

COMPACT SYNTHESIZED
VHF FM TWO-WAY RADIO

TK-705

SERVICE MANUAL

KENWOOD
ManualPlus.com

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GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

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

ORDERING REPLACEMENT PARTS

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

PERSONNEL SAFETY

The following precautions are recommended for personnel safety:

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

FCC COMPLIANCE AND TYPE ACCEPTANCE NUMBERS

Type acceptance number	Frequency range	Compliance
ALHTK-705-1	150 ~ 174MHz	Parts 15, 22, 74 and 90

1. POWER-UP

To turn on the radio, press the power switch (IO). The channel indicator will illuminate to indicate power is ON.

2. TO RECEIVE

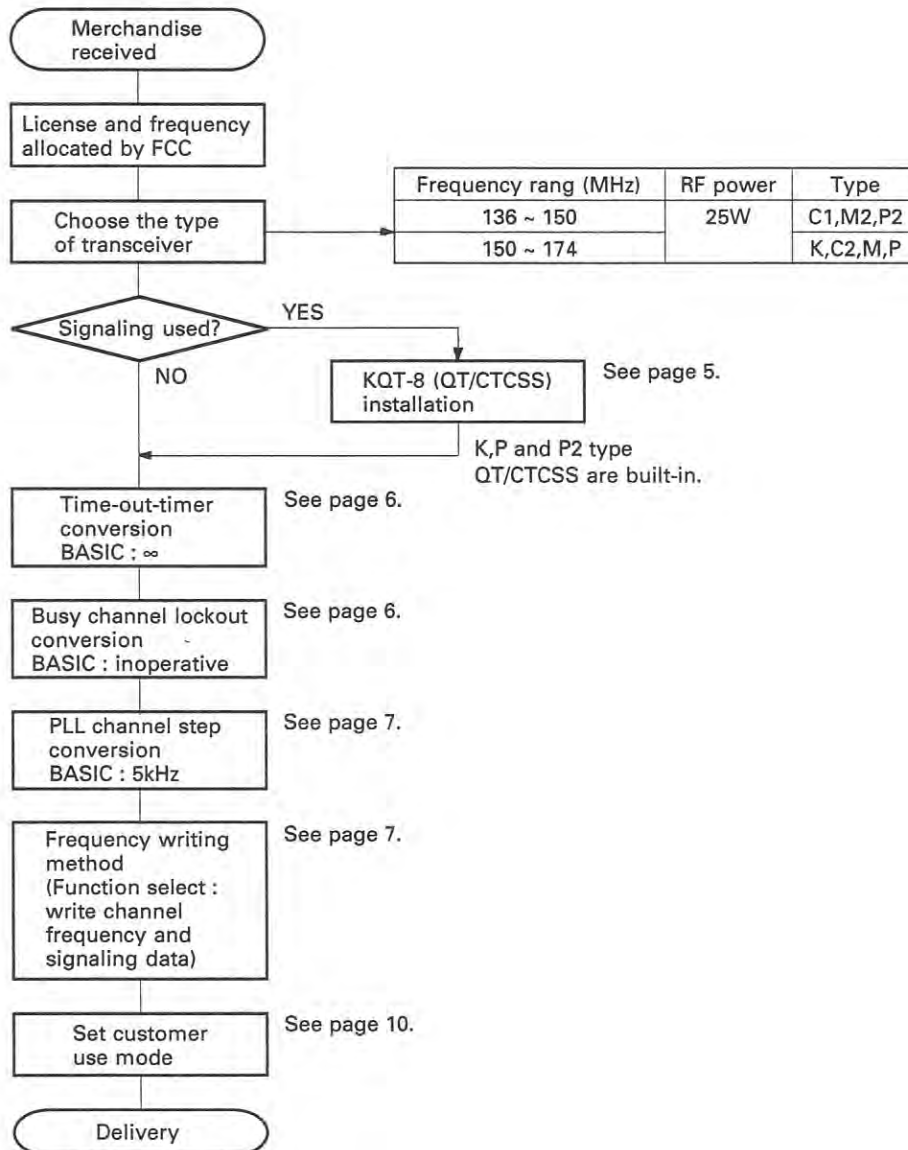
Operation	Procedure
1. Disable QT (if so equipped)	Remove microphone from its hanger.
2. Unsquench radio	Press the SQUELCH switch (↘).
3. Set VOLUME control	Adjust VOLUME control for a normal listening level.
4. Set SQUELCH control	Press the SQUELCH switch (↘) again.
5. Select operating frequency. (Multichannel models only)	Rotate CH selector switch to desired channel.
The radio will now receive all traffic on the selected channel.	
6. Enable QT (if so equipped)	Insert microphone back into its hanger to activate KQT-8.
You will now hear messages for your system only.	

3. TO TRANSMIT

Operation	Procedure
1. Disable QT (if so equipped)	Press the MONITOR switch (↵) or remove microphone from hanger.
2. Select operating frequency. (Multichannel models only)	
3. LISTEN	DO NOT TRANSMIT if channel is in use.
4. Key transmitter	Press and hold the microphone PTT switch. The LCD on the front panel will indicating the transmitter is ON (↗).
5. Transmit message	Hold microphone at about 2 inches distance and speak at a normal voice level. Keep transmissions brief.
6. Receive reply	Release the microphone PTT switch.
7. Enable QT at end of the conversation. (if QT equipped)	Press the MONITOR switch (↵) and replace the microphone into its hanger.

SYSTEM SET-UP

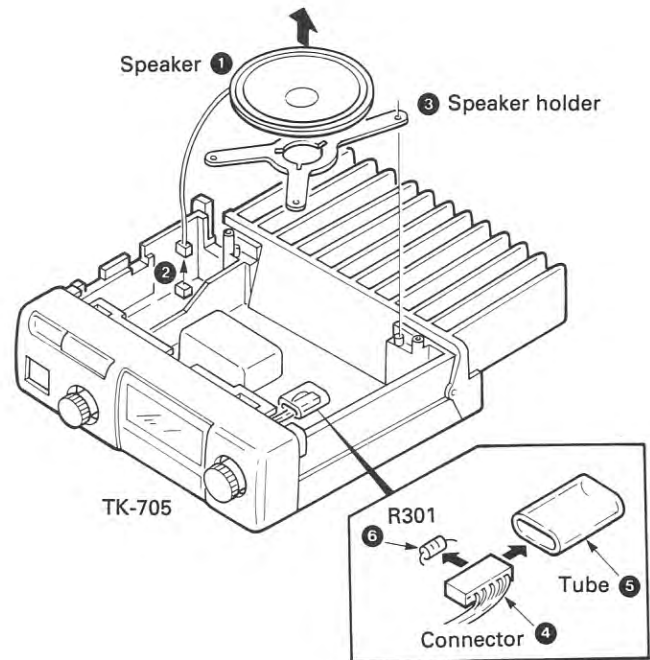
System Set-up



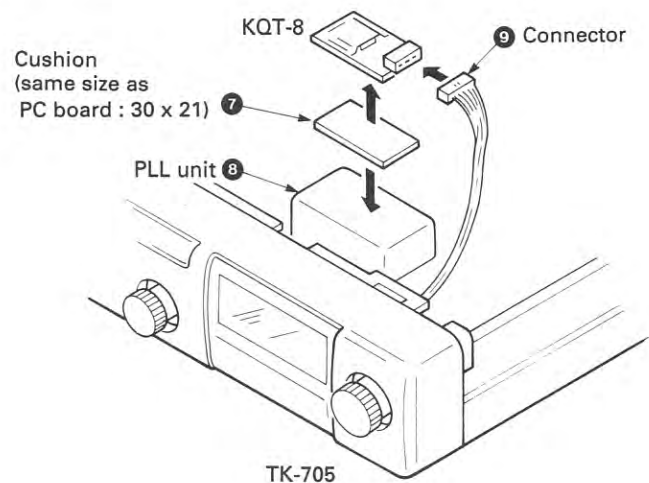
INSTALLATION

Installation of KQT-8

1. Remove the top case of the radio.
2. Remove the speaker (❶) and cable with connector (❷) from the radio.
3. Lift off the speaker holder from the radio (❸).
4. Remove the tube (❺) from the cable with connector (❹) in the radio, then remove the resistor R301 : RD14BB2B2R2 (❻).



5. Attach the cushion supplied with the KQT-8 to the foil side of the KQT-8 (❷).
6. Remove the paper from the cushion attached to the KQT-8, and stick the cushion onto the top case of the PLL unit (❸).
7. Connect the cable with connector (❹) to the connector of the KQT-8.
8. Insert the cable with connector (❷) of the speaker into the radio.
9. Reinstall the speaker holder (❸) in its original position in the radio, and place the speaker in the holder.



CONVERSION

Time-out-timer Conversion (TOT)

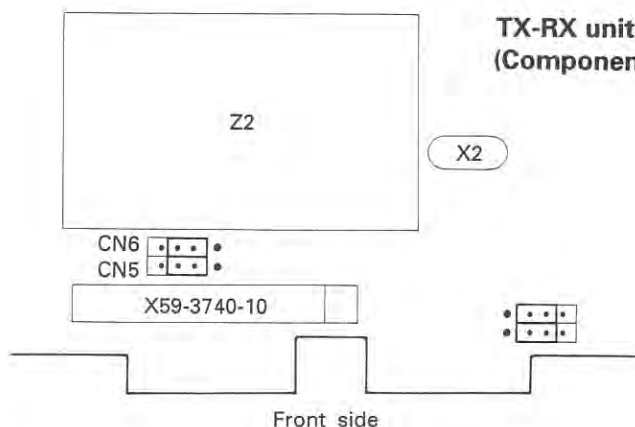
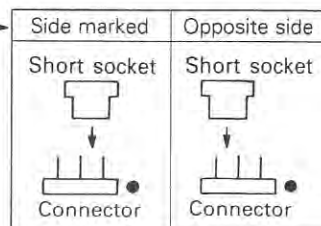
The time-out-timer returns the unit to the receive state automatically when transmission continues beyond a certain length of time.

The time limit for the time-out-timer is set by changing the short socket (E18-0254-05) of the connectors (CN5 and CN6) on the TX-RX unit (A/2).

Remove the socket from above.

TOT (sec)	CN5	CN6
∞^*	Side marked	Side marked
30	Side marked	Opposite side
60	Opposite side	Side marked
60	Opposite side	Opposite side

* : BASIC



TX-RX unit
(Component side view)

Busy Channel Lockout Conversion

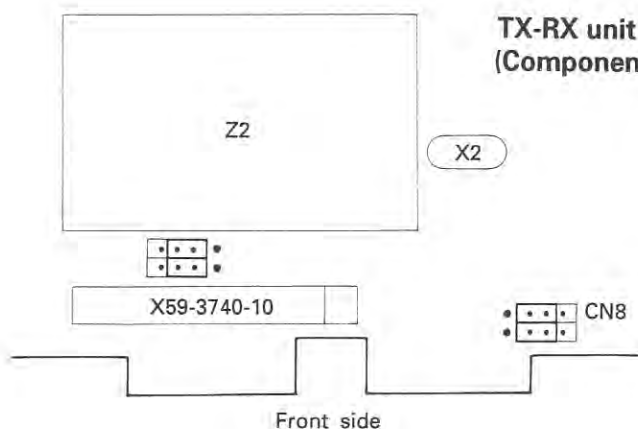
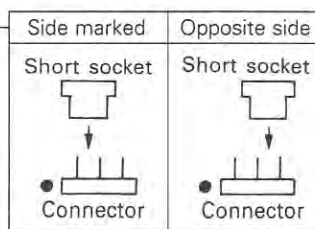
Busy channel lockout inhibits transmission from the local unit when some signaling has been set for the local unit and BUSY is ON and signaling mismatches.

The busy channel lockout is set by changing the short socket of the connector (CN8) on the TX-RX unit (A/2).

Remove the socket from above.

CN8	
Opposite side	Side marked*
Function operative	Function inoperative

* : BASIC



TX-RX unit
(Component side view)

CONVERSION / FREQUENCY WRITING METHOD

PLL Channel Step Conversion

The PLL channel step frequency is changed from 5kHz to 6.25kHz.

The frequency is set by changing the chip jumpers R207, R208 : R92-0670-05 on the TX-RX unit (B/2)

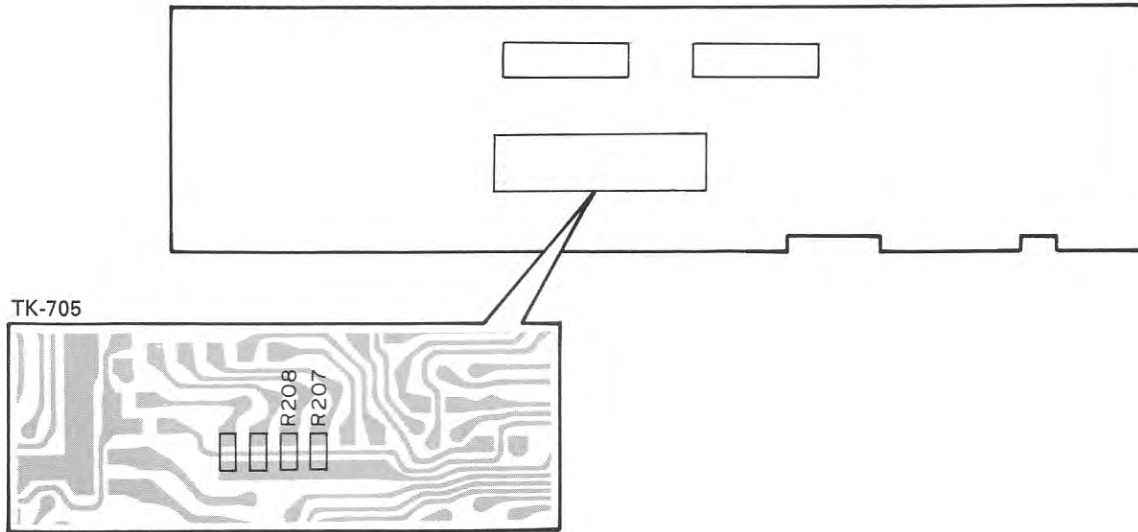
	R207	R208
5kHz*	○	○
6.25kHz	X	○

* : BASIC

○ : Installed

X : Removed

TX-RX unit (B/2) (Foil side view)



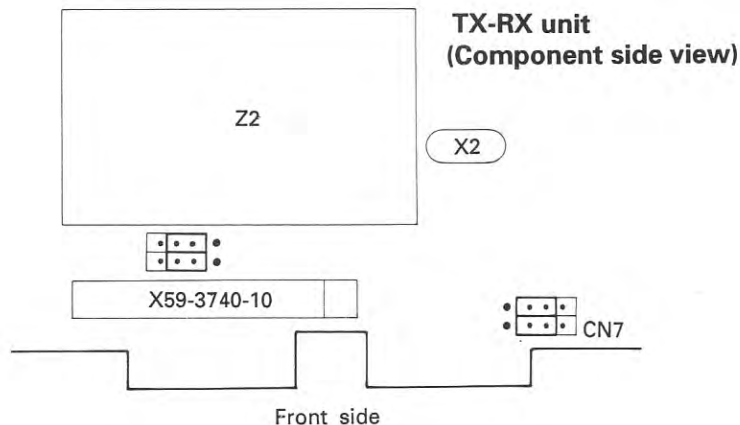
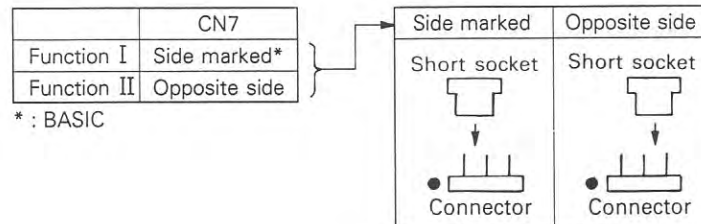
Frequency Writing Method (Function Select)

Function select I and II have the following mode 1) to 5). When frequencies and signaling data are written for the first time after delivery, use the frequency setting mode. Select an appropriate mode as required.

1. Function I and II setting method

To change the function to I or II, change the short socket of the connector CN7 on the TX-RX unit (A/2).

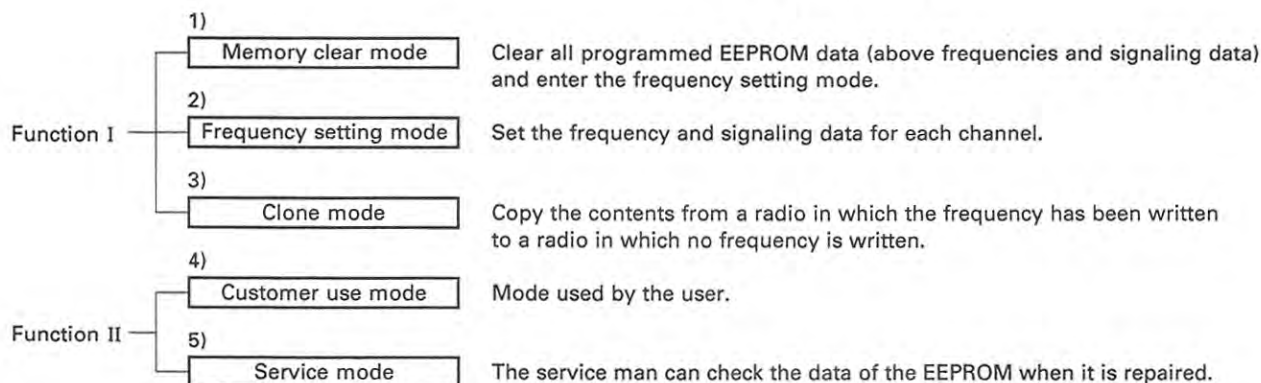
Remove the socket from above.



FREQUENCY WRITING METHOD

2. Modes

Note : After checking or setting in each mode, deliver the product with the customer use mode of Function II set.



1) Memory clear mode

This mode is set by turning the POWER switch on while pressing the MONITOR switch ($\triangleleft$).

After all data of the built-in EEPROM (transmit/receive frequency and transmit/receive signaling data) has been cleared, the frequency setting mode is set.

