

Quote



rf Services, Inc.

SUPPLYING THE
COMMUNICATIONS INDUSTRY
SINCE 1977

Date	Quote #
10/11/2011	154

Name / Address
CERT - Lake Arrowhead Bob Johnston 113 Gee Court Waleska, GA 30183 678-463-2005 - 770-479-6090

Purchase Orders To: rf Services, Inc. 442 Cadillac Parkway Dallas, GA 30157 770.443.9511 Office 770.443.9513 Fax

Rep	Project
JB	

Item	Qty	Description	Cost	List	Total
VX-451-G7-5 ...	20	High Performance PKG with FNB-V113Li 2400mAh Battery, ATU-16D antenna and VAC-450 1 hour Rapid Charger	210.00		4,200.00
VXR-7000UD	1	UHF Desktop Repeater/Base Station w/ power supply 450-480 MHz	1,155.00		1,155.00
VXD-60UD	1	50 Watt Internal Duplexer for VXR-7000. Allows for 1 antenna for TX and RX. Price includes tuning to frequency.	339.00		339.00
MISCELLANE...	1	50 foot run of RG-8 (9913) cable to connect the repeater to the antenna	40.00		40.00
RFN-1006-31	2	N Male for 9913 Type Cable	5.99		11.98
MD-12A8J	1	Optional: Desktop Microphone for VXR-7000 (for use as a base station)	102.00		102.00
CRX-450	1	UHF Base Station antenna (Ringo Ranger)	66.22		66.22
FG4505	1	Fiberglass Omnidirectional base station antenna, 450-460 MHz, 5 db gain	142.10		142.10
FREIGHT		NO CHARGE	0.00		0.00
PROG FEE		Programming Fee	0.00		0.00

Thank you for the opportunity to quote our products!

Total

\$6,056.30

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Rep	Project
JB	

Item	Qty	Description	Cost	List	Total
VX-231-AG7B-5	20	VX-231 UHF Package: Radio, FNB-V103Li battery, VAC-300B charger, ATU-6D antenna, spring-loaded belt clip	157.50		3,150.00
VXR-7000UD	1	UHF Desktop Repeater/Base Station w/ power supply 450-480 MHz	1,155.00		1,155.00
VXD-60UD	1	50 Watt Internal Duplexer for VXR-7000. Allows for 1 antenna for TX and RX. Price includes tuning to frequency.	339.00		339.00
MISCELLANE...	1	50 foot run of RG-8 (9913) cable to connect the repeater to the antenna	40.00		40.00
RFN-1006-31	2	N Male for 9913 Type Cable	5.99		11.98
MD-12A8J	1	Optional: Desktop Microphone for VXR-7000 (for use as a base station)	102.00		102.00
CRX-450	1	UHF Base Station antenna (Ringo Ranger)	66.22		66.22
FG4505	1	Fiberglass Omnidirectional base station antenna, 450-460 MHz, 5 db gain	142.10		142.10
FREIGHT		NO CHARGE	0.00		0.00
PROG FEE		Programming Fee	0.00		0.00

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Total

\$5,006.30

VX-450 Series

VHF/UHF Portable Radios

SPECIFICATION SHEET

Durable On-the-Job Responsiveness

The industrial grade VX-450 Series maximizes worker uptime with expanded safety applications and convenient built-in features designed for heavy duty use.

Monitor Worker Safety

As with all Vertex Standard radios, the VX-450 series includes built-in Emergency and Lone Worker alerts. Emergency notification is user-initiated with a press of a button for the radio to switch to a designated channel and send an alert for help. Lone Worker mode is a built-in timer that requires the user to reset at a predetermined interval. If not reset, the radio automatically switches to Emergency mode to alert help.

When constant contact is required at all times, Vertex Standard's exclusive Auto-Range Transpond System (ARTS™) is included to inform the user that other ARTS™ - equipped radios are within communication range.

No two job sites are alike and the optional Man Down function (with DVS-9 unit) is programmable to monitor a variety of worker timed safety scenarios vertically and horizontally as well as worker degree of motion. Adjusting the settings of the 3-axis sensor adapts the radio to each distinct work environment to monitor movement.

