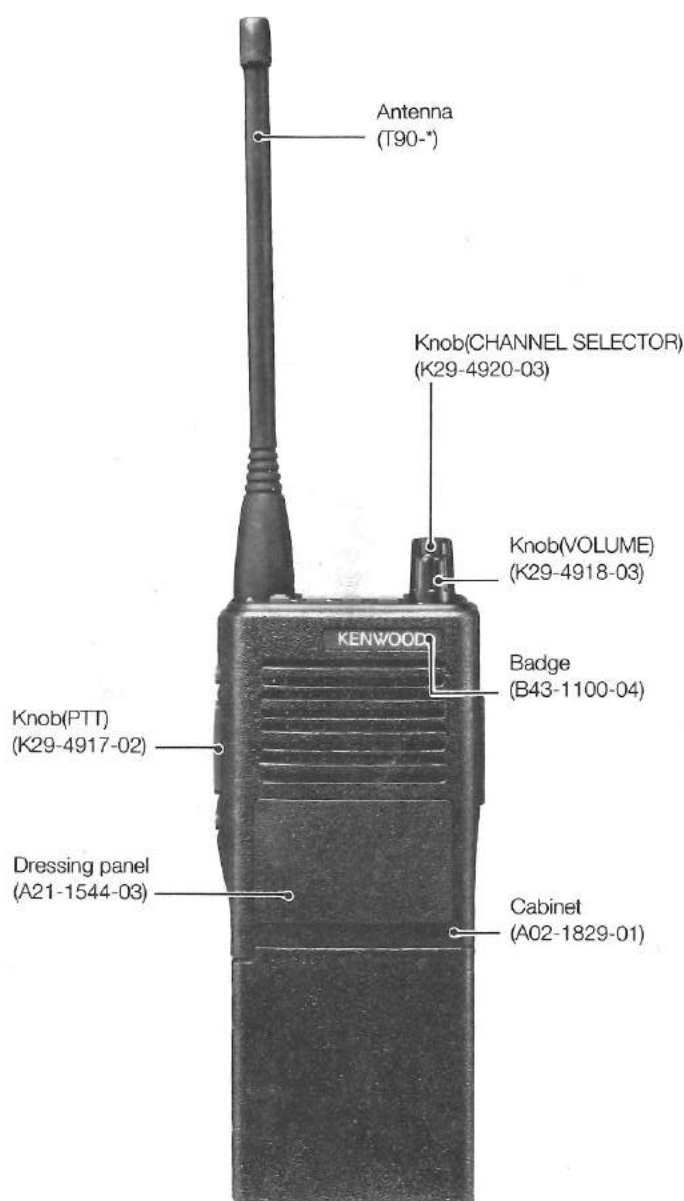




* Refer to parts list on page 39.

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CAUTION :

When using an external power connector, please use with maximum final module protection of 9V.

GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

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

ORDERING REPLACEMENT PARTS

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

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- This equipment should be serviced by a qualified technician only.

SERVICE

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

NOTE

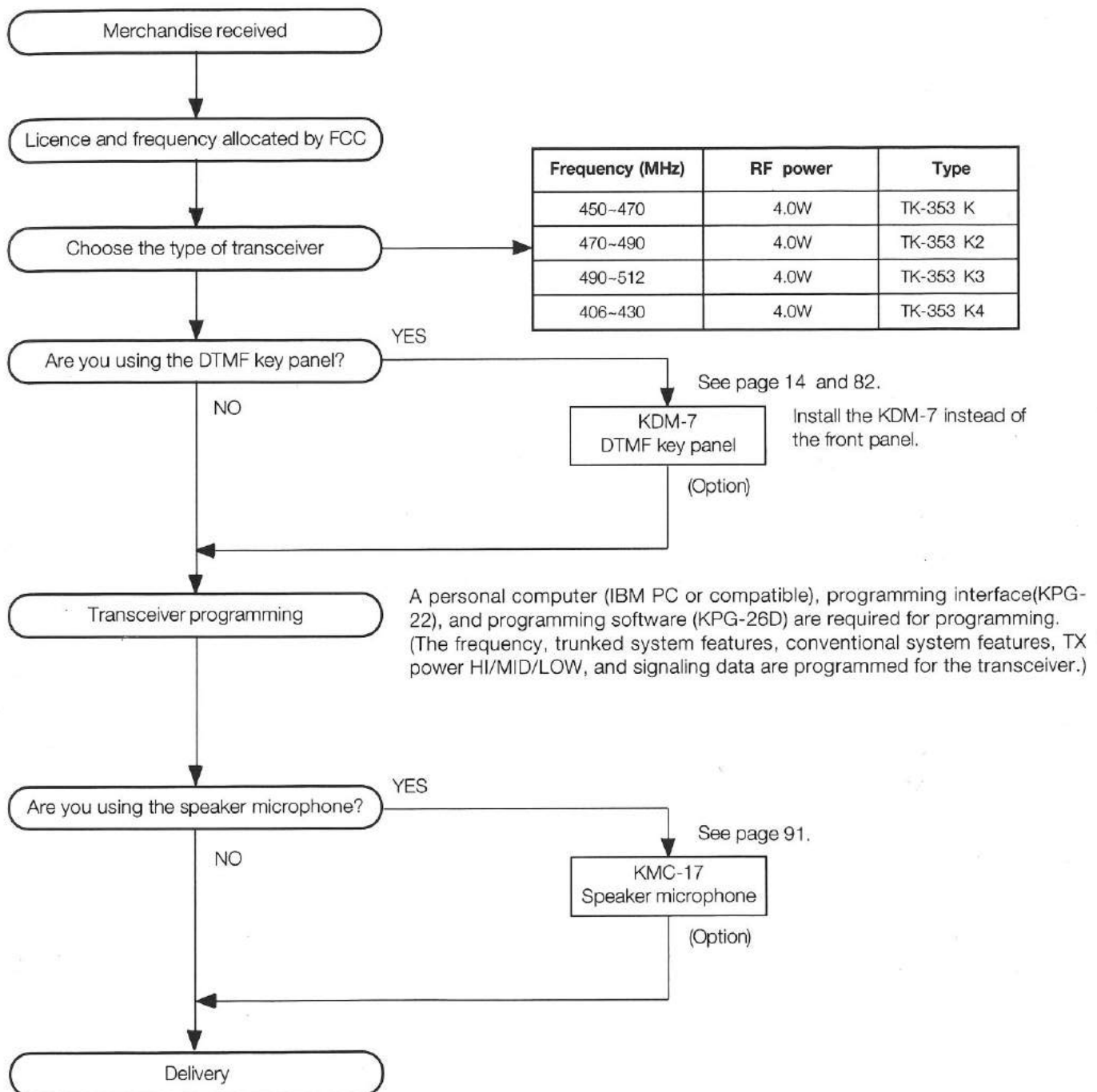
WE CANNOT guarantee oscillator stability when using channel element manufactured by other than KENWOOD or its authorized agents.

Version	Frequency range	Remarks		QT/DQT	Battery	Charger
K (TYPE 1)	450~470MHz	IF1	45.05MHz	○	OP	OP
		LOC	44.595MHz			
K2 (TYPE 2)	470~490MHz	IF1	45.05MHz	○	OP	OP
		LOC	44.595MHz			
K3 (TYPE 3)	490~512MHz	IF1	45.05MHz	○	OP	OP
		LOC	44.595MHz			
K4 (TYPE 4)	406~430MHz	IF1	45.05MHz	○	OP	OP
		LOC	44.595MHz			

FCC COMPLIANCE AND TYPE NUMBERS

Type acceptance number	Frequency range	Compliance
ALHTK-350-1	450~470MHz	Parts 22 and 90
ALHTK-350-2	470~490MHz	Parts 22 and 90
ALHTK-350-3	490~512MHz	Parts 22 and 90
ALHTK-350-4	406~430MHz	Parts 90

SYSTEM-UP



OPERATING FEATURES

1. Operation Features

The TK-353 is an 400 MHz band EFJ LTR™-compatible trunked radio designed to operate in both trunked and conventional modes. The programmable features are summarized.

1-1. General Transceiver Features

- Any combination of sixteen trunked and conventional systems programmable.
- Up to ten groups are programmable in each system.
- Four-digit alphanumeric characters are programmable for each group.
- System scan is selectable.
- System lockout during scanning
- Time-out timer (Dispatch/Telephone)
- CALL indicator
- Clear-to-talk
- Internal DTMF decoder
- Test mode

1-2. Trunked System Features

The following features are available with systems programmed for trunked transceiver operation.

- Group Scan
- Transmit Inhibit
- Telephone Interconnect (The optional KDM-7 DTMF key panel is required.)
- Free System Ringback (This feature is available only when a telephone interconnect ID code is selected.)
- AUTO TEL (This feature is available only when a telephone interconnect ID code is selected.)
- Transpond
- Talk-around (Can be set for each group.)
- System Search

1-3. Conventional System Features

The following features are available with systems programmed for conventional transceiver operation.

- Up to ten channels are programmable in each system.
- Carrier squelch and QT/DQT operation
- Transmit Disable (Receive-only channel)
- Talk-around (Can be set for each group.)
- Busy Channel Lockout (Can be set for each group.)

2. Transceiver Controls and Indicators(Fig.1)

2-1. Top Panel Controls

All the keys on the top panel are momentary-type push buttons. The functions of these keys and knob are explained below.

• VOLUME/POWER Switch

Transceiver Power and VOLUME Switch. Turn clockwise to switch ON the transceiver. Turn counterclockwise fully to switch OFF the transceiver. Also adjusts the volume level when the power is switched off, all the parameters, such as the system and group, are stored in memory. When the power is switched on again, the system returns to the previous conditions.

• SYSTEM or GROUP Selector Knob (Programmable)

Turning the system (or group) selector knob clockwise increases the system (or group) number by one. Turning the knob in the counterclockwise direction decreases the system (or group) number by one.

After the system number (or group number) reaches the highest system number (or group number), it goes back to lowest system number (or group number).

System numbers (or group numbers) not set are skipped.

CATION :

The FPU (KPG-26D) allows selecting between system selector and group selector.

• Function Keys

The FPU (KPG-26D) enables Function keys to select the following functions.

System up, System down, Group up, Group down, Monitor, System scan, DEL/ADD, Low power, Fixed channel revert, Alphanumeric, Auto tel and None.

These functions the FPU programs to the Function keys are described in the following sections.

1) System Up

When the key is pressed each time, the system number to be selected is incremented and repeats if held for one second or longer. The group selected for alphanumeric is displayed during the alphanumeric display. If inhibit system number display has been selected, System number goes out when the alphanumeric display is shown.

2) System Down

When the key is pressed each time, the system number to be selected is decremented and repeats if held for one second or longer. The group selected for alphanumeric is displayed during the alphanumeric display. If inhibit system number display has been selected, System number goes out when the alphanumeric display is shown.

OPERATING FEATURES

3) Group Up

When the key is pressed each time, the group number to be selected is incremented and repeats if held for one second or longer. The group selected for alphanumeric is displayed during the alphanumeric display. If inhibit system number display has been selected, System number goes out when the alphanumeric display is shown.

4) Group Down

When the key is pressed each time, the group number to be selected is decremented and repeats if held for one second or longer. The group selected for alphanumeric is displayed during the alphanumeric display. If inhibit system number display has been selected, System number goes out when the alphanumeric display is shown.

5) Monitor

Used to release signalling when operating as a conventional system. It is also used to reset Option signalling. The monitor function is enabled only while the key is depressed.

6) DEL/ADD

Used to select whether system scan routines are used during System scan. Each pressing of the key (to ON) toggles between Lockout and Lock. The scan routine is started when on Lock. The DEL indicator flashes when the system is on Lockout.

7) Low Power

Used to temporarily switch transmission output to low power. Turning the function on enables:

Hi → Low, Mid → Low, Low → Low

Key states are backed up, except in the PC mode when they are reset.

8) Fixed Channel Revert

Each pressing of the key selects a preset system/ group.

9) Alphanumeric

Pressing the key switches the alphanumerics and groups selected in the PC mode. The FPU is used to select whether to also display System when displaying the alphanumeric. If not selected, the system portion goes out during alphanumeric display.

10) AUTO TEL

Automatically connects available repeaters that are connected to telephone circuits when operating as an LTR system. The time allocated to search for available repeaters is 60 seconds, after which connection failure occurs, a DTMF tone is output and the function terminates.

If connection to an available circuit is made, only ID 253, EOT or Hang-up time-out can terminate the function.

• NONE

Not used.

The FPU's initial settings are shown in the table below.

SYSTEM/GROUP selector knob		System selector
Function keys	S key	NONE
	A key	NONE
	B key	NONE
	C key	NONE
	Monitor key	Monitor

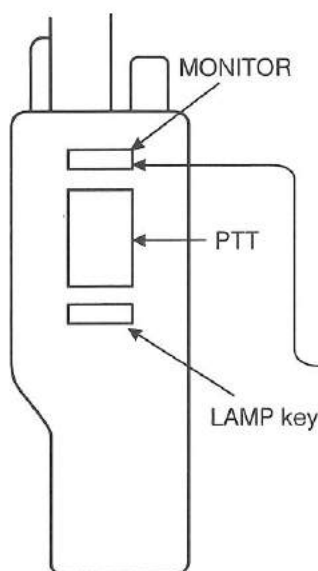
11) LAMP Key

This key illuminates the LCD on the top panel.

When the key is pressed, the LED lamp goes on.

When it is released, the lamp goes off after about five seconds. If any key, except the power key, is pressed while the LED lamp is on, the lamp is kept on for five seconds.

<LEFT SIDE VIEW>



<TOP PANEL VIEW>

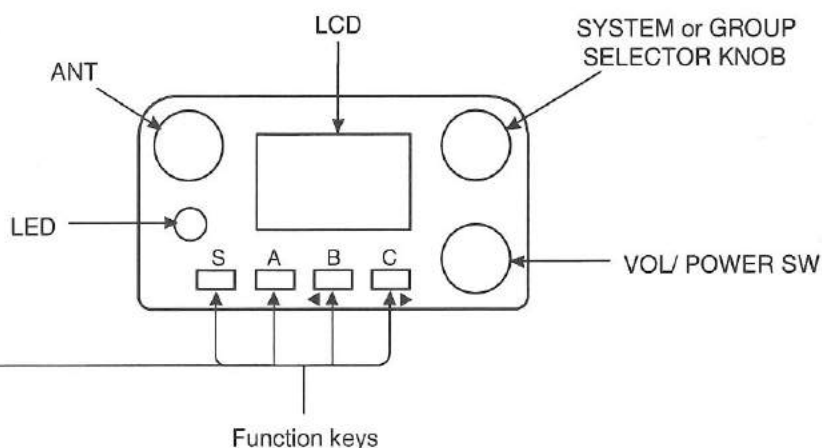


Fig. 1

OPERATING FEATURES

2-2. TOP Panel Displays and Indicators

• System display

Indicates the selected system number (1~MAX 16). Only the programmed systems are displayed. The system display is located above the Function (A) keys.

• Group display

Shows the selected group number (1~MAX 10). Only the programmed groups are displayed. The group display is located above the B/C key.

• Scan indicator

The (S) mark on the display goes on in system scan mode.

• Delete (►) indicator

When a system locked out of the system scan sequence is selected, the ► mark on the display goes on. The mark flashes if there is a locked system during fixed system scan.

• BUSY indicator

The BUSY indicator goes on if the PTT button is pressed when the trunked system is busy or while a TX inhibit ID is being received.

• CALL indicator

The CALL indicator can be programmed so that it goes on when a specified call is received. This indicator goes off when any key (except LAMP key) is pressed.

CATION :

1. The Call indicator flashes when a call is received using an ID other than the Fixed ID when operating as an LTR system. Then receive the Fixed ID, the Call indicator change to flashing.
2. The Call indicator does change from the flashing to the sustained On state but never the reverse. It is so designed to maintain the order of priority.
3. Groups with Option signalling selected are not be able to perform Call display and AF unmute without establishing an Option signalling match.

• Alphanumeric display

The 4-digit alphanumeric (A/N) display also shows system and group numbers. 4-digit alphanumeric displays can be programmed for each group. If the alphanumeric display is not programmed, the system and group numbers are displayed.

After the dealer's qualified service technician programs the transceiver, the alphanumeric display shows system numbers and group numbers for your specific network.

• TA indicator

Appears when the Talk-around system/group is selected when operating as an LTR system.

Appears when transmit and receive are set to the same frequency when operating as a conventional system.

• LO indicator

Appears when the low power function is enabled.

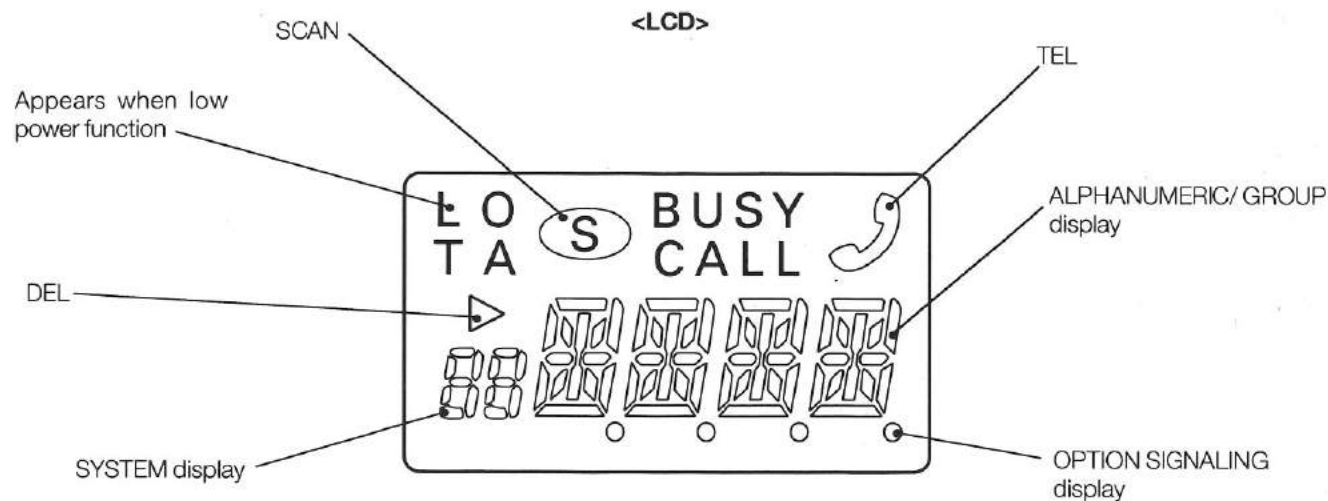


Fig. 2

OPERATING FEATURES

• Option Signalling indicator (●)

Appears when channels with option signalling selected are transmitting. Also appears during receive operations when an option signalling match is established.

• Handset indicator (J)

Appears when a group is selected that is programmed with telephone IDs. (It flashes during AUTO TEL.)

• TX/BATT indicator

This red LED lights during transmission (it does not light during busy or TX inhibit is enabled). If the battery voltage falls below the programmed voltage during transmission, the brightness of this indicator decreases at intervals of about one second, so it can be used as the battery voltage alert function (except during linking).

3. Details of Features

3-1. System Scan

System scan can be selected with the "S" key by programming the scan feature. When the "S" key is pressed and the (S) mark appears, scan mode is entered. Scanning starts from the system following the currently displayed system. When scanning, "SCAN" is indicated on the alpha-numeric display. When a call is received, scanning stops, and the system and group are displayed.

When the system knob or programming key is touched during scanning, the scan stops and the revert system or group can be changed. Scanning resumes one second after the key is released.

CATION :

This is possible when the FPU programs the "S" key for Scan. It will not operate unless programmed for the Scan feature.

3-2. System Lockout

The system lockout feature is used to lock systems out of the scan sequence, and can be selected by programming in the following two ways:

• Fixed lockout

The system to be locked out is selected by programming. When a locked system is selected, the Delete (►) indicator appears on the left of the SYSTEM indicator. The revert system is scanned even if it is locked out. If there is a locked system, the Delete (►) indicator flashes during fixed scanning.

• User selectable lockout

If the A key is programmed for the scan lockout feature, the user can lock systems out of the scan sequence with the

A key. To lock a system out of the scan sequence, press the A key when the system is displayed. The Delete (►) indicator is displayed on the left of the SYSTEM indicator.

To unlock a system, select the system and press the A key. The Delete (►) indicator disappears to indicate that the system has returned to the scan sequence. The revert system is scanned even if it is locked out. If there a locked system, the Delete (►) indicator flashes during fixed scanning. If all systems are locked out, the scan stops and only the revert system is received.

CATION :

This is possible when the FPU defines the "A" key for DEL/ADD.

3-3. Drop-Out Delay Time (Scan Resume Time)

If a call is received during scan, the scan stops. The scan resume time can be programmed as 0 to 254 seconds in one-second increments. The default value is 3 seconds.

3-4. Dwell Time

The dwell time is the time after transmission ends until the scan resumes in scan mode. It can be set to 0 to 254 seconds by programming. The default value is 3 seconds.

3-5. System/Group Revert

System/Group revert can be programmed for one of the following:

• Last call revert

The system or group changes to the revert system or group when a call is received with the system or group being scanned.

• Last use revert

If a system/group call is received during scanning and the PTT button is pressed for transmission and response within the drop out delay time, the system or group is assigned as the new revert system or group.

3-6. Scan Message Wait

The time for staying with the home repeater that receives a signal during system scan and monitoring data messages can be programmed. If there is no signal from the home repeater, the system is scanned for about 50ms. If there is a signal, three data messages are monitored. Normally, three data messages are monitored for each system, and it can be increased in multiples of three data messages per line to up to eight lines.

If the repeater data message indicates that there is no call, data monitoring is terminated and the home repeater of the next system is scanned.

OPERATING FEATURES

3-7. Call Indicator

The call indicator can be programmed for each group. In trunked systems, it can be set to respond to a selectable decode ID or one of two fixed IDs, except block IDs. When a call is received with a selectable decode ID, the call indicator flashes. When a call is received with a fixed ID, the call indicator lights continuously.

In a conventional system, the call indicator can be programmed to light for each QT or DQT code. It keeps flashing while a call is being received. It is turned off by pressing any front panel key.

3-8. Time-Out Timer

The time-out timer can be programmed in 15 seconds increments from 15 seconds to ten minutes for dispatch and interconnect operations. If the transmitter is keyed continuously for longer than the programmed time, the transmitter is disabled and a warning tone sounds while the PTT button is held down. The alert tone stops when the PTT button is released. The default value is one minute for dispatch and three minutes for interconnect.

3-9. Priority ID Codes

The priority of the programmable decode ID codes for each system is as follows:

- 1) Fixed ID code 1
- 2) Fixed ID code 2
- 3) Selected ID code
- 4) Other selectable ID codes (Group scan only)
- 5) Block decode codes

When a call with a higher priority is received, that call is received immediately (except when the transceiver is trunked out).

3-10. Group Scan Operation

Group scan can be programmed for each group. In addition to the ID codes of the selected group, the ID codes of the other groups that are permitted for group scan are decoded. (The two fixed ID and block decode codes are always decoded.)

If, during group scanning, a call is received with one of the selectable group ID codes for which group scan is enabled, the group display indicates the group number that the call came in with. That group then becomes the new selected group. Group scan resumes after the specified drop-out delay time or dwell time shared by the system scan elapses.

3-11. Transmit Inhibit

The transceiver can be programmed with a transmit inhibit block of ID codes. If an ID code within this block is decoded the preset time before the PTT button is pressed, transmission is inhibited. The BUSY indicator lights and a busy tone sounds until the PTT button is released to indicate that transmission is not possible (except clear-to-talk mode).

Transmission with the group for which the encode ID is not set is inhibited, and the busy tone is output while the PTT button is held down, regardless of the clear-to-talk setting.

3-12. TEL ID Codes (TEL MODE)

The ID code in the TEL ID block can be used to make a phone call by programming the block. To make a phone calls, an optional DTMF key pad (KDM-7) is required.

3-13. Free System Ringback

This feature is available only when a telephone interconnect ID code is selected. If a busy tone sounds when the PTT button is pressed, the transceiver enters this mode automatically.

When the PTT button is released, a beep sounds for 400ms to indicate that the mode has been entered. If the scan is on, it is resumed (the (S) mark goes on.) When any repeater becomes available, a ringing tone sounds and this mode ends.

The mode is terminated when the system, group, scan, PTT, key is changed.

3-14. System Search

This feature can be programmed to automatically access other programmed systems when the selected system cannot be accessed. If an intercept tone sounds when the PTT button is pressed after setting the mode, the transceiver has entered the mode.

If the group ID is a telephone interconnect ID, the transceiver then attempts to access, in succession, other systems that have a telephone interconnect ID in the revert group location. If the group ID is a dispatch ID, the transceiver attempts to access other systems that have a dispatch ID programmed in the revert group location.

If there is no system to be accessed, an intercept tone sounds, the mode is terminated, and the transceiver returns to the first system. If the access is successful, the mode is terminated, and the searched system becomes the new selected system. (If during scanning, the scan stops.)

3-15. Transpond

This feature can be programmed to turn on and off for each group. If the ID of the group for which transpond is enabled is received, two data messages (transmit ID and turn-off code) are automatically transmitted if the PTT button is not pressed as a response within the time set (0 to 254 seconds in 1-second increments). If the PTT button is pressed within the time, or if the signaling option has been set, the transpond is not performed.

OPERATING FEATURES

3-16. Talk-Around

This feature can be programmed to turn on or off for each group. When the PTT button is pressed for the group to which the talk-around feature is set, the home repeater channel is used for transmission, and the repeater link operation is not performed. Signaling must be in LTR format.

If clear-to-talk is set, a proceed tone is output at the beginning of transmission. If both interconnect and talk-around are set, the talk-around operation is not performed.

3-17. Preferred System Revert

This feature is available by assigning this feature to the Programmable key. The feature is used to move the revert system/group to the fixed programmed system/group quickly. When the Programmable key is pressed during scanning, the scan stops temporarily, and the revert system/group is displayed. The scan resumes about one second after the Programmable key is released.

3-18. Alphanumeric Display Select

The system/group number display and the alphanumeric display can be switched with FPU. Figure 3 shows the characters that can be displayed. These are basic characters, and can be displayed in each segment. Four digits can be displayed at the same time.



Fig. 3

3-19. AUTO TEL

A telephone interconnect call can be made by simply pressing the A key by assigning this feature to the key. This feature accesses the TEL channel of the available system automatically.

When the A key is pressed, a queue tone is output, and the "TEL" appears on the alphanumeric display along with a flashing handset indicator () to indicate that this mode has been entered. If the TEL ID is set for the revert system, the TEL channel of that system is accessed. If all TEL channels are busy, an attempt is made to access the TEL channels of another system in which the TEL ID code has been programmed. It is repeated for 60 seconds until the access succeeds. If the access succeeds, a dial tone returns from the repeater. If the A is pressed again when the queue tone is sounding, this mode is canceled.

If the access fails after 60 second, a deny tone is output and this mode is terminated. When the talk ends, the revert system/group returns. When the scan mode is effective, the scan resumes. The AUTO TEL feature can be programmed to turn on or off for each system.

3-20. Audible User Feedback Tones

The transceiver outputs various combinations of three tones (high, mid, and low) to notify the user of the transceiver operating state. The main tones are listed below. The high tone is 1480Hz, the mid tone is 940Hz, and the low tone is 770Hz.

• Busy tone

This tone is output when the PTT button is pressed but no repeater is available and transmission is not possible. It is output until transmission is enabled while the PTT button is held down and transmission starts, or until the PTT button is released. (The mid tone and low tone are output alternately in 150ms intervals.)

• Intercept tone

This tone indicates that the transceiver is out of range. It indicates that the PTT button is pressed, and transmission has started, but the repeater cannot be connected and talking is not possible. It is output until the PTT button is released. (The mid tone and low tone are output alternately in 200ms intervals.)

• Delay tone

This tone is output when the PTT button is pressed and the repeater is accessed three times or more to indicate connection with the repeater is delayed. This tone is the same as the Busy tone. (It is not output if CLEAR TO TALK has been set to YES.)

OPERATING FEATURES

• Proceed tone

This tone is output when the PTT button is pressed, transmission starts, and the repeater is connected to indicate that the user can talk if the Clear-to-Talk function has been set. (The high tone is output for 100ms.)

• Queue tone

This tone is output until the AUTO TEL function is set and the TEL channel is accepted successfully. (The mid tone on for 50ms, off for 50ms, and on for 50ms in 1 second intervals.)

• Deny tone

This tone is output if the AUTO TEL function is set, the queue tone is output, but the TEL channel cannot be accessed within 60 seconds. It is similar to the intercept tone. (The mid tone and low tone are output alternately in 150ms intervals.)

3-21. Clear-to-Talk

This feature can be programmed to turn on or off.

• Clear-to-talk operation (Set to ON)

If a dispatch ID is used and the PTT button is pressed when no repeater can transmit, a busy tone is not output (It is output when an interconnect ID is used). If transmission becomes possible while the PTT button is held down, transmission starts.

When connection with the repeater is completed, a proceed tone is output. The delay tone is not output in this mode. (It is output when an interconnect ID is used.)

• Normal operation (Set to OFF)

If the PTT button is pressed when there is no repeater that can transmit signals (no free repeater or TX inhibit is enabled), a busy tone is output. If transmission becomes possible while the PTT button is held down, transmission starts. The delay tone is output if link operation is performed three to six times.

3-22. Conventional System Operation

Up to 10(MAX) channels can be programmed for each system programmed as a conventional system. Channels can be selected by the group key.

QT (Quiet-Talk), DQT (Digital Quiet-Talk), or carrier squelch can be set for transmit or receive channels. If signaling is set for transmission, a squelch tail eliminator (reverse burst or turn-off code) is transmitted.

• Talk-around

The Talk-around feature can be programmed for each channel. When transmit frequency same as receive frequency, then Talk-around turns on.

• Transmit disable (receive-only channels)

Transmission can be programmed to be inhibited for each channel. This feature is used to set receive-only channels. When the PTT button is pressed on a receive-only channel, a busy tone sounds, and transmission is not performed. (When set only transmit frequency, then transmit disable turns on.)

• Busy channel lockout

The busy channel lockout feature can be programmed for each channel. If a channel is locked out by pressing the PTT button, a busy tone is output, and if transmission becomes possible, it starts.

• Scanning conventional systems

For the conventional system scan, only the revert channel of each system is scanned. If QT or DQT is set for the channel, the channels, including signaling, are scanned.

3-23. DTMF Decoder

Use of the optional decoder can be programmed for each group (for each channel of a conventional system). The monitor key functions as the external decoder reset key.

If it is supported, the following features are available:

• Audio mute

If the DTMF decodes and the LTR data or signaling matches (when the squelch is open if signaling is not set), the audio is output.

During system/group scanning, the "SCAN" display changes to the system/group display (or alphanumeric display). If it is the last call, the revert system/group returns.

• Call indicator, alert tone

If the DTMF decodes and the LTR data or signaling matches (when the squelch is open if signaling is not set), alert tone is output. CALL lights or flashes (or nothing occurs) according to the CALL indicator set for each group.

• Operation during scan

If signaling matches during scanning, the scan stops at the system. The display shows "SCAN" until decodes the DTMF. When decodes the DTMF, the system/group is displayed.

3-24. System Scan Type

• Fix system scan

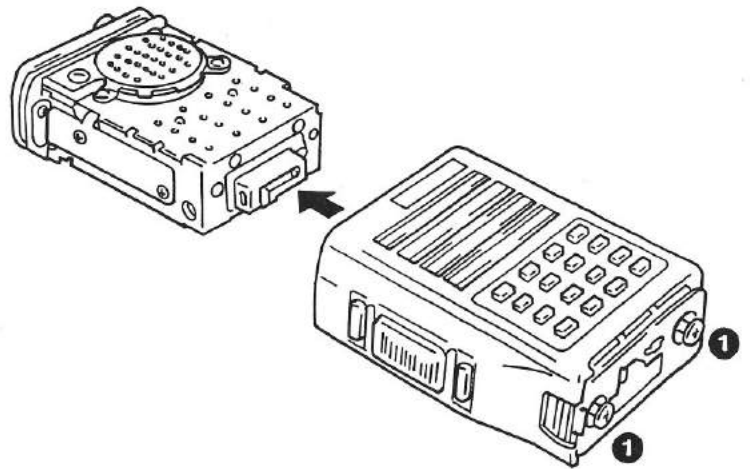
All the set systems except locked-out ones are scanned. If the DEL/ADD feature is assigned to the A key, it can be controlled from the front panel when "A" key sets as DEL/ADD.

DISASSEMBLY FOR REPAIR

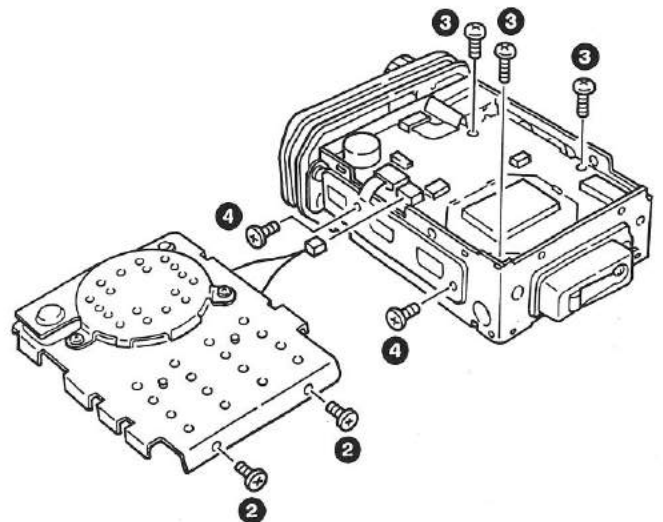
1. Loosen the two screws (❶) and remove the frame assembly from the case.

Note :

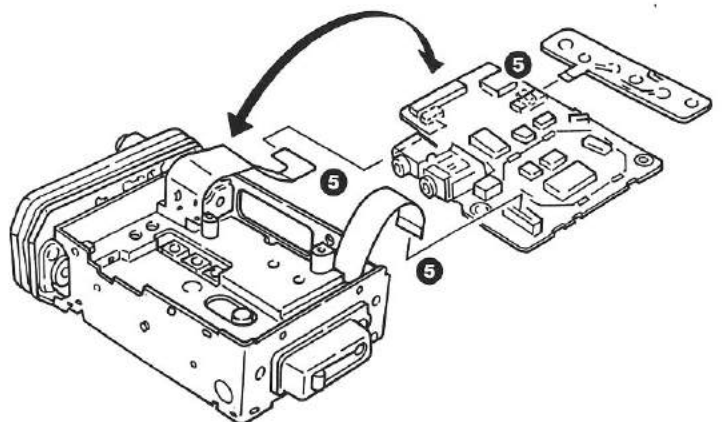
The case is stiff because of internal waterproofing. To avoid marring the set when pulling it out, use a screwdriver covered with a piece of cloth to depress the + side of the main unit battery connector and remove the case.



2. Remove the two shield plate screws (❷), the speaker connector, the three control printed circuit board screws (❸) and the two side switch FPC screws (❹).



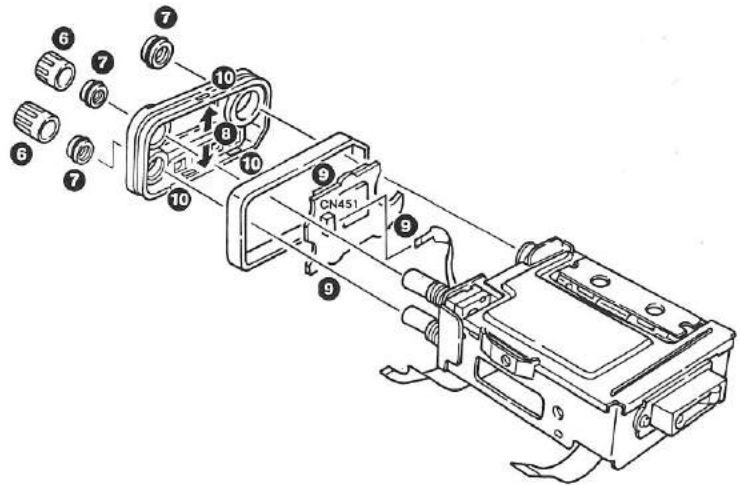
3. Flip over the control printed circuit board and remove the three connectors (❺).



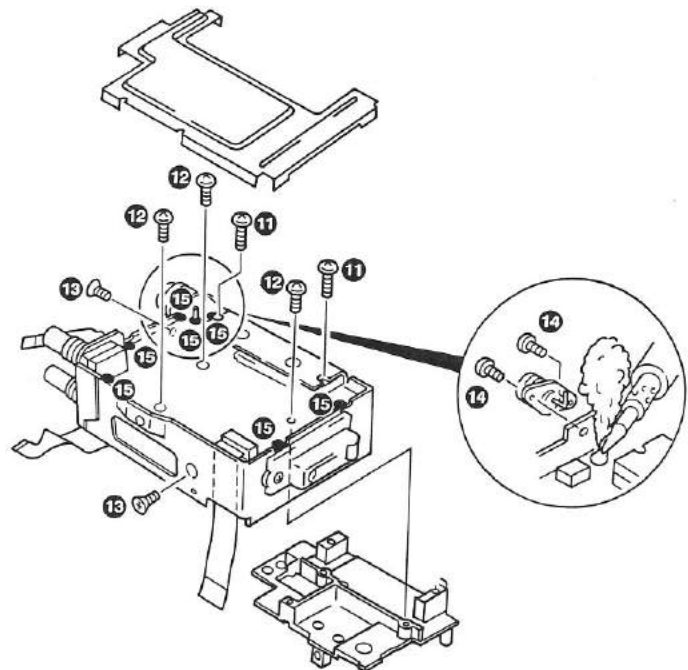
DISASSEMBLY FOR REPAIR

4. Remove the two knobs (6) and the three round nuts (7) with the rings still attached.

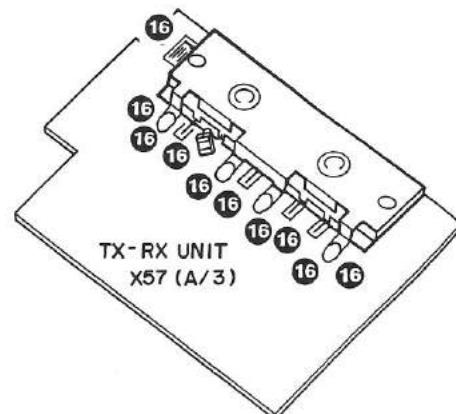
Spread the panel (8) slightly and remove the display section tabs (9) from the panel grooves (10) and remove the display. Then remove connector CN451.



5. Remove the final shield plate, remove the two screws (11), the three TX-RX printed circuit board screws (12), and the two shield cover attachment screws (13), and remove the shield cover. Remove the two antenna coaxial connector screws (14) and remove the seven soldered connections (15). You can now remove the TX-RX unit.



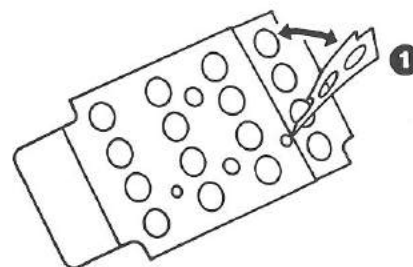
6. Remove the ten soldered connections (16) and remove the shield plate and the final module from the TX-RX printed circuit board.