2) Frequency setting mode

• Notes

Frequency setting is normal changed in 5kHz (6.25kHz) steps. If the channel selector is turned while pressing the SQUELCH switch ($\sim \vee$), it is changed in 1MHz steps.

If the signaling unit is not installed, the transmit/receive signaling data setting is not displayed by the CHANNEL indicator.

Transmission or reception cannot be performed in this mode.

• Writing method (See flowchart)

When the power switch is turned on, the receive frequency setting mode of CH1 on the channel indicator is set. (Only CH1 is initialized to 150.000MHz.)

The transmit/receive frequency and transmit/receive signaling data are set for each channel using the following procedure :

1. Set the receive frequency with the channel selector.
2. Press the PTT switch. The receive frequency specified in step 1 is memorized and the channel indicator shows receive signaling data input mode. The initial indication is off.

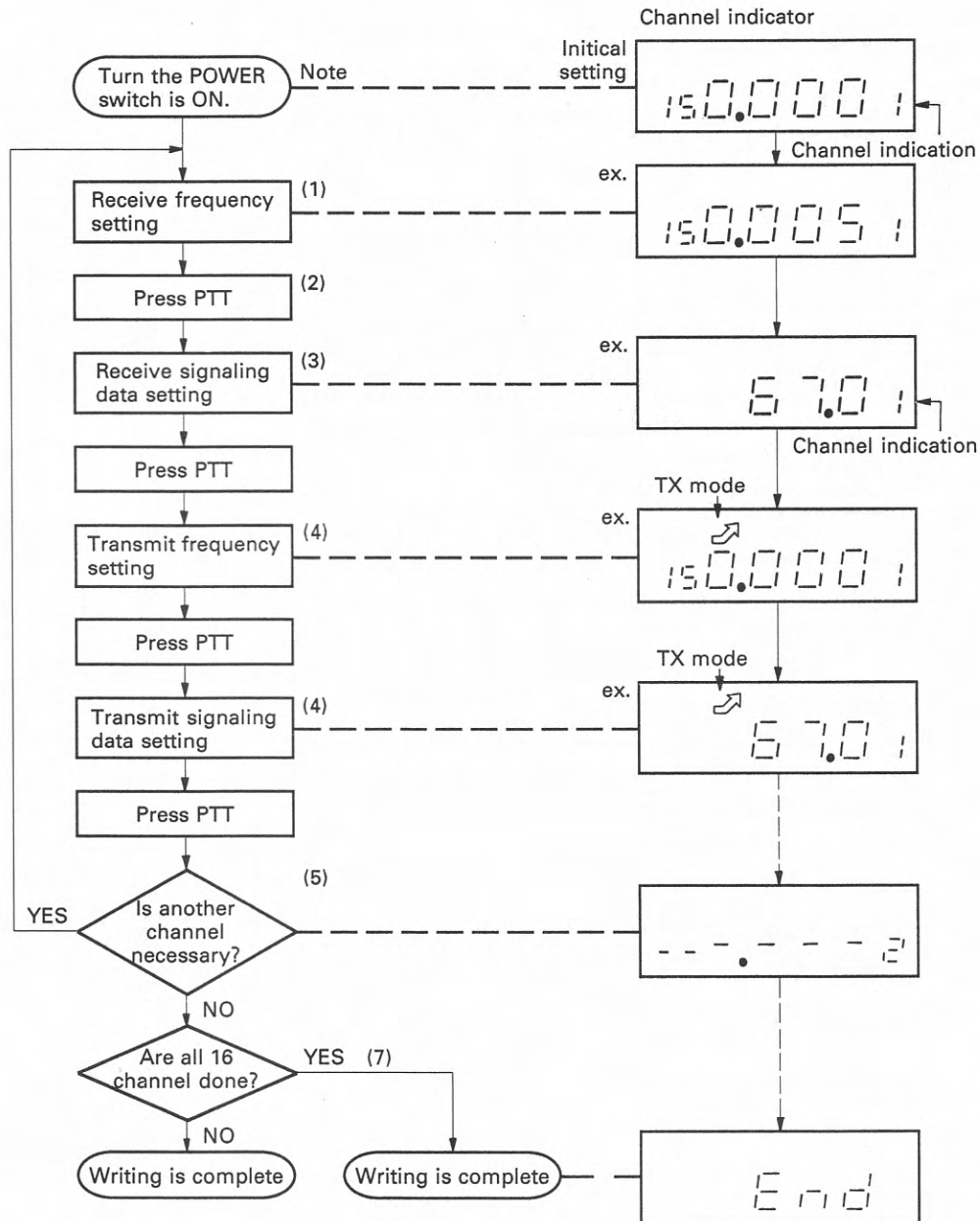
3. Set the receive signaling data with the channel selector and press the PTT switch. If the receive signaling data is not set, press the PTT switch.
4. The channel indicator now shows transmit frequency input mode. Set the transmit frequency by following step 1 to 3.



5. Repeat steps 1 to 4 for the channels for which frequencies need to be set.
6. If frequencies for a channel need not be set, simply press the PTT switch. The next step will be displayed.
7. When all 16 channels have been set up, "E-7" is displayed.
8. When setting is finished, the written contents can be checked by pressing the MONITOR switch ($\triangleleft$). Even when channel data is being checked with the MONITOR switch, the CHANNEL selector, PTT, and SQUELCH switch are valid, and channel data can be rewritten.

FREQUENCY WRITING METHOD

• Flowchart of frequency setting mode



FREQUENCY WRITING METHOD

3) Clone mode

In this mode, two RADIOS are connected, and the contents of the EEPROM data written in one are copied to the EEPROM of the other.

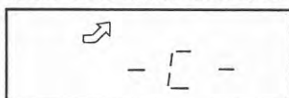
Note : When using the clone mode, verify that the **Function Select** (page 7) is set to **Function I** (the CN7 shorting socket is set to "Side marked").

The first IF and PLL step frequency must be set by the same model.

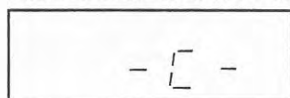
• Operation method

1. Pull out the CHANNEL selector knobs of the two radios.
2. Connect the two radios to the DC power supply. Connect the two radios with the supplied microphone cable (microphone connectors).
3. With the memory clear mode, clear the contents of the EEPROM of the radio to which the frequencies are to be written.
4. Set the two radios to the clone mode by turning on the POWER switch while pressing the "SET 1" key behind the CHANNEL selector with a thin insulating rod. The CHANNEL indicator will show "- C -".
5. Press again the "SET 1" key of the radio in which the frequencies have been written. The TX indicator will be displayed, and writing of frequencies will begin.

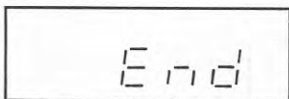
Radio from which data is written



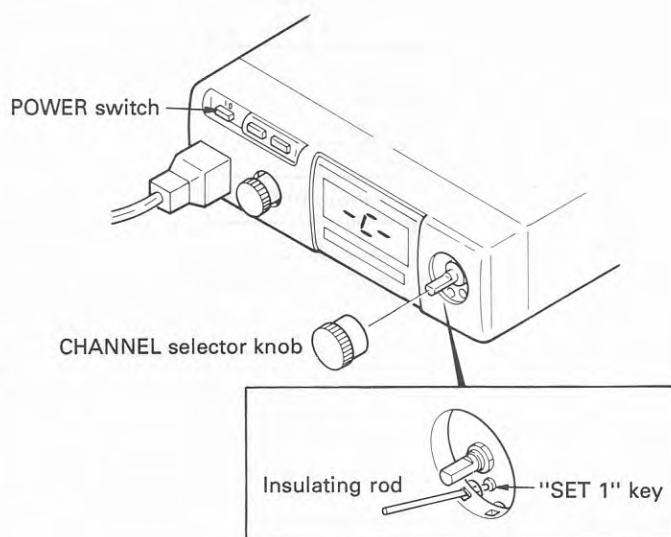
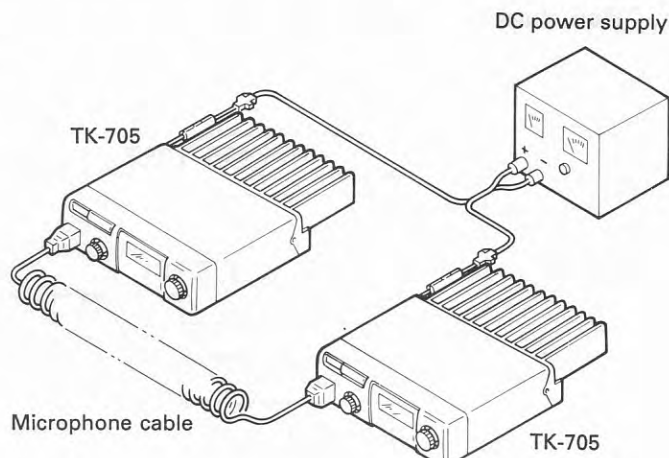
Radio to which data is written



6. Data transfer ends in about 15 seconds, a beep sounds, and the CHANNEL indicator shows "End" (on both radios).



7. Switch to the customer use mode of Function II, and finish writing.



4) Customer use mode

The user can use the radio in this mode.

Set Function II, then turn the POWER switch on to set this mode. (This mode is not set if the POWER switch is turned on while the "SET 1" key is held down.)

5) Service mode

The service man can check the data of the EEPROM in this mode during repair.

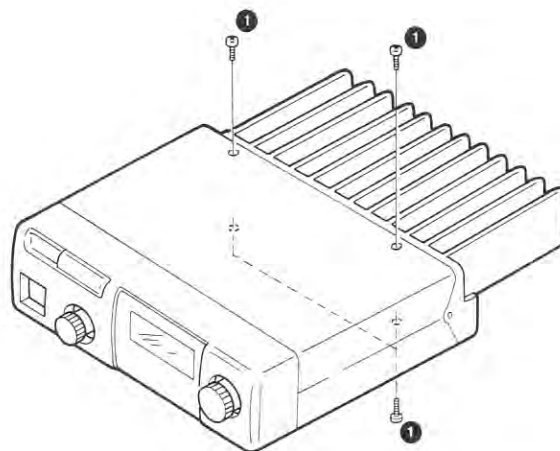
Set Function II, then turn the POWER switch on while the "SET 1" key is held down to set the service mode. The receive frequency of CH1 is displayed.

The data for each channel can be checked by pressing the MONITOR switch. However, the CHANNEL selector, PTT, and SQ OFF keys do not work.

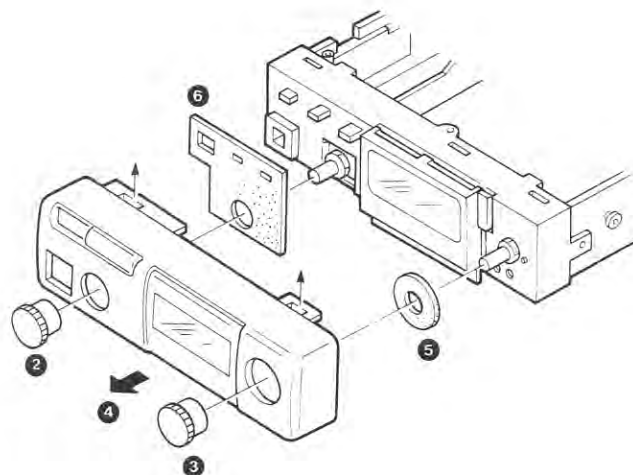
DISASSEMBLY FOR REPAIR

Removing the Front Panel

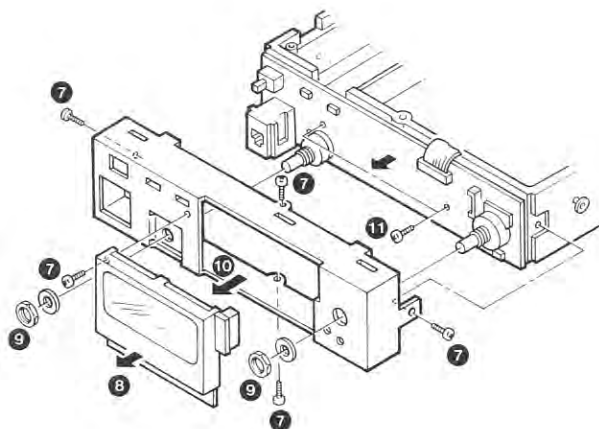
1. Remove the four screws holding the upper and lower cases (1).



2. Pull out the CHANNEL selector knob (2) and volume control knob (3).
3. Slightly lift the stoppers holding the top and bottom of the front panel and pull out the front panel (4).
4. Remove the cushions (5, 6).

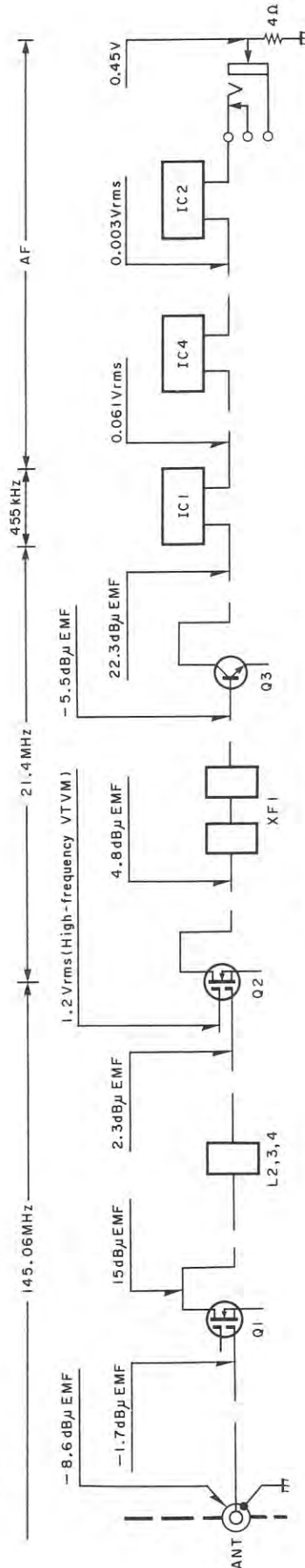


5. Remove the four screws on the sub-panel (7).
6. Pull the display section forward (8).
7. Remove the hexagonal nuts of the CHANNEL selector and volume controls (9).
8. Pull the sub-panel forward (10).
9. Remove the two screws holding the TX-RX unit (B/2), and remove the unit (11).



LEVEL DIAGRAM

Receiver section

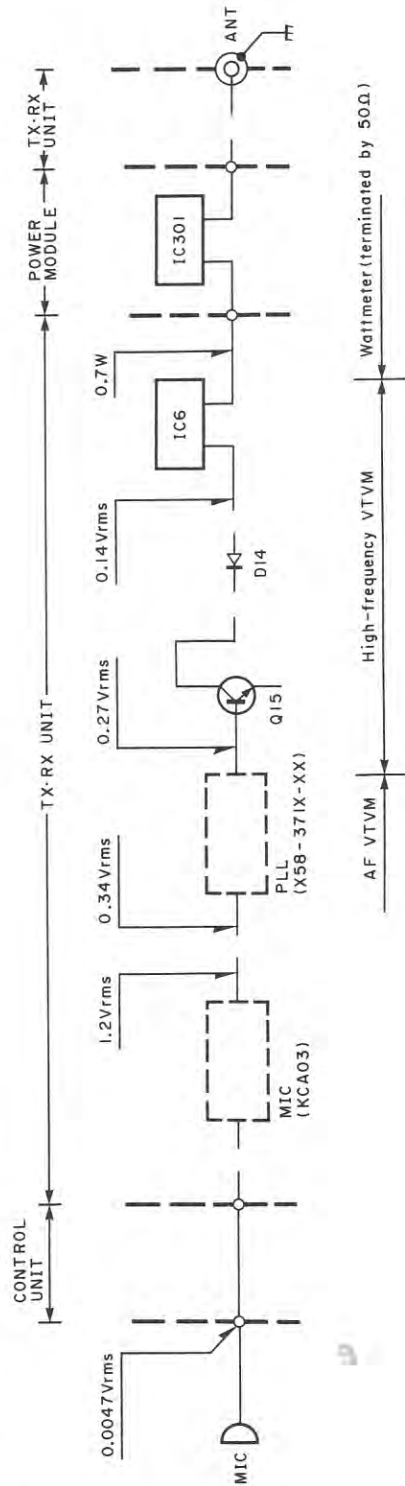


SG input level for which a 12dB SINAD are obtained. Measured by connecting the SG to each point via a $0.01\mu\text{F}$ capacitor.

AF VTVM

AF level obtained when the AF output level is adjusted for $0.45\text{V}/4\Omega$ with the front panel AF VOL control. Measured with AF voltmeter connected to the external speaker jack, receiving a 40dB EMF SSG signal modulated at 1kHz. DEV 3kHz.

