#### Specifications

	VX-920/970 SERIES		
	VHF	UHF	
<b>General Specification</b>	IS		
Frequency Range	134-174 MHz	400-470 MHz	
		450-512 MHz	
Number of Channels	512 (VX-929 / 924/ 979/ 9	974) / 48 (VX-921 / 971)	
Number of Groups	32 (VX-929 / 924 / 979 / 9	974) / 3 (VX-921 / 971)	
Channel Spacing	12.5 / 20	/ 25 kHz	
PLL Steps	1.25 / 2.5 / 5 / 6.25 kHz	5 / 6.25 kHz	
Operating Voltage	7.4 VD	C ±20 %	
Current Consumption			
STBY (w/save)	75 (30) mA	75 (30) mA	
RX	200 mA	200 mA	
ТХ	1.7A	1.9A	
Battery Life (w/Battery save)	12.5 h (16 h) w/ FNB-V87LI	11.5 h (15 h) w/ FNB-V87LI	
(RX 5 : TX 5 : STBY 90 Duty)			
Temperature Range	-22° F to + 140° F	(-30° C to +60° C)	
Frequency Stability	±2.5 ppm		
Dimensions (W x H x D)	2.3" x 5.3" x 1.5" (57.5 x 133 x 37.5 mm)		
Weight (approx.)	13.0 oz (370 g) w/Ant, Battery (FNB-V86LI) and Belt clip		
<b>Receiver Specificatio</b>	ns Measurements made p	er TIA/EIA-603	
Sensitivity (12 dB SINAD) EIA			
Adjacent Channel Selectivity (W/N)	75 / 70 dB		
Intermodulation (W/N)	75 / 70 dB		
Spurious and Image Rejection	80 dB	75 dB	
Hum and Noise (W/N)	48 / 42 dB		
Audio Out put	700 mW @16 Ohms, 5 % THD		
Transmitter Specifica	tions Measurements ma	de per TIA/EIA-603	
Power Output	5/2.5/1/0.25 W		
Modulation	16K0F3E		
	11k	COF3E	
Spurious Emissions	70 dB		
FM Hum and Noise (W/N)	45 / 40 dB		
Audio Distortion	Less than 3	3 % (@1 kHz)	

	VX-P920/P970 SERIES				
	VHF	UHF			
General Specifications					
Frequency range	134 - 174 MHz	380 - 450 MHz			
		450 - 512 MHz			
Number of Channels	512 (VX-P929/P924/P979/P974) / 48 (VX-P921/P971)				
Number of Groups	32 (VX-P929/P924/P979/P974) / 3 (VX-P921/P971)				
Channel Spacing	12.5 / 20	) / 25 kHz			
PLL Steps	1.25 / 2.5 / 5 / 6.25 kHz	5 / 6.25 kHz			
Operating Voltage	7.4 VD	C ±20 %			
Current Consumption					
STBY (Analog / Digital)	90 / 130 mA	90 / 130 mA			
RX	250 mA	250 mA			
ТХ	1.7 A	1.9 A			
Battery Life (w/Battery save)	10.4 h (14.4 h) w/ FNB-V87LI	10.0 h (13.0 h) w/ FNB-V87LI			
(RX 5 : TX 5 : STBY 90 Duty)					
Temperature Range	-22° F to + 140° F (-30° C to + 60° C)				
Frequency Stability	±2.5 ppm				
Dimensions (W x H x D)	2.3" x 5.3" x 1.5" (57.5 x 133 x 37.5 mm)				
Weight (approx.)	13.4 oz (380 g) w/Ant, Battery (FNB-V86LI) and Belt Clip				
<b>Receiver Specifications</b>	Measurements made per TIA/EIA-6	03 (Analog), TIA-102 CAAA (Digital)			
Sensitivity (12 dB SINAD) EIA	0.25 μV	0.32 μV			
Digital 5% BER	0.25 μV	0.32 μV			
Digital 1% BER	0.35 μV	0.40 μV			
Adjacent Channel Selectivity Analog (W/N)	75 / 70 dB	75 / 70 dB			
Intermodulation Analog (W/N)	75 / 70 dB	75 / 70 dB			
Spurious and Image Rejection Analog	80 dB	75 dB			
Hum and Noise Analog (W/N)	48 / 42 dB				
Audio Output	700 mW @16 Ohms, 5% THD				
Transmitter Specifications Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)					
Power Output	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	3 % @ 1kHz			