Solid Build for Extreme Environments

The VX-450 Series withstands job site abuse meeting military standards for ruggedness and meets the IP57 ingress protection standard where water does not harm the radio when submerged to a depth of 3 feet for up to 30 minutes.

Audio and Voice Responsiveness

Features 700 mW loud audio output ideal for noisy work environments.

Includes Channel Announcement which loudly speaks the channel description to simplify changing channels when focused on other tasks simultaneously.

Features voice activation (VOX) when used with MH-81A4B headset that enables users to transmit voice without pressing the Push To Talk button for hands-free operation.

Record and store up to 120 seconds of voice messages using the optional DVS-8 Voice Storage unit.

Built-in Selective Signaling Modes for Greater Flexibility

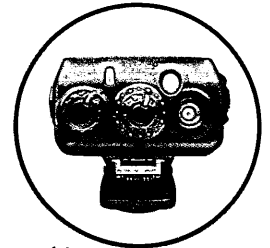
Includes MDC-1200® encode/decode along with both 2-tone and 5-tone encode/decode providing selective radio calling and efficiency in supporting a variety of discreet communications needs.

Large Group Communications Made Easy to Manage

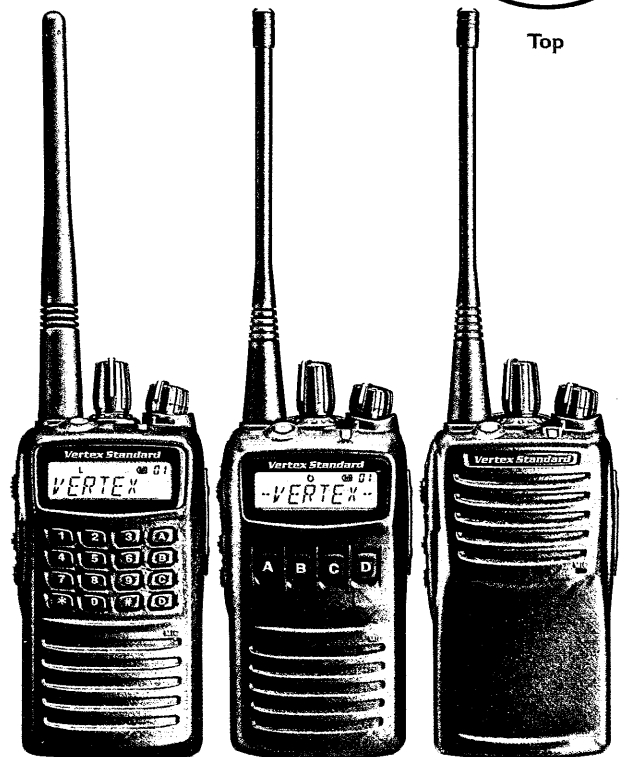
Both the VX-459 and VX-454 radios have a massive 512-channel capacity and 32 groups to easily manage a variety of calls at the most complex job site or plant operation. The VX-459 also includes Direct Channel Entry to punch in the channel desired from the keypad for fast navigation.

FCC Narrowband Compliant

Meets the FCC Part 90 requirement for using 12.5 kHz channels by January 1, 2013.



Top

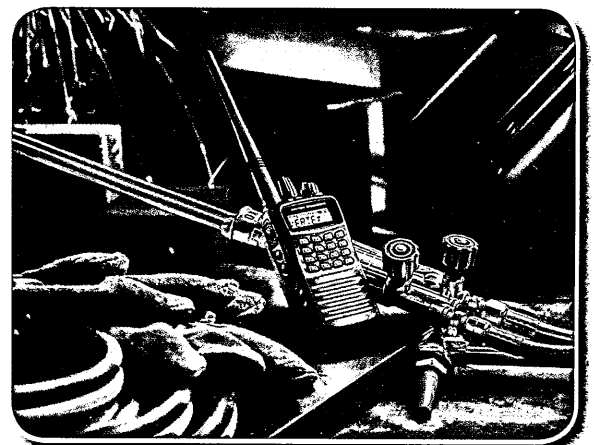


VX-459

VX-454

VX-451

4.29" (H) X 2.3" (W) X 1.34" (D)



The Vertex Standard Difference

Our number one goal is achieving superior customer satisfaction by delivering products and services that exceed your expectations. Vertex Standard radios are built to last and are backed by an industry-leading 3 year warranty – another great reason to choose Vertex Standard. Ask your Dealer for more details.