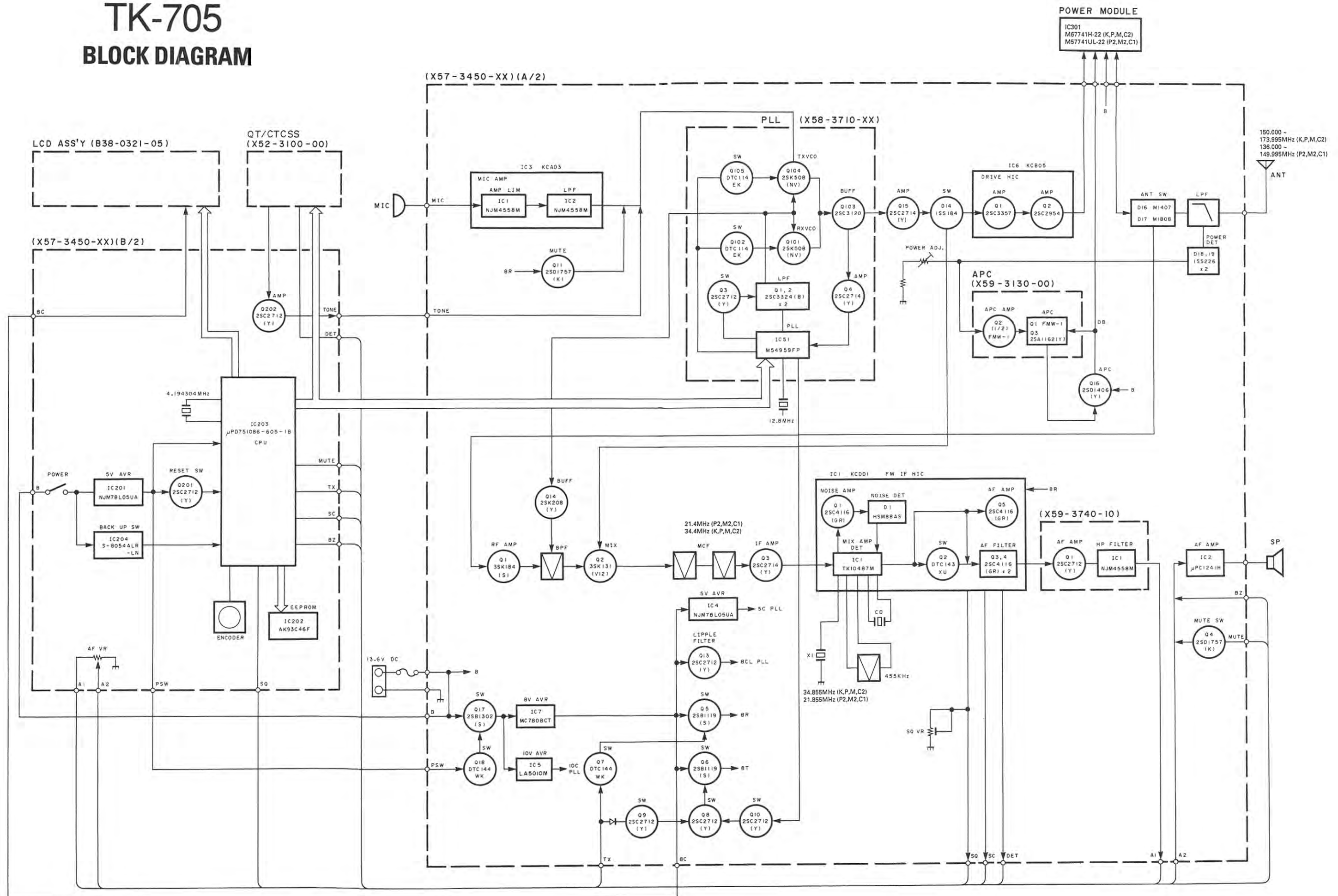
Transmitter section



1. AG is set so that MIC input becomes 3kHz DEV at 1kHz MOD.
2. Transmitting frequency : 145.06MHz

TK-705

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

	K,P,C2	M	P2,M2,C1
TX-RX UNIT (X57-345X-XX)	0-10	0-21	1-01

Table 1

Circuit Configuration By Frequency

The TK-705 incorporates a PLL synthesizer which uses a digital VFO to allow any channel step of 5 or 6.25kHz to be selected (See Figure 1).

The receiving system utilizes double-conversion techniques. That is, an incoming signal is mixed down to the 1st intermediate frequency (IF) of 34.4MHz (K,P,M,C2), 21.4MHz (P2,M2,C1), using a 1st local oscillator frequency of from 115.600 to 139.595MHz (K,P,M,C2), 114.600 to 128.595MHz (P2,M2,C1). The 1st IF signal is then mixed with the 2nd local oscillator frequency of 34.855MHz (K,P,M,C2), 21.855MHz (P2,M2,C1) to generate the 2nd IF of 455 kHz.

The transmitting system consists of a PLL circuit which allows direct modulation and direct frequency division. Signals from the PLL circuit are amplified by a linear amplifier for transmission.

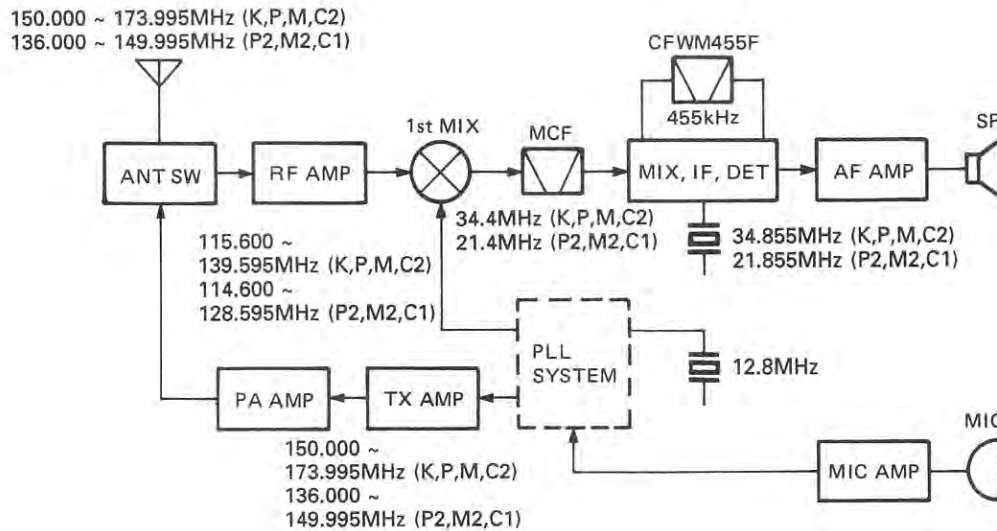


Fig. 1 Frequency configuration

CIRCUIT DESCRIPTION

Receiving System

• Overview

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

The signals are then passed through an antenna matching coil, where the high-frequency components are amplified by a GaAs FET. The signals are then fed into a four-stage bandpass filter that uses varactor diode tuning to reject unwanted signal components, and is fed to the 1st mixer. The 1st mixer uses the N-channel MOS FET that are used in the RF stage to obtain better two-signal characteristics. The 1st mixer mixes the signal with the 1st local oscillator frequency and converts it to the 1st IF (34.4/21.4MHz). The signal then passes through two monolithic crystal filters (MCFs) to remove unnecessary near-by frequency components. The signal from the MCFs is used as the 1st IF signal.

The 1st IF signal is amplified and fed into IC1 (KCD01) in the FM IF HIC. The IF signal is then mixed with the 2nd local oscillator frequency of 34.855/21.855MHz to generate the 2nd IF of 455kHz. The 455kHz signal is then passed through a six element ceramic filter (CFWM455F), and fed back into IC1 for additional amplification. The output signal from the IC1 is then fed into a power amplifier via the audio volume control for application to the speaker.

Item	Rating
Nominal center frequency	34.4MHz
Pass band width	$\pm 7.5\text{kHz}$ or more at 3dB
Attenuation band width	$\pm 28\text{kHz}$ or less at 40dB
Ripple	1.5dB or less
Insertion loss	3dB or less
Guaranteed attenuation	60dB or more within $\pm 1\text{MHz}$ (Spurious : 40dB or more)
Terminating impedance	800 Ω /1.5pF

**Table 2 MCF (L71-0298-05) (TX-RX unit XF1)
(K,P,M,C2)**

Item	Rating
Nominal center frequency	21.4MHz
Pass band width	$\pm 7.5\text{kHz}$ or more at 3dB
Attenuation band width	$\pm 25\text{kHz}$ or less at 40dB
Ripple	1.0dB or less
Insertion loss	2.5dB or less
Guaranteed attenuation	85dB or more within $\pm 1\text{MHz}$ (Spurious : 40dB or more)
Terminating impedance	1.6k Ω /1.0pF

**Table 3 MCF (L71-0244-05) (TX-RX unit XF1)
(P2,M2,C1)**

Item	Rating
Nominal center frequency	455kHz $\pm 1\text{kHz}$
6dB bandwidth	$\pm 6\text{kHz}$ or more (from 455kHz)
50dB bandwidth	$\pm 12.5\text{kHz}$ or less (from 455kHz)
Ripple (within $\pm 4\text{kHz}$ of 455kHz)	3dB or less
Insertion loss	6dB or less
Guaranteed attenuation (within $\pm 100\text{kHz}$ of 455kHz)	35dB or more
I/O matching impedance	2.0k Ω

**Table 4 Ceramic filter CFWM455F (L72-0372-05)
(TX-RX unit CF1)**

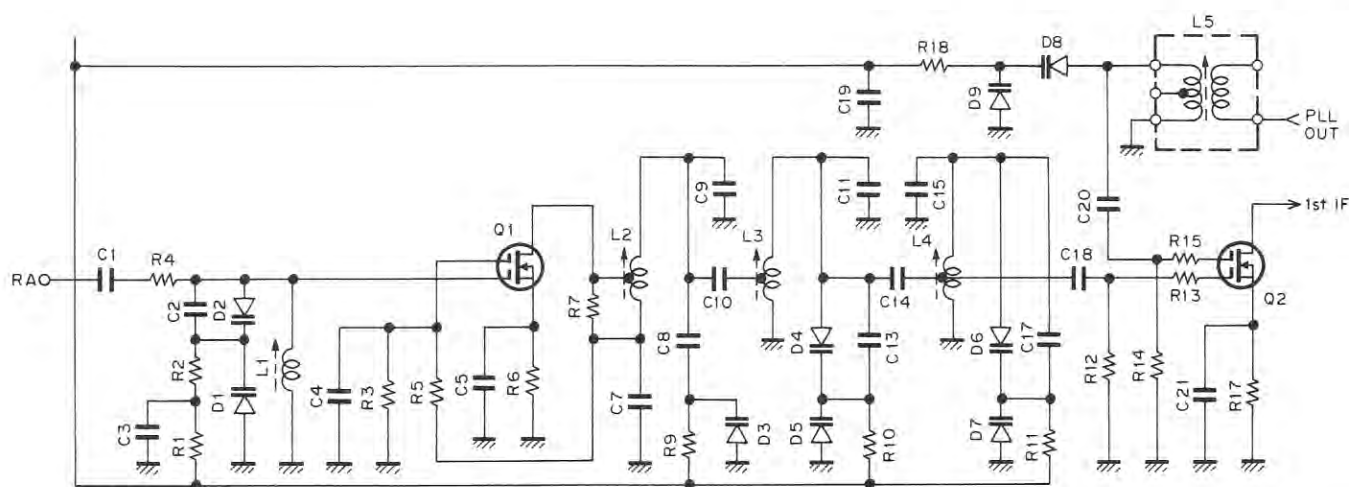


Fig. 2 Front-end section (varactor diode tuning)

CIRCUIT DESCRIPTION

Transmitting System

• Overview

The transmitter produces the target frequency thru the use of direct FM-modulation via a varactor diode.

• Modulation circuit

Audio signals from the microphone are fed into the mic amplifier HIC IC3 (KCA03) for amplification into two operational amplifiers. The operational amplifiers form a splatter filter for pre-emphasis, amplification, limiting, and removal of unnecessary high-frequency components.

The FM modulation circuit directly FM-modulates the VCO signals, using a varactor diode.

• Pre-amplifier stage circuit

Signals from the VCO are applied to the drive HIC IC6 (KCB05). The amplifier always operates in a linear mode so that signals can be amplified without degradation. Additionally, the amplifier is designed to cover a wide range of frequencies and can produce stable output without adjustment. The APC (Automatic Power Control) controls collector voltage from the last stage of the pre-amplifier.

• Power amplifier circuit

The drive signal is amplified to the required level by the power module. The TK-705 uses a large heat sink for efficient heat dissipation.

• APC circuit

The APC circuit for automatic transmit output control detects part of the power module output, and amplifies it to provide a control voltage for output control. The output control voltage is in inverse proportion to the output from the power module, so it is maintained at the same level.

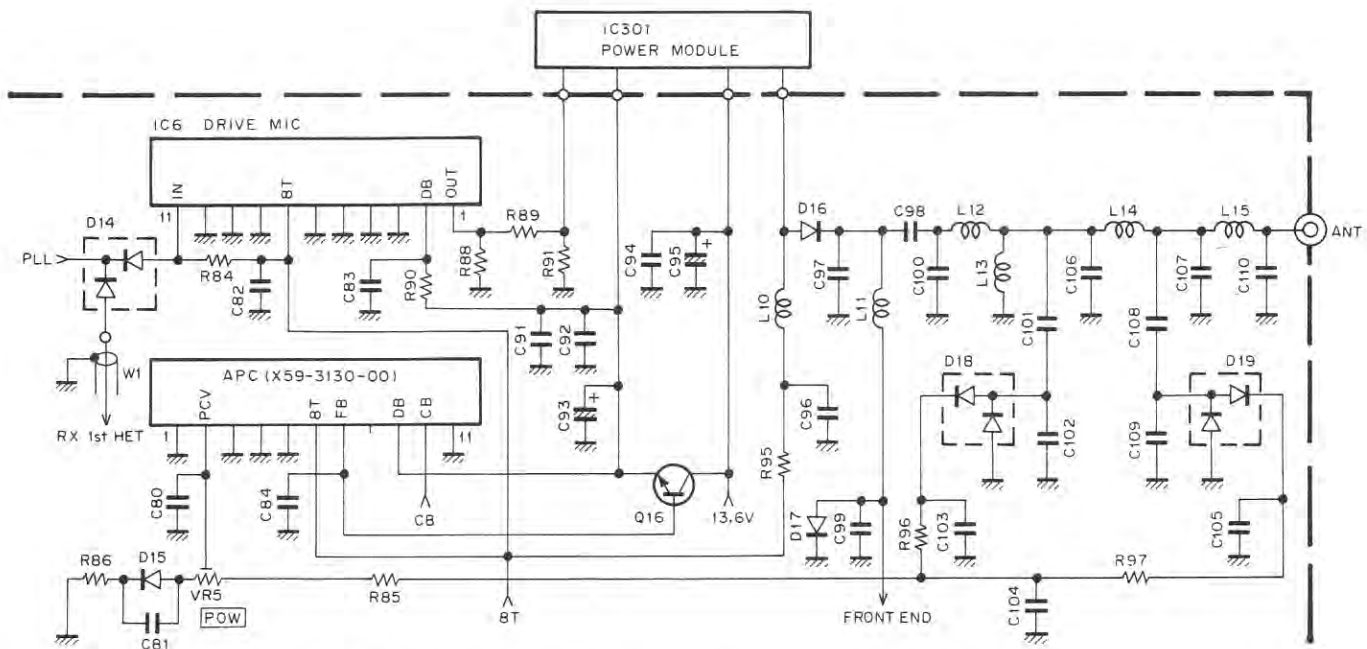


Fig. 3 Pre-amplifier stage, power amplifier, and APC circuits

Item	Symbol	Condition	Rating	Unit
Operating voltage	Vcc		17	V
Current consumption	Icc		7	A
Input power	Pin	Vcc1≤12.5V, ZG=ZL=50Ω	500	mW
Output power	Pout	ZG=ZL=50Ω	35	W
Operating case temperature	Tc(op)		-30 ~ +110	°C
Storage temperature	Tstg		-40 ~ +110	°C

Table 5 Power module M57741UL-22 : P2,M2,C1
Power module M67741H-22 : K,P,M,C2
maximum ratings (IC301)

CIRCUIT DESCRIPTION

PLL Synthesizer System

• Overview

Figure 4 is the PLL and VCO block diagram. In the TK-705, the PLL system is implemented as a sub-unit which is divided into the upper VCO and lower PLL blocks. The sub-unit is shielded to prevent external interference.

There are two reference frequencies, 6.25kHz and 5kHz, available to allow 5 and 6.25kHz-step operation. The 6.25kHz is obtained by dividing the reference oscillator frequency of 12.8MHz by 2048, and the 5kHz is obtained by dividing it by 2560. The VCO directly generates the dial frequency. This dial frequency is amplified once and then fed into a pulse swallow-type PLL IC for frequency division and phase comparison, in order to lock the frequency.

The PLL system is locked between transmit mode and receive mode. By using a signal ("H" in transmit mode) from pin 11 of the PLL IC (M54959FP), the LPF is deactivated-activated by Q3 only for the moment when the TK-705 enters transmit mode. This helps produce lock more rapidly than previous methods.

In 150MHz mode, f_{VCO} (RX) is calculated by the following formula:

$$f_{VCO} = (150 - 34.4) = \{(n \times 128) + A\} \times f_{osc} / R$$

where,

f_{VCO} : VCO output frequency

n : Binary value of the 10-bit programmable counter

A : Binary value of the 7-bit programmable counter

f_{osc} : 12.8MHz reference frequency

R : Binary value of the 14-bit programmable counter

2560 (5kHz step mode)

2048 (6.25kHz step mode)

In 5kHz step mode,

$n = 180$ and $A = 80$.

Therefore, f_{VCO} is calculated as follows:

$$\begin{aligned} f_{VCO} &= \{(180 \times 128) + 80\} \times 12800 / 2560 \\ &= \{23040 + 80\} \times 5 \\ &= 115600 = 115.600\text{MHz} \end{aligned}$$

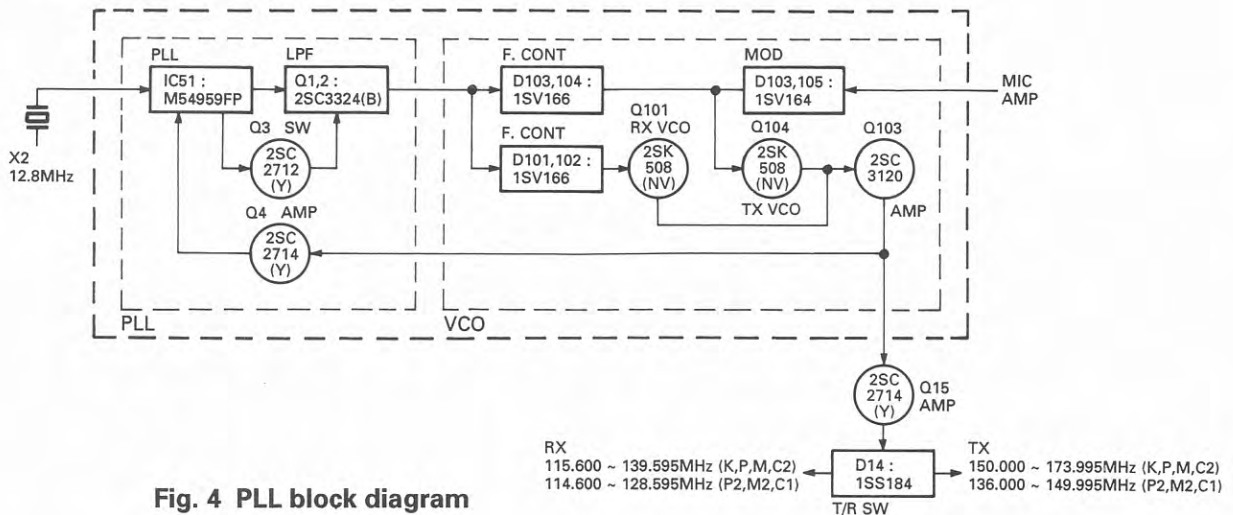


Fig. 4 PLL block diagram

• 8T (8V in transmit mode) and unlock circuits

In receive mode, the base of Q9 has 0.7V. As a result, Q9 is on, and Q8 and Q6 are off, and the collector of Q6 (8T) provides no voltage.

