

VXR-1000

16 Channel 5 W
VHF/UHF Vehicular Repeaters



Designed to enhance Public Safety and Industrial Communications Systems, the VXR-1000 Multi-Channel Cross-Band Vehicular Repeater provides dependable portable coverage throughout your system without the costly addition of site equipment. The VXR-1000 is a sophisticated, yet extremely simple to operate, addition to your mobile fleet to allow complete portable coverage utilizing the high output power of your mobiles. With a long list of built-in features, the VXR-1000 sets the standard for a cost effective way to optimize your system performance. Extremely small in size, and with a built-in DB-9 connector, the VXR-1000 will interface with most all brands of mobile radios in the market today. Let the VXR-1000 enhance your system now, and into the next century.



- Frequency Range:
 - VHF: 150~174 MHz
 - UHF: 450~470 MHz
- 16 Channel Capacity
- 5 Watts Power Output (Selectable 2.5, 1 and 0.5 W Low Power Levels)
- 12.5/25 kHz Bandwidth (Programmable By Channel)
- CTCSS/DCS Encode + Decode
- ARTS (Auto Range Transpond)
- Command Control (Allows VXR-1000 To Talk Directly With Portable)
- Built In Voice Inversion Encryption (Allows Secure Voice Between VXR-1000 and Portable)
- Local Volume Control (Requires External Speaker)
- First on Scene Logic With Priority Sampling
- Works With Most Popular Trunking Protocols
- Works With Most Low Band, VHF and UHF Systems
- PC Programmable
- MIL-STD 810 C/D/E



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Specifications

General Specifications	VHF	UHF
Number of Channels	16 Channel	
Frequency Range	150-174 MHz	450-470 MHz
Crystal or Synthesized	Synthesized	
Channel Spacing	15 /30 kHz	12.5/25 kHz
Power Supply Voltage	13.8 VDC	
Ambient Temperature Range	-30°C to +60°C	
Frequency Stability	± 2.5 ppm	
RF Input-Output Impedance	50 ohms	
Audio Output Impedance	8 ohms	
Dimensions	1.0" (H) x 4.4" (W) x 5.4" (D) (25.4 x 111 x 136 mm)	
Weight	14.1 oz. (400 g)	

Receiver Specifications	Measurements made per EIA standard TIA/EIA-204D	
Circuit Type	Double Conversion Superheterodyne	
Sensitivity		
EIA 12 dB SINAD	0.30 µV	0.35 µV
20 dB Quieting	0.40 µV	0.45 µV
Threshold Squelch	0.25 µV to 2 uV	
Adjacent Channel Selectivity	60 dB	
Intermodulation	60 dB	
Spurious and Image Rejection	60 dB	
Conducted Spurious Emissions	-57 dBm	
Audio Response	+3/- 8 dB from the 6 dB/oct. De-emphasis curve	
Audio Output	1W into 8 ohms w/ <5% THD	
Hum and Noise	40 dB	

Transmitter Specifications	Measurement made per EIA standard TIA/EIA-152-C	
RF Power Output	5 / 2.5 / 1 / 0.5 W (HI/M2/M1/LO)	
Modulation	16K0F3E/11K0F3E	
Maximum Deviation	± 5 kHz / ± 2.5 kHz	
Conducted Spurious Emissions	60 dBc	
FM Hum and Noise	40 dB	
Audio Response	+1/- 3 dB from the 6 dB/oct. Pre-emphasis curve	
Audio Distortion	<5.0%	

Standard	MIL-810C Method/Procedures	MIL-810D Methods/Procedures	MIL-810E Methods/Procedures
Dust	510.1/Procedure 1	510.2/Procedure 1	510.3/Procedure 1
Vibration	514.2/Procedure 8,10	514.3/Procedure 1	514.4/Procedure 1
Shock	516.2/Procedure 1, 2, 3, 5	516.3/Procedure 1, 3, 4, 5, 6	516.4/Procedure 1, 3, 4, 5, 6

The Vertex Warranty *
Vertex Radio Communications equipment includes an industry-leading 3- Year Limited Warranty on all transceivers and a 1-Year Warranty on all accessory items.
* U.S. and Canada

Accessories & Options

- MLS-100 External Speaker (12 Watt)
- MH-25A8J Microphone
- VPL-1 Radio to Computer Programming Cable
- FRB-4 Alignment Interface Box
- T9101411 Cloning Cable (set to set clone)



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Measurements per EIA standards unless noted above. Specifications subject to change without notice or obligation. Various accessories listed may not be available in some countries.

Vertex Standard
**VHF/UHF Vehicular
Repeater**

VXR-1000

16 Channel 5 Watts

Operating Manual



General Information:

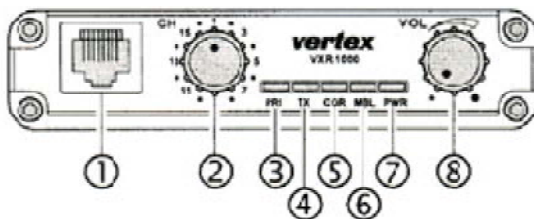
The VXR-1000 Series is designed to provide extended handheld coverage by repeating transmissions in both directions through an existing high power mobile radio.

