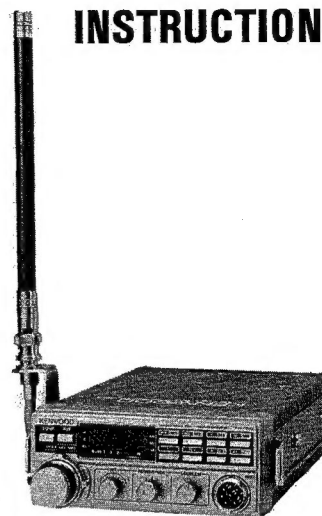


KENWOOD

TR-50

1200MHz FM TRANSCEIVER

INSTRUCTION MANUAL



Thank you for purchasing the new TR-50 transceiver. Please read this instruction manual carefully before placing your transceiver in service.

This unit has been carefully engineered and manufactured to rigid quality standards, and should give you satisfactory and dependable operation for many years.

CONTENTS:

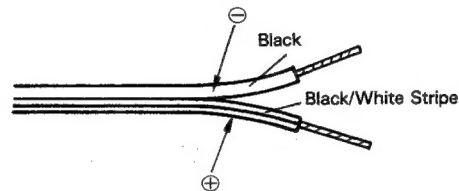
1. PRECAUTIONS	3
2. FEATURES	4
3. CONTROL FUNCTIONS	5
4. PREPARATION	11
5. OPERATION	14
6. ACCESSORIES	19
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■ ACCESSORIES

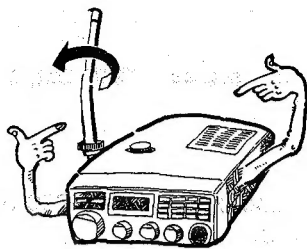
Carefully unpack your TR-50 and confirm that it is supplied with the following accessories.

- Microphone with 16 key pad (USA) 1
- Microphone (Other countries)..... 1
- 1/4 sleeve antenna (with BNC connector) 1 pc
- Phone plug 1 pc
- DC cord assembly..... 1 pc
- Shoulder strap 1 pc
- Instruction manual..... 1 copy
- Ni-Cad battery (PB-16) 1 set
- Battery case..... 1 set
- Dummy battery 1 pc
- Charger..... 1 pc
- Warranty card (USA only)..... 1 copy
- Cushion (USA only) 1 set

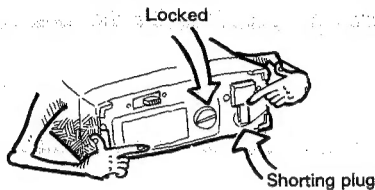
Note: The polarities of the DC cord assembly are as shown below. Do not reverse the polarities when connecting to the battery, as damage to the radio may result!



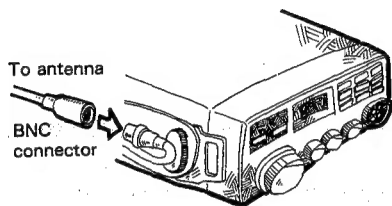
1. PRECAUTIONS



1. Attach the supplied whip antenna. Best results will be obtained when the radio is held away from the body, since the upper UHF frequency range is easily attenuated by most solid objects.



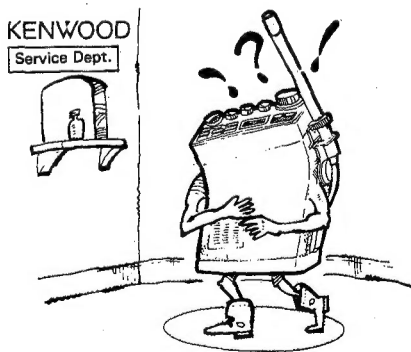
2. When the Ni-Cad battery is used, ensure that the battery case cover and the shunting plug are securely fastened.



3. If the TR-50 is used with an external antenna in mobile or fixed station operation, use a high quality, 50 ohm coaxial cable. The larger the cable, the better, since losses in the cable, "skin effect", are greater at the upper UHF frequency ranges.

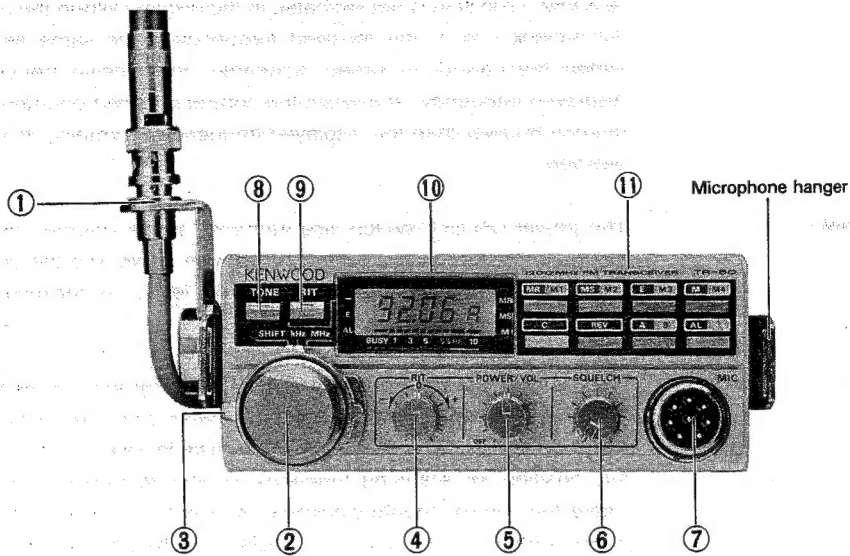


4. Do not adjust coils, trimmers, or pots. They have been pre-adjusted at the factory.



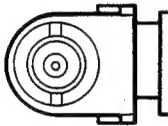
If your transceiver should fail to operate properly, contact the authorized Kenwood dealer where you purchased the unit, for quick reliable service.

3. CONTROLS AND THEIR FUNCTIONS



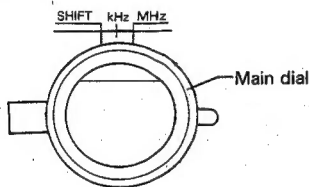
FRONT PANEL

1 Antenna mounting base



Attach the supplied whip antenna or an external antenna to the connector. (BNC type)
This base can be rotated. When using a whip type antenna, select the angle that provides the best receive and transmit signals.
When an external antenna is used, adjust the base to the most convenient angle, taking care not to apply excessive force to the antenna mounting base.

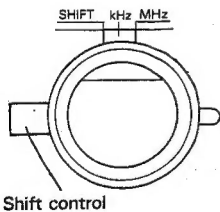
2 Main dial



This control is used to select the desired transmit and receive frequencies. Turning the dial clockwise increases the frequency, while turning the dial counterclockwise decreases the frequency.
The dial can be rotated thru 360 degrees, permitting continuous tuning. Rotating the dial during memory recall operation, will cause the radio to automatically revert to VFO A/B mode.

Note: In general, one click rotation shifts the displayed frequency one step up or down. Occasionally, the frequency may not change due to microprocessor transients.

