



TR 7800
TRIO
KENWOOD
VHF
TRANSCEIVER



SECTION 1

INSTALLATION

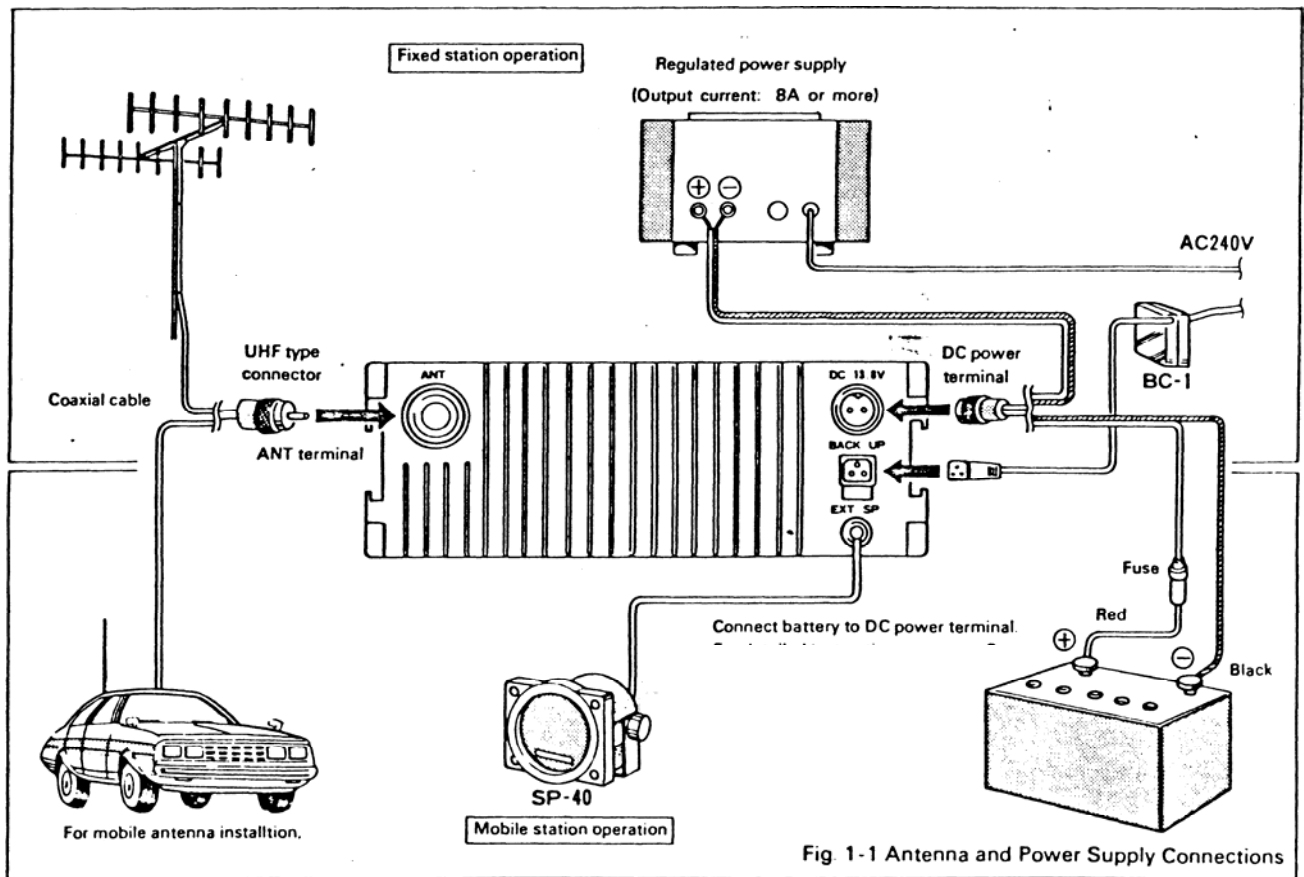
1-1 INTERCONNECTION

Connect the antenna and power supply as shown in Fig. 1-1 for fixed station.

1-2 FIXED STATION Installation, [general]

Power supply (Fig. 1-1)

A Power supply (output current; 8A or more) is required. Antenna (Fig. 1-3) various types of fixed station antennas are commercially available. Select your desired antenna according to your in-stallation space and application. Note that the SW R of your antenna should be less than 1.5 A high SWR will cause the TR-7800 protective circuit to operate, reducing the transmit output power.



1-3. MOBILE INSTALLATION, [GENERAL]

Installation location

Using the supplied mounting bracket, install the transceiver under the dashboard or on the side of the console in your car. - Refer to Fig. 1-2A and Fig. 1-2B.

If your car is equipped with an electronic fuel injector, the transceiver should be as far from the control equipment as possible.

Antenna installation

Various types of antenna for 2 meter mobile operation are available. (See Fig. 1-2C)

Note:

For gutter-mount installation, the antenna bracket must be grounded to the car body as shown in Fig. 1-2C. Affix the antenna securely, referring to the antenna instruction.

Power supply

Connect the supplied power cord with fuse directly to the battery terminals. Connecting to the cigarette lighter socket can cause a poor connection, and excessive voltage drop

Ignition noise

The transceiver is designed to suppress ignition noise; however, if excessive noise is present, it may be necessary to use suppressor spark plugs (with resistors).

