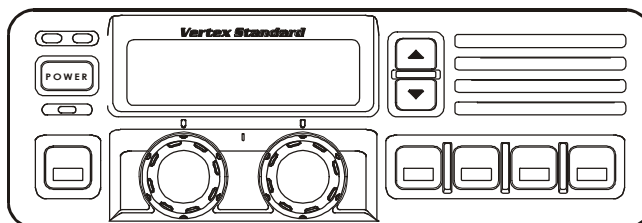


 **Vertex Standard**

VX-4000

OPERATING MANUAL MANUAL DE OPERACIÓN



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Congratulations!

You now have at your fingertips a valuable communications tool - a **vertex** two-way radio! Rugged, reliable and easy to use, your **vertex** 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** team. Call on us any time, because our business is communications. Let us help you get your message across.

NOTICE

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

Safety / Warning Information

WARNING - DO NOT operate the VX-4000L radio when someone (bystanders) outside the vehicle is within 47 inches (1.2 meter) of the antenna.

Safety Training information:

Antennas used for this transmitter must not exceed an antenna gain of 0 dBd. The radio must be used in vehicle-mount configurations with a maximum operating duty factor not exceeding 50%, in typical Push-to-Talk configurations.

This radio is restricted to occupational use, work related operations only where the radio operator must have the knowledge to control the exposure conditions of its passengers and bystanders by maintaining the minimum separation distance of 47 inches (1.2 m).

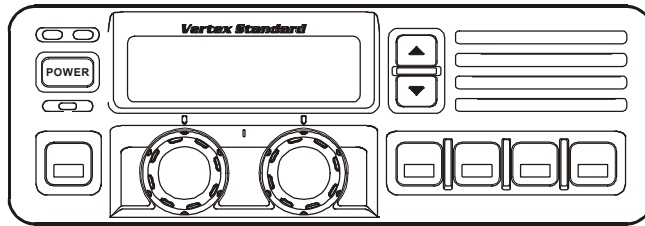
Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.

Antenna Installation:

For rear deck trunk installation, the antenna must be located at least 47 inches (1.2 m) away from rear seat passengers in order to comply with the FCC RF exposure requirements.

For roof top installation, the antenna must be placed in the center of the roof.

VX-4000 Operating Manual



The VX-4000 Series are full-featured FM transceivers designed for flexible mobile and base station business communications in the VHF Low-Band (60/25 Watts: programmable), VHF High-Band (50/25 Watts: programmable) and UHF (40/25 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. A 39-tone programmable CTCSS encoder/decoder is built in as standard.

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 CE35 Software.

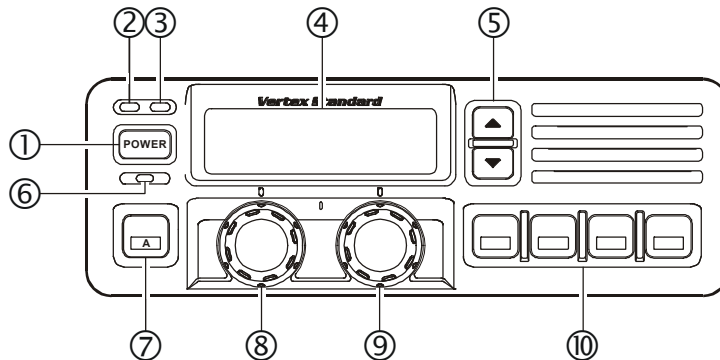
Special built-in features include:

- The 250-channels memories can each be programmed with a 8-character channel name.
- CTCSS (Continuous Tone Coded Squelch System);
- DCS (Digitally Coded Squelch);
- Extensive Selective Calling selections; and
- Two sets of scanning channels, one set preset by the dealer and another which is operator-selectable.

The pages which follow will detail the many advanced features provided on the VX-4000 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.

Controls & Connectors

Front Panel



① **PWR 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.

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 **HOME Indicator**

This lamp glows orange when incorrect position at the setting of CE35.

