

**AM/FM/SSB/CW MOBILE TRANSCEIVER**

# **OWNER'S MANUAL**

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## Specification

### GENERAL

Frequency Range	28.0000MHz – 29.9999MHz
Tuning Steps	100Hz, 1KHz, 10KHz, 100KHz, 1MHz
Emission Types	USB, LSB(A3J), CW(A1), AM(A3), FM(F3)
Frequency Control	Phase Lock Loop (PLL) Synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Operating Temperature Range	0°C to 40°C
Antenna Impedance	50 Ohms
Speaker Impedance	8 or 4 Ohms

### TRANSMITTER

Power Output	AM/FM 8W CW/SSB 25W (PEP)
Maximum FM Deviation	±3KHz
Clarifier Range	±500Hz
Unwanted Sideband Suppression	50dB
Spurious Radiation	50dB

### RECEIVER

Sensitivity	SSB/CW 0.3uv for 10dB S+N/N AM 0.5uv for 10dB S+N/N FM 1uv for 20dB S+N/N
Selectivity	AM/FM 6dB at 6KHz, 60dB at 18KHz SSB/CW 6dB at 4.2KHz, 60dB at 8.6KHz
Image Rejection	More than 65dB
IF Rejection	80dB
Squelch	Adjustable, threshold less than 0.5uv
Clarifier Range	±500Hz
Audio Output Power	Less than 10% at 2 watts Output into 8 Ohms
Intermediate Frequency	10.695MHz 1st 455KHz 2nd

## INSTALLATION

The transceiver is easy to install. All the necessary parts have been included with your transceiver.

1. Unpack the unit and inspect all parts provided.

Carefully remove the radio from the packing carton and examine it for shipping damage. If any damage is found, contact the retail dealer immediately. Save the carton and packing materials for future storage or shipping.

2. Verify that you have received all parts and accessories.

The following items should have been included with your transceiver:

Transceiver  
Microphone  
Power cable  
Mounting bracket  
Installation-hardware

3. Install the transceiver.

Choose a location for the transceiver where there is easy access to the front panel and free air circulation at the back of the unit. If you are installing the radio in a vehicle attach the mounting bracket first, then attach the transceiver to the mounting bracket using the hardware provided. Before making any electrical connections, make sure the transceiver is turned off (volume control).

4. Make power connections.

The transceiver works on any regulated 13.5 VDC negative ground source. An automobile 12 volt negative ground system is usually more than adequate.

The condition of a vehicle's electrical system can affect operation. A low battery, worn generator/alternator, or poor voltage regulator will impair the performance of the transceiver as well as the vehicle. For example, high noise generation or low voltage delivery can result from these conditions.

If an AC power supply is used with your transceiver, make sure it is regulated and rated for at least 7 amps. Low voltage while under load will reduce receiver gain and transmitter output.

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## CAUTION

Voltage above 15 VDC will damage your radio. Be sure to check the source voltage before connecting the power cord.

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The DC power cable that connects to the transceiver's rear panel has a positive (+) red wire and a negative (—) black wire. If you are installing the radio in a vehicle. It is recommended that you connect these wires directly to the battery terminals. If this is not possible, use any convenient B+lead in the interior of the vehicle and the negative frame. The transceiver has an internal DC filter that eliminates most transient voltage spikes.

### 5. Connect the antenna.

You can operate the transceiver with any standard 50 ohm ground-plane, vertical, mobile whip, long wire, or similar antenna. A standard SO-239 type connector is provided on the rear panel of the transceiver for use with a PL-259 antenna connector.