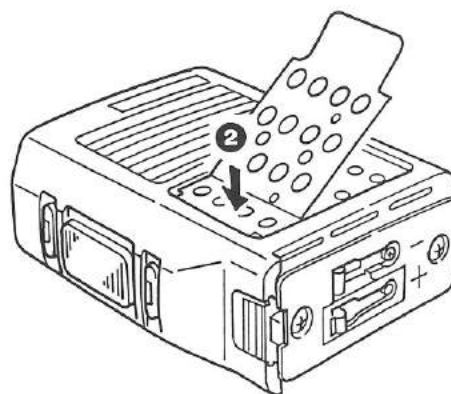
INSTALLATION

DRESSING PANEL (ACCESSORIES)

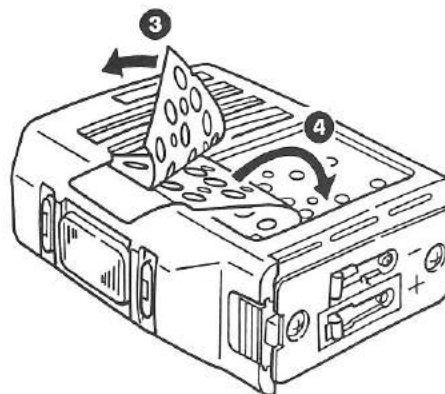
1. Peel off the right-hand side (the shorter section) of the brown backing material (❶) on the back side.



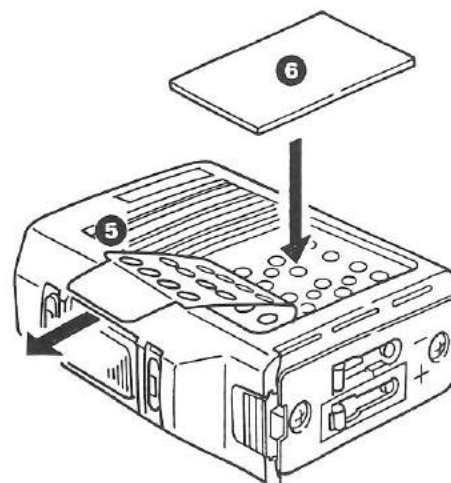
2. In the depression on the TK-353's top side, apply the adhesive sheet (see Step 1. above) from the left-hand side, and align it properly. The sheet adhesive is very strong, so please align carefully. Press the exposed portion of the adhesive surface firmly into place (❷).



3. Peel off the remainder of the brown backing material (❸) on the back side and press (❹) the sheet onto the main unit.



4. Remove the backing material (❺) from the front side and press the dressing panel (❻) into place.

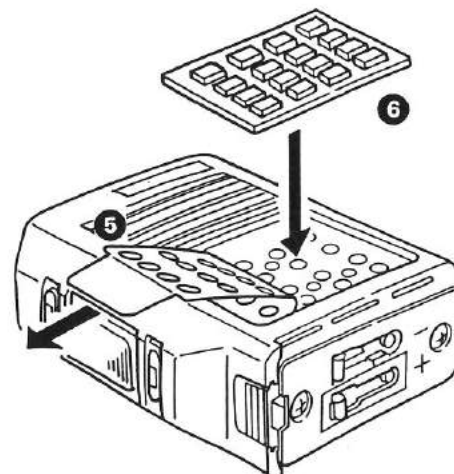
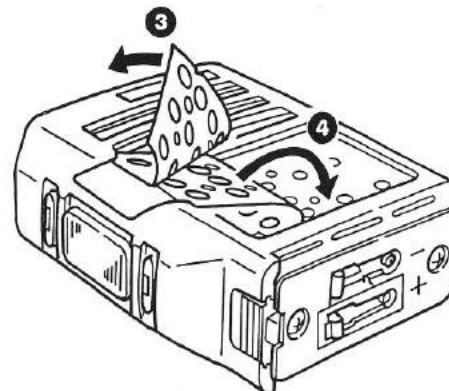
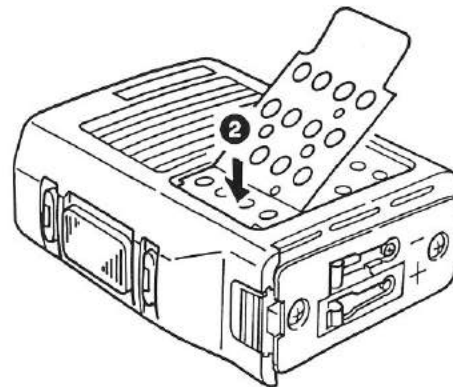
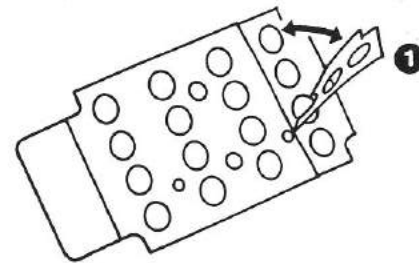


INSTALLATION

DTMF UNIT (KDM-7 Option) ATTACHMENT METHOD

Keyboard attachment

1. Peel off the right-hand side (the shorter section) of the yellow backing material (❶) on the back side.
2. In the depression on the TK-353's top side, apply the adhesive sheet (see Step 1. above) from the left-hand side, and align it properly. The sheet adhesive is very strong, so please align carefully. Press the exposed portion of the adhesive surface firmly into place (❷).
3. Peel off the remainder of the yellow backing material (❸) on the back side and press (❹) the sheet onto the main unit.
4. Remove the backing material (❺) from the front side and press the keyboard (❻) into place.



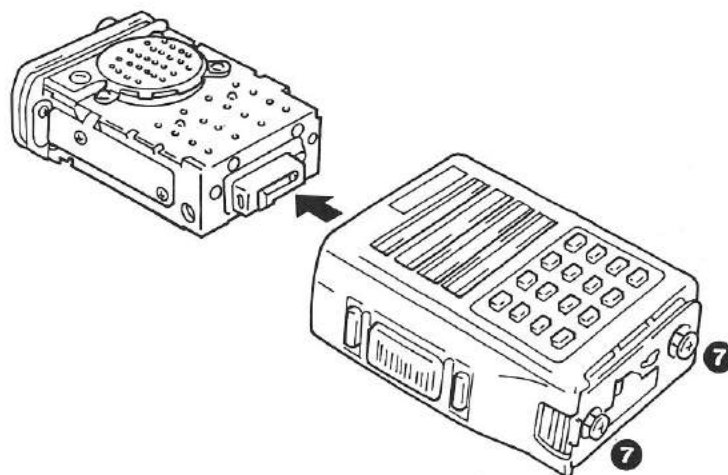
INSTALLATION

Keypad attachment method

- Loosen the two screws (7) on the underside of the frame assembly and remove the frame assembly from the case.

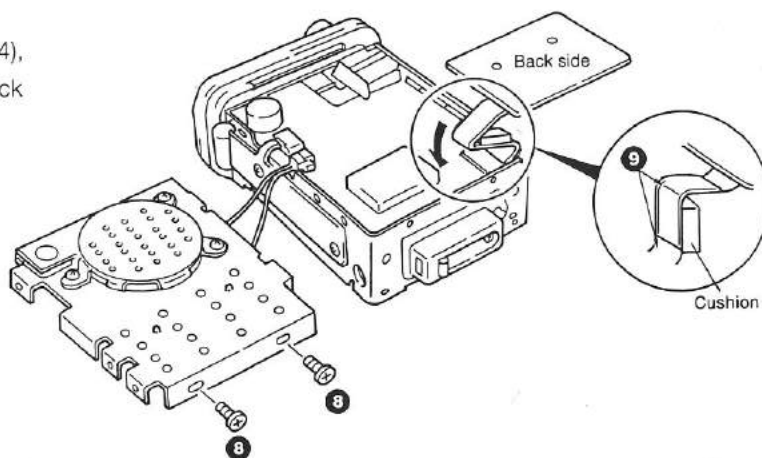
Note :

The case is stiff because of internal waterproofing. To avoid marring the set when pulling it out, use a screwdriver covered with a piece of cloth to depress the + side of the main unit battery connector and remove the case.



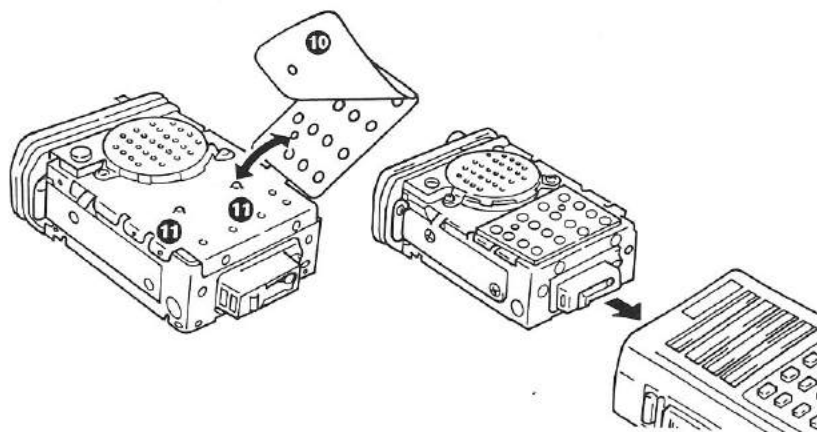
- Remove the two screws (8) and remove the shield plate.

Insert the keypad flat cable into the connector(CN204), cushion is inserted (9) and with the keypad bent back out of the way, press it into place.



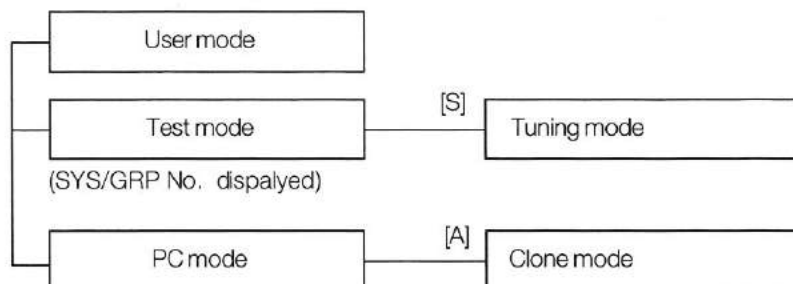
- While pressing on the flat cable of the keypad, bend it under the shield plate, " sandwich " it there, replace the shield plate and tighten the screws.

Peel off the keypad adhesive's backing material (10), align the projections atop the shield plate with the holes (11) in the keypad, press it firmly into place and return the frame assembly to the case.



REALIGNMENT

1. Modes



Mode	Function
User mode	Normal use
Tuning mode	The transceiver tuning in this mode. Realignment method refer to ADJUSTMENT.
PC mode	Destination data, function data, and channel settings are transferred from or to an IBM PC.
Clone mode	Destination data, function data, and channel data settings are transferred from or to another transceiver.

2. How to enter each mode

Mode	Operation
User mode	Power ON
Test mode	[LAMP] + [A] + Power ON (two seconds)
PC mode	[LAMP] + [C] + Power ON (two seconds)
Clone mode	[PC Mode] + [A]

REALIGNMENT

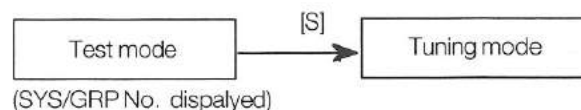
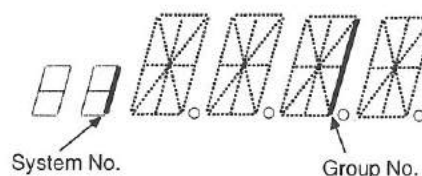
3. Test mode

In the test mode, the dealer initializes E²PROM data, and tuning the transceiver and sets functions and channel data.

● Procedure

- 1) Press LAMP, A together and turn power on. Hold LAMP and A until "1-1" appears on LCD.

Test mode display



● KEY description

SYSTEM KNOB	Varies system settings. If no frequency data has been preset, the frequency listed in Table 1 is written as the default value.
B/C KEY	Changes group. Used to select the signaling encode/decode data or squelch adjustment.
A KEY	Switches power levels between Hi → Med → Low. The "LO" indicator appears during the low power state.
S KEY	Enables the turning mode.
MON KEY	Turns the Monitor on and off
PTT	Transmits while depressed.
LAMP KEY	Turns lamp display light (lamp) on and off.

Frequency table for using on test mode

SYSTEM NO.	Desti-nation	K (TYPE 1)		K2 (TYPE 2)		K3 (TYPE 3)		K4 (TYPE 4)	
		TX freq	RX freq	TX freq	RX freq	TX freq	RX freq	TX freq	RX freq
1		460.000MHz	460.100MHz	480.000MHz	480.100MHz	500.000MHz	500.100MHz	418.000MHz	418.100MHz
2		450.000MHz	450.100MHz	470.000MHz	470.100MHz	490.000MHz	490.100MHz	406.000MHz	406.100MHz
3		469.9875MHz	469.975MHz	489.9875MHz	489.975MHz	511.9875MHz	511.975MHz	429.9875MHz	429.975MHz
4		460.000MHz		480.000MHz		500.000MHz		418.000MHz	
5		460.200MHz		480.200MHz		500.200MHz		418.200MHz	
6		460.400MHz		480.400MHz		500.400MHz		418.400MHz	

Table 1

Group No. list

GROUP No.	SIGNALING
1	NONE
2	100Hz square wave
3	LTR data (Area=0, Goto=12, Home=12, ID=47, Free=31)
4	QT (67.0Hz)
5	QT (151.4Hz)
6	QT (210.7Hz)
7	DQT (D023N)
8	DQT (D754N)
9	DTMF Dcoder (Code=159D, Alert=YES, Transpond=NO)
A	DTMF Single Tone (1633Hz)
B	DTMF Encode Tone(7)

By simply transmitting, and the DTMF single tone and encoded tone are encoded.

Table 2

4. Tuning Mode

This mode can be inhibited by programming. The following can be adjusted with the front keys :

- Squelch level
- QT fine deviation
- LTR ID fine deviation
- RF power (High-Mid-Low)
- DQT balance
- Maximum deviation
- DTMF deviation
- Battery warning indicator level

Pressing the "S" key in the Test mode enables the Turning mode. Adjustment mode is entered and the adjustment level can be varied between 1 to 256.

- **SYSTEM knob**

Used to change adjustment values.

- **A,B,C key**

Not in use.

- **S key**

Returns operation to the Test mode, but is inoperative when inhibited by the FPU.

- **MON key**

Turns the Monitor on and off.

- **PTT key**

Transmits while depressed.

- **LAMP key**

Pressing this key sets the new adjustment values selected using the SYSTEM knob, and shifts operation to the next adjustment item.

REALIGNMENT

5. PC mode

• Preface

The TK-353 transceiver is programmed by using a personal computer, programming interface (KPG-22) and programming software (KPG-26D).

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

• Connection procedure

- ① Connect the TK-353 to the personal computer with the interface cable.
- ② Hold down the [LAMP] and [C] keys, and turn the POWER

switch on. (Hold down the [LAMP] key for at least two seconds.) When the PC mode is entered, "-PC-" is displayed on the LCD.

When data transmitting from transceiver the red LED goes on.

When data receiving to transceiver the green LED goes on.

Notes:

- Do not connect the interface cable in the normal receive mode.
- The data stored in the personal computer must match UHF, and IF when it is written into the E²PROM.
- Do not press the [PTT] key during data transmission or reception.
- Change the TK-353 to PC mode, then plug in.

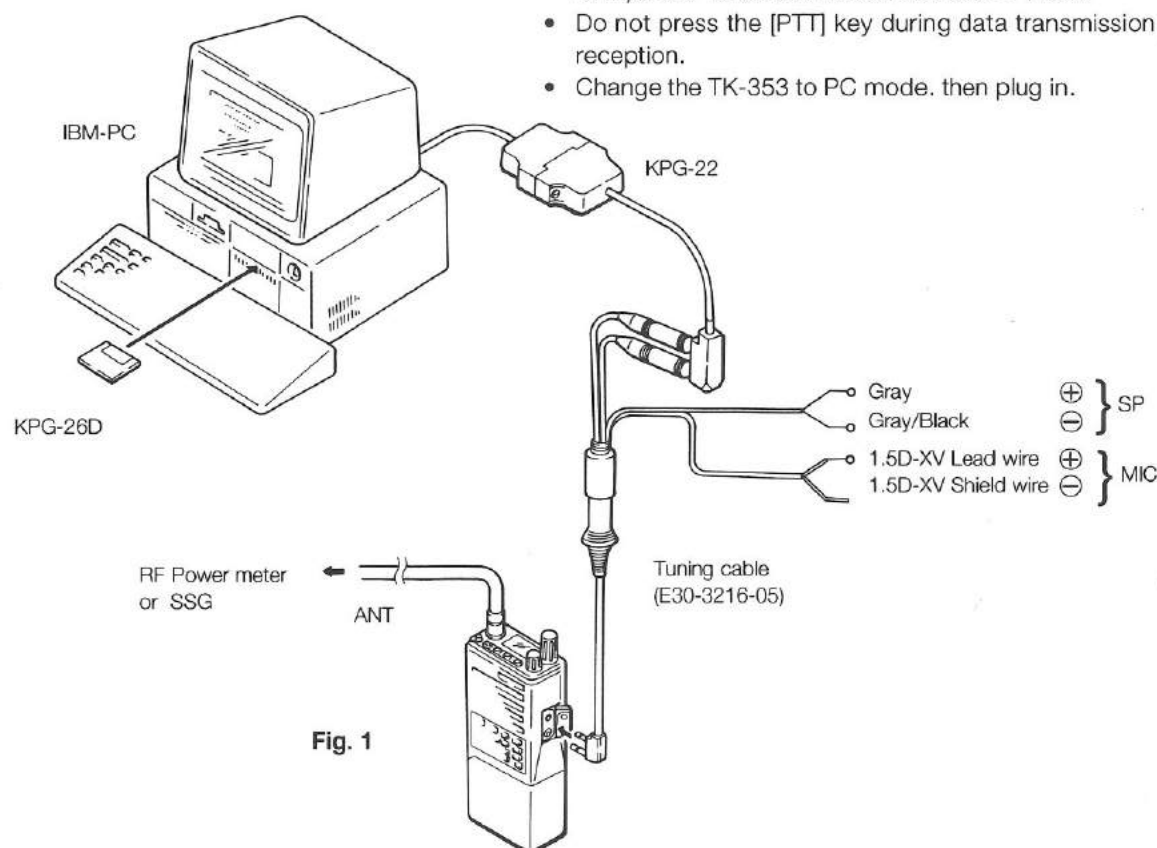


Fig. 1

• KPG-22 description

(P.C. programming interface cable: Option)

The KPG-22 is required to interface the TK-353 to the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-22 connects the side panel jacks of the TK-353 to the computer's RS-232C serial port.

• Programming software description

The KPG-26D Programming Disk is supplied in 5-1/4" and 3-1/2" disk format. The Software on this disk allows a user to program TK-353 radios via Programming Interface cable (KPG-22).

• Programming with IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-26D, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary.

Data can be programmed into the E²PROM in RS-232C format via the SP MIC plug.

In this mode the PTT and CLN lines operate as TXD and RXD data lines respectively.

(KPG-26D Instruction Manual)
Parts No: B62-0555-00

REALIGNMENT

6. PC TUNING mode

• Preface

The TK-353 transceiver is tuned by using a personal computer, Programming interface (KPG-22), tuning cable (E30-3216-05) and programming software (KPG-26D).

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

This mode also allows adjustment of the following items.

- Squelch
- RF Power (High/ Mid/Low)
- Maximum deviation
- DQT BALANCE
- QT fine deviation
- DQT fine deviation
- DTMF fine deviation
- Battery warning level

• Connection procedure

- ① Connect the TK-353 to personal computer with the interface cable and tuning cable.
- ② Hold down the [LAMP] and [C] keys, and turn the Power Switch on. (Hold down the [LAMP] key and [C] keys for at least two seconds.) When the PC mode is entered, "--PC--" is displayed on the LCD.
- ③ The 4 lines of the tuning cable are used to adjust maximum deviation (1.5D cable: MIC) and squelch (gray, gray/ black).
- ④ ANT is connected to the SSG or RF power meter.

NOTES :

- Do not connect the interface in the normal receive mode.
- Change the TK-353 to PC mode. Then plug in.

• Tuning Description

(Programming software procedures)

Change the TK-353 to the PC mode.

- ① With Programming software loaded, select Read from Radio and read the "set" data from the PC.
The green LED appears while receiving data to transceiver.
- ② Select Test mode.
- ③ Select the channel (frequency) and signalling to be adjusted.
- ④ Press function key F10 on the computer to select the Turning mode.
- ⑤ Select the item to adjust, then press the "Enter" key on the computer.

- ⑥ Adjust using the computer's "→" and "←" cursor keys (left, right) and press the Enter key when finished. This rewrites the adjustment point data in the E²PROM.

NOTES :

- Refer to Adjustment for information on adjustment values.

• KPG-22 description

(P.C. programming interface cable: Option)

The KPG-22 is required to interface the TK-353 to the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-22 connects the side panel jacks of the TK-353 to the computers RS-232C serial port.

• Programming software description

The KPG-26D Programming Disk is supplied in 5-1/4" and 3-1/2" disk format. The Software on this disk allows a user to program TK-353 radios via Programming Interface cable (KPG-22).

• Programming with IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-26D, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary.

Data can be programmed into the E²PROM in RS-232C format via the SP MIC plug.

In this mode the PTT and CLN lines operate as TXD and RXD data lines respectively.

(KPG-26D Instruction Manual
Parts No: B62- 0555-00)

• Tuning Cable Description

(Service part No.: E30-3216-05)

This tuning cable connects the KPG-22 and the TK-353 to enable input and output of external signals (when SP connector/MIC connector are present) when using a PC to tune the TK-353.

REALIGNMENT

7. Clone Mode

Enter from PC mode while pressing A key.

In the clone mode, two transceivers are connected together and the contents of the E²PROM of one transceiver are copied to the E²PROM of the other.

The optional KCT-8 is used for cloning. For the connection method, see Figure 2.

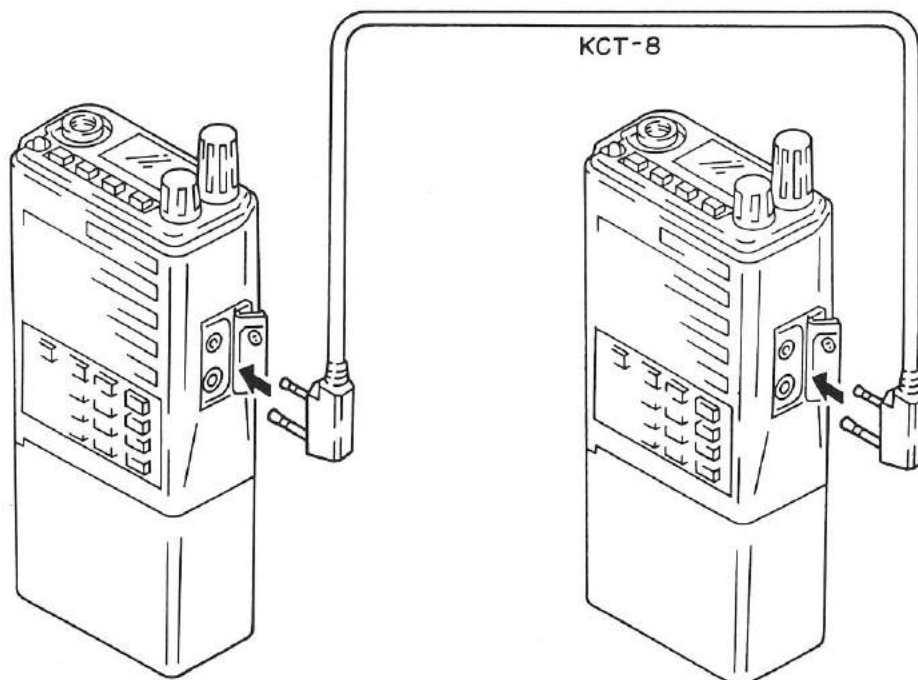


Fig. 2

• Procedure

- ① Connect the two TK-353 transceivers in the clone mode with the KCT-8 Interface cable.
- ② On the data reception side, while depressing the [LAMP] and [LO] keys, turn the power switch ON to enter the PC mode (the [LAMP] key remains illuminated for two seconds).
Additionally, on the data transmission side, press the [D/A] key to enter the clone mode ; " -C- " appears on the display.
- ③ When the [MONI] key on the transmitter is pressed, the

E²PROM data is copied, and the ON AIR indicator lights. The state of the receiver does not change. After (about 40 seconds) the E²PROM copying ends, and "END" is displayed on transmission side LCD. The ON AIR indicator on the transmitter goes off.

- ④ If the [SCAN] key is pressed while END is being displayed , " - C - " is displayed again, and cloning is made possible.

NOTES :

- UHF, and IF must match.
- Do not press the [PTT] key during data transmission.
- The TK-353 cannot be cloned with any other models.

CIRCUIT DESCRIPTION

1. OVERVIEW

The TK-353 is a UHF/FM hand-held transceiver designed to operate in the frequency range of 450 to 470MHz. The unit consists of a receiver, a transmitter, a phase-locked loop(PLL) frequency synthesizer, power supply circuits a control unit, a display unit.

2. CIRCUIT CONFIGURATION BY FREQUENCY

The receiver is a double-conversion superhetrodyne with a first intermediate frequency (IF) of 45.05MHz and a second IF of 455kHz. Incoming signals from the antenna are mixed with the local signal from the PLL to produce the first IF of 45.05MHz.

This is then mixed with the 44.595MHz second local oscillator output to produce the 455Hz second IF. This is detected to give the demodulated signal.

The transmit signal frequency is generated by the PLL VCO, and modulated by the signal from the microphone. It is then amplified and sent to the antenna.

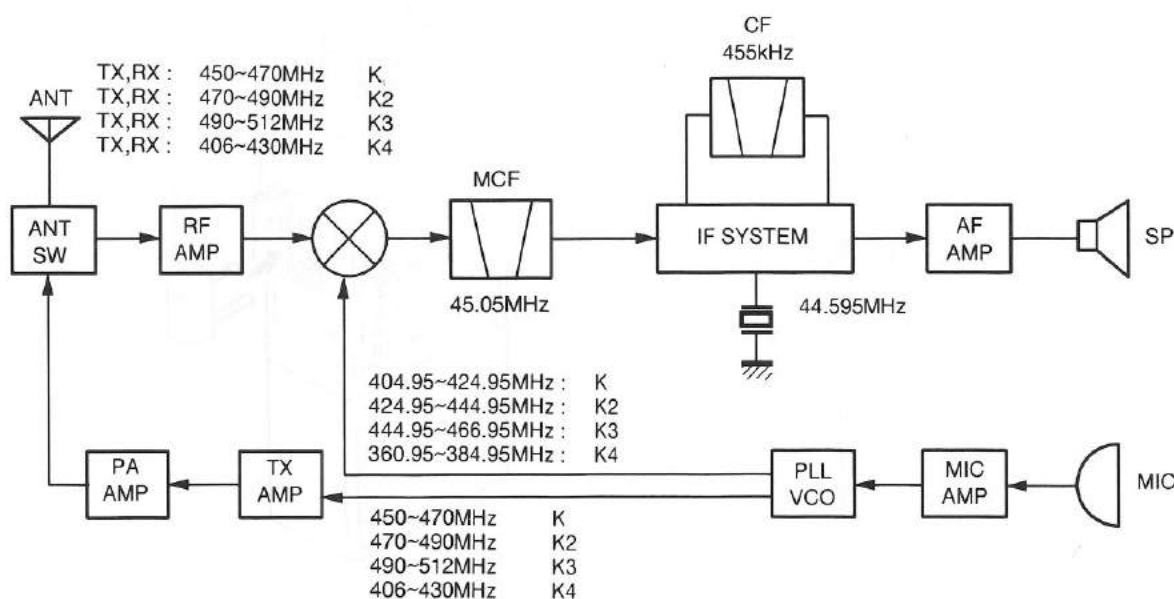


Fig. 1 Frequency configuration

3. RECEIVER SYSTEM

The receiver is double conversion superhetrodyne, designed to operate in the frequency range of 450 to 470MHz(K), 470~490MHz(K2), 490~512MHz(K3) and 406~430MHz(K4).

3.1 Front-end RF amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q17) after passing through a transmit/receive switch circuit (D5 and D6 are off) and a 2-pole helical filter (L18). After the signal is amplified, the signal is filtered by a 3-pole helical filter (L12) to eliminate unwanted signals before it is passed to the first mixer.

3.2 First mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q14) to become a 45.05MHz first intermediate frequency (1st IF) signal. The first IF signal is fed through two monolithic crystal filters (MCFs: XF1) to further remove spurious signals.

Item	Rating
Nominal center frequency	45.05MHz
Pass band width	±7.5kHz or more at 3dB
Attenuation band width	±22kHz or less at 2.5dB
Ripple	1.0dB or less
Insertion loss	4dB or less
Guaranteed attenuation	80dB or more within ±910kHz (Spurious: 40dB or more)
Terminating impedance	800Ω/2pF

XF1: L71-0409-15

CIRCUIT DESCRIPTION

3.3 IF amplifier

The first IF signal is amplified by Q10, and then enters IC2 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC2 to become a 455kHz second IF signal. The second IF signal is fed through a 455kHz ceramic filter to further eliminate unwanted signals before it is amplified and FM detected in IC2.

Item	Rating
Nominal center frequency	455kHz
6dB band width	$\pm 7.5\text{kHz}$ or more
40dB band width	$\pm 15.0\text{kHz}$ or more
Ripple	1.5dB or less ($455\text{kHz} \pm 5\text{kHz}$)
Guaranteed attenuation	27dB or more within $\pm 100\text{kHz}$
Insertion loss	6dB or less
Terminal impedance	1.5k Ω

CF1,2 : L72-0915-05

3.4 Audio amplifier

The recovered audio signal obtained from IC2 is amplified by IC208 (1/2)(control board), low-pass filtered by IC205 (2/2), high-pass filtered by IC205 (1/2) and band-eliminate filtered by IC211 (1/2). The audio signal is then passed through an audio frequency switch (Q204) and de-emphasized by IC211 (2/2). The processed audio signal passes through an audio volume control and is amplified to a sufficient level to drive a loud speaker by an audio power amplifier (IC222).

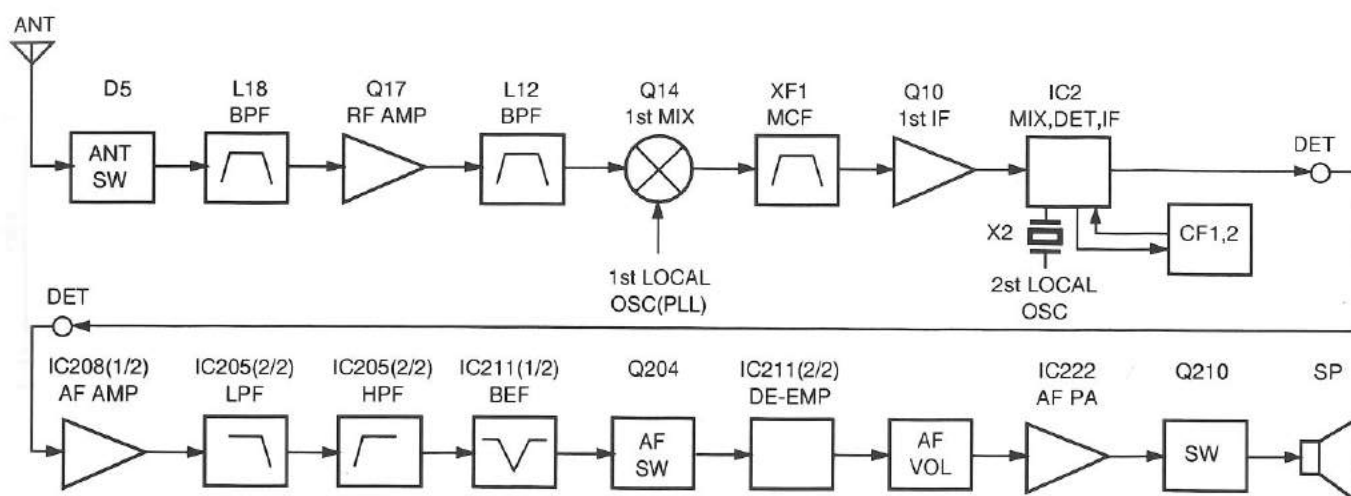


Fig. 2 Receiving system

3.5 Squelch and mute

The output signal from the squelch circuit, which consists of IC208 (2/2) and Q203, is applied to the microprocessor. The microprocessor passes information to the shift register (IC213) and it controls the mute control lines (AF MUTE and AC) according to the input signal (noise pulse) and the microprocessor task condition.

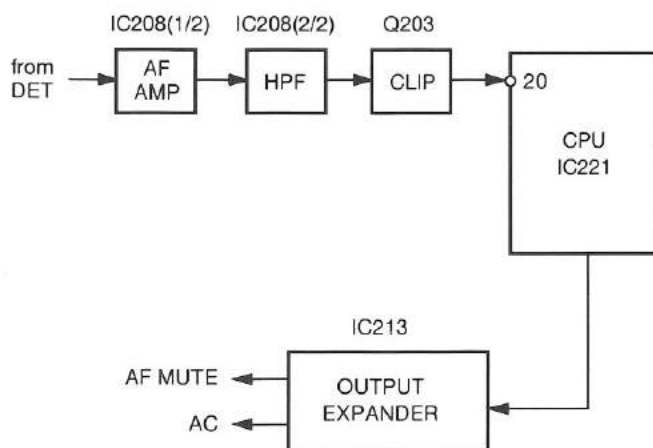


Fig. 3 Squelch and Mute

CIRCUIT DESCRIPTION

4. TRANSMITTER SYSTEM

4.1 Microphone amplifier

The signal from the microphone is high-pass filtered by IC207 (1/2), passed through microphone mute circuit (Q202), limited and pre-emphasized by IC207 (2/2), before being passed to the low-pass filter network (IC216).

4.2 Modulator

The output of the low-pass filter network (IC216) is passed to the D/A converter (IC206) for maximum deviation adjustment and the summing amplifier (IC201) before being applied to a varactor diode (D605) in the voltage controlled oscillator (VCO) located in the frequency synthesizer section.

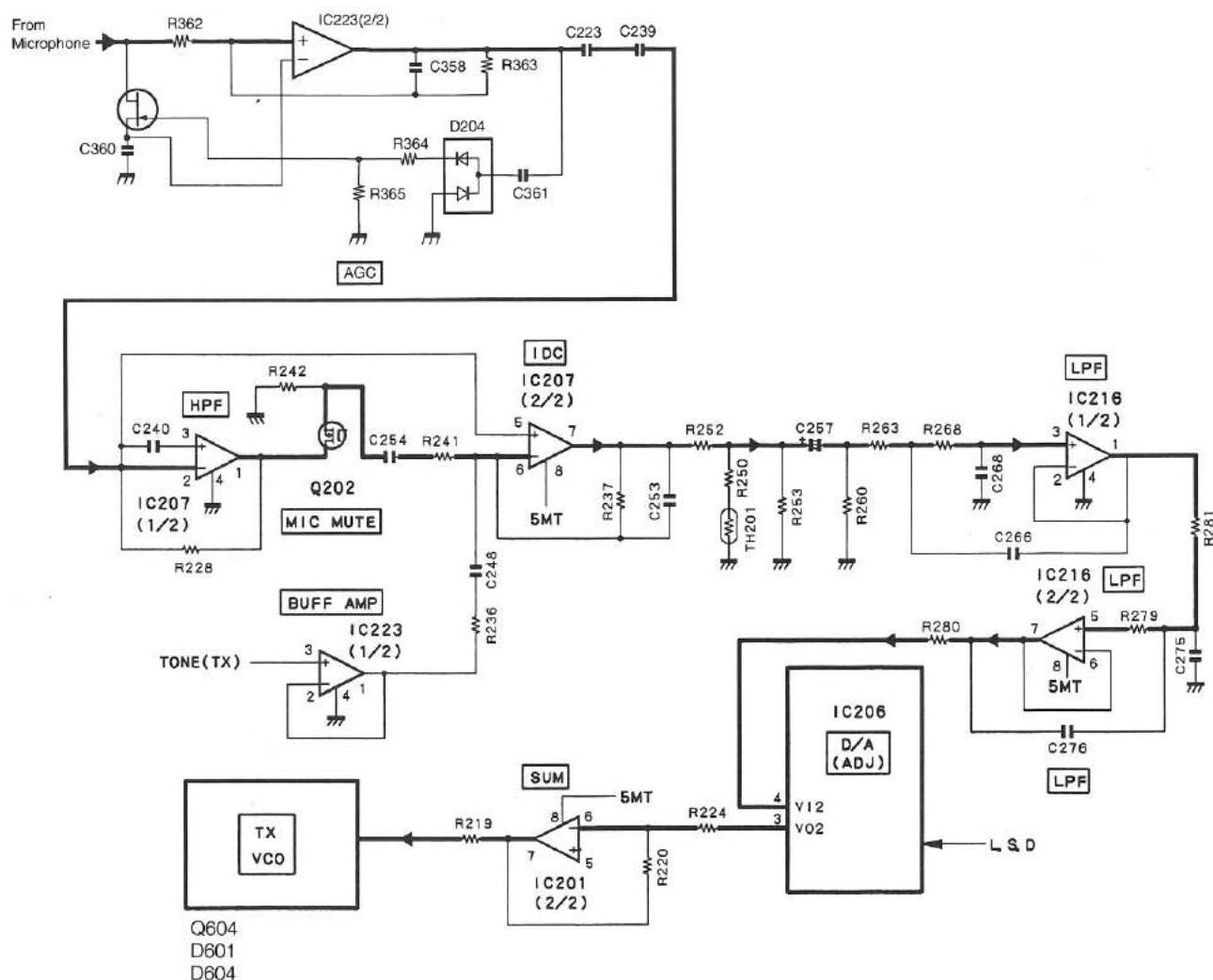


Fig. 4 Microphone amplifier , modulator

CIRCUIT DESCRIPTION

4.3 Driver and final power amplifier

The transmit signal obtained from the VCO buffer amplifier Q11, is amplified to approximately 18dBm by Q13 and Q15. This amplified signal is passed to the power module(IC5). The power module consist of a 3-stage amplifier and is capable of producing up to 4W of RF power.

