



COMMONWEALTH OF VIRGINIA
STANDARD CONTRACT

Contract No. UCPJMU5741

This contract entered into this 19th day of February 2020, by Stage Sound Inc. hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From February 19, 2020 through February 18, 2022 with eight (8) one-year renewal options.

The contract documents shall consist of:

- (1) This signed form;
(2) The following portions of the Request for Proposal SCK-1065 dated October 18, 2019:
(a) The Statement of Needs
(b) The General Terms and Conditions
(c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions
(d) Addendum No. One, dated November 13, 2019
(3) The Contractor's Proposal dated November 19, 2019 and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
(a) Negotiations Summary, dated February 13, 2020

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:
By: [Signature]
(Brian Taylor)
(Printed Name)
Title: VP, Design & Installation

PURCHASING AGENCY:
By: [Signature]
(Savana Kotcira)
(Printed Name)
Title: Buyer Specialist

RFP # SCK-1065, Atlantic Union Bank Center Audio System  
Stage Sound Inc.  
2/13/2020  
Negotiations Summary

1. The Contractor shall provide audio visual, multi-media, and related products, services and associated maintenance. The Contractor should provide access to every audio visual, multi-media and all related products and services that the company sells through the contract. Audio visual products and services added to the Contractor product mix after the award of the contracts may be incorporated into the contract.
2. Pricing shall be in accordance with the final pricing list provided by Stage Sound Inc. (*See Arena Audio pricing Attached*)
3. Additional labor pricing (outside the scope of the contract) is as follows:
  - Comprehensive system analysis and design: \$90.00/hour
  - AutoCAD and other technical drawings: \$76.00/hour
  - Project management: \$76.00/hour
  - Installation: \$76.00/hour
  - Late-night or weekend service and installation: \$114.00/hour
  - Hardware programming: \$100.00/hour
  - System calibration: \$100.00/hour
  - Training: \$100.00/hour
4. Contractor has agreed to offer prices for equipment and services expressed as a percentage discount off the manufacturer's list price for equipment and the Contractor's list price for services. The discounted price shall include all associated costs for equipment and services including the freight terms F.O.B. Destination/Prepaid and any travel and living expenses for technician services. *See equipment/services pricing attached.*
5. The Contractor should contain provisions for a select group of products for rent on an "as needed" basis specifically related to audio system at the Atlantic Union Bank Center. The Contractor should provide the necessary combination of services to include, but not limited to, a rental technician to run the equipment, delivery, set-up, and pick-up. Rental equipment may be subject to availability. *See rental pricing attached.*
6. Stage Sound Inc. has confirmed that there shall be no additional miscellaneous or incidental fees that have not been identified in the contract. There are no hidden charges, normal contract exclusions apply.
7. Stage Sound Inc. has agreed to take no exceptions to the Scope of Work and Technical Specifications provided in the contract. Work shall be performed as specified in the original RFP.



**RFP # SCK-1065, Atlantic Union Bank Center Audio System**  
**Stage Sound Inc.**  
**2/13/2020**  
**Negotiations Summary**

8. Stage Sound Inc. has agreed to extend their Standard Warranty for a 2-year (24-month) term in accordance with Item 1.8 A of Attachment E.
9. Payments shall be made in accordance with the Code of Virginia, §2.2-4347 through 2.2-4354, Prompt Payment.
10. Contractor agrees that this Negotiation Summary modifies the Contractor's response to RFP# SCK-1065.

MANUFACTURER	MODEL	DESCRIPTION	QTY	UNIT	EXTENDED
FOH AUDIO/PROCESSING/MICS/etc.					
QSC	NS-1148P	48 Port Layer 2/3/4 Managed Switch	3	\$ 3,173.00	\$ 9,519.00
LENOVO	PC	Rack Mounted PC with KVM Drawer	1	\$ 2,340.00	\$ 2,340.00
QSC	CORE 510i Kit	DSP Processor	2	\$ 5,384.60	\$ 10,769.20
QSC	CIML4	4 Line In	4	\$ 266.00	\$ 1,064.00
QSC	COL4	4 Line Out	6	\$ 243.20	\$ 1,459.20
QSC	CDN64	Dante Digital Network Card	2	\$ 1,269.20	\$ 2,538.40
QSC	CODP	Data Port cards	17	\$ 380.00	\$ 6,460.00
QSC	TSC-55W-G2	Networked Touchscreen Controller	8	\$ 874.00	\$ 6,992.00
QSC	I/O FRAME	I/O Box	5	\$ 1,808.80	\$ 9,044.00
QSC	SL-QSE-510-P	Scripting License	1	\$ 571.14	\$ 571.14
QSC	SL-QUD-510-P	UCI License	1	\$ 317.30	\$ 317.30
DENON	DN-700C	Professional Network CD/Media Player	1	\$ 429.14	\$ 429.14
DENON	DN-300DH	AM/FM Digital Tuner	1	\$ 171.14	\$ 171.14
WINEGARD	HD-6010	FM Antenna with mount and cable	1	\$ 109.77	\$ 109.77
CLICK EFFECTS	PRO AUDIO	Audio Clip Playback Laptop with USB Output	1	\$ 5,877.00	\$ 5,877.00
YAMAHA	QL5	Digital Mixing Console	2	\$ 12,974.25	\$ 25,948.50
YAMAHA	RIO3224-D2	32 Input 24 Output Rack Mounted DANTE Interface	1	\$ 7,124.25	\$ 7,124.25
YAMAHA	RIO1608-D2	16 Input 8 Output Rack Mounted DANTE Interface	1	\$ 3,936.75	\$ 3,936.75
YAMAHA	MSP3	Self Powered Studio Monitors	2	\$ 149.25	\$ 298.50
LISTEN TECHNOLOGIES	LP-41-072	Receiver package	2	\$ 2,972.80	\$ 5,945.60
LISTEN TECHNOLOGIES	LT-800-072	Transmitter Package with Antennas	2	\$ 852.80	\$ 1,705.60
ORION	DC2000RTX1	Uninterruptable Power Supply	2	\$ 1,340.63	\$ 2,681.25
SHURE	ULXD4D	Dual Channel Digital Wireless Receiver	2	\$ 2,316.94	\$ 4,633.88
SHURE	ULXD1	Digital Wireless Bodypack Transmitter	2	\$ 411.44	\$ 822.88
SHURE	MX185	Lavalier Microphone	2	\$ 199.06	\$ 398.12
SHURE	WA661	In-Line Bodypack Mute Switch	2	\$ 277.50	\$ 555.00
SHURE	ULXD2/SM58	Digital Wireless Handheld Microphone	2	\$ 438.82	\$ 877.64
SHURE	SBC800-US	8 Bay Battery Charging Station	1	\$ 405.52	\$ 405.52
SHURE	SB900A	Rechargeable Battery Pack	4	\$ 87.32	\$ 349.28
SHURE	SM58-LC	Handheld Microphone	4	\$ 91.76	\$ 367.04
EV	RE20	Announcer Mic with Desktop Stand	1	\$ 517.65	\$ 517.65
WHIRLWIND	THS1T	Push To Talk	1	\$ 366.89	\$ 366.89
BITTREE	B96DC-FNAIT/ID M2OU12B	2 x 48 Bantam QCP II 18" Chassis Audio Patchbay	2	\$ 1,393.20	\$ 2,786.40
RANE	DA216S	Audio Distribution Amplifier	1	\$ 339.15	\$ 339.15
BITTREE	BPC3600-110	3' Bantam Patch Cables	10	\$ 17.85	\$ 178.50
BITTREE	BPC7200-110	6' Bantam Patch Cables	10	\$ 21.25	\$ 212.50
WHIRLWIND	MK425	25' XLR Cables	4	\$ 37.74	\$ 150.96
WHIRLWIND	MK450	50' XLR Cables	4	\$ 55.10	\$ 220.40
ATLAS	AT100D	70 Volt Volume Control	8	\$ 35.19	\$ 281.52
CAMPLEX	HF-TR04LC-0100	LC Single Mode Fiber Snake 100'	2	\$ 389.66	\$ 779.32
<b>Audio Processing Subtotal</b>					<b>\$ 119,544.39</b>
LOUDSPEAKERS					
DANLEY SOUND LABS	SH96HOI-B	26.5" x 45" x 25" 220lbs.	17	\$ 6,840.60	\$ 116,290.20
DANLEY SOUND LABS	TH118I-B	40" x 22.5" x 28.5" 160lbs.	6	\$ 2,866.50	\$ 17,199.00
JBL	C67HC/T (S4)	Ceiling Pendant Speaker	37	\$ 300.00	\$ 11,100.00
JBL	24CT (S1)	2-Way Ceiling Speaker	179	\$ 109.46	\$ 19,593.34
JBL	67P/T (S2)	Ceiling Pendant Speaker	9	\$ 255.00	\$ 2,295.00
JBL	60PS/T (S3)	Ceiling Pendant Subwoofer Speaker	5	\$ 311.25	\$ 1,556.25
JBL	CRV (S5)	2-Way Ceiling Speaker	37	\$ 196.09	\$ 7,255.33
JBL	25-1 (S6)	2-Way Ceiling Speaker	19	\$ 146.25	\$ 2,778.75
JBL	64P/T (S7)	Ceiling Pendant Speaker	38	\$ 135.00	\$ 5,130.00
<b>Loudspeakers Subtotal</b>					<b>\$ 183,197.87</b>
AMPLIFIERS					
DANLEY SOUND LABS	DNA-20K4 Pro Dante	20K 4CH Amplifier with Dante	10	\$ 6,747.78	\$ 67,477.80
QSC	CX204V	70V Amplifier	9	\$ 1,394.60	\$ 12,551.40
QSC	CX108V	70V 8CH Amplifier	4	\$ 1,706.20	\$ 6,824.80
<b>Amplifier Subtotal</b>					<b>\$ 86,854.00</b>
RACKS AND UPS					
Lowell	LGR-4432-LRD	LGR Series Rack, 44RU, 32"D - Without Rear Door	3	\$ 1,076.74	\$ 3,230.22
Lowell	LRD-44FV	Vented Rear Door	3	\$ 300.08	\$ 900.24
Lowell	SDP-4432	Side Panels, 44RU, 31-32" D Racks	1	\$ 631.05	\$ 631.05
Lowell	FW4-7T	Fan Top	3	\$ 351.95	\$ 1,055.85
Lowell	ACS-2024	Power Strip, 12 Outlet, 20A	3	\$ 166.47	\$ 499.41
Lowell	CMV2-44	Lace Strip, 44RU, w/ Round Holes, 6pc.	3	\$ 139.79	\$ 419.37
ORION	DC3000RTX1	3000VA Uninterruptable Power Supply	3	\$ 1,761.50	\$ 5,284.50
ORION	OPS-RAILKIT	Rack Rail Kit for UPS	3	\$ 63.38	\$ 190.13
ORION	OPS-SNMP4-WEBCARD	Communications Card for UPS	3	\$ 276.25	\$ 828.75
<b>Racks and UPS Subtotal</b>					<b>\$ 13,039.52</b>
INTEGRATION AND MATERIALS					
INTEGRATION	MATERIAL	Cables, Connectors, Lift Rental, Etc.	1	\$ 81,427.89	\$ 81,427.89

INTEGRATION	LABOR	Design and Integration Labor	1	\$	175,705.00	\$	175,705.00
INTEGRATION	TRAVEL	Travel & Expenses	1	\$	19,056.05	\$	19,056.05
<b>Integration and Material Subtotal</b>						\$	<b>276,188.94</b>
<b>ARENA AUDIO SUBTOTAL</b>						\$	<b>678,824.72</b>

WARRANTY EXTENSION							
WARRANTY	YEAR 3	PARTS AND LABOR	1	\$	5,803.80	\$	5,803.80
WARRANTY	YEAR 4	PARTS AND LABOR	1	\$	7,593.80	\$	7,593.80
WARRANTY	YEAR 5	PARTS AND LABOR	1	\$	9,383.80	\$	9,383.80
WARRANTY	YEAR 6	PARTS AND LABOR	1	\$	11,173.80	\$	11,173.80
WARRANTY	YEAR 7	PARTS AND LABOR	1	\$	12,963.80	\$	12,963.80
WARRANTY	YEAR 8	PARTS AND LABOR	1	\$	14,753.80	\$	14,753.80
WARRANTY	YEAR 9	PARTS AND LABOR	1	\$	16,543.80	\$	16,543.80
WARRANTY	YEAR 10	PARTS AND LABOR	1	\$	18,333.80	\$	18,333.80
<b>Warranty Extension Subtotal</b>						\$	<b>96,550.40</b>

JMU Solicitation SCK-1065 Stage Sound Rental Rates

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Stage Sound, Inc 2240 Shenandoah Ave. NW Roanoke, VA 24017 800-778-9839

www.stagesound.com

Brand	Product Category	Product Description	Unit	List Price	Contract Discount	VASCUPP Price
AEI	Rigging	Litron 16' Crank Lift	day	\$60.00	28.57%	\$42.86
AKG	Microphone	170	day	\$15.00	28.57%	\$10.71
AKG	Microphone	C414	day	\$65.00	28.57%	\$46.43
AKG	Microphone	C535EB	day	\$25.00	28.57%	\$17.86
AKG	Microphone	D112	day	\$20.00	28.57%	\$14.29
Allen & Heath	Mixing Console	GL2400, 32x4x2	day	\$100.00	28.57%	\$71.43
Allen & Heath	Mixing Console	Mix Wizard, 16x2x1	day	\$75.00	28.57%	\$53.57
Altman	Lighting	3 Cell CYC Light Lighting Fixture	day	\$25.00	28.57%	\$17.86
Altman	Lighting	6" Fresnel Lighting Fixture	day	\$20.00	28.57%	\$14.29
Altman	Lighting	MR-16 Zip Strip Lighting Fixture	day	\$25.00	28.57%	\$17.86
Altman	Lighting	Q-Lite Lighting Fixture	day	\$10.00	28.57%	\$7.14
Altman	Lighting	Single Cell CYC Light Lighting Fixture	day	\$15.00	28.57%	\$10.71
Altman	Lighting	Star Par Lighting Fixture	day	\$10.00	28.57%	\$7.14
Altman	Spotlight	Luminator Follow Spot	day	\$35.00	28.57%	\$25.00
American DJ	Lighting	DMX Strobe	day	\$25.00	28.57%	\$17.86
American DJ	Lighting	Encore Burst 200	day	\$50.00	28.57%	\$35.72
American DJ	Lighting	H20 DMX Pro, Chauvet Abyss 3.0	day	\$50.00	28.57%	\$35.72
Analog Way	Video Switcher	Pulse 300	day	\$150.00	28.57%	\$107.15
Analog Way	Video Switcher	Smart Matrix	day	\$100.00	28.57%	\$71.43
Antari	Atmospheric	Antari Hazer Fog Machine	day	\$75.00	28.57%	\$53.57
Antari	Atmospheric	Cold Flow Attachment for Fog Machine	day	\$150.00	28.57%	\$107.15
Applied	Rigging	12-Way Motor Controller/Power	day	\$125.00	28.57%	\$89.29
Applied	Rigging	8-Way Motor Controller/Power	day	\$125.00	28.57%	\$89.29
Applied	Truss	12" Box ( 90 Degree Arc.) Truss Section	day	\$25.00	28.57%	\$17.86
Applied	Truss	12" Triangle (10 ft.) Truss Section	day	\$30.00	28.57%	\$21.43
Applied	Truss	12" 3 or 6-Way Corner Truss Section	day	\$10.00	28.57%	\$7.14
Applied	Truss	12" Box (10 ft.) Truss Section	day	\$30.00	28.57%	\$21.43
Applied	Truss	12" Box (5 ft.) Truss Section	day	\$15.00	28.57%	\$10.71
Applied	Truss	12" Box (8 ft.) Truss Section	day	\$30.00	28.57%	\$21.43
Applied	Truss	30" 4 Way Corner Truss Section	day	\$50.00	28.57%	\$35.72
Ashly	Processing	1502, Dual 15-Band EQ	day	\$25.00	28.57%	\$17.86
Ashly	Processing	3101, Single 31-Band EQ	day	\$25.00	28.57%	\$17.86
Ashly	Processing	3102, Dual 31-Band EQ	day	\$30.00	28.57%	\$21.43
Audio Technica	Microphone	ES991 Redundant Podium	day	\$40.00	28.57%	\$28.57
Audio Technica	Microphone	Microphone AT 4031	day	\$15.00	28.57%	\$10.71
Audix	Microphone	ADX-51	day	\$15.00	28.57%	\$10.71

