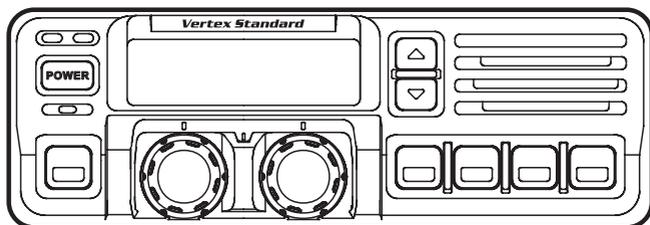# Vertex Standard

# VX-5500

## OPERATING MANUAL



**Vertex Standard LMR, Inc.**

4-6-8 Shibaura, Minato-ku, Tokyo 108-0023, Japan

# CONGRATULATIONS!

You now have at your fingertips a valuable communications tool - a Vertex Standard two-way radio! Rugged, reliable and easy to use, your Vertex Standard radio will keep you in constant touch with your colleagues for years to come, with negligible maintenance down time.

Please take a few minutes to read this manual carefully. The information presented here will allow you to derive maximum performance from your radio. After reading it, keep the manual handy for quick reference, in case questions arise later on.

We're glad you joined the Vertex Standard team. Call on us any time, because our business is communications. Let us help you get your message across.

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### NOTICE

There are no user-serviceable points inside this transceiver. All service jobs must be referred to your Authorized Service Center or Network Administrator.

# VX-5500 Operating Manual
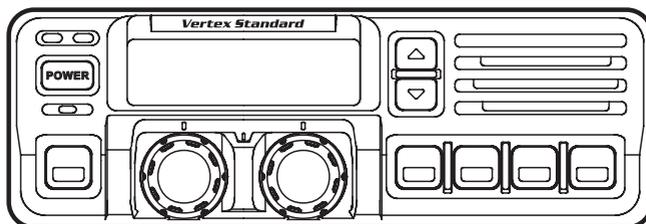


The **VX-5500** Series are full-featured FM transceivers designed for flexible mobile and base station business communications in the VHF Low-Band (70/30 Watts: programmable), VHF High-Band (50/25 Watts: programmable) and UHF (45/25 Watts: programmable) Land Mobile Bands. Each model is designed for reliable business communications in a wide variety of applications, with a wide range of operating capability provided by its leading-edge design.

The 250-channels memories can each be programmed with a 8-character channel name.

Important channel frequency data is stored in EEPROM and flash memory on the CPU, and is easily programmable by dealers using a personal computer and the Vertex Standard **CT-71** Programming Cable and **CE49** Software.

The pages which follow will detail the many advanced features provided on the **VX-5500** transceiver. After reading this manual, you may wish to consult with your Network Administrator regarding precise details of the configuration of this equipment for use in your application.

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## For North American Users Regarding 406 MHz Guard Band

The U.S. Coast Guard and National Oceanographic and Atmospheric Administration have requested the cooperation of the U.S. Federal Communications Commission in preserving the integrity of the protected frequency range 406.0 to 406.1 MHz, which is reserved for use by distress beacons. Do not attempt to program this apparatus, under any circumstances, for operation in the frequency range 406.0 - 406.1 MHz if the apparatus is to be used in or near North America.

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# WARNING! FCC RF EXPOSURE REQUIREMENTS

### ATTENTION!

**BEFORE USING THE RADIO, READ THE "PRODUCT SAFETY GUIDE" CHAPTER ON STARTING FROM PAGE 4 FOR MOBILE TWO-WAY RADIOS WHICH CONTAINS IMPORTANT OPERATING INSTRUCTIONS FOR SAFE USAGE AND RF ENERGY AWARENESS AND CONTROL FOR COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS.**

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.

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

❒ Reorient or relocate the receiving antenna.
❒ Increase the separation between the equipment and receiver.
❒ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
❒ Consult the dealer or an experienced radio/TV technician for help.

# Warning! IC RSS General Requirements

## English

☐ This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

☐ Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

☐ Antennas used for this transmitter (identify the device by certification number, or model number if Category II) must not exceed an antenna gain of 0 dBd. The radio must be used in vehicle-mount configurations with a maximum operating duty cycle not exceeding 50 %, in typical Push-to-Talk configurations. Antenna types having a gain greater than 0 dBd are strictly prohibited for use with this device.

## French

☐ Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

☐ Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

☐ Antennes utilisées pour cet émetteur (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie II) ne doit pas dépasser un gain de l'antenne de 0 dBd. La radio doit être utilisée dans des configurations de montage en véhicule avec un maximum d'utilisation en fonctionnement n'excédant ne pas 50 %, dans des configurations typiques de Push-to-Talk. Types d'antenne ayant un gain supérieur à 0 dBd sont strictement interdits pour une tilisation avec cet appareil.

# PRODUCT SAFETY GUIDE

**RF Energy Exposure Awareness and Control Information, and Operational Instructions for FCC Occupational Use Requirements.**

**NOTICE: This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.**

This two-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses radio frequency (RF) energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy. Other forms include, but are not limited to, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly, can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health, and industry work with organizations to develop standards for safe exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection.

All Vertex Standard two-way radios are designed, manufactured, and tested to ensure they meet government-established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of two-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it.

Please refer to the following Web sites for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits.

http://www.fcc.gov/oet/rfsafety/rf-faqs.html
https://www.osha.gov/SLTC/radiofrequencyradiation/hazards.html

# Product Safety Guide

## Federal Communication Commission Regulations

The FCC rules require manufacturers to comply with the FCC RF energy exposure limits for mobile two-way radios before they can be marketed in the U.S. When two-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a label directing users to specific user awareness information. Your Vertex Standard two-way radio has a RF exposure product label. Also, this Operating Manual includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

## Compliance with RF Exposure Standard

Your Vertex Standard two-way radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) regarding human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/ controlled RF exposure environment at duty factors of up to 50 % talk - 50 % listen and is authorized by the FCC for occupational use only. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio antenna radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.