When the PTT switch is depressed. As a result, P121 of CPU becomes "L", turning Q9 off, and Q8 and Q6 on. The 8T line is therefore supplied with 8V.

The unlock circuit operates only in transmit mode. Q10 is a PLL unlocking switching transistor. Usually, the base of Q10 is supplied with 0V ("L"), and the collector is supplied with 8V ("H").

When the PLL is unlocked, the base of Q10 is supplied with 0.7V, turning Q10 on. As a result, the collector of Q10 becomes "L" (0V). This turns Q8 off and the base of Q6 becomes 8V, turning it off. Therefore, when the PLL is unlocked, Q6 is off removing bias voltage from the 8T line. Without the 8T voltage no transmit signal is generated.

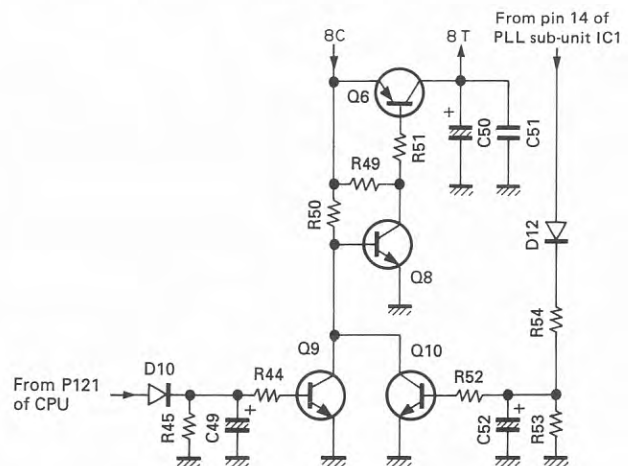


Fig. 5 8T and unlock circuits

CIRCUIT DESCRIPTION

Digital Control System

• Overview

The control system consists of a 4 bit micro-controller (IC203), a reset circuit (Q201), a memory back-up circuit (IC204) and an Electronically Erasable Read Only Memory (EEPROM).

• Frequency programming of transmit and receive

Transmit and receive frequencies are programmed by using the channel selector and the PTT switch on the transceiver when an internal jumper is installed.

After the internal jumper is removed, the transceiver reverts to the user mode and the channel selector only selects those frequencies already programmed into the EEPROM.

• Reset and back-up circuits

Micro-controller reset and memory back-up are enabled by monitoring 5C voltage.

At initial power on, a differentiator (C203) turns on Q201 to initiate reset of the micro-controller (IC203). If the voltage rises slowly, the output voltage transient of IC204 is detected by IC203 and reset is initiated internally.

If 5C voltage falls below 4.5V, the output of IC204 becomes low, causing the micro-controller to go to the back-up mode.

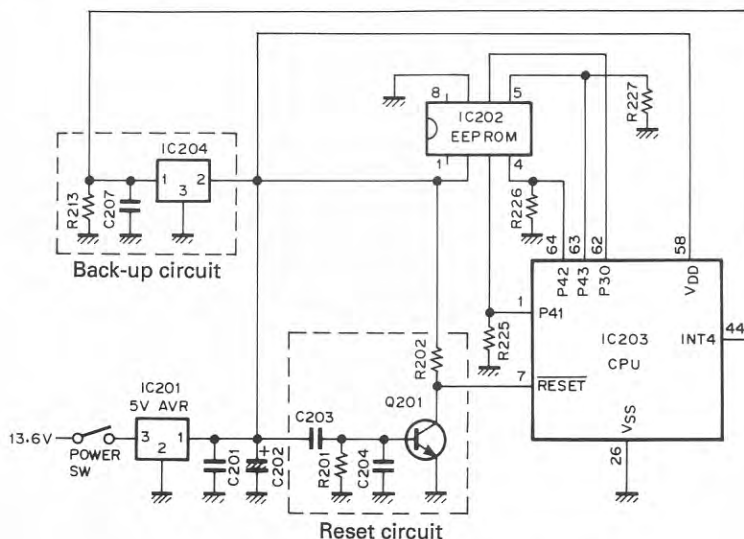


Fig. 6 Reset and back-up circuits

• Display circuit

The display circuit is contained in the LCD assembly. It consists of a LCD driver, its peripheral circuits, and an LCD. The LCD is dynamically operated at a 50% duty cycle. The LCD driver receives LCD data from P21, P22, and P23 of the CPU.

• PLL data output

PLL data is available from P72 (CK), P73 (DT), and P71 (EN1) of the CPU. Figure 7 is a timing chart for PLL data transfer, and Figure 8 shows the format of PLL data.

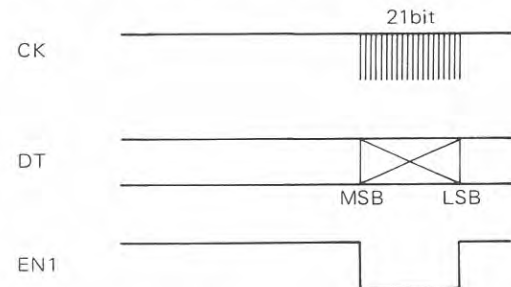
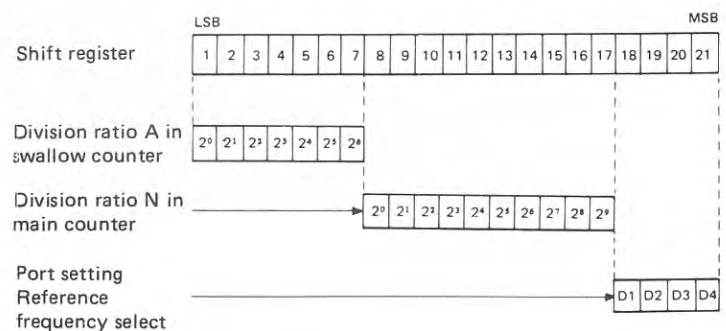


Fig. 7 Timing chart for PLL data transfer



The 21-bit data is made up of the following:

1. Division ratio data A and N (17 bits)

F (display – 34.4MHz in RX mode)

$$= \{(N \times 128) + A\} \times 12.8\text{MHz} / \text{ref}$$

N : Division ratio set in 10-bit main counter (binary)

A : Division ratio set in 7-bit swallow counter (binary)

2. Reference frequency (ref) select (2 bits)

Data		Phase reference frequency	
D1	D2		
L	L	5kHz	5kHz step mode
H	L	6.25kHz	6.25kHz step mode

3. Switch select (2 bits)

Data		Output port		
D3	D4	SW1	SW2	
L	H	L	H	RX mode
H	L	H	L	TX mode

Fig. 8 PLL data format

CIRCUIT DESCRIPTION

• Input and output of QT/CTCSS unit (option)

The optional CTCSS unit receives data from P70, P72, and P73 of the CPU. Figure 9 is a timing chart for CTCSS data transfer, and Figure 10 shows the format of CTCSS data. When a tone from the CTCSS unit is detected, a "H" level signal is sent to P61 of the CPU, opening the squelch.

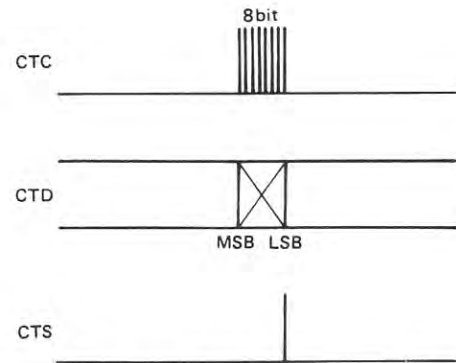


Fig. 9 Timing chart for QT/CTCSS data transfer

Tone frequency select data for CTCSS unit

D1	D2	D3	D4	D5	D6
----	----	----	----	----	----

Example : 88.5Hz L H L H H H

Fig. 10 QT/CTCSS data format

Pin No.	Pin name	I/O	Logic	Function	Pin No.	Pin name	I/O	Logic	Function
1	P41	O	–	CS of EEPROM.	33	PTH01	–	–	Not used.
2	P40	O	–	Not used.	34	PTH00	–	–	
3	P53	I	–	Distination.	35	TI1	–	–	
4	P52	I	–		36	TI0	–	–	
5	P51	I	–		37	P23	O	–	DATA of LCD.
6	P50	I	–		38	P22	O	–	CK of LCD.
7	RESET	I	L	Reset input.	39	P21	O	–	CE of LCD.
8	X2	–	–	4.194304MHz crystal oscillator.	40	P20	O	–	Beeper output.
9	X1	–	–		41	P03/SI	–	–	Not used.
10	P63	–	–	Not used.	42	P02/SO	–	–	
11	P62	I	L	Busy input. Busy : "L"	43	P01/SCK	–	–	
12	P61	I	H	QT/CTCSS tone matching input.	44	INT4	I	H	Back-up detect input.
13	P60	–	–	Not used.	45	P123	O	L	SQ off output. SQ off : "L"
14	P73	O	–	DATA of PLL IC and QT/CTCSS.	46	P122	–	–	Not used.
15	P72	O	–	CK of PLL IC and QT/CTCSS.	47	P121	O	L	TX/RX select.
16	P71	O	–	LE of PLL IC.	48	P120	O	L	Key output.
17	P70	O	–	ST of QT/CTCSS.	49	P133	–	–	Not used.
18	P83	O	H	MUTE output.	50	P132	–	–	
19	P82	–	–	Not used.	51	P131	I	–	Set 2 key input.
20	P81	–	–		52	P130	I	–	Set 1 key input.
21	P80	–	–		53	P143	I	–	SQ key input.
22	P93	I	–	Distination.	54	P142	I	–	Hook.
23	P92	I	–		55	P141	I	–	MONITOR input.
24	P91	I	–		56	P140	I	–	PTT key input.
25	P90	I	–		57	NC	–	–	Not used.
26	Vss	–	–	GND.	58	VDD	–	–	Power supply pin.
27	INT3	–	–	Not used.	59	P33	–	–	Not used.
28	INT2	I	–	Encoder input.	60	P32	O	–	
29	INT1	I	–		61	P31	I	–	Jumper key output.
30	INT0	–	–	Not used.	62	P30	I	–	DO of EEPROM.
31	PTH03	I	–	S-meter analog input.	63	P43	O	–	DI of EEPROM.
32	PTH02	I	–	Not used.	64	P42	O	–	SK of EEPROM.

Table 6 75104G-605-1B terminal functions (TX-RX unit IC203)

DESCRIPTION OF COMPONENTS

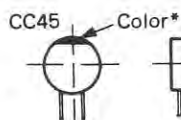
TX-RX UNIT (X57-345X-XX) 0-10 : (K, P, C2) 0-21 : (M) 1-01 : (P2, M2, C1)

Component	Use/Function	Operation/Condition/Compatibility
IC1	2nd local oscillator, IF amplification, detection, low-frequency amplification, noise amplification, noise detection, squelch switching	① 1st IF signal input. ③ ④ 2nd local oscillator. ⑨ Busy output. ⑩ Squelch control. ⑪ S-meter output. ⑬ RD output. ⑮ Low-frequency output.
IC2	AF amplification	① AF input, ⑨ AF output.
IC3	Mic amplification	① Mic input, ② Mic output.
IC4	5V AVR	
IC5	10V AVR	For PLL.
IC6	Transmit drive	
IC7	8V AVR	
IC201	5V AVR	
IC202	EEPROM	
IC203	Microprocessor	See circuit description.
IC204	Voltage detector	
Q1	High-frequency amplification	Operates in receive mode.
Q2	1st mixer	Converts received 144MHz-range signals to 1st IF 10.7MHz.
Q3	High-frequency amplification	Amplifies 1st IF signal.
Q4	AF line mute	Operates when transmit mode, AL 1ch receive mode, CTCSS, bell or squelch is ON.
Q5	8R switching	ON in receive mode.
Q6	8T switching	ON in transmit mode.
Q7	8R switching control	ON in receive mode.
Q8	8T switching control	ON in transmit mode.
Q9	8T switching control	OFF in transmit mode.
Q10	8T switching control	OFF when PLL locked.
Q11	Mic line mute	ON in receive mode.
Q13	PLL 8V ripple filter	
Q14	CV line buffer	
Q15	VCO output amplification	
Q16	TX drive stage +B control	
Q17	Power switch	
Q18	Power switch control	ON when power switch is ON.
Q201	Reset switch	ON for approx. 3m sw when system power turned on, usually OFF.
Q202	Tone amplification	
D4	VCO output switch	
D5	Temperature compensation	
D9	Vari-cap tuning	
D11	12.8MHz tuning	For PLL.
D10~12	Reverse current prevention	
D16, 17	Transmit/receive switching	
D18, 19	Power detection	For APC.
D20	Reverse power protection	
D201	CPU protection	

PARTS LIST

CAPACITORS

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



Capacitor value

1 0 3 = 0.01 μ F

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

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 $\pm$ 60 ppm/°C

Tolerance

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

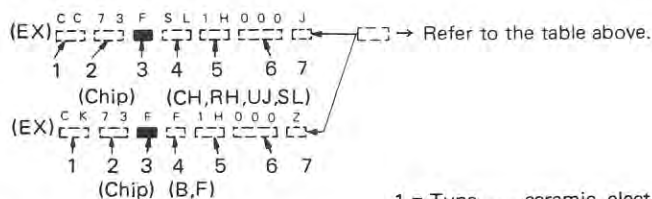
Code	B	C	D	F	G
(pF)	± 0.1	± 0.25	± 0.5	± 1	± 2

Less than 10 pF

Rating voltage

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



Dimension

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

Dimension

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

Rating wattage

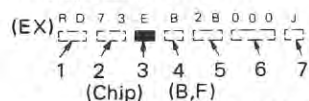
Cord	Wattage	Cord	Wattage	Cord	Wattage
2A	1/10W	2E	1/4W	3A	1W
2B	1/8W	2H	1/2W	3D	2W
2C	1/6W				

Dimension

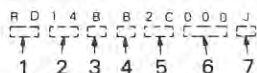


RESISTORS

Chip resistor (Carbon)



Carbon resistor (Normal type)



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

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TK-705						
1	1B		A01-1065-03	METALLIC CABINET(UPPER)		
2	2B		A01-1066-03	METALLIC CABINET(LOWER)		
3	1C		A10-1292-01	CHASSIS CALKED ASSY		
4	2A		A20-7032-03	PANEL ASSY		
5	2B		A22-0765-13	SUB PANEL		
7	2A		B03-0557-04	DRESSING PLATE		
8	2A		B10-1126-04	FRONT GLASS		
9	2B		B38-0321-05	LCD ASSY		
-			B38-0322-05	LED ASSY		
10	1C	*	B40-3987-04	MODEL NAME PLATE	KPC2	
10	1C	*	B40-3988-04	MODEL NAME PLATE	MM2P2	
10	1C	*	B40-3988-04	MODEL NAME PLATE	C1	
11	1B, 1C		B42-2455-04	LABEL(M4X8 MAX)		
-			B42-3394-04	FCC LABEL		
-			B46-0409-20	WARRANTY CARD	K	
-			B50-8316-00	INSTRUCTION MANUAL		
-			E30-2036-05	GND WIRE(MIC)		
-			E30-2076-05	DC CORD ASSY		
15	1C		E30-2145-05	ANT CABLE		
-			E30-2089-08	CURL CORD		
16	1C		E30-2172-05	DC CORD		
-			E31-3197-15	CONNECTING WIRE(SP)		
-			E40-9016-05	PIN CONNECTOR(LCD)		
19	1C		F05-1031-05	FUSE(10A)		
22	1B		G02-0576-14	FLAT S RING		
24	2A		G09-0405-05	KNOB FIXED SPRING		
25	1B		G10-0651-04	NON-WOVEN FABRIC		
26	1B, 2C		G10-0681-04	NON-WOVEN FABRIC(CHASSIS)		
27	1B, 2B		G10-0686-04	NON-WOVEN FABRIC(CABINET)		
28	1B		G13-0688-04	CUSHION(DC CORD)		
29	1B		G13-0818-04	CUSHION(CABINET)		
-			G13-0872-04	CUSHION(VCO)		
31	2B		G13-0935-04	CUSHION(SQ, MONI)		
32	2A		G13-0936-04	CUSHION(VOL)		
33	2B		G13-0937-04	CUSHION(CH)		
-			H11-0830-04	POLYSTYRENE PLATE		
-			H13-0814-04	PROTECTION BOARD		
-		*	H01-8287-04	ITEM CARTON BOX		
-			H10-2677-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0103-04	PROTECTION BAG(DC CORD)		
-			H25-0720-04	PROTECTION BAG(TK-705)		
-			J19-1376-15	MIC HANGER		
35	1C		J19-1434-04	HOLDER(SP)		
-			J21-4282-08	MOUNTING HARDWARE(LCD)		
-			J29-0441-03	MOUNTING BRACKET		
40	2B		K27-3052-04	KNOB(POWER)		
41	2A		K29-4533-04	KNOB(CH)		
42	2A		K29-4534-04	KNOB(VOL)		
43	2B		K29-4535-04	KNOB(SQ, MONI)		

