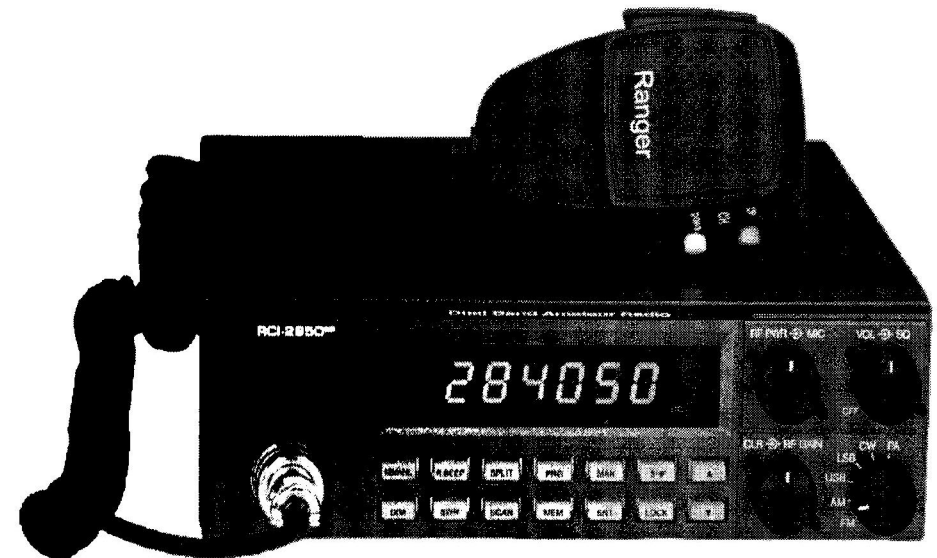**RANGER**
Communications, Inc.

RCI-2950 ^{CD}

AM/FM/SSB/CW Dual Band
Amateur Mobile Transceiver

RANGER
Communications, Inc.

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User's Manual

Table of Contents

Chapter 1 Specifications

GENERAL

Model	RCI-2950 CD
Frequency Range	12meter: 24.8900-24.9900 MHz 10meter :28.0000-29.6999 MHz
Tuning Steps	100 Hz, 1 KHz, 10 KHz, 100 KHz, 1 MHz
Emission	USB, LSB, CW, AM, FM
Frequency Control	Phase-Lock-Loop Synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Operating Temperature Range	-20°C to +50°C
Antenna Impedance	50 ohm
Microphone	Plug-In (6-Pin), 400 Ω Dynamic PTT
Meter Function	RF Output, RX Receive Signal Strength, SWR
Input Voltage	13.8 V DC
Dimensions	7 3/4" (W) x 10 3/4" (D) x 2 3/8" (H)
Weight	4 lb. 3 oz.

TRANSMITTER

RF Power Output	25W : USB/LSB Peak Power 10W : CW/AM/FM
RF Transmit Modes	USB, LSB, CW, AM, FM
Antenna Connector	UHF Type, 50 Ω
Modulation	16F3, A3E, J3E, A1A
Spurious Emissions	> -50 dB
Carrier Suppression	-50 dB

RECEIVER

Sensitivity	AM/CW : 0.5 μ V for 10dB Sinad FM : 0.25 μ V for 12dB Sinad USB/LSB : 0.15 μ V for 10dB Sinad
Image Rejection Ratio	> 50 dB
Audio Power Output	2.5W

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

Chapter 2 Introduction

Congratulations on your purchase of an RCI-2950 CD 10 and 12 meter dual band amateur radio. Your RCI-2950 CD
is designed to provide trouble-free service and state-of-the-art communications, incorporating many useful features and functions in the 10 and 12 meter dual band radio. Please read this manual thoroughly to ensure proper performance.

> **IMPORTANT**
> *To operate this radio, you must possess an amateur radio operator's license issued by the FCC. Operation of this unit without proper licensing is **ILLEGAL** and can result in severe penalties.*

> **NOTE**
> *The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate this equipment.*

Unpacking

The following items are included with our RCI-2950 CD. Carefully remove and examine all materials from the packing carton. If any items are missing or appear damaged, please contact your dealer immediately. Each unit should include:

(1) RCI-2950 CD Transceiver

(2) Dynamic Microphone with remote frequency adjustment switches

(3) Power Cord

(4) Mounting Bracket & Hardware

(5) Installation Hardware

(6) Owner's Manual

(7) Warranty Registration Card

It is recommended that you save the packing materials for future storage or shipping.