**Your Vertex Standard two-way radio complies with the following RF energy exposure standards and guidelines**:

- United States Federal Communications Commission (FCC), Code of Federal Regulations; 47 CFR et seq.
- FCC, OET Bulletin 65
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005
- International Commission on Non-Ionizing Radiation Protection (ICNIRP)
- Health Canada Safety Code 6
- Industry Canada RSS-102
- Australian Communications Authority Radiocommunications Standard et seq.

# PRODUCT SAFETY GUIDE

## RF Exposure Compliance and Control Guidelines and Operating Instructions

To control exposure to yourself and others and to ensure compliance with the RF exposure limits, always adhere to the following procedures.

### GUIDELINES:

- User awareness instructions should accompany device when transferred to other users.
- DO NOT use this device if the operational requirements described herein are not met.

### INSTRUCTIONS:

- **Transmit no more than the rated duty factor of 50 % of the time.** To transmit (talk), push the Push-To-Talk (PTT) button or, for radios equipped with VOX, speak into the microphone. The red will illuminate when the radio is transmitting. To receive calls, release the PTT button, or, for radios equipped with VOX, stop talking. The red LED will extinguish when the radio stops transmitting. Transmitting 50 % of the time, or less, is important because this radio generates measurable RF energy exposure (in terms of measuring for standards compliance) only when transmitting.
- **Transmit only when people outside the vehicle are at least the recommended minimum lateral distance away, as shown in Table below, from the body of a vehicle with a properly installed antenna.** This separation distance will ensure that there is sufficient distance from a properly installed (according to installation instructions) externally-mounted antenna to satisfy the RF exposure requirements in the applicable standards listed above.
- **Antennas used for this transmitter must not exceed an antenna gain of 0 dBd.**
  NOTE: Table below lists the recommended lateral distance for people in an uncontrolled environment from the body of a vehicle with a properly installed transmitting antenna (i.e., monopoles over a ground plane) with gain equal to or less than the specified maximum gain.

### Required Distances

|  | LOW VHF Model | VHF Model | UHF Model |
|---|---|---|---|
| **FCC RF Exposure Requirements** | 3.87 Feet (1.08 m) | 3.28 Feet (1.00 m) | 2.54 Feet (0.77 m) |
| **IC RF Exposure Requirements** | 5.61 Feet (1.71 m) | 5.12 Feet (1.56 m) | 4.10 Feet (1.25 m) |

- When a mobile radio is used in conjunction with another co-located transmitter such as a Vehicular Repeater, it is the vehicle operator's responsibility to take appropriate steps to keep bystanders at the required separation distance from the vehicle to ensure compliance with the FCC's RF energy exposure limits for the general population. See the co-located transmitter's user manual for more details.
  NOTE: If you are not sure of the rated power of your radio, contact your sales representative or dealer and supply the radio model number found on the radio model

label. Users of multi-band radios subject to different separation distances in different operating bands should select the larger applicable distance as the minimum lateral distance for bystanders outside the vehicle. The maximum power on the FCC Grant may be higher than the rated power allowing for production variation.

## Mobile Antenna Installation Guidelines

These mobile antenna installation guidelines are limited to metal body motor vehicles or vehicles with appropriate ground planes.

- Antennas should be installed in the center area of the roof or the trunk lid taking into account exposure conditions of backseat passengers and according to the specific instructions and restrictions in the "Installation" Chapter along with the requirements of the antenna supplier.
- Trunk lid installations are limited to vehicles with clearly defined flat trunk lids, and in some cases, to specific radio models and antennas. See the "Installation" Chapter for specific information on how and where to install specific types of antennas to facilitate recommended operating distances to all potentially exposed persons.
- Antennas with gains higher than the authorized maximum gain, unauthorized modifications, or attachments could damage the radio and may result in non-compliance with RF Safety Standards.

## Compliance and Control Guidelines and Operating Instructions for Mobile Two-Way Radios Installed as Fixed Site Control Stations

If mobile radio equipment is installed at a fixed location and operated as a control station or as a fixed unit, the antenna installation must comply with the following requirements in order to ensure optimal performance and compliance with the RF energy exposure limits in the standards and guidelines listed above:

- The antenna should be mounted outside the building on the roof or a tower if at all possible.
- As with all fixed site antenna installations, it is the responsibility of the licensee to manage the site in accordance with applicable regulatory requirements and may require additional compliance actions such as site survey measurements, signage and site access restrictions in order to ensure that exposure limits are not exceeded.
- For additional installation information, see the guidelines for minimum separation distances provided above in the RF Exposure Compliance and Control Guidelines and Operating Instructions section of this document.

# PRODUCT SAFETY GUIDE

**Compliance and Control Guidelines and Operating Instructions for Mobile Two-Way Radios Installed on Maritime Vessels**

If mobile radio equipment is installed on a vessel and operated as a fixed unit, the antenna installation must comply with the following requirements in order to ensure optimal performance and compliance with RF energy exposure limits in the standards and guidelines listed above:

- An antenna intended for Maritime operation should be chosen and installed according to the manufacturers recommendations.
- The antennas should be mounted solidly to the vessel structure at the highest location possible.
- As with all radio antenna installations, it is the responsibility of the operator to maintain adequate distances from the antenna and all personnel on board the vessel or adjacent to the vessel.
- For additional installation information, see the guidelines for minimum Separation distances proved above in the RF Exposure Compliance and Control Guidelines and Operating Instructions section of this document.

# INSTALLATION

When installing the **VX-5500** transceiver, make sure to plan the installation carefully and leave additional room in the rear of the radio for cabling and accessory connections; in the front of the radio for access, controls, and cabling; and to the sides of the radio so that you may access and install the Hex Head Bolts.

## Mounting Bracket Installation

The supplied mounting bracket allows desktop or overhead mounting.