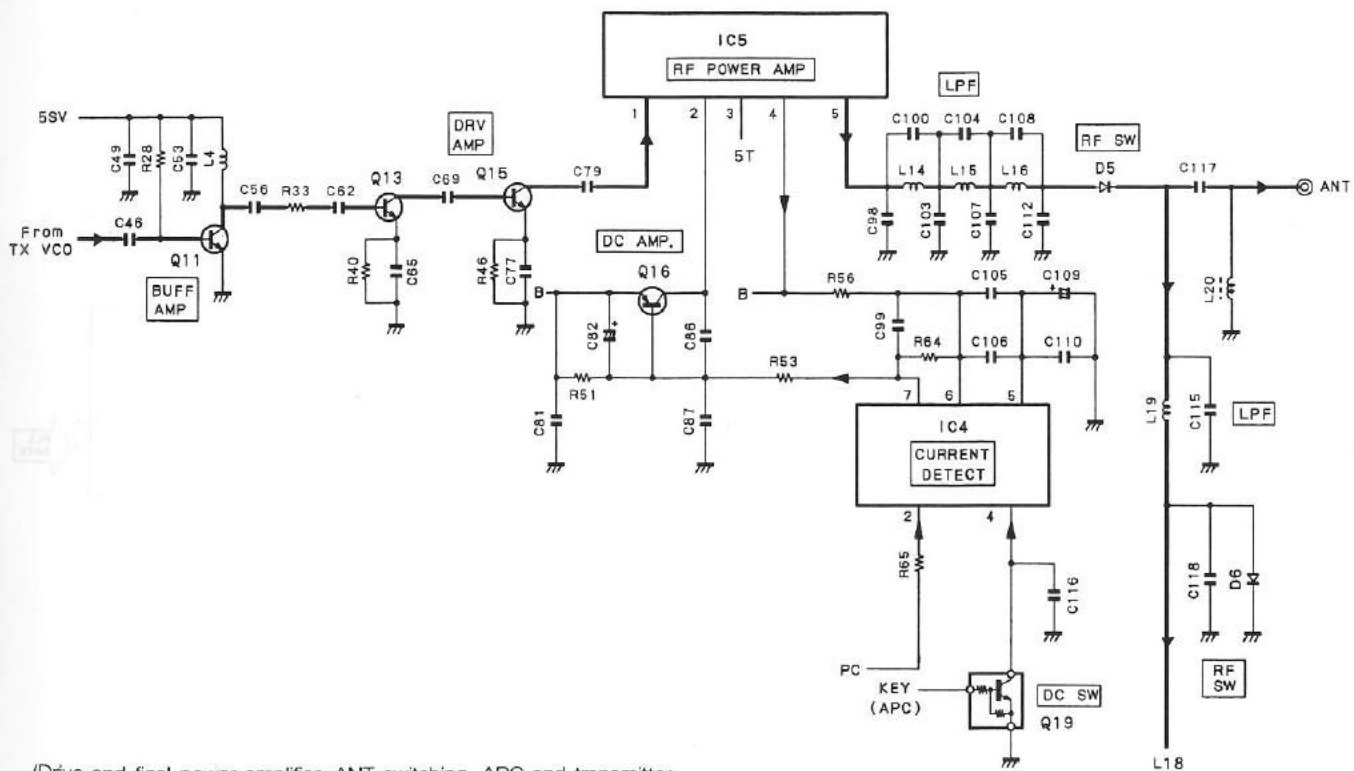
4.4 ANT switching

The power module output signal is passed through a 3-stage low-pass filter network and a transmit/receive switching circuit before it is passed to the antenna terminal. The transmit/receive switching circuit is comprised of D5 and D6. D5 and D9 are turned on (conductive) in transmit mode and turned off (isolated) in receive mode.

4.5 Automatic power control and transmitter output level switch

The automatic power control (APC) circuit stabilizes the transmitter output power at a pre-determined level by sensing the collector current of the final amplifier transistor in the power module. The voltage comparator (IC4) compares the voltage obtained by the above collector current with a reference voltage, set using the microprocessor and PC.

An APC voltage proportional to the difference between the sensed voltage and the reference voltage appears at the output of IC4. This output voltage controls Q16, which in turn controls the voltage at pin 2 of the power module, which keeps the transmitter output power constant. The transmitter output power can be varied to 1W or 2W output power by the microprocessor, which in turn changes the reference voltage and hence the output power.



(Drive and final power amplifier, ANT switching, APC and transmitter output level switch)

Fig. 5 Transmit power system

CIRCUIT DESCRIPTION

5. PLL FREQUENCY SYNTHESIZER

5.1 PLL

The frequency step of the PLL circuit is 12.5 or 10kHz. A 12.8MHz reference oscillator signal is divided at IC3 by a fixed counter to produce the 12.5 or 10kHz reference frequency. The VCO output signal is buffer amplified by Q12, then divided in IC3, by a dual-modules programmable counter in this case. The divided signal is compared in phase with the 12.5 or 10kHz reference signal in the phase comparator also in IC3. The output signal from the phase comparator is low-pass filtered and passed to the VCO to control the oscillator frequency.

5.2 Voltage controlled oscillator(VCO)

The operating frequency is generated by Q604 in transmit mode and Q605 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from

the phase comparator, to the varactor diodes (D601 and D603 in transmit mode and D602 and D604 in receive mode). The T/R pin is set high in receive mode causing Q601 and Q602 to turn off Q604, and turn on Q605, and is set low for transmit mode. The outputs from Q604 and Q605 are amplified by Q603 and outputed to the buffer amplifiers.

5.3 Unlock detector

If a pulse signal appears at the LD pin of IC3, an unlock condition occurs, the DC voltage obtained from Q9 and Q8, causes the voltage applied to the UL pin of the microprocessor to go low. When the microprocessor detects this condition, the transmitter is disabled by ignoring the push-to-talk switch input signal.

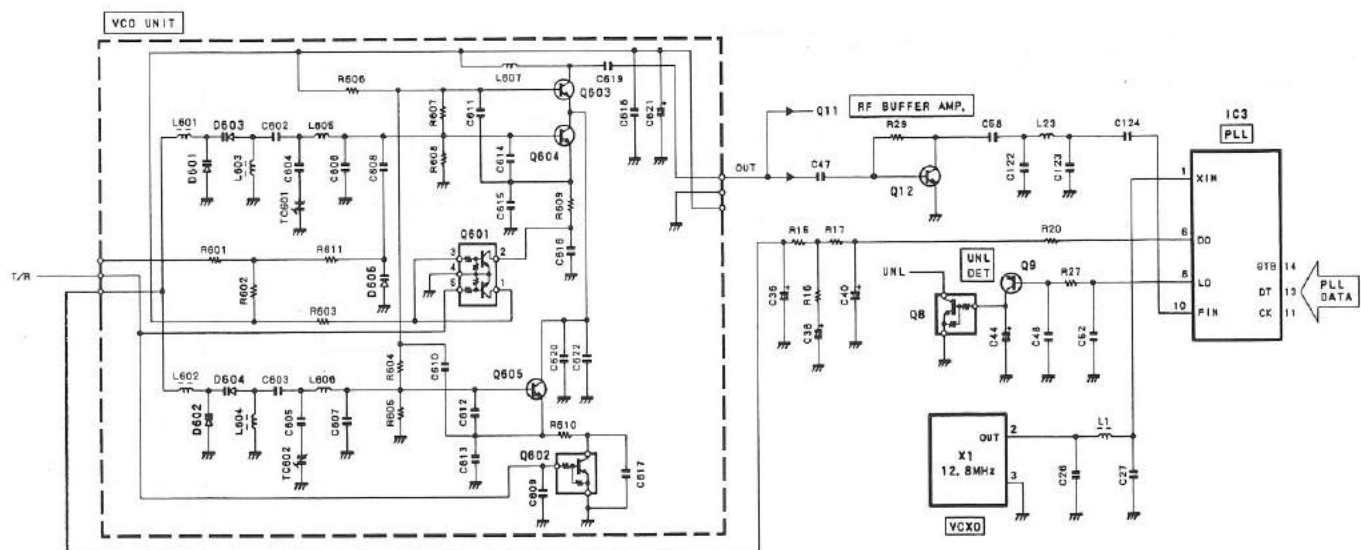


Fig .6 PLL frequency synthesizer

CIRCUIT DESCRIPTION

7. CONTROL UNIT

The control unit consists of microprocessor IC221 and its peripheral circuits. It controls the TX-RX unit and transfers data to and from the display section. The CPU (IC221) mainly performs the following :

- 1) Switching between transmission and reception by PTT signal input.
- 2) Reading channel, frequency, and program data from IC212, 220.
- 3) Sending frequency program data to the PLL.
- 4) Controlling squelch ON/OFF by the pulse signal input from the squelch circuit.
- 5) Controlling the audio mute circuit by decode data input.
- 6) Transmitting encode data.(QT, DQT)
- 7) Sending serial data to output expander (IC213) to control various function in the unit.

7.1 QT, DQT encode

The QT, DQT encoder tone is set by the data from the microprocessor. QT, DQT tone is generated by the microprocessor (IC221). The output is applied to the VCO and TCXO (X1) after passing through the D/A convertor (IC206) for tone deviation adjustment and the summing amplifier (IC201).

7.2 QT,DQT decode

A part of the recovered audio signal obtained at the amplifier IC208 (1/2) are the QT and DQT tones and are low pass filtered by IC214 (1/2) and passed to the microprocessor for decoding.

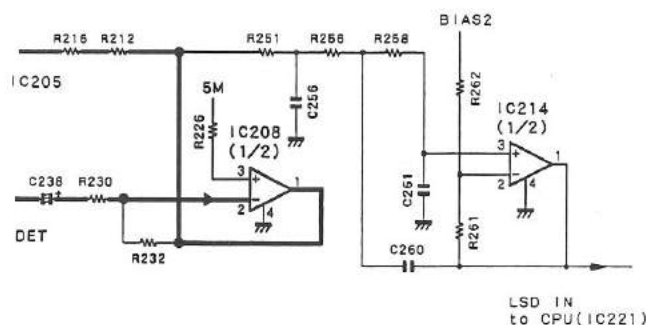
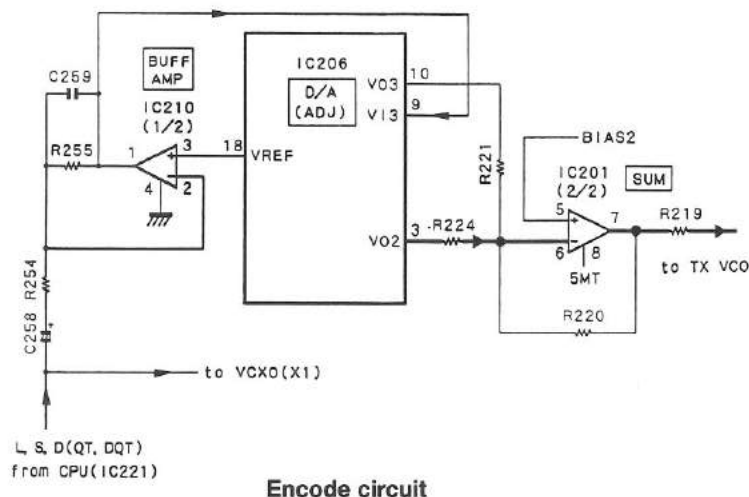


Fig. 8 QT, DQT encode, decode

CIRCUIT DESCRIPTION

8. DISPLAY CIRCUIT

The display circuit consists of the CPU, LCD, and peripheral circuits. The CPU (IC451) mainly controls the following functions :

- 1) Transmitting the ON/OFF serial data signal from the S switch, A switch, B switch, C switch and rotary encoder (channel selector) to the control unit.
- 2) Receiving the serial data signal from the control unit and displaying the data on the LCD. The LCD contains the 13-segment display and BUSY, CALL, SCAN, and other indicators. Controls the LEDs (TX, BUSY LAMP).
- 3) When the power is initially turned on, the reset circuit (IC452) resets both the display CPU (IC451) and the main CPU (IC221).

9. DTMF

9.1 DTMF encode

Once a signal is passed from the DTMF keypad to the microprocessor. The microprocessor passes this information to the DTMF encoder (IC219) for encoding. The encoded signal is then passed to IC206 (D/A convertor) for DTMF deviation adjustment. This signal provides a TX DTMF tone and a RX DTMF tone. The TX DTMF tone is passed to the pre-emphasis circuit (mic. amplifier) and then to the VCO. The RX DTMF tone is passed to the de-emphasis circuit, audio power amplifier and then to the speaker.

9.2 DTMF decode

The DTMF input signal from the DET line passes through the low pass filter (IC205 2/2) and is then passed to IC218, DTMF decoder. The decoded information is then processed by the microprocessor.

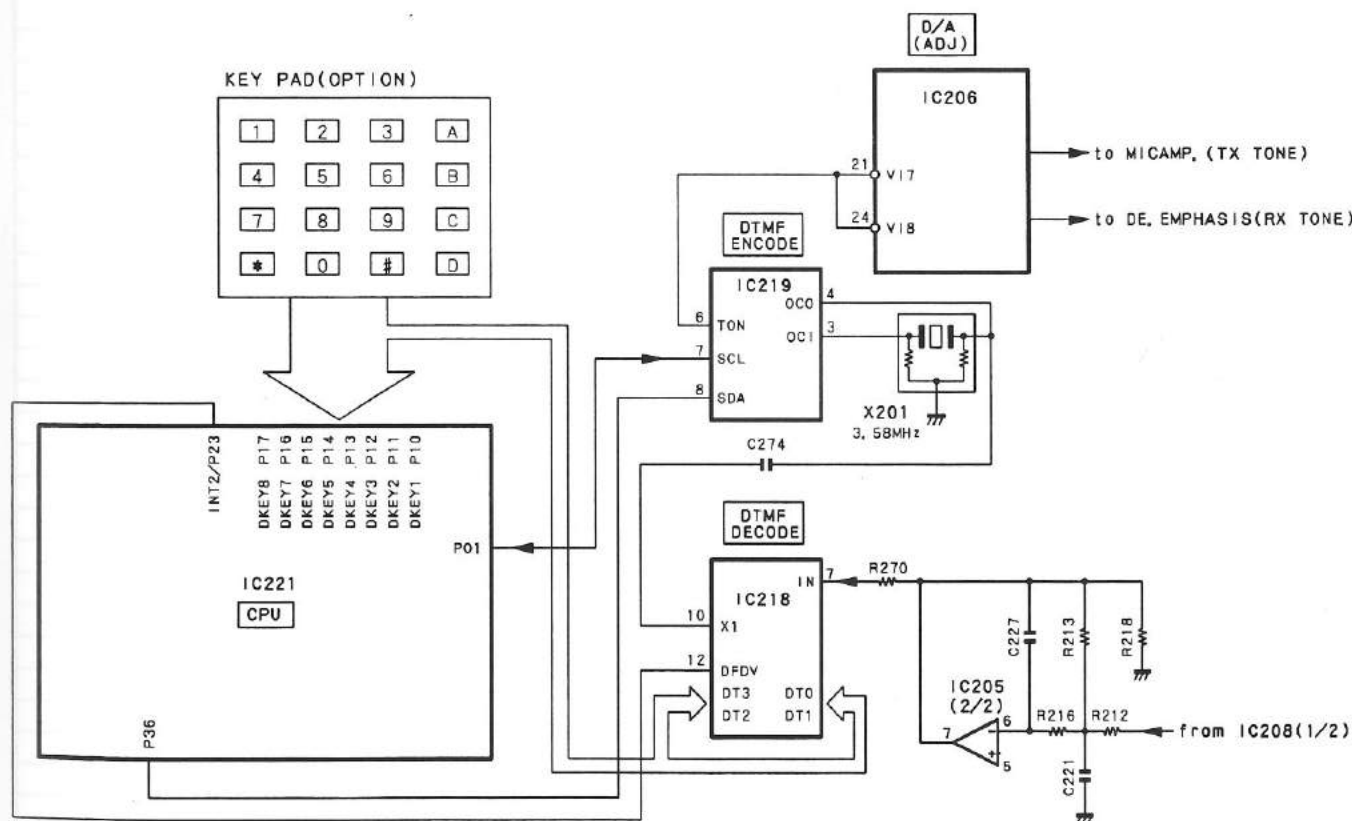
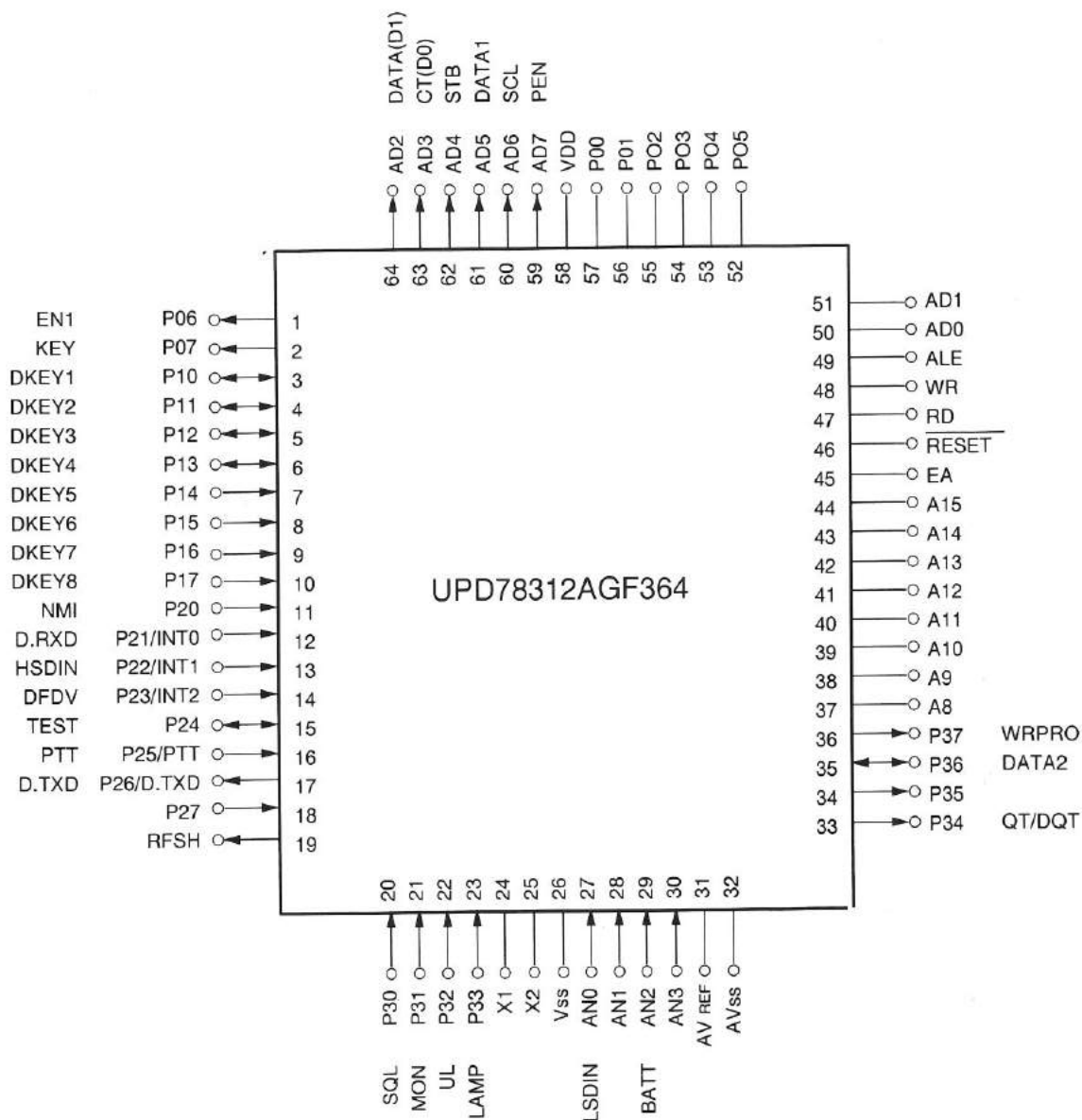


Fig. 9 DTMF. encode, decode

SEMICONDUCTOR DATA

Main microprocessor: UPD78312AGF364 (IC221)

● Pin connection



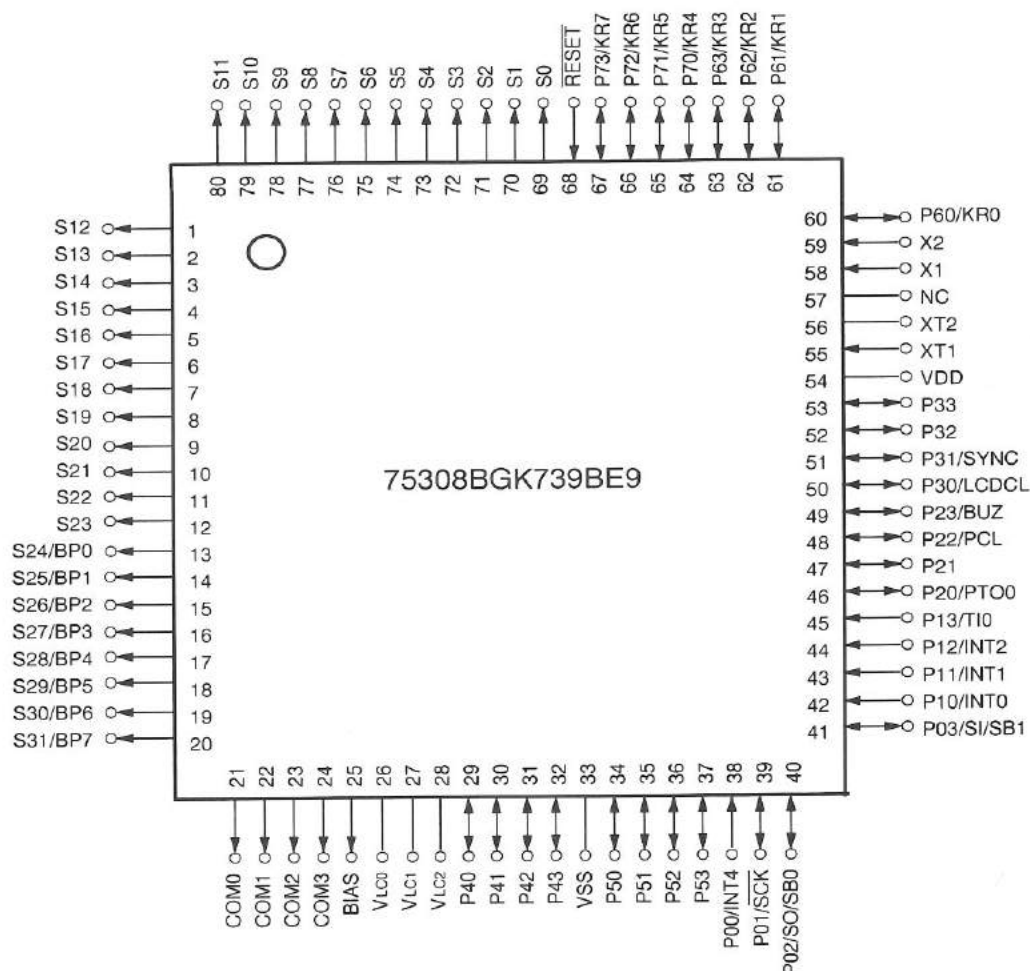
SEMICONDUCTOR DATA

● Pin function

Pin No.	Pin Name	Port Name	I/O	Function
1	P06	EN1	O	D/A converter enable output.
2	P07	KEY	O	T/R (Transmit Active "Low").
3	P10	DKEY1	I/O	Key Pad Row-1.
4	P11	DKEY2	I/O	Key Pad Row-2.
5	P12	DKEY3	I/O	Key Pad Row-3.
6	P13	DKEY4	I/O	Key Pad Row-4.
7	P14	DKEY5	I	Key Pad Column-4/DTMF Decode data-0.
8	P15	DKEY6	I	Key Pad Column-3/DTMF Decode data-1.
9	P16	DKEY7	I	Key Pad Column-2/DTMF Decode data-2.
10	P17	DKEY8	I	Key Pad Column-1/DTMF Decode data-3.
11	P20/NMI	NMI	I	GND.
12	P21/INTE0	D RXD	I	For display serial (RX) data input.
13	P22/INTE1	HSDIN	I	High speed decode data input.
14	P23/INTE2	DFDV	I	DTMF decode detect input.
15	P24/TXD	TEST	I/O	Data output with programming.
16	P25/RXD	PTT	I	PTT/program RXD.
17	P26/SCK	D TXD	O	For display serial (TX) data output.
18	P27/CTS		I	GND.
19	RFSH		O	
20	P30/CIO	SQL	I	Noise pulse input.
21	P33/CTRL0	MON	I	MONI switch input.
22	P31/CI1	UL	I	PLL unlock detect input.
23	P33/CTRL1	LAMP	I	LAMP switch input.
24	X1		—	12.000MHz (system clock).
25	X2		—	12.000MHz (system clock).
26	V _{SS}		—	GND.
27	AN0	LSDIN	I	Low speed data input.
28	AN1		I	Open (not used).
29	AN2	BATT	I	BATT check input.
30	AN3		I	
31	AV _{REF}		—	+5V.
32	AV _{SS}		—	GND.
33	P34/PWM0	QT/DQT	O	Low speed data (signalling) output.
34	P35/PWMI		O	Open (not used).
35	P36/CLR0/TO0	DATA2	I/O	Serial E ² PROM data output / input / Tone generator data output.
36	P37/CLR1/TO1	WRPRO	O	Parallel E ² PROM write protect output.
37~44	P50/A8~P57/A15		—	A8~A15 address bus.
45	EA		—	External access.
46	RESET		—	Power on reset.
47	RD		—	Read [bus].
48	WR		—	Write [bus].
49	ALE		—	Address latch.
50~57	P40/AD0 ~P47/AD7		—	AD0~AD7 address/data bus.
58	V _{DD}		—	GND.
59	P00	PEN	O	PLL enable output.
60	P01	SCL	O	Serial clock output.
61	P02	DATA1	O	PLL data output / Shift register data output / D/A converter data output.
62	P03	STB	O	Shift register strobe output.
63	P04	CT (D0)	O	Voice scrambler data output.
64	P05	DATA (D1)	O	Voice scrambler data output.

Display microprocessor: 75308BGK739BE9 (IC451)

● Pin connection



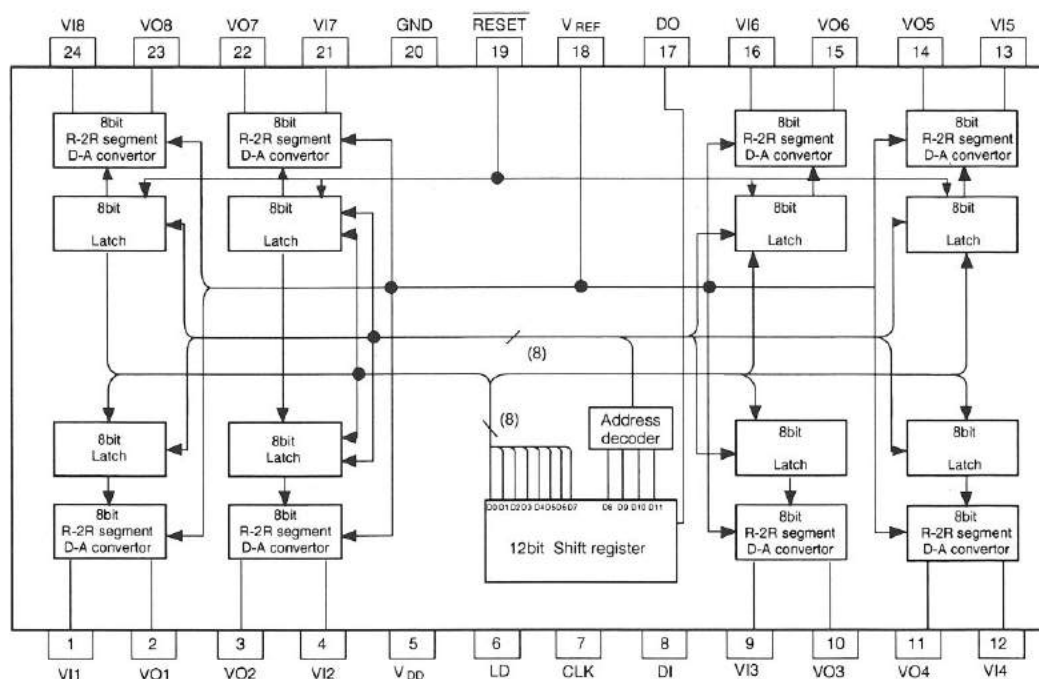
● Pin function

Pin No.	Pin Name	I/O	Function	Pin No.	Pin Name	I/O	Function
1-20	S12-S31	O	LCD output (S20-S0).	46-49	P20-P23	—	Open (not used).
21	COM0	O	LCD COM0.	50	P30	O	Serial (RX) data output.
22	COM1	O	LCD COM1.	51, 52	P31, 32	—	Open (not used).
23	COM2	O	LCD COM2.	53	P33	O	LAMP LED output.
24	COM3	O	LCD COM3.	54	V _{DD}	—	+5V.
25	BIAS	O	LCD power supply voltage.	55	XT1	—	+5V.
26-28	V _{LC0} -V _{LC2}	—	LCD voltage level generator.	56	XT2	—	Open (not used).
29-32	P40-P43	—	Open (not used).	57	NC	—	Open (not used).
33	V _{SS}	—	GND.	58, 59	X1, X2	I	System clock input.
34	P50	O	GREEN LED output.	60	P60	I	GND.
35	P51	O	RED LED output.	61	P61	O	Reset output.
36, 37	P52, P53	—	Open (not used).	62, 63	P62, 63	—	Open (not used).
38-40	P00-P02	I	GND.	64	P70	I	LO switch input.
41	P03	I	Rotary encoder input.	65	P71	I	TA switch input.
42	P10	I	Rotary encoder input.	66	P72	I	D/A switch input.
43	P11	I	Serial (TX) data input.	67	P73	I	SCN switch input.
44	P12	I	GND.	68	RESET	I	Power on reset input.
45	P13	O	Test output.	69-80	S0-S11	—	Open (not used).

SEMICONDUCTOR DATA

D/A converter : M62363FP (IC206)

● Block diagram

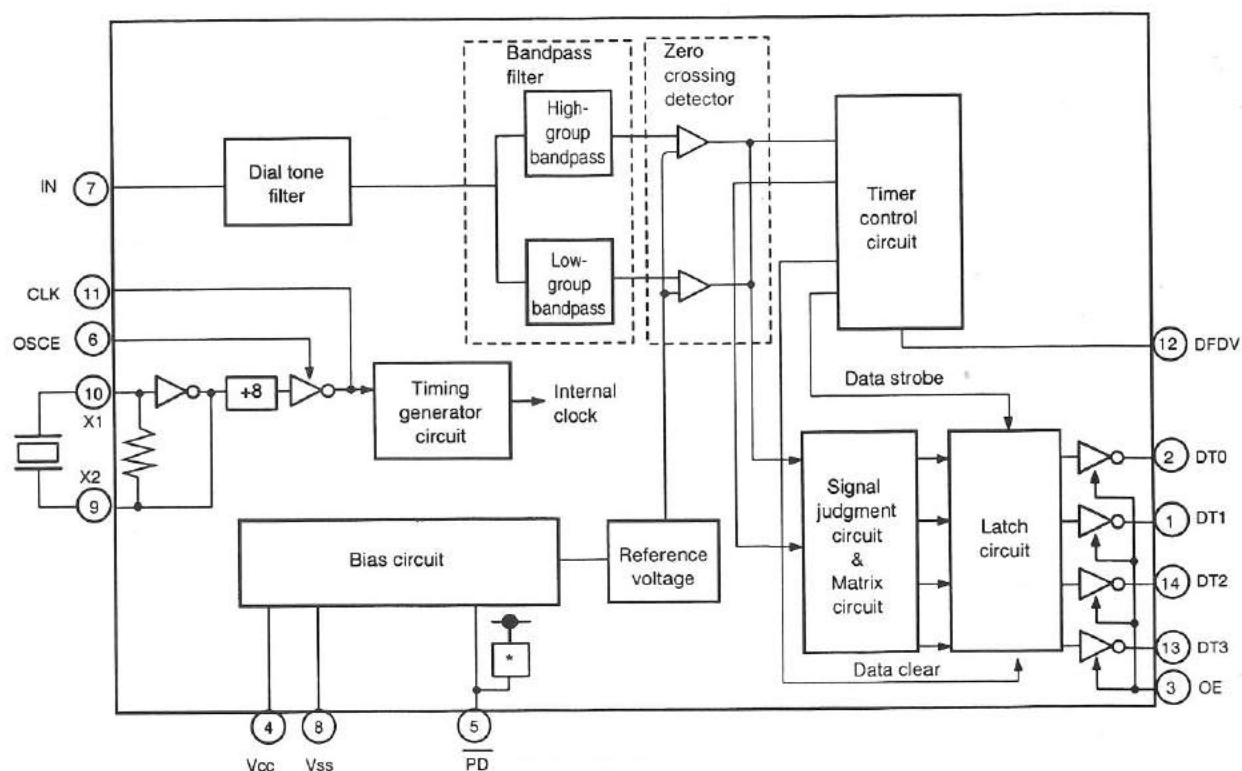


● Pin function

Pin No.	Pin code	Function
1	V _{IN1}	D/A converter input terminal
2	V _{OUT1}	8-bit resolution D/A terminal
3	V _{OUT2}	8-bit resolution D/A terminal
4	V _{IN2}	D/A converter input terminal
5	V _{DD}	Power supply terminal
6	LD	When the LD terminal is at the Low level, the clock input reception mode is entered, and data can be uptaken by the 12-bit shift register. Then at the threshold rising from Low to High, the 12-bit shift register value is loaded to the D/A output register.
7	CLK	Shift clock input terminal. With the rise of the shift clock, the input signal from the DI terminal is input to the 12-bit shift register.
8	DI	serial data input terminal. Input serial data 12 bits long.
9	V _{IN3}	D/A converter input terminal
10	V _{OUT3}	8-bit resolution D/A terminal
11	V _{OUT4}	8-bit resolution D/A terminal
12	V _{IN4}	D/A converter input terminal
13	V _{IN5}	D/A converter input terminal
14	V _{OUT5}	8-bit resolution D/A terminal
15	V _{OUT6}	8-bit resolution D/A terminal
16	V _{IN6}	D/A converter input terminal
17	DO	12-bit shift register MSB bit data is output.
18	V _{DAREF}	Terminal for determining the D/A conversion reference point level $V_o = (V_{IN} - V_{DAREF}) \times n/256 + V_{DAREF}$
19	RESET	When a Low level signal is input to the RESET terminal, all the D/A output register value become Low.
20	GND	GND terminal
21	V _{IN7}	D/A converter input terminal
22	V _{OUT7}	8-bit resolution D/A terminal
23	V _{OUT8}	8-bit resolution D/A terminal
24	V _{IN8}	D/A converter input terminal

DTMF decoder : TC35305P/F(IC218)

● Internal block diagram



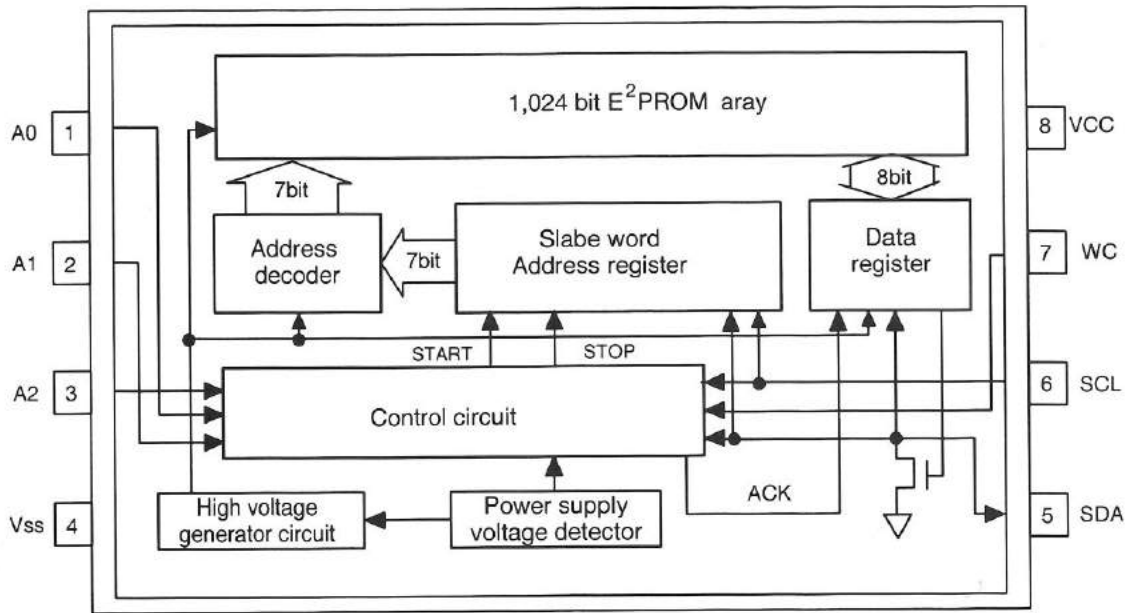
● Pin function

Pin No.	Pin Name	I/O	Function
1	D2	O	Reception data output terminal.
2	D1	O	OE = " L " ; high impedance OE = " H " ; output as the 4-bit code .
3	OE	I	D1~D4 3-state control terminal. OE = " H " ; enable OE = " L " ; high impedance
4	VDD	V	Power supply terminal (normally 5V)
5	PD	I	Enters standby mode when " L " is applied.
6	OSCE	I	Oscillation stage control terminal.
7	SIGIN	I	Signal input terminal.
8	VSS	G	Power supply terminal.(Nrmally 0V)
9	XOUT	O	3.579545MHz quartz crystal.
10	XIN	I	3.579545MHz quartz crystal. Connected to VDD when using an external clock.
11	CLK	I/O	OSCE = " H " ; external clock output OSCE = " H " ; external clock input
12	DV	O	Becomes " H " when an effective tone pair continues for the stipulated period and is detected.
13	D4	O	Reception data output terminal.
14	D3	O	OE = " L " ; high impedance OE = " H " ; output as the 4-bit code .

