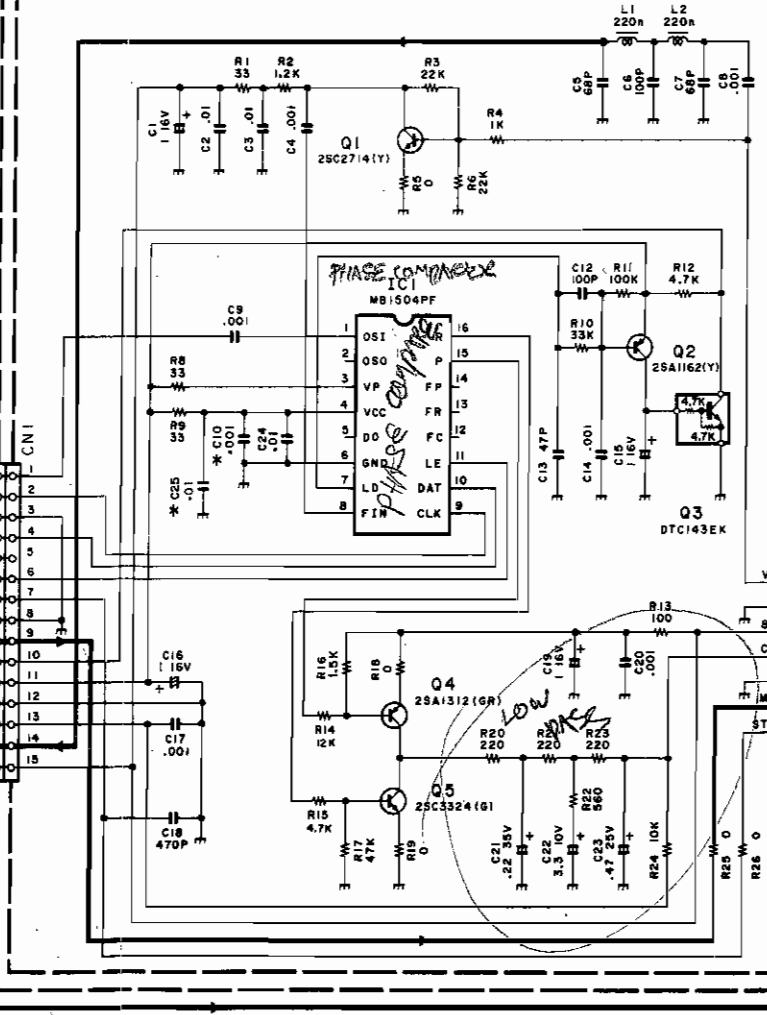
	C307	C310	C313	C343	C381	L301,302,304,305	R310,311	R355	Q303-306	Z302
X57-3960-10	NO	4P	3P	NO	YES	L34-4296-05	270	270	2SK1577(I)	X58-3850-10
X57-3960-11	NO	4P	2P	NO	YES	L34-4296-05	270	270	2SK1577(I)	X58-3850-11
X57-3960-12	YES	8P	8P	YES	NO	L34-4287-05	560	390	2SK1577(I)	X58-3850-12



INPUT DIGITAL SIGNAL
 ANY TITING ADJUST VR20 2 ONLY SOURCEWAVE

FROM CTRC BLS
 CROSS TONE LEVEL

Z302 VCO/PLL (X58-3850-XX) -XX:-10(K) -11(K2) -12(K3)



Q1,56 : 2SC2714(Y) IC1 : MB1504PF
 Q2 : 2SA1162(Y)
 Q3 : DTC143EK D51,53 : 1SV228
 Q4 : 2SA1312(GR) D52 : 1SV164
 Q5 : 2SC3324(G)
 Q51,53 : 2SK508NV(K52)
 Q52,54,55 : DTC114EK

