BST-1 CAR SHORTWAVE RADIO

FCC Part 15 ID: 2AF6KBST1

USERS MANUAL

Expert Technology Studios, LLC

Melbourne, FL 32901

Ver 16.0

CONTENTS

1 INTRODUCTION

1.1 WARNINGS, CAUTIONS, AND NOTES

Thank you for purchasing this product. To ensure safety, keep the following warnings and cautions in mind at all times when using this product.   Observe all notes.

| Warning	⚠	Inattention to proper operation of transport equipment (motor vehicle, ships, etc.) due to distractions while using this product may result in accidents resulting in death, serious injury, or significant property damage.
Warning	⚠	This is a consumer entertainment product and is not designed or manufactured for use in any situation in which malfunctions would threaten human life or result in injury. Nor is it designed or manufactured for use in other devices or systems requiring mission-critical quality and reliability.
Warning	⚠	This Device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Warning	⚠	Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.
Caution	⚠	Use only the automotive power cord that is supplied so that fuse protection is provided.
Caution	⚠	If left connected to an unswitched vehicle power source, the unit will enter a low current (20ma) standby mode after 2 hours. If used in this manner, insure that such standby current drain will not result in discharge of vehicle battery over long periods of inactivity. If in doubt, switch off power to the product by using the switch on the power plug.
Note		This product is not intended for repair by anyone other than the manufacturer.
Note		Reception of any specific shortwave station and general shortwave reception cannot be guaranteed due to uncertainties in ionospheric, atmospheric, and propagation conditions, internal and external

		interference sources, antenna performance, and other parameters which can affect the overall signal to noise ratio of the desired received signal.
Note		The contents of this document and the specifications of the product are subject to change without notice due to product improvements.
Note		We have made every effort to confirm that all information provided in this document is correct and reliable. However, we take no responsibility for losses or damages incurred or infringements of patents or other rights resulting from use of the information.
Note		This document neither warrants nor authorizes the right to exercise intellectual property rights or any other rights belonging to Expert Technology Studios, LLC or third parties.
Note		No part of this document may be duplicated or reproduced in any form without prior consent from Expert Technology Studios, LLC.

1.2 DESCRIPTION OF EQUIPMENT

The BST-1 is a shortwave receiver intended for vehicular use. It operates from a standard 11-14 V DC automotive electrical system. It has a 2-25 MHz AM shortwave receiver that tunes in 5 KHz channels and a built-in FCC Part 15 compliant FM transmitter. The FM transmitter allows the shortwave audio to be received by the vehicle's FM radio and audio system. The tuned shortwave frequency and signal level will also be displayed on vehicle FM radios that have RDS capability. The BST-1 is tuned by wireless remote control using a FCC Part 15 compliant 433 MHz key fob (Produced by other suppliers) that communicates with a 433 MHz data receiver in the BST-1.
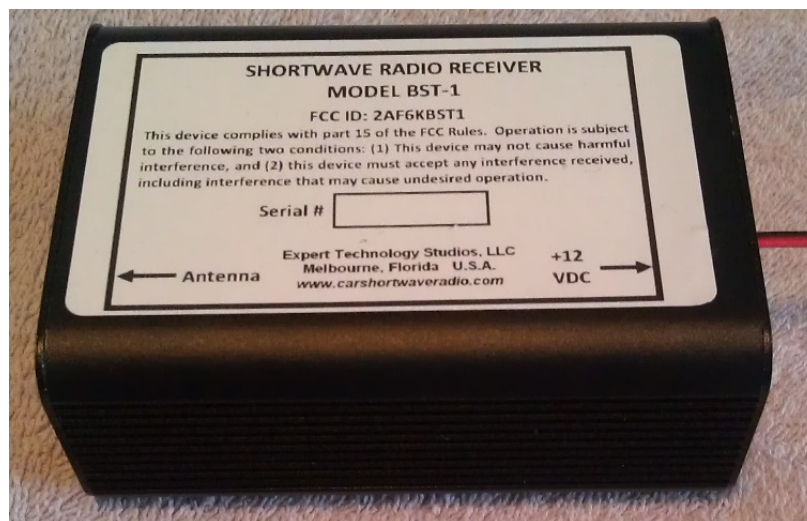
2 QUICK START INSTRUCTIONS

Note: These instructions assume the BST-1 has been installed in accordance with the installation instructions in Section 3.

