

KENWOOD

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VHF FM TRANSCEIVER

TK-690H(B)

SERVICE MANUAL

REVISED

KENWOOD

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This service manual applies to products with 30500001 or subsequent serial numbers. (KCH-10 and KCH-11 are applicable to the productions June 2001 and after.)

In terms of the products with the serial numbers earlier than 30500001, refer to the TK-690H(B) service manual as per part No. B51-8460-00.

TK-690H(B)



KCH-10



KCH-11



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GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

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

ORDERING REPLACEMENT PARTS

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

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 secure and any open connectors are properly terminated.
- SHUT OFF this equipment when near electrical blasting caps or while in an explosive atmosphere.
- All equipment should be properly grounded before power-up for safe operation.
- This equipment should be serviced by only qualified technicians.

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.
3. 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.

TK-690H(B)

SYSTEM SET-UP

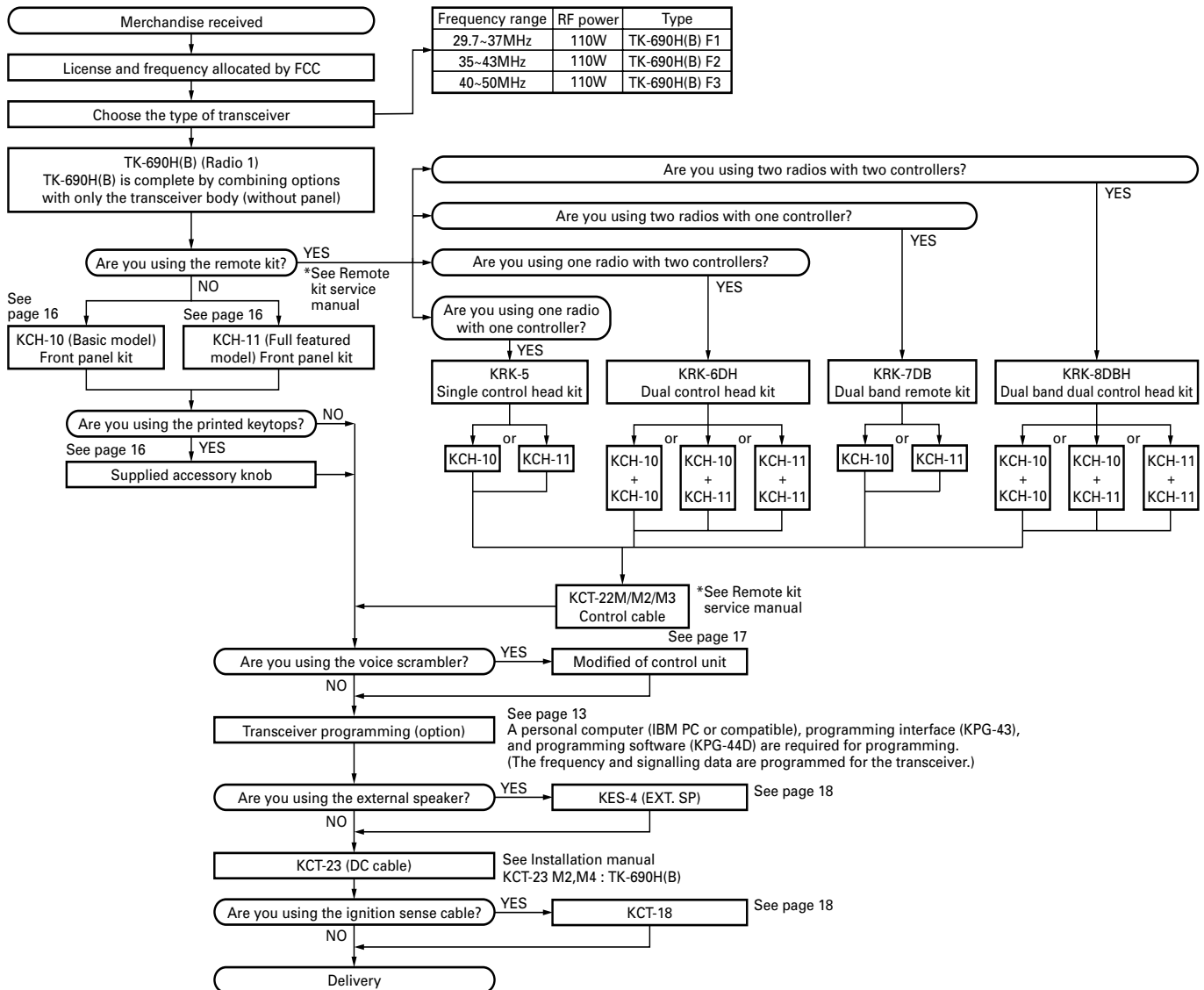
Before Reading About System Set-up

The TK-690H(B) is a transceiver main unit (without a panel or speaker) that you complete by adding options.

The options are classified into three types according to operation and function.

1. Install the front panel kit (controller) directly on a radio to operate it. (Form : Radio + KCH-10/11)
2. Remotely control one radio with one controller. (Form : Radio + KRK-5 + KCH-10/11 + KCT-22M/M2/M3)

3. Remotely control one radio with two controllers. (Form : Radio + KRK-6DH + KCH-10/11 (two) + KCT-22M/M2/M3 (two))
4. Remotely control two radios with one controller. (Form : Radios (two) + KRK-7DB + KCH-10/11 + KCT-22M/M2/M3)
5. Remotely control two radios with two controllers. (Form : Radio (two) + KRK-8DBH + KCH-10/11 (two) + KCT-22M/M2/M3 (two))



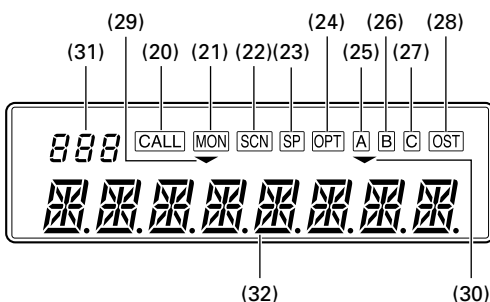
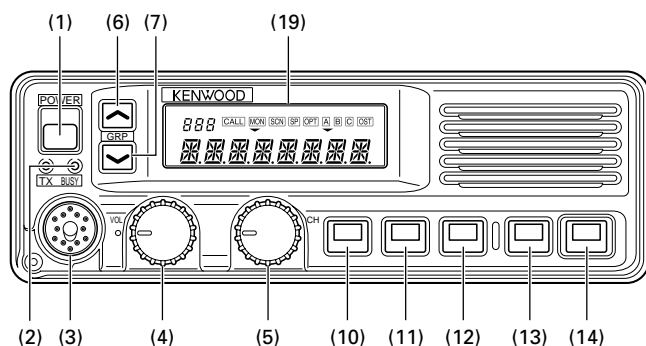
*Service manual parts No. list

| Model | Parts No. |
|--------------|-------------|
| KRK-5/6DH | B51-8445-20 |
| KRK-7DB/8DBH | B51-8452-00 |
| | B51-8452-10 |

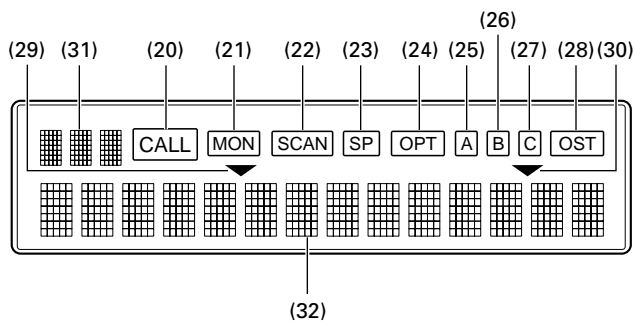
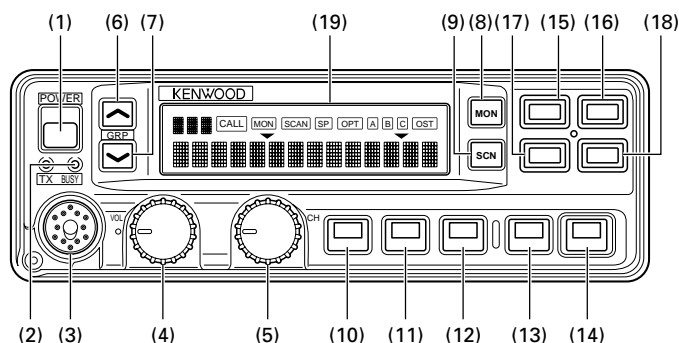
OPERATING FEATURES

1. Controls and Functions

1-1. Basic Function Panel



1-2. Full Function Panel



- (1) POWER Switch
Press to turn the power ON and OFF.
- (2) TX/BUSY Indicator
The TX Indicator (Red LED) shows that you are transmitting.
The BUSY Indicator (Green LED) shows that the channel is in use.
- (3) Microphone Connector
- (4) Volume Knob
To increase the volume level, turn clockwise (CW).
To decrease the volume level, turn counterclockwise (CCW).
- (5) UP/DOWN Knob
The function of this Knob can be programmed by the FPU.

| Function | Description | Note |
|-----------------|--|------------------|
| Channel UP/DOWN | Channel selector. To increase the channel, turn CW. To decrease the channel, turn CCW. | Default setting. |
| Group UP/DOWN | Group selector. To increase the group, turn CW. To decrease the group, turn CCW. | |

- (6) GR UP Key, (7) GR DW Key, (8) MON Key, (9) SCN Key, (10)~(18) PF1-9 Key
The function of these Keys can be programmed by the FPU.

| Function | Description | Note |
|---------------------|---|--|
| [] : Key top name | | |
| No Function | No function. | Default setting of PF1~9. |
| Monitor [MON] | If [MON] is pressed once while the RADIO is waiting for reception, all signalling* squelch is canceled. If [MON] is held down for 2 seconds, noise squelch is canceled and the audio is unmuted. | Default setting of MON. (Full function panel) all signalling; QT/DQT & 2 TONE/DTMF |
| Scan [SCN] | Start and stop the scanning sequence. | Default setting of SCN. (Full function panel) |
| Public Address [PA] | The RADIO works as a PUBLIC ADDRESS amplifier. | |
| Horn Alert [HA] | When the RADIO receives a the optional signalling calls that are assigned to the channel, the HA relay turns on. | |
| Talk Around [TA] | Use this function to communicate with other operators directry, without using a repeater. | |
| Intercom [IC] | Use this function to communicate between the HEAD1 and HEAD2 operator without transmitting. | Dual HEAD configuration only. |

OPERATING FEATURES

| Function [] : Key top name | Description | Note |
|---------------------------------|---|---|
| Channel Name [AN] | Switches the display between Group-Channel No. and Group channel name. | |
| Speaker Internal/ External [SP] | Switch the audio output between Internal speaker and PA speaker. | |
| Delete/ Add [D/A] | Changes the Scan DELETE/ADD setting of each channel or group. | Press and hold [D/A] for more than 2 seconds to toggle a Group DEL and ADD. |
| Squelch Level [SQL] | Press to enter Squelch Level Adjust Mode. The Squelch level can be adjusted by using the UP/DOWN Knob, or the preprogrammed channel Up/Down key or Group Up/Down key. | |
| Operator Selectable Tone [OST] | Select signalling from the pre-programmed QT/DQT list. | |
| Scrambler [OPT] | The optional board on and off. | Install the Scrambler board. |
| AUX A [AUXA] | Turns AUX A port on and off. | |
| AUX B [AUXB] | Turns AUX B port on and off. | |
| AUX C [AUXC] | Turns AUX C port on and off. | |
| Home Channel (Fixed) [HC] | Switches to the pre-programmed Home Channel. | |
| Home Channel (Toggle) [HC] | When pressed once, switches to the Home Channel. Press again to returns to the previous channel. | |
| CH1 Direct [CH1] | Switches to the GR1-CH1 directry. | |
| CH2 Direct [CH2] | Switches to the GR1-CH2 directry. | |
| CH3 Direct [CH3] | Switches to the GR1-CH3 directry. | |
| CH4 Direct [CH4] | Switches to the GR1-CH4 directry. | |
| CH5 Direct [CH5] | Switches to the GR1-CH5 directry. | |
| Channel Recall [RCL] | When pressed once, switches to the last called channel. Press again to return to the previous channel. | The [RCL] Key works in Scan Mode only. |
| Dimmer [DIM] | Use this function to adjust the LCD backlight brightness, Key backlight, TX/BUSY LED, and DTMF Mic Key backlight ON/OFF. | |

| Function [] : Key top name | Description | Note |
|--------------------------------|---|------------------------------------|
| Speaker 1-2 Mute [SPM] | Each speaker audio can be manually disabled from the other control head. | Dual HEAD configuration only. |
| Channel UP [^] | If [^] is pressed once, the channel increases by one step. If [^] is held down for 1 second, the channel increases continuously. | |
| Channel DOWN [v] | If [v] is pressed once, the channel decreases by one step. If [v] is held down for 1 second, the channel decreases continuously. | |
| Group UP [^] | If [^] is pressed once, the group increases by one step. If [^] is held down for 1 second, the group increases continuously. | |
| Group DOWN [v] | If [v] is pressed once, the group decreases by one step. If [v] is held down for 1 second, the group decreases continuously. | |
| Mobile Relay Station [RPT] | The RADIO works as a repeater. | Dual BAND configuration only. |
| Emergency Call [EMG] | To start an Emergency Call, press [EMG]. | This function needs the ANI board. |

(19) LCD Display

| | Description | Note |
|-----------|---|---|
| (20) CALL | Flashes when the RADIO is called by proper Optional Signalling (DTMF or 2Tone). | If Signalling has been set "AND", CALL lights after transmitting. |
| (21) MON | Lights when [MON] is pressed. Signalling squelch is disabled. | |
| (22) SCN | Indicates when scan mode is enabled. | |
| (23) SP | Lights when "PA speaker" is selected for audio output. | |
| (24) OPT | Lights when the optional board*, that is installed inside the RADIO, is enabled. | Optional Board : - Scrambler |
| (25) A | Lights when [AUXA] is pressed. The PF Port that is programmed with "AUX A" is ON. | |
| (26) B | Lights when [AUXB] is pressed. The PF Port that is programmed with "AUX B" is ON. | |

OPERATING FEATURES

| | Description | Note |
|---|---|------|
| (27) C | Lights when [AUXC] is pressed. The PF Port that is programmed with "AUX C" is ON. | |
| (28) OST | Lights when [OST] is pressed, Operator Selectable Tone is enabled. | |
| (29) ▼ (Group Add Status) | If the selected group is in the multi group scan sequence, the indicator appears at the group. | |
| (30) ▼ (Channel Add Status) | If the selected channel is in the scan sequence, the indicator appears at the channel. | |
| (31) • BASIC FUNCTION PANEL 7 SEGMENT display • FULL FUNCTION PANEL DOT MATRIX (S) display | Displays the channel status. P1 : Lights when a PRIORITY 1 channel is shown on the display. P2 : Lights when a PRIORITY 2 channel is shown on the display. PP : Lights when a PRIORITY 1 & 2 channel is shown on the display. HC : Lights when a Home Channel is selected by [HC] key. TA : Lights when the RADIO is in Talk Around mode. RCL : Lights when recall channel is selected by [RCL] key. R1-R15 : Lights when remote channel is selected by PF port. | |
| (32) • BASIC FUNCTION PANEL 13 SEGMENT display • FULL FUNCTION PANEL DOT MATRIX (L) display | Displays the operating Group-Channel number (Channel display), or name (Alphanumeric display) programmed by the FPU. Also displays the status of some features. | |

1-3. Microphone

Press PTT (Push To Talk) to transmit, then speak into the microphone.

2. Receive

- (1) To turn on the RADIO:
Press the Power Switch. The display and graphics illuminate to indicate the RADIO is ON.
- (2) To adjust the volume level:
Turn the Volume Knob CW to increase the volume level.
Turn the Volume Knob CCW to decrease the volume level.
- (3) To select a Group:
Select a Group by rotating the UP/DOWN Knob which has been programmed with "Group UP/DOWN" or by pressing the Keys which have been programmed with "Group UP" and "Group DOWN".
If the "Channel Tracking Function" is enabled, the channel number will not change.
- (4) To Select a Channel:
Select a Channel by rotating the UP/DOWN Knob which has been programmed with "Channel UP/DOWN" or by pressing the keys which have been programmed with "Channel UP" and "Channel DOWN".
- (5) To enter carrier squelch mode:
If you want to monitor a channel, press [MON] Key. If the "OFF HOOK Decode" function has been disabled, you can also enter monitor mode by taking the microphone off HOOK.

3. Transmit

- (1) Normal ON HOOK Scan Mode
First, lift the microphone from the HOOK. The scanning stops temporarily and the OFF HOOK revert channel is displayed. Listen for a few seconds to make certain the channel is not being used.
OFF HOOK Scan MODE
If scanning, pressing the PTT switch will stop the RADIO on the OFF HOOK revert channel and begin transmission immediately.
Not Scan Mode
Pressing PTT starts transmission at the selected channel.
- (2) Press PTT and start speaking. For best results, hold the microphone 1 to 1.5 inches from your mouth. Release PTT when your message is complete. Listen for a response.
- (3) When your conversation is finished, replace the microphone on its hook.

4. Scan Operation

4-1. General

There are two "Mic HOOK" scan modes in which the RADIO can be programmed to operate.

- ON HOOK Scan
Normal method of scanning that requires the microphone to be ON HOOK (hanged on the Mic Hanger) to initiate scan.
- OFF HOOK Scan
The microphone does not have to be ON HOOK to initiate scan or to scan channels.

OPERATING FEATURES

- (1) The scan feature is initiated by pressing the [SCN] Key.
- (2) A single confirmation tone sounds, and scanning starts. If there is only one or no added channels, an error tone will sound and scanning will not start.
- (3) The display shows "SCN" icon, and "SCAN" or the OFF HOOK Revert Channel Number (FPU setting).
- (4) If the RADIO receives a proper signal while scanning, scanning stops temporarily, audio is unmuted, and the channel number or name is displayed.
If either "Priority1" or "Priority2" is programmed and scanning stops at a Normal Channel by receiving a signal, the RADIO watches for a signal on the Priority Channel periodically. When a signal exists on the Priority Channel, the channel will change from the Normal Channel to Priority Channel.
If both "Priority1" and "Priority2" are programmed and scanning stops at the Priority2 Channel by receiving a signal, the RADIO watches a signal on the Priority1 Channel periodically. When a signal exists on the Priority1 Channel, the channel will change from the Priority2 Channel to the Priority1 Channel.
If there is no Priority Channel programmed, the scanning stops at a channel and receives only that channel.
- (5) If the [SCN] Key pressed again, Scan Mode ends at the revert channel, and two confirmation tones sound.

4-2. To Delete Undesired Channels

To temporarily delete undesirable channels, press [D/A] Key while the channel is displayed, and scanning resumes. (To temporarily delete Priority Channel 1 or 2, set the "Priority Temporary D/A" function to "YES".)

You can't delete a channel in Scan Mode under the following conditions:

- Priority Scan
There is only channel beside the Priority Channel in the scan sequence.
- Non-priority Scan
There are only 2 channels in the scan sequence. To restore the original scan sequence, either turn scan off and on or turn the RADIO off and on.

4-3. To Enter Carrier Squelch Scan While Scan is On

If you have pressed the [MON] Key, the MON indicator is turned on and the RADIO operates in carrier squelch scan.

5. Adding Channels and Groups to the Scan Sequence

- (1) Channels
To add the currently displayed channel to the scan sequence, press [D/A] Key. The CH ADD indicator (▼) lights, and the channel is added to the scan sequence.
- (2) Groups
To add the currently displayed group of channels to the scan sequence, hold down the [D/A] Key for 2 seconds. The GR ADD indicator (▼) lights, and the group is added to the scan sequence.

6. Deleting Channels and Groups from the Scan Sequence

- (1) Channels
To delete a channel from the scan sequence press [D/A] Key. The CH ADD indicator (▼) goes off, and the channel is deleted from the scan sequence.
- (2) Groups
To delete the currently displayed group of channels from the scan sequence, hold down [D/A] Key for 2 seconds. The GR ADD indicator (▼) goes off, and all the channels in the group are deleted from the multi group scan sequence.

7. Operator Selectable Priority

- (1) Operator Selectable Priority1
If Priority1 has been set to "Operator Selectable", you can set the currently displayed channel as Priority1. To set the currently displayed channel as Priority1, hold down the [SCN] Key and press the [MON] Key three times.
- (2) Operator Selectable Priority2
If Priority2 has been set to "Operator Selectable" you can set the currently displayed channel as Priority2. To set the currently displayed channel as Priority2, hold down the [SCN] Key and press the [MON] Key twice.

8. Talk Around (TA)

Talk Around is useful when you are close to other mobiles you want to talk to, or are outside the range of your repeater system.

Press the [TA] Key. A confirmation tone sounds, and "TA" (BASIC Panel : 7 segment, FULL Panel : DOT MATRIX (S)) is displayed. You can communicate without using a repeater.

To use a repeater, press [TA] again. A confirmation tone sounds, and "TA" goes off.

9. Horn Alert (HA)

If you are called from the base station using 2Tone/DTMF while you are away from your transceiver, you will be alerted by the vehicle horn or some other type of external alert. To turn the horn alert function on, press the [HA] Key. A confirmation tone sounds, and the display shows HORN ALERT (or HA).

If [HA] is pressed again, the horn alert function is turned off.

OPERATING FEATURES

10. Public Address (PA)

Public Address amplifies the microphone audio, and outputs it through a PA speaker. PA is activated by pressing the [PA] Key. A confirmation tone sounds, and the display shows PUBLIC ADDRESS (or PA). PA can be activated at anytime (scanning or non-scanning).

The RADIO continues to scan & receive calls while in PA mode. Pressing PTT activates PA, and will override an incoming call at anytime ; however, no RADIO transmission takes place. If [PA] is pressed again, a confirmation tone will sound, the display will return to the normal channel or SCAN display, and the PA function will turn off.

11. Speaker Internal/External (SP)

SP amplifies the received audio from the RADIO and outputs it through a PA speaker. SP is activated by pressing the [SP] Key. A confirmation tone sounds and the SP icon is displayed. SP can be activated at anytime (scanning or non-scanning).

The RADIO transmits and operates normally while SP is activated, but all received calls will be output through the PA speaker. If [SP] is pressed again, a confirmation tone sounds, the SP icon goes off and the SP function will turn off.

12. Channel Name (AN)

This function switches the 13-segment display (BASIC Panel) or DOT MATRIX (L) display (FULL Panel) between alphanumeric and Group-Channel number.

If you want to change from alphanumeric display to channel display, press [AN] Key. A confirmation tone sounds, and the alphanumeric display changes to the channel display.

If [AN] is pressed again, a confirmation tone sounds, and the channel display changes back to the alphanumeric display.

13. Intercom (IC) ; Dual Head Configuration only

Intercom (IC) allows one control head operator to talk to the another control head operator. IC mode is activated by pressing the [IC] Key. A confirmation tone sounds and the display shows INTERCOM. IC can be activated at anytime (scanning or non-scanning).

The RADIO continues to scan & receive calls while in IC mode. Pressing PTT activates IC and will override an incoming call at anytime ; however, no RADIO transmission takes place. If [IC] is pressed again, a confirmation tone sounds, the display returns to the normal channel or SCAN display, and the IC function will turn off.

14. Home Channel (HC)

This feature allows the radio operator to immediately select a pre-determined "Home Channel" by pressing the [HC] Key. HC can be activated as follows.

| | | | |
|------------------|--|--------------------------|---------------------------|
| | CASE1 : HC has been set as "HC (Fixed)" | | |
| | Non-Scan Mode | Scanning | Scan temporary stopping |
| press [HC] once | Change to Home Channel | | |
| press [HC] again | No effect | | |
| | CASE2 : HC has been set as "HC (Toggle)" | | |
| | Non-Scan Mode | Scanning | Scan temporary stopping |
| press [HC] once | Change to Home Channel | | |
| press [HC] again | Return to current channel | Change to Revert Channel | Return to current channel |

15. Squelch Level (SQL)

This function allows the radio operator to manually adjust the squelch threshold in 16 steps (Level 0~15) via the front panel controls. To adjust the squelch level:

- (1) Press the [SQL] Key. A confirmation tone sounds, and the RADIO enters Squelch Level Adjust Mode. In this mode, all signalings are canceled and audio is unmuted. The display shows SQUELCH XX (or SQL XX). (XX= squelch level)
- (2) Change the squelch level by pressing [^] and [v] Keys, or rotating the UP/DOWN Knob.
- (3) Press [SQL] again. A confirmation tone sounds, the display returns to the normal channel, the level setting is memorized, and Squelch Level Adjust Mode will turn off.

* This feature can be initiated when the RADIO is not in scanning mode.

16. Operator Selectable Tone (OST)

This function allows the radio operator to change the pre-set decode QT/DQT, encode QT/DQT. You can select Dec/Enc OFF or from up to 16 decode/encode pairs (Pair No. 1~16) programmed by the FPU. To select the Dec/Enc pairs:

- (1) Press the [OST] Key. A confirmation tone sounds, and the display shows the OST Name which is memorized in the channel for 2 seconds. The "OST" icon lights, and OST is enabled.
Press [OST] again, and the OST icon goes off and OST is disabled.
- (2) When the [OST] Key is held down, a confirmation tone sounds and the RADIO enters OST Select Mode.
- (3) Select the Dec/Enc pair by pressing the [^] and [v] Keys, or rotating the UP/DOWN Knob. The display shows TONE XX (XX=Dec/Enc pair number) or the OST Name.
- (4) Press [OST] again, a confirmation tone sounds, the display returns to the normal channel, the pair is memorized and OST Mode will turn off.

* You can select a Dec/Enc pair on each channel.

OPERATING FEATURES

17. Option Board (OPT)

If an optional Scrambler board has been installed in the RADIO, Scrambler is activated by pressing the [OPT] Key. A confirmation tone sounds, and the OPT icon is displayed. If [OPT] is pressed again, a confirmation tone sounds, the OPT icon goes off and the Scrambler will turn off.

If [OPT] is held down, the RADIO enters SCR Code Set Mode. A confirmation tone sounds, and the display shows CODE XX (XX=SCR Code). Change the SCR Code by pressing the [^] and [v] Keys, or rotating the UP/DOWN Knob.

Press [OPT] again, a confirmation tone sounds, the display returns to channel (SCR is ON), the SCR Code setting is memorized, then SCR Code Set Mode will turn off.

18. AUX A, AUX B, AUX C

This function switches the accessory PF Output ports which have been programmed with AUX A, AUX B and AUX C.

Press [AUXA] Key. A confirmation tone sounds, the A icon is displayed, and the AUX A Port is switched on (Low level). If [AUXA] is pressed again, a confirmation tone sounds, the A icon goes off and the AUX A Port is switched off (open collector).

In the same way, [AUXB] Key controls the AUX B Port, and [AUXC] Key controls the AUX C Port.

19. Direct Channel Access

This feature allows the radio operator to immediately select CHANNELs 1~5 which are contained in GROUP 1. To select GR1-CH1, press [CH1]. To select GR1-CH2~5, press [CH2] ~ [CH5],

20. Channel Recall (RCL)

This feature is enabled in scan mode.

This feature allows the radio operator to immediately access the last called (Unmuted) channel by pressing [RCL]. The 3-digit display shows "RCL". Press [RCL] again, and the radio returns to the previous channel.

21. Dimmer (DIM)

To adjust the brightness of the display backlight, TX/BUSY LED, panel Keys backlight and microphone keys backlight, press the [DIM] Key.

[DIM] controls the brightness at the same time as follows.

| | Display backlight | TX/BUSY LED | Panel Keys backlight | Microphone Keys backlight |
|---------------------|----------------------|-------------------|-------------------------|------------------------------|
| Default | High | High | High | High |
| Press [DIM] once | Medium | ↓ | ↓ | ↓ |
| Press again | Low | ↓ | ↓ | ↓ |
| Press again | OFF | OFF | OFF | OFF |
| Press again | return to High | return to High | return to High | return to High |

* The brightness setting is memorized.

22. Speaker 1-2 Mute (SPM)

; Dual Head Configuration only

This feature allows the radio operator to manually disable the speaker audio of another control head.

Press the [SPM] Key, a confirmation tone sounds, and the other head speaker is muted. Both head displays shows X MUTE (X=Muted HEAD number).

This muted condition is canceled by both head keys without PTT and Mic HOOK which is connected to Un-muted head.

23. Mobile Relay Station (RPT)

; Dual Band Configuration only

This function allows the radio operator to use the RADIO as a repeater.

- (1) Both "Repeater Channel 1" and "Repeater Channel 2" must be pre-programmed by the FPU. Each channels must be on different bands.
- (2) Press the [RPT] Key, then both the VHF and UHF units move to the repeater channel, and enter Repeater mode. Displays of both heads show "REPEATER".
- (3) If one unit receives a proper signal, the other unit will start transmitting (repeating).
- (4) If the signal stops, the repeat action will stop. If one of the units detects another signal, the repeat action will restart.
- (5) Press [RPT] again, both units return to their previous channels, and exit the Repeater mode. However, during the repeating mode, pressing [RPT] has no effect.

24. Emergency Call (EMG)

If the [EMG] Key is held down, the RADIO enters the Emergency Mode. In the Emergency Mode, the channel changes to the "Emergency Channel (set by the FPU)" internally. The display depends on "Emergency Channel Display" setting, and the Emergency Call (None, DTMF, MSK or ANI board) is transmitted.

If "ANI Board" is selected for the Emergency Type, turn the transceiver off, then turn it on again to recover "Normal Mode".

If "ANI Board" is not selected for the Emergency Type, press and hold [EMG] key to recover "Normal Mode".

OPERATING FEATURES

25. Busy Channel Lockout (BCL), BCL Override

The Busy Channel Lockout function prevents interference with other stations that may be using the same channel.

While the selected channel is in use, pressing PTT causes the RADIO to sound a warning tone, and transmission is inhibited. To stop the warning tone, release PTT.

If BCL Override has been enabled, pressing PTT within 500msec again will cancel BCL, and transmission is enabled.

26. 2TONE Signalling

2Tone signalling opens the squelch only when the RADIO receives a proper 2Tone code that is the same as the pre-programmed 2Tone for the channel. When the RADIO receives a 2Tone code, the CALL icon flashes.

If Transpond has been programmed, the RADIO will return an acknowledgment signal automatically after receiving the 2Tone code.

If Call Alert has been programmed, an Alert Tone sounds after receiving a 2Tone code. You can configure "Normal" (an alert tone beeps once) or "Continuous" (an alert tone beeps every 5 seconds) for the Call Alert. Unmute condition is canceled and the CALL icon goes off when ; (1) pressing the [MON] Key, (2) hanging the microphone on its hook, (3) muting continues for 10 seconds. (If "Auto Reset" has been programmed)

27. DTMF Signalling

DTMF Signalling opens the squelch only when the RADIO receives a proper DTMF code that is the same as the pre-programmed "Primary Code (Individual ; 1~7digits)" or "Secondary Code (Group ; 1~7digits)". When the RADIO receives a correct code, the CALL icon flashes.

If Transpond has been programmed, the RADIO will return an acknowledgment signal automatically after receiving the DTMF code.

If Call Alert has been programmed, an Alert Tone sounds after receiving a DTMF code. You can configure "Normal" (an alert tone beeps once) or "Continuous" (an alert tone beeps every 5 seconds) for the Call Alert. Unmute condition is canceled and the CALL icon goes off when ; (1) pressing the [MON] Key, (2) hanging the microphone on its hook, (3) muting continues for 10 seconds (If "Auto Reset" has been programmed), and (4) receiving reset code. (Primary code + "#" or secondary code + "#")

28. Time Out Timer

(Possible to configure to each group)

The Time Out Timer function interrupts continuous transmission after a specified time elapses.

Holding down PTT for longer than the programmed time causes the RADIO to stop transmitting and sound a warning tone. To stop the warning tone, release PTT.

29. Signalling AND/OR

(Possible to configure to each group)

The RADIO will be unmuted with a combination of QT/DQT and 2Tone/DTMF. The AND/OR setting works as follows.

29-1. AND

The audio is unmuted when the RADIO receives the correct QT/DQT and 2Tone/DTMF. After transmitting, 2Tone/DTMF will be canceled.

29-2. OR

The audio is unmuted when the RADIO receives the correct QT/DQT. 2Tone/DTMF is used just as an individual call or group call.

30. Off Hook Decode

If the OFF HOOK Decode function has been enabled, removing and replacing the microphone on the HOOK has no effect for decoding QT/DQT and 2Tone/DTMF.

31. TX Audio Monitor

; Dual Head Configuration only

This function allows the radio operator to hear another operator's voice which is transmitted through another control head.

If the TX Audio Monitor function is set to "w/Talk Interrupt" and one operator is transmitting, the other operator's control head displays "INTERCOM" and he/she can speak to the transmitting control head by pressing PTT.

32. Roll Over/Dead End

32-1. Roll Over

When [^] (CH UP) is pressed, or the CH UP/DOWN Knob is turned CW from the Maximum channel, the channel changes to the Minimum channel.

When [v] (CH DOWN) is pressed, or the CH UP/DOWN Knob is turned CCW from the Minimum channel, the channel changes to the Maximum channel.

32-2. Dead End

When [^] (GR UP) is pressed, or the GR UP/DOWN Knob is turned CW from the Maximum group, the group doesn't change.

When [^] (CH UP) is pressed, or the CH UP/DOWN Knob is turned CW from the Maximum channel, the channel doesn't change.

When [v] (GR DOWN) is pressed, or the GR UP/DOWN Knob is turned CCW from the Minimum group, the group doesn't change.

When [v] (CH DOWN) is pressed, or the CH UP/DOWN Knob is turned CCW from the Minimum channel, the channel doesn't change.

OPERATING FEATURES

33. Minimum Volume

When the Volume Knob is adjusted fully counterclockwise, the audio level is set to the Minimum Volume level which is programmed by the FPU.

34. Dead Beat Disable (DBD)

If the RADIO receives a DBD Code (1~7digits), the RADIO returns an acknowledgment signal automatically, and transmission is disabled. This TX INHIBIT condition is memorized.

If the RADIO receives a DBD Reset Code (DBD Code + #), the RADIO returns an acknowledgment signal automatically, and transmission is Enabled.

35. ANI Board

The ANI board contains functions which you can use. To use the function, you select that function on the ANI board.

36. Accessory Programmable Function Port (PF Port)

The RADIO has 13 PF Ports.

HEAD (12 pin) : PF Input Port 2, PF Output Port 2

DECK (Dsub 25 pin) : PF Input Port 5, PF Output Port 4

Each Port can be programmed with a function from next Table.

36-1. PF Input Port

| | |
|------------------|---|
| External HOOK | Open → OFF HOOK, Low → ON HOOK |
| CH Select A | The Channel changes to Remote Channel |
| CH Select B | 1~15. If CH Select A~D are set "H" or "Open", the channel is selected by using the [^]/[v] keys or UP/DOWN Knob. (User Channel) |
| CH Select C | |
| CH Select D | |
| External PTT | Open → PTT OFF, Low → PTT ON |
| Scan | Open → Scan OFF, Low → Scan ON |
| Home Channel | Open → Current Channel, Low → Home Channel |
| Light Sense | Open → LCD Backlight is controlled by [DIM], Low → LCD Backlight is set "Low" |
| Repeater SW | Open → Repeater inactive, Low → Repeater Active * Dual BAND configuration only |
| External Monitor | Open → Monitor OFF, Low → Monitor ON |

36-2. PF Output Port

| | |
|-------|---|
| AUX A | Pressing [AUXA] once → Low, Pressing [A] [AUXA] again → OPEN-COLLECTOR |
| AUX B | Pressing [AUXB] once → Low, Pressing [B] [AUXB] again → OPEN-COLLECTOR |
| AUX C | Pressing [AUXC] once → Low, Pressing [C] [AUXC] again → OPEN-COLLECTOR |
| TOR | Receiving correct QT/DQT → Low, Not receiving correct QT/DQT → OPEN-COLLECTOR |
| COR | BUSY → Low, Not BUSY → OPEN-COLLECTOR |

37. Timed Power Off

This function works as "Automatic Power Switch Off".

Timed Power Off timer starts from the ignition-off. After the timer expires, the RADIO will automatically turn off. The timer will be reset if the ignition is turned on and off.

This function requires ignition-sense. Connect the ignition-line to the 9-pin connector which is located at the rear of the RADIO.

After the timer expires, you can turn the transceiver on again with 2 methods below.

- 1) Timed power off function (Default)
Press the power switch.
- 2) Ignition function & Timed power off function
Turn the ignition on.

38. Emergency

- **Active tone**
Automatic transmission period in the emergency mode.
- **Interval Time**
Interval time between the automatic transmissions.
- **Duration of Locator Tone 1**
Duration of an alert tone before the automatic transmission is performed.
- **Duration of Locator Tone 2**
Duration of an alert tone after the automatic transmission is performed.
- **Emergency Channel Display**
Setting for the display in the emergency mode.
The transceiver can be programmed to display "EMERGENCY" channel name when it is in emergency mode.
If you set to "off" by KPG-44D the transceiver shows selected group/channel/status before entering to the emergency mode however the transceiver is in an emergency mode.

OPERATING FEATURES

- **Emergency Mode Type**
Speaker mute on or off in the emergency mode.
- **Emergency Type**
Select an Emergency code format from DTMF, MSK, ANI board or OFF (Disabled).
- **Emergency DTMF ID**
The emergency DTMF ID code when you select DTMF in the emergency type.
- **Emergency Call Fleet**
The emergency fleet number when you select MSK in the emergency type.
- **Emergency Call ID**
The ID number when you select MSK in the above emergency type.

39. MSK PTT ID

- **Side Tone**
A tone to notify the voice transmission is allowed after sending the MSK PTT ID (Connect ID).
- **Fleet (Own)**
- **ID (Own)**
Configure the Fleet/ID of the MSK PTT ID (Fleet Sync Format).
- **Data TX Mod. Delay**
Delay time of transmitting the MSK ID after the transceiver enters the transmission mode.

40. Power On Text

To display the Power on text for approximately 2 seconds when the transceiver is turned on.

41. Data Programming (PC Mode)

41-1. Preparation and Connection

TK-690H transceiver is programmed by using a personal computer, programming interface cable KPG-43, and programming software KPG-44D.

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

41-2. Programming Interface Cable KPG-43 Description

The KPG-43 is required to interface TK-690H to the computer. It has a circuit in its D-sub 25 pin connector case that converts RS-232C logic level to TTL level.

KPG-43 is used to connect between TK-690H microphone connector and RS-232C serial port of computer.

41-3. Programming Software KPG-44D Description

KPG-44D is the programming software for TK-690H supplied on a 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 machine.

The data can be input to or read from TK-690H and edited on the screen. The programmed or edited data can be printed out. It is also possible to tune the transceiver.

We recommend that install KPG-44D for example to harddisk first then use it.

KPG-44D instruction manual part No. : B62-1011-XX.

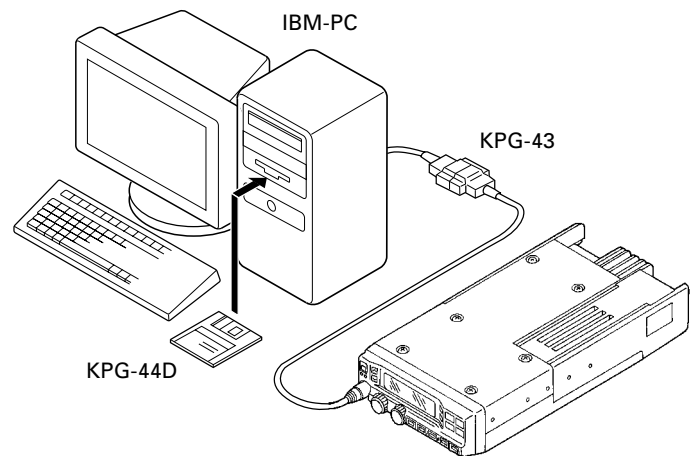
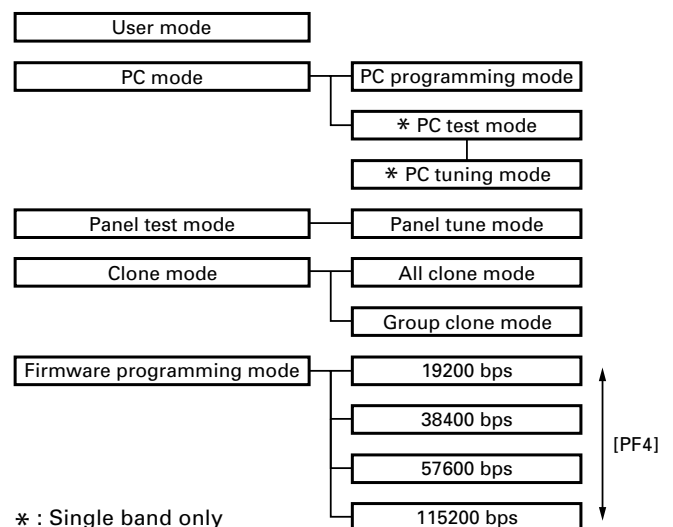


Fig. 1

42. Mode



OPERATING FEATURES

| Mode | Function |
|--|--|
| User mode | Customer use this mode |
| PC mode | Communication between the radio and PC (IBM compatible). It requires the KPG-44D. |
| Panel test mode (Refer to ADJUSTMENT) | Dealer uses to check the fundamental characteristics. |
| Panel tune mode (Refer to ADJUSTMENT) | Dealer uses to tune the radio. |
| Clone mode | Programmed data is transferred from one transceiver to another by using a cloning cable. |
| Firmware programming mode | Re-write the firmware of the flash ROM. Note : When programming the firmware, it is best to copy the data from the floppy disk to your hard disk, then from the hard disk to the CPU. Directly copying from the floppy disk to the CPU may not work because the access speed is too slow. |

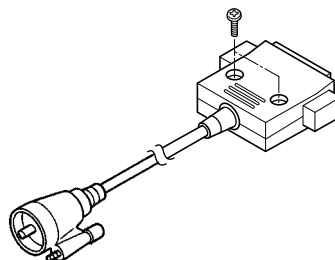
42-1. How to Enter Each Mode

| Mode | Operation |
|---------------------------|---|
| User mode | Power on |
| PC mode | Connect the PC and turn the power on. Then the radio can be controlled by the FPU. |
| Panel test mode | Hold down the [PF1] key, turn the radio power on. |
| Panel tune mode | Press the [GR ^] key from the panel test mode. |
| Clone mode | Hold down the [PF5] key, turn the radio power on. |
| Firmware programming mode | Hold down the [PF2] key, turn the radio power on. |

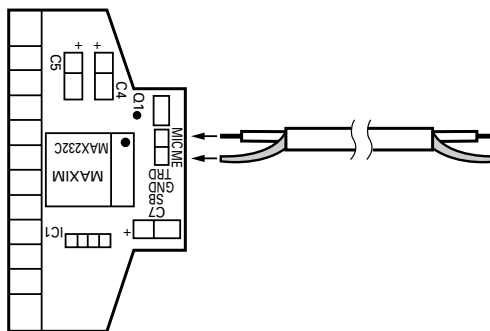
43. PC Tuning Mode

When making adjustment while in PC tuning mode, modify the KPG-43 programming interface cable as described below.

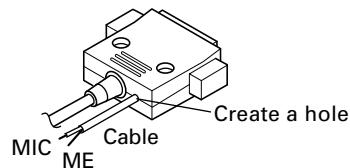
1. Remove the two screws from the plug cover, then lift the cover from the plug.



2. Solder the lead wire onto the MIC tab on the PCB, and the ground wire onto the ME tab.



3. Create a hole in the casing (as shown in the illustration) then fit the cable into the hole. Replace the cover and secure it using the two screws.

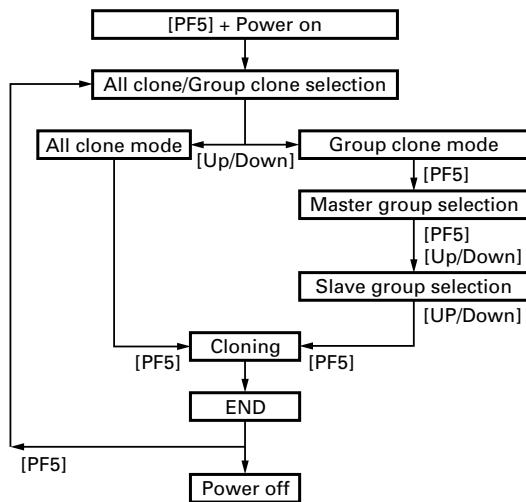


OPERATING FEATURES

44. Clone Modes

There are two clone modes : "All Clone Mode", in which all data programmed in one transceiver with the "FPU" is copied to another transceiver, and "Group Clone Mode", in which group data in one transceiver is copied to a group in another transceiver.

The cloning operation is performed from the master side transceiver.



44-1. To Enter the Clone Mode and Connect Transceivers

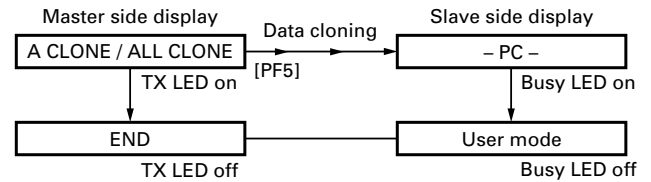
- Hold down the [PF5] key and turn on the power switch on the master side transceiver.
Turn on the power switch on the slave side transceiver as usual.
- Connect the master and slave side transceivers with a cloning cable.