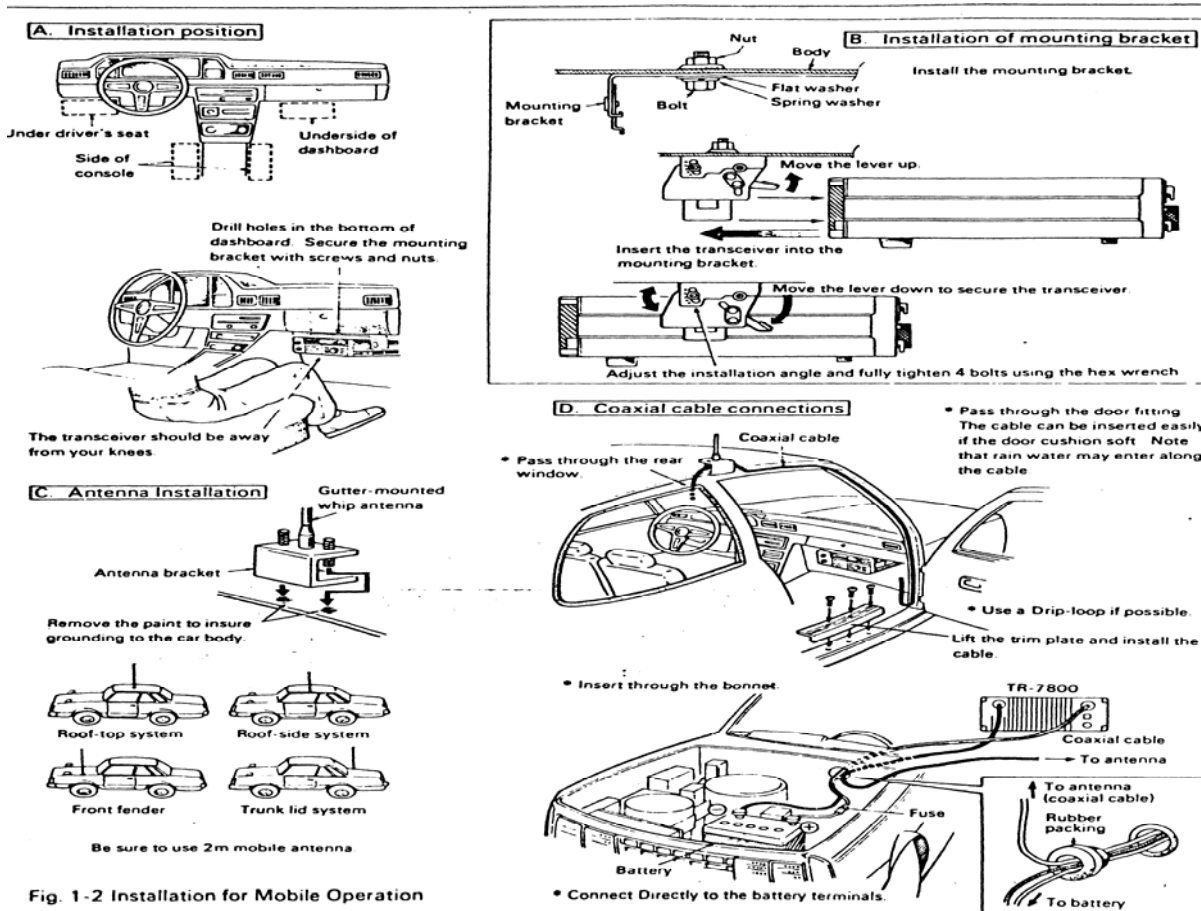
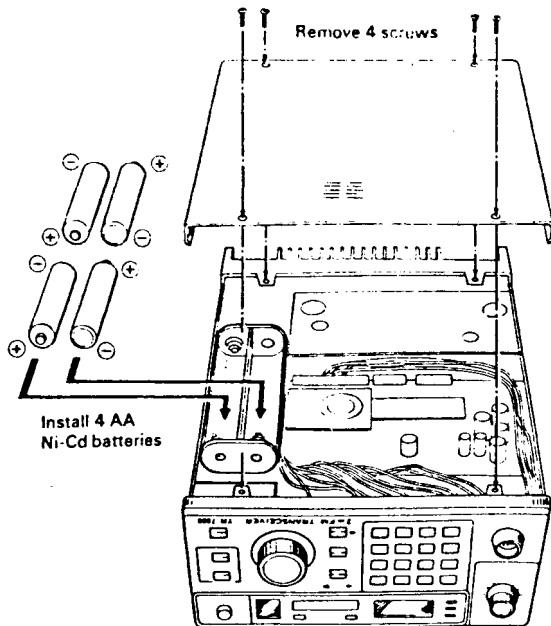


Fig. 1-2 Installation for Mobile Operation

1 4. Back-up Power

1 With power supplied directly from the car battery, the micro computer continues operating even when the power switch is OFF. Current drain is very low, approximately 25 mA.

2 If you wish to retain the memories even when moving the unit between the car and the fixed station, utilize a battery back-up system. Otherwise, all the memories are cleared when the power cord is disconnected.



- (1)** Use four AA NiCad batteries, available Locally.
- (2)** Open the lower cover of the transceiver.
- (3)** Install the batteries into the battery case located on the left side, making sure that polarity is correct.
- (4)** The batteries are charged when the power switch is turned ON.

Charging current is about 30 mA. The battery back-up function operates only when the power cord is disconnected.

- 3.** Back-up is available for about 3 to 5 days. To extend the back-up period, connect the (optional) BC-1 to the external back-up terminal.

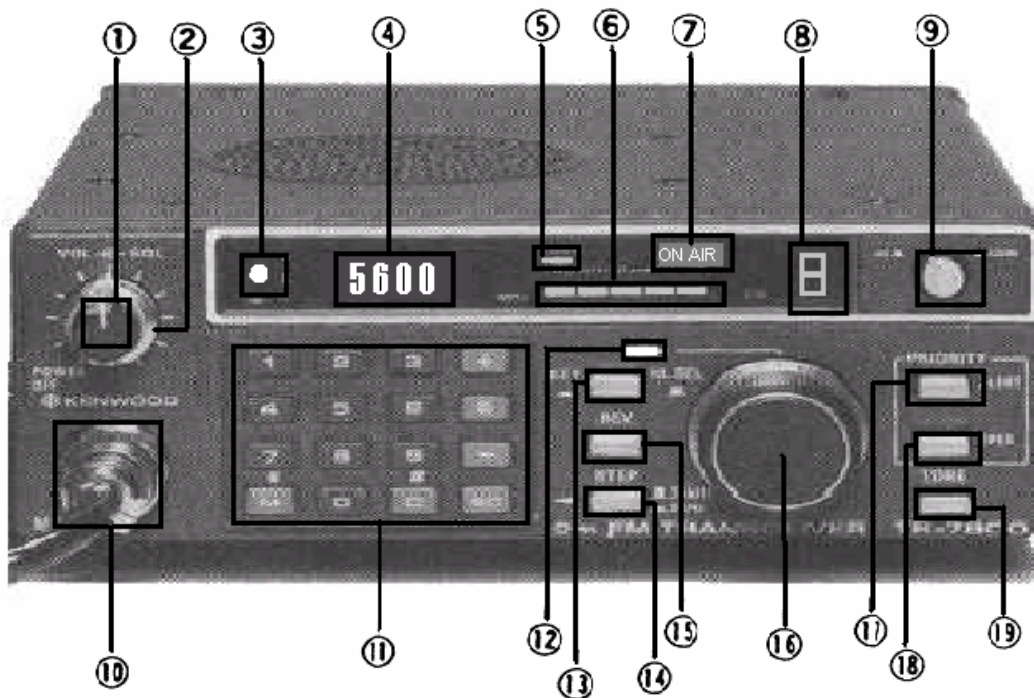
Fig. 1-4 Battery Back-up

Note:

- 1.** Employ the same brand batteries in the same charge condition.
- 2.** Take the batteries away if you don't use them for a long period.

SECTION 2.

CONTROLS AND TERMINALS



2-1. Front Panel

1. VOL/POWER

Power ON-OFF switch and volume control are combined. Turning the control fully counter clockwise will turn the power OFF. Clockwise rotation will increase the volume. In the power OFF position, about 2.5mA current is drawn to back-up the micro-computer, provided the power cable is connected to a constant power source. To completely disable the transceiver, disconnect the power cable.

2. SQUELCH

The squelch control is used to eliminate noise during no-signal time. Normally, this control is adjusted clockwise until the noise disappears and the BUSY indicator goes off (threshold level). For scan operation, this control must be set to the threshold point.

3. TX Shift Indicator

+ (RED): By pressing the GD key on the keyboard (11). the indicator will light, indicating that transmit frequency is switched up 600 kHz from the receive frequency. (Refer to the item FH key)

S (YELLOW): By pressing the S key on the keyboard # (11). the indicator will light, indicating that the transceiver is operating in the simplex mode. (Refer to the item S key)

— (RED): by pressing the - key on the keyboard # (11). the indicator will light, indicating that transmit frequency is switched down 600 kHz from the receive frequency. (Refer to the item - key)

4. Frequency Display

This LED frequency display indicates the operating frequency in 4 digits (MHz-kHz).
Example: 145.950 MHz is indicated as "5.950".