TX VCO

REV VCO

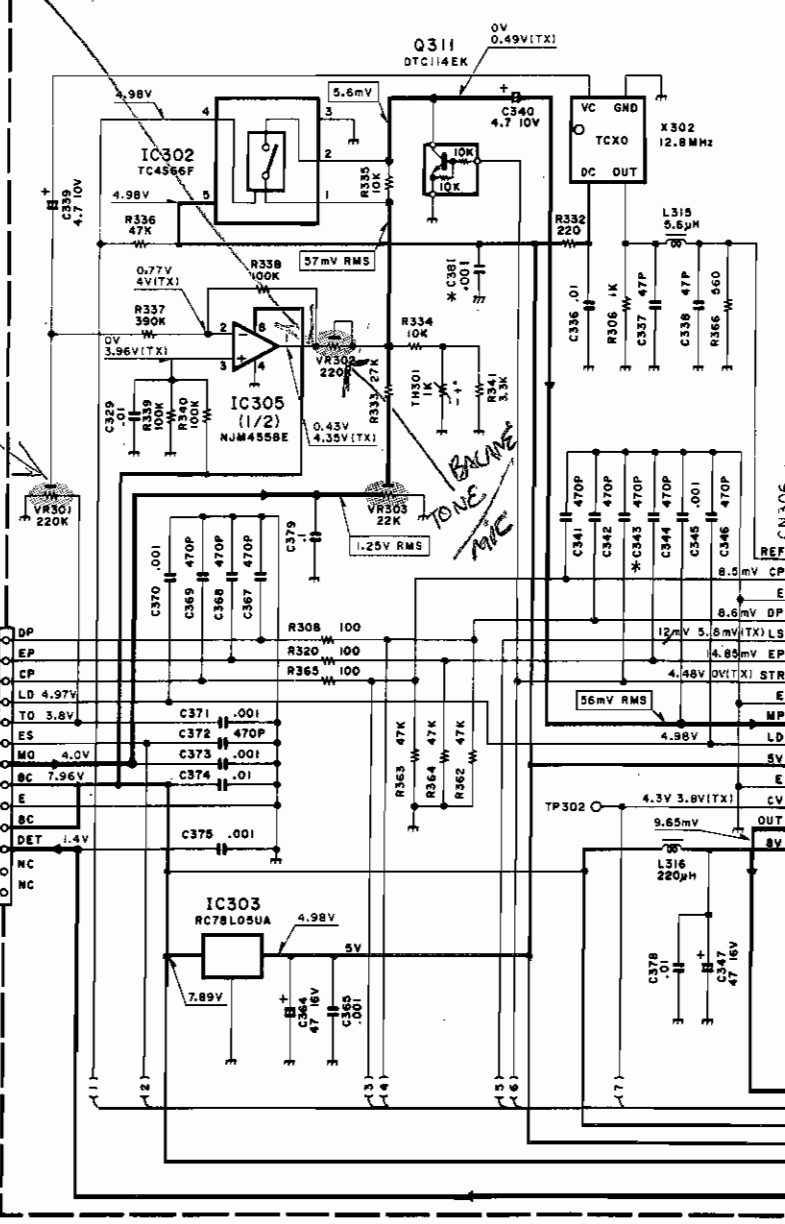
STR

STR

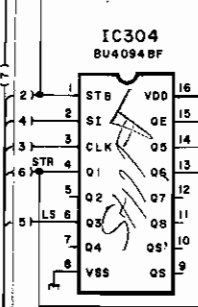
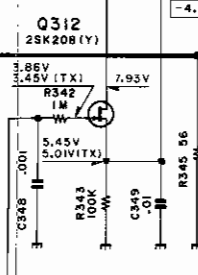
STR