❒ Use a 7/32 inch (5.5 mm) bit to drill the holes to a surface which is more 0.4 inch (10 mm) thick and can support more than 6.6 lbs (3 kg) and secure the bracket with the supplied screws, spring washers, flat washers, and nuts.

You may secure the bracket using the supplied tapping screws, instead of the screws and nuts. In this case, drill the small pilot holes instead of the 7/32 inch (5.5 mm) holes.

❒ Install the transceiver to the bracket using the supplied Hex Head Bolts.

⚠ **Use only the supplied Hex Head Bolts or equivalent size screws (HSM4X8B).**



**DESKTOP MOUNT** (WITH TAPPING SCREW)    **OVERHEAD MOUNT** (WITH SCREW & NUT)
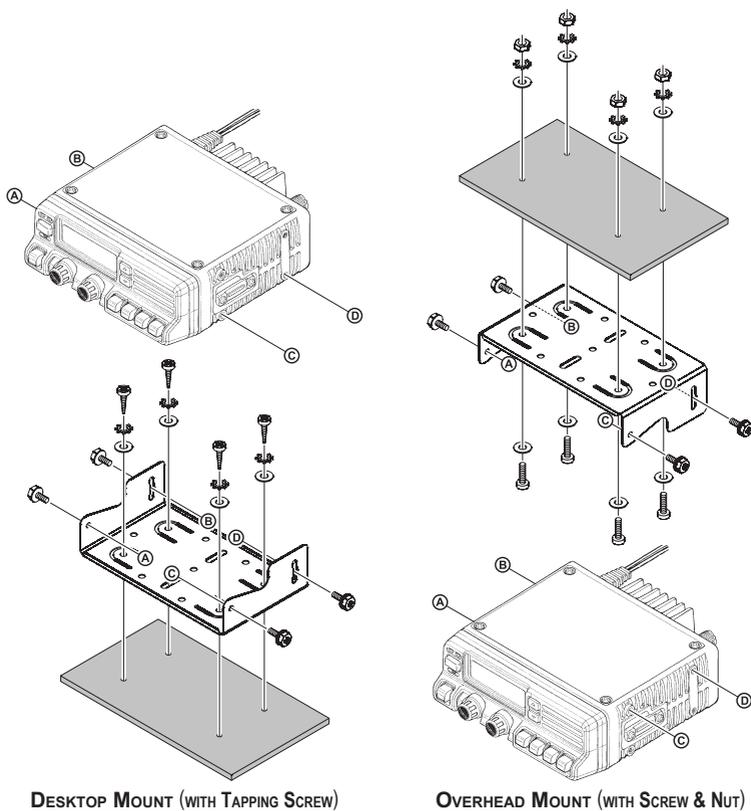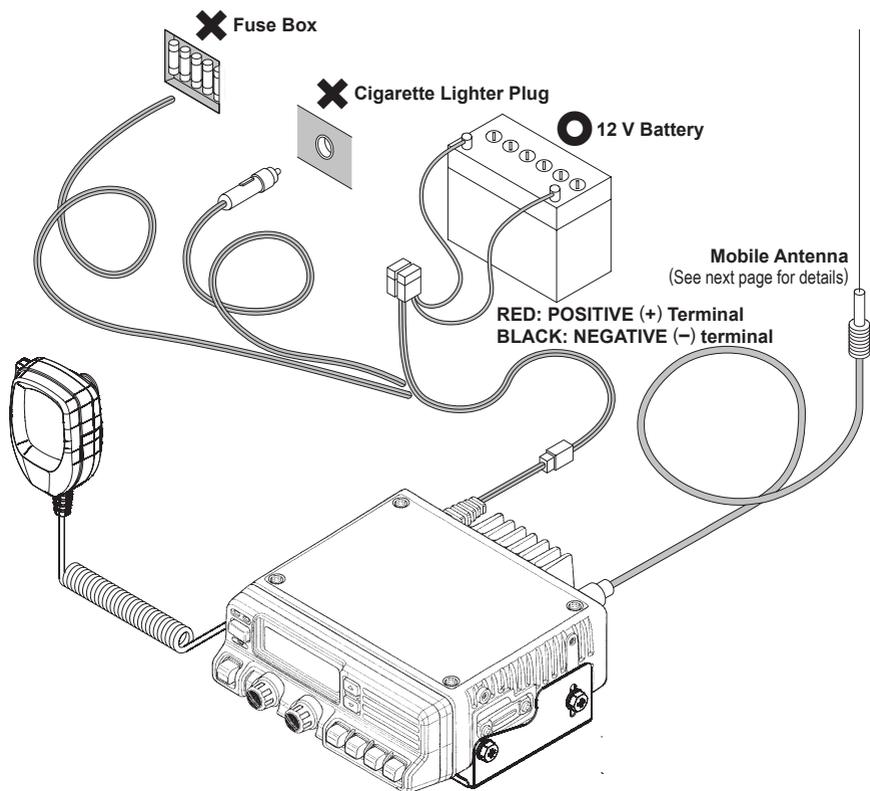
# INSTALLATION

## Mobile Installation

### POWER CONNECTION

**VX-5500** transceiver operates only in negative ground electrical systems. Before starting the installation, make sure that the ground polarity of the vehicle is correct. Accidentally reversing the polarity will not damage the transceiver, but will cause the cable fuses to blow.

To minimize voltage drop and avoid blowing the vehicle's fuses, connect the supplied DC power cable directly to the battery terminals. Do not attempt to defeat or bypass the DC cable's fuse - it is there to protect you, your transceiver, and your vehicle's electrical system.

⚠ **Warning!** Never apply AC power to the power cable of the transceiver, nor DC voltage greater than 15.6 Volts. When replacing the fuse, only use a 15-A fuse. Failure to observe these safety precautions will void the Limited Warranty on this product.



