



TR-121CP



SOLID STATE CITIZENS BAND
AM MOBILE TRANSCEIVER

OWNER'S MANUAL

MIC971205

Printed In Malaysia
AT0022010D

TABLE OF CONTENTS

Specifications	2
Installation	
Location	3
Mounting the Radio	3
Ignition Noise Interference	4
Antenna	4
Tuning the Antenna for Optimum SWR	5
Ext. Speaker	6
Operation	
Control Function	7
Front Panel	7
Rear Panel	8
Microphone	9
Operating Procedure	9
Frequency Range	10
Use Channel 9 For Emergency Only	11
A Few Rules That Should Be Obeyed	13
How Your CB Can Serve You	13

SPECIFICATIONS

GENERAL

Frequency Range	26.965 - 27.405 MHz
Emission Steps	AM
Frequency Control	Phase-Lock-Loop Synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Temperature Range	-30°C to +55°C
Antenna Impedance	50 Ohms
Input Voltage	13.8V DC
Size	5 7/8" (W) x 7 1/4" (D) 1 7/8" (H)
Weight	1.5 lbs

TRANSMITTER

RF Power Output	4W
RF Transmit Modes	AM
Antenna Connector	UHF Type, 50 Ohms
Modulation	AM
Spurious Emissions	-60dB
Carrier Suppression	-60dB

RECEIVER

Sensitivity for 10dB (S+N)/N AM	0.5uV
Squelch Sensitivity	0.5uV
Image Rejection Ratio	-65dB
AGC Figure of Merit	100mV for 10dB Change in Audio Output
Audio Response	300 to 2500 Hz
Audio Output Power	2.0W
@ 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 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 grounding 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 ANT 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 that the microphone is readily accessible.

- 3 -

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 SWR

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 (CH 1) requires a longer antenna than high channel (CH 40) because it is a lower 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 (CH 20). 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 (CH 1) and then to high channel (CH 40) 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 OR 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.

- 5 -

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 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, 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 a steel hull.

2. *Be very careful not to cut too much at one time, as once it is cut, it can no longer be lengthened.*
3. The whip is easily cut by filing a notch all the way around and breaking the piece off with pliers.

If you are having difficulties in adjusting your antenna, check the followings:

- 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 lamp post, fences, etc.)

NOTE

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

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.

PUBLIC ADDRESS

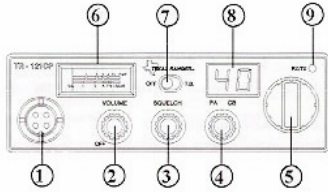
To use the transceiver as a public address system, connect an external 8 ohms speaker (4 watts minimum) to the PA SPK jack located on the rear panel. Direct speaker away from the microphone to prevent acoustic feedback. Physical separation or isolation of the microphone and speaker is important when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

- 6 -

OPERATION

1.0 INTRODUCTION

This section explains the basic operating procedures for the TR-121CP Citizens Band mobile transceiver.



1.1 CONTROLS AND CONNECTIONS

- 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 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 counter-clockwise, 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.
- 4. PA/CB SELECTOR :** This selector is used to select CB or PA functions.

- 7 -

- 4. PA SPEAKER :** This jack accepts PA speaker for PA operation. Before operating, you must first connect a PA speaker (8 ohms, 4W) to this jack.

1.3 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 unit comes with a low impedance dynamic microphone.

1.4 OPERATING PROCEDURE TO RECEIVE

- Be sure that power cord, microphone and antenna are connected to the proper connectors before proceeding further.
- Turn the unit ON by rotating the **VOLUME** knob clockwise.
- Set the **VOLUME** to a comfortable listening level.
- Set the **CB/PA**-selector to the **CB** mode.
- Listen to the background noise from the speaker. Turn the **SQUELCH** knob slowly clockwise until the noise JUST disappear. Leave the control at this setting. This **SQUELCH** 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.
- Set the **CHANNEL** selector to the desired channel.

1.5 OPERATING PROCEDURE TO TRANSMIT

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

- 5. CHANNEL SELECTOR :** This control is used to select a desired transmit and receive channel.

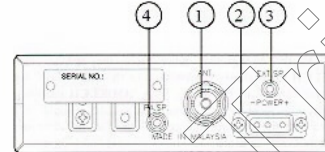
- 6. FRONT PANEL METER :** The Front Panel Meter allows the user to monitor signal strength and RF output power level.