3 Shift Control



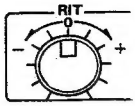
The frequency shift control is used to designate repeater operation (where the transmit frequency is different than the receive frequency), and also selects the tuning rate of the main dial (10 kHz or 1 MHz).

Note: If the repeater offset would place the transmit frequency outside the tuning range of the transmitter, simplex operation will automatically selected by the microprocessor.

Control Position	Operation
SHIFT	-20 MHz TX offset (Versions other than below) +33 MHz TX offset (European version)
kHz	10 kHz level is changed with the dial.
MHz	1 MHz level is changed with the dial.

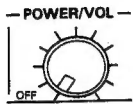
The shift control also determines how much the dial frequency will change when one of the microphone UP/DWN pushbuttons is depressed. In the SHIFT and kHz positions the frequency is changed 10 kHz each time a button is pressed in VFO B, and 20 kHz in VFO A. In the MHz position the frequency is changed in 1 MHz steps regardless of which VFO has been selected.

④ RIT Control



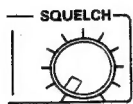
When the RIT switch is ON, the received frequency can be varied approximately ± 5 kHz. (The shift is not indicated in the display) When the control is at approximately 12 o'clock ("0"), the received frequency is the same as the transmit frequency. When the control is turned clockwise, the receive frequency is higher than the displayed frequency, and when the control is turned counterclockwise the receive frequency is lower than the displayed frequency. Normally, this control is set to the "0" position.

⑤ POWER/VOL control



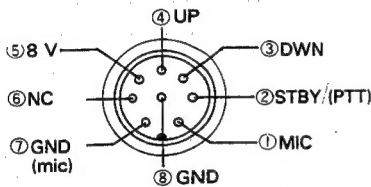
The power ON/OFF switch also functions as the volume control. Turning the control fully counterclockwise will turn the volume down and the power off. Clockwise rotation of the control will increase the audio level. To conserve battery power, turn the radio off during periods of inactivity.

⑥ SQUELCH control



The squelch control is used to eliminate background noise during no signal periods. Normally, this control is adjusted clockwise until the background noise just disappears. This point is known as the "Threshold Point". The radio must be adjusted to this position for scanning functions to operate properly. For weak signal reception rotate the control counterclockwise from the "Threshold point", so that background noise appears. This will allow signals to be heard that are too weak to "Open" the squelch.

⑦ MIC connector (8 pins)



Front panel side view

Microphone audio input. Frequency UP/DWN control and PTT lines are included. Pin assignments of the MIC connector are shown at left.

⑧ TONE switch



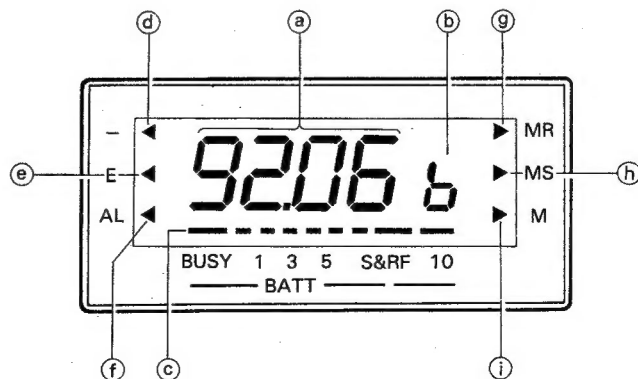
When this switch is pressed, a tone signal is transmitted, that corresponds with the local repeater requirements. For European models a 1750 Hz tone burst is transmitted. For US models a sub-audible tone signal is transmitted. US models require use of the optional TU-6 tone module.

⑨ RIT switch



When this switch is ON, the RIT annunciator lights in the display, and the received frequency can be varied with the RIT control. (See 4 above). To turn OFF the RIT, press the switch again.

⑩ Display



Ⓐ Transmit/Receive frequency

1260.00 MHz is displayed as "60.00".

Ⓑ Channel display

Memory channel "1-5" or VFO A "A" and VFO B "b" are displayed.

③ S/RF and BATT meter

- 1) During receive, the input signal strength is shown on the bar graph.
- 2) During transmit, the relative transmit RF level output is shown by the bar graph.
- 3) The battery or external power supply voltage is shown by the bar graph. When the BATT switch on the rear is set to ON, the graph indicates the approximate battery voltage remaining. When two of the long bars disappear, it indicates that approximately 10 volts remain, and it is therefore time to recharge or replace the battery.

Note: The bar graph will not indicate voltages below 10 volts accurately. Therefore, whenever the voltage drops to 10 volts, recharge or replace the battery.

④ RIT/ON indicator

This lights when the RIT switch is on.

⑤ ERASE indicator

This lights when the Erase function is active.

⑥ ALERT indicator

This lights during alert operation.

⑦ MR indicator

This lights during memory recall mode.

⑧ MS indicator

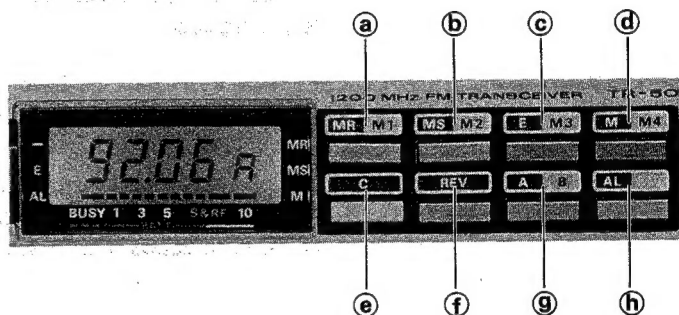
This lights during memory scan.

⑨ M indicator

This lights during memory storage operations.

Note: There is a difference in the appearance of the S/RF bar graph and the other indicators. This is normal and is not a defect.

⑪ Keyboard




① MR/M1 (Memory Recall) key



Used to initiate memory recall operations. This key is also used to select M1. When this key is pressed, an audio "beep" is generated, and the "►MR" annunciator lights. The display will sequentially show those channels that currently have data stored. To select one of the channels simply press the corresponding key (1-5). A "beep" will sound, the display will show the contents of the memory channel, and display the memory channel number. If a channel with no data is selected, the display frequency will not change and 3 beeps will sound to signal an error.



② MS/M2 (Memory Scan) key



Used to initiate memory scan. This key is also used to select memory channel 2, M2. When this key is pressed in other than the MR mode, a "beep" will sound, the "►MS" annunciator will light and memory channels with data stored in them will be sequentially scanned. If a signal is present on one of these channels, the radio will pause for approximately 5 seconds, the busy indicator will light, and then scan will resume. To stop scan, press the PTT switch or the  key.

③ E/M3 (Erase) key



Used to erase data from memory. This key is also used to recall memory channel 3, M3. When this key is pressed in other than the MR mode, a "beep" will sound, the "◀E" annunciator will light, and those memory channel numbers with data stored will be sequentially displayed. To check the contents of one of these channels press the corresponding key (1-5, 0). A "beep" will sound, and the memory channel number and contents will be displayed. If you wish to erase this data, press the  key, again. An "R" will sound in Morse Code the contents of the memory channel will be cleared, and the radio will return to VFO operation. If you decide not to clear a memory channel, press the  key to cancel the procedure.

d) M/M4 (Memory Input) key



This key is used to initiate memory storage. See section 5, on page 16 for further information. During memory recall operations this key is used to recall memory channel 4, M4.

e) C (Clear) key



This key is used to cancel any procedure before completion.