44-2. All Clone

- Enter the All Clone Mode from the clone mode with the [Up/down] knob.
- Press the [PF5] key to start cloning.

44-3. Group Clone

- Enter the group clone mode from the clone mode with [Up/Down] knob.
- Press the [PF5] key to enter the master group select mode. Select the master group with [Up/Down] knob.



- Press the [PF5] key to enter the slave group select mode. Select the slave group with [Up/Down] knob.
- Press the [PF5] key to start cloning.

Note : The transceiver does not enter the clone mode if it is disabled with the FPU. To clone the transceiver both transceivers must be same. If the panels, frequency ranges, optional board are different, they cannot be cloned.

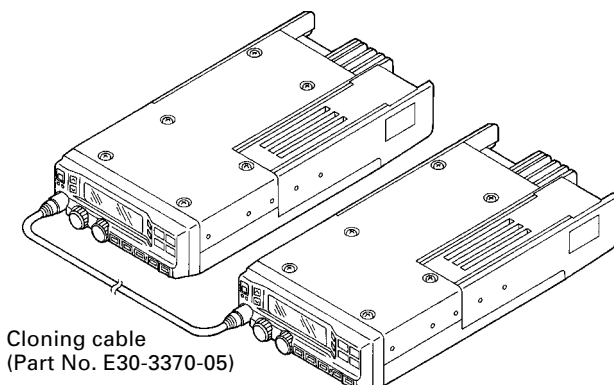
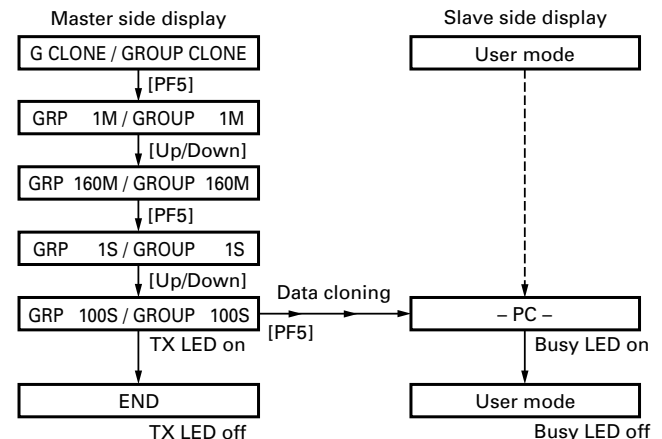


Fig. 2

TK-690H(B)

INSTALLATION

1. Contents

- Front panel kit (KCH-10, KCH-11)
Description and use of the knob supplied with the KCH-10/11
- Optional voice scrambler function
Voice scrambler use and connection
- Optional ANI function
ANI board connection
- Ignition sense cable (KCT-18)
Description of the ignition function and timed power off function and connection
- External speaker (KES-4)
KES-4 connection method and modification for increasing the speaker output of the control head
- Horn alert function
Modification for changing the function of the ACC terminal for horn alert
- Accessory terminal function
Description and use of D-SUB 25-pin ACC terminals, "MI/DI" and "SB"
- Connection with remote kit
Modification of the radio to use KRK-5, KRK-6DH, KRK-7DB, or KRK-8DBH

2. Front Panel Kit (KCH-10, KCH-11)

2-2. Connection with TK-690H(B)

1. Remove the upper and lower halves of the case of the TK-690H(B).
2. Connect the lead (W501) with a connector of the control unit (X57-560 B/2) to CN1 of the KCH-10 or KCH-11.
3. Install the KCH-10 or KCH-11 on the radio using the screws (N32-3006-46) (❶) supplied with the front panel kit. Take care not to get the lead between the KCH-10 or KCH-11 and an edge of the case. (You can install the panel upside down if necessary to install the radio.)
4. Reinstall the upper and lower halves of the case.
5. Connection the short plug for the accessory connector (9-pins) on the rear of the radio.

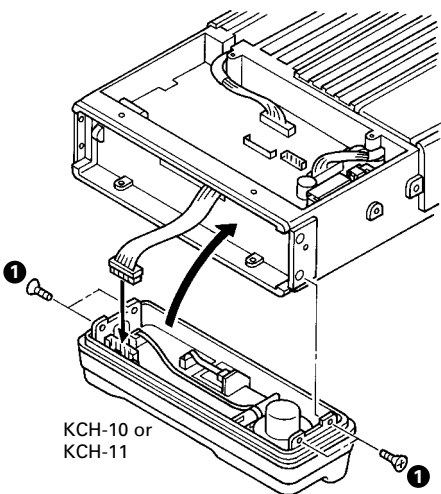


Fig. 1

2-3. Install the accessory knobs

When a function is set by the programming software (KPG-44D), the key legend can be changed by inserting the accessory knobs into PF1 to PF9 of the KCH-11 (PF1 to PF5 : KCH-10). The accessory contains a set of 30 knobs : AN, D/A, DIM, HA, HC, IC, MON, OPT, OST, PA, RCL, RPT, SCN, SP, SPM, SQ, TA, ^, v, CH1, CH2, CH3, CH4, CH5, AUX A, AUX B, AUX C, EMG, and blank.

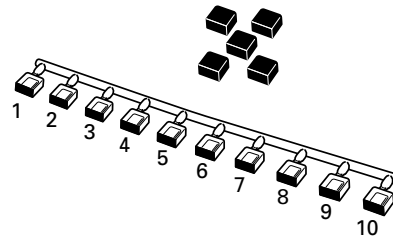
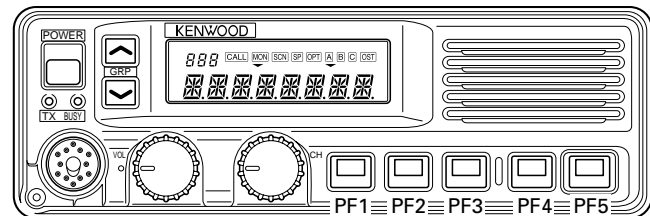


Fig. 2

| No. | K29-5276-*3 | K29-5277-*3 | K29-5305-*3 |
|-----|-------------|-------------|-------------|
| 1 | AN | RCL | CH1 |
| 2 | D/A | RPT | CH2 |
| 3 | DIM | SCN | CH3 |
| 4 | HA | SP | CH4 |
| 5 | HC | SPM | CH5 |
| 6 | IC | SQ | AUX A |
| 7 | MON | TA | AUX B |
| 8 | OPT | ^ | AUX C |
| 9 | OST | v | EMG |
| 10 | PA | No printing | |

KCH-10



KCH-11

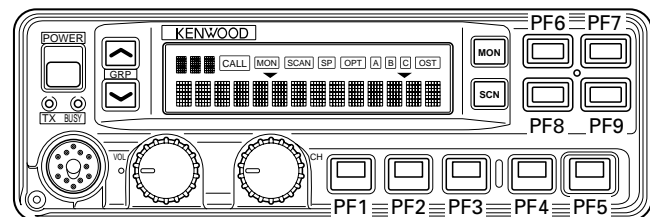


Fig. 3

INSTALLATION

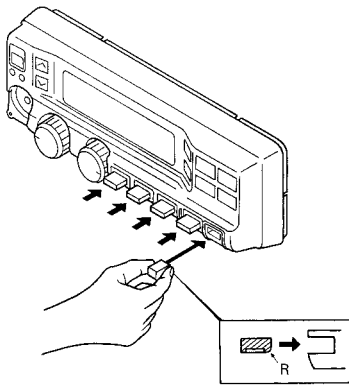


Fig. 4-1 Knob insertion

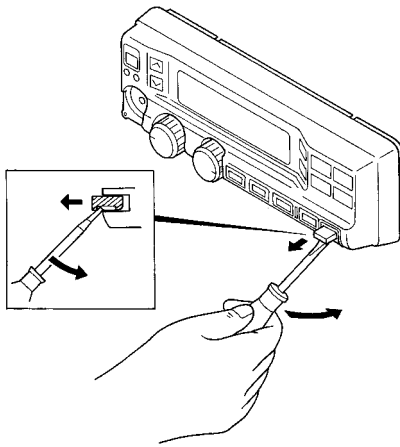


Fig. 4-2 Knob removal

3. Optional Voice Scrambler Function

The optional voice scrambler function can be used by two methods.

1. Assign this function to the OPT key by using the programming software (KPG-44D).
When the OPT key is pressed, the **[OPT]** indicator comes on, and the optional (scrambler) function is enabled. When the key is pressed again, the **[OPT]** indicator goes off and the function is disabled.
2. Assign the optional scrambler function to each channel by using the programming software (KPG-44D). The optional scrambler function can be used without pressing the OPT key.

3-1. Code setting

The code can be set by two methods.

1. Hold down the OPT key to enter the code setting mode. Codes 1 to 16 will be displayed. Set a code by turning the [Up/Down] knob. When the OPT key is pressed again, the code setting mode terminates.
2. Set a code for each channel by using the programming software (KPG-44D).

3-2. Voice scrambler board connection

• Modification

1. Remove the upper half of the case of the TK-690H(B).
2. Remove R515 and R604 on the control unit (X57-560 B/2) (Refer to page 21).

• Connection

The functions of pins of CN508 on the control unit (X57-560 B/2) are shown in the figure.

Join the CN508 connector to the voice scrambler board via the E37-0808-05 connector cable.

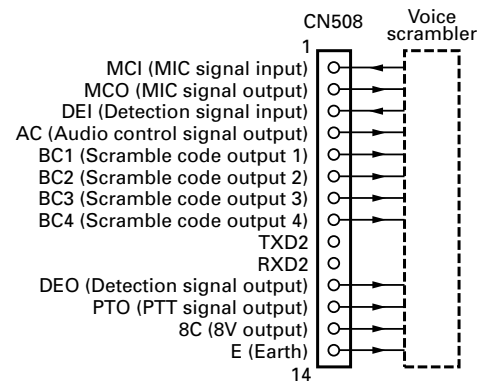


Fig. 5

4. Optional ANI Function

• Connection

Join the CN507 connector to the ANI board via the E37-0809-05 connector cable, and the CN508 connector to the ANI board via the E37-0808-05 connector cable.

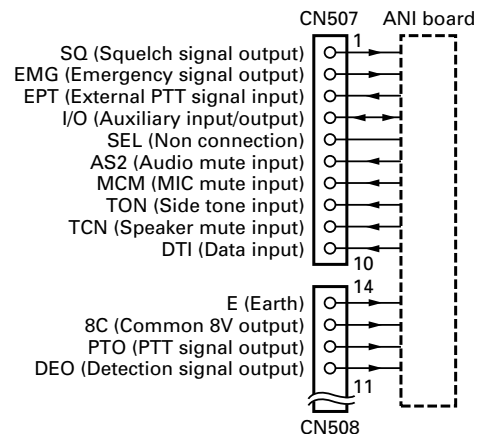


Fig. 6

INSTALLATION

5. Ignition Sense Cable (KCT-18)

The KCT-18 is an optional cable to use the following functions:

5-1. Ignition function

The ignition function allows you to turn the transceiver's power on and off with the ignition key of your car. When you are driving with the ignition key on, the horn alert function is disabled.

5-2. Timed power off function

The timed power off function turns the transceiver's power off the time specified with the programming software (KPG-44D) after the ignition key is turned off. When you are driving with the ignition key on, the horn alert function is disabled.

The ignition sense function and the timed power off function can be used at the same time.

5-3. Modification

• If the TK-690H(B) and KCH-10 or KCH-11 are used

1. Remove the short plug from the accessory connector (9 pins) on the back of the transceiver.
2. Insert the KCT-18 into pin 1 (IGN).
3. Remove the upper half of the case of the TK-690H(B).
4. Set jumper resistors (0 ohm), R504, R506, R742 and R743, on the control unit (X57-560 B/2) as shown in Table 1 (Refer to page 21).
5. Reinstall the upper half of the case.

• When the remote kit is used

If the accessory connector (9 pins) on the rear of the transceiver is available, use the method described above. (If the KRK-7DB or KRK-8DBH is used, use the accessory connector (9 pins) on the back of radio 1.)

If the accessory connector (12 pins) on the back of the control head is used:

1. Remove the plug from the accessory connector (12 pins) on the back 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 1 (IGN) 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 case of the TK-690H(B).
5. Set jumper resistors (0 ohm), R504, R506, R742 and R743, on the control unit (X57-560 B/2) as shown in Table 1 (Refer to page 21).
6. Reinstall the upper half of the case.

Note : If the KCT-18 is used for the KRK-8DBH, use the 9-pin plug on the back of radio 1 or the 12-pin plug on the back of head 1. The plugs on radio 2 and head 2 cannot be used. If the KCT-18 is used for the KRK-7DB, use the 9-pin plug on the back of radio 1 or the 12-pin plug on the back of the head. The plug on radio 2 cannot be used.

| Available function when KCT-18 is connected | R504 | R506 | R742 | R743 |
|--|---------|---------|---------|---------|
| Horn alert function OFF during driving, Timed power off function (Default) | Present | Absent | Present | Absent |
| Horn alert function OFF during driving, Ignition function | Absent | Present | Present | Absent |
| None (The transceiver cannot be turned on.) | Absent | Absent | Present | Absent |
| HA function OFF during driving, Ignition function & Timed power off function | Present | Absent | Absent | Present |

Table 1 R504, R506, R742 and R743 setup chart (Refer to page 21)

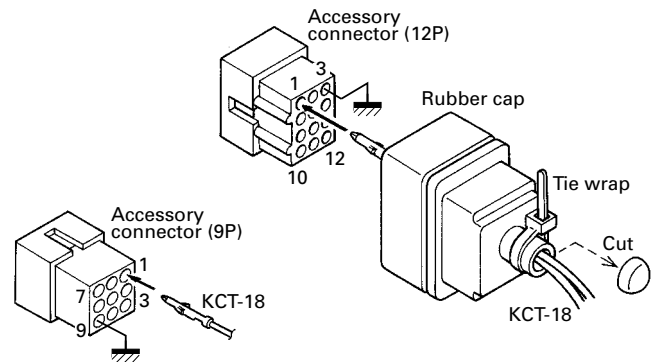


Fig. 7

6. External Speaker (KES-4)

The speaker output from the TK-690H(B) is as follows:

1. The KCH-10 has a built-in speaker (3W/8 ohms).
2. The KCH-11 does not have a built-in speaker.
3. The external speaker output from the accessory connector (9 pins) on the back of the transceiver is 13W/4 ohms. Use the KES-4.
4. The speaker output from the accessory connector (12 pins) on the back of the control head is 2W/4 ohms. If the remote kit (KRK-5, KRK-6DH, KRK-7DB or KRK-8DBH) is used, use the KSP-1A or KES-4. If the KSP-1A is used, do not attempt to modify the transceiver to increase the audio output.

Note : Since the TK-690H(B) uses a BTL audio amplifier, do not ground the speaker output pin.

INSTALLATION

6-1. Connection for the KES-4 with the TK-690H(B)

- **When taking the AF output from the accessory connector (9-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. 8-1).

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 3 and 6 using the extracting tool.

Removing the jumper lead (Fig. 8-2)

- 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 2, and the terminal with the black lead into hole number 6 (Fig. 8-3).
 4. Attach the connector to the external speaker connector on the radio.

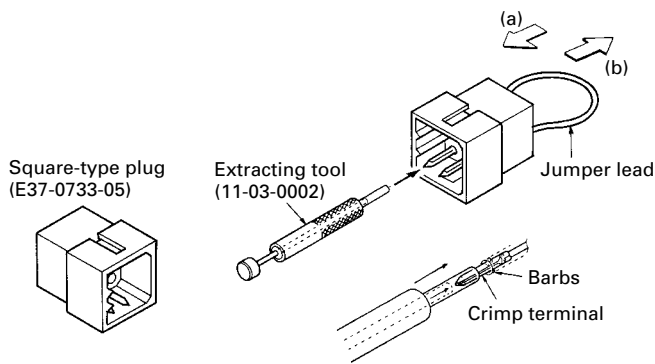


Fig. 8-1

Fig. 8-2

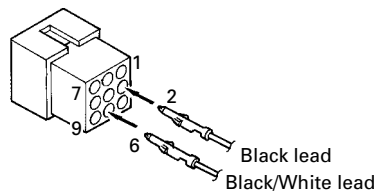


Fig. 8-3

6-2. Connection for the KES-4 with the remote kit (KRK-5, KRK-6DH, KRK-7DB, KRK-8DBH)

- **When output is from the 12-pin accessory connector on the rear of the control head : remote operation**

• Modification of plug (12-pin)

1. Remove the plug from the accessory connector (12-pins) on the rear of the control head.
2. Cut off the end of the rubber cap, insert the KES-4 speaker cable into the cap, and insert it into pins 10 and 11.
3. 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.

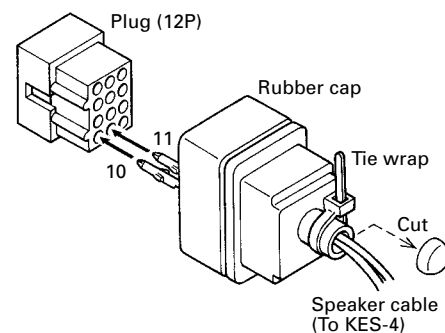


Fig. 9

• If the KCH-10 is used

If the KSP-1A or KES-4 is connected to the 12-pin accessory connector, cut the internal speaker wire at the base of the speaker.

If the internal speaker is used, cut the wire connected to pins 10 and 11 of the 12-pins accessory connector at the base of the connector (Fig. 10).

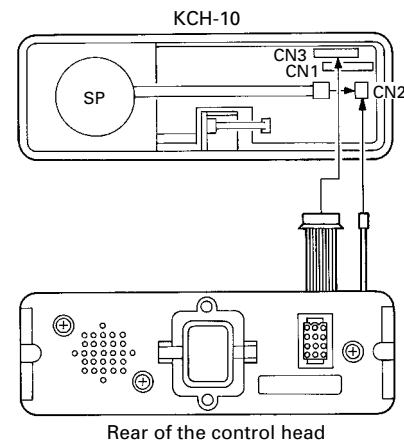


Fig. 10

INSTALLATION

6-3. Modification to increase the audio output of the control head

The speaker output can be increased to 13W by moving jumper resistor (0 ohm) R628 on the control unit (X57-560 B/2) to R627. In this case, the KCH-10 internal speaker cannot be used because the maximum input (3W) of the internal speaker is exceeded. Therefore, use the KES-4.

Note : Even if the KRK-6DH is modified in this way, the audio output of head 2 cannot be increased. To increase the audio output of head 2 of the KRK-8DBH, modify radio 2 in the same manner.

6-4. Use as public address speaker

1. Remove the short plug from the 9-pin accessory connector on the rear of the radio. (Remove the jumpers as described in Section 5-1.)
2. Insert the KES-4 speaker leads into pins 7 and 8.
3. If you remove jumper shorting pins 3 and 6, the 20W PA (public address) voice signal is output from pins 7 and 8. (Only when the PA or SP switch is on.)
4. If you use the radio with pins 3 and 6 shorted, the internal speaker is available (when the KCH-10 is used). The KCH-11 does not contain a speaker.

Note : Relation ship between accessory connector (9-pins) connection and speaker output.
When pins 3 and 6 are shorted ; The 3W internal speaker is used (KCH-10 only).
When pins 3 and 6 are open and output is from pins 7 and 8 ; The 20W external speaker is used.

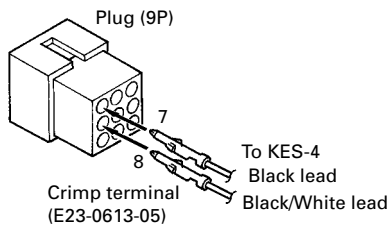


Fig. 11

7. Horn Alert Function

The HR1 pin of the accessory connector (9-pin) on the rear of the transceiver is an open collector and the maximum current is 100mA. The maximum available current can be increased to 1A by installing a relay.

1. Remove the upper half of the case of the TK-690H(B).
2. Move jumper resistor (0 ohm) R691 on the control unit (X57-560 B/2) to R692. To make the HR2 pin, remove R692 (Refer to page 21).
3. Remove screws and erect the PC board. Install and solder relay K501 (Part No. : S76-0407-05).
4. Reinstall the PC board and the upper half of the case.

| | Default | Modification 1 | Modification 2 |
|-------|---------|----------------|----------------|
| R690 | Present | Present | Absent |
| R691 | Present | Absent | Absent |
| R692 | Absent | Present | Present |
| State | | | |

Table 2 (Refer to page 21)

8. Accessory Terminal Function

8-1. 25-pin accessory terminal

• Pin 13

MI/DI (MIC Signal Input/Output or Data Audio Input)
This pin has one of the two functions listed in Table 3 by setting jumper resistors (0 ohm) R640 and R641 on the control unit (X57-560 B/2). (Refer to page 21).

1) MIC signal input/output

This pin is directly connected to the MIC input pin of the transceiver, so it has the same function as the MIC input pin. When the input is 5mV/3 kHz, DEV (600 ohms) modulation is obtained. The MIC input is output from the transceiver panel as it is.

2) Data audio input

The signal from this pin passes through the LPF (fc: about 10kHz), is summed with the MIC AMP output, and goes to the modulator. Therefore, it is not preemphasized.

• Pin 14

SB (DC Power Output After Power Switch)
The maximum output (13.4V / 0.5A) can be obtained by modifying the control unit as follows:
Short the land of the print pattern near CN505 of the control unit (X57-560 B/2).

| R640 | R641 | Function |
|---------|---------|----------------------------|
| Present | Absent | MIC signal input/output |
| Absent | Present | DATA audio input : Default |

Table3 (Refer to page 21)

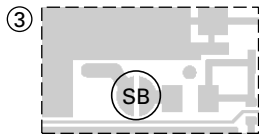
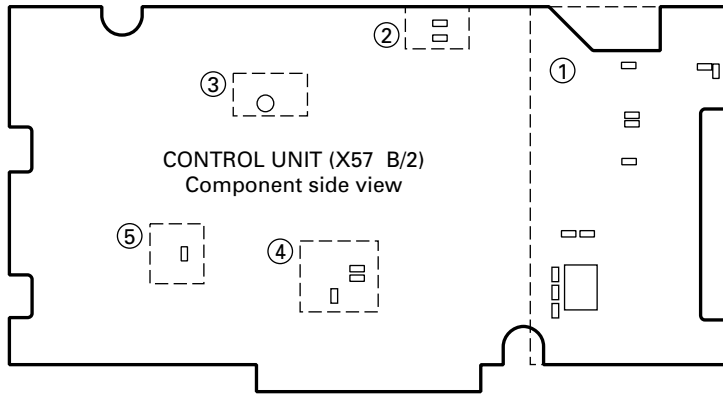
9. Connection with the Remote Kit

When the KRK-5, KRK-6DH, KRK-7DB or KRK-8DBH is used, set chip resistors and transistors as shown in the table below.

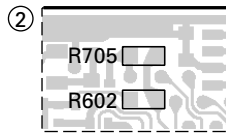
| | KRK-5 | KRK-6DH | KRK-7DB | KRK-8DBH |
|---------|-------------|---------|--|----------|
| Radio 1 | Unnecessary | | | |
| Radio 2 | - | | Remove R546 and R661 Move R602 to R705. | |

Table 4 (Refer to page 21)

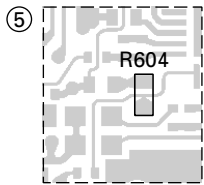
INSTALLATION



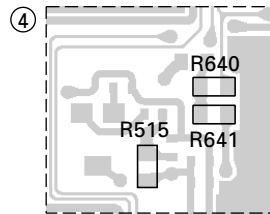
Accessory terminal function (Page 20)



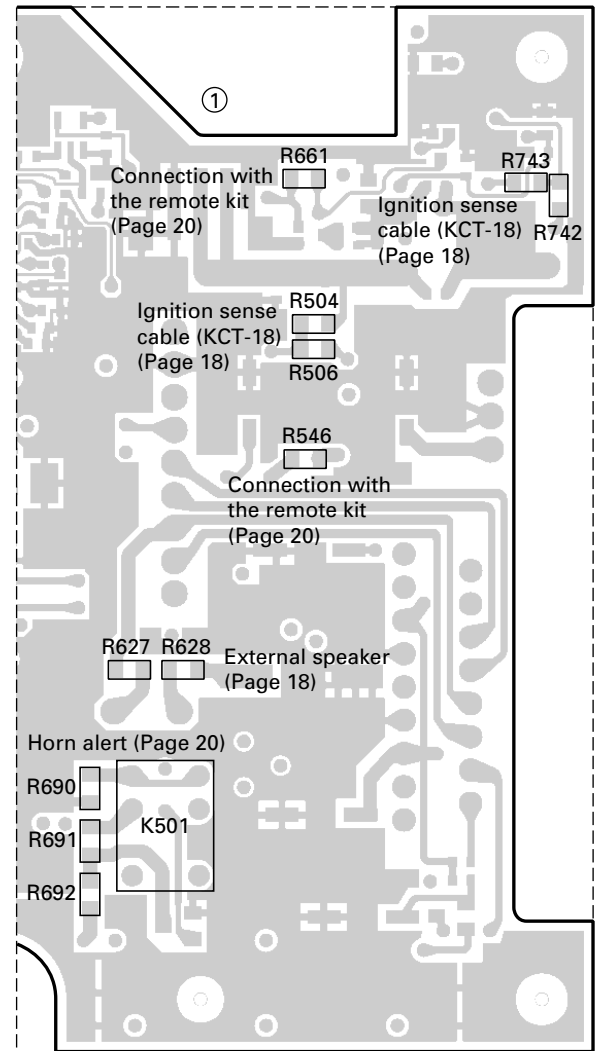
Connection with the remote kit (Page 20)



Voice Scrambler (Page 17)



R515 : Voice Scrambler (Page 17)
R640,641 : Accessory terminal function (Page 20)



TK-690H(B)

DISASSEMBLY FOR REPAIR

1. Removing the Case and Shield Cover

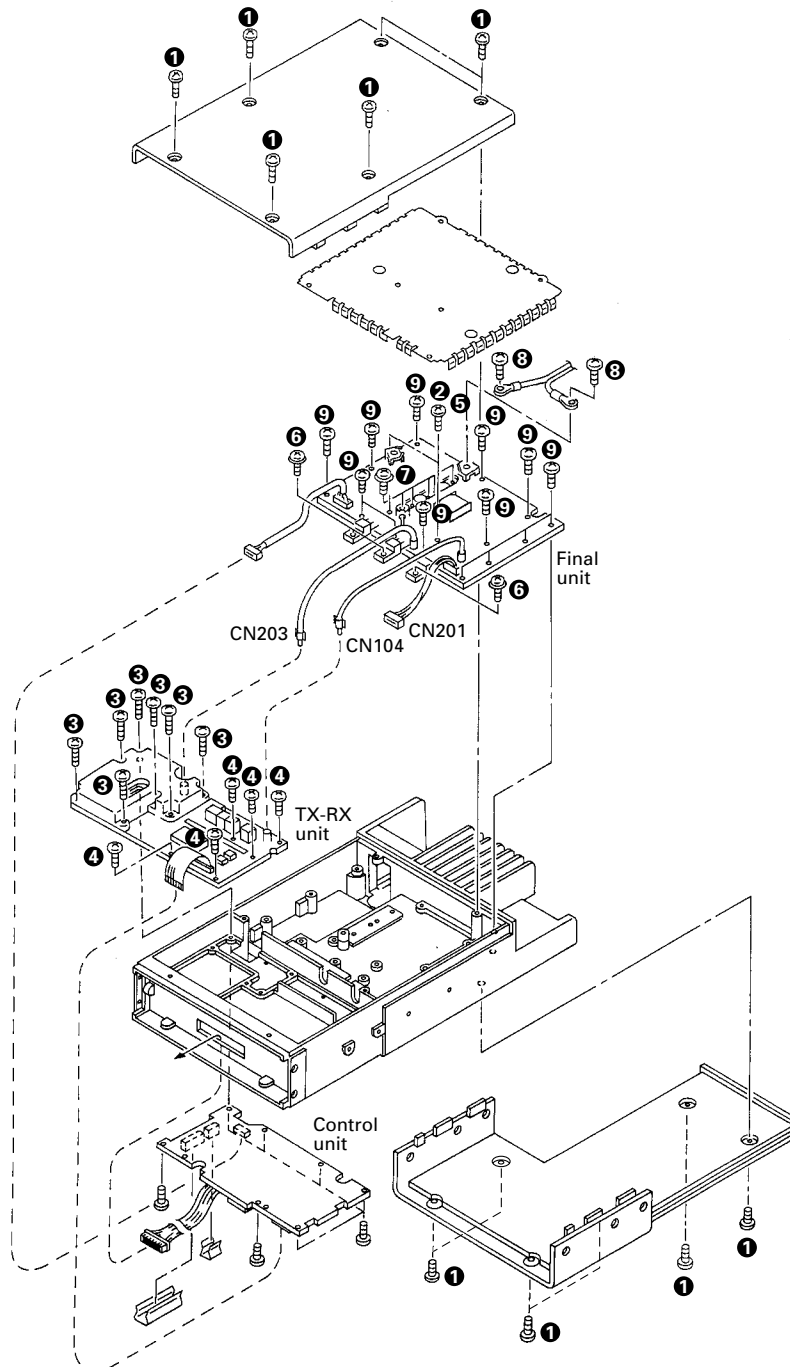
1. Remove the 12 screws (❶), and remove the upper and lower halves of the case. (Remove the 6 screws holding the upper half and the 6 screws holding the lower half.)

2. Removing the TX-RX Unit (X57-560 A/2)

1. Remove the 7 screws (❸), and remove the PLL shield case.
2. Remove the connector (CN201) and coaxial plugs (CN104, CN203) from the final unit, and remove the flat cable (CN202) upwards from the control unit (CN502).
3. Remove the 5 screws (❹).

3. Removing the Final Unit (X45-355)

1. Remove the 2 screws (❺).
2. Remove the 3 screws (❻) holding the power module and transistor to the frame.
3. Desolder two transistors.
4. Remove the 1 screw (❼) holding TH1.
5. Remove the 4 screws (❼) holding the final transistor.
6. Remove the 2 screws (❽) holding the lead terminal from DC connector (4P) on the rear.
7. Remove the 13 screws (❾) holding the PC board.
8. Desolder W3 on the antenna connector.



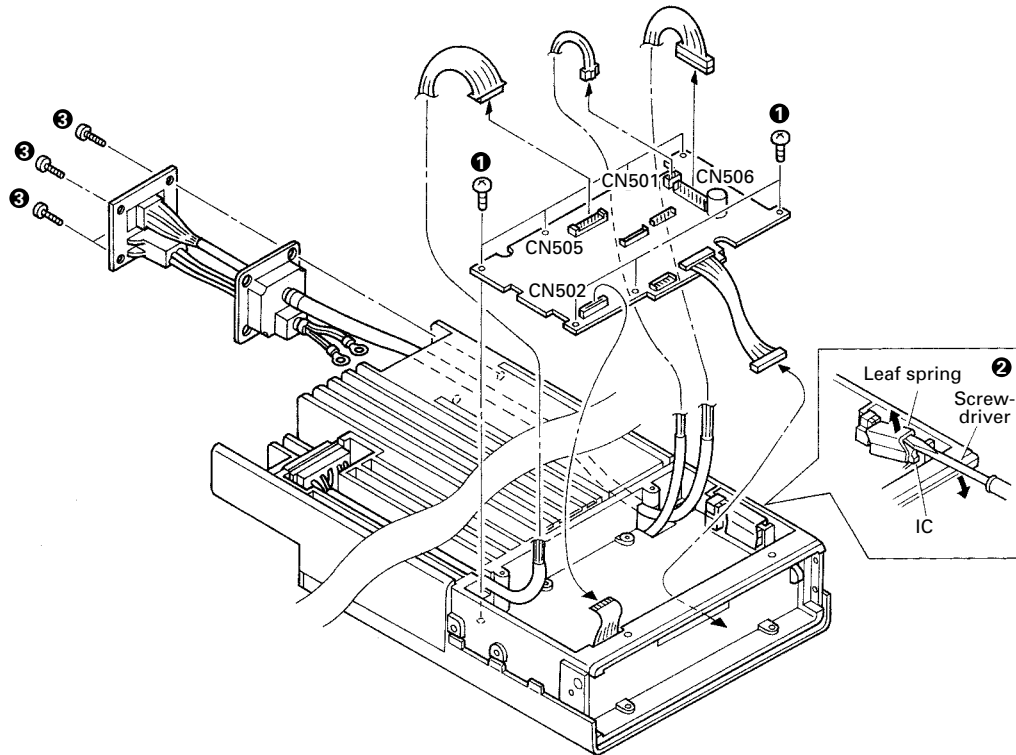
DISASSEMBLY FOR REPAIR

4. Removing the Control Unit (X57-560 B/2)

1. Remove the 8 screws (❶).
2. With a screwdriver, remove the 2 leaf springs holding the ICs to the frame (❷).
3. Remove the flat cable (CN502).
4. Remove the 2 connectors CN501 and CN506.
5. Remove the connector (CN505) from D-sub connector (25P) on the rear.

5. Removing the Accessory Connector on the Rear

1. Confirm that the screw holding +DC cable (red) and the screw holding -DC cable (black) of the final unit are removed, and that CN506 of the control unit (X57-560 B/2) is disconnected. Remove the 4 screws on the rear (❸).
2. Pull out the connector. (Take the connector terminals out through the opening in the frame.)

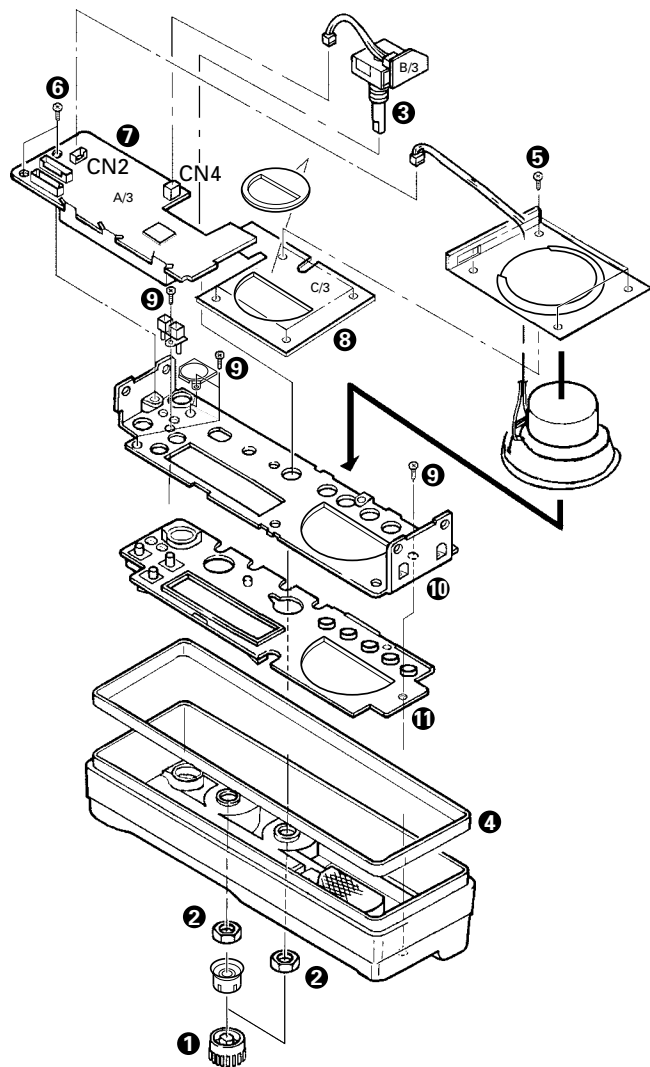


TK-690H(B)

DISASSEMBLY FOR REPAIR

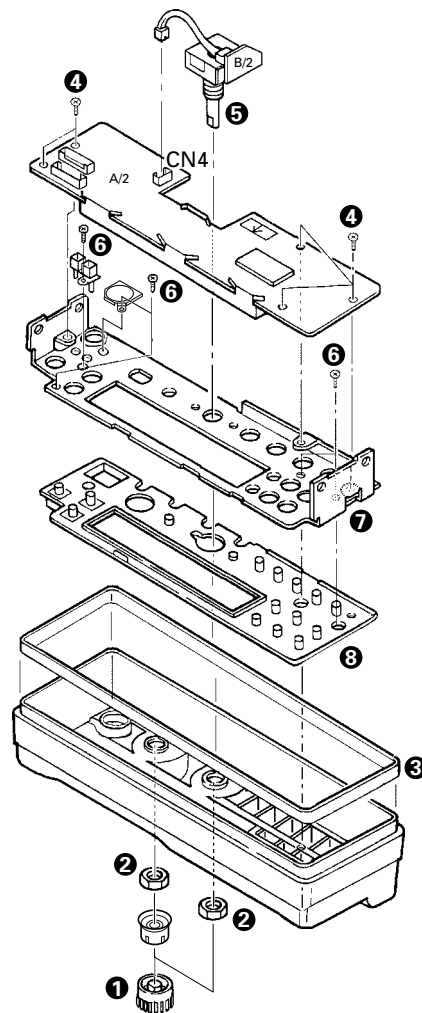
6. Disassembly of the Display Unit (X54-3190) : KCH-10

1. Pull out the VOL and UP/DOWN knobs (❶).
2. Remove the 2 hexagonal nuts (❷).
3. Disconnect the 2 connectors (CN2 and CN4) of the display unit (X54-3190 A/3). You can remove the UP/DOWN encoder (❸).
4. Remove the waterproof seal (❹).
5. Remove the 4 screws (❺) holding the speaker and PC board fitting.
6. Remove the 3 screws (❻). You can remove the display units (X54-3190 A/3 and C/3) (❼ and ❸).
7. Remove the 3 screws (❾), and remove the sub-panel (❿) and keytop (⓫).



7. Disassembly of the Display Unit (X54-3200) : KCH-11

1. Pull out the VOL and UP/DOWN knobs (❶).
2. Remove the 2 hexagonal nuts (❷).
3. Remove the waterproof seal (❸).
4. Disconnect the connector (CN4) of the display unit (X54-3200 A/2), and remove the 5 screws (❹). you can remove the up/down encoder (❺) and display unit.
5. Remove the 4 screws (❻), and remove the sub-panel (❼) and keytop (❸).



CIRCUIT DESCRIPTION

1. Transmitter Circuit

1-1. Microphone amplifier section (X57 B/2)

The audio input from the microphone is attenuated by VR501 and passes through the active high-pass filter (pre-emphasis circuit) in IC505, the compressor circuit in IC504, the IDC (limiter circuit) in IC505, the summing amplifier circuit in IC510, the active low-pass filter in IC510, the summing amplifier circuit in IC513, and the D/A converter in IC512, and is output from the CN502 to the CN202. Q504 is used as a microphone mute switch.

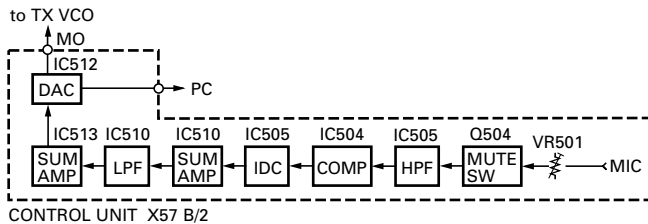


Fig. 1

1-2. Modulation section (X57 A/2)

The signal from the MO terminal of the CN202 goes to D305 in the VCO, and the VCO is directly modulated. The transmit signal output from the VCO passes through switch D306, is amplified by Q203, and is output from the CN203 to the CN1.

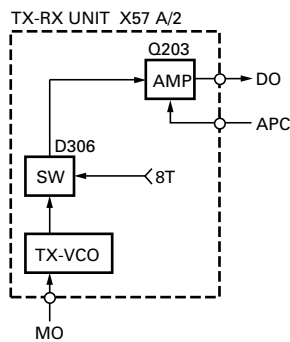


Fig. 2

1-4. Final amplifier section (X45)

The signal from the DO terminal of the CN1 is applied to drive two transistors Q1 and Q5, and the output is divided into two signals which are amplified by Q6 and Q7. The signals are mixed and the resulting signal is fed through transmit/receive switching diode; D2, D3, D4 and D10, low-pass filter, and CM coupler to the antenna connector.

CM coupler is a coil for detecting traveling and reflected waves. Traveling waves are detected by D9 and fed through the APC control to differential amplifiers Q8, which compare the signal level with the reference voltage of PC tuned.

The output is amplified by DC amplifier Q7 to control APC DC amplifier Q6. Q7 controls the power supply voltage for pre-drive amplifier Q203 on the TX-RX unit (X57-560 A/2), keeping the transmitter output constant. To protect the transmitter power amplifier stages, there are two protection circuits which one is against abnormal antenna loading and the other is against overheating.

If an abnormal antenna load is connected, the reflected wave level increases. Reflected waves are detected by D6, D5 and the output level is fed to the differential amplifier Q8, leading to the transmitter output power being reduced in the way already described. If an abnormal high temperature is detected by the thermistor TH1, DC SW Q2 is made to reduce the reference voltage of the PC tuned. This also leads to the transmitter output power being reduced. Antenna switching is done by four diodes; D2, D3, D4 and D10 with 8T.

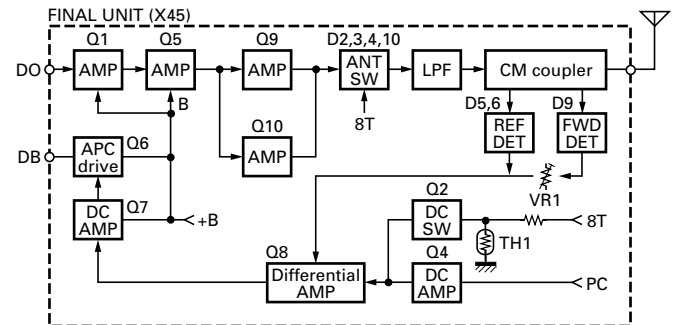


Fig. 3

2. Receiver Circuit

The incoming received signal from the antenna socket passes through the low-pass filter, the transmit/receive switching diodes (D2, D3, D4 and D10), and the second low-pass filter, then is fed to CN104 in the TX-RX unit.

The signal passes through the band-pass filter in the TX-RX unit, is amplified by RF amplifier Q101 and Q102, then passes through the second band-pass filter (BPF). The tuned varactor BPF (L101, L102, L104 and L105) changes the cut-off frequency according to the receive frequency.

After the signal has passed through the BPF, it enters RX first mixer Q110 to Q113. The local signal (received frequency + 10.7MHz) from the PLL 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 A102 and IF amplifier Q103, and enters NB gate Q105 and Q106. 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 (XF101), IF amplifier Q301, monolithic crystal filter (XF102), and enters FM IF system IC (IC101).

The signal is heterodyned again to 455kHz using the second local signal generated by the crystal oscillator (11.155MHz), at the second mixer in IC101. The second IF signal is filtered by CF101 and CF102 (ceramic filter), amplified by limiting amplifiers in IC101, and is detected as an FM signal.

The output AF signal from IC101, then passes through the control unit's HPF and D/A converter IC. After entering the AF power amplifier (IC522), the signal is output from the speaker.

CIRCUIT DESCRIPTION

| Item | Rating |
|--------------------------|---|
| Nominal center frequency | 10.7MHz |
| Pass bandwidth | 7.5kHz or more at 3dB |
| Attenuation bandwidth | ±25kHz or less at 40dB |
| Ripple | 1.0dB or less |
| Insertion loss | 2.5dB or less |
| Guaranteed attenuation | 80dB or more at $f_{o\pm 1000\text{kHz}}$ |
| Terminating impedance | 3.0kΩ / 1.5pF |

**Table 1 Crystal filter (L71-0534-05)
(TX-RX unit XF101)**

| Item | Rating |
|--------------------------|---|
| Nominal center frequency | 10.7MHz |
| Pass bandwidth | ±7.5kHz or more at 3dB |
| Attenuation bandwidth | ±25kHz or less at 18dB |
| Ripple | 0.5dB or less |
| Insertion loss | 2.0dB or less |
| Guaranteed attenuation | 40dB or more at $f_{o\pm 1000\text{kHz}}$ |
| Terminating impedance | 3.0kΩ / 2.5pF |

**Table 2 Crystal filter (L71-0533-05)
(TX-RX unit XF102)**

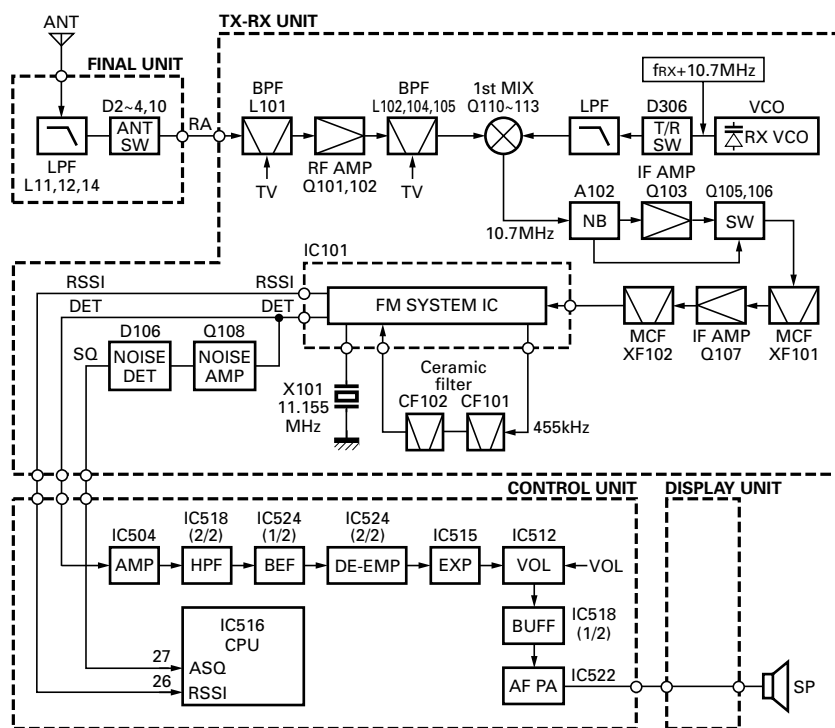


Fig. 4 Receiver circuit

3. Squelch Circuit

The output from IC101 enters FM IC again, then passed through a band-pass filter. The noise component output from IC101 is amplified by Q108 and rectified by D106 to produce a DC voltage corresponding to the noise level.

