

FERRIS

SOLID STATE AM/SSB MOBILE CRS TRANSCIVER

SSB-5000



INSTRUCTION MANUAL

WESTON ELECTRONICS COMPANY

Sydney: 2 The Crescent, Kingsgrove, N.S.W. 2208 Australia

Your FERRIS SSB-5000 represents the most advanced Mobile Station type radio designed for use in the Citizens Radio Service (C.R.S.). It will operate on any of the 18 frequencies designated as CRS band channels by the Postal & Telecommunications Department (P.T.D.) Your FERRIS SSB-5000 features a frequency synthesizing circuit with PHASE LOCK LOOP techniques to assure ultraprecise frequency control.

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WARNING

You must read and know RB14, CONDITIONS GOVERNING THE LICENCING AND OPERATION OF THE CITIZENS RADIO SERVICE.

Any adjustments or alterations which would alter the performance of the transceiver's original P.T.D. Type approval or which would change the frequency determining method are strictly prohibited.

Operation of this equipment requires a valid station license issued by the P.T.D. Do not transmit with your equipment until you have received your license. Illegal operation can result in severe penalties. Be certain that you have read RB14 before operating your radio.

Replacement or substitution of Crystals, Transistors, IC, Regulator or any other part of a unique nature, with parts other than those recommended by us, may cause violation of the technical regulations of RB 249 P.T.D. Rules.

Stations shall not communicate over distance in excess of 32 kilometers. Refer to paragraph 2.1(a) of RB14 rules.

INTRODUCTION

FREQUENCY RANGE

This radio provides high level, trouble-free performance in the Citizen Radio Service which is comprised of the following frequency assignment.

Channel No.	Frequency	Transmitter Output Power	Remarks
1	27.015 MHz	4 watts (P _m) 12 watts (P _p)	
2	27.025 MHz		
3	27.035 MHz		
4	27.055 MHz		
5	27.065 MHz		φEmergency Calling
6	27.085 MHz		φCalling
7	27.095 MHz		
8	27.105 MHz		
9	27.115 MHz		
10	27.125 MHz		
11	27.135 MHz		
12	27.155 MHz		
13	27.165 MHz		
14	27.175 MHz		
15	27.185 MHz		
16	27.195 MHz		
17	27.205 MHz		
18	27.225 MHz		

φSuggested channel usage

These frequency are generated and accurately controlled by a phase lock loop(PLL) circuit ensuring high reliability and excellent frequency stability on the above channel.

To obtain maximum performance from your radio, please read carefully the following description and operating instruction.

If you install or service your own transceiver, do not attempt to make any transmitter tuning adjustment other than those supplied by the manufacturer.

SPECIFICATIONS

GENERAL

Channels:	18 AM, 18 LSB, 18 USB
Frequency Range:	27.015 to 27.225 MHz
Frequency Control:	Phase Lock Loop(PLL) synthesizer
Frequency Tolerance:	0.005%
Operating Temperature Range:	-20° C to +50° C
Microphone:	Plug-in type: dynamic
Input Voltage:	12V DC nom. (positive or negative ground)
Size:	200mm x 60mm x 290mm
Weight:	6 Pounds (2.8 Kg)
Antenna Connector:	S0239
Semiconductors:	46 transistors, 8 FET, 7 IC, 64 Diodes, 3 LEDs
Meter:	Illuminated; indicates relative RF output and received signal strength.

TRANSMITTER

Power output:	4 watts (AM), 12 watts REP (SSB)
Frequency Response:	300 – 2500 Hz
Output Impedance:	50 ohms unbalanced
Output Indicator:	TX indicator (LED)

RECEIVER

Sensitivity:	less than 0.5 μ V for 10 dB (S+N) /N
Selectivity:	AM 65 dB (10 KHz), SSB 65 dB (10 KHz)
Image Rejection:	70 dB
Adjacent-Channel Desensitigation:	50 dB
I.F. Frequency :	7.8 MHz
Squelch:	Adjustable 0.25 to 1000 μ V
Clarifier Range:	\pm 1250 Hz
Audio output power:	3.5 watts into 8 ohms
Frequency Response:	350 to 2500 Hz
Distortion:	less than 10% at 3.5 watts output
Built-in Speaker:	8 ohms, round
Indicator:	RX Indicator (LED)

PA SYSTEM

Output power:	3.5 watts into external speaker
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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 passenger in the vehicle. In automobiles, the transceiver is usually mounted to the dash panel with microphone bracket beside it.