- 1) When this key is pressed during MR operations, operation will be returned to VFO A or VFO B.
- 2) When this key is pressed during MS operations, operation will be returned to MR.
- 3) When this key is pressed during E operations, operation will be returned to VFO A or VFO B.
- 4) When this key is pressed during M operations, operation will be returned to VFO A or VFO B.

f) REV (Reverse) key



This key is used to check the input of a repeater pair. This function will allow you to determine if simplex communications are possible.

g) A/B (VFO selector) key



Used to select VFO A or VFO B. Each time the key is depressed, the VFO is alternated from A to B, B to A...

The initial frequency setting and step width are as follows:

	Frequency	Display	Step Width
VFO A	1260 MHz	"60.00R"	20 kHz
VFO B	1295 MHz	"95.00b"	10 kHz

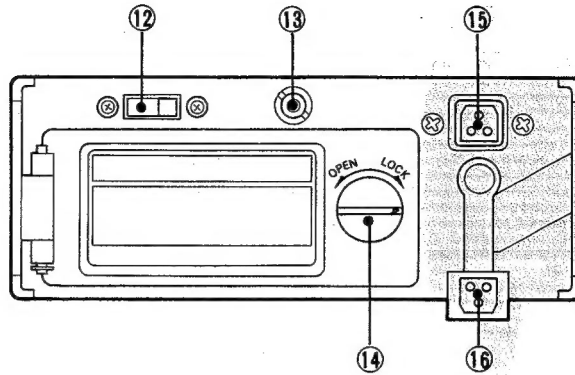
The above values are selected when the reset button is depressed or the Lithium battery is replaced.

h) AL/M5 (Alert) key

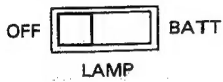


When this key is depressed in other than the MR mode, the alert indicator will light, and the receiver will switch to the frequency stored in memory channel M1 once approximately every 6 seconds. If activity is present on M1, "2 Beeps" will sound to alert you to that activity. Memory channel 5, M5, is used to store both the transmit and receive frequencies, so that repeaters with other than the normal offset may be used. For specific details refer to section 5, page 18.

REAR PANEL



12 LAMP/BATT switch



When the switch is in the BATT position, the S/RF meter function can not be used.

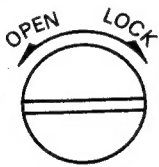
This switch is used to check battery voltage with the LCD bar graph, and also to turn on the display lamp. When the switch is in the LAMP position the display is illuminated. When the switch is in the BATT position the lamp is turned on and the BATT voltage can be checked on the display. To conserve the battery, do not use the lamp unless it is necessary.

13 EXT. SP (External Speaker) jack



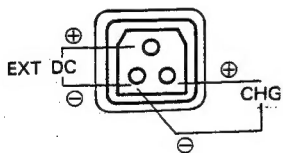
External speaker terminal. Connect a 4-16 ohm speaker using the supplied speaker plug, if desired.

14 OPEN/LOCK screw



Used to secure the battery compartment cover. Ensure this latch is securely fastened when using battery power.

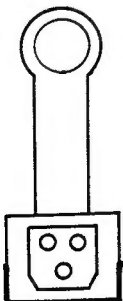
15 EXT DC/CHG terminal



Dual purpose jack. Used to charge the Ni-Cad battery pack (PB-16), and to connect an external DC supply (using the supplied DC cable assembly).

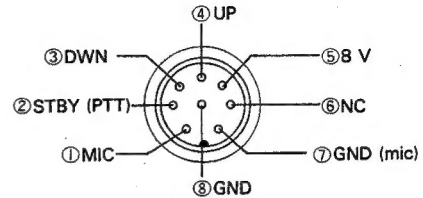
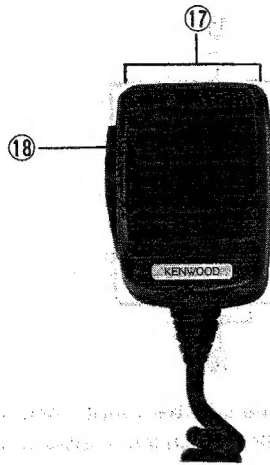
Use caution when connecting to an external supply. Do not reverse the polarity.

16 Shorting Plug



Must be installed whenever using battery power. If the plug is not installed the radio will not function.

■ MICROPHONE



Plug side view

17 UP/DWN (Up/down) switch

- 1) Depressing the Up or the Down key will shift the frequency one step. Step size is determined by the VFO and Shift switch settings.
- 2) Holding the Up or DWN key depressed for about one second will initiate the band scan function.
- 3) Depressing the Up or DWN key during MR, M, or E operations will return the radio to VFO operation.

18 PTT switch

This switch is used to initiate transmit. The switch also functions to stop scan. If scan is active and the PTT switch is depressed one time, the scan will stop, without actually transmitting on the air. Subsequent use of the PTT switch will initiate transmit.

19 Belt hook (For attaching the shoulder strap)

- 1) Install the Buckle as shown in Figure 1.
- 2) Slide on the retainer as shown in Figure 2.
- 3) Pass the strap through the Metal Fixture then back through the retainer, and finally through the buckle, as shown in Figure 3.
- 4) The strap length may be easily adjusted by loosening the buckle, and sliding the retainer up, as shown in Figure 4.

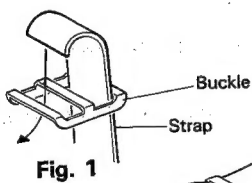


Fig. 1

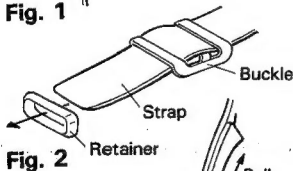


Fig. 2

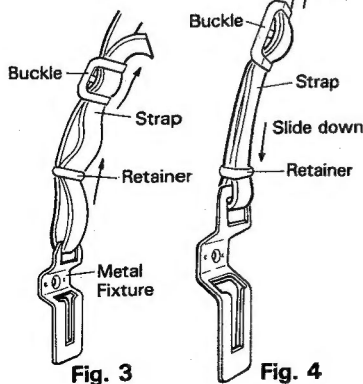


Fig. 3

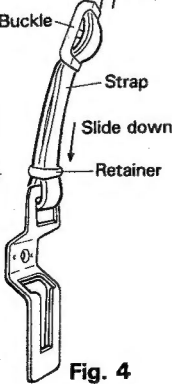
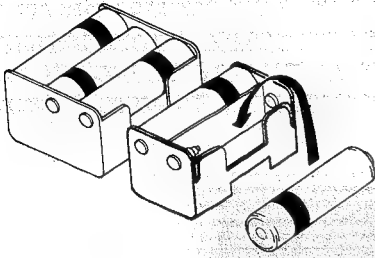


Fig. 4

4. PREPARATION

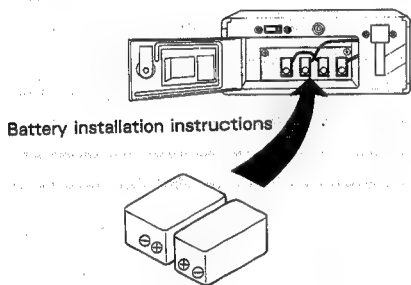
■ BATTERY



Load nine (9) "AA/R6" dry cells or alkaline batteries, and one dummy battery (supplied) in the battery case. For best results use manganese type batteries, as they generally last longer than normal cells.