Reliability is assured by a highly integrated surface mount circuit design and a aluminum extrusion chassis. Important channel frequency data is stored in EEPROM, and is easily programmable by dealers using a personal computer and the Vertex VPL-1 Programming Cable and CE22 Software.

Please take a few minutes to read this manual carefully. The information presented here will allow you to derive maximum performance from your VXR-1000.

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Front Panel



1. **Microphone Jack**
Connect the microphone plug to this jack.
2. **CHANNEL Selector Knob**

Functional Description:

When the user leaves the vehicle, they activate their mobile radio via its front panel or a separate switch. When the mobile radio is receiving a signal, the VXR-1000 will begin transmitting on the hand-held's receive frequency. The user is able to hear and respond to all radio traffic, including other hand-helds on the same frequency. The repeater jumpers and potentiometers are custom configured for use with the particular mobile radio to which it will be connected. The CE-22 software is used to program the repeater for the required operating parameters.

Trunking Operation:

When the radio is connected to a trunking mobile you wish to access the system from your handheld radio, key the handheld briefly then release the PTT key. The radio will attempt to acquire a voice channel on the trunking system by keying the mobile for 200 ms and monitoring the "on-air detect" line from the mobile. If the VXR-1000 does not see the radio transmit at all (system is busy), it will send a low tone to the handheld to alert you that the system is busy. The radio will automatically retry every 5 seconds and send a "busy" tone to the handheld with each unsuccessful attempt, to indicate progress of the call attempt. If unsuccessful after 30 seconds, the radio will transmit an "intercept" tone to alert the handheld that the call attempt failed.

When the VXR-1000 detects that the mobile is transmitting, it will continue to monitor the

- This knob selects the operating channel.
3. **PRI Indicator**
When on, "PRI" indicates that the unit is at priority count zero and will repeat all transmissions.
 4. **TX Indicator**
When on, "TX" indicates that the repeater is transmitting to the handheld.
 5. **COR Indicator**
This lamp blinks red when the VXR-1000 is receiving a signal from a handheld, and glows red while the VXR-1000 is receiving a sub-audible tone from the handheld.
 6. **MBL Indicator**
This lamp blinks red when the Mobile is receiving signal from repeater or base, and glows red while the Mobile is transmitting to the repeater or base.
 7. **PWR Indicator**
This is the main "POWER ON" indicator for the VXR-1000.
 8. **VOLUME Knob**
This knob adjusts the receiver volume.

Error Message

No Channel Data (Channel is Vacant)	TX, COR, and PWR Indicators Blink
ARTS Out of Range	PWR Indicator Blinks

Hardware Settings:

JP1004: Controls the output impedance of the transmit audio line to the mobile radio. Short: low-Z (600 ohms); open: high-Z (4.7 k ohms)
*

JP 1005: Controls the maximum drive level of the transmit audio output to the mobile. Short: low level output (0-100 mV)*; open: high level output (0-5 V).

JP1001/1002/1003: Polarity of Power supply control. Default setting: active high (JP 1003: short). (* default setting)

VR1001: Mobile Microphone level

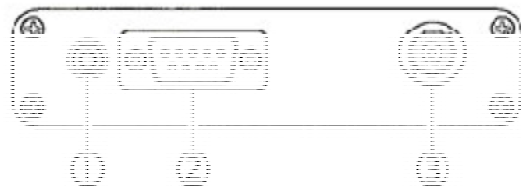
VR1002: Mobile RX Audio (Ext. Mod level)

VR1007: Mobile TX Audio (output level)

"on-air detect" line until the transmitter remains keyed for at least 250 ms to determine if the radio is merely handshaking or retrying. After successful acquisition of a voice channel, it will continue to hold the mobile's PTT active for 2 seconds and transmit a "go-ahead" blip to the handheld. You may then key their handheld to speak on the voice channel. If you do not key up within the 2-second period, the radio will un-key the mobile and send the "intercept" tone, as before.

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Rear Panel



1. **EXT SP (External Speaker)**
An external loudspeaker may be connected to this 2-contact, 3.5-mm mini-phone jack.
2. **DSUB 9-Pin Accessory Connector**
External TX audio line-input, PTT, external RX audio line-output, and other signals may be obtained from this connector for use with accessories.
3. **Antenna Socket**
The Antenna socket is a standard 50 ohm BNC antenna connector.

Pin Assignments	
Pin 1	GND
Pin 2	Mobile TX Audio
Pin 3	PWR Supply Cntrl
Pin 4	Mobile PTT Output
Pin 5	Vcc (13.8V DC)
Pin 6	Mobile RX Audio
Pin 7	Mobile COR Detect
Pin 8	Mobile Mic Audio
Pin 9	Mobile TX Detect/ Microphone PTT

The VXR-1000 has a fixed 3 minute time-out timer for base to handheld transmissions. If the mobile COR is active for more than 3 minutes it will send a error blip and cease transmission until the mobile COR is inactive.