Chapter 3 Installation

The RCI-2950 CD is easy to install. All necessary parts (less the antenna and coax cable) have been included to facilitate installation.

Transceiver Mounting

Choose a suitable location for the transceiver that will allow easy access to the front panel as well as proper air circulation to the back of the unit. If you are installing the unit in a vehicle, attach the mounting bracket first, and then attach the transceiver to the mounting bracket using the hardware provided. Before making any electrical connection, ensure that the transceiver is turned off and the vehicle's battery is disconnected.

Power Connection

The transceiver operates off of any 12 to 13.8 VDC source. Beware of voltage drops caused by operating from Cigarette Lighter Plugs or long DC wire runs. Sometimes it is best to connect direct to the battery for best RF output and TX audio quality

> **NOTE**
> *The condition of a vehicle's electrical system can affect the operation of your **RCI-2950 CD**. A low battery, worn generator/ alternator, or poor voltage regulator will impair performance of the unit as well as the vehicle.*

If an AC power supply is used with your radio, it must be regulated and rated for at least 7 Amps continuous for the RCI-2950 CD. Low voltage while under load will cause reduced receiver gain and low transmitter output with possible distortion and splatter.

> **CAUTION**
> *Voltage above 15 VDC will damage the unit. Be sure to check the source voltage before connecting the power cord.*

Chapter 4 Operation

Front Panel
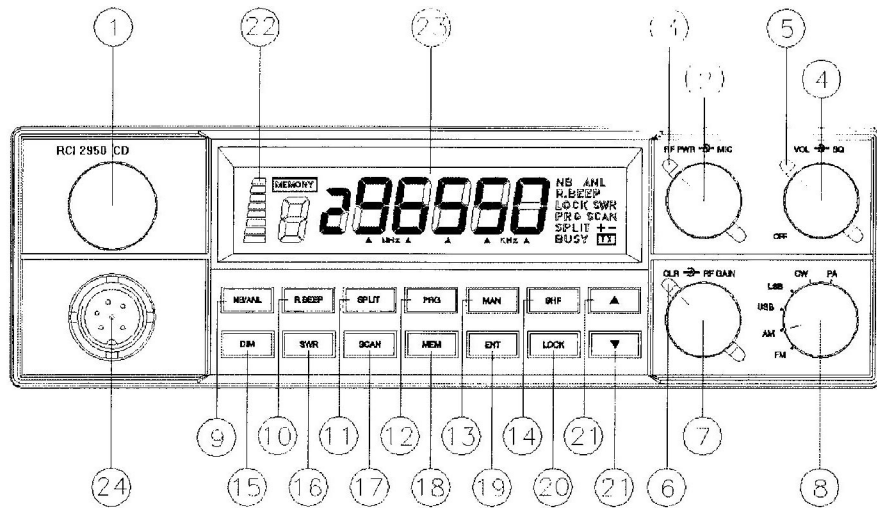
1. **FREQUENCY SELECTOR**: Used to set the desired transmit and receive frequency. The frequency is digitally displayed in the Display window next to the selector. The FREQUENCY SELECTOR knob next to the display, allows changing each digit on the frequency display by first placing the frequency display cursor (using SHF button) below the desired digit and then turning the selector knob.

2. **RF POWER CONTROL**: This control adjust the Transmitter's RF power output level.

3. **MIC GAIN CONTROL**: This feature adjust the microphone gain for the transmit and PA modes. Experiment with this control for the setting that will provide best audio quality. Avoid over-modulation, which causes interference to adjacent stations and "splatter".

4. **ON/OFF VOLUME CONTROL**: Turn clockwise to apply power to the radio and to set the desired listening level.

Operation (Continued)

5. **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.

6. **RF GAIN CONTROL**: This control is used to reduce the receiver's front-end gain when receiving strong signals.

