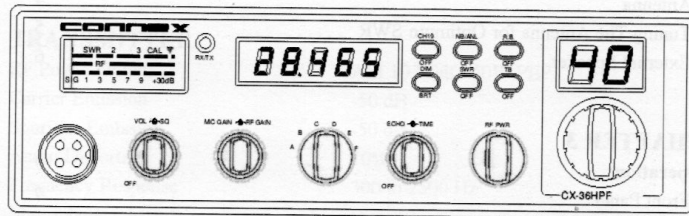


# CONNEX

## CX-36HPF



**AM 10 Meter  
Amateur Mobile Transceiver**

**Owner's Manual**



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## CHAPTER 1 SPECIFICATIONS

### GENERAL

Model	CX-36HPF
Frequency Range	28.015 ~ 28.465 MHz
Frequency Control	Phase-Lock-loop (PLL) Synthesizer
Frequency Stability	0.001%
Temperature Range	-30°C to +50°C
Antenna Impedance	50 Ohms
Antenna Connectors	Standard SO-239 type
Input Voltage	13.8V DC
Size	8.26" (W) x 11.02" (D) x 3.54" (H)
Weight	7.936 lbs

### TRANSMITTER

RF Power Output	AM 10 Watt / 40W PEP
Carrier Emission	-50 dB
Spurious Emission	-50 dB
Audio Distortion	10%
Frequency Response	300 to 2500 Hz
Microphone	Dynamic

### RECEIVER

Sensitivity for 10 dB (S+N)/N	< 1.0 $\mu$ V
Squelch Sensitivity	< 0.5 $\mu$ V
Image Rejection	More than 65 dB
AGC Figure of Merit	100 mV for 10dB Change in Audio Out
Audio Power Output	2.5W @ 10% Distortion
Audio Response	300 to 2500 Hz

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

## CHAPTER 2 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 automobiles, 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 present electrical noise. The primary source of noise in automobile installation is from generator and ignition system in the vehicle. Under most operating conditions, if signal level is adequate, the background noise does not present a serious problem. 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 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. 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 resistance 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 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.

## TUNING THE ANTENNA FOR OPTIMUM S.W.R

Since there is such a wide variety of base and mobile antennas, this section will strictly concern itself to the various types of mobile adjustable antennas.

Because the antenna length is directly related to the channel frequency, it must be tuned to resonate optimally on all channels of the transceiver. Low channel (CH1) requires a longer antenna than high channel (CH40) because it is lower in its frequency of operation.

Due to the various methods of adjusting antennas for proper S.W.R, we have chosen what we think is the optimum method:

### A. Antenna with adjustment screws (set screws).

1. Starts with the antenna extended and tighten the set screw lightly enough so that the antenna can be lightly tapped with your finger for easy adjustment.
2. Set your transceiver to middle channel (CH20). Press the PTT (push-to-talk) switch, and tap the antenna (making it shorter). The S.W.R meter will show a lower reading each time the antenna is tapped. By continuing to shorten the antenna, you will notice the S.W.R reading will reach a low point and then start rising again. This means that you have passed the optimum point for Channel 20.

Extend the antenna a short distance and again follow the procedure above. When the lowest point has been reached, switch to low channel (CH1) and then to high channel (CH40) and compare S.W.R readings. They should be almost equal.

#### NOTE

*The proper setting is achieved when the SWR is 1.5 or below, and when it has the same reading for low and high channels.*

### B. Antennas which must be cut to proper length

1. Follow the same procedure as above but adjust the length by cutting in 1/8" increments until a good match is obtained.
2. Be very careful not to cut too much at one time, as once it is cut, it can no longer be lengthed.
3. The whip is easily cut by filing a notch all the way around and breaking the piece off with pliers.