5. BUSY Indicator

This lamp will light when the squelch is open in receive mode.

6. S/Rf Level meter

This LED level meter indicates receive input signal strength (S) or transmit output (RF).

7. ON AIR indicator

A light emitting diode (L E D) will light in the transmit mode.

8 CH Indicator

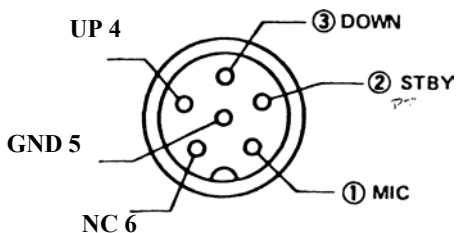
This LED indicator indicates the channel No (0 through 14) in 2 digits

9. HI/LOW Switch

This switch is used to set transmit output power to either 25W (high) or 5W (low).
Power is high at the normal out position, and is low at the in position.

10. MIC Connector (6-pin)

For connection of the supplied microphone.



MIC connector (from FRONT PANEL)

11. Keyboard

The keyboard has the following functions (Refer to "SECTION 3. OPERATION"):

[1] – [0] (Number key):

Depress four keys to set the desired operating frequency.

Example: Depress the keys, [5].[9].[5] and [0]. The frequency display will indicate "5.950" (145.950 MHz).

[+] (+ shift key):

After setting the operating frequency, depress this key. The transmit frequency will be switched up 600 kHz from the receive frequency.

[S] (Simplex key):

Depress this key and the transceiver will be set in simplex mode (transmit and receive frequencies are the same).

[-] (- shift key):

After setting the operating frequency, depress this key. The transmit frequency will be switched down 600 kHz from the receive frequency

[M] (Memory key):

This is used to input desired frequencies (including ± 600 kHz shift) to each channel for memory. Press the key and a check tone will be heard.

[C] (Clear key):

By pressing this key, the frequency set by the number keys is cleared. In this case, the frequency display indicates the frequency that was displayed before the number keys were pressed. Use this key you have mistakenly entered setting this key is also used to release the scan operation.

[SC] (Scan key):

This is used for scan operation. Press the key when this SQUELCH (2) is ON. Auto-scan or memory-scan starts according to the position of the KEY/M SEL switch and STEP switches.

12. KEY/M. SEL Indicator

This indicates the position of the KEY/M. SEL switch. The KEY indicator will light when the switch is depressed, and the M. indicator will light in the out position.

13. KEY/M. SEL Switch

This switch is used to select the method of setting frequency, either by the keyboard or the memory. In the depressed position the operating frequency can be set by the keyboard; in the normal out position, the operating frequency can be set by using the MEMORY channel selector (16).

14. STEP Switch

Use this switch to select the steps 25kHz (button out), or 5kHz (button in) during frequency scan or microphone UP/DOWN operation.

15. REV Switch

This switch is used to reverse the repeater shift (± 600 kHz) and other transmit/receive frequencies (CH 13, 14). It is a momentary non-lock type switch and returns to the normal out position when released.

16. MEMORY Channel Selector

This switch is used to select the desired memory channel. There are 15 memory channels. Of these, channels 0 ~ 12 store frequencies including ± 600 kHz shift. The other two channels, 13 and 14 are "ODD split" channels, storing transmit and receive frequencies individually. Channel "14" is the priority channel.

17. PRIORITY ALERT Switch

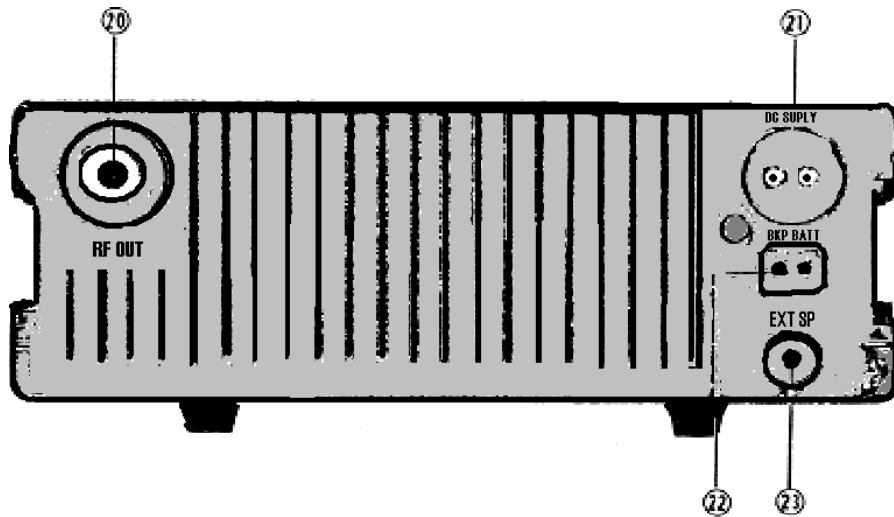
This switch is used to check the priority "14" channel. Depress the switch and the priority channel can be checked at about 6 second intervals regardless of the KEY/M. SEL switch position. Tone sounds when the priority channel is in use.

18. PRIORITY OPER Switch

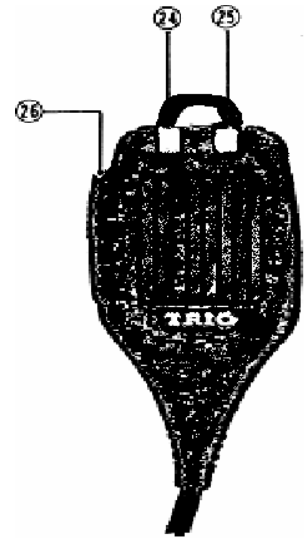
This switch is used to call up the priority ("14") channel. By depressing the switch, the operating frequency is switched to the priority channel.

19. TONE Switch

When this switch is pressed, the repeater control tone burst signal (1.750 Hz) is emitted for about 0.5 second at the beginning of each transmission.



2-2. Rear Panel



2-3. Microfone

20. ANT Terminal

Antenna terminal. impedance. Connect an antenna of 50 ohms

21. DC Power Terminal

DC power input terminal. Connect the supplied power cord with plug. Input voltage is 13.8V DC. Observe plus (+) and minus (—) polarity

22. EXT. BACK-UP

External power back-up terminal to retain the memories. For internal back-up operation, install four AA NiCd batteries in the built-in battery case. Use this terminal to retain the memories for a long period of time (more than 1 week), or with the power cord disconnected.

23. EXT. SP Terminal

External speaker terminal. Connect an 8 ohms speaker using the supplied plug.

24. DWN Switch

This switch is used to step the operating frequency down during both keyboard and MEMORY Channel operation. When pressing the switch, a tone will sound. When the DWN or UP switch is held, the frequency shifts rapidly. Pressing both the UP and DWN switches simultaneously results in stopping the frequency control operation.

25. UP Switch.

This switch is used to step up the operating frequency in both keyboard and MEMORY channel operation. When pressing the switch, a tone will sound.

