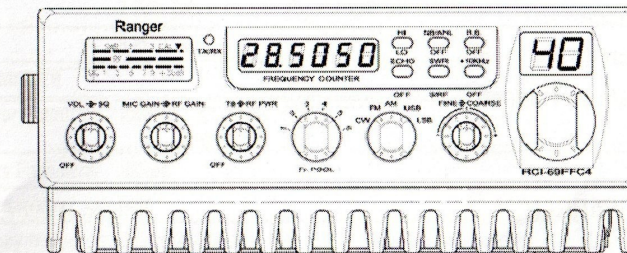


**RANGER**  
Communications, Inc.

# RCI-69FFC4

## AM/FM/SSB/CW Amateur Transceiver with Built-in Frequency Counter



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PRINTED IN TAIWAN  
P/N:A38251616A

## User's Manual

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**LIMITED WARRANTY** ..... Inside Back Cover

### NOTE

Amateur Radio License is required to operate this device. For licensing information within the United States of America, visit <http://www.fcc.gov>, for residence of Canada, visit <http://www.rac.ca>

## Chapter 1 Specifications

### GENERAL

|                     |  |
|---------------------|--|
| Model               | RCI-69FFC4   |
| Frequency Range :   | 1. 28.245 ~ 28.685 MHz<br>2. 28.695 ~ 29.135 MHz<br>3. 29.145 ~ 29.585 MHz<br>4. 28.315 ~ 28.755 MHz<br>5. 28.765 ~ 29.205 MHz<br>6. 29.215 ~ 29.655 MHz |
| Modes               | CW/FM/AM/SSB   |
| Frequency Control   | Phase-Lock-Loop Synthesizer  |
| Frequency Stability | 0.001%   |
| Temperature Range   | -30°C to +50°C   |
| Input Voltage       | DC 13.8 V  |
| Antenna Impedance   | 50 ohms  |
| Size                | 7 7/8" (W) x 11 1/8" (D) x 3 1/4" (H)  |
| Weight              | 8 lb. 3 oz.  |

### TRANSMITTER

|                    |                                       |
|--------------------|---------------------------------------|
| RF Power Output    | AM/FM/CW: 200W. RMS<br>SSB: 400W. PEP |
| Spurious Emissions | -50 dB                                |
| Audio Distortion   | 10%                                   |
| Frequency Response | 300 to 2500Hz                         |
| Microphone         | Dynamic                               |

### RECEIVER

|                     |  |
|---------------------|--|
| Sensitivity         | CW/AM: 0.5 $\mu$ V for 10dB S+N/N<br>FM: 0.25 $\mu$ V for 12dB S+N/N<br>SSB: 0.15 $\mu$ V for 10dB S+N/N |
| Squelch Sensitivity | 0.5 $\mu$ V  |
| Selectivity         | -55 dB   |
| Image Rejection     | -50 dB   |
| Hum & Noise         | 40dB   |
| Audio Power Output  | 2.5W at 10% THD  |

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

## Chapter 2 Installation

### Installing the Radio

Choose a convenient location for operation that does not interfere with driver or passenger. This radio 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 grounding connection to the chassis of the vehicle. Proceed as follows to install the radio.

1. Locate a convenient area in your vehicle for the installation of the radio. Hold the mounting bracket with the radio in the location where the radio is to be installed. Make sure nothing will interfere with either the radio or the mounting bolts. Mark and then drill holes for the mounting bracket.
2. Most radio antennas come equipped with a PL-259 plug. Connect this plug to the ANT. Jack in the rear of the radio.
3. Extending from the rear of the radio is a fused red and black wire for the DC connections to the vehicle's electrical system. For best performance, it is strongly recommended that the red lead be taken directly to the positive terminal on the vehicle's battery and the black lead be connected to the nearest chassis ground. (Note: ***This radio is designed for vehicles with negative ground systems.***)

Connections should be made using appropriate "crimp on" lugs of a size large enough to make good contact with the bolt used to fasten to the battery and the chassis ground. It is a good safety idea to install a second fuse, in series with the red wire at the battery connection. This second fuse would provide protection in case the red wire was to "fray" or get pinched and short to the body of the vehicle, some where between the battery and the radio.