Audio Distortion

VX-920/P9	20 Series : Aj	oplicable Interi	national Protection Standard	VX-970/P	970 Series :	Applicable Intern	ational Protection Standard
IP54 Splash Proof	IP55 Water Jets	Submersible 3 feet for 30 min	Special Order Version	Water Jets	Submersible 3 feet for 30 min	Super Submersible 6 feet for 3 hrs	Special Order Version

#### VX-920/970/P920/P970 Series : Applicable MIL-STD

Measurements per EIA standards unless noted above. Specifications are subject to change without notice or obligation.

Standard	MIL 810C	MIL 810D	MIL 810E	MIL 810F
	Methods/Procedures	Methods/Procedures	Methods/Procedures	Methods/Procedures
Low Pressure High Temperature Low Temperature Shock Solar Radiation Rain Humidity Salt Fog Dust Immersion* Vibration Shock	500.1/Procedure I, II 501.1/Procedure I, II 502.1/Procedure I, II - 505.1/Procedure I 507.1/Procedure I 507.1/Procedure I, II 509.1/Procedure I 510.1/Procedure I 512.1/Procedure I 514.2/Procedure I Cat. 10,8 516.2/Procedure I	500.2/Procedure I, II 501.2/Procedure I, II 502.2/Procedure I, II - 505.2/Procedure II Cat. A1 506.2/Procedure II Cat. A1 507.2/Procedure II, III 509.2/Procedure I 510.2/Procedure I 514.3/Procedure I Cat. 10 516.3/Procedure I	500.3/Procedure I, II 501.3/Procedure I, II 502.3/Procedure I, II - 505.3/Procedure II Cat. A1 506.3/Procedure II Cat. A1 507.3/Procedure I, III 509.3/Procedure I 510.3/Procedure I 512.3/Procedure I 514.4/Procedure I Cat. 10 516.4/Procedure I	500.4/Procedure I, II 501.4/Procedure I, II 502.4/Procedure I, II 503.4/Procedure I 505.4/Procedure I 505.4/Procedure I 509.4/Procedure I 510.4/Procedure I 510.4/Procedure I 514.5/Procedure I 516.5/Procedure I

#### Intrinsically Safe Information

The Intrinsically Safe Version of VX-920/970/P920/P970 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.



MGMT. SY: YAESU MUSEN CO., LTD YAESU MUSEN CO., LTD ISO9001:2000 certification ISO14001:2004 certification







**US Headquarters** 10900 Walker Street, Cypress, CA 90630, U.S.A. Phone 714/827-7600; Fax 714/827-8100 http://www.vertexstandard.com

Vertex Standard

Vertex Standard We make a difference



# VX-P920/P970 SERIES

Reliability, ruggedness, and interoperability like never before. The VX-P920/P970 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 (VX-P920) / IP68 (VX-P970) specifications, and built to U.S. MIL-STD specifications, the VX-P920/P970 Portables are your assurance of long-term reliability under the most difficult operating circumstances.