26. PTT Switch

Press-to-talk switch used for transmission. This will also release scan operation.

SECTION 3

OPERATION

3-1 General

1. This transceiver uses a PLL synthesizer controlled by micro-computer. The operating frequency can be shifted in either 5 kHz or 25 kHz steps.
2. Operating frequencies can be set by simply pressing the keys on the keyboard. Frequencies can also be stored in the memory channels (15 channels).
3. Transmitter precautions
 - (1) The TR-7800 antenna impedance is 50 ohms. Be sure to connect an antenna of 50 ohms impedance.
 - (2) Check the transmit frequency before operating to insure that you do not interfere with other stations.
 - (3) By pressing the microphone PTT switch, the TR-7800 is set in transmit mode; the ON AIR Indicator will light and the meter indicates transmit power. Hold the microphone about 5 cm from your mouth and speak.
4. Micro-Computer Reset (At first power-up)

If, at initial TURN-ON, an erroneous or incorrect readout is displayed, reset the MICRO-COMPUTER. This is not an equipment malfunction.

To proceed:

- (1) Disconnect the power plug from the DC power terminal (21) and after about five seconds reconnect the power plug. Turn on the power switch (1).
- (2) if BACK-UP BATTERIES INSTALLED
First remove the batteries, and reset the MICRO-COMPUTER as previously described. Reinstall the batteries.

3-2 Memory Input

The TR-7800 has two different memories; normal memory and split channel memory (including priority memory channel).

1. Normal memory (CH 0-12)

Example: To store 145.950 MHz (— 600 kHz shift) in CH 5.

- (1) Set the KEY/M.SEL switch to the KEY position (—).
- (2) Set the MEMORY channel selector (16) to the CH 5 position.
- (3) Input the frequency.

[DISPLAY]	Frequency before input
a) Press the [5] key (MHz digit).....	5
b) Press the [9] key (100 KHz digit).	59
c) Press the [5] key (10 kHz digit)...	.595
d) Press the [0] key (1 kHz digit).....	.5950

(Simplex operation)

Note:

- a. To input MHz digit, use the [4] and [5] keys.
- b. When a wrong frequency is input by mistake, press the [C] key to clear the frequency. The frequency display will indicate the frequency before input, Re-enter the correct frequency by pressing the keys once again starting with the MHz digit.
- c. When the 1 kHz digit key ([0] – [4]) is pressed, the frequency display indicates 0 . When the ([5]-[9]) key is pressed, the display indicates 5.
- d. Do not press any other key until the correct frequency is input.
- e. The transceiver holds the previous frequency until the new frequency is input.

(4) Input the shift mode.

Press the [-] key (the indication changes from "S" to "-").

(5) Store the frequency in the memory. Press the [M] key.

A tone will sound, indication data entry. Change the channel and input other frequencies in the same manner.

Note:

1. If you wish to change the shift mode from simplex, press the shift key of the desired mode.
2. When the transmit frequency is shifted ± 600 kHz and it is outside the amateur band (144.000 ^ 145.995 MHz), the transceiver operates in simplex mode.

2. Split channel memory (CH 13, 14)

Example: To store a receive frequency of 144.550 MHz and transmit frequency of 145.625 MHz in CH 14, proceed as follows:

- (1) Set the KEY/M.SEL switch (13) to the KEY position down.
- (2) Set the memory channel selector (16) to CH 14.
- (3) Input the receive frequency. Frequency before input:
 - a) Press the [4] key (MHz'digit)..... 4.
 - b) Press the [5] key (100 KHz digit).... 4.5
 - c) Press the [5] key (10 kHz digit)..... 4.55
 - d) Press the [0] key (1 kHz digit)..... 4.550

Note:

For frequency input precautions, refer to "Notes" in normal memory.

(4) Store the receive frequency in memory. Press the (M) key.

A continuous tone will sound, indicating transmit frequency is ready to be accepted

Note:

1. The tone will sound intermittently until the transmit frequency is stored in memory.
2. When the receive frequency is stored. transmit frequency before the split (CH 14) is indicated.

(5) Input the transmit frequency

- a) Press the [5] key ;MHz digit)..5
- b) Press the [6] key (100 kHz digit)... . 5.6
- c) Press the [2] key (10 kHz digit)..5.62
- d) Press the [5] key (1kHz digit) 5.625

(6) Store the transmit frequency in memory. –

Press the (M) key (tone stops.)..... 4.550

The transceiver is now ready for split frequency operation Set the KEY/M. switch (13) to the M. position {*button up*}.

Note:

When the transmit frequency is stored, the frequency display indicates the receive frequency set by step (3).

3. Memory channel operation

With the KEY/M.SEL switch in the M. position (button up). the transceiver operates on the frequency set by the MEMORY channel selector (16).

4. Changing memory frequencies.

If you wish to change memory frequency, store a new frequency using the above procedures. The old frequency is erased when the new frequency is stored.

3-3 SCAN (Busy stop) Operation

The SCAN operation is classified into keyboard scan, memory scan and priority channel scan. For SCAN operation, the squelch control should be advanced to the threshold point. See 3.6 Squelch.

• KEYBOARD SCAN

1. Set the KEY/M.SEL switch (13) to the KEY position
2. Depress the [SC] key. Scan starts automatically in 25 kHz or 5 kHz steps according to the position of the STEP switch (14).
3. When a signal is present, scanning stops. Scan restarts automatically about 5 seconds later.
4. To release the scan, press the [C] key (or the microphone PTT (push-to-talk) switch).

• MEMORY SCAN

1. Set the KEY/M. SEL switch (13) to the M. SEL position.
2. Depress the [SC] key. The memory channels are scanned.
Scan stops and restarts the same as in the keyboard scan.

• PRIORITY CHANNEL SCAN

Depress the PRIORITY ALERT switch (17). A tone will sound and the BUSY indicator (5) will light at about 6 seconds intervals (regardless of the KEY/M. SEL switch position) if the priority channel is in use.

3-4 PRIORITY OPER Switch

To call up the frequency stored in the priority "14" channel depress the PRIORITY OPER switch (19).

3-5 TX OFFSET and REVERSE

After setting channels by the number keys on the keyboard, press the [+] or [-] key. The transmit frequency will be switched up or down 600 kHz from the receive frequency and the TX shift indicator (3) will illuminate. By pressing the REV switch (15), the transmit and receive frequencies will be reversed. If, at this time, the transmit frequency is beyond the amateur band frequency, a tone will sound and the transceiver is automatically set in simplex mode. When the REV switch is pressed, the frequency indicated on the display is also reversed, but the TX shift indicator (3) does not alter the indication.

3-6 SQUELCH

To eliminate the noise at no-signal condition, turn the squelch slowly clockwise until the noise disappears and the BUSY indicator goes off (threshold point). Turn to an empty channel. The BUSY indicator will light and the speaker will operate when a signal is received. The squelch control is also used for scan operation control. If the signal is weak or fades during mobile operation, readjust the squelch for the clearest reception.

3-7 HI/LOW Switch

For local communication, it is recommended that power be reduced to eliminate interference to other stations and to minimize power consumption. By pressing the HI/LOW switch, transmit power is reduced from 25W to about 5W.

3-8 "S" Meter

The LED level meter functions as an "S" meter during reception and as an RF meter during transmission.

