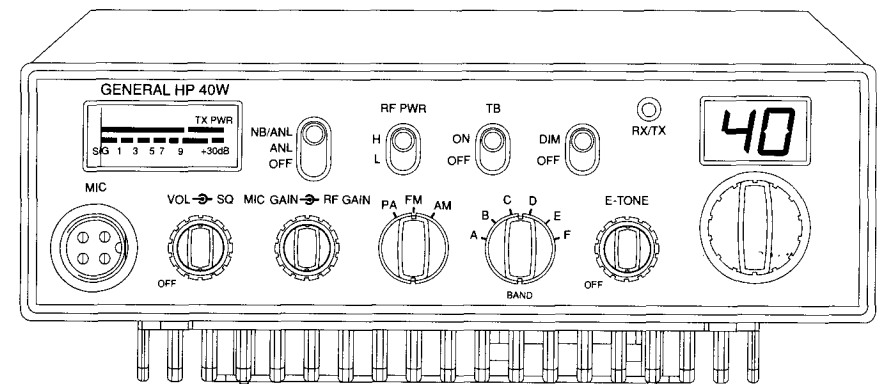


# General HP 40W



## Full Channel AM/FM Amateur Mobile Transceiver

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### OWNER'S MANUAL

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## SPECIFICATIONS

### **GENERAL**

Model	General HP 40W
Frequency Range	28.015 ~ 28.585 MHz
Modes	AM/FM
Frequency Control	Phase-Locked-Loop Synthesizer
Frequency Stability	0.001%
Temperature Range	0°C to +50°C
Input Voltage	DC 13.8V
Antenna Impedance	50 Ohms
Size	7 7/8"(W) x 9 1/4"(D) x 2 3/8"(H)
Weight	5.0 lbs

### **TRANSMITTER**

RF Power Output (AM/FM)	H :40W ; L : 10W
Spurious Emission	-50dB
Audio Distortion	10%
Frequency Response	300 to 2500Hz
Microphone	Dynamic

### **RECEIVER**

Sensitivity	AM 0.5 uV for 10dB S+N/N FM 0.25 uV for 12dB S+N/N
Squelch Sensitivity	0.5uV
Selectivity	-55dB
Image Rejection	-50dB
Hum & Noise	40dB
Audio Output Power	2.5W at 10% THD

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

## **INSTALLATION**

### **LOCATION**

Plan the location of the transceiver and microphone bracket before starting the installation. Select a location that is convenient for operation and does not interfere with the driver or passengers in the automobile, the transceiver is usually mounted the dash panel with the microphone bracket beside it.

### **MOUNTING THE RADIO**

The transceiver is supplied with a universal mounting bracket. When mounting the bracket and radio to your car, make sure it is mechanically strong. Also provide a good electrical connection to the chassis of the vehicle. Proceed as follows to mount the transceiver:

1. After you have determined the most convenient location in your vehicle, hold the transceiver with mounting bracket in the exact location desired. If nothing will interfere with mounting it in the desired position remove the mounting bolts. Before drilling the holes, make sure nothing will interfere with the installation of the mounting bolts.
2. Connect the antenna cable plug to the standard receptacle on the rear panel. Most transceiver antennas are terminated with a type PL-259 plug and mate with the receptacle.
3. Connect the red DC power input wire (with the fuse) to +13.8V DC. This wire extends from the rear panel. In automobile installation, +13.8V DC is usually obtained from the accessory contact on the ignition switch. This prevent the set being left on accidentally when the driver leaves the car and also permits operating the unit without the engine running. Locate the accessory contact on most ignition switches by tracing the power wire from the AM broadcast receiver in the car.
4. Connect the black lead to -13.8V DC. This is usually the chassis of the car. Any convenient location with good electrical contact (remove paint) may be used.
5. Mount the microphone bracket on the right side of the transceiver, using two screws supplied. When mounting in an automobile, place the bracket under the dash so that microphone is readily accessible.

### **IGNITION NOISE INTERFERENCE**

Use of a mobile receiver at low signal levels is normally limited by the presence of electrical noise. The primary source of noise in automobile installation is from the generator and ignition system in the vehicle. Under most operating conditions, when signal level is adequate, the background noise does not present a serious problem. Also, when extremely low level signals are being received, the transceiver may be operated with vehicles engine turned off. The unit requires very little current and therefore will not significantly discharge the vehicle battery.

Even though the transceiver has ANL and NB controls, in some installation ignition interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist, as variations between vehicles require different solutions to reduce the noise.

