

## VX-600/900V Operating Manual

### 1, Controls & Connectors

#### **LED Indicator**

Glows Green: Scan active

Blinks Green: Busy Channel (or SQL off)

Glows Red: Transmit

Blinks Red: Battery Voltage is low

#### **Antenna Jack**

#### **PTT (Push to Talk) Switch**

#### **Monitor Button**

#### **Lamp Button**

#### **CH (Channel) Selector**

#### **VOL/PWR Knob**

#### **LCD (VX-900 only)**

#### **SEL1 KEY (TOP)**

#### **SEL2 KEY (LEFT SIDE)**

#### **Toggle SW**

#### **MIC/SP Jack (External MIC/SP)**

#### **Speaker**

#### **Main Microphone**

#### **Sub Microphone (Noise Canceling Microphone)**

#### **Battery Pack Latch**

#### **16-Button DTMF Keypad (16-key version only)**

## 2, 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 unfolding the Belt Clip.

**Caution!:** Do not attempt to open any of the rechargeable Li-ion 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 reaches 6.0 volts, 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 Li-ion 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).

### Safety information

When transmitting with a portable radio, hold radio in a vertical position with the microphone 2.5 to 5 centimeters (1 to 2 inches) away from the mouth. Keep antenna at least 2.5 centimeters (1 inch) from your head or body when transmitting.

If you wear a portable two-way radio on your body, ensure that the antenna is at least 2.5 centimeters (1 inch) from the body when transmitting.

### 3,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-600/900.

#### Operation Quick Start

- ❑ To turn the top panel's **VOL/PWR** knob clockwise to turn on the radio on.
- ❑ Pull and turn the top panel's **CH** selector knob to choose the desired operating channel. A channel number or channel name will appear on the LCD.(VX-900 only)
- ❑ Rotate the **VOL/PWR** knob to set the volume level. If no signal is present, press and hold the Monitor button (the third button on the left side) more than 2 seconds; 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 the Monitor button more than 2 seconds (or press the Monitor button twice) to quiet the noise and resume normal (quiet) monitoring.

- ❑ To transmit, press and hold the **PTT** switch. Speak into the microphone area of the front panel grille (center right-hand corner) in a normal voice level. To return to the Receive mode, release the **PTT** switch.
- ❑ Press the top panel's **SEL1** and left side panel's **SEL2** button to active one of the preprogrammed functions that may have been enabled at the time of programming by the dealer. See the next section for details regarding the available features.
- ❑ Switch the top panel's **Toggle SW** position to active one of the preprogrammed functions which may have been enabled at the time of programming by the dealer. There are three positions of [**A** (left)], [**I** (center)] and [**B** (right)] in the toggle switch. See the next section for details regarding the available features.
- ❑ Press the **DTMF** keys on the telephone keypad to send DTMF tones.(16-key version only)
- ❑ If a Speaker/Microphone is available, remove the plastic cap and its two mounting screws from the right side of the transceiver, then make the connector of the Speaker/Microphone touch; secure the connector pin using the screw 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.

#### 4,KEY and TOGGLE Functions

VX-600/900 have the **[SEL1], [SEL2], [MON], [LAMP] Key, ([A], [B], [C], [D] Key: 16-key version only) and Toggle SW**. The Key and SW function can be customized, via programmed by **Vertex Standard** dealer, to meet your communications requirements. Some features may require the purchase and installation of optional internal accessories. The possible KEY and SW programming features are illustrated below.

##### [SEL1], [SEL2], [MON], [LAMP],[A], [B], [C] and [D] Key

**Monitor** (Generally, it sets to MON Key)

**Lamp** (Generally, it sets to LAMP Key)

**Channel Scan**

**Dual Watch**

**High/Low Power**

**Talk Around**

**TX Save Disable**

**Encryption Disable** (only, when using DTMF/Encryption Unit)

**Follow-Me DW**

**Group Up**

**Group Down**

**Channel Up**

**Channel Down**

**SET Mode**

**Call/Reset** (only, when using DTMF/Encryption Unit)

**Speed Dial** (only, when using DTMP/Encryption Unit)

**Emergency** (only, when using DTMF/Encryption Unit)

**LCD Invert**

##### TOGGLE Switch

**Channel Scan**

**Dual Watch**

**High/Low Power**

**Talk Around**

**TX Save Disable**

**Encryption Disable** (only, when using DTMF/Encryption Unit)

**Follow-Me Scan**

**Lock**

## **5, Understanding Radio Waves**

Radio waves travel from one point to another by several different means. The general term for these methods of wave travel is “propagation”. You may know that “short-wave” signals can be propagated over distances of several thousand miles by reflection off of the upper regions of the atmosphere.

