

West Virginia Department of Public Safety

Bid For

Low Band 100 Watt Base Stations

June 15, 2006

1:30 PM



**2432 Ridgeland Dr.
Avon, OH 44011
(440) 934-5268
(440) 934-4679 (FAX)**

**1324 N. Main St.
Mansfield, OH 44907
(419) 524-7970
(419) 524-8262 (FAX)**



June 13, 2006

**State of West Virginia
Purchasing Division
2019 Washington St., East
P. O. Box 50103
Charleston, WV 25305-0130**

Re: Bid for Radio Equipment for the West Virginia State Police, DPS0660

Gentlemen:

Enclosed is our Bid for Radio Equipment for the West Virginia State Police.

Terms of our bid are:

**Terms: Net 30
Delivery: 120 Days ARO
Warranty: Two Years Parts and Labor**

Vasu Communications has proposed equipment that we feel will meet and exceed your requirements. We have a fully compliant bid with any exceptions as noted. We have based our bid on years of experience in both types of equipment and system design.

The State of West Virginia has used our company's services and I am sure that we have proven to be a competent and worthy supplier.

After you have reviewed our bid, we will be available at your convenience to further discuss our proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Donna M. Vasu", is written over a white background.

**Donna M. Vasu
President**



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
DPS0660

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
BETTY FRANCISCO
304-558-0468

VENDOR

*709023510 440-934-5268
VASU COMMUNICATIONS INC
PO BOX 236
2432 RIDGELAND DR
AVON OH 44011

SHIP TO

DEPARTMENT OF PUBLIC SAFETY
4124 KANAWHA TURNPIKE

SOUTH CHARLESTON, WV
25309 746-2141

DATE PRINTED 05/22/2006	TERMS OF SALE Net 30	SHIP VIA	F.O.B.	FREIGHT TERMS
BID OPENING DATE: 06/15/2006		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT. NO	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>REQUEST FOR QUOTATION</p> <p>THE PURCHASING DIVISION IS SOLICITING BIDS FOR AN OPEN END CONTRACT TO FURNISH A LOW BAND 100 WATT SOLID STATE BASE STATION TO THE WEST VIRGINIA STATE POLICE, COUNTY AGENCIES, AND MUNICIPALITIES.</p> <p>ATTACHMENTS: 1. SPECIFICATIONS 2. BID FORM 3. AFFIDAVIT</p> <p>QUESTIONS: WRITTEN QUESTIONS SHALL BE ACCEPTED THROUGH JUNE 7, 2006, 2:00 PM EASTERN. QUESTIONS MAY BE SENT VIA EMAIL (PREFERRED METHOD), USPS, FAX, COURIER, OR MAIL. IN ORDER TO ASSURE NO VENDOR RECEIVES AN UNFAIR ADVANTAGE, NO SUBSTANTIVE QUESTIONS WILL BE ANSWERED ORALLY. ADDRESS INQUIRIES TO: JOHN ABBOTT, SENIOR BUYER DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25311 FAX: (304) 558-4115 EMAIL: JABBOTT@WVADMIN.GOV</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS			
SIGNATURE <i>Donna M. Lane</i>	TELEPHONE 440-934-5268	DATE 6/13/2006	
TITLE President	FEIN 34-1633623	ADDRESS CHANGES TO BE NOTED ABOVE	

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
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BETTY FRANCISCO 304-558-0468

VENDOR	*709023510 440-934-5268
	VASU COMMUNICATIONS INC
	PO BOX 236
	2432 RIDGELAND DR
	AVON OH 44011

SHIP TO	DEPARTMENT OF PUBLIC SAFETY 4124 KANAWHA TURNPIKE
	SOUTH CHARLESTON, WV 25309 746-2141

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
05/22/2006				

BID OPENING DATE: **06/15/2006** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT	
0001	1	EA		725-27	\$11,891.63	\$11,891.63	
	LOW BAND 100 WATT SOLID STATE BASE STATION						
***** THIS IS THE END OF RFQ DPS0660 ***** TOTAL:						\$11,891.63	

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

Low Band 100 Watt Solid State Base Station Specifications

Purpose

The West Virginia State Police is requesting competitive bids for a Low Band (42-50 MHZ) Solid State Base Station as per the attached specifications. The contract shall be available for use by all other entities of state government, as well as counties and municipalities.

General Specifications

Station shall be mounted in an 84" aluminum rack. Service speakers for each receiver and a service microphone will be provided. Each speaker will be individually adjustable.

A 72" cabinet shall be available as an option, and listed on the bid form as a separate line item. The front and rear doors shall be removable, and both shall be capable of being locked with the same key.

Station shall be capable of a 100% transmit duty cycle (Continuous duty).

Station shall be capable of functioning from -30°C to +60°C. Station shall include full metering capability built into each cabinet. All metering shall take place at centralized metering sockets for the receiver and transmitters. Auxiliary receivers shall have the same capability, and metering shall be functional in these stations. If metering in the auxiliary receivers requires a "portable" test set, one shall be included. The metering test set shall not be a VTVM or equivalent, but rather a piece of test equipment capable of performing readings from a centralized metering jack by means of switch settings on the meter. Minimum metering shall include Forward & Reverse power measurement, Power supply voltage, and Receiver IF signal strength level.

Any and all programming and diagnostic software available shall be provided. Programming that is necessary shall take place from a Windows based computer. Any interfacing hardware necessary that is proprietary to the manufacturer shall be provided with each radio.

Installation and Service Manuals: A complete and comprehensive installation and instruction manual shall be supplied as part of the radio equipment, including all options. The manual shall provide complete service information, including theory of operation, schematics, layout drawings and parts list to permit quick and efficient maintenance or repair of the equipment by a technician.

Power Supply: Station shall be operated on 120 volts standard AC line voltage. The Power supply shall include lightning protection. Optional standby battery source power will be priced as an option, but not included in the standard station pricing.

Transmitter: Stations must be capable of delivering at least 100 watts RF to the output terminals of the transmitter when the output terminals are connected to an antenna or load with a nominal impedance of 50 ohms. Station shall be capable of operating on two frequencies to be specified at time of award. Transmitter shall operate at Full Specifications with a transmitter bandwidth not less than .25 MHz. Transmitter shall consist of all solid state components. Station shall have an output RF impedance of 50 ohms. Spurious and Harmonic Emission shall be -70 db or greater. Frequency stability shall be $\pm 0.0005\%$ or better. Modulation deviation shall be ± 5 kHz. Audio distortion shall be less than 3%. Transmitter exciter shall be capable of transmitting a full 50 watts, and of being connected to allow independent operation of the exciter in continuous duty mode at full power in the event of failure of the power amplifier module.

Receiver: Receivers shall have single frequency capability with rated EIA 12dB SINAD of .251 microvolts or less. 20dB Quieting shall be achieved at .354 microvolts or less. Receivers shall have a modulation acceptance of ± 7.5 kHz. Inter-modulation at 20kHz shall be -80 dB or better. Spurious and Image rejection shall be -90 db or better. Audio output shall be 5 watts with less than 3% distortion. Receivers shall have independent, programmable CTCSS decoders. It shall be possible to disable the CTCSS decoders by means of an external switch provided.

Station shall have the capability for four independent receivers. All receivers shall be self contained and function independently of each other with regard to power supply, audio and control circuitry. An antenna matching/preamplifier (multi-coupler) shall be employed to enable fully rated specification on each receiver with no degradation. Receivers shall have noise blanking. A carrier operated relay shall be provided with 2 form C outputs available at the system plug for each receiver. Audio shall be available at a screw type terminal strip near each receiver. Each receiver shall be provided with an independent speaker, which may be disabled while causing receiver output levels to remain unchanged. A common terminal strip area shall be provided to allow for CTCSS enable/disable and COR output to be accessed for all receivers.

Two receivers described above will be provided. As an option, two additional receivers may be added and listed on the bid form as a separate line item. All circuitry for all four receivers will already be in place in the station, and the receivers will plug in and be operational.

A Doug Hall Electronics Receiver Line Card (RCL) will be provided and installed in the station enabling all four receivers to be selected to vote. RLC input will be from the unsquelched receiver discriminator audio. Utilization of the squelched 600 ohm receiver audio output is not acceptable.

These receivers shall be configured to operate in a priority arrangement, with all audio sources being available at one connection point with an impedance not lower than 600 ohms. The prioritization shall cause receivers to mute when a "higher level" unit is operating. Priority may be illustrated as follows:

- Recvr. 1 Priority 1 (muted only by transmitter)
- |
- Recvr. 2 Priority 2 (muted when Recvr. 1 or transmitter active)
- |
- Recvr. 3 Priority 3 (muted when Recvr. 1 or 2 or transmitter active) (Optional)
- |
- Recvr. 4 Priority 4 (muted when Recvr. 1, 2 or 3 or transmitter active) (Optional)

Control Circuitry: Station shall contain interfacing hardware to allow station to be utilized with 600 ohm telephone line utilizing standard tone control, or connected to radio link type equipment, utilizing 600 ohm input and output circuits for audio connections. Station shall have circuitry to allow for transmit frequency to be changed from a remote location.

Audio circuitry shall be provided for all receivers to be combined into a single 600 ohm audio output, prioritized as indicated.

OPTIONS:

- 1) Option to increase power of transmitter to 250 watts RF output
- 2) Battery backup capability (batteries not included)
- 3) Each additional receiver (maximum two additional)
- 4) Mount radio in 72" cabinet

BID FORM - DPS0660 - LO-BAND SOLID STATE BASE STATION

ITEM DESCRIPTION	QTY.	UNIT PRICE
Low Band 100 Watt Solid State Base Station	1	\$ 11,708.30
84" Aluminim Rack	1	\$ 183.33
OPTIONS:		
250 Watt Transmitter - RF Output	1	\$ 1,886.68
Battery Backup (batteries not included)	1	\$ 233.60
Additional Receivers (Maximum purchase qty. = 2)	1	\$ 3,770.00
Mounted in 72" Cabinet	1	\$ 1,254.00
Grand Total		\$ 19,035.91

BIDDER / VENDOR INFORMATION:

Name: Vasu Communications, Inc.
Address: 2432 Ridgeland Dr.
Avon, OH 44011
Phone#: 440-934-5268
Email: donna@vasucom.com

CONTRACT COORDINATOR INFORMATION:

Name: Donna M. Vasu
Address: P. O. Box 236
Avon, OH 44011-0236
Phone#: 440-934-5268
Email: donna@vasucom.com

A F F I D A V I T

West Virginia Code §5A-3-10a states:

No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions.

"Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION:

The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

LICENSING:

The vendor must be licensed in accordance with any and all state requirements to do business with the state of West Virginia.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendors should visit www.state.wv.us/admin/purchase/privacy for the Notice of Agency Confidentiality Policies.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), it is hereby certified that the vendor acknowledges the information in this said affidavit and are in compliance with the requirements as stated.

Vendor's Name: Vasu Communications, Inc.

Authorized Signature:  Date: 6/13/2006

Donna M. Vasu, President



ACTION BY UNANIMOUS WRITTEN CONSENT OF THE DIRECTORS
OF
VASU COMMUNICATIONS, INC.

Pursuant to the authority of Section 1701.54 of the Ohio Revised Code, the undersigned, being all of the members of the Board of Directors of the corporation, do hereby take and adopt the following by unanimous written consent:

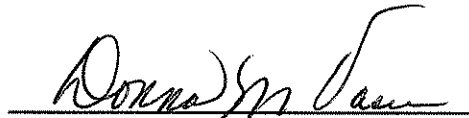
RESOLVED:

That, Donna M. Vasu, as President, Alan L. Vasu, as Vice President and Secretary of the Corporation and Michael J. Vasu, as an Agent, are hereby authorized to execute all necessary legal documents and Bid package materials, to submit a bid to the State of West Virginia, Department of Public Safety for a Low Band 100 Watt Base Station.

Dated: June 12, 2006



Alan L. Vasu, Director



Donna M. Vasu, Director

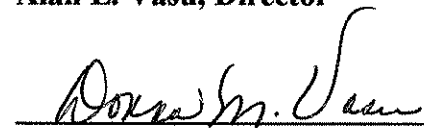


WAIVER OF NOTICE
OF
SPECIAL MEETING OF BOARD OF DIRECTORS

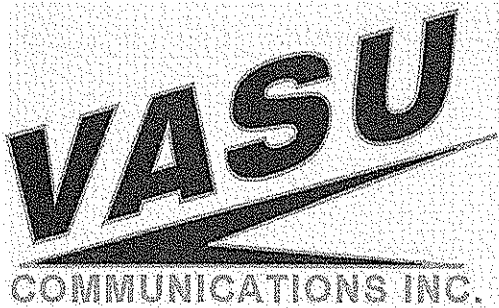
We, the undersigned, being all of the directors of Vasu Communications, Inc., hereby waive notice and consent to the holding of a special meeting of the Board of Directors at the office of Vasu Communications, Inc. on June 12, 2006.



Alan L. Vasu, Director



Donna M. Vasu, Director



Company Profile

Vasu Communications Inc. is a Woman-owned, Sales and Service firm, established in September 1971 and incorporated in December 1989. We provide communications services to Public Safety, Business and Industry. Our sales include mobiles, handhelds, base stations, dispatch center consoles, paging systems, towers, antennas and installations. We maintain two locations, our headquarters in Avon, OH and the other in Mansfield, OH.

Headquarters

2432 Ridgeland Dr.
P. O. Box 236
Avon, OH 44011
440-934-5268
440-934-4679 (Fax)
Emails
Sales: sales@vasucom.com
Service: serviceavon@vasucom.com

Mansfield Branch

1324 N. Main St.
Mansfield, OH 44903
419-524-7970
419-524-8262 (Fax)
Emails
Sales: salesmansfield@vasucom.com
Service: servicemansfield@vasucom.com

Key Personnel

Donna M. Vasu, President/Treasurer, Office Administrator and Stockholder

35+ years in the electronics industry. Office Management and Sales Coordinator.
Bid review.
440-934-5268, 440-934-4679 (Fax), Email: donnav@vasucom.com

Alan L. Vasu, Vice President/Secretary, General Manager and Stockholder

40+ years in the electronics industry. Background in RF, microwave, radar, land mobile communications, and telephone systems. Oversees all engineering and designing of communications systems.
440-934-5268, 440-934-4679 (Fax), Email: alanv@vasucom.com

Richard Gerrone, Sales Manager

30+ years as a Communications Manufacturer's Sales Rep. Background in project management and system design of communication systems.
440-934-5268, 440-934-4679 (Fax), Email: rickgerrone@vasucom.com

Gregory Catlett, General Manager, Mansfield Branch

35+ years in the communications industry including project management, engineering and system design. Responsible for the management of the Mansfield Branch.

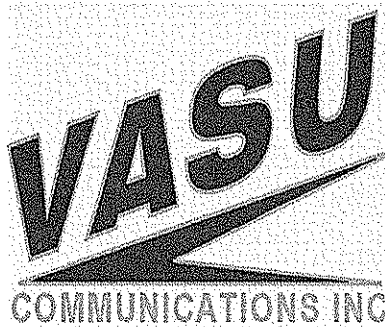
419-524-7970, 419-524-8262 (Fax), Email: gregc@vasucom.com

Vince Bak, Senior Technician

40+ years in the communication industry. Background includes design, and repair of major systems. Oversees all service, both in the shop and in the field.

440-934-5268, 440-934-4679 (Fax), Email: vinceb@vasucom.com

COMPANY INFORMATION SHEET



**2432 Ridgeland Dr.
P. O. Box 236
Avon, OH 44011
(440) 934-5268
(440) 934-4679 (FAX)**

**Primary Contact: Alan L. Vasu
Secondary Contact: Richard Gerrone**

**Second Location Address:
1324 N. Main St.
Mansfield, OH 44903
(419) 524-7970
(419) 524-8262 (FAX)**

Business Type is a Corporation in the State of Ohio

In business since September 1971

Incorporated December 1989

Federal EIN: 34-1633623

Ohio Vendor's #: 47-067067 (Lorain County)

Ohio Vendor's #: 70-047610 (Richland County)

Full-time Employees: Sales 3 Technical 9 Installers 11 Office/Admin 6

Total Full-time & Part-time Employees : 37

Number of Vehicles in Service Dept.: 15

Number of Service Monitors in Service Dept.: 12

Value Added Service

- 1) **Licensing** – Full time employee devoted to FCC Licensing and coordination (20+ years experience)
- 2) **FCC Data Base** – Maintain a current Per Con Data Base of all FCC Licensed radio users
- 3) **Propagation Study** – Software based system with color printer capability
- 4) **Full Time Staff** – 29 full time employees
- 5) **Extended Service Hours** – Monday-Friday 8am until 9pm
- 6) **In House Support** – Fax, Internet (e-mail), color/oversized copying and full computer network system
- 7) **Test/Service Capability** – Maintain 8-Hewlett Packard, 2-IFR 500, 4-IFR 1200 and 1-IFR 120B Service Monitors
- 8) **Turn Key Experience** – Total experience doing complete projects from initial consulting to final acceptance
- 9) **Insured And Bonded** – \$2,000,000 Insurance Liability plus fully bondable



2432 RIDGELAND DRIVE
P.O. BOX 236
AVON, OHIO 44011
(440) 934-5268 (440) 934-4679 (FAX)

1324 N. MAIN ST.
P.O. BOX 246
MANSFIELD, OHIO 44903
(419) 524-7970 (419) 524-8262(FAX)

Page.....: 1
Date.....: 06/13/06
Telephone....:
Fax.....:

100W LOW BAND BASE WITH 2 RECEIVERS

WEST VIRGINIA STATE POLICE
Attn.: BETTY FRANCISCO
4124 KANAWHA TURNPIKE
SOUTH CHARLESTON, WV 25309

Quote No: 11079

Qty	Model No.	Make	Description	Cost	Total
2	R50	RF-TECHN	25-50 MHZ RECEIVE MODULE	1885.00	3770.00
1	T50	RF-TECHN	25-50MHZ EXCITER	1885.00	1885.00
1	PA50C	RF-TECHN	100 WATT CONTINUOUS DUTY PWR AMP	1925.00	1925.00
2	RF50-19	RF-TECHN	19"RACK FRAME FOR MODULES	335.00	670.00
1	60-2201	DOWKEY	T/R RELAY 250 WATT SPDT N CONN.	180.00	180.00
8	JP6NN	VASU	6' LMR-195 N MALE JUMPER	16.00	128.00
1	RM-50M	ASTRON	35 AMP POWER SUPPLY	354.95	354.95
1	IS-PSP-120	POLYPHAS	LIGHTNING PROTECTOR 120 VOLT AC	75.00	75.00
1	HDWE	VASU	MISC HARDWARE CONNECTORS & WIRE	100.00	100.00
1	METER-RF	VASU	CUSTOM METERING MODULE	783.00	783.00
1	D-CABLE-9	VASU	PROGRAMMING CABLE	41.67	41.67
1	WTH50	RF-TECHN	WINTECHELP 50 SOFTWARE	267.00	267.00
5	RFPCB	RF-TECHN	RACK FRAME PCP KITS	64.00	320.00
1	M50	VASU	SERVICE MANUAL	49.00	49.00
1	D-EXTENSION-25	VASU	SERVICE EXTENSION CABLE	71.00	71.00
1	FMF-2	RF-TECHN	SERVICE MIC.	100.00	100.00
1	CUST-INTERFC	VASU	CUSTOM PRIORITY AUDIO INTERFACE	350.00	350.00
1	1212-18	ASTRON	18 AMP POSITIVE GROUND CONVERTER	129.95	129.95
1	P45VDG	ADVANCED	45-50MHZ GASFET PREAMP	155.71	155.71
1	ZFSC-4-1B	MIN-CUR	4 WAY POWER DIVIDER	121.00	121.00
1	P10-20-AC1-C1-0	CRESCEND	20W TO 100W PWR AMP 42-50MHZ	1416.60	1416.60
1	BATT-9	VASU	19"BASIC POWER DIST.	98.00	98.00
1	RACK-SHELF-1.75	MCM	1.75"X19" RACK SHELF	44.50	44.50
1	DSP-223	VEGA	DIGITAL TONE REMOTE TERM PANEL	589.00	589.00
1	223RACK	VEGA	RACK MOUNT FOR DSP223	72.00	72.00
1	PM-2A-50	TELEWAVE	30-88 MHZ DUAL 1KW POWER MONITOR	142.00	142.00
1	DHE-C-RLC	D.HALL E	REC. TELCO LINE CARD	147.00	147.00