3-9 Adjustments

Refer to Fig. 3-1.

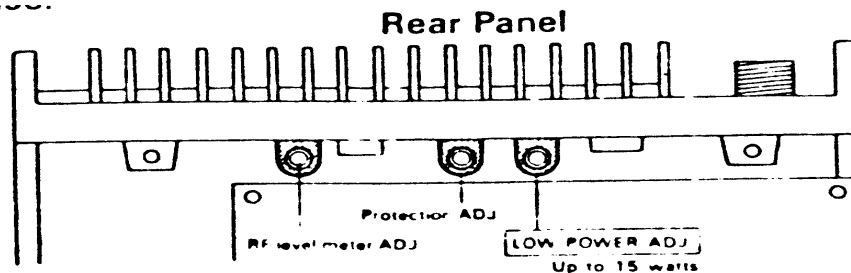


Fig. 3-1

[BOTTOM VIEW]

SECTION 4 - ADDITIONAL INFORMATION

4-1 General Information

Your TR-7800 has been factory aligned and tested to specification before shipment. Under normal circumstances, the transceiver will operate in accordance with these operating instructions. If your transceiver fails to work, contact the authorized dealer from which you purchased it for quick, reliable repair. All adjustable trimmers and coils in your transceiver were preset at the factory and should only be readjusted by a qualified technician with proper test equipment. Attempting service or alignment without factory authorization can void the transceiver's warranty.

4-2 How the TX Final Module are Protected

Final module protection is provided by sampling the reflected power. As the reflected power is increased (higher SWR) transmitter drive is reduced, thus decreasing input to the final module. This in turn reduces collector loss, protecting the final transistors.

4-3 Battery Precaution

When charging your vehicle battery, or when jump-starting a dead battery ALWAYS disconnect the power lead from the back of the transceiver.

4-4 Ordering Spare Parts

When ordering replacement or spare parts for your equipment, be sure to specify the following:

Model and serial number of your transceiver. Schematic number of the part. Printed circuit board number on which the part is located. Part number and name, if known, and Quantity desired.

Note:

A full service manual is available as a separate publication.

4-5 Service

Should it ever become necessary to return the equipment for repair, pack in its original boxes and packing, and include a full description of the problems involved. Also include your telephone number. You need not return accessory items unless directly related to the service problem. Tag all returned items with your call for easy I.D. Please mention the model and serial number of your radio in any correspondence, whether phone or written. For future reference, record this information in the space provided on the back cover of this manual.

Note:

When claiming warranty service, please include a photocopy of the bill of sale; or other proof of purchase showing the date of sale.

Kenwood TR 7800

Frequency range: 144-146 MHz (Europe) / 143.900-149 MHz (USA)

Mode: FM

RF Power output: Hi: 25W, Lo: 5W - Impedance: 50 ohms, SO-239

Voltage: 13.8 VDC Current drain: RX: 0.4-0.9 A, TX: Max 6 A

Dimensions (W*H*D): 175*64*206 mm Weight: 2.1 Kg

FEATURES

- 15 Multifunction memory channels, easily selectable with a rotary control
- Priority alert
- Internal battery back-up for all memories
- Extended frequency coverage
- Front-panel keyboard
- Autoscan
- UP/DOWN manual scan
- Repeater reverse switch
- Separate digital readouts
- Selectable power output
- Built-in piezo-electric buzzer
- LED bar meter
- LED indicator

SPECIFICATIONS

[GENERAL]

- Frequency range: Region 1 = 144.000–145.995 MHz, Region 2 and 3 = 143.900–148.995 MHz
- Mode: FM (F3)
- Antenna impedance: 50Ω
- Power requirement: 13.8V DC ±15%
- Grounding: Negative
- Current drain:

0.4A in receive mode with no input signal, 6A in HI transmit mode (approx.), 2.5A in LOW transmit mode (approx.), Less than 2.5 mA for memory backup (from DC power supply), Less than 3 mA for memory backup (from built-in battery)

● Dimensions: 175 (7)W x 64 (2.6)H x 206 (8.2)D mm

● Weight: 2.1 kg (4.6 lbs) approx.

[TRANSMITTER]

- RF output power; HI = 25 W min., LOW = 5 W approx.
- Modulation: variable reactance direct shift
- Frequency tolerance: less than $\pm 20 \times 10^{-6}$
- Spurious radiation: HI = Less than -60 dB, LOW = less than -53 dB
- Microphone: dynamic with PTT switch, 500Ω

[RECEIVER]

- Circuitry: Double conversion superheterodyne
- Sensitivity: FM more than 0.5 μ V for dB S/N, more than 0.2 μ V for 12 dB SINAD
- Selectivity: FM = more than 12 kHz (-6 dB), less than 24 kHz (-60 dB)
- Spurious response: more than 60 dB
- Squelch sensitivity: 0.16 μ V
- AF output power: more than 2 W

OPTIONAL ACCESSORIES

- PS-8: DC power supply
- SP-40: compact mobile speaker
- MC-40S UP/DOWN microphone

MODIFICATIONS FOR THE KENWOOD TR-7800

TR-7800 Loss of Memory

Intermittent loss of memory may be corrected by adding one resistor at the microprocessor on the control unit.

Procedure:

Remove bottom cover, 4 screws.

From the Control unit X53-1180-xx unplug the rear mounted connectors 8-11.

Remove 6 screws from the board.

Swing the unit forward.

Install a 470K ohm 1/8 watt or larger resistor from connector 11, "UP" pin, to ground. (microprocessor pin 35, PA2 port). Space is limited: Be certain not to create a solder bridge when installing the resistor.

Reverse steps 4-1 for reassembly.

TR-7800/TR-9000 Optional Ceramic Filters

FM Adjacent channel rejection in either unit may be improved by installing an optional narrow ceramic filter.

Filter	Part No.	-6db Bandwidth	-70db Bandwidth	Retail
CFK-455F	L72-0304-05	+/- 6 kHz	+/- 12 kHz	\$ 33.50
CFK-455G	(CFK-455G)*	+/- 4 kHz	+/- 10 kHz	\$ 33.50

*Not original part. No computer part number.

Procedure

In the location:

TR-7800, RX unit X55-1270-10 part, L10 or TR-9000, RX unit X55-1260-11 part, CF1

To install, desolder the original filter and clear the second set of holes for the optional filter.

Solder the new filter in place.

Be sure all pins are actually soldered, and that there are no solder bridges between pins or across the printed circuit board.

Clip the pins flush to the board, and reinstall the circuit board.

Note:

Squelch operation will vary from unit to unit with an optional narrow filter. Tighter coupling from the detector to the squelch circuit may be tried to restore "original feel".

TR-7800 Tone pad conversion for 4th column function

Users who desire ABCD control functions may be accommodated by an alteration to the Control unit and to the REV switch. This switch will then perform dual functions.

Procedure

Remove top and bottom covers, 4 screws each.

To free the front panel remove 4 screws securing the front panel bracket to the side frame.

Unplug 5 multiconnectors from the Control unit along the front and left edges of the board.

Remove 6 screws from the Control unit and swing the board over.

Remove and save R51 22 Kohm located between IC's Q19 and Q28. (Q28 pin 5).