High power radios such as this one require large DC current flow when in the TX mode. Poor power connections can cause supply voltage drops that can substantially decrease the performance of your radio. A good DC connection is probably one of the most important things for getting the best transmitter performance and in some cases, least receiver noise.

## Installation (Continued)

4. Mount the microphone bracket near the radio in an easily accessible spot using the two screws provided.

### Ignition Noise Interference

With weak signals, you may experience interference of the signal by background noise. This radio has NB and ANL controls which will help reduce background noise from sources such as your ignition system. However, background electrical noise may come from several sources and all noise may not be eliminated. With extremely weak signals, you can operate this radio with the engine turned off, which should improve reception. If the ignition noise level is too high to allow proper operation under most conditions, you should have your installation of the radio checked by a qualified technician.

### Antenna

This radio has a jack in the rear for a standard PL-259 antenna plug. If you are looking for the most range for your transmission, use a vertically polarized, quarter-wave length antenna. If antenna height is a problem, you may use a shorter, loaded-type whip antenna although you can expect some loss of transmission range.

To improve performance, your antenna should be matched to your radio. Your antenna can be adjusted so that it matches your radio.

### External Speaker

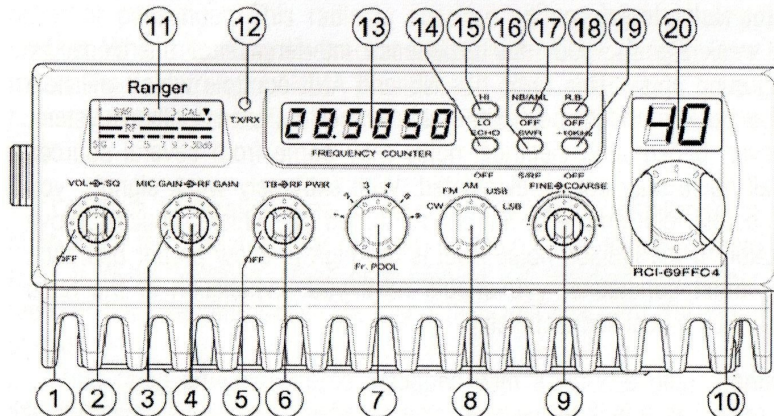
The external speaker jack (EXT. SPK) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 4watts. When the external speaker is plugged in, the internal speaker is disconnected.

### Public Address

To use the Public Address (PA) function, first connect an external speaker to the PA. SP. Jack on the rear of the radio. See the above specifications for a proper external speaker. Keep the speaker away from the microphone to avoid acoustic feedback.

## Chapter 3 Operation

### Controls and Indicators



### Front Panel

1. **SQUELCH CONTROL:** This control is used to control or eliminate receiver background noise in the absence of an incoming signal. For maximum receiver sensitivity, it is necessary that the control be adjusted only to the point where the receiver background noise is eliminated. Turn fully counterclockwise and then slowly clockwise until the receiver noise just disappears. Any signal to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level that a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise squelch 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.