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100W LOW BAND BASE WITH 2 RECEIVERS

WEST VIRGINIA STATE POLICE
Attn.: BETTY FRANCISCO
4124 KANAWHA TURNPIKE
SOUTH CHARLESTON, WV 25309

Quote No: 11079

<u>Qty</u>	<u>Model No.</u>	<u>Make</u>	<u>Description</u>	<u>Cost</u>	<u>Total</u>
			Equipment Total		13,985.38
			Labor		450.00
			Subtotal		14,435.38
			Sales Tax		0.00
			Total Purchase		14,435.38
			Shipping		200.00
			Frequency Coordination		0.00
			FCC License Fees		0.00
			Total Cost		14,635.38
			Less Trade In		0.00
			Less Down Payment		0.00
			Discount		2,927.08
			Balance Due		11,708.30

Presented By: ALAN L. VASU

Terms.....: NET 30



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Page.....: 1
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 Telephone...:
 Fax.....:

84" CABINET

WEST VIRGINIA STATE POLICE
 Attn.: BETTY FRANCISCO
 4124 KANAWHA TURNPIKE
 SOUTH CHARLESTON, WV 25309

Quote No: 11106

<u>Qty</u>	<u>Model No.</u>	<u>Make</u>	<u>Description</u>	<u>Cost</u>	<u>Total</u>
1	EDR19FM45U	HOFFMAN	84" OPEN LAN RACK	183.33	183.33
				Equipment Total	183.33
				Labor	0.00
				Subtotal	183.33
				Sales Tax	0.00
				Total Purchase	183.33
				Shipping	0.00
				Frequency Coordination	0.00
				FCC License Fees	0.00
				Total Cost	183.33
				Less Trade In	0.00
				Less Down Payment	0.00
				Discount	0.00
				Balance Due	183.33

Presented By: ALAN L VASU

Terms.....: NET 30



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250 WATT OPTION

WEST VIRGINIA STATE POLICE
 Attn.: BETTY FRANCISCO
 4124 KANAWHA TURNPIKE
 SOUTH CHARLESTON, WV 25309

Quote No: 11080

Qty	Model No.	Make	Description	Cost	Total
1	RM-50M	ASTRON	35 AMP POWER SUPPLY	354.95	354.95
1	P25-5AC1-C1	CRESCEND	20W IN 250W OUT PA AMP 42-50MHZ	3166.00	3166.00
1	JPN69913N	VASU	6' LMR400 JUMPER N MALE	25.00	25.00
1	HDWE 1	VASU	MISC. HARDWARE, WIRE AND CONN.	20.00	20.00
-1	P10-20-AC1-C1-0	CRESCEND	20W TO 100W PWR AMP 42-50MHZ.	1416.60	-1416.60
-1	JP6NN	VASU	6' LMR-195 N MALE JUMPER	16.00	-16.00
1	IS-PSP-120	POLYPHAS	LIGHTNING PROTECTOR 120 VOLT AC	75.00	75.00
				Equipment Total	2,208.35
				Labor	150.00
				Subtotal	2,358.35
				Sales Tax	0.00
				Total Purchase	2,358.35
				Shipping	0.00
				Frequency Coordination	0.00
				FCC License Fees	0.00
				Total Cost	2,358.35
				Less Trade In	0.00
				Less Down Payment	0.00
				Discount	471.67
				Balance Due	1,886.68

Presented By: ALAN L. VASU

Terms.....: NET 30



2432 RIDGELAND DRIVE
P.O. BOX 236
AVON, OHIO 44011
(440) 934-5268 (440) 934-4679 (FAX)

1324 N. MAIN ST.
P.O. BOX 246
MANSFIELD, OHIO 44903
(419) 524-7970 (419) 524-8262(FAX)

Page.....: 1
Date.....: 06/13/06
Telephone....:
Fax.....:

BATTERY OPTION

WEST VIRGINIA STATE POLICE
Attn.: BETTY FRANCISCO
4124 KANAWHA TURNPIKE
SOUTH CHARLESTON, WV 25309

Quote No: 11081

<u>Qty</u>	<u>Model No.</u>	<u>Make</u>	<u>Description</u>	<u>Cost</u>	<u>Total</u>
1	HDWE 1	VASU	MISC. HARDWARE, WIRE AND CONN.	35.00	35.00
1	BATT2	VASU	BATT.BACKUP AND DC POWER NO\BATT	290.00	290.00
-1	BATT-9	VASU	19"BASIC POWER DIST.	98.00	-98.00
				Equipment Total	227.00
				Labor	65.00
				Subtotal	292.00
				Sales Tax	0.00
				Total Purchase	292.00
				Shipping	0.00
				Frequency Coordination	0.00
				FCC License Fees	0.00
				Total Cost	292.00
				Less Trade In	0.00
				Less Down Payment	0.00
				Discount	58.40
				Balance Due	233.60

Presented By: ALAN L. VASU

Terms.....: NET 30



2432 RIDGELAND DRIVE
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Page.....: 1
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ADDITIONAL RECEIVERS

WEST VIRGINIA STATE POLICE
 Attn.: BETTY FRANCISCO
 4124 KANAWHA TURNPIKE
 SOUTH CHARLESTON, WV 25309

Quote No: 11104

<u>Qty</u>	<u>Model No.</u>	<u>Make</u>	<u>Description</u>	<u>Cost</u>	<u>Total</u>
2	R50	RF-TECHN	25-50 MHZ RECEIVE MODULE	1885.00	3770.00
Equipment Total					3,770.00
Labor					0.00
Subtotal					3,770.00
Sales Tax					0.00
Total Purchase					3,770.00
Shipping					0.00
Frequency Coordination					0.00
FCC License Fees					0.00
Total Cost					3,770.00
Less Trade In					0.00
Less Down Payment					0.00
Discount					0.00
Balance Due					3,770.00

Presented By: ALAN L VASU

Terms.....: NET 30



2432 RIDGELAND DRIVE
P.O. BOX 236
AVON, OHIO 44011
(440) 934-5268 (440) 934-4679 (FAX)

1324 N. MAIN ST.
P.O. BOX 246
MANSFIELD, OHIO 44903
(419) 524-7970 (419) 524-8262(FAX)

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Telephone...:
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72" CABINET MOUNTING

WEST VIRGINIA STATE POLICE
Attn.: BETTY FRANCISCO
4124 KANAWHA TURNPIKE
SOUTH CHARLESTON, WV 25309

Quote No: 11105

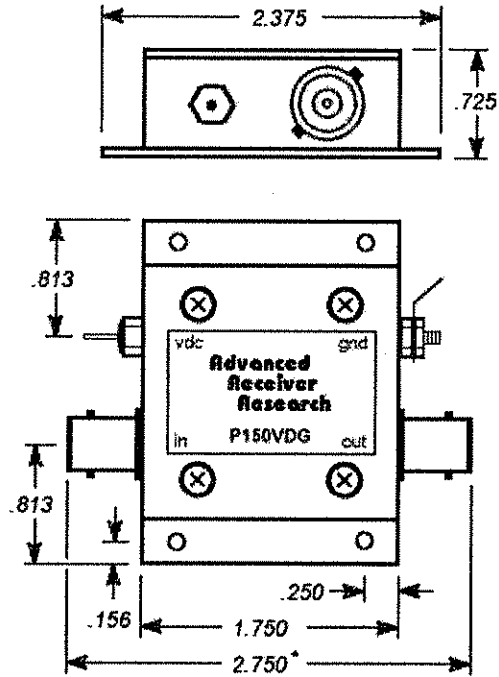
<u>Qty</u>	<u>Model No.</u>	<u>Make</u>	<u>Description</u>	<u>Cost</u>	<u>Total</u>
1	CAB-1172	VASU	72" RACK MOUNT CABINET W/DOORS	1254.00	1254.00
Equipment Total					1,254.00
Labor					0.00
Subtotal					1,254.00
Sales Tax					0.00
Total Purchase					1,254.00
Shipping					0.00
Frequency Coordination					0.00
FCC License Fees					0.00
Total Cost					1,254.00
Less Trade In					0.00
Less Down Payment					0.00
Discount					0.00
Balance Due					1,254.00

Presented By: ALAN L VASU

Terms.....: NET 30



PXXXVDX Dimensional Drawing



Notes: Dimensions are in inches. Shown with BNC connectors. * dimension for optional connector types: N - 3.000, SMA - 2.250, TNC - 2.750, RCA - 2.570, F - 2.670.

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.... POWER ON WITH ASTRON LINEAR POWER SUPPLIES

ASTRON LINEAR POWER SUPPLIES HEAVY DUTY HIGH QUALITY RUGGED RELIABLE

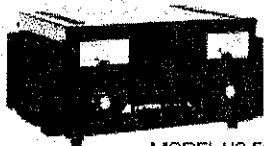
SPECIAL FEATURES

- SOLID STATE ELECTRONICALLY REGULATED
- FOLD-BACK CURRENT LIMITING Protects Power Supply from excessive current & continuous shorted output.
- CROWBAR OVERVOLTAGE PROTECTION on all Models except RS-3A, RS-4A, RS-5A, RS-4L, RS-5L
- MAINTAIN REGULATION & LOW RIPPLE at low line input Voltage
- HEAVY DUTY HEAT SINK CHASSIS MOUNT FUSE

- THREE CONNECTOR POWER CORN
- ONE YEAR WARRANTY - MADE IN USA

PERFORMANCE SPECIFICATIONS

- INPUT VOLTAGE 105 - 125 VAC
- OUTPUT VOLTAGE 13.8 VDC ± 0.05 volts
(Internally Adjustable: 11-15 VDC)
- RIPPLE Less than 5mV peak to peak (f load and low line)