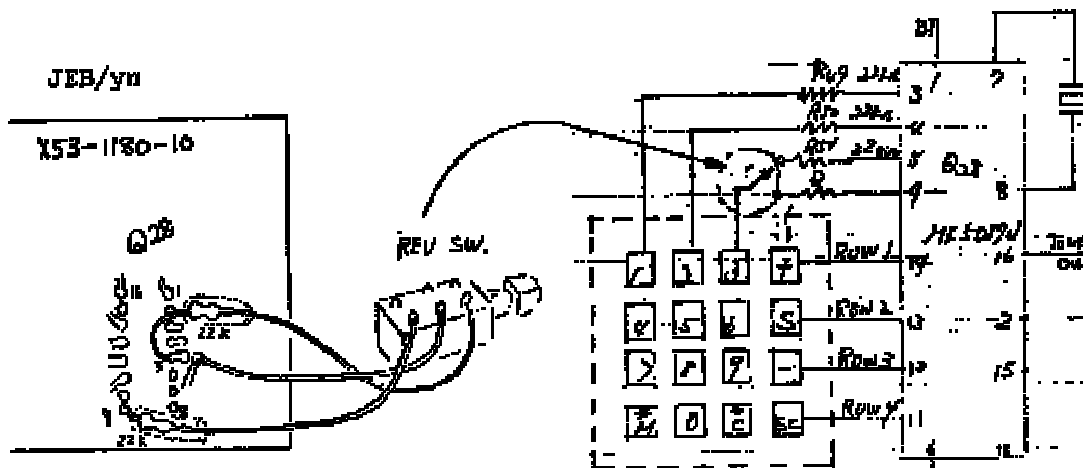
Resolder this 22 Kohm resistor to Q28 pin 5, and solder another 22 Kohm resistor to Q28 pin 9. Using a short piece of hookup wire, extend these connections to the REV switch as shown.

Connect a line from the center switch contact to the original feed point of R51, which is the B3 line.

To reassemble, reverse steps 4 through 1.

To operate the ABCD column, hold the REV switch IN and key the 3, 6, 9, or # keys. Normal 3rd column tones are supplied when the REV switch is not depressed. The receive REV function is not altered by this change.

Note: This switch is a DPDT and many have both sets of contacts bridged. Free one set of contacts for this new function.

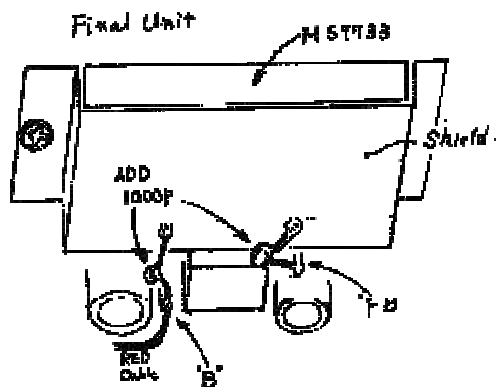


TR-7800 Pulse noise

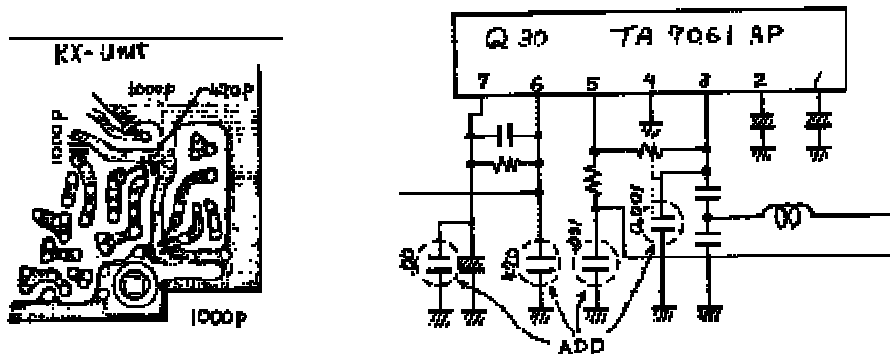
Low level Pulse Noise reported in high power TX, or as a buzz from the speaker during TX, may be reduced or eliminated by the following steps.

Procedure:

If not already present, install a shield (F11-0781-04) and two 1000pF capacitors (C52-1710-26) at the final amplifier module M57733 as shown.



On the RX unit X55-1270-10 add three additional 1000pF caps (c52-1710-26) and one additional 470pF cap (C52-1747-16) as shown.



TR-7800 Optional continuous charge for internal batteries

The internal batteries for memory back-up charge only when the radio is on. If the radio is used less than 2 hours a day, the internal batteries may not charge sufficiently to retain memory if the main power is disconnected. This optional change may be made to continuously charge the internal batteries from the main power source, whether the radio is on or off.

Procedure

On the RX unit X55-1270-10, change R94 from 56 ohm to 120 ohm, ½W. Cut the foil at the input to Q27 and connect via a 3/4" lead to the BB terminal on connector 1. Battery charge current will be 15mA nominal.

Note:

The radio should be connected directly to the vehicle battery and not through the ignition switch.

Turn the radio off before connecting or disconnecting the power cable.

For early units: Before closing the case, check clearance from the back of the battery case to the chassis.

If very close, add suitable insulation between the battery case and chassis.

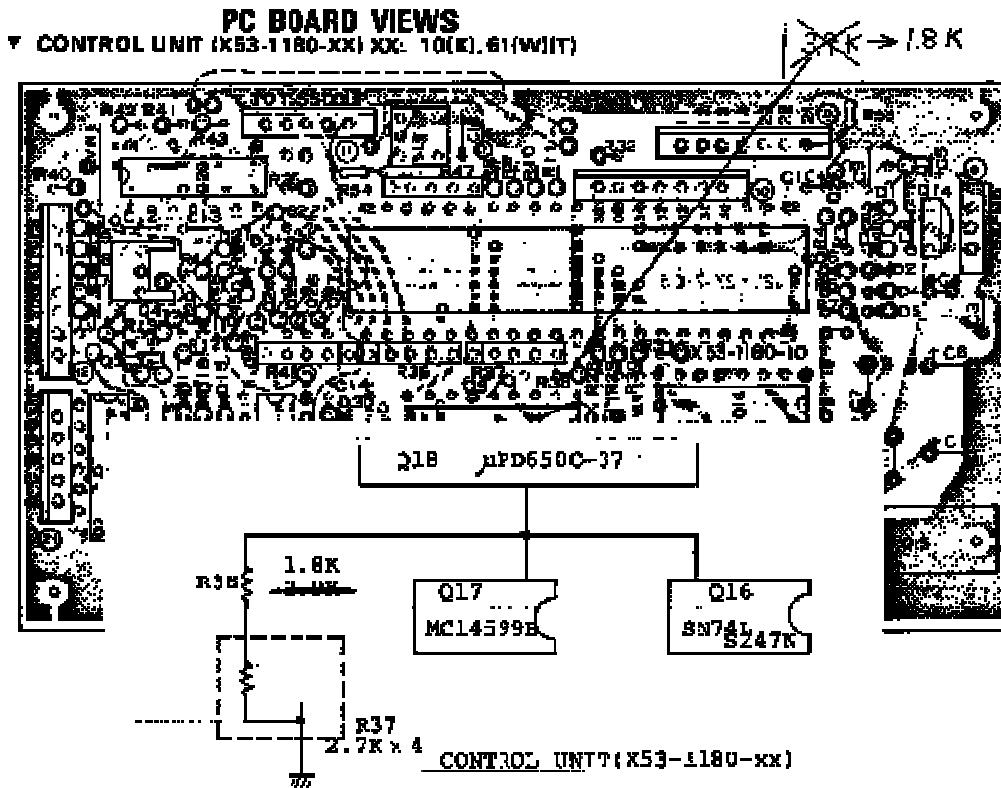
Check for the presence of a 470 kohm 1/8W resistor which should be located on the bottom of the Control unit X53-1180-xx, Connector 11, UP pin. Add if not already installed (and see Service Bulletin #829).