1. Make sure the car FM radio is operational and radio volume is set by first tuning in an FM station receivable in your area.

2. Tune your car FM radio to 88.5 MHz - this is the transmit frequency for the BST-1, as shipped.

3. If 88.5 MHz is not a strong local station in use in your area, you should hear noise or shortwave signals from the BST-1 and see a frequency displayed (if your FM radio has RDS capability). If you hear noise and see a SW frequency displayed, it is working.

   Note : Each time power is applied to the BST-1, your FM radio will display VER 0XXX where XXX is the current SW version.   If you don't hear noise or shortwave signals from the BST-1 and don't see the BST-1 frequency information, go to step 5.

4. To operate the BST-1, momentarily press the bottom button and release. This starts the scanning of the 50 preset channels that are programmed as shipped from the factory (See Appendix A). The BST-1 will search and stop on an active channel.   Momentarily pressing and releasing the bottom button will re-start the preset scanning to the next active station.

   For more advanced key fob functions, read the ADVANCED OPERATING INSTRUCTIONS in Section 3.0.

5. If 88.5 MHz *IS* in use in your area, you may not receive the signal from the BST-1 because the local station is strong and overpowers the FCC Part 15 signal level of the BST-1 signal.

   In either case, tune your FM radio to 88.3, 88.7 or 88.9 MHz - there should be no local signals on at least one of these channels.   You *MAY* hear a weak FM broadcast signal but the BST-1 signal will overpower it when it changes frequency from the default frequency of 88.5.   Select one of these three channels on your car FM radio.

   To change the frequency on the BST-1, hold down the bottom button on the key fob controller for about 7 seconds and then release. This starts the BST-1 FM transmitter in a transmit scan mode on each of the 4 possible FM channels (88.3, 88.5, 88.7 and 88.9) for about 3 seconds on each frequency. You will hear a clear "beeping" tone when the BST-1 changes frequency to your currently tuned FM channel.   When you hear this beeping tone, momentarily press any key and it will stop and lock on that channel. It will remain on that channel until changed, even with power cycles.

   With the BST-1 now on a clear FM frequency, follow the tuning instructions in Step 4.

3 INSTALLATION

3.1 ANTENNA
A trunk lip type antenna is recommended. See the information on the recommended antenna at *www.carshortwaveradio.com*.

Trunk Lip Mount Whip Antenna

Trunk Lip Mounted on Hatchback

3.2 COMPONENTS FOR INSTALLATION
This BST-1 is supplied with a 10' long power cord and key fob 433 MHz wireless controller.

3.3 INSTALLATION
Locate the BST-1 in the desired mounting area. In most cases it can be located out of sight in spare tire area of the trunk, in the trunk, or rear cargo area of vehicles.   Route the power cable to the BST-1 from the cigarette power outlet in the vehicle to the area where the BST-1 is mounted and plug in both the connector to the BST-1 power input and the car cigarette power outlet. When power is applied, you will see a red indicator illuminated in the opening for the power connector on the rear of the BST-1. The power cord also has an on/off switch and power illumination on the plug which inserts into the vehicle.   Leave this switch ON so that the indicator is illuminated.

There is no installation required for the FM Transmitter/Key Fob antenna permanently attached to the BST-1 other than to stretch the cable out to its full length. Keep it away from the metal portion of the vehicle so as to obtain the best performance.

Note: For use in extremely cold environments (below 0 F), it may be advantageous to use foam or bubble wrap type insulating material to completely wrap the BST-1. This will help retain the heat inside the BST-1 that is generated by normal operation and provide a more suitable internal temperature environment.

3.4 INSTALLATION OF ANTENNA
Mount the antenna according to the manufacturer's instructions. The antenna cable is 8 feet long so as to reduce signal loss due to capacitance of the cable. Thus, the antenna must be located near the BST-1. Connect the antenna to the ANTENNA input of the BST-1.