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Aurora	Distribution Amplifier	1:4 HDMI Splitter	day	\$20.00	28.57%	\$14.29
Aurora	Video	HDBaseT Receiver/Transmitter	day	\$15.00	28.57%	\$10.71
AVO	Lighting Controller	Pearl Expert Pro Lighting Console	day	\$750.00	28.57%	\$535.73
AVO	Lighting Controller	Sapphire 2000 Lighting Console	day	\$300.00	28.57%	\$214.29
AVO	Lighting Controller	Titan Touch Lighting Console	day	\$200.00	28.57%	\$142.86
Barco	Scan Converter	9700XL	day	\$125.00	28.57%	\$89.29
Barco	Scan Converter	ImagePRO	day	\$300.00	28.57%	\$214.29
Behringer	Digital Snake	Behringer S16 Digital Snake 16x8	day	\$50.00	28.57%	\$35.72
Behringer	Mixing Console	X32 Producer	day	\$100.00	28.57%	\$71.43
Beyer	Microphone	M88	day	\$25.00	28.57%	\$17.86
Black Magic Design	Distribution Amplifier	UpDownCross SDI Hub	day	\$20.00	28.57%	\$14.29
Black Magic Design	Format Converter	Analog-SDI	day	\$15.00	28.57%	\$10.71
Black Magic Design	Format Converter	HDMI-SDI	day	\$15.00	28.57%	\$10.71
Black Magic Design	Format Converter	SDI-Analog	day	\$15.00	28.57%	\$10.71
Black Magic Design	Format Converter	SDI-HDMI	day	\$15.00	28.57%	\$10.71
Black Magic Design	Video	Micro Studio Camera	day	\$50.00	28.57%	\$35.72
Black Magic Design	Video Recorder	Hyperdeck SSD Recorder	day	\$50.00	28.57%	\$35.72
Black Magic Design	Video Switcher	Atem 1 M/E Switcher	day	\$250.00	28.57%	\$178.58
Brite-Lite	Slide Projector	Brite-lite Module	day	\$20.00	28.57%	\$14.29
BSS	Processing	960, Dual 31-Band EQ	day	\$35.00	28.57%	\$25.00
Chauvet	Lighting	Colorband Pix LED Strip Fixture	day	\$25.00	28.57%	\$17.86
Chauvet	Lighting	Colordash LED Intelligent Lighting Wash Fixture	day	\$35.00	28.57%	\$25.00
Chauvet	Lighting	Freedom Par RGBA	day	\$20.00	28.57%	\$14.29
Chauvet	Lighting	Mega Moon, DMF-10, Circus	day	\$25.00	28.57%	\$17.86
Chauvet	Lighting	Q-Wash 260 Moving Head LED Fixture	day	\$50.00	28.57%	\$35.72
Chauvet	Lighting	Rouge R3 Wash Fixture	day	\$100.00	28.57%	\$71.43
Chauvet	Lighting	Scorpion Storm FX Laser	day	\$25.00	28.57%	\$17.86
CM Lodestar	Rigging	CM 1/2-Ton Motor (60' Lift)	day	\$75.00	28.57%	\$53.57
CM Lodestar	Rigging	CM 1/4-Ton Motor (60' Lift)	day	\$50.00	28.57%	\$35.72
CM Lodestar	Rigging	CM 1-Ton Motor (60' Lift)	day	\$100.00	28.57%	\$71.43
Coffing	Rigging	Beam Clamp	day	\$10.00	28.57%	\$7.14
Cosmic Truss	Truss	U-Torm Ladder Truss	day	\$20.00	28.57%	\$14.29
Crest	Power Amplifier	VS1500	day	\$30.00	28.57%	\$21.43
Crown	Microphone	PCC160	day	\$25.00	28.57%	\$17.86
Custom	Power Distribution	Exhibition/Booth/Press, Per Drop Power Distribution System	day	\$35.00	28.57%	\$25.00
Custom	Power Distribution	Feeder, #2x5-Wire, Camlock Power Distribution System	day/FT	\$1.00	28.57%	\$0.71
Custom	Power Distribution	Feeder, 2/0x5-Wire, Camlock Power Distribution System	day/FT	\$1.50	28.57%	\$1.07
Custom	Power Distribution	Feeder, 4/0x5-Wire, Camlock Power Distribution System	day/FT	\$2.00	28.57%	\$1.43
Custom	Power Distribution	Single Phase, 4-Pin/3-Pin/Edison Power Distribution System	day	\$100.00	28.57%	\$71.43
Custom	Power Distribution	Three Phase, 4-Pin/3-Pin/Edison Power Distribution System	day	\$150.00	28.57%	\$107.15
DaLite	Screen	Tripod Screens 70" X 70"	day	\$25.00	28.57%	\$17.86

JMU Solicitation SCK-1065 Stage Sound Rental Rates

DaLite	Screen	Tripod Screens 96" X 72"	day	\$40.00	28.57%	\$28.57
Data Video	Video Recorder	MP6000 DVD-R	day	\$45.00	28.57%	\$32.14
DBX	Processing	160 Compressor	day	\$25.00	28.57%	\$17.86
DBX	Processing	166/266 Compressor	day	\$20.00	28.57%	\$14.29
Draper	Easel	Easel with pad	day	\$25.00	28.57%	\$17.86
Draper	Easel	Easel without pad	day	\$15.00	28.57%	\$10.71
Draper	Screen	Stage Screen 9' x 16' Viewable Truss Style(16:9 Format)	day	\$500.00	28.57%	\$357.15
Draper	Screen	Standard Fast Fold Screen 10.5' X 14' Fast Fold	day	\$125.00	28.57%	\$89.29
Draper	Screen	Standard Fast Fold Screen 6' x 8' Fast Fold	day	\$75.00	28.57%	\$53.57
Draper	Screen	Standard Fast Fold Screen 9' X 12' Fast Fold	day	\$100.00	28.57%	\$71.43
Draper	Screen	Truss Style Screen 10.5' x 14' Viewable Truss Style	day	\$350.00	28.57%	\$250.01
Draper	Screen	Truss Style Screen 15' x 20' Viewable Truss Style	day	\$400.00	28.57%	\$285.72
Draper	Screen	Truss Style Screen 9' x 12' Viewable Truss Style	day	\$300.00	28.57%	\$214.29
Draper	Screen	Ultimate Fast Fold Screen 7' X 12' Fast Fold(16:9 Format)	day	\$250.00	28.57%	\$178.58
Drawmer	Processing	DL201 Gate	day	\$25.00	28.57%	\$17.86
Drawmer	Processing	DL241 Compressor	day	\$25.00	28.57%	\$17.86
EAW	Monitors	500i	day	\$50.00	28.57%	\$35.72
EAW	Speaker	EAW KF760	day	\$200.00	28.57%	\$142.86
EAW	Speaker	EAW KF760/761 Flybar Module	day	\$200.00	28.57%	\$142.86
EAW	Speaker	EAW KF761	day	\$200.00	28.57%	\$142.86
EAW	Speaker	EAW KF850 Flybar Module	day	\$35.00	28.57%	\$25.00
EAW	Speaker	EAW KF850e	day	\$100.00	28.57%	\$71.43
EAW	Speaker	EAW SB1002 Sub	day	\$125.00	28.57%	\$89.29
Elation	Lighting	Protron Eclypse	day	\$150.00	28.57%	\$107.15
Electro Voice	Microphone	ND408	day	\$10.00	28.57%	\$7.14
Electro Voice	Microphone	ND468	day	\$16.00	28.57%	\$11.43
Electro Voice	Microphone	PL10	day	\$15.00	28.57%	\$10.71
Electro Voice	Microphone	PL20/RE20	day	\$40.00	28.57%	\$28.57
Electro Voice	Speaker	MTL4 (4x18") Sub	day	\$100.00	28.57%	\$71.43
ETC	Dimming	Sensor Rack (48x2.4kW)	day	\$250.00	28.57%	\$178.58
ETC	Dimming	SmartPack Rack (48x1.2kW)	day	\$175.00	28.57%	\$125.00
ETC	Lighting	Source Four (19,26,36,50 Degree) Lighting Fixture	day	\$22.00	28.57%	\$15.71
ETC	Lighting	Source Four Barrel (5, 10, 90 Degree) Lighting Fixture	day	\$11.00	28.57%	\$7.86
ETC	Lighting	Source Four Jr. (26 Degree) Lighting Fixture	day	\$15.00	28.57%	\$10.71
ETC	Lighting Controller	Express 48/96 DMX Lighting Console	day	\$155.00	28.57%	\$110.72
ETC	Lighting Controller	SmartFade 12/48 DMX Lighting Console	day	\$75.00	28.57%	\$53.57
ETC	Lighting Controller	SmartFade 24/96 DMX Lighting Console	day	\$90.00	28.57%	\$64.29
ETC	Rigging	Single or Double Cheeseborough	day	\$5.00	28.57%	\$3.57
Eventide	Processing	H3000D/SE	day	\$75.00	28.57%	\$53.57
Extron Electronics	Video Switcher	MVX84 VGA Matrix Switcher	day	\$100.00	28.57%	\$71.43
Flying Pig Systems	Lighting Controller	Whole Hog II Lighting Console	day	\$300.00	28.57%	\$214.29

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Generic	Audio Snake	16x4, 100'	day	\$20.00	28.57%	\$14.29
Generic	Audio Snake	24x8, 100'	day	\$30.00	28.57%	\$21.43
Generic	Audio Snake	6, 9, 12-Channel, 50'	day	\$15.00	28.57%	\$10.71
Generic	Audio Snake	6, 9, 12-Channel, 75'	day	\$20.00	28.57%	\$14.29
Generic	AV Cart	AV Cart 30" w/ drape	day	\$10.00	28.57%	\$7.14
Generic	AV Cart	AV Cart 42" w/ drape	day	\$10.00	28.57%	\$7.14
Generic	AV Cart	AV Cart 54" w/ drape	day	\$10.00	28.57%	\$7.14
Generic	Cabling	100' Microphone Cable	day	\$3.00	28.57%	\$2.14
Generic	Cabling	25' Microphone Cable	day	\$2.00	28.57%	\$1.43
Generic	Cabling	50' Microphone Cable	day	\$2.50	28.57%	\$1.79
Generic	Décor	Carpet (Red, Black, Grey)	Priced Per Event		28.57%	\$0.00
Generic	Décor	Plastic Rope and Stanchion per linear foot	day	\$1.00	28.57%	\$0.71
Generic	Décor	Red Velvet Rope and Stanchion per linear foot	day	\$5.00	28.57%	\$3.57
Generic	Easel	Easel White Marker Board 4' X 5'	day	\$40.00	28.57%	\$28.57
Generic	Intercomm	Intercom Beltpack Station	day	\$7.50	28.57%	\$5.36
Generic	Intercomm	Intercom Blazon Call Beacons	day	\$10.00	28.57%	\$7.14
Generic	Intercomm	Intercom Dual Channel Beltpack Station	day	\$15.00	28.57%	\$10.71
Generic	Intercomm	Intercom Headset (Single or Dual Muff)	day	\$7.50	28.57%	\$5.36
Generic	Intercomm	Intercom One Channel Power Supply	day	\$10.00	28.57%	\$7.14
Generic	Intercomm	Intercom Telephone Handset	day	\$7.50	28.57%	\$5.36
Generic	Intercomm	Intercom Three Channel Power Supply	day	\$25.00	28.57%	\$17.86
Generic	Intercomm	Walkie Talkie 2 Channel UHF	day	\$15.00	28.57%	\$10.71
Generic	Lectern	Lectern in Plexi-glass	day	\$95.00	28.57%	\$67.86
Generic	Lectern	Lectern in Wood	day	\$75.00	28.57%	\$53.57
Generic	Lighting	16" Mirror Ball	day	\$15.00	28.57%	\$10.71
Generic	Lighting	24" Mirror Ball	day	\$30.00	28.57%	\$21.43
Generic	Lighting	Japanese Lantern, 12"-24"	day	\$10.00	28.57%	\$7.14
Generic	Lighting	Japanese Lantern, 30-36"	day	\$15.00	28.57%	\$10.71
Generic	Lighting	Octal Pin Spot Bank Lighting Fixture	day	\$15.00	28.57%	\$10.71
Generic	Lighting	Oscillating Pin Spot	day	\$15.00	28.57%	\$10.71
Generic	Lighting	Par 38 Lighting Fixture	day	\$10.00	28.57%	\$7.14
Generic	Lighting	Pin Spot Lighting Fixture	day	\$2.50	28.57%	\$1.79
Generic	Lighting	Quad Pin Spot Bank Lighting Fixture	day	\$10.00	28.57%	\$7.14
Generic	Lighting	Single 48" Blacklight	day	\$15.00	28.57%	\$10.71
Generic	Lighting	Street Light	day	\$25.00	28.57%	\$17.86
Generic	Lighting	Swivelier Gooseneck	day	\$5.00	28.57%	\$3.57
Generic	Overhead Projector	HI Intensity Overhead	day	\$45.00	28.57%	\$32.14
Generic	Overhead Projector	Standard Overhead	day	\$30.00	28.57%	\$21.43
Generic	Presentation	Laser Pointer	day	\$10.00	28.57%	\$7.14
Generic	Presentation	Power Point Extra Remote	day	\$5.00	28.57%	\$3.57
Generic	Presentation	Power Point Power Presenter RF (100' range)	day	\$25.00	28.57%	\$17.86

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Generic	Processing	Stereo 2or 3-Way Crossover	day	\$20.00	28.57%	\$14.29
Generic	Rigging	10' Pipe & Base	day	\$15.00	28.57%	\$10.71
Generic	Rigging	Saddle Sandbag (25lbs)	day	\$5.00	28.57%	\$3.57
Generic	Slide Projector	Extra Tray	day	\$5.00	28.57%	\$3.57
Generic	Slide Projector	Wireless Remote	day	\$15.00	28.57%	\$10.71
Genie	Rigging	Super Tower	day	\$100.00	28.57%	\$71.43
Global	Truss	16" Box ( 90 Degree Arc.) Truss Section	day	\$25.00	28.57%	\$17.86
Global	Truss	16" Box (8 ft.) Truss Section	day	\$30.00	28.57%	\$21.43
GLP	Lighting	Impression X4 Bar 20	day	\$225.00	28.57%	\$160.72
GLP	Lighting	X4 Bar 20 Moving LED Strip Fixture	day	\$150.00	28.57%	\$107.15
Guardian	Rigging	Horizontal Fall Arrest	day	\$50.00	28.57%	\$35.72
Guardian	Rigging	Vertical Fall Arrest	day	\$50.00	28.57%	\$35.72
HazeBase	Atmospheric	Hazer Pro Fog Machine	day	\$125.00	28.57%	\$89.29
High End	Atmospheric	F-100 Fog Machine	day	\$50.00	28.57%	\$35.72
High End	Lighting	Studio Color 575 Intelligent Lighting Fixture	day	\$150.00	28.57%	\$107.15
High End	Lighting	Studio Spot 575 CMY Intelligent Lighting Fixture	day	\$200.00	28.57%	\$142.86
Hitachi	Projector	HDMI/XGA Video/Data Projector 6500 ANSI Lumens	day	\$350.00	28.57%	\$250.01
IDX Systems	Accessory	Studio Camera Accessory ID-200a Dual Channel Camera Power Supply	day	\$50.00	28.57%	\$35.72
Inline	Distribution Amplifier	Inline 3214 1x4 Composite	day	\$15.00	28.57%	\$10.71
JBL	Monitors	SRX 712M	day	\$40.00	28.57%	\$28.57
JBL	Processing	644 Quad Gate	day	\$20.00	28.57%	\$14.29
Jensen	Video	Ground Loop Isolator VBH-1BB	day	\$25.00	28.57%	\$17.86
Jensen	Video	Ground Loop Isolator VBH-5BB	day	\$35.00	28.57%	\$25.00
JVC	Camcorder	VHS Camcorder	day	\$45.00	28.57%	\$32.14
JVC	Tripod	Camcorder Tripod	day	\$20.00	28.57%	\$14.29
JVC	Video Recorder	DVD Player	day	\$20.00	28.57%	\$14.29
Kodak	Slide Projector	Kodak Carousel	day	\$30.00	28.57%	\$21.43
Kramer Electronics	Distribution Amplifier	104LN 1x4 Composite	day	\$15.00	28.57%	\$10.71
Kramer Electronics	Distribution Amplifier	VM-1055 1x5 RGBHV	day	\$35.00	28.57%	\$25.00
Kramer Electronics	Distribution Amplifier	VP-10 1x10 RGBHV	day	\$50.00	28.57%	\$35.72
Kramer Electronics	Distribution Amplifier	VP-123 1x3 RGBHV	day	\$30.00	28.57%	\$21.43
Kramer Electronics	Distribution Amplifier	VP-400 1x4 VGA	day	\$20.00	28.57%	\$14.29
Kramer Electronics	Scan Converter	VP-703-SC Scan Converter	day	\$65.00	28.57%	\$46.43
Kramer Electronics	Video Switcher	VP-720DS Switcher/Scaler	day	\$80.00	28.57%	\$57.14
Lab Gruppen	Power Amplifier	10000-Q	day	\$125.00	28.57%	\$89.29
Lab Gruppen	Power Amplifier	fp6400	day	\$100.00	28.57%	\$71.43
Leviton	Dimming	D4DMX (4x600W)	day	\$25.00	28.57%	\$17.86
Lexicon	Processing	LXP-15	day	\$35.00	28.57%	\$25.00
Lycian	Spotlight	1275 Follow Spot	day	\$175.00	28.57%	\$125.00
Lycian	Spotlight	Midget Follow Spot	day	\$35.00	28.57%	\$25.00

JMU Solicitation SCK-1065 Stage Sound Rental Rates

MA Lighting	Lighting	GrandMA Compact XT	day	\$1,000.00	28.57%	\$714.30
Mackie	Mixing Console	LZ1604,16x4x2	day	\$45.00	28.57%	\$32.14
Mackie	Mixing Console	ProFX 12	day	\$25.00	28.57%	\$17.86
Mackie	Mixing Console	ProFx 16	day	\$30.00	28.57%	\$21.43
Magenta Research	Video	Receiver/Transmitter	day	\$15.00	28.57%	\$10.71
Manfrotto	Tripod	Camera Tripod	day	\$50.00	28.57%	\$35.72
Marshall	Accessory	Studio Camera Accessory Marshall V-LCD70XP-3GSDI Monitor w/ Noga CineArm	day	\$100.00	28.57%	\$71.43
Martin	Atmospheric	Magnum 2000 Fog Machine	day	\$40.00	28.57%	\$28.57
Martin	Atmospheric	Magnum 650 Fog Machine	day	\$20.00	28.57%	\$14.29
Martin	Atmospheric	Magnum 850 Fog Machine	day	\$35.00	28.57%	\$25.00
Martin	Lighting	2510 Controller for SCX 500	day	\$25.00	28.57%	\$17.86
Martin	Lighting	Mac 700 Profile Intelligent Lighting Fixture	day	\$250.00	28.57%	\$178.58
Martin	Lighting	Raptor	day	\$25.00	28.57%	\$17.86
Martin	Lighting	SCX 500/Mania	day	\$35.00	28.57%	\$25.00
Martin	Lighting Controller	Light Jockey ISA Computer Intelligent Lighting Controller Interface	day	\$150.00	28.57%	\$107.15
Martin	Lighting Controller	Light Jockey USB Dongle Intelligent Lighting Controller Interface	day	\$100.00	28.57%	\$71.43
Martin Audio	Audio	Martin LE200	day	\$75.00	28.57%	\$53.57
MDG	Atmospheric	Hazer Fog Machine	day	\$75.00	28.57%	\$53.57
Merlyn	Speaker	S1/t (1x10", 1x1")	day	\$30.00	28.57%	\$21.43
Merlyn	Speaker	S2/t (2x10", 1x1")	day	\$45.00	28.57%	\$32.14
Merlyn	Speaker	S3 (2x15", 1x10", 1x1")	day	\$60.00	28.57%	\$42.86
Merlyn	Speaker	T3B (3x18") Sub	day	\$50.00	28.57%	\$35.72
Midas	Audio	DL 251 Head Amp	day	\$200.00	28.57%	\$142.86
Midas	Audio	Midas M32	day	\$200.00	28.57%	\$142.86
Midas	Audio	Midas Pro2	day	\$300.00	28.57%	\$214.29
NEXO	Speaker	GEO S1210	day	\$150.00	28.57%	\$107.15
NEXO	Speaker	GEO S1210/S1230 Flybar Module	day	\$125.00	28.57%	\$89.29
NEXO	Speaker	GEO S1230	day	\$150.00	28.57%	\$107.15
NEXO	Speaker	RS18 Sub	day	\$150.00	28.57%	\$107.15
NSI	Dimming	(16x2.4kW)	day	\$80.00	28.57%	\$57.14
NSI	Dimming	(32x2.4kW)	day	\$150.00	28.57%	\$107.15
NSI	Dimming	(48x2.4kW)	day	\$250.00	28.57%	\$178.58
NSI	Dimming	(96x2.4kW)	day	\$325.00	28.57%	\$232.15
NSI	Dimming	6000 (4x1.2kW)	day	\$20.00	28.57%	\$14.29
NSI	Lighting Controller	1616 16-Channel MPX/DMX Lighting Console	day	\$15.00	28.57%	\$10.71
NSI	Lighting Controller	508 8-Channel MPX Lighting Console	day	\$15.00	28.57%	\$10.71
NSI	Lighting Controller	7008 8/16-Channel MPX Lighting Console	day	\$15.00	28.57%	\$10.71
NSI	Lighting Controller	7024 24/48-Channel MPX/DMX Lighting Console	day	\$25.00	28.57%	\$17.86
Numark	Mixing Console	1200 DJ Mixer	day	\$20.00	28.57%	\$14.29
Panasonic	Accessory	Studio Camera Accessory 10 Pin, 10 Meter Cable	day	\$50.00	28.57%	\$35.72