7. **CLARIFIER CONTROL**: Allows variation of the receive frequency above and below the selected receive frequency as shown on the display. This control is intended primarily to tune in SSB signals when communicating with several stations that may not be exactly on frequency. It may also be used to optimize AM/FM signals as described in the operating procedure paragraph. The clarifier can adjust the receive frequency ±2.5KHz but does not affect the transmit frequency or the frequency display.

8. **MODE SWITCH**: This switch allows you to select one of the following six operating modes: FM, AM, USB, LSB, CW and PA.

9. **NB/ANL BUTTON (NB/ANL)**: The noise blanker (NB) is very effective in eliminating repetitive impulse noise such as ignition interference. In the ANL position, the AUTOMATIC NOISE LIMITER also limits noise at the receiver audio stages.

10. **ROGER BEEP BUTTON (R.BEEP)**: This switch activates the ROGER BEEP circuit, when its function is selected. When enabled, the radio automatically transmits an audio tone each time you release the PTT. This indicates the end of each transmission so that stations who may

Operation (Continued)

be having trouble receiving will know that you have finished transmitting. This feature is sometimes used in weak signal conditions or other special circumstances. We discourage use of this feature in normal operation, as it can be annoying to other operators.

11. **SPLIT BUTTON (SPLIT)**: Enables the offsetting of the transmitter frequency by up to ± 2 MHz (programmable) for FM repeater operation.

12. **PROGRAM BUTTON (PRG)**: Used to pre-program operating or scanning frequencies into memory. See the OPERATION section of this manual for details.

13. **MANUAL BUTTON (MAN)**: Used to return the unit to manual mode.

14. **SHIFT BUTTON (SHF)**: Determines which digit will change when changing frequencies, by placing a "cursor" under the desired digit. Allows frequency to be changed in 100 Hz, 1KHz, 10KHz, 100KHz and 1 MHz increments.

15. **DIM BUTTON (DIM)**: This button adjusts the display backlighting in four different steps to best match the ambient light.

16. **SWR BUTTON (SWR)**: Used to check relative SWR.

17. **SCAN BUTTON (SCAN)**: Used to enable the scanning of frequencies. See the PROGRAMMING and SCANNING section of this manual for detailed information on using the scan control.

18. **MEMORY BUTTON (MEM)**: Used to program often used frequencies in memory. Detailed information on how to use this control is provided in the PROGRAMMING section of the manual.

19. **ENTER BUTTON (ENT)**: Used to program frequencies in memory. See PROGRAMMING section.

Operation (Continued)

20. **LOCK BUTTON (LOCK)**: Disables the Frequency Selector Control, UP/DOWN buttons on the front control panel and remote UP/DOWN buttons on the microphone. Pressing this switch again will re-enable the frequency selectors.

21. **UP/DOWN SELECTOR**: These buttons are used to increase or decrease the frequency digit above the SHF cursor on the display.

22. **METER:** This meter indicates received signal strength, transmitter RF output power and SWR level.

23. **DISPLAY:** The Displays show frequency selected, functions and memory channel.

24. **MIC JACK:** Accept 6 pin female connecter.

Operation (Continued)

Rear Panel
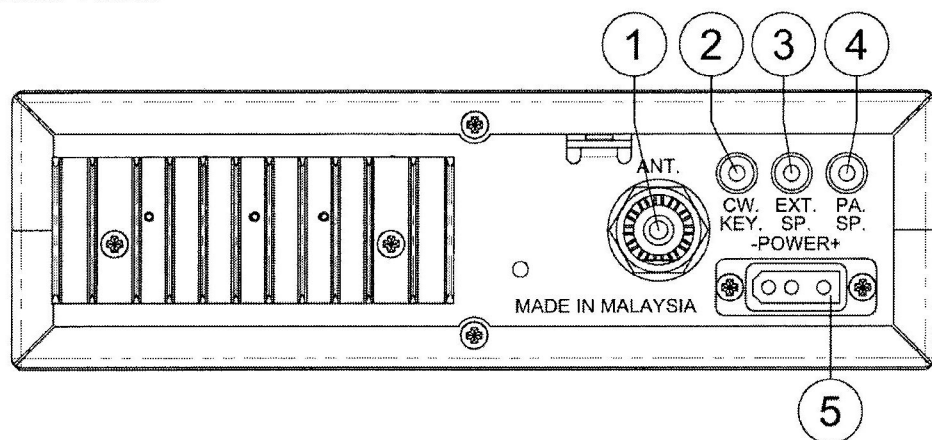
1. **ANTENNA**: This jack accepts a 50 ohms coaxial cable with a PL-259 style plug.