MODEL VS-50M

i LOW PROFILE POWER SUPPLY

SL SERIES



MODEL	COLORS Gray Black	CONTINUOUS Duty (Amps)	ICS (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
SL-11A	• •	7	11	2 5/8 x 7 5/8 x 9 3/4	12
SL-11R	• •	7	11	2 5/8 x 7 x 9 3/4	12
SL-11R-MC	• •	7	11	5 3/8 x 7 1/4 x 9 3/4	13
SL-11R-GE	• •	7	11	5 5/8 x 7 x 9 3/4	13
SL-11R-RA	• •	7	11	4 3/4 x 7 x 9 3/4	13
SL-11R-EFJ	• •	7	11	5 3/8 x 7 1/4 x 9 3/4	13
SL-11MG	• •	7	11	5 1/4 x 7 1/16 x 9 3/4	13
SL-15R	• •	12	15	2 3/8 x 7 x 9 3/4	13
SL-15R-GE	• •	12	15	5 5/8 x 7 1/4 x 9 3/4	14
SL-15R-RA	• •	12	15	4 3/4 x 7 1/4 x 9 3/4	14
SL-15R-EFJ	• •	12	15	5 3/8 x 7 1/4 x 9 3/4	14

i POWER SUPPLIES WITH BUILT IN CIGARETTE RECEPTACLE

RS-L SERIES



MODEL	COLORS Gray Black	CONTINUOUS Duty (Amps)	ICS (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RS-4L	•	3	4	3 1/2 x 6 1/8 x 7 1/4	6
RS-5L	•	4	5	3 1/2 x 6 1/8 x 7 1/4	6

i 19" RACK MOUNT POWER SUPPLIES

RM SERIES

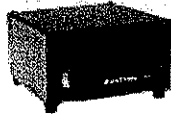


MODEL RM-35M

MODEL	CONTINUOUS Duty (Amps)	ICS (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RM-12A	9	12	5 1/4 x 19 x 8 1/4	16
RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
RM-60A	50	55	5 1/4 x 19 x 12 1/2	60
i Separate Volt and Amp Meters				
RM-12M	9	12	5 1/4 x 19 x 8 1/4	16
RM-35M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50M	37	50	5 1/4 x 19 x 12 1/2	50
RM-60M	50	55	5 1/4 x 19 x 12 1/2	60

MODEL	COLORS Gray Black	CONTINUOUS Duty (Amps)	ICS (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RS-3A	•	2.5	3	3 x 4 3/4 x 5 3/4	4
RS-4A	• •	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A	• •	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	• •	5	7	3 3/4 x 6 1/2 x 9	9

RS-A SERIES



MODEL RS-7A

RS-10A	• •	7.5	10	4	x 7 1/2	x 10 3/4	11
RS-12A	• •	9	12	4 1/2	x 8	x 9	13
RS-12B	• •	9	12	4	x 7 1/2	x 10 3/4	13
RS-20A	• •	16	20	5	x 9	x 10 1/2	18
RS-35A	• •	25	35	5	x 11	x 11	27
RS-50A	• •	37	50	6	x 13 3/4	x 11	46
RS-70A	• •	57	70	6	x 13 3/4	x 12 1/8	48

RS-M SERIES

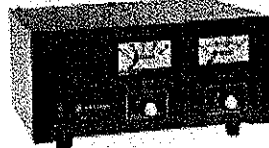


MODEL RS-35M

MODEL	CONTINUOUS		ICS	Size (IN)			Shipping Wt. (lbs.)
	Duty (Amps)			H	W	D	
<i>i</i> Switchable Volt and Amp Meter							
RS-12M	9	12	4 1/2	x 8	x 9	13	
<i>i</i> Separate Volt and Amp Meters							
RS-20M	16	20	5	x 9	x 10 1/2	18	
RS-35M	25	35	5	x 11	x 11	27	
RS-50M	37	50	6	x 13 3/4	x 11	46	
RS-70M	57	70	6	x 13 3/4	x 12 1/8	48	

- i* Separate Volt and Amp Meters
- i* Output Voltage adjustable from 12-15 volts
- i* Current limit adjustable from 1.5 amp to full load

VS-M AND VRM-M SERIES



MODEL VS-35M

MODEL	CONTINUOUS			ICS*	Size (IN)			Shipping Wt. (lbs.)
	Duty (Amps)				H	W	D	
	@13.8VDC	@10VDC	@5VDC	@13.8VDC				
VS-12M	9	5	2	12	4 1/2	x 8	x 9	13
VS-20M	16	9	4	20	5	x 9	x 10 1/2	20
VS-35M	25	15	7	35	5	x 11	x 11	29
VS-50M	37	22	10	50	6	x 13 3/4	x 11	46
VS-70M	57	34	16	70	6	x 13 3/4	x 12 1/8	48
<i>i</i> Variable rack mount power supplies								
VRM-35M	25	15	7	35	5 1/4	x 19	x 12 1/2	38
VRM-50M	37	22	10	50	5 1/4	x 19	x 12 1/2	50

* ICS - Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. of

RS SERIES



MODEL RS-12S

MODEL	COLORS		CONTINUOUS	ICS	Size (IN)			Shipping Wt. (lbs.)
	Gray	Black			Duty (Amps)	(Amps)	H	
RS-7S	•	•	5	7	4	x 7 1/2	x 10 3/4	10
RS-10S	•	•	7.5	10	4	x 7 1/2	x 10 3/4	12
RS-12S	•	•	9	12	4 1/2	x 8	x 9	13
RS-20S	•	•	16	20	5	x 9	x 10 1/2	18
SL-11S	•	•	7	11	2 3/4	x 7 5/8	x 9 3/4	12

BATTERY BACKUP POWER SUPPLIES



MODEL RM-35M-BB

The RS-10A, RS-12A, RS-20A, RM-35A/M, RM-50A/M, RM-10A, RM-12A/M & RM-60M are available with battery revert and trickle charge circuit with zero switch over time. (Battery not included.) To specify the backup circuit add BB after the model number i.e. RS-60M-BB

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

- EF JOHNSON AVENGER GX-MC41
- EF JOHNSON AVENGER GX-MC42
- EF JOHNSON GT-ML81
- EF JOHNSON GT-ML83

EF JOHNSON 9800 SERIES

GE MARC SERIES

GE MONOGRAM SERIES & MAXON SM-4000 SERIES

GE MVS,MTD & TMX

LINEAR MODELS

- SL-11R-EFJ
- SL-15R-EFJ

SL-11R-MC

SL-11MG

SL-11R-GE

NEW SWITCHING MODELS

SS-10GX SS-12GX

SS-18GX

SS-12EFJ

SS-18EFJ

SS-10EFJ-98, SS-12EFJ-98, SS-18EFJ-98

SS-12MC

SS-10MG, SS-12MG

GE MVS,MTD & TMX	SL-15R-GE	
ICOM IC-F11020 & IC-F2020	SL-11iF	SS-10iF, SS-12iF
KENWOOD TK760, 762, 840, 860, 940, 941		SS-10TK
KENWOOD TK760H, 762H		SS-12TK OR SS-18TK
MIDLAND LOW POWER XTR & 70-1340B	SL-11A-XTR	
MIDLAND HIGH POWER XTR & 70-1340B	SL-15A-XTR	
MOTOROLA LOW POWER SM50, SM120 & GTX	SL-11SM/GTX	SS-10SM/GTX
MOTOROLA HIGH POWER SM50, SM120 & GTX	SL-15SM/GTX	SS-12SM/GTX SS-18SM/GTX
MOTOROLA RADIUS & GM300	SL-11R-RA	SS-10RA
MOTOROLA RADIUS & GM300	SL-15R-RA	SS-12RA
MOTOROLA RADIUS & GM300		SS-18RA
SEA ESP504	SL-11R-SEA	
UNIDEN SMH1525, SMU4525		SS-10SMU, SS-12SMU, SS-18SMU
VERTEX - FTL-1011, FTL-2011, FTL-7011		SS-10V, SS-12V, SS-18V

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[28VDC](#)
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9 Autry, Irvine, CA 92618
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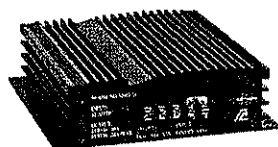


ASTRON DC-DC Converters

ï HEAVY DUTY ï HIGH QUALITY ï RUGGED ï RELIABLE

Standard Features

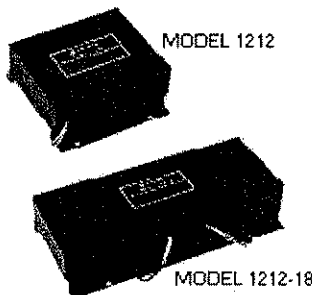
- Overvoltage Protection
- Overcurrent Protection
- Short Circuit Protection
- Terminal Block Connectors
- **Extra Terminal** provided to allow converters to be turned and **OFF** with the ignition switch.



Model	N2412-12	N2412-24
Input Voltage	22-32 VDC	22-32 VDC
Output Voltage	13.8 VDC	13.8 VDC
Line/Load Regulation	.03 VDC	.04 VDC
Ripple	20mVrms	20mVrms
Continuous Current	10 Amps	20 Amps
Peak Current	12 Amps	24 Amps
Overvoltage Protection	16 VDC	16 VDC
Efficiency	88%	88%
Dimensions	2" x 6.2" x 6"	2" x 6.2" x 7"
Weight	1.5 Lbs	2 Lbs

MODEL 1212 & 1212-18 Switching Regulated Converter

Designed for FM transceivers and other applications requiring 12-volt power source converted from 12-volt positive ground battery. Regulated with pulse with modulation at 20 KHz.
 Input - 12 V DC (Positive ground only). Functional from - 11 V DC - 16 V DC.
 Output + 13.8 V DC (Negative ground only).

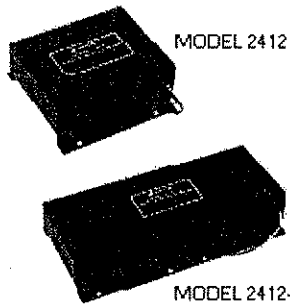


	1212	1212-18
Output Voltage	13.8 V DC (±.2V DC)	13.8 V DC (±.2V DC)
Line/Load Regulation	200mV	200mV
Ripple Noise	50mV RMS	50mV RMS
Current Continuous	6 Amp	14 Amp
Current (ICS)	7 Amp	18 Amp
Current Limit	8 Amp	19 Amp
Case	2 3/4(H) x 6(W) x 6(D)	2 3/4(H) x 6(W) x 12(D)
Shipping Weight	2 lbs.	4 lbs.