Observe polarities when installing the batteries!

■ BATTERY CASE INSTALLATION

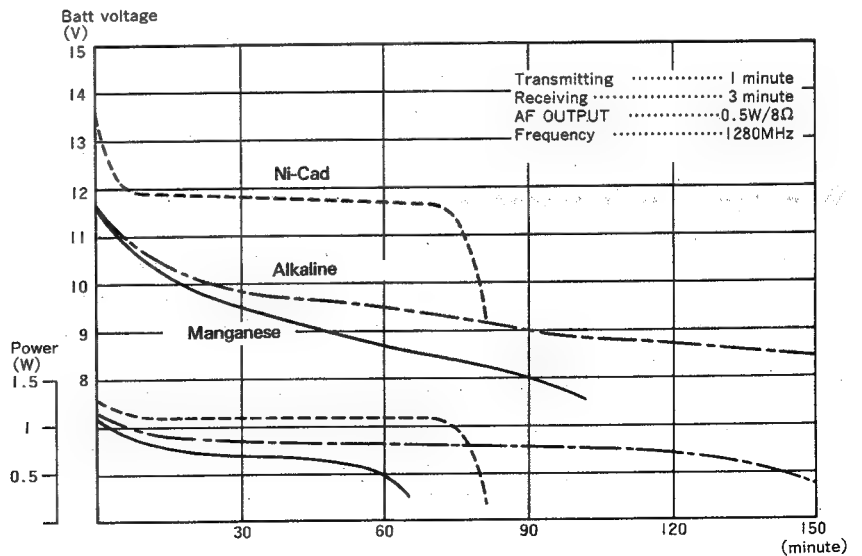


Battery installation instructions

Insert the battery into the TR-50 holders according to the instructions contained on the battery compartment cover. Do not forget to lock the cover after installation.

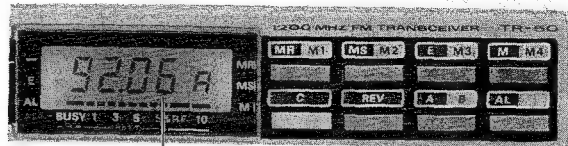
■ OPERATING TIME

Normal operating time for the TR-50 with 1 minute transmit and 3 minutes receive is shown in the accompanying chart. Since the power consumption of the TR-50 is greater than handheld transceivers on the 2-meter and 70-cm bands, even in standby (receive only, squelched), the power switch should be turned off during periods of extended inactivity.



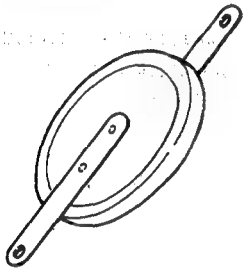
■ BATTERY VOLTAGE CHECK

When the battery voltage drops below the rated level, proper operation may not be possible. The battery voltage should be checked occasionally. Internal calibration methods differ slightly with each type of battery that may be used (Ni-cad, manganese, and alkaline). In general, when the two long bars of the bar graph disappear in receive, replace or recharge the battery.



Bar graph

■ MEMORY BACK-UP

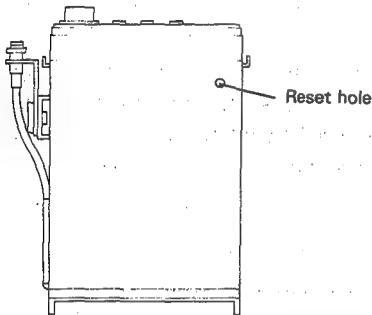


The TR-50 includes a lithium back-up battery to retain memory in the microprocessor. When changing batteries, or if the Ni-Cad battery should fully discharge, memory will always be retained. Back-up battery life is estimated at 5 years.

If an abnormal display appears when the power switch is turned on, press the reset switch. (See the following section) If the display is still abnormal, after resetting, it means the lithium battery is near exhaustion. Replace the battery as soon as possible.

Note: The memory back-up battery should be replaced by an authorized dealer or service facility.

■ RESET



The TR-50 microprocessor can be easily reset (initialized). To reset the microprocessor, turn the power switch ON and press the internal switch with a small non metallic probe, thru the reset hole.

Note: Reset only when necessary. Continued use may cause premature failure of the switch contacts.

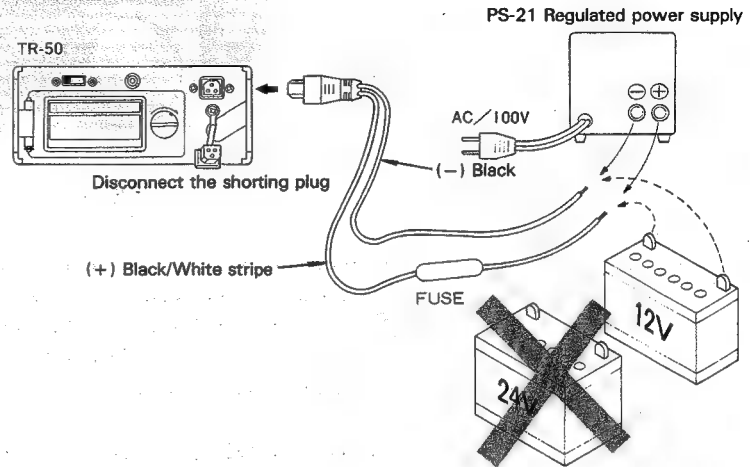
■ UL (PULL UNLOCK) DISPLAY

When the supply voltage or the memory back-up battery voltage drops abnormally, "UL" will be displayed. Transmit and receive are prohibited in this state. The "UL" that is occasionally displayed during the transition from power OFF to ON is not abnormal.

■ USE OF AN EXTERNAL POWER SUPPLY

Connect the external supply as shown in the figure below.

Connection to 24 V system is not possible as supplied. An external DC to DC converter is necessary.

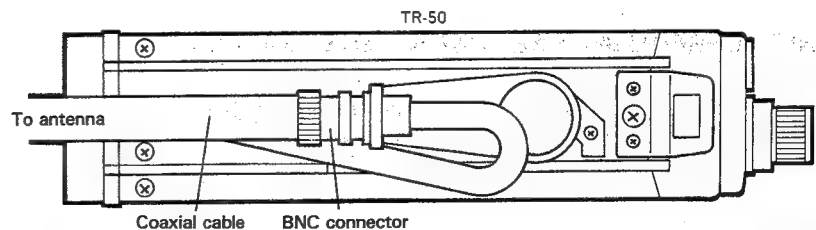


Note: If a supply other than the PS-21 is used, select a regulated supply that supplies 13.8 volts at 1 amp. Battery chargers are unsuitable as a power source since they have an unfiltered output.