If you're having difficulties in adjusting your antenna, check the following:

- a. All doors must be closed when adjusting the antenna
- b. Make sure the antenna base is grounded.
- c. Check your coaxial cable routing (it may be pinched when routed into the car)
- d. Try a different location in your car (keeping in mind the radiation pattern you wish.)
- e. Is the antenna perfectly vertical?
- f. Try a different location in your neighborhood. Stay away from large metal objects when adjusting (metal telephone polls or light post, fences, etc.)

#### NOTE

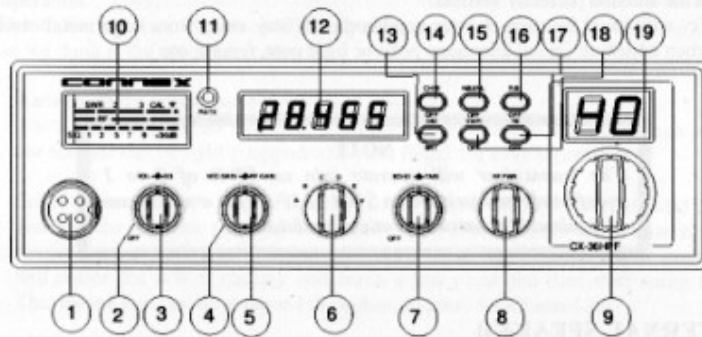
*The transceiver will operate into an SWR of 2 to 1 indefinitely and sustain an SWR of 20 : 1 for a maximum of 5 minutes at rated operating conditions.*

## 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.

## CHAPTER 3 OPERATION

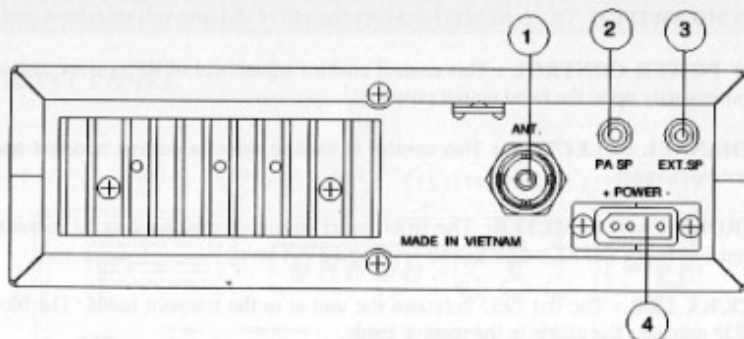
### FRONT PANEL



1. **MICROPHONE JACK:** Used to connect microphone for voice source.
2. **SQUELCH CONTROL :** This switch is used to eliminate background noise being heard through the receiver which can be disturbing when no transmission are being heard through the received. To use this feature, turn the switch fully counterclockwise and then turn clockwise slowly until the background noise is just eliminated. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signal will be heard at a maximum clockwise setting.
3. **ON/OFF VOLUME CONTROL :** This knob controls the volume and power to the radio. To turn radio on, rotate the knob clockwise. Turning the knob further will increase the volume of the receiver.
4. **RF GAIN CONTROL :** This control is used to reduce the gain of the RF amplifier under strong signal conditions.
5. **MIC GAIN CONTROL :** Adjust the microphone gain in the transmit modes. This controls the gain to the extent that full talk power is available several inches away from the microphone.
6. **BAND SELECTOR :** This band selector allow the user to select the desired band.