The DC voltage is sent to the analog port of the CPU (IC516/pin 27). And IC101 output a DC voltage (RSSI) corresponding to the input of the IF amplifier. The CPU reads the RSSI signal via pin 26. IC101 determines whether to output sounds from the speaker by comparing the input voltage of pin 27 with the present value.

Only during scan, the RSSI DC voltage is used together with the noise wave detection pin's DC voltage (pin 27).

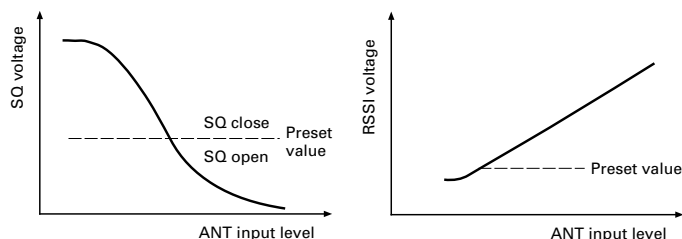


Fig. 5 Squelch and RSSI voltage vs ANT input level

CIRCUIT DESCRIPTION

4. RX BPF (L101,102,104,105)

The signals are then fed into band-pass filter that uses varactor diode tuning to reject unwanted signal components, and is fed to the 1st mixer.

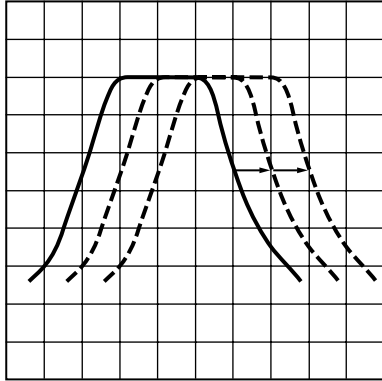


Fig. 6

5. VCO/PLL Circuit

The VCO of TK-690H(B) consists of two VCO circuits which one oscillates the transmit signal with Q306 and the other does the first local receive signal with Q307.

Each oscillators are switched by turning the source line for Q308, Q309 and Q310 on and off. The signal output of the VCO is amplified by the buffer amplifier Q311 and divided into two signals which one is amplified by Q313 and the other is done by Q312. The signal from Q313 passes through D306 which is transmit/receive switch, is amplified by Q203, and is output from the CN203.

The signal from Q312 passes through the low-pass filter and is applied to IC301 which is PLL frequency synthesizer with VCXO ; X301. The VCXO of which the frequency stability is within 5.0ppm (temperature range of -30 to $+60^{\circ}\text{C}$) generates 16.8MHz. The PLL-IC consists of three modulus prescaler, fractional divider, reference divider, digital phase comparator with charge pump output.

This PLL-IC is Fractional-N type synthesizer and performs is 25kHz reference signal which is fifth of the channel step (5kHz). The input signal from the pins 5 and 8 of the PLL-IC is divided down to the 25kHz and compared at digital phase comparator.

The pulsed output signal of the digital phase comparator is applied to the charge pump and transformed into DC signal. The DC signal from the pin 14 of the PLL-IC passes through the active low-pass filter (loop filter), is applied to the VCO and controls to keep the frequency of the VCO.

The serial data (DT, CP, EP) from the microprocessor IC516 is input to the PLL-IC. And PLL lock condition is always monitored by the pin 28 (UL) of IC516.

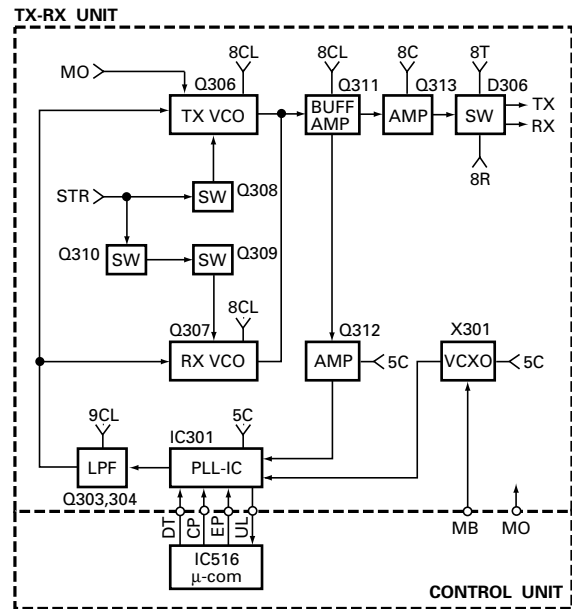


Fig. 7 VCO/PLL circuit

6. Control Circuit

The control unit consists of microprocessor IC and its peripheral circuits. It controls the TX-RX unit and transfers data to and from the control unit. The CPU (IC516) mainly performs the following :

- 1) Switching between transmission and reception according to the PTT signal input.
- 2) Reading channel, frequency, and program data from the memory circuit.
- 3) Sending frequency data to the PLL.
- 4) Turning the squelch on and off according to the voltage from the squelch circuit.
- 5) Controlling the audio mute circuit according to input decode data.
- 6) Sending encode data (QT, DQT).
- 7) Sending data to the D/A converter.

6-1. Memory circuit

A flash memory (IC519) with a capacity of 2Mbits contains the transceiver control program for the CPU (IC516) and data such as transceiver channels and operating features.

This program can be easily written from an external devices. Data, such as DTMF memories and operating status, tuning data are programmed into the EEPROM (IC514).

6-2. Shift register

IC517 and IC523 are an interface IC for I/O port expansion. It is used to expand the CPU (IC516) output ports.

CIRCUIT DESCRIPTION

6-3. D/A converter

IC512 is used as a conventional semi-fixed-resistor converter. It sets the following :

- 1) RX sensitivity
- 2) Transmission power
- 3) Modulation level
- 4) Audio power
- 5) Frequency

6-4. Power supply circuit

D507 is a protection diode for the excess voltage.

- 1) Turning the transceiver on/off with a power switch. Each time you press the power switch, the IC501 output is alternated. The output is feed through Q501, Q503 to turn Q519 on. The power source is always supplied to the IGN terminal. If 24V DC is supplied to the transceiver by mistake, Q502 is turned on then Q503 and Q519 are turned off to protect the transceiver (turned off).
- 2) Turning the transceiver on with a power switch, then turning the transceiver off with the Timed Power Off (TPO) function. POF is controlled by CPU's TPO function. POF is to turn the transceiver off. The POF logic signal is feed through Q507 and Q506 then 8 pin of IC501 to turn the transceiver off.
- 3) Turning the transceiver on with IGN SENS, then turning the transceiver off with TPO function. If IGN is turned on, Q543 and Q542 are turned on then the IC501 detects the change. IC501 outputs the signal to turn Q541 off, then Q503 and Q519 are turned on. When POF is detected by 6 pin of IC501, Q541 is turned on then Q503 and Q519 are turned off.

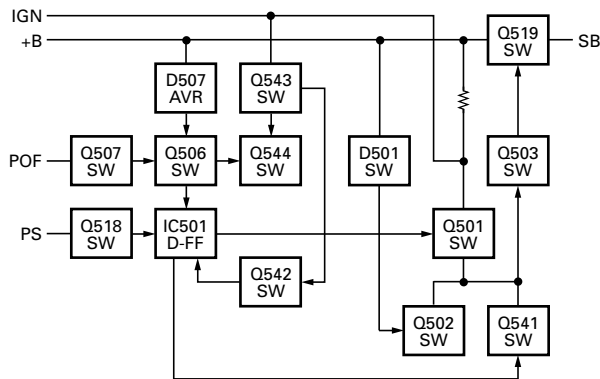


Fig. 8 Power supply circuit

7. Signalling Circuit

7-1. Encode

• QT, DQT

The CPU (IC516) transmits the encode data selected by the program. The data items are output from CPU pin 34.

The signal from this pin passes through the CR low-pass filter and goes to the summing amplifier (IC510) in the microphone amplifier.

• DTMF

The DTMF-encoder (IC511) transmits the encode data. The encode data is passed to the D/A converter (IC512) for DTMF deviation adjustment, and goes to IC505 in the IDC circuit of the microphone amplifier.

7-2. Decode

• QT, DQT

The demodulated signal from CN502 pin 5 is amplified by IC521 and passes through a low-pass filter (IC502) to remove audio components. The signal is input to pin 25 of the CPU. The CPU digitizes this signal, and decodes the signal.

• 2 TONE

The demodulated signal from CN502 pin 5 is amplified by IC504 and passes through a high-pass filter (IC518) and a band-elimination filter (IC524) to remove QT and DQT.

This signal is amplified by IC521 and inputs pin 91 of the CPU.

• DTMF

The demodulated signal from CN502 pin 5 is amplified by IC504 and passes through a high-pass filter (IC518) and band-elimination filter (IC524) to remove QT and DQT.

This signal inputs pin 1 of the DTMF decoder (IC525).

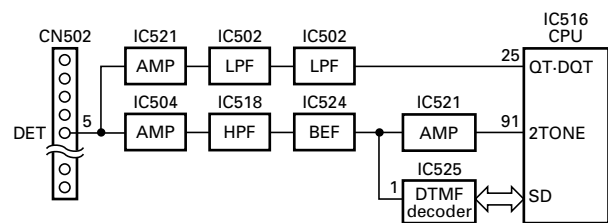


Fig. 9 Decode

CIRCUIT DESCRIPTION

8. Display Unit

The optional display unit (front panel unit) for the TK-690H(B) comes in two models : KCH-10 and KCH-11

8-1. KCH-10

This display unit consists of a CPU (IC4) containing the LCD driver, a reset IC (IC2), 5V AVR (IC1), EEPROM (IC3), and other components.

• Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC4), and converted to a serial data signal, and are sent to the control unit.

• Power supply

Power is supplied to the CPU by converting SB from the control unit to 5V by IC1. And SB is supplied to the LED for backlight.

• 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-segments, 8-digits LCD and 7-segments, 3-digits LCD by the built-in LCD driver.

• Dimmer function

From the control of the CPU's DM1/DM2 port, you can switch the LCD/KEY backlight, busy/TX LED, or the optional KMC-28 key backlight as shown in the following table.

| Dimmer setting | LCD | KEY | Busy/TX | KMC-28 |
|----------------|-----|-----|---------|--------|
| H | H | ON | ON | ON |
| M | M | ON | ON | ON |
| L | L | ON | ON | ON |
| OFF | OFF | OFF | OFF | OFF |

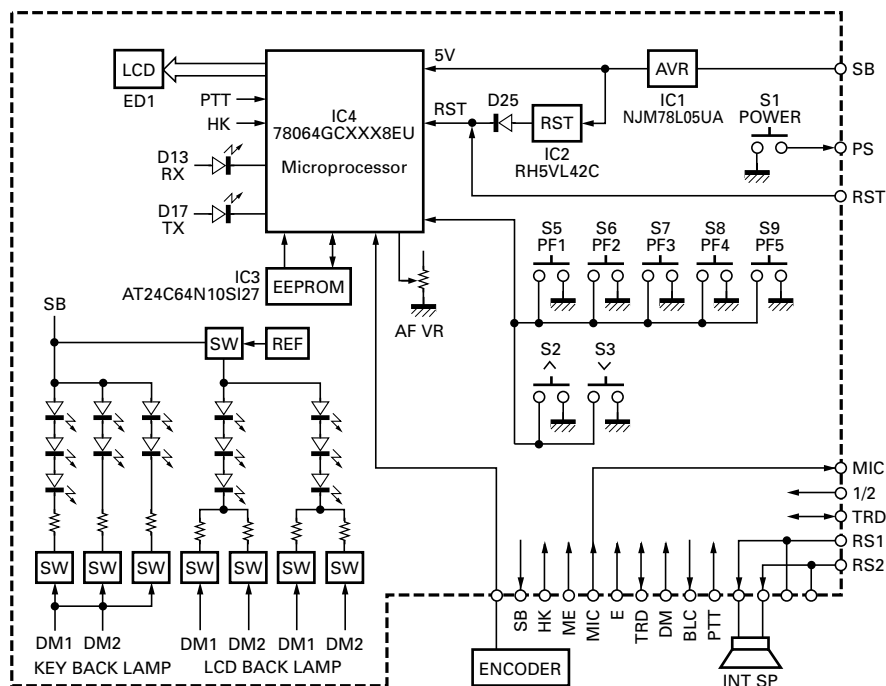


Fig. 10 KCH-10 block diagram

CIRCUIT DESCRIPTION

8-2. KCH-11

This display unit consists of a CPU (IC4) a reset IC (IC2), 5V AVR (IC1), EEPROM (IC3), and other components.

• Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC4), and converted to a serial data signal, and are sent to the control unit.

• Power supply

Power is supplied to the CPU by converting SB from the control unit to 5V by IC1. And SB is supplied for the LED of backlight.

• CPU

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 14-digits and 3-digits dot matrix alphanumeric display.

• Dimmer function

From the control of the CPU's DM1/DM2 port, you can switch the LCD/KEY backlight, busy/TX LED, or the optional KMC-28 key backlight as shown in the following table.

| Dimmer setting | LCD | KEY | Busy/TX | KMC-28 |
|----------------|-----|-----|---------|--------|
| H | H | ON | ON | ON |
| M | M | ON | ON | ON |
| L | L | ON | ON | ON |
| OFF | OFF | OFF | OFF | OFF |

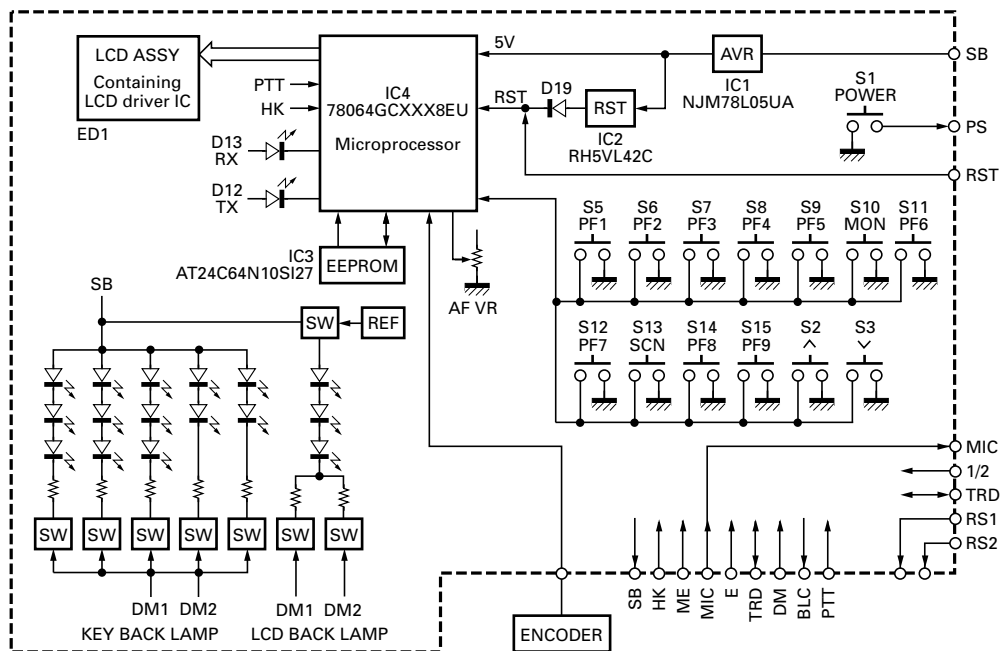


Fig. 11 KCH-11 block diagram

SEMICONDUCTOR DATA

Microprocessor : 784214GCXX8EU (Control Unit IC516)

• Terminal function

| Pin No. | Pin name | I/O | Action | Pin No. | Pin name | I/O | Action |
|---------|----------|-----|-------------------------------|---------|----------|-----|--------------------------------------|
| 1 | FCLR | O | Modem FCLR | 40 | RXD1 | I | Serial interface RXD |
| 2 | CK | O | Common CLOCK | 41 | TXD1 | O | Serial interface TXD |
| 3 | EM | O | D/A converter CS | 42 | STB | O | Modem STB |
| 4 | MSKE | O | Modem MSKE | 43 | EC1 | O | Shift register1 (Control) CS |
| 5 | DIN | O | Modem DIN | 44 | EI | O | Shift register (Interface) CS |
| 6 | EP | O | PLL LE | 45 | SEL | I/O | GE-STAR I/O |
| 7 | SCL | O | DTMF encoder CLOCK | 46 | EPT | I | GE-STAR EPT |
| 8 | SDT | O | DTMF encoder DATA | 47 | EMG | O | GE-STAR EMG |
| 9 | VDD | | +5V | 48~71 | | | Flash ROM access port |
| 10,11 | X2, X1 | | X'tal | 72 | VSS | | GND |
| 12 | VSS | | GND | 73~74 | | | Flash ROM access port |
| 13 | XT2 | | Open | 75 | | | Flash ROM (4Mbit) access port |
| 14 | XT1 | | GND | 76 | | | Not used. |
| 15 | RESET | | CPU reset | 77~78 | | | Flash ROM access port |
| 16 | TEST | I | Serial interface TEST | 79 | POF | O | Timed Power OFF. |
| 17 | TRD | I | Modem TRD | 80 | | | Not used. |
| 18 | RTM | I | Modem RTM | 81 | VDD | | +5V |
| 19 | STD | I | DTMF decoder STD | 82 | EN2 | O | D/A converter (Interface) CS |
| 20 | EC2 | O | Shift register 2 (Control) CS | 83 | CLK | O | EEPROM CLOCK |
| 21 | DT | O | Common DATA | 84 | SDA | I/O | EEPROM DATA |
| 22 | ACK | O | DTMF decoder CLOCK | 85 | RSV1 | O | Reserved |
| 23 | AVDD | | +5V | 86 | AI1 | I | Acc PF Input 1 |
| 24 | AVREF0 | | +5V | 87 | AI2 | I | Acc PF Input 2 |
| 25 | TI | I | QT/DQT IN | 88 | AI4 | I | Acc PF Input 4 |
| 26 | RSI | I | RSSI IN | 89 | AI3 | I | Acc PF Input 3 |
| 27 | ASQ | I | Analog squelch IN | 90 | AI5 | I | Acc PF Input 5 |
| 28 | UL | I | PLL UNLOCK | 91 | 2TN | I | 2tone pulse IN |
| 29 | SD | I | DTMF decoder SD | 92 | KEY | O | TX power SW |
| 30 | RDT | I | Modem RDT | 93 | SQ | O | Acc SQ OUT L : BUSY, H : Not BUSY |
| 31 | RSV2 | I | Reserved | 94 | TEST | | GND |
| 32 | IGN | I | Ignition IN | 95 | AO1 | O | Acc PF Output 1 |
| 33 | AVSS | | GND | 96 | AO2 | O | Acc PF Output 2 |
| 34 | TO | O | QT/DQT OUT | 97 | AO3 | O | Acc PF Output 3 |
| 35 | CP | O | PLL CLOCK | 98 | AO4 | O | Acc PF Output 4 |
| 36 | AVREF1 | | +5V | 99 | 1/2 | I | Deck 1/2 L : Deck 1, H : Deck 2 |
| 37 | RXD2 | I | Acc RXD | 100 | SFT | O | Beat shift |
| 38 | TXD2 | O | Acc TXD | | | | |
| 39 | ES | O | Shift register (TX/RX) CS | | | | |

SEMICONDUCTOR DATA

Microprocessor : 78064GCXXX8EU (Display Unit IC4)

• Terminal function

| Pin No. | Pin name | I/O | Action |
|---------|----------|-----|---|
| 1 | PTT | I | MIC PTT L : ON, H : OFF |
| 2 | K5 | I | [MON] key L : ON, H : OFF |
| 3 | K6 | I | [PF6] key L : ON, H : OFF |
| 4 | K7 | I | [PF1] key L : ON, H : OFF |
| 5 | K8 | I | [PF2] key (Full) L : ON, H : OFF |
| 6 | K9 | I | [PF3] key (Full) L : ON, H : OFF |
| 7 | K10 | I | [PF7] key (Full) L : ON, H : OFF |
| 8 | AVDD | - | +5V |
| 9 | AVREF | - | +5V |
| 10 | RED | O | TX LED (Red) L : ON, H : OFF |
| 11 | GRN | O | BUSY LED (Green) L : ON, H : OFF |
| 12 | E | - | GND |
| 13 | DM1 | O | Backlight (Dimmer) |
| 14 | DM2 | O | Backlight (Dimmer) |
| 15 | | I | Not used |
| 16 | K11 | I | [SCN] key (Full) L : ON, H : OFF |
| 17 | K12 | I | [PF8] key (Full) L : ON, H : OFF |
| 18 | K13 | I | [PF9] key (Full) L : ON, H : OFF |
| 19 | K1 | I | [PF4] key L : ON, H : OFF |
| 20 | K2 | I | [PF5] key L : ON, H : OFF |
| 21 | 1/2 | I | HEAD 1/2 jumper HEAD 1 : Jumper installed, HEAD 2 : Jumper removed |
| 22 | B/F | I | Panel type Jumper Basic panel : Jumper installed. Full panel : Jumper removed |
| 23~26 | COM0~3 | O | LCD drive common 0~3 |
| 27 | BIAS | | LCD drive bias |
| 28~30 | VLC0~2 | | LCD drive power supply |
| 31 | VSS | | GND |
| 32~67 | S0~35 | O | LCD drive segment 0~35 |
| 68 | S36 | O | LCD drive segment 36 (Basic) |
| | CE | | DOT matrix driver CE (Full) |
| 69 | S37 | O | LCD drive segment 37 (Basic) |
| | CL | | DOT matrix driver CL (Full) |
| 70 | S38 | O | LCD drive segment 38 (Basic) |
| | DI | | DOT matrix driver DI (Full) |
| 71 | S39 | O | LCD drive segment 39 (Basic) |
| | DO | | DOT matrix driver DO (Full) |
| 72 | SCK | O | EEPROM serial clock |
| 73 | SDT | I/O | EEPROM serial data |

| Pin No. | Pin name | I/O | Action |
|---------|----------|-----|---|
| 74 | | | Not used |
| 75 | RXD | I | Serial interface RXD |
| 76 | TXD | O | Serial interface TXD |
| 77 | | | Not used |
| 78 | | - | GND |
| 79 | X2 | - | X'tal 4.19MHz |
| 80 | X1 | - | X'tal 4.19MHz |
| 81 | VDD | - | +5V |
| 82,83 | | | Not used |
| 84 | RST | - | Reset |
| 85 | END | I | Encoder data |
| 86 | K3 | I | [GR ^] Key L : ON, H : OFF |
| 87 | K4 | I | [GR v] Key L : ON, H : OFF |
| 88 | ENI | I | Encoder interrupt |
| 89 | TEST | I | Serial interface test |
| 90 | AO2 | O | Programable AUX output B |
| 91 | AO1 | O | Programable AUX output A |
| 92 | AI2 | I | Programable AUX input B |
| 93 | AI1 | I | Programable AUX input A |
| 94 | BLC | O | MIC backlight ON/OFF L : ON, H : OFF |
| 95,96 | | | Not used |
| 97 | DM | I | DTMF MIC key pad data input |
| 98 | HK | I | MIC hook L : ON, H : OFF |
| 99 | AVSS | - | GND |
| 100 | VOL | I | AF volume |

Shift Register Output : BU4094BCF

• Shift register 1 on control unit (IC523)

| Pin No. | Port | Name | Action |
|---------|------|------|-----------------------|
| 4 | Q1 | PTO | GE-STAR/Scrambler PTO |
| 5 | Q2 | BC4 | Scrambler BC4 |
| 6 | Q3 | BC3 | Scrambler BC3 |
| 7 | Q4 | BC2 | Scrambler BC2 |
| 14 | Q5 | AC | Scrambler AC |
| 13 | Q6 | BC1 | Scrambler BC1 |
| 12 | Q7 | HR | Acc HR |
| 11 | Q8 | | Not used |

SEMICONDUCTOR DATA

• Shift register 2 on control unit (IC517)

| Pin No. | Port | Name | Action |
|---------|------|------|-------------------------------|
| 4 | Q1 | MM | MIC mute H : Mute, L : Unmute |
| 5 | Q2 | AS | Audio line SW RX BPF↔DE-EMP |
| 6 | Q3 | DS | DET line SW DET↔RX BPF |
| 7 | Q4 | AM1 | Audio mute 1 |
| 14 | Q5 | RG1 | Modem RG1 |
| 13 | Q6 | RG2 | Modem RG2 |
| 12 | Q7 | MS | MOD line SW MIC AMP↔RX BPF |
| 11 | Q8 | AM2 | Audio mute 2 |

• Shift register on TX-RX (IC201)

| Pin No. | Port | Name | Action |
|---------|------|------|------------------|
| 4 | Q1 | STR | TX/RX VCO SW |
| 5 | Q2 | | Not used |
| 6 | Q3 | | Not used |
| 7 | Q4 | | Not used |
| 14 | Q5 | 8R | 8R SW |
| 13 | Q6 | NB | Noise blanker SW |
| 12 | Q7 | | Not used |
| 11 | Q8 | | Not used |

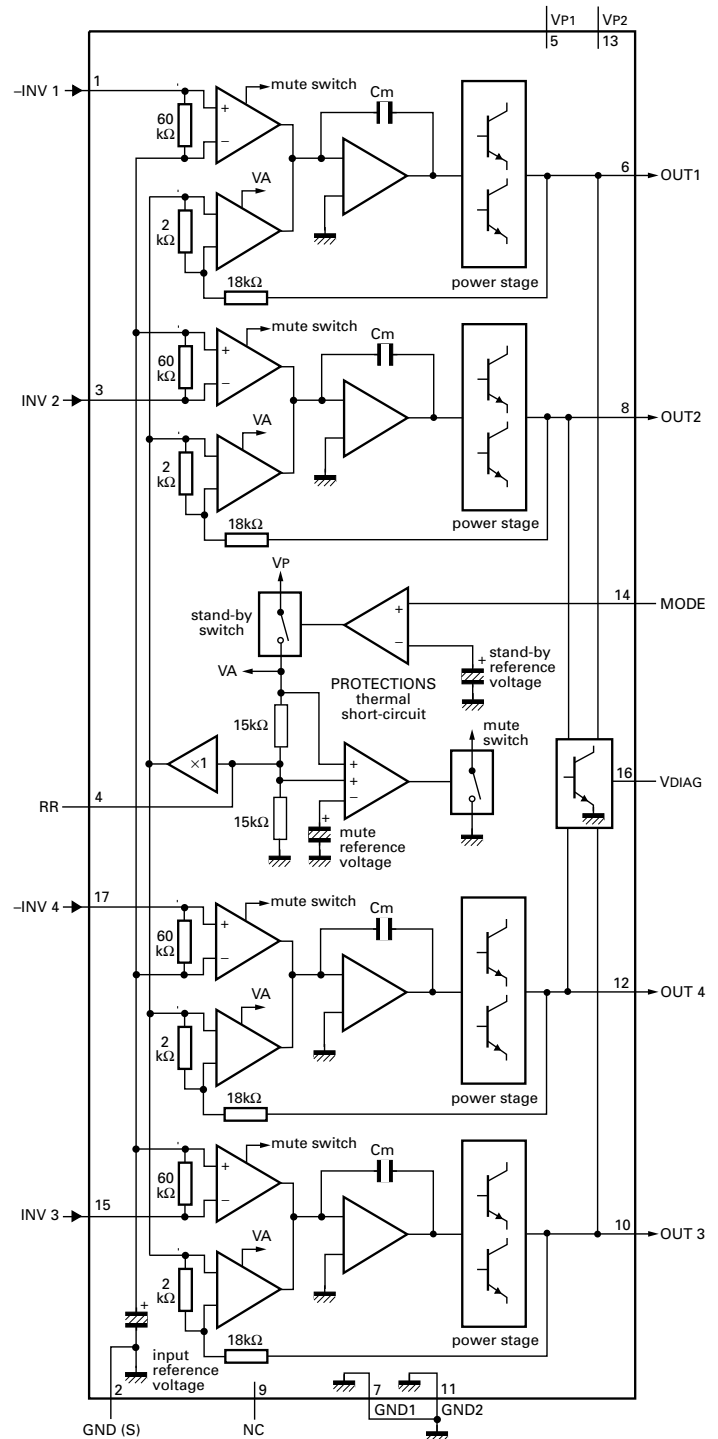
Audio Power Amplifier

: TDA8561Q (Control Unit IC522)

• Terminal description

| Pin No. | Symbol | Description |
|---------|---------|---------------------------------|
| 1 | -INV1 | Non-inverting input 1 |
| 2 | GND (S) | Signal ground |
| 3 | INV 2 | Inverting input 2 |
| 4 | RR | Supply voltage ripple rejection |
| 5 | VP1 | Supply voltage |
| 6 | OUT 1 | Output 1 |
| 7 | GND1 | Power ground 1 |
| 8 | OUT 2 | Output 2 |
| 9 | NC | Not connected |
| 10 | OUT 3 | Output 3 |
| 11 | GND2 | Power ground 2 |
| 12 | OUT 4 | Output 4 |
| 13 | VP2 | Supply voltage |
| 14 | MODE | Mode select switch input |
| 15 | INV 3 | Inverting input 3 |
| 16 | VDIAG | Diagnostic output |
| 17 | -INV 4 | Non-inverting input 4 |

• Block diagram



TK-690H(B)

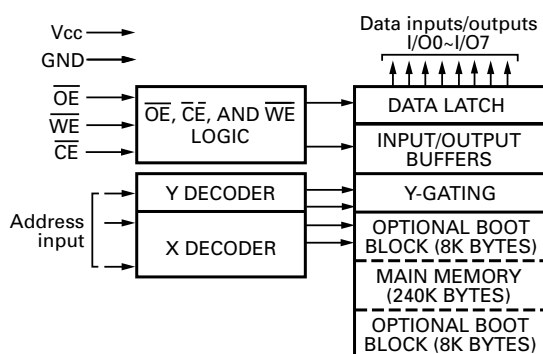
SEMICONDUCTOR DATA / DESCRIPTION OF COMPONENTS

Flash ROM : AT29C020-90TI (Control Unit IC519)

• Terminal description

| Pin Name | Function |
|-----------------|---------------------|
| A0~A17 | Addresses |
| \overline{CE} | Chip enable |
| \overline{OE} | Output enable |
| \overline{WE} | Write enable |
| I/O0~I/O7 | Data inputs/outputs |
| NC | No connect |

• Block diagram



Final Unit (X45-3550-XX)

-10 : K -11 : K2 -12 : K3

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------------|---------------------|
| Q1 | TX drive amplifier | |
| Q2 | DC amplifier | APC controller |
| Q3,4 | DC switch | |
| Q5 | TX drive amplifier | |
| Q6 | APC controller | |
| Q7 | DC amplifier | APC controller |
| Q8 | APC comparator | APC controller |
| Q9 | Final amplifier | |
| Q10 | Final amplifier | |
| Q11 | DC switch | |
| D1 | Temperature compensation | |
| D2~4 | Antenna switch | |
| D5 | Protector | |
| D6 | Reflected wave rectification | |
| D7 | Surge absorption | |
| D8 | Protection of reverse connection | |
| D9 | Forward wave rectification | |
| D10 | Antenna switch | |

Final Amplifier : 2SC2694 (Final Unit Q9, Q10)

• Absolute maximum ratings

Tc= 25°C unless otherwise noted

| Symbol | Parameter | Condition | Rating |
|--------|---------------------------|-----------|--------------|
| Vcbo | Collector-base voltage | | 35V |
| Vebo | Emitter-base voltage | | 4V |
| Vceo | Collector-emitter voltage | RBE = ∞ | 17V |
| Ic | Collector current | | 20A |
| Pc | Collector dissipation | | 140W |
| Tj | Junction temperature | | 175°C |
| Tstg | Storage temperature | | -55 to 175°C |

TX-RX Unit (X57-5600-XX) (A/2)

-10 : K -11 : K2 -12 : K3

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------|---|
| IC101 | FM IC | 1, 2 : Oscillator (11.155MHz) 3 : Mixer output 4 : Vcc 5 : IF input (455kHz) 7 : Noise filter output 8 : Noise filter input 9 : DET output (AF OUT) 10 : Quad input 12 : RSSI output 16 : Input (10.7MHz) |
| IC201 | Shift register | |
| IC202 | AVR | Input : 8V Output : 5V |
| IC203 | AVR | Input : SB Output : 9V |

DESCRIPTION OF COMPONENTS

| Ref. No. | Use/Function | Operation/Condition |
|----------|------------------------|---|
| IC301 | PLL IC | 1 : CP 2 : DT 3 : EP 4 : Vss 5 : Fin 7 : Vcc 8 : REFin (16.8MHz) 14 : Charge pump output 18 : UL ("H" when lock) 20 : VDD (5V) |
| Q101,102 | 1st amplifier | RX frequency |
| Q103 | IF amplifier | 10.7MHz |
| Q105,106 | NB gate | |
| Q107 | IF amplifier | 10.7MHz |
| Q108 | SQL amplifier | (Noise amplifier) |
| Q110~113 | RX 1st mixer | |
| Q114 | NB switch | On when NB on |
| Q115 | DC switch | On when TX |
| Q201 | 8T switch | 8V when TX |
| Q202 | 8T switch | On when TX |
| Q203 | TX pre-drive amplifier | |
| Q204 | 8R switch | On when RX |
| Q205 | 8R switch | 8V when RX |
| Q301 | Ripple filter | 8CL |
| Q302 | Ripple filter | 9CL |
| Q303,304 | Loop filter | |
| Q306 | OSC | TX-VCO |
| Q307 | OSC | RX-VCO |
| Q308 | DC switch | On when TX |
| Q309 | DC switch | On when RX |
| Q310 | DC switch | Off when RX |
| Q311 | Buffer amplifier | |
| Q312,313 | Amplifier | |
| D102~105 | BPF tuning | Vari-cap tuning |
| D106 | Noise detector | |
| D107 | DC switch | On when TX |
| D301 | Frequency controller | TX-VCO |
| D302 | Frequency controller | RX-VCO |
| D303 | Frequency controller | TX-VCO |
| D304 | Frequency controller | RX-VCO |
| D305 | Modulator | |
| D306 | RF switch | TX/RX |

Control Unit (X57-5600-XX) (B/2)

-10 : K -11 : K2 -12 : K3

| Ref. No. | Use/Function | Operation/Condition |
|----------|--------------|---------------------|
| IC501 | D FF | |

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------------|-------------------------------|
| IC502 | LPF | |
| IC503 | AVR | Input : SB, Output : 8V |
| IC504 | Audio processor | |
| IC505 | HPF/IDC | |
| IC506 | AVR | Input : 8V, Output : 5V |
| IC508 | Limiter/Buffer amplifier | |
| IC509 | Buffer amplifier | |
| IC510 | Summing amplifier/LPF | |
| IC511 | DTMF encoder | |
| IC512 | D/A converter | |
| IC513 | LPF/Summing amplifier | |
| IC514 | EEPROM | |
| IC515 | Analog switch | |
| IC516 | CPU | |
| IC517 | Shift register | |
| IC518 | Buffer amplifier | |
| IC519 | Flash ROM | |
| IC520 | NOR gate | |
| IC521 | Buffer amplifier/ Amplifier | |
| IC522 | Audio power amplifier | |
| IC523 | Shift register | |
| IC524 | Buffer amplifier/ De-emphasis | |
| IC525 | DTMF decoder | |
| IC526 | Amplifier | |
| Q501 | DC switch | |
| Q502 | DC switch | On when 18V or more |
| Q503 | DC switch | On when the power switch on |
| Q504 | Muting switch | MIC mute |
| Q505 | DC switch | |
| Q506,507 | DC switch | Timed power off switch |
| Q509 | DC switch | Off when P/A |
| Q510 | DC switch | Off when EXT SP |
| Q511 | DC switch | Off when INT SP |
| Q512 | DC switch | Off when RX busy |
| Q513 | DC switch | |
| Q514 | Muting switch | On when AF mute |
| Q516,517 | DC switch | On when on signalling code |
| Q518 | DC switch | On when push the power switch |
| Q519 | Power switch | On when the power switch on |
| Q520 | DC switch | On when horn alert |
| Q522 | Beat shift switch | On when beat shift |

DESCRIPTION OF COMPONENTS

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------|----------------------------|
| Q523 | DC switch | Serial data inverter |
| Q524 | DC switch | Serial data transmitter |
| Q525 | DC switch | |
| Q533~540 | DC switch | On when output port on |
| Q541 | DC switch | On when timed power off |
| Q542,543 | DC switch | IGN switch |
| Q544 | DC switch | Timed power off switch |
| D501 | Voltage reference | Protection of high voltage |
| D502 | Reverse current prevention | |
| D503 | Surge absorption | |
| D504 | Voltage reference | |
| D505,506 | DC switch | |
| D507 | Voltage reference | |
| D508 | DC switch | |
| D511 | DC switch | |
| D512 | Reverse current prevention | |
| D513~517 | Surge absorption | |
| D519 | Surge absorption | |
| D521 | Surge absorption | |
| D523,524 | Surge absorption | |
| D526,527 | Surge absorption | |
| D528,529 | Reverse current prevention | |

Display Unit (X54-3190-20) : KCH-10

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------|---------------------------------------|
| IC1 | AVR | Input : SB Output : 5V |
| IC2 | Reset | |
| IC3 | EEPROM | |
| IC4 | CPU/LCD driver | |
| Q1 | 9V AVR | |
| Q3 | DC switch | Dimmer "Hi", "Low" : ON |
| Q4 | DC switch | Λ , v key lighting : ON |
| Q5 | DC switch | Dimmer "Hi", "Mid" : ON |
| Q6 | DC switch | Dimmer "Hi", "Low" : ON |
| Q7 | DC switch | Dimmer "Hi", "Mid" : ON |
| Q9 | DC switch | "PF1", "PF2", "PF3" key lighting : ON |

| Ref. No. | Use/Function | Operation/Condition |
|----------|-------------------|--------------------------------|
| Q11 | DC switch | "PF4", "PF5" key lighting : ON |
| Q12,13 | TRD switch | |
| Q14,15 | DC switch | On when output port on |
| D1,2 | Surge absorption | |
| D5 | Voltage reference | |
| D6~11 | LCD backlight | |
| D12 | BUSY LED | |
| D13 | TX LED | |
| D16,17 | Surge absorption | |
| D19~21 | Surge absorption | |
| D24 | DC switch | Key lighting : ON |
| D25 | DC switch | |

Display Unit (X54-3200-20) : KCH-11

| Ref. No. | Use/Function | Operation/Condition |
|----------|-------------------|---------------------------------------|
| IC1 | AVR | Input : SB Output : 5V |
| IC2 | Reset | |
| IC3 | EEPROM | |
| IC4 | CPU | |
| Q1 | 9V AVR | |
| Q2 | DC switch | Λ , v key lighting : ON |
| Q3 | DC switch | Dimmer "Hi", "Low" : ON |
| Q4 | DC switch | "MON", "PF6", "PF7" key lighting : ON |
| Q5 | DC switch | "PF1", "PF2", "PF3" key lighting : ON |
| Q6 | DC switch | Dimmer "Hi", "Mid" : ON |
| Q7 | DC switch | "SCN", "PF8", "PF9" key lighting : ON |
| Q8 | DC switch | "PF4", "PF5" key lighting : ON |
| Q9,10 | TRD switch | |
| Q14,15 | DC switch | On when output port on |
| D1,2 | Surge absorption | |
| D5 | Voltage reference | |
| D6 | BUSY LED | |
| D7 | TX LED | |
| D11,12 | Surge absorption | |
| D14~16 | Surge absorption | |
| D18 | DC switch | Key lighting : ON |
| D19 | DC switch | |

PARTS LIST

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

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

TK-690H(B)

FINAL UNIT (X45-3550-XX)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination | |
|-------------------|---------|-----------|-------------|--|-------------|---|---------|-----------|---------------|-------------|-------------|------|
| TK-690H(B) | | | | | | FINAL UNIT (X45-3550-XX) -10 : K -11 : K2 -12 : K3 | | | | | | |
| 1 | 3B | | A01-2163-01 | CABINET (UPPER) | | C1 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 2 | 1A | | A01-2164-01 | CABINET (LOWER) | | C3-5 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 3 | 2B | | A10-1389-01 | CHASSIS | | C6 | | | CK73FB1E104K | CHIP C | 0.10UF | K |
| 6 | 3A,3B | | B42-2455-04 | STICKER (M4X8 MAX) | | C7,8 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 7 | 1G | | B46-0470-00 | WARRANTY CARD ACSY | | C9 | | | C90-2020-05 | ELECTRO | 15UF | 25WV |
| 8 | 1G | | B62-0970-10 | INSTRUCTION MANUAL | | C10 | | | CK73FB1H102K | CHIP C | 1000PF | K |
| 9 | 2B | * | B72-1471-24 | MODEL NAME PLATE | K | C11,12 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 9 | 2B | * | B72-1472-24 | MODEL NAME PLATE | K2 | C13 | | | C92-0729-05 | ELECTRO | 330UF | 25WV |
| 9 | 2B | * | B72-1473-24 | MODEL NAME PLATE | K3 | C14 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 11 | 2B | | E04-0167-05 | RF COAXIAL PECEPTACLE (M) | | C15 | | | CK73FB1E104K | CHIP C | 0.10UF | K |
| 13 | 2A | | E31-3301-05 | LEAD WIRE WITH MINIPIN PLUG (RA/DO) | | C16 | | | CK73FB1H471K | CHIP C | 470PF | K |
| 14 | 2B | | E37-0709-05 | LEAD WIRE WITH CONNECTOR (ACC : 9P) | | C17 | | | CC73FCH1H471J | CHIP C | 470PF | J |
| 15 | 2B | | E37-0731-05 | LEAD WIRE WITH CONNECTOR (DC : 2P) | | C17 | | | CK73FB1H331K | CHIP C | 330PF | K |
| 16 | 2B,2H | | E37-0733-05 | SHORT PLUG (SP) ACSY | | C18 | | | CC73FCH1H101J | CHIP C | 100PF | J |
| 17 | 2B | | E37-0773-25 | LEAD WIRE WITH CONNECTOR (D-SUB : 25P) | | C18 | | | CK73FB1H101J | CHIP C | 100PF | J |
| 18 | 3A | | E37-0776-05 | FLAT CABLE (CONT-TX : 18P) | | C19 | | | C92-0726-05 | ELECTRO | 47UF | 25WV |
| 23 | 2B | | F09-0445-05 | CAP (D-SUB) | | C20 | | | C93-0603-05 | CHIP C | 1000PF | K |
| 24 | 1B | | F10-1488-02 | SHIELDING PLATE (FINAL) | | C21 | | | C93-0571-05 | CHIP C | 82PF | J |
| 22 | 1H | | F29-0472-04 | INSULATING COVER ACSY | | C21 | | | C93-0572-05 | CHIP C | 100PF | J |
| 27 | 3A | | G02-0709-04 | FLAT SPRING (AUDIO AMP) | | C22 | | | C92-0736-05 | ELECTRO | 10UF | 50WV |
| 28 | 3A | | G02-0715-04 | FLAT SPRING (AVR) | | C23 | | | CK73FB1H102K | CHIP C | 1000PF | K |
| 29 | 2B | | G53-0715-03 | PACKING (DC,ACC) | | C24 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 32 | 3B | | G53-0871-03 | PACKING (CABINET UPPER) | | C25 | | | C93-0568-05 | CHIP C | 47PF | J |
| 33 | 1A | | G53-0872-03 | PACKING (CABINET LOWER) | | C25 | | | C93-0570-05 | CHIP C | 68PF | J |
| 35 | 1G | | H02-0604-03 | INNER PACKING CASE | | C26-29 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 36 | 2H | | H10-6617-11 | POLYSTYRENE FOAMED FIXTURE | | C30 | | | C93-0568-05 | CHIP C | 47PF | J |
| 37 | 1H | | H11-0815-04 | POLYSTYRENE FOAMED BOARD | | C30 | | | C93-0570-05 | CHIP C | 68PF | J |
| 38 | 2H | | H11-0853-04 | POLYSTYRENE FOAMED BOARD | | C30 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 39 | 2G | | H11-0892-04 | POLYSTYRENE FOAMED BOARD | | C30 | | | C93-0568-05 | CHIP C | 47PF | J |
| 40 | 2G | | H12-1410-04 | PACKING FIXTURE | | C30 | | | C93-0571-05 | CHIP C | 82PF | J |
| 41 | 2H | | H12-1442-04 | PACKING FIXTURE | | C31 | | | CK73FB1E104K | CHIP C | 0.10UF | K |
| 42 | 2G | | H13-1066-04 | CARTON BOARD | | C32 | | | C92-0726-05 | ELECTRO | 47UF | 25WV |
| 44 | 1H | | H25-0103-04 | PROTECTION BAG (125/250/0.07) | | C33 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| 45 | 1G | | H25-0724-04 | PROTECTION BAG (300/500/0.07) | | C34 | | * | C93-0600-05 | CHIP C | 560PF | K |
| 43 | 1H | | H25-2063-04 | PROTECTION BAG (80/120/0.03) | | C34 | | | C93-0603-05 | CHIP C | 1000PF | K |
| 46 | 3H | | H52-1378-02 | ITEM CARTON CASE | | C35,36 | | * | C93-0683-05 | CERAMIC | 4700PF | K |
| 47 | 2B | | J21-8347-04 | HARDWARE FIXTURE (DC,ACC) | | C37,38 | | | CM73F2H121J | CHIP C | 120PF | J |
| 50 | 1H | | J61-0307-05 | BAND ACSY | | C37,38 | | | CM73F2H161J | CHIP C | 160PF | J |
| M | 2B | | N09-2292-05 | HEXAGON HEAD SCREW | | C37,38 | | | CM73F2H181J | CHIP C | 180PF | J |
| N | 1A,3B | | N33-3006-45 | OVAL HEAD MACHINE SCREW | | C39 | | | C92-0726-05 | ELECTRO | 47UF | 25WV |
| O | 1B | | N35-3006-46 | BINDING HEAD MACHINE SCREW | | C43,44 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| P | 2A,2B | | N67-3008-46 | PAN HEAD SEMS SCREW W | | C45 | | | CM73F2H120J | CHIP C | 12PF | J |
| Q | 1A,1B | | N68-4006-46 | PAN HEAD SEMS SCREW A | | C45 | | | CM73F2H560J | CHIP C | 56PF | J |
| R | 2A,3B | | N87-2606-46 | BRAZIER HEAD TAPTITE SCREW | | C46 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| S | 2A | | N87-2612-46 | BRAZIER HEAD TAPTITE SCREW | | C47 | | | CK73FB1E104K | CHIP C | 0.10UF | K |
| T | 2B | | N87-3008-46 | BRAZIER HEAD TAPTITE SCREW | | C48 | | | C93-0684-05 | CERAMIC | 6800PF | K |
| 59 | 2H | | N99-0365-05 | SCREW SET ACSY | | C49,50 | | | CK73FB1H472K | CHIP C | 4700PF | K |
| | | | | | | C51 | | | C93-0684-05 | CERAMIC | 6800PF | K |
| | | | | | | C52 | | | C93-0570-05 | CHIP C | 68PF | J |
| | | | | | | C52 | | | C93-0571-05 | CHIP C | 82PF | J |
| | | | | | | C53 | | | CM73F2H390J | CHIP C | 39PF | J |
| | | | | | | C53 | | | CM73F2H820J | CHIP C | 82PF | J |
| | | | | | | C54 | | | CM73F2H040D | CHIP C | 4.0PF | D |
| | | | | | | C54 | | | CM73F2H080D | CHIP C | 8.0PF | D |
| | | | | | | C55 | | | CM73F2H101J | CHIP C | 100PF | J |
| | | | | | | C55 | | | CM73F2H121J | CHIP C | 120PF | J |
| | | | | | | C55 | | | CM73F2H181J | CHIP C | 180PF | J |
| | | | | | | C56 | | | CM73F2H220J | CHIP C | 22PF | J |