CONT-A/3-102

CONT	1	2	3	4	5	6	7	8	9	10	11	12	13
DP	DP	EP	CP	LD	TO	ES	MO	BC	E	BC	DET	NC	NC
	4.97V	3.8V		4.97V	4.0V	7.96V					1.4V		

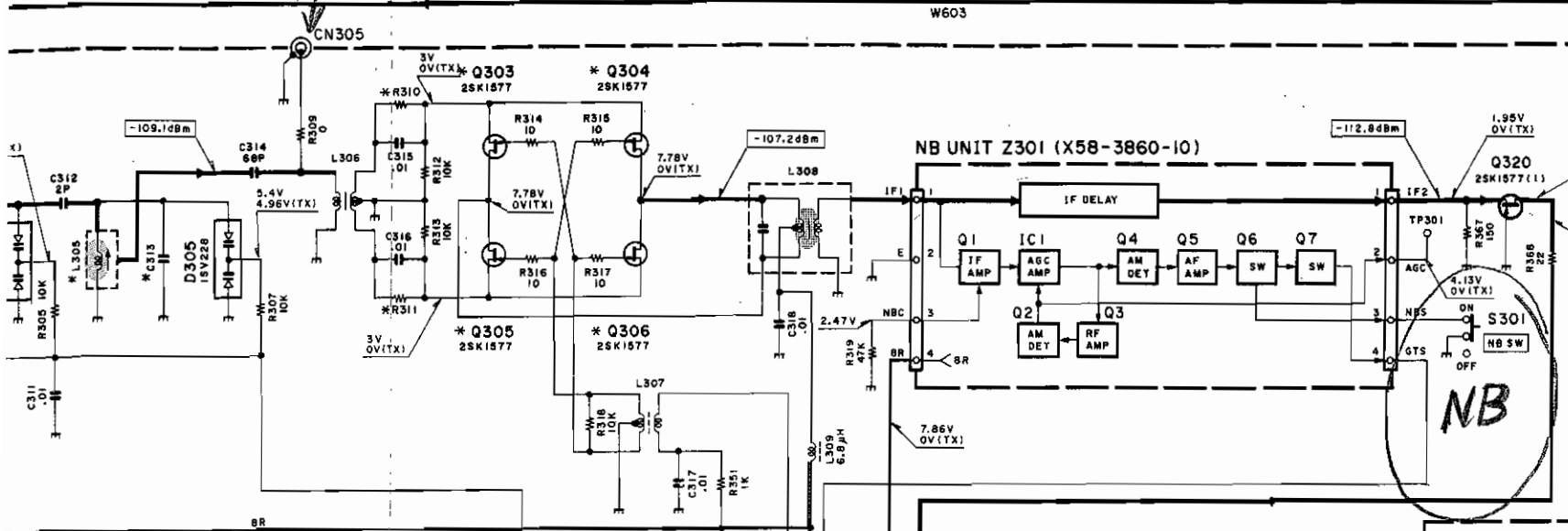


	C10	C25	C53	C58	C85	R54	R56	R63	L62	L54
X58-3850-10	YES	YES	2P	82P	18P	270	1.2K	270	L34-4290-05	L34-4294-05
X58-3850-11	YES	YES	6P	86P	15P	220	1.5K	220	L34-4281-05	L34-4293-05
X58-3850-12	NO	NO	4P	68P	7P	220	2.2K	220	L34-4282-05	L34-4285-05



CIRCUIT DIAGRAM TK-630H(E)