Additional Features

- Nine programmable keys (VX-459)
- Seven programmable keys (VX-454)
- Three programmable keys (VX-451)
- 8-Character alphanumeric display (VX-454/459)
- Voice inversion encryption
- Manual on/off encryption activation
- RX/TX Battery power save
- DTMF ANI
- DTMF Speed dial
- DTMF Paging
- CTCSS / DCS Encode and Decode
- Stun/kill/revive (5-tone)
- Compander
- Clear voice
- Whisper
- Minimum volume control
- Manual squelch adjustment
- BCLO, BTLO and TOT Functions
- Programmable LED color alert
- Priority scan
- Dual Watch scan
- Follow-me scan
- Talk Around scan
- Radio-to-radio cloning

Accessories

- MH-360S: Compact speaker microphone
- MH-37A4B: Earpiece microphone
- MH-450S: Speaker microphone
- MH-45B4B: Noise cancelling speaker microphone
- MH-81A4B: Over-the-head light duty VOX headset
- VH-110S: Over-the-head heavy duty dual-muff headset
- VH-115S: Behind-the-head headset w/boom mic
- VH-215S: Over-the-head single-muff headset
- VH-120S: Earpiece mic w/palm PTT switch
- VH-130S: Earpiece w/palm mic and PTT switch
- FNB-V113LI: 2400 mAh Li-Ion battery
- FNB-V112LI: 1170 mAh Li-Ion battery
- Desktop chargers available

Option Boards

- DVS-8: Digital voice storage unit
- DVS-9: Man down alert with digital voice storage

VX-450 Series Specifications

	VHF	UHF
General Specification		
Frequency Range	134 - 174MHz	450 - 512 MHz
Number of Channels and Groups	512 / 32 Groups (VX-459, VX-454) 32 / 2 Groups (VX-451)	
Power Supply Voltage	7.5V DC ± 20%	
Channel Spacing	12.5 / 20 / 25 kHz	
PLL Steps	1.25 / 2.5 / 5 / 6.25 kHz	5 / 6.25 kHz
Battery Life (5-5-90 duty)	18.5 hours (w/saver) / 16 hours 9.5 hours (w/saver) / 8.6 hours	
2400 mAh FNB-V113LI	18 hours (w/saver) / 15.6 hours	
1170 mAh FNB-V112LI	9.2 hours (w/saver) / 8.3 hours	
IP Rating	IP 57	
Operating Temperature Range	-22° F to +140° F (-30° C to +60° C)	
Frequency Stability	±2.5 ppm	
RF Input-Output Impedance	50 Ohms	
Dimension (H x W x D)	4.29 x 2.3 x 1.34 inches (109 x 58.5 x 34 mm) (w/FNB-V112LI) 4.29 x 2.3 x 1.69 inches (109 x 58.5 x 43 mm) (w/FNB-V113LI)	
Weight (Approx.)	10.44 oz (296 g) (w/FNB-V112LI, ANT, Belt Clip) 11.99 oz (340 g) (w/FNB-V113LI, ANT, Belt Clip)	
Receiver Specification: measured by TIA/EIA-603		
Sensitivity 12dB SINAD	0.25 µV	0.32 µV
Adjacent Channel Selectivity	70 dB / 65 dB	
Hum and Noise	45 dB / 40 dB	
Intermodulation	70 dB / 65 dB	
Spurious and Image Rejection	70 dB	
Audio Output	700 mW (internal @ 16 Ohms, 5% THD) 500 mW (external @ 4 Ohms, 5% THD)	
Transmitter Specification: measured by TIA/EIA-603		
Output Power	5 / 2.5 / 1 / 0.25 Watt (selectable by channel)	
Modulation	16K0F3E, 11K0F3E	
Maximum Deviation	± 5.0 kHz / ± 2.5 kHz	
Conducted Spurious Emissions	70 dB below carrier	
FM Hum and Noise	45 dB / 40 dB	
Audio Distortion	< 3 % @ 1 kHz	

