

VX-4204 Operating Manual

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 downtime.

Please take a few minutes to read this manual carefully. The information presented here will allow you to derive maximum performance from your radio, in case questions arise later on.

We're glad you joined the VERTEX STANDARD team. Call on us anytime, because communications is our business. Let us help you get your message across.

Notice !

There are no owner-serviceable parts inside the transceiver. All service jobs must be referred to an authorized VERTEX STANDARD Service Representative. Consult your Authorized VERTEX STANDARD Dealer for installation of optional accessories.

Safety/Warning Information

WARNING - DO NOT operate the VX-4200 radio when any person(s) (bystanders) outside the vehicle are within the distances shown in the chart at the bottom of this section.

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 25%, 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 shown below.

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 the following distance away from rear-seat passengers in order to comply with the FCC RF exposure requirements.

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

Introduction

The VX-4200 Series are full-featured FM transceivers designed for flexible mobile and base station business communications in the VHF or UHF Land Mobile bands. These transceiver are designed for reliable business communications in a wide variety of applications with a wide range of operating capability provided by their leading-edge design.

The 501-channel memories can each be programmed with a 12-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 VPL-1 Programming Cable and CE59 Software.

The pages which follow will detail the many advanced features provided on the VX-4200 Series 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

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.

Controls & Connectors

Front Panel

Important! - All buttons located on the Front Panel are Programmable Function (PF) Buttons, configured according to your network requirements and programmed by your VERTEX STANDARD dealer. The instructions below a typically-configured radio.

1. [xxx] Button
Press the [xxx] button more than 2 seconds to turn the radio on. Press it again more than 2 seconds to turn the radio off.
2. VOL Knob
Turn this control clockwise to increase the volume.
3. BUSY/TX Indicator
Indicate transceiver Transmit/Receive Status
Steady Red: Transmitting in progress
Steady Green: Busy Channel
Blinking Green: Tone Squelch in defeated condition
4. LCD (Liquid Crystal Display)
The display includes 3-character numeric section showing various statuses, and 12-character alphanumeric section showing Group and Channel name tag and identity information, and error messages etc.
5. [0]/[π] Buttons (Programmable Function Buttons)
Pressing either button changes the current channel (and displayed channel number or name). **Holding a button for more than 1/2 second causes the function to repeat.**
6. Microphone Jack
Connect the microphone plug to this jack.
7. [A] Button (Programmable Function Button)
This button can be set up for special applications, such as High/Low power selection, Monitor, Talk-Around, etc, as determined by your network requirements and programmed by your VERTEX STANDARD dealer.
8. [P1] - [P4] Buttons (Programmable Function Buttons)
These buttons can be set up for special applications, such as High/Low power selection, Monitor, Talk-Around, etc, as determined by your network requirements and programmed by your VERTEX STANDARD dealer.

Rear Panel

1. Antenna Socket
The 50-Ohm coaxial feedline to the antenna must be connected here, using a type-M (PL-259) plug.
2. 13.6V DC Cable Pigtail with 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.
3. External Speaker Jack
An external loudspeaker may be connected to this 2-contact, 3.5-mm mini-phone jack.
Caution: Do not connect either wire of this line to ground, and be certain that the speaker has adequate capability to handle the audio output (12 W) from the radio.
4. D-Sub 15-Pin Accessory Connector
External TX audio line input, PTT (Push To Talk), Squelch, and external RX audio line output signals may be obtained from this connector for use with accessories such as data transmission/reception modems, and external Channel control input 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

- Press the PWR button to turn the radio on. The display will become illuminated.
- Press the [0]/[π] button to choose the desired operating channel. A channel name will appear on the display. If you want to select an operating channel from a different group, press the pre-defined Group Up/Down button to select the group you want before selecting the operating channel.