MOUNTING AND CONNECTION

This radio is supplied with a universal mounting bracket. The transceiver is held in the bracket by four bolts supplied, permitting adjustment to the most convenient angle. The bracket must be mounted with the machine screw and nuts supplied. The mounting must be mechanically strong and also provide a good electrical connection to the chassis of the vehicle. Proceed as follows to mount the transceiver.

1. After you determine the most convenient location in your vehicle, hold the radio with mounting bracket in the exact location desired. If nothing will interfere with mounting it in the desired position, remove the mounting bracket 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 CB antennas are terminated with a type PL-259 plug and mate with the receptacle.
3. Connect the DC power input wire with the fuse (red) to +12V DC. This wire extends from the rear panel. In automobile installation, +12V 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 radio 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 wire to -12V 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 unit or near the unit, using two screws supplied. When mounting in an automobile, place the bracket under the dash. So, the microphone is readily accessible.

GROUND INFORMATION

This radio may be installed and used in any 12V DC negative or positive ground system vehicle. Most newer Australian and foreign made cars or small trucks use a negative ground system while some older cars and some newer large trucks may use a positive ground system.

1. Negative ground system; In negative system, connect the Red power cord from the radio to the positive or + battery terminal or other convenient point, and connect the Black power cord to the chassis or vehicle frame or - battery terminal.
2. Positive ground system; In the case of a positive ground system, connect the Black power cord from the radio to the negative or - battery terminal or other convenient point, and connect the Red power cord to the chassis or vehicle frame or + battery terminal.

Antenna

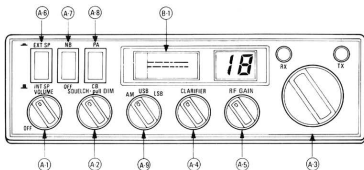
The radio is factory-adjusted to give optimum performance using 50-ohm antenna. The antenna selected must be specifically designed for CB equipment. No attempt should be made to tune the transmitter to the antenna. Instead, the antenna should be adjusted to present the lowest possible SWR (standing wave ratio). A very low SWR means that the antenna is operating at maximum efficiency and will also mean that it is adjusted to 50 ohms. The coaxial antenna lead-in should be as short as possible and only types RG-58/U or RG-8U are recommended.

Base Station Operation

To operate the transceiver from your home or office, using the regular house current as the power source, you will require a separate power supply capable of supplying two (2) amps at a 12 volt DC output with a nominal input voltage of 240 volts AC, 50 Hz. Simply connect the red(+) and black(-) leads of the transceiver to the corresponding terminals of the AC power supply.

NOTE: Do not attempt to operate this transceiver by connecting directly to 240V AC. When AC power supply is used with the transceiver for base station operation, any Citizens Radio Service Band dipole, ground plane or vertical antenna may be used. A ground plane vertical antenna will provide the most uniform horizontal coverage.

OPERATING INSTRUCTIONS



A. CONTROLS FUNCTION

- 1. OFF/ON/VOLUME:** Turn clockwise to apply power to the unit and to set the desired listening level.
- 2. SQUELCH:** 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 desirable that the control be adjusted only to the point where the receiver background noise or ambient background noise is eliminated. Turn 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 the maximum clockwise setting.
DIMMER CONTROL (when pulled): Controls the brightness of the LED channel indicator and meter illumination for optimum intensity for day or nighttime driving.
- 3. CHANNEL SELECTOR SWITCH:** This switch selects any one of the eighteen Citizens Radio Service Band channel desired. The selected channel is shown by large LED in the channel window to enable you a direct reading.
- 4. CLARIFIER:** Allows a slight variation of receive frequency above and below the actual channel frequency. This operation is similar to fine tuning control and while it is primarily intended for SSB operation, it also allows precise adjustment in the AM mode. The setting of this control is somewhat critical in the SSB mode and if it is not properly adjusted, the signals you receive will be distorted.
- 5. The RF GAIN Control** is used to adjust your Transceiver's receiver section to the signal strength in your area.
- 6. INT. SP/EXT SP SWITCH:** In EXT SP position, internal speaker is disconnected and sound come out from external speaker.
- 7. NB-OFF SWITCH:** When the switch is placed in the NB position the RF noise blanker is activated. The RF noise blanker is very effective for repetitive impulse noise such as ignition interference.