✖ **Fuse Box**

✖ **Cigarette Lighter Plug**

● **12 V Battery**

**Mobile Antenna**
(See next page for details)

**RED: POSITIVE (+) Terminal**
**BLACK: NEGATIVE (−) terminal**

# INSTALLATION

❒ Before connecting the transceiver, check the voltage at the battery terminals while revving the engine. If the voltage exceeds 15 Volts, adjust the vehicle's voltage regulator before proceeding with installation.

❒ Connect the **RED** power cable lead to the **POSITIVE** (+) battery terminal, and the **BLACK** power cable lead to the **NEGATIVE** (−) terminal. If you need to extend the power cable, use #12 AWG or larger insulated, stranded copper wire. Solder the splice connections carefully, and wrap the connections thoroughly with insulating electrical tape.

❒ Wire the cable so that not to disturb with the driving.

❒ Before connecting the cable to the transceiver, verify the voltage and polarity of the voltage at the transceiver end of the DC cable using a DC voltmeter.
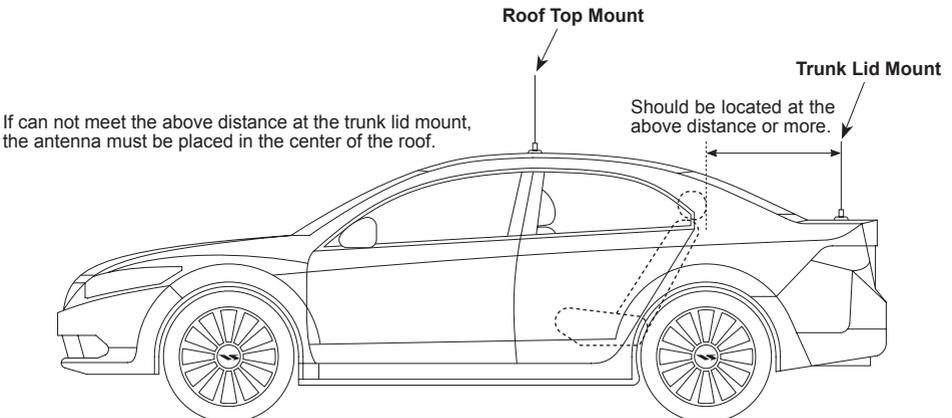Now connect the transceiver to the DC cable.

## ANTENNA INSTALLATION

The mobile antenna installation is limited to metal body motor vehicles or vehicles with appropriate ground planes.

Antennas mounted on the trunk should be located at least the following distance away from operator and passengers in order to comply with the FCC/IC RF exposure requirements. If can not meet these requirements, the antenna must be placed in the center of the roof.

### Required Distances

|  | LOW VHF Model | VHF Model | UHF Model |
|---|---|---|---|
| **FCC RF Exposure Requirements** | 3.87 Feet (1.08 m) | 3.28 Feet (1.00 m) | 2.54 Feet (0.77 m) |
| **IC RF Exposure Requirements** | 5.61 Feet (1.71 m) | 5.12 Feet (1.56 m) | 4.10 Feet (1.25 m) |

**Roof Top Mount**

**Trunk Lid Mount**

Should be located at the above distance or more.

If can not meet the above distance at the trunk lid mount, the antenna must be placed in the center of the roof.
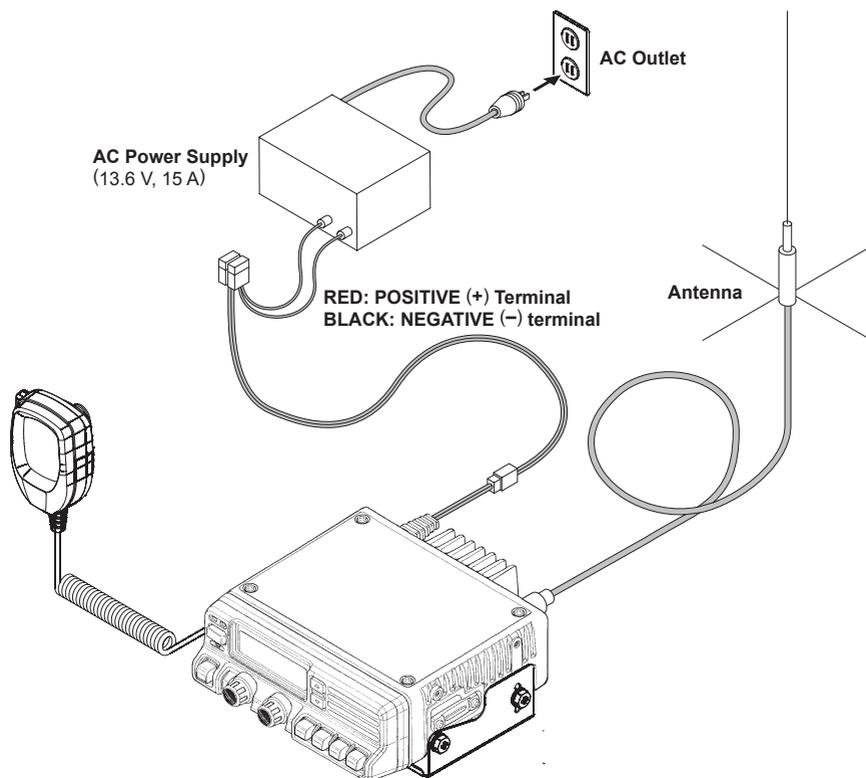
# INSTALLATION

## Base Station Installation

### POWER CONNECTION

Operation of the **VX-5500** transceiver from an AC line requires a power supply capable of providing at least 15 Amps continuously at 13.6 Volts DC. Please contact your dealer to select an optimal power supply that satisfy these requirements.

Use the supplied DC power cable for making power connections to the power supply. Connect the **RED** power cable lead to the **POSITIVE** (+) power supply terminal, and connect the **BLACK** power cable lead to the **NEGATIVE** (−) power supply terminal.

