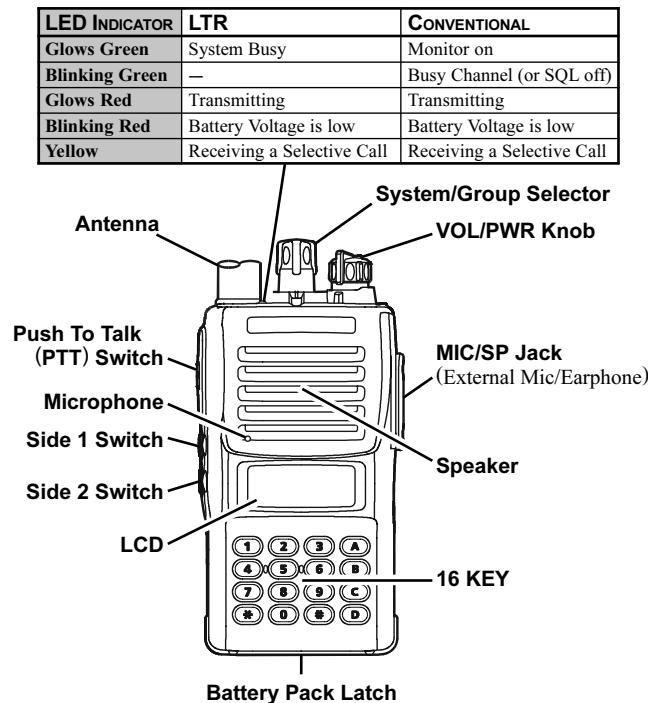


## VX-420A Series (LTR) Operating Manual

### CONTROLS & CONNECTORS (16 KEY)



### SAFETY TRAINING INFORMATION

This Radio has been tested and complies with the Federal Communications Commission (FCC) RF exposure limits for Occupational Use/Controlled exposure environment. In addition, it complies with the following Standards and Guidelines:

- FCC 96-326, Guidelines for Evaluating the Environmental Effects of Radio-Frequency Radiation.
- FCC OET Bulletin 65 Edition 97-01 (1997) Supplement C, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- ANSI/IEEE C95.1-1992, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz.
- ANSI/IEEE C95.3-1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields-RF and Microwave.

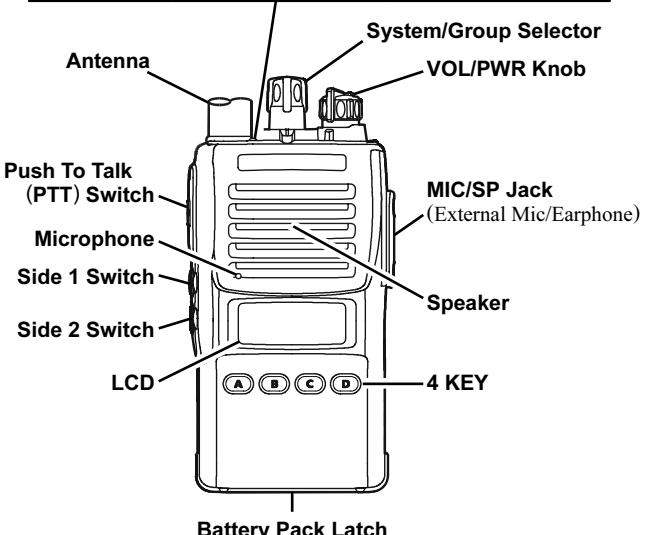
**WARNING:** This radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as **Occupational Use Only**, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is not intended for use by the **General Population** in an uncontrolled environment.

**CAUTION:** To ensure that your exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:

- This radio is NOT approved for use by the general population in an uncontrolled environment. This radio is restricted to occupational use, work related operations only where the radio operator must have the knowledge to control its RF exposure conditions.
- When transmitting, hold the radio in a vertical position with its microphone 1 to 2 inches (2.5 to 5 cm) away from your mouth and keep the antenna at least 1 inch (2.5cm) away from your head and body.

### CONTROLS & CONNECTORS (4 KEY)

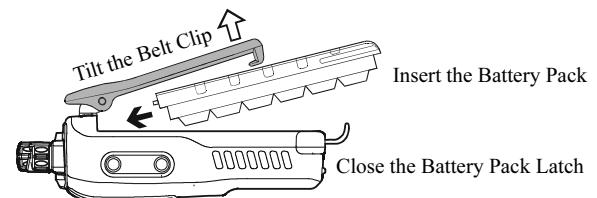
LED INDICATOR	LTR	CONVENTIONAL
Glow Green	System Busy	Monitor on
Blinking Green	—	Busy Channel (or SQL off)
Glow Red	Transmitting	Transmitting
Blinking Red	Battery Voltage is low	Battery Voltage is low
Yellow	Receiving a Selective Call	Receiving a Selective Call



### BEFORE YOU BEGIN

#### Battery Pack Installation and Removal

- To install the battery, hold the transceiver with your left hand, so your palm is over the speaker and your thumb is on the top of the belt clip. Insert the battery pack into the battery compartment on the back of the radio while tilting the Belt Clip outward, then close the Battery Pack Latch until it locks in place with a "Click."