Note: while the BST-1 has internal protection circuits to prevent damage from moderately strong nearby RF sources, locate the shortwave antenna away from any other transmitting antenna on the vehicle, such as ones used for CB radios or 2 way radios.   If excessive energy is applied from the antenna to the BST-1, the BST-1 may be damaged. One method of reducing coupling is to mount the BST-1 antenna or bend the element so it is at 90 degrees relative to the other antenna. For instance, if a vertical CB whip is on the vehicle, mount or bend the BST-1 so it is more horizontal. The polarization of the shortwave antenna will have minimal effect on received signals as long as it is away from metal surfaces.

4 ADVANCED OPERATING INSTRUCTIONS

4.1 KEY FOB FUNCTIONS
Using only the two buttons on the key fob you can perform all the functions required to operate the BST-1:

1. Scan or single step up or down the PRESET channels (up to 100 channels)

2. Scan or single step up or down in 5 KHz channels in a TUNE mode (starting from any given PRESET frequency)

3. Change the tuning direction in PRESET or TUNE mode between Up and Down

4. Switch between PRESET or TUNE mode.

5. Toggle receiver bandwidth between settings for SPEECH and MUSIC

6. Automatically cycle the FM transmit frequency amoung 88.3. 88.5, 88.7 and 88.9 MHz. It will emit a beeping sound when scanning and can be halted on any of these channels by momentarily pressing any key on the key fob.

7. Annunciate the operating frequency in Morse Code (also toggles noise blanker on and off.)

8. Save any frequency in TUNE mode to a new Preset Channel

9. Delete any existing PRESET channel.

10. Quick tune to WWV at 5 MHz on Channel 50 with ability to then quickly scan up to Channel 51 with WWV at 10 MHz, Channel 52 with WWV at 15 MHz and Channel 53 with WWV at 20 MHz.

11. Toggle between HI Sensitivity and LO Sensitivity to improve reception in the presence of strong stations on nearby frequencies. LO sensitivity is typically needed during nighttime operation when very strong signal are present.

12. Optimize internal oscillator frequency for minimum interference and save settings for each individual preset channel.

The following instructions explain how to activate each of the above functions.

4.2 SUMMARY OF KEY FOB ACTION

4.2.1   TOP BUTTON

Short press (click)   Single step PRESET channels or tune in 5 KHz steps in TUNE mode

1 Beep   Toggles sensitivity between HIGH and LOW sensitivity

2 Beeps   Sends frequency in Morse code and toggles S-Meter and Noise Blanker   on/off

3 Beeps   Quick to tune Preset Channel 50, WWV at 5 MHz.

4 Beeps   If in TUNE mode, stores currently tuned frequency (Morse code "S"). If in PRESET mode, it will delete the channel.   To prevent accidental deletions, this delete function must be executed twice. The first activation will display the message "R U SURE" and send the Morse code "?".   The second activation will delete the channel and then display the message "DELETED".

4.2.2   BOTTOM BUTTON

Short Press (click)   Starts scanning up or down in PRESET and TUNE mode

1 Beep   Toggles tuning direction up or down

2 Beeps   Toggles between PRESET or TUNE Mode

3 Beeps   Toggles receiver bandwidth between SPEECH (3 KHz) and MUSIC (5 KHz)

4 Beeps   Starts scanning of FM transmitter among 4 frequencies : 88.3, 88.5, 88.7, 88.9 MHz.

4.3 PRESET MODE

Note : the following instructions assume the BST-1 is already in PRESET mode (as shipped from the factory). If it is in TUNE mode, refer to CHANGING MODES to first select PRESET Mode.

To scan and find an active PRESET channel, momentarily press the bottom button. The display will read out operating frequency and preset channel numbers as it scans and stops on an active frequency. Because of the slow RDS update rate on some car FM receivers, it may not show every preset channel, but every valid frequency in memory is being checked for activity.   See APPENDIX A for the list of preset frequencies that are pre-programmed in the BST-1 as shipped. Any or all of these frequencies may be deleted and replaced with other presets, as desired.