When installing the TR-50 in an auto, connect the power cord directly to the car battery.

■ EXTERNAL ANTENNAS

When the TR-50 is operated with an external antenna, performance depends to a great extent on the quality of the antenna and coaxial cable. Select 50 ohm coaxial cable with as large a diameter as possible. The upper frequency ranges of the UHF bands and above are especially vulnerable to attenuation of the signal due to the "Skin Effect". Keep cable runs as short as possible, to again avoid unnecessary losses. Use of the N-BNC conversion connector will also help.



5. OPERATION

RECEIVE



- Install the battery or connect an external supply.
- Connect the supplied antenna or an external antenna.
- ① Turn the POWER/VOL control clockwise to turn on power. The display should indicate "60.00A". Advance the POWER/VOL control clockwise until the desired audio level is reached.
- ② Turn the SQUELCH control to the "Threshold point". Refer to page 6 for instructions how to use this control.
- ③ Select the desired operating frequency, using the procedures previously discussed.

TRANSMIT

To transmit, first select the desired frequency and see whether it is busy or not. If it is not busy, simply depress the mic PTT switch to transmit. The RF meter will indicate the relative power output. Speak into the microphone. The optimum distance from your mouth to the microphone is about 5 cm (3-4 inches).

Speaking too close to the microphone will make your voice difficult to understand, at the receiving station.

Note: The IF frequency is the same for transmit and receive in the TR-50. Note, that when two TR-50's are operated closely together, they may interfere with each other, regardless of the dial frequencies.

INITIAL FREQUENCY SETTINGS (RESET VALUES)

When the microprocessor is manually reset, or the lithium battery is replaced, the reset values of the VFO's are as follows:

	Frequency	Display
VFO A	1260.00 MHz	"60.00A"
VFO B	1295.00 MHz	"95.00b"

■ AUDIO TONE CONFIRMAITON TABLE

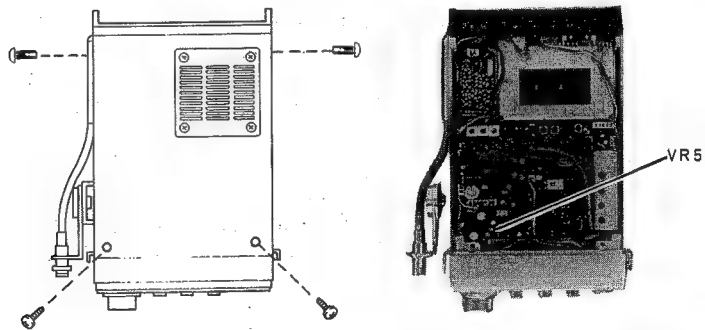
Several different audio tones are generated by the TR-50 to confirm proper, and improper operation of controls; and to signal the microprocessor is awaiting additional information. See the table below for additional information:

Audio tone	Conditions
Once	General confirmation Repeater band confirmation
Twice	Signals activity on priority channel.
Three beeps	Error tone: <ul style="list-style-type: none"> • A channel with no data has been selected. • Attempted to write into a channel that allready contains data. • Attempted MS when all channels were empty. • AL key was depressed and memory channel one was empty.
Series of 4 beeps	Signals that the microprocessor is waiting for the transmit frequency to be entered. (Memory channel 5)
Morse "R"	Signifies completion of task. <ul style="list-style-type: none"> • After memory storage • After memory erasure

The tone volume is adjustable.



- 1) Remove the top cover as shown at left.
- 2) Adjust VR5 to the desired level.
- 3) Replace the top cover.

CAUTION: Do not adjust any other controls. Doing so may cause damage or reduced performance.






■ MEMORY CHANNEL ENTRY

1 M1-M4 (Simplex channels)

	Function	Switch	Procedure
1	Frequency selection	Main dial, MIC UP/DWN	Select the desired frequency
2	Function selection		Pressing the [M] key causes the ► M annunciator to light, an audio tone to sound, and the display to sequentially display channel numbers that currently contain data.
3	Memory channel selection		<p>Depress the key corresponding to the desired memory channel.</p> <p>A morse code "R" will sound to indicate that the channel has accepted the data.</p> <p>If a channel is selected that already contains data, an error tone of 3 beeps will sound. If you wish to rewrite the data that had been previously stored, press the corresponding key again. The "R" should sound.</p>




2 M5 (Odd split channel)

	Function	Switch	Procedure
1	Receive frequency selection	Main dial, Mic UP/DWN	Select the desired receive frequency.
2	Function selection		Pressing the [M] key causes the ► M annunciator to light, an audio tone to sound and the display to sequentially display channel numbers that currently have data stored in them.
3	Memory channel selection		<p>Press the M5 key.</p> <p>A single beep will sound, to indicate that the receive frequency has been accepted. If the error signal appears, 3 beeps, and you want to change the frequency that was stored before press the M5 key again.</p>
4	Transmit frequency selection	Main dial, Mic UP/DWN	A series of 4 beeps will sound after the receive frequency has been entered (step 3). Select the desired transmit frequency.
5	Transmit frequency entry		Press the M5 key to store the transmit frequency. A morse code "R" will sound to signal data storage.

■ SCAN OPERATION

1 Memory Scan

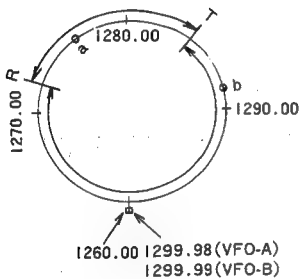
Before initiating scan operation, adjust the SQUELCH control to the "Threshold Point", or scanning functions will not operate properly.

	Function	Switch	Results
1	Scan start		The MS annunciator will light, and scan will proceed from channel 1 thru channel 5..... Memory channels without data will not be scanned.
2			The BUSY indicator will light, and scan will stop, when a signal is received. Scan will resume when the carrier drops out.
3	Rapid Advance		The radio will advance to the next channel, even if a signal is present.
4	Scan Release		The unit will revert to MR mode.

Note: To resume scan first press the [C] key to return to VFO operation. Scan can only be started from VFO mode.

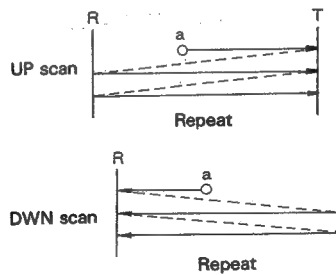
Since all memory channels are cleared when the reset switch is pressed, an error alarm will sound if you try to scan an empty memory bank.

2 Program scan

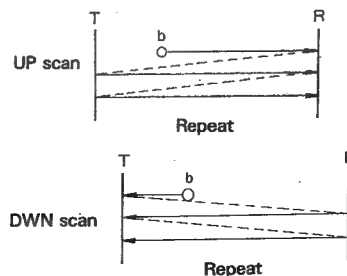


Depressing the mic UP or DWN switch during VFO A or VFO B operation, will initiate scan within the range of frequencies specified in channel 5. In the companion figure R denotes the receive frequency in channel 5, and T denotes the transmit frequency.