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Panasonic	Accessory	Studio Camera Accessory 10 Pin, 90 Meter Cable	day	\$100.00	28.57%	\$71.43
Panasonic	Accessory	Studio Camera Accessory Panasonic AG-EC4 CCU	day	\$200.00	28.57%	\$142.86
Panasonic	Studio Camera	AG-HMX370	day	\$400.00	28.57%	\$285.72
Panasonic	Studio Camera	HMC-150(16:9 HD) Camera (SD Card)	day	\$175.00	28.57%	\$125.00
Panasonic	Studio Camera	Studio Camera Panasonic AG-HMX370 Package Includes: Panasonic AG-HMX370 w/17x Lens Marshall V-LCD70XP-3GSDI Monitor w/ Noga CineArm Panasonic AG-EC4 CCU 10 Pin, 10 Meter Control Cable Varizoom VZ-PG-F Zoom Control Varizoom VZ-FC-F Focus Control IDX Systems IA-200a Dual Channel Power Supply Camera Tripod Plate	day	\$600.00	28.57%	\$428.58
Panasonic	Video	PTZ Camera	day	\$500.00	28.57%	\$357.15
Panasonic	Video	PTZ Controller	day	\$200.00	28.57%	\$142.86
Panasonic	Video Display	42" Plasma 16:9	day	\$250.00	28.57%	\$178.58
Panasonic	Video Display	58" Plasma 16:9	day	\$350.00	28.57%	\$250.01
Panasonic	Video Display	BS-901Y 8" CRT	day	\$20.00	28.57%	\$14.29
Panasonic	Video Switcher	AG-HMX-100	day	\$250.00	28.57%	\$178.58
Panasonic	Video Switcher	AG-MX70p	day	\$350.00	28.57%	\$250.01
Panasonic	Video Switcher	WJ-MX50	day	\$200.00	28.57%	\$142.86
Peavey	Power Amplifier	2600	day	\$25.00	28.57%	\$17.86
Peavey	Speaker	SP2	day	\$25.00	28.57%	\$17.86
Petes	Pre Rig Truss	8-Light Bar Lighting Fixture	day	\$10.00	28.57%	\$7.14
Phillips	Video Recorder	3475 DVD-R	day	\$35.00	28.57%	\$25.00
Pioneer	Audio Deck	DJ Coffin w/2-Turntable & Mixer	day	\$75.00	28.57%	\$53.57
Pioneer	Video Recorder	DVD-V7400	day	\$50.00	28.57%	\$35.72
Pioneer	Video Recorder	DVD-V8000	day	\$100.00	28.57%	\$71.43
QSC	Power Amplifier	PL 2.4MB	day	\$30.00	28.57%	\$21.43
QSC	Power Amplifier	PL224	day	\$30.00	28.57%	\$21.43
QSC	Power Amplifier	PL236	day	\$40.00	28.57%	\$28.57
QSC	Power Amplifier	PL380	day	\$100.00	28.57%	\$71.43
QSC	Speaker	I282-H	day	\$35.00	28.57%	\$25.00
QSC	Speaker	K12 Powered 2-Way	day	\$50.00	28.57%	\$35.72
QSC	Speaker	KW153 Powered 3 -Way	day	\$75.00	28.57%	\$53.57
QSC	Speaker	KW181 Powered Sub	day	\$60.00	28.57%	\$42.86
QSC	Speaker	QSC Wideline Large Flybar Module	day	\$125.00	28.57%	\$89.29
QSC	Speaker	Wideline ISIS WL2102	day	\$150.00	28.57%	\$107.15
QSC	Speaker	Wideline Small Flybar Module	day	\$100.00	28.57%	\$71.43
Ramlatch	Audio Snake	30-Channel 2-Way Split, 150'	day	\$60.00	28.57%	\$42.86

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Ramlatch	Audio Snake	32-Channel 3-Way Split, 250'	day	\$70.00	28.57%	\$50.00
Renkus Heinz	Speaker	TRX-82	day	\$35.00	28.57%	\$25.00
Robe	Lighting	Robin Pointe Moving Head LED Beam Fixture	day	\$225.00	28.57%	\$160.72
Roland	Processing	SDE 1000/SDE3000	day	\$30.00	28.57%	\$21.43
Roland	Scan Converter	VC-1 Up, Down, Cross Scan Converter	day	\$20.00	28.57%	\$14.29
Roland	Video	HDMI Video Switcher	day	\$75.00	28.57%	\$53.57
Roland	Video	SDI Video Switcher	day	\$75.00	28.57%	\$53.57
RoseBrand	Décor	10' Spandex Truss Sock	day	\$25.00	28.57%	\$17.86
RoseBrand	Décor	12'x20' Backdrop	day	\$50.00	28.57%	\$35.72
RoseBrand	Décor	13' to 16' Tall Pipe and Drape per linear foot	day	\$9.00	28.57%	\$6.43
RoseBrand	Décor	17' Spandex Sail	day	\$125.00	28.57%	\$89.29
RoseBrand	Décor	28'x35' Backdrop	day	\$75.00	28.57%	\$53.57
RoseBrand	Décor	28'x41' Backdrop	day	\$90.00	28.57%	\$64.29
RoseBrand	Décor	3' to 4' Tall Pipe and Drape per linear foot	day	\$3.00	28.57%	\$2.14
RoseBrand	Décor	40'x16' Cyclorama Backdrop	day	\$75.00	28.57%	\$53.57
RoseBrand	Décor	40'x24' Cyclorama Backdrop	day	\$125.00	28.57%	\$89.29
RoseBrand	Décor	5' to 8' Tall Pipe and Drape per linear foot	day	\$5.00	28.57%	\$3.57
RoseBrand	Décor	8' Spandex Circle	day	\$125.00	28.57%	\$89.29
RoseBrand	Décor	8' Spandex Sock	day	\$80.00	28.57%	\$57.14
RoseBrand	Décor	9' to 12' Tall Pipe and Drape per linear foot	day	\$7.00	28.57%	\$5.00
RoseBrand	Décor	Small Spandex Sail	day	\$50.00	28.57%	\$35.72
RoseBrand	Rigging	16" x 21' Truss Teaser	day	\$25.00	28.57%	\$17.86
RoseBrand	Rigging	30" x 21' Truss Teaser	day	\$25.00	28.57%	\$17.86
Sachtler	Tripod	Camera Tripod	day	\$125.00	28.57%	\$89.29
Sanyo	Projector	WXGA 720P HD Video/Data Projector 5000 ANSI Lumens	day	\$300.00	28.57%	\$214.29
Sanyo	Projector	XGA Video/Data Projector 10000 ANSI Lumens	day	\$600.00	28.57%	\$428.58
Sanyo	Projector	XGA Video/Data Projector 2000 ANSI Lumens	day	\$100.00	28.57%	\$71.43
Sanyo	Projector	XGA Video/Data Projector 3000 ANSI Lumens	day	\$150.00	28.57%	\$107.15
Sanyo	Projector	XGA Video/Data Projector 5000 ANSI Lumens	day	\$250.00	28.57%	\$178.58
Sennheiser	Microphone	MD421	day	\$30.00	28.57%	\$21.43
Sennheiser	Monitors	IEM 300-G2	day	\$75.00	28.57%	\$53.57
Sharp	Video Display	32" CRT	day	\$75.00	28.57%	\$53.57
Shure	Microphone	Beta 52	day	\$17.00	28.57%	\$12.14
Shure	Microphone	Beta 56A / 57A / 58A / BG4.1	day	\$15.00	28.57%	\$10.71
Shure	Microphone	Beta 91	day	\$22.00	28.57%	\$15.71
Shure	Microphone	Beta 98	day	\$20.00	28.57%	\$14.29
Shure	Microphone	KSM32	day	\$50.00	28.57%	\$35.72
Shure	Microphone	SM57/58	day	\$10.00	28.57%	\$7.14
Shure	Microphone	SM81, AKG C3000	day	\$30.00	28.57%	\$21.43
Shure	Microphone	WL 183/184/185	day	\$8.00	28.57%	\$5.71

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Shure	RF Microphones	Wireless Microphone System Shure UC / ULXP (UHF) Handheld or Lavalier Systems with Mic	day	\$50.00	28.57%	\$35.72
SLS	Speaker	LS8695	day	\$200.00	28.57%	\$142.86
Sony	AC/Battery	PVM-13L2 13" CRT (AC/Battery)	day	\$75.00	28.57%	\$53.57
Sony	AC/Battery	PVM-9L2 8" CRT (AC/Battery)	day	\$35.00	28.57%	\$25.00
Sony	Accessory	Studio Camera Accessory 26 Pin, 100 Meter Cable	day	\$80.00	28.57%	\$57.14
Sony	Accessory	Studio Camera Accessory 26 Pin, 50 Meter Cable	day	\$40.00	28.57%	\$28.57
Sony	Accessory	Studio Camera Accessory Sony CA-537	day	\$40.00	28.57%	\$28.57
Sony	Accessory	Studio Camera Accessory Sony CCU-M5	day	\$175.00	28.57%	\$125.00
Sony	Accessory	Studio Camera Accessory Sony DXF-50	day	\$25.00	28.57%	\$17.86
Sony	Audio Deck	CD-R	day	\$75.00	28.57%	\$53.57
Sony	Audio Deck	DAT Player/Recorder	day	\$50.00	28.57%	\$35.72
Sony	Audio Deck	Dual CD Player with Pitch Control	day	\$45.00	28.57%	\$32.14
Sony	Audio Deck	Single CD Player with Pitch Control	day	\$25.00	28.57%	\$17.86
Sony	Audio Deck	Tape Deck Dual	day	\$20.00	28.57%	\$14.29
Sony	Audio Deck	Tape Deck Standard	day	\$15.00	28.57%	\$10.71
Sony	Scan Converter	1024HD	day	\$150.00	28.57%	\$107.15
Sony	Studio Camera	DXC-D30	day	\$350.00	28.57%	\$250.01
Sony	Video Recorder	DSR-1500A DVCAM	day	\$350.00	28.57%	\$250.01
Sony	Video Recorder	VHS VCR	day	\$20.00	28.57%	\$14.29
Sony, Canon	Studio Camera	Studio Camera Sony DXC-D30 ENG Package Includes: Sony DXC-D30 w/18x Lens Sony DXF-50 Sony CA-537 Sony CCU-M5 26 Pin, 50 Meter Cable Canon Remote Zoom Control Canon Remote Focus Control Camera Tripod Plate	day	\$525.00	28.57%	\$375.01
StageSound	Monitors	RAW215	day	\$40.00	28.57%	\$28.57
TC Electronics	Processing	M5000/2290	day	\$50.00	28.57%	\$35.72
Technics	Audio Deck	SL-1200 Turntable	day	\$25.00	28.57%	\$17.86
Thomas	Lighting	Eight Light Crowd Blinder Lighting Fixture	day	\$30.00	28.57%	\$21.43
Thomas	Lighting	Par 64/56 Aluminum Lighting Fixture	day	\$12.00	28.57%	\$8.57
Thomas	Truss	30" Box (10 ft.) Truss Section	day	\$50.00	28.57%	\$35.72
Times Square	Spotlight	Follow Spot	day	\$25.00	28.57%	\$17.86
Ultimate	Rigging	Ultimate Support Stand	day	\$2.00	28.57%	\$1.43
Various	Direct Boxes	Active Direct Boxes	day	\$15.00	28.57%	\$10.71
Various	Direct Boxes	Passive Direct Boxes	day	\$7.50	28.57%	\$5.36

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Various	Lighting	Tripod Lighting System 4 Can Lighting System (w/Dimming) controller included with rental of 2 or more	day	\$35.00	28.57%	\$25.00
Various	Mic Stands	Microphone Stand	day	\$2.00	28.57%	\$1.43
Various	Mic Stands	Microphone Stand Choir Boom	day	\$10.00	28.57%	\$7.14
Various	Rigging	1/2" or 5/8" Shackle	day	\$1.00	28.57%	\$0.71
Various	Rigging	3/8" Wire Rope: (1' to 30')	day	\$2.00	28.57%	\$1.43
Various	Rigging	Block & Fall (45' lift)	day	\$25.00	28.57%	\$17.86
Various	Rigging	Ratchet Strap	day	\$5.00	28.57%	\$3.57
Various	Rigging	Round Slings (3' to 12')	day	\$2.00	28.57%	\$1.43
Various	Rigging	Wire Rope Ladder	day	\$30.00	28.57%	\$21.43
Vestax	Mixing Console	05/275 DJ Mixer	day	\$30.00	28.57%	\$21.43
Vizio	Video Display	32" LCD 16:9	day	\$100.00	28.57%	\$71.43
Wenger	Staging	Stair Set for Stage	day	\$50.00	28.57%	\$35.72
Wenger	Staging	Wenger Showmaster Stage 4'x8 per deck Height: 30" - 84" Adjustable Stage	day	\$45.00	28.57%	\$32.14
Wenger	Staging	Wenger Versalite Stage 4'x8' per deck Height: 12", 18", 24" - 42" Adjustable Stage	day	\$45.00	28.57%	\$32.14
Whirlwind	Audio Snake	20-Channel Multicore Drive, 250'	day	\$100.00	28.57%	\$71.43
Whirlwind	Audio Snake	48-Channel 3-Way ISO Split, 300'	day	\$200.00	28.57%	\$142.86
Whirlwind	Audio Snake	48-Channel 4-Way ISO Split, 300'	day	\$225.00	28.57%	\$160.72
Whirlwind	Audio Snake	8-Channel Drive Snake, 250'	day	\$50.00	28.57%	\$35.72
Whirlwind	Pressbox	12-Channel Active Multi Box	day	\$60.00	28.57%	\$42.86
Whirlwind	Pressbox	12-Channel Passive Press Box	day	\$50.00	28.57%	\$35.72
Whirlwind	Pressbox	16-Channel Active Press Box	day	\$75.00	28.57%	\$53.57
Yamaha	Digital Snake	RIO 1608 Digital Snake 16x8	day	\$160.00	28.57%	\$114.29
Yamaha	Digital Snake	RIO 3224 Digital Snake 32x24	day	\$300.00	28.57%	\$214.29
Yamaha	Mixing Console	12-Channel Powered Mixhead	day	\$45.00	28.57%	\$32.14
Yamaha	Mixing Console	6-Channel Powered Mixhead	day	\$30.00	28.57%	\$21.43
Yamaha	Mixing Console	8-Channel Powered Mixhead	day	\$40.00	28.57%	\$28.57
Yamaha	Mixing Console	CL5	day	\$500.00	28.57%	\$357.15
Yamaha	Mixing Console	M7CL-48 ES	day	\$350.00	28.57%	\$250.01
Yamaha	Mixing Console	PM3500, 48x8x2	day	\$450.00	28.57%	\$321.44
Yamaha	Mixing Console	PM3500M, 52x18	day	\$550.00	28.57%	\$392.87
Yamaha	Mixing Console	PM5D-RH	day	\$600.00	28.57%	\$428.58

JMU Solicitation SCK-1065 Stage Sound Rental Rates

Yamaha	Mixing Console	QL5	day	\$300.00	28.57%	\$214.29
Yamaha	Monitors	CM10	day	\$15.00	28.57%	\$10.71
Yamaha	Monitors	CM15	day	\$25.00	28.57%	\$17.86
Yamaha	Power Amplifier	P7000	day	\$30.00	28.57%	\$21.43
Yamaha	Power Amplifier	PC9501N	day	\$30.00	28.57%	\$21.43
Yamaha	Processing	ProR3/REV 5	day	\$50.00	28.57%	\$35.72
Yamaha	Processing	REV 7/SPX 90/SPX 90-II	day	\$25.00	28.57%	\$17.86
Yamaha	Processing	SPX 990/SPX1000	day	\$35.00	28.57%	\$25.00
	Atmospheric	DF50 Hazer Fog Machine	day	\$75.00	28.57%	\$53.57
	Rigging	Chain Fall (45' Lift)	day	\$25.00	28.57%	\$17.86

The following are package systems that span a variety of Event Needs and Scopes, the package prices do not					
Category/Service	Type	Unit	Rate	Discount from List	
<b>Camera and Switcher System 1:</b> Composite/Component/VGA System with switching, routing, video playback & record, multi-station intercom system, cabling, and one 2/3" professional camera with professional tripod.	Video Capture	day	\$2,070.69	28.57%	\$ 1,479.09
<b>Camera and Switcher System 2:</b> Composite/Component/VGA System with switching, routing, video playback & record, multi-station intercom system, cabling, and two 2/3" professional cameras with professional tripods	Video Capture	day	\$3,230.81	28.57%	\$ 2,307.77