The BST-1 will skip over unprogrammed PRESET channels and also channels that are not currently active and stop on the first active PRESET channel. When stopped, you will see the tuned frequency displayed along with the two digit preset channel number.   For the example :

5890 31

This indicates the BST-1 is tuned to 5890 and is on PRESET channel 31.   After 3 seconds, the preset channel indication will change to the S meter function, that of the letter "S" followed by a number from 1-9.   This indicates relative signal strength, and this function will be explained in detail later in this manual.

To single step through the Preset channels, momentarily press the top button.   With each momentary press of the button, the BST-1 will advance one preset channel that is in memory, even if it is not currently active.   The receiver audio is automatically decreased when channels are changed and will remain decreased unless the channel is active ("S" meter indicates something other than " S -")

4.4 CHANGING TUNING DIRECTION
To toggle the tuning direction up or down, hold the bottom button for about 1 second until you hear one short "beep" tone, then release it.   The Morse Code letter "U" (dit dit dah) for Up or "D" (dah dit dit) for Down will be heard to indicate the new tuning direction. The direction toggles each time the button is held for 1 Beep. The RDS will display PSET UP or PSET DN if you are in PRESET MODE. If you are in TUNE mode, it will display TUNE UP or TUNE DN.

4.5 CHANGING MODES - TOGGLING BETWEEN TUNE AND PRESET MODES
To toggle between TUNE and PRESET modes, hold down the bottom button for about 3 seconds. After the 1st second, you will hear the one "beep" that indicates direction change, but this time, do not release when you hear this first beep and instead keep the bottom button depressed until you hear two "beeps". Release the button and you will hear Morse code letter "T" for Tune (if you were originally in PRESET mode).   The tuning direction will remain from the previous setting and the display will indicate TUNE UP or TUNE DN.   Repeating this will toggle back to PRESET mode with the Morse code "P" (dit dah dah dit) and the message PSET UP or PSET DN.

4.6 TUNE MODE
To scan while in the TUNE mode and find an active channel, momentarily press the bottom button. Depending on tuning direction, it will scan up or down in 5 kHz steps from the start frequency. The display will read out the tuned frequency as it scans and then stop on the first active frequency. Because of the slow RDS update rate on some car FM receivers, it may not show every 5 kHz frequency step, but each channel is being checked for activity.

When stopped on an active frequency, you may see a frequency display followed by two dashes in place of the normal preset channel number. This indicates the current frequency is not in preset memory.

For example:

9440 --

If the tuned frequency is already in Preset Memory, then the Preset Memory will be displayed as in PRESET mode with the frequency and preset number associated with that frequency.

To single step in TUNE mode, momentarily press the top button. Depending on the tuning direction, it will tune up or down in 5 KHz steps each time the button is pressed. Use this method to find a station that you may want to later save in PRESET memory, as explained in Section 3.12.

4.7 SENSITIVITY CONTROL

In some circumstances, very strong signals may be audible in the background of a much weaker, desired signal. To improve reception of the weaker signal, in most cases this can be obtained by adjusting the BST-1 for low sensitivity.   This is accomplished by holding down the top button for 1 "beep", which will toggle the sensitivity between HIGH (most sensitive) and LOW (reduced sensitivity).   The Morse code "H" (dit dit dit dit) or "L"(dit dah dit dit) will be sent to indicate status and the RDS display will momentarily read "HI SENSE" or "LO SENSE".

4.8 RECEIVER BANDWIDTH

Holding down the bottom button for 3 "beeps", will toggle the receiver bandwidth for speech or for music reception. The display will momentarily indicate SPEECH or MUSIC as each selection is made. There is no Morse code annunciation of this selection. By listening to the audio, one can hear the difference in audio response, especially with music content.