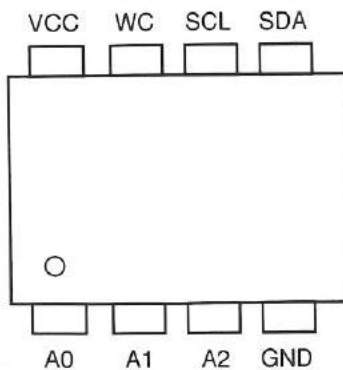
SEMICONDUCTOR DATA

E²PROM : XL24C01AF (IC220)
: BR24C01AF(IC220)

● Block diagram



● Pin layout



● Pin function

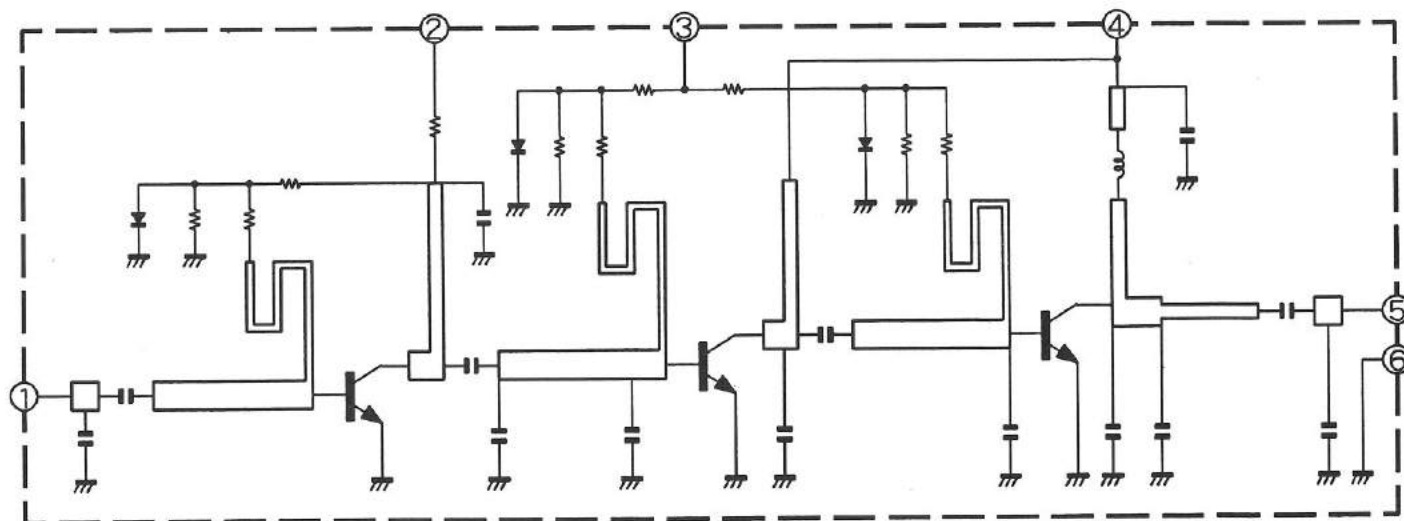
Pin Name	I/O	Function
VCC	-	Connect to the power supply.
GND	-	Reference voltage for all I/O, 0V.
A0•A1•A2	I	Slave address setting (terminal)
SCL	I	Serial clock input
SDA	I/O	slave and word address, serial data input
TEST	I	Connect to GND

- The SDA terminal is the N ch open drain output, so use with a pull-up resistor attached to the outside.

SEMICONDUCTOR DATA

Power module : M57786MB :K
 M57786NB :K2
 M57786HB :K3
 M57786LB :K4

● Equivalent circuit diagram



Electrode configuration

1. Input terminal
2. First power supply terminal
3. Base bias power supply terminal
4. End power supply terminal
5. Output terminal
6. Fin (earth)

DESCRIPTION OF COMPONENTS

TX-RX UNIT: TX-RX section (X57-4450-10) A/3

Ref. No.	Parts No.	Description
IC1	NJU7201U50	Voltage Regulator 5V
IC2	MC3372V	IF system
IC3	MB1512PFV-G-BND	Phase locked loop system
IC4	NJMI458M	Current detector(APC)
IC5	M57786MB(K, M)	RF Power amp. M57786NB: K2 ; M57786HB: K3 ; M57786LB : K4
Q1	DTC144EE	DC switch
Q2	2SJ243	DC switch
Q3	DTA114YE	DC switch
Q4	DTA123JE	DC switch
Q5	2SC4617 (S)	DC switch
Q6	2SB1119 (S)	DC switch
Q7	2SC4617 (S)	Ripple filter
Q8	DTC143EE	PLL unlock detector
Q9	2SA1832 (GR)	PLL unlock detector
Q10	2SC4215 (Y)	IF amp.
Q11	2SC5090	RF buffer amp.
Q12	2SC5066 (O)	RF buffer amp.
Q13	2SC4226 (R24)	RF amp. TX driver
Q14	SGM2014M	Mixer
Q15	2SC4703	RF amp. TX driver
Q16	2SB1119 (S)	DC amp.
Q17	2SC4094 (R37)	RF amp.
Q19	DTC144EE	DC switch
Q20	2SC4617 (S)	Temperature protection
D1	D1F20	Reverse polarity protection
D2	1SS368	Current steering
D3	1SS368	Current steering
D5	MI809	RF switch
D6	MI809	RF switch
D7	HSM88AS	Overload protection

TX-RX UNIT: Control section (X57-4450-10) B/3

Ref. No.	Parts No.	Description
IC201	TA75W01FU	Buffer amp., Summing amp.
IC202	TC7S66FU	Audio mute switch
IC203	NJU7201U50	Voltage Regulator 5V
IC204	NJU7201U50	Voltage Regulator 5V
IC205	TA75W01FU	Active filter
IC206	M62363FP	D/A Converter (Adjustment)
IC207	TA75W558FU	Active filter, Limiter
IC208	MC33172D	Audio amp., Active filter
IC209	TC74VHC573FS	Address latch
IC210	TA75W01FU	Buffer amp., DC shift
IC211	TA75W01FU	Active filter, Audio amp.
IC212	HN58C257T-20	E ² PROM
IC213	XRU4094BCFV or BU4094BCFV	Shift register
IC214	TA75W01FU	Active filter, Audio amp.
IC215	TC7S32FU	Address decoder
IC216	TA75W01FU	Active filter
IC217	TC7S04FU	Address decoder

DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Description
IC218	TC35305F	DTMF decoder
IC219	PCD3312CT	TONE (DTMF) encoder
IC220	XL24C01AF or BR24C01AF	E ² PROM
IC221	78312AGF3553BE	Microprocessor
IC222	TA7368F	Audio power amp.
IC223	TA75W558FU	Buffer amp.
Q201	2SJ243	DC switch
Q202	2SK1824	Audio mute switch
Q203	DTC144EE	DC switch
Q204	2SA1586 (Y, GR)	Audio mute switch
Q205	DTC144EE	DC switch
Q206	DTC144EE	DC switch
Q207	DTC144EE	DC switch
Q208	2SA1362 (GR)	DC switch
Q210	2SK1588	Audio mute switch
Q211	DTA144EE	DC switch
Q212	2SK879(Y)	Auto gain control switch
D202	DA221	Voltage clamp
D203	DA221	Voltage clamp
D204	DA221	AGC detector

TX-RX UNIT: Display section (X57-4450-10) C/3

Ref. No.	Parts No.	Description
IC451	75308BGK739BE9	Microprocessor (display)
IC452	S-8054ALB-LM-T1	Reset Switch
D451	B30-2019-05	Red, green (LED)
D452	B30-2047-05	LCD back light

VCO UNIT (X58-4140-10)

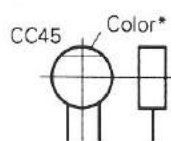
Ref. No.	Parts No.	Description
Q601	UMG2	DC switch
Q602	DTC144E	DC switch
Q603	2SC4226 (R24)	RF buffer amp.
Q604	2SC4226 (R24)	VCO oscillator
Q605	2SC4226 (R24)	VCO oscillator
D601	HVU350	VCO voltage control
D602	HVU350	VCO voltage control
D603	HVU350	VCO voltage control
D604	HVU350	VCO voltage control
D605	MA360	TX modulation

PARTS LIST

CAPACITORS

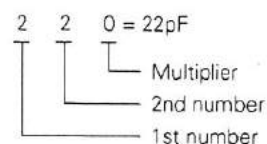
CC 45 TH 1H 220 J
1 2 3 4 5 6

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



• Capacitor value

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



• Temperature coefficient

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

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

Example: CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

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

(Less than 10pF)

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

• Voltage rating

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

• Chip capacitors

- (EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
- (Chip) (CH, RH, UJ, SL)
- (EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
- (Chip) (B, F)
- Refer to the table above.
- 1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

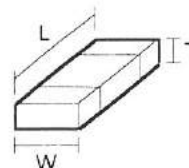
- (EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
- (Chip) (B, F)

• Carbon resistor (Normal type)

- (EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

- 1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS LIST

* New Parts.  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-353

TX-RX UNIT (X57-4450-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-353					
1	2C		A02-1829-11	PLASTIC CABINET	
3	3B		A13-1611-12	FRAME	
4	1D		A21-1544-03	DRESSING PANEL ACCESSORIES	
6	2D		A40-0635-13	BOTTOM PLATE	
7	3A	*	A62-0409-04	PANEL ASSY	
10	2C		B09-0344-03	CAP	
11	3C		B42-3394-14	STANDARD LABEL	
12	2C		B43-1100-04	KENWOOD BADGE	
13			B46-0409-40	WARRANTY CARD ACCESSORIES	
14		*	B62-0522-00	INSTRUCTION MANUAL (EN,SP,FR)	
15	3D	*	B72-0882-04	MODEL NAME PLATE	K
15	3D	*	B72-0883-04	MODEL NAME PLATE	K2
15	3D	*	B72-0884-04	MODEL NAME PLATE	K3
15	3D	*	B72-0885-04	MODEL NAME PLATE	K4
16	3B		E04-0192-05	RF COAXIAL CABLE RECEPTACLE	
17	2B,2D		E23-0474-14	BATTERY TERMINAL OUT SIDE	
18	2B		E23-0966-04	BATTERY TERMINAL IN SIDE	
19	2B		E23-0998-04	GROUND TERMINAL POWER MODULE	
20	2B		E37-0435-05	FLAT CABLE TX-RX CN1-CN201	
21	1B		E37-0437-05	LEAD WIRE WITH CONNECTOR SP	
-			E30-3074-05	TRUNK CABLE FOR SERVICE REPAIR	
-			E30-3216-05	TRUNK CABLE FOR SERVICE REPAIR	
-			E37-0556-05	LEAD WIRE WITH CONNECTOR	
25	2B		F10-2112-02	SHIELDING COVER TX-RX	
26	3B		F10-2165-13	SHIELDING PLATE TX-RX	
27	1B		F10-2114-03	SHIELDING PLATE CONTROLE	
28	2B		F10-2115-04	SHIELDING PLATE POWER MODULE	
30	2D		G01-0867-04	COIL SPRING RELEASE	
32	2B,2D		G11-0617-04	CUSHION BATTERY TERMINAL	
33	2B		G53-0742-14	PACKING HOLDER	
34	2A		G53-0766-03	PACKING SPEAKER/MIC	
35	3A		G53-0767-04	PACKING PANEL	
36		*	H52-0694-02	ITEM CARTON CASE	
37			H12-1470-02	PACKING FIXTURE	
38			H25-0029-04	PROTECTION BAG 60X110	
39			H25-0085-04	PROTECTION BAG 100X200	
40	2B		J19-1525-04	HOLDER BATTERY TERMINAL	
43	1B		J21-4461-13	HARDWARE FIXTURE SPEAKER	
44	2C		J21-4462-04	HARDWARE FIXTURE ACCESSORIES	
45	1C		J21-4463-04	HARDWARE FIXTURE ACCESSORIES	
46	2C		J21-4464-14	HARDWARE FIXTURE PTT	
47	2D		J21-4474-04	HARDWARE FIXTURE PTT	
50	3D		J29-0616-23	BELT HOOK ACCESSORIES	
52	1B		J39-0604-14	SPACER MIC	
54	3A		J69-0321-05	RING CH,VOL	
55	2D		J69-0330-05	RING BOTTOM PLATE	
56	3A		J69-0331-05	RING ANTENNA	
58	3B		J82-0032-35	FLAT CABLE PTT-CN202	
59	2A		J82-0033-05	FLAT CABLE VOL,CH-CN205,CN451	
61	1D		J99-0337-04	ADHESIVE TAPE ACCESSORIES	
65	2D		K29-4800-04	KNOB RELEASE	
66	2D		K29-4917-02	KNOB PTT	
67	3A		K29-4918-03	KNOB VOLUME	

Ref. No.	Address	New parts	Parts No.	Description	Destination
68	3A		K29-4919-03	KNOB KEY TOP	
69	3A		K29-4920-03	KNOB CHANNEL SELECTOR	
A	3B		N09-1492-05	PAN HEAD SCREW M2.6X3.5 BLACK	
B	2B,3B		N09-2053-05	SEMS SCREW M2X3.5	
C	2D		N09-2185-05	BINDING HEAD SCREW M2.6X8	
D	3A		N14-0545-04	CIRCULAR NUT CH,VOL	
E	3A		N14-0560-04	CIRCULAR NUT ANTENNA	
F	3B		N14-0562-04	CIRCULAR NUT CH,VOL(BOTTOM)	
G	2D		N17-1026-60	TOOTHED LOCK WASHER	
H	1B,3B		N39-2020-46	PAN HEAD MACHINE SCREW	
J	3B		N78-2080-46	PAN HEAD TAPTITE SCREW	
K	1B,2B		N09-2251-05	FLAT HEAD TAPTITE SCREW	
L	2B,3B		N88-2005-46	FLAT HEAD TAPTITE SCREW	
M	2C,3D		N99-0387-05	SCREW SET ACCESSORIES	
VR1	2A		R05-3471-05	POTENTIOMETER 10KA	
80			T90-0380-05	WHIP ANTENNA 450-520MHz ACC	K,K2K3
80			T90-0448-05	WHIP ANTENNA 400-450MHz ACC	K4
SP201	1B		T07-0314-05	LOUDSPEAKER(FULLRANGE)	
EN1	2A		W02-1814-05	ENCODER CHANNEL SELECTOR	

TX-RX UNIT (X57-4450-XX) -14 : K, -15 : K2, -16 : K3, -17 : K4

101	3A		B11-1107-04	REFLECTOR LCD	
D451			B30-2019-05	LED RED/GREEN	
D452			B30-2047-05	LED BACK LIGHT	
LCD1	3A	*	B38-0750-05	DISPLAY ASSY LCD	
C1			CC73GB1H101J	CHIP C	100PF J
C3-7			CK73GB1H102K	CHIP C	1000PF J
C8,9			CC73GB1H101J	CHIP C	100PF K
C10			CK73GB1H471K	CHIP C	470PF K
C11			CK73GB1H103K	CHIP C	0.010UF K
C12			CK73GB1H471K	CHIP C	470PF K
C13			C92-0513-05	CHIP-TAN	3.3UF 6.3WV
C14,15			CK73GB1H103K	CHIP C	0.010UF K
C16			C92-0543-05	CHIP-TAN	3.3UF 10WV
C17,18			CK73GB1H471K	CHIP C	470PF K
C19			C92-0519-05	CHIP-TAN	1.0UF 25WV
C20			CK73GB1H102K	CHIP C	1000PF K
C21			C92-0543-05	CHIP-TAN	3.3UF 10WV
C22,23			CK73GB1H103K	CHIP C	0.010UF K
C24			CK73GB1C393K	CHIP C	0.039UF K
C25			CK73GB1C104K	CHIP C	0.10UF K
C26,27			CC73GB1H220J	CHIP C	22PF J
C28			C92-0507-05	CHIP-TAN	4.7UF 6.3WV
C29			CK73GB1H102K	CHIP C	1000PF K
C30			CC73GB1H101J	CHIP C	100PF J
C31			CK73GB1H103K	CHIP C	0.010UF K
C32,33			CC73GB1H180J	CHIP C	18PF J
C34			CK73GB1H471K	CHIP C	470PF K
C35			CK73GB1C104K	CHIP C	0.10UF K
C36			C92-0001-05	CHIP-TAN	0.10UF 35WV
C37			C92-0513-05	CHIP-TAN	3.3UF 6.3WV
C38			C92-0543-05	CHIP-TAN	3.3UF 10WV

PARTS LIST

TX-RX UNIT (X57-4450-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C39			CK73GB1H103K	CHIP C 0.010UF K		C98			CC73FCH1H080D	CHIP C 8.0PF D	K
C40			C92-0002-05	CHIP-TAN 0.22UF 35WV		C99			CK73GB1C104K	CHIP C 0.10UF K	
C41 42			CK73GB1H102K	CHIP C 1000PF K		C100			CC73FCH1H1R5C	CHIP C 1.5PF C	K
C43			CK73GB1H103K	CHIP C 0.010UF K		C101			CK73GB1H102K	CHIP C 1000PF K	
C44			C92-0004-05	CHIP-TAN 1.0UF 16WV		C102			CC73GCH1H180J	CHIP C 18PF J	K,K2K3
C45			CK73GB1H471K	CHIP C 470PF K		C102			CC73GCH1H220J	CHIP C 22PF J	K4
C46			CC73GCH1H180J	CHIP C 18PF J		C103			CC73FCH1H050C	CHIP C 5.0PF C	K3
C47			CC73GCH1H100D	CHIP C 10PF D		C103			CC73FCH1H080D	CHIP C 8.0PF D	K2
C48			CK73GB1H102K	CHIP C 1000PF K		C103			CC73FCH1H080D	CHIP C 8.0PF D	K4
C49			CK73GB1H103K	CHIP C 0.010UF K	K,K4	C103			CC73FCH1H100D	CHIP C 10PF D	K
C50			CK73GB1H102K	CHIP C 1000PF K		C104			CC73FCH1H010C	CHIP C 1.0PF C	K3,K4
C51			CC73GCH1H101J	CHIP C 100PF J		C104			CC73FCH1H1R5C	CHIP C 1.5PF C	K,K2
C52			CK73GB1H471K	CHIP C 470PF K		C105			CK73GB1H103K	CHIP C 0.010UF K	
C53			CK73GB1C104K	CHIP C 0.10UF K	K2,K3	C106			CK73GB1H102K	CHIP C 1000PF K	
C53			CK73GB1H102K	CHIP C 1000PF K	K,K4	C107			CC73FCH1H070D	CHIP C 7.0PF D	K3
C54			C92-0513-05	CHIP-TAN 3.3UF 6.3WV		C107			CC73FCH1H080D	CHIP C 8.0PF D	K2,K4
C55			CK73GB1H102K	CHIP C 1000PF K		C107			CC73FCH1H100D	CHIP C 10PF D	K
C56			CC73GCH1H040C	CHIP C 4.0PF C	K2,K3	C108			CC73FCH1H010C	CHIP C 1.0PF C	K
C56			CC73GCH1H050C	CHIP C 5.0PF C	K	C108			CC73FCH1H050C	CHIP C 5.0PF C	K2,K3
C56			CC73GCH1H090D	CHIP C 9.0PF D	K4	C108			CC73FCH1H080D	CHIP C 6.0PF D	K4
C57			CK73GB1H103K	CHIP C 0.010UF K		C109			C92-0502-05	CHIP-TAN 0.33UF 35WV	K2K3K4
C58			CC73GCH1H030C	CHIP C 3.0PF C	K3	C109			C92-0511-05	CHIP-TAN 0.15UF 35WV	K
C58			CC73GCH1H040C	CHIP C 4.0PF C	K	C110,111			CK73GB1H102K	CHIP C 1000PF K	
C58			CC73GCH1H050C	CHIP C 5.0PF C	K2	C112			CC73FCH1H0R5C	CHIP C 0.5PF C	K2K3K4
C58			CC73GCH1H080D	CHIP C 8.0PF D	K4	C112			CC73FCH1H070D	CHIP C 7.0PF D	K
C59			CC73GCH1H080D	CHIP C 6.0PF D		C113			CC73GCH1H470J	CHIP C 47PF J	K,K4
C60			CK73GB1H471K	CHIP C 470PF K		C114			CK73GB1H102K	CHIP C 1000PF K	
C61			CK73GB1H103K	CHIP C 0.010UF K		C115			CC73FCH1H040C	CHIP C 4.0PF C	K2,K3
C62			CC73GCH1H220J	CHIP C 22PF J		C115			CC73FCH1H050C	CHIP C 5.0PF C	K
C63			CK73GB1H103K	CHIP C 0.010UF K		C115			CC73FCH1H080D	CHIP C 6.0PF D	K4
C64-66			CK73GB1H471K	CHIP C 470PF K		C116			CK73GB1H102K	CHIP C 1000PF K	
C67			CK73GB1H103K	CHIP C 0.010UF K		C117			CK73FB1H102K	CHIP C 1000PF K	
C68			CC73GCH1H150J	CHIP C 15PF J		C118			CC73GCH1H040C	CHIP C 4.0PF C	K2K3K4
C69			CC73GCH1H050C	CHIP C 5.0PF C	K,K2K3	C118			CC73GCH1H100D	CHIP C 10PF D	K
C69			CC73GCH1H090D	CHIP C 9.0PF D	K4	C119			CC73GCH1H060D	CHIP C 6.0PF D	K4
C70			CK73GB1H103K	CHIP C 0.010UF K		C119			CC73GCH1H101J	CHIP C 100PF J	K
C71-73			CC73GCH1H101J	CHIP C 100PF J		C119			CC73GCH1H470J	CHIP C 47PF J	K2,K3
C74,75			CK73GB1H471K	CHIP C 470PF K		C121			CC73GCH1H020C	CHIP C 2.0PF C	K2,K3
C76			CK73GB1H103K	CHIP C 0.010UF K		C121			CC73GCH1H030C	CHIP C 3.0PF C	K4
C77			CK73GB1H471K	CHIP C 470PF K		C121			CC73GCH1H1R5C	CHIP C 1.5PF C	K
C78			CC73GCH1H030C	CHIP C 3.0PF C	K,K2K4	C122,123			CC73GCH1H070D	CHIP C 7.0PF D	
C78			CC73GCH1H1R5C	CHIP C 1.5PF C	K3	C124			CK73GB1H103K	CHIP C 0.010UF K	
C79			CC73GCH1H040C	CHIP C 4.0PF C	K,K3	C125			CK73GB1H102K	CHIP C 1000PF K	
C79			CC73GCH1H050C	CHIP C 5.0PF C	K2,K4	C126			CK73GB1H103K	CHIP C 0.010UF K	
C80			CC73GCH1H020C	CHIP C 2.0PF C	K3	C128			CK73GB1C104K	CHIP C 0.10UF K	
C80			CC73GCH1H030C	CHIP C 3.0PF C	K,K2	C129			CK73GB1H103K	CHIP C 0.010UF K	
C80			CC73GCH1H040C	CHIP C 4.0PF C	K4	C130			CK73GB1H102K	CHIP C 1000PF K	
C81			CK73GB1H102K	CHIP C 1000PF K		C134			CC73GCH1H050C	CHIP C 5.0PF C	K
C82			C92-0001-05	CHIP-TAN 0.10UF 35WV	K2K3K4	021100					
C82			C92-0004-05	CHIP-TAN 1.0UF 16WV	K	C201			CK73GB1H102K	CHIP C 1000PF K	
C83			C92-0578-05	CHIP-ELE 22UF 16WV		C202			CC73GCH1H101J	CHIP C 100PF J	
C84-87			CK73GB1H102K	CHIP C 1000PF K		C203,204			CK73GB1H102K	CHIP C 1000PF K	
C89			C92-0536-05	CHIP-TAN 10UF 10WV		C205			CC73GCH1H101J	CHIP C 100PF J	
C90			CC73GCH1H030C	CHIP C 3.0PF C	K,K2	C206,207			CK73GB1H102K	CHIP C 1000PF K	
C90			CC73GCH1H040C	CHIP C 4.0PF C	K3,K4	C208			CC73GCH1H101J	CHIP C 100PF J	
C91			C92-0578-05	CHIP-ELE 22UF 16WV		C209			CK73GB1H102K	CHIP C 1000PF K	
C92-94			CK73GB1H102K	CHIP C 1000PF K		C210-216			CC73GCH1H101J	CHIP C 100PF J	
C95			CK73GB1H471K	CHIP C 470PF K		C217			CK73GB1H102K	CHIP C 1000PF K	
C96			CK73GB1H103K	CHIP C 0.010UF K		C218			CK73GB1H103K	CHIP C 0.010UF K	
C97			CK73GB1H102K	CHIP C 1000PF K		C219,220			CK73GB1H102K	CHIP C 1000PF K	
						C221			CK73GB1H472K	CHIP C 4700PF K	

PARTS LIST

TX-RX UNIT (X57-4450-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C222			CK73GB1H103K	CHIP C 0.010UF K		C318,319			CK73HB1E221K	CHIP C 220PF K	
C223,224			C92-0519-05	CHIP-TAN 1.0UF 25WV		C323			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C225			C92-0543-05	CHIP-TAN 3.3UF 10WV		C324-326			CK73HB1E221K	CHIP C 220PF K	
C226			CK73GB1H103K	CHIP C 0.010UF K		C327			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C227			CK73GB1H102K	CHIP C 1000PF K		C328			CC73GCH1H101J	CHIP C 100PF J	
C228,229			CK73GB1H103K	CHIP C 0.010UF K		C329			C92-0514-05	CHIP-TAN 2.2UF 10WV	
C231			CK73GB1H103K	CHIP C 0.010UF K		C331			CK73HB1C103K	CHIP C 0.010UF K	
C233			CK73GB1E223K	CHIP C 0.022UF K		C332			CK73GB1C473K	CHIP C 0.047UF K	
C234			CK73GB1H103K	CHIP C 0.010UF K		C333			CK73GB1H102K	CHIP C 1000PF K	
C235			C92-0543-05	CHIP-TAN 3.3UF 10WV		C334			C92-0002-05	CHIP-TAN 0.22UF 35WV	
C236			CK73GB1H682K	CHIP C 6800PF K		C335			CC73HCH1E680J	CHIP C 68PF J	
C237			C92-0543-05	CHIP-TAN 3.3UF 10WV		C337,338			CC73HCH1E330J	CHIP C 33PF J	
C238			C92-0536-05	CHIP-TAN 10UF 10WV		C339			CK73GB1H472K	CHIP C 4700PF K	
C239			CK73GB1E223K	CHIP C 0.022UF K		C340			C92-0546-05	CHIP-TAN 68UF 6.3WV	
C240			CC73GCH1H470J	CHIP C 47PF J		C342			CK73GB1H103K	CHIP C 0.010UF K	
C241			CK73GB1H103K	CHIP C 0.010UF K		C343			CK73GB1H102K	CHIP C 1000PF K	
C242			C92-0543-05	CHIP-TAN 3.3UF 10WV		C344			CC73GCH1H101J	CHIP C 100PF J	
C243-245			CK73GB1H103K	CHIP C 0.010UF K		C345			CK73GB1H102K	CHIP C 1000PF K	
C246			CK73GB1H102K	CHIP C 1000PF K		C347-350			CK73GB1H102K	CHIP C 1000PF K	
C247			CK73GB1H103K	CHIP C 0.010UF K		C352			CK73GB1C104K	CHIP C 0.10UF K	
C248			CK73GB1C473K	CHIP C 0.047UF K		C354			C92-0543-05	CHIP-TAN 3.3UF 10WV	
C249			C92-0543-05	CHIP-TAN 3.3UF 10WV		C355			CK73HB1E472K	CHIP C 4700PF K	
C251			CC73GCH1H270J	CHIP C 27PF J		C357			CK73GB1C104K	CHIP C 0.10UF K	
C252			CK73GB1H103K	CHIP C 0.010UF K		C358			CC73GCH1H100D	CHIP C 10PF D	
C253			CC73GCH1H100D	CHIP C 10PF D		C359			CK73FB1A105K	CHIP C 1.0UF K	
C254			CK73GB1E223K	CHIP C 0.022UF K		C360			CK73FB1E104K	CHIP C 0.10UF K	
C255			CK73GB1H103K	CHIP C 0.010UF K		C361			CK73GB1C104K	CHIP C 0.10UF K	
C256			CK73GB1C273K	CHIP C 0.027UF K		C363			C92-0566-05	CHIP-TAN 10UF 6.3WV	
C257			CK73FB1A105K	CHIP C 1.0UF K		C364,365			CK73GB1H471K	CHIP C 470PF K	
C258			C92-0543-05	CHIP-TAN 3.3UF 10WV		C452-454			CC73GCH1H101J	CHIP C 100PF J	
C259			CK73GB1H561K	CHIP C 560PF K		C455			CK73GB1H103K	CHIP C 0.010UF K	
C260			CK73GB1C393K	CHIP C 0.039UF K		C456			CK73GB1E223K	CHIP C 0.022UF K	
C261			CK73GB1H102K	CHIP C 1000PF K		111	3A		E29-1125-04	INTER CONNECTOR	
C262			CK73GB1H103K	CHIP C 0.010UF K		CN1			E40-5717-05	FLAT CABLE CONNECTOR	
C263			CK73GB1H332K	CHIP C 3300PF K		CN201			E40-5719-05	FLAT CABLE CONNECTOR	
C264			CK73GB1H103K	CHIP C 0.010UF K		CN202			E40-5660-05	FLAT CABLE CONNECTOR	
C265			C92-0519-05	CHIP-TAN 1.0UF 25WV		CN204			E40-5657-05	FLAT CABLE CONNECTOR	
C266			CK73GB1H122K	CHIP C 1200PF K		CN205			E40-5614-05	FLAT CABLE CONNECTOR	
C267			CK73GB1H102K	CHIP C 1000PF K		CN206			E40-5662-05	PIN CONNECTOR	
C268			CC73FCH1H751J	CHIP C 750PF J		CN451			E40-5718-05	FLAT CABLE CONNECTOR	
C269			CK73HB1E102K	CHIP C 1000PF K		J1			E03-0170-05	DC JACK	
C270			CK73GB1C104K	CHIP C 0.10UF K		J201			E11-0457-05	PHONE JACK	
C271,272			CK73GB1H103K	CHIP C 0.010UF K		F1			F53-0104-05	FUSE 4A/125V	
C273			C92-0543-05	CHIP-TAN 3.3UF 10WV		116			J21-4458-14	HARDWARE FIXTURE LCD	
C274			CC73GCH1H101J	CHIP C 100PF J		-			J30-1212-04	SPACER	
C275			CC73GCH1H181J	CHIP C 180PF J		CD1			L79-1065-05	TUNING COIL	
C276			CK73GB1H332K	CHIP C 3300PF K		CF1,2	*		L72-0915-05	CERAMIC FILTER 455kHz	
C277			CK73HB1C103K	CHIP C 0.010UF K		L1			L40-1001-37	SMALL FIXED INDUCTOR 1.0UH	
C278-280			CK73HB1E221K	CHIP C 220PF K		L2			L40-1095-34	SMALL FIXED INDUCTOR 1UH	
C281			CC73HCH1E101J	CHIP C 100PF J		L4			L40-2271-35	SMALL FIXED INDUCTOR 22nH	
C282-291			CK73HB1E221K	CHIP C 220PF K		L5			L40-2271-36	SMALL FIXED INDUCTOR 22nH	
C292			CK73GB1H221K	CHIP C 220PF K		L6			L40-2271-35	SMALL FIXED INDUCTOR 22nH	
C293,294			CK73HB1E221K	CHIP C 220PF K		L7			L40-2781-37	SMALL FIXED INDUCTOR 0.27UH	
C300,301			CK73HB1E221K	CHIP C 220PF K		L8			L40-5681-37	SMALL FIXED INDUCTOR 0.56UH	
C302			CK73GB1H103K	CHIP C 0.010UF K		L9			L40-1871-35	SMALL FIXED INDUCTOR 18nH	K,K2K3
C303			CK73FF1C334Z	CHIP C 0.33UF Z		L9			L40-2271-35	SMALL FIXED INDUCTOR 22nH	K4
C304-311			CK73HB1E221K	CHIP C 220PF K		L10,11			L40-2271-35	SMALL FIXED INDUCTOR 22nH	
C312			CK73GB1H221K	CHIP C 220PF K							
C313-315			CK73HB1E221K	CHIP C 220PF K							
C316,317			CK73HB1E471K	CHIP C 470PF K							

PARTS LIST

TX-RX UNIT (X57-4450-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L12			L79-1073-05	FILTER 460MHz	K	R33			RK73GB1J101J	CHIP R 100 J 1/16W	K4
L12			L79-1147-05	FILTER 500MHz	K3	R33			RK73GB1J470J	CHIP R 47 J 1/16W	K
L12			L79-1149-05	FILTER 480MHz	K2	R33			RK73GB1J560J	CHIP R 56 J 1/16W	K2
L12			L79-1151-05	FILTER 413MHz	K4	R33			RK73GB1J680J	CHIP R 68 J 1/16W	K3
L13			L40-1871-35	SMALL FIXED INDUCTOR 18nH	K,K2	R34			RK73GB1J331J	CHIP R 330 J 1/16W	
L13			L40-2271-35	SMALL FIXED INDUCTOR 22nH	K3,K4	R35			RK73GB1J472J	CHIP R 4.7K J 1/16W	K3
L14			L33-0760-05	CHOKE COIL 1T	K2K3K4	R35			RK73GB1J562J	CHIP R 5.6K J 1/16W	K,K2K4
L14-16			L33-0762-05	CHOKE COIL 3T	K	R36-39			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L15			L33-0762-05	CHOKE COIL 3T	K2K3K4	R40			RK73GB1J560J	CHIP R 56 J 1/16W	
L16			L33-0760-05	CHOKE COIL 1T	K2K3K4	R41			RK73GB1J100J	CHIP R 10 J 1/16W	
L17			L40-1295-34	SMALL FIXED INDUCTOR 1.2UH		R42			RK73GB1J101J	CHIP R 100 J 1/16W	
L18			L79-1074-05	FILTER 460MHz	K	R43			RK73GB1J223J	CHIP R 22K J 1/16W	K4
L18			L79-1146-05	FILTER 480MHz	K2	R43			RK73GB1J273J	CHIP R 27K J 1/16W	K2
L18			L79-1148-05	FILTER 413MHz	K4	R43			RK73GB1J822J	CHIP R 8.2K J 1/16W	K,K3
L18			L79-1150-05	FILTER 500MHz	K3	R44			RK73GB1J153J	CHIP R 15K J 1/16W	
L19			L33-0762-05	CHOKE COIL 3T		R45			RK73GB1J471J	CHIP R 470 J 1/16W	
L20			L40-1571-48	SMALL FIXED INDUCTOR 15nH	K	R46			RK73GB1J100J	CHIP R 10 J 1/16W	K,K2K3
L20			L40-5682-48	SMALL FIXED INDUCTOR 560nH	K2K3K4	R46			RK73GB1J330J	CHIP R 33 J 1/16W	K4
L21			L92-0136-05	FERRITE TIP		R47			RK73GB1J100J	CHIP R 10 J 1/16W	
L22			L92-0137-05	FERRITE TIP		R49			RK73GB1J333J	CHIP R 33K J 1/16W	
L23			L40-1571-36	SMALL FIXED INDUCTOR 15nH	K,K2K3	R50			RK73GB1J330J	CHIP R 33 J 1/16W	
L23			L40-1871-36	SMALL FIXED INDUCTOR 18nH	K4	R51			RK73GB1J473J	CHIP R 47K J 1/16W	
L24			L40-1571-36	SMALL FIXED INDUCTOR 15nH	K	R52			RK73GB1J100J	CHIP R 10 J 1/16W	
L201			L40-1005-48	SMALL FIXED INDUCTOR 10UH		R53			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L202			L40-1005-34	SMALL FIXED INDUCTOR 10UH		R54			R92-1218-05	CHIP R 0.1 J 1/2W	
X1			L77-1583-15	CRYSTAL RESONATOR 12.8MHz		R55			RK73GB1J331J	CHIP R 330 J 1/16W	
X2			L77-1527-15	CRYSTAL RESONATOR 44.595MHz		R56			RK73GB1J222J	CHIP R 2.2K J 1/16W	
X201			L78-0332-15	RESONATOR 3.58MHz		R57			RK73GB1J822J	CHIP R 8.2K J 1/16W	
X202			L78-0331-05	RESONATOR 12MHz		R58			RK73GB1J104J	CHIP R 100K J 1/16W	
X451			L78-0336-05	RESONATOR 4.19MHz		R59			RK73GB1J470J	CHIP R 47 J 1/16W	
XF1			L71-0409-15	CRYSTAL FILTER 45.050MHz		R60			RK73GB1J104J	CHIP R 100K J 1/16W	
R1			RK73GB1J104J	CHIP R 100K J 1/16W		R61			RK73GB1J154J	CHIP R 150K J 1/16W	
R2,3			RK73GB1J224J	CHIP R 220K J 1/16W		R62,63			RK73GB1J104J	CHIP R 100K J 1/16W	
R4			RK73GB1J330J	CHIP R 33 J 1/16W		R64			RK73GB1J224J	CHIP R 220K J 1/16W	
R5			RK73GB1J102J	CHIP R 1.0K J 1/16W		R65			RK73GB1J104J	CHIP R 100K J 1/16W	
R6			RK73GB1J473J	CHIP R 47K J 1/16W		R66			RK73FB2A181J	CHIP R 180 J 1/10W	
R7			RK73GB1J472J	CHIP R 4.7K J 1/16W		R68			RK73FB2A181J	CHIP R 180 J 1/10W	
R8			RK73GB1J473J	CHIP R 47K J 1/16W		R69			RK73GB1J101J	CHIP R 100 J 1/16W	
R9			RK73GB1J472J	CHIP R 4.7K J 1/16W		R70			RK73GB1J330J	CHIP R 33 J 1/16W	
R13			RK73GB1J102J	CHIP R 1.0K J 1/16W		R71			R92-1252-05	CHIP R 0 OHM	K2K3K4
R14			RK73GB1J220J	CHIP R 22 J 1/16W		R72			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R15			RK73GB1J221J	CHIP R 220 J 1/16W		R201-210			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R16			RK73GB1J102J	CHIP R 1.0K J 1/16W	K,K2	R211			RK73GB1J471J	CHIP R 470 J 1/16W	
R16			RK73GB1J821J	CHIP R 820 J 1/16W	K3,K4	R212,213			RK73GB1J223J	CHIP R 22K J 1/16W	
R17			RK73GB1J221J	CHIP R 220 J 1/16W		R215			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R18			RK73GB1J102J	CHIP R 1.0K J 1/16W		R216			RK73GB1J183J	CHIP R 18K J 1/16W	
R20			RK73HB1J221J	CHIP R 220 J 1/16W		R218			RK73GB1J103J	CHIP R 10K J 1/16W	
R21			RK73GB1J151J	CHIP R 150 J 1/16W		R219			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R22,23			RK73GB1J101J	CHIP R 100 J 1/16W		R220			RK73GB1J124J	CHIP R 120K J 1/16W	
R24			RK73GB1J330J	CHIP R 33 J 1/16W		R221			RK73GB1J104J	CHIP R 100K J 1/16W	
R25			RK73GB1J104J	CHIP R 100K J 1/16W		R222			RK73GB1J224J	CHIP R 220K J 1/16W	
R26			RK73GB1J272J	CHIP R 2.7K J 1/16W		R223			RK73GB1J104J	CHIP R 100K J 1/16W	
R27			RK73GB1J333J	CHIP R 33K J 1/16W		R224			RK73GB1J563J	CHIP R 56K J 1/16W	
R28			RK73GB1J124J	CHIP R 120K J 1/16W	K2K3K4	R225			RK73GB1J153J	CHIP R 15K J 1/16W	
R28,29			RK73GB1J184J	CHIP R 180K J 1/16W	K	R226			RK73GB1J123J	CHIP R 12K J 1/16W	
R29			RK73GB1J184J	CHIP R 180K J 1/16W	K2K3K4	R227			RK73GB1J103J	CHIP R 10K J 1/16W	
R30			RK73GB1J330J	CHIP R 33 J 1/16W		R228			RK73GB1J823J	CHIP R 82K J 1/16W	
R31			RK73GB1J684J	CHIP R 680K J 1/16W		R229			RK73GB1J473J	CHIP R 47K J 1/16W	
R32			RK73GB1J681J	CHIP R 680 J 1/16W		R230			RK73GB1J683J	CHIP R 68K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-4450-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R231			RK73GB1J224J	CHIP R 220K J 1/16W		R313-315			RK73HB1J101J	CHIP R 100 J 1/16W	
R232			RK73GB1J154J	CHIP R 150K J 1/16W		R316			RK73GB1J101J	CHIP R 100 J 1/16W	
						R317			RK73GB1J473J	CHIP R 47K J 1/16W	
R233			RK73GB1J273J	CHIP R 27K J 1/16W		R318			RK73HB1J104J	CHIP R 100K J 1/16W	
R234			RK73GB1J563J	CHIP R 56K J 1/16W		R319			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R235			R92-0670-05	CHIP R 0 OHM		R320-323			RK73HB1J473J	CHIP R 47K J 1/16W	
R236			RK73GB1J471J	CHIP R 470 J 1/16W		R324			RK73GB1J100J	CHIP R 10 J 1/16W	
R237			RK73GB1J223J	CHIP R 22K J 1/16W		R326,327			RK73HB1J473J	CHIP R 47K J 1/16W	
R239			RK73GB1J154J	CHIP R 150K J 1/16W		R328			RK73GB1J223J	CHIP R 22K J 1/16W	
R240			RK73GB1J104J	CHIP R 100K J 1/16W		R329			RK73HB1J473J	CHIP R 47K J 1/16W	
R241			RK73GB1J152J	CHIP R 1.5K J 1/16W		R330			RK73HB1J104J	CHIP R 100K J 1/16W	
R242			RK73GB1J104J	CHIP R 100K J 1/16W		R331			RK73GB1J474J	CHIP R 470K J 1/16W	
R243			RK73GB1J223J	CHIP R 22K J 1/16W		R332			R92-1252-05	CHIP R 0 OHM	
R244			RK73GB1J824J	CHIP R 820K J 1/16W		R334			RK73GB1J333J	CHIP R 33K J 1/16W	
R245			RK73GB1J684J	CHIP R 680K J 1/16W		R335			RK73GB1J393J	CHIP R 39K J 1/16W	
R246			RK73GB1J223J	CHIP R 22K J 1/16W		R336			RK73GB1J103J	CHIP R 10K J 1/16W	
R247			RK73GB1J824J	CHIP R 820K J 1/16W		R337,338			RK73GB1J473J	CHIP R 47K J 1/16W	
R248			RK73GB1J153J	CHIP R 15K J 1/16W		R340			RK73GB1J473J	CHIP R 47K J 1/16W	
R249			RK73GB1J822J	CHIP R 8.2K J 1/16W		R341			R92-1368-05	CHIP R 0 OHM	
R250			RK73GB1J153J	CHIP R 15K J 1/16W		R342			RK73GB1J103J	CHIP R 10K J 1/16W	
R251			RK73GB1J473J	CHIP R 47K J 1/16W		R343			R92-1368-05	CHIP R 0 OHM	
R252,253			RK73GB1J103J	CHIP R 10K J 1/16W		R344			RK73GB1J473J	CHIP R 47K J 1/16W	
R254-256			RK73GB1J104J	CHIP R 100K J 1/16W		R346			RK73GB1J101J	CHIP R 100 J 1/16W	
R257			RK73GB1J154J	CHIP R 150K J 1/16W		R347			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R258			RK73GB1J104J	CHIP R 100K J 1/16W		R348			RK73GB1J103J	CHIP R 10K J 1/16W	
R259			RK73HB1J473J	CHIP R 47K J 1/16W		R349-351			RK73GB1J104J	CHIP R 100K J 1/16W	
R260			RK73GB1J104J	CHIP R 100K J 1/16W		R353			RK73GB1J153J	CHIP R 15K J 1/16W	
R261			R92-1252-05	CHIP R 0 OHM		R354			RK73GB1J203J	CHIP R 20K J 1/16W	
R263			RK73GB1J563J	CHIP R 56K J 1/16W		R356			RK73HB1J103J	CHIP R 10K J 1/16W	
R264			RK73GB1J104J	CHIP R 100K J 1/16W		R357			RK73GB1J103J	CHIP R 10K J 1/16W	
R265			RK73GB1J223J	CHIP R 22K J 1/16W		R358			RK73GB1J104J	CHIP R 100K J 1/16W	
R266			RK73GB1J683J	CHIP R 68K J 1/16W		R360			R92-0670-05	CHIP R 0 OHM	
R267			RK73GB1J101J	CHIP R 100 J 1/16W		R361			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R268			RK73GB1J823J	CHIP R 82K J 1/16W		R362			RK73GB1J473J	CHIP R 47K J 1/16W	
R269			RK73GB1J330J	CHIP R 33 J 1/16W		R363			RK73GB1J824J	CHIP R 820K J 1/16W	
R270			RK73GB1J103J	CHIP R 10K J 1/16W		R364			RK73GB1J223J	CHIP R 22K J 1/16W	
R271			RK73GB1J330J	CHIP R 33 J 1/16W		R365			RK73GB1J474J	CHIP R 470K J 1/16W	
R272			RK73HB1J473J	CHIP R 47K J 1/16W		R452			RK73GB1J100J	CHIP R 10 J 1/16W	
R273			RK73GB1J103J	CHIP R 10K J 1/16W		R455			RK73GB1J271J	CHIP R 270 J 1/16W	
R274			RK73GB1J101J	CHIP R 100 J 1/16W		R457			RK73GB1J471J	CHIP R 470 J 1/16W	
R275			RK73GB1J474J	CHIP R 470K J 1/16W		R459			RK73GB1J100J	CHIP R 10 J 1/16W	
R276,277			RK73GB1J103J	CHIP R 10K J 1/16W		R462-466			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R278			RK73GB1J102J	CHIP R 1.0K J 1/16W		R467			RK73GB1J561J	CHIP R 560 J 1/16W	
R279			RK73GB1J683J	CHIP R 68K J 1/16W		R468-471			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R280			R92-1252-05	CHIP R 0 OHM		R472			RK73GB1J103J	CHIP R 10K J 1/16W	
R281			RK73GB1J683J	CHIP R 68K J 1/16W		R473			RK73GB1J473J	CHIP R 47K J 1/16W	
R282			RK73HB1J330J	CHIP R 33 J 1/16W							
R283			RK73HB1J473J	CHIP R 47K J 1/16W							
R284-292			RK73HB1J101J	CHIP R 100 J 1/16W		MIC201			T91-0547-05	MICROPHONE ELEMENT	
R293			R92-1368-05	CHIP R 0 OHM		D1			D1F20	DIODE	
R294-296			RK73HB1J472J	CHIP R 4.7K J 1/16W		D2,3			1SS368	DIODE	
R297			RK73GB1J473J	CHIP R 47K J 1/16W		D4			HSM88AS	DIODE	
R298			R92-1368-05	CHIP R 0 OHM		D5,6			M1809	DIODE	
						D7			HSM88AS	DIODE	
R299-302			RK73HB1J472J	CHIP R 4.7K J 1/16W		D202-204			DA221	DIODE	
R303			RK73GB1J473J	CHIP R 47K J 1/16W		IC1			NJU7201U50	IC(VOLTAGE REGULATOR)	
R304			RK73HB1J472J	CHIP R 4.7K J 1/16W		IC2			MC3372V	IC(FM IF)	
R305-309			RK73HB1J101J	CHIP R 100 J 1/16W		IC3			LMX1511TMX	IC(PLL FREQUENCY SYNTHESIZER)	
R310			RK73HB1J473J	CHIP R 47K J 1/16W		IC4			NJM1458M	IC(OP AMP X2)	
R311			RK73GB1J473J	CHIP R 47K J 1/16W		IC5			M57786HB	IC(POWER MODULE/490-512MHZ5W)	K3
R312			RK73GB1J104J	CHIP R 100K J 1/16W							