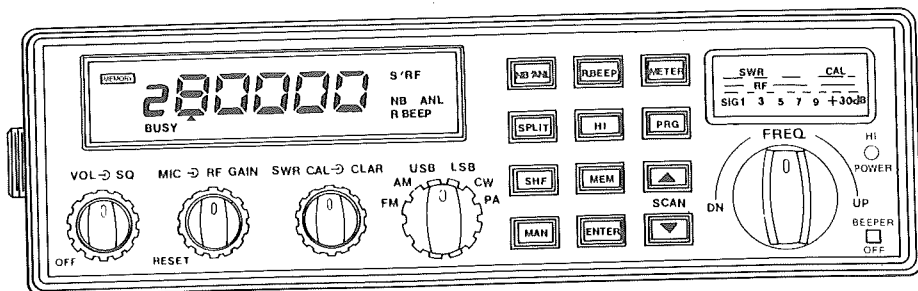
A ground-plane antenna provides greater coverage and is ideal for base station to mobile operation since it is essentially non-directional. From base station to base station, or point to point operation, a directional beam operates at greater distances even under adverse conditions.

A non-directional antenna should be used in a mobile installation, and a vertical whip antenna is best suited for this purpose. The base loaded whip antenna normally provides effective communications. For greater range and more reliable operation, a full quarter wave whip may be used. Either of these antennas use the metal car body as a ground-plane. The shield of the base as well as the metal case of the transceiver should be grounded.

### 6. Attach the microphone to the radio.

A high quality, dynamic microphone is supplied with the transceiver. Simply plug it into the jack provided on the left side of the transceiver. To transmit, press the PTT (Push-to-talk) button: release the button to receive.

## CONTROL FUNCTIONS



1. **OFF/ON/VOLUME** (inner dual concentric):  
Turn clockwise to apply power to the unit and to set the desired listening level. During normal operation the **VOLUME** control is used to adjust the output level obtained either at the transceiver speaker or the external speaker, if used.
2. **SQUELCH** (outer dual concentric):  
This control is used to cut off or eliminate receiver background noise in the absence of an 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 signals will be heard at a maximum clockwise setting.
3. **RF GAIN CONTROL** (outer dual concentric):  
Use to reduce the gain of the RF amplifier under strong signal conditions.
4. **MIC GAIN** (inner dual concentric):  
Adjusts 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.
5. **RESET**:  
Is the **ON/OFF** control for the radio's backup voltage power. When this control is turned on, there is enough DC power to maintain any information you have saved in memory. Turn the control clockwise until you hear a click to turn on the backup power. If you turn this control off anything saved in memory is erased.
6. **SWR CAL CONTROL** (inner dual concentric):  
In order for you to achieve maximum radiated power and the longest range, it is important that your antenna be in good condition, properly adjusted and matched to your transceiver. The built-in SWR (standing wave ratio) meter lets you easily measure your antenna condition. To operate this function, connect your antenna to the transceiver antenna output connector. Select a channel near the middle of the band. Turn the power on and set

the meter function switch to the CAL position. Press and hold the microphone push-to-talk button and using the SWR CAL control, adjust the meter to read the CAL position indicated on the meter face. Then, without releasing the microphone button, switch the meter function switch to the SWR position and read the SWR indicated. The lower the figure, the better with 1 being ideal. Generally speaking, readings up to 3 are acceptable but over 3 indicates that you are losing radiated power and antenna adjustment may be advisable.

7. **CLARIFIER:**

Is a fine tuning control. You can adjust a frequency  $\pm 500$  Hz for best reception.

8. **MODE SELECTOR:**

Is used to select one of the following operating modes;

FM (F3)	Frequency Modulation
AM (A3)	Amplitude Modulation
USB (A3J)	Upper Side Band
LSB (A3J)	Lower Side Band
CW (A1)	Carrier Wave
PA	Public Address

9. **FREQUENCY SELECTOR:**

This switch allows you to select up or down the frequency by 100Hz, 1KHz, 10KHz, 100KHz or 1MHz each step.

10. **NB/NB-ANL/OFF SELECTOR:**

In the ANL position, only the automatic noise limiter in the audio circuits is activated. When the selector is placed in the ANL + NB position, the RF noise blanker also is activated. The RF noise blanker is very effective for repetitive impulse noise such as ignition interference.

