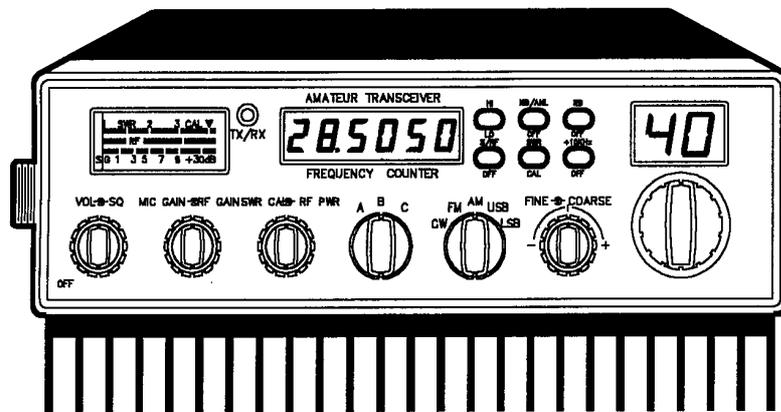




# General Grant



Downloaded from [www.cbradio.nl](http://www.cbradio.nl)  
Full Channel AM/FM/SSB/CW  
Amateur 2-Way Mobile Transceiver

## OWNER'S MANUAL

<b>SPECIFICATIONS:</b>	
<b>GENERAL</b>	
Frequency Range	28.005 -- 29.655 kHz

Modes	AM/FM/USB/LSB/CW
Frequency Control	Phase-Lock-Loop Synthesizer
Frequency Stability	0.001%
Temperature Range	0 degrees C to 50 degrees C
Input Voltage	DC 13.8V
Antenna Impedance	50 Ohms
Size	7 3/4"(W) x 10 3/4" (L) x 3 7/8" (H)
Weight	7 lbs. 6oz.
<b>TRANSMITTER</b>	
RF Power Output	AM/FM/CW: 50W SSB: 100W (PEP)
Spurious Emission	-50dB
Audio Distortion	10%
Frequency Response	300 to 2500Hz
Microphone	Dynamic
<b>RECEIVER</b>	
Sensitivity	AM 1.0uV for 10 dB S+N/N FM 1.0uV for 20dB S+N/N SSB 0.5uV for 10dB S+N/N
Squelch Sensitivity	0.5uV
Selectivity	-55dB
Image Rejection	-50dB
Hum & Noise	40dB
Audio Output Power	2.5W at 10% THD

## 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 vehicles. In automobiles, the transceiver is usually mounted below 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 prevents 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 or near the transceiver, using two screws supplied. When mounting in an automobile, place the bracket under the dash so the 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 installations 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 vehicle 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 installations ignition interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist; 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, the loaded whips do not present the problems of height 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 purposes, 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 a 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 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 lengths directly related to the channel frequency, it must be tuned to resonate optimally all channels of the transceiver. Low channel requires a longer antenna than high channel because it is lower in operate frequency.

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 adjustable screws (set screws).**

1. Start 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. 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 print and then start rising again. This means that your have passed the optimum point for middle channel. Extend the antenna a short distance and again follow the procedure above. When the lowest point has been reached, switch to Low channel or high channel and compare S.W.R. readings. They should be almost equal.

### **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 lengthen.
3. The whip is easily cut by filing a notch all the way around and breaking the piece off with pliers.

### **NOTE**

**THE PROPER SETTING IS ACHIEVED WHEN THE SWR IS 1.5 OR BELOW, AND WHEN IT HAS THE SAME READING FOR LOW OR HIGH CHANNELS.**

If your are 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 on 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 or light post, fences, etc.)