JMU Solicitation SCK-1065 Stage Sound Rental Rates

<p><b>Camera and Switcher System 3:</b> Composite/Component/VGA System with switching, routing, video playback &amp; record, multi-station intercom system, cabling, and three 2/3" professional cameras with professional tripods</p>	<p>Video Capture</p>	<p>day</p>	<p>\$4,883.31</p>	<p>28.57%</p>	<p>\$ 3,488.15</p>
<p><b>Projection and Screen System 1:</b> Two ground supported 2,000 lumen LCD projectors and two ground supported 6'X8' fast fold screens with front and rear projection surfaces.</p>	<p>Video playback and recording with Imag.</p>	<p>day</p>	<p>\$1,308.51</p>	<p>28.57%</p>	<p>\$ 934.67</p>
<p><b>Projection and Screen System 2:</b> Two ground supported 5,000 lumen LCD projectors, two ground supported 9'X12' truss style screens with front or rear projection surfaces, and two 42" Plasma monitors.</p>	<p>Video playback and recording with Imag.</p>	<p>day</p>	<p>\$2,104.41</p>	<p>28.57%</p>	<p>\$ 1,503.18</p>
<p><b>Projection and Screen System 3:</b> Two flown 10,000 lumen LCD projectors and two flown 15'X20' truss style screens with front or rear projection surfaces, two 58" Plasma monitors, and four 42" Plasma monitors.</p>	<p>Video playback and recording with Imag.</p>	<p>day</p>	<p>\$8,626.74</p>	<p>28.57%</p>	<p>\$ 6,162.08</p>

JMU Solicitation SCK-1065 Stage Sound Rental Rates

<p><b>Stage System 1:</b> One 32' x 16' stage with black skirting, handrail, and two stair sets. Available in various heights from 1'-0" to 3'-6".</p>	<p>Staging</p>	<p>day</p>	<p>\$1,807.64</p>	<p>28.57%</p>	<p>\$ 1,291.19</p>
<p><b>Stage System 2:</b> One 48' x 40' stage with black skirting, handrail, one 16' aluminum loading ramp, and two stair sets. Available in various heights from 2'-6" to 7'-0".</p>	<p>Staging</p>	<p>day</p>	<p>\$4,775.39</p>	<p>28.57%</p>	<p>\$ 3,411.06</p>
<p><b>Corporate/Special Event Lighting System 1:</b> Up to 80' of 1' box truss ground supported or flown with twenty ETC Source 4 leko units, eight conventional wash fixtures, twenty-four channels of dimming, twenty-four channel lighting console, and appropriate cabling.</p>	<p>Lighting</p>	<p>day</p>	<p>\$2,036.96</p>	<p>28.57%</p>	<p>\$ 1,455.00</p>
<p><b>Corporate/Special Event Lighting System 2:</b> Up to 160' of 1' box truss ground supported or flown with forty ETC Source 4 leko units, sixteen conventional wash fixtures, forty-eight channels of dimming, forty-eight channel lighting console, and appropriate cabling.</p>	<p>Lighting</p>	<p>day</p>	<p>\$4,208.82</p>	<p>28.57%</p>	<p>\$ 3,006.36</p>

JMU Solicitation SCK-1065 Stage Sound Rental Rates

<p><b>Concert Lighting System 1:</b> Sixty 1000W Par 64 on two ground supported or flown box trusses, 41' x 28' Backdrop, thirty-two channels of dimming, twenty-four channel lighting console, and appropriate cabling.</p>	<p>Concert lighting</p>	<p>day</p>	<p>\$2,300.01</p>	<p>28.57%</p>	<p>\$ 1,642.90</p>
<p><b>Concert Lighting System 2:</b> Ninety 1000W Par 64 on two ground supported or flown box trusses, four ACL bars, eight downstage ETC Source 4 lekos, two 8-lite Crowd Blinders, 41' x 28' Backdrop, forty-eight channels of dimming, forty-eight channel lighting console, one hazer unit, and appropriate cabling.</p>	<p>Concert lighting</p>	<p>day</p>	<p>\$3,434.51</p>	<p>28.57%</p>	<p>\$ 2,453.27</p>
<p><b>Concert Lighting System 3:</b> One hundred twenty 1000W Par 64 on two ground supported or flown box trusses, four ACL bars, eight downstage ETC Source 4 lekos, four 8-lite Crowd Blinders, 41' x 28' Backdrop, ninety-six channels of dimming, ninety-six channel lighting console, two hazer units, one fog unit, and appropriate cabling.</p>	<p>Concert lighting</p>	<p>day</p>	<p>\$4,169.70</p>	<p>28.57%</p>	<p>\$ 2,978.42</p>

JMU Solicitation SCK-1065 Stage Sound Rental Rates

<p><b>Audio System 1:</b> Ground supported SLS Line Array with 4 double-18" subs, thirty-two channel analog FOH console, four passive monitor mixes on eight wedges, wired mic package, 32-channel snake, and appropriate cabling.</p>	<p>Event and Concert Audio</p>	<p>day</p>	<p>\$1,348.98</p>	<p>28.57%</p>	<p>\$ 963.58</p>
<p><b>Audio System 2:</b> Ground supported or flown sixteen box QSC Line Array with 4 quad-18" subs, forty-channel analog FOH console, forty-channel analog monitor console, eight passive monitor mixes on eight wedges (including cue wedge), wired mic package, three-way-forty-eight-channel isolated splitter snake, and appropriate cabling.</p>	<p>Event and Concert Audio</p>	<p>day</p>	<p>\$2,832.86</p>	<p>28.57%</p>	<p>\$ 2,023.51</p>
<p><b>Audio System 3:</b> Flown thirty-two box QSC Line Array with 6 quad-18" subs, forty-eight-channel analog FOH console, forty-eight-channel analog monitor console, twelve bi-amplified monitor mixes on twelve wedges (including cue wedge), wired mic package, three-way-forty-eight-channel isolated splitter snake, and appropriate cabling.</p>	<p>Event and Concert Audio</p>	<p>day</p>	<p>\$3,507.35</p>	<p>28.57%</p>	<p>\$ 2,505.30</p>

JMU Solicitation SCK-1065 Stage Sound Rental Rates

<p><b>Audio System 4:</b> Flown twenty-two box Nexo Line Array with 6 dual-18" subs, forty-eight-channel analog FOH console, forty-eight-channel analog monitor console, twelve bi-amplified monitor mixes on twelve wedges (including cue wedge), wired mic package, two-way-forty-eight-channel isolated splitter snake, and appropriate cabling.</p>	<p>Event and Concert Audio</p>	<p>day</p>	<p>\$4,620.26</p>	<p>28.57%</p>	<p>\$ 3,300.25</p>
<p><b>Audio System 5:</b> Flown twenty-box EAW 760 line array with 12 double-18" subs, forty-eight-channel analog FOH console, forty-eight-channel analog monitor console, twelve bi-amplified monitor mixes on twelve wedges (including cue wedge), EV MTL-4 drum sub, two four-way sidefills, wired mic package, four-way forty-eight-channel isolated splitter snake, and appropriate cabling.</p>	<p>Event and Concert Audio</p>	<p>day</p>	<p>\$4,620.26</p>	<p>28.57%</p>	<p>\$ 3,300.25</p>

<p><b>Technical Services Labor Charges</b></p>			
<p><b>Technical Director</b></p>		<p>Per Hour</p>	<p>\$90.00/HR</p>
<p><b>Audio A1 - Lead/Operator/Designer</b></p>	<p>Audio Engineer</p>	<p>Per Hour</p>	<p>\$75.00/HR</p>

**JMU Solicitation SCK-1065 Stage Sound Rental Rates**

<b>Audio A2 - System Tech/Operator</b>	Audio Engineer	Per Hour	\$60.00/HR
<b>Lighting L1 - Lead/Operator/Designer</b>	Lighting Designer	Per Hour	\$75.00/HR
<b>Lighting L2 - System Tech/Operator</b>	Lighting Technician	Per Hour	\$60.00/HR
<b>Video V1 - Lead/Operator/Designer</b>	Video Designer	Per Hour	\$75.00/HR
<b>Video V2 -System Tech/Operator</b>	Video Technician	Per Hour	\$60.00/HR
<b>Rigger R1 - Lead/Operator/Designer</b>	Head Rigger	Per Hour	\$75.00/HR
<b>Rigging R2 - System Tech/Operator</b>	Rigging Technician	Per Hour	\$60.00/HR
<b>Camera Operator</b>	Camera Operator	Per Hour	\$65.00/HR

The rental rates are full price for the first day and 1/2 the original price for each additional day. Half day prices are not available. A week price is based on Package Systems pricing does not include Technical Services Labor Charges. Minimum billing \$500.00.

Stage Sound Pricing JMU Solicitation SCK-1065, 2020 Revision

	A	B	C	D	E	F	G	H	I	J
1			Broadcast TV Equipment	Multimedia Presentation	Multimedia Dev. Equipment	Satellite Trans. Receiving Equipment	Teleconferencing Comm. Equipment	Computer Presentation	Broadband Dist. Equipment	Multimedia Furniture
2	Brand	Contract Discount								
3	Ace Backstage	25.00%		X			X	X		
4	Acoustics First	5.00%	X	X	X			X		
5	AJA	2.00%	X	X	X		X	X		
6	AKG	30.00%	X	X	X		X	X		
7	Allen & Heath QU	25.00%	x	x	x		x	x		
8	Allen & Heath SQ	25.00%	x	x	x		x	x		
9	Allen & Heath GR	25.00%	x	x	x		x	x		
10	Allen & Heath ZED	28.00%	x	x	x		x	x		
11	Allen & Heath Broadcast	28.00%	x	x	x		x	x		
12	Allen & Heath ME	25.00%	x	x	x		x	x		
13	Allen & Heath Mix Wizard	25.00%	x	x	x		x	x		
14	Allen & Heath GL2400	25.00%	x	x	x		x	x		
15	Allen & Heath CAT5 Reels	20.00%	x	x	x		x	x		
16	Allen & Heath D-Live S	20.00%	x	x	x		x	x		
17	Allen & Heath D-Live C	18.00%	x	x	x		x	x		
18	Allen & Heath Flight Cases	15.00%	x	x	x		x	x		
19	Allen & Heath GLD CARDS	15.00%	x	x	x		x	x		
20	Allen & Heath Accessories	15.00%	x	x	x		x	x		
21	Altman	20.00%	X	X				X		
22	American DJ	12.00%	X	X	X			X		
23	American Technical Furniture	40.00%								X
24	Analog Way	10.00%	X	X	X		X	X		
25	Anchor Audio	15.00%		X				X		
26	Ashly	20.00%		X			X	X		
27	Atlas	20.00%	X	X	X		X	X		
28	Atlona	27.00%	X	X	X		X	X	X	
29	Attero Tech	25.00%	X	X	X		X	X		
30	Audio Technica	20.00%	X	X	X		X	X		
31	Audix	30.00%	X	X	X		X	X		
32	Auralex Acoustics	10.00%	X	X	X			X		
33	Aurora Multimedia	27.00%	X	X	X		X	X	X	
34	AVFI	33.00%		X			X	X		X
35	Aviom	25.00%		X				X		
36	Avolites	10.00%	X	X				X		
37	Behringer	40.00%	X	X	X			X		
38	Beyerdynamic	15.00%	X	X	X		X	X		

Stage Sound Pricing JMU Solicitation SCK-1065, 2020 Revision

	A	B	C	D	E	F	G	H	I	J
39	Biamp Nexia	30.00%		X			X	X		
40	Biamp TesiraFORTE	30.00%		X			X	X		
41	Black Magic	2.00%	X	X	X		X	X		
42	Bose Professional	25.00%		X			X	X		
43	Bose Portable L1/F/S1	10.00%		X	X		X	X		
44	Brightsign	4.00%		X				X		
45	BSS Professional	25.00%	X	X	X		X	X		
46	Cables to Go	117.00%	X	X	X		X	X		
47	CBI	10.00%	X	X	X		X	X		
48	Chauvet Lighting (All)	25.00%	X	X				X		
49	Chief (Mounts)	27.00%	X	X	X		X	X		
50	Chief (Racks)	39.00%	X	X	X		X	X		X
51	Clearsonic	10.00%	X	X	X		X			
52	Community Pro	25.00%		X			X	X		
53	Countryman	28.00%	X	X	X		X	X		
54	Crestron	35.00%	X	X			X	X	X	
55	Crown Power Amps	30.00%	X	X	X		X	X		
56	Crown Xti & Comercial Series	10.00%								
57	Da-Lite	22.00%		X			X	X		
58	Danley	20.00%		X						
59	DBX	20.00%	X	X	X		X	X		
60	Denon Pro	10.00%	X	X	X		X	X		
61	DPA	5.00%	X	X	X		X	X		
62	Draper	24.00%		X			X	X		
63	EAW	10.00%		X			X	X		
64	Elation	20.00%	X	X				X		
65	Elitecore Cables	20.00%	X	X	X		X	X		
66	Eminence	30.00%		X			X	X		
67	ETC	15.00%	X	X	X		X	X		
68	ETC 4WRD	15.00%	X	X	X		X	X		
69	EV Pro	15.00%		X			X	X		
70	Exact Furniture	33.00%		X			X	X		X
71	Extron	35.00%	X	X	X			X		
72	Focusrite	25.00%	X	X	X		X	X		X
73	FSR	20.00%	X	X	X		X	X		
74	Fulcrum Acoustic	27.00%		X				X		
75	Furman	25.00%	X	X	X		X	X		
76	Galaxy Audio	35.00%		X				X		
77	Gator	35.00%		X				X		
78	Genelec	15.00%	X	X	X		X	X		
79	Genelec Accessories	8.00%	X	X	X		X	X		

Stage Sound Pricing JMU Solicitation SCK-1065, 2020 Revision

	A	B	C	D	E	F	G	H	I	J
80	Global Truss	10.00%	X	X				X		
81	Goo Systems	14.00%		X			X	X		
82	Maxell Projectors	30.00%		X			X	X		
83	Hosa	30.00%	X	X	X		X	X		
84	HSA Rolltops	10.00%		X			X	X		X
85	InFocus	2.00%		X			X	X		
86	JBL Professional	27.00%	X	X	X		X	X		
87	K&M	15.00%	X	X	X			X		
88	KanexPro	27.00%	X	X	X		X	X	X	
89	Kramer	33.00%	X	X	X		X	X	X	
90	Lab Gruppen	35.00%	X	X	X		X	X		
91	Lake	35.00%								
92	Leviton Entertainment Products	15.00%		X				X		
93	Lewitt	30.00%	X	X	X		X	X		
94	Lex Products	10.00%	X	X	X			X	X	
95	Lexicon	26.00%		X				X		
96	LG Commercial Displays	5.00%	X	X	X		X	X		
97	Liberty AV	24.00%		X			X	X	X	
98	Lightronics	10.00%	X	X				X		
99	Listen	20.00%	X	X	X		X	X		
100	Littlelite	25.00%	X	X	X			X		
101	Livemix	25.00%	X	X	X		X	X		
102	Lowell Manufacturing	35.00%	X	X	X		X	X		X
103	LumaStream	20.00%	X	X	X			X		
104	MA Lighting	15.00%	X	X	X		X	X		
105	Mackie	15.00%		X				X		
106	Manhasset Stands	10.00%	X	X	X			X		
107	Marshall Electronics	10.00%	X	X	X		X	X		
108	Martin Audio	25.00%	X	X				X		
109	Martin Lighting	20.00%		X				X		
110	Midas	25.00%	X	X	X			X		
111	Middle Atlantic	30.00%	X	X	X		X	X		X
112	Nexo Speakers/Power Amps	20.00%								
	Nexo									
113	Flyware/Accessories/Cabling	15.00%	X	X	X		X	X		X
114	Nord	20.00%		X	X					X
115	OSP Cases	30.00%	X	X	X		X	X		X
116	Panasonic Projector Accessories	3.00%	X	X	X		X	X		
117	Panasonic Pro Displays/PTZ	6.00%	X	X	X		X	X		

Stage Sound Pricing JMU Solicitation SCK-1065, 2020 Revision

	A	B	C	D	E	F	G	H	I	J
118	Panasonic Fix Install/Large Venue Projectors	25.00%	X	X	X		X	X		
119	Peavey	20.00%		X				X		
120	Planar Commercial Displays	8.00%	X	X	X		X	X		
121	Poly Service Contracts/Video Conferencing Accessories	3.00%	X	x			X	X		
122	Poly Realpresence Desktop Software	6.00%	X	X			X	X		
123	Poly G7500, RealPresence, HDX Series Codex	15.00%	X	X			X	X		
124	Premier Mounts	10.00%	X	X	X		X	X		
125	Presonus	25.00%		X				X		
126	Prime Acoustics	10.00%	X	X	X		X	X		
127	Pro Intercom	20.00%	X	X	X		X	X		
128	QSC	20.00%		X			X	X		
129	QSC Q-SYS	18.00%		X			X	X		
130	Rane	15.00%	X	X	X		X	X		
131	RCF	20.00%		X				X		
132	Renkus-Heinz	24.00%		X				X		
133	Roland A/V Accessoires	10.00%	X	X	X		X	X		
134	Roland Pro A/V	10.00%	X	X	X		X	X		
135	Roland MI Electronics	20.00%	X	X	X			X		
136	Rolls	20.00%		X				X		
137	Samsung Commercial Displays	15.00%	X	X	X		X	X		
138	Sennheiser	24.00%	X	X	X		X	X		
139	Sharp Commercial Displays	15.00%	X	X	X		X	X		
140	Shure	26.00%	X	X	X		X	X		
141	Shure Accesories	10.00%	X	X	X		X	X		
142	Shure MXA	10.00%	X	X	X		X	X		
143	SKB	25.00%		X				X		
144	Soundcraft	21.00%	X	X	X			X		
145	Strong Racks & Mounts	30.00%	X	X	X		X	X		
146	Symetrix	20.00%		X			X	X		
147	Tascam	17.00%	X	X	X		X	X		
148	Turbosound	30.00%		X				X		
149	Vaddio	10.00%		X			X	X		
150	Westone	20.00%	X	X	X			X		
151	WePresent	10.00%	X	X			X	X		
152	Whirlwind	15.00%	X	X	X		X	X		
153	Williams Sound	25.00%		X			X	X		

Stage Sound Pricing JMU Solicitation SCK-1065, 2020 Revision

	A	B	C	D	E	F	G	H	I	J
154	Yamaha Pro Digital Consoles CL/QL/TF Accessories and Peripherals	20.00%	X	X	X		X	X		
155	Yamaha Cascading Cable SS30/Rack Kits/CS700 Video Collaboration Systems	5.00%	X	X	X		X	X		
156	Yamaha Pro Analog Mixers/ Loudspeakers/Power Amps/Processing	25.00%	X	X	X		X	X		
157	Yamaha Rivage	5.00%	X	X	X		X	X		
158	Audio and Lighting Products Not Listed	10.00%	X	X	X	X	X	X	X	X
159	Video Products Not Listed	5.00%	X	X	X	X	X	X	X	X
160	Design Engineer	\$90/Hr								
161	Project Manager	\$90/Hr								
162	Programmer	\$100/Hr								
163	Trainer	\$100/Hr								
164	Installation tech	\$76/Hr								
165	After hours service	\$114/Hr								
166	After Warranty Service	\$90/Hr								
167	Service Tech	\$76/Hr								
168	Consulting	\$120/Hr								

**REQUEST FOR PROPOSAL**  
**RFP# SCK-1065**

**Issue Date:** October 18, 2019  
**Title:** Atlantic Union Bank Center – Audio Systems Package  
**Issuing Agency:** Commonwealth of Virginia  
James Madison University  
Procurement Services MSC 5720  
752 Ott Street, Wine Price Building  
First Floor, Suite 1023  
Harrisonburg, VA 22807

**Period of Contract: From Date of Award Through Two (2) Years with the option to renew for eight (8) additional one year periods**

**Sealed Proposals Will Be Received Until 2:00 PM on November 15, 2019 for Furnishing The Services Described Herein.**

*SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.*

All Inquiries For Information And Clarification Should Be Directed To: Savana Koteita, Buyer Specialist, Procurement Services, [koteitsc@jmu.edu](mailto:koteitsc@jmu.edu); 540-568-4280; (Fax) 540-568-7935 not later than **November 15, 2019**.

**NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.**

In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

Stage Sound, Inc  
2240 Shenandoah Ave NW  
Roanoke Va 24017

By:   
(Signature in Ink)

Name: Reid C. Henion  
(Please Print)

Date: 11.19.2019

Title: President

Web Address: www.stagesound.com

Phone: 540.342.2040

Email: installation@stagesound.com

Fax #: 540.345.5158

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1  #2  #3  #4  #5  (please initial)

**CONTRACTOR/SUBCONTRACTOR LICENSE REQUIREMENT:** By my signature on this solicitation, I certify that this firm/individual and subcontractor is properly licensed for providing the goods/services specified. License # 2701038911 Type Class A

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

YES;  NO; *IF YES* ⇒  SMALL;  WOMAN;  MINORITY **IF MINORITY:**  AA;  HA;  AsA;  NW;  Micro

**Note: This public body does not discriminate against faith-based organizations in accordance with the Code of Virginia, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.**



## PLAN AND METHODOLOGY

### OVERVIEW

Stage Sound takes great pride in the overall performance of all of the systems that we provide and install. And since our systems are usually installed in auditoria and other large meeting spaces, our concept of "performance" is usually divided into three areas:

- **Visual performance:** Is the installation visually appealing to the user and all of their guests that enter and use the particular auditorium or room? Is all of the inherent infrastructure of the system (wiring, support hardware, etc.) hidden or modified to be as aesthetically pleasing as possible?
- **Functional performance:** Does the system meet the requirements of the user and designer? Do all of the necessary functions work properly and are all of the controls designed or laid out in a logical and easily understandable manner?
- **Ideal performance:** Does the sound quality of an audio system exceed the user's expectations? This is where our experience and understanding of how large scale audio-video systems work and should sound and look in larger auditoria and other similar venues comes into play.

### METHODOLOGY

When we begin any project for a customer, we place great value in understanding or learning the following criteria:

- **Know your users:** To us, a system specification is not just a list of equipment and a document showing how it should be connected. We place a special emphasis on speaking with the actual users of the equipment to understand what their needs and expectations are so that we can ensure that the system will actually meet these expectations before we begin the actual installation.
- **Know your equipment:** We attend every major industry trade show so that we are always aware of the latest technologies and methods to help our clients reach their goals with any new system implementation. We are continuously training ourselves and seeking outside training expertise to have a solid understanding of all of the digital and computer controlled technologies that affect our industry.
- **Understand and use the proper testing and measurement equipment:** We hold certifications from EASE (Enhanced Acoustic Simulator for Engineers) design software and Smaart acoustical measurement software. Because we use this test equipment regularly during the course of our event production business and while commissioning many hundreds of these systems in the past for our clients, we know and understand the relationship between what the measurements are telling us and how the human ear and eyes perceive everything.
- **Adhere to industry standards:** All of our installers and technicians are trained to Infocomm standards as far as terminating and properly installing the equipment. We



create detailed AutoCAD drawings and specifications for every major job we work on, and our installers are taught to follow these drawings closely.

- Installation checklist and in-progress testing: We follow a checklist procedure that we have developed over many years of use so that each subsystem is installed properly and tested before proceeding to the next phase of the installation. Our installers have direct contact with our engineering staff when needed to answer performance questions while they are working in the field.
- Final commissioning by a senior member of our team: All major systems are commissioned by one of our top designers or engineers to assure the best possible performance of the completed system. These engineers (usually the President, one of the Vice Presidents, or our Senior Software Programmer) are the ones that are making and saving all final performance measurement data and are programming all software-based digital control equipment to ensure that the final product meets or exceeds all design parameters.
- Training: Final training of the users of the system is always performed by one of our senior trainers. These product and system trainers are usually the ones that know the most about each particular system we install and are well-informed so that any user questions are answered promptly and correctly.
- Documentation: We provide printed or electronic copies of all system user manuals and as-built system diagrams for the end users of each system. All major control equipment is labeled as to their use so that the end users can more easily remember how to best use the system.

## EXPERIENCE

We can service the entire Commonwealth, as we have been for 32 years. We intend to do this without subcontractors or alliances, since we already have a deep bench of qualified installers, designers, trainers, repair technicians, and a network of Quick-Response Field Service Technicians located in key areas across the state.

We believe that we have become Virginia's primary source for complex audio and video systems in larger meeting and performance facilities. We have an unparalleled understanding of such systems, from design and installation, through end-user training.



## **WRITTEN NARRATIVE STATEMENT**

### **A BRIEF HISTORY**

Stage Sound was founded in 1979 and incorporated in 1981 as a Virginia C corporation. Originally, the company built, sold, rented, and serviced professional audio gear. In 1985, the company was nearly wiped out by "The great flood of 85", which rolled through the Roanoke valley causing unprecedented damage to businesses in the downtown area. In the wake of this event, two of the founding partners in Stage Sound, decided to pursue other ventures. All outstanding shares of stock were purchased by Reid Henion, the third principal of the corporation. The business took advantage of a Federal Flood Disaster Loan through the Small Business Administration and began to rebuild. In 1986, Mr. Henion purchased a new building (on higher ground), to house the new business. With just a handful of employees and some muddy gear, Stage Sound was reborn.

Over the next decade, Stage Sound grew in size and also in the range of products and services we could offer our growing customer base. We started selling more gear to churches and theaters and added projection equipment and stage lighting to our list of offerings. In 1993, we expanded into a second location and began to see a shift in our core business from retail sales and services, to design and installation. We paid off our loans, hired more designers and installers and began concentrating on institutional A/V business. Our largest single customer group became houses of worship, with regional colleges and universities being a close second.

In 2006, Mr Henion purchased an 80,000 sf warehouse in downtown Roanoke and started the process of rebuilding the structure to meet the needs of the growing business. By 2009, all operations had been shifted to this modern new facility.

Today, Stage Sound has 37 employees, a wonderful new facility, a long list of suppliers and loyal customers, and is poised to grow even stronger.

### **OUR CORE BUSINESS, THEN AND NOW**

In the 80's, our firm built its reputation as a supplier of professional audio services, specifically sound reinforcement of concerts, festivals, and corporate events. Although we have grown in different directions in the 30 plus years since then, we are still heavily involved in this part of the industry and more importantly, we have found that our extensive experience in live event A/V production work has made us much more effective as designers, installers and integrators, especially in larger meeting and performance spaces. Several senior members of our staff have personally operated complex audio, video or lighting gear for well over 2000 live events each! Many of us have worked for years doing serious, high-profile work for U.S. Presidents, foreign heads of state, A-list performers, and major institutional events with attendance in the tens of thousands. This fact makes us unique in Virginia in our depth of understanding of live production systems, and is often the reason our customers give for why they hired us to design, install, or service systems for them.



Today, our business consists mostly of design/build solutions for Universities, Institutions, and larger Houses of Worship. We also do a good bit of bid work through eVA and by bidding directly to general contractors and electrical contractors. We hold a VASCUPP state contract.

## **EXPERIENCE**

We have hundreds of systems in service in meeting, performance, sporting and teaching facilities across the state, including systems at Virginia Tech, Radford University, University of VA, W&L University, VMI, New River Community College, Longwood University, Salem Police Academy, Northern VA Community College, Lord Fairfax Community College, Old Dominion University, dozens of Virginia high schools and middle schools, Roanoke Performing Arts Theater, Roanoke Special Event Center, The Roanoke Higher Education Center, Roanoke College, The Jefferson Center, The Jefferson Theater, The Paramount Theater, The Barter Theater, and literally hundreds of houses of worship both big and small.

### **Specialized Areas of Expertise:**

- Implementation of complex audio control systems using digital mixing platforms by Yamaha, Allen & Heath, Midas, and Roland, among others.
- Implementation of digital audio routing and control using Dante, Q-SYS, and AVB platforms, among others.
- Optimal deployment of Line Array speaker systems by many manufacturers. With hundreds of deployments behind us, we know things that the predictive and aiming software doesn't always show.
- EASE analysis and predictive acoustic modeling.
- Remedial acoustic treatment to improve intelligibility and/or achieve specific goals for a desired sonic signature.
- Training in the operation of Digital audio mixing consoles.
- Integration schemes to control stage and architectural lighting along with video, and audio systems.
- Digital video signal routing, switching, distribution, and projection.
- Conference rooms with highly integrated control via Extron and Crestron.
- In-house repair of large-format analog and digital mixing consoles.
- Theatrical stage lighting, including intelligent lights and A/V/L integration.



## **ORGANIZATION AND STRUCTURE**

Stage Sound has three divisions:

- Sales Division, which also includes in-house (depot) electronic repair service
- Equipment Rental and Event Services Division
- Design and Installation Division, which also includes Rapid-Response Regional Field Service

Upper management is shared, as are front-office operations like shipping and receiving, Human Resources, Accounts Payable, Accounts Receivable, Information Technologies, and Marketing.

## **LOCATIONS**

As mentioned Previously, Stage Sound works out of a single main location in Roanoke VA. The facility is a newly rebuilt 80,000 sf complex, featuring 18 loading bays, 3 conference rooms, a retail showroom, multiple clean rooms for system staging and wiring, electronic repair bench stations, offices, stockrooms, and lots of warehouse space.

Our Rapid-Response Field Service Technicians work out of offices in their homes in Lexington, Blacksburg, and Petersburg. They provide troubleshooting and “triage” quickly, and allow us to keep up our customer service standards over a wide area.



## **FUTURE, LONG TERM VISION AND STRATEGIC PLANS**

Keeping up with emerging technologies has always been part of our identity, reputation, and our passion. Our designers attend trade shows religiously, and subscribe to all the leading trade magazines. Our installers and product specialists take classes from Avixa/Infocomm, LDI, and other such organizations. We encourage and pay for our employees to take formal continuing education courses in many subjects from welding to AutoCAD. We attend nearly every seminar offered by our suppliers, including workshops in cardioid subwoofer deployments in France, to digital mixing workshops in Nashville, to Smaart analysis training in Orlando, to Bose Modeler courses in Texas.

Our long-term goals for Stage Sound include active ongoing efforts in the following areas:

- Gaining more confidence in the design and installation of all-digital video control room installations
- Improving our understanding of emerging edge-blending schemes in more complex multi-projector applications.
- We are actively working to include more gesture-recognition technology into our list of interactive offerings.
- We are working with Samsung to master large-scale digital signage deployments.
- We look forward to adding telepresence solutions to our higher end conference room installations.

We plan to increase the number of certifications our typical designers and project coordinators hold. We are currently adding certifications in Crestron, ETC, and BSS.



## RESUME AND QUALIFICATIONS

Stage Sound uses a distributed management model to provide service and support to our clients. This means that while some of our procedures are hierarchical (how we would handle incoming calls, for example), the person that would be managing each project would be the "specialist", or person that was most capable of understanding the user's needs and designing and managing a system that would best meet these needs. The following is a list of our key personnel:

**Brian Taylor, VP Design & Installation:** Brian brings a broad base of knowledge with him from his 25+ years in the audio and electronics fields. He has designed many church, theater, and auditorium sound and video systems and is familiar with the latest computer-aided sound system design techniques. He holds certifications from EASE (Enhanced Acoustic Simulator for Engineers) design software, Smart acoustical measurement software, as well as having many factory training certificates for the products we represent. In addition, Brian understands the construction business and helps users successfully manage the installation process of the audio-video systems that we would provide. Brian is the chief sound system trainer at Stage Sound

**Jay Ensor, Field Service & Installation Coordinator:** Jay has 20 years experience in the electrical, audio-visual contracting, and construction industries as a lead technician, crew leader, and project manager. Jay's primary strengths include resource loading (recruiting and staffing), resource leveling (sharing resources), team building, team consensus building, budget management, and maintaining construction and job timelines, and meeting installation deadlines and equipment delivery dates. Jay immensely enjoys navigating all aspects of complex projects.

**Reid C. Henion, President:** Reid has been an active sound engineer since 1972, and he has extensive experience in audio recording, live sound engineering, system design, customer training, and project management. Reid is involved with the higher profile or more complicated systems that would benefit from his wide range of knowledge and experience. In our Event Services division, Reid shepherded such recent projects as the "Royal Welcome" for Queen Elizabeth in 2007. In 2008, he directed our production of both the state Republican and Democratic conventions. In our Design & Installation division, Reid was the principal salesman and designer for the audio and lighting systems that we installed at the Jefferson Theater in Charlottesville, and this system was the featured cover story of the July 2010 issue of "Live Sound International" magazine, the leading journal for professional audio-video systems in auditoria and arenas.

**Jeff Moore, VP Sales / General Manager:** Jeff has worked for Stage Sound for the past 27 years, and in this time, he has designed and sold many portable and installed sound and lighting systems. Acting as Stage Sound's chief purchasing agent, he would use this vast knowledge of the products we offer to secure the best possible savings from our manufacturers in order to pass these savings on to our customers. As an active live sound engineer, Jeff can offer users a wealth or "real world" experience on how to best use the products we would provide.

ATTACHMENT A

OFFEROR DATA SHEET

TO BE COMPLETED BY OFFEROR

- 1. **QUALIFICATIONS OF OFFEROR:** Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
- 2. **YEARS IN BUSINESS:** Indicate the length of time you have been in business providing these types of goods and services.

Years 40 Months \_\_\_\_\_

- 3. **REFERENCES:** Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #	
Virginia Tech			/	
Berglund Center				
Media General WSLC Channel 10				see
Carilion Roanoke Memorial Hosp.				attached
Hollins University				

- 4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.

Stage Sound, Inc 2240 Shenandoah Ave NW  
Roanoke, VA 24017

- 5. **RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA:** Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

[ ] YES [X] NO  
IF YES, EXPLAIN: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Customer References

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### **Media General – WSLs Channel 10 (Client)**

c/o Varney Inc (contractor)  
P O Box 7266  
Roanoke, VA 24016  
Email: [mpreas@wsls.com](mailto:mpreas@wsls.com)  
[kthaxton@varneyinc.com](mailto:kthaxton@varneyinc.com)

Project Description: New studio pipe grid, lighting contact / distribution system – approximately \$125,000

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### **Carilion Roanoke Memorial Hospital**

Attn: Jennifer Rotenberry  
P O Box 13851  
Roanoke, VA 24037  
Email: [jfrotenberry@carilionclinic.org](mailto:jfrotenberry@carilionclinic.org)

Project Description: multiple projects over the past 18 months sound, lighting, video systems including main command / control center; conference/training/boardroom/executive office suites; fitness center -- approximately \$385,000

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### **Longwood University – Wygal Auditorium**

201 High Street  
Farmville, VA 23909

Project Description: Furnished and installed a ceiling-recessed projection screen and in-wall display junction / device back boxes – approximately \$117,000

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### **Berglund Center**

Attn: Robyn Schon  
710 Williamson Road NE  
Roanoke, VA 24016  
Email: [robyn.schon@roanokeva.gov](mailto:robyn.schon@roanokeva.gov)

Project Description: Furnish and installed upgraded sound system and infrastructure cabling -- approximately \$213,000

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### **Hollins University**

Attn: John Forsman, Faculty Technical Directory  
Department of Theatre & Dance  
7916 Williams Road  
Roanoke, VA 24019

Project Description: Furnished and installed lighting and control system

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**James Madison University**

c/o Southern Air (contractor)  
Attn: Corbin Evans  
P O Box 4205  
Lynchburg, VA 24502-0205

Project Description: Subcontract for Student Housing Audio/Visual project to furnish and install projectors, projector screens, recessed ceiling loudspeakers, touch panels, wireless gateways – approximately \$92,000

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**EastLake Community Church**

Attn: Troy Keaton, Pastor  
1118 Hendricks Store Road  
Moneta, VA 24121  
540.297.0966

Project Description: Design/build for a new facility with updated audio, video, and lighting – approximately \$560,000

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**Virginia Tech – various**

Attn: West Livingston, Assistant Director of Production Services  
Squires Student Center Suite 321  
Blacksburg, VA  
540.231.3499  
Email: [westm18@vt.edu](mailto:westm18@vt.edu)

Attn: Robert Gainer, Audio Supervisor  
Moss Arts Center  
190 Alumni Mall  
Blacksburg, VA 24061  
540.231.5406  
Email: [rkgainer@vt.edu](mailto:rkgainer@vt.edu)

ATTACHMENT B

Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Offeror Name: Stage Sound, Inc Preparer Name: K. Walker

Date: 11

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes  No

If yes, certification number: 660814 Certification date: currently being recertified

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes  No

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes  No

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes  No

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

**Instructions:** *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWAMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

**Small Business:** "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

**Woman-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

**Minority-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

**Micro Business** is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees AND no more than \$3 million in average annual revenue over the three-year period prior to their certification.

**All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).**

**RETURN OF THIS PAGE IS REQUIRED**

**ATTACHMENT B (CNT'D)**  
**Small, Women and Minority-owned Businesses (SWaM) Utilization Plan**

Procurement Name and Number: \_\_\_\_\_

Date Form Completed: 11.19.19

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses  
for this Proposal and Subsequent Contract

Offeror / Proposer:  
Stage Sound, Inc  
Firm

2240 Shenandoah Ave NW  
Address Roanoke Va 24017

K. Walker  
Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)
self-perform					

*(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)*

**RETURN OF THIS PAGE IS REQUIRED**

## Kimberly Walker

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**From:** paris.miller@sbsd.virginia.gov on behalf of SBSB, rr <sbsd@sbsd.virginia.gov>  
**Sent:** Tuesday, November 19, 2019 10:30 AM  
**To:** Jeff Moore; Kimberly Walker  
**Subject:** SWaM Application Status Update - 660814

Dear SWaM Vendor,

The standard processing time until the initial review for both SWaM initial applications and for re-certifications is approximately 60 business days or 90 calendar days from the time that we received a completed SWaM/DBE application AND the required supporting documents. The signed SWaM application and supporting documents for your company were received on 09/20/2019 which is still within the normal 60 business day processing time frame (40 business days). Although we make every effort to process applications as quickly as possible, there is always a possibility that an application may go beyond the 60 business day window depending on how many applications are in the processing queue as well as the complexity and completeness of each application. Applications are processed in the order of receipt. Once the application has been assigned and is in-review, the assigned certification officer will provide feedback via email should they require any additional supporting documentation.