Applicable MIL-STD (Pending Test Completion)

Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures	MIL 810G Methods/Procedures
Low Pressure	500.1 / Procedure I	500.2 / Procedure I, II	500.3 / Procedure I, II	500.4 / Procedure I, II	500.5 / Procedure I, II
High Temperature	501.1 / Procedure I, II	501.2 / Procedure I, II	501.3 / Procedure I, II	501.4 / Procedure I, II	501.5 / Procedure I, II
Low Temperature	502.1 / Procedure I	502.2 / Procedure I, II	502.3 / Procedure I, II	502.4 / Procedure I, II	502.5 / Procedure I, II
Temperature Shock	503.1 / Procedure I	503.2 / Procedure I	503.3 / Procedure I	503.4 / Procedure I	-
Solar Radiation	505.1 / Procedure I	505.2 / Procedure II Cat. AI	505.3 / Procedure II Cat. AI	505.4 / Procedure I, II Cat. AI	-
Rain	506.1 / Procedure I, II	506.2 / Procedure I, II	506.3 / Procedure I, II	506.4 / Procedure I, III	506.5 / Procedure I, III
Humidity	507.1 / Procedure I, II	507.2 / Procedure II, III	507.3 / Procedure II, III	507.4 / Procedure III	507.5 / Procedure I, III
Salt Fog	509.1 / Procedure I	509.2 / Procedure I	509.3 / Procedure I	509.4 / Procedure I	509.5 / Procedure I
Dust	510.1 / Procedure I	510.2 / Procedure I	510.3 / Procedure I	510.4 / Procedure I, III	510.5 / Procedure I
Vibration	514.2 / Procedure VIII, X	514.3 / Cat. 10	514.4 / Cat. 10	514.5 / Cat. 20, 24	514.6 / Cat. 20, 24
Shock	516.2 / Procedure I, III, V	516.3 / Procedure I, IV	516.4 / Procedure I, IV	516.5 / Procedure I, IV	516.6 / Procedure I, IV

Specifications are subject to change without notice or obligation.

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NSS_450_10/2010

VXR-7000 Series

VHF/UHF Desktop Repeater/Base Station

SPECIFICATION SHEET

Dual-Purpose Repeater For Efficient Communications

The VXR-7000 not only helps expand the communication range of two-way radio systems, but it also serves as a base station for convenient, easy fleet communications in public safety, industrial or administrative work areas. Continuous-duty and cycle-rated, this one unit is designed to enhance productivity for a maximum return on investment.

Convert To Talk At a Press Of A Button

While a full-featured repeater, the VXR-7000 immediately switches to function in base station mode simply by pressing the Push to Talk Transmit button. Once released, the unit converts back to repeater mode.

Local Or Remote Operating Capability

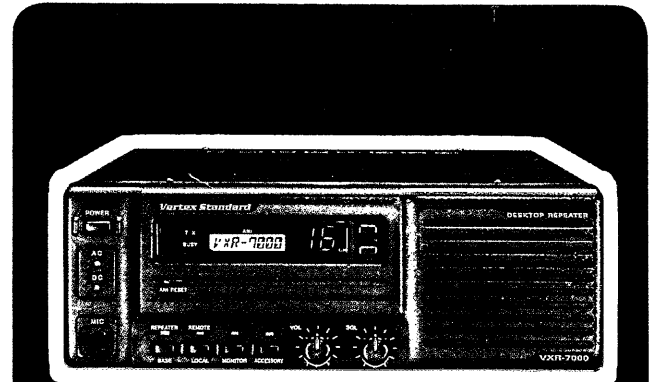
Controlled by the operator with a press of a button, the VXR-7000 is designed to function as programmed. Or, switch to remote mode and the unit is controlled by instructions received from an external device connected to the accessory connector.