MODEL 2412 & 2412-20, 4812 & 4812-20 Switching Regulated Converter

Designed for FM transceivers and other applications requiring 12-volt power source converted from 24-volt positive ground battery. Regulated with pulse with modulation at 20 KHz.

	2412	2412-20	4812	4812-20
Input (Negative ground only)	22-32V DC	22-32V DC	30-56V DC	30-56V DC



Output Voltage ($\pm 2V$ DC)	13.8V DC	13.8V DC	13.8V DC	13.8V DC
Line/Load Regulation	200mV	200mV	200mV	200mV
Ripple Noise	50mV RMS	50mV RMS	50mV RMS	50mV RMS
Current Continuous	9 Amp	16 Amp	9 Amp	16 Amp
Current Limit	12 Amp	20 Amp	12 Amp	20 Amp
2412/4812 Case Size	2 3/4 (H) x 6 (W) x 6 (D)			
2412-20/4812-20 Case Size	2 3/4 (H) x 6 (W) x 12 (D)			
Shipping Weight	2 lbs.	3 lbs.	2 lbs.	3 lbs.

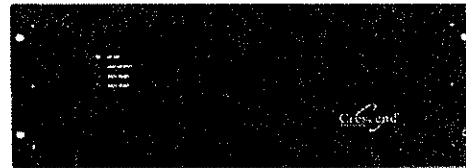
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P10 Series VHF Low Band

30-50 MHz 100 Watts Output Power

Frequency Range:	3 Ranges: 30-36 MHz (AA), 36-42 MHz (AB), 42-50 MHz (AC)
Operating Voltage:	13.8 VDC
Current Draw:	23 Amperes (Max)
Duty Cycle:	100%
Power Input:	See chart below
Power Output:	100 Watts, set at factory
Spurious & Harmonics:	Meets FCC Requirements
Input/Output Impedance:	50 ohms (Nominal)
Load VSWR Tolerance:	See chart below
Input/Output Connector:	Type 'N' Female
Cooling Method:	Fan Forced Air Over Heat Sinks
Operating Temp. Range:	-30 ^o C to +60 ^o C
Storage & Transport:	-40 ^o C to +70 ^o C
Humidity:	80% at +40 ^o C (non-condensing)
Altitude:	10,000 feet maximum

SIZE

Vertical Mounting:	10.5"
Horizontal Mounting:	19.0"
Depth:	6.0"
Weight:	20 pounds nominal

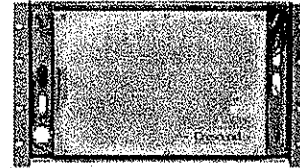
POWER INPUT RANGE

<u>Model Description*</u>	<u>Required Power In</u>	<u>Power Output</u>
P10-2XX1-C5-001	2-5 W	100 W
P10-5XX1-C5-001	5-10 W	100 W
P10-10XX1-C5-001	10-20 W	100 W
P10-20XX1-C5-001	20-50 W	100 W

** XX-Insert the letter definition for the frequency range chosen.*

LOAD MISMATCH TOLERANCE

Full Power, Sustained Operation	1.5:1 or better
Sustained Operation at Reduced Power	2.5:1



P25 Series VHF Low Band

30-50 MHz 250 Watts Output Power

Frequency Range:	3 Ranges: 30-36 MHz (AA), 36-42 MHz (AB), 42-50 MHz (AC).
Operating Voltage:	13.8 VDC
Current Draw:	42 Amperes (Max)
Duty Cycle:	100%
Power Input:	See chart below
Power Output:	250 Watts, set factory
Spurious & Harmonics:	Meets FCC Requirements
Input/Output Impedance:	50 ohms (Nominal)
Load VSWR Tolerance:	See chart below
Input/Output Connector:	Type 'N' Female
Cooling Method:	Fan Forced Air Over Heat Sinks
Operating Temp. Range:	-30° C to +60° C
Storage & Transport:	-40° C to +70° C
Humidity:	80% at +40° C (non-condensing)
Altitude:	10,000 feet maximum

SIZE

Vertical Mounting:	10.5"
Horizontal Mounting:	19.0"
Depth:	6.0"
Weight:	25 pounds nominal

POWER INPUT RANGE

<u>Model Description</u>	<u>Required Power In</u>	<u>Power Output</u>
P25-3XX1-C1-001	3-5 W	250 W
P25-5XX1-C1-001	5-10 W	250 W
P25-10XX1-C1-001	10-20 W	250 W
P25-20XX1-C1-001	20-50 W	250 W

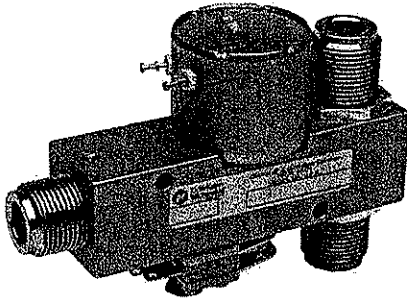
LOAD MISMATCH TOLERANCE

Full Power, Sustained Operation	1.5:1 or better
Sustained Operation at Reduced Power	2.5:1

60 Series SPDT Switch



**DowKey®
Microwave**
CORPORATION



**DowKey® 60 Series
SPDT Switch**

Specifications :

Operating Voltage:

(across temperature range)
12 Vdc (11-14 Vdc)
28 Vdc (24-32 Vdc)

Coil Current (Nominal):

12 Vdc 250 mA
28 Vdc 108 mA

Operate Time:

20 mS maximum

Operating Temperature:

0°C to +65°C

Mechanical Life, Cycles:

1 x 10⁶ minimum

Nominal Weight:

12.0 oz., (340g.)

The DowKey 60 Series coaxial relays are ruggedly constructed and designed for operation to a maximum power level of 1 kilowatt. They have been the standard for air traffic control and two way radio systems for over forty years.

Also available in the 60 Series is a patented, high isolation option ("G" option) for transmit-receive applications. This option leaves the unused input open, and increases the isolation on the N/C connector to 85 dB at frequencies up to 500 MHz. This option reduces the maximum power rating of the N/C connector to 20 Watts, and will increase the VSWR of this terminal above approximately 400 MHz. They are available with or without two form "C" auxiliary contacts.

Typical applications for the 60 Series include:

- Transmit-Receive Switching
- Communication Antenna Switching
- Video Switching
- Hot Standby Transmitters or Receivers

RF Characteristics

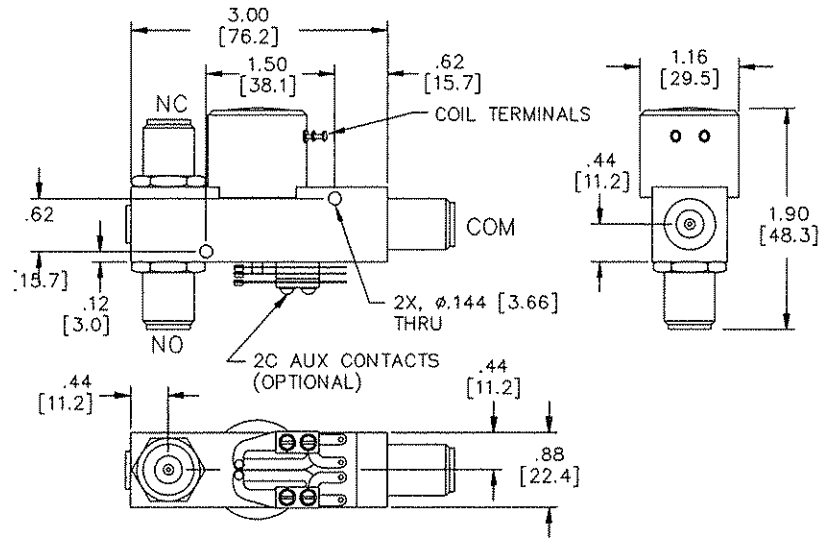
Frequency MHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)	RF Power Watts (CW)
50	1.10	40	0.10	1,000
100	1.15	35	0.15	1,000
400	1.30	25	0.20	500
1,000	1.60	20	0.25	350

Connectors and Part Numbers

Nominal Coil Voltage	Connector Type	SPDT	SPDT w/DPDT Aux. Contacts	"G" Option	"G" Option w/DPDT Aux. Con.
12 Vdc	N	60-2201	60-220142	60-2225	60-222542
28 Vdc	N	60-2301	60-230142	60-2325	60-232542
115 Vac	N	60-2601	60-260142	60-2625	60-262542
12 Vdc	BNC	60-2202	60-220242	60-2226	60-222642
28 Vdc	BNC	60-2302	60-230242	60-2326	60-232642
115 Vac	BNC	60-2602	60-260242	60-2626	60-262642
12 Vdc	UHF*	60-2204	60-220442	60-2228	60-222842
28 Vdc	UHF*	60-2304	60-230442	60-2328	60-232842
115 Vac	UHF*	60-2604	60-260442	60-2628	60-262842

*Not recommended for applications above 300 MHz.