- To remove the battery, turn the radio off and remove any protective cases. Open the Battery Pack latch on the bottom of the radio, then slide the battery downward and out from the radio while holding the Belt Clip.

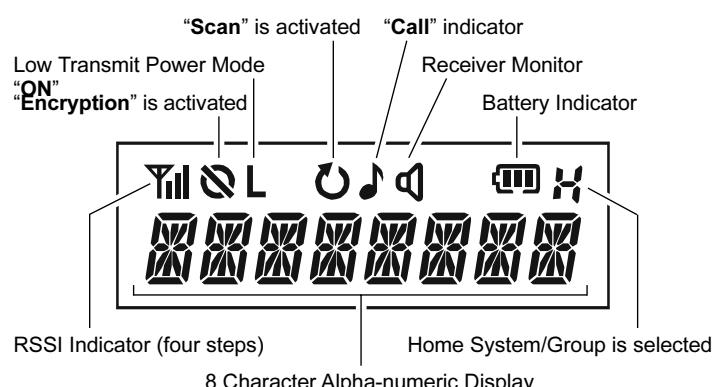
#### Caution!

*Do not attempt to open any of the rechargeable Ni-Cd packs, as they could explode if accidentally short-circuited.*

#### Low Battery Indication

- As the battery discharges during use, the voltage gradually becomes lower. When the battery voltage becomes to low, substitute a freshly charged battery and recharge the depleted pack. The **TX/BUSY** indicator on the top of the radio will blink **red** when the battery voltage is low.
- Avoid recharging Ni-Cd batteries often with little use between charges, as this can degrade the charge capacity. We recommend that you carry an extra, fully-charged pack with you so the operational battery may be used until depletion (this "deep cycling" technique promotes better long-term battery capacity).

### DISPLAY ICONS & INDICATORS



#### 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.

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

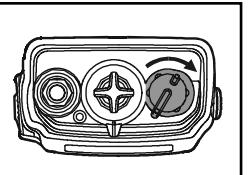
### OPERATION

#### Preliminary Steps

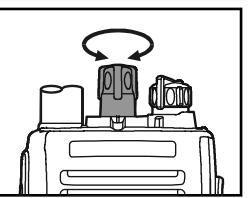
- Install a charged battery pack onto the transceiver, as described previously.
- Screw the supplied antenna onto the Antenna jack. Never attempt to operate this transceiver without an antenna connected.
- If you have a Speaker/Microphone, we recommend that it not be connected until you are familiar with the basic operation of the **VX-420A Series (LTR)**.

#### Operation Quick Start

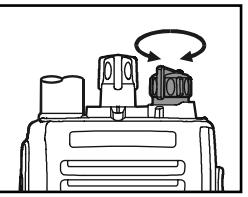
- Turn the top panel's **VOL/PWR** knob clockwise to turn on the radio.



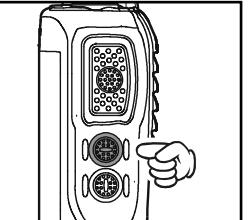
- Turn the top panel's **System/Group** selector knob to choose the desired operating channel.



- Rotate the **VOL/PWR** knob to set the volume level. If no signal is present, press and hold in the **Programmable** key assigned to "NSQL" for more than one second; background noise will now be heard, and you may use this to set the **VOL/PWR** knob for the desired audio level.



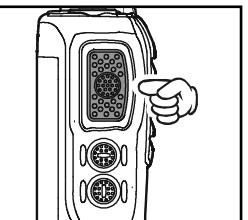
- Press and hold in the **Programmable** key assigned to "NSQL" for more than one second (or press the **NSQL** key twice) to quiet the noise and resume normal (quiet) monitoring.



- To transmit, monitor the channel and make sure it is clear.

#### THIS IS AN FCC REQUIREMENT!

- To transmit, press and hold in the **PTT** switch. Speak into the microphone area of the front panel grille (lower left-hand corner) in a normal voice level. To return to the Receive mode, release the **PTT** switch.