4.9 CHANGING FM TRANSMIT FREQUENCY

To automatically cycle the FM transmitter frequency between 88.3, 88.5, 88.7 and 88.9 MHz, hold down the bottom button through the 1 and 2 and 3 "beep" alerts for about 7 seconds until you hear the 4th beep and then the Morse Code letters "FM".   Then release and the BST-1 will then beginning scanning through the 4 FM channels. Retune your FM radio to the desired clear frequency of the possible 4 channels. You will hear a distinctive beeping sound when it tunes to the FM frequency you have selected on your car radio.   When you hear it stop on the channel, momentarily press any button to stop it.   If you don't press any button, it will continue the scanning and return to that channel in about 12 seconds. Once a new channel is selected, the BST-1 will always power up on the last chosen FM frequency.

4.10 MORSE CODE ANNUNCIATION

To annunciate the current frequency in Morse code, hold down the top button though the 1 "beep" and until you hear the distinctive two "beeps", then release. You will hear the frequency annunciated in Morse code.

On any channel, the first annunciation of Morse code also disables the "S meter" updates, freezing the current display and also unmuting the audio. This will eliminate any pulsating noise that may be heard as a result of internal oscillators in the BST-1. The "S Meter" can be turned on again by activating the Morse Code again or activating any other button on the key fob, for instance receiver bandwidth or the up/down function.

4.11 QUICK TUNE TO WWV

To quick tune to Channel 50 which contains WWV time station on 5 MHz, hold down the top button for about 3 seconds. Hold down through the one and two beep alerts and then release

after the 3 beep alert. The BST-1 will send the Morse code message "WWV" and automatically switch to preset mode, tuning in the "up" direction on Channel 50 which contains WWV at 5 MHz.

If no signal is heard on 5 MHz because of time of day and distance from Fort Collins, Colorado, momentarily press the bottom button to begin scanning in preset mode.   If there is WWV activity on 10 MHz, the BST-1 will stop on that frequency, if not it will continue scanning in the up direction, checking for activity on 15 MHz and then 20 MHz. If none of these channels are audible it will continue scanning preset channels until it encounters an active channel.

4.12 STORING NEW PRESET CHANNELS
When in TUNE mode, a tuned frequency can be saved to a Preset channel in the following manner :

Hold down the top button though the 1 "beep", 2 "beep" and 3 "beep" annunciations for about 5 seconds until you hear Morse Code letter "S" (dit dit dit) then release. You will see the tuned frequency with the new preset channel displayed and then after 3 seconds it will revert to the S meter display.

Should memory be full (100 channels), when you attempt to store a channel you will see the message, MEM FULL.

Note: If you are in TUNE mode and tuned to a frequency that is already in Preset mode, entering the save mode will simply store the tuned frequency again in the same preset channel.

4.13 DELETING PRESET CHANNELS
When in PRESET mode, a tuned preset channel can be deleted in the following manner:

Hold down the top button though the 1 "beep", 2 "beep", and 3 "beep" annunciations for about 5 seconds until you hear two long tones and then the Morse code "?" (dit dit dah dah dit dit) then release. You will see the message " R U SURE" on the display.   Repeat the sequence for a second time and then you will again hear the two long tones and then see the message DELETED on the display. The channel will be deleted and the preset channel will advance to the next preset channel.

If you erase a desired PRESET channel, simply go back to TUNE mode, retune to the frequency and save it again. It will most likely be placed in a different PRESET channel number than before since new PRESET channels are assigned in the order of the first vacant channel starting from channel 0.

4.14 S-METER
The two digit S-Meter reading indicates relative signal strength. When tuned to a channel with no signal it will display two dashes and audio will remain muted. A weak signal which just unmutes the audio will be S1 and increase to S9. With extremely strong signals (greater than - 20 dBm) the display will indicate S+.

Any time a desired signal decreases in level such that the S meter drops to S - , then receiver audio will be muted after 2 seconds.

4.15 SLEEP MODE
If none of the key fob buttons have been pressed for about 2 hours, the BST-1 will shut down and enter a sleep mode with lower current consumption (15 ma). It may be awakened by momentarily pressing any button.

It will respond with the RDS message VER 0XXX, were XXX is the version of the software installed. It then will resume operation on the last tuned frequency with Mode selection, tuning direction, sensitivity level and last FM channel retrieved.