2. **CW KEY**: The CW key is used for Morse Code operation. To operate connect a CW key to this jack, and place the mode switch in the CW position.

3. **EXTERNAL SPEAKER**: This jack accepts a 4 - 8 ohm 5W external speaker. When an external speaker is connected to this jack, the built-in speaker is disabled.

4. **PA SP.**: This jack is for public address operation. Before operating in the PA mode, you must first connect a PA speaker (8 Ohms, 4W, 1/8" or 3.5mm diameter plug) to this jack.

5. **POWER**: This socket accepts a 13.8 VDC power cable with built-in fuse. The power cord provided with the radio consists of a black wire (negative) and a red wire (positive).
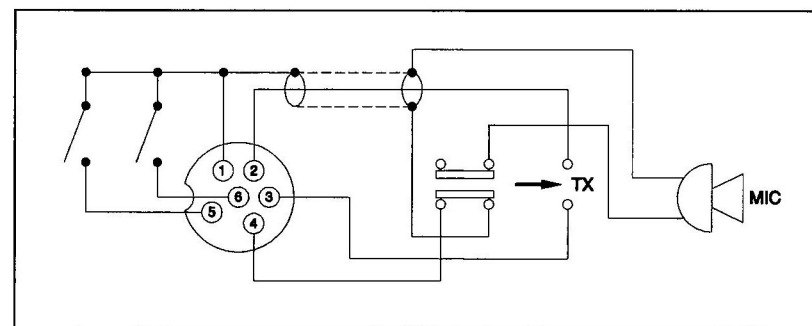
Operation (Continued)

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". This transceiver comes complete with a 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.

6 WIRE MIC CABLE

Pin Number	Mic Cable Lead
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control
5	Up Control
6	Down Control

Transceiver Microphone Schematic Diagram

Operation (Continued)

Frequency Selection

Frequency selection in the RCI-2950 CD can be accomplished using any one of the following three methods:

1. The first method of frequency selection uses the **SHF** (Shift) button and the ▲ (UP)/▼(DOWN) buttons located on the front panel. To accomplish this, press the **SHF** button until the display cursor on the frequency display is positioned under the frequency digit that is to be changed. Use the"▲" button to increase the number. Press the "▼" button to decrease the number. Perform the steps described above for each digit until the desired frequency is displayed in the **LCD** frequency display window.

2. The second method of frequency selection is performed using the **SHF** button and the **FREQUENCY** select knob located on the front panel. Use the **SHF** button in the manner described above to select the digit to be changed. Then rotate the **FREQUENCY** selector clockwise to increase the frequency and counterclockwise to decrease the frequency.

3. The third method of frequency selection is through the use of the **SHF** button and the remote **UP** and **DOWN** buttons located on the microphone. Frequency selection by this method is accomplished in the same manner as with the "▲" button and the "▼" button on the front panel keypad.

Sometimes when receiving more than one station on a fixed frequency such as on a "Net" or "round table" operation, it is convenient to be able to vary the receive frequency slightly without changing the transmit frequency. To do this, rotate the clarifier control while an off frequency station is transmitting. You can vary the receiver frequency by ±2.5 KHz for clearest voice reception. The clarifier can be optionally modified to vary both Transmit and Receive frequencies together.

Operation (Continued)

Mode Selection

To select an operating mode, rotate the MODE selector, and place it in the desired operating mode position.

RF Power Control

This feature allows the adjustment of the RF output power continuously over the range of 1W through 25W.

Chapter 5 Programming

Receive Scanning

The receive scanning feature allows you to locate active frequencies in the entire band segment. To begin scanning, slowly turn the Squelch control clockwise until the receiver noise disappears. Next, press the scan button. The unit should start scanning from the lower to the higher frequencies. Pressing the Scan button again will change the direction of scanning. Each time the Scan button is pressed, "SCAN+" or "SCAN-" will be displayed on the LCD display. The scan will stop on any active frequency for the duration of the transmission. When the transmission stops, the RCI-2950 CD will wait approximately 2 seconds before it resumes scanning. To deactivate the Scan mode, press the **MAN** (manual) button or turn the Squelch control counterclockwise until you hear receiver noise. The **MAN** button will disable the Scan function. (See **FREQUENCY SCANNING**, pg. 15 for more information.)