### Operation (Continued)

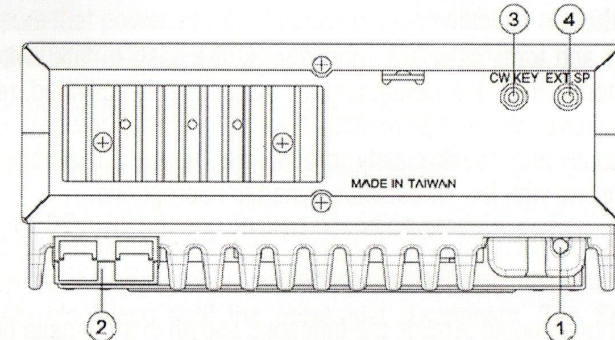
4. **MIC GAIN CONTROL:** Adjust the microphone gain in the transmit mode. This control is used to set the audio level of the microphone for maximum performance and clarity.
5. **RF POWER CONTROL:** This control enables adjustment of RF power output continuously up to the rated output power.
6. **TALKBACK/OFF CONTROL:** Adjust this knob for desired volume of Talkback. This is used to monitor your own voice. Or example, you could use this feature to compare different microphones.
7. **Fr. POOL:** The *Frequency Pool* allows the user to select the desired segments of frequencies.
8. **MODE SWITCH:** This switch allows you to select one of 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. (Coarse and Fine operates both TX/RX).
10. **FREQUENCY SELECTOR:** This control is used to select a desired transmit and receive frequency.
11. **FRONT PANEL METER:** The front panel meter allows the user to monitor signal strength and RF power out level.
12. **TX/RX LED:** The red LED indicates the radio is in the transmit mode. The blue indicates the radio is in the receive mode.
13. **FREQUENCY COUNTER:** This frequency counter indicates the transmit frequency digitally.
14. **ECHO SWITCH:** This control is used for echo effect.

## Operation (Continued)

15. **HI/LOW TONE SWITCH:** This switch changes tone quality in receive only. In LO position, bass is increased and in HI position, treble is increased.
16. **S-RF/SWR SWITCH:** 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 adjustment because the SWR circuit in this radio calibrates itself automatically.
17. **NB/ANL SWITCH:** In the NB/ANL position, the RF Noise Blanker and the automatic Noise Limiter in the audio circuits are also activated. The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference.
18. **ROGER BEEP SWITCH:** 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.
19. **+10KHz SWITCH:** In the +10KHz position, the transmit and receive frequency is shifted 10KHz up.
20. **CHANNEL DISPLAY:** The channel display indicates the current selected channel.

## Operation (Continued)

### Rear Panel



1. **ANTENNA:** This jack accepts a 50 ohms coaxial cable with a PL-259 style plug.
2. **POWER:** This accepts 13.8 VDC 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:** The CW key 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 a 4 - 8 ohm, 5watt external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.

## Operation (Continued)

### Operation

#### A. Microphone

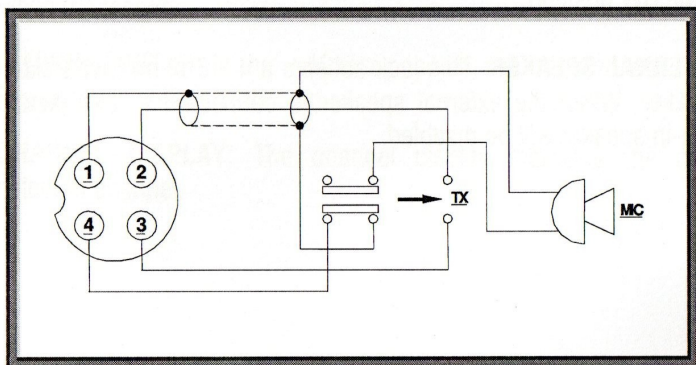
The receiver and transmitter are controlled by the push-to-talk switch on the microphone. Press the switch and the transmitter is activated, release switch to receive. When transmitting hold the microphone two inches from the mouth and speak clearly in a normal "voice". The transceiver comes complete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

For best results, the user should select a low-impedance dynamic type microphone or a transistorized microphone.

The microphone should provide the functions shown in schematic below.

#### 4 WIRE MIC CABLE

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



Transceiver Microphone Schematic Diagram

## Operation (Continued)

#### 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 turning **VOL** knob clockwise.
3. Set the **VOL** for a comfortable listening level.
4. Set **MODE** switch to the desired operation 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** switch to the desired channel.
7. Set the **RF** gain control fully clockwise for maximum **RF** gain.

#### C. Procedure to Transmit

1. Select the desired channel of transmission.
2. Set the **MIC GAIN** to the level that will best suit your individual use.
3. If the channel is clear, press the push-to-talk switch on the microphone and speak in a normal voice.