When Safety Counts

The VXR-7000 has DTMF decoding built-in to coordinate with the Emergency and ANI functions found in Vertex Standard mobile and portable two-way radios. If an Emergency alert is received from a mobile or portable radio, the VXR-7000 will beep loudly and blink the LCD to notify the dispatcher of the emergency alert.

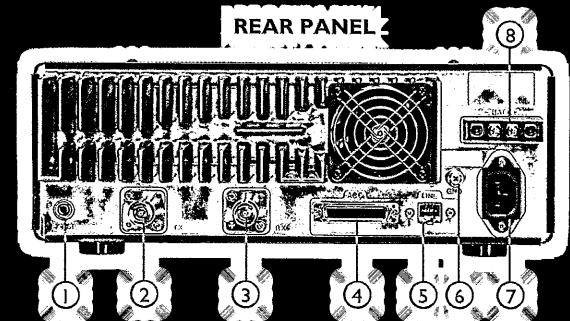
Uninterrupted Power Supply

For uninterrupted operation during power failures, a 12 volt rechargeable battery may be connected. During a power outage, the automatic power control circuit will immediately switch the repeater to the backup battery.



VXR-7000

12.8" (W) X 4.5" (H) X 15.4" (D)



REAR PANEL

- | | |
|-------------------|-----------------|
| ① EXT SP Jack | ⑤ LINE Jack |
| ② TX Antenna Jack | ⑥ GND Terminal |
| ③ RX Antenna Jack | ⑦ AC Jack |
| ④ ACC Jack | ⑧ BATT Terminal |



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Additional Features

- 16 Channels
- 47 CTCSS tones / 108 DCS codes encode & decode
- 8-Character ANI / ENI ID Display
- CW ID Transmitter
- BCLO, BTLO
- DTMF Encode and decode
- Community repeater operation (up to 16 tones)
- Time-Out Timer, Hang Timer, Guard Timer
- D-Sub 25 pin accessory connector
- Line interface port

Accessories

- MH-67A8]: Standard microphone
- MD-12A8]: Desktop microphone
- MR-3: 19" Rack mount kit (4U size)
- MR-4: 19" Rack mount kit (3U size)

Duplexer Options

- CT-68: Duplexer installation kit
- VXD-60VC: Internal duplexer VHF 148 -160 MHz
- VXD-60UD: Internal duplexer UHF 440 – 470 MHz

VXR-7000 Series Specifications

	VHF	UHF
General Specification		
Frequency Range	134 - 150 MHz (A) 150 - 174 MHz (C)	400 - 430 MHz (A) 450 - 480 MHz (D) 480 - 512 MHz (F)
Number of Channels	16	
Power Supply Voltage	115 / 230V AC \pm 10% 50/60 Hz or 13.8V DC	
Channel Spacing	12.5 / 20 / 25 kHz	
Operating Temperature Range	-22° F to +140° F (-30° C to +60° C)	
Frequency Stability	\pm 2.5 ppm	
RF Input-Output Impedance	50 Ohms	
Dimension (W X H X D)	12.8 x 4.5 x 15.4 inches (325 x 115 x 391.5 mm)	
Weight (Approx.)	22 lbs (10 kg)	
Receiver Specification: measured by TIA/EIA-603		
Sensitivity 12dB SINAD	0.35 μ V	
Adjacent Channel Selectivity	80 dB / 74 dB	
Intermodulation	75 dB	
Spurious and Image Rejection	90 dB	
Audio Output	4W @ 4 Ohms	
Transmitter Specification: measured by TIA/EIA-603		
Output Power	10 to 50W (adjustable)	
Duty Cycle	100%	
Modulation	16K0F3E, 11K0F3E	
Maximum Deviation	\pm 5.0 kHz / \pm 2.5 kHz	
Audio Distortion	< 2.5% @ 1kHz	
Conducted Spurious Emission	Better than 75 dB below carrier	

VX-230 Series

VHF/UHF Portable Radios

SPECIFICATION SHEET

Compact Radio with Long-Lasting Li-Ion Battery

The Vertex Standard VX-231 provides wide band coverage, more signaling features and improved ergonomics* that adds up to a better return on your investment.

Improved Portability

A radio that won't get in the way, the VX-231 is more compact and lightweight than the VX-160 series. A radio that is easier to carry with you on the job.