- 7. TALK BACK :** Switch on to monitor transmitting output sound.

- 8. CHANNEL DISPLAY :** The channel display indicates the current selected channel.

- 9. TX/RX INDICATOR :** This indicator will light red when in the transmit mode and green for receive mode.

1.2 REAR PANEL CONNECTOR



- 1. ANTENNA :** This jack accepts 50 ohms coaxial cable with a PL-259 type plug.
- 2. POWER :** This jack 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.
- 3. EXTERNAL SPEAKER :** 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.

FREQUENCY RANGE

Channel	Channel Frequency	Channel	Channel Frequency
1	26.965MHz	21	27.215MHz
2	26.975MHz	22	27.225MHz
3	26.985MHz	23	27.255MHz
4	27.005MHz	24	27.235MHz
5	27.015MHz	25	27.245MHz
6	27.025MHz	26	27.265MHz
7	27.035MHz	27	27.275MHz
8	27.055MHz	28	27.285MHz
9	27.065MHz	29	27.295MHz
10	27.075MHz	30	27.305MHz
11	27.085MHz	31	27.315MHz
12	27.105MHz	32	27.325MHz
13	27.115MHz	33	27.335MHz
14	27.125MHz	34	27.345MHz
15	27.135MHz	35	27.355MHz
16	27.155MHz	36	27.365MHz
17	27.165MHz	37	27.375MHz
18	27.175MHz	38	27.385MHz
19	27.185MHz	39	27.395MHz
20	27.205MHz	40	27.405MHz

- 9 -

- 10 -

USE CHANNEL 9 FOR EMERGENCY ONLY

OPERATING PROCEDURE FOR EMERGENCY COMMUNICATIONS

1. For EMERGENCY communications, set the radio to Channel 9. For non-emergency communications, select desired Channel by depressing either up or down TUNING buttons until reaching the desired Channel.

Be sure the antenna is properly connected to the transceiver before transmitting. Prolonged transmitting without an antenna, or use of a poorly matched antenna, could cause damage to the transmitter.

2. When asking for aid on Channel 9, it is suggested that you request a REACT base to respond by saying " Break Channel 9 for a REACT base " and provide the CB DISTRESS DATA (called " CLIP ") :

CALL SIGN - Identify yourself and vehicle.

LOCATION - Be exact.

INJURIES - Number, Type, Trapped ?

PROBLEM - Give details and help required. Air CLIP repeatedly so any monitor can aid you.

If you don't receive a response on Ch 9 ; try Ch 14 or 19.

FCC gives the following examples of permitted and prohibited types of communications for use on Channel 9. These are guidelines and are not intended to be all-inclusive.

<u>Permitted</u>	<u>Example message</u>
Yes	A tornado sighted six miles north of town.
No	This is observation post number 10. No tornado sighted.
Yes	I am out of gas on Interstate 95 at mile marker 121.
No	I am out of gas in my driveway.
Yes	There is four-car collision at Exit 10 on the Beltway, send police and ambulance.
No	Traffic is moving smoothly on the Beltway.
Yes	Base to unit 1, the Weather Bureau has just issued a thunderstorm warning. Bring the sailboat into port.
No	Attention all motorists, The Weather Bureau advises that the snow tomorrow will accumulate 4 to 6 inches.
Yes	There is a fire in the building on the corner of 6th and Main Streets.
No	This is Halloween patrol unit number 3. Everything is Quiet here.

A FEW RULES THAT SHOULD BE OBEYED

1. You are not allowed to carry on a conversation with another station for more than five minutes at a time without taking a one-minute break to give others a chance to use the channel.
2. You are not allowed to blast others off the air by overpowering them with illegally amplified transmitter power or illegally high antennas.
3. You can't use the CB to promote illegal activities.
4. You are not allowed to use profanity.
5. You may not play music in your CB.
6. You may not use your CB to sell merchandise or professional service.

HOW YOUR CB CAN SERVE YOU

1. Warn of traffic tie ups ahead.
2. Provide weather and road information.
3. Provide help fast in event of emergency or breakdown.
4. Suggest good spot to eat and sleep.
5. Make long trips more interesting, and help keep you awake.
6. Provide direct contact with your office or home.
7. Make friends for you as you travel.
8. Provide " local information " to find you destination.
9. Help law enforcement officers by reporting drunk and reckless drivers.