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PARTS LIST

FINAL UNIT (X45-3550-XX)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|---------------|-----------------------------|-------------|----------|---------|-----------|--------------|-----------------------------|-------------|
| C56 | | | CM73F2H270J | CHIP C 27PF J | K3 | L14 | | | L34-1256-05 | AIR-CORE COIL | K3 |
| C57 | | | CC73FCH1H680J | CHIP C 68PF J | K3 | L14 | | | L34-1259-05 | AIR-CORE COIL | K,K2 |
| C57 | | | CC73FCH1H820J | CHIP C 82PF J | K,K2 | L15 | | | L40-5675-34 | SMALL FIXED INDUCTOR (56NH) | K |
| C58 | | | CM73F2H101J | CHIP C 100PF J | K2 | L15 | | | L40-6875-34 | SMALL FIXED INDUCTOR (68NH) | K2,K3 |
| C58 | | | CM73F2H121J | CHIP C 120PF J | K | L16 | | | L40-2205-34 | SMALL FIXED INDUCTOR (22UH) | |
| C59 | | | CM73F2H470J | CHIP C 47PF J | K,K2 | L17 | | * | L39-1420-15 | TOROIDAL COIL | |
| C59 | | | CM73F2H820J | CHIP C 82PF J | K3 | L18 | | | L40-2205-34 | SMALL FIXED INDUCTOR (22UH) | |
| C60 | | | CC73FCH1H330J | CHIP C 33PF J | K2 | | | | | | |
| C60 | | | CC73FCH1H560J | CHIP C 56PF J | K,K3 | R1 | | | RK73FB2A151J | CHIP R 150 J 1/10W | K,K3 |
| C61 | | | CM73F2H390J | CHIP C 39PF J | K2 | R1 | | | RK73FB2A181J | CHIP R 180 J 1/10W | K2 |
| C61 | | | CM73F2H470J | CHIP C 47PF J | K3 | R2 | | | RK73FB2A270J | CHIP R 27 J 1/10W | K2 |
| C61 | | | CM73F2H510J | CHIP C 51PF J | K | R2 | | | RK73FB2A390J | CHIP R 39 J 1/10W | K,K3 |
| C62 | | | CC73FCH1H121J | CHIP C 120PF J | K2 | R3 | | | RK73FB2A151J | CHIP R 150 J 1/10W | K,K3 |
| C62 | | | CC73FCH1H151J | CHIP C 150PF J | K | R3 | | | RK73FB2A181J | CHIP R 180 J 1/10W | K2 |
| C62 | | | CC73FCH1H820J | CHIP C 82PF J | K3 | R4 | | | R92-0699-05 | CHIP R 10 J 1/2W | K |
| C63 | | | CM73F2H390J | CHIP C 39PF J | K3 | R5 | | | R92-1261-05 | CHIP R 150 J 1/2W | |
| C63 | | | CM73F2H820J | CHIP C 82PF J | K,K2 | R6 | | | RK73FB2A271J | CHIP R 270 J 1/10W | |
| C64 | | | CE04EW1E102M | ELECTRO 1000UF 25WV | | R7 | | | RK73FB2A223J | CHIP R 22K J 1/10W | |
| C65 | | | CC73FCH1H330J | CHIP C 33PF J | K2 | R8 | | | R92-1245-05 | CHIP R 47 J 1/2W | |
| C65 | | | CC73FCH1H560J | CHIP C 56PF J | K,K3 | R9 | | | RK73FB2A103J | CHIP R 10K J 1/10W | |
| C66 | | | CM73F2H020C | CHIP C 2.0PF C | | R10 | | | R92-0699-05 | CHIP R 10 J 1/2W | K |
| C67 | | | CC73FCH1H820J | CHIP C 82PF J | | R11 | | | RK73FB2A471J | CHIP R 470 J 1/10W | |
| C68 | | | CK73FB1H472K | CHIP C 4700PF K | | R12 | | | RS14DB3F101J | FL-PROOF RS 100 J 3W | |
| C70 | | | CK73FB1H472K | CHIP C 4700PF K | | R13 | | | R92-0685-05 | CHIP R 22 J 1/2W | |
| C71 | | | CK73FB1H102K | CHIP C 1000PF K | | R14 | | | RK73FB2A471J | CHIP R 470 J 1/10W | |
| C72,73 | | | CK73FB1H472K | CHIP C 4700PF K | | R15 | | | RK73FB2A222J | CHIP R 2.2K J 1/10W | |
| C74 | | | CM73F2H020C | CHIP C 2.0PF C | | R16 | | | RK73FB2A122J | CHIP R 1.2K J 1/10W | |
| C75 | | | CC73FCH1H680J | CHIP C 68PF J | | R17 | | | RK73FB2A101J | CHIP R 100 J 1/10W | |
| C76 | | | CK73FB1H472K | CHIP C 4700PF K | | R18,19 | | | RS14DB3F4R7J | FL-PROOF RS 4.7 J 3W | |
| C77,78 | | | CK73FB1H103K | CHIP C 0.010UF K | | R20 | | | RK73FB2A562J | CHIP R 5.6K J 1/10W | |
| C79,80 | | | CK73FB1E104K | CHIP C 0.10UF K | | R21,22 | | | RS14DB3F221J | FL-PROOF RS 220 J 3W | |
| C81 | | | CK73FB1H103K | CHIP C 0.010UF K | | R23,24 | | | RS14DB3A4R7J | FL-PROOF RS 4.7 J 1W | |
| C82 | | | CK73FB1E104K | CHIP C 0.10UF K | | R25,26 | | | RS14DB3F221J | FL-PROOF RS 220 J 3W | |
| C83 | | | CK73FB1H103K | CHIP C 0.010UF K | | R27 | | | R92-1253-05 | CHIP R 82 J 1/2W | |
| C84,85 | | | CM73F2H161J | CHIP C 160PF J | K2 | R28 | | | R92-0670-05 | CHIP R 0 OHM | |
| CN1 | | | E04-0154-05 | PIN SOCKET | | R29-31 | | | RK73FB2A270J | CHIP R 27 J 1/10W | K,K2 |
| CN4,5 | | | E23-1116-05 | RELAY TERMINAL | | R29-31 | | | RK73FB2A330J | CHIP R 33 J 1/10W | K3 |
| CN6 | | | E04-0154-05 | PIN SOCKET | | R32 | | | RK73FB2A220J | CHIP R 22 J 1/10W | |
| W1 | | | E37-0783-05 | PROCESSED LEAD WIRE | | R33 | | | RK73FB2A472J | CHIP R 4.7K J 1/10W | |
| W4 | | | E37-0706-05 | LEAD WIRE WITH CONNECTOR | | R34 | | | R92-1245-05 | CHIP R 47 J 1/2W | |
| W5 | | | E37-0701-05 | LEAD WIRE WITH CONNECTOR | | R35 | | | R92-1061-05 | JUMPER REST 0 OHM | |
| A1 | 1B | | F10-2277-04 | SHIELDING PLATE | | R110 | | | R92-0670-05 | CHIP R 0 OHM | K |
| - | | | L92-0125-05 | TROIDAL CORE | | R111 | | | R92-0670-05 | CHIP R 0 OHM | K2 |
| L1 | | | L40-1095-34 | SMALL FIXED INDUCTOR (1UH) | | R112 | | | R92-0670-05 | CHIP R 0 OHM | K3 |
| L2 | | | L34-0908-05 | AIR-CORE COIL | | VR1 | | | R12-6423-05 | TRIMMING POT. (10K) | |
| L3 | | | L34-1039-05 | AIR-CORE COIL | | D1 | | | 1SS184 | DIODE | |
| L4 | | | L33-0666-05 | CHOKE COIL | | D2,3 | | | MA4PH633 | DIODE | |
| L5 | | | L39-1211-25 | TOROIDAL COIL | | D4 | | | MI809 | DIODE | |
| L6 | | | L39-1213-25 | TOROIDAL COIL | | D4 | | | XB15A709 | DIODE | |
| L7 | | | L39-1214-25 | TOROIDAL COIL | K | D5 | | | 1SS184 | DIODE | |
| L7 | | | L39-1215-25 | TOROIDAL COIL | K3 | D6 | | | HSM88AS | DIODE | |
| L7 | | | L39-1239-05 | TOROIDAL COIL | K2 | D7 | | | 22ZR-10D | SURGE ABSORBER | |
| L8 | | | L33-0625-15 | TOROIDAL COIL | | D8 | | | SG-5L(R) | DIODE | |
| L9 | | * | L40-1001-41 | SMALL FIXED INDUCTOR (10UH) | | D9 | | | HSM88AS | DIODE | |
| L10,11 | | | L34-1150-05 | AIR-CORE COIL | K,K2 | D10 | | | MI809 | DIODE | |
| L10,11 | | | L34-1241-05 | AIR-CORE COIL | K3 | D10 | | | XB15A709 | DIODE | |
| L12 | | | L34-1151-05 | AIR-CORE COIL | K3 | Q1 | | | 2SC1971 | TRANSISTOR | |
| L12 | | | L34-1241-05 | AIR-CORE COIL | K,K2 | Q2 | | | 2SC2712(Y) | TRANSISTOR | |
| | | | | | | Q3 | | | DTC114EK | DIGITAL TRANSISTOR | |
| | | | | | | Q4 | | | 2SC2712(Y) | TRANSISTOR | |

PARTS LIST

FINAL UNIT (X45-3550-XX)
TX-RX UNIT (X57-5600-XX)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---|---------|-----------|----------------|------------------|-------------|----------|---------|-----------|---------------|---------------------|-------------|
| Q5 | | | 2SC1972 | TRANSISTOR | | C140 | | | CC73GCH1H331J | CHIP C 330PF J | |
| Q6 | | | 2SD2531 | TRANSISTOR | | C141 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| Q7 | | | 2SA1162(Y) | TRANSISTOR | | C142 | | | CC73GCH1H470J | CHIP C 47PF J | |
| Q8 | | | FMW1 | TRANSISTOR | | C143 | | | CC73GCH1H181J | CHIP C 180PF J | |
| Q9,10 | | | 2SC2694 | TRANSISTOR | | C144 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| Q11 | | | 2SC2712(Y) | TRANSISTOR | | C145 | | | CK73GB1H102K | CHIP C 1000PF K | |
| TH1 | | | PTH9M04BC471TS | THERMISTOR | | C146 | | | CC73GCH1H221J | CHIP C 220PF J | K3 |
| TX-RX UNIT (X57-5600-XX) -10 : K -11 : K2 -12 : K3 | | | | | | C147 | | | CC73GCH1H270J | CHIP C 27PF J | |
| C101 | | | CC73GCH1H180J | CHIP C 18PF J | | C148 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C102 | | | CK73GB1E103K | CHIP C 0.010UF K | | C149 | | | CC73GCH1H221J | CHIP C 220PF J | |
| C103-106 | | | CK73GB1H103K | CHIP C 0.010UF K | | C150 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C107 | | | CC73GCH1H060D | CHIP C 6.0PF D | K3 | C151 | | | CC73GCH1H050C | CHIP C 5.0PF C | |
| C108 | | | CC73GCH1H030C | CHIP C 3.0PF C | K,K2 | C152 | | | CC73GCH1H331J | CHIP C 330PF J | |
| C108 | | | CC73GCH1H040C | CHIP C 4.0PF C | K3 | C153 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C109 | | | CC73GCH1H040C | CHIP C 4.0PF C | K2 | C154 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C109 | | | CC73GCH1H080D | CHIP C 8.0PF D | K,K3 | C155 | | | CC73GCH1H090D | CHIP C 9.0PF D | |
| C110 | | | CC73GCH1H030C | CHIP C 3.0PF C | K,K2 | C156 | | | CC73GCH1H390J | CHIP C 39PF J | |
| C110 | | | CC73GCH1H040C | CHIP C 4.0PF C | K3 | C157 | | | CC73GCH1H090D | CHIP C 9.0PF D | |
| C111 | | | CK73GB1H103K | CHIP C 0.010UF K | | C158-160 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C112 | | | CC73GCH1H040C | CHIP C 4.0PF C | K2 | C161 | | | CC73GCH1H560J | CHIP C 56PF J | |
| C112 | | | CC73GCH1H080D | CHIP C 8.0PF D | K,K3 | C162 | | | CC73GCH1H820J | CHIP C 82PF J | |
| C113 | | | CK73GB1H103K | CHIP C 0.010UF K | | C163 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C114 | | | CC73GCH1H820J | CHIP C 82PF J | | C164 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C115 | | | CK73GB1H152K | CHIP C 1500PF K | | C166 | | | C92-0606-05 | CHIP-TAN 4.7UF 10WV | |
| C116 | | | CK73GB1H103K | CHIP C 0.010UF K | | C167 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C117 | | | CC73GCH1H560J | CHIP C 56PF J | | C168 | | | CC73GCH1H820J | CHIP C 82PF J | |
| C118 | | | CC73GCH1H220J | CHIP C 22PF J | K | C169 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C118 | | | CC73GCH1H470J | CHIP C 47PF J | K2,K3 | C170-172 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C119 | | | CC73GCH1H390J | CHIP C 39PF J | | C173 | | | CK73GB1H472K | CHIP C 4700PF K | |
| C120 | | | CC73GCH1H050C | CHIP C 5.0PF C | K3 | C174 | | | CK73GB1H681K | CHIP C 680PF K | |
| C120 | | | CC73GCH1H120J | CHIP C 12PF J | K2 | C175 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C120 | | | CC73GCH1H220J | CHIP C 22PF J | K | C176 | | | CK73GB1C333K | CHIP C 0.033UF K | |
| C121 | | | CC73GCH1H470J | CHIP C 47PF J | K | C177 | | | CK73FB1C334K | CHIP C 0.33UF K | |
| C121 | | | CC73GCH1H820J | CHIP C 82PF J | K3 | C181-183 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C121,122 | | | CC73GCH1H101J | CHIP C 100PF J | K2 | C185,186 | | | CC73GCH1H090D | CHIP C 9.0PF D | |
| C122 | | | CC73GCH1H101J | CHIP C 100PF J | K,K3 | C189 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C123 | | | CC73GCH1H100D | CHIP C 10PF D | K3 | C190 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C123 | | | CC73GCH1H120J | CHIP C 12PF J | K2 | C192-194 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C123 | | | CC73GCH1H220J | CHIP C 22PF J | K | C197,198 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C124 | | | CC73GCH1H101J | CHIP C 100PF J | K2 | C201 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C124 | | | CC73GCH1H470J | CHIP C 47PF J | K | C202 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C124 | | | CC73GCH1H680J | CHIP C 68PF J | K3 | C203 | | | C92-0044-05 | CHIP-ELE 47UF 10WV | |
| C125 | | | CC73GCH1H331J | CHIP C 330PF J | | C204 | | | C92-0578-05 | CHIP-ELE 22UF 16WV | |
| C126 | | | CC73GCH1H100D | CHIP C 10PF D | K3 | C205 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C126 | | | CC73GCH1H120J | CHIP C 12PF J | K2 | C206 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C126,127 | | | CC73GCH1H220J | CHIP C 22PF J | K | C206,207 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C127 | | | CC73GCH1H330J | CHIP C 33PF J | K3 | C208 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C127 | | | CC73GCH1H470J | CHIP C 47PF J | K2 | C209 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C128,129 | | | CC73GCH1H221J | CHIP C 220PF J | | C210 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C130 | | | CK73GB1H103K | CHIP C 0.010UF K | | C211 | | | C92-0008-05 | CHIP-TAN 3.3UF 16WV | |
| C131 | | | CK73FB1E473K | CHIP C 0.047UF K | | C212 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C132 | | | CC73GCH1H331J | CHIP C 330PF J | | C213 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C133 | | | CC73GCH1H181J | CHIP C 180PF J | | C214 | | | CC73FCH1H101J | CHIP C 100PF J | |
| C134 | | | CC73GCH1H101J | CHIP C 100PF J | | C215 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C135 | | | CK73GB1H103K | CHIP C 0.010UF K | | C216 | | | C92-0044-05 | CHIP-ELE 47UF 10WV | |
| C136,137 | | | CC73GCH1H271J | CHIP C 270PF J | | C217 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C138 | | | CK73GB1H102K | CHIP C 1000PF K | | C218 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C139 | | | CK73FB1E473K | CHIP C 0.047UF K | | C219-222 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| | | | | | | C223 | | | CK73GB1H102K | CHIP C 1000PF K | |
| | | | | | | C301 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |

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PARTS LIST

TX-RX UNIT (X57-5600-XX)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|---------------|-----------------------|-------------|----------|---------|-----------|---------------|----------------------|-------------|
| C302-304 | | | CK73GB1H102K | CHIP C 1000PF K | | C384 | | | CK73GB1C473K | CHIP C 0.047UF K | K2 |
| C305 | | | CK73GB1H103K | CHIP C 0.010UF K | | C384 | | | CK73GB1C683K | CHIP C 0.068UF K | K,K3 |
| C306 | | | CK73GB1H102K | CHIP C 1000PF K | | C501 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C307 | | | CC73GCH1H390J | CHIP C 39PF J | K3 | C524 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C307 | | | CC73GCH1H560J | CHIP C 56PF J | K2 | C525 | | | CK73FB1E683K | CHIP C 0.068UF K | |
| C307 | | | CC73GCH1H820J | CHIP C 82PF J | K | C526,527 | | | CK73GB1H471K | CHIP C 470PF K | |
| C308 | | | CC73GCH1H220J | CHIP C 22PF J | | C528 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C309 | | | CK73FB1E104K | CHIP C 0.10UF K | | C529 | | | C92-0585-05 | CHIP-TAN 4.7UF 16WV | |
| C310 | | | CC73GCH1H121J | CHIP C 120PF J | K2 | C530 | | | CK73GB1E123K | CHIP C 0.012UF K | |
| C310 | | | CC73GCH1H151J | CHIP C 150PF J | K | C531 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |
| C310 | | | CC73GCH1H820J | CHIP C 82PF J | K3 | C532 | | | CK73GB1H222K | CHIP C 2200PF K | |
| C311,312 | | | CK73GB1H103K | CHIP C 0.010UF K | | C533 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |
| C313 | | | CK73FB1E104K | CHIP C 0.10UF K | | C534 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C314 | | | CC73GCH1H220J | CHIP C 22PF J | | C535 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |
| C315 | | | CC73GCH1H390J | CHIP C 39PF J | K3 | C536,537 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C315 | | | CC73GCH1H560J | CHIP C 56PF J | K2 | C538 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C315 | | | CC73GCH1H820J | CHIP C 82PF J | K | C539 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C316 | | | C92-0633-05 | CHIP-TAN 22UF 10WV | | C540 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C317 | | | C90-4016-05 | ELECTRO 47UF 16WV | | C541 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C318 | | | C92-0555-05 | CHIP-TAN 0.047UF 35WV | | C542 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C319 | | | C92-1341-05 | ELECTRO 100UF 16WV | | C543 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C320 | | | C90-4016-05 | ELECTRO 47UF 16WV | | C544 | | | CC73GCH1H121J | CHIP C 120PF J | |
| C321,322 | | | CK73GB1H103K | CHIP C 0.010UF K | | C545 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C323,324 | | | C92-0519-05 | CHIP-TAN 1.0UF 25WV | | C546 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C327 | | | C92-0519-05 | CHIP-TAN 1.0UF 25WV | | C547 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C328-331 | | | CK73GB1H103K | CHIP C 0.010UF K | | C548 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C332 | | | CC73GCH1H390J | CHIP C 39PF J | K | C549 | | | CK73GB1H222K | CHIP C 2200PF K | |
| C332 | | | CC73GCH1H470J | CHIP C 47PF J | K2 | C550 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C332 | | | CC73GCH1H820J | CHIP C 82PF J | K3 | C551 | | | CK73FB1E333K | CHIP C 0.033UF K | |
| C333 | | | CC73GCH1H390J | CHIP C 39PF J | K3 | C552 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C333 | | | CC73GCH1H560J | CHIP C 56PF J | K2 | C553,554 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C333 | | | CC73GCH1H680J | CHIP C 68PF J | K | C555 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C334 | | | C92-0606-05 | CHIP-TAN 4.7UF 10WV | | C557 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C335 | | | CC73GCH1H390J | CHIP C 39PF J | | C558 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C336 | | | CC73GCH1H101J | CHIP C 100PF J | | C559 | | | C92-0036-05 | CHIP-ELE 4.7UF 16WV | |
| C337 | | | CC73GCH1H030C | CHIP C 3.0PF C | K | C562 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C337 | | | CC73GCH1H060D | CHIP C 6.0PF D | K3 | C563 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C337,338 | | | CC73GCH1H120J | CHIP C 12PF J | K2 | C565 | | | C92-0003-05 | CHIP-TAN 0.47UF 25WV | |
| C338 | | | CC73GCH1H150J | CHIP C 15PF J | K | C566 | | | CC73GCH1H100D | CHIP C 10PF D | |
| C338,339 | | | CC73GCH1H020C | CHIP C 2.0PF C | K3 | C567 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C339 | | | CC73GCH1H020C | CHIP C 2.0PF C | K,K2 | C568 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C340-343 | | | CC73GCH1H470J | CHIP C 47PF J | | C570 | | | C92-0036-05 | CHIP-ELE 4.7UF 16WV | |
| C344-347 | | | CK73GB1H103K | CHIP C 0.010UF K | | C571 | | | C92-0585-05 | CHIP-TAN 4.7UF 16WV | |
| C348,349 | | | CC73GCH1H040C | CHIP C 4.0PF C | | C572,573 | | | CC73GCH1H030C | CHIP C 3.0PF C | |
| C350,351 | | | CK73GB1H102K | CHIP C 1000PF K | | C574 | | | CK73GB1H472K | CHIP C 4700PF K | |
| C352 | | | CK73GB1H103K | CHIP C 0.010UF K | | C575 | | | C92-0628-05 | CHIP-TAN 10UF 10WV | |
| C353 | | | CC73GCH1H101J | CHIP C 100PF J | | C576 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C354 | | | CC73GCH1H680J | CHIP C 68PF J | | C578 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C355 | | | CC73GCH1H101J | CHIP C 100PF J | | C579 | | | CK73GB1H472K | CHIP C 4700PF K | |
| C356 | | | CC73GCH1H680J | CHIP C 68PF J | | C580-582 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C357-360 | | | CK73GB1H102K | CHIP C 1000PF K | | C583 | | | C92-0546-05 | CHIP-TAN 68UF 6.3WV | |
| C361,362 | | | CK73GB1H103K | CHIP C 0.010UF K | | C584 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C363 | | | CK73GB1H102K | CHIP C 1000PF K | | C585 | | | CC73FCH1H751J | CHIP C 750PF J | |
| C369 | | | CK73GB1H103K | CHIP C 0.010UF K | K | C586 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C373 | | | CK73FB1E224K | CHIP C 0.22UF K | | C587 | | | CK73GB1H122K | CHIP C 1200PF K | |
| C374 | | | CK73FB1E104K | CHIP C 0.10UF K | | C588 | | | CC73GCH1H070D | CHIP C 7.0PF D | |
| C376,377 | | | CK73GB1H103K | CHIP C 0.010UF K | | C589 | | | CC73GCH1H181J | CHIP C 180PF J | |
| C378 | | | CK73FB1E224K | CHIP C 0.22UF K | | C590 | | | CK73GB1H332K | CHIP C 3300PF K | |
| C381,382 | | | CK73GB1H103K | CHIP C 0.010UF K | | C591 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C383 | | | CK73FB1E224K | CHIP C 0.22UF K | | C592 | | | CK73GB1H102K | CHIP C 1000PF K | |

PARTS LIST

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| Ref. No. | Address | New parts | Parts No. | Description | Desti-nation | Ref. No. | Address | New parts | Parts No. | Description | Desti-nation |
|-----------|---------|-----------|---------------|---------------------------|--------------|-----------|---------|-----------|-------------|------------------------------|--------------|
| C593 | | | C92-0633-05 | CHIP-TAN 22UF 10WV | | CN101 | | | E04-0154-05 | PIN SOCKET | |
| C594 | | | CK73GB1H103K | CHIP C 0.010UF K | | CN102,103 | | | E40-5538-05 | PIN ASSY | |
| C595-597 | | | CK73GB1H102K | CHIP C 1000PF K | | CN104 | | | E04-0154-05 | PIN SOCKET | |
| C598,599 | | | CK73FB1E104K | CHIP C 0.10UF K | | CN201 | | | E40-5752-05 | PIN ASSY | |
| C600 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | CN202 | | | E40-5978-05 | FLAT CABLE CONNECTOR | |
| C601 | | | CK73GB1H102K | CHIP C 1000PF K | | CN203 | | | E04-0154-05 | PIN SOCKET | |
| C602 | | | CK73GB1H562K | CHIP C 5600PF K | | CN501 | | | E40-5703-05 | PIN ASSY | |
| C603 | | | CK73GB1H102K | CHIP C 1000PF K | | CN502 | | | E40-5978-05 | FLAT CABLE CONNECTOR | |
| C604,605 | | | CK73GB1H562K | CHIP C 5600PF K | | CN504 | | | E40-5661-05 | PIN ASSY SOCKET | |
| C606 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | CN505 | | | E40-5960-05 | PIN ASSY | |
| C607 | | | CK73GB1H102K | CHIP C 1000PF K | | CN506 | | | E40-5066-05 | PIN ASSY | |
| C608 | | | CK73GB1H332J | CHIP C 3300PF J | | CN507 | | | E40-5751-05 | PIN ASSY | |
| C609 | | | CK73GB1H272J | CHIP C 2700PF J | | CN508 | | | E40-5701-05 | PIN ASSY | |
| C610 | | | CK73FB1E104K | CHIP C 0.10UF K | | W501 | | | E37-0707-05 | LEAD WIRE WITH CONNECTOR | |
| C611 | | | CK73GB1H272J | CHIP C 2700PF J | | F501 | | | F53-0128-05 | FUSE (0.5A) | |
| C612 | | | C92-1341-05 | ELECTRO 100UF 16WV | | F502 | | | F53-0108-05 | FUSE (1.8A) | |
| C613 | | | C92-0040-05 | CHIP-ELE 47UF 16WV | | CD101 | | | L79-1701-05 | TUNING COIL | |
| C614 | | | CK73GB1H102K | CHIP C 1000PF K | | CF101,102 | | | L72-0916-05 | CERAMIC FILTER (455KHZ) | |
| C615 | | | CK73GB1H272J | CHIP C 2700PF J | | L101,102 | | | L34-4296-05 | COIL | K,K2 |
| C616 | | | CK73GB1H103K | CHIP C 0.010UF K | | L101,102 | | | L34-4297-05 | COIL | K3 |
| C617 | | | CK73FB1E104K | CHIP C 0.10UF K | | L103 | | | L40-1005-34 | SMALL FIXED INDUCTOR (10UH) | |
| C618 | | | CK73GB1H272J | CHIP C 2700PF J | | L104,105 | | | L34-4296-05 | COIL | K,K2 |
| C619 | | | C92-0721-05 | ELECTRO 330UF 25WV | | L104,105 | | | L34-4297-05 | COIL | K3 |
| C620 | | | CK73GB1H103K | CHIP C 0.010UF K | | L106 | | | L40-1585-34 | SMALL FIXED INDUCTOR (150NH) | |
| C621 | | | CK73FB1E104K | CHIP C 0.10UF K | | L107 | | | L40-3995-34 | SMALL FIXED INDUCTOR (3.9UH) | |
| C622 | | | CK73GB1H102K | CHIP C 1000PF K | | L108 | | | L40-1285-34 | SMALL FIXED INDUCTOR (120NH) | K3 |
| C623 | | | C92-0040-05 | CHIP-ELE 47UF 16WV | | L108 | | | L40-1585-34 | SMALL FIXED INDUCTOR (150NH) | K,K2 |
| C624 | | | CK73GB1H102K | CHIP C 1000PF K | | L109 | | | L40-2785-34 | SMALL FIXED INDUCTOR (270NH) | |
| C625 | | | CK73GB1H103K | CHIP C 0.010UF K | | L110 | | | L40-1285-34 | SMALL FIXED INDUCTOR (120NH) | K3 |
| C626 | | | C92-0004-05 | CHIP-TAN 1.0UF 16WV | | L110 | | | L40-1585-34 | SMALL FIXED INDUCTOR (150NH) | K,K2 |
| C627,628 | | | CK73FB1E104K | CHIP C 0.10UF K | | L111 | | | L40-6885-34 | SMALL FIXED INDUCTOR (680NH) | |
| C629,630 | | | CK73GB1H102K | CHIP C 1000PF K | | L112 | | | L40-1285-34 | SMALL FIXED INDUCTOR (120NH) | K3 |
| C631 | | | CC73GCH1H101J | CHIP C 100PF J | | L112 | | | L40-1585-34 | SMALL FIXED INDUCTOR (150NH) | K,K2 |
| C632-639 | | | CK73GB1H102K | CHIP C 1000PF K | | L113 | | | L40-1095-34 | SMALL FIXED INDUCTOR (1UH) | |
| C640 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | | L114,115 | | | L40-1295-34 | SMALL FIXED INDUCTOR (1.2UH) | |
| C641,642 | | | CK73FB1E104K | CHIP C 0.10UF K | | L116 | | | L40-2205-34 | SMALL FIXED INDUCTOR (22UH) | |
| C666-680 | | | CC73GCH1H101J | CHIP C 100PF J | | L117 | | | L40-1295-34 | SMALL FIXED INDUCTOR (1.2UH) | |
| C681 | | | CK73GB1H102K | CHIP C 1000PF K | | L118 | | | L40-2285-48 | SMALL FIXED INDUCTOR (220NH) | K3 |
| C682,683 | | | CC73GCH1H101J | CHIP C 100PF J | | L119 | | | L40-1295-34 | SMALL FIXED INDUCTOR (1.2UH) | |
| C684 | | | CK73GB1H102K | CHIP C 1000PF K | | L120 | | | L40-1095-34 | SMALL FIXED INDUCTOR (1UH) | |
| C685 | | | CC73GCH1H101J | CHIP C 100PF J | | L121 | | | L40-6885-34 | SMALL FIXED INDUCTOR (680NH) | |
| C686 | | | CK73GB1H102K | CHIP C 1000PF K | | L122 | | | L40-2785-34 | SMALL FIXED INDUCTOR (270NH) | |
| C687 | | | CK73GB1H103K | CHIP C 0.010UF K | | L123 | | | L39-1272-05 | TOROIDAL COIL | |
| C688 | | | CC73GCH1H221J | CHIP C 220PF J | | L124 | | | L34-4216-05 | COIL | |
| C689 | | | CC73GCH1H101J | CHIP C 100PF J | | L125 | | | L40-6895-34 | SMALL FIXED INDUCTOR (6.8UH) | |
| C690 | | | CK73FB1E104K | CHIP C 0.10UF K | | L126 | | | L39-1272-05 | TOROIDAL COIL | |
| C691,692 | | | CC73GCH1H101J | CHIP C 100PF J | | L127 | | | L40-4705-34 | SMALL FIXED INDUCTOR (47UH) | |
| C693 | | | CK73GB1H103K | CHIP C 0.010UF K | | L128,129 | | | L30-0534-05 | COIL | |
| C694 | | | C92-0633-05 | CHIP-TAN 22UF 10WV | | L130 | | | L40-6805-34 | SMALL FIXED INDUCTOR (68UH) | |
| C695 | | | CC73GCH1H101J | CHIP C 100PF J | | L131-133 | | | L34-4561-05 | COIL | |
| C696 | | | C92-0628-05 | CHIP-TAN 10UF 10WV | | L135 | | | L40-2795-34 | SMALL FIXED INDUCTOR (2.7UH) | |
| C697 | | | CK73GB1H103K | CHIP C 0.010UF K | | L201 | | | L40-3905-34 | SMALL FIXED INDUCTOR (39UH) | |
| C698-701 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | | L301,302 | | | L40-1285-34 | SMALL FIXED INDUCTOR (120NH) | K2,K3 |
| C703 | | | CK73FB1E104K | CHIP C 0.10UF K | | L301,302 | | | L40-1585-34 | SMALL FIXED INDUCTOR (150NH) | K |
| C704 | | | CK73GB1H103K | CHIP C 0.010UF K | | L303,304 | | | L40-5605-34 | SMALL FIXED INDUCTOR (56UH) | |
| C705 | | | C92-0519-05 | CHIP-TAN 1.0UF 25WV | | L305 | | | L34-4290-05 | COIL | K |
| C712 | | | CK73GB1E473J | CHIP C 0.047UF J | | L305 | | | L34-4291-05 | COIL | K2 |
| C713 | | | C92-0003-05 | CHIP-TAN 0.47UF 25WV | | L305 | | | L34-4292-05 | COIL | K3 |
| TC301,302 | | | C05-0393-05 | CERAMIC TRIMMER CAP (8PF) | | L306 | | | L34-4293-05 | COIL | K2 |

TK-690H(B)

PARTS LIST

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| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|--------------|---------------------------------|-------------|----------|---------|-----------|--------------|---------------------|-------------|
| L306 | | | L34-4294-05 | COIL | K | R167 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| L306 | | | L34-4295-05 | COIL | K3 | R168 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| L307 | | | L40-3985-34 | SMALL FIXED INDUCTOR (390NH) | | R201 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| L308,309 | | | L40-2285-34 | SMALL FIXED INDUCTOR (220NH) | | R202 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| L310 | | | L40-4705-34 | SMALL FIXED INDUCTOR (47UH) | | R203 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| L311 | | | L40-3385-34 | SMALL FIXED INDUCTOR (330NH) | | R204 | | | RK73GB1J101J | CHIP R 100 J 1/16W | K2 |
| L312 | | | L92-0148-05 | FERRITE CHIP | | R205 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| L313,314 | | | L40-5605-34 | SMALL FIXED INDUCTOR (56UH) | | R206 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| L501,502 | | | L40-1005-34 | SMALL FIXED INDUCTOR (10UH) | | R207 | | | RK73FB2A100J | CHIP R 10 J 1/10W | |
| X101 | | | L77-1294-05 | CRYSTAL RESONATOR (11.155MHZ) | | R208 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| X301 | | * | L77-1873-05 | VCXO (16.8MHZ) | | R209 | | | R92-0685-05 | CHIP R 22 J 1/2W | |
| X501 | | | L77-1708-05 | CRYSTAL RESONATOR (3.579545MHZ) | | R210 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| X502 | | | L77-1863-05 | CRYSTAL RESONATOR (12.0MHZ) | | R211 | | | RK73FB2A821J | CHIP R 820 J 1/10W | |
| XF101 | | | L71-0534-05 | CRYSTAL FILTER (10.7MHZ) | | R212,213 | | | RK73FB2A100J | CHIP R 10 J 1/10W | |
| XF102 | | | L71-0533-05 | CRYSTAL FILTER (10.7MHZ) | | R214 | | | RK73FB2A821J | CHIP R 820 J 1/10W | |
| R10 | | | R92-1252-05 | CHIP R 0 OHM | K | R301 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| R11 | | | R92-1252-05 | CHIP R 0 OHM | K2 | R302-305 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R12 | | | R92-1252-05 | CHIP R 0 OHM | K3 | R306 | | | R92-1252-05 | CHIP R 0 OHM | |
| R101 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R307 | | | RK73GB1J560J | CHIP R 56 J 1/16W | |
| R102 | | | RK73GB1J680J | CHIP R 68 J 1/16W | | R309,310 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| R103 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R311,312 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R104-106 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R313,314 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | |
| R107 | | | R92-1252-05 | CHIP R 0 OHM | | R315 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R108 | | | RK73GB1J821J | CHIP R 820 J 1/16W | | R316 | | | RK73GB1J183J | CHIP R 18K J 1/16W | |
| R109 | | | RK73GB1J5R6J | CHIP R 5.6 J 1/16W | | R317,318 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R110 | | | RK73GB1J821J | CHIP R 820 J 1/16W | | R319 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R111 | | | RK73GB1J470J | CHIP R 47 J 1/16W | | R320 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R112 | | | RK73GB1J271J | CHIP R 270 J 1/16W | | R321,322 | | | R92-1252-05 | CHIP R 0 OHM | |
| R113 | | | RK73GB1J180J | CHIP R 18 J 1/16W | | R323 | | | RK73FB2A392J | CHIP R 3.9K J 1/10W | |
| R114 | | | RK73GB1J271J | CHIP R 270 J 1/16W | | R324 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| R116 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | | R325,326 | | | R92-1252-05 | CHIP R 0 OHM | |
| R117 | | | RK73GB1J151J | CHIP R 150 J 1/16W | | R327 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R118 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R328 | | | R92-1252-05 | CHIP R 0 OHM | K |
| R119 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R328,329 | | | R92-1252-05 | CHIP R 0 OHM | K2,K3 |
| R120 | | | R92-1252-05 | CHIP R 0 OHM | | R329 | | | RK73GB1J101J | CHIP R 100 J 1/16W | K |
| R121 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R330-332 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R122 | | | RK73GB1J561J | CHIP R 560 J 1/16W | | R333 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R126 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | | R334 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| R128,129 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | | R334,335 | | | RK73GB1J471J | CHIP R 470 J 1/16W | K |
| R130 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R335 | | | RK73GB1J471J | CHIP R 470 J 1/16W | K |
| R132 | | | RK73GB1J272J | CHIP R 2.7K J 1/16W | | R336,337 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R133 | | | R92-1252-05 | CHIP R 0 OHM | | R338 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| R134 | | | RK73GB1J334J | CHIP R 330K J 1/16W | | R339 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R136 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | | R340 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| R137 | | | RK73GB1J331J | CHIP R 330 J 1/16W | | R341,342 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R138 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | | R343,344 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R139 | | | RK73GB1J154J | CHIP R 150K J 1/16W | | R345 | | | RK73GB1J330J | CHIP R 33 J 1/16W | |
| R140 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | | R346 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R141 | | | RK73GB1J331J | CHIP R 330 J 1/16W | | R347 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| R142 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | | R348,349 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R144 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R350 | | | RK73GB1J330J | CHIP R 33 J 1/16W | |
| R145 | | | RK73GB1J823J | CHIP R 82K J 1/16W | | R351 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | K2,K3 |
| R146,147 | | | RK73GB1J271J | CHIP R 270 J 1/16W | | R351 | | | RK73GB1J471J | CHIP R 470 J 1/16W | K |
| R148,149 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R352 | | | R92-1252-05 | CHIP R 0 OHM | |
| R150-153 | | | RK73GB1J100J | CHIP R 10 J 1/16W | | R353 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R154 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R354 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | |
| R155 | | | RK73GB1J563J | CHIP R 56K J 1/16W | | R355 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R162,163 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | | R356 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| R164,165 | | | RK73GB1J560J | CHIP R 56 J 1/16W | | R357 | | | RK73FB2A470J | CHIP R 47 J 1/10W | |
| R166 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R358 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |

PARTS LIST

TX-RX UNIT (X57-5600-XX)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|--------------|---------------------|-------------|----------|---------|-----------|--------------|---------------------|-------------|
| R359 | | | RK73GB1J820J | CHIP R 82 J 1/16W | K | R577 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | |
| R359 | | | R92-1252-05 | CHIP R 0 OHM | K2,K3 | R578 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R366 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | K | R579,580 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| R366,367 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | K2,K3 | R581,582 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R367 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | K | R583 | | | R92-0670-05 | CHIP R 0 OHM | |
| R501 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | R584 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R502 | | | RK73GB1J471J | CHIP R 470 J 1/16W | | R586 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R504 | | | R92-0670-05 | CHIP R 0 OHM | | R587 | | | R92-0670-05 | CHIP R 0 OHM | |
| R505 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R588 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R507 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | R589 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R508 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R591,592 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| R509-511 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R594-597 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R512 | | | RK73GB1J184J | CHIP R 180K J 1/16W | | R598 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R513 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | R599,600 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R514 | | | RK73GB1J184J | CHIP R 180K J 1/16W | | R601 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R515 | | | R92-0670-05 | CHIP R 0 OHM | | R602 | | | RK73FB2A473J | CHIP R 47K J 1/10W | |
| R516,517 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R603 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R518 | | | RK73GB1J181J | CHIP R 180 J 1/16W | | R604 | | | R92-0670-05 | CHIP R 0 OHM | |
| R519 | | | RK73GB1J393J | CHIP R 39K J 1/16W | | R605 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R520 | | | RK73GB1J154J | CHIP R 150K J 1/16W | | R606 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| R521 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R607 | | | R92-1252-05 | CHIP R 0 OHM | |
| R522 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R608 | | | RK73GB1J123J | CHIP R 12K J 1/16W | |
| R523 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | R609 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R524 | | | RK73GB1J224J | CHIP R 220K J 1/16W | | R611 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R525 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R612 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| R526 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R613 | | | RK73GB1J393J | CHIP R 39K J 1/16W | |
| R527 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | R615 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | |
| R528 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R616 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | |
| R529,530 | | | RK73GB1J334J | CHIP R 330K J 1/16W | | R617 | | | RN73GH1J274D | CHIP R 270K D 1/16W | |
| R531 | | | RK73GB1J154J | CHIP R 150K J 1/16W | | R618 | | | RN73GH1J334D | CHIP R 330K D 1/16W | |
| R532 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | R619,620 | | | RN73GH1J274D | CHIP R 270K D 1/16W | |
| R533 | | | RN73GH1J473D | CHIP R 47K D 1/16W | | R621 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R534 | | | RN73GH1J563D | CHIP R 56K D 1/16W | | R622 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R535 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R623 | | | RN73GH1J274D | CHIP R 270K D 1/16W | |
| R536 | | | RK73GB1J681J | CHIP R 680 J 1/16W | | R624 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R537 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R625 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| R539 | | | RK73GB1J561J | CHIP R 560 J 1/16W | | R626 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | |
| R541 | | | R92-0670-05 | CHIP R 0 OHM | | R627 | | | RN73GH1J274D | CHIP R 270K D 1/16W | |
| R542 | | | RK73GB1J470J | CHIP R 47 J 1/16W | | R628 | | | R92-0670-05 | CHIP R 0 OHM | |
| R543 | | | RK73GB1J220J | CHIP R 22 J 1/16W | | R629 | | | RN73GH1J563D | CHIP R 56K D 1/16W | |
| R545 | | | RK73GB1J564J | CHIP R 560K J 1/16W | | R630 | | | RN73GH1J473D | CHIP R 47K D 1/16W | |
| R546 | | | R92-0670-05 | CHIP R 0 OHM | | R631 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R547 | | | R92-1252-05 | CHIP R 0 OHM | | R632 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R549 | | | RK73GB1J153J | CHIP R 15K J 1/16W | | R633,634 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R552 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | R635 | | | R92-0670-05 | CHIP R 0 OHM | |
| R553 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | | R636 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R557,558 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R638 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R559 | | | RK73GB1J224J | CHIP R 220K J 1/16W | | R639 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R562 | | | RK73GB1J274J | CHIP R 270K J 1/16W | | R641 | | | R92-0670-05 | CHIP R 0 OHM | |
| R563 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R642-648 | | | RK73FB2A102J | CHIP R 1.0K J 1/10W | |
| R564 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | R652 | | | RK73FB2A102J | CHIP R 1.0K J 1/10W | |
| R565 | | | RK73GB1J123J | CHIP R 12K J 1/16W | | R654-656 | | | RK73FB2A102J | CHIP R 1.0K J 1/10W | |
| R566 | | | RK73GB1J153J | CHIP R 15K J 1/16W | | R657 | | | R92-0670-05 | CHIP R 0 OHM | |
| R567 | | | RK73GB1J224J | CHIP R 220K J 1/16W | | R658 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R568 | | | R92-1252-05 | CHIP R 0 OHM | | R659 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R570 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | R661 | | | R92-0670-05 | CHIP R 0 OHM | |
| R572 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R662 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R573 | | | RK73GB1J274J | CHIP R 270K J 1/16W | | R663 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R574 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R664 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R575,576 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R665 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |

PARTS LIST

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| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|--------------|----------------------------|-------------|----------|---------|-----------|----------------|-----------------------------|-------------|
| R666,667 | | | R92-0670-05 | CHIP R 0 OHM | | D519 | | | DA204U | DIODE | |
| R668 | | | R92-1252-05 | CHIP R 0 OHM | | D521 | | | DA204U | DIODE | |
| R670 | | | R92-0670-05 | CHIP R 0 OHM | | D523,524 | | | DA204U | DIODE | |
| R671 | | | RK73GB1J683J | CHIP R 68K J 1/16W | | D526,527 | | | DA204U | DIODE | |
| R672 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D528,529 | | | 1SS355 | DIODE | |
| R674,675 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC101 | | | TA31136FN | IC (FM IC) | |
| R676 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | IC201 | | | BU4094BCF | IC (SHIFT REGISTER) | |
| R677 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC202 | | | NJM78L05UA | IC (AVR) | |
| R678,679 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | | IC203 | | | AN8009M | IC (AVR) | |
| R680 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | IC301 | | | SA7025DK | IC (PLL IC) | |
| R690,691 | | | R92-0670-05 | CHIP R 0 OHM | | IC501 | | | TC4013BF(N) | IC (D FF) | |
| R693 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | IC502 | | | NJM4558M | IC (LPF) | |
| R695 | | | R92-1252-05 | CHIP R 0 OHM | | IC503 | | | TA7808S | IC (AVR) | |
| R697 | | | R92-1252-05 | CHIP R 0 OHM | | IC504 | | | TC35453F | IC (AUDIO PROCESSOR) | |
| R698 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC505 | | | NJM4558M | IC (HPF/IDC) | |
| R699 | | | R92-1252-05 | CHIP R 0 OHM | | IC506 | | | L78LR05B-FA | IC (AVR) | |
| R700 | | | RK73GB1J220J | CHIP R 22 J 1/16W | | IC508 | | | NJM4558M | IC (LIMITER/BUFFER AMP) | |
| R701 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | IC509 | | | MC33172D | IC (BUFFER AMP) | |
| R702 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC510 | | | NJM4558M | IC (SUMMING AMP/LPF) | |
| R703 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | IC511 | | | PCD3312CT | IC (DTMF ENCODER) | |
| R706 | | | R92-0670-05 | CHIP R 0 OHM | | IC512 | | | M62364FP | IC (D/A CONVERTER) | |
| R707-713 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | IC513 | | | NJM4558M | IC (LPF/SUMMING AMP) | |
| R714 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | IC514 | | | AT24C64N10SI27 | IC (EEPROM) | |
| R715 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | IC515 | | | BU4066BCF | IC (ANALOG SWITCH) | |
| R716 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | IC516 | | | 784214GC0518EU | IC (CPU) | |
| R717 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | IC517 | | | BU4094BCF | IC (SHIFT REGISTER) | |
| R718 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | IC518 | | | NJM4558M | IC (BUFFER AMP) | |
| R719 | | | RS14DB3D2R2J | FL-PROOF RS 2.2 J 2W | | IC519 | | | AT29C020-90T1 | IC (FLASH ROM) | |
| R720 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | IC520 | | | TC7S02F | IC (NOR GATE) | |
| R721 | | | RK73GB1J224J | CHIP R 220K J 1/16W | | IC521 | | | NJM4558M | IC (BUFFER AMP) | |
| R725 | | | R92-0670-05 | CHIP R 0 OHM | | IC522 | | | TDA8561Q | IC (AUDIO POWER AMP) | |
| R728 | | | R92-1252-05 | CHIP R 0 OHM | | IC523 | | | BU4094BCF | IC (SHIFT REGISTER) | |
| R729-736 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC524 | | | NJM4558M | IC (BUFFER AMP/DE-EMPHASIS) | |
| R737 | | | RK73GB1J824J | CHIP R 820K J 1/16W | | IC525 | | | LC73872M | IC (DTMF DECODER) | |
| R738 | | | RK73GB1J684J | CHIP R 680K J 1/16W | | IC526 | | | TA75S01F | IC (AMP) | |
| R739 | | | R92-1252-05 | CHIP R 0 OHM | | Q101,102 | | | 2SK520(K43) | FET | |
| R740,741 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | Q103 | | | 2SK508NV(K52) | FET | |
| R742 | | | R92-0670-05 | CHIP R 0 OHM | | Q105,106 | | | 2SK508NV(K52) | FET | |
| R744 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | Q107 | | | 2SC4215(Y) | TRANSISTOR | |
| R745,746 | | | R92-1252-05 | CHIP R 0 OHM | | Q108 | | | 2SC4617(S) | TRANSISTOR | |
| R747 | | | R92-0670-05 | CHIP R 0 OHM | | Q110-113 | | | 2SK508NV(K52) | FET | |
| R748 | | | R92-1252-05 | CHIP R 0 OHM | | Q114 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| VR501 | | | R12-6417-05 | TRIMMING POT. (1K) | | Q115 | | | 2SK1824 | FET | |
| D102-105 | | | 1SV228 | VARIABLE CAPACITANCE DIODE | | Q201 | | | 2SB1132(Q,R) | TRANSISTOR | |
| D106 | | | MA716 | DIODE | | Q202 | | | DTC114EUA | DIGITAL TRANSISTOR | |
| D107 | | | 1SS355 | DIODE | | Q203 | | | 2SC2954 | TRANSISTOR | |
| D301-304 | | | 1SV228 | VARIABLE CAPACITANCE DIODE | | Q204 | | | DTC114EUA | DIGITAL TRANSISTOR | |
| D305 | | | 1SV214 | VARIABLE CAPACITANCE DIODE | | Q205 | | | 2SB1132(Q,R) | TRANSISTOR | |
| D306 | | | DAN235K | DIODE | | Q301,302 | | | 2SC4116(GR) | TRANSISTOR | |
| D501 | | | 02CZ18(X,Y) | ZENER DIODE | | Q303,304 | | | 2SC3722K(S) | TRANSISTOR | |
| D502,503 | | | 1SS355 | DIODE | | Q306,307 | | | 2SK508NV(K52) | FET | |
| D504 | | | 02CZ5.6(X,Y) | ZENER DIODE | | Q308,309 | | | 2SC4116(Y) | TRANSISTOR | |
| D505 | | | 1SS355 | DIODE | | Q310 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| D506 | | | 1SS301 | DIODE | | Q311,312 | | | 2SC4215(Y) | TRANSISTOR | |
| D507 | | | 02CZ15(X,Y) | ZENER DIODE | | Q313 | | | 2SC3357 | TRANSISTOR | |
| D508 | | | 1SS355 | DIODE | | Q501 | | | DTA114EUA | DIGITAL TRANSISTOR | |
| D511 | | | 1SS301 | DIODE | | Q502,503 | | | DTC114EUA | DIGITAL TRANSISTOR | |
| D512 | | | 1SS355 | DIODE | | Q504 | | | DTC363EK | DIGITAL TRANSISTOR | |
| D513-517 | | | DA204U | DIODE | | Q505 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| | | | | | | Q506 | | | DTA114YUA | DIGITAL TRANSISTOR | |

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TX-RX UNIT (X57-5600-XX)
NB (X58-4610-10)
KCH-10

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|-------------------------|---------|-----------|---------------|----------------------------------|-------------|
| Q507 | | | DTC114YUA | DIGITAL TRANSISTOR | |
| Q509-513 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| Q514 | | | DTA144TKA | DIGITAL TRANSISTOR | |
| Q516 | | | DTA114TUA | DIGITAL TRANSISTOR | |
| Q517 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| Q518 | | | DTA114EUA | DIGITAL TRANSISTOR | |
| Q519 | | | 2SJ506(S) | FET | |
| Q520 | | | DTD114EK | DIGITAL TRANSISTOR | |
| Q522 | | | 2SC4215(Y) | TRANSISTOR | |
| Q523,524 | | | DTC114TU | DIGITAL TRANSISTOR | |
| Q525 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| Q533-536 | | | DTC144EUA | DIGITAL TRANSISTOR | |
| Q537-540 | | | DTD114EK | DIGITAL TRANSISTOR | |
| Q541 | | | DTA114EUA | DIGITAL TRANSISTOR | |
| Q542 | | | DTA114EUA | DIGITAL TRANSISTOR | |
| Q543,544 | | | DTC114EUA | DIGITAL TRANSISTOR | |
| TH101 | | | 157-503-53006 | THERMISTOR | |
| NB (X58-4610-10) | | | | | |
| C1 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C2 | | | C92-0543-05 | CHIP-TAN 3.3UF 10WV | |
| C3 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C4 | | | CC73GCH1H680J | CHIP C 68PF J | |
| C5 | | | C92-0543-05 | CHIP-TAN 3.3UF 10WV | |
| C6,7 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C8 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C9 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C10 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C11 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C12 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C13,14 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C15 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C16 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C17 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C18 | | | C92-0543-05 | CHIP-TAN 3.3UF 10WV | |
| C19 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C20 | | | CC73GCH1H221J | CHIP C 220PF J | |
| C21 | | | CC73GCH1H680J | CHIP C 68PF J | |
| C22-24 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C25 | | | CC73GCH1H221J | CHIP C 220PF J | |
| CN1,2 | | | E40-6007-05 | PIN ASSY | |
| L1 | | | L40-1005-34 | SMALL FIXED INDUCTOR (10UH) | |
| L2 | | | L40-5695-34 | SMALL FIXED INDUCTOR (5.6UH) | |
| L3 | | | L40-1015-34 | SMALL FIXED INDUCTOR (100UH) | |
| L4 | | | L40-5695-34 | SMALL FIXED INDUCTOR (5.6UH) | |
| R1 | | | R92-1252-05 | CHIP R 0 OHM | |
| R2 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R3 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R4 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R5 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R6 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R7 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R8 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R9 | | | RK73GB1J330J | CHIP R 33 J 1/16W | |
| R10 | | | RK73GB1J563J | CHIP R 56K J 1/16W | |
| R11 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| R12 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R13 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R14 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R15 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R16 | | | RK73GB1J562J | CHIP R 5.6K J 1/16W | |
| R17 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R18 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R19 | | | RK73GB1J562J | CHIP R 5.6K J 1/16W | |
| R20 | | | RK73GB1J273J | CHIP R 27K J 1/16W | |
| R21 | | | RK73GB1J334J | CHIP R 330K J 1/16W | |
| R22 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R23 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| R24 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| R25 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R26 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R27 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R28 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R29 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R30 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R31,32 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R33 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| D1 | | | 1SS184 | DIODE | |
| IC1 | | | MC1350D | IC (IF AMP) | |
| Q1 | | | 3SK131(M) | FET | |
| Q2 | | | 2SA1162(Y) | TRANSISTOR | |
| Q3-6 | | | 2SC2712(Y) | TRANSISTOR | |
| Q7 | | | 2SA1162(Y) | TRANSISTOR | |
| KCH-10 | | | | | |
| 201 | 3C | | A62-0606-13 | PANEL ASSY | |
| 203 | 1D | | E37-0787-05 | LEAD WIRE WITH CONNECTOR (SP) | |
| 205 | 3D | | G53-0838-03 | PACKING (PANEL ASSY) | |
| 206 | 1C | | G53-0839-14 | PACKING (SP) | |
| 207 | 3C | | G53-1523-04 | PACKING (VOL) | |
| 208 | 2J | | H10-6622-02 | POLYSTYRENE FOAMED FIXTURE | |
| 209 | 1I | | H11-0894-04 | POLYSTYRENE FOAMED BOARD | |
| 210 | 1J | | H13-1059-04 | CARTON BOARD | |
| 211 | 1J | | H25-0029-04 | PROTECTION BAG (60/110/0.07) | |
| 212 | 2I | | H25-0103-04 | PROTECTION BAG (125/250/0.07) | |
| 213 | 2J | | H25-0117-04 | PROTECTION BAG (80/250/0.07) | |
| 214 | 3I | | H52-1271-02 | ITEM CARTON CASE | |
| 217 | 2C | | J21-8417-04 | HARDWARE FIXTURE (MIC CONNECTOR) | |
| 216 | 2C | | J39-0625-04 | SPACER (TX-BUSY) | |
| 218 | 3C | | K29-4664-04 | KNOB (VOL,UP/DOWN) | |
| 219 | 2J | | K29-4704-04 | KNOB ACSY | |
| 220 | 2C | | K29-5251-12 | KEY TOP | |
| 221 | 2J | | K29-5276-03 | KNOB ACSY | |
| 222 | 2J | | K29-5277-03 | KNOB ACSY | |
| 223 | 2J | | K29-5305-03 | KNOB ACSY | |
| U | 1C | | N87-2605-46 | BRAZIER HEAD TAPTITE SCREW | |
| V | 1C,1D | | N87-2608-46 | BRAZIER HEAD TAPTITE SCREW | |
| W | 2C,2D | | N87-3006-46 | BRAZIER HEAD TAPTITE SCREW | |
| 225 | 1J | | N99-0364-05 | SCREW SET ACSY | |
| 227 | 2D | | T07-0265-05 | SPEAKER | |

TK-690H(B)

PARTS LIST

DISPLAY UNIT (X54-3190-20) : KCH-10
KCH-11

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|--|---------|-----------|----------------|---------------------------------------|-------------|
| DISPLAY UNIT (X54-3190-20) : KCH-10 | | | | | |
| - | | | B11-1148-14 | ILLUMINATION GUIDE | |
| - | | | B11-1149-04 | FILTER | |
| D6-11 | | | B30-2140-05 | LED (YEL) | |
| D12 | | | B30-2194-05 | LED (GREEN) | |
| D13 | | | B30-2193-05 | LED (RED) | |
| ED1 | | | B38-0800-05 | LCD | |
| C11 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C17 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C20 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C22 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| C23,24 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C25 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| C27 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C28,29 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| C30 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C32 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C35-37 | | | CK73GB1E103K | CHIP C 0.010UF K | |
| C43-47 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C48-50 | | | CK73GB1H102K | CHIP C 1000PF K | |
| - | | | E29-1192-04 | INTER CONNECTOR | |
| CN1 | | | E40-5953-05 | PIN ASSY | |
| CN2 | | | E40-5704-05 | PIN ASSY | |
| CN3 | | | E40-5952-05 | PIN ASSY | |
| CN4 | | | E40-5738-05 | PIN ASSY | |
| CN5 | | | E40-5957-05 | PIN ASSY SOCKET | |
| CN6 | | | E40-5958-05 | PIN ASSY | |
| J1 | | | E56-0410-15 | RF COAXIAL RECEPTACLE (MIC CONNECTOR) | |
| W1 | | | E37-0703-05 | LEAD WIRE WITH CONNECTOR | |
| X1 | | | L78-0043-05 | RESONATOR (4.19MHZ) | |
| R1,2 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R5 | | | RK73FB2A561J | CHIP R 560 J 1/10W | |
| R7 | | | RK73FB2A331J | CHIP R 330 J 1/10W | |
| R8 | | | R92-2023-05 | CHIP R 820 J 1/2W | |
| R9 | | | RK73FB2A181J | CHIP R 180 J 1/10W | |
| R10 | | | R92-0670-05 | CHIP R 0 OHM | |
| R11 | | | RK73FB2A331J | CHIP R 330 J 1/10W | |
| R12 | | | RK73FB2A181J | CHIP R 180 J 1/10W | |
| R13,14 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R15 | | | RK73FB2A151J | CHIP R 150 J 1/10W | |
| R16 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R17 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| R18 | | | R92-1281-05 | FUSE R 4.7 J 1/4W | |
| R21 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R23 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R24 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R26 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R29-33 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R34,35 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R36 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R38 | | | R92-1252-05 | CHIP R 0 OHM | |
| R39,40 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R41-43 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R45 | | | R92-2063-05 | CHIP R 680 J 1/2W | |
| R47 | | | R92-2023-05 | CHIP R 820 J 1/2W | |
| R48 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R49-51 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| KCH-11 | | | | | |
| R52 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | |
| R54 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R55 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R67 | | | R92-1252-05 | CHIP R 0 OHM | |
| VR1 | | | R31-0607-05 | VARIABLE RESISTOR (10K) | |
| S1 | | | S40-1420-05 | TACT SWITCH | |
| S2,3 | | | S70-0410-15 | TACT SWITCH | |
| S5-9 | | | S70-0410-15 | TACT SWITCH | |
| D1,2 | | | DA204U | DIODE | |
| D5 | | | O2C29.1(X,Y) | ZENER DIODE | |
| D16,17 | | | DA204U | DIODE | |
| D19-21 | | | DA204U | DIODE | |
| D24 | | | 1SS301 | DIODE | |
| D25 | | | MA2S111 | DIODE | |
| IC1 | | | NJM78L05UA | IC (AVR) | |
| IC2 | | | RH5VL42C | IC (RESET) | |
| IC3 | | | AT24C64N10SI27 | IC (EEPROM) | |
| IC4 | | | 78064GCA458EU | IC (CPU/LCD DRIVER) | |
| Q1 | | | 2SC2873(Y) | TRANSISTOR | |
| Q3-7 | | | DTC144EU | DIGITAL TRANSISTOR | |
| Q9 | | | DTC144EU | DIGITAL TRANSISTOR | |
| Q11 | | | DTC144EU | DIGITAL TRANSISTOR | |
| Q12,13 | | | DTC114TU | DIGITAL TRANSISTOR | |
| Q14,15 | | | DTD114EK | DIGITAL TRANSISTOR | |
| S4 | | | W02-0393-05 | ENCODER | |
| 301 | 3E | | A62-0607-13 | PANEL ASSY | |
| 303 | 3F | | G53-0838-03 | PACKING (PANEL ASSY) | |
| 304 | 3E | | G53-1523-04 | PACKING (VOL) | |
| 305 | 2L | | H10-6622-02 | POLYSTYRENE FOAMED FIXTURE | |
| 306 | 1K | | H11-0894-04 | POLYSTYRENE FOAMED BOARD | |
| 307 | 1L | | H13-1059-04 | CARTON BOARD | |
| 308 | 2L | | H25-0029-04 | PROTECTION BAG (60/110/0.07) | |
| 309 | 2K | | H25-0103-04 | PROTECTION BAG (125/250/0.07) | |
| 310 | 2L | | H25-0117-04 | PROTECTION BAG (80/250/0.07) | |
| 311 | 3K | | H52-1271-02 | ITEM CARTON CASE | |
| 312 | 1E | | J21-8417-04 | HARDWARE FIXTURE (MIC CONNECTOR) | |
| 313 | 1E | | J39-0625-04 | SPACER (TX-BUSY) | |
| 315 | 3E | | K29-4664-04 | KNOB (VOL,UP/DOWN) | |
| 316 | 2L | | K29-4704-04 | KNOB ACSY | |
| 317 | 2F | | K29-5252-12 | KEY TOP | |
| 318 | 2L | | K29-5276-03 | KNOB ACSY | |
| 319 | 2L | | K29-5277-03 | KNOB ACSY | |
| 320 | 2L | | K29-5305-03 | KNOB ACSY | |
| X | 1E | | N87-2605-46 | BRAZIER HEAD TAPTITE SCREW | |
| Y | 1E,1F | | N87-2608-46 | BRAZIER HEAD TAPTITE SCREW | |
| Z | 1E,2F | | N87-3008-46 | BRAZIER HEAD TAPTITE SCREW | |
| 322 | 1L | | N99-0364-05 | SCREW SET ACSY | |

PARTS LIST

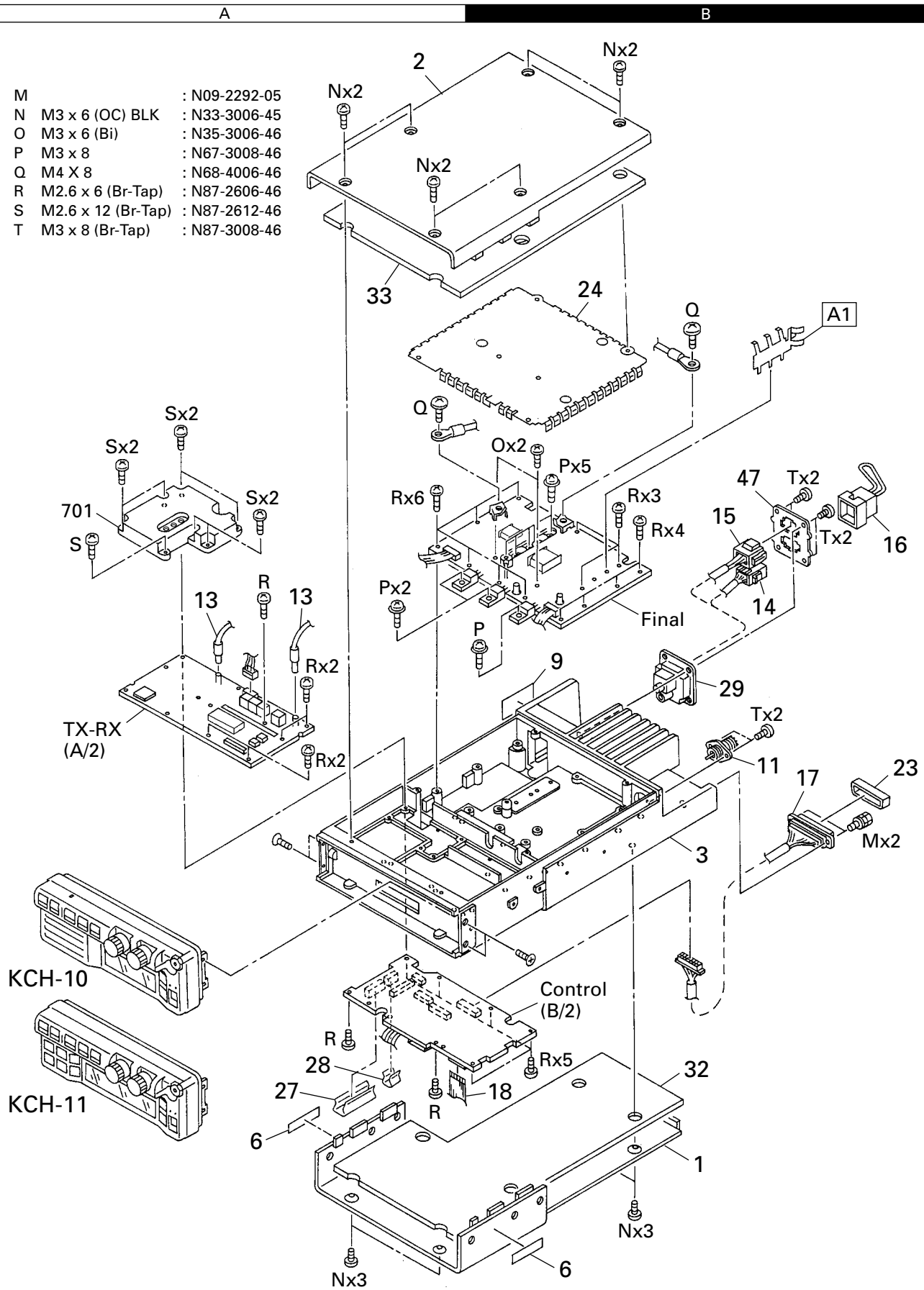
DISPLAY UNIT (X54-3200-20) : KCH-11

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|--|---------|-----------|---------------|---------------------------------------|-------------|----------|---------|-----------|----------------|-------------------------|-------------|
| DISPLAY UNIT (X54-3200-20) : KCH-11 | | | | | | VR1 | | | R31-0607-05 | VARIABLE RESISTOR (10K) | |
| D6 | | | B30-2194-05 | LED (GREEN) | | S1 | | | S40-1420-05 | TACT SWITCH | |
| D7 | | | B30-2193-05 | LED (RED) | | S2,3 | | | S70-0410-15 | TACT SWITCH | |
| ED1 | | | B38-0801-15 | LCD ASSY | | S5-15 | | | S70-0410-15 | TACT SWITCH | |
| C9 | | | CC73GCH1H101J | CHIP C 100PF J | | D1,2 | | | DA204U | DIODE | |
| C14 | | | CC73GCH1H101J | CHIP C 100PF J | | D5 | | | 02CZ9.1(X,Y) | ZENER DIODE | |
| C20 | | | CK73GB1H102K | CHIP C 1000PF K | | D11,12 | | | DA204U | DIODE | |
| C22 | | | CK73GB1E103K | CHIP C 0.010UF K | | D14-16 | | | DA204U | DIODE | |
| C23,24 | | | CC73GCH1H101J | CHIP C 100PF J | | D18 | | | 1SS301 | DIODE | |
| C25 | | | CK73GB1E103K | CHIP C 0.010UF K | | D19 | | | MA2S111 | DIODE | |
| C27 | | | CK73GB1E223K | CHIP C 0.022UF K | | IC1 | | | NJM78L05UA | IC (AVR) | |
| C28,29 | | | CK73GB1E103K | CHIP C 0.010UF K | | IC2 | | | RH5VL42C | IC (RESET) | |
| C30 | | | CC73GCH1H101J | CHIP C 100PF J | | IC3 | | | AT24C64N10SI27 | IC (EEPROM) | |
| C32 | | | CC73GCH1H101J | CHIP C 100PF J | | IC4 | | | 78064GCA458EU | IC (CPU) | |
| C35,36 | | | CK73GB1E103K | CHIP C 0.010UF K | | Q1 | | | 2SC2873(Y) | TRANSISTOR | |
| C40 | | | CK73GB1E103K | CHIP C 0.010UF K | | Q2-8 | | | DTC144EU | DIGITAL TRANSISTOR | |
| C50-60 | | | CC73GCH1H101J | CHIP C 100PF J | | Q9,10 | | | DTC114TU | DIGITAL TRANSISTOR | |
| C61-67 | | | CK73GB1H102K | CHIP C 1000PF K | | Q14,15 | | | DTD114EK | DIGITAL TRANSISTOR | |
| CN1 | | | E40-5953-05 | PIN ASSY | | S4 | | | W02-0393-05 | ENCODER | |
| CN2 | | | E40-5704-05 | PIN ASSY | | | | | | | |
| CN3 | | | E40-5952-05 | PIN ASSY | | | | | | | |
| CN4 | | | E40-5738-05 | PIN ASSY | | | | | | | |
| CN5 | | | E40-5823-05 | FLAT CABLE CONNECTOR | | | | | | | |
| J1 | | | E56-0410-15 | RF COAXIAL RECEPTACLE (MIC CONNECTOR) | | | | | | | |
| W1 | | | E37-0703-05 | LEAD WIRE WITH CONNECTOR | | | | | | | |
| X1 | | | L78-0043-05 | RESONATOR (4.19MHZ) | | | | | | | |
| R1,2 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R5 | | | RK73FB2A561J | CHIP R 560 J 1/10W | | | | | | | |
| R6 | | | R92-2023-05 | CHIP R 820 J 1/2W | | | | | | | |
| R7 | | | R92-0670-05 | CHIP R 0 OHM | | | | | | | |
| R8,9 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R10 | | | RK73FB2A151J | CHIP R 150 J 1/10W | | | | | | | |
| R11 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | | | | | | |
| R12 | | | RK73GB1J331J | CHIP R 330 J 1/16W | | | | | | | |
| R13 | | | R92-1281-05 | FUSE R 4.7 J 1/4W | | | | | | | |
| R14 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R16 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R19,20 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R21 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R22 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | | | | | | |
| R24 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R26 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | | | | | | |
| R28-32 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R33,34 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R35 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R37,38 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R39 | | | RK73FB2A331J | CHIP R 330 J 1/10W | | | | | | | |
| R40,41 | | | R92-2063-05 | CHIP R 680 J 1/2W | | | | | | | |
| R42 | | | RK73FB2A181J | CHIP R 180 J 1/10W | | | | | | | |
| R43 | | | R92-2063-05 | CHIP R 680 J 1/2W | | | | | | | |
| R44 | | | R92-2023-05 | CHIP R 820 J 1/2W | | | | | | | |
| R45-56 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R57-62 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | | | | | | |
| R63 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | | | | | | |
| R65 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | | | | | | |
| R66 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | | | | | | | |
| R67 | | | R92-1252-05 | CHIP R 0 OHM | | | | | | | |

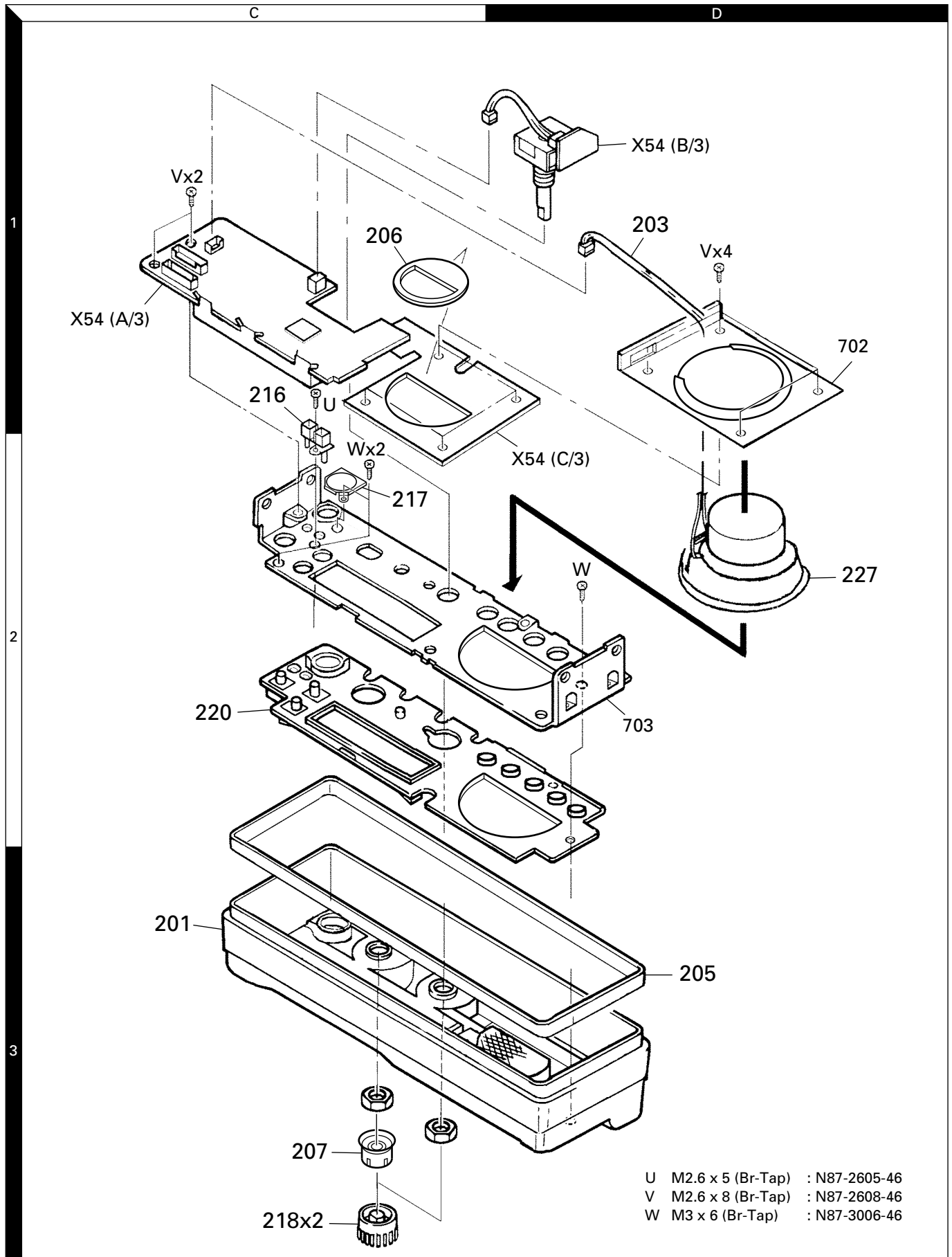
TK-690H(B)

EXPLODED VIEW

| | | |
|---|--------------------|---------------|
| M | | : N09-2292-05 |
| N | M3 x 6 (OC) BLK | : N33-3006-45 |
| O | M3 x 6 (Bi) | : N35-3006-46 |
| P | M3 x 8 | : N67-3008-46 |
| Q | M4 X 8 | : N68-4006-46 |
| R | M2.6 x 6 (Br-Tap) | : N87-2606-46 |
| S | M2.6 x 12 (Br-Tap) | : N87-2612-46 |
| T | M3 x 8 (Br-Tap) | : N87-3008-46 |



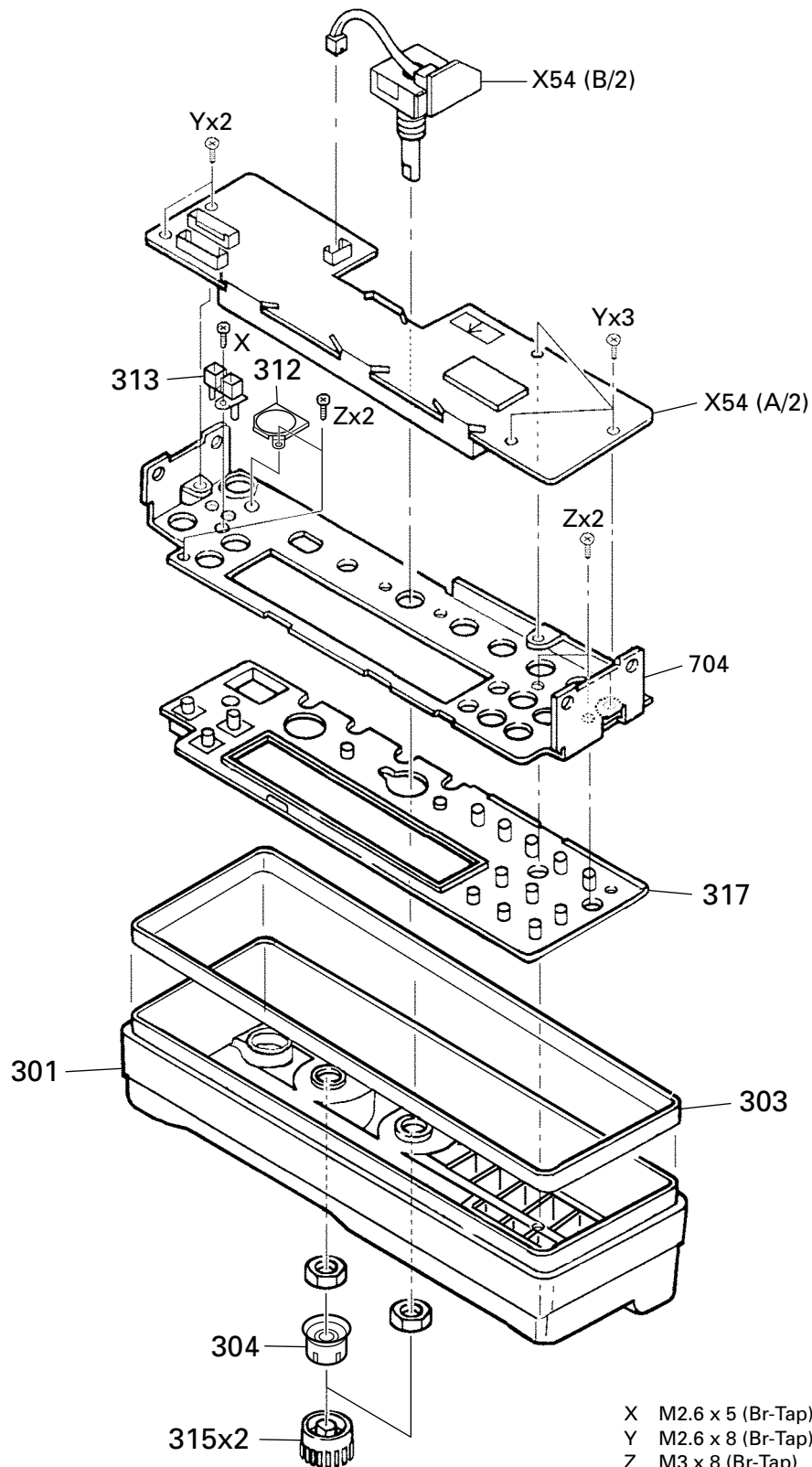
EXPLODED VIEW (KCH-10)



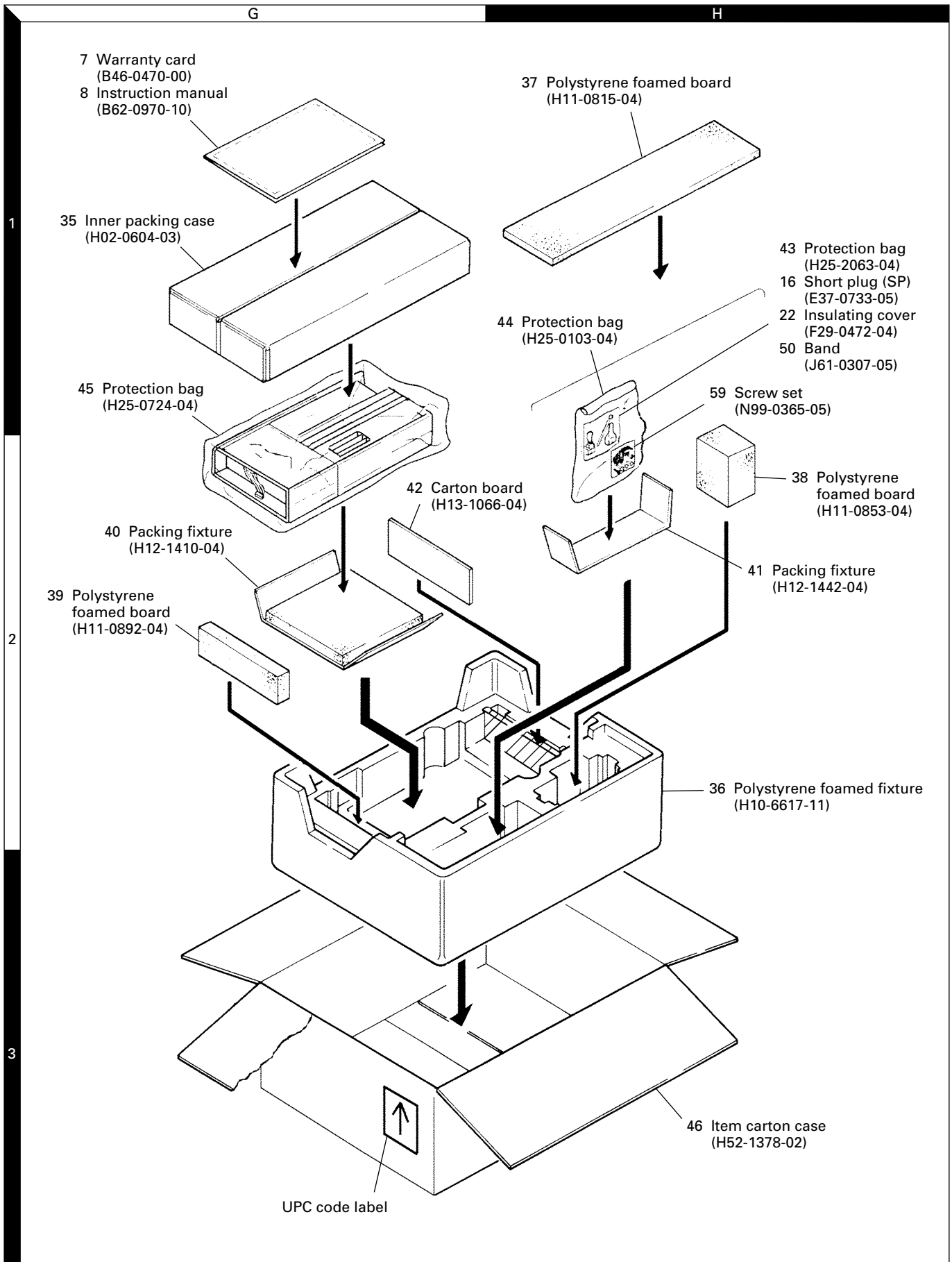
Parts with the exploded numbers larger than 700 are not supplied.