More Battery Power

Designed to use powerful Li-Ion battery technology for longer battery life. Includes a 1150 mAh battery providing 9 hours of operation with the battery saver enabled.

Or choose the optional 2000 mAh Li-Ion battery for up to 16.5 hours battery life.

Wide Band Coverage for Added Value

One radio designed to cover the full band in the VHF and upper range of the UHF bands, which provides expanded options in frequencies to use.

More Scanning Options

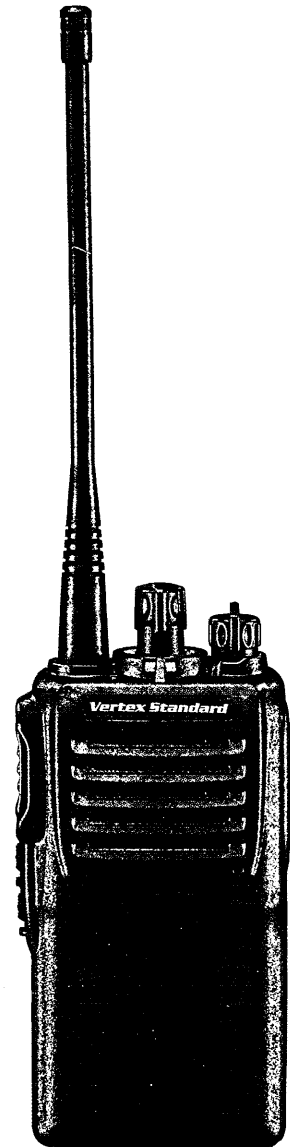
While many radios provide 1 or 2 scanning options, the VX-231 radio gives you 4 additional scanning options for greater convenience and flexibility for the way you need your radios to perform. Options include: Priority, Dual Watch, Follow Me and Talk Around scan.

Exclusive Auto-Range Transponding System –

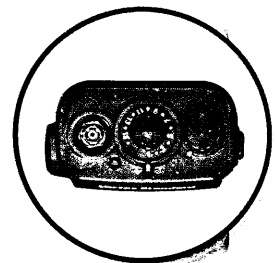
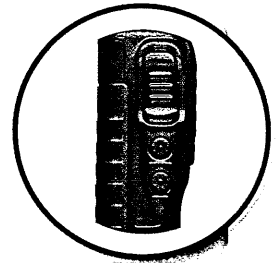
ARTS™

Only Vertex Standard radios are designed to inform you when you and another ARTS™-equipped station are within communication range. If out of range for more than 2 minutes, your radio senses no signal has been

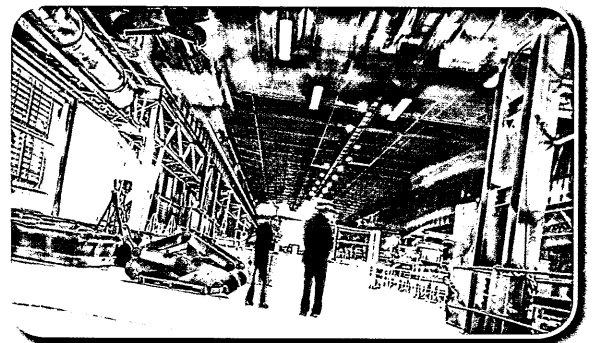
*Compared to VX-160 series.



4.3" (H) X 2.3" (W) X 1.2" (D)



Top



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received and beeps to alert you. The base station can then alert the field unit to move back in range. A great solution to keep your workers coordinated.