Setting the Volume

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

Transmitting

- To transmit, monitor the channel and make sure it is clear.
THIS IS AN FCC REQUIRMENT!
- Press the PF button which is programmed to the Monitor feature to listen for channel activity.
- When receiving a call, transmit only after the incoming call ends. The radio cannot receive a call and transmit simultaneously.
- Press the PTT switch.
- If the channel is clear, the BUSY/TX indicator will glow red. The radio is now transmitting. While holding in the PTT switch, speak across the face of the microphone in a clear and normal voice. For best transmission, hold the microphone about 1-1/2 to 2 inches away from your mouth. Release the PTT switch to receive.
- If the Busy Channel Lockout feature has been programmed on a channel, the radio will not transmit when a carrier is present. Instead, the radio will generate short beep three times and indicate * ERROR * on the display. Release the PTT switch

- and wait for the channel to be clear of activity.
- If CTCSS or Digital Coded Squelch (DCS) Lockout has been programmed on a channel, the radio can transmit only when there is no carrier being received or when the carrier being received includes the correct CTCSS tone or DCS code.

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 10 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 switch and wait for the “penalty timer” to expire (if you press the PTT switch before this timer expires, the timer restarts, and you will have to wait another “penalty” period)

Advanced Operation

Programmable Function (PF) Buttons

The VX-4200 Series includes seven Programmable Function (PF) Buttons. 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. The possible PF button programming features are illustrated below, and these functions are explained on the pages to follow.

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

Programmable Functions

MONI
DIMMER
SCAN
DW (Dual Watch)
Follow-Me SCAN
Follow-Me DW
LOW
TA (Talk Around)
TX SAVE Disable
Encryption Disable *
Channel Up
Channel Down
Group Up
Group Down
CALL/RESET
CALL 1 to Call 5
Code Up/Down
Code SET
Speed Dial
HOME
Selectable Tone
Horn Alert
Public Address
Key Lock
EXT. ACC1

EXT. ACC2
Direct CH#1
Direct CH#2
Direct CH#3
Direct CH#4
REC/PLAY *
AF ATT

* needs optional unit

Description of Operating Functions

Monitor

Press the assigned programmable key to cancel CTCSS- and DCS-controlled squelch; the BUSY/TX indicator will blink green. Press and hold this button for 1.5 seconds to hear background noise (unmute the audio); the BUSY/TX indicator will glow green.

Channel Up/Down

Press the assigned programmable key (generally the [θ]/[π] button) to select a different channel within the current group.

Channel Scan

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 programmable key to activate scanning.
- The scanner will search the channels of each channel, looking for active ones; it will pause each time it finds a channel on which someone is speaking.
- Press the assigned programmable key again to disable scanning. Operation will revert to the programmed revert channel.

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 programmable key.
- 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 programmable key.
- Operation will revert to the “Dual Watch Start” channel.

Talk Around (TA)

Press the assigned programmable key to activate the Talk Around feature when you are operating on duplex channel systems (separate receive and transmit frequencies, utilizing a “repeater” station). The Talk Around feature allows you to bypass the repeater station and talk directly to a station that is nearby. This feature has no effect when you are operating on “simplex” channels, where the receive and transmit frequencies are already the same.

When the “TA” function is activated, the “TA Icon” will be indicated on the display.

Note that your dealer may have mode provision for “Talk Around” channels by programming “repeater” and “Talk Around” frequencies on two adjacent channels. If so, the key may be used for one of the other Pre-Programmed Functions.

Low Power

Press the assigned programmable key to set the radio’s transmitter to the “Low Power” mode, thus extending battery life. Press the key again to return to “High Power” operation when in difficult terrain.

Horn Alert

Press the assigned programmable key to turn the Horn Alert function ON or OFF. If you receive a call from the base station with 2Tone, 5Tone or DTMF signaling, horn alert will be activated.

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

Home Channel

Press the assigned programmable key to recall the pre-defined Home group/channel. When you recall the Home group/channel, the “H” will appear on the LCD.

Public Address (PA)

Press the assigned programmable key to use the transceiver as a PA amplifier. When you enable this function, a tone sounds and “Public ADRS” will appear on the display. The public address can be used even while scanning and receiving a call.

Selectable Tone

Press the assigned programmable key to select a sub-audible tone (CTCSS/DCS) from the pre-defined tone table. You can operate the indicated sub-audible tone in Selectable Tone mode.

Call 1 to Call 5

Press the assigned programmable key to send a 5tone sequential which is pre-defined.

Code Up/Down

Press the assigned programmable key to select a 5tone encode code from pre-defined encode list.

Code Set

Press the assigned programmable key to change the encode digit of 5tone. To change the specific digit, select the desired digit by “P1” or “P2”, change the number by Up/Down key.