AC Outlet

AC Power Supply
(13.6 V, 15 A)

RED: POSITIVE (+) Terminal
BLACK: NEGATIVE (−) terminal

Antenna

# INSTALLATION

## ANTENNA INSTALLATION

When used the **VX-5500** transceiver as a base station, the antenna installation must comply with the following requirements in order to ensure optimal performance and compliance with the RF energy exposure limits in the standards and guidelines.

☐ The antenna should be mounted outside the building on the roof or a tower if at all possible.

☐ As with all fixed site antenna installations, it is the responsibility of the licensee to manage the site in accordance with applicable regulatory requirements and may require additional compliance actions such as site survey measurements, signage, and site access restrictions in order to insure that exposure limits are not exceeded.

# C&#x1D0F;NTROLS **&** C&#x1D0F;NNECTORS

## *Front Panel*
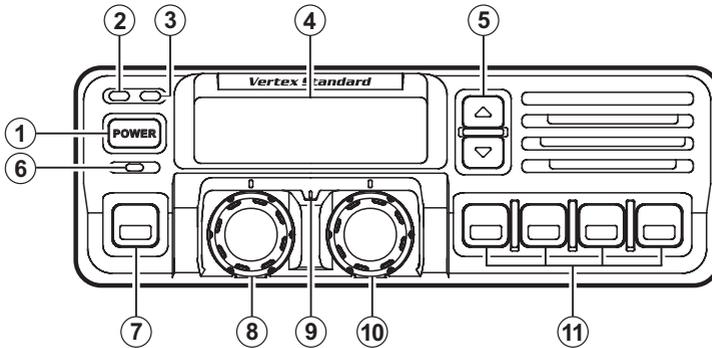


## ① **POWER Button**
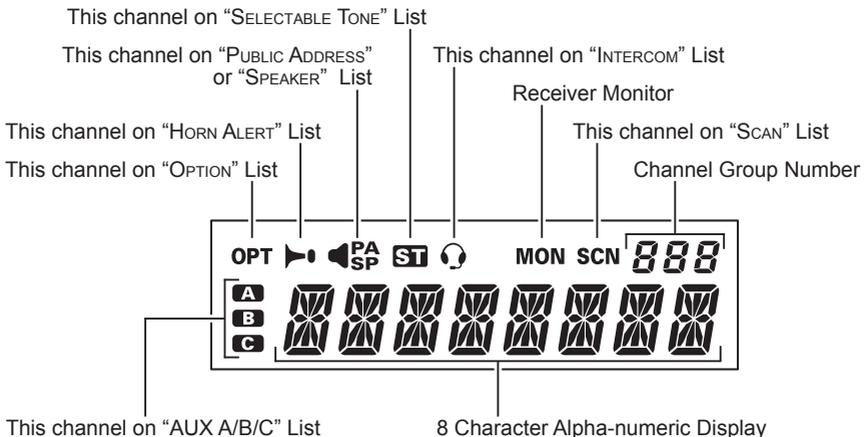Press the button to turn the transceiver ON and OFF.

## ② **TX Indicator**
This lamp glows red when the radio is transmitting.

## ③ **BUSY Indicator**
This lamp glows green when the channel is busy.

## ④ **Liquid Crystal Display**
The display include an 8-character alpha-numeric section showing channel and group names, status and identity information, and error messages. Additional indicators on the display show priority channel assignments and scan include/exclude selection.



This channel on "S&#x1D07;&#x029F;&#x1D07;&#x1D04;&#x1D1B;&#x1D00;&#x0299;&#x029F;&#x1D07; T&#x1D0F;&#x0274;&#x1D07;" List

This channel on "P&#x1D1C;&#x0299;&#x029F;&#x026A;&#x1D04; A&#x1D05;&#x1D05;&#x0280;&#x1D07;&#x0455;&#x0455;" or "S&#x1D18;&#x1D07;&#x1D00;&#x1D0B;&#x1D07;&#x0280;" List

This channel on "I&#x0274;&#x1D1B;&#x1D07;&#x0280;&#x1D04;&#x1D0F;&#x1D0D;" List

Receiver Monitor

This channel on "H&#x1D0F;&#x0280;&#x0274; A&#x029F;&#x1D07;&#x0280;&#x1D1B;" List

This channel on "S&#x1D04;&#x1D00;&#x0274;" List

This channel on "O&#x1D18;&#x1D1B;&#x026A;&#x1D0F;&#x0274;" List

Channel Group Number

This channel on "AUX A/B/C" List

8 Character Alpha-numeric Display

## ⑤ ▲/▼ Button

Pressing these buttons changes the current group (and displayed group number or name). Holding this button for more than 1/2 second causes the function to repeat.

## ⑥ SQC Indicator

This lamp glows orange when incorrect position at the setting of CE49.

## ⑦ Programmable Function Button (PF button)

This button can be set up for special applications, such as high/low power selection, monitor, dimmer, talk-around, and call alert function, as determined by your network requirements and programmed by your Vertex Standard dealer.

## ⑧ VOLUME Knob

This knob sets the volume of the receiver.

## ⑨ EMERGENCY Microphone

The emergency microphone is located behind this small slit. When the emergency feature is activated, this Microphone is enabled.

## ⑩ CHANNEL Selector Knob

This knob select the operating channel.

## ⑪ Programmable Function Button (PF button)

This button can be set up for special applications, such as high/low power selection, monitor, dimmer, talk-around, and call alert function, as determined by your network requirements and programmed by your Vertex Standard dealer.
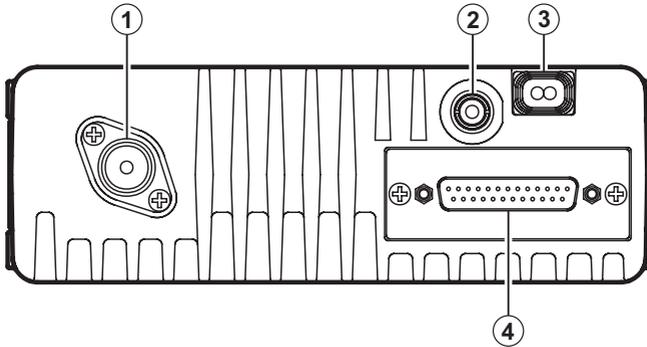
## *Side Panel*

**Microphone Jack** (It is on both sides.)

Connect the microphone plug to this jack.