Split Frequency

This function enables you to split the transmit and receive frequencies by a pre-programmed amount. This feature is necessary for operation with FM repeaters. (See **OFFSET FREQUENCY OPERATION**, pg. 16 for more information). To split frequencies, press the **MAN** button and the **SPLIT** button to select + split frequency (transmitter higher than receiver). For - split frequency, press the SPLIT button again (transmitter lower than receiver).

Memory Function

The transceiver can store up to 16 frequencies in memory locations zero to F.

A) To program a frequency into memory, follow the procedure described below:

1. Set the desired frequency you wish to store in memory.

2. Press the **PRG** button.

3. Press the **MEM** button.
   ("**MEMORY**" and "**0**" should appear on the left hand side of the display).
   Pressing the **MEM** button will increase the memory counter to the next memory location.

4. Press the **ENT** button.

Programming (Continued)

5. To program other memory channels, press **MAN** button and repeat step 1 thru 4

> **NOTE**
> *If all memory channels are programmed, the display will show "FULL"*

B) To clear a memory channel or to erase all programmed frequencies, follow the procedures below:

1) To clear a particular memory location, locate the memory channel you wish to clear using the **MEM** button, press and hold the **PRG** button for about four seconds or until "ErASE" is displayed, selected memory channel is now cleared of its frequency.

2) To clear all memory channels (including programmed scan limits and split frequencies), press **MEM** button, then press and hold **ENT** button for about ten seconds, "CLEAr" will appear on the display followed by "ErASE". Release the **ENT** button, memory is now cleared of all programmed frequencies.

Metering

The segmented bars on the left-hand side of the LED display provide the following information:

1. **S/RF METER**: Provides a relative indication of transmit RF output power while transmitting or signal strength while receiving

2. **SWR METER**: This function allows the checking of relative SWR. To use this function, set the unit to AM mode and push the SWR button on the front panel while holding down the PTT switch on the microphone. The bars on the meter will indicate approximate SWR. If there is no bar, your antenna system is well matched. If several bars appear, the antenna needs adjustment. The fewer the bars, the better the match.

Chapter 6 Frequency Scanning

Frequency scanning can be achieved by either of two methods: the first method involves scanning of all frequencies between a pre-set upper and lower scan frequency. The second method permits the scanning of frequencies previously programmed in the memory locations 0 thru F.

All-Frequency scanning

To allow All-Frequency scanning, the user must first program the upper and lower scan limit frequencies as follows:

1. Press the **PRG** (Program) button.
2. Press the **SCAN** button. (**"PRG SCAN+"** should appear in the lower right-hand corner of the display window.)
3. Using the **SHF** button and the **UP** and **DOWN** arrows, select the upper scan limit frequency.
4. Press the **SCAN** button again. (**"SCAN-"** should appear in the display window.)
5. Using the **SHF** button and **UP** and **DOWN** arrows, select the lower scan limit frequency, then press **ENT**.

The upper and lower scan limits have now been programmed. To activate the scan feature, return the radio to manual operation and press the **SCAN** button. If the display shows **"SCAN+"**, the radio will scan from the lower limit to the upper limit. If **"SCAN-"** is displayed, the unit will scan from the upper limit to the lower limit. To change from **"SCAN+"** to **"SCAN-"** or vice versa, press **SCAN**.

NOTE

Whichever upper and lower scan limits are programmed in, are also the upper and lower operating limits of the radio. The radio will not operate above or below the scan limits last programmed in. Full band coverage can be returned by reprogramming the original band edges.

Frequency Scanning (Continued)

Memory Scanning

The RCI-2950 CD has 16 non-volatile memory locations which can be programmed with any frequency within the operating range of the radio. The scan function of the unit can scan the frequencies in the 16 memory locations.