1) When the VFO is at point "a", scan will proceed as follows:



2) When the VFO is at point "b", scan will proceed as follows:



When the frequency passes either limit during scan an audio tone will sound.

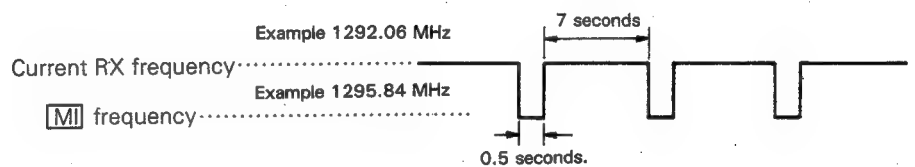
Note: When UP/DWN scan is selected with the SHIFT control set to the MHz position, the unit will increment 1 MHz before scan starts. For best results always initiate scan with the SHIFT control in the SHIFT or kHz positions.

- 3) When there is no frequency in channel 5 or both frequencies are the same, the radio will scan the entire band.
- 4) Operation of program scan:
 1. Store lower and upper limit frequencies in memory channel 5.
 2. To initiate scan, simply depress and hold either the microphone UP or DWN buttons for more than one second.
 3. Scan will stop on a busy channel for approximately 5 seconds, and then resume.
 4. You may continue scanning by pressing the UP or DWN switch at any time.
 5. To stop on a channel either press [C] or the PTT switch.
 6. Rapid scan is possible by pressing and holding either the UP or DWN pushbutton.
 7. To change scan direction, press the key corresponding to the desired direction, during scan.

Note: Releasing scan with the PTT switch will not cause the radio to transmit. Subsequent depression of the PTT switch will initiate transmit.

■ ALERT OPERATION

When the AL (alert) key is pressed, Memory channel 1 MI is scanned approximately once every 7 seconds. If there is activity on the frequency two beeps will sound. The primary frequency will drop out for a brief period (0.5 sec) while channel one is scanned.

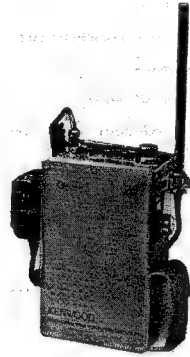


6. OPTIONAL ACCESSORIES

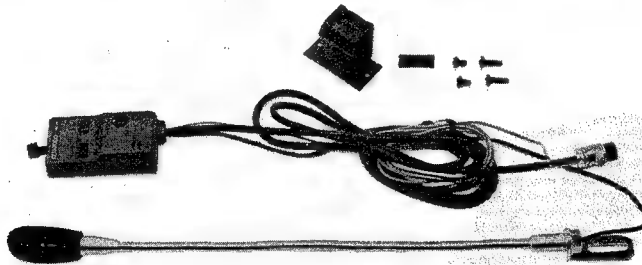
■ PB-16 NI-CAD BATTERY



■ SC-10 SOFT CARRING BAG



■ MC-55 MOBILE MICROPHONE



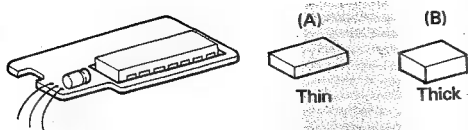
■ MC-42S MICROPHONE WITH UP/DWN SWITCH



■ PS-21 POWER SUPPLY



■ TU-6 TONE UNIT (USA ONLY)

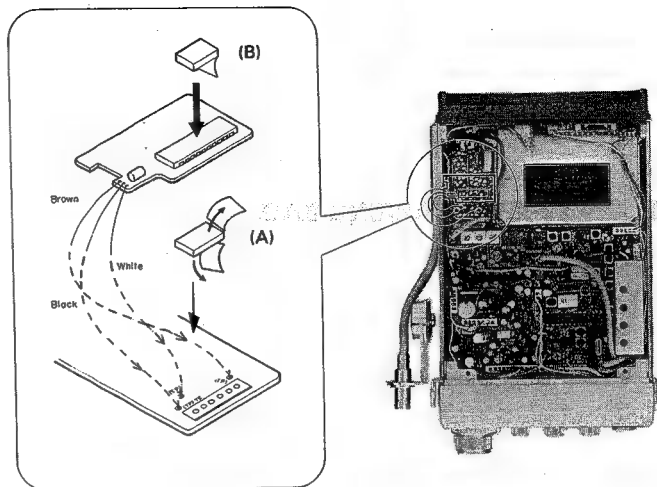


TU-6 Installation

- 1) For the top cover removal, refer to the figure on page 15.
- 2) Peel the waxed sheet off the supplied cushion (A) and affix the cushion on the mounting space indicated.
- 3) Peel the other side of the waxed sheet off the cushion and secure the TU-6 unit on the cushion properly.
- 4) Solder TU-6 lead wires to the terminals as shown.
For soldering, use a pen type solder iron. At this time, be careful not to apply excessive heat.

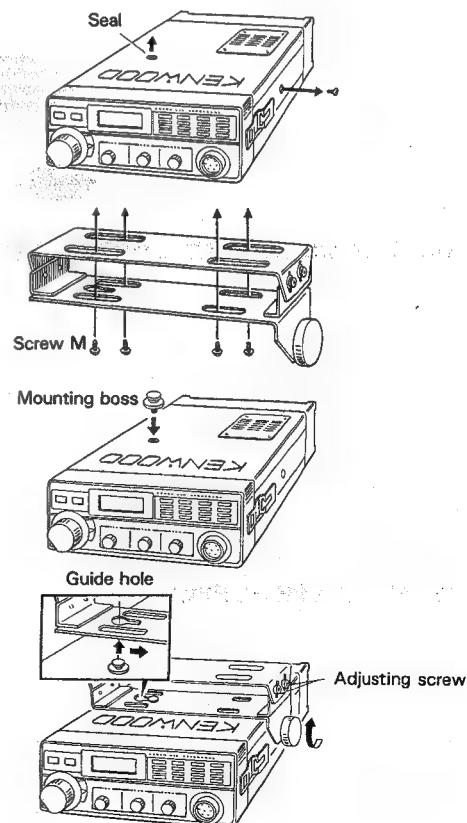
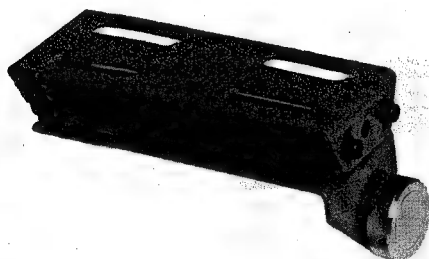
Solder points: Brown lead ----- (TP) +
 Black lead ----- (TP) TE
 White lead ----- (TP)

- 5) Peel the waxed sheet off the supplied cushion (B) and affix the cushion on the TU-6 unit as shown.
- 6) Replace the top cover.