⑦ **Programmable Function 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.

The default function is set as **Dimmer Button**.

⑧ **VOLUME Knob**

This knob sets the volume of the receiver.

⑨ **CHANNEL Selector Knob**

This knob select the operating channel.

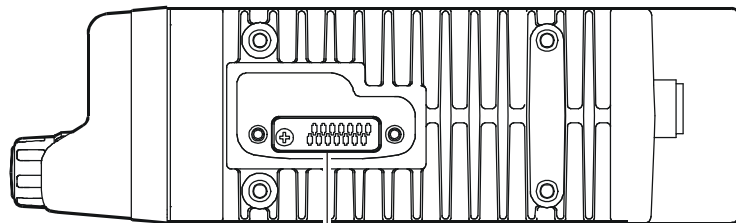
⑩ **Programmable Function Button**

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.)

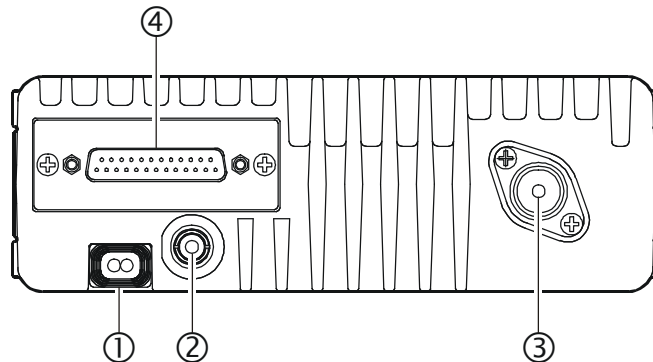
Connect the microphone plug to this jack.



Microphone Jack

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REAR (Heatsink)



① **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.

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-4000.

③ **Antenna Cable with Connector**

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

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.

The display should show either a channel number or scan mode indicator (**DSC**, **USC**, **GDS**, **GUS**, **PDS**, **PUS**, **DDW** or **UDW**). If "ERR" is displayed instead, the transceiver has not yet been programmed with channel frequencies; switch off the power and contact your network administrator or VERTEX STANDARD dealer. If a scan mode indicator is displayed, you can press the **SCAN** button to display a channel number, and then press either the **UP** (**▲**) or **DOWN** (**▼**) button to change channels.

Setting the Volume

Turn the **VOL** knob clockwise to increase the volume, and counterclockwise to decrease it.

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.

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).

Selecting Groups and Channels

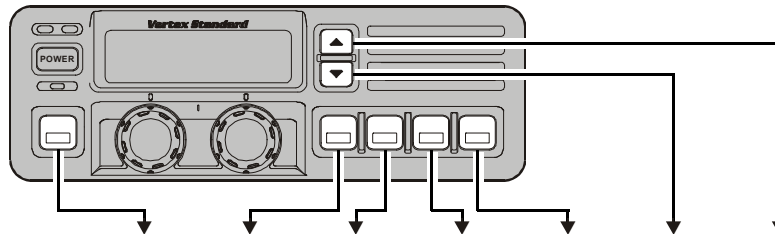
- Press the **UP** (**▲**) or **DOWN** (**▼**) button (repeatedly, if necessary) to select a different group of channels.
- Turn the CHANNEL selector knob to select a different channel *within the current group*.

Advanced Operation

Programmable Function Button

The VX-4000 includes the seven **Programmable Function Buttons**. The **Programmable Function 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. The possible **Programmable Function Button** programming features are illustrated at the below, and their functions are explained on page ?.

For further details, contact your VERTEX STANDARD dealer. For future reference, check the box next to each function that has been assigned to the **Programmable Function Button** on your particular radio, and keep it handy.