We appreciate your patience while we work to get your application processed. Should you have any additional questions or need further assistance, please feel free to contact us.

Thank you,

**DSBSD Customer Service Team**  
**Virginia Department of Small Business and Supplier Diversity**  
101 N. 14th Street, 11th Floor  
Richmond, VA 23219  
Office: (804) 786-6585  
Email: [sbsd@sbsd.virginia.gov](mailto:sbsd@sbsd.virginia.gov)  
Web: [www.sbsd.virginia.gov](http://www.sbsd.virginia.gov)





### Certification Status Search

Search by:  Tracking Number  Company Name

Tracking Number:

660814

SEARCH

Tracking #: 660814

Legal Business Name: STAGE SOUND, INC.

Trade Name: STAGE SOUND, INC.

Submitted Date: 09-20-2019

Swamp Expiration Date: 10-19-2019

5

Pending recertification

**VASCUPP SALES  
LAST 12 MONTHS**





## TRAINING OPTIONS AVAILABLE

Stage Sound, Inc. is an authorized dealer/installer and has the technical know-how to meet all the requirements of this system. We have 3 departments within our company that have the experience, training, and specialized manpower needed to provide everything you might want and need. We use cutting-edge technologies in our everyday operations to provide the highest customer service in sales, installation, training, and service. As per the bid specifications, we will provide training upon completion of the project, 6 months after the project is completed, and a final training session 12 months after the project is completed. After this 12-month period, Stage Sound can provide additional training at our standard rate of \$100.00 per hour plus \$0.71 per mile mileage fee. If you decide to purchase any of our extended warranties detailed in our bid, additional training (once per year) would be included in those costs.

**Training Email:** [service@stagesound.com](mailto:service@stagesound.com)

**Training Phone:** 540-342-2040

## SERVICE CALL PROCEDURE

We currently serve the entire state of Virginia from our main offices in Roanoke, VA. We also have service technicians that operate out of their home/satellite offices in Lexington, VA and Blacksburg, VA. All service and support calls are handled (with a technician arriving on-site) within 24 hours, and emergency service is available after-hours, on weekends, and on holidays, if necessary. We provide support for all systems, hardware, wiring, programming, and the operation of the equipment that we provide and install. This support includes a comprehensive package of services including onsite repair and diagnosis, depot service, and telephone/email support. We also offer extended warranties and maintenance agreements when required.

**Service Call Email:** [service@stagesound.com](mailto:service@stagesound.com)

**Service Call Phone:** 540-342-2040

## EXCALATION PROCEDURES

We provide support for all systems, hardware, wiring, programming, and the operation of the equipment that we provide and install. This support includes a comprehensive package of services including onsite repair and diagnosis, depot service, and telephone/email support. In the event that we are unable to provide an immediate repair of any damaged equipment or wiring, our escalation procedures would include providing "loaner equipment" to get you back up and running if the repair would be lengthy or if we need to send any equipment back to the manufacturer. The loaner equipment would stay in place until a repair or replacement solution has been implemented. There would be no cost to the University for any service or loaners during the warranty period. Outside of the warranty period, there would be no charges for the loaner, though our prevailing service and mileage rate would be assessed.

**Escalation Phone:** 540-342-2040

**Brian Taylor**, VP of Design & Installation

**Jay Ensor**, System Designer/Project Manager



## **OUR APPROACH TO PROVIDE FRP PARAMETERS**

We have decided to propose/bid the exact system as specified by Anthony James Partners in the bid documents, with the minor exceptions of using the current versions of the equipment that was discontinued, and the inclusion of QSC network switches in place of the discontinued HP network switches as they are recommended by QSC (the manufacturer of the control and signal distribution equipment used in this project). While JBL and other approved substitutes could work in this installation, we have experience installing Danley Sound Labs loudspeakers and amplification/processing, and we believe that they would provide the best possible performance in this installation.

## **ALTERNATIVE SOLUTIONS**

We have decided to propose/bid the exact system as specified by Anthony James Partners in the bid documents, with the minor exceptions of using the current versions of the equipment that was discontinued, and the inclusion of QSC network switches in place of the discontinued HP network switches as they are recommended by QSC (the manufacturer of the control and signal distribution equipment used in this project). While JBL and other approved substitutes could work in this installation, we have experience installing Danley Sound Labs loudspeakers and amplification/processing, and we believe that they would provide the best possible performance in this installation.

## CUSTOMER REFERENCES PAST THREE YEARS

### THE BERGLUND CENTER Coliseum Audio System

**Contact:**

Robyn Schon  
General Manager  
Phone: 540-853-6861

710 Williamson Road  
Roanoke, VA 24016



**CARILION CLINIC**  
**Carilion Transfer and Communication Center Video System**

**Contact:**

Jennifer Rotenberry  
Project Manager (Construction)  
Phone: 540-981-8902

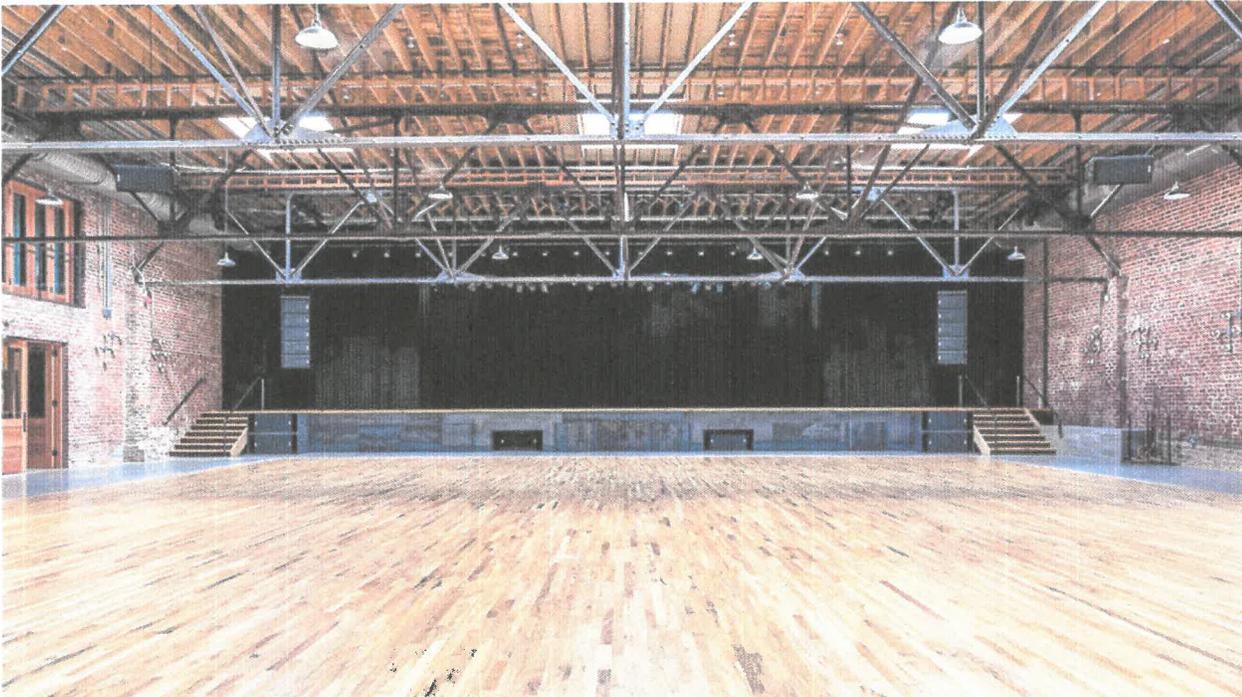
213 McClanahan Street, Suite 300  
Roanoke, VA 24014



**THE MILL & MINE**  
**Audio, Video, Lighting, and Acoustics System**

**Contact:**  
Mark Heinz  
Owner  
Email: [mark@dewhirstproperties.com](mailto:mark@dewhirstproperties.com)

227 W Depot Avenue  
Knoxville, TN 37917

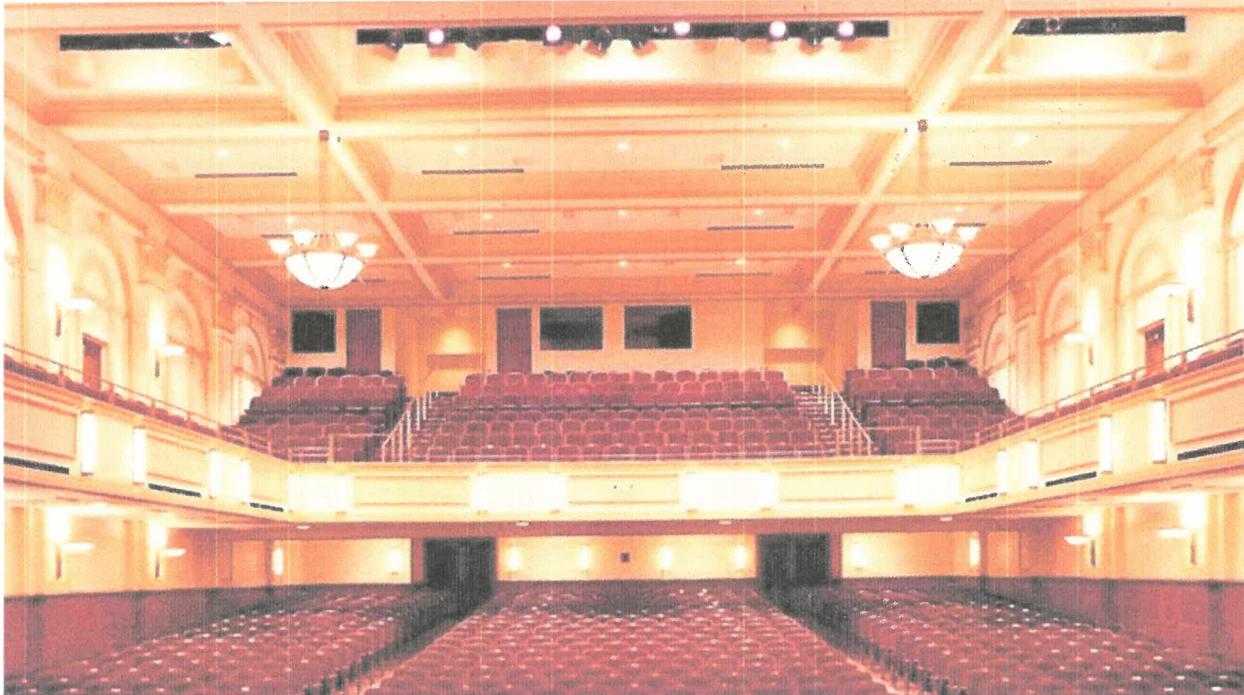


**JEFFERSON CENTER**  
**Complete Audio, Acoustic, and Rigging System**

**Contact:**

Sarah Halstead  
Assistant Technical Director  
Phone: 540-685-2314

541 Luck Ave SW  
Roanoke, VA 24016



**COLLEGIATE SCHOOL  
Complete Audio System**

**Contact:**

Scott Carson

Director of Facilities Management & Construction

Phone: 804-741-8235

103 N Mooreland Road

Richmond, VA 23229



**JAMES MADISON UNIVERSITY, NEW CONVOCATION CENTER  
ARENA AUDIO**



MANUFACTURER	MODEL	DESCRIPTION	QTY	UNIT	EXTENDED
<b>FOH AUDIO/PROCESSING/MICS/etc.</b>					
QSC	NS-1148P	48 Port Layer 2/3/4 Managed Switch	3	\$ 3,250.00	\$ 9,750.00
LENOVO	PC	Rack Mounted PC with KVM Drawer	1	\$ 2,340.00	\$ 2,340.00
QSC	CORE 510i Kit	DSP Processor	2	\$ 5,200.00	\$ 10,400.00
QSC	CIML4	4 Line In	4	\$ 273.00	\$ 1,092.00
QSC	COL4	4 Line Out	6	\$ 247.00	\$ 1,482.00
QSC	CDN64	Dante Digital Network Card	2	\$ 1,300.00	\$ 2,600.00
QSC	CODP	Data Port cards	17	\$ 390.00	\$ 6,630.00
QSC	TSC-55W-G2	Networked Touchscreen Controller	8	\$ 910.00	\$ 7,280.00
QSC	I/O FRAME	I/O Box	5	\$ 1,950.00	\$ 9,750.00
QSC	SL-QSE-510-P	Scripting License	1	\$ 585.00	\$ 585.00
QSC	SL-QUD-510-P	UCI License	1	\$ 325.00	\$ 325.00
DENON	DN-700C	Professional Network CD/Media Player	1	\$ 455.00	\$ 455.00
DENON	DN-300DH	AM/FM Digital Tuner	1	\$ 182.00	\$ 182.00
FANFARE	FM-2G	FM Antenna	1	\$ 149.49	\$ 149.49
CLICK EFFECTS	PRO AUDIO	Audio Clip Playback Laptop with USB Output	1	\$ 5,880.00	\$ 5,880.00
YAMAHA	QL5	Digital Mixing Console	2	\$ 15,741.70	\$ 31,483.40
YAMAHA	RIO3224-D2	32 Input 24 Output Rack Mounted DANTE Interface	1	\$ 8,644.09	\$ 8,644.09
YAMAHA	RIO1608-D2	16 Input 8 Output Rack Mounted DANTE Interface	1	\$ 4,776.59	\$ 4,776.59
YAMAHA	MSP3	Self Powered Studio Monitors	2	\$ 150.74	\$ 301.48
LISTEN TECHNOLOGIES	LP-41-072	Receiver package	2	\$ 2,921.16	\$ 5,842.32
LISTEN TECHNOLOGIES	LT-800-072	Transmitter Package with Antennas	2	\$ 804.99	\$ 1,609.98
ORION POWER SYSTEMS	DC2000RTX1	Uninterruptable Power Supply	2	\$ 1,552.20	\$ 3,104.40
SHURE	ULXD4D	Dual Channel Digital Wireless Receiver	2	\$ 2,587.00	\$ 5,174.00
SHURE	ULXD1	Digital Wireless Bodypack Transmitter	2	\$ 455.00	\$ 910.00
SHURE	MX185	Lavalier Microphone	2	\$ 196.30	\$ 392.60
SHURE	WA661	In-Line Bodypack Mute Switch	2	\$ 312.00	\$ 624.00
SHURE	ULXD2/SM58	Digital Wireless Handheld Microphone	2	\$ 487.50	\$ 975.00
SHURE	SBC800-US	8 Bay Battery Charging Station	1	\$ 455.00	\$ 455.00
SHURE	SB900A	Rechargeable Battery Pack	4	\$ 97.50	\$ 390.00
SHURE	SM58	Handheld Microphone	4	\$ 104.00	\$ 416.00
EV	RE20	Announcer Mic with Desktop Stand	1	\$ 475.02	\$ 475.02
WHIRLWIND	THS1T	Push To Talk	1	\$ 303.20	\$ 303.20
ADC	PPB3-18MKIINO	2 x 48 Bantam QCP II 18" Chassis Audio Patchbay	2	\$ 1,987.96	\$ 3,975.92
RANE	DA216S	Audio Distribution Amplifier	1	\$ 364.00	\$ 364.00
WHIRWIND	BKB3	3' Bantam Patch Cables	10	\$ 25.37	\$ 253.70
WHIRWIND	BKB6	6' Bantam Patch Cables	10	\$ 28.96	\$ 289.60
WHIRWIND	MK425	25' XLR Cables	4	\$ 31.22	\$ 124.88

WHIRLWIND	MK450	50' XLR Cables	4	\$	45.23	\$	180.92
ATLAS	AT100D	70 Volt Volume Control	8	\$	28.26	\$	226.08
CAMPLEX	HF-TR04LC-0100	LC Single Mode Fiber Snake 100'	2	\$	514.94	\$	1,029.88

**Audio Processing Subtotal** **\$ 131,222.55**

**LOUDSPEAKERS**

DANLEY SOUND LABS	SH96HOI-B	26.5" x 45" x 25" 220lbs.	17	\$	6,825.00	\$	116,025.00
DANLEY SOUND LABS	TH118I-B	40" x 22.5" x 28.5" 160lbs.	6	\$	2,860.00	\$	17,160.00
JBL	C67HC/T (S4)	Ceiling Pendant Speaker	37	\$	312.00	\$	11,544.00
JBL	24CT (S1)	2-Way Ceiling Speaker	179	\$	108.15	\$	19,358.85
JBL	67P/T (S2)	Ceiling Pendant Speaker	9	\$	265.20	\$	2,386.80
JBL	60PS/T (S3)	Ceiling Pendant Subwoofer Speaker	5	\$	323.70	\$	1,618.50
JBL	CRV (S5)	2-Way Ceiling Speaker	37	\$	203.94	\$	7,545.78
JBL	25-1 (S6)	2-Way Ceiling Speaker	19	\$	152.10	\$	2,889.90
JBL	64P/T (S7)	Ceiling Pendant Speaker	38	\$	140.40	\$	5,335.20

**Loudspeakers Subtotal** **\$ 183,864.03**

**AMPLIFIERS**

DANLEY SOUND LABS	20K4PRO	20K 4CH Amplifier with Dante	10	\$	6,097.00	\$	60,970.00
QSC	CX204V	70V Amplifier	9	\$	1,362.40	\$	12,261.60
QSC	CX108V	70V 8CH Amplifier	4	\$	1,618.50	\$	6,474.00

**Amplifier Subtotal** **\$ 79,705.60**

**RACKS AND UPS**

Middle Atlantic	WRK-44-32LRD	WRK Series Rack, 44RU, 32"D - Without Rear Door	3	\$	1,229.07	\$	3,687.21
Middle Atlantic	MW-LVRD-44	Vented Rear Door	3	\$	299.62	\$	898.86
Middle Atlantic	SPN-44-312	Side Panels, 44RU, 31-32" D Racks	1	\$	624.69	\$	624.69
Middle Atlantic	MW-4QFT-FC	Fan Top	3	\$	618.50	\$	1,855.50
Middle Atlantic	PDT-1220C-NS	Power Strip, 12 Outlet, 20A	3	\$	172.19	\$	516.57
Middle Atlantic	LACE-P	Lace Strip, 45RU, w/ Round Holes, 6pc.	3	\$	128.81	\$	386.43
ORION	DC3000RTX1	3000VA Uninterruptable Power Supply	3	\$	1,843.40	\$	5,530.20
ORION	OPS-RAILKIT	Rack Rail Kit for UPS	3	\$	63.70	\$	191.10
ORION	OPS-SNMP4-WEBCARD	Communications Card for UPS	3	\$	295.10	\$	885.30

**Racks and UPS Subtotal** **\$ 14,575.86**

**INTEGRATION AND MATERIALS**

INTEGRATION	MATERIAL	Cables, Connectors, Lift Rental, Etc.	1	\$	99,934.29	\$	99,934.29
INTEGRATION	LABOR	Design and Integration Labor	1	\$	175,705.00	\$	175,705.00
INTEGRATION	TRAVEL	Travel & Expenses	1	\$	19,056.05	\$	19,056.05

**Integration and Material Subtotal** **\$ 294,695.34**

**ARENA AUDIO SUBTOTAL** **\$ 704,063.38**

**WARRANTY EXTENSION**

WARRANTY	YEAR 3	PARTS AND LABOR	1	\$	5,803.80	\$	5,803.80
WARRANTY	YEAR 4	PARTS AND LABOR	1	\$	7,593.80	\$	7,593.80

WARRANTY	YEAR 5	PARTS AND LABOR	1	\$ 9,383.80	\$ 9,383.80
WARRANTY	YEAR 6	PARTS AND LABOR	1	\$ 11,173.80	\$ 11,173.80
WARRANTY	YEAR 7	PARTS AND LABOR	1	\$ 12,963.80	\$ 12,963.80
WARRANTY	YEAR 8	PARTS AND LABOR	1	\$ 14,753.80	\$ 14,753.80
WARRANTY	YEAR 9	PARTS AND LABOR	1	\$ 16,543.80	\$ 16,543.80
WARRANTY	YEAR 10	PARTS AND LABOR	1	\$ 18,333.80	\$ 18,333.80
<b>Integration and Material Subtotal</b>					<b>\$ 96,550.40</b>

**Q-SYS NS Series Network Switches**



The **Q-SYS NS Series network switches** offer a plug-n-play solution for Q-SYS system installers intending to deploy a local AV network for media distribution. The NS Series network switches ship pre-configured with a QSC developed, independently verified\* configuration tailored towards the real-time demands of Q-LAN™ audio and video as well as Dante™ and AES67 streams. The Q-SYS NS Series network switches eliminate the need for time consuming network configuration and troubleshooting on site, thereby reducing labor costs, minimizing system commissioning time and reducing the need for network support specialists.