PARTS LIST

TX-RX UNIT (X57-4450-XX)
VCO UNIT (X58-4140-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
IC5			M57786LB	IC(POWER MODULE/400-430MHz5VW)	K4	A1			X58-4140-10	SUB UNIT PLL	K
IC5			M57786MB	IC(POWER MODULE/440-480MHz5VW)	K	A1			X58-4140-11	SUB UNIT PLL	K2
IC5			M57786NB	IC(POWER MODULE/470-490MHz5VW)	K2	A1			X58-4140-12	SUB UNIT PLL	K3
IC201			TA75W01FU	IC(OP AMP X2)		A1			X58-4140-13	SUB UNIT PLL	K4
IC202			TC7S66FU	IC(ANALOG SWITCH)		VCO UNIT (X58-4140-XX) -10 : K, -11: K2, -12: K3, -13 : K4					
IC203,204			NJU7201U50	IC(VOLTAGE REGULATOR)		C602			CC73HCH1E040C	CHIP C 4.0PF C	K3
IC205			TA75W01FU	IC(OP AMP X2)		C602			CC73HCH1E060D	CHIP C 6.0PF D	K4
IC206			M62363FP	IC(8bit D/A CONVERTER)		C602-604			CC73HCH1E060D	CHIP C 6.0PF D	K
IC207			TA75W558FU	IC(OP AMP X2)		C602,603			CC73HCH1E050C	CHIP C 5.0PF C	K2
						C603			CC73HCH1E070D	CHIP C 7.0PF D	K3
IC208			MC33172D	IC(OP AMP X2)		C603			CC73HCH1E090D	CHIP C 9.0PF D	K4
IC209			TC74VHC573FS	IC(8bit D TYPE LATCH)		C604			CC73HCH1E070D	CHIP C 7.0PF D	K4
IC210,211			TA75W01FU	IC(OP AMP X2)		C604,605			CC73HCH1E060D	CHIP C 6.0PF D	K2,K3
IC212			HNS8C257T-20	IC(32768X8bit EEPROM)		C605			CC73HCH1E080D	CHIP C 8.0PF D	K,K4
IC213			BU4094BCFV	IC(8bit SHIFT/STORE REGISTER)		C606			CC73HCH1E050C	CHIP C 5.0PF C	K2
						C606,607			CC73HCH1E050C	CHIP C 5.0PF C	K,K3
IC213			XRU4094BCFV	IC(8bit SHIFT/STORE REGISTER)		C606,607			CC73HCH1E060D	CHIP C 6.0PF D	K4
IC214			TA75W01FU	IC(OP AMP X2)		C607			CC73HCH1E060D	CHIP C 6.0PF D	K2,K4
IC215			TC7S32FU	IC(2INPUT OR GATE)		C608			CC73HCH1E0R5C	CHIP C 0.5PF C	
IC216			TA75W01FU	IC(OP AMP X2)		C609			CK73HB1C103K	CHIP C 0.010UF K	
IC217			TC7S04FU	IC(INVERTER)		C610			CC73HCH1E030C	CHIP C 3.0PF C	K2K3K4
IC218			TC35305F	IC(DTMF RECEIVER)		C610			CC73HCH1E040C	CHIP C 4.0PF C	K
IC219			PCD3312CT	IC(DTMF/MODEM/MUSICAL TONE)		C611			CC73HCH1E010C	CHIP C 1.0PF C	K,K3K4
IC220			BR24C01AF	IC(128X8bit EEPROM)		C611			CC73HCH1E1R5C	CHIP C 1.5PF C	K2
IC220			XL24C01AF	IC(128X8bit EEPROM)		C612			CC73HCH1E060D	CHIP C 6.0PF D	
IC221	*		UPD78312AGF364	IC(MICROPROCESSOR)		C613			CC73HCH1E100D	CHIP C 10PF D	
						C614			CC73HCH1E060D	CHIP C 6.0PF D	K
IC222			TA7368F	IC(AF POWER AMP)		C614			CC73HCH1E070D	CHIP C 7.0PF D	K2,K3
IC223			TA75W558FU	IC(OP AMP X2)		C614			CC73HCH1E100D	CHIP C 10PF D	K4
IC451			75308BGK739BE9	IC(4bit MICROPROCESSOR)		C615			CC73HCH1E090D	CHIP C 9.0PF D	K3
IC452			S-8054ALB-LM	IC(VOLTAGE DETECTOR)		C615			CC73HCH1E100D	CHIP C 10PF D	K,K2K4
Q1			DTC144EE	DIGITAL TRANSISTOR		C616-618			CK73HB1E102K	CHIP C 1000PF K	
Q2			2SJ243	FET		C619			CC73HCH1E050C	CHIP C 5.0PF C	K2
Q3			DTA114EE	DIGITAL TRANSISTOR		C619			CC73HCH1E060D	CHIP C 6.0PF D	K,K3K4
Q4			DTA123EE	DIGITAL TRANSISTOR		C620			CK73HB1E471K	CHIP C 470PF K	
Q5			2SC4617(S)	TRANSISTOR		C621			C92-0513-05	CHIP-TAN 3.3UF 6.3WV	
Q6			2SB1119(S)	TRANSISTOR		C622			CK73HB1C103K	CHIP C 0.010UF K	
Q7			2SC4617(S)	TRANSISTOR		TC601,602			C05-0384-05	TRIM CAP 10PF	
Q8			DTC143EE	DIGITAL TRANSISTOR		CN601-606			E23-0983-05	PIN TERMINAL	
Q9			2SA1832(GR)	TRANSISTOR					F10-2117-14	SHIELDING PLATE	
Q10			2SC4215(Y)	TRANSISTOR		L601-604			L40-3391-37	SMALL FIXED INDUCTOR 3.3UH	
Q11			2SC5090	TRANSISTOR		L605			L33-0744-05	CHOKE COIL 23nH	K,K2K3
Q12			2SC5066(O)	TRANSISTOR	K,K2K4	L605			L33-1267-05	CHOKE COIL 27nH	K4
Q13			2SC4226(R24)	TRANSISTOR	K3	L606			L33-0744-05	CHOKE COIL 23nH	K3
Q13			2SC5090	TRANSISTOR		L606			L33-0745-05	CHOKE COIL 27nH	K4
Q14			SGM2014M	FET		L606			L33-1267-05	CHOKE COIL 27nH	K,K2
Q15			2SC4703	TRANSISTOR		L607			L40-2271-36	SMALL FIXED INDUCTOR 22nH	K,K3
Q16			2SB1119(S)	TRANSISTOR		L607			L40-2771-36	SMALL FIXED INDUCTOR 27nH	K2,K4
Q17			2SC4094(R37)	TRANSISTOR	K,K2K4	R601,602			RK73HB1J104J	CHIP R 100K J 1/16W	
Q17			2SC4095(R47)	TRANSISTOR	K3	R603			RK73HB1J103J	CHIP R 10K J 1/16W	
Q19			DTC144EE	DIGITAL TRANSISTOR		R604			RK73HB1J682J	CHIP R 6.8K J 1/16W	
Q20			2SC4617(S)	TRANSISTOR		R605			RK73HB1J822J	CHIP R 8.2K J 1/16W	
Q201			2SJ243	FET		R606			RK73HB1J332J	CHIP R 3.3K J 1/16W	
Q202			2SK1824	FET							
Q203			DTC144EE	DIGITAL TRANSISTOR							
Q204			2SA1586(Y,GR)	TRANSISTOR							
Q205-207			DTC144EE	DIGITAL TRANSISTOR							
Q208			2SA1362(GR)	TRANSISTOR							
Q210			2SK1588	FET							
Q211			DTA144EE	DIGITAL TRANSISTOR							
Q212			2SK879(Y)	FET							
TH1			TN103S472JT	TERMISTER							
TH201			157-302-53008	TERMISTER							

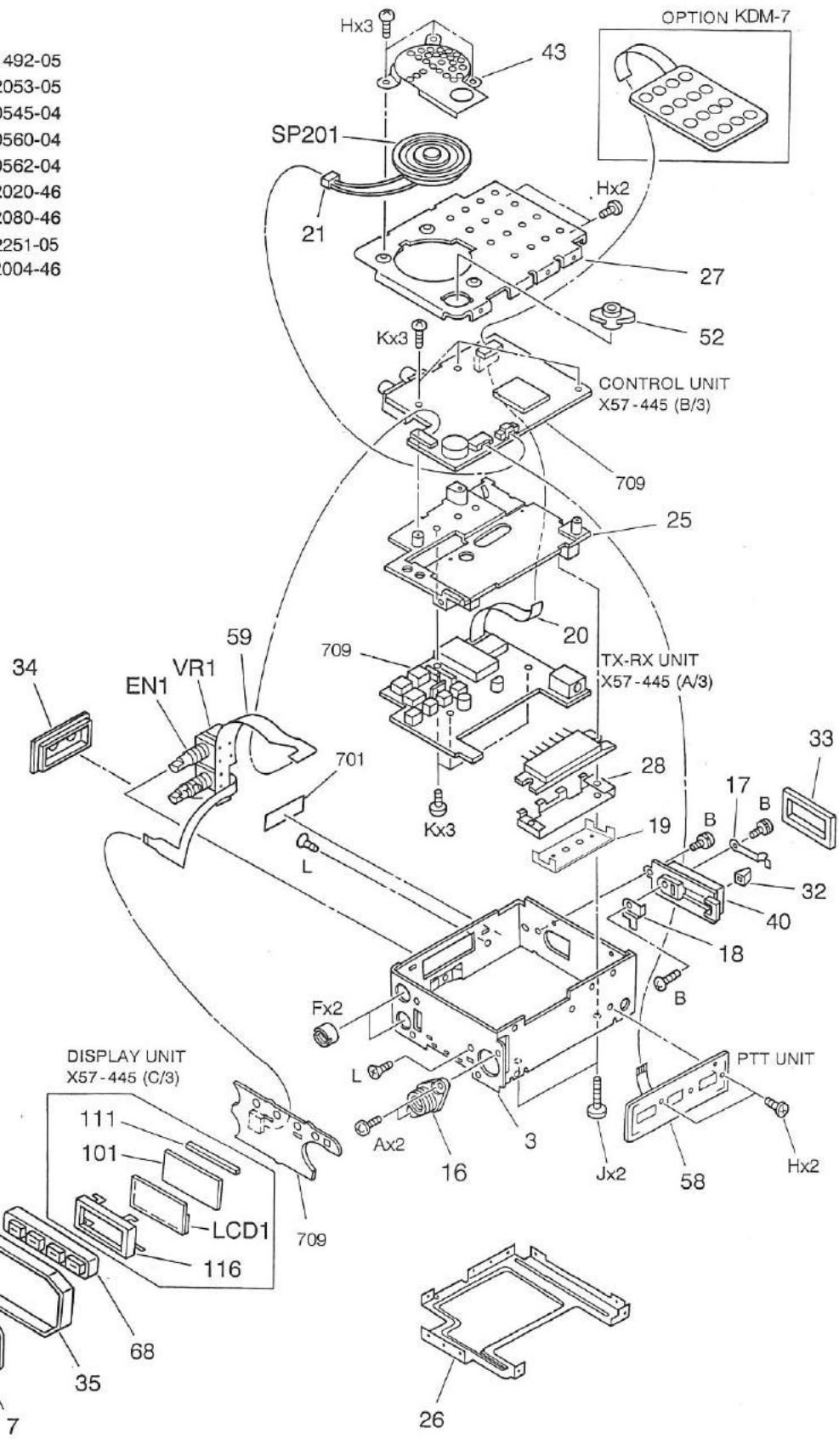
PARTS LIST

VCO UNIT (X58-4140-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R607			RK73HB1J682J	CHIP R 6.8K J 1/16W	
R608			RK73HB1J822J	CHIP R 8.2K J 1/16W	
R609,610			RK73HB1J271J	CHIP R 270 J 1/16W	
R611			RK73HB1J472J	CHIP R 4.7K J 1/16W	
D601-604			HMU350	VARI-CAP DIODE	
D605			MA360	VARI-CAP DIODE	
Q601			UMG2	DIGITAL TRANSISTOR	
Q602			DTC144EE	DIGITAL TRANSISTOR	
Q603			2SC5090	TRANSISTOR	
Q604,605			2SC4226(R24)	TRANSISTOR	

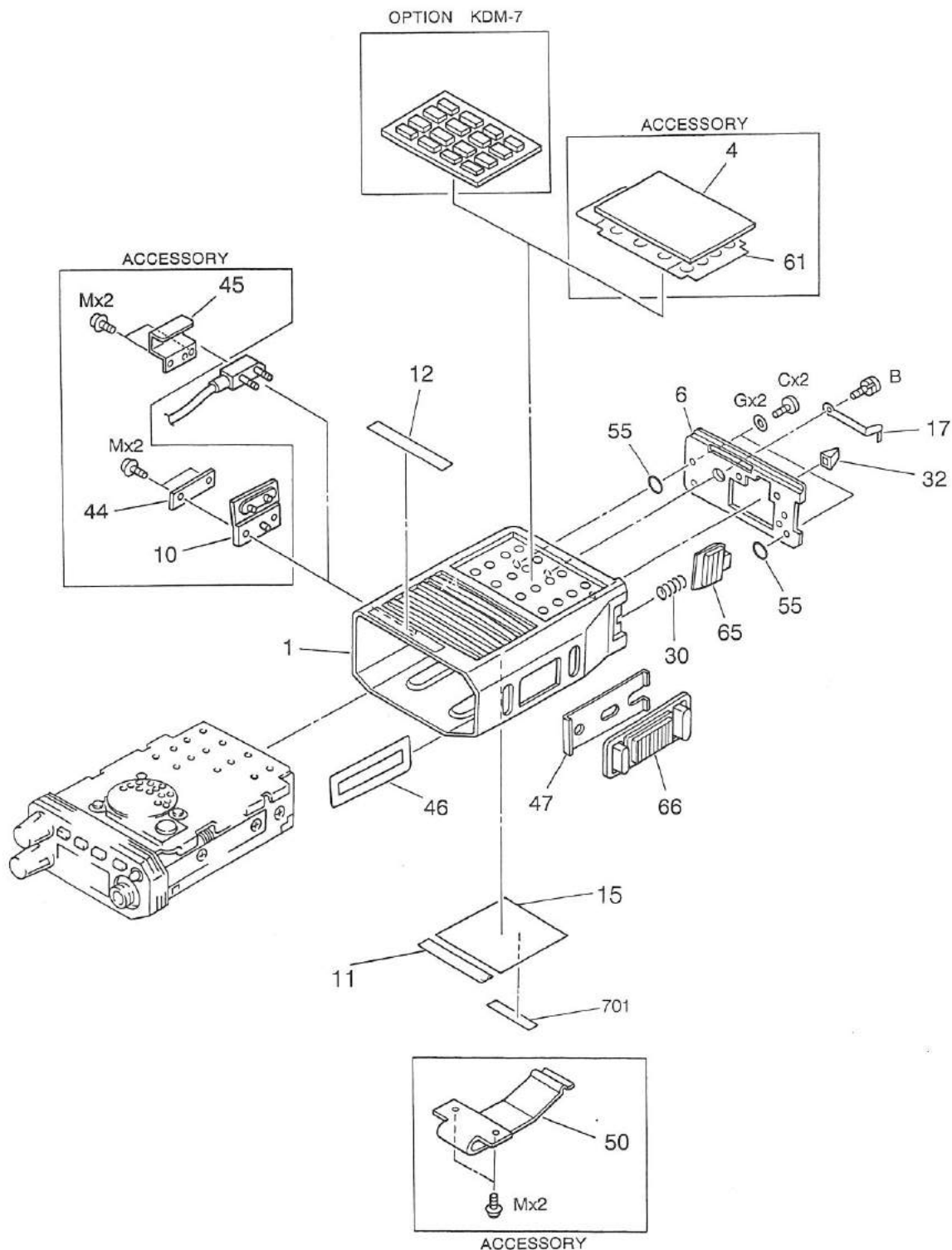
EXPLODED VIEW

A	M2.6x3.5(BLK)	:N09-1492-05
B	M2x3.5	:N09-2053-05
D	NUT	:N14-0545-04
E	NUT	:N14-0560-04
F	NUT	:N14-0562-04
H	M2x2.0	:N39-2020-46
J	M2x8.0	:N79-2080-46
K	M2x5	:N09-2251-05
L	M2x4(F-Tap)	:N88-2004-46

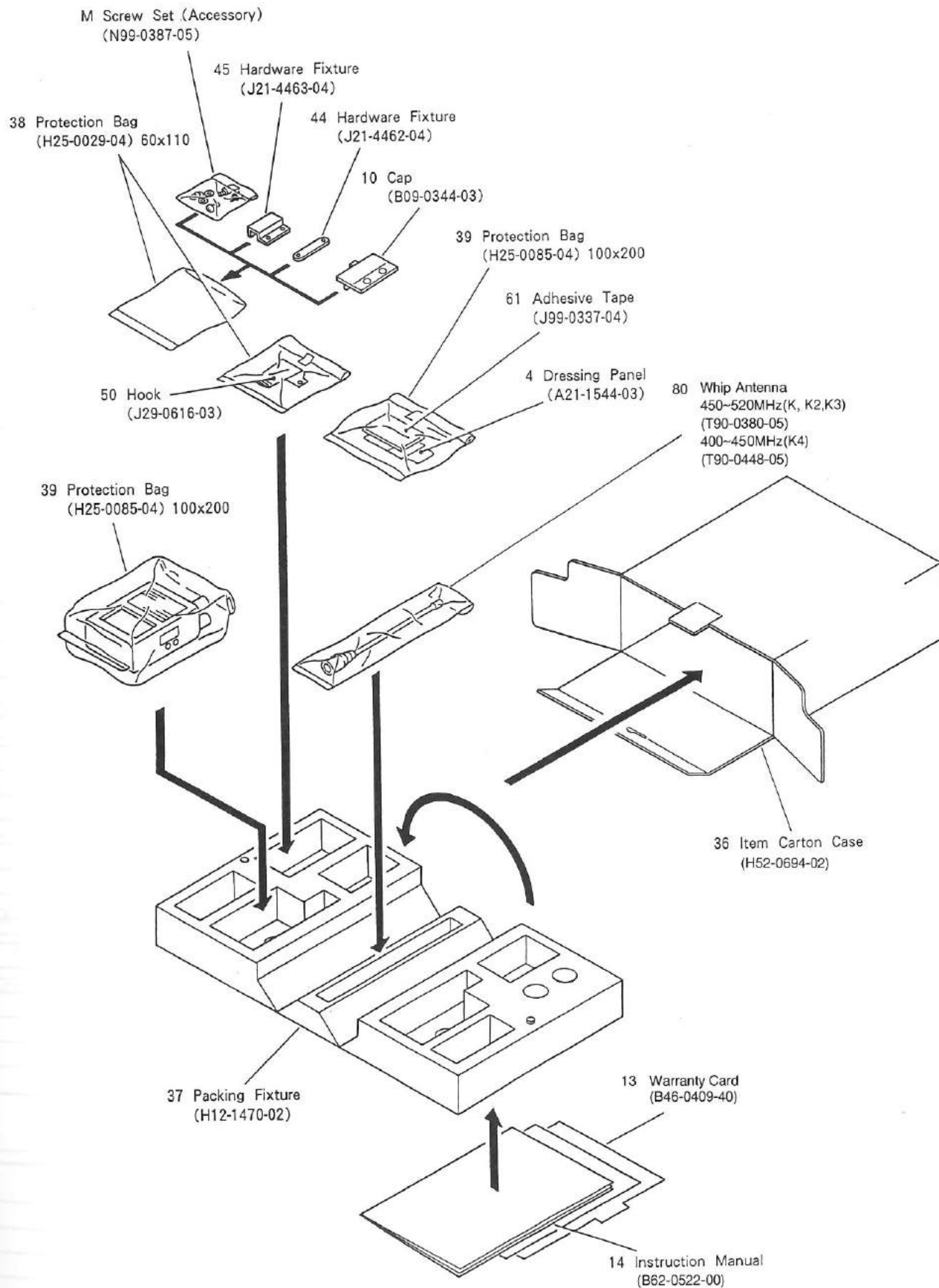


EXPLODED VIEW

B	M2x3.5	:N09-2053-05
C	M2.6x8	:N09-2185-05
G	WASHER	:N17-1026-60
M	SCREW SET	:N99-0387-05



PACKING



TX-RX UNIT(X57-4450-10) (A/3) : TX-RX section

Connector No.	Pin No.	Pin Name	I/O	Function
CN1	1	E	-	GND
	2	DE	O	AF detection signal output (RX)
	3	MD	I	AF modulation signal input (TX)
	4	BL	I	AF modulation signal (Low Speed Data) input (TX)
	5	CK	I	PLL clock data input
	6	PE	I	PLL enable data input
	7	DT	I	PLL data line input
	8	KY	I	Normally : 5V, Transmit : 0V
	9	UL	O	Normally : 5V, Transmit : 0V
	10	SV	I	Normally : 0V, Transmit : 5V
	11	TR	I	Normally : 5V, Transmit : 0V
	12	PC	I	APC power control input (TX)
	13	SB	I	Power input after power switch
	14	PB	O	Power output after passing through the fuse
	15	B	O	Power output after passing through the fuse

TX-RX UNIT(X57-4450-10) (A/3) : TX-RX section

Connector No.	Pin No.	Pin Name	I/O	Function
J1	1	+B	I	External power supply input

TX-RX UNIT(X57-4450-10) (B/3) : Control section

Connector No.	Pin No.	Pin Name	I/O	Function
CN201	1	E	-	GND
	2	DE	I	AF detection signal input (RX)
	3	MD	O	AF modulation signal output (TX)
	4	BL	O	AF modulation signal (Low Speed Data) output (TX)
	5	CK	O	PLL clock data output
	6	PE	O	PLL enable data output
	7	DT	O	PLL data line output
	8	KY	O	Normally : 5V, Transmit : 0V
	9	UL	I	Normally : 5V, Transmit : 0V
	10	SV	O	Normally : 0V, Save mode : 5V
	11	TR	O	Normally : 5V, Transmit : 0V
	12	PC	O	APC power control output (TX)
	13	SB	O	Power output after power switch
	14	PB	I	Power input after passing through the fuse
	15	B	I	Power input after passing through the fuse

TX-RX UNIT(X57-4450-10) (B/3) : Control section

Connector No.	Pin No.	Pin Name	I/O	Function
CN202	1	MON	I	Normally : 5V, Monitor when connected GND.
	2	PTT	I	Normally : 5V, Transmit when connected GND.
	3	LMP	I	Normally : 5V, Lamp when connected GND.
	4	E	-	GND

TERMINAL FUNCTION

TX-RX UNIT(X57-4450-10) (B/3) : Control section

Connector No.	Pin No.	Pin Name	I/O	Function
CN204	1	DKEY1	I	DTMF KEY
	2	DKEY2	I	DTMF KEY
	3	DKEY3	I	DTMF KEY
	4	DKEY4	I	DTMF KEY
	5	DKEY5	I	DTMF KEY
	6	DKEY6	I	DTMF KEY
	7	DKEY7	I	DTMF KEY
	8	DKEY8	I	DTMF KEY

TX-RX UNIT(X57-4450-10) (B/3) : Control section

Connector No.	Pin No.	Pin Name	I/O	Function
CN205	1	5M	O	5V
	2	TD	O	Serial control signal output
	3	RD	I	Serial control signal input
	4	RT	I	Reset signal input
	5	E	-	GND
	6	B	O	Power output after passing through the fuse
	7	SB	I	Power input after power switch
	8	AE	-	GND
	9	AI	I	AF signal input after volume
	10	A2	O	AF signal output for volume

TX-RX UNIT(X57-4450-10) (B/3) : Control section

Connector No.	Pin No.	Pin Name	I/O	Function
CN206	1	SP	O	Output for internal speaker
	2	E	-	GND

TX-RX UNIT(X57-4450-10) (C/3) : Display section

Connector No.	Pin No.	Pin Name	I/O	Function
CN451	1	EC1	I	Encoder data input
	2	EC2	O	Encoder data input
	3	E	-	GND
	4	RST	O	Reset signal output
	5	RXD	O	Serial control signal output
	6	TXD	I	Serial control signal input
	7	5M	I	5V

TERMINAL FUNCTION

VCO UNIT(X58-4140-10)

Connector No.	Pin No.	Pin Name	I/O	Function
CN601	1	MOD	I	AF modulation signal input (TX)
	2	T/R	I	Normally : 5V, Transmit : 0V
	3	LV	I	PLL lock voltage input (0~5V)

VCO UNIT(X58-4140-10)

Connector No.	Pin No.	Pin Name	I/O	Function
CN602	1	OUT	O	VCO output
	2	E	-	GND
	3	5V	I	5V

ADJUSTMENT

REQUIRED TEST EQUIPMENT

1. Stabilized Power Supply

- 1) The supply voltage can be changed between 5V and 18V, and the current is 3A or more.
- 2) The standard voltage is 7.5V.

2. DC Ammeter

- 1) Class 1 ammeter (17 ranges and other features)
- 2) The full scale can be set to either 300mA or 3A.
- 3) A cable of less internal loss must be used.

3. Frequency Counter (f. counter)

- 1) Frequencies of up to 1 GHz or so can be measured.
- 2) The sensitivity can be changed to 250MHz or below, and measurements are highly stable and accurate (0.2 ppm or so).

4. Power Meter

- 1) Measurable frequency: Up to 500MHz
- 2) Impedance: 50Ω, unbalanced
- 3) Measuring range: Full scal of 10W or so
- 4) A standard cable (5D2W 1m) must be used.

5. RF VTVM (RF V.M)

- 1) Measurable frequency: Up to 500MHz or so

6. Linear Detector

- 1) Measurable frequency: Up to 500MHz
- 2) Characteristics are flat, and CN is 60dB or more.

7. Digital Voltmeter

- 1) Voltage range: FS = 18V or so
- 2) Input resistance: 1MΩ or more

8. Oscilloscope

- 1) Measuring range: DC to 30MHz
- 2) Provides highly accurate measurements for 5 to 25MHz.

9. AF Voltmeter (AF VTVM)

- 1) Measurable frequency: 50Hz to 1MHz
- 2) Maximum sensitivity: 1mV or more

10. Spectrum Analyzer

- 1) Measuring range: DC to 1GHz or more

11. Standard Signal Generator (SSG)

- 1) Maximum frequency: 500MHz or more
- 2) Output: -20dB/0.1μV to 120dB/1V
- 3) Output impedance: 50Ω

12. Tracking Generator

- 1) Center frequency: 50kHz to 500MHz
- 2) Frequency deviation: ±35MHz
- 3) Output voltage: 100mV or more

13. Dummy Load

- 1) 8Ω, 3W or more

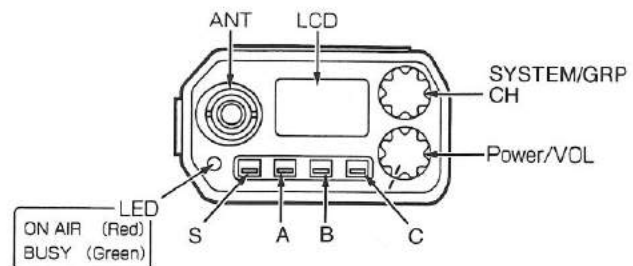
- Use a non-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils).
- To protect the SSG, do not send out signals while adjusting the receiving unit.

- The indicated SSG output levels are for maximum output.

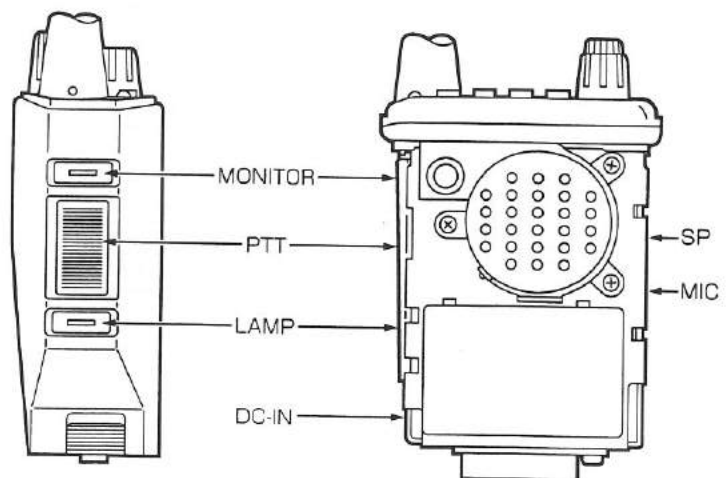
TK-353

Version	Frequency range	Remark
K (TYPE 1)	450~470MHz	IF1 45.05MHz LOC 44.595MHz
K2 (TYPE 2)	470~490MHz	IF1 45.05MHz LOC 44.595MHz
K3 (TYPE 3)	490~512MHz	IF1 45.05MHz LOC 44.595MHz
K4 (TYPE 4)	406~430MHz	IF1 45.05MHz LOC 44.595MHz

Panel side view



Left and Right side view

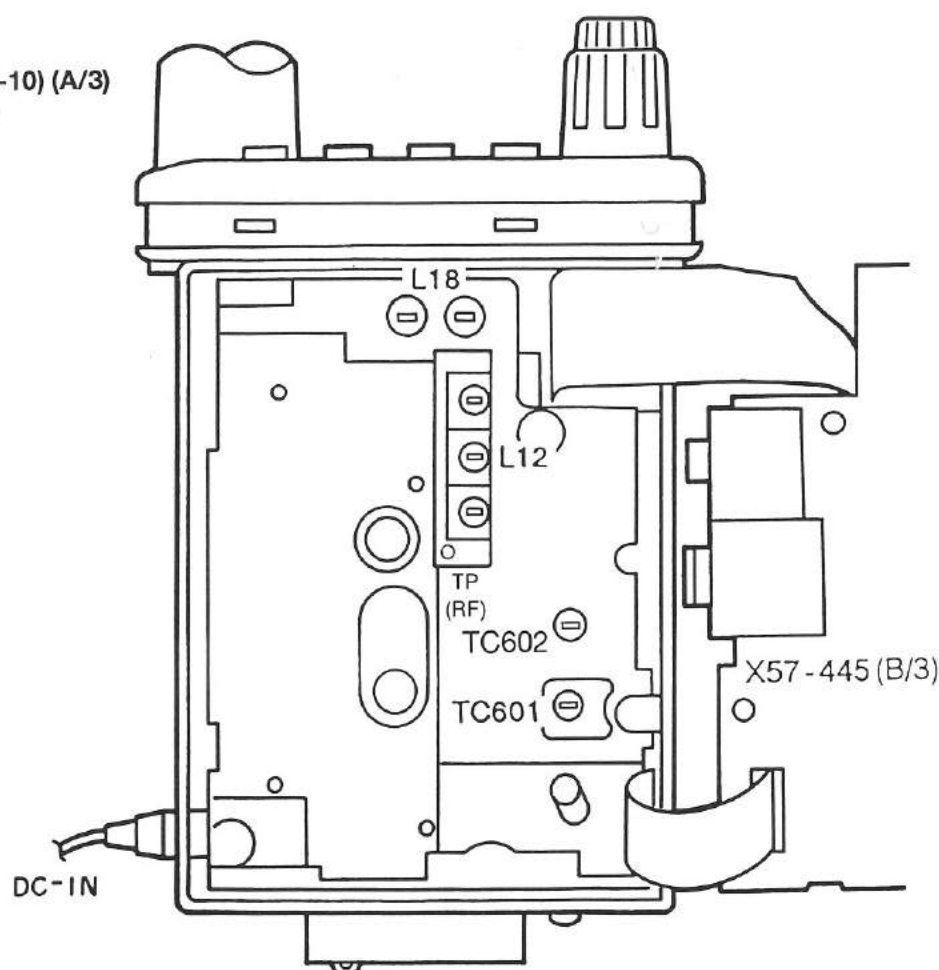


ADJUSTMENT

Adjustment points

TX-RX UNIT(X57-4450-10) (A/3)

Component side view



Tuning mode

Frequency table for using on tuning mode

SYSTEM NO.	Destination	K (TYPE 1)		K2 (TYPE 2)		K3 (TYPE 3)		K4 (TYPE 4)	
		TX freq	RX freq	TX freq	RX freq	TX freq	RX freq	TX freq	RX freq
1		460.000MHz	460.100MHz	480.000MHz	480.100MHz	500.000MHz	500.100MHz	418.000MHz	418.100MHz
2		450.000MHz	450.100MHz	470.000MHz	470.100MHz	490.000MHz	490.100MHz	406.000MHz	406.100MHz
3		469.9875MHz	469.975MHz	489.9875MHz	489.975MHz	511.9875MHz	511.975MHz	429.9875MHz	429.975MHz
4		460.000MHz		480.000MHz		500.000MHz		418.000MHz	
5		460.200MHz		480.200MHz		500.200MHz		418.200MHz	
6		460.400MHz		480.400MHz		500.400MHz		418.400MHz	

Group No. list

Group No.	Signaling
1	NONE
2	100Hz square wave
3	LTR data (Area=0, Goto=12, Home=12, ID=47, Free=31)
4	QT (67.0Hz)
5	QT (151.4Hz)
6	QT (210.7Hz)
7	DQT (D023N)
8	DQT (D754N)
9	DTMF Dcoder (Code=159D, Alert=YES, Transpond=NO)
A	DTMF Single Tone (1633Hz)
B	DTMF Encode Tone(7)

By simply transmitting, and the DTMF single tone and encoded tone are encoded.