Memory Channel 7 Indicator Erratic

When Memory Channel 7 is selected, the LED may fail to indicate the number 7, although frequency is correctly recalled and all other operations are normal. Cause is incorrect voltage level at Q16 & Q17, and is related to individual differences between these IC's. Correction is by changing one resistor value on the control unit.

On the control unit X53-1180-xx, replace R38 from 3.9 Kohm to a 1.8 Kohm resistor (RD14CB2E182J). No adjustments are required.

This change should be performed only as necessary, and applies to units before serial number 205xxxx.



Installation time for this procedure is ½ hour or less.

TR-7800, TR-7850 Memory Improvements

TR-7800 & TR-7850 memory retention may be improved by the following changes on the control and RX units.

Procedure

Control unit X53-1180-xx

If not already present, add a 470 Kohm $\frac{1}{2}W$ resistor (RD14BB2B474J) (R54) on the foil side of the board from connector 11 UP line to ground. (Unite before serial number 1119391).

If not already present, add a 470 Kohm $\frac{1}{2}W$ resistor (RD14BB2B474J) (R55) on the foil side of the board connector 11 DOWN line to ground. (Unite before serial number 1119391).

Hard-wire the two via holes (through hole without components leads installed) along the foil trace between Q18 pin 1 and L1.

Change D1 from an ZX-060 (6V, 5%) to a WZ-040 (VII-4102-40) (4V, 10%) Zener.

Check D3 for leakage, which would load the MB line voltage below its normal 5.2 V DC setting.

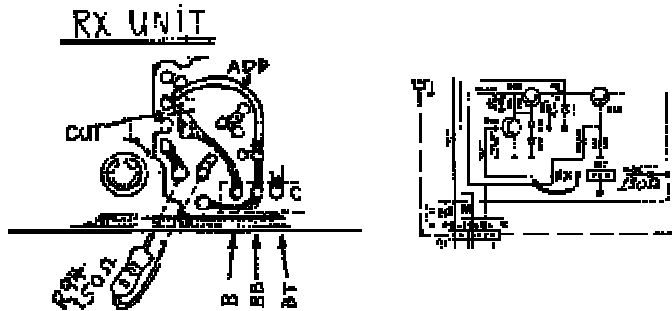
RX unit X55-1270-xx

TR-7800: Change R94 from 56 ohm to 150 ohm $\frac{1}{2}W$ (RD14CB2E151J).

TR-7850: Change R94 from 100 ohm to 150 ohm $\frac{1}{2}W$ (RD14CB2E151J).

Cut the foil at the input to Q27, and connect Q27 input to the BB terminal. Connector 1 for constant battery charge at Power switch Off, and floating battery charge when using a TK-1 or BC-1 charger unit for memory back-up in base station operation.

Check D18 for leakage, loading the MB line.



Note:

With 13.8V DC applied to the radio, and the power switch OFF, adjust VR2 on the RX unit for 5.2V DC at connector 1, MB terminal.

We recommend using either Sanyo or GE NiCad Batteries.

We suggest not using Radio Shack or Eveready batteries in these radios.

If memory loss persists after all changes and checks suspect control unit Q18 is defective.

KENWOOD

Amateur Radio Division

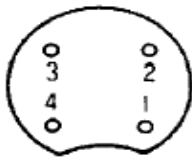
Subject: Miscellaneous Connectors

Date: January 26, 1999

This information is provided "as is," and is subject to change without notice. Kenwood Service Corporation makes no warranty of any kind with regard to this information, including, but not limited to, the implied warranties of merchant ability and fitness for a particular purpose. Kenwood Service Corporation shall not be liable for any error or for incidental or consequential damage in connection with the furnishing, performance, or use of this information.

Microphone Connectors Pin Numbers Usually Imprinted in Insulator

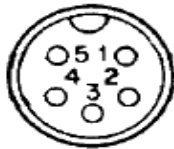
4 Pin Microphone Plug



TR-7200A/7400A/7500
TS-120S/130S/180S/511S/520/530/600/700/820/830

Pin 1 Microphone
Pin 2 Push To Talk
Pin 3 Chassis Ground
Pin 4 Microphone Ground

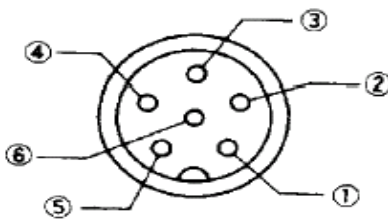
5 Pin Microphone Plug



TR-7600/7625

Pin 1 Microphone
Pin 2 Push To Talk
Pin 3 No Connection
Pin 4 Chassis Ground
Pin 5 Microphone Ground

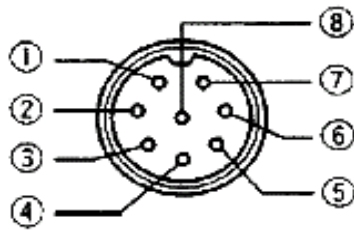
6 Pin Microphone Plug



TR-7730/7800/7850/7930/7950/8400/9000/9130/9500

Pin 1 Microphone
Pin 2 Push To Talk
Pin 3 Down
Pin 4 Up
Pin 5 8VDC (150ma Max) Or N.C.
Pin 6 Chassis Ground

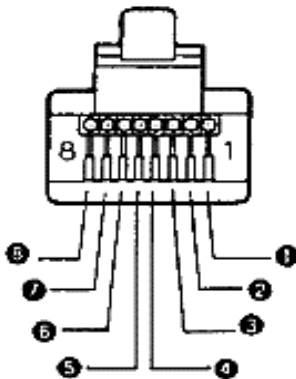
8 Pin Microphone Plug



TM-201A/201B/211/221/231/241/321/331
 TM-401A/401B/421/431/441/521/531/541
 TM-621/631/701/721/731/2530/2550/2570
 TR-50/751/851
 TS-50/60/140/430/440/450/570/660/670/680
 TS-690/711/780/811/850/870/930/940/950
 TW-4000/4100

- Pin 1 Microphone**
- Pin 2 Push To Talk**
- Pin 3 Down**
- Pin 4 Up**
- Pin 5 8VDC (150ma Max)**
- Pin 6 RX Audio (Some Models)**
- Pin 7 Microphone Ground**
- Pin 8 Chassis Ground**