4.16 TUNING RANGE
The RF filtering is optimized for shortwave coverage from 2.5 to 25 MHz. However, the BST-1 will tune from 155 KHz to 30 MHz but with reduced sensitivity due to the front end filtering designed to only pass the 2.5 to 25 MHz range.   Very strong local AM broadcast and long wave beacons may be received if very close to the stations.   To access these out-of-band frequencies, enter TUNE mode and scan up or down until you reach the desired frequency.   With the exception of frequencies below 255 KHz, these out-of-band frequencies may also be saved to PRESET memory.   Frequencies below 255 KHz appear to the memory selecting software as empty channels and thus will not be saved.

4.17 EMI REDUCTION
Due to the complexity of the digital circuits, on some very few tuned channels, there may be heard a low level pulsating noise from the internal circuits of the BST-1. This can be eliminated by "shifting" the oscillators within the BST-1 when operating on that frequency.   With the BST-1 in TUNE mode, once a desired channel is selected in the tune mode, press the bottom button for one "beep" to toggle between up and down tuning. One of these two tuning directions, either up or down, should yield a signal with no interference.   Once this condition is obtained, then STORE the frequency by holding the top button down for about 5 seconds through the 1, 2 and 3 "beep" annunciations until the STORE message (Morse code letter "S") is heard.

Now, whenever this frequency is tuned in the PRESET mode, the clock shift chosen to give no r minimal interference will be automatically selected.   If there is ever any residual pulsating noise that cannot be eliminated in this matter, then on that PRESET channel, simply annunciate Morse Code frequency (hold top button for 2 "beeps") and the "S Meter" reading will be halted on that channel and any pulsating EMI should also be eliminated.

4.18 KEY FOB RANGE
The key fob transmitter power and sensitivity of the key fob receiver within the BST-1 should always provide adequate range in most vehicles. However, if the BST-1 is located in an area of the vehicle such that there is high attenuation between its key fob receiver antenna and the key fob, some intermittent control operation may be experienced.   The location of the key fob may be critical and the user may need to determine best operating position.   The BST-1 may also be

relocated slightly and/or its build in keyfob/FM antenna positioned for best performance.

5   TROUBLESHOOTING

If the BST-1 is operating but will not tune, the most likely issue is a weak battery in the Key Fob controller.   Open the Key Fob controller by removing the two screws and replace the battery.

If no FM signal is heard from the BST-1, make sure you have not accidentally changed FM channels, by first listening for it on 88.3, 88.5, 88.7 or 88.9 MHz.   If this does not help, make sure the +12 Volt outlet supplying power to the cigarette lighter adapter is providing voltage and the switch on the power plug is depressed such that the red power indicator is illuminate. A power indicator LED should be visible in one corner of the rear power connector area on the BST-1.

If power is applied and the FM transmitter can be heard and tuning initiated, but no shortwave signals are received, make sure the external antenna is applied to the BST-1.

6 SPECIFICATIONS

<u>Specifications are subject to change for product improvement.</u>

Guaranteed Sensitivity Frequency Range : 2.5 to 25 MHz in 5 KHz steps

Actual Tuning range : 155 kHz to 30000 KHz in 5 KHz steps.   Sensitivity will be greatly reduced below 1.8 MHz due to the AM broadcast band filter.

Number of Preset Channels : 100

Sensitivity : Not less than 6 dB SINAD with 30% AM at 2 microvolts (hard) when applied to the coax antenna input for signals in the 2.5 to 25 MHz range. Usable sensitivity for frequencies as low as 1.8 MHz and as high as the CB band (27 MHz)

FM Broadcast on 88.3, 88.5, 88.7 or 88.9, compliant with FCC Part 15 requirements with built-in antenna.

Operating voltage : 11.0 to 14.5 VDC at less than 100 ma. Protected against reverse polarity.

Approximate dimensions (3 x 1.5 x 5 in.)

Tuning by 433.9 MHz, FCC certified Key Fob.   The device is manufactured by Linx Technologies

Operating Temperature : 0 F to + 130 F.   Operation at lower temperatures is possible if the BST-1 is wrapped in non-flammable insulating material and allowed to warm up prior to operation.