512 ch/32 groups with 4 Keys and LCD

48 ch/3 groups without LCD

512 ch/32 groups with 16 Keys and LCD

<sup>2</sup> Actual Size

# **P25 DIGITAL MODE**

#### NAC (Network Access Code)

NAC (Network Access Code) are programmable and are 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.

typically used to control network access but may also be used to steer repeater operations. NAC codes are used the same way as an analog CTCSS tone (or DCS code). There are 4096 unique NAC codes. AMBE+2<sup>™</sup> Vocoder For superior voice quality in narrow-band, digital, P25 mode of operation our products use the AMBE+2<sup>™</sup> 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

Advanced Encryption Standard (AES) is a newer and more Talk Group IDs (TGIDs) provide for the logical grouping of radio robust system based on 256 bit algorithm. Encryption Kevs users into distinct organizations and can also be used to minimize Multiple encryption keys can be stored in the unit as required. co-channel interference. There are more than 65,000 unique TGID addresses. Miscellaneous · Emergency Decode Indication

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

P25 contains special provisions for Emergency Calling. When The calling station will be identified either by their Alphanumeric an "Emergency" signal is received, the radio's "Busy" LED can provide a very bright white blinking indication while the LCD can Tag (if defined in the Individual ID List), or by their ID number (if a Tag show the Unit ID or Alpha Tag of the unit in distress... is not defined).

# VERSATILITY

#### VX-P929/P924/P979/P974 with LCD: Maximum 512 Channels/32 Groups VX-P921/P971 w/o LCD: Maximum 48 Channels/3 Groups

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/P970 Series without the LCD can accommodate up to 48 channels in up to three groups.

#### Intelligent RX/TX Battery Saver

In addition to the traditional battery saver modes, our exclusive Intelligent Saver reduces power consumption associated with the DŠP.

#### Multi-Band Reception (optional)

The optional SRX-3 (UHF) and SRX-4 (VHF) Multi-Band Receiver Units expand the versatility of the VX-P920/P970 Series significantly. For example, a UHF version of the VX-920/970 Series may have the SRX-4 installed, expanding reception to include both UHF and VHF channels so that information or commands from a dispatch center will never be missed.

## Clear Voice (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.

### Individual ID List / Paging Group

#### 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...

#### 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.

#### Rugged, Submersible Design

The VX-P920 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 3 feet for up to 30 minutes). For even more demanding environments, the VX-970 Series version meets IP68 specifications (submersion to 6 feet for 3 hours), and is available via special order.



#### Other Features

 CTCSS/DCS Encode and Decode
 DTMF ANI/DTMF Paging •2-Tone Encode and Multiple 2-Tone Decode •User Selectable Tone (VX-P929/P924/P979/P974) •Scan: Channel Scan, Priority Scan, Dual Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan •Compander (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/P979/P974) 
• Programmable Home Channel Function ●Audio Pitch Control ●ARTS™ (Auto-Range Transpond System) •BCLO/BTLO and TOT





# VERSATILITY

#### VX-929/924/979/974 with LCD: Maximum 512 Channels/32 Groups VX-921/971 w/o LCD: Maximum 48 Channels/3 Groups

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 iurisdictions or organizations, ensuring seamless interoperability. The VX-920/970 Series without the LCD can accommodate up to 48 channels in up to three groups.

#### CTCSS / DCS Encode and Decode

High-performance Encoder/Decoder circuits for both CTCSS and Digital Code Squelch are provided, for access to tone/code controlled systems. DCS is ideal for crowded RF environments, providing superior immunity from false opening of the squelch.

#### DTMF ANI / DTMF Paging

Fleet and network operation are enhanced by the built-in DTMF ANI/Paging circuit.

#### 2-Tone Encode and Multiple 2-Tone Decode

The VX-920/970 Series can transmit a 2-Tone paging call, and can receive 2-Tone calls using different tone combinations.

#### User Selectable Tone (VX-927/924/979/974)

One of the front panel's "programmable" keys may be designated so as to allow the user to select a CTCSS or DCS tone from a pre-defined Tone Table.

#### Scan: Channel Scan, Priority Scan, Dual Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan

The VX-920/970 Series provides unmatched flexibility in its scanning features. Designed to optimize operation in a wide variety of system environments, these scanning capabilities ensure that you never miss an important call.