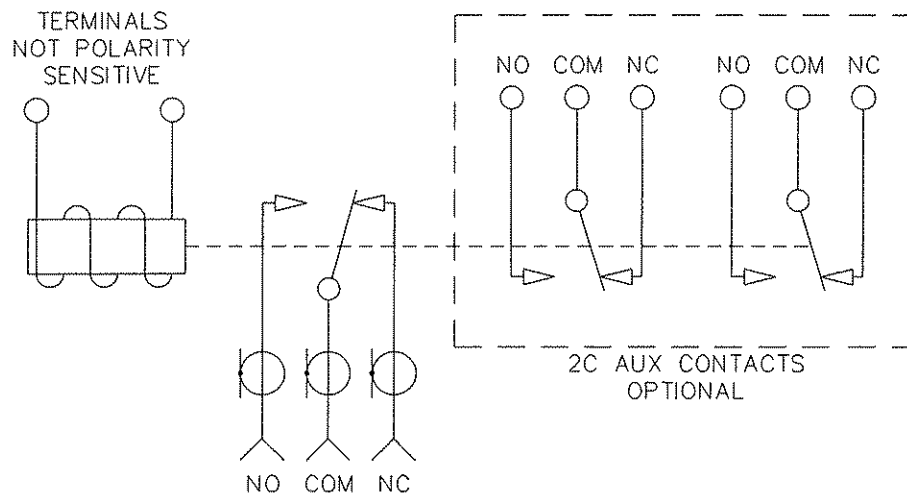
Mechanical



TYPICAL CONNECTOR LENGTHS

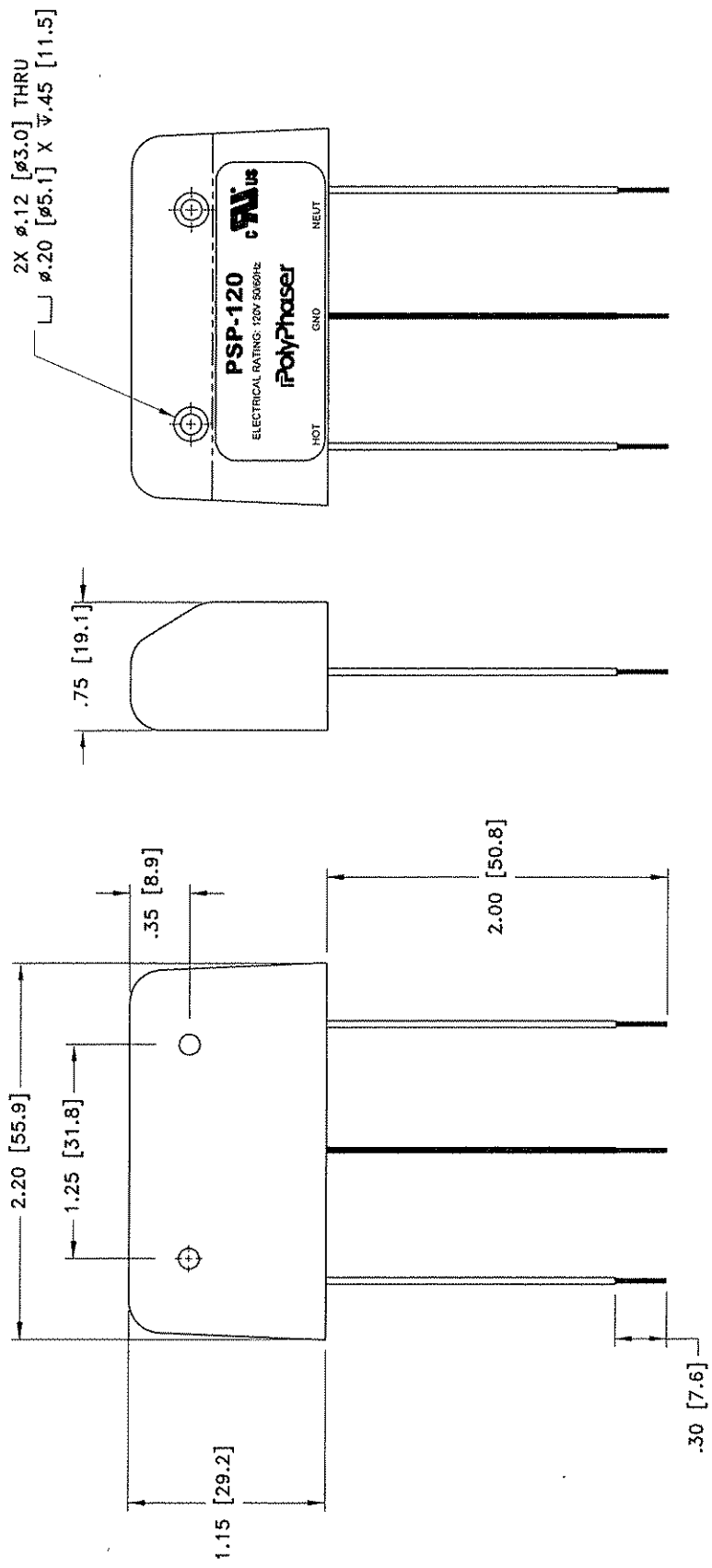
CONN. DIM.	N 01	BNC 02	UHF 04	C 05	N"G" 25	BNC"G" 26	UHF"G" 28
NC	0.70 [17.8]	0.60 [15.2]	0.70 [17.8]	0.70 [17.8]	1.20 [30.5]	1.20 [30.5]	1.00 [25.4]
NO	0.70 [17.8]	0.60 [15.2]	0.70 [17.8]	0.70 [17.8]	0.70 [17.8]	0.60 [15.2]	0.70 [17.8]
COMMON	0.50 [12.7]	0.70 [17.8]	0.50 [12.7]	0.50 [12.7]	0.50 [12.7]	0.70 [17.8]	0.50 [12.7]

Electrical



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REVISIONS			
REV LTR	DATE	ENG	Q.A.
A	07/01/03	LC	LJ



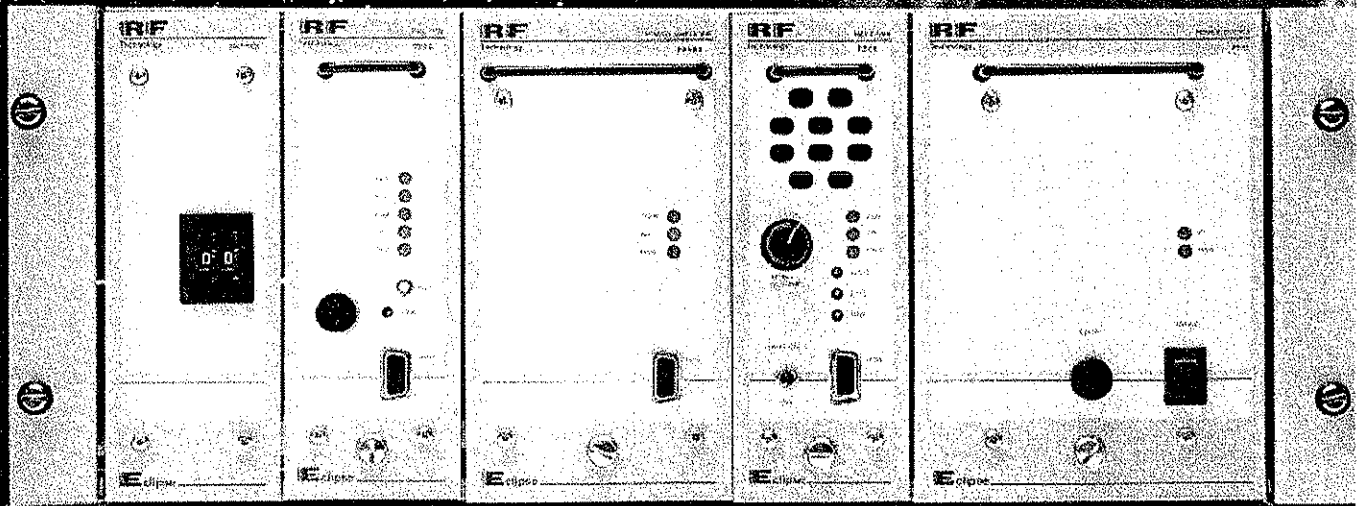
MAXIMUM CHARACTERISTICS	
SURGE:	35ka IEC 61000-4-5 8/20µs WAVEFORM
TURN-ON:	±240Vdc LINE TO LINE ±360 TO 700Vdc LINE TO GROUND
SUPPRESSION:	400V LINE TO LINE 400V LINE TO GROUND
TURN-ON TIME:	<2ns L TO L, 10ns L TO G FOR 2kV/ns

ALL REVISIONS TO THIS DOCUMENT MUST BE UL APPROVED.

CUSTOMER APPROVAL: _____ DATE: _____
 ALL DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY.

DRAFTER	J. BENNETT	DATE	02/28/03	 P.O. BOX 9000, WINDEN, NV 89433 TEL: 775-782-2811 FAX: 775-782-4476 P.S. NO/PART NO/DESCRIPTION PSP-120 CUSTOMER PRINT	
MECH ENGINEER	J. JONES	DATE	03/26/03		
ELEC ENGINEER	L. CHANG	DATE	03/26/03		
MARKETING	S. DOTTER	DATE	03/26/03		
QUALITY DEPT	R. MATHEUS	DATE	03/26/03		
PAGE CDR# FILE NAME			-C1	SCALE	1/1
			61114	SHEET	1 OF 1

ECLIPSE



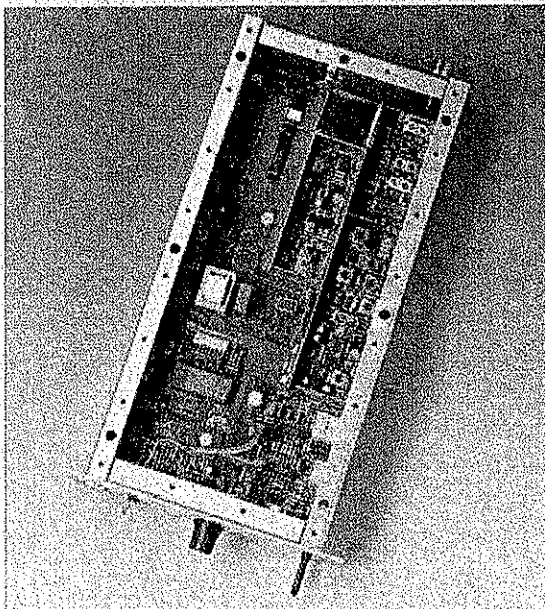
Base Station/Repeater System

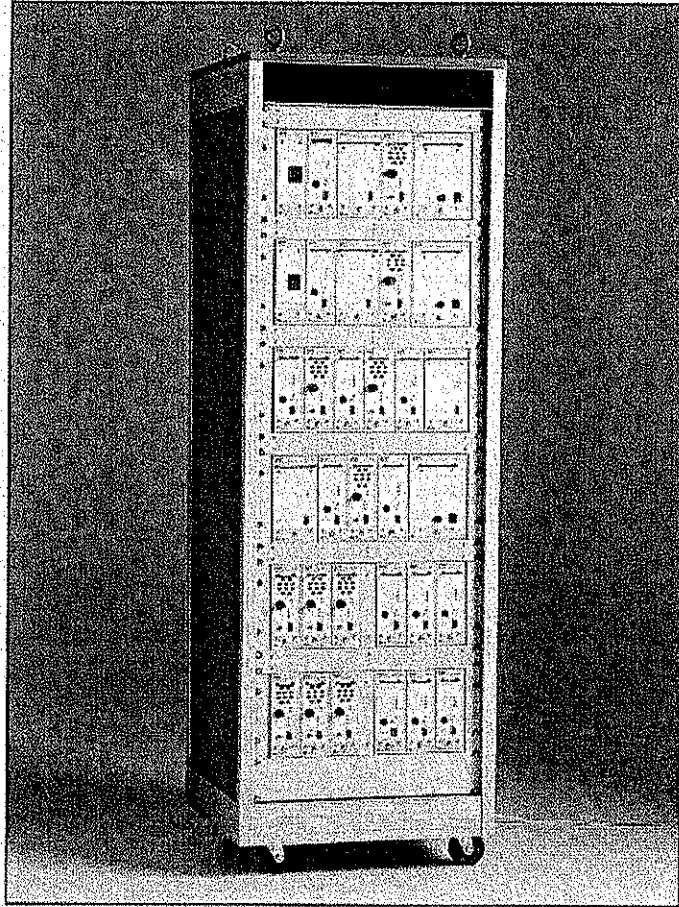
RF Technology

The ECLIPSE range is a totally new state of the art Base Station/Repeater system. Following an extensive survey of user requirements, high reliability and superb performance were combined with many unique features to produce a superior, user friendly product.