## NOTE

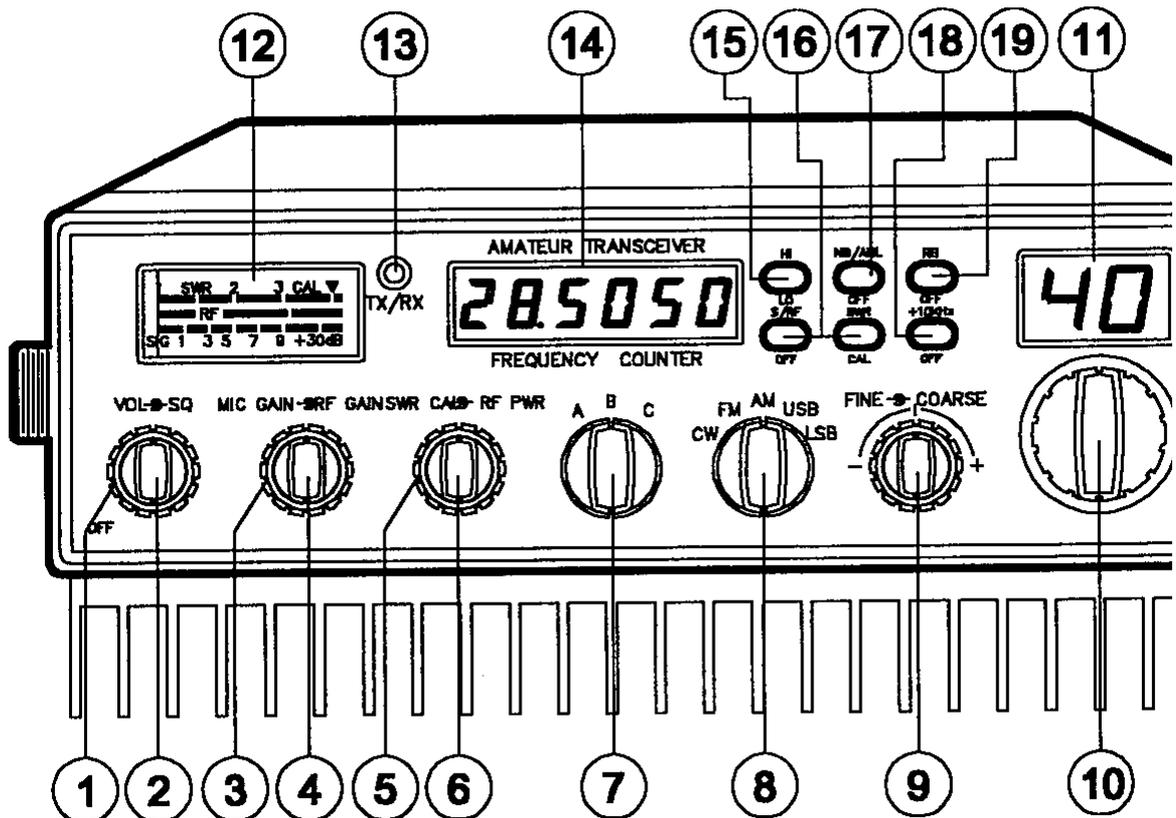
The transceiver will operate into an SWR of 2 to 1 indefinitely and sustain an SWR of 20:1 for a maximum of 5 minutes at rated operating condition.

## External Speaker

The external speaker jack (EXT.SPK) 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.

## OPERATION

## CONTROLS AND CONNECTIONS



1. **SQUELCH CONTROL:** This control is used to control or eliminate receiver background noise in the absence of incoming signal. For maximum receiver sensitivity, it is desired that the control be adjusted only to the point where the receiver background noise is eliminated. Turn fully counterclockwise, then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average received noise. 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

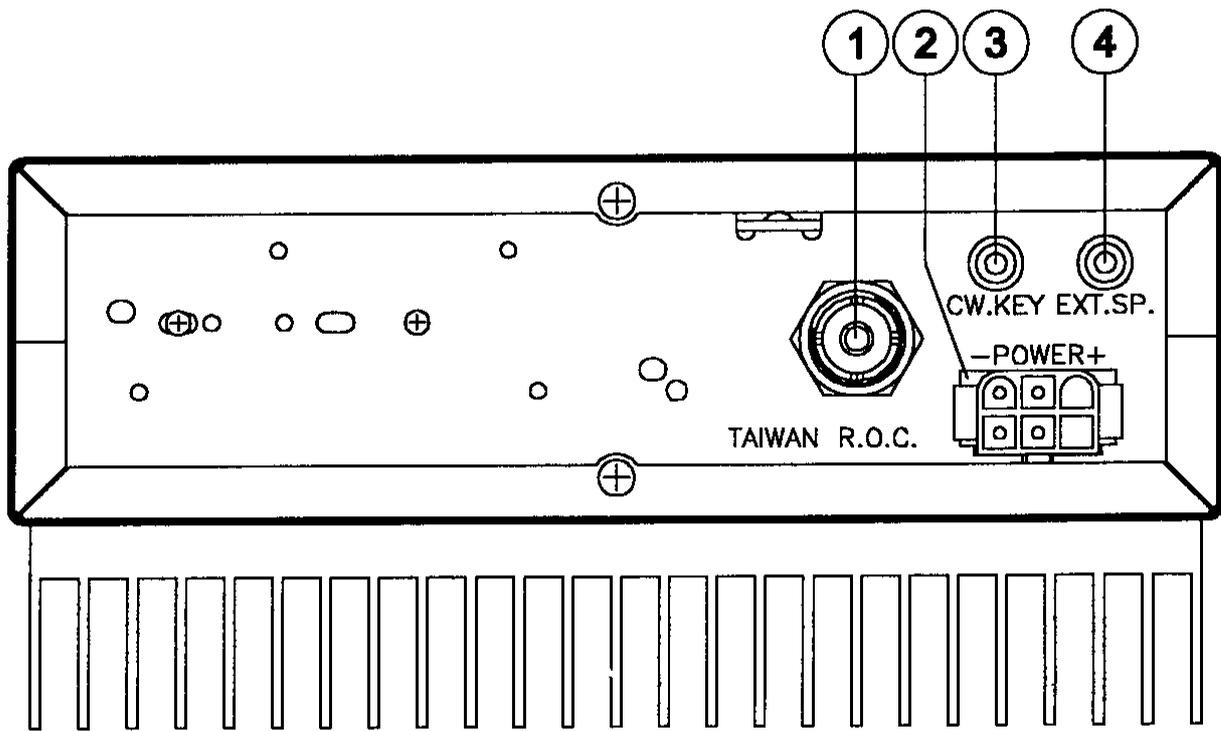
clockwise setting.