- If a Speaker/Microphone is available, remove the plastic cap and its two mounting screws from the right side of the transceiver, then insert the plug from the Speaker/Microphone into the **MIC/SP** jack; secure the plug using the screws supplied with the Speaker/Microphone. Hold the speaker grille up next to your ear while receiving. To transmit, press the **PTT** switch on the Speaker/Microphone, just as you would on the main transceiver's body.

*Note:* Save the original plastic cap and its mounting screws. They should be re-installed when not using the Speaker/Microphone.

#### Trunking System

- Press the **PTT** switch.
- When a channel is available, the **TX/BUSY** indicator will glow red. The radio is now transmitting. While holding the **PTT** switch, speak into the microphone area of the front panel grille (lower left-hand corner) in a normal voice level.
- If all channels are busy, a continuous tone will be heard from the speaker, and the "**BUSY**" notation will appear on the display when the **PTT** switch is pressed. Release the **PTT** switch.
- If the radio is out of range during the transmitting attempt, slow beeps will be heard followed by a continuous tone from the speaker.

## KEY FUNCTIONS

The **VX-420A Series (LTR)** provides programmable [A], [B], [C], [D] function keys and programmable [Side 1] and [Side 2] switches. These “**Programmable**” keys functions can be customized (set to other functions), 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** key programming features are illustrated below, and their functions are explained in the next chapter. 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** key on your particular radio, and keep it handy.

Function	Programmable key (Press/Press and Hold)					
	[A]	[B]	[C]	[D]	[Side 1]	[Side 2]
System Up	/	/	/	/	/	/
System Down	/	/	/	/	/	/
Group Up	/	/	/	/	/	/
Group Down	/	/	/	/	/	/
Monitor	/	/	/	/	/	/
NSQ	-/	-/	-/	-/	-/	-/
TX Low Power	/	/	/	/	/	/
Key Lock	/	/	/	/	/	/
Lighting	/	/	/	/	/	/
Scan	/	/	/	/	/	/
Talkaround	/	/	/	/	/	/
Scan A/D	/	/	/	/	/	/
Phone	/	/	/	/	/	/
Call/Reset	/	/	/	/	/	/
Call 1	/	/	/	/	/	/
Call 2	/	/	/	/	/	/
Code Up	/	/	/	/	/	/
Code Down	/	/	/	/	/	/
Code Set	/	/	/	/	/	/
Emergency	-/	-/	-/	-/	-/	-/
Home	/	/	/	/	/	/
Home Set	/	/	/	/	/	/
Short-cut to GP 1	/	/	/	/	/	/
Short-cut to GP 2	/	/	/	/	/	/
Short-cut to GP 3	/	/	/	/	/	/
Short-cut to GP 4	/	/	/	/	/	/
Continuous System Up	-/	-/	-/	-/	-/	-/
Continuous System Down	-/	-/	-/	-/	-/	-/
Continuous Group Up	-/	-/	-/	-/	-/	-/
Continuous Group Down	-/	-/	-/	-/	-/	-/

## DESCRIPTION OF OPERATING FUNCTIONS

### System Up, Down

Press (or Press and hold) the assigned **Programmable** key to switch to a higher (or lower) System. Once the desired System is reached, rotate the **System/Group** knob to select the desired System/Group within the selected System.

### Group Up, Down

Press (or Press and hold) the assigned **Programmable** key to switch to a higher (or lower) operating Group number.

### Monitor

Press (or Press and hold) the assigned **Programmable** key to disable the Signaling Squelch (CTCSS, DCS, 5-Tone Signaling, or DTMF Pager). Again press (or Press and hold) the assigned **Programmable** key to resume normal (quiet) the Signaling Squelch action.

When the Signaling Squelch is disabled, the “

### NSQ

Press and hold the assigned **Programmable** key to disable both the Noise and Signaling Squelch (CTCSS, DCS, 5-Tone Signaling, or DTMF Pager) systems. Again press and hold the assigned **Programmable** key to resume normal (quiet) operation of the Noise and Signaling Squelch system.

When the Signaling Squelch is disabled, the “

### TX Low Power

Press (or Press and hold) the assigned **Programmable** key to set the radio's transmitter to the “Low Power” mode, thus extending battery life. Press (or Press and hold) the assigned **Programmable** key again to return to “High Power” operation when in difficult terrain. When the radio's transmitter is set to “Low Power” mode, the “

### Key Lock

Press (or Press and hold) the assigned **Programmable** key to lock the **Programmable** keys (except **Lock**, **Emergency**, **Monitor**, **Lighting**, and **NSQ** keys); thus, the [A], [B], [C], and [D] keys can be disabled to prevent radio settings from being disturbed. In the Lock mode, the display will show “**LOCK**” when you rotate the **System/Group** selector knob or touch a **Programmable** key.