ADJUSTMENT

VCO

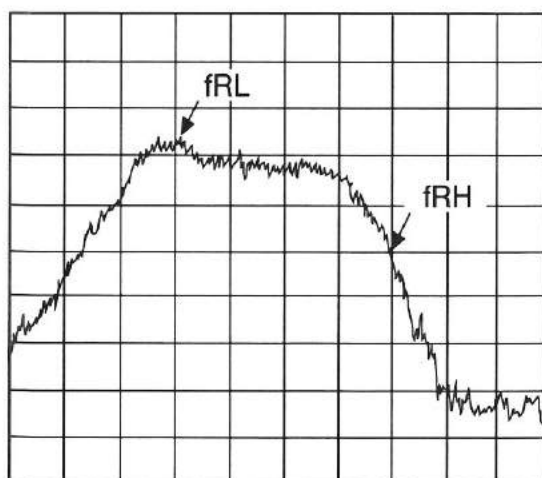
Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. TX lock voltage check	1) CH : Channel with highest freq' fTH	DV.M	VCO	LV	VCO	TC601	3.5V	$\pm 0.05V$
2. TX lock voltage check	1) CH : Channel with lowest freq' fTL							1.1~2.1V(TYPE 1,2) 0.9V~1.7V(TYPE 3,4)
3. RX lock voltage check	1) CH : Channel with highest freq' fRH					TC602	3.5V	$\pm 0.05V$
4. RX lock voltage check	1) CH : Channel with lowest freq' fRL							0.6~1.7V(TYPE 1,2,4) 0.8~1.9V(TYPE 3)

Helical

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Helical adjustment check	1) CH : Channel with center freq' fRL Connect the spectrum analyzer to TP(RF)	Trk. Gen. Spectrum Analyzer	TX-RX (A/3)	ANT TP (RF)	TX-RX (A/3)	L12 L18	Adjust wave form to figure at below.	

CAUTION :

When using an external power connector, please use with maximum final module protection of 9V.



CENTER 460.000MHz :TYPE 1
 480.000MHz :TYPE 2
 501.000MHz :TYPE 3
 418.000MHz :TYPE 4

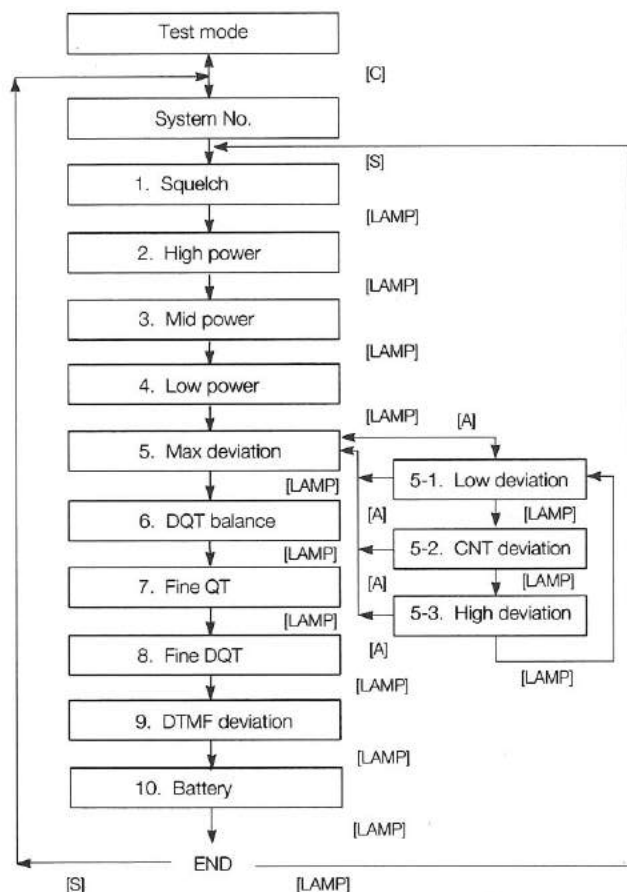
SPAN 50MHz
 MARKER 450MHz
 TG LEVEL -20dBm

ADJUSTMENT

● Procedure

- 1) Press LAMP, A together and turn power on. Hold LAMP and A until "SEL" appears on LCD.
- 2) When the [C] key is pressed, the tuning mode is entered.

● Tuning mode



1) Preparations for tuning the transceiver

Before attempting to tune the transceiver, connect the unit to a suitable power supply (without case).

Use the optional DC cable(PG-2W). Maximum input voltage is 9V DC.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter). The speaker output connector must be terminated with an 8ohm dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

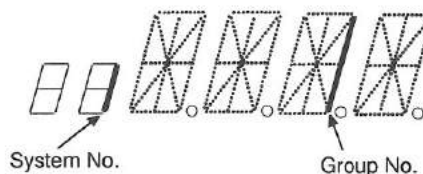
2) Transceiver tuning

2)-1 To place transceiver in tuning mode

●Press "C", and channel appears on LCD. Set channel according to tuning requirements.

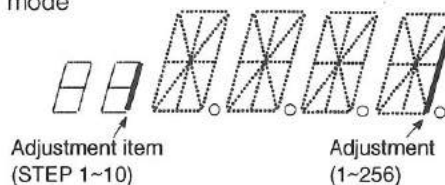
LCD display

Channel No.



●Press "SCN", now in tuning mode. Use "LAMP" button to toggle through tuning modes, and channel selector knob to adjust tuning requirements(1 to 256 appears on LCD).

Tuning mode



Item	Condition	Measurement			Adjustment		Specifications/ Remarks
		Test equipment	Unit	Terminal	Parts	Method	
1. AF LEVEL check	1) System No. : 1 Group No. : 1 SSG ATT : -53dBm	Spectrum Analyzer		SP/MIC		Check	0.63V ±0.3V
2. AF distortion check	1) System No. : 1 Group No. : 1 SSG ATT : -53dBm	Oscilloscope		ANT		Check	3% or less
3. Large inout S/N check	1) System No. : 1 Group No. : 1 SSG ATT : -53dBm			DC-IN			45dBm or more
4. Squelch adjustment	1) System No. : 1 Group No. : 1 SSG ATT : -123dBm				SYSTEM/GRP	Adjust to point of closing squelch	
5. Squelch check	1) System No. : 1 Group No. : 1 SSG ATT : -127dBm					Check	Close squelch

ADJUSTMENT

Item	Condition	Measurement			Adjustment		Specifications/ Remarks		
		Test equipment	Unit	Terminal	Parts	Method			
6. Receiver sensitivity check	1) System No. : 1 Group No. : 1 SSG ATT : -118dBm	Spectrum Analyzer SSG Oscilloscope AF. VTVM		SP/MIC ANT DC-IN		check	SINAD 12dB or more		
	2) System No. : 2 Group No. : 1 SSG ATT : -116dBm								
	3) System No. : 3 Group No. : 1 SSG ATT : -118dBm								
7. MAX power check	1) System No. : 1 Group No. : 1 BATT terminal voltage : 7.5V PTT : ON	Power meter Deviation meter Oscilloscope						SYSTEM/ GRP	3.8W ±0.1W
8. TX High power adjustment	1) System No. : 1 Group No. : 1 PTT : ON								
9. Consumption current check	1) System No. : 1 Group No. : 1 PTT : ON							check	1.8A or less
10. TX High power check	1) System No. : 2 Group No. : 1 PTT : ON				check	3.3~5.0W			
	2) System No. : 3 Group No. : 1								
11. TX Low power adjustment	1) System No. : 1 Group No. : 1 PTT : ON	SYSTEM/ GRP			1.0W ±0.1W				
12. TX Low power check	1) System No. : 2 Group No. : 1 PTT : ON				check	0.5~1.5W			
	2) System No. : 3 Group No. : 1								
13. MAX DEV adjustment	1) System No. : 1 Group No. : 1 AG : 1kHz/150mV PTT : ON	SYSTEM/ GRP			3.8kHz ±50Hz				
	2) Press A knob, shift to low deviation and adjust MAX DEV at each of the LOW, CNT and HIGH points. ※1								
14. MIC sensitivity check	1) AG : 1kHz/15mV PTT : ON				check	2.2~3.6kHz			
15. DQT BAL adjustment	1) System No. : 1 Group No. : 2 AG : OFF PTT : ON	SYSTEM/ GRP			Makes demodulation waves into square waves				
16. QT DEV adjustment	1) System No. : 1 Group No. : 5 AG : OFF PTT : ON	SYSTEM/ GRP			0.75kHz ±20Hz (larger to +,-)				
17. DQT DEV adjustment	1) System No. : 1 Group No. : 7 AG : OFF PTT : ON	SYSTEM/ GRP			0.75kHz ±50Hz (larger to +,-)				
18. LTR adjustment	1) System No. : 1 Group No. : 3 PTT ON				1.0kHz ±0.1kHz (larger to +,-)				
19. DTMF DEV adjustment	1) System No. : 1 Group No. : 11 AG : OFF PTT : ON	SYSTEM/ GRP			2.2kHz ±200Hz (larger to +,-)				
20. Transmission S/N check	1) CH : 1 Signaling No. : 1 PTT : ON				check	42dB or more			
21. BATT detection writing	1) CH : 1 Signaling No. : 1 PTT : ON	SYSTEM/ GRP			BATT terminal voltage : 6.0V				
22. BATT detection check	1) CH : 1 Signaling No. : 1 BATT terminal voltage : 5.7V PTT : ON				check	can't transmit LED(PTT) blinks.			

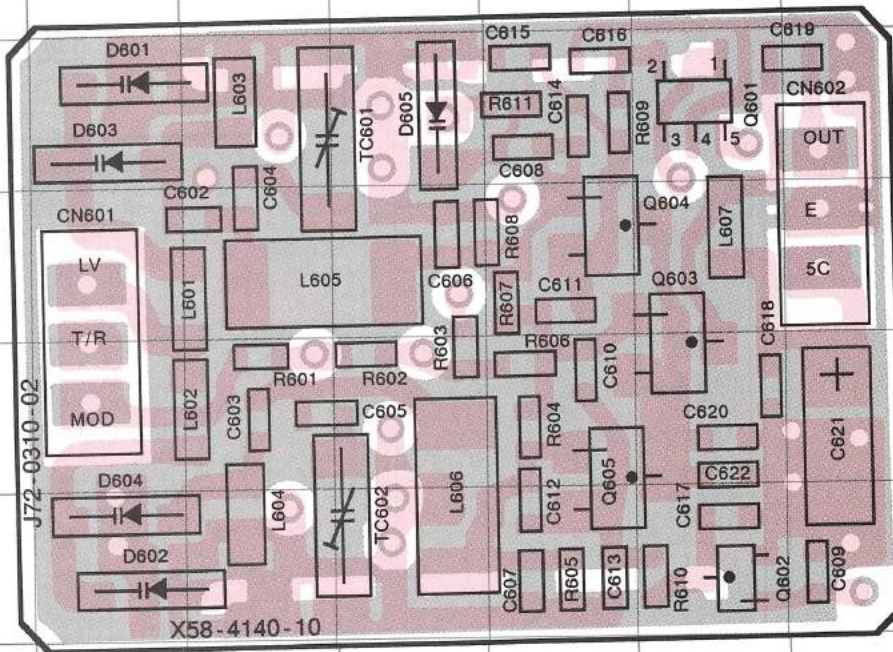
PC BOARD VIEWS

TK-353

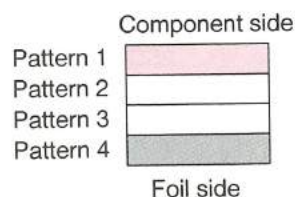
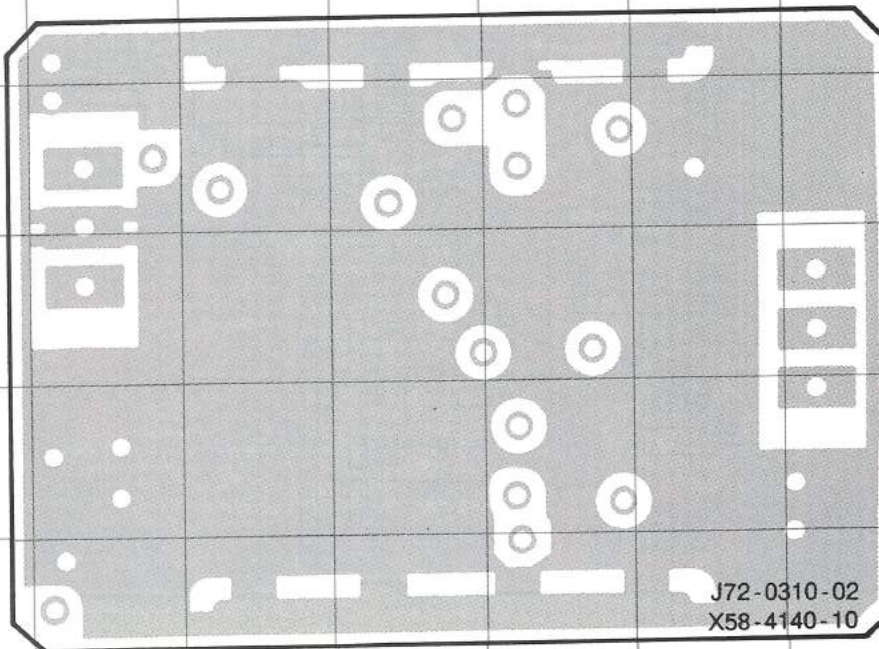
VCO UNIT (X57-4140-XX) Component side view
0-10 : K, 0-11 : K2, 0-12 : K3, 0-13 : K4

VCO UNIT(X57-4140-XX)
(Component side)

Ref. No	Address
Q601	3G
Q602	6G
Q603	5G
Q604	4G
Q605	6G
D601	3C
D602	6C
D603	3C
D604	6C
D605	3E

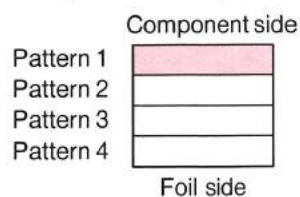


VCO UNIT (X57-4140-XX) Foil side view
0-10 : K, 0-11 : K2, 0-12 : K3, 0-13 : K4



TX-RX UNIT(X57-4450-XX)(V

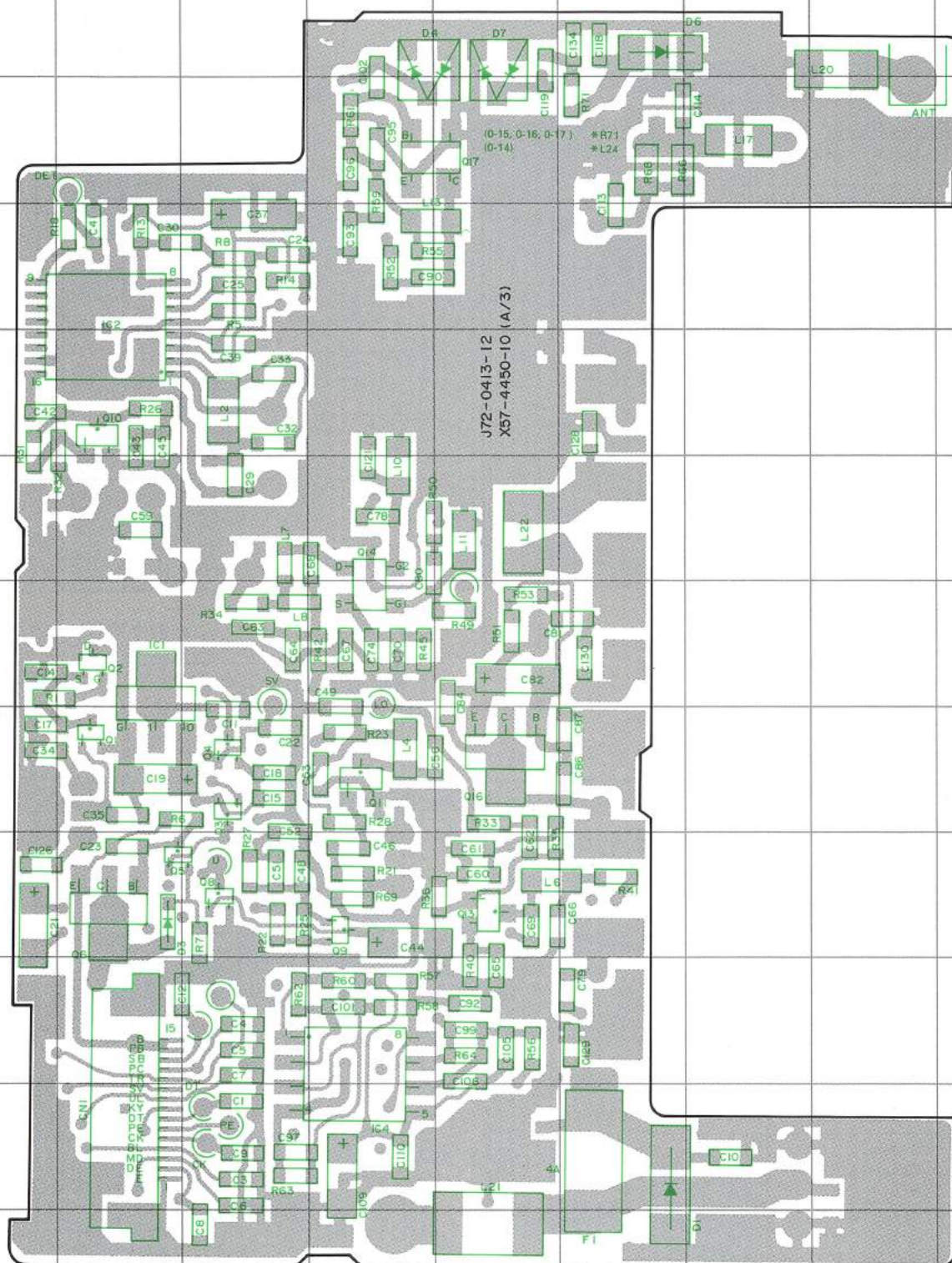
Ref. No	Address
IC3	8G
IC5	8B
Q7	8F
Q12	9F
Q15	10D
Q19	11F
Q20	10E
D2	8F
D5	3B



2SC4617
2SC4226
2SC4215
2SC5090
DTC144EE
2SA1832
2SC5066



TX-RX UNIT (X57-4450-XX) (A/3) Foil side view
0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4



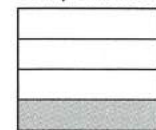
Ref. No	Address
IC1	7L
IC2	5L
IC4	10N
Q1	8L
Q2	7L
Q3	8M
Q4	8M
Q5	9M
Q6	9L
Q8	9M
Q9	9N
Q10	5L
Q11	8N
Q13	7O
Q14	7N
Q16	8O
Q17	3O
D1	11P
D3	9L
D4	3N
D6	3P
D7	3O

Component side

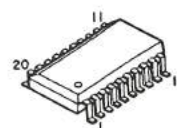
2SB119

MB1512PFV-G-BND

Pattern 1
 Pattern 2
 Pattern 3
 Pattern 4



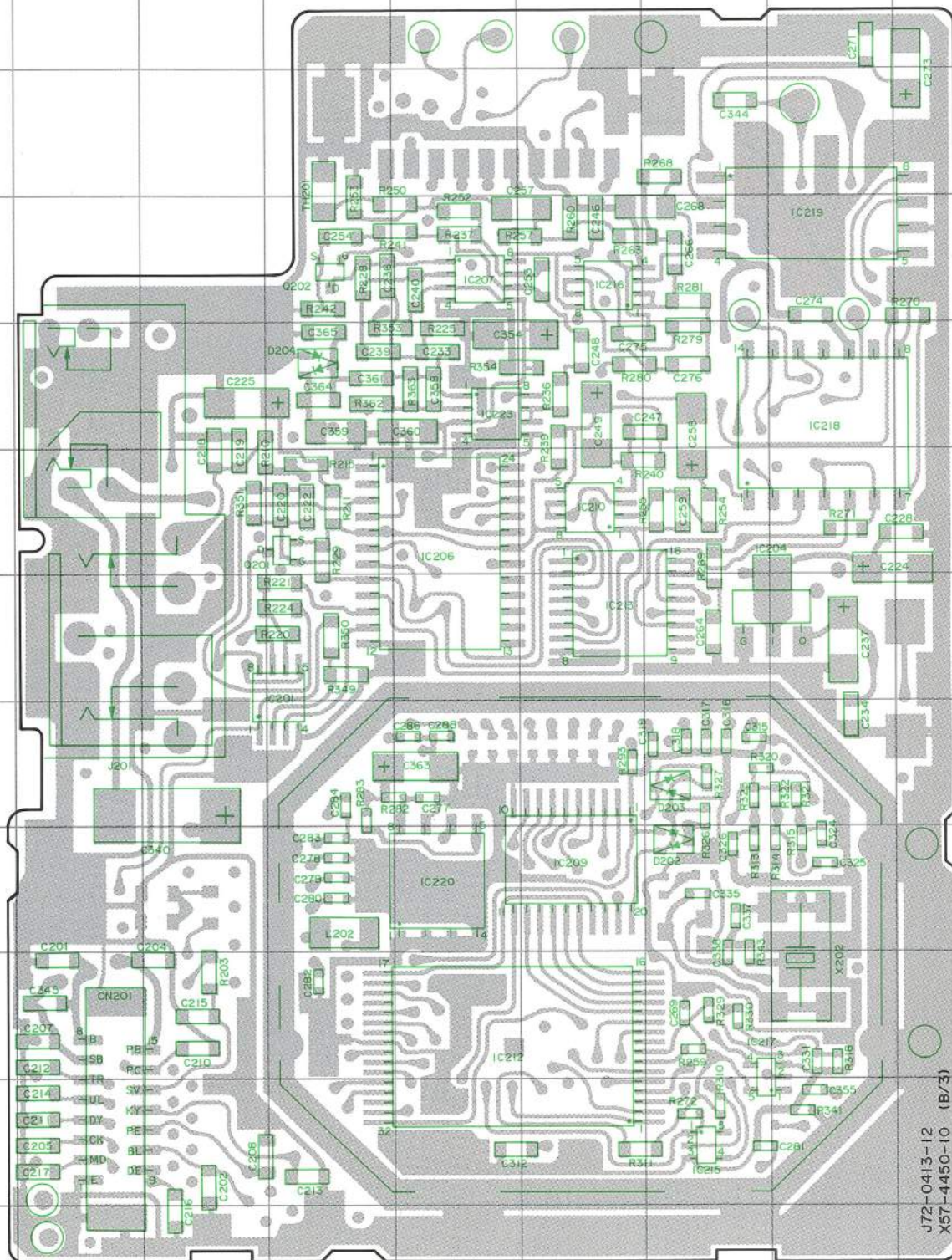
Foil side



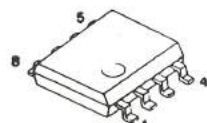
A 3D perspective drawing of a rectangular block. The top surface is labeled 'G'. The left vertical face is labeled 'S'. The right vertical face has a small rectangular protrusion at the bottom, which is labeled 'C'.

TX-RX UNIT (X57-4450-XX) (B/3) Foil side view
0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4

Ref. No	Address
IC201	7M
IC206	7N
IC207	4N
IC209	9O
IC210	6O
IC212	10N
IC213	7O
IC215	11P
IC216	4O
IC217	10P
IC218	5Q
IC219	4Q
IC220	9M
IC223	5N
Q201	6M
Q202	4M
D202	9P
D203	8P



TA75W558FU



MC33172D
XL24C01AF

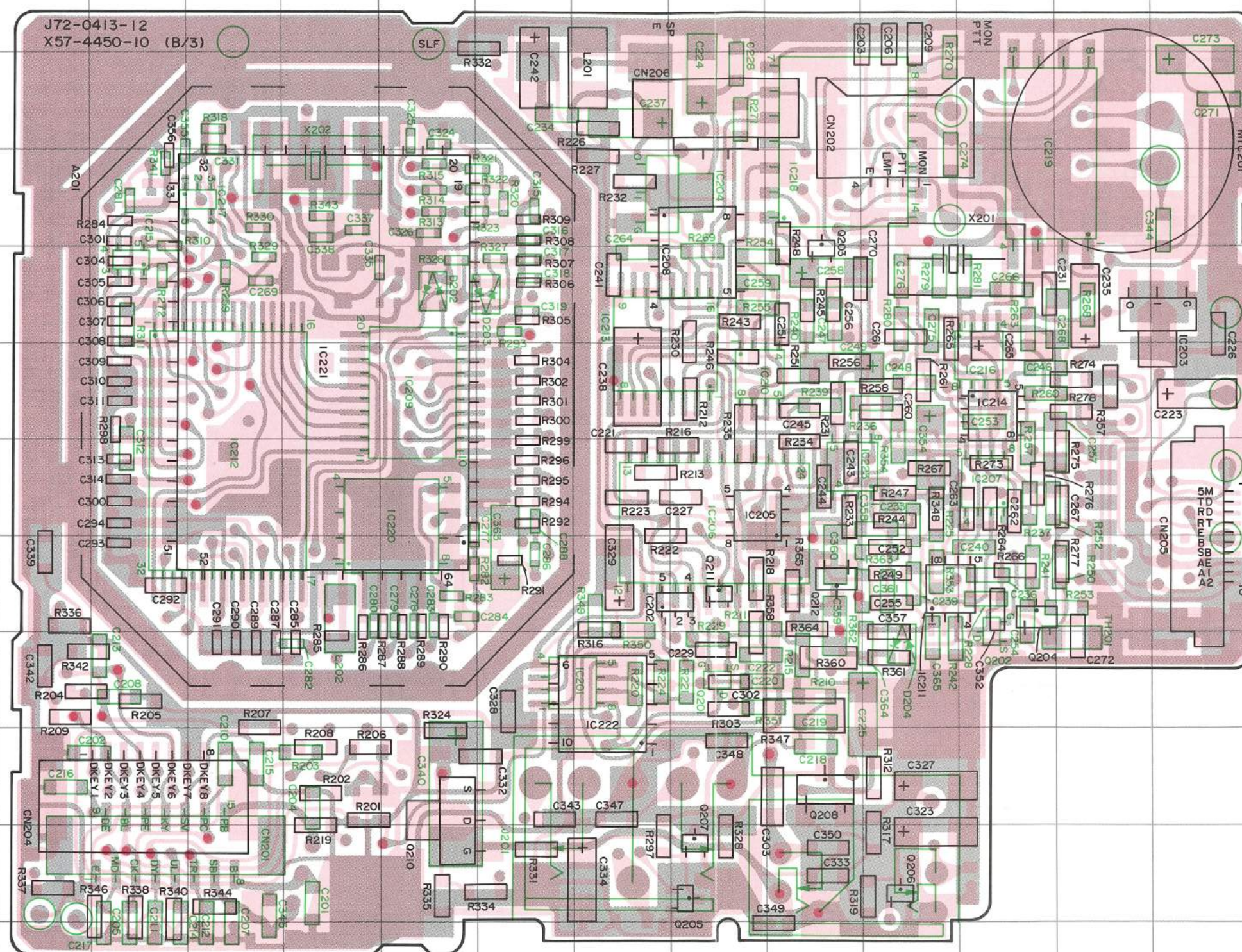


Component side
 Pattern 1
 Pattern 2
 Pattern 3
 Pattern 4
 Foil side

PCD3312CT



Ref. No	Address
IC201	7M
IC206	7N
IC207	4N
IC209	9O
IC210	6O
IC212	10N
IC213	7O
IC215	11P
IC216	4O
IC217	10P
IC218	5Q
IC219	4Q
IC220	9M
IC223	5N
Q201	6M
Q202	4M
D202	9P
D203	8P

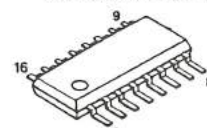
TX-RX UNIT (X57-4450-XX) (B/3) Component side + Foil side view
0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4TX-RX UNIT(X57-4450-XX)(B/3)
(Component side + Foil side side)

Ref. No	Address
IC201	9AB
IC202	8AC
IC203	5AH
IC204	4AB
IC205	8AC
IC206	7AC
IC207	4AF
IC208	5AC
IC209	6Z
IC210	6AC
IC211	8AF
IC212	7W
IC213	5AB
IC214	6AF
IC215	5W
IC216	6AF
IC217	4X
IC218	3AD
IC219	4AF
IC220	8Z
IC221	6Y
IC222	9AB
IC223	7AD
Q201	9AC
Q202	9AF
Q203	5AD
Q204	8AF
Q205	11AC
Q206	11AE
Q207	11AC
Q208	10AC
Q212	8AD
D202	5Z
D203	5AA

PCD3312CT



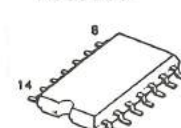
64

BU4094BCFV
MC3372V
XRU4094BCFV

Component side
Pattern 1
Pattern 2
Pattern 3
Pattern 4
Foil side

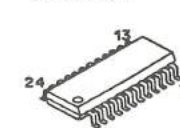
● Connect 1 and 4.

TC35305F

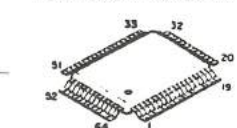


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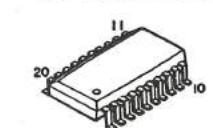
M62363FP



78312AGF3553BE



TC74VHC573FS



66

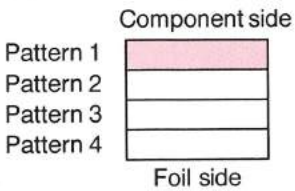
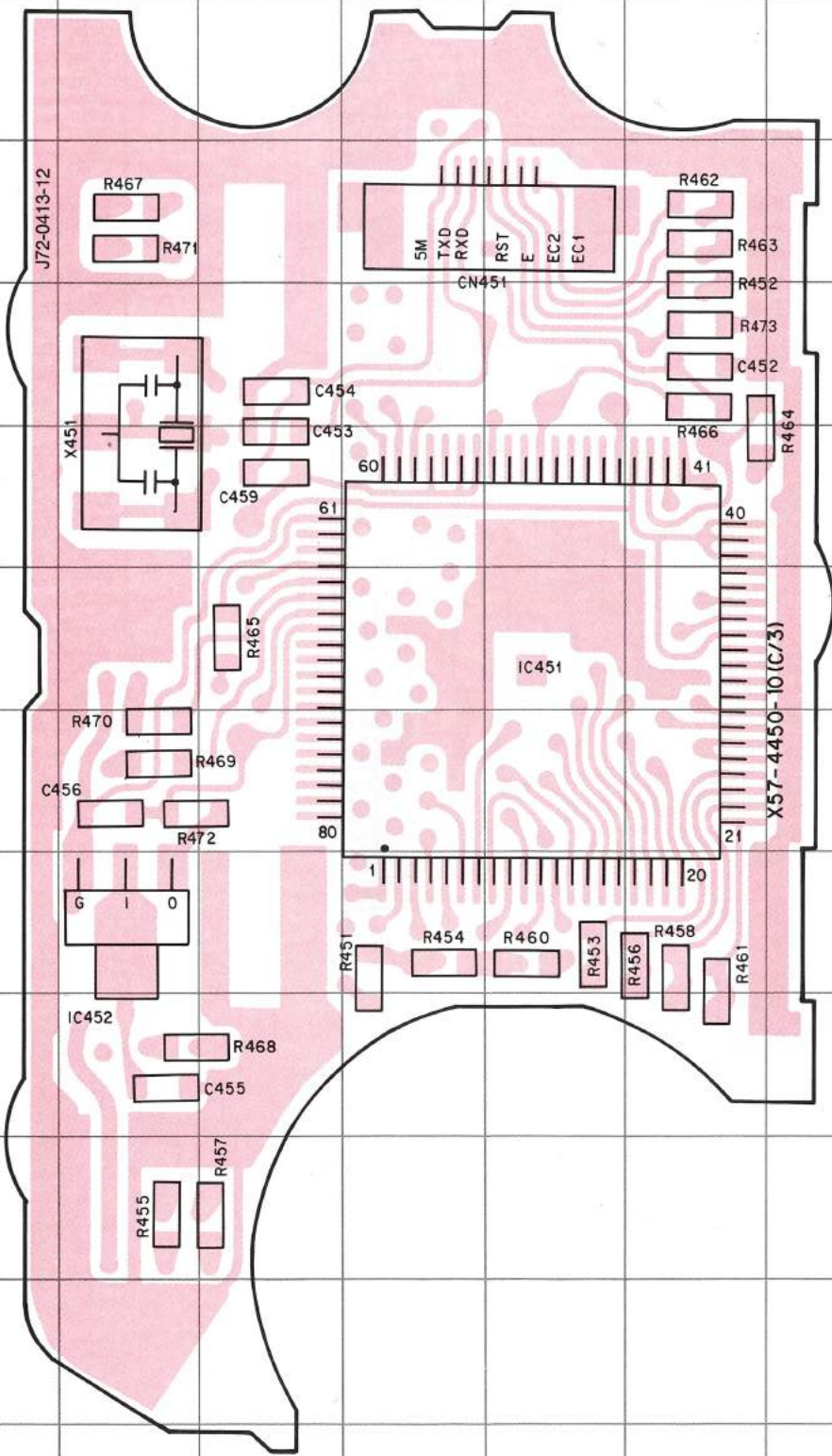
TK-353 PC BOARD VIEWS

TX-RX UNIT(X57-4450-XX) (C/3) (Component side)

Ref. No	Address
IC451	7F
IC452	9C

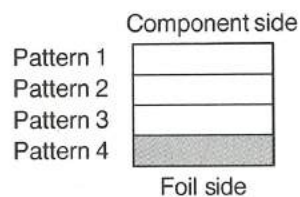
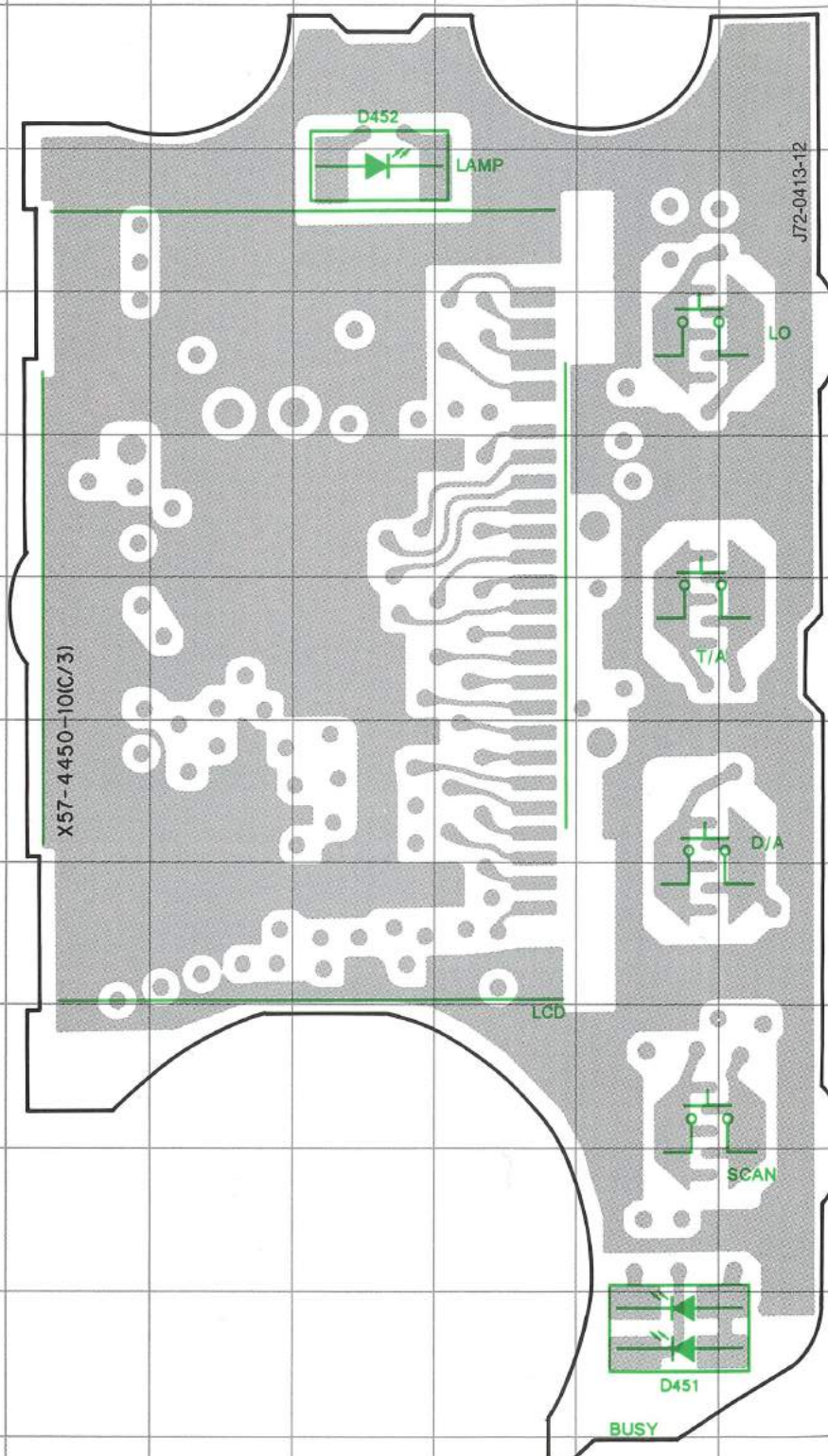
TX-RX UNIT (X57-4450-XX) (C/3) Component side view
 0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4

TX-R
0-14



Ref. No	Address
D451	12Q
D452	4O

TX-RX UNIT (X57-4450-XX) (C/3) Foil side view
0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4