Additional Features

- 16 channel capacity
- Two programmable keys
- Flexible channel spacing: 12.5 kHz to 25 kHz
- Battery power save option
- Emergency
- Lone Worker
- DTMF ANI
- DTMF Speed Dial
- 2-Tone Encode and Decode
- CTCSS / DCS Encode and Decode
- Manual squelch adjustment
- Radio-to-radio cloning

Accessories

- MH-450S: Speaker microphone
- MH-360S: Compact speaker microphone
- MH-45B4B: Noise cancelling speaker microphone
- MH-37A4B: Earpiece microphone
- VH-115S: Behind-the-head headset w/boom mic
- VH-215S: Over-the-head single-muff headset
- VC-25: Over-the-head VOX headset
- FNB-V104LI: 2000 mAh Li-Ion battery
- FNB-V106: 1200 mAh Ni-MH battery
- FNB-V103LI: 1150 mAh Li-Ion battery
- VAC-300: Desktop rapid charger (Li-Ion only)
- VAC-20: Desktop charger (FNB-V106)
- DCM-1: Desktop charger mounting adapter
- VCM-2: Vehicle charger mounting adapter
- VAC-6020: 6-unit charger (FNB-V106)
- VAC-6300: 6-Unit multi rapid charger (Li-Ion only)
- LCC-350: Leather case

VX-230 Series Specifications

	VHF	UHF
General Specification		
Frequency Range	134 MHz - 174 MHz	400 - 470 MHz; 450 - 512MHz
Number of Channels	16	
Power Supply Voltage	7.4V DC±20%	
Channel Spacing	12.5/20/25 kHz	
PLL Steps	2.5/5/6.25 kHz	5/6.25 kHz
Battery Life (5-5-90 duty)		
1200 mAh FNB-V106	9.0 hours (7.3 hours w/o saver)	
1150 mAh FNB-V103LI	9.0 hours (7.3 hours w/o saver)	
2000 mAh FNB-V104LI	16.5 hours (13.5 hrs w/o saver)	
IP Rating	IP54	
Operating Temperature Range	-22° F to +140° F (-30° C to +60° C)	
Frequency Stability	±2.5 ppm	
RF Input-Output Impedance	50 Ohms	
Dimension (H x W x D)	4.3 x 2.3 x 1.2 inches (110 x 58 x 30 mm) (w/ FNB-V103LI)	
Weight (Approx.)	10.1 oz. (285g) (w/FNB-V103LI, Antenna, Belt Clip)	
Receiver Specification: measured by TIA/EIA-603		
Sensitivity 12dB SINAD	0.25µV typical	
Adjacent Channel Selectivity	65 / 60 dB 25 kHz / 12.5 kHz	
Intermodulation	65 / 60 dB 25 kHz / 12.5 kHz	
Spurious and Image Rejection	65 dB	
Audio Output	500mW @ 4 Ohms 5% THD	
Transmitter Specification: measured by TIA/EIA-603		
Output Power	5 / 1W	
Modulation	16K0F3E, 11K0F3E	
Conducted Spurious Emissions	65 dB below carrier	
FM Hum & Noise	45 / 40 dB 25 kHz / 12.5 kHz	
Audio Distortion	< 3 % @ 1kHz	

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	500.2/Procedure I, II	500.3/Procedure I, II	500.4/Procedure I, II
High Temperature	501.1/Procedure I	501.2/Procedure I, II	501.3/Procedure I, II	501.4/Procedure I, II
Low Temperature	502.1/Procedure I	502.2/Procedure I	502.3/Procedure I, II	502.4/Procedure I, II
Temperature Shock	503.1/Procedure I	503.2/Procedure I	503.3/Procedure I	503.4/Procedure I, II
Solar Radiation	505.1/Procedure I	505.2/Procedure I Cat. A1	505.3/Procedure I Cat. A1	505.4/Procedure I Cat. A1
Rain	506.1/Procedure I, II	506.2/Procedure I, II	506.3/Procedure I, II	506.4/Procedure I, III
Humidity	507.1/Procedure I, II	507.2/Procedure II, III	507.3/Procedure II, III	507.4/Procedure I
Salt Fog	509.1/Procedure I	509.2/Procedure I	509.3/Procedure I	509.4/Procedure I
Dust	510.1/Procedure I	510.2/Procedure I	510.3/Procedure I	510.4/Procedure I, III
Vibration	514.2/Procedure X	514.3/Procedure I Cat. 10	514.4/Procedure I Cat. 10	514.4/Procedure I Cat. 24
Shock	516.2/Procedure I, II, V	516.3/Procedure I, IV	516.4/Procedure I, IV	516.5/Procedure I, V

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NSS230_07/2009