Vertex Standard

VX-410E/-420E Series Operating Manual

Controls & Connectors

LED Indicator

Glows Green	Monitor on (or Side 1, 2 switch is activated : VX-410E series only)
Blinking Green	Busy Channel (or SQL off)
Glows Red	Transmitting
Blinking Red	Battery Voltage is low
Yellow	Receiving a Selective Call

- Antenna
- CH (Channel) Selector
- VOL/PWR Knob
- PTT (Push To Talk) Switch
- MIC/SP Jack (External Mic/Earphone)
- Microphone
- Side 1 Switch
- Side 2 Switch
- Speaker
- LCD (VX-420E series)
- 16 KEY (VX-420E series)
- Battery Pack Latch

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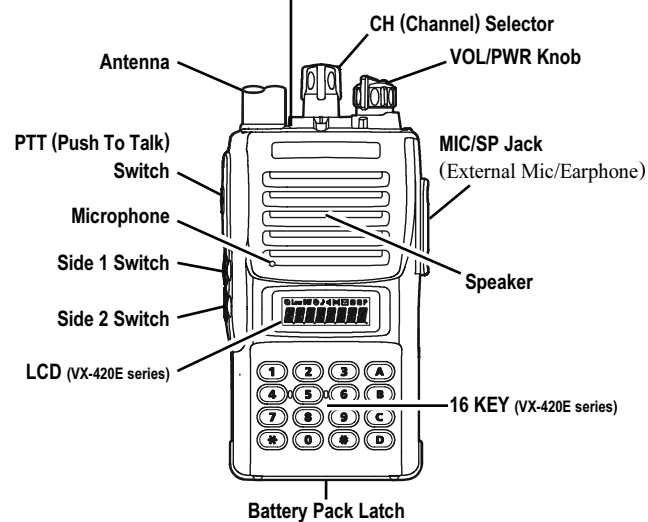
Before You Begin

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."

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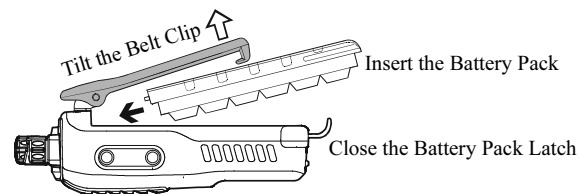
- ❏ To remove the battery, turn the radio off and remove any protective cases. Open the Battery Pack latch on the bottom of the radio, then slide the battery downward and out from the radio while holding the Belt Clip.

> ### Caution!
> *Do not attempt to open any of the rechargeable battery 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 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).
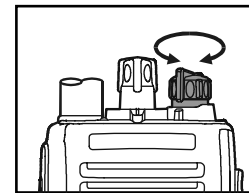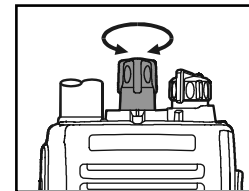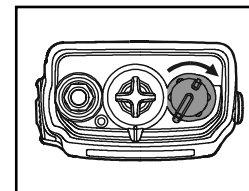
Operation

Preliminary Steps

- ❏ Install a rechargeable battery pack onto the transceiver, as described previously.
- ❏ Charge a battery pack in accordance with a charger manual.
- ❏ 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-410E/-420E**.

Operation Quick Start

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

- ❏ Turn the top panel's **CH** 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 *"MONITOR"* for more than 1 seconds; background noise will now be heard, and you may use this to set the **VOL/PWR** knob for the desired audio level.

Display Icons & Indicators (VX-420E Only)

- ↻ : "**Scan**" is activated
- ↻ : "**Priority Scan**" is activated
- "**Dual Watch**" is activated
- "**Encryption**" is enabled
- "**Call**" indicator
- Receiver Monitor
- "**Talk-Around**" is enabled
- "**Voice Message**" received
- Group "**A**"
- Group "**B**"

↻ Low DW ↻ ♪ ◁ |←→| ☒ Ⓐ Ⓑ Ⓟ

- Priority Channel
- 8 Character Alpha-numeric Display
- Low Transmit Power Mode "**ON**"

Operation (continued)