8. **PA/CB SWITCH:** Selects the mode of operation. In the CB position, the PA function is disabled and the unit will transmit and receive on the selected frequency. The PA function should not be used unless a PA speaker is connected. To use this PA features, a speaker having a voice coil impedance of 8 ohms and a power handling capability of at least 4 watts should be used.
9. **MODE SWITCH:** This switch enables the operator to select the mode of operation, upper (USB) or lower (LSB) side band or AM. The switch changes both the transmitter and the receiver.

B. INDICATOR FUNCTION

S/R/F PWR METER: Shows relative transmitter RF output power and input signal strength when receiving. The meter is illuminated when power is on.

C. PRESS TO TALK MICROPHONE

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. Press the switch and the transmitter is activated. Release the switch to receive. When transmitting hold the microphone about three inches from your mouth and speak clearly in a normal voice. The radio comes complete with the low impedance dynamic microphone.

D. OPERATING PROCEDURE TO RECEIVE

1. Place CB-PA switch to CB position.
2. Turn the unit ON by turning the VOLUME control clockwise, until a click is heard.
NOTE: Microphone must be plugged in for receiver to operate.
3. Set the VOLUME control for a comfortable listening level.
4. Listen to the background noise from the speaker. Turn the SQUELCH control slowly clockwise until the noise just disappears. The 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 the weaker signals will not be heard.
5. Set the channel selector switch to the desired channel.

E. OPERATING PROCEDURE TO TRANSMIT

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

CAUTION

Be sure the antenna is properly connected to the transceiver before transmitting. Transmitting without an antenna or with a poorly matched antenna (high SWR; over 2) can cause damage to the transmitter.

Public Address

An external 8 ohm, 4 watts speaker must be connected to the PA SPKR jack located on the rear panel when the transceiver is used as a public address system. The speaker should be directed 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.

Remote Speaker

The external speaker monitoring. The external speaker should handle at least 3 watts. When

EXT. SPKR) 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 3 watts. When the external speaker is plugged in, the internal speaker is disconnected.

PREVENTIVE MAINTENANCE

At six to twelve month intervals, the following system checks should be made:

1. Check Standing Wave Ratio (SWR).
2. Inspect all electrical connections to ensure that they are tight.
3. Inspect antenna coaxial cable for wear or breaks on shielding.
4. Inspect all screws and other mounting hardware for tightness.

OPERATOR TROUBLESHOOTING

Should the unit malfunction or not perform properly, the operator should perform the procedures indicated below:

1. If the transceiver is completely inoperative.
 - * Check the power cord and fuse.
2. If trouble is experienced with receiving.
 - * Check ON/OFF VOLUME CONTROL setting.
 - * Be sure SQUELCH is adjusted properly. Is the Radio over-squelched?
 - * Check to see that the radio is switched to an operational mode.
3. If trouble is experienced with transmitting.
 - * Be sure that the PA-CB SWITCH is set to the CB position.
 - * Check to see that the transmission line (coaxial cable) is securely connected to the ANTENNA CONNECTOR.
 - * Be sure that the antenna is fully extended for proper operation.
 - * Be sure that all transmission line (coaxial cable) connections are secure and free of corrosion.
 - * Be sure that you are fully pressing the Push-to-Talk switch on the microphone.

SERVICE YOUR TRANSCEIVER

The technical information, diagrams and charts provided in the Instruction Manual are supplied for the use of a qualified holder of radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this radio is operating at all times in accordance with the P.T.D. RB14 Citizens Radio Service regulations.

If you install your own transceiver, do not attempt to make any transmitter tuning adjustments, as they are prohibited by the P.T.D. unless you hold or are in the presence and under the supervision of radiotelephone licensed person.

Please refer to the WARNING information contained in the first page of your Instruction Manual.

(NOTE: When ordering parts, it is essential to specify the correct model number and production number of the unit.)

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