

**Accessories & Options**

VX-7100/7200 Series	
 <b>MH-25A6J</b> Standard Microphone	 <b>MH-700D</b> DTMF Back-lit Microphone
 <b>MD-11A8J</b> Desktop Microphone	 <b>MD-12A8J</b> Desktop Microphone
 <b>MLS-100</b> External Speaker (12 W Peak Power)	 <b>MLS-200</b> External Speaker (12 W Peak Power)
 <b>FP-1030A</b> External Power Supply (13.8 VDC 25 A)	 <b>VPL-1</b> Programming Cable (Computer to Radio)
 <b>LF-1</b> Line Filter	 <b>CT-104/A</b> Radio Programming Cable (for FIF-10/A)
 <b>CT-4</b> Cloning cable (T9101411)	 <b>FIF-10/A</b> USB Programming Interface

VX-P920/P820 Series	
 <b>MH-50D7A</b> Speaker/Microphone	 <b>MH-66A7A MH-66B7A</b> w/PF key, Toggle Submersible External Microphone
 <b>VH-111</b> Over the Head, Heavy Duty Headset	 <b>VH-121</b> 3-Wire Earpiece, Mic, Palm PTT Switch
 <b>VH-131</b> 2-Wire Earpiece, Palm Mic / PTT Combo	 <b>VAC-6920B/C/U*</b> 6-unit Multi Charger for FNB-V86LI, V87LI, V92LI/IS
 <b>VAC-920B/C/U*</b> Desktop Rapid Charger for FNB-V86LI, V87LI, V92LI/IS	 <b>FNB-V92LI/IS*</b> 7.4 V 3000 mAh Li-Ion Battery *IS : IS Version
 <b>FNB-V86LI</b> 7.4 V 1150 mAh Li-Ion Battery	 <b>FNB-V87LI</b> 7.4 V 2000 mAh Li-Ion Battery
 <b>FBA-34</b> Alkaline Battery Case (6XAA)	 <b>FIF-10/A</b> USB Programming Interface

**CE76** Programming Software  
**MH-65B7A** Submersible External Microphone  
**CT-108** PC Programming Cable (for FIF-10/A)  
**CT-109** PC Programming Kit (CT-29 + CT-115)  
**CT-115** PC Programming Cable (for VPL-1)  
**CT-116** Radio to Radio Cloning Cable  
**LCC-920** Leather Case (VX-P920 Series)  
**LCC-820** Leather Case (VX-P820 Series)  
**CE76** Programming Software

**P25 Transceiver**

Specifications	VX-7100		VX-7200	
	VHF	UHF	VHF	UHF
<b>General Specifications</b>				
Frequency range	134 - 174 MHz		380 - 450 MHz 450 - 512 MHz	
Number of Channels	8	501	8	501
Number of Groups	1	32	1	32
Channel spacing	12.5 / 20 / 25 kHz			
Operating voltage	13.6 VDC ±15%			
Current drain				
Standby	0.4 A			
Receive	2.5 A			
Transmit	11.0 A			
Operating Temperature	-30° C to +60° C			
Frequency Stability	±2.5 ppm			
Dimensions (W x H x D)	165 x 43 x 155 mm			
Weight	1.4 kg			
<b>Receiver Specifications</b>	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)			
Sensitivity				
Analog 12dB SINAD	0.25 µV		0.30 µV	
Digital 5% BER	0.25 µV		0.30 µV	
Digital 1% BER	0.35 µV		0.40 µV	
Adjacent Channel Selectivity				
Analog (W/N)	85 / 75 dB		80 / 72 dB	
Intermodulation				
Analog (W/N)	80 / 75 dB		80 / 75 dB	
Spurious and Image Rejection				
Analog	90 dB		85 dB	
Hum and Noise				
Analog (W/N)	50 / 44 dB		46 / 40 dB	
Audio Output	Internal: 2 W @ 32 Ohms 5 % THD External: 12 W @ 4 Ohms 5 % THD			
<b>Transmitter Specifications</b>	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)			
RF power output	50 / 25 / 10 W		45 / 25 / 10 W	
<b>Modulation</b>				
Analog (W/N)	16K0F3E / 11K0F3E			
Digital	8K10F1D / 8K10F1E			
<b>FM Hum and Noise</b>				
Analog (W/N)	46 / 40 dB			
<b>Spurious Emissions</b>	70 dB			
<b>Audio Distortion</b>	Less than 3 % @ 1kHz			

  