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A	2B		N09-0626-04	SCREW(M3X10)		
B	2A, 2B		N09-0650-05	SCREW(LCD)		
C	1C, 2C		N33-2606-45	OVAL HEAD MACHINE SCREW(CABI.)		
D	1C, 2B		N87-2606-46	BRAZIER HEAD TAPTITE SCREW(PCB)		
E	2A, 2B		N88-2606-46	FLAT HEAD TAPTITE SCREW(SUB PA)		
-			N99-0321-05	SCREW SET		
R301			RD14BB2B2R2J	RD 2.2 J 1/8W	MM2	
R301			RD14BB2B2R2J	RD 2.2 J 1/8W	C1C2	
45	1B		T07-0246-05	LOUDSPEAKER(FULLRANGE)		
-			T91-0362-15	MICROPHONE(WITH CURL CORD)		
-			LC7582	IC(LCD DRIVER)		
-			X52-3100-00	QT/CTCSS UNIT	KPP2	
47	2B, 2C	*	X57-3450-10	TX-RX UNIT	KPC2	
47	2B, 2C	*	X57-3450-21	TX-RX UNIT	M	
47	2B, 2C	*	X57-3451-01	TX-RX UNIT	P2M2C1	
TX-RX UNIT (X57-345X-XX)						
C1			CC73FCH1H030C	CHIP C 3.0PF C	KMPC2	
C1			CC73FCH1H040C	CHIP C 4.0PF C	P2M2C1	
C2			CC73FCH1H220J	CHIP C 22PF J	P2M2C1	
C3			CK73FB1H103K	CHIP C 0.010UF K		
C4 , 5			CK73FB1H102K	CHIP C 1000PF K		
C6			CK73FB1H103K	CHIP C 0.010UF K		
C7			CK73FB1H102K	CHIP C 1000PF K		
C8			CC73FCH1H220J	CHIP C 22PF J	P2M2C1	
C8			CC73FCH1H330J	CHIP C 33PF J	KMPC2	
C9			CC73FCH1H030C	CHIP C 3.0PF C	P2M2C1	
C10			CC73FCH1H0R5C	CHIP C 0.5PF C		
C11			CC73FCH1H030C	CHIP C 3.0PF C		
C12			CK73FB1H103K	CHIP C 0.010UF K		
C13			CC73FCH1H220J	CHIP C 22PF J	P2M2C1	
C14			CC73FCH1H0R5C	CHIP C 0.5PF C		
C15			CC73FCH1H0R5C	CHIP C 0.5PF C	KMPC2	
C15			CC73FCH1H020C	CHIP C 2.0PF C	P2M2C1	
C16			CK73FB1H102K	CHIP C 1000PF K		
C17			CC73FCH1H220J	CHIP C 22PF J	P2M2C1	
C18			CC73FCH1H150J	CHIP C 15PF J		
C19			CK73FB1H103K	CHIP C 0.010UF K		
C20			CC73FCH1H030C	CHIP C 3.0PF C		
C21 , 22			CK73FB1H102K	CHIP C 1000PF K		
C23			CK73FB1H103K	CHIP C 0.010UF K		
C24			CC73FCH1H070D	CHIP C 7.0PF D	P2M2C1	
C24			CC73FCH1H090D	CHIP C 9.0PF D	KMPC2	
C25			CE04EW1A470M	ELECTR0 47UF 10WV		
C26			CK73FB1H103K	CHIP C 0.010UF K		
C27 , 28			CK73FB1H102K	CHIP C 1000PF K		
C29			CC73FCH1H330J	CHIP C 33PF J	P2M2C1	
C29			CC73FCH1H470J	CHIP C 47PF J	KMPC2	
C30			CC73FCH1H390J	CHIP C 39PF J	KMPC2	
C31			CC73FCH1H820J	CHIP C 82PF J	P2M2C1	
C31			CK73FB1H102K	CHIP C 1000PF K	KMPC2	
C32			C92-0511-05	CHIP TAN 0.15UF 35WV		
C33			CK73EF1C105Z	CHIP C 1.0UF Z		

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C34 ,35 C36 C37 C38 C39 -41			CK73EB1H104K CE04EW1A471M CK73FB1H103K CE04EW1C470M CE04EW1A470M	CHIP C 0.10UF K ELECTRØ 470UF 10WV CHIP C 0.010UF K ELECTRØ 47UF 16WV ELECTRØ 47UF 10WV		
C42 C43 C44 C45 ,46 C47			CK73FB1H273K CC73FSL1H101J CE04EW1C100M CK73EF1C105Z CK73FB1H103K	CHIP C 0.027UF K CHIP C 100PF J ELECTRØ 10UF 16WV CHIP C 1.0UF Z CHIP C 0.010UF K		
C48 C49 C50 C51 C52			CE04EW1A470M C92-0504-05 CE04EW1C100M CK73FB1H103K C92-0504-05	ELECTRØ 47UF 10WV CHIP-TAN 0.68UF 20WV ELECTRØ 10UF 16WV CHIP C 0.010UF K CHIP-TAN 0.68UF 20WV		
C53 ,54 C56 C56 C57 C58			CK73FB1H102K CK73EB1E473K CK73EB1H683K CK73FB1H103K CC73FCH1H180J	CHIP C 1000PF K CHIP C 0.047UF K CHIP C 0.068UF K CHIP C 0.010UF K CHIP C 18PF J	KMPC2 P2M2C1	
C59 C60 C61 C62 C63 -65			CC73FCH1H150J CC73FCH1H010C CK73EF1C105Z CK73FB1H103K CK73FB1H102K	CHIP C 15PF J CHIP C 1.0PF C CHIP C 1.0UF Z CHIP C 0.010UF K CHIP C 1000PF K		
C66 C67 C68 C69 C70 ,71			CK73EB1H102K CK73FB1H103K CE04EW1A470M CK73FB1H103K CE04EW1A221M	CHIP C 1000PF K CHIP C 0.010UF K ELECTRØ 47UF 10WV CHIP C 0.010UF K ELECTRØ 220UF 10WV		
C72 C73 ,74 C75 C76 C77			CK73FB1H103K CK73FB1H102K CC73FCH1H220J CK73FB1H102K CC73FCH1H220J	CHIP C 0.010UF K CHIP C 1000PF K CHIP C 22PF J CHIP C 1000PF K CHIP C 22PF J		
C78 C79 C80 -82 C83 C84			CE04EW1C471M CK73FB1H103K CK73FB1H102K CK73EF1C105Z CK73FB1H102K	ELECTRØ 470UF 16WV CHIP C 0.010UF K CHIP C 1000PF K CHIP C 1.0UF Z CHIP C 1000PF K		
C85 C86 C87 C88 ,89 C90			CK73FB1H103K CE04EW1A470M CK73FB1H102K CK73FB1H103K CE04EW1C102M	CHIP C 0.010UF K ELECTRØ 47UF 10WV CHIP C 1000PF K CHIP C 0.010UF K ELECTRØ 1000UF 16WV		
C91 C92 C93 C94 C95			CK73FB1H102K CK73EF1C105Z CE04EW1C470M CK73FB1H102K CE04EW1C100M	CHIP C 1000PF K CHIP C 1.0UF Z ELECTRØ 47UF 16WV CHIP C 1000PF K ELECTRØ 10UF 16WV		
C96 C97 C98 C99 C99			CK73FB1H102K CC45SL2H180J CK45B2H102K CC73FCH1H090D CC73FCH1H120J	CHIP C 1000PF K CERAMIC 18PF J CERAMIC 1000PF K CHIP C 9.0PF D CHIP C 12PF J	KPC2 M	

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UE: AAFES(Europe) X: Australia

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C99			CC73FCH1H220J	CHIP C 22PF J	P2M2C1	
C100			CM73F2H220J	CHIP C 22PF J		
C101			CC73FCH1H0R5C	CHIP C 0.5PF C		
C102			CC73FCH1H020C	CHIP C 2.0PF C	P2M2C1	
C102			CC73FCH1H030C	CHIP C 3.0PF C	KMPC2	
C103-105			CK73FB1H102K	CHIP C 1000PF K		
C106			CC45SL2H470J	CERAMIC 47PF J		
C107			CC45SL2H390J	CERAMIC 39PF J	KM	
C108			CC73FCH1H0R5C	CHIP C 0.5PF C		
C109			CC73FCH1H020C	CHIP C 2.0PF C		
C110			CC45SL2H150J	CERAMIC 15PF J	KMPC2	
C110			CC45SL2H220J	CERAMIC 22PF J	P2M2C1	
C112			CK73FB1H102K	CHIP C 1000PF K		
C113			CK73FB1H223K	CHIP C 0.022UF K	KMPC2	
C114			C92-0005-05	CHIP-TAN 2.2UF 6.3WV		
C201			CK73FB1H103K	CHIP C 0.010UF K		
C202			CE04CW1C100M	ELECTRO 10UF 16WV		
C203			CK73FB1H223K	CHIP C 0.022UF K		
C204			CK73FB1H102K	CHIP C 1000PF K		
C205, 206			CC73FCH1H330J	CHIP C 33PF J		
C207			CC73FSL1H101J	CHIP C 100PF J		
C208-212			CK73FB1H102K	CHIP C 1000PF K		
C213			C92-0005-05	CHIP-TAN 2.2UF 6.3WV		
C214			C92-0501-05	CHIP-TAN 1.5UF 6.3WV		
TC1			C05-0346-05	TRIMMING CAP (6PF)		
CN1			E40-3237-05	PIN CONNECTOR (SP)		
CN3 , 4			E40-5202-05	PIN CONNECTOR (13P, TX-RX)		
CN5 -8			E40-5328-05	PIN CONNECTOR (3P)		
CN201, 202			E40-5203-05	PIN CONNECTOR (13P, CONT)		
CN203			E40-3485-05	PIN CONNECTOR (6P, LCD)		
J1			E11-0425-05	PHONE JACK		
J2 -5		*	E18-0254-05	SOCKET		
J201			E08-0673-05	RECTANGULAR RECEPTACLE (MIC)		
TP1 , 2			E23-0465-05	TERMINAL		
W1		*	E33-1902-05	FINISHED WIRE SET		
W201		*	E31-6062-05	CONNECTING WIRE (QT/CTCSS)		
			J30-0545-05	SPACER		
CD1			L79-0855-05	CERAMIC DISCR (CDB455C7)		
CF1			L72-0372-05	CERAMIC FILTER (CFWM455E)		
L1 -4			L34-4080-05	COIL		
L5			L34-0956-05	COIL		
L6			L30-0508-05	IFT (21.4MHZ)	P2M2C1	
L6		*	L34-4191-05	IFT (34.4MHZ)	KMPC2	
L7			L40-1001-19	SMALL FIXED INDUCTOR (10UH)		
L8 , 9			L40-1092-19	SMALL FIXED INDUCTOR (1UH)	KMPC2	
L9			L40-3391-19	SMALL FIXED INDUCTOR (3.3UH)	P2M2C1	
L10			L34-1239-05	COIL		
L11			L34-0895-05	COIL		
L12			L34-0742-05	COIL	KMPC2	
L12			L34-0894-05	COIL	P2M2C1	
L13			L34-0908-05	COIL		
L14 , 15			L34-0499-05	COIL	KMPC2	
L14 , 15			L34-0894-05	COIL	P2M2C1	

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X1		*	L77-1415-05	CRYSTAL RESONATOR(34.855MHZ)	KPMC2	
X1		*	L77-1416-05	CRYSTAL RESONATOR(21.855MHZ)	P2M2C1	
X2			L77-1383-05	CRYSTAL RESONATOR(12.8MHZ)		
X201			L77-1397-05	CRYSTAL RESONATOR(4.194304MHZ)		
XF1			L71-0244-05	MCF(21.4MHZ)	P2M2C1	
XF1		*	L71-0298-05	MCF(34.4MHZ)	KPMC2	
R1			R92-0670-05	CHIP R 0 OHM		
R2			RK73FB2A104J	CHIP R 100K J 1/10W		
R3			RK73FB2A222J	CHIP R 2.2K J 1/10W	KPP2	
R3			RK73FB2A222J	CHIP R 2.2K J 1/10W	C1C2	
R3			RK73FB2A472J	CHIP R 4.7K J 1/10W	M	
R4			RK73FB2A330J	CHIP R 33 J 1/10W	P2M2C1	
R4			R92-0670-05	CHIP R 0 OHM	KMPC2	
R5			RK73FB2A274J	CHIP R 270K J 1/10W		
R6			RK73FB2A101J	CHIP R 100 J 1/10W		
R7			RK73FB2A103J	CHIP R 10K J 1/10W		
R8			RK73FB2A101J	CHIP R 100 J 1/10W		
R9 -11			RK73FB2A104J	CHIP R 100K J 1/10W		
R12			RK73FB2A473J	CHIP R 47K J 1/10W		
R13			R92-0670-05	CHIP R 0 OHM		
R14			RK73FB2A473J	CHIP R 47K J 1/10W		
R15			RK73FB2A470J	CHIP R 47 J 1/10W		
R16			RK73FB2A274J	CHIP R 270K J 1/10W		
R17			RK73FB2A470J	CHIP R 47 J 1/10W		
R18			RK73FB2A104J	CHIP R 100K J 1/10W		
R19			RK73FB2A471J	CHIP R 470 J 1/10W		
R20			RK73FB2A101J	CHIP R 100 J 1/10W		
R21			RK73FB2A681J	CHIP R 680 J 1/10W	P2M2C1	
R21			R92-0670-05	CHIP R 0 OHM	KMPC2	
R22			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R23			RK73FB2A391J	CHIP R 390 J 1/10W		
R24			RK73FB2A101J	CHIP R 100 J 1/10W		
R25			RK73FB2A224J	CHIP R 220K J 1/10W		
R26			RK73FB2A471J	CHIP R 470 J 1/10W		
R27			R92-0670-05	CHIP R 0 OHM		
R28			R92-0670-05	CHIP R 0 OHM	P2M2C1	
R29			RK73FB2A153J	CHIP R 15K J 1/10W	KMPC2	
R29			RK73FB2A473J	CHIP R 47K J 1/10W	P2M2C1	
R30			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R31			R92-0670-05	CHIP R 0 OHM		
R32 ,33			RK73FB2A273J	CHIP R 27K J 1/10W		
R34			R92-1220-05	CHIP R 1 J 1/10W		
R35			RK73FB2A101J	CHIP R 100 J 1/10W		
R36			R92-0670-05	CHIP R 0 OHM		
R37			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R38			RK73FB2A473J	CHIP R 47K J 1/10W		
R39			RK73FB2A333J	CHIP R 33K J 1/10W		
R40			RK73FB2A473J	CHIP R 47K J 1/10W		
R41			RK73FB2A223J	CHIP R 22K J 1/10W		
R42			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R43			RK73FB2A153J	CHIP R 15K J 1/10W		
R44			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R45			RK73FB2A334J	CHIP R 330K J 1/10W		
R46			RK73FB2A223J	CHIP R 22K J 1/10W		

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R47 R48 -50 R51 R52 R53			RK73FB2A182J RK73FB2A103J RK73FB2A182J RK73FB2A223J RK73FB2A473J	CHIP R 1.8K J 1/10W CHIP R 10K J 1/10W CHIP R 1.8K J 1/10W CHIP R 22K J 1/10W CHIP R 47K J 1/10W		
R54 R55 R58 ,59 R60 R61			R92-0670-05 RK73FB2A102J RK73FB2A103J R92-0670-05 RK73FB2A103J	CHIP R 0 OHM CHIP R 1.0K J 1/10W CHIP R 10K J 1/10W CHIP R 0 OHM CHIP R 10K J 1/10W	P2M2C1	
R61 R62 R63 R63 R65			RK73FB2A223J R92-0670-05 RK73FB2A183J RK73FB2A473J R92-0670-05	CHIP R 22K J 1/10W CHIP R 0 OHM CHIP R 18K J 1/10W CHIP R 47K J 1/10W CHIP R 0 OHM	KMPC2 P2M2C1 KMPC2	
R67 R68 R69 R70 R71			RK73FB2A104J RK73FB2A473F RK73FB2A823F RK73FB2A183F RK73FB2A220J	CHIP R 100K J 1/10W CHIP R 47K F 1/10W CHIP R 82K F 1/10W CHIP R 18K F 1/10W CHIP R 22 J 1/10W		
R72 R73 R74 R75 R76			R92-0670-05 RK73FB2A104J RK73FB2A105J RK73FB2A471J R92-0670-05	CHIP R 0 OHM CHIP R 100K J 1/10W CHIP R 1.0M J 1/10W CHIP R 470 J 1/10W CHIP R 0 OHM		
R77 R78 R79 R80 R81 ,82			RK73FB2A122J RK73FB2A220J RK73FB2A223J RK73FB2A103J RK73FB2A101J	CHIP R 1.2K J 1/10W CHIP R 22 J 1/10W CHIP R 22K J 1/10W CHIP R 10K J 1/10W CHIP R 100 J 1/10W		
R83 ,84 R85 R86 R87 R88			RK73FB2A102J RK73FB2A104J R92-0670-05 RK73FB2A220J RK73FB2A471J	CHIP R 1.0K J 1/10W CHIP R 100K J 1/10W CHIP R 0 OHM CHIP R 22 J 1/10W CHIP R 470 J 1/10W	P2M2C1	
R89 R89 R90 R90 R91			RK73FB2A120J R92-0670-05 R92-0685-05 R92-0699-05 RK73FB2A471J	CHIP R 12 J 1/10W CHIP R 0 OHM CHIP R 22 J 1/2W CHIP R 10 J 1/2W CHIP R 470 J 1/10W	P2M2C1 KMPC2 P2M2C1 KPMC2 P2M2C1	
R92 R93 R94 R95 R96 ,97			R92-0670-05 R92-1215-05 RK73FB2A103J R92-1213-05 RK73FB2A223J	CHIP R 0 OHM CHIP R 470 J 1/2W CHIP R 10K J 1/10W CHIP R 100 J 1/2W CHIP R 22K J 1/10W		
R98 R99 R201 R202-206 R207,208			RK73FB2A392J RK73FB2A471J RK73FB2A563J RK73FB2A473J R92-0670-05	CHIP R 3.9K J 1/10W CHIP R 470 J 1/10W CHIP R 56K J 1/10W CHIP R 47K J 1/10W CHIP R 0 OHM		
R209 R210 R211 R212 R213			R92-0670-05 R92-0670-05 RK73FB2A473J RK73FB2A104J RK73FB2A183J	CHIP R 0 OHM CHIP R 0 OHM CHIP R 47K J 1/10W CHIP R 100K J 1/10W CHIP R 18K J 1/10W	P2M2C1	