Emergency

The VX-4200 series include an “Emergency” feature which may be useful if you have someone monitoring on the same frequency as your transceiver’s channel. Press the assigned programmable key to initiate an emergency call. For further details contact your VERTEX STANDARD dealer.

Encryption (Option)

When the Voice Scrambler feature is enabled, pressing the assigned programmable key to toggle the voice encryption on and off.

Sub-Band Receive (Option)

This function is able to use only when the radio is installed Sub-Band Receiving Unit (Option). To install the Sub-Band unit makes the radio unit to have ability "cross band operation" on each operation channel.

Voice Recording (Option)

This function is able to record the received voice message and to play back the recorded audio. It needs to install Optional Voice Recording Unit.

Recording;

Press the assigned programmable key (Rec/Play) more than 1.5 seconds to enable the Voice Recording Mode. If the incoming carrier has a condition to unmute audio, then the “Message Icon” will flash and received audio will be recorded. When the voice recording is completed, the “Message Icon” stays on.

Playback;

Press the Rec/Play key, Playback will start. While playback is proceeding, press the Up key forwards 8seconds and the Down key turns back 8 seconds. To stop the playback, play the stored message is finished or press the “A” key.

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, when the radio receives correct ARTS signal, a short beep will sound and the “In” (means In Service) will be displayed on the sub-LCD. If you move out of range for more than two minutes, your radio senses that no signal has been received; a three times of short beep will sound, and “Out” (means Out of Service) will be displayed on the sub-LCD. If you subsequently move back into range, as soon as the other station transmits, a short beep will sound and “In” will be displayed again on the sub-LCD.

DTMF Paging System

This system allows paging and selective calling, using DTMF tone sequences.

When your radio is paged by a station bearing a tone sequence which matches yours, your radio’s squelch will open and the alert will sound. The three-digit code of the station which paged you will be displayed on your radio’s LCD.

User Set Mode

The VX-4200 Series have the “User Set Mode” which the user is able to define various settings, for example, Beep On/Off, Squelch, LCD contrast and/or Dimmer.

Press the assigned key to enter the “User Set Mode”, select the item you want change by “P1” or “P2” key, then you can select the status of the item by Up/Down key. Press the

“P1” or “P2” key to store the changed condition.
 Press “A” key to exit the “User Set Mode”.

	Display	Description
1	SQL	Select Squelch Level
2	SCN List	Select Scan List “User” or “Dealer”
3	BEEP	Set the Beep On/Off
4	BELL	Set the Bell On/Off (called sound by sub-audio CTCSS/DCS)
5	Lighting	Set the Busy/Tx LED On/Off
6	Lock	Set the Lock function to be Locked (Key/PTT/Key+PTT)
7	Group	Set the Operation Group
8	SCAN	Set the Scan status (same function as Scan key)
9	DW	Set the Dual Watch status (same function as DW key)
10	TA	Set the Talk Around status (same function as TA key)
11	Encrypt	ENB: temporal encryption off DIS: encryption on
12	AF MinVR	Set the minimum volume level
13	Beep VR	Set the Beep volume level
14	Contrast	Set the LCD contrast
15	Dimmer	Set the brightness of key and LCD back light
16	REC Mode	ONE: enables to record One message (max 120 seconds), and playback from beginning of the message. ROL: enables to record with the audio unmute condition, and playback from the last 120 seconds.
17	PlayMode	Set the priority audio on playback mode. PLY: playback is higher priority than received signal SIG: received signal is higher priority than playback audio

Note;

The menu “16: REC Mode” and “17: PlayMode” will appear only when the Voice recording Unit is installed.

When you set the menu “11: Encrypt” as “DIS” without installing the Voice Scrambler Unit, the encryption function will never be activated.

Optional Accessories

FVP-25	Encryption/DTMF Pager Unit
FVP-35	Encryption Unit
DVS-5	Voice Recording Unit
VTP-50	VX-Trunk Unit
FP-1023A	External Power Supply
MLS-100	Mobile Loudspeaker (12 W Peak Power)
LF-1	Line Filter
MH-700D	DTMF Back-lit Microphone
MH-25A8J	Microphone
DM-11A8J	Desktop Microphone
VPL-1	Programming Kit

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.