Specifications	VX-P920 Series		VX-P820 Series	
	VHF	UHF	VHF	UHF
<b>General Specifications</b>				
Frequency range	134 - 174 MHz		380 - 450 MHz 450 - 512 MHz	
Number of Channels	512 (VX-P929/P924) / 48 (VX-P921)		512 (VX-P829/P824) / 16 (P821)	
Number of Groups	32 (VX-P929/P924) / 3 (VX-P921)		32 (VX-P829/P824) / 1 (P821)	
Channel spacing	12.5 / 20 / 25 kHz			
PLL Stops	5 / 6.25 kHz			
Operating voltage	7.4 VDC			
Battery Life	10.4 h w/ FNB-V87LI	10.0 h w/ FNB-V87LI	10.6 h w/ FNB-V87LI	11.0 h w/ FNB-V87LI
Temperature Range	-30° C to +60° C			
Frequency Stability	±2.5 ppm			
Dimensions (W x H x D)	57.5 x 133 x 37.5 mm			
Weight (approx.)	380 g w/Ant, Battery (FNB-V86LI) and Belt Clip		310 g w/Ant, Battery (FNB-V86LI) and Belt Clip	
<b>Receiver Specifications</b>	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)			
Sensitivity (12 dB SINAD) EIA	0.25 µV	0.32 µV	0.25 µV	0.32 µV
Digital 5% BER	0.25 µV	0.32 µV	0.25 µV	0.32 µV
Digital 1% BER	0.35 µV	0.40 µV	0.35 µV	0.40 µV
Adjacent Channel Selectivity (W/N)	75 / 70 dB	75 / 70 dB	75 / 70 dB	75 / 70 dB
Intermodulation Analog (W/N)	75 / 70 dB	75 / 70 dB	75 / 70 dB	75 / 70 dB
Spurious and Image Rejection Analog	80 dB	75 dB	80 dB	75 dB
Hum and Noise Analog (W/N)	48 / 42 dB			
Audio Output	700 mW @ 16 Ohms, 5% THD			
<b>Transmitter Specifications</b>	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)			
Power Output	5 / 2.5 / 1 / 0.25 W		5 / 2.5 / 1 / 0.25 W	
Modulation Analog (W/N)	16K0F3E / 11K0F3E			
Digital	8K10F1D / 8K10F1E			
Spurious Emissions	70 dB			
FM Hum and Noise Analog (W/N)	46 / 40 dB			
Audio Distortion	Less than 3 % @ 1kHz			

**VX-P920/P820 Series : Applicable International Protection Standard**

<b>IP54</b> Splash Proof	<b>IP55</b> Water Jets	<b>IP57</b> Submersible 1 m for 30 min	<b>IS</b> Special Order Version Intrinsically Safe Version Available
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**Intrinsically Safe Information**

The Intrinsically Safe Version of VX-P920/P820 series, equipped with any of optional units, meets the requirements of ANSI/UL913 6th Edition for Class I, Division 1, Groups A-D; Class II, Groups E-G; and Class III for hazardous locations.

**VX-7100/7200 Series : Applicable MIL-STD**

Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures
Low Pressure	500.1/Procedure II	500.2/Procedure I, II	500.3/Procedure I, II	500.4/Procedure I, II
High Temperature	501.1/Procedure I, II	502.2/Procedure I, II	502.3/Procedure I, II	502.4/Procedure I, II
Low Temperature	502.1/Procedure I	503.2/Procedure I	503.3/Procedure I	503.4/Procedure I, II
Temperature Shock	503.1/Procedure I	504.2/Procedure I, II	504.3/Procedure I, II	504.4/Procedure I, II
Solar Radiation	505.1/Procedure I	505.2/Procedure I, II	505.3/Procedure I, II	505.4/Procedure I, II
Rain	506.1/Procedure I, II	506.2/Procedure I, II	506.3/Procedure I, II	506.4/Procedure I, II
Humidity	507.1/Procedure I, II	507.2/Procedure I, II, III	507.3/Procedure I, II, III	507.4/Procedure I, II, III
Salt Fog	509.1/Procedure I	509.2/Procedure I	509.3/Procedure I	509.4/Procedure I
Sand and Dust	510.1/Procedure I	510.2/Procedure I	510.3/Procedure I	510.4/Procedure I, III
Vibration	514.2/Procedure VIII, X	514.3/Procedure Cat. 8	514.4/Procedure Cat. 8	514.5/Procedure Cat. 24
Shock	516.2/Procedure I, II, V	516.3/Procedure I, IV, V, VI	516.4/Procedure I, IV, V, VI	516.5/Procedure I, IV, V, VI