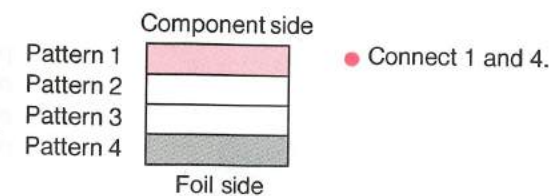
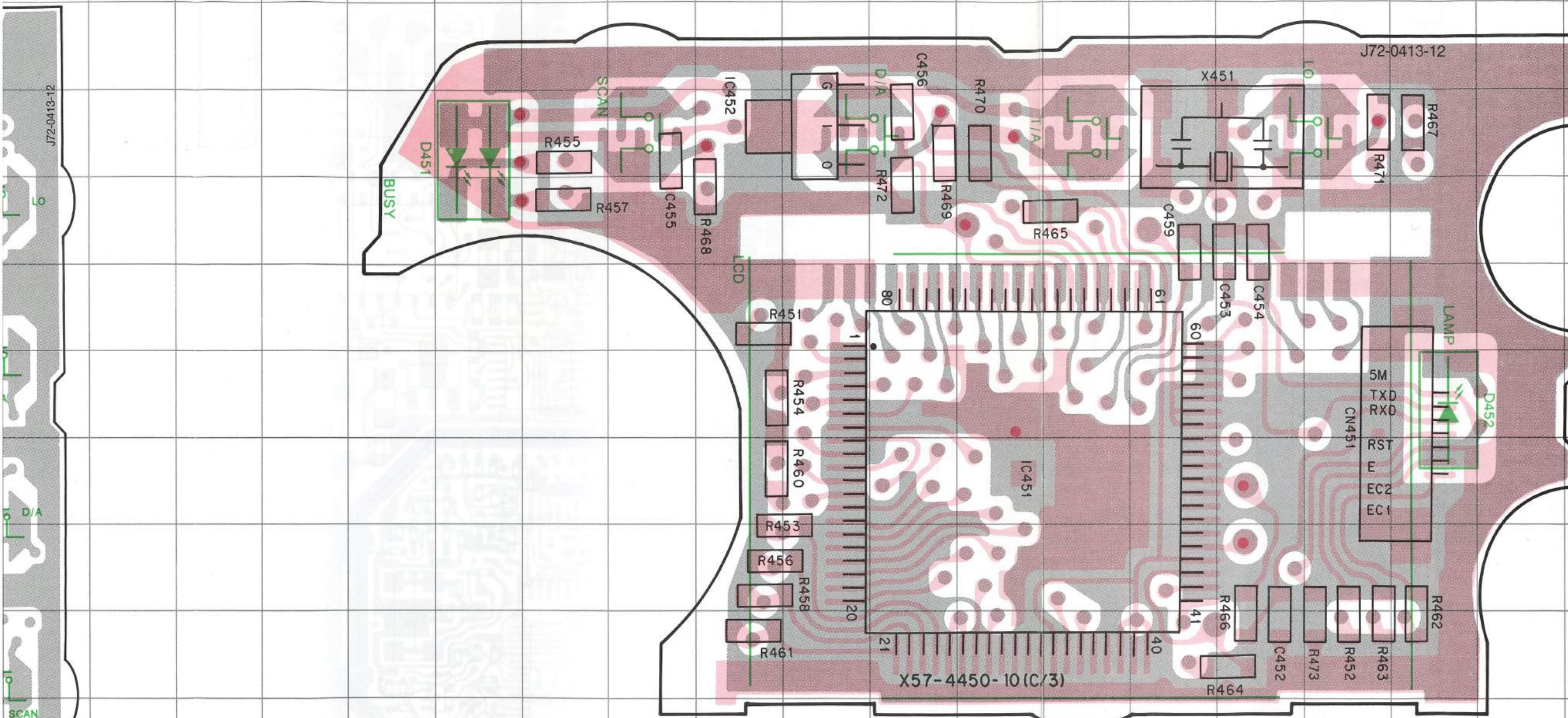
UNIT(X57-4450-XX) (C/3) (Foil side)

o	Address
	12Q
	4O

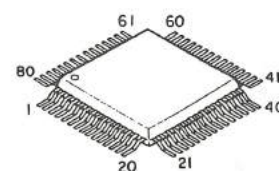
TX-RX UNIT (X57-4450-XX) (C/3) Component side + Foil side view
0-14 : K, 0-15 : K2, 0-16 : K3, 0-17 : K4

TX-RX UNIT(X57-4450-XX)(C/3)
(Component side) + (Foil side)

Ref. No	Address
IC451	8AC
IC452	4AA
D451	4W
D452	7AH

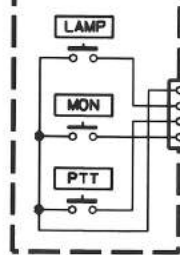


75308BGK739BE9

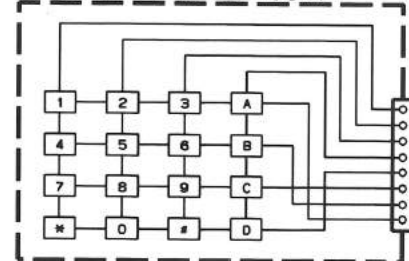


X57-4450-14(B/3)(K) X57-4450-16(B/3)(K3)
X57-4450-15(B/3)(K2) X57-4450-17(B/3)(K4) TX-RX UNIT (CONTROL SECTION)

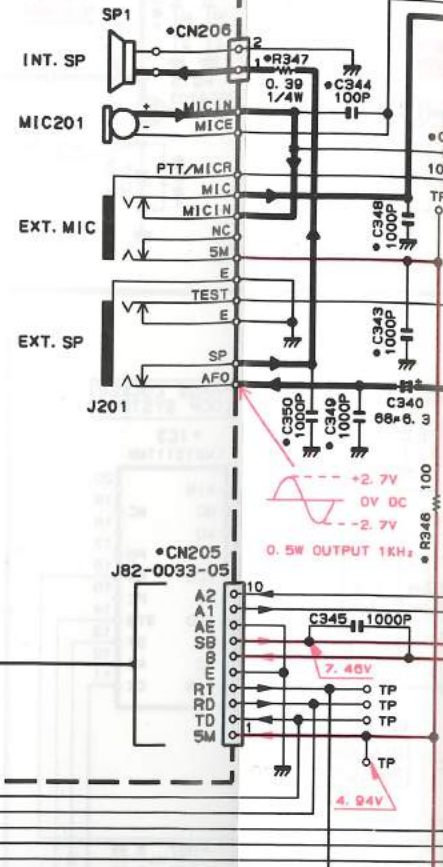
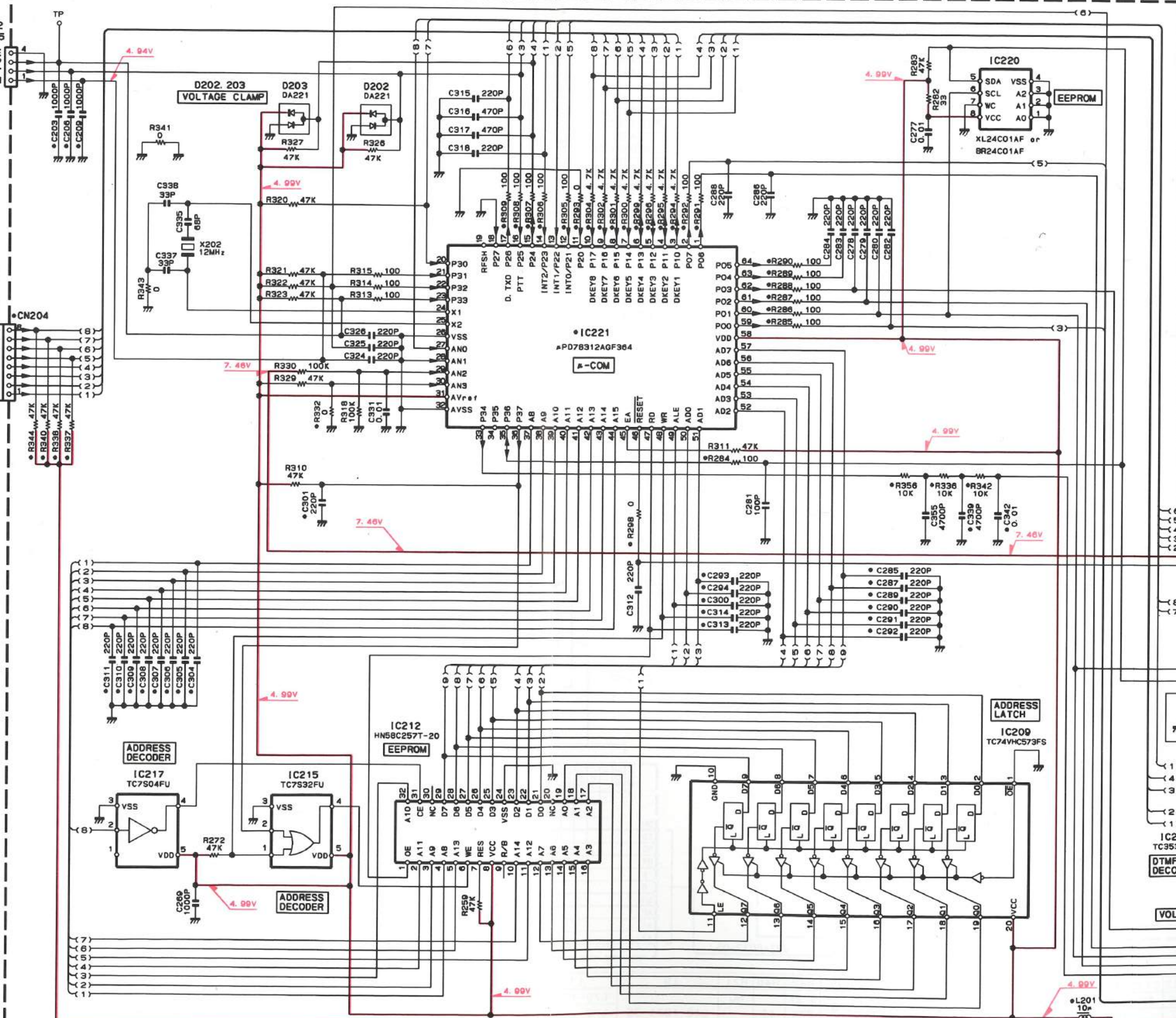
SIDE SW



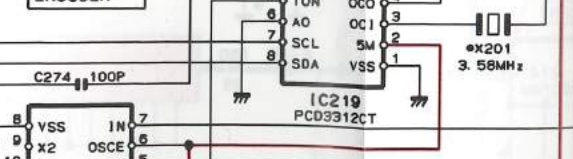
DTMF KEY PAD(OPTION)



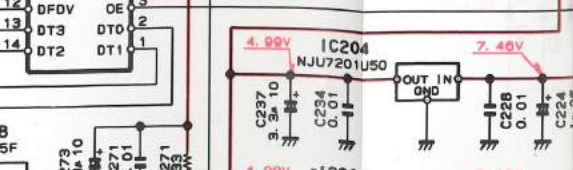
- | | |
|-------------|--------------------------------|
| IC201, 205. | : TA75W01FU |
| 210, 211. | |
| 214, 216. | |
| IC202 | : TC7S66FU |
| IC203, 204 | : NJU7201U50 |
| IC206 | : M62363FP |
| IC207 | : TA75W558FU |
| IC208 | : MC33172D |
| IC209 | : TC74VHC573FS |
| IC212 | : HN58C257T-20 |
| IC213 | : XRU4094BCFV or
BU4094BCFV |
| IC215 | : TC7S32FU |
| IC217 | : TC7S04FU |
| IC218 | : TC35305F |
| IC219 | : PCD3312CT |
| IC220 | : XL24C01AF or
BR24C01AF |
| IC221 | : PD78312AGF364 |
| IC222 | : TA7368F |
| IC223 | : TA75W558FU |
| Q201 | : 2SJ243 |
| Q202 | : 2SK1824 |
| Q203. | : DTC144EE |
| 205~207 | |
| Q204 | : 2SA1586(Y. GR) |
| Q208 | : 2SA1362(OR) |
| Q210 | : 2SK1588 |
| Q211 | : DTA144EE |
| Q212 | : TN103S472JT |
| D202~204 | : DA221 |



TONE (DTMF) ENCODER



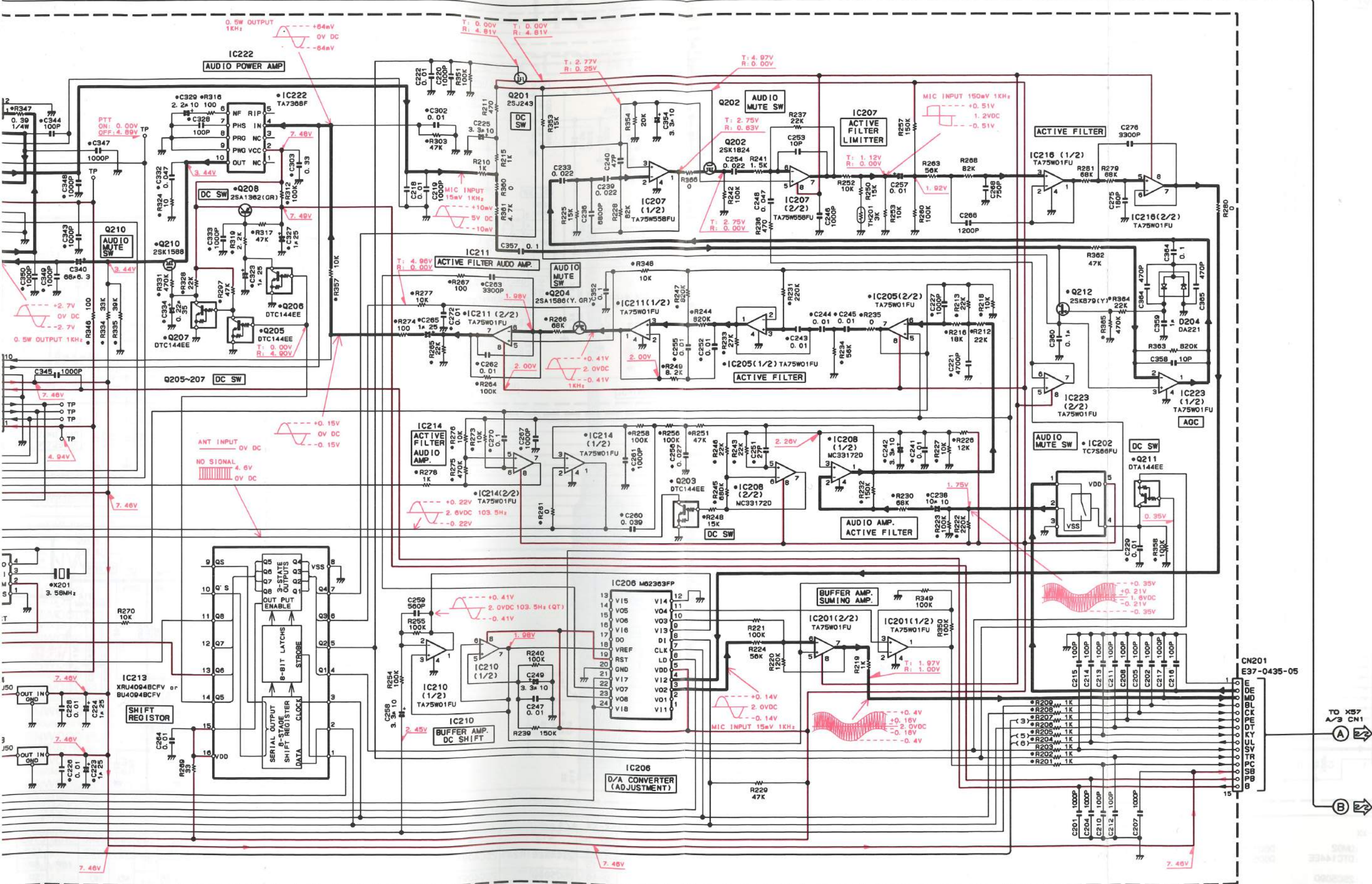
DTMF DECODER



VOLTAGE REGULATOR 5V



SCHEMATIC DIAGRAM TK-353

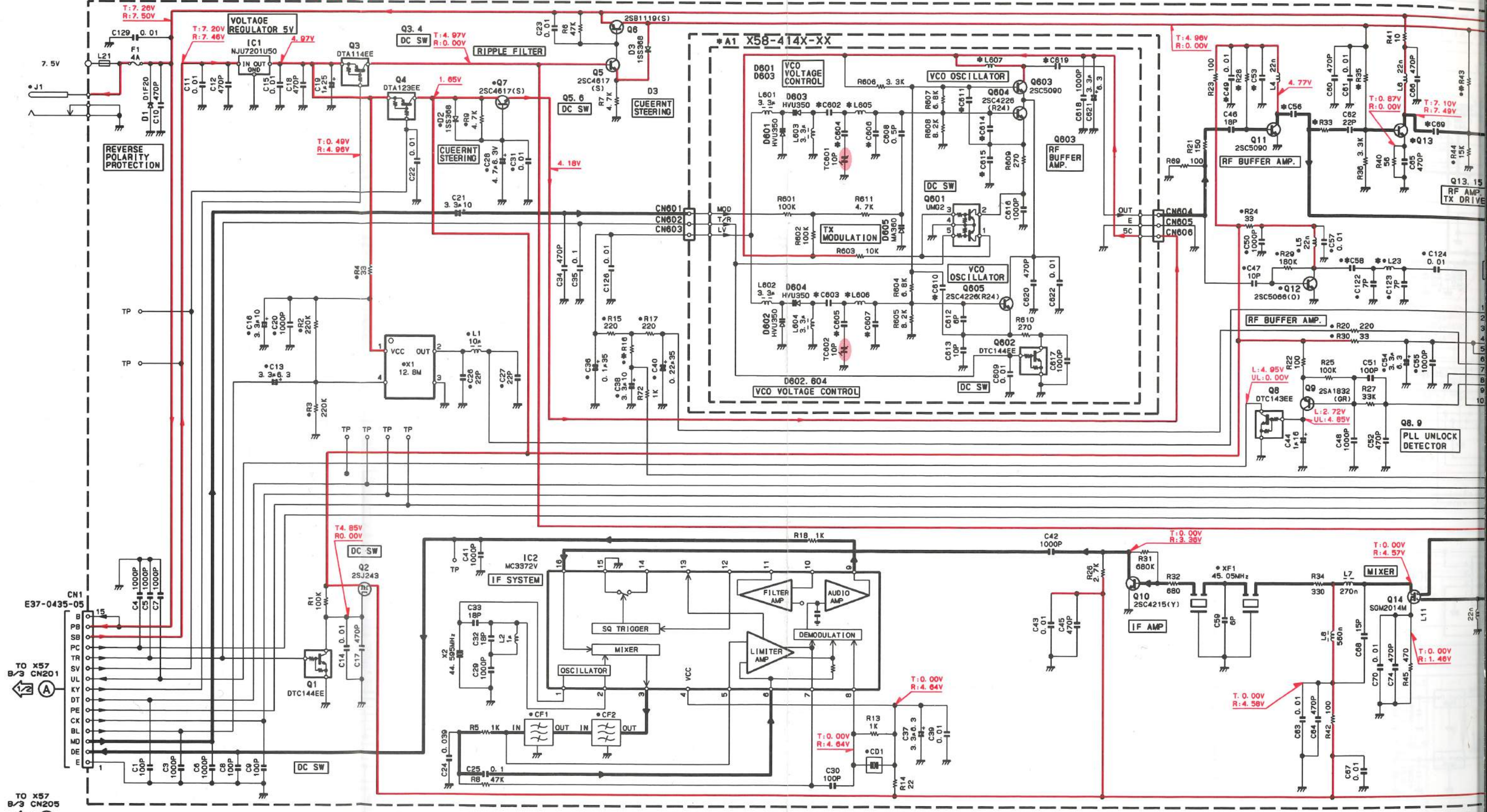


Note) ● Ref. No : Parts of pattern 1.

TK-353 SCHEMATIC DIAGRAM

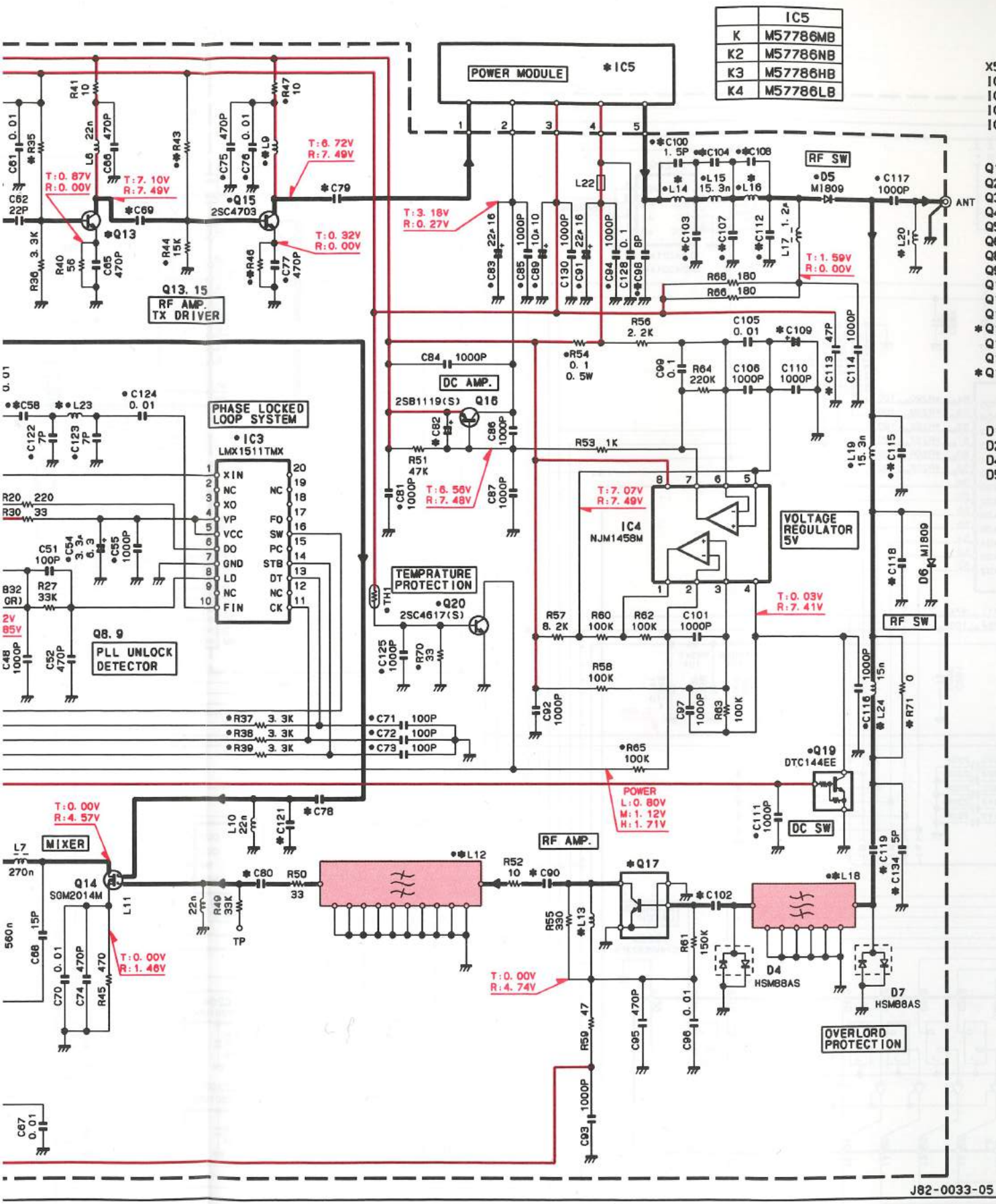
X57-445X-XX A/3 TX-RX UNIT

L: PLL LOCK
UL: PLL UNLOCK



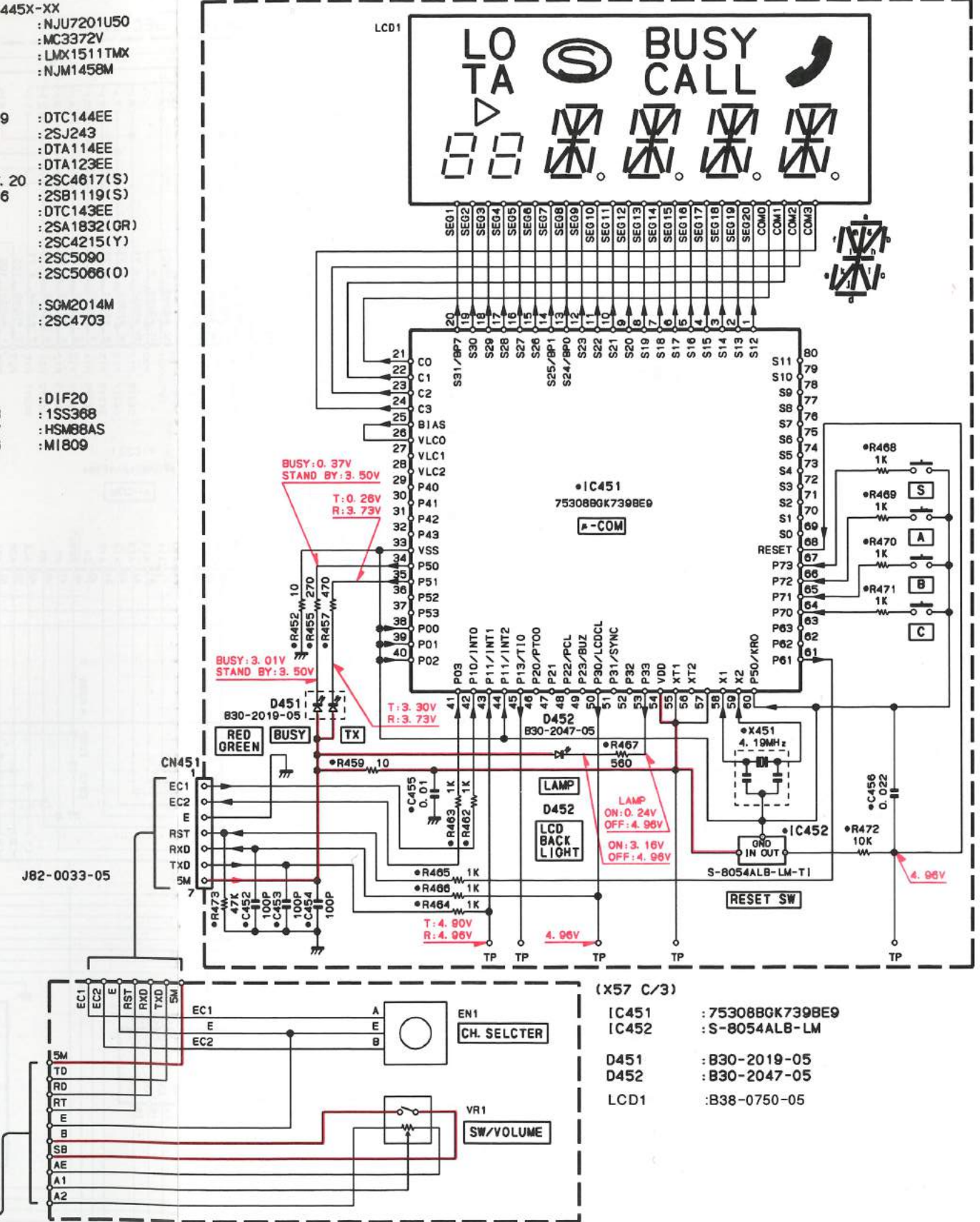
A1 X58-414X-XX														
ABB	REF NO	C602	C603	C604	C605	C606	C607	C610	C611	C614	C619	L605	L606	L607
K	0-10	6P	6P		8P		5P	4P	1P	6P	6P	23n	27n	22n
K2	0-11	5P	5P	6P	6P	5P	6P		1.5P	7P	5P			10P
K3	0-12	4P	7P		6P		5P	3P	1P		6P		23n	22n
K4	0-13	6P	9P	7P	8P	6P	6P		1P	10P		27n	27n	27n

X57-445X-XX A/3														
ABB	REF NO	Q13	Q17	C49	C53	C56	C58	C69	C78	C79	C80	C82	C90	C98
K	0-14	2SC4226(R24)	2SC4094(R37)	YES	1000P	5P	4P		3P	4P	3P	1#16	3P	YES
K2	0-15			NO	0.1#	4P	5P	5P	3P	5P	2P			NO
K3	0-16	2SC5090	2SC4095(R47)						1.5P	4P	2P	0.1#35	4P	NO
K4	0-17	2SC4226(R24)	2SC4094(R37)	YES	1000P	9P	8P	9P	3P	5P	4P			NO



- X57-445X-XX
IC1 : NJU7201U50
IC2 : MC3372V
IC3 : LMX1511TMX
IC4 : NJM1458M
- Q1. 19 : DTC144EE
Q2 : 2SJ243
Q3 : DTA114EE
Q4 : DTA123EE
Q5. 7. 20 : 2SC4617(S)
Q6. 16 : 2SB1119(S)
Q7 : DTC143EE
Q8 : 2SA1832(OR)
Q9 : 2SC4215(Y)
Q10 : 2SC5090
Q11 : 2SC5066(O)
Q12 : SCM2014M
Q13 : 2SC4703
Q14 :
Q15 :
Q17 :
- D1 : DIF20
D2. 3 : 1SS368
D4. 7 : HSM88AS
D5. 6 : M1809

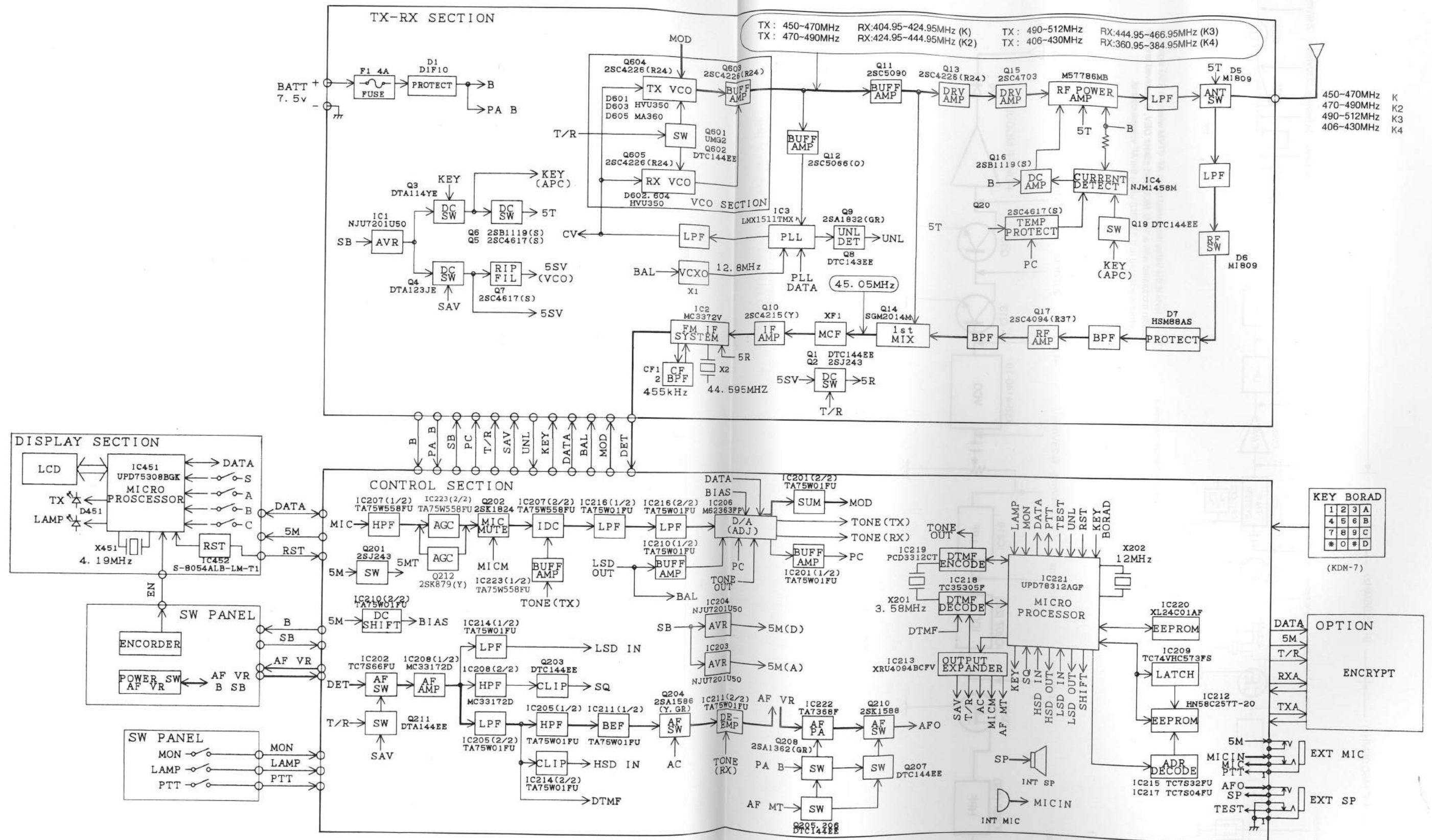
X57 C/3 TX-RX UNIT(DISPLAY SECTION)



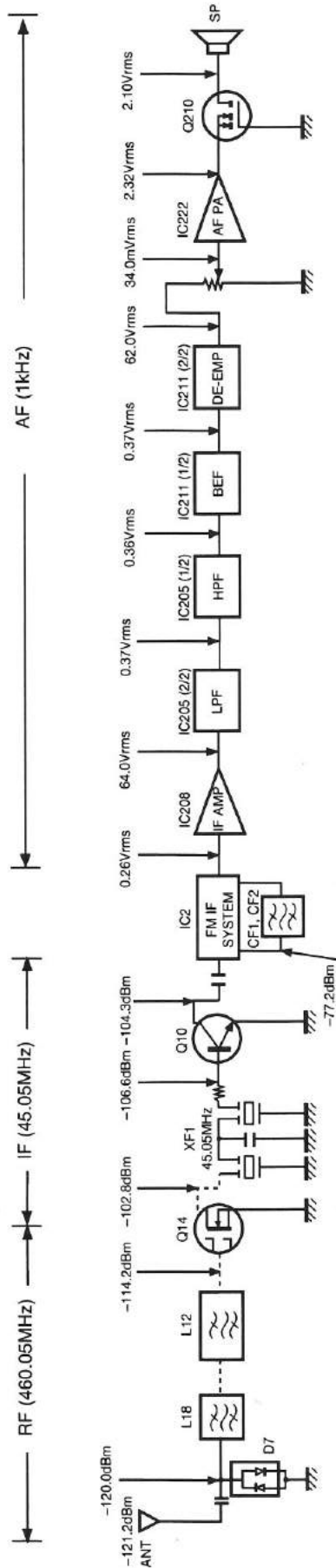
IC98	IC100	IC102	IC103	IC104	IC107	IC108	IC109	IC112	IC113	IC115	IC118	IC119	IC121	IC134	R16	R28	R33	R35	R43	R46	R71	L9	L12	L13	L14	L16	L18	L20	L23	L24
YES	YES	18P	10P	1.5P	10P	1P	0.15*35	7P	YES	5P	10P	100P	1.5P	YES	1K	180K	47	5.6K	8.2K	10	NO	L40-1871-35	L79-1073-05	L40-1871-35	L33-0762-05	L33-0762-05	L79-1074-05	L40-1571-48		YES
NO	NO	22P	8P	1P	8P	5P	0.33*35	0.5P	NO	4P	4P	47P	2P	NO	820	120K	68	4.7K	8.2K		YES	L40-2271-35	L79-1149-05	L40-2271-35	L33-0760-05	L33-0760-05	L79-1146-05	L40-5682-48	L40-1571-36	
					7P	8P			YES	6P		6P	3P			100	5.6K	22K	33										L40-1871-36	NO

Note) ● Ref. No : Parts of pattern 1.

BLOCK DIAGRAM TK-353



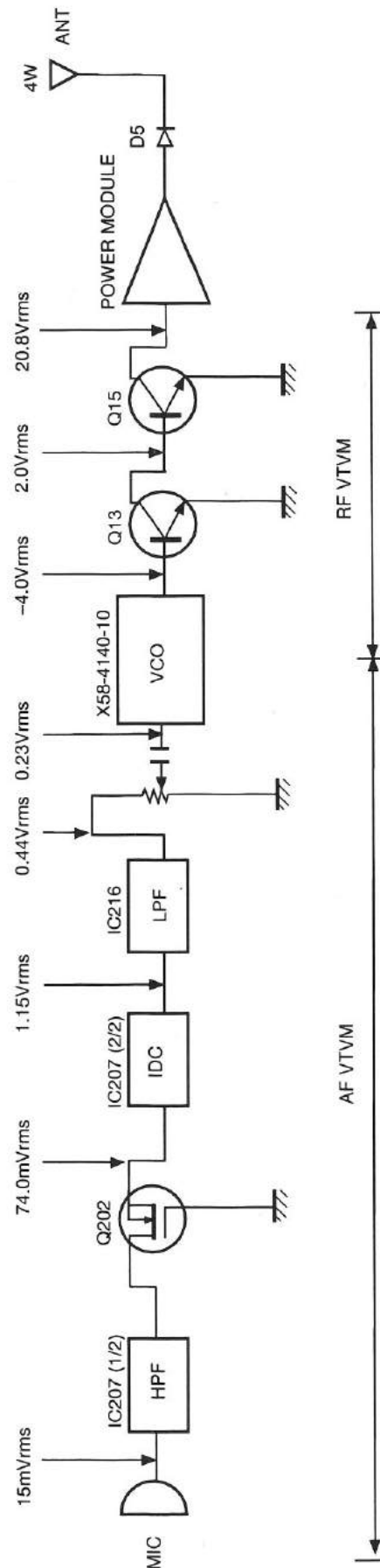
RX Section



Each of the levels plotted from RF to the first IF is the level that can provide a 12 dB SINAD for an SSG signal through a 470pF capacitor.
The first local level is the value measured by an RF VTVM.

The AF level is the value measured by an AF VTVM when an SSG signal of -40dBm modulated with a 1kHz MOD and ± 3 kHz DEV. is received and the AF output is adjusted to 0.63V(8 Ω) using the AF volume control.

TX Section



The AF level is measured by an AF VTVM. The RF level is measured by an RF VTVM. Each of levels measured at high impedance.
The supply voltage from the DC IN terminal is 13.8V.
The transmitting frequency is 460.100MHz.
The audio generator is controlled so that the input signal at the MIC pin has a deviation of ± 3 kHz for a modulation frequency of 1kHz.