8 Pin Modular Microphone Plug

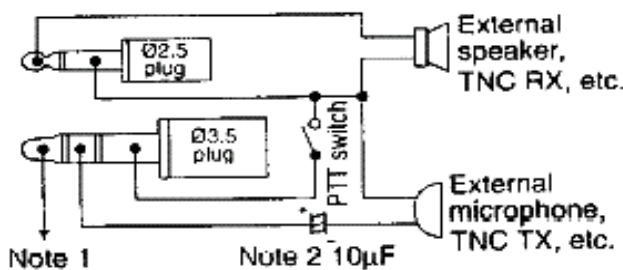


TM-251/255/261/451/455/461/641
 TM-642/732/733/741/742/941/942
 TM-G707/V7A

- Pin 1 Up**
- Pin 2 8VDC (150ma Max)**
- Pin 3 Chassis Ground**
- Pin 4 Push-To-Talk**
- Pin 5 Microphone Ground**
- Pin 6 Microphone**
- Pin 7 RX Audio (Some Models)**
- Pin 8 Down**

Speaker/Microphone Connection

TH-21AT/21BT/22/25/26/27/28/31AT/31BT
 TH-41AT/41BT/42/45/46/47/48/55/75/77
 TH-78/79/D7/G71/205/215/225/235/315/415



2.5mm Plug

- 1 Tip Speaker**
- 2 Sleeve Speaker & PTT Ground**

3.5mm Plug

- 1 Tip No Connection**
- 2 Ring Microphone**
- 3 Sleeve PTT**

13 Pin ACC 2 Plug



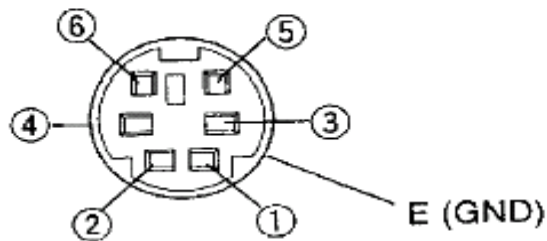
(Rear Panel view)

TS-140/440/450/680/690/570/711/790/811/850
TS-870/940/950

- Pin 1** N/C
- Pin 2** N/C
- Pin 3** RX Audio Output
- Pin 4** Shield For Pin 3
- Pin 5** Squelch Control Or N/C
- Pin 6** S-Meter Output Or N/C
- Pin 7** N/C
- Pin 8** Chassis Ground
- Pin 9** PTT (Standard Mic
Input is Muted)
- Pin 10** N/C
- Pin 11** Microphone Input
- Pin 12** Shield for Pin 11
- Pin 13** PTT (Standard Mic
Input is Active)
- Shell Earth (Ground)**

Accessory and Data (Packet) Connectors Pin Numbers Usually Imprinted in Insulator

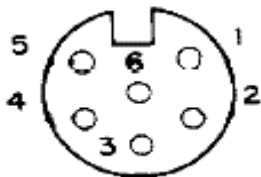
6 Pin Data Plug



TM-251/451/G707/V7

- Pin 1 Data Input (Microphone)**
- Pin 2 Ground (Mic Ground)**
- Pin 3 Packet Standby (PTT)**
- Pin 4 9600bps RX Audio Output**
- Pin 5 1200bps RX Audio Output**
- Pin 6 Squelch Control Output**
- Shell Earth (Ground)**

6 Pin ACC Plug



TS-450/690/570/850/870/950

- Pin 1 GND Signal Ground**
- Pin 2 TXD Transmit Data**
- Pin 3 RXD Receive Data**
- Pin 4 CTS Transmit Enable**
- Pin 5 RTS Receive Enable**
- Pin 6 No Connection**
- Shell Earth (Ground)**

7 Pin Remote Plug



TS-120/130/140/180/430/440/450/530/570
TS-680/690/830/850/870/940/950

- Pin 1 Speaker Output**
- Pin 2 Relay Common (Ground)**
- Pin 3 PTT for Footswitch**
- Pin 4 Relay Close On Transmit**
- Pin 5 Relay Open On Transmit**
- Pin 6 ALC Input**
- Pin 7 12VDC On Transmit
(10ma Max)**
- Shell Earth (Ground)**

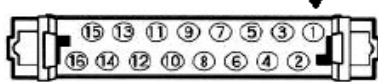


VC-H1 Wire Connections Using Optional Cable E30-3352-08

Color	Orange	Orange	Yellow	Yellow	White	White	Gray	Gray	Pink	Pink	Shield
Markings	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Shield
Pin No.	4	5	6	7	8	9	11	13	14	15	16

Note: Pins 1, 2 and 10 are not connected. Pins 3 and 12 are jumpered.

Pin 1 is indicated by a triangle



VC-H1 Connections for SSTV and speaker microphone		
Wire Color	VCH1 Pin No.	
Orange/Red	4	→ Chassis Ground
Shield	16	
Yellow/Black	7	→ PTT
Gray/Red	11	
Pink/Red	14	→ Audio Input (Microphone)
White/Black	9	→ Audio Output **
Gray/Black	13	

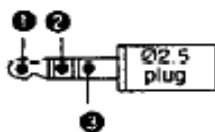
VC-H1 Connections for SSTV		
Wire Color	VCH1 Pin No.	
Orange/Red	4	→ Chassis Ground
Shield	16	
Yellow/Black	7	→ PTT
White/Red	8	→ Audio Input (Microphone)
White/Black	9	→ Audio Output **

VC-H1 Connections for TS-570/TS-870		
Wire Color	VCH1 Pin No.	
Orange/Red	4	→ 8 Chassis Ground
Yellow/Black	7	→ 9 PTT
Yellow/Red	8	→ 11 Audio Input
White/Black	9	→ 3 Audio Output
Shield	16	→ 12 Shield
		→ 4

** A 47uf 16v capacitor may be needed to avoid audio distortion

Specialized Connections and Cables

TH-D7A



GPS Connection

2.5mm Plug

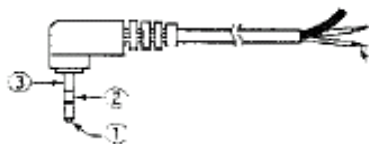
1 Tip	To RXD on GPS
2 Ring	To TXD on GPS
3 Sleeve	Ground

PC Connection

2.5mm Plug

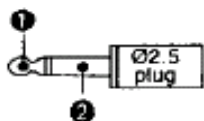
1 Tip	To RXD on PC
2 Ring	To TXD on PC
3 Sleeve	Ground

Supplied Cable Part No E30-3374-05



1 White	RXD On GPS
2 Red	TXD On GPS
3 Shield	GND On GPS

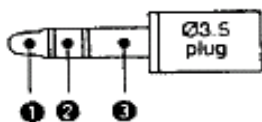
VC-H1



Video Output Plug

2.5mm Plug

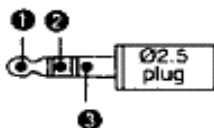
1 Tip	Video Signal
2 Sleeve	Ground



Video Input Plug

3.5mm Plug

1 Tip	N/C (For VC-H1 Camera ONLY)
2 Ring	Video Signal
3 Sleeve	Ground



Com Jack Connection

2.5mm Plug

1 Tip	To RXD on PC
2 Ring	To TXD on PC
3 Sleeve	Ground