FCC Compliance Information:

FCC ID: 2AF6KBST1

It is up to the user to assure that this device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference; (2) This device must accept any interference.

7 WARRANTY AND SERVICE INFORMATION

7.1 WARRANTY CONDITIONS

Expert Technology Studios, LLC warrants the BST-1 and accessories to be free of defects in material and manufacture under normal use for a period of 90 days. The term of this warranty begins on the date of sale to the purchaser from Expert Technology Studios, LLC. Units returned for warranty repair will be repaired or replaced at the manufacturer's option, free of charge. Please note this guarantee may be subject to other conditions as dictated by the customer's legal warranty rights under the applicable national legislation governing the sale of consumer goods.

The 433 MHz Key Fob controller is manufactured by other suppliers but Expert Technology Studios, LLC will serve as the focal point for any warranty issues with this device.

Expert Technology Studios, LLC reserves the right to change or improve design at any time without prior notification. Design changes are not implemented retroactively, and the incorporation of design changes into future units does not imply the availability of a no-cost upgrade to existing units. This warranty is void if Expert Technology Studio, LLC determines, in its sole business judgment, the defect to be the result of abuse, neglect, alteration or attempted repair by unauthorized personnel. The warranties set forth above are in lieu of all other warranties, expressed or implied, and Expert Technology Studios, LLC specifically disclaims any and all implied warranty of merchantability or of fitness for a particular purpose. The buyer acknowledges and agrees that in no event shall the company be held liable for any special, indirect, incidental or consequential damages, or for injury, loss or damage sustained by any person or property, that may result from this product failing to operate correctly at any time.

In the event your product needs to be repaired, it is necessary to contact Expert Technology Studios, LLC at: service@experttechnologystudios.com prior to shipping, and a Return Merchandise Authorization (RMA) number will be assigned.

IMPORTANT NOTE ABOUT PRODUCT REPAIR:

WHEN RETURNING YOUR PRODUCT, YOU ARE RESPONSIBLE FOR THE COST OF SHIPPING TO EXPERT TECHNOLOGY STUDIOS, LLC. ANY SHIPMENT THAT IS NOT PRE-PAID OR IS SENT WITHOUT AN RMA NUMBER WILL NOT BE ACCEPTED.

7.2 SHIPPING

Pack the unit in its original box and packing. Caution: Improper packing may result in damage during shipment.   It is recommended using USPS Priority mail for shipping, using the original packing and carton.

Include the following:

1. Full description of any problems

2. Daytime telephone number, name & address and e-mail.

A flat rate of $25.00 will apply to repairs not covered by warranty or units that are over 90 days old.   Send only cashier's check, money order or Master Card or Visa card number.

7.3 WARRANTY EXCLUSIONS

- A product purchased through any reseller not directly authorized by Expert Technology Studios, LLC.
- Any used product purchased from a third party online or directly.
- Products with missing or defaced serial numbers.
- Products damaged by environmental factors, such as oxidation and/or damages caused by natural disaster.
- Physical Damages which include, but are not limited to the following unauthorized modifications:

  o Misuse, neglect or improper assembly
  o Transport damages due to improper packaging or carrier
  o Burns resulting from faulty or failed electric power
  o Missing/bent parts
  o Cracked components
  o Liquid/water damage
  o Excessive RF energy applied to antenna input, such as operation in close proximity to CB radio or other transmission source.

Because of the characteristics of all shortwave radios and possible external interference sources, it is normal to experience fading, distortion, noise, and other interruptions to received shortwave signals. Expert Technology Studios, LLC reserves the right to not accept returns or address any warranty issues related to quality of reception.

This warranty does not include any external antenna, or the cost of labor for removal or re-installation of the product in a vehicle or other mounting.

Some states do not allow for the exclusion or limitation of implied warranties or liability for incidental or consequential damage, so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

7.4 SERVICE INFORMATION

Your product contains no user-serviceable components; refer to Expert Technology Studios, LLC for repair or upgrade. Your warranty will be voided if you tamper with the internal components. If you have any questions with regard to the above, please contact Expert Technology Studios, LLC.