### **ANTENNA**

A vertically polarized, quarter-wavelength whip antenna provides the most reliable operation and greatest range. Shorter, loaded-type whip antennas are more attractive, compact and adequate for applications where the maximum possible distance is not required. Also, loaded whips do not present the problems of high wind resistant imposed by a full quarter-wavelength whip.

Mobile whip antennas utilize the metal body of the vehicle as a ground plane. When mounted at a corner of the vehicle they are slightly directional, in the direction of the body of the vehicle. For all practical purpose, however, the radiation pattern is nondirectional. The slight directional characteristic will be observed only at extreme distances. A standard antenna connector (type So-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

If the transceiver is not mounted on a metal surface, it is necessary to run a separate ground wire from the unit to good metal electrical ground in the vehicle. When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plate, unless the vessel has a steel hull.

Before installing the transceiver in a boat, consult your dealer for information regarding an adequate grounding system and prevention of electrolysis between fittings in the hull and water.

### EXTERNAL SPEAKER

The external speaker jack (EXT SP.) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 4 watts. When the external speaker is plugged in, the internal speaker is disconnected.

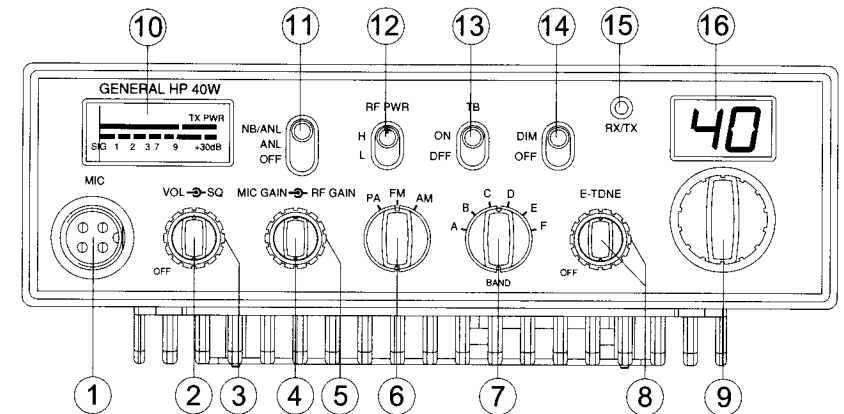
### PUBLIC ADDRESS

To use the transceiver as a public address system, connect an external 8 Ohms speaker (4 watts minimum) to the PA SP jack located on the rear panel. Direct speaker away from the microphone to prevent acoustic feedback. Physical separation or isolation of the microphone and speaker is important when operating the PA at high output level.

## OPERATION

### CONTROLS AND INDICATORS

#### Front Panel

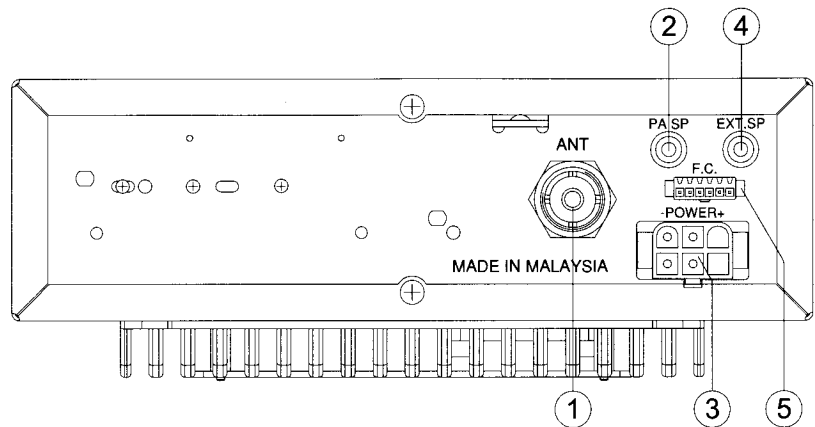


1. **MICROPHONE JACK** : Used to connect microphone for voice source.
2. **ON/OFF VOLUME CONTROL** : Turn clockwise to apply power to the radio and to set the desired listening level.
3. **SQUELCH CONTROL** : This switch is used to eliminate background noise being heard through the receiver which can be disturbing when no signal is being received. To use this feature of your radio, gently turn the switch fully counterclockwise and then turn clockwise until the background noise is just eliminated. Further clockwise rotation will increase the threshold level so that only strong signals will be heard.
4. **MIC GAIN CONTROL** : Adjust the microphone gain in the transmit and PA modes. This controls the gain to the extent that full talk power is available several inches away from the microphone. In the Public

Address (PA) mode, the control functions as the volume control.