**Microphone Jack**
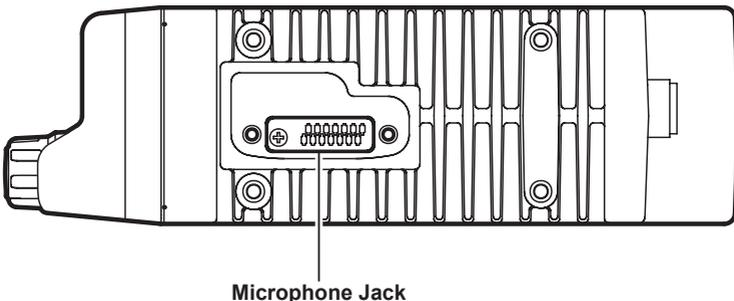
# Controls & Connectors

## *REAR (Heatsink)*



**① Antenna Socket**

The 50-ohm coaxial feedline to the antenna must be connected here, using a type-M (PL-259) plug.

**② External Speaker Jack**

An external loudspeaker may be connected to this 2-contact, 3.5-mm mini-phone jack.

*Caution: Do not connect this line to ground, and be certain that the speaker has adequate capability to handle the audio output from the VX-5500.*

**③ 13.8-V DC Cable Pigtail w/Connector**

The supplied DC power cable must be connected to this 2-pin connector. Use only the supplied fused cable, extended if necessary, for power connection.

**④ DSUB 25-Pin Accessory Connector**

External TX audio line input, PTT (Push To Talk), Squelch, and external RX audio line output signal may be obtained from this connector for use with accessories such as data transmission/reception modems, etc.

# Basic Operation of the Transceiver

**Important!** - Before turning on the radio the first time, confirm that the power connections have been made correctly and that a proper antenna is connected to the antenna jack.

## Switching Power ON/OFF

Push the **POWER** switch turn on the radio. The display will become illuminated. The radio will start up on the last channel used prior to shut-down during the previous operating session.

Turn the **CHANNEL** selector knob to choose the desired operating channel. A channel name will appear on the display. If you want to select the operating channel from a different Memory Channel Group, press the **UP** (▲) or **DOWN** (▼) button to select the Memory Channel Group you want before selecting the operating channel.

## Setting the Volume

Turn the **VOLUME** knob clockwise to increase the volume, and counterclockwise to decrease it. If no signal is present, press and hold in the **MON** button more than 1/2 seconds; background noise will now be heard, and you may use this to set the **VOLUME** knob for the desired audio level. Press and hold the **MON** button more than 1/2 seconds to quiet the noise and resume normal (quiet) monitoring.

## Transmitting

To transmit, wait until the "**BUSY**" indicator is off (the channel is not in use), and press the **PTT** (Push-To-Talk) switch on the side of the microphone (the "**TX**" indicator will appear or the "**TX**" indicator will glow red). While holding in the **PTT** switch, speak across the face of the microphone in a clear, normal voice level, and then release the **PTT** switch to receive.

## Selecting Groups and Channels

❍ Press the **UP** (▲) or **DOWN** (▼) button (repeatedly, if necessary) to select a different group of channels.

❍ Turn the **CHANNEL** selector knob to select a different channel *within the current group*.

## Automatic Time-Out Timer

If the selected channel has been programmed for automatic time-out, you must limit the length of each transmission. While transmitting, a beep will sound five seconds before time-out. Another beep will sound just before the deadline; the "**TX**" indicator will disappear and transmission will cease soon thereafter. To resume transmitting, you must release the **PTT** and wait for the "penalty timer" to expire (if you press the **PTT** before this timer expires, the timer restarts, and you will have to wait another "penalty" period).

# Basic Operation of the Transceiver

## ARTS™ (Auto Range Transpond System)

This system is designed to inform you when you and another ARTS™-equipped station are within communication range.

During ARTS™ operation, your radio automatically transmits for about 1 second every 25 (or 55) seconds (the interval is programmed by Dealer) in an attempt to Shake hands with the other station.

If you move out of range for more than one minutes, your radio senses that no signal has been received, a ringing beeper will sound. If you subsequently move back into range, as soon as the other station transmits, your beeper will sound.

# Advanced Operation

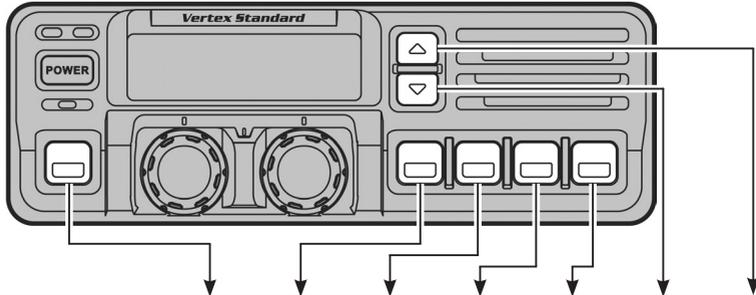## *Programmable Function Button (PF button)*

The **VX-5500** includes the seven Programmable Function Buttons (**PF** button). The **PF** button functions can be customized, via programming by your Vertex Standard dealer, to meet your communications/network requirements. Some features may require the purchase and installation of optional internal accessories.

To activate the primary Accessory function, press the **PF** button momentarily. To access the secondary Accessory function (which may include the Alarm), press and hold the **PF** button for 1.5 seconds or longer.

The possible **PF** button programming features are illustrated at the next page, and their functions are explained on page 20.