The Q-SYS NS Series network switches include QSC developed AV&C (audio, video and control) profiles that provide optimal QoS (Quality of Service) configuration for Q-LAN audio, Q-LAN video, Dante™ audio (standard and low latency modes), and AES67 audio streaming formats. The preloaded configurations for the NS Series network switches provide DSCP (Differential Services Code Point) values appropriate for each AV&C profile in addition to advanced protocol detection and queue mapping to ensure that all time-critical media data described above is prioritized appropriately for on-time delivery.

In order to ensure optimal performance for real-time media in situations with large amounts of multicast traffic, the Q-SYS NS Series network switches also include a preconfigured IGMP Querier and IGMP Snooping to facilitate multicast filtering and forwarding whenever necessary.

The Q-SYS NS Series products are economical, enterprise grade, access class, managed network switch products. The Q-SYS NS Series network switches are Dell EMC N1100P-ON series OEM hardware products that are preconfigured for Q-SYS AV&C applications. The Q-SYS NS Series switch products are offered in 8-port, 24-port and 48-port models. All Q-SYS NS Series models offer 1 GbE (1000 Mbps) operation on their primary copper ports. Additionally, all Q-SYS NS Series network switches offer 1GbE and/or 10GbE uplinks via optional SFP (Small Form-factor Pluggable) modules. All Q-SYS NS Series network switches are PSEs (Power Sourcing Equipment) and are compliant with IEEE 802.3af and IEEE 802.3at PoE and PoE+ (Power over Ethernet) standards, having power budgets of 75, 190, and 375 W on the first 4, 12, and 24 ports respectively.

**QSC Q-SYS NS Series models**

<p><b>NS-1108P</b></p>	<p>8x 10/100/1000 Mbps (4x PoE/PoE+, 75 Watts), 2x 1GbE, 2 SFP (GbE)</p>	
<p><b>NS-1124P</b></p>	<p>24x 10/100/1000 Mbps (12x PoE/PoE+, 190 Watts), 1x 1/10GbE, 4 SFP/SFP+ (10GbE)</p>	
<p><b>NS-1148P</b></p>	<p>48x 10/100/1000 Mbps (24x PoE/PoE+, 375 Watts), 1x 1/10GbE, 4 SFP/SFP+ (10GbE)</p>	

\*Network switch and configuration test validation has been carried out by the University of New Hampshire Interoperability Labs, an independent Ethernet testing and qualification specialist. For more information, please contact UNH-IOL <http://www.iol.unh.edu>

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\*Network switch and configuration test validation has been carried out by the University of New Hampshire Interoperability Labs, an independent Ethernet testing and qualification specialist. For more information, please contact UNH-IOL <http://www.iol.unh.edu>

Every attempt has been made to ensure that the pre-installed switch configuration natively provides all prioritization and management functions required for a typical Q-SYS installation, including common third party devices. However, should the Q-SYS system installer need to adapt the switch configuration for any reason, the QSC-supplied configurations provide default IP addresses and administrative credentials that allow a network professional to access the NS Series network switches using a common web browser.

**Default IP Configurations:**

192.168.0.130, 255.255.255.0 : NS-1108P (8-port)  
192.168.0.140, 255.255.255.0 : NS-1124P (24-port)  
192.168.0.150, 255.255.255.0 : NS-1148P (48-port)

**Default credentials:**

Username: admin  
Password: qscsystems

**IMPORTANT**

It should be noted that QSC Support can only assist with support inquiries when the NS Series Network Switch is running the original, unedited switch configuration. However, QSC Support can assist the user in returning the Q-SYS NS Series to the default, QSC pre-configured switch configuration if necessary.



TD-001583-01

**Q-SYS Contact Information****Q-SYS 24/7 Emergency Support:**

**1-888-252-4836 (North America)**  
**1-949-791-7722 (All other regions)**

Q-SYS 24/7 Support is for Emergency assistance with Q-SYS systems only. 24/7 support guarantees a call back within 30 minutes after a message is left. Please include: Name, Company, Call Back Number and description of the Q-SYS emergency for prompt call back. If calling during business hours please use the standard support contact telephone numbers or e-mail.

**Q-SYS Applications Engineering Team (AET) and Technical Services Group (TSG) Non-Emergency Support:**

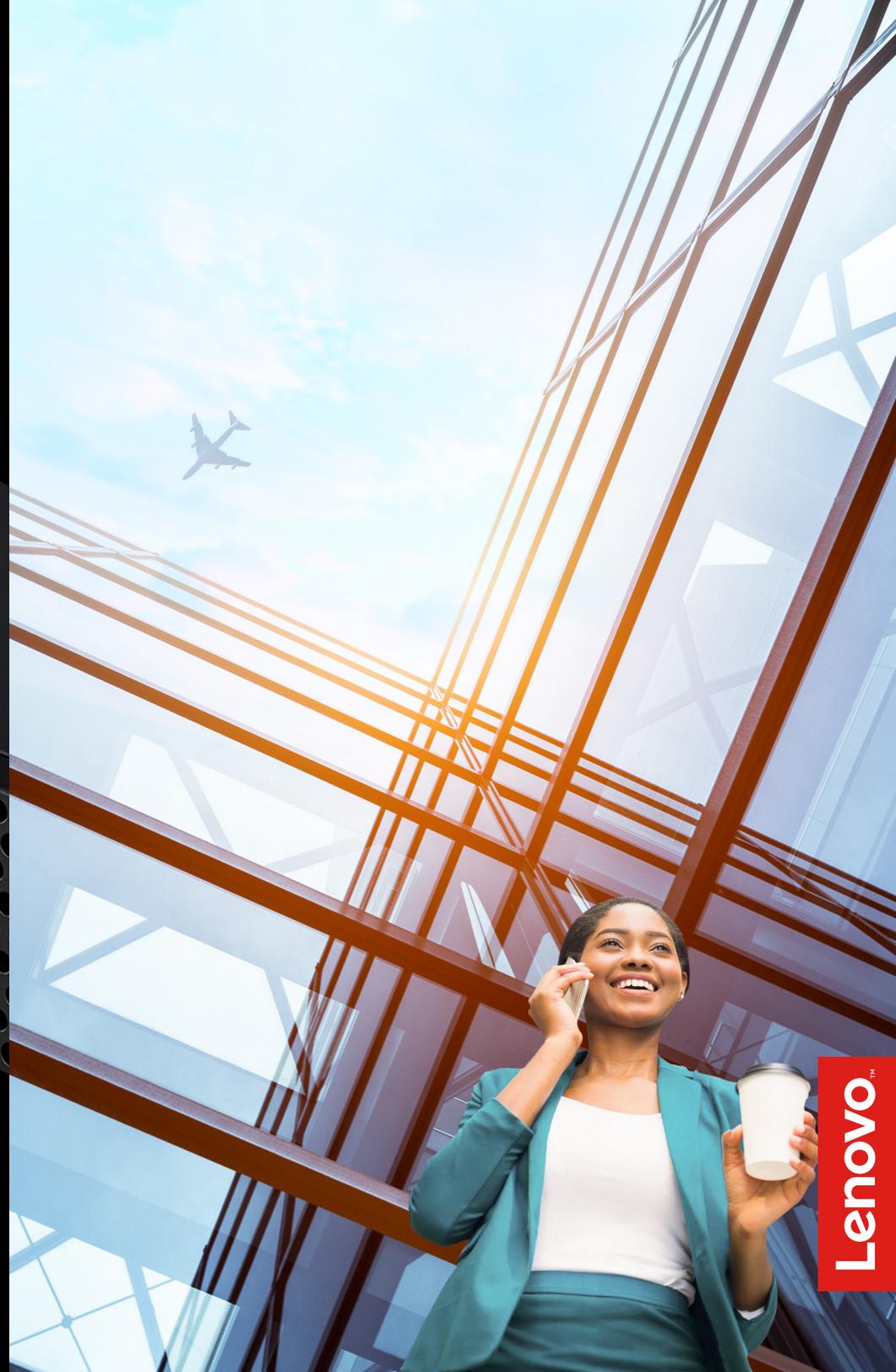
**1-800-772-2834 (North America)**  
**1-714-957-7150 (All other regions)**  
**Q-SYS support e-mail: [qsyssupport@qsc.com](mailto:qsyssupport@qsc.com)**

Q-SYS AET & TSG telephone support is available  
Monday – Friday, 7AM to 5PM PST (excluding holidays)

BIG ON PERFORMANCE.  
SMALL IN DESIGN.



**ThinkCentre** M715 Tiny



**Lenovo**™

# ThinkCentre M715 Tiny Desktop



## COMPACT WITHOUT COMPROMISE

With a 1Liter chassis, the M715q desktop has a smaller footprint, allowing it to fit anywhere, horizontally or vertically. Despite its compact design, this Tiny boosts your PC's responsiveness by 40% with up to AMD Ryzen™ 5 2400GE PRO Processor and super-fast DDR4 memory.

- **Power-packed Performance:** the PCIe SSD storage coupled with 3D NAND technology allows you to seamlessly switch between tasks, and handle large files and applications with ease.
- **Robust Security:** the TPM 2.0 chip (Trusted Platform Module) encrypts your data and enables hardware authentication.
- **Effortless Management:** the Smart Power On feature allows you to switch on your desktop via the USB keyboard even when your PC is mounted away and is out of reach.
- **Sustainable Growth:** your desktop is certified to be energy efficient, enabling cost savings and ensuring sustainable practices through your PC's life cycle.

## ACCESSORIES

### ThinkVision T24i-10 Monitor ▶

The T24i-10 comes with borderless full-HD display that is perfectly suited for your corporate endeavors. Available with VGA, DisplayPort™, HDMI, and four USB ports matched with an audio port, this monitor maximizes your productivity. Its full-function stand lifts, tilts, pivots CCW/CW 90 degrees, and swivels for viewing comfort.



### ◀ ThinkCentre Tiny VESA Mount II

The VESA standard design enables this mount to attach to Tiny or any other device that is VESA compatible for utmost mounting flexibility. This versatile mounting device can be used separately or combined with other options for secure mounting functionality.



### Kensington® MicroSaver™ 2.0 Twin ▶ Cable Lock

The Kensington® MicroSaver™ 2.0 Twin Cable Lock secures two devices with the same cable lock. Engineered to be the smallest, strongest lock for desktops, laptops, monitors, and other devices, the MicroSaver™ DS 2.0 represents the next generation of device security.



# ThinkCentre M715 Tiny Desktop

## PERFORMANCE

### Processor

Up to AMD Ryzen™ 5 2400GE PRO Processor

### Memory

2 DDR4 SODIMM (Maximum 32GB)

### Graphics

AMD Radeon™ Vega Graphics

### PSU

65W 88% Adapter

### OS Support

Windows 10 Pro 64bit

Windows Home 64bit

## CONNECTIVITY

### Front Ports

2 x USB 3.1 Gen 1 (1 for Fast Charge)

2 x Audio

### Rear Ports

3 x USB 2.0 + USB 3.1 Gen 1

DP + DP

1 x Punch Out (HDMI/DP/Serial/VGA)

1 x LAN

1 x Audio

### Expansion Slot

1 x M.2 2280 for PCIe SSD

1 x M.2 for WiFi

## Internal Bay

1 x 2.5" HDD

## DESIGN

### Form Factor

1L Tiny 3

### EOU

Optional

### TIO Compatibility

Yes

### Dimension (W x D x H)

34.5 x 182.9 x 179mm

1.36 x 7.20 x 7.05 inches

### Weight

Starting at 1.3kg/2.9lbs.

### MIL-SPEC

Yes, 10 items

## SECURITY

AMD GuardMI Technology

TPM 2.0

AES 128-bit Encryption Engine

BIOS-based Smart USB Protection

Kensington™ Lock

Padlock Loop

## WINDOWS 10 PRELOAD

Lenovo Tangram

Microsoft Office 2016

## MANAGEABILITY

DASH Manageability

KVM

Smart Power On

## GREEN CERTIFICATIONS

Energy Star® 7.0



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Lenovo™



## Q-SYS Core 510i

### Features

- Q-SYS Core processing in a flexible chassis featuring 8 onboard I/O card slots
- Install any combination of Q-SYS I/O cards for maximum flexibility
- Audio, video and control processing on a dedicated Linux™ realtime OS
- Software configurable as either a Core 510i processor, or an I/O-510i expander
- Built using standard computer industry hardware and IT industry networking protocols
- Control and integrate external devices using TCP/IP, RS232 and GPIO
- Design with powerful and intuitive Q-SYS Designer Software application
- Seamlessly integrates with Q-SYS AV-to-USB bridging peripherals
- Provides simple integration with QSC amplifiers and loudspeakers
- Multiple levels of system redundancy

## Q-SYS Core 510i Integrated Core Processor and I/O Expander



### Introduction

The Q-SYS™ Core 510i processor is an audio, video and control processing system that leverages Intel™ CPUs and motherboards as well as a dedicated, Linux™ realtime operating system developed by QSC to provide class-leading capabilities for AV systems of any scale.

The Q-SYS Core 510i processor offers the most flexible audio I/O of any Core in the Q-SYS catalog, perfect for applications that require a diversity of analog, digital and networked audio connectivity. It features eight onboard I/O card slots that can be populated with any combination of Q-SYS Type-II I/O cards allowing diverse connectivity options. The Core 510i processor also offers two modes of operation whereby it can be deployed as a Q-SYS Core Processor with full processing capabilities, or configured as an I/O expander when configured via software as an I/O-510i.

### Applications – Q-SYS Core mode

When deployed as a Q-SYS Core, the Core 510i processor provides an abundance of raw processing power for all audio, video and control requirements including integration with the new Q-SYS AV-to-USB Bridging solution. Onboard acoustic echo cancellation (AEC) processing coupled with high channel capacity networked audio provide the ability to manage multiple small to mid-sized conference spaces or a single large space.

### Applications – I/O Frame mode

When configured via software as an I/O-510i, the device offers the ability to add up to 128 x 128 audio channels in to the Q-SYS system for processing on a separate Q-SYS Core. It can accommodate any combination of Q-SYS Type-II I/O cards.

This is particularly useful when integrating large numbers of networked audio channels from Dante™, CobraNet™ or AVB™ devices and subsystems in to the Q-SYS Platform.

### Network

The Q-SYS Platform utilizes IEEE networking standards and solutions for audio, control and video distribution over a standard Ethernet / IP network. Q-LAN provides deterministic system latencies with analog input to analog output guaranteed at 3.167ms. The Q-SYS Platform uses Q-LAN for audio, video and control connectivity with all Q-SYS peripherals. Additionally, the Q-SYS Core supports VoIP, SIP, LDAP, AES67, TCP/IP and HTTP Web Sockets among many other standard IT networking solutions.

### Scalable Redundancy

While QSC is dedicated to building the most reliable products, some applications call for additional assurance. Any element on the Q-SYS Platform – Cores, networks, I/O-Frames and even amplifiers may be deployed in a redundant configuration. The system designer has the choice of making one or all system elements redundant.

### Peripherals

The capabilities of the Q-SYS Platform are further enhanced by the ever growing suite of Q-SYS peripheral devices, all of which are compatible with all Q-SYS Core processors, including the Q-SYS Core 510i. The catalog of Q-SYS networked peripheral devices include amplifiers, touch screen controllers, paging stations, I/O channel expanders, PTZ-IP cameras for the conference room and AV-to-USB Bridging devices.