8 APPENDIX A

Pre-Programmed Frequencies (Subject to change due to frequency assignment changes by regulatory agencies)

Preset	Frequency	Station Name	Location	
0	0			
1	9420	Voice of Greece	Athens	Greece
2	5830	WTTW	Tennessee	USA
3	9930	WTTW	Tennessee	USA
4	5025	Radio Rebelde (Music) 24 hrs	Havana	Cuba
5	7365	WHRI	South Carolina	USA
6	7520	WHRI and WWCR	South Carolina & Nashville	USA
7	0			
8	0			
9	0			
10	0			
11	0			
12	0			
13	0			
14	5085	WTTW	Tennessee	USA
15	0			
16	0			
17	1985	160 meter Ham AM Callling Freq		
18	9840	WHRI	South Carolina	USA
19	7315	WHRI	South Carolina	USA
20	7290	40 meter Ham AM Calling Freq		

21	3885	80 meter Ham AM Calling Freq		
22	0			
23	3185	WWRB	Tennessee	USA
24	3195	WWRB / WWCR	Tennessee	USA
25	3215	WWRB / WWCR	Tennessee	USA
26	4840	WWCR	Tennessee	USA
27	5040	Radio Havana	Havana	Cuba
28	0			
29	5110	WBCQ	Maine	USA
30	9580	Radio Australia	Shepparton	Australia
31	5890	WWCR	Tennessee	USA
32	0			
33	6000	Radio Havana	Havana	Cuba
34	6030	Radio Marti	South Carolina	USA
35	0			
36	0			
37	0			
38	7490	WBCQ Night WWCR Day	Maine	USA
39	0			
40	0			
41	22800	For Production Test - May be deleted		
42	19200	For Production Test - May be deleted		
43	15600	For Production Test - May be deleted		
44	13200	For Production Test - May be deleted		
45	9600	For Production Test - May be deleted		
46	7200	For Production Test - May be deleted		

47	4800	For Production Test - May be deleted		
48	3600	For Production Test - May be deleted		
49	2400	For Production Test - May be deleted		
50	5000	WWV	Colorado	USA
51	10000	WWV	Colorado	USA
52	15000	WWV	Colorado	USA
53	20000	WWV	Colorado	USA
54	9265	WINB and WMLK	Pennslyvania	USA
55	9330	WBCQ	Maine	USA
56	9370	WWRB	Tennessee	USA
57	11565	WHRI	South Carolina	USA
58	11635	WHRI	South Carolina	USA
59	7550	India Radio	Delhi	India
60	0			
61	11550	EWTN	Alabama	USA
62	12105	WTTW	Tennessee	USA
63	13845	WWCR	Tennessee	USA
64	12160	WWCR	Tennessee	USA
65	12050	EWTN - Spanish	Alabama	USA
66	15530	WHRI	South Carolina	USA
67	0			
68	21600	WHRI	South Carolina	USA
69	0			
70	9790	Radio Romania	Bucharest	Romania
71	0			
72	0			

73	15420	WBCQ	Maine	USA
74	15795	WWCR	Tennessee	USA
75	15825	WWCR	Tennessee	USA
76	0			
77	5050	WWRB	Tennessee	USA
78	9555	WRMI	Florida	USA
79	9395	WRMI	Florida	USA
80	7570	WRMI	Florida	USA
81	0			
82	6115	WWCR	Tennessee	USA
83	5070	WWCR	Tennessee	USA
84	0			
85	7505	WRNO	New Orleans	USA
86	0			
87	9350	WWCR	Tennessee	USA
88	0			
89	9980	WWCR	Tennessee	USA
90	0			
91	0			
92	0			
93	19000	Radio Australia	Shepparton	Australia
94	5935	WWCR	Tennessee	USA
95	9475	WTTW	Tennessee	USA
96	5920	WHRI	South Carolina	USA
97	17610	WHRI	South Carolina	USA
98	0			

99	6070	CFRX -Relay of 1010 AM	Toronto	Canada