For further details, contact your Vertex Standard dealer. For future reference, check the box next to each function that has been assigned to the **PF** button on your particular radio, and keep it handy.

# ADVANCED OPERATION



| Functions | Programmable Function Button (PF Button) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec | <1.5 sec | >1.5 sec |
| None | | | | | | | | | | | | | | |
| Channel Scan (SCN) | | | | | | | | | | | | | | |
| Dual Watch | | | | | | | | | | | | | | |
| Call/Reset | | | | | | | | | | | | | | |
| Noise Blanker (NB)※1 | | | | | | | | | | | | | | |
| Talk-Around (TA) | | | | | | | | | | | | | | |
| Alpha Numeric (A/N) | | | | | | | | | | | | | | |
| DIMMER (DIM) | | | | | | | | | | | | | | |
| Emergency (EMG) | | | | | | | | | | | | | | |
| Horn Alert (HA) | | | | | | | | | | | | | | |
| Home Channel (HOM) | | | | | | | | | | | | | | |
| Intercom (IC) | | | | | | | | | | | | | | |
| Low Power (LOW) | | | | | | | | | | | | | | |
| Group Up (GRP UP) | | | | | | | | | | | | | | |
| Group Down (GRP DWN) | | | | | | | | | | | | | | |
| Channel Up (CH UP) | | | | | | | | | | | | | | |
| Channel Down (CH DWN) | | | | | | | | | | | | | | |
| AUX A | | | | | | | | | | | | | | |
| AUX B | | | | | | | | | | | | | | |
| AUX C | | | | | | | | | | | | | | |
| Public Address (PA) | | | | | | | | | | | | | | |
| Monitor (MON) | | | | | | | | | | | | | | |
| Channel Recall (RCL) | | | | | | | | | | | | | | |
| Selectable Tone (ST) | | | | | | | | | | | | | | |
| Speaker (SP)※2 | | | | | | | | | | | | | | |
| Squelch Level (SQL) | | | | | | | | | | | | | | |
| Compander (COMP) | | | | | | | | | | | | | | |
| Encryption (OPT)※3 | | | | | | | | | | | | | | |

※1: for VX-5500L
※2: requires RMK-4000
※3: requires Encryption Unit

# ADVANCED OPERATION

## Channel Scan (SCN)

The Scanning feature is used to monitor multiple signals programmed into the transceiver. While scanning, the transceiver will check each channel for the presence of a signal, and will stop on a channel if a signal is present.

**To activate scanning**:
- ❍ Press the assigned **PF** button of the "**Scan**" momentarily to activate scanning.
- ❍ The scanner will search the channels, looking for active ones; it will pause each time it finds a channel on which someone is speaking.

**To stop scanning**
- ❍ Press the assigned **PF** button of the "**Scan**".
- ❍ Operation will revert to the channel to which the **CHANNEL** selector knob is set.
  - *Note*: Your dealer may have programmed your radio to stay on one of the following channels if you press the **PTT** switch during scanning pause:
    - ❒ Current channel ("Talk Back")
    - ❒ "Last Busy" channel
    - ❒ "Priority" channel
    - ❒ "Home" channel
    - ❒ "Scan Start" channel

## Dual Watch

The Dual Watch feature is similar to the Scan feature, except that only two channels are monitored:
- ❒ The current operating channel; and
- ❒ The "Priority" channel.

**To activate Dual Watch:**
- ❍ Press the assigned **PF** button of the "**Dual Watch**".
- ❍ The scanner will search the two channels; it will pause each time it finds a channel on which someone is speaking.

**To stop Dual Watch:**
- ❍ Press the assigned **PF** button of the "**Dual Watch**".
- ❍ Operation will revert to the channel to which the **CHANNEL** selector knob is set.

## Call/Reset

When this feature is programmed and a selective call has been received, momentarily press the assigned **PF** button of the "**Call/Reset**" to reset the flashing indicator and mute the receiver, otherwise press the assigned **PF** button of the "**Call/Reset**" to sent your radio's identification code (ANI) to the dispatcher.

## Noise Blanker (NB)

Because local noise can be particularly troublesome in the VHF Low-Band frequency spectrum, the Low-Band version of the **VX-5500** includes a Noise Blanker feature, which may be toggled on and off by pressing the assigned **PF** button of the "**Noise Blanker**" for the appropriate length of time.

# ADVANCED OPERATION

## Talk-Around (TA)

The feature causes the assigned **PF** button of the "**Talk-Around**" to select simplex operation on semi-duplex channels: the transmit frequency becomes the same as the receive frequency (regardless of any programmed offset for the channel).

*Note*: *This feature has no effect on simplex channels. After pressing the button,* "**-TAKARD-**" *is displayed on the LCD.*

## Alpha Numeric (A/N)

Press the assigned **PF** button of the "**Alpha Numeric**" to switch the display between the Group/Channel number, and the Group/Channel name (alphanumeric). A tone will sound each time you switch between numerical and alphanumerical display.

## DIMMER (DIM)

Press the assigned **PF** button of the "**DIM**" to adjust the brightness of the display and key backright.

## Emergency (EMG)

Press the assigned **PF** button of the "**EMG**" to initiate an emergency call (requires ANI board). When an emergency call is made, not tone is emitted and the display does not change. To end the emergency call, turn the transceiver power OFF.

## Horn Alert (HA)

Press the assigned **PF** button of the "**HA**" to turn the Horn Alert function ON or OFF. If you receive a call from the base station with 2-Tone or DTMF signaling, horn alert will activate.

When you turn Horn Alert ON, a tone will sound and "▶•" appears on the display.

## Home Channel (HOM)

Press the assigned **PF** button of the "**Home**" to select the pre-programmed Home Channel. Press it again to return to the previous channel. If used while scanning, pressing this key a second time will change to the revert channel.