5. **RF GAIN CONTROL** : This control is used to reduce the gain of the RF amplifier under strong signal conditions.
6. **MODE CONTROL** : This control allows you to select one of the following operating modes : PA/FM/AM.
7. **BAND SELECTOR** : This band selector allow the user to select the desired band.
8. **E-TONE CONTROL** : This control is used for echo effect and intervals of echo sound.
9. **CHANNEL SELECTOR** : This control is used to select a desired transmit and receive channel.
10. **FRONT PANEL METER** : The front panel meter allows the user to monitor signal strength and RF output power level.
11. **NB/ANL/OFF SWITCH** : This is a three position switch. Move the switch all the way up to activate the Noise Blanker (NB) and Automatic Noise Limiter (ANL). The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference. When the switch is moved to the middle position, only the Automatic Noise Limiter is engaged. Move the switch to the bottom position to turn off the ANL and NB.
12. **RF POWER HI/LO SWITCH** : This switch is used to select the HI or LO transmitting power.
13. **T.B./OFF SWITCH** : This switch is used to monitor the sound feedback effects.
14. **DIMMER SWITCH** : This switch is used to select lower the level of brightness of display.
15. **TX/RX LED** : The red LED indicates the units is in the transmit mode. The green indicates the units is in the receive mode.
16. **CHANNEL DISPLAY** : This channel display indicates the current selected channel.

## Rear Panel Connectors



1. **ANTENNA** : This jack accepts 50 ohms coaxial cable with a PL-259 type plug.
2. **PA. SP.** : This jack is used for PA operation. Before operating, you must first connect a PA speaker (8 ohms, 4W) to this jack.
3. **POWER** : This accepts 13.8V DC power cable with built-in fuse. The power cord provided with the radio has a black and red wire. The black goes to negative and the red goes to positive
4. **EXT SP.** : This jack accepts 4 to 8 ohm, 5 watts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.
5. **F.C.** : This connector is used for an external frequency counter that indicates the frequency of the selected channel.

## PROCEDURE TO RECEIVE AND TRANSMIT

### A. MICROPHONE

The receiver and transmitter are controlled by the push-to-talk switch on the microphone. Press the switch and the transmitter is activated, release switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. This transceiver comes complete with a low impedance dynamic microphone.

### B. PROCEDURE TO RECEIVE

1. Be sure that power source, microphone and antenna are connected to the proper connectors before going to the next step.
2. Turn **VOL** knob clockwise to apply power to the radio.
3. Set the **VOL** for a comfortable listening level.
4. Set the **MODE** switch to the desired mode.
5. Listen to the background noise from the speaker. Turn the **SQ** knob slowly clockwise until the noise just disappears. The **SQ** is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the control too far or some of weaker signals will not be heard.
6. Set the **CHANNEL** selector switch to the desired channel.
7. Set the **RF GAIN** control fully clockwise for maximum RF gain.

### C. PROCEDURE TO TANSMIT

1. Select the desired channel of transmission
2. Set the **MIC GAIN** control fully clockwise.

3. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

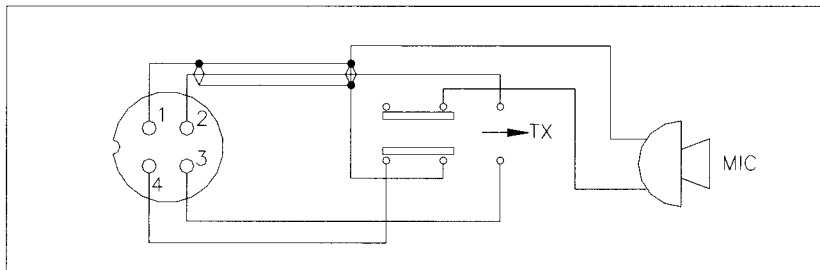
### ALTERNATE MICROPHONES AND INSTALLATION

For best results, the user should select a low-impedance dynamic type microphone or a transistorized microphone. Transistorized type microphones have low output impedance characteristics. The microphones must be provided with a five-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is for receive control, the fourth is for grounding and fifth is for transmit control.

The microphone should provide the functions shown in schematic below.