TK-690H(B)

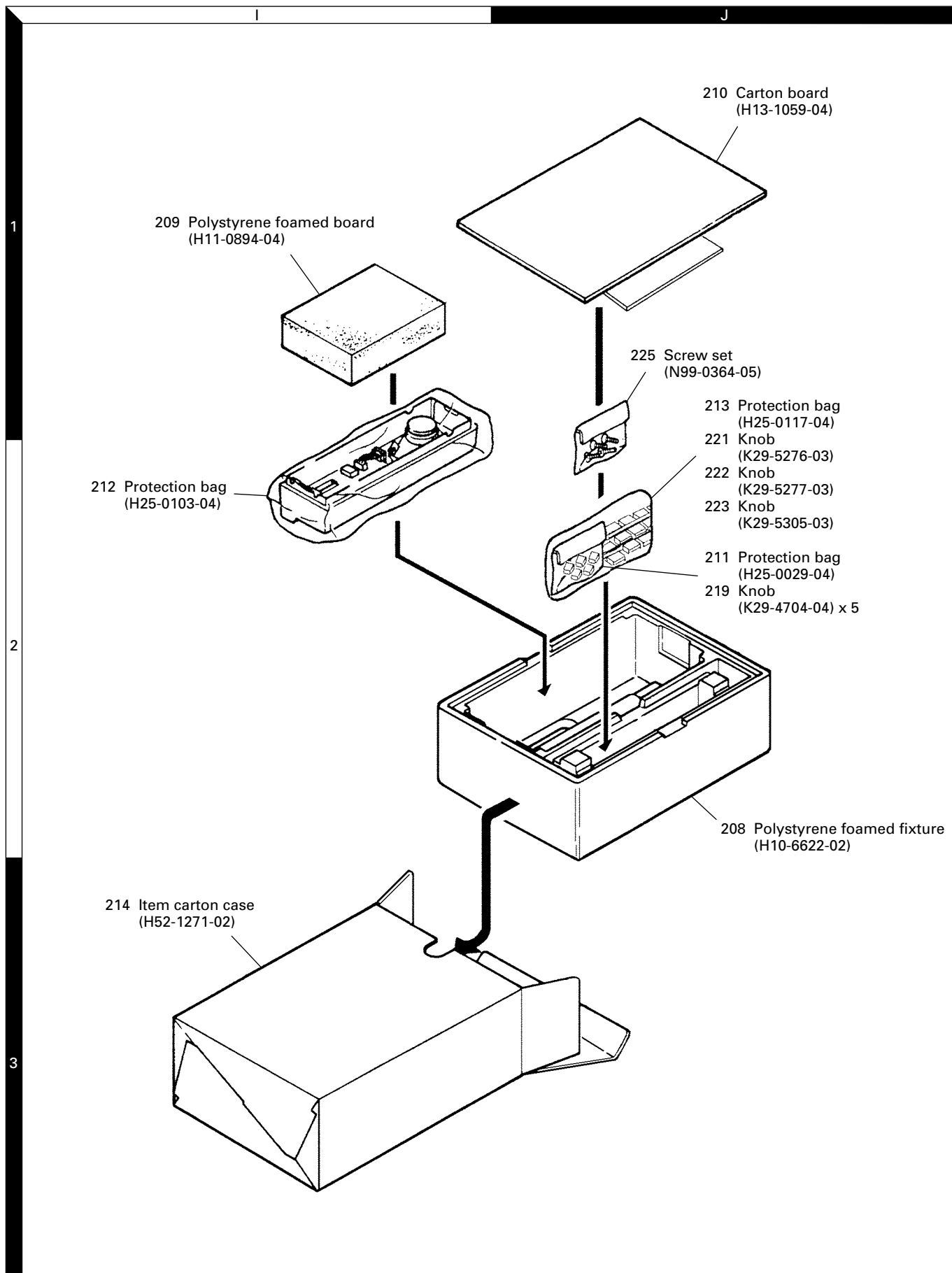
EXPLODED VIEW (KCH-11)



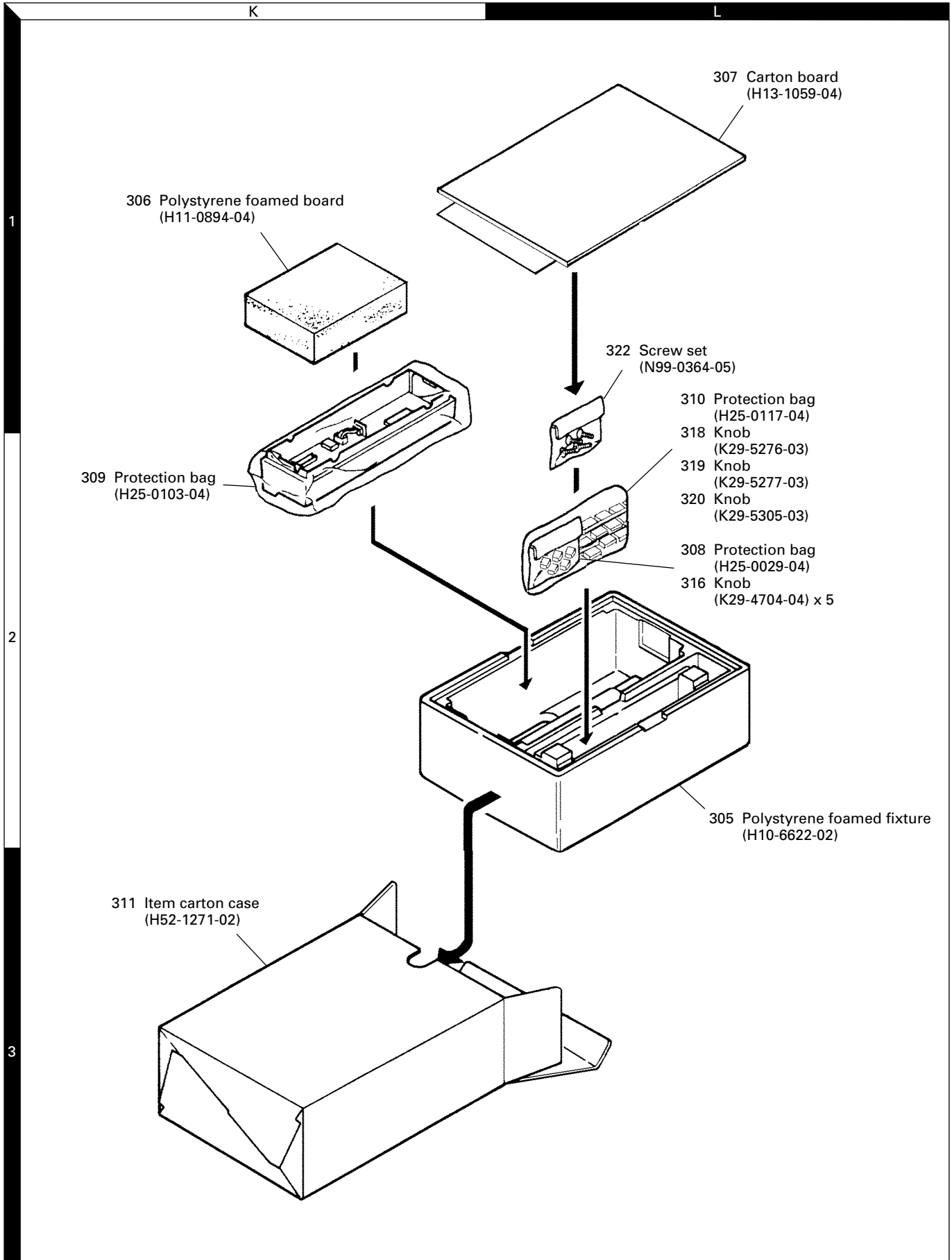
PACKING



PACKING (KCH-10)



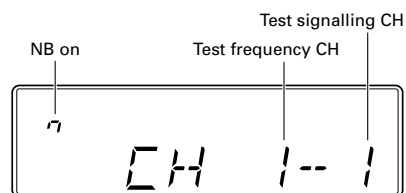
PACKING (KCH-11)



ADJUSTMENT

Key Functions in Panel Test Mode and Panel Tune Mode

| Knob/Key | Test mode | Tune mode |
|----------|--------------------------------|---------------------|
| GRP UP | Test mode/Tune mode changeover | |
| GRP DOWN | Monitor ON/OFF | |
| UP/DOWN | NB ON/OFF | |
| PF1 | Frequency CH down | Tuning item down |
| PF2 | Frequency CH up | Tuning item up |
| PF3 | Signalling CH down | Tuning value down |
| PF4 | Signalling CH up | Tuning value up |
| PF5 | Not used | Tuning value backup |

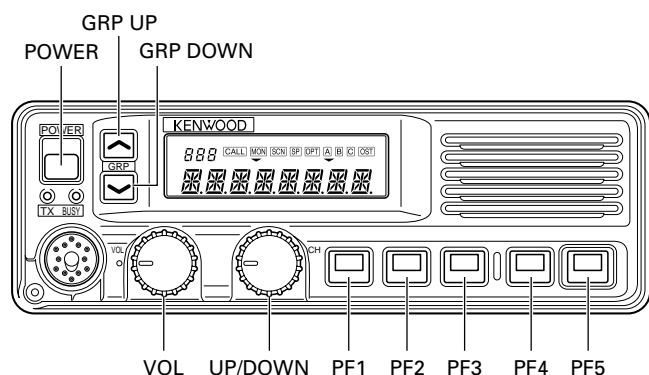


Note : When a key other than GRP down is pressed, the optional signalling is reset.

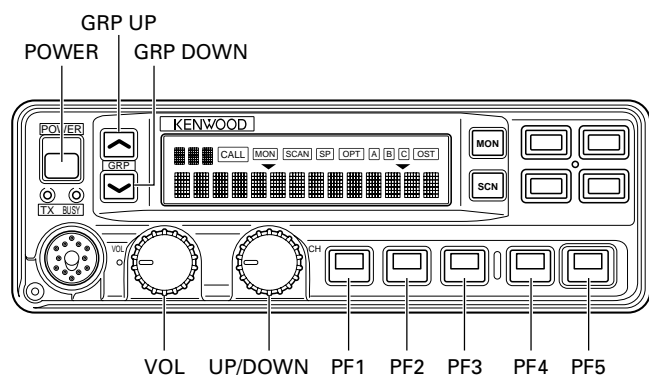
• Test frequency channel (MHz)

| CH | K | | K2 | | K3 | |
|------------|--------|--------|--------|--------|--------|--------|
| | TX | RX | TX | RX | TX | RX |
| 1 (Center) | 33.300 | 33.400 | 39.000 | 39.100 | 45.000 | 45.100 |
| 2 (Low) | 29.700 | 29.800 | 35.000 | 35.100 | 40.000 | 40.100 |
| 3 (High) | 37.000 | 36.900 | 43.000 | 42.900 | 50.000 | 49.900 |
| 4 | 33.300 | 33.300 | 39.000 | 39.000 | 45.000 | 45.000 |
| 5 | 33.500 | 33.500 | 39.200 | 39.200 | 45.200 | 45.200 |
| 6 | 33.700 | 33.700 | 39.400 | 39.400 | 45.400 | 45.400 |

Basic function panel



Full function panel



• Test signalling channel

| CH No. | Encode tone | Decode tone |
|--------|--------------------|----------------------|
| 1 | None | None |
| 2 | 100Hz square wave | None |
| 3 | QT 67.0Hz | QT 67.0Hz |
| 4 | QT 151.4Hz | QT 151.4Hz |
| 5 | QT 250.3Hz | QT 250.3Hz |
| 6 | DQT 023N | DQT 023N |
| 7 | Single tone 1633Hz | 2 tone 321.7/928.1Hz |
| 8 | DTMF [9] | DTMF [159] |
| 9 | MSK | None |

Panel Test Mode

The transceiver's transmission output, receive sensitivity, and other items are measured and QT, DQT, 2tone and DTMF signaling is decoded in this mode.

• To enter the panel test mode

Hold down [PF1] and turn the power switch on to enter this mode. The test frequency channel and test signalling channel will be displayed.

Panel Tune Mode

The transceiver is adjusted in this mode.

• To enter the panel tune mode

Press the [GRP ^] key in the panel test mode.

In this mode, QT and DQT signalling is decoded, but 2tone and DTMF signalling is not decoded.

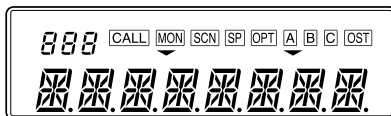
The adjustment items, the frequency and signalling, other than the maximum deviation and sensitivity, return to the values that were effective for the test frequency channel and test signalling channel before entering the panel tune mode.

ADJUSTMENT

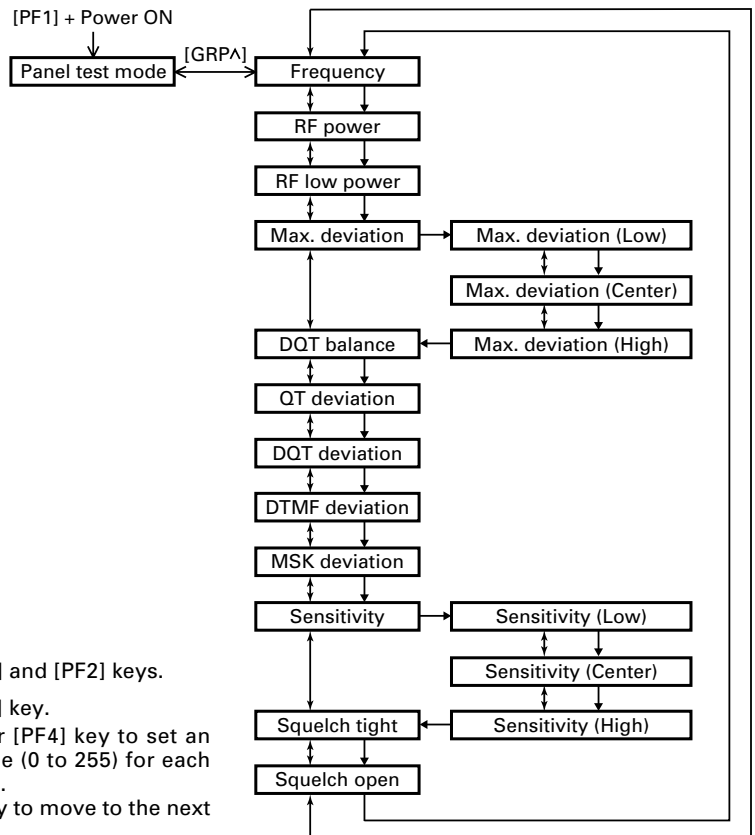
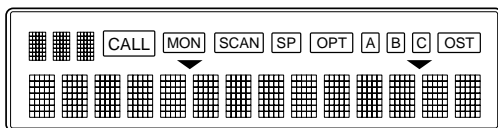
• Tuning item and display (XXX : 0~255)

| Tuning item | Basic display | Full display | Note |
|-------------------------|---------------|------------------|---|
| Frequency | FREQ_XXX | FREQUENCY_XXX_ | |
| RF power | _POW_XXX | POWER_ _ _ _XXX_ | |
| RF low power | LPOW_XXX | LOW_POWER_XXX_ | |
| Max. deviation | MXDV_XXX | MAX_DEV_ _ _XXX_ | |
| Max. deviation (Low) | MXDV_XXX | MAX_DEV_ _ _XXX_ | Three digits on the upper left side: “_ _ L” Transmission and reception at the low edge |
| Max. deviation (Center) | MXDV_XXX | MAX_DEV_ _ _XXX_ | Three digits on the upper left side: “_ _ C” Transmission and reception at the center |
| Max. deviation (High) | MXDV_XXX | MAX_DEV_ _ _XXX_ | Three digits on the upper left side: “_ _ H” Transmission and reception at the high edge |
| DQT balance | BLNC_XXX | DQT_BLNCE_XXX_ | |
| QT deviation | QTDV_XXX | QT_DEV_ _ _XXX_ | |
| DQT deviation | DQDV_XXX | DQT_DEV_ _ _XXX_ | |
| DTMF deviation | DTDV_XXX | DTMF_DEV_ _XXX_ | |
| MSK deviation | MSDV_XXX | MSK_DEV_ _ _XXX_ | |
| Sensitivity | SENS_XXX | RX_SENSE_ _XXX_ | |
| Sensitivity (Low) | SENS_XXX | RX_SENSE_ _XXX_ | Three digits on the upper left side: “_ _ L” Transmission and reception at the low edge |
| Sensitivity (Center) | SENS_XXX | RX_SENSE_ _XXX_ | Three digits on the upper left side: “_ _ C” Transmission and reception at the center |
| Sensitivity (High) | SENS_XXX | RX_SENSE_ _XXX_ | Three digits on the upper left side: “_ _ H” Transmission and reception at the high edge |
| Squelch tight point | SQ_T_XXX | SQL_TIGHT_XXX_ | |
| Squelch open point | SQ_O_XXX | SQL_OPEN_ _XXX_ | |

Basic display



Full display



ADJUSTMENT

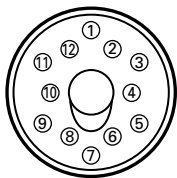
Test Equipment Required for Alignment

| No. | Test Equipment | Major Specifications | |
|-----|------------------------------------|--|---|
| 1 | Standard Signal Generator (SSG) | Frequency Range Modulation Output | 50kHz to 500MHz. Frequency modulation and external modulation. 0.1μV to greater than 1mV. |
| 2 | Power Meter | Input Impedance Operation Frequency Measurement Capability | 50Ω. 50MHz or less. Vicinity of 200W. |
| 3 | Deviation Meter | Frequency Range | 29.7 to 50.0MHz. |
| 4 | Digital Volt Meter (DVM) | Measuring Range Accuracy | 1 to 20V DC. High input impedance for minimum circuit loading. |
| 5 | Oscilloscope | | DC through 30MHz. |
| 6 | High sensitivity Frequency Counter | Frequency Range Frequency Stability | 10Hz to 200MHz. 0.2ppm or less. |
| 7 | Ammeter | | 30A. |
| 8 | AF Volt Meter (AF VTVM) | Frequency Range Voltage Range | 50Hz to 10kHz. 3mV to 3V. |
| 9 | Audio Generator (AG) | Frequency Range Output | 50Hz to 5kHz or more. 0 to 1V. |
| 10 | Distortion Meter | Capability Input Level | 3% or less at 1kHz. 50mV to 10Vrms. |
| 11 | Voltmeter | Measuring Range Input Impedance | 10 to 1.5V DC or less. 50kΩ/V or greater. |
| 12 | 4Ω Dummy Load | | Approx. 4Ω 30W. |
| 13 | Regulated Power Supply | | (Adjustable from 9 to 17V, 30A). Useful if ammeter equipped. |

Caution

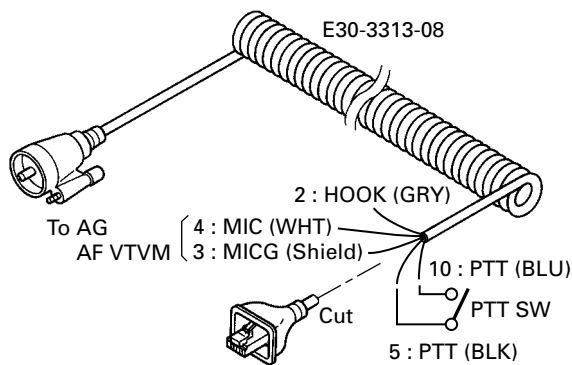
Since the RX AF output is a BTL output, there is a DC Component. Isolate this with a capacitor or transformer as shown in the figure.

MIC connector (Front view)

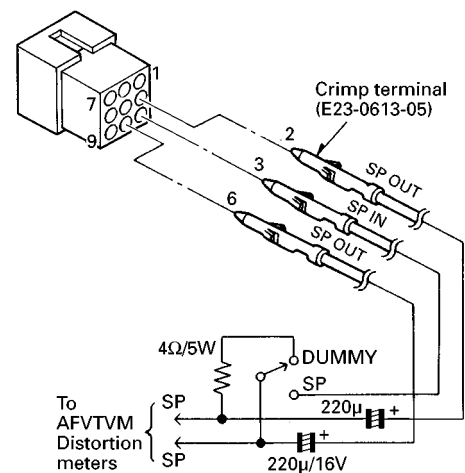


- 1 : SB
- 2 : HOOK
- 3 : MICG
- 4 : MIC
- 5 : Earth
- 6 : TRD
- 7 : NC
- 8 : DM
- 9 : BLC
- 10 : PTT
- 11 : NC
- 12 : NC

Test cable for microphone input

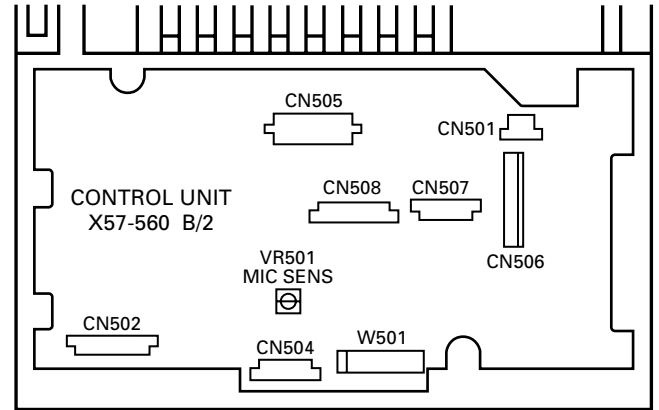
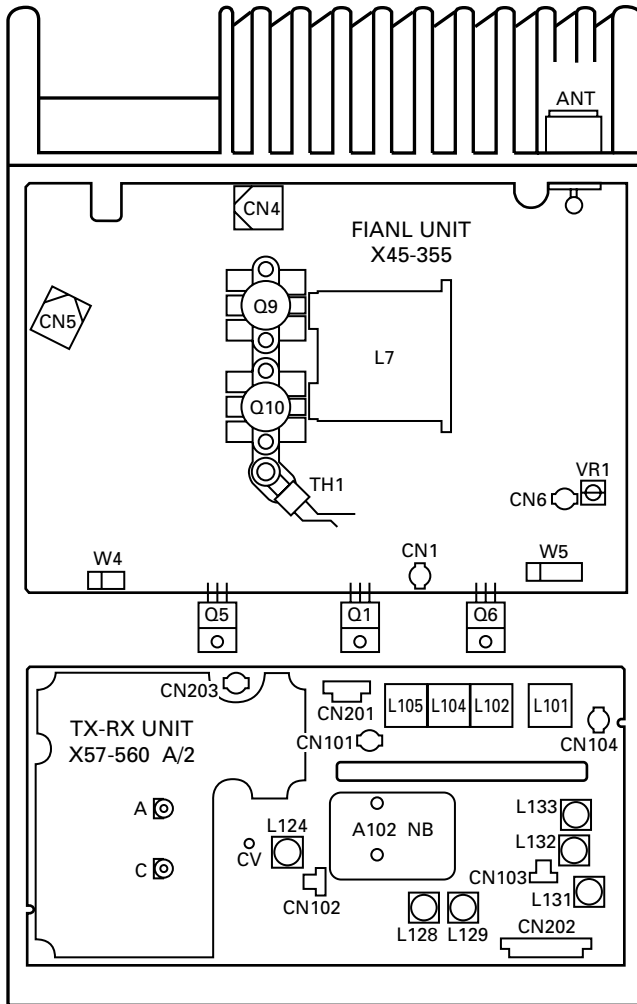


Test cable for speaker output



ADJUSTMENT

Adjustment Points



Common Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--|----------------------|--------|----------|------------|--------|--------|--|----|----|----|----|----|----|------------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|--|--|--|--|--|--|--------|-------------|-------------|---|------|------|---|-------------------|------|---|-----------|-----------|---|------------|------------|---|------------|------------|---|----------|----------|---|--------------------|----------------------|---|----------|------------|---|-----|------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Frequency list | <ul style="list-style-type: none"> Frequency range (MHz) K : 29.7~37.0 K2 : 35.0~43.0 K3 : 40.0~50.0 Adjustment frequency (MHz) | | | | | | | <ul style="list-style-type: none"> Signalling | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th rowspan="2">CH</th> <th colspan="2">K</th> <th colspan="2">K2</th> <th colspan="2">K3</th> </tr> <tr> <th>TX</th> <th>RX</th> <th>TX</th> <th>RX</th> <th>TX</th> <th>RX</th> </tr> </thead> <tbody> <tr> <td>1 (Center)</td> <td>33.300</td> <td>33.400</td> <td>39.000</td> <td>39.100</td> <td>45.000</td> <td>45.100</td> </tr> <tr> <td>2 (Low)</td> <td>29.700</td> <td>29.800</td> <td>35.000</td> <td>35.100</td> <td>40.000</td> <td>40.100</td> </tr> <tr> <td>3 (High)</td> <td>37.000</td> <td>36.900</td> <td>43.000</td> <td>42.900</td> <td>50.000</td> <td>49.900</td> </tr> <tr> <td>4</td> <td>33.300</td> <td>33.300</td> <td>39.000</td> <td>39.000</td> <td>45.000</td> <td>45.000</td> </tr> <tr> <td>5</td> <td>33.500</td> <td>33.500</td> <td>39.200</td> <td>39.200</td> <td>45.200</td> <td>45.200</td> </tr> <tr> <td>6</td> <td>33.700</td> <td>33.700</td> <td>39.400</td> <td>39.400</td> <td>45.400</td> <td>45.400</td> </tr> </tbody> </table> | CH | K | | K2 | | K3 | | TX | RX | TX | RX | TX | RX | 1 (Center) | 33.300 | 33.400 | 39.000 | 39.100 | 45.000 | 45.100 | 2 (Low) | 29.700 | 29.800 | 35.000 | 35.100 | 40.000 | 40.100 | 3 (High) | 37.000 | 36.900 | 43.000 | 42.900 | 50.000 | 49.900 | 4 | 33.300 | 33.300 | 39.000 | 39.000 | 45.000 | 45.000 | 5 | 33.500 | 33.500 | 39.200 | 39.200 | 45.200 | 45.200 | 6 | 33.700 | 33.700 | 39.400 | 39.400 | 45.400 | 45.400 | | | | | | <table border="1"> <thead> <tr> <th>CH No.</th> <th>Encode tone</th> <th>Decode tone</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>None</td> <td>None</td> </tr> <tr> <td>2</td> <td>100Hz square wave</td> <td>None</td> </tr> <tr> <td>3</td> <td>QT 67.0Hz</td> <td>QT 67.0Hz</td> </tr> <tr> <td>4</td> <td>QT 151.4Hz</td> <td>QT 151.4Hz</td> </tr> <tr> <td>5</td> <td>QT 250.3Hz</td> <td>QT 250.3Hz</td> </tr> <tr> <td>6</td> <td>DQT 023N</td> <td>DQT 023N</td> </tr> <tr> <td>7</td> <td>Single tone 1633Hz</td> <td>2 tone 321.7/928.1Hz</td> </tr> <tr> <td>8</td> <td>DTMF [9]</td> <td>DTMF [159]</td> </tr> <tr> <td>9</td> <td>MSK</td> <td>None</td> </tr> </tbody> </table> | CH No. | Encode tone | Decode tone | 1 | None | None | 2 | 100Hz square wave | None | 3 | QT 67.0Hz | QT 67.0Hz | 4 | QT 151.4Hz | QT 151.4Hz | 5 | QT 250.3Hz | QT 250.3Hz | 6 | DQT 023N | DQT 023N | 7 | Single tone 1633Hz | 2 tone 321.7/928.1Hz | 8 | DTMF [9] | DTMF [159] | 9 | MSK | None |
| CH | K | | K2 | | K3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TX | RX | TX | RX | TX | RX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 (Center) | 33.300 | 33.400 | 39.000 | 39.100 | 45.000 | 45.100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 (Low) | 29.700 | 29.800 | 35.000 | 35.100 | 40.000 | 40.100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 (High) | 37.000 | 36.900 | 43.000 | 42.900 | 50.000 | 49.900 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 33.300 | 33.300 | 39.000 | 39.000 | 45.000 | 45.000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 33.500 | 33.500 | 39.200 | 39.200 | 45.200 | 45.200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 33.700 | 33.700 | 39.400 | 39.400 | 45.400 | 45.400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CH No. | Encode tone | Decode tone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | None | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 100Hz square wave | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | QT 67.0Hz | QT 67.0Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | QT 151.4Hz | QT 151.4Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | QT 250.3Hz | QT 250.3Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | DQT 023N | DQT 023N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Single tone 1633Hz | 2 tone 321.7/928.1Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | DTMF [9] | DTMF [159] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | MSK | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TK-690H(B)

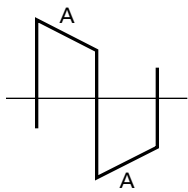
ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|-----------------------|--|---|----------------|----------|----------------|------------------------------|--|---------------------------------------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 2. Setting | <ul style="list-style-type: none"> Receiver section The indicated SSG output level are for maximum output. Whenever there is no modulation designation, standard modulation (MOD : 1kHz, DEV : 3kHz) <p>Connect the front panel (KCH-10 or KCH-11) to the transceiver's body.</p> | | | | | | | |
| 3. PLL lock voltage | 1) CH-SIG : 3-1 2) CH-SIG : 3-1 PTT : ON 3) CH-SIG : 2-1 4) CH-SIG : 2-1 PTT : ON | DC VM Power meter | TX-RX (A/2) | CV | TX-RX (A/2) | A (TC302) C (TC301) | 1.5V | ±0.1V |
| 4. Transmit frequency | 1) CH-SIG : 1-1 Select FREQ_XXX in tune mode PTT : ON | Power meter f. counter | Rear | ANT | Panel | PF3 key PF4 key | CH-1 frequency | K : ±50Hz K2 : ±60Hz K3 : ±70Hz |
| 5. BPF | 1) CH-SIG : 2-1 Spectrum analyzer Span : 50MHz Scale : 5dB div Tracking generator Output : -20dBm | Spectrum analyzer Tracking generator | TX-RX (A/2) | CN101 | TX-RX (A/2) | L101 L102 L104 L105 | Adjust the coils in the following order : L101, L102, L104, L105 | |
| | <p>K</p> <p>Adjust it so it is almost symmetrical (±1MHz), and so the gain is maximum.</p> | | | | | | | |
| | <p>K2</p> <p>Adjust it so it is almost symmetrical (±2MHz), and so the gain is maximum.</p> | | | | | | | |
| | <p>K3</p> <p>Adjust it so it is almost symmetrical (±2MHz), and so the gain is maximum.</p> | | | | | | | |

ADJUSTMENT

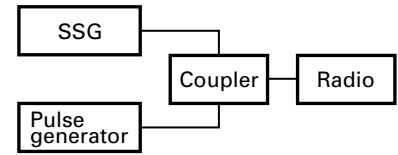
| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|-----------------------------|--|---|-------------|--------------------|-------------|--------------------------------------|---|--|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 6. MCF | 1) CH-SIG : 1-1 Spectrum analyzer Span : 25kHz Scale : 2dB div Center frequency : 10.70MHz Tracking generator Output : -20dBm | Spectrum analyzer Tracking generator | TX-RX (A/2) | CN103 CN102 | TX-RX (A/2) | L133 L132 L131 L129 L128 | Adjust it so it is almost symmetrical, and so the gain is maximum. Adjust the coils in the following order : L133, L132, L131, L129, L128. | |
| 7. Distortion | 1) CH-SIG : 1-1 SSG output : -53dBm/501μV AF output : 1V/4Ω | SSG Distortion meter AF VTVM Oscilloscope 4Ω dummy load | Rear | ANT EXT.SP | | | Check | 3% or less If the distortion value exceeds 3%, you must adjust L129 to obtain a minimum distortion value. |
| 8. RF power (High power) | 1) CH-SIG : 1-1 Select _POW_XXX in tune mode PTT : ON | Power meter Ammeter | Rear | ANT | Final | VR1 | Maximum clockwise | 115W or more |
| | | | | | | | 110W adj. | 110W±5W, 20A or less |
| (Low power) | 1) CH-SIG : 1-1 Select LPOW_XXX in tune mode PTT : ON | | | | Panel | PF3 key PF4 key | Check | 110W±1W |
| | | | | | | | 45W adj. | 45W±1W |
| 9. Maximum deviation | 1) Select __L MXDV_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF AG : 1kHz/50mV | Power meter Deviation meter AF VTVM AG Oscilloscope | Rear | ANT | Panel | PF3 key PF4 key | ±4.05kHz | ±0.05kHz |
| | 2) Select __C MXDV_XXX in tune mode PTT : ON | | Panel | MIC | | | | |
| | 3) Select __H MXDV_XXX in tune mode PTT : ON | | | | | | | |
| 10. MIC sensitivity | 1) CH-SIG : 1-1 PTT : ON Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF AG : 1kHz/5mV | | | | TX-RX (B/2) | VR501 | Check | 2.75~3.25kHz |

ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks | | |
|--------------------|---|---|---|----------|------------|--------------------|--------------------------------------|--|----------|----------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | | | |
| 11. DQT balance | 1) CH-SIG : 1-2 Select BLNC_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 3kHz De-emphasis : OFF | Power meter Deviation meter AF VTVM AG Oscilloscope | Rear | ANT | Panel | PF3 key PF4 key | Make the demodulation waveform neat. | Flat the a parts.  | | |
| 12. QT deviation | 1) CH-SIG : 1-4 Select QTDV_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 3kHz De-emphasis : OFF | | Panel | MIN | | | | | ±0.75kHz | ±0.05kHz |
| 13. DQT deviation | 1) CH-SIG : 1-6 Select DQDV_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 3kHz De-emphasis : OFF | | ±0.75kHz | ±0.05kHz | | | | | | |
| 14. DTMF deviation | 1) CH-SIG : 1-8 Select DTDV_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF | | ±3.0kHz | ±0.1kHz | | | | | | |
| 15. MSK deviation | 1) CH-SIG : 1-9 Select MSDV_XXX in tune mode PTT : ON Deviation meter filter HPF : OFF LPF : 15kHz De-emphasis : OFF | | ±3.0kHz | ±0.1kHz | | | | | | |
| 16. Sensitivity | 1) Select __L SENS_XXX in tune mode SSG output : -116dBm/0.35μV AF output : 1V/4Ω | | SSG AF VTVM Distortion meter Oscilloscope 4Ω dummy load | Rear | | | | | ANT | Panel |
| | 2) Select __C SENS_XXX in tune mode | | | EXT.SP | | Center check | | | | |
| | 3) Select __H SENS_XXX in tune mode | | | | | High check | | | | |

ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|-------------------------|---|---|------|-------------------|------------|--------------------|------------------------------------|--|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 17. Squelch tight point | 1) CH-SIG : 1-1 Select SQ_T_XXX in tune mode SSG output : Value when 6dB is added from the sensitivity value of 12dB SINAD. Up/down knob : Set the NB on | SSG AF VTVM Distortion meter Oscilloscope 4Ω dummy load | Rear | ANT EXT.SP | Panel | PF3 key PF4 key | Adjust to point of opening squelch | Set the value to 255. Adjust the SSG output to "Condition". Then, decrease the value to the point of opening the squelch. |
| 18. Squelch open point | 1) CH-SIG : 1-1 Select SQ_O_XXX in tune mode SSG output : Value when 3dB is subtracted from the sensitivity value of 12dB SINAD. Up/down knob : Set the NB on | | | | | | | |
| | 2) SSG output : OFF | | | | | | Check | Squelch must be closed. |
| 19. NB | 1) Output : -109dBm/0.8μV Pulse generator Output : 0.5Vp-p/50Ω Cycle : 100μsec Pulse width : 10ns Up/down knob : Set the NB on | SSG Pluse generator Distortion meter Oscilloscope AF VTVM | Rear | ANT EXT.SP | | | Check | SINAD 12dB or more. |



TERMINAL FUNCTION

| Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function |
|---------------------------------------|---|---|--|--|
| FINAL UNIT (X45-3550-XX) | | | | |
| CN1 To TX-RX unit | 1 | DO | I | Transmission drive input. Coaxial connector. |
| CN4 | 1 | E | - | Earth. |
| CN5 | 1 | +B | I | Power supply input (13.4V±15%). |
| CN6 To TX-RX unit | 1 | RA | O | Receiver signal output. Coaxial connector. |
| W4 To Control unit | 1 2 3 | E +B +B | - O O | Earth. Power supply output (13.4V±15%). Power supply output (13.4V±15%). |
| W5 To TX-RX unit | 1 2 3 4 5 | DB E 8R 8T PC | O - I I I | Transmission drive control voltage output (APC). Earth. 8V input during reception. 8V input during transmission. TX power control signal input. |
| TX-RX UNIT (X57-5600-XX) (A/2) | | | | |
| CN104 To Final unit | 1 | RA | I | Receiver signal input. Coaxial connector. |
| CN201 To Final unit | 1 2 3 4 5 | PC 8T 8R E DB | O O O - I | TX power control signal output. 8V output during transmissioin. 8V output during reception. Earth. Transmission drive control voltage input (APC). |
| CN202 To Control unit | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 | NC UL EP CP MO MB SB DT ES CK KEY 8C E DET SQL RSI TV PC | - O I I I I I I I I I I - O O O I I I I | Not used. Lock detect output for PLL. "H" : Lock, "L" : Unlock ENABLE input for PLL. CLOCK input for PLL. Modulation signal input for VCO. Modulation and frequency control signal input for VCXO. Power output after power switch (13.4V±15%). DATA input. ENABLE input for shift register. CLOCK input for shift register. KEY signal input. "H" : TX Common 8V (8V±5%). Earth. Detection signal output. Squelch signal output. RSSI signal output. Tuning voltage signal input for RX BPF. TX power control signal input. |
| CN203 To Final unit | 1 | DO | O | Transmission drive output. Coaxial connector. |

| Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function |
|--|---|---|--|--|
| CONTROL UNIT (X57-5600-XX) (B/2) | | | | |
| W501 To Display unit | 1 2 3 4 5 6 7 8 9 10 11 | RS2 RS1 SB IGN PS TRD 1/2 RST E MIC ME | O O O I I I/O O O - I - | Output for remote speaker. Output for remote speaker. Power output after power switch (13.4V±15%). Ignition input. Power swith control signal input. TX data output/RX data input. Remote head 1 signal output. RESET signal output. Earth. MIC signal input. MIC earth. |
| CN501 To Final unit | 1 2 3 | +B +B E | I I - | Power supply input (13.4V±15%). Power supply input (13.4V±15%). Earth. |
| CN502 To TX-RX unit | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 | PC TV RSI SQL DET E 8C KEY CK ES DT SB MB MO CP EP UL NC | O O I I I - O O O O O O O O O O I - | TX power control signal output. Tuning voltage signal output for RX BPF. RSSI signal input. Squelch signal input. Detection signal input. Earth Common 8V (8V±5%). KEY signal output. "H" : TX CLOCK output for shift register. ENABLE output for shift register. DATA output. Power output after power switch (13.4V±15%). Modulation and frequency control signal output for VCXO. Modulation signal output for VCO. CLOCK output for PLL. ENABLE output for PLL. Lock detect input for PLL. "H" : Lock, "L" : Unlock. Not used. |
| CN504 To Control cable (Remote kit) | 1 2 3 4 5 6 7 8 9 10 | AFO DE3 E EI CK DT RST 5C PSC CS | O I/O - O O O I/O O I/O O | RX audio signal output for head 2. Detection signal input from Radio 2. Earth ENABLE output for shift register. CLOCK output for shift register. DATA output for shift register. RESET signal output for Radio 2. Common 5V (5V±5%). Power switch control signal input/output. Chip select output for D/A converter. |
| CN505 To Acc 25 pin D-sub connector | 1 2 3 4 5 6 7 8 9 10 11 12 13 | RSI NC (SB) AI1 RSV1 AI2 RSV2 AI3 AFO AI4 E AI5 DEO E | O O I O I I I O I - I O O - | RSSI signal output. Non connection. Auxiliary input 1 (FPU selectable). Reserved Auxiliary input 2 (FPU selectable). Reserved. Auxiliary input 3 (FPU selectable). RX audio signal output. Auxiliary input 4 (FPU selectable). Earth. Auxiliary input 5 (FPU selectable). Detector signal output. Earth. |

TERMINAL FUNCTION

| Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function | Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function |
|---------------------------------------|--------------|---------------|-----|--|---|--------------|---------------|-----|---|
| | 14 | AO1 | O | Auxiliary output 1 (FPU selectable). | DISPLAY UNIT (X54-3190-20) : KCH-10 (X54-3200-20) : KCH-11 | | | | |
| | 15 | AO2 | O | Auxiliary output 2 (FPU selectable). | CN1 | 1 | ME | - | MIC earth. |
| | 16 | AO3 | O | Auxiliary output 3 (FPU selectable). | To | 2 | MIC | O | MIC signal output. |
| | 17 | TXD2 | O | Serial data output. | Control | 3 | E | - | Earth. |
| | 18 | AO4 | O | Auxiliary output 4 (FPU selectable). | unit | 4 | RST | I | RESET signal input. |
| | 19 | RXD2 | I | Serial data input. | | 5 | 1/2 | I | Remote head 1/2 signal input. "L" : Head 1, "H" : Head 2 |
| | 20 | SQ | O | Squelch signal output. "H" : Busy, "L" : Not busy | | 6 | TRD | I/O | TX data output/RX data input. |
| | 21 | TXS | O | TX sense signal output. "H" : TX, "L" : Another | | 7 | PS | O | Power switch control signal output. |
| | 22 | SPM | I | Speaker mute signal input. "H" : Mute on | | 8 | IGN | O | Ignition sense output. |
| | 23 | MCM | I | MIC mute signal input. "H" : Mute on | | 9 | SB | I | Power input after power switch (13.4V±15%). |
| | 24 | ME | - | MIC earth. | | 10 | RS1 | I | Remote speaker input. |
| | 25 | MI/DI | I | Mic/Data signal input 1. (Default : DI) | | 11 | RS2 | I | Remote speaker input. |
| | 26~30 | - | - | Non connection. | CN2 | 1 | RS1 | O | Remote speaker output. |
| CN506 To Acc 9 pin connector | 1 | IGN | I | Ignition sense input. | To | 2 | RS2 | O | Remote speaker output. |
| | 2 | E | - | Earth. | Remote speaker | | | | |
| | 3 | HR1 | O | Horn alert signal output 1. | CN3 | 1 | IGN | I | Ignition sense input. |
| | 4 | HR2 | O | Horn alert signal output 2. | To Acc | 2 | SB | O | Power output after power switch (13.4V±15%). |
| | 5 | OS1 | O | BTL output for external speaker B (PA). | connector | 3 | E | - | Earth. |
| | 6 | OS2 | O | BTL output for external speaker B (PA). | | 4 | MIC | I | MIC signal input. |
| | 7 | ES2 | O | BTL output for external speaker A. | | 5 | ME | - | MIC earth. |
| | 8 | ES1 | O | BTL output for external speaker A. | | 6 | AI1 | I | Auxiliary input 1 (FPU selectable). |
| | 9 | RS1 | I | Remote speaker switch. | | 7 | AI2 | I | Auxiliary input 2 (FPU selectable). |
| | | | | | | 8 | AO1 | O | Auxiliary output 1 (FPU selectable). |
| | | | | | | 9 | AO2 | O | Auxiliary output 2 (FPU selectable). |
| CN507 To ANI board | 1 | SQ | O | Squelch signal output. "H" : Busy, "L" : No signal | J1 (MIC jack) | 1 | SB | O | Power output after power switch (13.4V±15%) |
| | 2 | EMG | O | Emergency signal output. | | 2 | HK | I | Hook signal input. "L" : On hook, "H" : Off hook |
| | 3 | EPT | I | External PTT signal input. | | 3 | ME | - | MIC earth. |
| | 4 | IO | I/O | Auxiliary input/output. | | 4 | MIC | I | MIC signal input. |
| | 5 | SEL | - | Non connection. | | 5 | E | - | Earth. |
| | 6 | AS2 | I | Audio mute input. "HiZ" : No change, "L" : Mute | | 6 | TRD | I/O | TX data output/RX data input. |
| | 7 | MCM | I | MIC mute input. "HiZ" : No change, "L" : Mute | | 7 | NC | - | Not used. |
| | 8 | TON | I | Sidetone input. | | 8 | DM | I/O | Serial data input/output for keypad MIC. |
| | 9 | TCN | I | Speaker mute input. "HiZ" : No change, "L" : Unmute | | 9 | BLC | O | MIC backlight control signal output. "H" : On, "L" : Off |
| | 10 | DTI | I | Data input. | | 10 | PTT | I | PTT signal input. "L" : TX, "OPEN" : RX |
| CN508 To voice scrambler | 1 | MCI | I | MIC signal input. | | 11 | NC | - | Not used. |
| | 2 | MCO | O | MIC signal output. | | 12 | NC | - | Not used. |
| | 3 | DEI | I | Detection signal input. | | | | | |
| | 4 | AC | O | Audio control signal output. "H" : OPT SW off, "L" : On | | | | | |
| | 5 | BC1 | O | Scramble code output. | | | | | |
| | 6 | BC2 | O | Scramble code output. | | | | | |
| | 7 | BC3 | O | Scramble code output. | | | | | |
| | 8 | BC4 | O | Scramble code output. | | | | | |
| | 9 | TXD2 | O | TX data output 2. | | | | | |
| | 10 | RXD2 | I | RX data input 2. | | | | | |
| | 11 | DEO | O | Detection signal output. | | | | | |
| | 12 | PTO | O | PTT signal output. | | | | | |
| | 13 | 8C | O | Common 8V output. | | | | | |
| | 14 | E | - | Earth. | | | | | |

TERMINAL FUNCTION

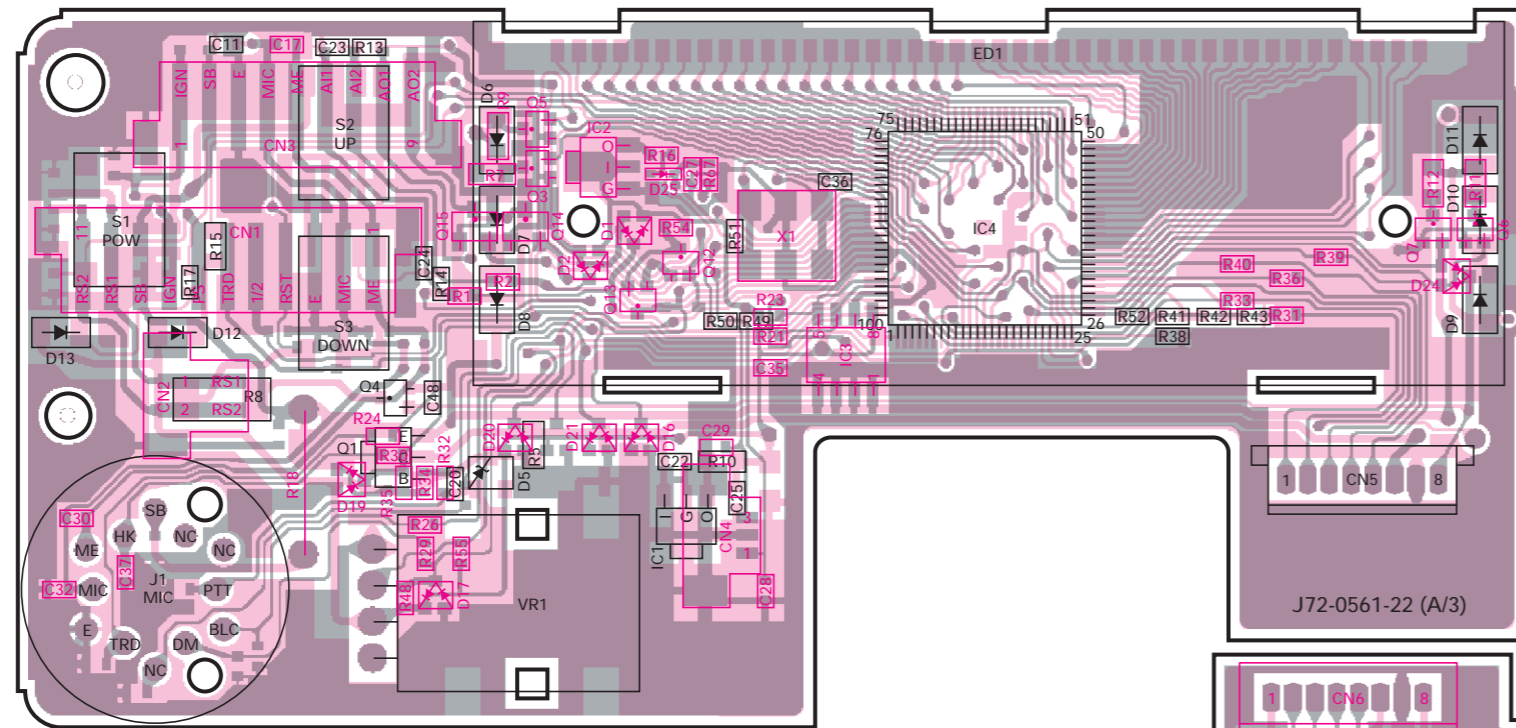
| Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function | | | | | | | | | | | | |
|-----------------------------------|--------------|---------------|-----|--|-----------------------|----------|------|-----|------|------|------|-----|------|-----|-----|-----|
| Acc 25 pin D-sub connector | | | | | | | | | | | | | | | | |
| | 1 | RSI | O | RSSI signal output. <div style="text-align: center;"> <p>RSSI vs ANT input (Typical value)</p> <table border="1"> <caption>Data points from RSSI vs ANT input graph</caption> <thead> <tr> <th>ANT input level [dBm]</th> <th>RSSI [V]</th> </tr> </thead> <tbody> <tr> <td>-130</td> <td>0.6</td> </tr> <tr> <td>-120</td> <td>0.75</td> </tr> <tr> <td>-110</td> <td>1.0</td> </tr> <tr> <td>-100</td> <td>1.2</td> </tr> <tr> <td>-90</td> <td>1.5</td> </tr> </tbody> </table> </div> | ANT input level [dBm] | RSSI [V] | -130 | 0.6 | -120 | 0.75 | -110 | 1.0 | -100 | 1.2 | -90 | 1.5 |
| ANT input level [dBm] | RSSI [V] | | | | | | | | | | | | | | | |
| -130 | 0.6 | | | | | | | | | | | | | | | |
| -120 | 0.75 | | | | | | | | | | | | | | | |
| -110 | 1.0 | | | | | | | | | | | | | | | |
| -100 | 1.2 | | | | | | | | | | | | | | | |
| -90 | 1.5 | | | | | | | | | | | | | | | |
| | 2 | AI1 | I | Auxiliary input 1 (FPU selectable). | | | | | | | | | | | | |
| | 3 | AI2 | I | Auxiliary input 2 (FPU selectable). | | | | | | | | | | | | |
| | 4 | AI3 | I | Auxiliary input 3 (FPU selectable). | | | | | | | | | | | | |
| | 5 | AI4 | I | Auxiliary input 4 (FPU selectable). | | | | | | | | | | | | |
| | 6 | AI5 | I | Auxiliary input 5 (FPU selectable). | | | | | | | | | | | | |
| | 7 | E | - | Earth | | | | | | | | | | | | |
| | 8 | AO2 | O | Auxiliary output 1 (FPU selectable). | | | | | | | | | | | | |
| | 9 | TXD2 | O | Serial data output. | | | | | | | | | | | | |
| | 10 | RXD2 | I | Serial data input. | | | | | | | | | | | | |
| | 11 | TXS | O | TX sense signal output. "H" : TX, "L" : Another | | | | | | | | | | | | |
| | 12 | MCM | I | MIC mute signal input. "L" : Mute on, "H" : No change | | | | | | | | | | | | |
| | 13 | MI/DI | I | MIC/Data signal input 1. (Default : DI) Input impedance DI : 10kΩ or more MI : 600Ω Coupling DI : DC coupling MI : DC coupling Frequency response DI : ~9.6kHz +1/-3dB (1kHz=0dB) MI : Compliance with TIA/EIA-603 Deviation DI : 60% deviation or more. (1kHz 2.5Vp-p input) MI : 60% deviation (1kHz 5mV±1.5mV input) | | | | | | | | | | | | |
| | 14 | NC (SB) | O | Non connection. (SB : 13.4V 0.5A max. Refer to page 20) | | | | | | | | | | | | |
| | 15 | RSV1 | - | Reserved. | | | | | | | | | | | | |
| | 16 | RSV2 | - | Reserved. | | | | | | | | | | | | |
| | 17 | AFO | O | RX audio signal output (Same as CN504 pin No.1) RX condition : RX audio output. Output level 125mVrms. (Standard modulation) PA condition : MIC output. Output level 300mVrms. (1kHz 5mV input) | | | | | | | | | | | | |
| | 18 | E | - | Earth | | | | | | | | | | | | |
| | 19 | DEO | O | Detector signal output. Output impedance 1kΩ or less Coupling DC coupling | | | | | | | | | | | | |

| Connector No. | Terminal No. | Terminal Name | I/O | Terminal Function |
|---------------|--------------|---------------|-----|---|
| | | | | Output level : 100mVrms (Standard modulation) Output frequency response : 300~4.8kHz +1/-5dB (1kHz=0dB) |
| | 20 | AO1 | O | Auxiliary output 1 (FPU selectable). |
| | 21 | AO3 | O | Auxiliary output 3 (FPU selectable). |
| | 22 | AO4 | O | Auxiliary output 4 (FPU selectable). |
| | 23 | SQ | O | Squelch signal output. "L" : Busy, "H" : Not busy |
| | 24 | SPM | I | Speaker mute signal input. "L" : Mute on |
| | 25 | ME | - | MIC earth. |