The first step in utilizing the memory scan function is programming the desired frequencies into the memory locations 0 through F (Refer to Memory Function section on page 13).

1. After the desired memory locations have been programmed, return the unit to the manual mode of operation by pressing the **MAN** button.
2. Press MEM button.
3. Slowly turn the Squelch knob clockwise until the receiver noise disappears.
4. Press the SCAN button. The unit will scan from lower to higher memory locations.
   Pressing the SCAN button again will cause the unit to scan from higher to lower
   memory locations.
5. To stop scanning while on a memory location, press the **MAN** button. You can also turn the Squelch knob counterclockwise until you hear the receiver noise.
6. To disable memory scan function and go back to manual mode of operation, press the **MAN** button twice.

Chapter 7 Offset Frequency Operation

The split frequency function offsets the transmitter frequency either above or below the receiver frequency by a user-programmable amount. This is necessary for operating on FM repeaters. In the following example, the programming of a 1 MHz offset will be described. Before attempting to program the offset frequency, ensure that the radio is operating in the manual mode by pressing the **MAN** button.

NOTE: FM repeaters may require that a sub-audible CTCSS tone be transmitted to gain access to the repeater. The RCI-2950 CD can be equipped with an optional CTCSS encoder.

TO PROGRAM TX OFFSET:
1. Press the **PRG** (Program) button.
2. Press the **SPLIT** button. The LED display will indicate **00000** with **PRG** and **SPLIT** showing in the lower left-hand corner of the display.
3. Using the **SHF** button and the **UP** and **DOWN** arrows as described earlier, program the display to read **10000**.
4. Press **ENT**. A 1 MHz offset has now been programmed into the radio.
5. Return the radio to manual operation by pressing the **MAN** button.
6. Using the **SHF** key and the **UP** and **DOWN** arrows as described previously, set the radio to the desired receive frequency.
7. Press **SPLIT**. Either **"SPLIT+"** or **"SPLIT-"** will be displayed in the lower right corner of the display. If **"SPLIT+"** is displayed, the transmitter will be offset 1 MHz above the receive frequency when keyed. If **"SPLIT-"** is displayed, the transmitter will be offset 1 MHz below the receive frequency.

> **NOTE**
> *When the transmitter is keyed, the frequency display will change to show the frequency being transmitted.*

Memo

Memo

Memo

Memo

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Ranger Communications Limited Warranty

Ranger Communication, Inc. (Ranger) warrants to the original purchaser only this product against defects in material or workmanship, as noted below.

Effective December 1, 2001, Ranger Communications, Inc.'s Amateur and CB radio products are covered by a two (2) year limited warranty:

The above products are warranted for the specified period from the original date of purchase as shown on the original purchaser's bill of sale, receipted invoice or other proof of purchase. After this period, the original purchaser must pay for any labor at the prevailing rate either at an authorized Ranger warranty repair facility or at the factory.

In the event of a defect during the warranty period, Ranger shall, at its option, repair or replace the defective product. Such action shall constitute the purchaser's exclusive remedy under this warranty.

A Return Authorization Number must be obtained from the Ranger Customer Service Department before any returns for warranty repair will be accepted. Send the defective product postage-paid, along with proof of the date of purchase (photocopy of the original invoice or receipt). Please contact RCI for Return Authorization at:

Ranger Communications, Inc.
867 Bowsprit Road
Chula Vista, CA 91914
E-mail: sales@rangerusa.com

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, improper installation, UNAUTHORIZED MODIFICATION, or any action in violation of the product's instruction manual. This warranty is valid only in the U. S. A.

1. "Limited" means that we will repair problems that are caused by factory defects, only for the above-mentioned products and time limit, at no charge. Work performed by qualified technicians who did not cause any damage to the radio will not void the warranty. Problems or damage caused by unqualified or misinformed technicians, operator abuse or other miscellaneous actions may be able to be repaired, but there will be a charge. This warranty is limited to the radio only.

2. Generally, if the warranty sticker is removed or cut, the radio is considered "Void of Warranty". However, our policy is to be as lenient as we can, and to take this into consideration. We will usually repair the radio - under warranty - if no abuse or misuse is found. Radios that have parts removed cut or clipped; or the PCB has been damaged, will not be repaired under warranty.