11. **ROGER BEEP SELECTOR:**

This selector activates the ROGER BEEP circuit when R Beep function is selected.

12. **METER SELECTOR:**

METER is used to select the meter functions which indicate received-signal strength, transmitter RF output power or SWR level.

13. **SPLIT SELECTOR:**

Press in when you want to use split frequency operation. Repress the button when you want to resume normal operation.

14. **RF POWER OUTPUT HI/LO SELECTOR:**

HI/LO is used to select transmitting output power HI or LO level.

15. **PROGRAM SELECTOR:**

PGR is used to program memory mode.

16. **SHIFT SELECTOR:**

SHF is used to select 100Hz, 1KHz, 10KHz, 100KHz and 1MHz frequency steps.

17. **MEMORY SELECTOR:**

MEM is used to select memory channel for programming or recall.

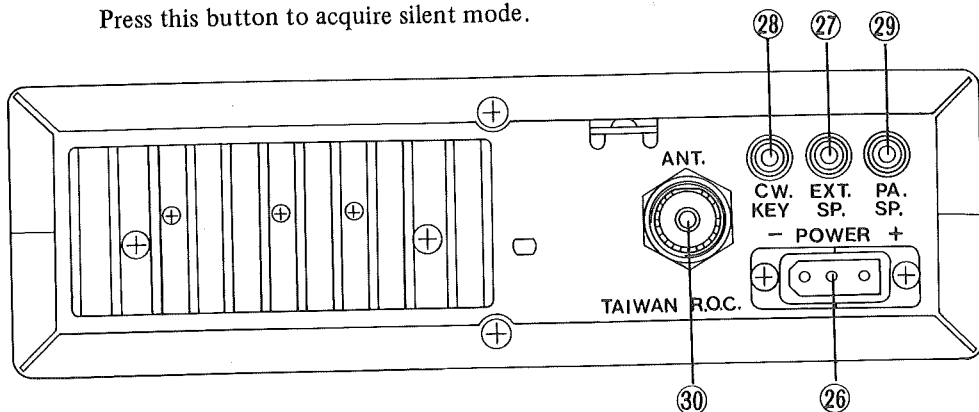
18. **▲ UPPER SELECTOR:**

This selector is used to select up frequency scanning.

19. **MANUAL SELECTOR:**

MAN is used to return to manual mode

20. **ENTER SELECTOR:**  
This selector is used to program frequencies in memory.
21. **▼ DOWN SELECTOR:**  
This selector is used to select down frequency scanning.
22. **LCD DISPLAY:**  
The LCD display displays the frequency select function and memory channel.
23. **METER:**  
This meter indicates received signal strength, transmitter RF output power and SWR level.
24. **RF POWER INDICATOR:**  
This red LED is illuminated when RF HI power output is selected.
25. **BEEPER/OFF:**  
Press this button to acquire silent mode.



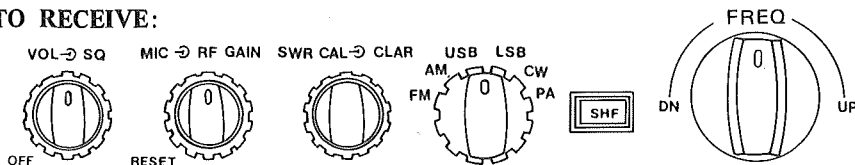
26. **POWER:**  
Accepts 13.8V DC power cable with built-in fuse to be connected.
27. **EXT SP:**  
Accepts 4-to 8-ohm 5-watt external speaker to be connected. When external speaker is connected to this jack, the built-in speaker is automatically disconnected.
28. **CW KEY:**  
This jack is for Morse code operation. To operate, connect a CW key to this jack and place the CW/AM/USB/LSB switch in the CW position.
29. **PA.SP:**  
Used to connect a PA speaker (8 ohm 4W) for PA operation. Before operating PA you must first connect a PA speaker to this jack.
30. **ANTENNA:**  
Accepts 50 ohm coaxial cable with a type PL-259 plug to be connected.