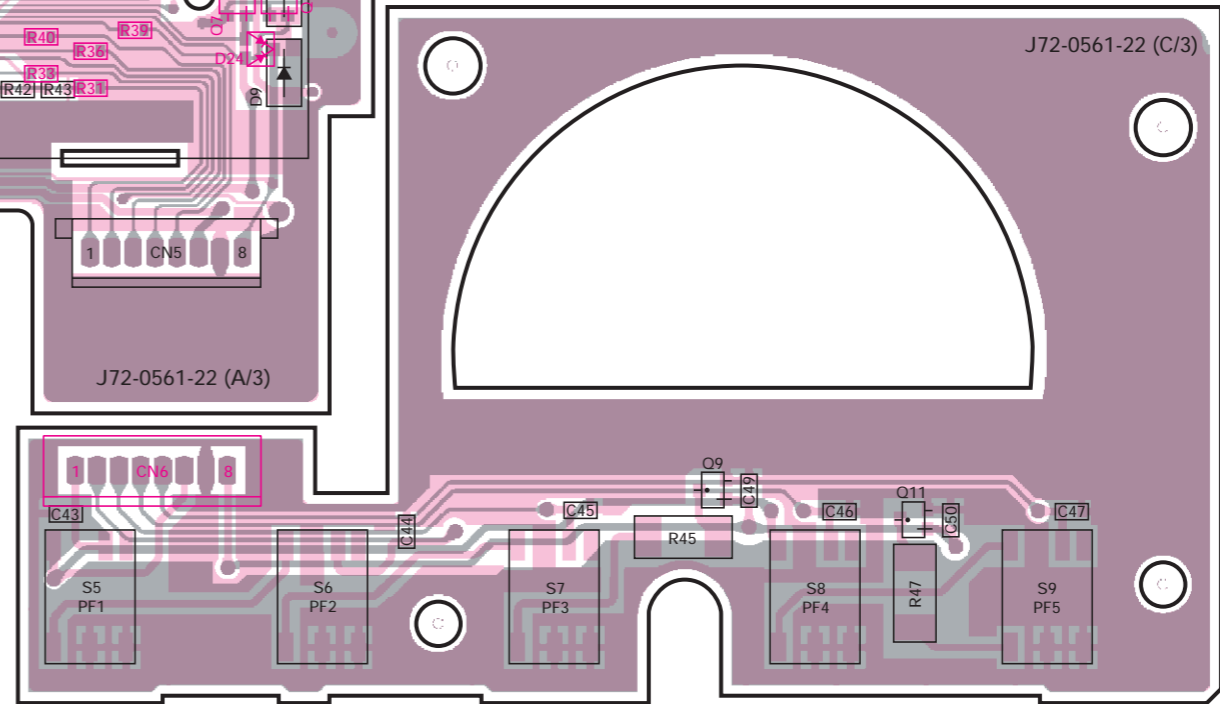
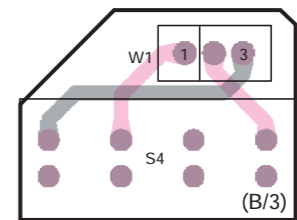
| Acc 9 pin connector | | | | |
|----------------------------|---|-----|---|---|
| | 1 | IGN | I | Ignition sense input. |
| | 2 | ES2 | O | BTL output for external speaker A. |
| | 3 | RS1 | I | Remote speaker switch |
| | 4 | HR1 | O | Horn alert signal output 1. |
| | 5 | HR2 | O | Horn alert signal output 2. |
| | 6 | ES1 | O | BTL output for external speaker A. |
| | 7 | OS1 | O | BTL output for external speaker B (PA). |
| | 8 | OS2 | O | BTL output for external speaker B (PA). |
| | 9 | E | - | Earth. |

| Acc 12 pin connector (Remote kit) | | | | |
|--|----|-----|---|---|
| | 1 | IGN | I | Ignition sense input. |
| | 2 | SB | O | Power output after power switch (13.4V±15%). |
| | 3 | E | - | Earth. |
| | 4 | MIC | I | MIC signal input. |
| | 5 | ME | - | MIC earth. |
| | 6 | AI1 | I | Auxiliary input 1 (FPU selectable). |
| | 7 | AI2 | I | Auxiliary input 2 (FPU selectable). |
| | 8 | AO1 | O | Auxiliary output 1 (FPU selectable). |
| | 9 | AO2 | O | Auxiliary output 2 (FPU selectable). |
| | 10 | RS1 | O | Remote speaker output. |
| | 11 | RS2 | O | Remote speaker output. |
| | 12 | - | - | Non connection. |

DISPLAY UNIT (X54-3190-20) Component side view : KCH-10

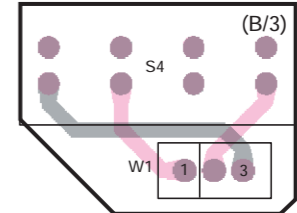
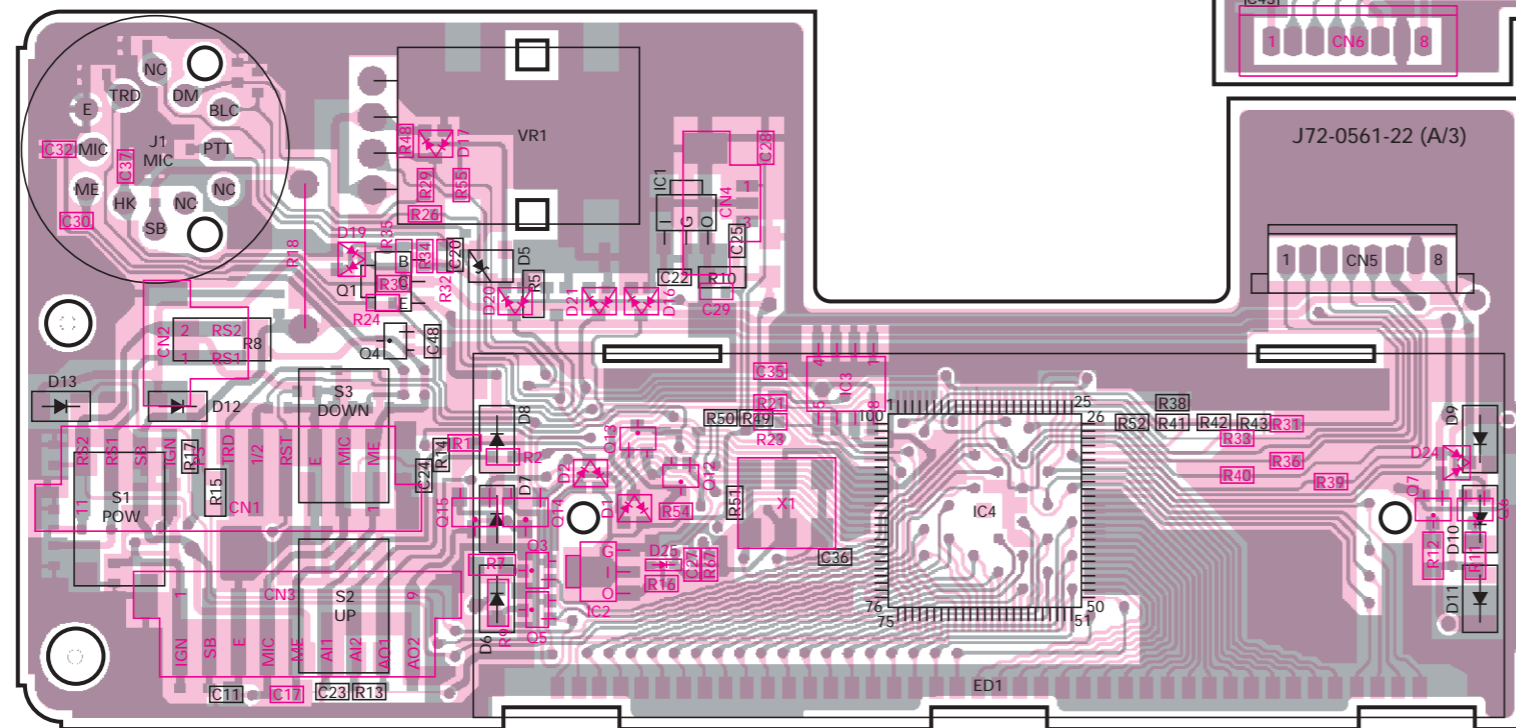


PC BOARD VIEWS TK-690H(B)



Component side
Foil side

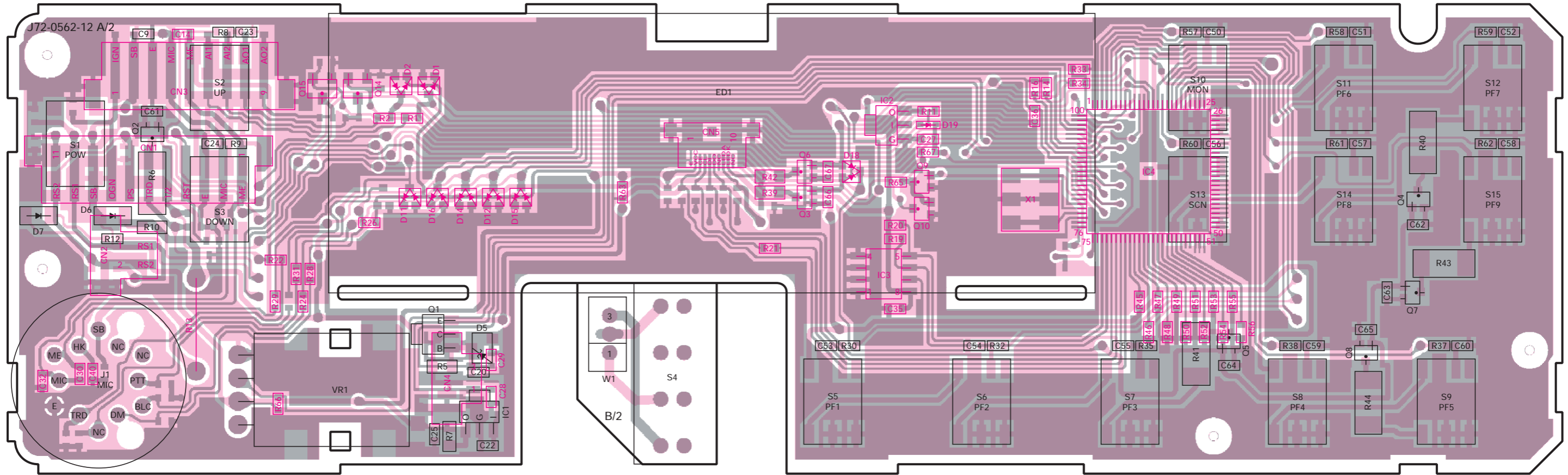
DISPLAY UNIT (X54-3190-20) Foil side view : KCH-10



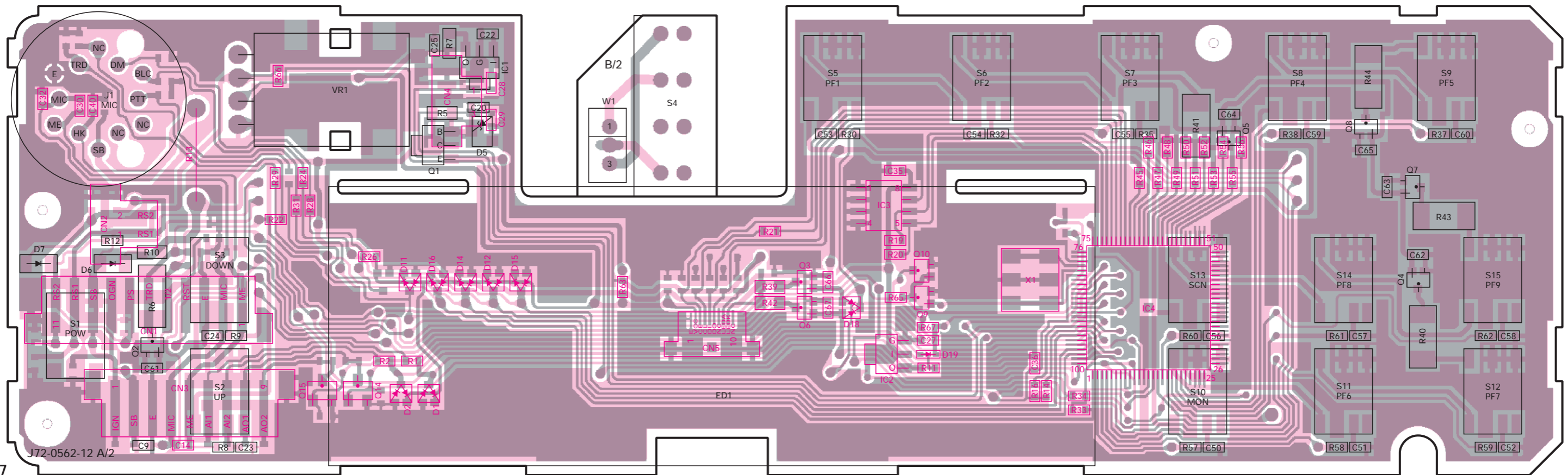
TK-690H(B) PC BOARD VIEWS

Component side
Foil side

DISPLAY UNIT (X54-3200-20) Component side view : KCH-11

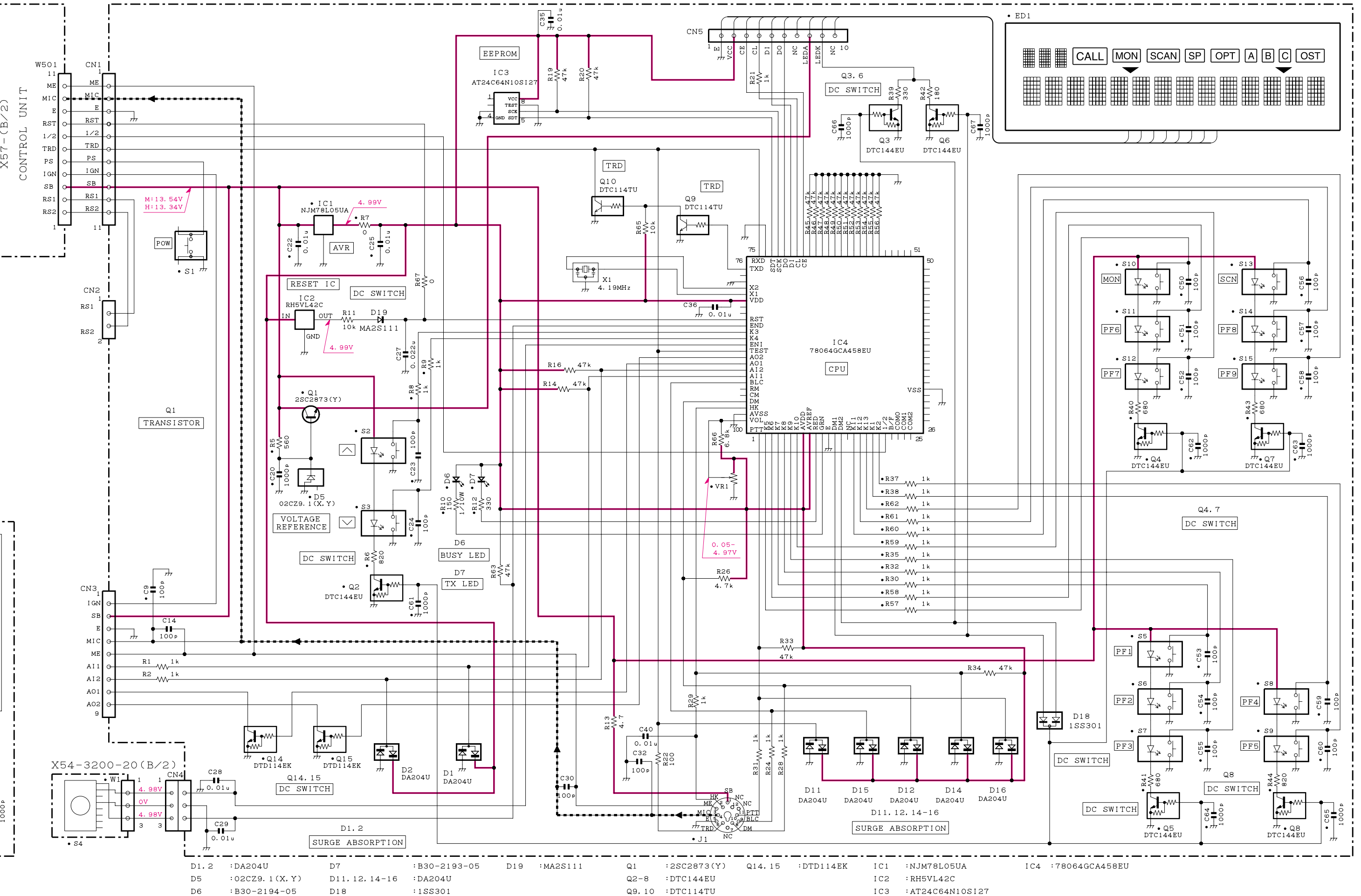
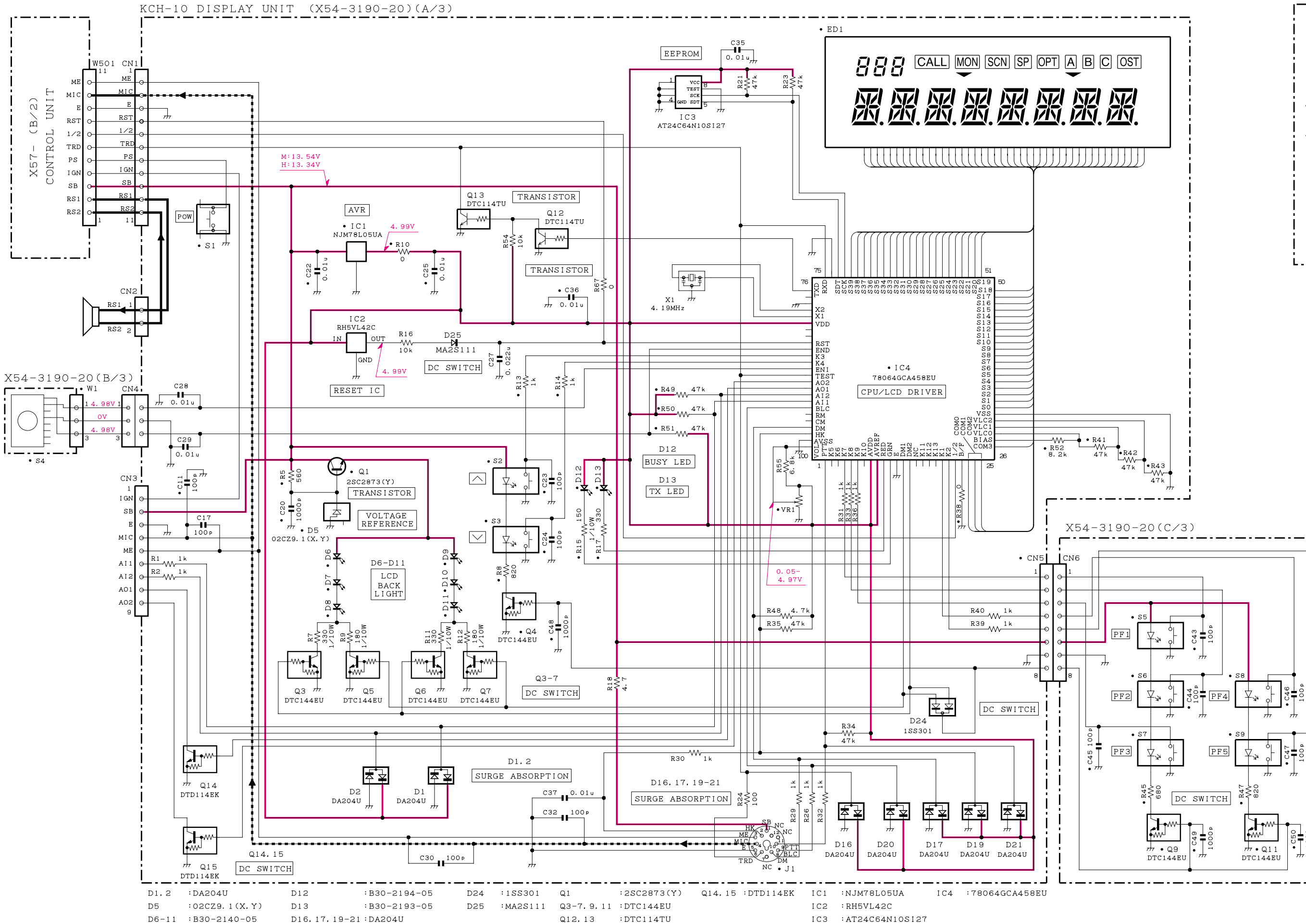


DISPLAY UNIT (X54-3200-20) Foil side view : KCH-11



Note : Components marked with a dot (·) are parts of pattern 1.

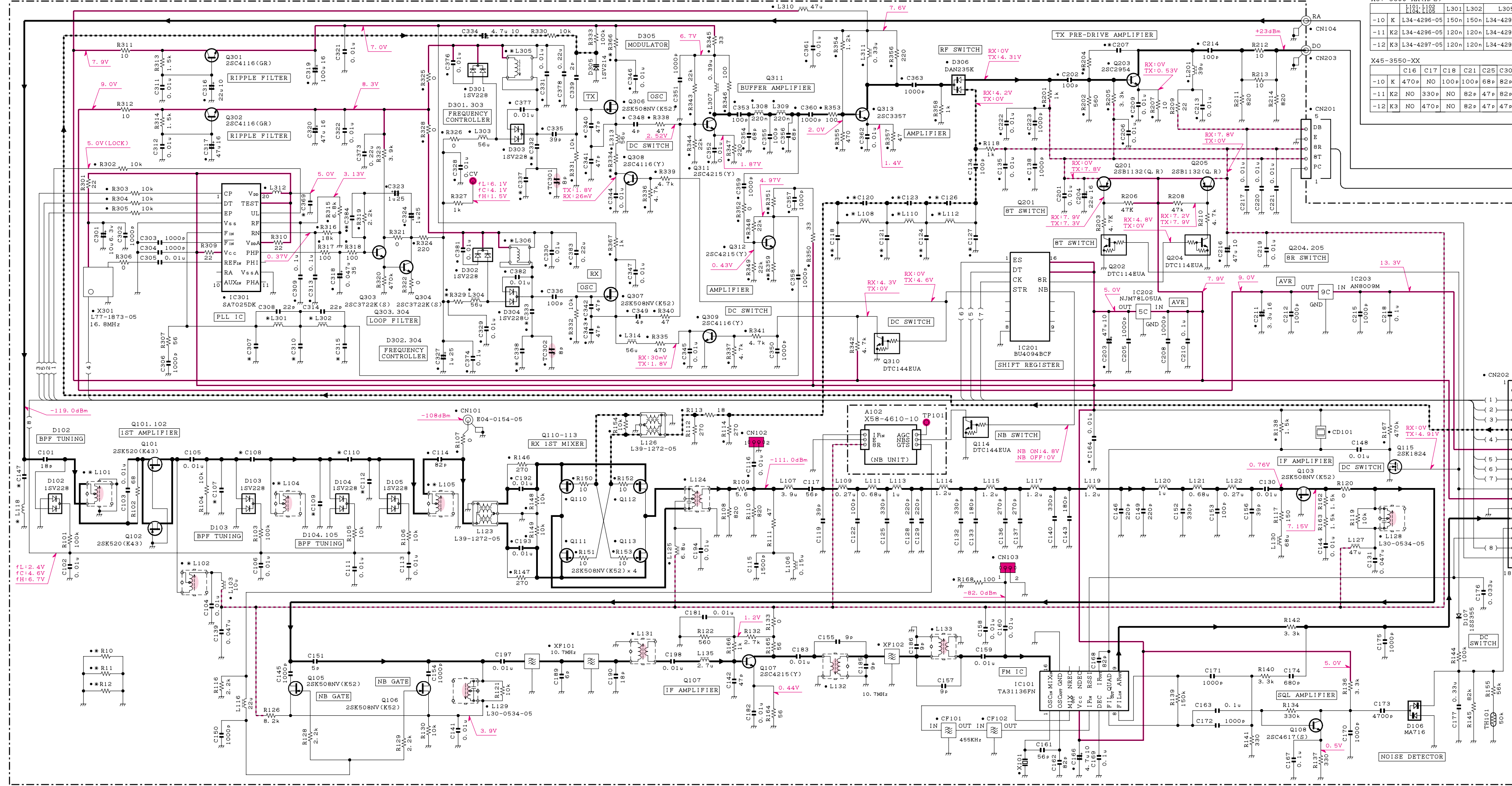
CIRCUIT DIAGRAM TK-690H(B)



TK-690H(B) CIRCUIT DIAGRAM

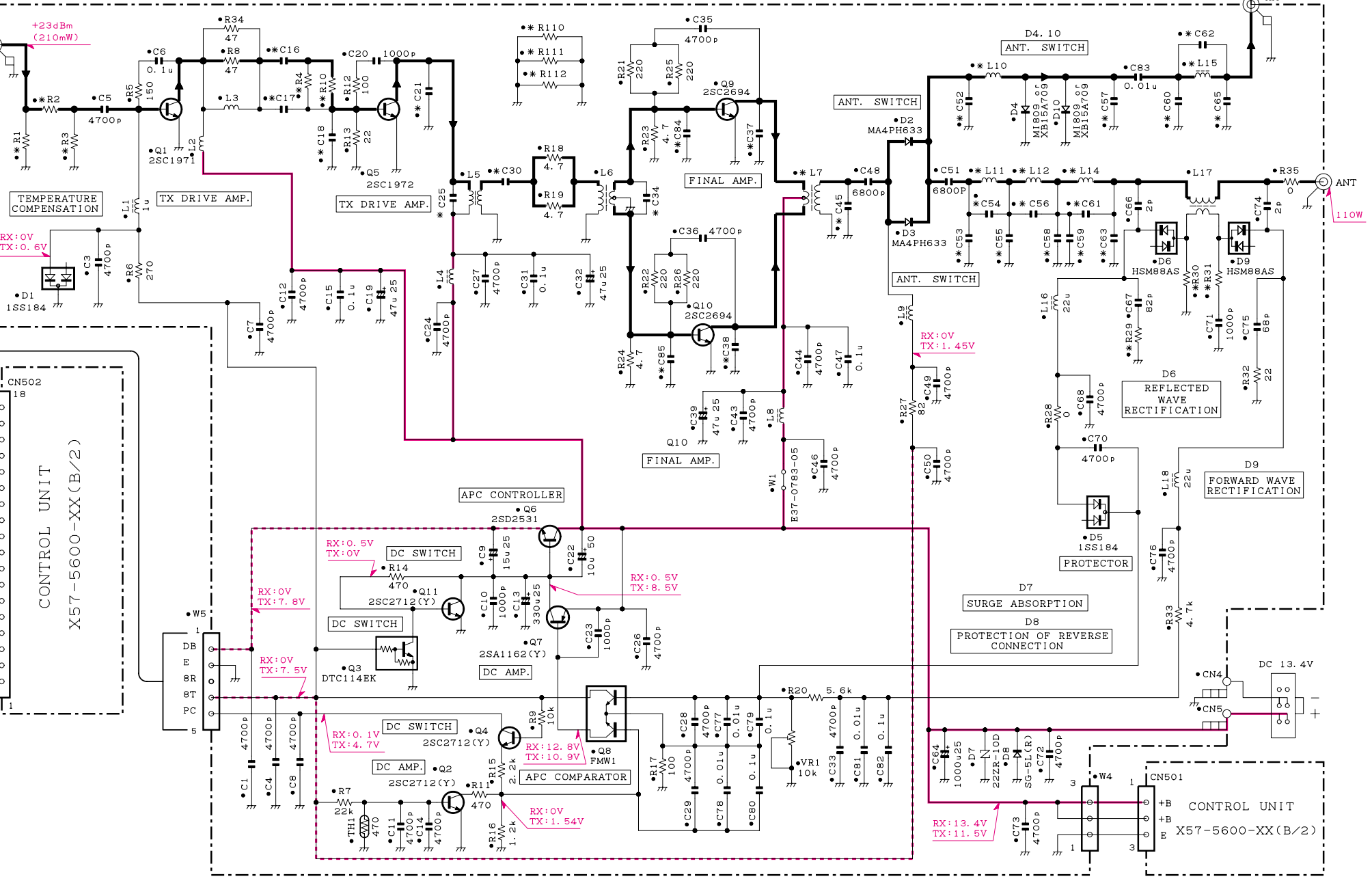
Note : Components marked with a dot (·) are parts of pattern 1.

TX-RX UNIT (X57-5600-XX) (A/2)



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|------|------|-------------|------|------|-------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|-------|--------|--------|-----|------|------|------|------|------|------|------|------|
| X57-5600-XX(A/2) | L101 | L102 | L301 | L302 | L305 | L306 | L108 | L110 | L112 | L118 | C107 | C108 | C109 | C110 | C112 | C118 | C120 | C121 | C123 | C124 | C126 | C127 | C147 | C207 | C307 | C310 | C315 | C332 | C333 | C337 | C338 | C369 | C384 | R10 | R11 | R12 | R15 | R204 | R329 | R334 | R351 | R359 | R366 |
| | -10 | K | L34-4296-05 | 150n | 150n | L34-4290-05 | L34-4294-05 | 150n | 150n | 150n | NO | NO | 3p | 8p | 3p | 8p | 22p | 22p | 47p | 22p | 22p | 22p | NO | NO | 82p | 150p | 82p | 39p | 68p | 3p | 15p | 0.01u | 0.068u | 0 | NO | NO | 56k | NO | 100 | 560 | 470 | 82 | 1.5k |
| | -11 | K2 | L34-4296-05 | 120n | 120n | L34-4291-05 | L34-4293-05 | 150n | 150n | 150n | NO | NO | 3p | 4p | 3p | 4p | 47p | 12p | 100p | 12p | 100p | 12p | 47p | NO | 0.01u | 56p | 120p | 56p | 47p | 56p | 12p | NO | 0.047u | NO | NO | 100k | 100 | 0 | 470 | 1.2k | 0 | 1k | |
| | -12 | K3 | L34-4297-05 | 120n | 120n | L34-4292-05 | L34-4295-05 | 120n | 120n | 120n | 220n | 6p | 4p | 8p | 4p | 8p | 47p | 5p | 82p | 10p | 68p | 10p | 33p | 27p | NO | 39p | 82p | 39p | 82p | 39p | 6p | 2p | NO | 0.068u | NO | NO | 100k | 100 | 0 | 470 | 1.2k | 0 | 1k |

FINAL UNIT (X45-3550-XX)

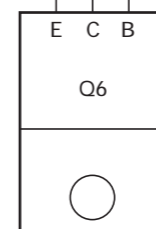
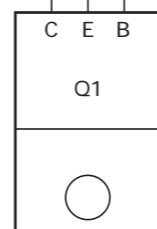
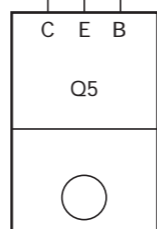
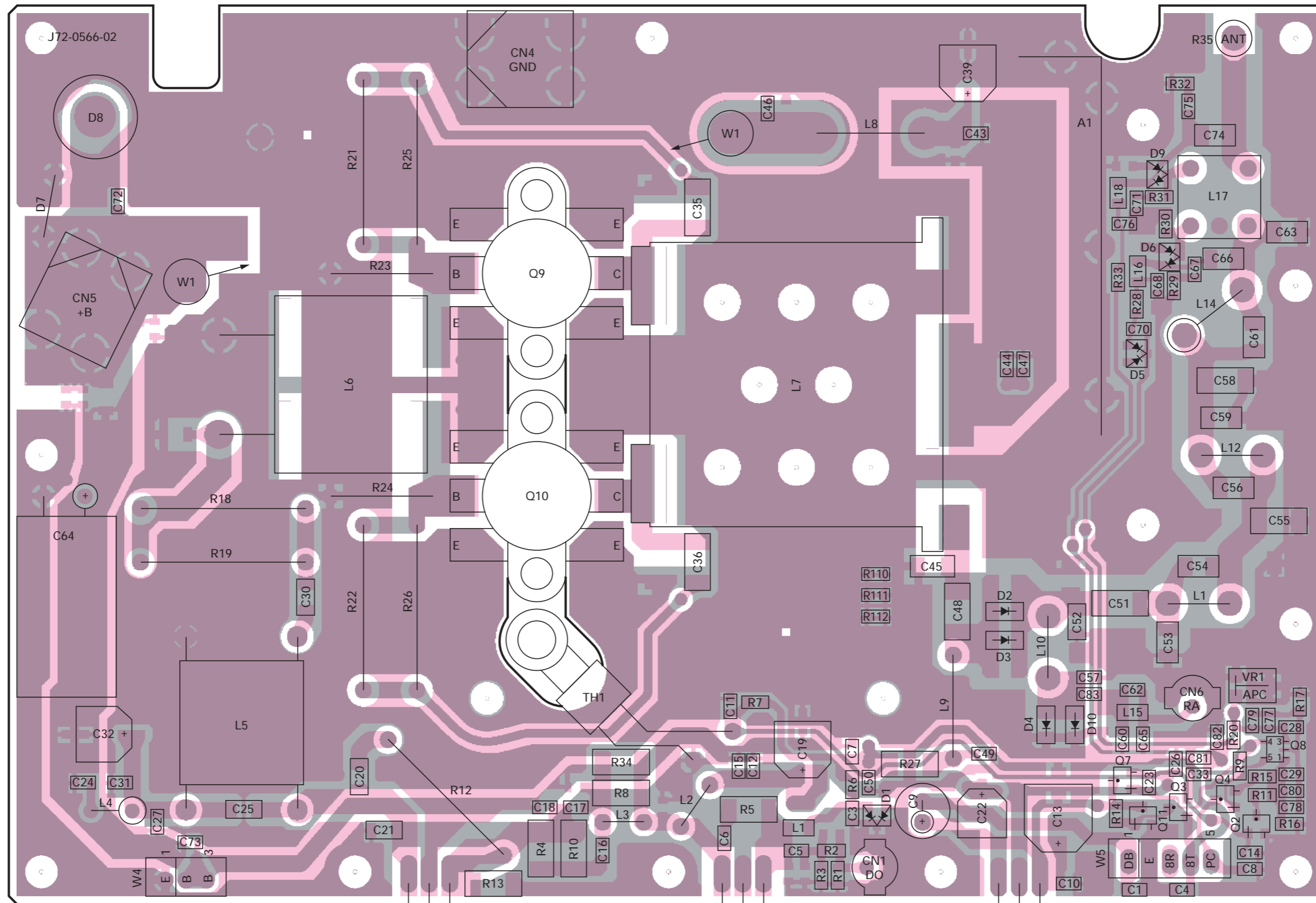


CONTROL UNIT
X57-5600-XX(B/2)

| | | |
|------------------|-----------------------|----------------|
| X57-5600-XX(A/2) | IC101 | :TA31136PN |
| | IC201 | :BU4094BCP |
| | IC202 | :NJM78L05UA |
| | IC203 | :AN8009M |
| | IC301 | :SA7025DK |
| | Q101.102 | :2SK520(K43) |
| | Q103.105.106.110-113. | :2SK508NV(K52) |
| | Q202.204 | :DTC114EUA |
| | Q203 | :2SC2954 |
| | Q301.302 | :2SC4116(GR) |
| | Q303.304 | :2SC3722K(S) |
| | Q308.309 | :2SC4617(S) |
| | Q114.310 | :DTC144EUA |
| | Q115 | :2SK1824 |
| | Q201.205 | :2SB1132(Q,R) |
| | D102-105.301-304 | :1SV228 |
| | D106 | :MA716 |
| | D107 | :2SC4116(GR) |
| | D305 | :1SV214 |
| | D306 | :DAN235X |
| | Q1 | :2SC1971 |
| | Q2.4.11 | :2SC2712(Y) |
| | Q3 | :DTC114EK |
| | Q4 | :2SC1972 |
| | Q5 | :2SD2531 |
| | Q6 | :2SA1162(Y) |
| | Q7 | :2SC2694 |
| | Q9.10 | :2SC2694 |
| | D1.5 | :1SS184 |
| | D2.3 | :MA4PH633 |
| | D4.10 | :MI809 |
| | or XB15A709 | |
| | D6.9 | :HSM88AS |
| | D7 | :22R-10D |
| | D8 | :SG-5L(R) |

PC BOARD VIEW TK-690H(B)

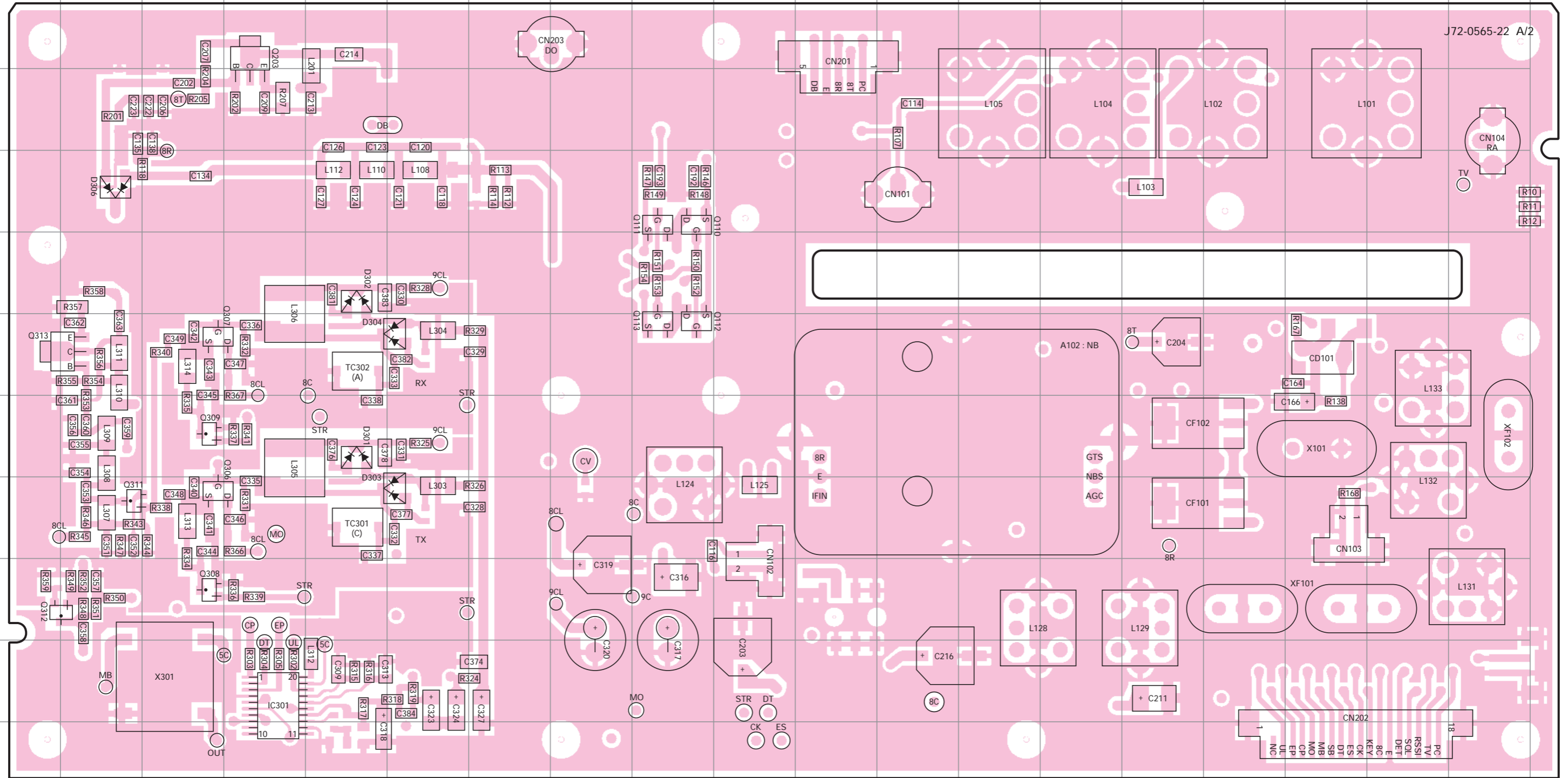
FINAL UNIT (X45-3550-XX) -10 : K -11 : K2 -12 : K3 Component side view