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R214-216 R219,220 R221 R222 R223			RK73FB2A473J RK73FB2A473J R92-0679-05 RK73FB2A332J RK73FB2A473J	CHIP R 47K J 1/10W CHIP R 47K J 1/10W CHIP R 0 0HM CHIP R 3.3K J 1/10W CHIP R 47K J 1/10W		
R224 R225-227 R228 R229 R230			RK73FB2A472J RK73FB2A473J RK73FB2A103J RK73FB2A334J RK73FB2A561J	CHIP R 4.7K J 1/10W CHIP R 47K J 1/10W CHIP R 10K J 1/10W CHIP R 330K J 1/10W CHIP R 560 J 1/10W		
R231 R232 VR1 VR2 VR4			RK73FB2A102J RK73FB2A103J R12-3132-05 R12-6423-05 R12-3132-05	CHIP R 1.0K J 1/10W CHIP R 10K J 1/10W TRIMMING POT. (47K) TRIMMING POT. (10K) TRIMMING POT. (47K)		
VR5 VR201		*	R12-3126-05 R05-3452-05	TRIMMING POT. (10K) POTENTIOMETER (10K-A)		
S201 S202,203 S204,205		*	S40-2440-15 S40-1086-05 S40-1436-05	PUSH SWITCH (POWER) TACT SWITCH (MONI,SQ) TACT SWITCH (SET1,2)		
D1 D2 D3 D4 D5			1SV164 1SV164 1SV164 1SV164 1SV164	CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIODE	KMPC2	
D5 D6 D7 ,8 D9 D9			1SV166 1SV164 1SV164 1SV164 1SV166	CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIPDE	KMPC2 KMPC2 P2M2C1 KMPC2	
D10 D11 D12 D14 D15			1SS184 MA344B 1SS184 1SS184 1SS181	CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIODE CHIP DIODE		
D16 D17 D18 ,19 D20 D201			MI407 MI808 1SS226 DSA3A1 1SS226	DIODE CHIP DIODE CHIP DIODE DIODE CHIP DIODE		
IC1 IC2 IC3 IC4 IC5		*	KCD01 UPC1241H KCA03 NJM78L05UA LA5010M	H.IC(FM-IF) IC(AF POWER AMP) H.IC(MIC AMP) IC(VOLTAGE REGULATOR/+5V) IC(VOLTAGE REGULATOR/+10V)		
IC6 IC7 IC201 IC202 IC203		*	KCB05 MC7808CT NJM78L05UA AK93C46F 75104G-605-1B	H.IC(DRIVE) IC(VOLTAGE REGULATORS/ +8V) IC(VOLTAGE REGULATORS/ +5V) IC(EEPROM) IC(CPU)		
IC204 IC301 IC301 Q1		*	S-8054ALR-LN M67741H-22 M57741UL-22 3SK184(S)	IC(BACK-UP) IC(POWER MODULE:136-150MHZ) IC(POWER MODULE:150-175MHZ) CHIP FET	KMPC2 P2M2C1	

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Q2			3SK131(V12)	CHIP FET		
Q3			2SC2714(Y)	CHIP TRANSISTOR		
Q4			2SD1757(K)	CHIP TRANSISTOR		
Q5 , 6			2SB1119S	CHIP TRANSISTOR		
Q7			DTC144WK	DIGITAL TRANSISTOR		
Q8 -10			2SC2712(Y)	CHIP TRANSISTOR		
Q11			2SD1757(K)	CHIP TRANSISTOR		
Q13			2SC2712(Y)	CHIP TRANSISTOR		
Q14			2SK208(Y)	CHIP FET		
Q15			2SC2714(Y)	CHIP TRANSISTOR		
Q16			2SD1406(Y)	TRANSISTOR		
Q17			2SB1302S	CHIP TRANSISTOR		
Q18			DTC114WK	DIGITAL TRANSISTOR		
Q201, 202			2SC2712(Y)	CHIP TRANSISTOR		
TH1		*	157-252-55038	THERMISTOR (2.5K)		
S206			W02-0866-05	ROTARY ENCODER		
Z1		*	X59-3740-10	SUB UNIT(HPF)		
Z2		*	X58-3710-10	SUB UNIT(PLL)	KPMC2	
Z2		*	X58-3711-01	SUB UNIT(PLL)	P2M2C1	
Z3			X59-3130-00	SUB UNIT(APC)		

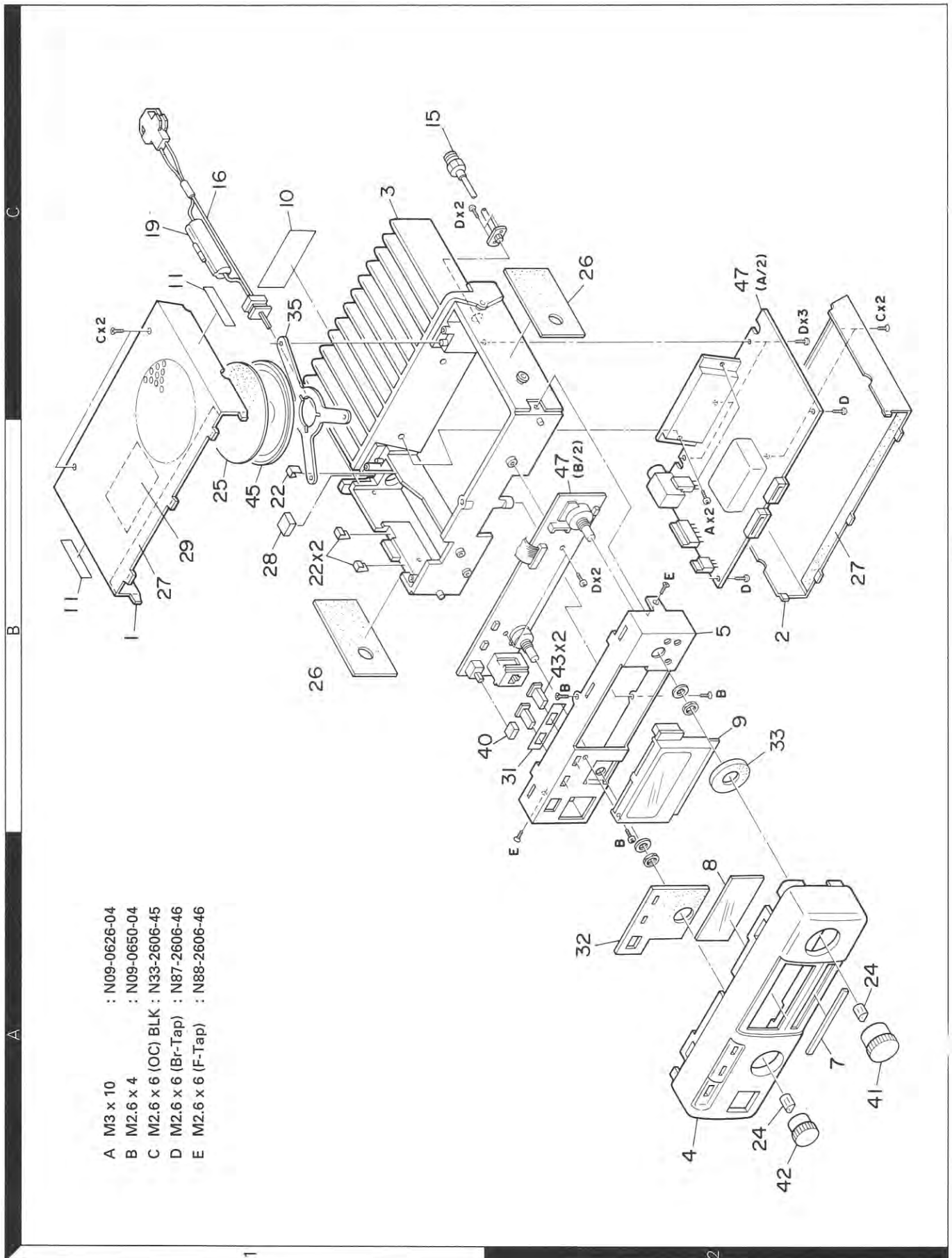
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EXPLODED VIEW



- A M3 x 10 : N09-0626-04
- B M2.6 x 4 : N09-0650-04
- C M2.6 x 6 (OC) BLK : N33-2606-45
- D M2.6 x 6 (Br-Tap) : N87-2606-46
- E M2.6 x 6 (F-Tap) : N88-2606-46

ADJUSTMENT

Test Equipment Required for Alignment

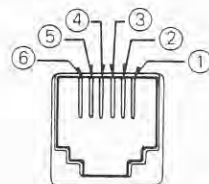
No.	Test Equipment	Major Specifications	
1	Standard Signal Generator (SSG)	Frequency Range Modulation Output	130 to 174MHz. Frequency modulation and external modulation. 0.1 μ V to greater than 1mV.
2	Power Meter	Input Impedance Operation Frequency Measurement Capability	50 Ω . 130 to 174MHz or more. Vicinity of 60W.
3	Deviation Meter	Frequency Range	130 to 174MHz.
4	Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 10V DC. High input impedance for minimum circuit loading.
5	Oscilloscope		DC through 30MHz.
6	High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 200MHz. 0.2ppm or less.
7	Ammeter		10A.
8	AF Volt Meter (AFVTVM)	Frequency Range Voltage Range	50Hz to 10kHz. 3mV to 3V.
9	Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz or more. 0 to 1V.
10	Distortion Meter	Capability Input Level	3% or less at 1kHz. 50mV to 10Vrms.
11	Voltmeter	Measuring Range Input Impedance	1.5 to 10V DC or less. 50k Ω /V or greater.
12	4 Ω Dummy Load		Approx. 4 Ω , 3W.
13	Regulated Power Supply		13.6V, approx. 15A (adjustable from 9 to 17 V). Useful if ammeter equipped.

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

	RX freq' fr() MHz			TX freq' fr() MHz		
	L	M	H	L	M	H
K,P,M,C2	150.050	162.050	173.950	150.000	162.000	173.995
P2,M2,C1	136.050	143.050	149.950	136.000	143.000	149.995

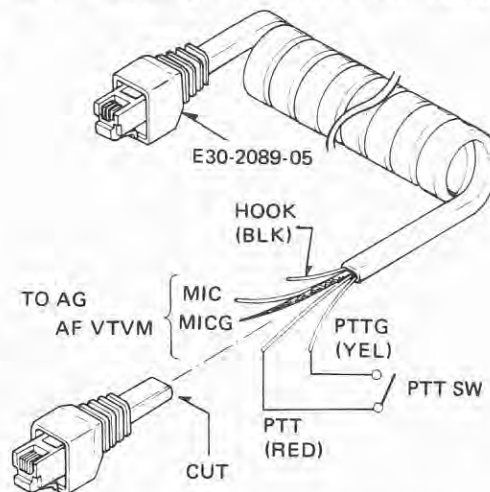
L : Low freq' M : Mid freq' H : Hi freq'

**MIC connector
front view**



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

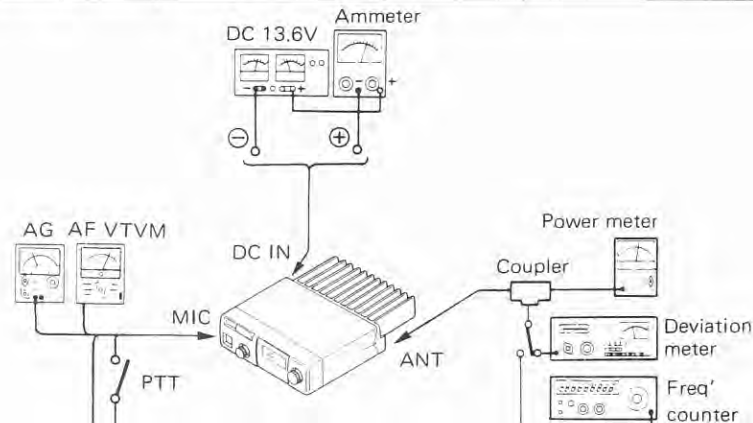
• The following test cables are recommended.



Test cable for Microphone input

ADJUSTMNET

Common Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Write in freq' and signaling data with EEPROM writer. Source voltage : DC 13.6V POWER SW : OFF VOL VR : Full counterclockwise (CCW). TX-RX unit VR1, 5 : CCW VR2, 4 : Center							
2. PLL	RX	DVM Dummy	TX-RX Rear panel	TP2 ANT			Check	1.5 ~ 3.5V K,P,M,C2 1.5 ~ 3.0V P2,M2,C1
								6.5 ~ 9.0V K,P,M,C2 6.0 ~ 9.0V P2,M2,C1
	TX							2.5 ~ 4.0V K,P,M,C2 1.5 ~ 3.5V P2,M2,C1
								6.5 ~ 9.0V K,P,M,C2 5.5 ~ 9.0V P2,M2,C1
3. Transmit frequency adjustment	1) CH : Channel with TX center FREQ' (f _{TM}). PTT : ON	f. counter Power meter	Rear panel	ANT	TX-RX	TC1	Freq' adj. of TX.	±100Hz
	2) CH : Check other channel PTT : ON						Check	

Receiver Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. BPF	1) CH : Channel with lowest RX FREQ' (f _{RL}). K,P,M,C2 CH : Channel with RX center FREQ' (f _{RM}). P2,M2,C1 SSG output : 0.5μV/-113dBm MOD : 1kHz DEV : ±3kHz SQ SW (↖↗) : OFF	DC V.M	TX-RX	TP1	TX-RX	L1 ~ 5	Repeat for MAX.	
2. Distortion	1) CH : Channel with RX center FREQ' (f _{RM}). SSG output : 501μV/-53dBm MOD : 1kHz DEV : ±3kHz	Distortion meter Oscilloscope	Rear panel	SP	TX-RX	L6	Repeat for MIN.	

ADJUSTMENT

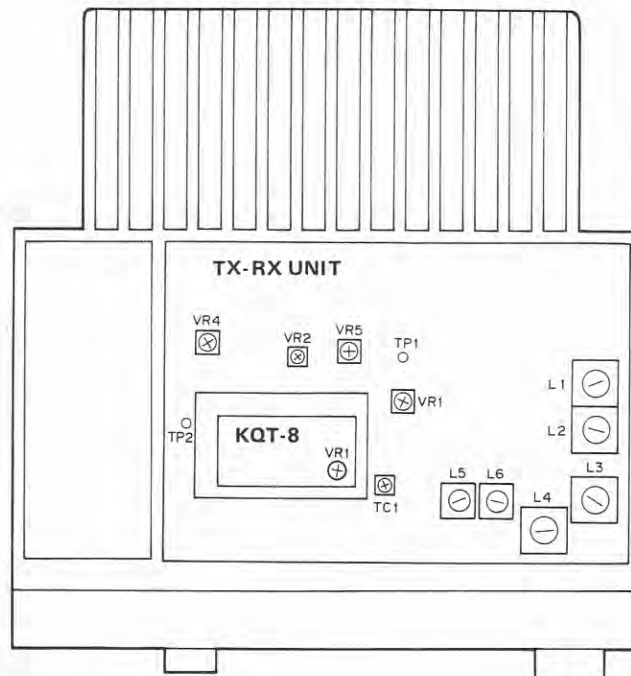
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. Receiving sensitivity	1) CH : Channel with lowest RX FREQ' (f _{RL}), channel with RX center FREQ' (f _{RM}) and channel with highest RX FREQ' (f _{RH}). SSG output : 0.25μV/-119dBm MOD : 1kHz DEV : ±3kHz SQ SW : OFF	AF V.M Oscilloscope	Rear Panel	SP			Check	SINAD 12dB or more.
4. Squelch	1) CH : Channel with RX center FREQ' (f _{RM}). SQ SW : ON SSG output : 0.2μV/-121dBm	LCD			TX-RX	VR1	Set to the point at which squelch just open.	Busy indicator () should light.
	2) SSG output : 0.1μV/-127dBm						Check	Squelch should close.
	3) SSG output : 0.25μV/-119dBm							Squelch should open.
5. Adjusting decoder sensitivity for signaling squelch KQT-8	1) CH : Set the channel selector to the channel with which QT (CTCSS) is used. SSG FREQ' : Set it to the FREQ' of the channel mentioned above. SSG output : Turn the SSG output so that the SINAD sensitivity becomes 10dB.							
	2) SSG MOD SW : EXT. MOD AG1 FREQ' : 1kHz AG2 FREQ' : QT tone freq'.							
	3) AG1 : Power switch OFF. AG2 output : Adjust the output level of AG2 so that SSG deviation becomes 0.75kHz.							
	4) AG1 : Power switch ON. AG1 output : Adjust the output level of AG1 so that the SSG deviation becomes 3.75kHz. (i.e., QT tone frequency/ 0.75kHz deviation, +1kHz/3kHz deviation) MIC hook : ON hook MONI SW : OFF	Rear panel	EXT. SP	KQT-8			Check	Open.