**VX-P920/P820 Series : Applicable MIL-STD**

Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures
Low Pressure	500.1/Procedure I, II	500.2/Procedure I, II	500.3/Procedure I, II	500.4/Procedure I, II
High Temperature	501.1/Procedure I, II	502.2/Procedure I, II	502.3/Procedure I, II	502.4/Procedure I, II
Low Temperature	502.1/Procedure I	503.2/Procedure I	503.3/Procedure I	503.4/Procedure I, II
Temperature Shock	503.1/Procedure I	504.2/Procedure I, II	504.3/Procedure I, II	504.4/Procedure I, II
Solar Radiation	505.1/Procedure I	505.2/Procedure I, II	505.3/Procedure I, II	505.4/Procedure I, II
Rain	506.1/Procedure I	506.2/Procedure I	506.3/Procedure I, II	506.4/Procedure I, II
Humidity	507.1/Procedure I, II	507.2/Procedure I, II, III	507.3/Procedure I, II, III	507.4/Procedure I, II, III
Salt Fog	509.1/Procedure I	509.2/Procedure I	509.3/Procedure I	509.4/Procedure I
Sand and Dust	510.1/Procedure I	510.2/Procedure I	510.3/Procedure I	510.4/Procedure I, III
Vibration	514.2/Procedure I, II, III, X	514.3/Procedure I, II, III, X	514.4/Procedure I, II, III, X	514.5/Procedure I, II, III, X
Shock	516.2/Procedure I	516.3/Procedure I	516.4/Procedure I	516.5/Procedure I

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**VX-7100/7200/P920/P820 Series**

**P25 VHF · UHF Transceiver**



**VX-P929**  
512 ch/32 groups with 16 Keys and LCD

**VX-P924**  
512 ch/32 groups with 4 Keys and LCD

**VX-P921**  
48 ch/3 groups without LCD

**VX-P829**  
512 ch/32 groups with 16 Keys and LCD

**VX-P824**  
512 ch/32 groups with 4 Keys and LCD

**VX-P821**  
16 ch/1 group without LCD

**VX-7100**  
8 ch/1 group

**VX-7200**  
501 ch/32 groups

**Vertex Standard**  
 We make a difference

\* B for 120 VAC / C for 230-240 VAC / U for 230 VAC

# VX-7100/7200 SERIES



P25 VHF·UHF Mobile Radios

Public Safety applications require three essential elements: reliability, ruggedness and performance versatility. These three elements are found in the VX-7100 (8-Channel) and VX-7200 (501-Channel) series of FM Mobiles from Vertex Standard. Wide programmable frequency coverage, high power output (50 W VHF/45 W UHF), leading-edge signaling capability, and a 12-character alpha-numeric display are just a few of the many reasons why the VX-7100 and VX-7200 are the best choice for the most demanding Public Safety environments.

# VX-P920/P820 SERIES



P25 VHF·UHF Portable Radios

Reliability, ruggedness and interoperability like never before. The VX-P920/P820 series of Vertex Standard portables is ready to respond when you are, with a wide array of signaling capability, along with big audio, operator and system security measures, and PC programmability for quick deployment. Submersible to IP57 specifications, and built to U.S. MIL-STD specifications, the VX-P920/P820 Portables are your assurance of long-term reliability under the most difficult operating circumstances.



## P25 DIGITAL MODE

### NAC (Network Access Code)

NAC (Network Access Code) are programmable and are typically used to control network access but may also be used to steer repeater operations. NAC codes are also the same way as an analog CTCSS tone (or DCS code). There are 4096 unique NAC codes.

### AMBE+2™ Vocoder

For superior voice quality in narrow-band, digital, P25 mode of operation our products use the AMBE+2™ Vocoder protocol from DVSI, Inc.

### P25 Digital Conventional

Because our products are fully TIA/EIA-102 Series compliant, you are assured of broad compatibility within a wide range of P25 Digital Mode systems.

### RSSI Indicator / RSSI Warning

Certain models feature Liquid Crystal Displays (LCD) and provide visual indication of receive signal level (signal strength). All models feature an audible indication of low receive signal strength. When received signal strength falls to a level not suitable for reliable communications, an alert tone will sound.

This feature is useful if the unit has no display or if it is difficult for the user to see the display during normal operation.

### Talk Group ID

Talk Group IDs (TGIDs) provide for the logical grouping of radio users into distinct organizations and can also be used to minimize co-channel interference. There are more than 65,000 unique TGID addresses.

### Caller ID Display (Units with LCD only)

The calling station will be identified either by their Alphanumeric Tag (if defined in the Individual ID List), or by their ID number (if a Tag is not defined).