### Lighting

Press (or Press and hold) the assigned **Programmable** key to illuminate the LCD for five seconds.

### Scan

The Scanning feature is used to monitor multiple channels programmed into the transceiver. While scanning, the radio 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 (or Press and hold) the assigned **Programmable** key. 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 (or Press and hold) the assigned **Programmable** key. Operation will revert to the channel to which the **System/Group** knob is set.

### Talk Around

Press (or Press and hold) 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 ON**” notation will be appeared on the display.

Note that your dealer may have made 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.

### Scan A/D

The Add/Del feature allows the user to arrange a custom Scan. Press (or Press and hold) the assigned **Programmable** key to delete/restore the current channel to/from your scanning list.

When you delete a stored channel, the “

### Phone

Your Dealer may have pre-programmed Auto-Dial telephone number memories into your radio.

To dial a number, just press (or Press and hold) the Dealer-assigned **Programmable** key for Speed Dialing. The DTMF tones sent during the dialing sequence will be heard in the speaker.

### Call/Reset

Press (or Press and hold) the assigned **Programmable** key to silence the receiver and reset for another call (when your communication is finished).

### Call 1/Call 2

Press (or Press and hold) the assigned **Programmable** key to send a 5-tone sequential tone group which is pre-defined.

### Call Up/Call Down

Press (or Press and hold) the assigned **Programmable** key to select a 5-tone encode code from the pre-defined encode list.

### Code Set

Press (or Press and hold) the assigned **Programmable** key to change the encode digits for 5-tone operation. To change a specific digit, select the desired digit using the [A] key, then change the number using the [B]/[C] keys, and store the number using the [D] key.

### Emergency

The **VX-420A Series (LTR)** includes an “Emergency” feature, which may be useful, if you have someone monitoring on the same frequency as your transceiver's channel. For further details contact your **VERTEX STANDARD** dealer.

### Home

Press (or Press and hold) the assigned **Programmable** key to recall the pre-programmed Home system/group. When you recall the Home system/group, the “

Press (or Press and hold) the assigned **Programmable** key again to return to previous system/group; the “

### Home Set

Press (or Press and hold) the assigned **Programmable** key to store the current system/group to the Home register.

### Short-cut GP-1, GP-2, GP-3, GP-4

Press (or Press and hold) the assigned **Programmable** key to recall the Dealer pre-programmed System/Group directly.

### Continuous System Up, Down

Press and hold the assigned **Programmable** key causes the radio to begin stepping (repeatedly) upward or downward through the Systems.

### Continuous Group Up, Down

Press and hold the assigned **Programmable** key causes the radio to begin stepping (repeatedly) upward or downward through the Groups.

## 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 in an attempt to shake hands with the other station.

If you have out of range for more than two minutes, your radio senses that no signal has been received, a ringing beeper will sound, and “**GROU OUT**” will appear on the LCD. If you subsequently move back into range, as soon as the other station transmits, your beeper will sound and “**GROU IN**” will appear on the LCD.

## DTMF PAGING SYSTEM (REQUIRES FVP-25 OPTIONAL BOARD)

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.

## ACCESSORIES & OPTIONS

FNB-V57	7.2 V 1100 mAh Ni-Cd Battery
FNB-V57IS	Intrinsically-Safe 7.2 V 1100 mAh Ni-Cd Battery
FNB-V67LIA	7.4 V 2300 mAh Lithium-Ion Battery
FNB-83	7.2 V 1400 mAh Ni-MH Battery
FNB-V94	7.2 V 1800 mAh Ni-MH Battery
FBA-25A	Alkaline Battery Case
VAC-10	Desktop Rapid Charger (for FNB-V57/V57IS/V83/V94)
VAC-800	Desktop Rapid Charger (for FNB-V57/V57IS)
VAC-810	Desktop Rapid Charger (for FNB-V67LIA)
VAC-6800	6-unit Multi Charger (for FNB-V57/V57IS)
VAC-6810	6-unit Multi Charger (for FNB-V67LIA)
MH-45 <sup>B4B</sup>	Speaker/Microphone
MH-37 <sup>A4B</sup>	Earpiece Microphone
VC-25	VOX Headset
VCM-1	Mobile Mounting Bracket (for VAC-800/810)
FVP-25	DTMF pager Unit
ATU-6D	Rubber Antenna 450-490 MHz
ATV-6XL	Untuned Antenna 134-174 MHz
ATV-8C	Rubber Antenna 161-174 MHz
CE47	Programming Software
FIF-12	USB Programming Interface
CT-27A	Radio to Radio Cloning Cable
CT-28	Programming Cable (for CT-29)
CT-29	RS-232C Programming Interface Cable
CT-106	Programming Cable (for FIF-12)

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