#### **Compander (Wide and Narrow Band)**

For operation in systems requiring Companding, the VX-920/970 Series portables include both Wide- and Narrow-band Companding circuitry, programmable channel by channel.

#### Lone Worker

The Lone Worker feature is designed to emit an alarm for 30 seconds when the Lone Worker Timer (programmed by the dealer) has expired. If the user does not reset the timer by pressing the PTT switch, the radio switches to the Emergency mode.

#### **RX / TX Battery Saver**

When engaged, the Receive-mode Battery Saver rapidly pulses the portable on and off, reducing current consumption and extending battery life. If a call is received, the Battery Saver is disengaged, and normal operation resumes. On transmit, the Battery Saver will reduce transmitter power, thus extending operating time, when you are within close range of a strong repeater or dispatch center.

#### **Programmable Function Keys**

Customization of feature access is easily accomplished at the time of programming, thanks to the "programmable" keys that may be assigned functions needed most in your operating environment.



#### **PC Programmable**

All channel and other configuration data may be uploaded to the portable by the dealer in a matter of minutes, allowing efficient setup of a fleet of radios when rapid deployment is reauired.

## ANI Encoding and Decoding (MDC-1200<sup>®</sup>. GE-Star<sup>®</sup>. and DTMF (Encode): optional VME-100 or VMDE-200 required)

Automatic Number Identification, triggered by the pressing of the PTT key, is available in the most popular industrystandard formats, via the optional VME-100 (for Encoding only) or VMDE-200 (for Encoding and Decoding) module.

# **DURABLE CONSTRUCTION**

#### **Rugged, Submersible Design**

The VX-920 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 3 feet for up to 30 minutes).



For even more demanding environments, the VX-970 Series version meets IP68 specifications (submersion to 6 feet for 3 hours), and is available via special order.

#### 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.

# HIGH PERFORMANCE

#### **Power Output: 5 W**

The VX-920/970 Series provides up to five solid Watts of transmitter power, for extended communications range. For more localized applications, the power output may be reduced to 2.5 W, 1 W, or 1/4 W, for enhanced battery life.

#### Wide/Narrow (12.5/20/25 kHz) Programmable per Channel

When programming radios for use in different jurisdictions, the VX-920/970 Series portables may be set up, channel by channel, for use in 12.5 kHz, 20 kHz, or 25 kHz channel spacing environments. Deviation and bandwidth are automatically set according to the configuration you choose.

#### **Built-in 5-Tone Signaling**

For advanced network or fleet operations, a 5-Tone Encoder-Decoder circuit is included in the VX-920/970 Series. An expensive option on many competing brands, this included feature enhances operation without impacting your budget.

#### **Multi-Band Reception (optional)**

The optional SRX-3 (UHF) and SRX-4 (VHF) Multi-Band Receiver Units expand the versatility of the VX-920/970 Series significantly. For example, a UHF version of the VX-920/970 Series may have the SRX-4 installed, expanding reception to include both UHF and VHF channels so that information or commands from a dispatch center will never be missed.

#### Loud 700 mW Audio Output

Ideal for reception in noisy environments, high-powered audio of the VX-920/970 Series is coupled to a large internal speaker, assuring solid copy throughout difficult crowd control, fire, or sporting-event operations.

#### Clear Voice (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.

#### Speed Dial (16-key Version only)

An easy-to-use DTMF Speed Dialer feature is included in the VX-929/979, for specialized selective calling, telephone interconnect, or other applications.

#### Voice Storage (optional DVS-5 required)

The optional DVS-5 Digital Voice Storage Unit allows you to store and play back up to 120 seconds of incoming received audio, so you can archive an important incoming message.

# **EASY USER INTERFACE**

## 7-Color LED for Incoming Call Alert

The front panel of the VX-920/970 Series includes an ultra-bright LED that can display up to seven different colors, with a variable flash pattern, to alert the operator when a 2-Tone or 5-Tone call has come in, and during Emergency mode operation.