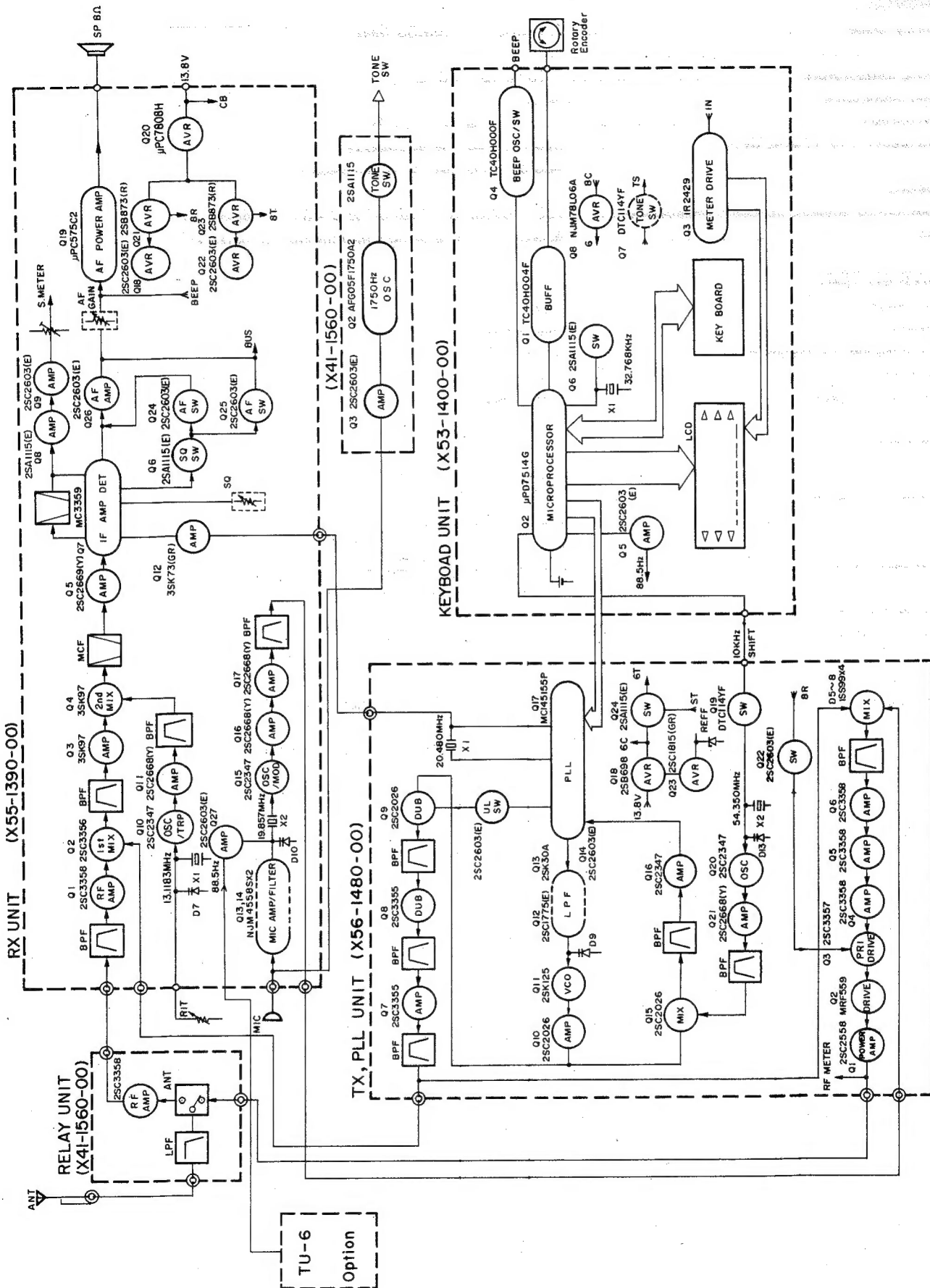


TU-6 Installation

■ MB-3 MOBILE MOUNT KIT



7. BLOCK DIAGRAM



8. SPECIFICATIONS

[GENERAL]

Frequency range	1260.00 – 1299.99 MHz
Mode	F3
Operating temperature	– 20°C to + 50°C
Antenna impedance	50 Ω
Supply voltage	13.8 V + 15 %, – 25 %
Current drain (13.8 V, lamp OFF)	Approx. 180 mA at standby Approx. 850 mA at transmission (1 W)
Dimensions (Maximum dimensions including projections)	123 (157.5) W \times 192 (210) D \times 51 (51.5) H mm
Weight	Approx. 1,200 g (including antenna and battery)

[TRANSMITTER]

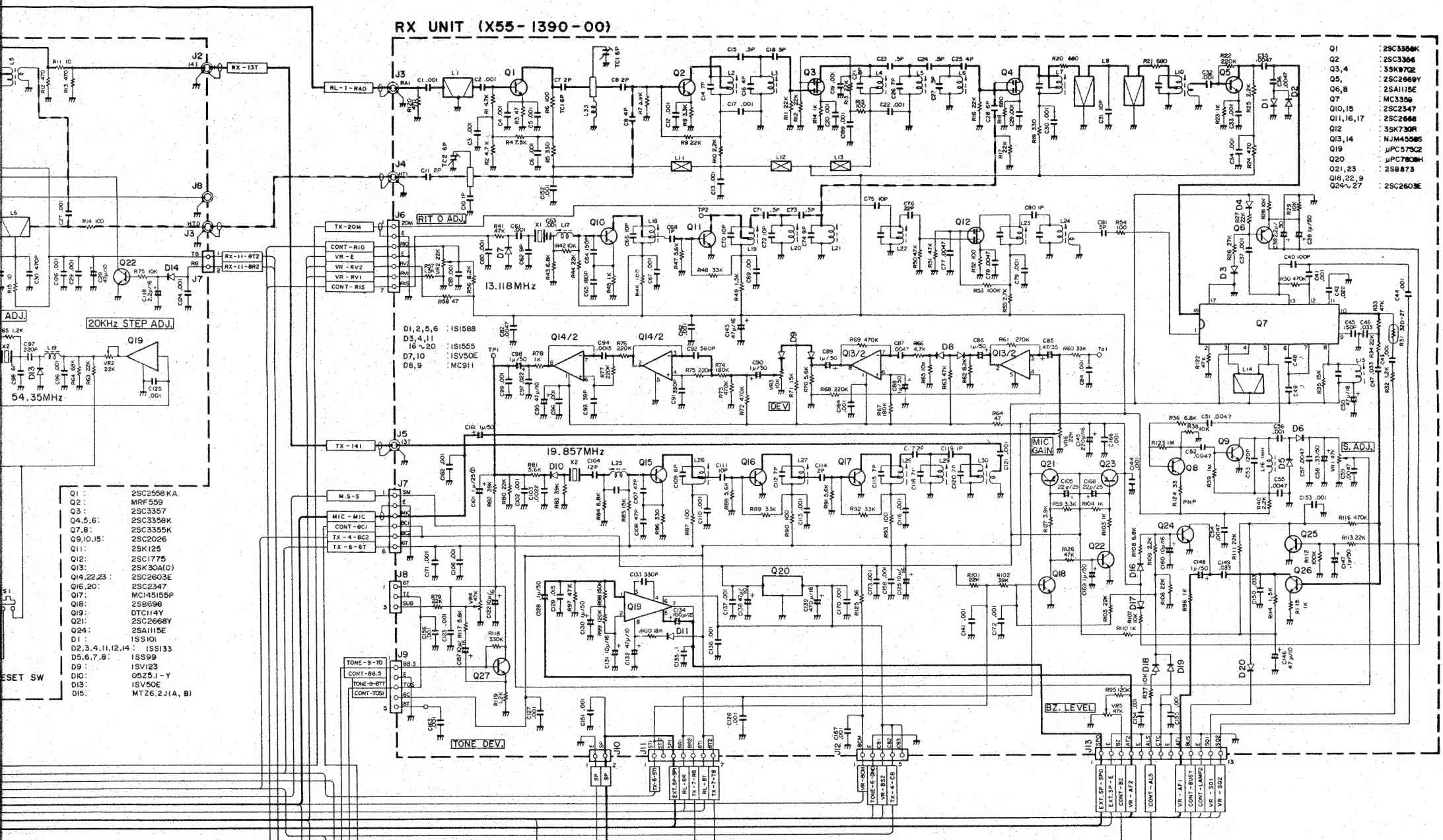
Output power	1 W
Modulation	Reactance
Maximum frequency deviation	\pm 5 kHz
Spurious radiation	– 40 dB
Microphone impedance	500 – 600 Ω