- ❏ Press and hold in the **Programmable** key assigned to *"MONITOR"* for more than 1 seconds (or press the **MONITOR** key twice) to quiet the noise and resume normal (quiet) monitoring.
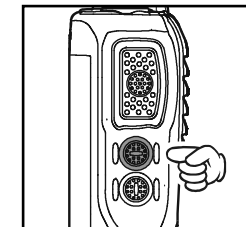
- ❏ To transmit, monitor the channel and make sure it is clear.
- ❏ To transmit, press and hold in the **PTT** switch. Speak into the microphone area of the front panel grille (lower left-hand corner) in a normal voice level. To return to the Receive mode, release the **PTT** switch.
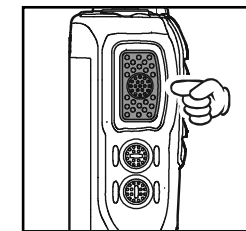
  ⚠ **Do not transmit the radio without an antenna connected.**
- ❏ If a Speaker/Microphone is available, remove the plastic cap and its two mounting screws from the right side of the transceiver, then insert the plug from the Speaker/Microphone into the **MIC/SP** jack; secure the plug using the screws 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.

Operating Temperature Range

Operation: –25 °C to +55 °C
Battery Charging: +10 °C to +40 °C

Accessories & Options

FNB-V67LI	7.4 V 1600 mAh Lithium-Ion Battery
FNB-83	7.2 V 1400 mAh Ni-MH Battery
FBA-25A	Alkaline Battery Case
VAC-10	Desktop Rapid Charger (for FNB-83)
VAC-810	Desktop Rapid Charger (for FSB-V67LI)
MH-45B4B	Speaker/Microphone
MH-37A4B	Earpiece Microphone
VC-25	VOX Headset
VCM-1	Mobile Mounting Bracket (for VAC-810)
VT60F	VX-Trunk Unit
VT60FS	VX-Trunk/Encryption Unit
FVP-25	Encryption/DTMF pager Unit
FVP-35	Encryption Unit (Rolling code voice scrambler)
DVS-5	Voice Storage Unit
MDC1200	Digital ANI Encoder Unit
VME-100	ANI Encoder Unit
VMDE-200	ANI Encoder/Decoder Unit
ATU-6D	Rubber Antenna 450-490 MHz
ATV-6XL	Rubber Antenna 134-174 MHz
ATV-8C	Rubber Antenna 161-174 MHz
CE64	Programming Software
FIF-10A	USB Programming Interface
CT-42	PC Programming Cable
CT-27	Radio to Radio Cloning Cable
CT-106	Programming Cable (for FIF-10A)

Key Functions

The **VX-420E** series provides programmable [**A**], [**B**], [**C**], and [**D**] function keys, and both **VX-410E** series and **VX-420E** series provides the programmable [Side 1] and [Side 2] switches. These "**Programmable**" keys functions can be customized (set to other functions), via programming by your **VERTEX STAN-DARD** 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
Monitor	/	/	/	/	/	/
Squelch Off	/	/	/	/	/	/
Low Power	/	/	/	/	/	/
Lock※	'/	/	/	/	/	/
Lamp※	/	/	/	/	/	/
Channel Up※	/	/	/	/	/	/
Channel Down※	/	/	/	/	/	/
Scan	/	/	/	/	/	/
Follow-Me Scan	/	/	/	/	/	/
Dual Watch	/	/	/	/	/	/
Talkaround	/	/	/	/	/	/
Add/Del※	/	/	/	/	/	/
Reset	/	: /	/	/	/	/
Speed Dial	/	/	/	/	/	/
Tx Save Off	/	/	/	/	/	/
Call 1	/	/	/	/	/	/
Call 2	/	/	/	/	/	/
Call 3	/	/	/	/	/	/
Code Select※	/	/	/	/	/	/
Code Up※	/	/	/	/	/	/
Code Down※	/	/	/	/	/	/
Emergency	−/	−/	−/	−/	−/	−/
Group	/	/	/	/	/	/
ACC 1	/	/	/	/	/	/
ACC 2	/	/	/	/	/	/
Play	/	/	/	/	/	/
Record	/	/	/	/	/	/
Encryption						
Lone Worker	−/	−/	−/	−/	−/	−/

※ VX-420E series only

Description of Operating Functions

Monitor
Press (or Press and hold) the assigned **Programmable** key momentarily to disable the Tone squelch.

Squelch Off
Press (or Press and hold) the assigned **Programmable** key to disable the Noise and Tone squelch. Again press (or Press and hold) the assigned **Programmable** key to resume normal (quiet) Noise and Tone squelch action.