## Intercom (IC)

This feature requires dual head configuration. Press the assigned **PF** button of the "**IC**" to turn the intercom feature ON or OFF. While ON, you can press the **PTT** switch to communicate to another control head operator without transmitting over the air. When you press this key, a tone sounds and "🎧" appears on the display. The intercom can be used even while scanning and receiving a call

## Low Power (LOW)

Press the assigned **PF** button of the "**Low Power**" to set the radio's transmitter to the "Low Power" mode.

Press this key again to return to "High Power" operation when in difficult terrain.

# ADVANCED OPERATION

## Group Up/Down (GRP UP/DWN)

Press the assigned **PF** button of the "**GRP UP**" or "**GRP DWN**" to select a different group of channels.

## Channel Up/Down (CH UP/DWN)

Press the assigned **PF** button of the "**CH UP**" or "**CH DWN**" to select a different channel within the current group.

## AUX A/B/C

Press the assigned **PF** button of the "**AUX A**", "**AUX B**", or "**AUX C**" to turn the output port (respectively).

## Public Address (PA)

Press the assigned **PF** button of the "**PA**" to use the transceiver as a PA amplifier. When you enable this function, a tone sounds and "◀**PA**" appears on the display. The public address can be used even while scanning and receiving a call.

## Monitor (MON)

Press the assigned **PF** button of the "**MONI**" momentarily to cancel CTCSS and DCS signaling squelch; the "**MON**" icon appears on the display. Press and hold this key for 1/2 seconds to hear background noise (unmute the audio); the **MON** icon blinks on the display.

## Channel Recall (RCL)

During scan, you can press the assigned **PF** button of the "**RCL**" to select the last called channel.

## Selectable Tone (ST)

Press the assigned **PF** button of the "**Selectable Tone**", then rotate the **CHANNEL** selector knob to select a 2-Tone.

## Speaker (SP)

Press the assigned **PF** button of the "**SP**" to switch "Front panel", "Front panel & Body" and "Body" speaker. When "Body" is selected, a tone sounds and the "◀**SP**" icon appears on the display. You can use this function while scanning and receiving a call. However, all audio will be emitted from the PA speaker.

## Squelch Level (SQL)

You can manually adjust the squelch level using this function:
1.  Press the assigned **PF** button of the "**SQL**". A tone sounds and "**SQL**" appears on the display with the current squelch level.
2.  Rotate the **CHANNEL** selector knob to select the desired level.
3.  Press the this key. A tone sounds and the display returns to the normal channel.

# ADVANCED OPERATION

## Compander (COMP)

Press the **PF** button assigned to the "**COMP**" function to turn the "Compander" IC ON or OFF.

This IC contains two variable gain circuits configured for compressing and expanding the dynamic range of the radio's transmitted and received audio signal.

When you enable this function, the signal-to-noise radio can be improved by reducing the transmitted audio dynamic range.

## Encryption (OPT)

When the Voice Scrambler feature is enabled, pressing the assigned **PF** button of the "**Encryption**" toggles the Scrambler on and off.

# OPTIONAL ACCESSORIES

| | |
|---|---|
| **MH-53C7A** | Heavy Duty Microphone |
| **MH-53A7A** | Heavy Duty Microphone w/Noise Canceler |
| **MH-53B7A** | Heavy Duty DTMF Microphone w/Noise Canceler |
| **MD-12A7A** | Desktop Microphone |
| **CNT-6000** | Control Head |
| **BSC-5000** | Base Station Console |
| **RF DECK** | RF Deck w/MMB-75 (for Dual Band Installations) |
| **RMK-4000SH** | Remote Kit (for Single Transceiver) |
| **RMK-4000DH** | Remote Kit (for Dual-Head Installations) |
| **RMK-4000DB** | Remote Kit (for Dual Band Installations) |
| **RMK-4000DBH** | Remote Kit (for Dual Band plus Dual Head Installations) |
| **CT-93** | Cable for RMK-4000 (33 ft, 10 m) |
| **CT-81** | Cable for RMK-4000 (20 ft, 6 m) |
| **CT-82** | Cable for RMK-4000 (8 ft, 2.5 m) |
| **CT-83** | Cable for RMK-4000 (2 ft, 0.6 m) |
| **F2D-8** | 2-Tone Decode Unit (Requires FIF-7A) |
| **FVP-25** | Voice Inversion Encryption/DTMF pager Unit (Requires FIF-7A) |
| **FVP-35** | Rolling Code Encryption Unit (Requires FIF-7A) |
| **FVP-36** | Voice Inversion Encryption Unit (Requires FIF-7A) |
| **VME-100** | MDC1200®, GE-Star® Encoder Unit (Requires FIF-7A) |
| **MLS-100** | External Speaker (12 W Peak Power) |
| **MLS-200** | Waterproof External Speaker (12 W Peak Power) |
| **MMB-75** | Mobile Mounting Bracket |
| **MMB-76** | Locking Mobile Mounting Bracket |
| **FIF-7A** | Inter face Board (for F2D-8, FVP-25/-35/-36, VME-100) |
| **CN-6** | Inter face Board (for Accessories) |
| **LF-1** | Line Filter |
| **CE49** | Programming Software |
| **FIF-12** | USB Programming Interface |
| **CT-71** | Radio to PC Programming Cable |
| **CT-72** | Radio to Radio Programming Cable |
| **CT-105** | Radio Programming Cable (for FIF-12) |

*Availability of accessories may vary; some accessories are supplied standard per local requirements, others may be unavailable in some regions.*

*Check with your Vertex Standard Dealer for changes to this list.*

# WARRANTY POLICY

Vertex Standard warrants, to the original purchaser only, its Vertex Standard manufactured communications products against defects in materials and workmanship under normal use and service for a given period of time from the date of purchase.

Limited Warranty Details:
• North America customers (USA and Canada):
     http://www.vertexstandard.com/lmr/warranty-terms.aspx
• Customers outside of North America:
     Contact the authorized dealer in your country.

**Vertex Standard**

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