Functions	Programmable Function Button						
None							
Call/Reset							
Talk-Around							
Noise Blanker							
Alpha Numeric							
DIM							
EMG							
HA							
Home							
IC							
MONI							
NB							
GRP UP/DWN							
CH UP/DWN							
PA							
SCAN							
SP*							
SQL							
Encryption**							

* requires YSK-4000

** requires Encryption Unit

Scanning Modes

There are eight scanning modes, described in the list below. Each channel can be independently enabled or disabled for scanning; only channels selected for scanning within the enabled group are scanned. Also, as mentioned before, each group can have up to two priority channels which are scanned more often than the non-priority channels.

The SCAN modes and their corresponding displays are as follows:

Display	Scanning Function
DSC	Dealer Scan (only within the current group)
USC	User Scan: only user-selected channels (only within the current group)
GDS	Group Dealer Scan: scan all Dealer-selected channels in all groups
GUS	Group User Scan: scan all User-selected channels in all groups
PDS	Priority Dealer Scan: DSC plus priority channel(s)
PUS	Priority User Scan: USC plus user priority channel(s)
DDW	Dealer Dual Watch: Monitor one channel and priority channel(s)
UDW	User Dual Watch: Monitor User-selected channel and priority channel(s)

Scanning Operation

With the microphone in its hanger, press the assigned **Programmable Function Button** of the “**SCAN**” momentarily to activate scanning. Typically, “**DSC**” will initially appear on the display, indicating Dealer Channel Scan as the scanning mode. If you wish to change to one of the modes described in the list above, press the assigned **Programmable Function Button** of the “**SEL**” button repeatedly until that mode appears on the display.

If you pick up the microphone while no signal is being received, operation will shift to a particular channel. Which channel that will be depends on which of the following options the dealer has programmed for off-hook channel selection:

Scan Start Channel

Lifting the microphone causes operation to revert to the group and channel last selected before scanning started or resumed.

Priority Revert

Lifting the microphone activates the Priority 1 channel in the current group. If no channel is assigned level 1 priority, operation will be on the Priority 2 channel. If no priority channels have been assigned, operation reverts to the Scan Start Channel.

Last Busy

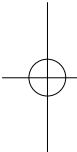
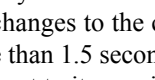
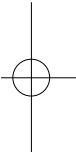
Lifting the microphone causes operation to revert to the group and channel where activity was last detected. If no activity was detected since turning on the radio, operation reverts to the Scan Start Channel.



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How to Select Channels to be Scanned

If your radio has been configured by your Dealer to allow you, the operator, to make changes to the list of channels to be scanned, you can make these changes by following this simple process:

- ① Press and hold in the **SEL** button; while holding this button in, press the POWER button to turn the radio on. You may now release the **??** button.
 - ② Press the **??** button, as necessary, until the Memory Group and Memory Channel numbers will appear in small characters in the right side of the display area.
 - ③ You may now push the **??** key momentarily as many times as necessary to choose the Memory Group within which you wish to make changes to the channel scan list. Once you have selected the desired Memory Group, you may use the **UP (▲)** or **DOWN (▼)** button to choose a particular channel within the current group. Pressing the **??** button will change the scanning status of the selected channel. If you are adding the channel to those you wish to scan, pressing the **??** button causes a “U” appear on the display, indicating that the channel has been added to the User Scan List. If you are deleting the channel from the User Scan List (the channel's data itself will not be deleted; the channel just will not be scanned), the “U” will disappear.
 - ④ Repeat step 3 for each channel you wish to enable or disable for scanning.
 - ⑤ When you are done making changes to the channels you wish to scan, press and hold in the **??** button for more than 1.5 second. Operation will return to its normal status, and the display will revert to its previous appearance.
- 
- 
- 

How to Change the “User Priority” Channels

Your Dealer may have configured your radio so as to allow you to make changes to the “User Priority” Channels (the channels you designate to be scanned more frequently than the others). The selection process is almost identical to that used for making changes to the User Scan List.