2. **ON/OFF VOLUME CONTROL** : Turn clockwise to apply power to the radio and to set the desired listening level.
3. **RF GAIN CONTROL** : This control is used to reduce the gain of the RF amplifier under strong signal conditions.
4. **MIC GAIN** : Adjusts the microphone gain in the transmit mode. This controls the gain to the extent that full talk power is available several inches away from the microphone.
5. **SWR CAL CONTROL** : This SWR CAL control allows the user to calibrate the SWR Meter.
6. **RF POWER CONTROL** : This control enables adjustment of RF power output continuously over the range of 8 watts through 100 watts ( AM/FM: 8W to 50W; SSB : 18W to 100W).
7. **BAND SELECTOR** This band selector allow the user to select the desired band.
8. **MODE CONTROL** This control allows you to select one of five following operating modes: CW/FM/AM/LSB/USB.
9. **COARSE/FINE CONTROL**: Allows variation of the receiver operating frequency above and below the assigned frequency. Although this control is intended primarily to tune in SSB signal, it may be used to optimize AM/FM signals as described in the operating procedure paragraphs.
10. **CHANNEL SELECTOR** : This control is used to select a desired transmit and receive channel.
11. **CHANNEL DISPLAY** : The channel display indicates the current selected channel.
12. **FRONT PANEL METER** : The front panel meter allows the user to monitor signal strength and RF power out level.
13. **TX/RX LED** : The red LED indicates the radio is in the transmit mode. The green LED indicates the radio is in the receive mode.
14. **FRIEQUENCY COUNTER** : This frequency counter indicates the selected channel you wish to operate .
15. **BAND SWITCH** : The band switch allow the user to select the HI or LO band.
16. **METER SWITCH** : The meter switch allows the user to meter, the receiver signal strength in the S/RF position while receive. the standing wave ratio ( while in the SWR position ). or calibrate the SWR meter (while in the CAL operation).
17. **NB/ANL SWITCH** : When the switch is place in the ANL/NB position, the RF noise blanker also is activated. The noise blacker is very effective in eliminating repetitive impulse noise such as ignition interference.
18. **+10 kHz SWITCH** : When this switch is pressed, the frequency is shifted 10 kHz up on the following channels. A channel an be used by setting this switch to +10 kHz position.

Normal	+10 kHz
3	3A
7	7A
11	11A
15	15A
19	19A

19. **ROGER BEEP SWITCH** : When this switch is placed in the ROGER BEEP position, your radio automatically transmits the audio sign at the end of your transmission. The listener can note easily your transmission is over through the sign.

## REAR PANEL CONNECTOR



1. **ANTENNA:** This jack accepts 50 ohm coaxial cable with a PL-259 type plug.
2. **POWER:** This accepts 13.8VDC 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.
3. **CW KEY :** This is used for Morse Code operation. To operate this mode, connect a CW key to this jack and place the mode switch in the CW position.
4. **EXTERNAL SPEAKER :** This jack accepts 4 to 8 ohms, 5 wafts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.

## OPERATION

### 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 inch from the mouth and speak clearly in a normal "voice". The transceiver come complete with 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 unit on by rotating **VOL** knob clockwise on transceiver.
3. Set the **VOL** for a comfortable listening level.
4. Set the **MODE** switch to the desire mode.
5. Listen to the background noise from the speaker. Turn the **SQ** knob slowly clockwise until the noise just disappear. Level the control at this setting. This **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** select or switch to the desired channel.

7. Set the **RF** gain control fully clockwise for maximum **RF** gain.

### **C. RF POWER CONTROL**

This feature allows the adjustment of the RF output power continuously over the range of 8 watts through 100 Watts.  
( AN/FM : 8W to 50 W, SSB: 18W to 100W)

### **D. PROCEDURE TO TRANSMIT**

1. Select the desired channel of transmission
2. Set the **MIC GAIN** control fully clock wise.
3. If the channel is clear, depress the push-to talk switch on the microphone and speak in a normal voice.