Low Power
Press (or Press and hold) the assigned **Soft** key to set the radio's transmitter to the "Low Power" mode, thus extending battery life. Press (or Press and hold) the assigned **Soft** key again to return to "High Power" operation when in difficult terrain.
When the radio's transmitter is set to "Low Power" mode, the "**Low**" icon will be indicated on the display.

Lock
Press (or Press and hold) the assigned **Programmable** key to lock the **Programmable** keys (except *Lock* key); thus, the [**A**], [**B**], [**C**], and [**D**] keys can be disabled to prevent radio settings from being disturbed.

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

Channel Up
Press (or Press and hold) the assigned **Programmable** key to switch to a higher operating channel number.

Channel Down
Press (or Press and hold) the assigned **Programmable** key to switch to a lower operating channel number.

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 **CH** knob is set.

Follow-Me Scan
"Follow-Me" Scan feature checks a *User-assigned* Priority Channel regularly as you scan the other channels. Thus, if only Channels 1, 3, and 5 (of the 8 available channels) are designated for "Scanning," the user may nonetheless assign Channel as the "User-assigned" Priority Channel via the "Follow-Me" feature. Press the assigned **Programmable** key to activate "Follow-Me" scanning, then turn the **CH** selector knob to the channel which you want to designate as the "User-Assigned Priority Channel". When the scanner stops on an "active" channel, the User-assigned Priority Channel will automatically be checked every few seconds.

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 (or Press and hold) 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 (or Press and hold) the assigned **Programmable** key. Operation will revert to the channel to which the **CH** 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 "⇥⇤" icon will be indicated 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.

Add/Del
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 current channel, "-SKIP-" will appear on the LCD for one second after pressing the **Programmable** key. When you restore a current channel, "-STOP-" will appear on the LCD for one second after pressing the **Programmable** key.

Speed Dial
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 **Soft** key for Speed Dialing. The DTMF tones sent during the dialing sequence will be heard in the speaker.

TX Save Off
Press (or Press and hold) the assigned **Programmable** key to disable the Transmit Battery Saver, if you are operating in a location where high power is almost always needed.
The Transmit Battery Saver helps extend battery life by reducing transmit power when a very strong signal from an apparently nearby station is being received. Under some circumstances, though, your hand-held radio may not be heard well at the other end of the communication path, and high power may be necessary at all times.

Call 1, 2, 3/Reset
When the 2-tone or 5-Tone selective calling unit is installed, press (or Press and hold) the assigned **Programmable** key to silence the receiver and reset for another call, when a communication is finished.

Code Select
Press (or Press and hold) the assigned **Programmable** key to enable the changing the 5-Tone Paging code which is recalled by the "**Call 1**" key.

Code Up, Down
Press (or Press and hold) the assigned **Programmable** key to switch to a higher (or lower) paging code number for the 5-Tone Paging System.

Emergency
The VX-410E/-420E series 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.

Group
Press (or Press and hold) the assigned **Programmable** key to select a "**A**" or "**B**" group of channels.
Once the desired Group is reached, rotate the **CH** knob to select the desired channel within the selected Group.

ACC 1, 2
When the optional unit is installed, these functions are various uses.
For further details, contact your **VERTEX STANDARD** dealer.

REC/PLAY (Voice Storage: Option)
This function, which requires the optional Voice Storage Unit, Allows you to record and play back incoming receiver audio.

Recording:
Press (or Press and hold) the assigned **Programmable** key to toggle the recording feature "on" and "off." If the incoming signal is being heard through the speaker when the recording feature is set to "on," the received audio will be recorded. The last 2 minutes of incoming audio will be stored on a first-in, first-out basis.

Playback:
Press (or Press and hold) the assigned **Programmable** key to start playback. During playback, pressing then "#" key lets you jump forward 8 seconds, while pressing the "∗" key lets you go back 8 seconds. To stop playback before the stored message is complete, press (or Press and hold) the assigned **Programmable** key.

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

Lone Worker
Press and hold the assigned **Programmable** key to toggle the Lone Worker feature "on" and "off."
The Lone Worker feature perform to emit an alarm for 30 seconds at one second interval when the Lone Worker Timer is expired. If the user does not reset the timer by pressing **PTT** switch, the radio switches to the Emergency modo.

ARTS [Auto Rande Transpond System : VX-420E only]
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 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 receives, a ringing beeper will sound, and "OUT RANGE" will appear on the LCD. If you subsequently move back into range, as soon as the other station transmits, your beeper will sound and "IN RANGE" will appear on the LCD.

DTMF Paging System (VX-420E only)
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.