### Individual ID List / Paging Group

In P25 operation each transceiver can be programmed with a unique Unit ID. There are over 16 Million possible Unit IDs available. Additionally, using the Paging Group feature, each unique Unit ID can be identified with an Alphanumeric Tag, making selective calling by name is possible. What's more, if no Paging call list has been defined, direct input of the Unit ID number is possible, permitting direct calling of any particular user. When receiving, the Alphanumeric Tag (Name) of the calling station will be shown (LCD models only). If no call list has been defined, only the transmitting station's Code number will be displayed.

The Paging Group may be subdivided into up to 15 sub-groups, and each channel may be assigned to a sub-group in advance.

### Mixed Mode

Channels can be programmed for analog only, digital only or Mixed Mode dual Analog/Digital operation. The radio will automatically switch to the appropriate format when it receives a call. This capability provides seamless switching between Analog and Digital systems saves available channel programming capacity and simplifies user operation of the unit.

### AES / DES Encryption Options

Data Encryption Standard (DES) is an older format system based on a 64 bit encryption algorithm...

Advanced Encryption Standard (AES) is a newer and more robust system based on 256 bit algorithm. Encryption Keys Multiple encryption keys can be stored in the unit as required.

### Miscellaneous - Emergency Decode Indication

P25 contains special provisions for Emergency Calling. When an "Emergency" signal is received, the radio's "Busy" LED can provide a very bright white blinking indication while the LCD can show the Unit ID or Alpha Tag of the unit in distress...(VX-P920/P820 Series)

## VERSATILITY

**Popular 2-Tone Encode and Decode Functions**  
2-Tone encode and decode gives you the selective calling used nationwide. Encode and decode functions for the 2-tone format include multiple decode pairs as well as multiple encode tones. DTMF paging and identification is also built-in to allow selective paging and to see who is calling you.

### Programmable Minimum Volume

Another feature to ensure all calls are heard. The radio can be programmed for a minimum volume level. If the radio is on, the minimum volume level will ensure the audio of a call will be heard.

## HIGH PERFORMANCE

### Wide Bandwidth

For communicating with other agencies, companies, or even within your own communications system, the wide bandwidth of this radio will let you operate anywhere within the 40 MHz (VHF) or 70 / 62 MHz (UHF) band.

### Wide / Narrow (12.5 / 20 / 25 kHz Per Channel)

The VX-7100/VX-7200 may be programmed with Wide or Narrow operating bandwidths, channel by channel, to conform to your local channel environment. Ideal for multi-jurisdiction operations.

### Audio Companding

The built-in Audio Companding system compresses the voice waveform during transmission, and expands it during reception, allowing full-sounding audio despite the restricted transmission bandwidth.

### Loud Audio Output Front Speaker

The VX-7100/VX-7200's high-powered audio (2 W) is coupled to a large, front-facing speaker, producing high-quality, crisp audio that will punch through even in the noisy environments experienced by public safety officers.

### Versatile Scanning Features

The VX-7100 provides scan of all or some of the eight channels programmed. Also, if a channel is flagged as Priority, that channel is monitored even during non-priority calls. Besides the normal Scan and Priority Scan modes, the VX-7200 adds Group Scan. You can scan all Groups or selected Groups.

### ARTS™ (Auto-Range Transpond System)

The Auto-Range Transpond System, a Vertex Standard exclusive, alerts the operator when another ARTS™ equipped station (for example, a hand-held unit) moves out of communication range. You can then advise the other user to move to a better location.

## SECURITY

### Emergency Mode

When the Emergency feature is activated, the radio will switch to an emergency channel and transmit with live mic audio through a front panel mounted microphone. Among the many programmable features of the emergency mode are: Live TX time, RX Live time, and more.

## DURABLE CONSTRUCTION

### Built Tough, Built to Last

Rugged design to meet MIL-STD 810 C/D/E/F will allow this radio to last. The Ultra-rugged design enables this mobile to pass a torrent of MIL-STD tests listed in this brochure. The extraordinary design and construction ensures many years of reliable service, even in high vibration, dusty or extreme temperature environments.

## OTHER FEATURES

### D-Sub 15 Pin Accessory Connector

The included D-Sub 15 pin connector on the rear panel allows for access to Audio In, Audio Out, Ext PTT, RSSI, and many more functions making this radio perfect for third party interfaces.

### TOT, BCLO, BTLO Features

Among the most useful protection features of the VX-7100/7200 are the transmitter Time-Out Timer (TOT), Busy Channel Lock-Out (BCLO), and Busy Tone Lock-Out (BTLO)(Except for Digital Mode) to ensure efficient network performance at all times.