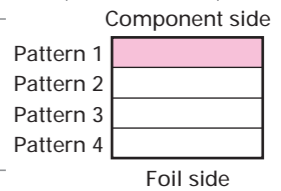
Component side
Foil side

TK-690H(B) PC BOARD VIEW

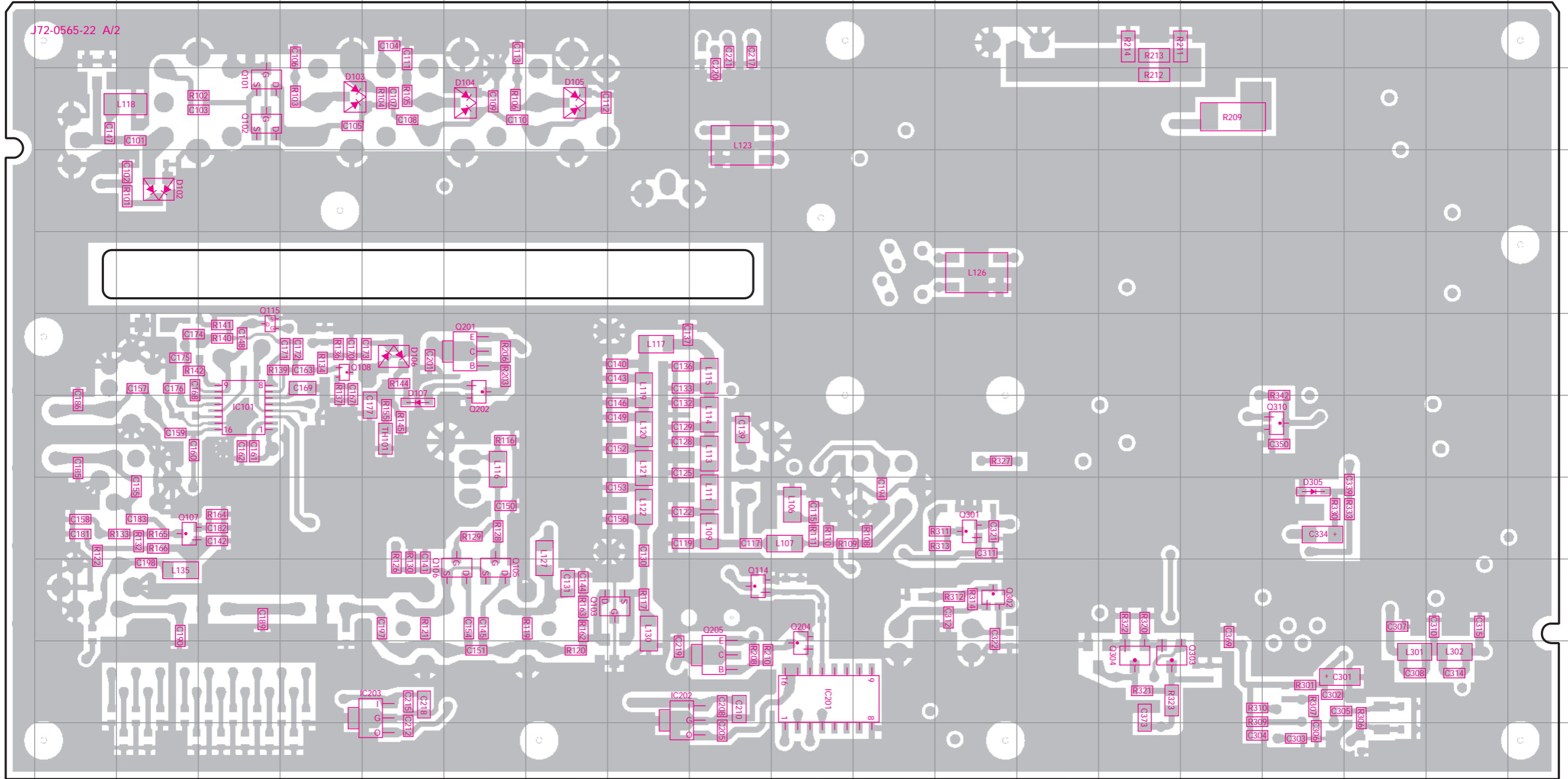
TX-RX UNIT (X57-5600-XX) (A/2) -10 : K -11 : K2 -12 : K3 Component side view



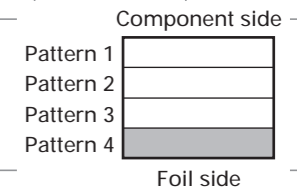
| Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|
| IC301 | 10D | Q307 | 6C | D302 | 5E |
| Q110 | 4I | Q308 | 9C | D303 | 8F |
| Q111 | 4I | Q309 | 7C | D304 | 6F |
| Q112 | 6I | Q311 | 8B | D306 | 4B |
| Q113 | 6I | Q312 | 9B | | |
| Q203 | 2D | Q313 | 6B | | |
| Q306 | 8C | D301 | 7E | | |



TX-RX UNIT (X57-5600-XX) (A/2) -10 : K -11 : K2 -12 : K3 Foil side view

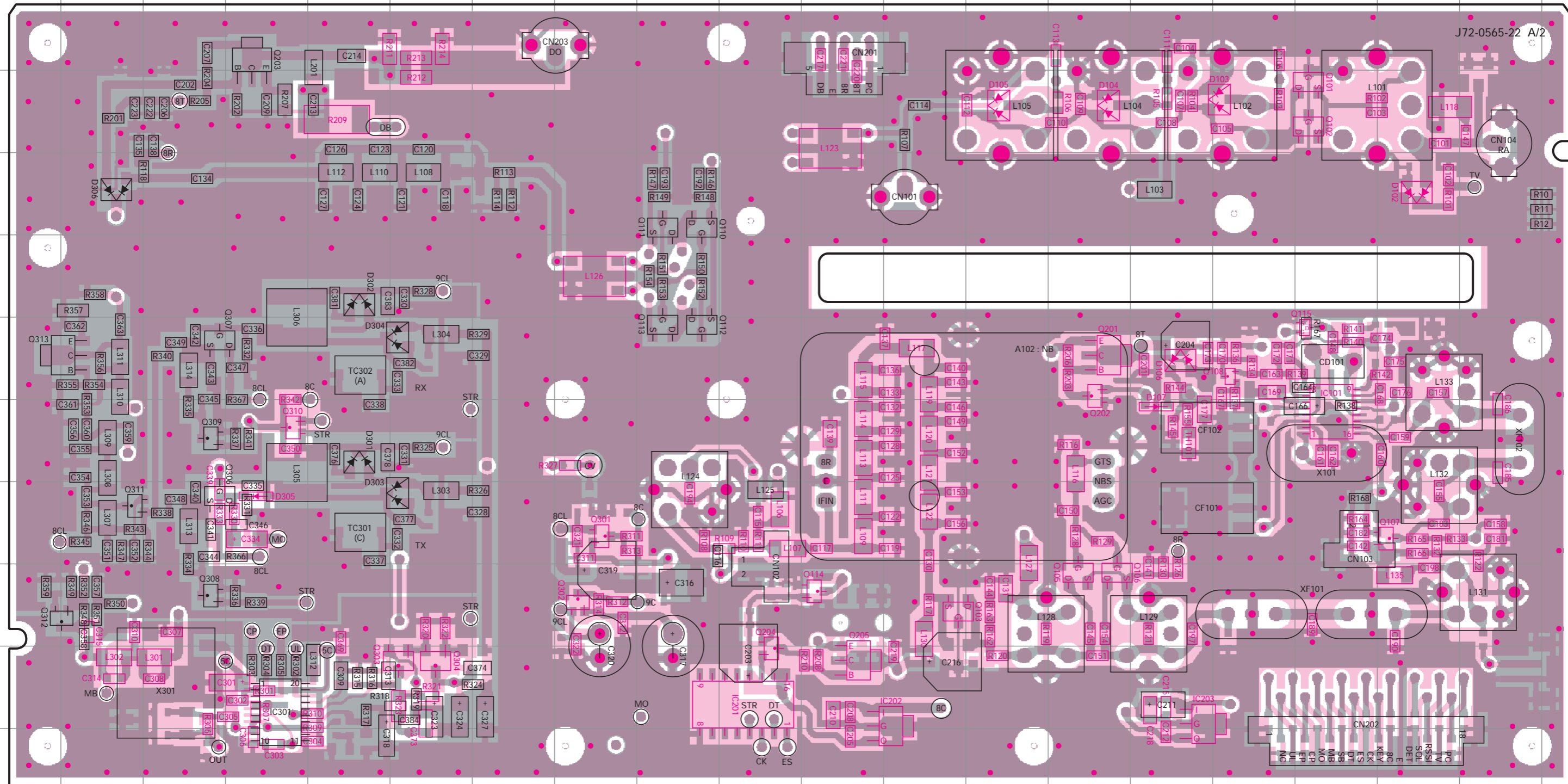


| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC101 | 7C | Q105 | 9F | Q202 | 6F | Q310 | 7P | D305 | 8P |
| IC201 | 10J | Q106 | 9F | Q204 | 10J | D102 | 4B | | |
| IC202 | 10H | Q107 | 8B | Q205 | 10I | D103 | 3D | | |
| IC203 | 10E | Q108 | 6D | Q301 | 8L | D104 | 3F | | |
| Q101 | 3C | Q114 | 9I | Q302 | 9L | D105 | 3G | | |
| Q102 | 3C | Q115 | 6C | Q303 | 10N | D106 | 6E | | |
| Q103 | 9H | Q201 | 6F | Q304 | 10N | D107 | 7E | | |




TK-690H(B) PC BOARD VIEW


TX-RX UNIT (X57-5600-XX) (A/2) -10 : K -11 : K2 -12 : K3 Component side view + Foil side





| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC101 | 7Q | Q103 | 9L | Q112 | 6I | Q204 | 10J | Q307 | 6C | D102 | 4R | D302 | 5E |
| IC201 | 10J | Q105 | 9N | Q113 | 6I | Q205 | 10K | Q308 | 9C | D103 | 3P | D303 | 8F |
| IC202 | 10L | Q106 | 9N | Q114 | 9K | Q301 | 8H | Q309 | 7C | D104 | 3N | D304 | 6F |
| IC203 | 10O | Q107 | 8R | Q115 | 6Q | Q302 | 9H | Q310 | 7D | D105 | 3M | D305 | 8D |
| IC301 | 10D | Q108 | 6P | Q201 | 6N | Q303 | 10F | Q311 | 8B | D106 | 6O | D306 | 4B |
| Q101 | 3Q | Q110 | 4I | Q202 | 6N | Q304 | 10F | Q312 | 9B | D107 | 7O | | |
| Q102 | 3Q | Q111 | 4I | Q203 | 2D | Q306 | 8C | Q313 | 6B | D301 | 7E | | |

Component side


Pattern 1 

Pattern 2 

Pattern 3 

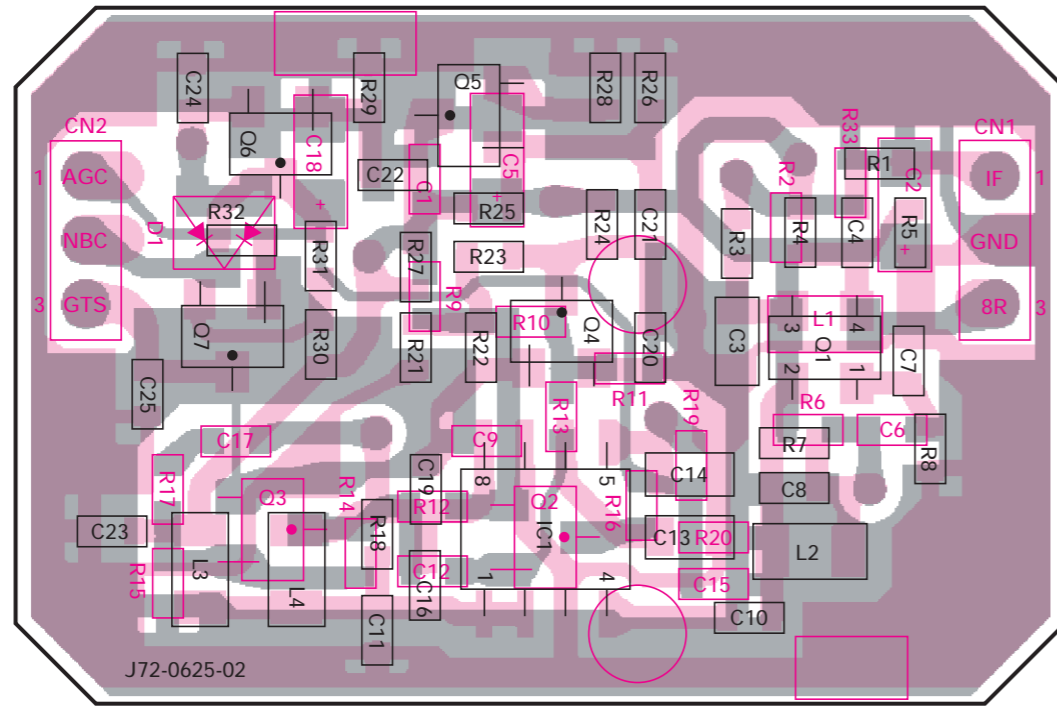
Pattern 4 

Foil side

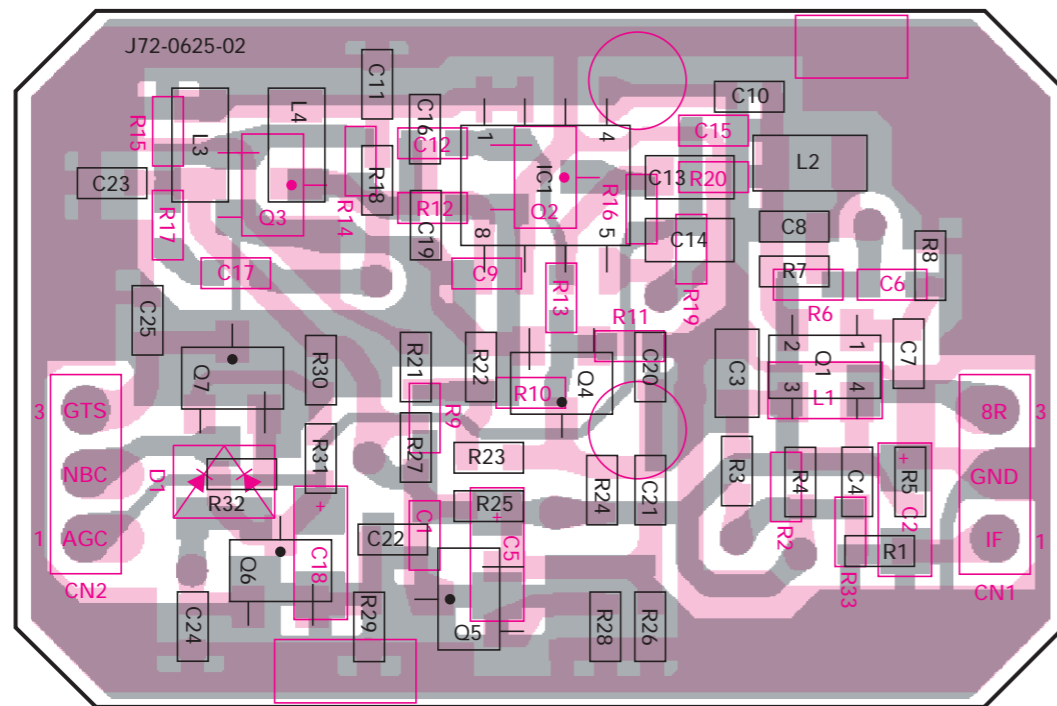
 Connect 1 and 4

PC BOARD VIEWS TK-690H(B)

NB (X58-4610-10) Component side view



NB (X58-4610-10) Foil side view

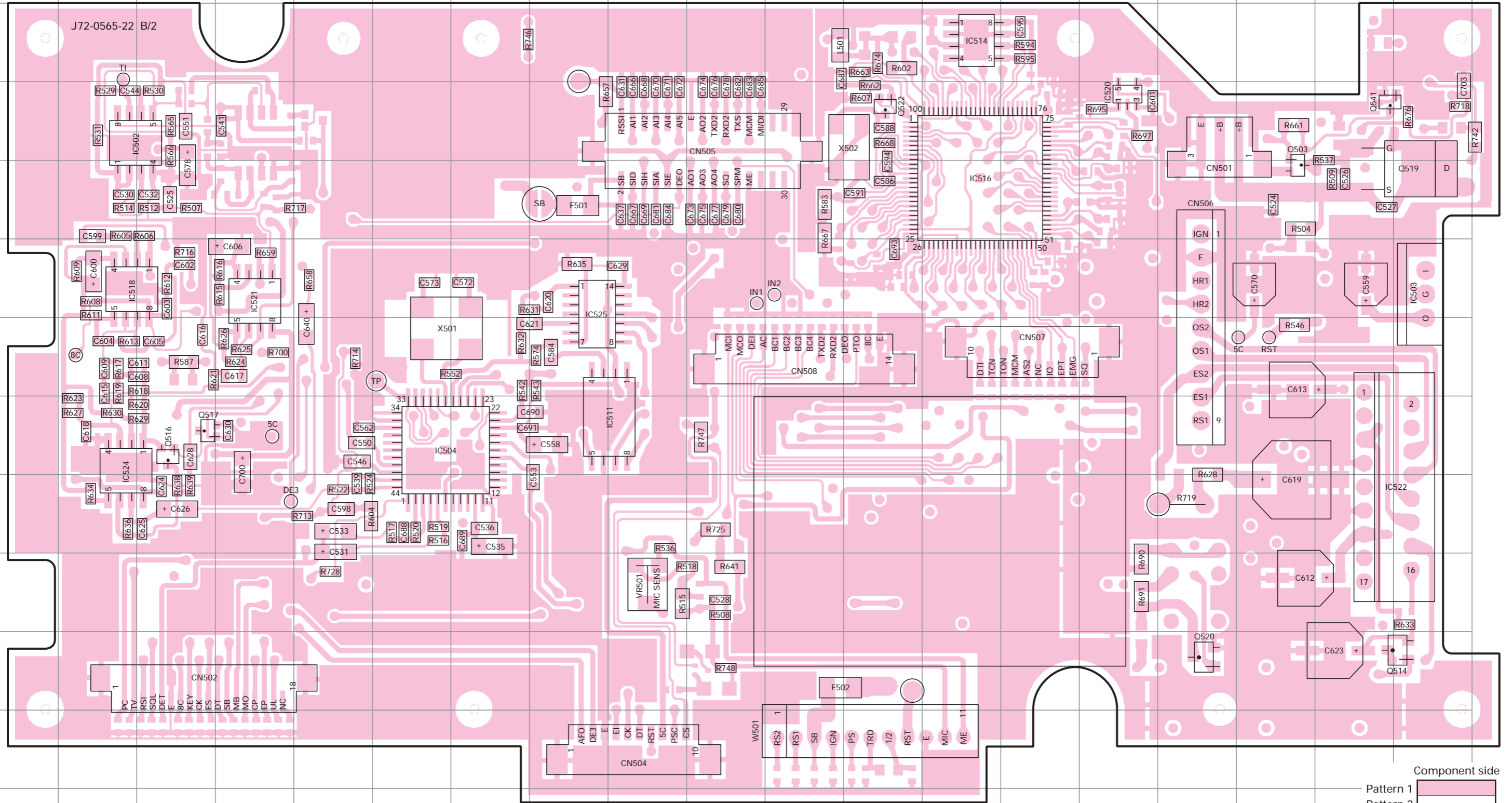


Component side
Foil side

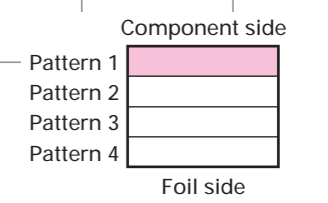
| | | | | | |
|---|---|-------------|---------------------------------|---------------|----------------------------------|
| DTC114EK DTC114TU DTC114YUA DTC144EU DTC363EK DTD114EK 2SA1162 2SC2712 | 2SC3722K 2SC4116 2SC4215 2SC4617 | 2SJ506 | AT24C64N10SI27 NJM4558M | TDA8561Q | DA204U DTA114YUA HSM88AS |
| 2SB1132 2SC2873 2SC2954 2SC3357 | TA7808S | MC33172D | SA7025DK | DAN235K | |
| FMW1 | NJM78L05UA RH5VL42C | MC1350D | M62364FP | MA716 | |
| DTA114EUA DTA114TUA DTA144TKA | DTC114EUA DTC144EUA | L78LR05B-FA | TC4013BF | AT29C020-90TI | 02CZ15 02CZ5.6 02CZ18 02CZ9.1 |
| 3SK131 | AN8009M | LC73872M | TC35453F | 1SS301 | |
| 2SK508NV 2SK520 | TC7S02F | BU4066BCF | 78064GCA458EU 784214GC0518EU | | |
| 2SK1824 | TA75S01F | BU4094BCF | 2SC2694 | | |
| 2SC1971 2SC1972 | PCD3312CT | TA31136FN | 2SD2531 | | |

TK-690H(B) PC BOARD VIEW

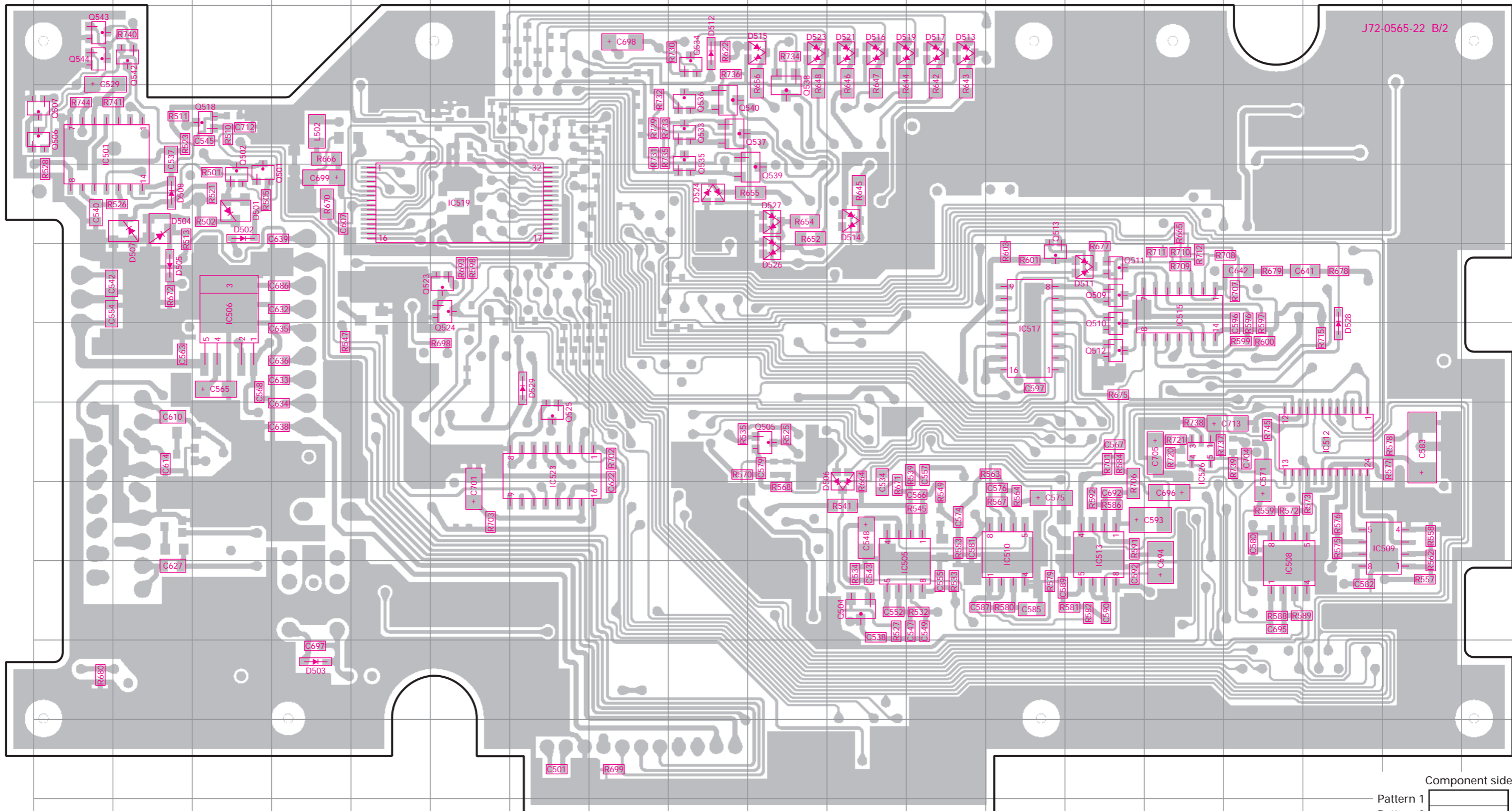
CONTROL UNIT (X57-5600-XX) (B/2) -10 : K -11 : K2 -12 : K3 Component side view



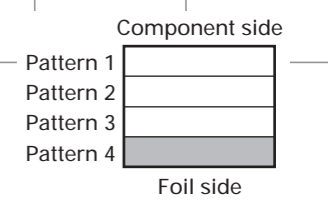
| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|
| IC502 | 3B | IC518 | 5B | Q503 | 4Q | Q522 | 3L |
| IC503 | 5S | IC520 | 3O | Q514 | 10S | Q541 | 3R |
| IC504 | 7F | IC521 | 5D | Q516 | 7C | | |
| IC511 | 7I | IC522 | 8S | Q517 | 7C | | |
| IC514 | 2M | IC524 | 7B | Q519 | 4S | | |
| IC516 | 4M | IC525 | 5H | Q520 | 10P | | |



CONTROL UNIT (X57-5600-XX) (B/2) -10 : K -11 : K2 -12 : K3 Foil side view

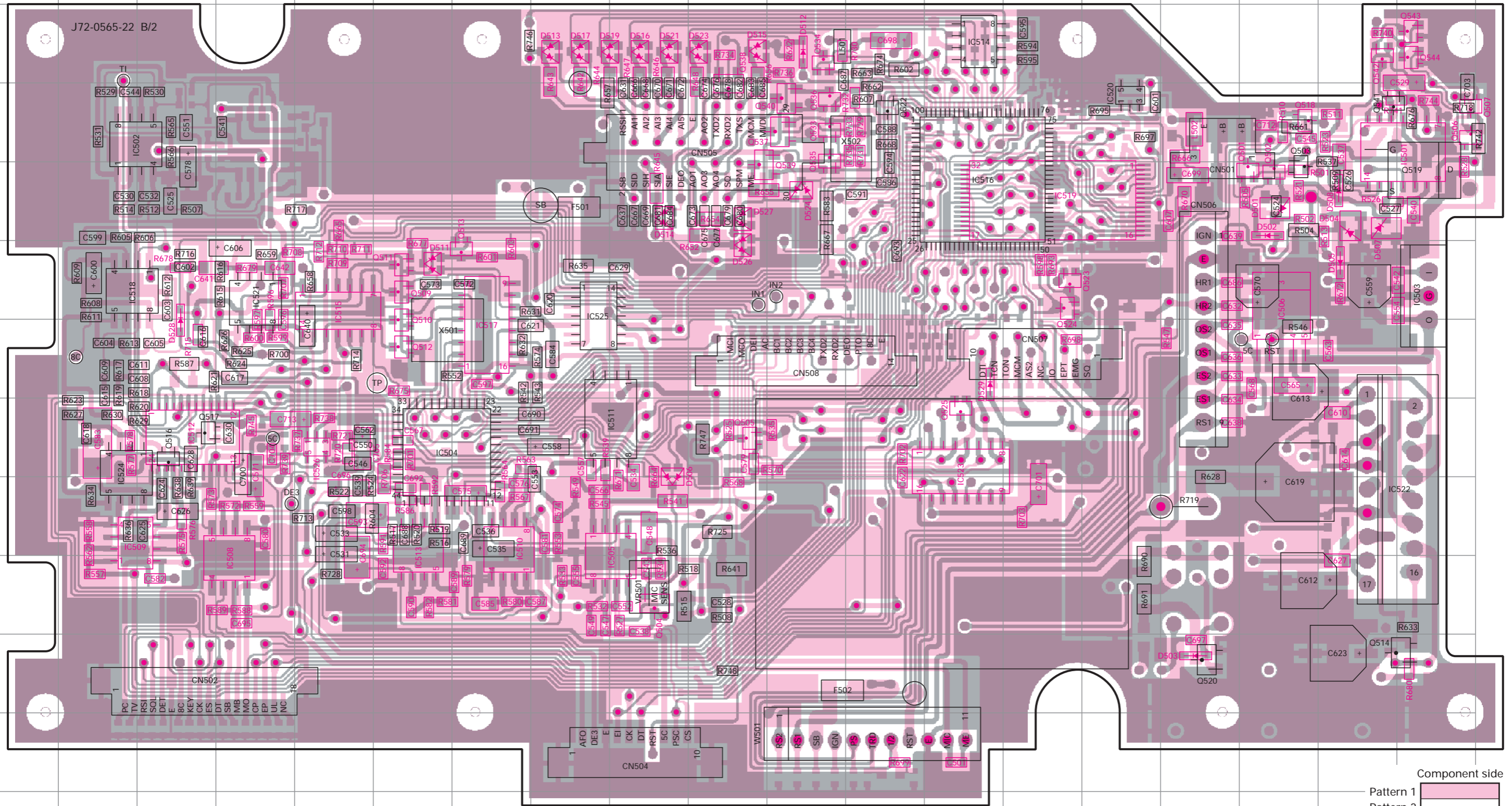


| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|
| IC501 | 3A | IC512 | 7Q | IC526 | 7O | Q507 | 3A | Q518 | 3C | Q535 | 3I | Q542 | 2B | D504 | 4B | D512 | 2I | D519 | 2K | D528 | 6Q | | | | |
| IC505 | 9K | IC513 | 8N | Q501 | 4C | Q509 | 5N | Q523 | 5F | Q536 | 3I | Q543 | 2A | D505 | 5B | D513 | 2L | D521 | 2K | D529 | 6G | | | | |
| IC506 | 5C | IC515 | 5O | Q502 | 4C | Q510 | 6N | Q524 | 5F | Q537 | 3I | Q544 | 2A | D506 | 7K | D514 | 4K | D523 | 2J | | | | | | |
| IC508 | 9P | IC517 | 6M | Q504 | 9K | Q511 | 5N | Q525 | 7G | Q538 | 2J | D501 | 4C | D507 | 4B | D515 | 2J | D524 | 4I | | | | | | |
| IC509 | 8R | IC519 | 4F | Q505 | 7J | Q512 | 6N | Q533 | 3I | Q539 | 4J | D502 | 4C | D508 | 4B | D516 | 2K | D526 | 5J | | | | | | |
| IC510 | 8M | IC523 | 7G | Q506 | 3A | Q513 | 5M | Q534 | 2I | Q540 | 3I | D503 | 10D | D511 | 5N | D517 | 2L | D527 | 4J | | | | | | |



TK-690H(B) PC BOARD VIEW

CONTROL UNIT (X57-5600-XX) (B/2) -10 : K -11 : K2 -12 : K3 Component side view + Foil side



| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC501 | 3S | IC509 | 8B | IC516 | 4M | IC523 | 7M | Q504 | 9I | Q512 | 6F | Q520 | 10P | Q535 | 3K | Q542 | 2R | D505 | 5R | D514 | 4I | D524 | 4K |
| IC502 | 3B | IC510 | 8G | IC517 | 6G | IC524 | 7B | Q505 | 7J | Q513 | 5G | Q522 | 3L | Q536 | 3K | Q543 | 2S | D506 | 7I | D515 | 2J | D526 | 5J |
| IC503 | 5S | IC511 | 7I | IC518 | 5B | IC525 | 5H | Q506 | 3S | Q514 | 10S | Q523 | 5N | Q537 | 3K | Q544 | 2S | D507 | 4R | D516 | 2I | D527 | 4J |
| IC504 | 7F | IC512 | 7C | IC519 | 4N | IC526 | 7E | Q507 | 3S | Q516 | 7C | Q524 | 5N | Q538 | 2J | D501 | 4Q | D508 | 4R | D517 | 2H | D528 | 6C |
| IC505 | 9I | IC513 | 8F | IC520 | 3O | Q501 | 4Q | Q509 | 5F | Q517 | 7C | Q525 | 7M | Q539 | 4J | D502 | 4Q | D511 | 5F | D519 | 2I | D529 | 6M |
| IC506 | 5Q | IC514 | 2M | IC521 | 5D | Q502 | 4Q | Q510 | 6F | Q518 | 3Q | Q533 | 3K | Q540 | 3K | D503 | 10P | D512 | 2K | D521 | 2I | | |
| IC508 | 9D | IC515 | 5E | IC522 | 8S | Q503 | 4Q | Q511 | 5F | Q519 | 4S | Q534 | 2K | Q541 | 3R | D504 | 4R | D513 | 2H | D523 | 2J | | |

Component side

Pattern 1

Pattern 2

Pattern 3

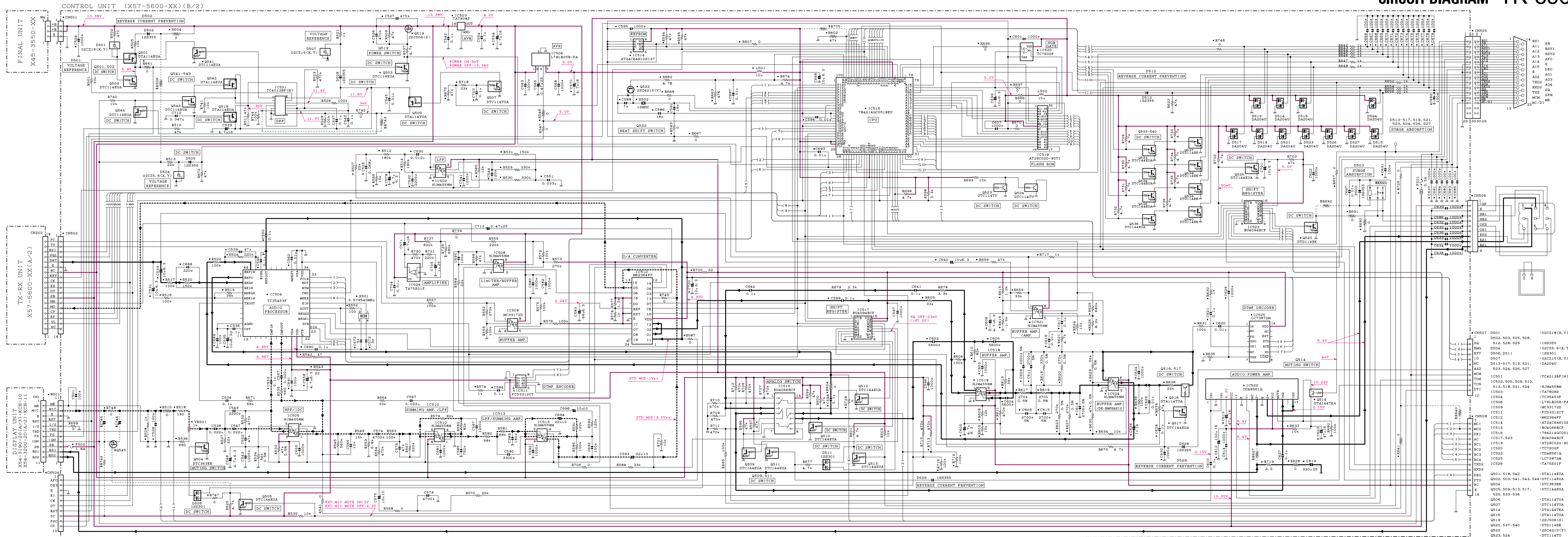
Pattern 4

Foil side

● Connect 1 and 4

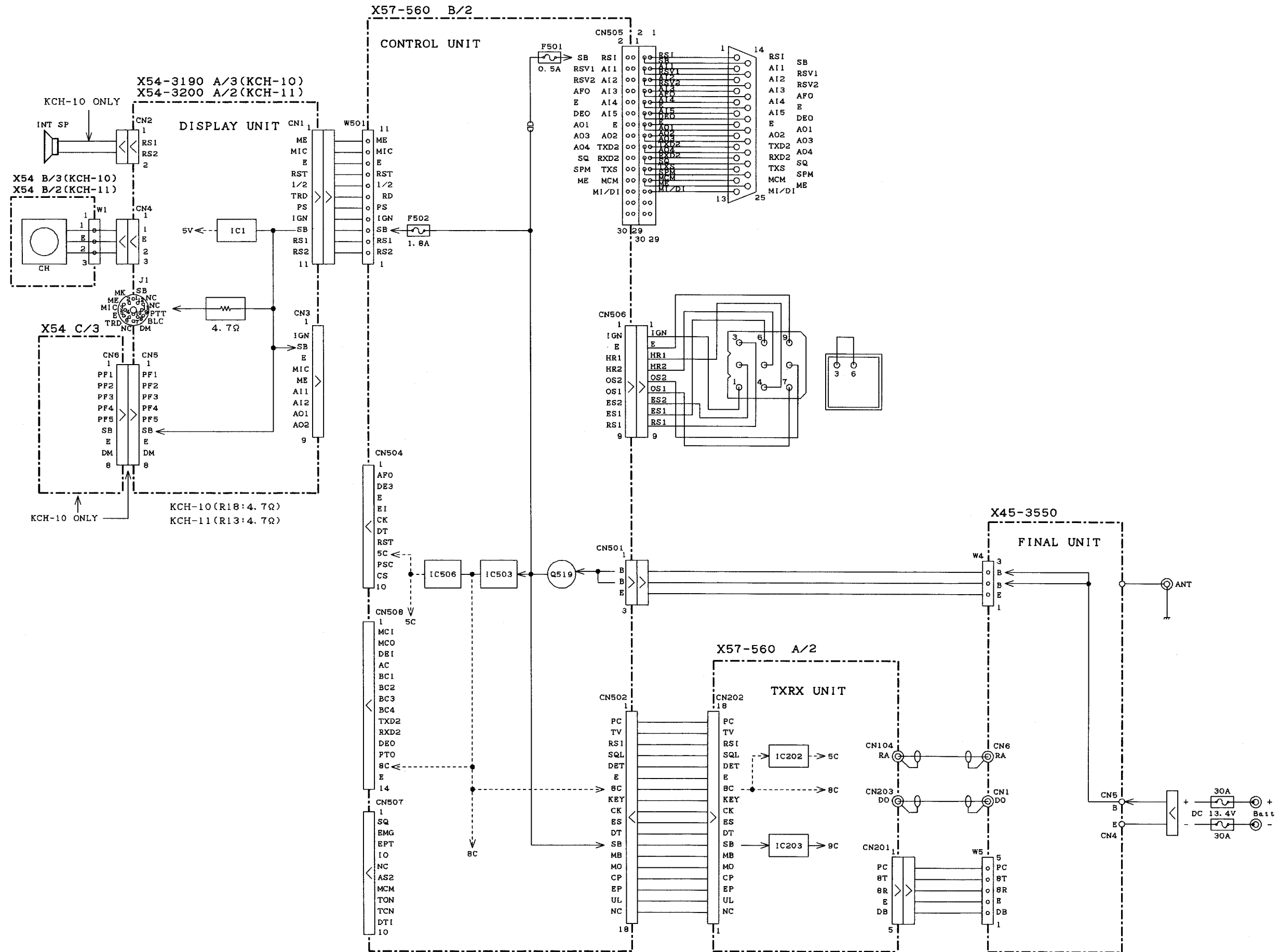
Note : Components marked with a dot (·) are parts of pattern 1.

CIRCUIT DIAGRAM TK-690H(B)



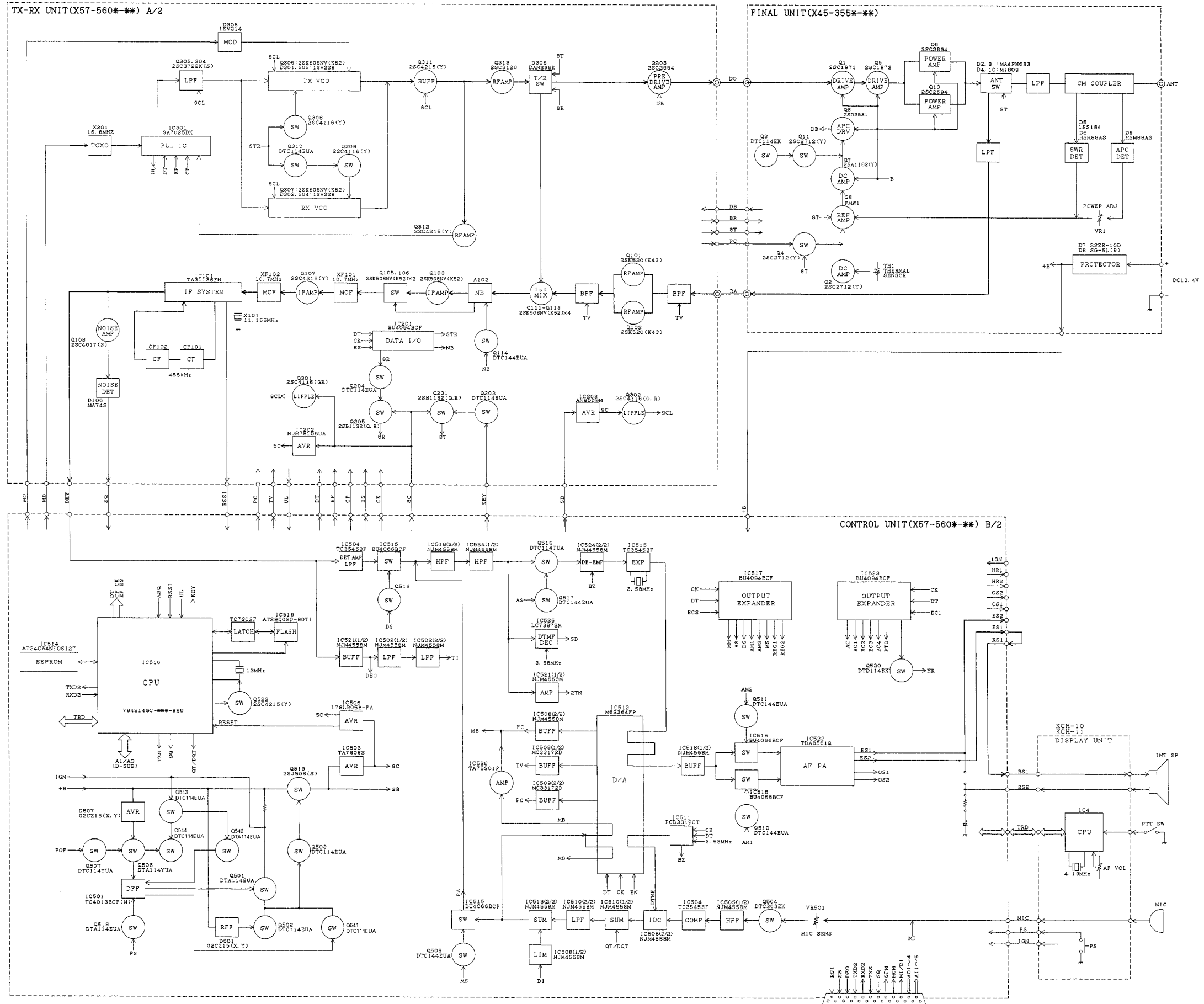
TK-690H(B) TK-690H(B)

WIRING



TK-690H(B) TK-690H(B)

BLOCK DIAGRAM



SPECIFICATIONS

GENERAL

| | | | |
|-----------------------------------|--|-------------------|-------------------|
| Frequency Range | K : 29.7~37.0MHz | K2 : 35.0~43.0MHz | K3 : 40.0~50.0MHz |
| Number of Channels | 160 channels | | |
| Channel Spacing | 20kHz (PLL channel step : 5kHz) | | |
| Operating Voltage | 13.4V DC±15% negative ground | | |
| Current Drain | 0.6A on standby 2.2A on receive 25A on transmit | | |
| Duty Cycle | Transmit 20% | | |
| Frequency Stability | ±0.0005% (-30°C to +60°C) | | |
| Operating Temperature Range | -30°C to +60°C (-22°F to +140°F) | | |
| Dimensions & Weight | 7.01" (178mm) W x 2.36" (60mm) H x 12.88" (327mm) D, 7.92lbs (3.6kg) | | |

RECEIVER (Measurements made per EIA standard EIA/TIA-240-D)

| | | | |
|------------------------------------|---|-------------|--------------|
| Antenna Impedance | 50Ω | | |
| Sensitivity | 12dB SINAD : 0.25μV, 20dB Quieting : 0.35μV | | |
| Selectivity | 85dB | | |
| Intermodulation | 80dB | | |
| Spurious and Image Rejection | 90dB | | |
| Audio Output | 13W at 4Ω less than 5% distortion (12W at 4Ω less than 3% distortion) | | |
| Band Spread | K : 7.3MHz | K2 : 8.0MHz | K3 : 10.0MHz |

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

| | | | |
|----------------------------|------------------------|-------------|--------------|
| RF Power Output | 110W adjustable to 45W | | |
| Antenna Impedance | 50Ω | | |
| Spurious Response | 80dB | | |
| Type of Emission | 16K0F3E | | |
| FM Hum and Noise | 55dB | | |
| Microphone Impedance | 600Ω | | |
| Audio Distortion | Less than 2% at 1000Hz | | |
| Band Spread | K : 7.3MHz | K2 : 8.0MHz | K3 : 10.0MHz |

KENWOOD follows a policy of continuous advancement in development. For this reason, specifications may be changed without notice.

APPLICABLE (MIL-STD)

| Military Standard | Method/Procedures | | |
|--|--------------------------|----------------------------------|----------------------------------|
| | 810C | 810D | 810E |
| Low Pressure | 500.1/Procedure I | 500.2/Procedure I, II | 500.3/Procedure I, II |
| High temperature | 501.1/Procedure I, II | 501.2/Procedure I, II Cat, A1 | 501.3/Procedure I, II Cat, A1 |
| Low Temperature | 502.1/Procedure I | 502.2/Procedure I, II Cat, C1 | 502.3/Procedure I, II Cat, C1 |
| Temperature Shock | 503.1/Procedure I | 503.2/Procedure I Cat, A1,C1 | 503.3/Procedure I Cat, A1,C1 |
| Solar Radiation | 505.1/Procedure I | 505.2/Procedure I | 505.3/Procedure I |
| Rain (Procedure I : Control head only) | 506.1/Procedure I, II | 506.2/Procedure I, II | 506.3/Procedure I, II |
| Humidity | 507.1/Procedure II | 507.2/Procedure II | 507.3/Procedure II |
| Salt Fog | 509.1/Procedure I | 509.2/Procedure I | 509.3/Procedure I |
| Dust | 510.1/Procedure I | 510.2/Procedure I | 510.3/Procedure I |
| Vibration | 514.2/Procedure VII, X | 514.3/Procedure I Cat, 8 | 514.4/Procedure I Cat, 8 |
| Shock | 516.2/Procedure I, II, V | 516.3/Procedure I, IV | 516.4/Procedure I, IV |

TK-690H(B)

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Sales Marketing Division

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