Double Balanced Mixer

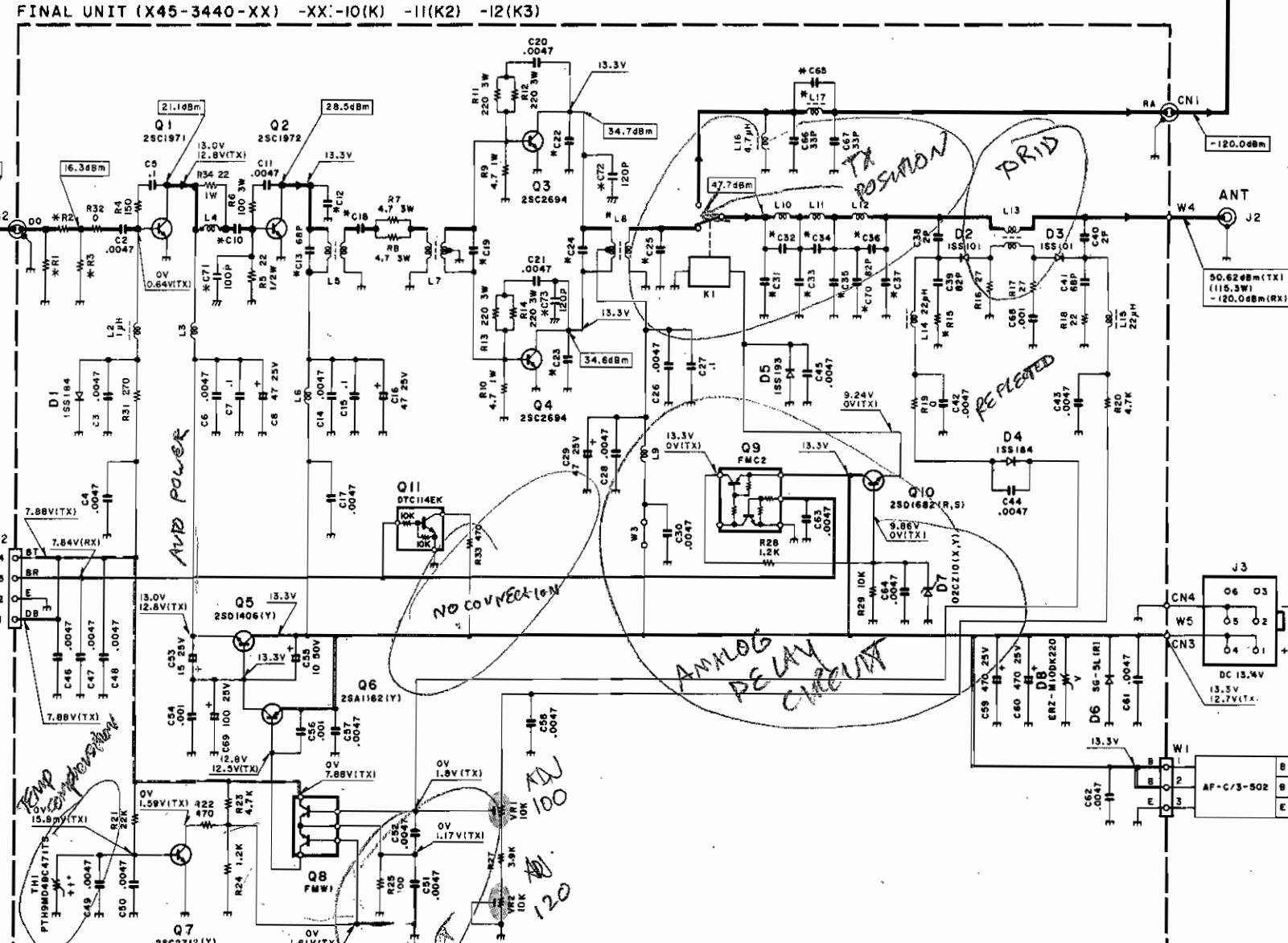
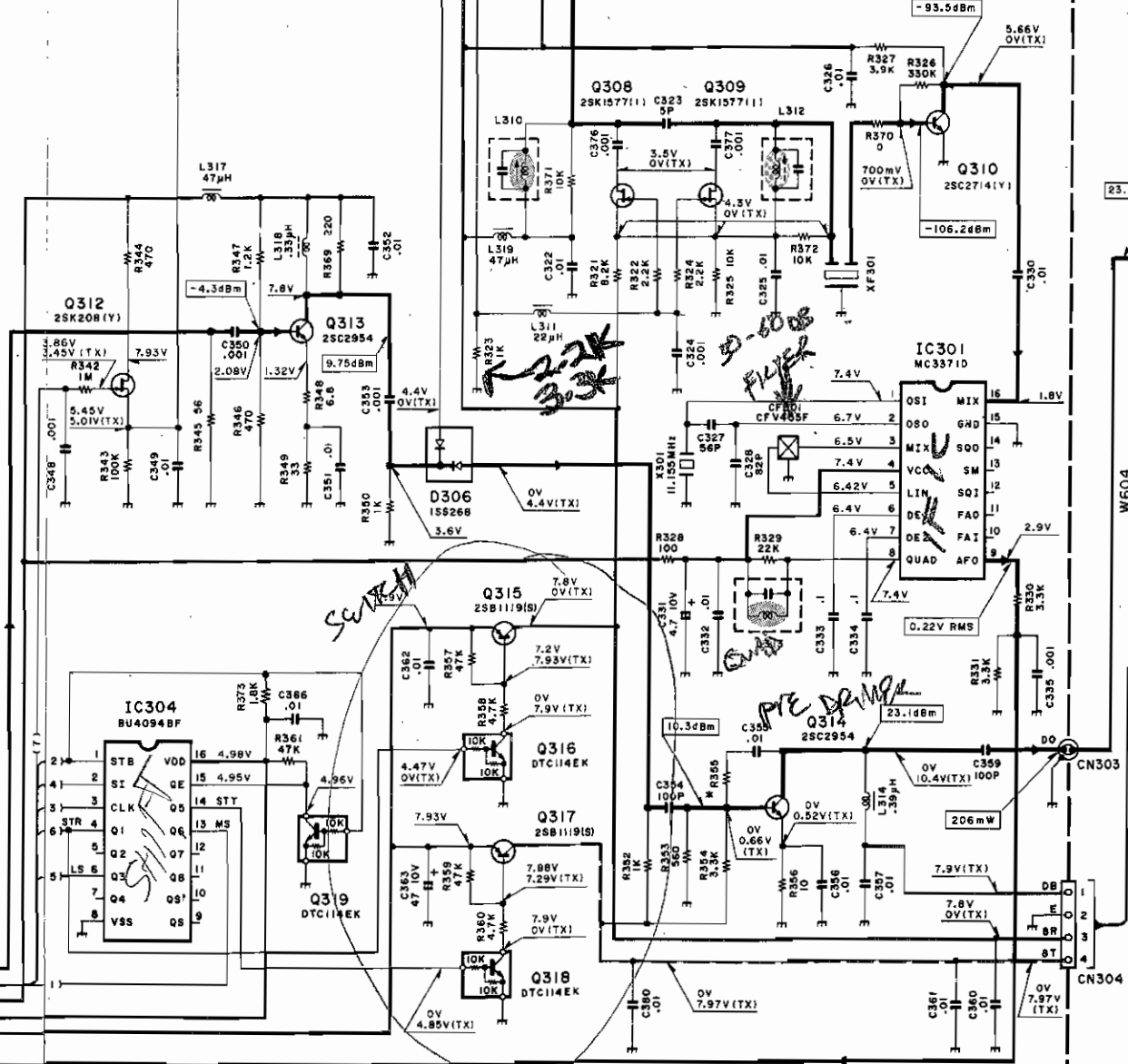
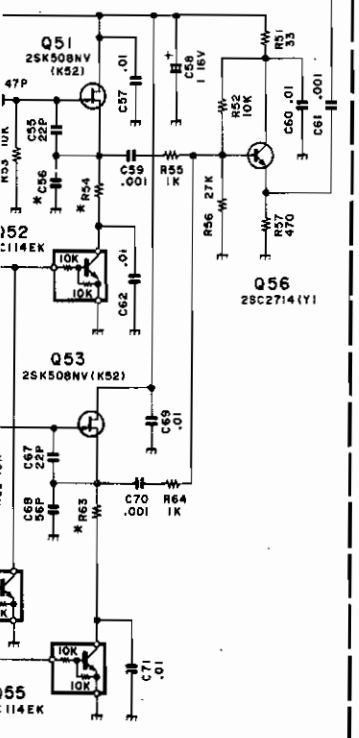