## OPERATING

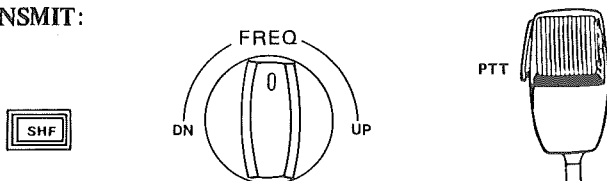
The operation of the transmitter and the receiver is controlled by the push button located on the side of the microphone. When this button is depressed, the transmitter is in operation and the receiver becomes inoperative. When the microphone button is released, the unit is placed in the receiver mode.

### TO RECEIVE:



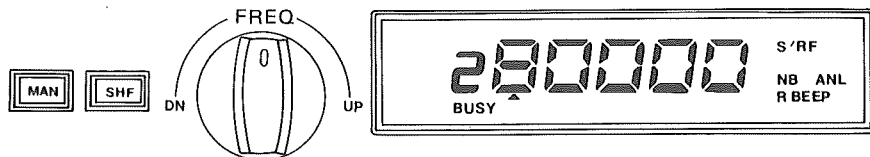
1. Rotate the VOL control clockwise to the on position. Advance the volume to the desired audio level.
2. Turn the RESET (MIC GAIN) control clockwise until you hear a click.
3. Turn the SQ control slowly clockwise until the noise just disappears.
4. Turn the RF GAIN control fully clockwise for maximum RF gain.
5. Set the MODE switch to the desired mode.
6. Press SHF key and rotate frequency selector to the desired frequency.
7. Adjust the CLARIFIER control to clarify the SSB/CW signals or to optimize AM/FM signals.

### TO TRANSMIT:



1. Press SHF key and rotate frequency selector to the desired frequency.
2. Turn the MIC GAIN control fully clockwise.
3. Depress the push-to-talk switch on the microphone and speak in a normal voice.

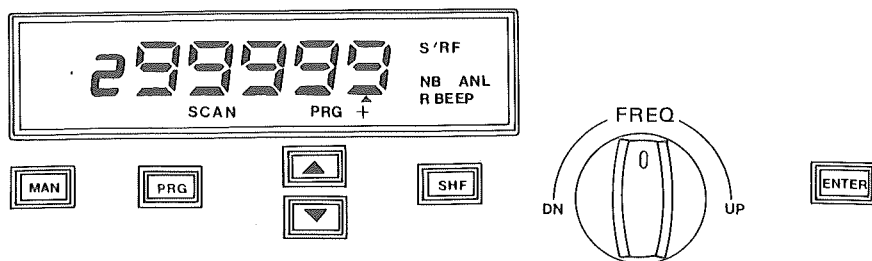
### TO SELECT FREQUENCY:



1. Press MAN key for manual mode.
2. Press SHF key to select 1MHz, 100KHz, 10KHz, 1KHz or 100Hz frequency step.

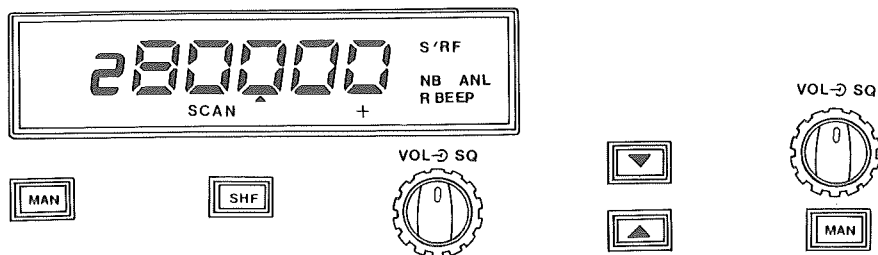
3. Rotate frequency selector up (clockwise) or down (counterclockwise) to select desired frequency.