- ① Turn the transceiver OFF by press the **POWER** button.
- ② Press and hold in the **??** button; while holding this button in, press the **POWER** button to turn the radio on. You may now release the **??** button.
- ③ Press the **??** button, as necessary, until the Memory Group and Memory Channel numbers will appear in *large* characters in the *right side* of the display area (as compared to small characters in the case of changes to the Scan List).
- ④ You may now push the **??** button momentarily as many times as necessary to choose the Memory Group within which you wish to make changes to the User Priority Channel(s). Once you have selected the desired Memory Group, you may use the **UP** (**▲**) or **DOWN** (**▼**) button to choose a particular channel within the current group.

Pressing the **??** button will change/assign the Priority status of the selected channel.

If you are assigning the channel to Priority status, pressing the **??** button causes “**Pr1**” or “**Pr2**” to flash on the display, indicating that the channel has been assigned the status of **Priority 1** or **Priority 2**, respectively. Pressing the **??** button repeatedly toggles the Priority Level between “1” and “2.” If you are deleting the channel from Priority status, the “**Prn**” indicator will disappear.

- ⑤ Repeat step 4 for each channel you wish to assign to or delete from Priority status.
- ⑥ When you are done making changes to the Priority Channels, press and hold in the **??** button for more than 1.5 second. Operation will return to its normal status, and the display will revert to its previous appearance.



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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.

The A Button Function

The A (Accessory) button can be programmed by the dealer to provide two of the other functions described below.

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



Call/Reset

When this feature is programmed and a selective call has been received, momentarily press the **A** button to reset the flashing indicator and mute the receiver, otherwise press the **A** button to sent your radio’s identification code (ANI) to the dispatcher.

Talk-Around

The feature causes the A button 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, “TA” is displayed on the LCD.*

Noise Blanker

Because local noise can be particularly troublesome in the VHF Low-Band frequency spectrum, the Low-Band version of the VX-4000 includes a Noise Blanker feature, which may be toggled on and off by pressing the **A** button for the appropriate length of time.

Alpha Numeric

Press this key 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 alphanumeric display.

DIM

Press this key to adjust the brightness of the display and key backlight.

EMG (Emergency)

Press this key to initiate an emergency call (requires ANI board). When an emergency call is made, no tone is emitted and the display does not change. To end the emergency call, turn the transceiver power OFF.

HA (Horn Alert)

Press this key to turn the Horn Alert function ON or OFF. If you receive a call from the base station with 2Tone or DTMF signaling, horn alert will activate.

When you turn Horn Alert ON, a tone will sound and “**HA**” appears on the display.

Home (Home Channel)

Press this key 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.

IC (Intercom)

This feature requires dual head configuration. Press this key 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 “**INTERCOM**” appears on the display. The intercom can be used even while scanning and receiving a call.

MONI (Monitor)

Press this key 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.

GRP UP/DWN

Press this key to select a different group of channels.

CH UP/DWN

Press this key to select a different channel within the current group.

PA (Public Address)

Press this key 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.

SCAN

Press this key to start or stop the scanning sequence.

SP

Press this key 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.

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SQL (Squelch Level)

You can manually adjust the squelch level using this function:

1. Press the this key. A tone sounds and SQL appears on the display with the current squelch level.
2. Rotate the DIAL knob to select the desired level.
3. Press the this key. A tone sounds and the display returns to the normal channel.

Encryption (Option)

When the Voice Scrambler feature is enabled, pressing the **A** button toggles the Scrambler on and off.

Optional Accessories

MH-25_{B7A}	Hand Microphone
MH-53_{A7A}	Hand Microphone (Noise Canceling)
MH-53_{B7A}	DTMF Keypad Microphone (Noise Canceling)
CE35	Programming Software (for IBM PC/compatibles only)
CT-71	PC Programming Cable (CT-29 + CT-70)
CT-72	Cloning Cable
FP-1023	Heavy-Duty (23A) AC Power Supply
MLS-100	External Loudspeaker
MMB-76	
LF-1	DC Line Filter
F2D-9	2-Tone / DTMF
VTP-60	VX-Trunk Unit
YSK-4000	Separation Kit



This device complies with Part 15 of the FCC rules.
Operation is subject to the condition that this device
does not cause harmful interference.





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