ADJUSTMENT

Transmitter Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. APC	1) CH : Channel with TX center FREQ' (f _{TM}). PTT : ON	Power meter Ammeter	Rear panel	ANT			Check	30W or more.
					TX-RX	VR5	27W	TX indicator () on.
	2) CH : Channel with lowest TX FREQ' (f _{TL}) and channel with highest TX FREQ' (f _{TH}). PTT : ON						Check	±1W, 7.0A or less.
2. Tone deviation adjustment KQT-8	1) CH : Set the channel selector to the channel with which QT (CTCSS) is used. Deviation meter filter LPF : 3kHz HPF : OFF De-emphasis : OFF PTT : ON	Power meter Deviation meter	Rear panel	ANT	KQT-8	VR1	±0.75kHz	±100Hz
3. Maximum deviation adjustment	1) Connect AG to the MIC terminal. AG : 1kHz/50mV Deviation meter filter LPF : 20kHz HPF : 50Hz De-emphasis : 750μsec. TX-RX unit VR1 : MAX CW. CH : Channel with highest TX FREQ' (f _{TH}). PTT : ON	Power meter Deviation meter	Rear panel	ANT	TX-RX	VR4	±4kHz ADJ. (±4.9kHz ADJ. when signaling unit installed.) Adjust one more than the other by switching between -P and +P.	±100Hz
4. MIC sensitivity adjustment	1) AG : 1kHz/5mV				TX-RX	VR2	±3.0kHz ADJ. (±3.75kHz ADJ. when signaling unit installed.)	±100Hz
5. Protection	1) CH : Channel with lowest TX FREQ' (f _{TL}). ANT : OPEN PTT : ON	Ammeter					Check	7.0A or less.

Adjustment Point (Top View)

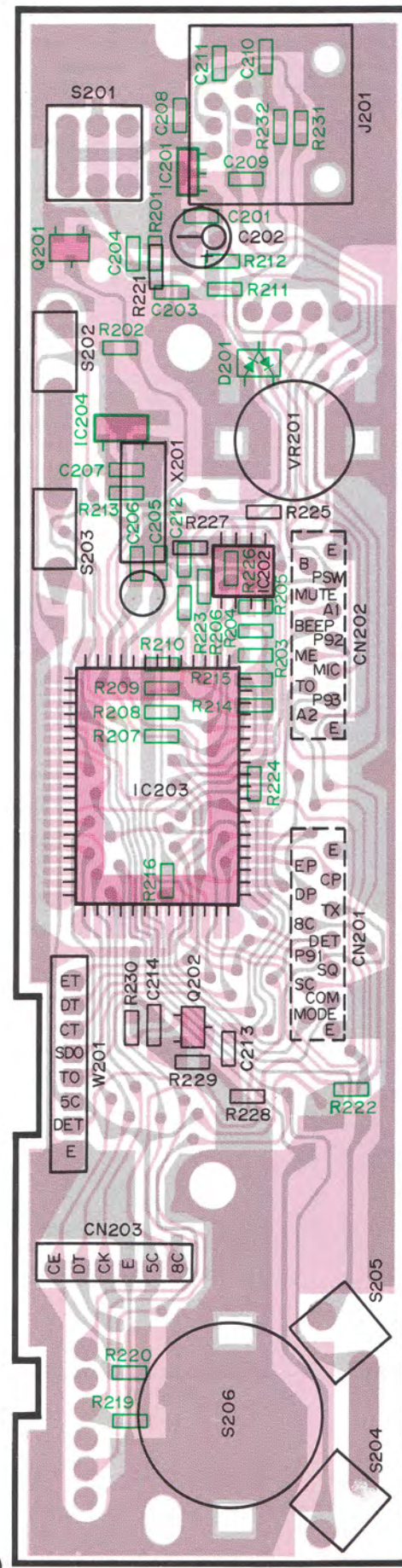
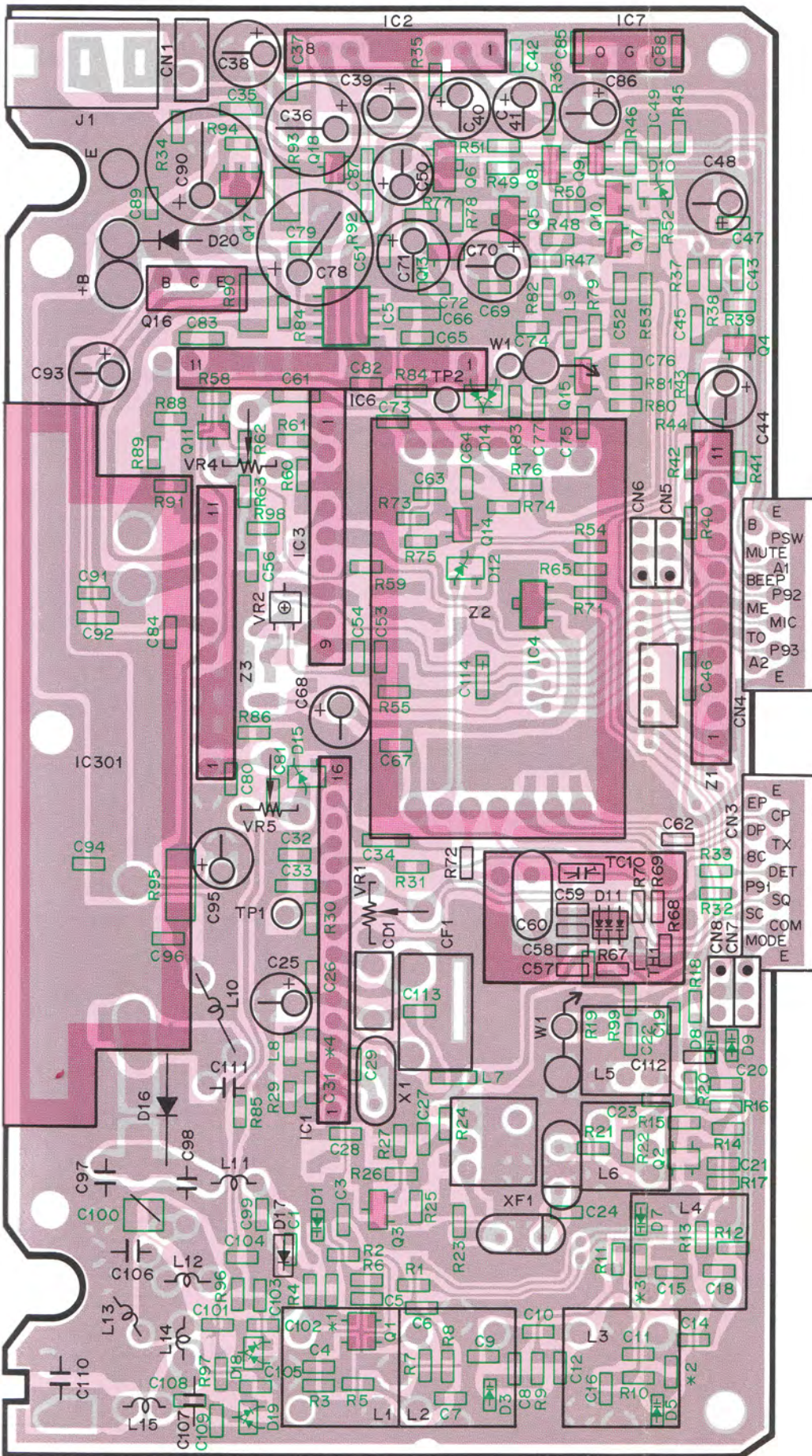


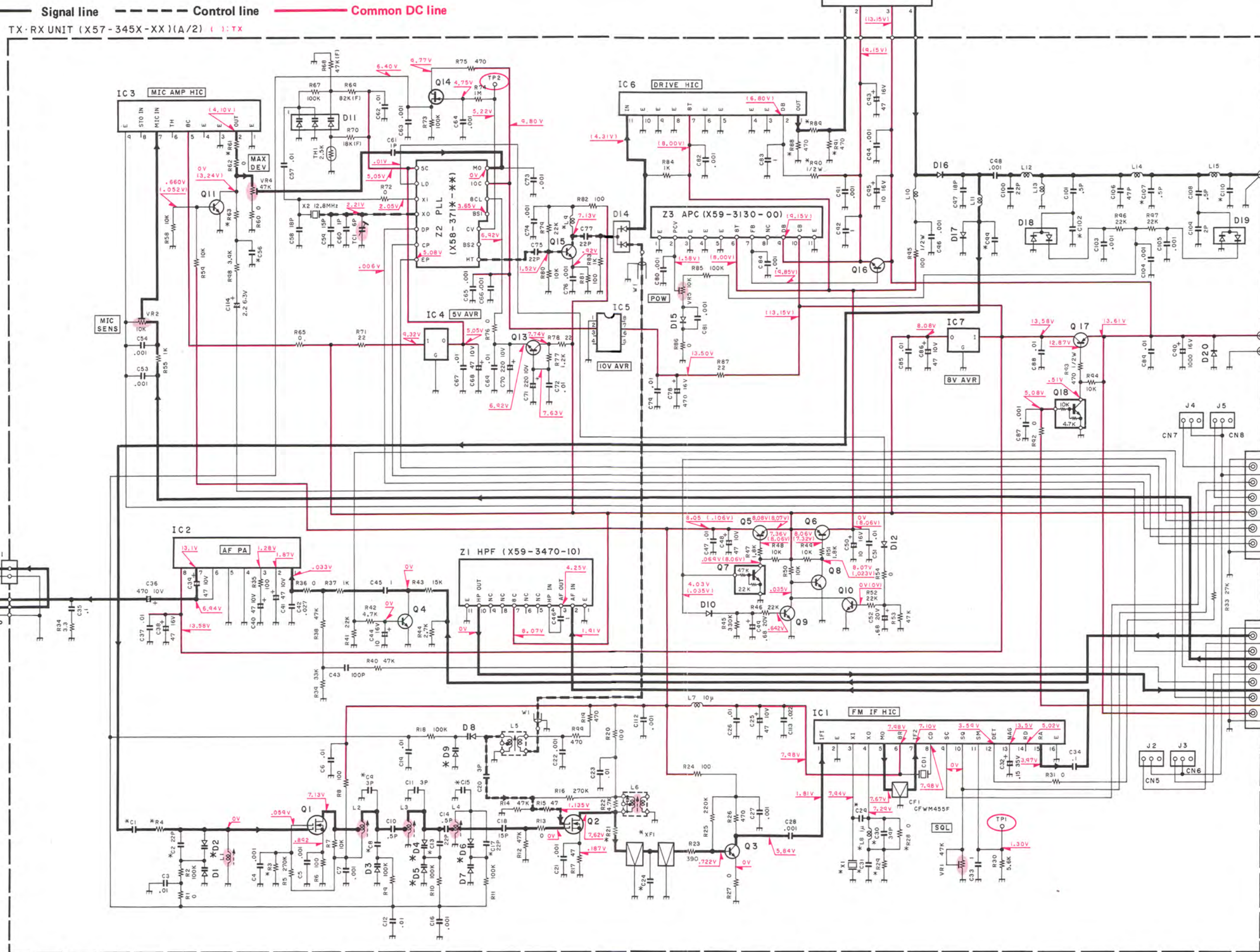
TERMINAL FUNCTIONS

Connector No.	Terminal No.	Terminal Name	Terminal Function
TX-RX UNIT (X57-345X-XX) (A/2)			
CN1	1	SP	Speaker input.
	2	E	GND.
CN3	1	E	GND.
	2	MODE	Function select.
	3	COM	Common.
	4	SC	Squelch busy control output.
	5	SQ	Squelch output.
	6	P91	Busy CH lockout control select.
	7	DET	Audio output.
	8	8C	Common +8V.
	9	TX	TX control.
	10	DP	PLL data.
	11	CP	PLL clock.
	12	EP	PLL enable.
	13	E	GND.
CN4	1	E	GND.
	2	A2	Audio input.
	3	P93	T.O.T. select.
	4	TO	Tone input.
	5	MIC	MIC input.
	6	ME	MIC GND.
	7	P92	T.O.T. select.
	8	BEEP	BEEP input.
	9	A1	AF output.
	10	MUTE	AF mute input.
	11	PSW	Power switch control input.
	12	B	+13.6V
	13	E	GND.

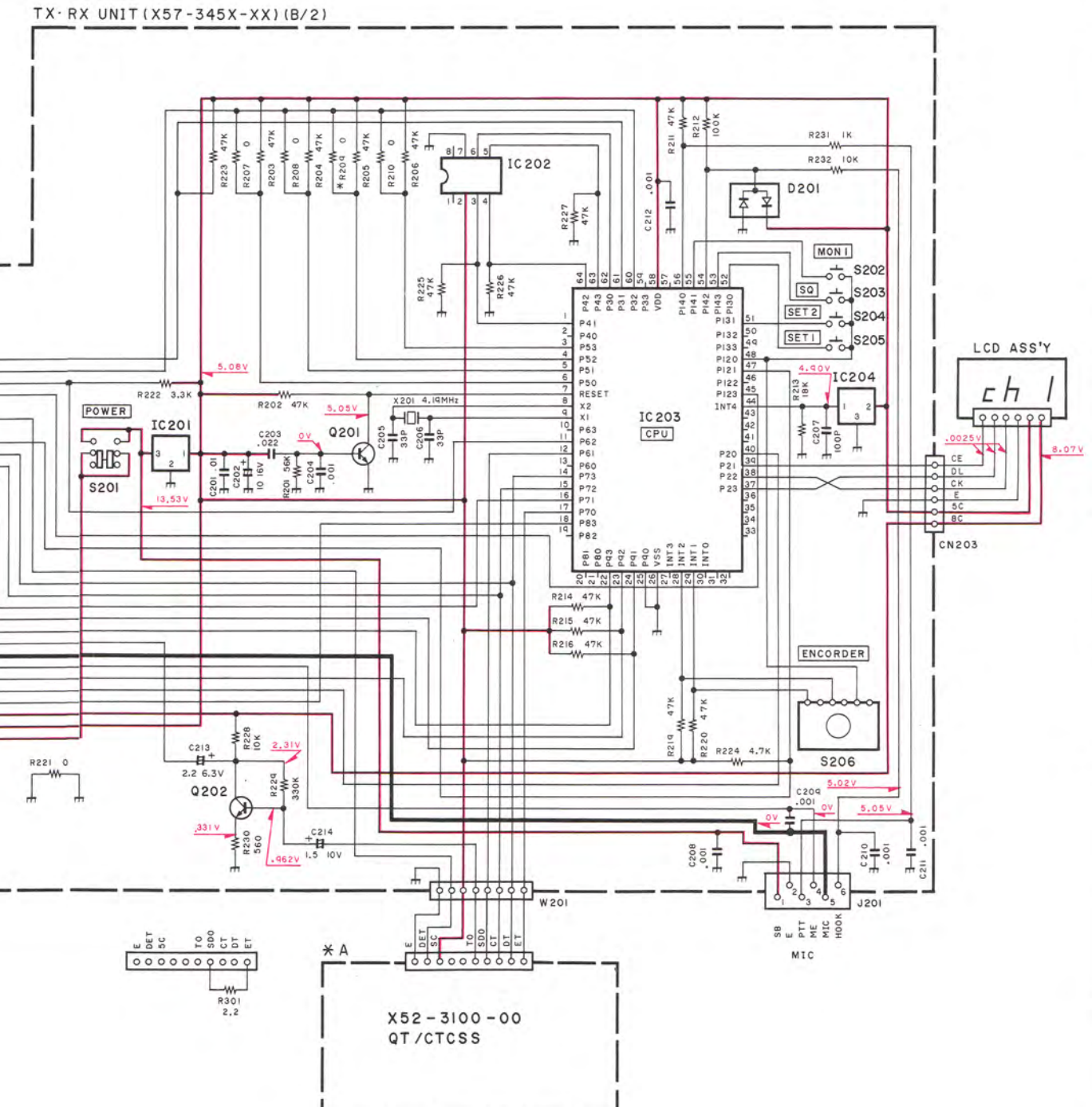
Connector No.	Terminal No.	Terminal Name	Terminal Function
TX-RX UNIT (X57-345X-XX) (B/2)			
CN201	1	E	GND.
	2	MODE	Function select.
	3	COM	Common.
	4	SC	Squelch busy control output.
	5	SQ	Squelch output.
	6	P91	Busy CH lockout control select.
	7	DET	Audio output.
	8	8C	Common +8V.
	9	TX	TX control.
	10	DP	PLL data.
	11	CP	PLL clock.
	12	EP	PLL enable.
	13	E	GND.
CN202	1	E	GND.
	2	A2	Audio input.
	3	P93	T.O.T. select.
	4	TO	Tone input.
	5	MIC	MIC input.
	6	ME	MIC GND.
	7	P92	T.O.T. select.
	8	BEEP	BEEP input.
	9	A1	AF output.
	10	MUTE	AF mute input.
	11	PSW	Power switch control input.
	12	B	+13.6V
	13	E	GND.
CN203	1	CE	Display enable.
	2	DT	Display data.
	3	CK	Display clock.
	4	E	GND.
	5	5C	Common +5V.
	6	8C	Common +8V.