### 5 WIRE MIC CABLE

<u>Pin Number</u>	<u>Mic Cable Lead</u>
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control

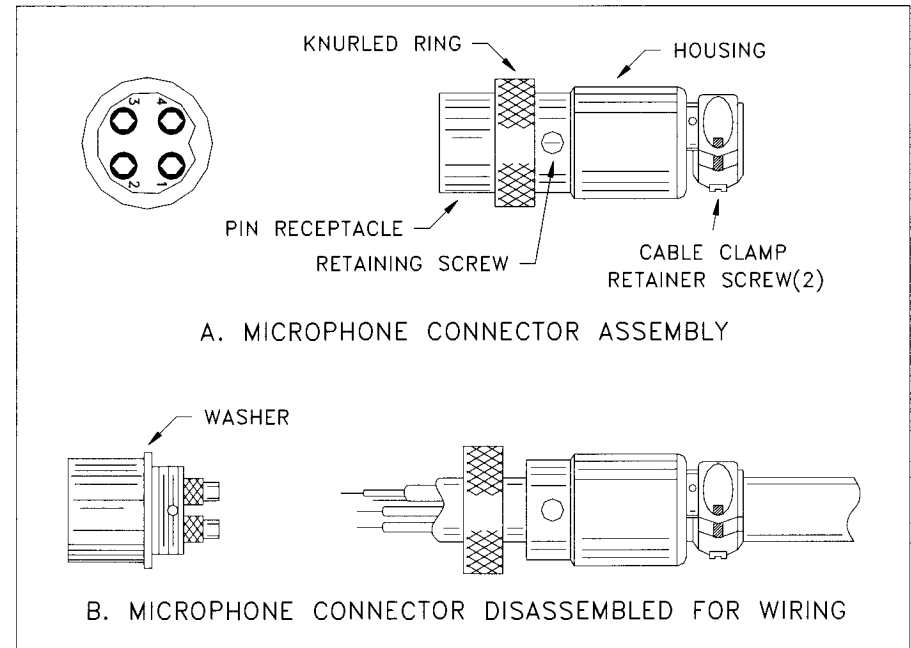


**Fig. 1** Your transceiver microphone schematic.

If the microphone to be used is provided with pre-cut leads, they must be revised as follows.

1. Cut leads so that they extend 7/16" beyond the plastic insulating jacket of the microphone cable.
2. All leads should be cut to the same length. Strip the ends of each wire 1/8" and tin the exposed wire.

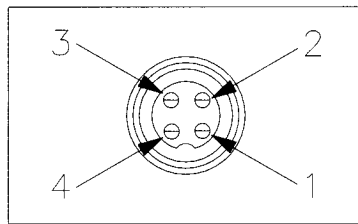
Before beginning the actual wiring, read carefully the circuit and wiring information provided with the microphone you select. Use the minimum heat required in soldering the connections. Keep the exposed wire lengths to a minimum to avoid shorting when the microphone plug is reassembled.



**Fig. 2** Microphone plug wiring

To wire the microphone cable to the plug provided, proceed as follows :

1. Remove the retaining screw.
2. Unscrew the housing from the pin receptacle body.
3. Loosen the two cable clamp retainer screws.
4. Feed the microphone cable through the housing, knurled ring and washer as shown Figure 2.
5. The wires must now be soldered to the pins as indicated in the above wiring tables. If a vise or clamping tool is available it should be used to hold the pin receptacle body during the soldering operation, so that both hands are free to perform the soldering. If a vise or clamping tool is not available, the pin receptacle body can be held in a stationary position by inserting it into the microphone jack on the front panel. The numbers of the microphone plug are shown in Fig. 3, as viewed from the back of the plug. Before soldering the wire to the pins, pre-tin the wire receptacle of each pin of the plug.



**Fig. 3** Microphone plug pin numbers viewed from rear of pin receptacle.

6. Be sure that the housing and the knurled ring of Figure 2 are pushed back onto the microphone cable before starting to solder. If the washer is not captive to the pin receptacle body,

make sure that it is placed on the threaded portion of the pin receptacle body before soldering.

7. If the microphone jack is used to hold the pin receptacle during soldering operation, best results are obtained when the connections to pin 1 and 3 are made first and then the connections to pins 2, 4 and 5. Use a minimum amount of soldering and be careful to prevent excessive solder accumulation on pins, which could cause a short between the pin and the microphone plug housing.
8. When all soldering connections to the pins of the microphone are completed, push the knurled ring and the housing forward and screw the housing onto the threaded portion of the pin receptacle body. Note the location of the screw clearance hole in the plug housing with respect to the threaded hole in the pin receptacle body. When the housing is completely threaded into the pin receptacle body, a final fraction of a turn either clockwise or counterclockwise may be required to align the screw hole with the threaded hole in the pin receptacle body. When these are aligned, the retaining screw is then screwed into place to secure the housing to the pin receptacle body.
9. The two cable clamp retainer screws should now be tightened to secure the housing to the microphone cord. If the cutting directions have been carefully followed, the cable clamp should secure to the insulation jacket of the microphone cable.
10. Upon completion of the microphone plug wiring, connect and secure the microphone plug in the transceiver.