7. **ECHO SWITCH:** This control is used for echo effect and intervals of echo sound.
8. **RF POWER CONTROL :** This control enables adjustment of RF power output continuously up to the rated output power.
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 and SWR level.
11. **TX/RX LED :** The red LED indicates the unit is in the transmit mode. The blue LED indicates the unit is in the receive mode.
12. **FREQUENCY COUNTER :** This frequency counter indicated the selected channel frequency digitally.
13. **DIM/ OFF :** This switch is used to selects the brightness of display.
14. **CH19/OFF :** Instant access to Channel 19.
15. **NB/ANL/OFF :** When the switch is place in the NB/ANL position, the RF Noise Blanker (NB) and the Automatic Noise Limiter (ANL) in the audio circuits are activated. The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference.
16. **ROGER BEEP/OFF :** When this switch is placed in the ROGER BEEP position, the radio automatically transmits an audio tone at the end of your transmission. This indicates the end of your transmission so that people who are having trouble hearing you will know that you are done speaking. As a courtesy to others, use the Roger Beep only when necessary.
17. **TALKBACK/OFF :** This switch is used to monitor the sound feedback effects.
18. **S-RF/SWR :** In the S-RF position, the meter swings Proportionally to the strength of the received signal. When transmitting the meter indicates relative RF output power. When in the SWR position, the Standing Wave Ratio (SWR) of your antenna. There are no adjustments because the SWR circuit this radio calibrates itself automatically.
19. **CHANNEL DISPLAY :** The channel display indicates the current selected channel.

## REAR PANEL



1. **ANTENNA** : This jack accepts 50 ohms coaxial cable with a PL-259 type plug.
2. **EXT PA** : This jack is for PA operation. Before operating, you must first connect external PA speaker (8 ohms, 4w) to this jack.
3. **EXT. SP** : This jack accepts 4 to 8 ohms, 5 watts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.
4. **DC POWER** : This accepts 13.8V DC power cable with built-in fuse. The power cord provided with the radio consist of a blue wire (negative) and a red wire (positive).

## 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 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 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 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 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.
8. Adjust the **FINE/COARSE** control to clarify the SSB/CW signals or to optimize AM/FM signals.

### C. PROCEDURE TO TRANSMIT

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 four-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is for transmit control and fourth is for receiving control.

The microphone should provide the functions shown in schematic below.

### 4 WIRE MIC CABLE

Pin Number	Mic Cable Lead
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control

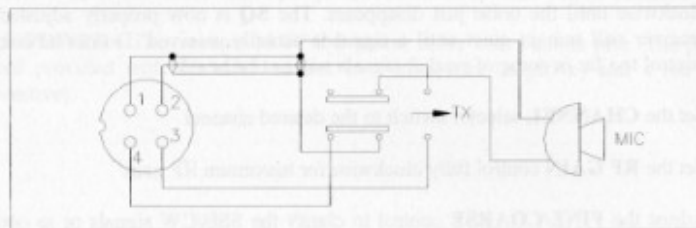


Fig. 1 Your transceiver microphone schematic.

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 the microphone plug when it is reassembled.

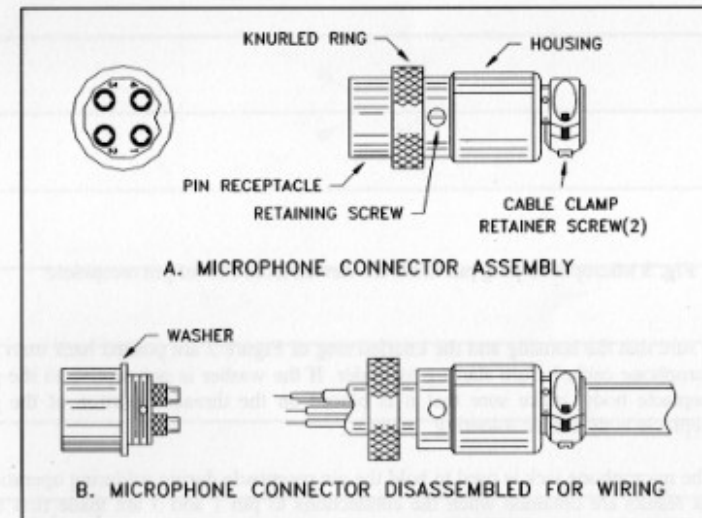


Fig. 2 Microphone plug wiring

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 in Figure 2.
5. The wires must now be soldered to the pins as indicated in the above wiring diagram. 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 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