### Radio to Radio Clone Feature

For quick programming of VX-7100/7200 radios for an emergency task force, the Clone feature allows copying of all channel and other configuration data from one VX-7100/7200 to another, using the optional CT-4 Cloning Cable.

## VERSATILITY

**VX-P929/P924/P829/P824 with LCD:**  
Maximum 512 Channels/32 Groups  
**VX-P921 w/o LCD:**  
Maximum 48 Channels/3 Groups  
**VX-P821 w/o LCD:**  
Maximum 16 Channels / 1 Group

The LCD-equipped version provides massive channel storage capability: up to 512 channels may be programmed into as many as 32 groups. A single radio may therefore be programmed with channel sets for a number of different jurisdictions or organizations, ensuring seamless interoperability. The VX-P920 Series without the LCD can accommodate up to 48 channels in up to three groups. The VX-P820 Series without the LCD can accommodate up to 16 channels in a single memory group.

## HIGH PERFORMANCE

### Intelligent RX/TX Battery Saver

In addition to the traditional battery saver modes, our exclusive Intelligent Saver reduces power consumption associated with the DSP, yielding a remarkable extension of battery life.

### Clear Voice (VX-P920 Series) (Improves TX Audio in Noisy Environments)

The unique Clear Voice feature provides a specialized form of audio processing that helps the user's voice stand out more clearly when he or she is operating in a very noisy environment.

### Loud 700 mW Audio Output

Ideal for reception in noisy environments, high-powered audio of the VX-P920/P820 Series is coupled to a large internal speaker, assuring solid copy throughout difficult crowd control, fire or sporting-event operations.

## DURABLE CONSTRUCTION

### Rugged, Submersible Design

The VX-P920/P820 Series portables are housed in an ultra-rugged, impact-resistant case that is designed to exceed U.S. MIL-STD 810C/D/E/F standards for shock, vibration and driving rain; it also meets international waterproofing standard IP55 (water jets) and IP57 (submersion in water to a depth of 1 meter for up to 30 minutes).

### Submersible External Speaker/Microphone MH-66 Series (optional)

When operating in an emergency situation where immersion of the radio and/or its accessories could occur, the optional MH-66 Series Speaker/Microphone is rated to the same submersibility specifications as the portable itself (IP57), ensuring that your essential communications won't be interrupted if the microphone gets dropped into the water.



VX-P920 Series VX-P820 Series

### VX-P920 Series Features

- DTMF ANI/DTMF Paging •CTCSS/DCS Encode and Decode •2-Tone Encode and Multiple 2-Tone Decode •User Selectable Tone (VX-P929/P924) •Scan: Channel Scan, Priority Scan, Dual Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan •Companion (Wide and Narrow Band) •Lone Worker •Programmable Function Keys •PC Programmable •Power Output: 5 W •Wide/Narrow (12.5/20/25 kHz) Programmable per Channel •Battery Indicator •Loud 700 mW Audio Output •Speed Dial (16-key Version only) •7-Color LED for Incoming Call Alert •Large LCD (Dot Matrix/12 Characters + 7 Segments/ 3 Characters) (VX-P929/P924) •Programmable Home Channel Function •Audio Pitch Control •ARTS™ (Auto-Range Transpond System) •BCLO/BTLO (Analog Mode) and TOT

### VX-P820 Series Features

- CTCSS/DCS Encode and Decode •DTMF ANI/DTMF Paging (optional FVP-25 required for DTMF Paging) •2-Tone Encode and Multiple 2-Tone Decode •User Selectable Tone (VX-P829/P824) •Scan: Channel Scan, Priority Scan, Dual Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan •Companion (Wide and Narrow Band) •Lone Worker •Programmable Function Keys •PC Programmable •Power Output: 5 W •Battery Indicator •Wide / Narrow (12.5 / 20 / 25 kHz programmable per channel) •Speed Dial (16-key version only) •Large LCD (Dot Matrix / 12 Characters +7 Segments / 3 Characters) (VX-P829/P824) •7-Color LED for Incoming Call Alert •Programmable Home Channel Function •ARTS™ (Auto-Range Transpond System) •BCLO / BTLO (Analog Mode) and TOT •Audio Pitch Control



VX-7100  
8 ch/1 group

VX-7200  
501 ch/32 groups



VX-P929  
512 ch/32 groups with 16 Keys and LCD

VX-P924  
512 ch/32 groups with 4 Keys and LCD

VX-P921  
48 ch/3 groups without LCD



VX-P829  
512 ch/32 groups with 16 Keys and LCD

VX-P824  
512 ch/32 groups with 4 Keys and LCD

VX-P821  
16 ch/1 group without LCD