### TO PROGRAM SCANNER:



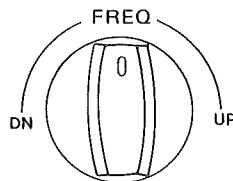
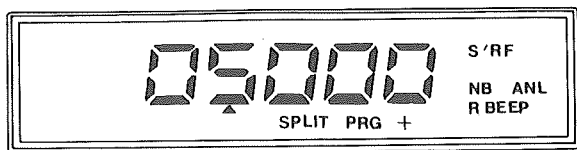
1. Press MAN key for manual mode.
2. Press PRG key for program mode.
3. Press ▲ or ▼ key to select upper end or lower end frequency.
4. Press SHF key to select 1MHz, 100KHz, 10KHz, 1KHz or 100Hz frequency step.
5. Rotate frequency selector up (clockwise) or down (counterclockwise) to select desired frequency.
6. Press ENTER key to program upper end or lower end frequency.
7. Repeat step 3 to 5 to select another frequency.
8. Press ENTER key to complete programming scanner frequency.

### TO SCAN:



1. Press MAN key for manual mode.
2. Press SHF key to select 1MHz, 100KHz, 10KHz, 1KHz or 100Hz frequency step.
3. Turn the SQ control slowly clockwise until the noise just disappears.
4. Press ▲ key to upper scanning for program scanner frequency or press ▼ key to lower scanning for program scanner frequency.
5. To stop automatic scanning, turn SQ counterclockwise or press MAN key.

## TO PROGRAM SPLIT FUNCTION:



You can transmit and receive on different frequencies and preset the frequencies you want to use.

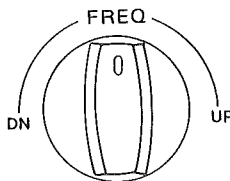
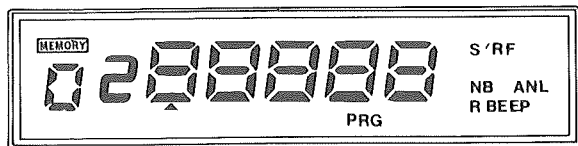
1. Press MAN key for manual mode.
2. Press PRG key for program mode.
3. Press SPLIT key to program split frequency.
4. Press SHF key to select 1MHz, 100KHz, 10KHz, 1KHz or 100Hz frequency step.
5. Rotate frequency selector up (clockwise) or down (counterclockwise) to select desired split frequency (maximum 1.9999 MHz).
6. Press ENTER to complete split frequency program.

## TO USE SPLIT FREQUENCY:



1. Press MAN key for manual mode.
2. Press SPLIT key to select + split or press again to select - split.
3. Depress PTT switch on the microphone. The transmit frequency will be higher (if + split is selected) or lower (if - split is selected) than the receiver frequency.

## TO PROGRAM FREQUENCY IN MEMORY CHANNEL:



1. Press MAN key for manual mode.
2. Press PRG key for program mode.
3. Press MEM key to select memory channel (memory channel from 0 to 9).
4. Press SHF key to select 1MHz, 100KHz, 10KHz, 1KHz or 100Hz frequency step.
5. Rotate frequency selector up (clockwise) or down (counterclockwise) to select desired frequency.
6. Press ENTER key to complete memory frequency program.  
(if you want to use two or more memory channels, repeat step 3 through 6)

#### TO SCAN MEMORY CHANNEL:



VOL → SQ



VOL → SQ



1. Press MAN key for manual mode.
2. Press MEM key for memory mode.
3. Turn the SQ control slowly clockwise until the noise just disappears.
4. Press ▲ key for upper scanning memory channel or press ▼ key for lower scanning memory channel.
5. To stop automatic scanning, turn SQ counterclockwise or press MAN key.

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