Your hand-held transceiver, on the other hand, operates on the so-called VHF (Very-High Frequency) band. On this band, radio waves usually do not reflect off of the atmosphere. Instead, the radio waves behave almost as light: they travel in a straight line, and when they meet a building or obstruction, they go no further in that direction.

Therefore, it is important that you be as high and free from obstructions as possible to cover the greatest distance when using your radio. If you operate from inside a car or building, any metal around you can absorb much of the signal, both transmitted and received. Coverage may therefore be very poor under those conditions. However, if you must operate from indoors, moving next to a window will improve communications.

In view of the factors just discussed, you can easily see the potential benefit of holding the radio up high near your mouth while transmitting. In this way the antenna is high and clear, and coverage is best.

On final note regarding propagation is useful in improving coverage. Because radio waves at VHF is similar to light waves, they do reflect, to varying degrees, off of hills, buildings, and the like. In a crowded urban area, with many close buildings close together, many reflections may occur, and interfere with one another, causing variations in signal strength at different locations.

Therefore, if a signal is weak and you walk a few feet in any direction, reception may suddenly become clear, because a particular reflection path may become dominant. Reflections are frequently useful, as they can allow for communications between two stations over a highly obstructed path.

## 6, Specifications

### GENERAL

<b>Frequency Range:</b>	134-160 MHz 148-174 MHz
<b>Number of Channels:</b>	512 channels
<b>Channel Spacing:</b>	12.5/25/30 kHz
<b>Battery Voltage:</b>	7.4 VDC
<b>Temperature Range:</b>	-30 °C to +60 °C
<b>Case Size (W x H x D):</b>	59 x 155 x 34 mm w/FNB-V68LI
<b>Weight (approx.):</b>	420 grams with FNB-V68LI, antenna, and belt clip

### RECEIVER

<b>Circuit Type:</b>	Double-conversion super-heterodyne
<b>IFs:</b>	22.05 MHz & 450 kHz
<b>12-dB SINAD Sensitivity:</b>	< 0.25 $\mu$ V
<b>Squelch Sensitivity:</b>	< 0.25 $\mu$ V
<b>Selectivity:</b>	> 75 dB (25kHz) / 70dB (12.5kHz)
<b>Intermodulation:</b>	> 75 dB (25kHz) / 68dB (12.5kHz)
<b>Spurious Rejection:</b>	> 75 dB
<b>Image Rejection:</b>	> 75 dB
<b>AF Output:</b>	0.5 W @ 16 $\Omega$ , 3 % THD (BTL output)

### TRANSMITTER

<b>Power Output:</b>	5.0 / 2.5 / 1.0 / 0.25 W (Selectable)
<b>Frequency Stability:</b>	better than $\pm$ 2.5 ppm
<b>Modulation System:</b>	Direct FM
<b>Maximum Deviation:</b>	$\pm$ 5 kHz (25 kHz) / $\pm$ 2.5 kHz (12.5 kHz)
<b>FM Noise:</b>	> 45 dB (25 kHz) / > 40 dB (12.5 kHz)
<b>Spurious Emission:</b>	> 70 dB below carrier
<b>AF Distortion (@ 1 kHz):</b>	< 3 %
<b>Microphone Type:</b>	2-k $\Omega$ condenser

*Specifications are subject to change without notice or obligation.*

**Accessories & Options**

<b>FBA-27</b>	Battery Case
<b>FNB-V68LI</b>	7.4 V 1700 mAh Li-ion Battery
<b>FNB-V69LI</b>	7.4 V 2400 mAh Li-ion Battery
<b>CD-16</b>	Rapid Desk-Top Charger
<b>CA-29</b>	Charger Sleeve with <b>CD-16</b>
<b>PA-23A</b>	AC100 V Adapter with <b>CD-16</b>
<b>PA-23B</b>	AC120 V Adapter with <b>CD-16</b>
<b>PA-23C</b>	AC220 V Adapter with <b>CD-16</b>
<b>PA-23U</b>	AC230 V Adapter with <b>CD-16</b>
<b>VAC-6000</b>	6-unit Multi Rapid Charger
<b>F2D-8</b>	2-tone unit
<b>F5D-14</b>	5-tone unit
<b>FVP-25</b>	Encryption/DTMF Pager Unit
<b>VTP-50</b>	VX-Trunk Unit
<b>MH-50E7A</b>	Speaker/Microphone
<b>VH-110</b>	Heavy Duty Head Set
<b>VH-120</b>	3-wire Ear-piece Microphone
<b>VH-130</b>	2-wire Ear-piece Microphone
<b>VC-25</b>	VOX Headset
<b>CT-71</b>	PC Programming Cable
<b>CT-27</b>	Radio to Radio Programming Cable
<b>CE39</b>	Programming Software
<b>SVC39</b>	Alignment Software



## SAFETY INFORMATION

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