Features and Advantages

- Exceptional systems performance.
- Modular construction with independent Receivers and Transmitters. This allows split RX and TX racking for convenient connection to multicouplers etc.
- Easily configured for Duplex, Simplex, Trunked or Linked applications.
- High Power Exciters can be used alone for 1-25 watt applications.
- Separate High Power Amplifiers can be added for 25-150 watt output.
- Transmitter power adjustable over a wide range to meet local licensing requirements.
- Synthesized design with programming by IBM compatible PC through front panel RS232 port on each Receiver and Transmitter.
- 100 channel capacity.
- Individually programmable CTCSS with squelch tail elimination for each channel.
- Programmable processor controlled repeater hang time.
- Internal links for flat or emphasised audio response.
- Wide Receiver and Transmitter frequency spreads.
- The 19" rack module positions can be simply coded to automatically select channel and CTCSS tones.
- All modules mate with readily available D range connectors.
- DC5 compatible without modification.
- Direct FSK data transmission options are available for paging and data link applications.
- Balanced 4 wire 600 Ohm and Unbalanced audio I/O.
- Separate sub-audible ports allow tones and data to be repeated without regeneration, or for easy connection to tone panels.
- Isolated DC loop for PTT and COR functions.
- Built in diagnostics of: low supply voltage, power out, reverse power, receive signal strength, VCO voltage, channel information, squelch open/close, CTCSS, noise and carrier squelch.
- Remote monitoring, channel change and programming through RS232 port.
- Front panel display of alarm functions.
- System monitoring and service made easy with "TecHelp" software.
- 20 msec TX/RX for efficient data transmission.
- Carrier adjustable squelch from -140 to -70 dBm.
- Low signal alarm adjustable -140 to -70 dBm for links etc.
- Signal strength adaptive noise squelch virtually eliminates squelch tail on signals over 2 uV.
- Operational over temperature range -30° C to +60° C.
- Automatic protection with power reduction at high VSWR and temperature.
- All external preset controls are multi-turn potentiometers.
- SimulCast and Voting compatible.
- Monitor speaker included in Receiver.
- All modules operate from 13.8 Vdc (nominal 12v) supply.
- Fully rated linear Power Supply available.





RF Technology Pty. Ltd.

ECLIPSE SERIES SPECIFICATIONS SUMMARY

	Frequency	Receiver	Exciter	Power Amp	With Fan	PA-501	SMPS-12	PS-PS	Channel Spacing
Eclipse 50 Series	25-32 MHz	R50	T50	3.55 Kg	4.85 Kg	4.65 Kg	2.6 Kg	8.0 Kg	Software selectable
	30-40 MHz	R50	T50	3UW	4UW	5UW	2UW	4UW	
	38-50 MHz	R50	T50						
	66-88 MHz	R71A	T70A						Note: Eclipse 50 Series requires 28V supply
	136-156 MHz	R150A	T150A						12.5, 15, 20, 25, 30 kHz in 5 or 6.25 kHz steps
Eclipse 70 Series	148-174 MHz	R150B	T150B						12.5, 15, 20, 25, 30 kHz in 5 or 6.25 kHz steps
	215-240 MHz	R220A	T220A						6.25, 7.5, 12.5, 25 in 6.25 or 7.5 kHz steps
	300-330 MHz	R350D	T350D						12.5, 20, 25, 30 kHz in 10 or 12.5 kHz steps
	330-360 MHz	R350C	T350C						
	360-380 MHz	R350A	T350A						
Eclipse 150 Series	375-400 MHz	R350B	T350B						
	400-430 MHz	R500A	T500A						12.5, 25 kHz in 5, 10, 6.25 or 12.5 kHz steps
	425-453 MHz	R500D	T500D						
	450-490 MHz	R500B	T500B						
	485-520 MHz	R500C	T500C						
Eclipse 500 Series	800-830 MHz	R800A	T800A						12.5, 25 kHz in 6.25, 10 or 12.5 kHz steps
	850-870 MHz	R800B	T800B						
	896-930 MHz	R800C	n/a						
	928-941 MHz	n/a	T800C						
		1.45 Kg	1.8 Kg						
General									
Weight	2UW	2UW							
Dimension									

Weight 1.45 Kg 1.8 Kg 2UW 2UW

Dimension 4.85 Kg 4UW 4.65 Kg 5UW

Power Amp 3.55 Kg 3UW

With Fan 4.85 Kg 4UW

PA-501 4.65 Kg 5UW

SMPS-12 2.6 Kg 2UW

PS-PS 8.0 Kg 4UW

**(width) 2UW=62mm(2 7/16 inch)*

13UW wide, 4U high, 19 inch 4.55 kg
 Available in 1UW, 2UW, 3UW, 4UW width
 +13 Vdc or 120/240 volt, 50/60 Hz AC with SMPS12 power supply or PS12 power supply
 100 Channels, BCD coded 00-99
 Fully programmable, one EIA Tone per channel
 Through serial port of IBM compatible PC
 TechHelp (Dos) or Service Monitor (Win 95/98/XP), WinTekHelp (for Series 50)
 Front panel test connector and ALM, SQ, ALC, Tx and PWR LEDs
 Selectable flat or 750uSec pre/de-emphasis
 Standard 600 Ohm 0dBm balanced and HI-Z unbalanced

Receivers	R50	R71	R150	R220	R350	R500	R800
Frequency spread for 1dB degradation	25 MHz	15 MHz	20 MHz	25 MHz	5 MHz	10 MHz	25 MHz
Frequency stability	1 ppm standard (TCXO) Temp -30 to +60C						
Sensitivity	0.25 uV (-119 dBm) for 12 dB SINAD, 0.35 uV (-116 dBm) for 20 dB Quieting						
Spurious & Image	Rejection 90 dB						
Selectivity	80 dB at 25 kHz spacing per RS-204-C, 70 dB at 12.5 kHz spacing						
Intermodulation	80 dB per RS-204-C						
Modulation acceptance	7.5 and 3.75 kHz						
Squelch	Noise squelch, adjustable from 6 to 26 dB SINAD Carrier squelch, adjustable from 1 to 200 uV						
Audio level	+1 to -3 dB						
Audio response	600 Ohm line adjustable from -10 to +10 dB Monitor output, 3 watts @ 4 Ohms Discriminator & subtone output 1 V peak at 100% system deviation						
Audio Distortion	Less than 3 % at 1 kHz, 60% system deviation with 750 uSec de-emphasis						
COS output	Opto-coupled +12V, GND and free Switch connections						
Alarms	Unlock, tuning voltage, signal strength, external mute and supply voltage						

13UW wide, 4U high, 19 inch 4.55 kg
 Available in 1UW, 2UW, 3UW, 4UW width
 +13 Vdc or 120/240 volt, 50/60 Hz AC with SMPS12 power supply or PS12 power supply
 100 Channels, BCD coded 00-99
 Fully programmable, one EIA Tone per channel
 Through serial port of IBM compatible PC
 TechHelp (Dos) or Service Monitor (Win 95/98/XP), WinTekHelp (for Series 50)
 Front panel test connector and ALM, SQ, ALC, Tx and PWR LEDs
 Selectable flat or 750uSec pre/de-emphasis
 Standard 600 Ohm 0dBm balanced and HI-Z unbalanced

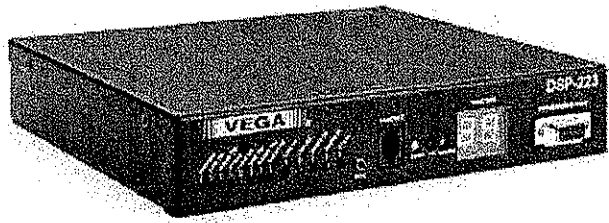
Exciters / Transmitters	I50	I70	I150	I220	I350	I500	I800
Frequency spread	25 MHz	15 MHz	20 MHz	2 MHz	5 MHz	10 MHz	25 MHz
Frequency stability	+/- 2.5 ppm standard						
Power output adjustable	0.5 to 1 watt						
Duty Cycle	+/- 10% from 12-16 Vdc, 0 to 50 deg C, all channels						
Carrier & modulation	100% to 40 deg C Temp -30 to +60C						
attack time	Less than 20 mSec						
Spurious and harmonics	Less than 0.25 uW (-36dBm)						
Audio response	+1 to -3 dB						
Audio distortion	Less than 3% at 60% system deviation at 1 kHz						
Residual hum & noise	Less than -50 dB relative to 60% system deviation						
Audio input level	600 Ohm line, -30 to +10 dBm Hi-Z input, 25 mV to 1 Vrms Subtone input compatible with receivers, Test microphone, 6 mV rms at 200 Ohms						
Remote keying	DC Opto-coupled input						
External ref. option	Allows the transmitter to be phase locked to an external 1 MHz reference						
Alarms	Unlock, tuning voltage, forward and reverse voltage						
DC Power Consumption (DC Amps)	R50	R70A	R150	R220	R350	R500	R800
Idle	0.50	0.40	0.39	0.39	0.42	0.43	0.41
50% vol.	0.55	0.48	0.48	0.48	0.52	0.51	0.51
100% vol.	0.60	0.65	0.66	0.66	0.68	0.68	0.69
Transmitter	Standard						
Tx Model	2W	5W	10W	15W	25W	35W	50W
T50	0.32	n/a	n/a	n/a	n/a	n/a	n/a
T70	0.3	2.2	3.0	4.0	4.7	4.4	6.0
T150	0.3	1.8	2.5	3.3	5.0	5.0	6.2
T220	0.2	3.2	4.2	5.0	6.6	n/a	n/a
T350	0.2	1.8	2.5	3.3	4.1	4.6	5.2
T500	0.2	2.3	3.2	4.2	5.0	4.4	4.8
T800	0.2	2.2	2.8	3.8	5.0	n/a	n/a
Note: for a repeater or base station add Rx, Tx and PA currents for a total figure							
AC Power Input (AC Amps)	Quiescent						
Switch Mode Supplies	Rx	Rx / Tx	Rx / Tx / PA	Tx On	PA On	PA On	PA On
SMPS12-2	0.18	0.21	0.21	15W	25W	50W	100W
SMPS28-1	0.085	0.175	0.213	0.67	0.58	1.22	2.14
Linear Supply	Rx	Rx / Tx	Rx / Tx / PA	Tx On	PA On	PA On	PA On
PS12	0.08	0.11	0.11	15W	25W	50W	100W
				0.67	0.75	1.37	2.35