0-10 : K,P,C2 0-21 : M 1-01 : P2,M2,C1





- (A/2)
- IC1 : KCD01
IC2 : PC1241H
IC3 : KCA03
IC4 : NJM78L05UA
IC5 : LA5010M
IC6 : KC805
IC7 : MC7808CT
IC301 : *
- Q1 : 3SK184(S)
Q2 : 3SK131(VI2)
Q3,15 : 2SC2714(Y)
Q4,11 : 2SD1757(K)
Q5,6 : 2SB119S
Q7 : DTC144WK
Q8,9,10,13 : 2SC2712(Y)
Q14 : 2SK208(Y)
Q16 : 2SD1406(Y)
Q17 : 2SB1302S
Q18 : DTC114WK
- D1,3,7,8 : 1SV164
D2,4,6 : 1SV164
D5 : *
D9 : *
D10,12,14 : 1SS184
D11 : MA344B
D15 : 1SS181
D16 : M1407
D17 : M1808
D18,19 : 1SS226
D20 : DSA3A1
- (B/2)
- IC201 : NJM78L05UA
IC202 : AK93C46F
IC203 : 75104G-60S-1B
IC204 : S-8054ALR-LN
Q201,202 : 2SC2712(Y)
D201 : 1SS226



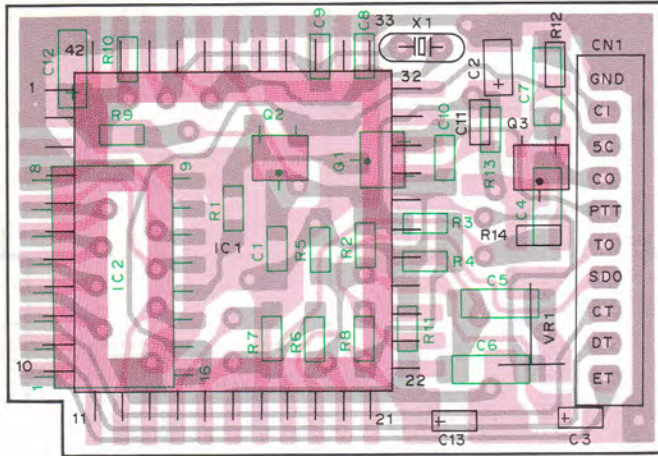
○:USED X:NOT USED

COMPONENT	MODEL	VALUE	UNIT	MARKING	REMARKS
C1	X57-345X-XX	X58-371X-XX	3P	X	
C2	X57-345X-XX	X58-371X-XX	3P	X	
C3	X57-345X-XX	X58-371X-XX	3P	X	
C4	X57-345X-XX	X58-371X-XX	3P	X	
C5	X57-345X-XX	X58-371X-XX	3P	X	
C6	X57-345X-XX	X58-371X-XX	3P	X	
C7	X57-345X-XX	X58-371X-XX	3P	X	
C8	X57-345X-XX	X58-371X-XX	3P	X	
C9	X57-345X-XX	X58-371X-XX	3P	X	
C10	X57-345X-XX	X58-371X-XX	3P	X	
C11	X57-345X-XX	X58-371X-XX	3P	X	
C12	X57-345X-XX	X58-371X-XX	3P	X	
C13	X57-345X-XX	X58-371X-XX	3P	X	
C14	X57-345X-XX	X58-371X-XX	3P	X	
C15	X57-345X-XX	X58-371X-XX	3P	X	
C16	X57-345X-XX	X58-371X-XX	3P	X	
C17	X57-345X-XX	X58-371X-XX	3P	X	
C18	X57-345X-XX	X58-371X-XX	3P	X	
C19	X57-345X-XX	X58-371X-XX	3P	X	
C20	X57-345X-XX	X58-371X-XX	3P	X	
C21	X57-345X-XX	X58-371X-XX	3P	X	
C22	X57-345X-XX	X58-371X-XX	3P	X	
C23	X57-345X-XX	X58-371X-XX	3P	X	
C24	X57-345X-XX	X58-371X-XX	3P	X	
C25	X57-345X-XX	X58-371X-XX	3P	X	
C26	X57-345X-XX	X58-371X-XX	3P	X	
C27	X57-345X-XX	X58-371X-XX	3P	X	
C28	X57-345X-XX	X58-371X-XX	3P	X	
C29	X57-345X-XX	X58-371X-XX	3P	X	
C30	X57-345X-XX	X58-371X-XX	3P	X	
C31	X57-345X-XX	X58-371X-XX	3P	X	
C32	X57-345X-XX	X58-371X-XX	3P	X	
C33	X57-345X-XX	X58-371X-XX	3P	X	
C34	X57-345X-XX	X58-371X-XX	3P	X	
C35	X57-345X-XX	X58-371X-XX	3P	X	
C36	X57-345X-XX	X58-371X-XX	3P	X	
C37	X57-345X-XX	X58-371X-XX	3P	X	
C38	X57-345X-XX	X58-371X-XX	3P	X	
C39	X57-345X-XX	X58-371X-XX	3P	X	
C40	X57-345X-XX	X58-371X-XX	3P	X	
C41	X57-345X-XX	X58-371X-XX	3P	X	
C42	X57-345X-XX	X58-371X-XX	3P	X	
C43	X57-345X-XX	X58-371X-XX	3P	X	
C44	X57-345X-XX	X58-371X-XX	3P	X	
C45	X57-345X-XX	X58-371X-XX	3P	X	
C46	X57-345X-XX	X58-371X-XX	3P	X	
C47	X57-345X-XX	X58-371X-XX	3P	X	
C48	X57-345X-XX	X58-371X-XX	3P	X	
C49	X57-345X-XX	X58-371X-XX	3P	X	
C50	X57-345X-XX	X58-371X-XX	3P	X	
C51	X57-345X-XX	X58-371X-XX	3P	X	
C52	X57-345X-XX	X58-371X-XX	3P	X	
C53	X57-345X-XX	X58-371X-XX	3P	X	
C54	X57-345X-XX	X58-371X-XX	3P	X	
C55	X57-345X-XX	X58-371X-XX	3P	X	
C56	X57-345X-XX	X58-371X-XX	3P	X	
C57	X57-345X-XX	X58-371X-XX	3P	X	
C58	X57-345X-XX	X58-371X-XX	3P	X	
C59	X57-345X-XX	X58-371X-XX	3P	X	
C60	X57-345X-XX	X58-371X-XX	3P	X	
C61	X57-345X-XX	X58-371X-XX	3P	X	
C62	X57-345X-XX	X58-371X-XX	3P	X	
C63	X57-345X-XX	X58-371X-XX	3P	X	
C64	X57-345X-XX	X58-371X-XX	3P	X	
C65	X57-345X-XX	X58-371X-XX	3P	X	
C66	X57-345X-XX	X58-371X-XX	3P	X	
C67	X57-345X-XX	X58-371X-XX	3P	X	
C68	X57-345X-XX	X58-371X-XX	3P	X	
C69	X57-345X-XX	X58-371X-XX	3P	X	
C70	X57-345X-XX	X58-371X-XX	3P	X	
C71	X57-345X-XX	X58-371X-XX	3P	X	
C72	X57-345X-XX	X58-371X-XX	3P	X	
C73	X57-345X-XX	X58-371X-XX	3P	X	
C74	X57-345X-XX	X58-371X-XX	3P	X	
C75	X57-345X-XX	X58-371X-XX	3P	X	
C76	X57-345X-XX	X58-371X-XX	3P	X	
C77	X57-345X-XX	X58-371X-XX	3P	X	
C78	X57-345X-XX	X58-371X-XX	3P	X	
C79	X57-345X-XX	X58-371X-XX	3P	X	
C80	X57-345X-XX	X58-371X-XX	3P	X	
C81	X57-345X-XX	X58-371X-XX	3P	X	
C82	X57-345X-XX	X58-371X-XX	3P	X	
C83	X57-345X-XX	X58-371X-XX	3P	X	
C84	X57-345X-XX	X58-371X-XX	3P	X	
C85	X57-345X-XX	X58-371X-XX	3P	X	
C86	X57-345X-XX	X58-371X-XX	3P	X	
C87	X57-345X-XX	X58-371X-XX	3P	X	
C88	X57-345X-XX	X58-371X-XX	3P	X	
C89	X57-345X-XX	X58-371X-XX	3P	X	
C90	X57-345X-XX	X58-371X-XX	3P	X	
C91	X57-345X-XX	X58-371X-XX	3P	X	
C92	X57-345X-XX	X58-371X-XX	3P	X	
C93	X57-345X-XX	X58-371X-XX	3P	X	
C94	X57-345X-XX	X58-371X-XX	3P	X	
C95	X57-345X-XX	X58-371X-XX	3P	X	
C96	X57-345X-XX	X58-371X-XX	3P	X	
C97	X57-345X-XX	X58-371X-XX	3P	X	
C98	X57-345X-XX	X58-371X-XX	3P	X	
C99	X57-345X-XX	X58-371X-XX	3P	X	
C100	X57-345X-XX	X58-371X-XX	3P	X	

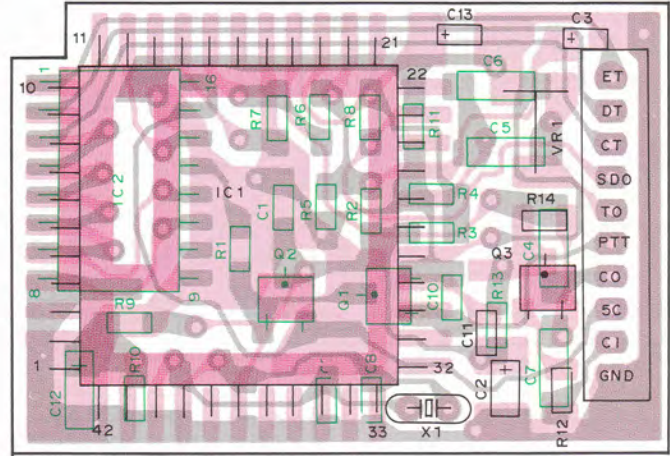
KQT-8 (QT / CTCSS)

KQT-8 PC Board View

Component side view

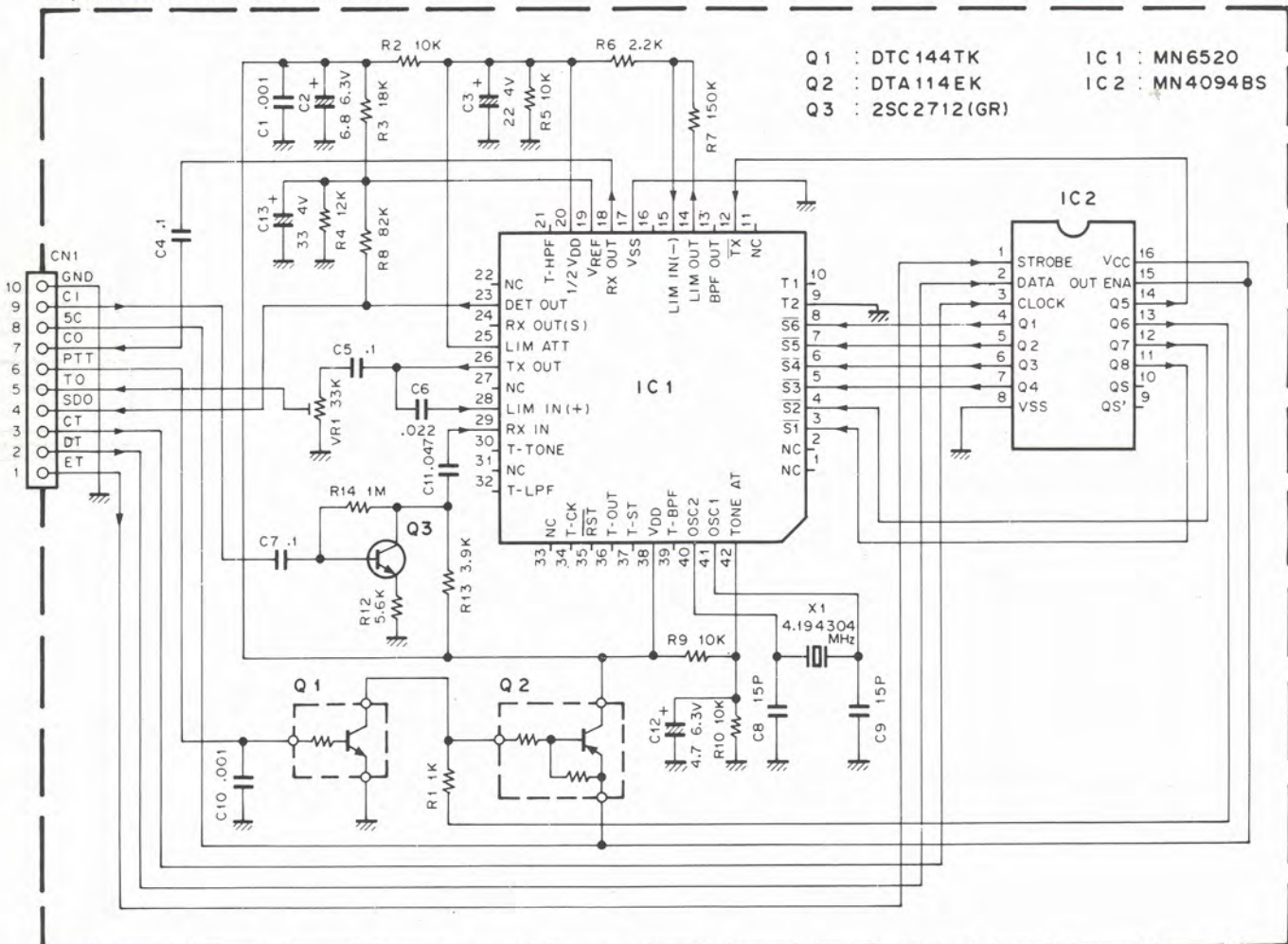


Foil side view



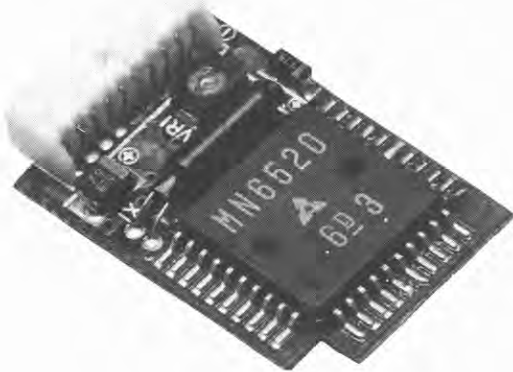
KQT-8 Circuit Diagram

QT/CTCSS UNIT (X52-3100-00)



KQT-8 (QT / CTCSS)

KQT-8 External View



KQT-8 Reference Data

Tone frequency and MN6520 (IC1) relationship

Tone frequency (Hz)	MN6520 terminal					
	S6	S5	S4	S3	S2	S1
	MN4094BS terminal					
	Q1	Q2	Q3	Q4	Q7	Q8
67.0	L	H	H	H	L	H
71.9	L	H	H	H	L	L
74.4	L	H	H	L	H	H
77.0	L	H	H	L	H	L
79.7	L	H	H	L	L	H
82.5	L	H	H	L	L	L
85.4	L	H	L	H	H	H
88.5	L	H	L	H	H	L
91.5	L	H	L	H	L	H
94.8	H	H	H	L	L	H
100.0	H	H	H	L	L	L
103.5	H	H	L	H	H	H
107.2	H	H	L	H	H	L
110.9	H	H	L	H	L	H
114.8	H	H	L	H	L	L
118.8	H	H	L	L	H	H
123.0	H	H	L	L	H	L
127.3	H	H	L	L	L	H
131.8	H	H	L	L	L	L
136.5	H	L	H	H	H	H
141.3	H	L	H	H	H	L
146.2	H	L	H	H	L	H
151.4	H	L	H	H	L	L
156.7	H	L	H	L	H	H
162.2	H	L	H	L	H	L
167.9	H	L	H	L	L	H
173.8	H	L	H	L	L	L
179.9	H	L	L	H	H	H
186.2	H	L	L	H	H	L
192.8	H	L	L	H	L	H
203.5	H	L	L	H	L	L
210.7	H	L	L	L	H	H
218.1	H	L	L	L	H	L
225.7	H	L	L	L	L	H
233.6	H	L	L	L	L	L
241.8	L	H	H	H	H	H
250.3	L	H	H	H	H	L

KQT-8 Parts List

Ref No.	New Parts	Parts No.	Description
QT/CTCSS UNIT (X52-3100-00)			
C1		CK73FB1H102K	Chip C 1000pF K
C2		C92-0010-05	Tantal 6.8μF 6.3WV
C3		C90-2082-05	Tantal 22μF 4.0WV
C4,5		CK73EB1E104K	Chip C 0.1μF K
C6		CK73EB1H223K	Chip C 0.022μF K
C7		CK73EB1E104K	Chip C 0.1μF K
C8,9		CC73FCH1H150J	Chip C 15pF J
C10		CK73FB1H102K	Chip C 1000pF K
C11		CK73FB1E473M	Chip C 0.047μF M
C12		C92-0507-05	Chip tan 4.7μF 6.3WV
C13		C92-0510-05	Chip tan 3.3μF 4.0WV
		E40-5152-05	Pin connector (10P)
X1		L77-1313-05	X'tal resonator 4.194304MHz
R1~10		RK73FB2AXXXJ	Chip R
R11		R92-0670-05	Chip R 0Ω
R12~14		RK73FB2AXXXJ	Chip R
VR1		R12-3460-05	Trimming pot. 33kΩ
Q1		DTC144TK	Digital transistor
Q2		DTA114EK	Digital transistor
Q3		2SC2712(GR)	Chip transistor
IC1		MN6520	IC
IC2		MN4094BS	IC

KQT-8 Fine Adjustment of Tone Frequency

The tone frequency can be fine adjusted with an interval of 0.5% step over the range of 0 to +1.5%. Ground the T1 (pin 10) and T2 (pin 9) of IC1 to obtain the desired frequency.

	T1	T2
0%	X	X
+0.5%	○	X
+1.0%	X	○
+1.5%	○	○

○ : GND, X : OPEN

SPECIFICATIONS

GENERAL

Frequency Range	136 ~ 150MHz (M2,P2,C1 type)
	150 ~ 174MHz (K,P,M,C2 type)
Number of Channels	16 semi-duplex channels
Channel Spacing	30kHz (PLL channel step 5.0kHz)
Input Voltage	13.6V DC negative ground
Current Drain	0.3A on standby
	0.7A on receive
	6.0A on transmit
Duty Cycle	Receiver 100%, Transmitter 20%
Temperature Range	-30°C to +60°C (-22°F to +140°F)
Dimensions and Weight	5.51" (140mm) W x 1.58" (40mm) H x 34" (161mm) D, 2.20lbs. (1.0kg)

RECEIVER

(Measurements made per EIA standard EIA-204-C)

RF Input Impedance	50Ω
Sensitivity	
EIA 12dB SINAD	0.2μV
20dB Quieting	0.3μV
Squelch Sensitivity	0.25μV threshold
Modulation Acceptance	±7kHz
Selectivity	-80dB
Intermodulation	-75dB
Spurious and Image Rejection	-90dB
Audio Power Output	4W at 4Ω less than 5% distortion
Frequency Stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	24MHz

TRANSMITTER

(Measurements made per EIA standard EIA-152-B)

RF Power Output	25W adjustable to 5W
RF Output Impedance	50Ω
Spurious and Harmonics	-70dB
Modulation	F3E, ±5kHz for 100% at 1000Hz
FM Noise	-50dB
Microphone Impedance	Low impedance
Audio Distortion	1.0% at 1000Hz
Frequency Stability	±0.0005% from -30°C to +60°C
Channel Frequency Spread	24MHz

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