KDM-7(DTMF KEY PAD) / BELTHOOK(KBH-6) KHS-1 (HEAD SET WITH VOX & PTT)

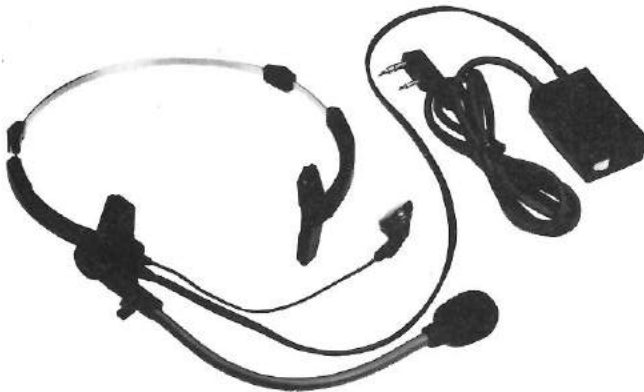
KDM-7 Exploded View



KBH-6 Exploded View



KHS-1 External View



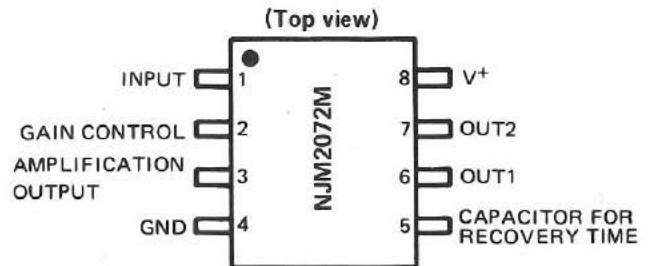
KHS-1 Specifications

Electrical characteristic

- **Earphone**
 - Diameter $\phi 19$
 - Impedance 19Ω (1000Hz)
 - Max. input power 50mW
- **Microphone**
 - Output sensitivity -70dB (0dB = $1V/\mu\text{bar}$ 1000Hz)
 - Output impedance $1.6k\Omega$ (1000Hz)

KHS-1 Semiconductor Data

• **Terminal connection diagram**

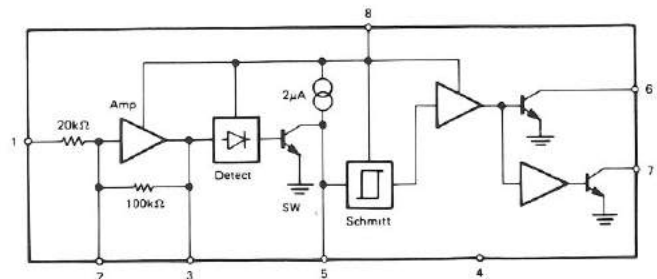


KHS-1 Parts List

* : New Parts

Ref. No.	New Parts	Parts No.	Description
VR1		A02-0840-08	Case (Front)
		A02-0841-08	Case (Rear)
		E30-2088-08	Cable with plug
		F09-0418-08	Microphone pad
		F09-0419-08	Ear pad
		J29-0427-18	Clip
		R05-4422-08	Potentiometer 50k Ω
		S31-1416-08	Slide switch PTT/VOX
		S50-1413-05	Tact switch PTT
		T18-0056-08	Earphone with cable
Q1 Q2 Q3		T91-0373-28	Microphone Ass'y
		W02-0806-18	VOX/PTT unit
		FMG2	Digital transistor
IC1		FMW2	Digital transistor
		2SC2712(GR)	Chip transistor
D1		NJM2072M	IC
		1SS133	Diode

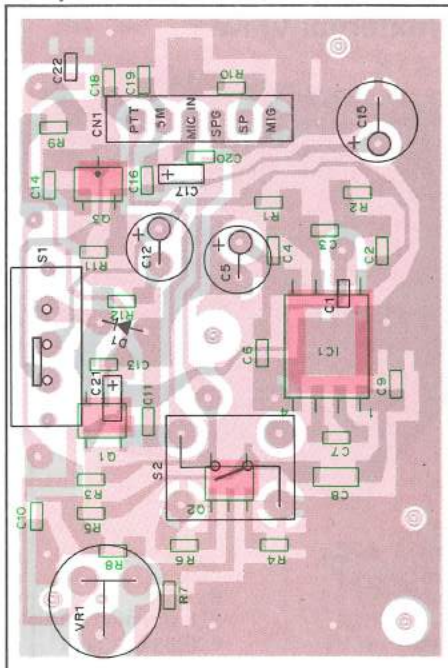
• **Block diagram**



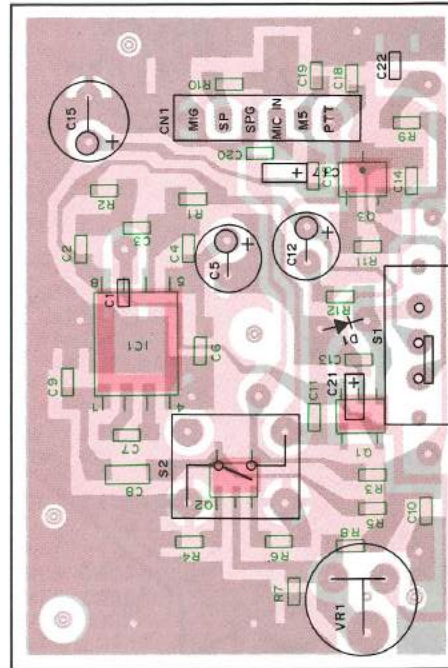
KHS-1 (HEAD SET WITH VOX & PTT)

KHS-1 PC Board Views

Component side view



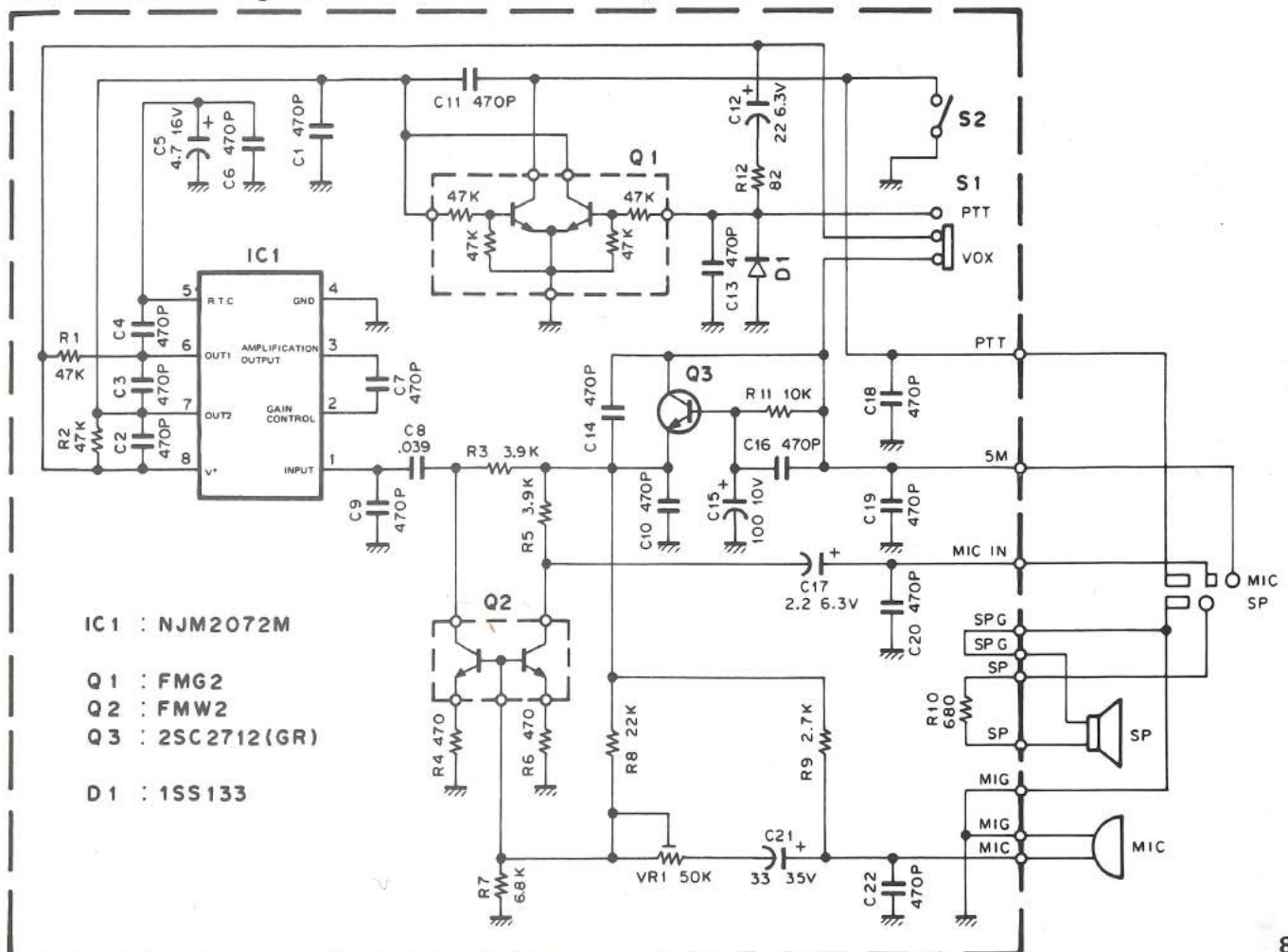
Foil side view



: Component side

: Foil side

KHS-1 Circuit Diagram

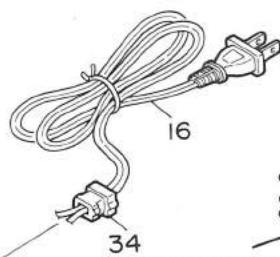
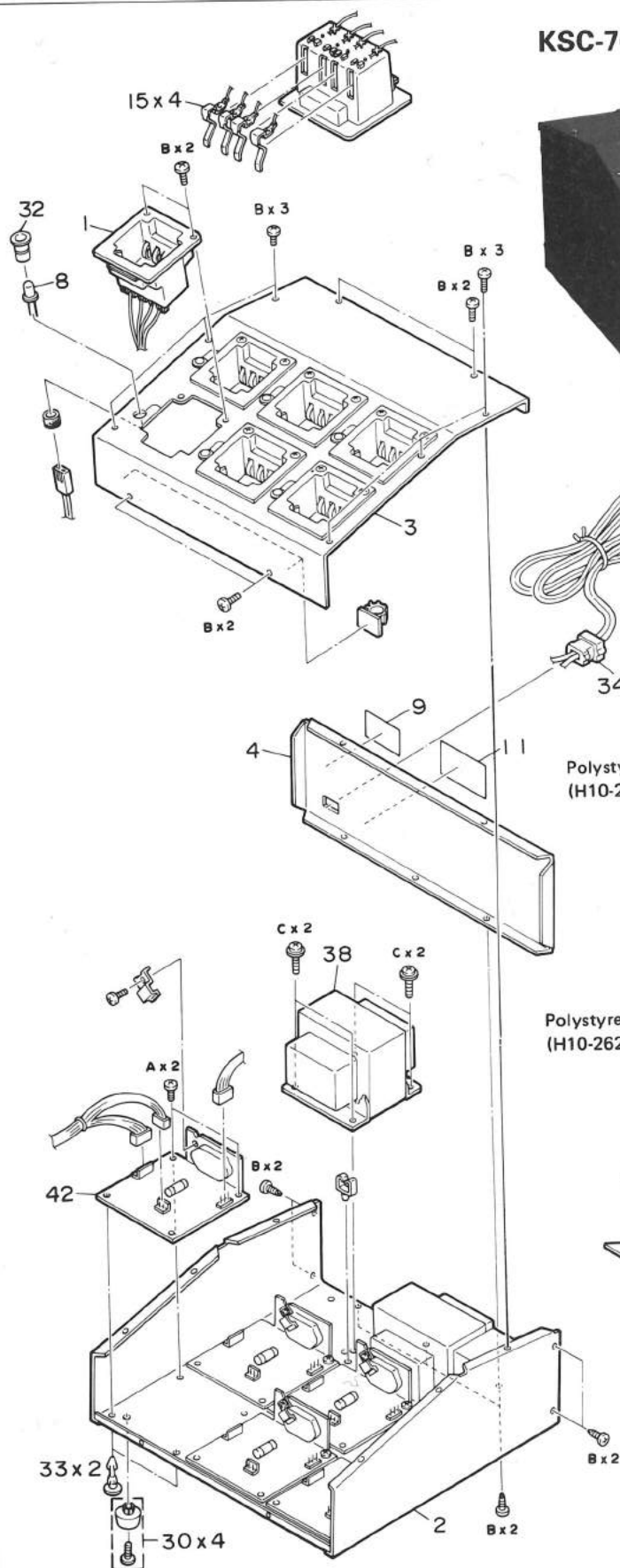


TK-353

KSC-76 (MULTIPLE RAPID CHARGER)

KSC-76 Exploded View/Packing

KSC-76 External View



Instruction manual
(B50-8233-00)

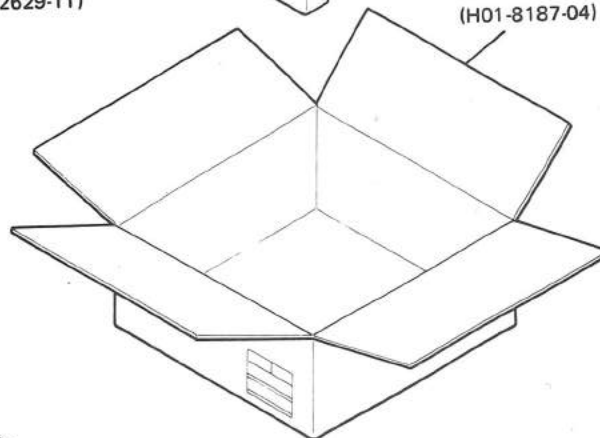
Warranty card
(B46-0418-10) K

Protection cover (KSC-76)
(H20-1403-03)

Polystyrene foamed fixture (L)
(H10-2623-11)

Polystyrene foamed fixture (R)
(H10-2629-11)

Item carton box
(H01-8187-04)



A	M3 x 6 (Bl) NI	N35-3006-41
B	Ø3 x 8 (Bl-Tap) BLK	N89-3008-45
C		N66-4008-46

KSC-76 (MULTIPLE RAPID CHARGER)

KSC-76 Parts List

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
1	1A		A02-0817-05	BATTERY POCKET		
2	3A		A10-1283-21	CHASSIS		
3	2A		A20-2661-01	PANEL ASSY		
4	2A		A23-1496-03	REAR PANEL	KMT	
4	2A		A23-1513-13	REAR PANEL	PXE	
8	1A		B30-0853-05	LED(SLP-530D)		
9	2A		B40-3819-14	MODEL NAME PLATE	KP	
9	2A		B40-3820-14	MODEL NAME PLATE	M	
9	2A		B72-0188-14	MODEL NAME PLATE	X	
9	2A		B72-0200-14	MODEL NAME PLATE	E	
9	2A		B72-0344-14	MODEL NAME PLATE	T	
11	2A		B41-0658-14	CAUTION LABEL		
11	2A		B41-0668-04	CAUTION LABEL	K	
-			B46-0418-20	WARRANTY CARD	K	
-			B50-8233-20	INSTRUCTION MANUAL		
			E23-0604-05	TERMINAL		
16	2B		E30-0780-05	AC POWER CORD	KM	
16	2B		E30-2125-05	AC POWER CORD	P	
16	2B		E30-2140-05	AC POWER CORD	X	
16	2B		E30-2153-15	AC POWER CORD	E	
16	2B		E30-3160-05	AC POWER CORD	T	
-			H01-8187-04	ITEM PACKING CASE		
-			H10-2623-11	POLYSTYRENE FOAMED FIXTURE		
-			H10-2629-11	POLYSTYRENE FOAMED FIXTURE		
-			H20-1434-03	PROTECTION COVER		
-			H25-0105-04	PROTECTION BAG		
30	3A		J02-0323-05	FOOT		
32	1A		J19-1423-05	LEAD HOLDER		
33	3A		J39-0424-05	SPACER		
34	2B		J42-0083-05	POWER CORD BUSHING	KM	
34	2B		J42-0085-05	POWER CORD BUSHING	T	
34	2B		J42-0489-05	POWER CORD BUSHING	PXE	
38	2A		L01-8015-05	POWER TRANSFORMER (120,240V)	M	
38	2A		L01-8061-05	POWER TRANSFORMER (120V)	KP	
38	2A		L01-8382-05	POWER TRANSFORMER (240V)	XT	
38	2A		L07-1007-05	POWER TRANSFORMER (230V)	E	
-	1A		N09-2112-05	BINDING HEAD SCREW	X	
-	1A		N17-1030-41	TOOTHED LOCK WASHER	X	
-	1A		N35-3006-46	BINDING HEAD MACHINE SCREW	XT	
-	1A		N89-2612-46	BINDING HEAD TAPTITE SCREW	X	
A	3A		N35-3006-41	BINDING HEAD MACHINE SCREW		
B	3A		N89-3008-45	BINDING HEAD TAPTITE SCREW		
C	2A		N66-4008-46	PAN HEAD SEMS SCREW B		
42	3A		W02-0819-15	FRONT END UNIT,ELECTRIC UNIT		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)

T:England

E:Europe

Y:AAFES(Europe)

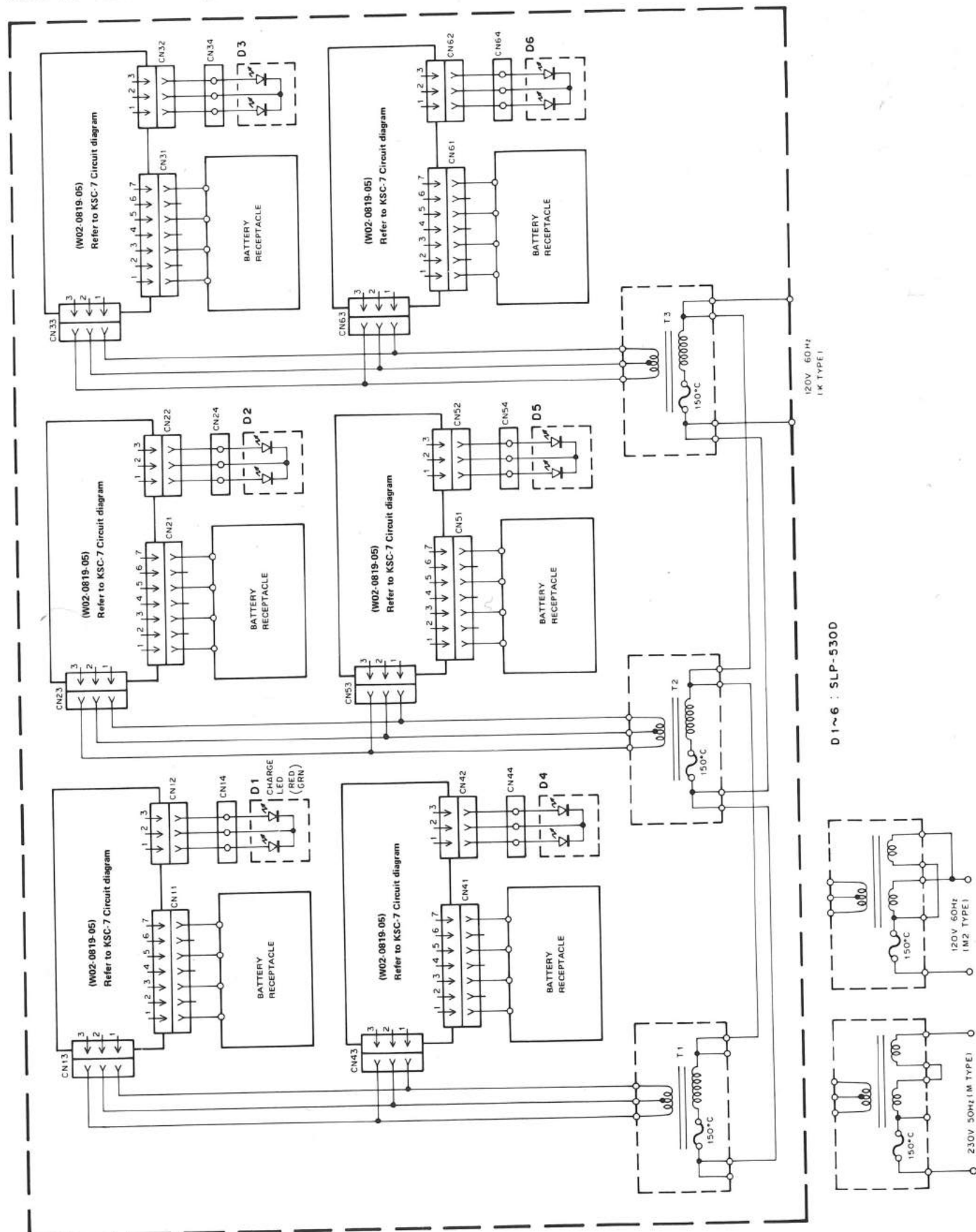
X:Australia

M:Other Areas

⚠ indicates safety critical components.

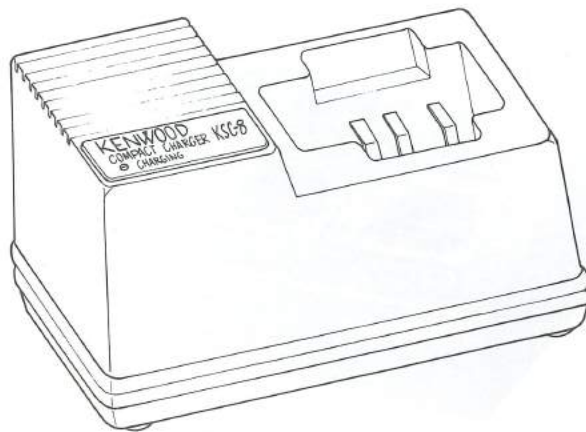
KSC-76 (MULTIPLE RAPID CHARGER)

KSC-76 Circuit Diagram

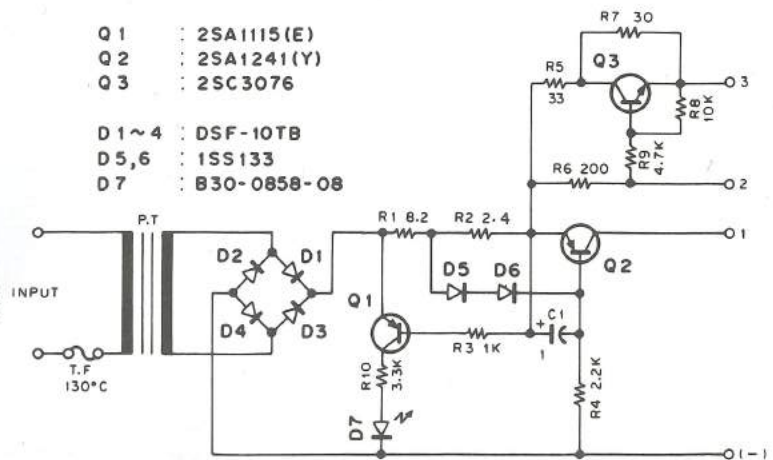


KSC-8 (COMPACT CHARGER)

KSC-8 External View



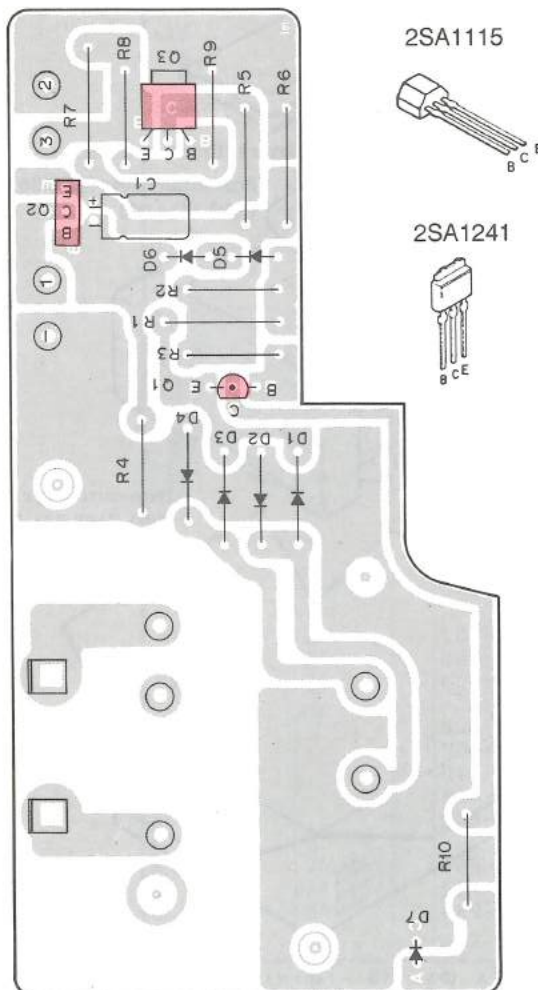
KSC-8 Circuit Diagram



KSC-8 Parts List

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

KSC-8 PC Board View

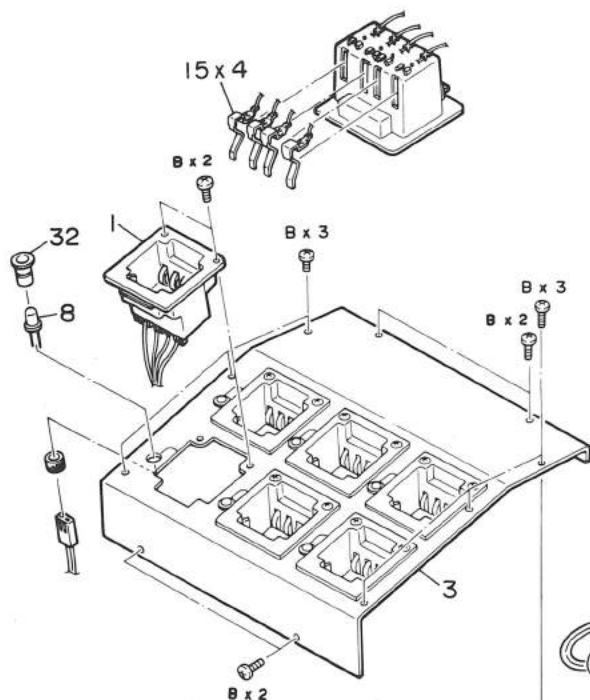


Ref. No. 参照番号	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向
	A02-0539-08 A02-0830-08 A02-0832-08	PLASTIC CABINET(UPPER) PLASTIC CABINET(UPPER) PLASTIC CABINET(BOTTOM)	XTE KMM2P
	B40-3791-18 B40-3792-08 B40-3911-18 B72-0205-08 B72-0206-08	MODEL NAME PLATE MODEL NAME PLATE MODEL NAME PLATE MODEL NAME PLATE MODEL NAME PLATE	KM2 M P X T
	B72-0285-08 B41-0667-08 B50-8205-08 B50-8205-08 B62-0124-18	MODEL NAME PLATE CAUTION LABEL INSTRUCTION MANUAL INSTRUCTION MANUAL INSTRUCTION MANUAL	E KMM2E PX T
D7	B30-0858-08	LED(SR615D)	
	E23-0604-05 E30-0185-05 E30-2012-05 E30-2097-08 E30-2099-08	TERMINAL AC POWER CORD AC POWER CORD AC POWER CORD AC POWER CORD	X P KMM2 T
	E30-2100-08	AC POWER CORD	E
	H01-8150-08 H03-2702-08 H10-2639-08 H10-2640-08 H10-2664-08	ITEM PACKING CASE OUTER PACKING CASE POLYSTYRENE FOAMED FIXTURE UPP POLYSTYRENE FOAMED FIXTURE BOT POLYSTYRENE FOAMED FIXTURE UPP	KMM2ET PX
	H25-0722-08	PROTECTION BAG	
	L01-8027-05 L01-8111-05 L01-8152-08 L07-1004-08	POWER TRANSFORMER (220V) POWER TRANSFORMER (120V) POWER TRANSFORMER (240V) POWER TRANSFORMER (230V)	M KM2P XT E
D1 ~4 D5 ,6 Q1 Q2 Q3	DSF-10TB 1SS133 2SA1115(E) 2SA1241(Y) 2SC3076	DIODE DIODE TRANSISTOR TRANSISTOR TRANSISTOR	
	W02-0805-05 W02-0852-05	ELECTRIC UNIT ELECTRIC UNIT	KMM2ET PX

KSC-86 (MULTIPLE CHARGER)

KSC-86 Exploded View/Packing

KSC-86 External View



* Protection bag (Accessory)
(H25-0077-03)

Binding head machine screw
(N35-3008-41)x8

Holder (Accessory)
(J19-1417-04)x2

Screw (Accessory)

(N09-0694-05)x2

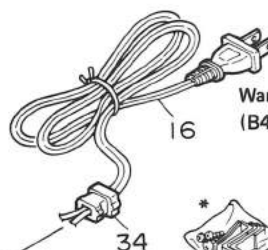
Foot (Accessory)

(J02-0437-04)x2

Formed plate

(G13-0811-04)x2

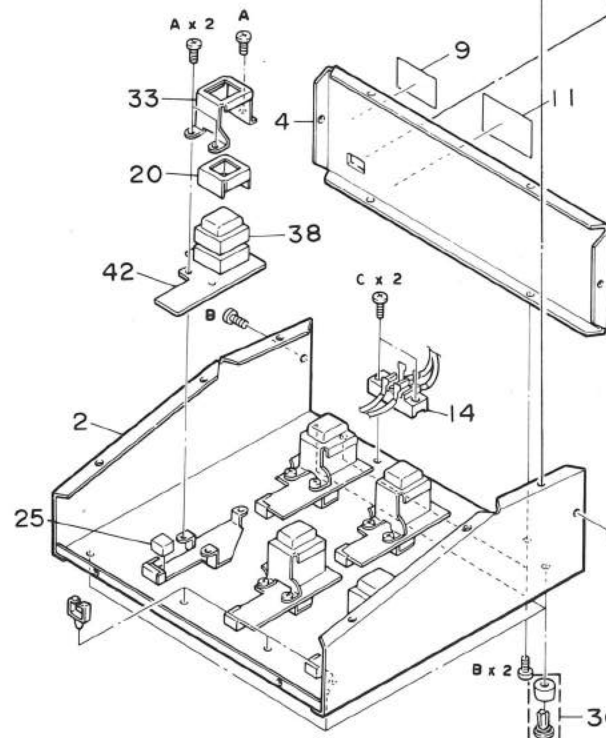
Instruction manual
(B50-8233-00)



Warranty card
(B46-0418-10) K

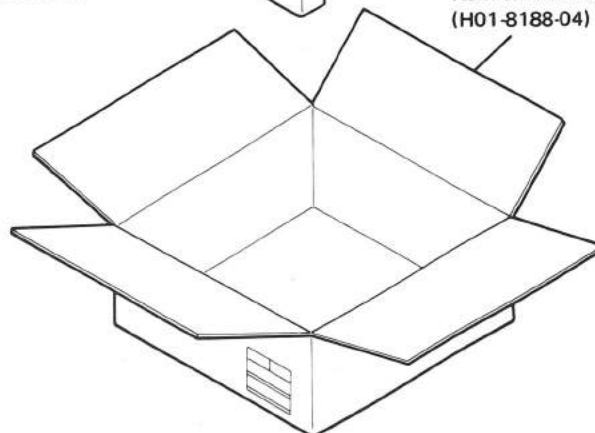
Polystyrene foamed fixture (L)
(H10-2605-11)

Protection cover (KSC-86)
(H20-1414-03)



Polystyrene foamed fixture (R)
(H10-2606-11)

Item carton box
(H01-8188-04)



A $\phi 3 \times 8$ (B i - Top) NI N89-3008-41
B $\phi 3 \times 8$ (B i - Top) BLK N89-3008-45
C $\phi 2.6 \times 12$ (B i - Top) N89-2612-46

KSC-86 (MULTIPLE CHARGER)

KSC-86 Parts List

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
KSC-86						
1	1A		A02-0817-05	BATTERY POCKET		
2	3A		A10-1290-11	CHASSIS		
3	2A		A20-2662-01	PANEL ASSY		
4	2A		A23-1497-03	REAR PANEL	KMT	
4	2A		A23-1514-13	REAR PANEL	PXE	
8	1A		B30-0854-05	LED(SLP-136B)		
9	2A		B40-3821-04	MODEL NAME PLATE	KP	
9	2A		B40-3822-04	MODEL NAME PLATE	M	
9	2A		B72-0187-04	MODEL NAME PLATE	X	
9	2A		B72-0201-04	MODEL NAME PLATE	B	
9	2A		B72-0262-04	MODEL NAME PLATE	T	
11	2A		B41-0658-14	CAUTION LABEL		
11	2A		B41-0668-04	CAUTION LABEL	K	
-			B46-0418-20	WARRANTY CARD	K	
-			B50-8233-20	INSTRUCTION MANUAL		
14	3A		E22-0271-05	TERMINAL BLOCK		
15	1A		E23-0604-05	RELAY TERMINAL		
16	2B		E30-0780-05	AC POWER CORD	KM	
16	2B		E30-2125-05	AC POWER CORD	P	
16	2B		E30-2153-15	AC POWER CORD	B	
16	2B		E30-2159-15	AC POWER CORD	X	
16	2B		E30-3160-05	AC POWER CORD	T	
20	2A		F20-1007-04	INSULATING BOARD		
25	3A		G13-0897-04	CUSHION		
-			G13-0811-04	CUSHION (ACCESSORY)		
-			H01-8188-04	ITEM PACKING CASE		
-			H10-2605-11	POLYSTYRENE FOAMED FIXTURE (L)		
-			H10-2606-11	POLYSTYRENE FOAMED FIXTURE (R)		
-			H20-1414-03	PROTECTION COVER		
-			H25-0077-03	PROTECTION BAG (ACCESSORY)		
-			H25-0105-04	PROTECTION BAG (AC POWER CORD)		
-			J02-0437-04	FOOT (ACCESSORY)		
-			J19-1417-04	HOLDER (ACCESSORY)		
30	3A		J02-0439-05	FOOT		
32	1A		J19-1423-05	HOLDER		
33	2A		J21-4238-04	MOUNTING HARDWARE		
34	2B		J42-0083-05	POWER CORD BUSHING	KM	
34	2B		J42-0085-05	POWER CORD BUSHING	T	
34	2B		J42-0489-05	POWER CORD BUSHING	PXE	
38	2A		L01-8027-05	POWER TRANSFORMER	M	
38	2A		L01-8111-05	POWER TRANSFORMER	KP	
38	2A		L01-8152-08	POWER TRANSFORMER	XTE	
-			N09-0694-05	PAN HEAD SCREW (ACCESSORY)		
-			N09-2112-05	BINDING HEAD SCREW	X	
-			N17-1030-41	TOOTHED LOCK WASHER	X	
-			N35-3006-41	BINDING HEAD MACHINE SCREW	PXTE	
-			N35-3008-41	BINDING HEAD MACHINE SCREW		
A	2A, 3A		N89-3008-41	BINDING HEAD TAPTITE SCREW		
B	3A		N89-3008-45	BINDING HEAD TAPTITE SCREW		
C	2A		N89-2612-46	BINDING HEAD TAPTITE SCREW		
42	2A		W02-0805-05	ELECTRIC CIRCUIT MODULE		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)

T:England

E:Europe

Y:AAFES(Europe)

X:Australia

M:Other Areas

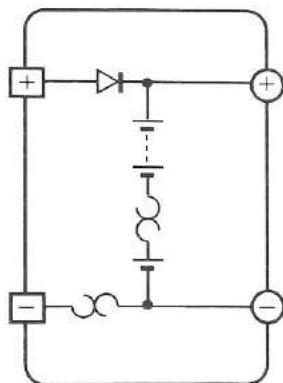
⚠ indicates safety critical components.

KNB-11A/12A(Ni-Cd BATTERY) KPG-22(PC PROGRAM INTERFACE) /KMC-17(SPEAKER MICROPHONE)

KNB-11A
EXTERNAL VIEW



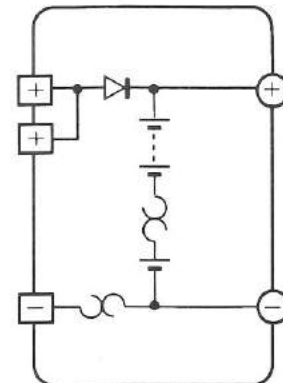
KNB-11A
CIRCUIT DIAGRAM



KNB-12A
EXTERNAL VIEW



KNB-12A
CIRCUIT DIAGRAM



KNB-11A SPECIFICATIONS

Electrical characteristic

Voltage 7.2V(1.2V × 6)

Charging current 800mAh

Dimensions 57.5 W × 60.5 H × 30.5 D(mm)

Weight 190g

KNB-12A SPECIFICATIONS

Electrical characteristic

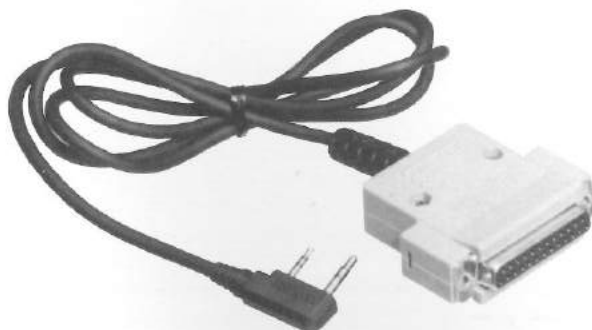
Voltage 7.2V(1.2V × 6)

Charging current 1100mAh

Dimensions 57.5 W × 75.5 H × 30.5 D(mm)

Weight 235g

KPG-22
EXTERNAL VIEW



KMC-17
EXTERNAL VIEW

Curl Code : E30-3138-08



SPECIFICATIONS

TK-353

GENERAL

Frequency Range	Type 1 (450~470MHz) Type 2 (470~490MHz) Type 3 (490~512MHz) Type 4 (406~430MHz)
SYSTEMS	Up to 16
GROUPS	Up to 10
Channel Spacing	25kHz (PLL channel step 12.5kHz)
Battery Voltage	7.2VDC
Battery Life	More than 8 hours at 4 watts (5-5-90 duty cycle with KNB-12A battery)
Temperature Life	-30°C to +60°C (-22 °F to +140 °F)
Dimensions and Weight	
With KNB-12A (7.2V 1100mA battery)	57.5 (2.27) W × 155 (6.12) H × 30.5 (1.21) D mm (in.) 545g (1.20 lbs.)
FCC ID/Compliance	ALHTK-350-1 (450~470MHz), ALHTK-350-2 (470-490MHz) ALHTK-350-3 (490~512MHz), ALHTK-350-4 (460-430MHz)

RECEIVER (Measurements made per EIA standard EIA-316B)

Sensitivity	
EIA 12dB SINAD	0.25µV
20dB Quieting	0.35µV
Modulation Acceptance	±7kHz
Selectivity	68dB
Intermodulation	65dB
Spurious	-70dB(except 1/2 IF)
Image Rejection	-70dB
Audio Power Output	500mW at less than 5% distortion
Frequency Stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	TYPE1,2 : 20MHz TYPE3 : 22MHz TYPE4 : 24MHz

TRANSMITTER (Measurements made per EIA standard EIA-316-B)

RF Power Output	4W/2W/1W
Spurious and Harmonics	-70dB
Modulation	F3E, ±5kHz for 100% at 1000Hz
FM Noise	-45dB
Microphone Impedance	High impedance
Audio Distortion	5%
Frequency Stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	TYPE1,2 : 20MHz TYPE3 : 22MHz TYPE4 : 24MHz

Frequency TYPE

TYPE1	K
TYPE2	K2
TYPE3	K3
TYPE4	K4

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