[RECEIVER]

Circuitry	Triple superheterodyne
Intermediate frequency	1st IF: 139 MHz 2nd IF: 20.935 MHz 3rd IF: 455 kHz
Receiver sensitivity	SINAD 12dB: – 10 dB μ (0.3 μ V) or less S/N ratio: 30 dB or more at 1 μ V input
Squelch sensitivity	0.25 μ V or more
Pass band width	15 kHz or more (– 6 dB) 30 kHz or less (– 60 dB)
RIT variable range	\pm 5 kHz or more
Audio output	1 W or more (10 % distortion, 8 Ω load)

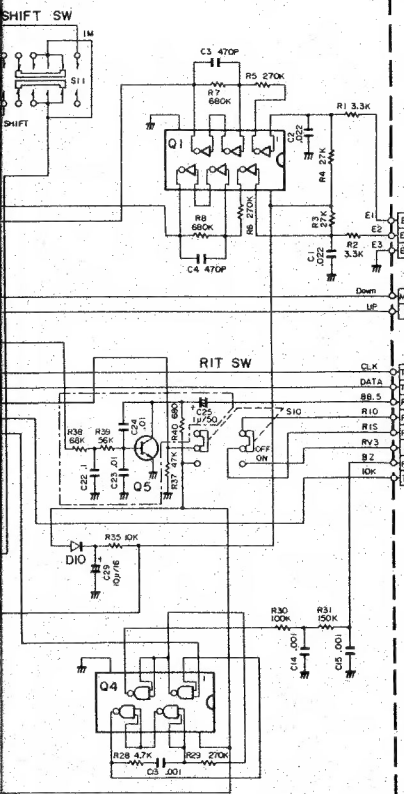
Note: Circuit and ratings are subject to change without notice due to developments in technology.

RX UNIT (X55-1390-00)

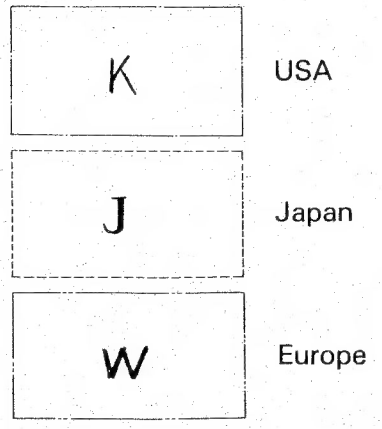
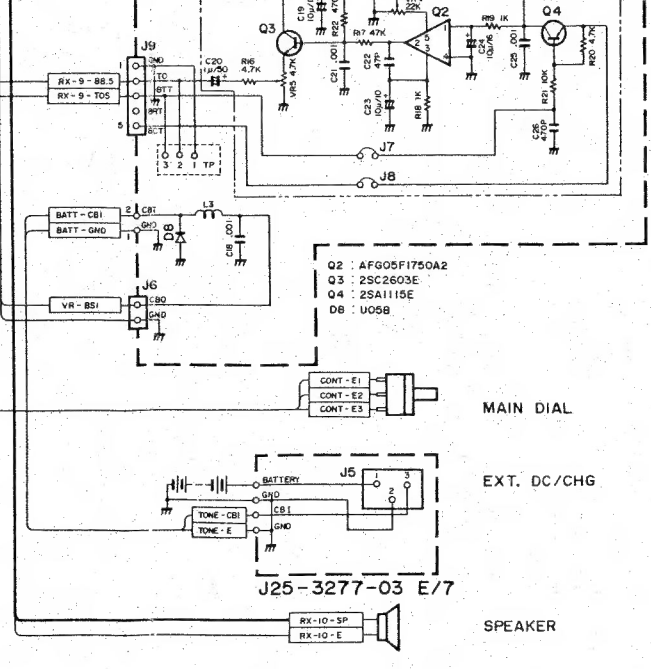


- Q1 : 2SC3356K
- Q2, 4 : 2SC3356
- Q3, 5 : 2SC2669Y
- Q6, 8 : 2SA115E
- Q7 : MC3356
- Q10, 15 : 2SC2347
- Q11, 16, 17 : 2SC2668
- Q12 : 3SK730R
- Q13, 14 : NJM4558S
- Q19 : μ PC575C2
- Q20 : μ PC7808H
- Q21, 22 : 2S9873
- Q24, 27 : 2SC2603E

- Q1 : 2SC2556K
- Q2 : MRF559
- Q3 : 2SC3357
- Q4, 5, 6 : 2SC3356K
- Q7, 8 : 2SC3359K
- Q9, 10, 15 : 2SC2026
- Q11 : 2SK125
- Q12 : 2SK1775
- Q13 : 2SK30A(O)
- Q14, 22, 23 : 2SC2603E
- Q16, 20 : 2SC2347
- Q17 : NCI4515P
- Q18 : 2SB958
- Q19 : DTC114Y
- Q21 : 2SC2668Y
- Q24 : 2SA115E
- D1 : ISS101
- D2, 3, 4, 11, 12, 14 : ISS133
- D5, 6, 7, 8 : ISS99
- D9 : ISV123
- D10 : OS251-Y
- D13 : ISV50E
- D15 : MT26.2(A, B)



(X41-1560-00) B/7



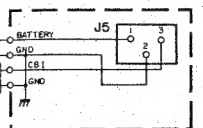
- Q1 : TC40H004F
- Q2 : μ PD75H4G-030-12
- Q3 : 1R2429
- Q4 : TC40H004F
- Q5 : 2SC2603E
- Q6 : 2SA115E
- Q7 : DTC114YF
- Q8 : NJM78L06A
- D1 ~ D10, D12 ~ D16 : ISS133

- Q2 : AFG05F1750A2
- Q3 : 2SC2603E
- Q4 : 2SA115E
- D8 : U05B

CONT-E1
CONT-E2
CONT-E3

MAIN DIAL

EXT. DC/CHG



J25-3277-03 E/7

SPEAKER