#### Large LCD (Dot Matrix/12 Characters + 7 Segments/ 3 Characters) (VX-929/924/979/974)

The large, easy-to-read display includes a 12-character dot matrix that provides a wealth of information about the operating channel, as well as various status icons. Illuminated using Vertex Standard's renowned Omni-Glow<sup>™</sup> back-lighting, the VX-929/924/ 979/974's LCD is clearly visible at night, with minimal degradation of your night vision.



#### Programmable Home Channel Function

The user may select, out of the dealer-programmed channel list, one channel to be the "Home" channel, which may be assigned to a "programmable" key for one-touch access to a critically-important channel.

#### **Direct Channel Recall (#1 - #4)**

Any or all of the programmable keys may be assigned as direct-access one-touch keys for selecting important operating

#### Audio Pitch Control

When using the radio in a noisy environment, the Audio Pitch Control adds aggressive equalization to the audio on the incoming signal, allowing it to "punch" through the ambient noise so the user will have a better chance of understanding the incoming transmission.

#### **ARTS<sup>™</sup>** (Auto-Range Transpond System)

The ARTS<sup>™</sup> feature is a "handshake" system that uses DCS coding to confirm that two ARTS<sup>™</sup>-equipped units are within communication range. If an "out of range" condition develops, an alarm will sound and the communications center can instruct the field unit to move to a better location (or assistance to the field unit can be dispatched).

## SECURITY

## **BCLO/BTLO and TOT**

To prevent interference to other users on busy channels, the Busy Channel Lock-Out (BCLO) and Busy Tone Lock-Out (BTLO) features prevent transmission by the portable if the channel is occupied. And the Time-Out Timer (TOT) feature will automatically cut of transmission if the programmed maximum transmit time is exceeded.

#### Remote Radio Stun/Kill/Revive (5-Tone)

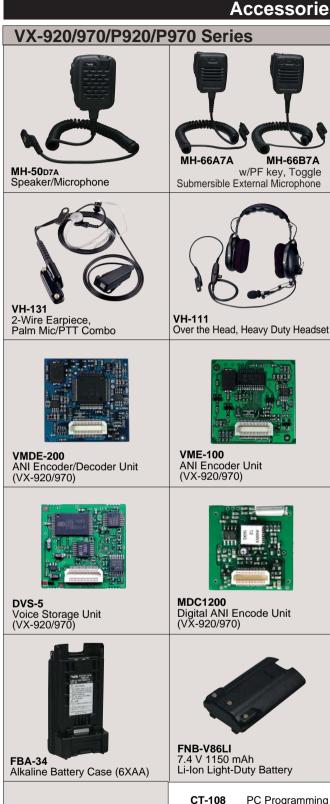
To prevent use of the portable by an unauthorized operator (in case of theft, non-payment of subscription, etc.), a dispatch center can send a 5-Tone command to "Stun" (temporary disabling) or "Kill" (permanent disabling) a unit. If the "Stun" command has been sent, another 5-Tone "Revive" command may also be sent, re-enabling operation of the portable.

#### Encryption (Optional FVP-35 or FVP-36 required)

The FVP-35 (Rolling Code) and FVP-36 (Inversion) Encryption Units provide security for your important public safety and security communications.

#### Other Features

•AF Minimum Volume •Radio-to-Radio Cloning •Signal Strength Meter •Battery Indicator





CT-108PC Programming Cable (for FIF-10/A)CT-109PC Programming Kit (CT-29 + CT-115)CT-115PC Programming Cable (for VPL-1)CT-116Radio to Radio Cloning CableLCC-920Leather CaseCE59Programming Software (VX-920/970)CE76Programming Software (VX-P920/P970)

FIF-10/A USB Programming Interface

# **Accessories & Options**