- FINAL UNIT**
- Q1 : 2SC1971
 - Q2 : 2SC1972
 - Q3,4 : 2SC2694
 - Q5 : 2SD1406(Y)
 - Q6 : 2SA1162(Y)
 - Q7 : 2SC2712(Y)
 - Q8 : FMW1
 - Q9 : FMC2
 - Q10 : 2SD1682(R,S)
 - Q11 : DTC114EK
- D1,4 : 1SS184
 - D2,3 : 1SS101
 - D5 : 1SS193
 - D6 : SG-5L(R)
 - D7 : 02CZ10(X,Y)
 - D8 : ERZ-M10DK220

	R1,3	R2	R16	C10	C12	C13	C18	C19	C22,23	C24	C26	C31	C32	C33	C34	C35	C36	C37	C66	C70	C71	C72,73	L8	L17
X45-3440-10	150	39	27	470P	100P	YES	82P	560P	180P	1100P	33P	82P	8P	150P	22P	120P	51P	47P	160P	NO	YES	NO	L38-1214-25	68n
X45-3440-11	150	39	22	330P	82P	NO	88P	390P	NO	750P	18P	82P	4P	120P	22P	100P	39P	43P	100P	NO	NO	YES	L38-1239-05	68n
X45-3440-12	270	18	33	150P	82P	YES	47P	270P	100P	560P	12P	62P	8P	100P	27P	NO	47P	33P	120P	YES	NO	YES	L39-1215-25	96n

1 : MB1504PF
 51,53 : 1SV228
 52 : 1SV164

	C85	R54	R58	R63	L82	L84
16P	270	1.2K	270	L34-4290-05	L34-4294-05	
18P	220	1.8K	220	L34-4291-05	L34-4292-05	
7P	220	2.2K	220	L34-4292-05	L34-4295-05	



SEARCH

PTE DRMP

ANALOG DELAY CIRCUIT

NO CONNECTION

NO CONNECT

REFLECTED

POSITION

DRID

TEMP COMPENSATION

120

120

SPECIFICATIONS

GENERAL

Frequency Range	29.7 to 50MHz
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	20kHz (PLL channel step 5kHz)
Input Voltage	13.4V DC negative ground
Current Drain	0.6A on standby 2.2A on receive (at 13W) 25A 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 12.97" (329.5mm) D, 8.38lbs (3.8kg) : 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
Intermodulation	-80dB
Spurious and Image Rejection	-85dB
Audio Power Output	13W at 4Ω less than 5% distortion
Frequency stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	7.3MHz (29.7 to 37.0MHz) 8.0MHz (35.0 to 43.0MHz) 9.0MHz (41.0 to 50.0MHz)

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

RF Power Output	110W adjustable to 45W
RF Output Impedance	50Ω
Spurious and Harmonics	-80dB
Modulation	F3E, F1D, F2D
FM Noise	-55dB
Microphone Impedance	Low impedance
Audio Distortion	Less than 2% at 1000Hz
Frequency Stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	7.3MHz (29.7 to 37.0MHz) 8.0MHz (35.0 to 43.0MHz) 9.0MHz (41.0 to 50.0MHz)

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-152-C and EIA-204-D.

TK-630H(B)

TK-30 CM STV
TRAINING TAPE

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