We reserve the right to alter specifications or design without notice. In any special critical application please consult with the manufacturer. This publication is issued to provide an outline of specifications of the products shown. It is not to form an order or contract or be regarded as a representation of the product unless agreed to in writing by the company.



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Email: rinfo@rftechnology.com.au



Model DSP-223 Tone Remote Adapter Panel

- Police and Fire Departments
- Utility and Energy Companies
- Railroads and Airline Industries
- US Forestry and BLM Agencies

The Vega DSP-223 tone-remote adapter provides a reliable means of remotely controlling two-way-radio base stations. The adapter can be used in conjunction with all Vega consoles, or other manufacturers' (such as Motorola and GE) remote consoles that use the industry-standard sequential tone-keying format.

The DSP-223 is interconnected to the distant remote control console(s) by any voice-grade transmission medium such as a microwave link, a leased telephone line, or a twisted-pair 600-ohm line.

All DSP-223s are capable of decoding the PTT (push-to-talk/transmitter-on) tone sequence and the voice-plus-tone signals during transmission.

All models are prepared for jumper-plug conversion from two-wire-line operation to four-wire-line operation. In the four-wire mode, the panels are full-duplex capable

The DSP-223 provides the following features:

Front Panel:

- PTT, Monitor, and Power LED indications
- RS-232C port on front panel for configuration via Windows application
- Front panel test points and level set potentiometers
- Local handset port for intercom back to console operator or PTT of the radio
- 99-digit display

Rear Panel:

- DB25 Connector to the radio provides 6 digital outputs for channel selection, completely programmable per function tone or external relay control board
- RJ-45 connector to the telephone line (2-wire or 4-wire) jumper selectable

System:

- Two PTT modes and three monitor modes
- PTT& Monitor Relays
- Single Function tone recognition (16 function tones)
- Dual function tone recognition (100 function tones)
- Relays can be placed in any of four groups for separation of function
- Loop back tone for line level test and alignment
- CTCSS generation (64 frequencies)
- F1 and F2 Relays (programmable to any function tone or Revert to F1)
- Ability to pass-through to a second tone adapter with 400ms built in delay line (RF Link) control
- Morse Code Encoder for Automatic station identification



1-800-752-7560

TELEX Communications, Inc
VEGA Signaling Products

8601 East Cornhusker Highway, Lincoln, Nebraska, 68507
Phone: (402) 465-7026 Fax: (402) 467-3279
E-mail: vega@telex.com, Web: www.vega-signaling.com

NAME	PROJECT	COMPLETION DATE	CONTACT TELEPHONE	BONDED	CONTRACT AMOUNT
West Virginia State Police	Open End Contract for VHF & UHF Control & Repeater Stations	In Progress	Dave Saffel 304-637-0200	No	OPEN
Cuyahoga County	NPSAC Communications System Upgrade	In Progress	Murray Withrow 216-443-5700	No	\$901,475
City of Bay Village	Dispatch Center and Radio System Enhancements	In Progress	Lt. Mark Spaetzel 440-871-1234	Yes	\$136,270
Ravenna Township Fire Dept.	Fire/EMS Communications System	In Progress	Chief Steven Bosso 330-297-2192	No	\$334,512
City of North Olmsted	Radio Interoperability System for the North Olmsted Fire Dept	Mar-06	James Dunwoodie 440-777-1220	Yes	\$76,333
City of Mansfield	VOC-Alarm Replacement for Fire Dept.	Mar-06	Chief Michael Hartson 419-755-9814	No	\$52,341
Richland County	EMA Console Upgrades	Jan-06	Keith Markley 419-774-5686	No	\$106,160
City of Bay Village	Antenna Support Structure	Nov-05	Lt. Mark Spaetzel 440-871-1234	Yes	\$33,837
Huron Fire Dept.	Communications System Upgrade	Oct-05	Chief Paul Berlin 419-433-3544	No	\$278,883
City of Brecksville	Communications System Upgrade	Sep-05	Donna Shirer 440-526-2614	Yes	\$107,275
City of Avon	Construction of Maintenance Garage and Salt Storage Building - Communications	Jun-05	Bob Allen, Safety Dir 440-937-7800	Yes	\$19,056
City of Brunswick	Warning Sirens	Mar-05	Pat Beyer, Safety Dir 216-225-9111	Yes	\$83,832
Ashland County	Village of Savannah Emergency Warning Siren Furnishing & Installation of Furniture & Equipment for the Renovated Dispatch Center	Jan-05	Mike Wolfson, Project Eng 419-282-4262	Yes	\$13,677
Cleveland Municipal School District	New Radio Communications Systems & Related Console Furniture For Mt. Vernon PD	Dec-04	Jorge Dorantes 216-574-8588	Yes	\$169,999
Knox County Commissioners	Upgrade Fire Stations (3) Alerting Systems	Oct-04	Rochelle Shackle 393-6703	Yes	\$169,937
City of Lakewood	City Hall Roof Antenna Tower, Tower Platform and Antennas	Oct-04	Nick Sullivan 529-6073	Yes	\$16,222
City of Lakewood	Outdoor Warning Sirens	Mar-04	Nick Sullivan 529-6073 Diane Adams, Clerk 419-433-2755	Yes	\$52,400
Huron Township Trustees	Outdoor Warning Sirens	Mar-04		Yes	\$98,525

NAME	PROJECT	COMPLETION DATE	CONTACT TELEPHONE	BONDED	CONTRACT AMOUNT
City of Brunswick	Portable Radios	Jan-04	Pat Beyer, Safety Dir 216-225-9111	Yes	\$41,536
North Central EMS	New Communications Systems	Dec-03	Don Ballah 419-668-4357	No	\$160,182
City of Avon Lake	Portable Radios	Nov-03	Chief William Morrison 440-933-8305	Yes	\$21,315
Knox County Commissioners	100 Portable Radios	Nov-03	Rochelle Shackle 740 393-6703	Yes	\$60,900
Cardinal Joint Fire District	Mobiles, Portables, Fire Station Controllers and Installation	Oct-03	Chief Robert Tieche 330-533-1531	Yes	\$41,716
City of Avon	New Communications Systems for the new Fire Station	Jun-03	Chief Frank Root 440-934-1222	Yes	\$133,697
City of Seven Hills	Wide Area Voice Radio System	Jun-03	Capt. Bill Ringen 440-524-4421	Yes	\$74,995
Richland County	Installation of Outdoor Warning System as a Subcontractor	May-03	Keith Markley 419-774-5686	No	\$60,000
Firelands Ambulance	Repeater/Radios	Dec-02	Dan Bailey 419-929-3911	No	\$24,507
City of Pickerington	Console Furniture & Electronics as a Subcontractor	Dec-02	Carolyn Sharp 614-837-2330	No	\$157,075
Knox County 911	New 911 Center	Nov-02	Larry Hatton 740-393-6772	No	\$422,740
City of Avon Lake	Upgrade of Detention Facility Electronics Control and Monitor System	Nov-02	Dwayne Streater 440-933-4567	Yes	\$31,553
Ohio Turnpike Commission	High Band Portable Radios	Nov-02	Telecommunications Mgr. 216-234-2081	Yes	\$28,908
Medina County Commissioners	Sheriff's Simulcast & Voter Upgrade	Nov-02	Lt. John Detchon 330-725-0028	Yes	\$52,962
Lorain County 911	Radio Comm Control Systems Upgrade	Jul-02	Robbin Jones 440-329-5444	Yes	\$159,531
Richland County	Plymouth Tornado Siren Warning Sirens	May-02	Keith Markley 419-774-5686	Yes	\$26,671
City of Reynoldsburg	Police Communications Center	Mar-02	David Reichelt 216-263-8716	Yes	\$124,096
City of Sandusky	100 Ft. Tower	Dec-01	Bill Martin 419-627-5969	Yes	\$36,039

NAME	PROJECT	COMPLETION DATE	CONTACT TELEPHONE	BONDED	CONTRACT AMOUNT
Medina County Commissioners	Sheriff's Simulcast & Voter Upgrade	Oct-01	Lt. John Detchon 330-725-0028	Yes	\$107,086
Richland County	Tornado Siren Warning Sirens	Oct-01	Keith Markley 419-774-5686	Yes	\$26,671
Lorain County 911	Tower & Associated Antenna Systems	Jul-01	Robbin Jones 440-32-5444	Yes	\$49,730
Ashland County 911	Combined Dispatch Center	Apr-01	David Martin 281-0219 419	Yes	\$259,510
Sylvania Township	Communications Console	Feb-01	Chief Wayne Seely 419-882-1250	No	\$277,251
City of Brecksville	Communications System Enhancements for Safety Forces	Jan-01	Donna Shirer 440-526-2614	Yes	\$133,003
Richland County	Tornado Siren	Jan-01	Keith Markley 419-774-5686	Yes	\$54,008