# Q-SYS Core 510i Integrated Processor

Description	System processor and control engine with integrated I/O (or I/O expander when configured via software as I/O-510i)
Configuration Modes	“Q-SYS Core” - centralized processor and control engine for a Q-SYS system“I/O-510i configuration suited to integrating high channel-count networked I/O cards (Dante, CobraNet, AVB)” - peripheral to an additional Q-SYS Core processor on the system
Supported Peripherals (when configured as a Q-SYS Core Processor.)	I/O-8 Flex Channel Expander, I/O-USB Bridge, PTZ-IP Camera series, I/O Frame, I/O-Frame 8s, I/O-22, I/O-11 Series, Page Station Series, TSC Series touch screens
Software Requirements	Q-SYS Designer 6.x.x

## Channel Capacity

Network Channel Capacity	256 x 256 (in Q-SYS Core mode) / 128 x 128 (in I/O Frame mode)
Local Audio I/O Capacity	8 audio I/O card slots - accommodates up to 128x128 total onboard I/O channels
AEC Channel Capacity	64 at 200ms tail length (available when configured as a Q-SYS Core Processor only)
Multitrack Player Capacity	16 tracks, expandable to 128 tracks (available when configured as a Q-SYS Core Processor only)
Media Drive Capacity	Approximately 6GB on the default drive (when configured as a Q-SYS Core Processor only, upgrade options are available)

## Configure to Order Inputs/Outputs Options

Audio I/O Cards	COL4: Line output card (4 channels) CODP4: DataPort card (4 channels) CIML4: Mic/line input card (4 channels) CIML4-HP: High Performance mic/Line input card (4 channels) CAES4: AES3 digital I/O card (4x4 channels) CIAES16: AES3 digital input card (16 channels) CCN32: CobraNet network bridge card (up to 32x32 channels) CAN32: AVB network bridge card (up to 32 channels) CDN64: Dante network bridge card (up to 64x64 channels)
Media Drives (in Q-SYS Core Mode)	M2-MD-S: 128GB M2-MD-M: 256GB M2-MD-L: 512GB
Multitrack Players (MTP): (in Q-SYS Core Mode)	MTP-32: 32 tracks MTP-64: 64 tracks MTP-128: 128 tracks

## Controls and Indicators

Front Panel Controls	“NEXT” OLED page forward capacitive touch button “ID” device identification capacitive touch button “Clear Network Settings” - invoked when “NEXT” and “ID” are pressed simultaneously
Front Panel Connectors	AUX USB: USB Host x2 (Type A connectors)
Front Panel Indicators	Blue “POWER” LED 304x96 monochrome OLED display
Rear Panel Connectors	RS232: Male 9-pin D shell connector (DE-9) Video out: HDMI AUX USB: USB Host x4 (Type A connectors) AUX Network: RJ45 10/100/1000 Mbps GPIO: Female 15-pin D shell connector x2 (DA-15) Media Network LAN A: RJ45 1000 Mbps (QLAN, AES67, VoIP, WAN, Media Streaming, etc) Media Network LAN B: RJ45 1000 Mbps (QLAN, AES67, VoIP, WAN, Media Streaming, etc) AC Mains Power: IEC connector
Rear Panel Indicators	“Link”, “Speed” and “Activity” LEDs on all LAN ports

# Q-SYS Core 510i Integrated Processor

## Miscellaneous

Line Voltage	100 VAC - 240 VAC 50-60 Hz
Current Draw	3.7A Max @100 VAC (actual current draw depends on configuration options such as I/O cards and/or Media Drive, DSP loading and network loading)
Operating Temperature Range	0°C - 50°C
Storage Temperature	-20°C to +70°C
BTU/Hour	600 (power conversion estimate under typical load)
Humidity	5% to 85%
Regulatory	FCC 47 CFR Part 15 Class A, IC ICES-003, CE (EN55032, EN55035), EU RoHS directive 2011/65/EU, WEEE directive 2012/19/EU, China RoHS directive GB/T26572, EAC, RCM, UL, C-UL, EFUP 10, Expected Product Life Cycle 20 years
Product Dimensions	3.5" x 19" x 15" (89mm x 483mm x 381mm)
Shipping Carton Dimensions	23.5" x 20" x 6.5" (597mm x 508mm x 165mm)
Shipping Weight	23 lbs. minimum (installation of I/O cards increases shipping weight)
Included Accessories	6' UL/CSA/IEC line cord, safety instructions, regulatory statement, I/O connectors (included when purchasing I/O cards with Euro style terminal blocks)



1675 MacArthur Boulevard • Costa Mesa, CA 92626 • Ph: +1.800.854.4079 or +1.714.957.7100 • Fax: +1.714.754.6174



I/O Cards	Mic/Line Input Card CIML4	High-Performance Mic/Line Input Card CIML4-HP	Line Output Card COL4	DataPort Output Card CODP4
Description	Four channels of microphone/line-level analog audio input with 48V phantom power	Four channels of microphone / line-level analog audio input with 48V phantom power and high performance pre-amplifiers and A/D converters	Four channels of balanced, line-level analog output	Four audio output channels (2 DataPorts) for connection to DataPort equipped QSC amplifiers
Performance				
Dynamic Range Unweighted	> 105 dB	> 112 dB	> 112 dB	> 114 dB
Dynamic Range A-weighted	> 108 dB	> 115 dB	> 115 dB	> 117 dB
Distortion 20 Hz – 20 kHz +4 dBu (nominal input)	< 0.009% THD+N	< 0.004% THD+N	–	–
Distortion 20 Hz – 20 kHz 2 dB below clip (max)	< 0.08% THD+N	< 0.06% THD+N	< 0.004% THD+N	< 0.004% THD+N
Crosstalk 20 Hz – 20 kHz				
Inter-channel (max)	> 100 dB	> 110 dB	> 100 dB	> 95 dB
Inter-channel (typ)	> 110 dB	> 110 dB	> 110 dB	> 100 dB
Intra-channel (max)	> 100 dB	> 110 dB	> 100 dB	> 100 dB
Intra-channel (typ)	> 110 dB	> 110 dB	> 110 dB	> 110 dB
Frequency Response 20 Hz – 20 kHz (max)	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB
Frequency Response 20 Hz – 20 kHz (typ)	± 0.2 dB	± 0.2 dB	± 0.2 dB	± 0.2 dB
Input Impedance				
Balanced (nominal)	10 k ohms	10 k ohms	–	–
Unbalanced (nominal)	10 k ohms	10 k ohms	–	–
Common Mode Rejection 20 Hz – 20 kHz (max)	> 45 dB	> 45 dB	–	–
Common Mode Rejection 20 Hz – 20 kHz (typ)	> 50 dB	> 50 dB	–	–
Max Input Level	0.125, 2.25, 8.70, 17.35 Vrms -16, 10, 21, 27 dBu -18.2, 7.04, 18.8, 24.78 dBv (4 selections)	1.23 to 17.35 Vrms -56 to 27 dBu -58.2 to 24.8 dBv (continuously variable)	–	–
Mute	Infinite attenuation (via digital mute)	Infinite attenuation (via digital mute)	Infinite attenuation (via electro-mechanical relays)	Infinite attenuation (via electro-mechanical relays)
Audio Converters				
Analog to Digital Conversion (ADCs)	24-bit delta-sigma at 48 or 96 kHz sample rate	24-bit delta-sigma at 48 or 96 kHz sample rate	–	–
Digital to Analog Conversion (DACs)	–	–	24-bit delta-sigma at 48 or 96 kHz sample rate	24-bit delta-sigma at 48 or 96 kHz sample rate
Group Delay	< 13 FS (≈ 271 μs) at 48 kHz	< 13 FS (≈ 271 μs) at 48 kHz	< 10 FS (≈ 196 μs) at 48 kHz	< 13 FS (≈ 271 μs) at 48 kHz
Connectors	Four 3-terminal Euro-style detachable terminal blocks	Four 3-terminal Euro-style detachable terminal blocks	Four 3-terminal Euro-style detachable terminal blocks	Two 15-pin HD15 connectors
User-configurable Options (software enabled)				
Phantom Power	+48 V phantom power (meets IEC 1938 [1996] spec)	+48 V phantom power (meets IEC 1938 [1996] spec)	–	–
Output Trim				
Vrms (max)	–	–	8.7 V	–
dBu (max)	–	–	21 dBu	–
dBv (max)	–	–	18.8 dBv	–
Amplifier Standby	–	–	–	Set or clear amplifier in standby mode
Mute	–	–	–	Set or clear individual channel mutes
Enable Meters	–	–	–	Enable data collection of meters for each channel
Audio Output Levels	–	–	–	Adjust individual audio channel levels
Amplifier Model Support	–	–	–	CX, PowerLight™ 3 Series, DCA, and legacy V1 models

I/O Cards	AES-3 Input/Output Card CAES4	CobraNet Bridge Card CCN32
Description	Four input and four output channels of AES-3 digital audio	Up to 32 input and 32 output channels of CobraNet digital audio
Frequency Response	± 0.2 dB	± 0.2 dB
Mute	Infinite attenuation (via digital mute)	Infinite attenuation (via digital mute)
Group Delay	37 Samples (0.760 ms actual) with Sample Rate Converter enabled	Selectable: 64 Samples (2.687 ms actual) 128 Samples (4.020 ms actual) 256 Samples (6.686 ms actual)
I/O Capacity	4x4	Selectable: 4x4 8x8 16x16 32x32 (in Core only)
Bundle Packing	—	0 to 8 channels
Network Transmitters	—	4
Network Receivers	—	4
Management	—	CobraNet management via SNMP
Connectors	Four 3-terminal Euro-style detachable terminal blocks	Dual RJ-45



Mic/Line Analog Input Card



High-Performance Mic/Line Analog Input Card



Analog Line Output Card



DataPort Output Card



AES-3 Digital Input/Output Card



CobraNet™ Digital Input/Output Card



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I/O Card Spec Sheet 12/21/12



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Integrated System Platform

**CDN64 Dante Bridge Card**

**Features**

Features

- Up to 64x64 Dante network audio channels
- Sample rate conversion to and from other network audio transports such as CobraNet, AVB and Q-Lan
- Integrate Dante-enabled 'front-of-house' input or output sources with the 'back-of-house' or 'facility-wide' Q-Sys integrated platform



Q-Sys™ is a complete integrated system that encompasses everything from the audio input to the output of the loudspeakers; it provides all the routing, processing, control and monitoring, while maintaining the audio quality and reliability QSC has come to be known for.

The CDN64 Dante™ bridge card provides third-party Dante enabled digital audio products and Dante edge networks the ability to connect and interface with Q-Sys™.

**Applications:**

The CDN64 Dante Bridge Card is ideal for use in Performance venues such as theatres, auditoriums, convention centers and houses of worship, as well as a general solution to bridge Dante-enabled sources such as wireless microphones and digital mixers, directly into the Q-Sys eco-system for advanced processing and re-distribution over Q-Lan for larger LAN and WAN IT infrastructures.

**Specifications**

System Hardware	Q-Sys Dante Bridge Card
Description	Dante network audio input and output bridge card
Capacity and Sample Rate Support: *Sample rate conversion to Q-Sys system standard 48 kHz	64x64 channels at 44.1/48 kHz 32x32 channels at 88.2/96 kHz * 16x16 channels at 176.4/192 kHz *
Connectors	Dual RJ45

*As part of QSC's ongoing commitment to product development, specifications are subject to change without notice.*



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TSC-55w-G2  
TSC-80w-G2  
TSC-116w-G2

Q-SYS Platform  
touch screen controller

### Features

- Capacitive LCD touch surface:  
In-plane switching (IPS) technology
- High resolution displays
- Power over Ethernet: IEEE 802.3af  
compliance allows for simplified  
single cable installation
- Universal mounting options: Included  
accessories for mounting to US  
standard and European wall and  
junction boxes
- Complete design freedom: Create  
custom branded graphical interfaces  
using Q-SYS UCI Editor within  
Q-SYS Designer Software



Q-SYS TSC-G2 Series touch screen controllers combine capacitive touch technology with a bright, high resolution full color LCD for state-of-the-art control of a Q-SYS system. Control elements and layout for GUIs on this versatile touch screen controller are completely customizable to provide end users a full range of controls, from complete system control and monitoring, to one-touch deployments of pre-programmed presets.

Designers can create custom user control interfaces (UCI) within Q-SYS Designer Software using the UCI Editor. Drag and drop any control Q-SYS element from a Q-SYS design schematic into UCI Editor and easily deploy your design to the touch screen,

UCI Editor allows the import of room diagrams, corporate logos or other graphical elements in most major graphic file formats including .png, .jpg, .svg, and .gif. In order to deploy UCI designs onto Q-SYS touch screens, a software license is required for each Q-SYS Core processor.

TSC-G2 Series touch screen controllers are offered in black and designed for easy surface mount installation in a wall, lectern or similar flat surface. Universal mounting accessories are included for standard US and European wall and junction boxes for vertical or horizontal installations.

Table top stand accessories are available for the TSC-80w-G2 and TSC-116w-G2 models.



(shown with optional table top stands  
available for TSC-80W-G2 and TSC-116W-G2)

# Q-SYS TSC-G2 Series



**TSC-55w-G2**



**TSC-80w-G2**



**TSC-116w-G2**

## Display

Description	Capacitive Touch Surface, In-Plane Switching (IPS) technology, 16M colors.		
Panel Dimensions	5.85" X 3.44" X 1.33" (148.5 mm X 87.5 mm X 33.7 mm)	8.8" X 5.8" X 1.4" (223.5 mm X 148.4 mm X 36.3 mm)	12.3" X 7.9" X 1.6" (313.6 mm X 201.5 mm X 39.85 mm)
Viewable screen dimensions (diagonal)	5.5" (127 mm)	8.0" (203 mm)	11.6" (295 mm)
Resolution	1280x720	1280x800	1920x1080
Brightness	400 Nits	400 Nits	350 Nits
Panel Orientation	Vertical / Horizontal	Vertical / Horizontal	Vertical / Horizontal

## Power

Power over Ethernet	IEEE PoE 802.3af class 3 via LAN port		
Aux power PSU	+24VDC @ 0.5A (power supply not included)		
Aux power connection type	Locking terminal	Barrel connection	Barrel connection

## Weight

Product weight (net)	6.31 oz (179 g)	17.64 oz (500 g)	32.1 oz (910 g)
----------------------	-----------------	------------------	-----------------

## Environment

Operating temperature	0°-50° C (32°-122° F)	0°-50° C (32°-122° F)	0°-50° C (32°-122° F)
BTUs	17 typical	23 typical	30 typical
Humidity	5-85rh non-condensing	5-85rh non-condensing	5-85rh non-condensing

## Enclosure

Rear Panel	LAN, 1000Mbps full-duplex RJ-45	LAN, 1000Mbps full-duplex RJ-45	LAN, 1000Mbps full-duplex RJ-45
Wall Mount	Yes	Yes	Yes
Table Top	No	Optional table top stand accessory	Optional table top stand accessory

Specs subject to change without notice



# QSC™

## Q-SYS™

Integrated System  
Platform

### I/O Frame



#### Features

- I/O Frames may be equipped with a variety of audio input and output cards
- Premium 24-bit AD and DA conversion used throughout
- I/O Frames may be located with the Core or remotely – whichever best suits the needs of the installation
- Intuitive and easy to use design GUI
- Uses standard Gigabit Ethernet hardware for audio transport and control
- System seamlessly integrates with QSC amplifiers and loudspeakers
- Q-Sys technical support is available 24/7 – worldwide

24/7

Q-Sys™ is a complete integrated system that encompasses everything from the audio input to the output of the loudspeakers; it provides all the routing, processing, control and monitoring, while maintaining the audio quality and reliability QSC has come to be known for.

Physically located near audio sources and destinations, I/O Frames provide the points of connection used to interface Q-Sys with other components of the audio system, such as mixers and power amplifiers.

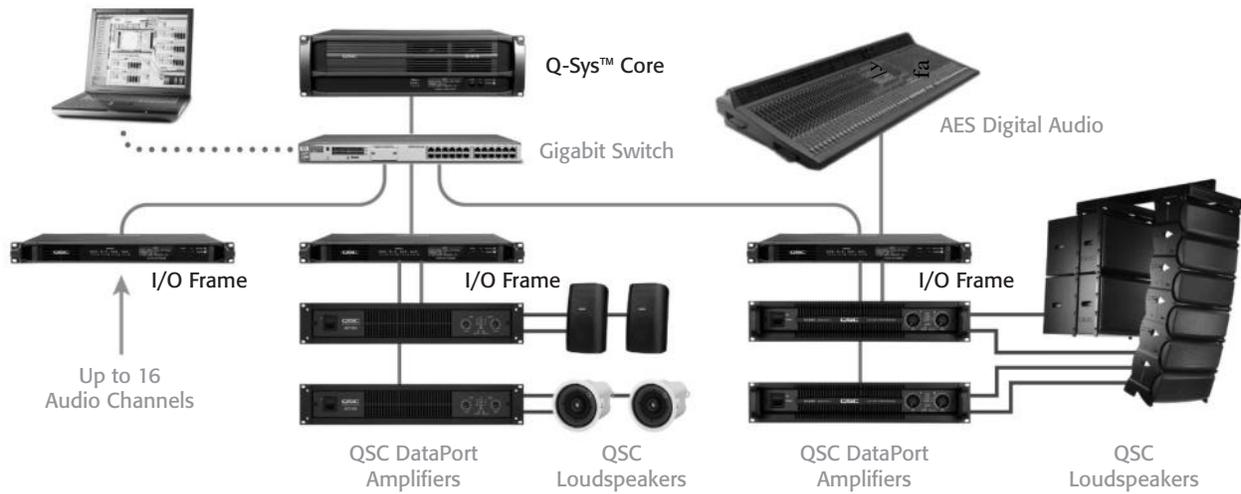
Each I/O Frame features four card slots, which can support up to four of the following I/O cards, mixed and matched in any configuration: **Mic/Line Input card** – Four channels of switchable mic/line-level analog audio input with 48V phantom power (available with standard or premium pre-amps and A/D converters). **Line Output card** – Four channels of balanced, line-level analog output. **DataPort Output card** – Four audio output channels (2 DataPorts) for connection to DataPort equipped QSC amplifiers. **AES Input/Output card** – Four input and four output channels of AES-3 digital audio. The I/O Frame will also support a single network card (such as Cobranet, and future cards such as Dante / AVB) to provide a bridge to the Q-Sys Core, up to 16 inputs and 16 outputs.

One of the primary development goals was to create a platform that had nearly unlimited resources; Q-Sys truly lives up to that goal with unrivaled processing breadth and depth. The design interface was created specifically to harness its unmatched power while remaining intuitive and easy to use. The processing tools are extensive and simple to apply. Once the system is designed, you will find that Q-Sys also offers a useful suite of trouble shooting and measurement tools.

The strength of the centralized architecture used by Q-Sys is that it facilitates the implementation of total or partial system redundancy. A system can be created with Core, Network, I/O Frame and even amplifier redundancy. In a redundant Q-Sys system, a problem with any of the primary devices will result in the backup device taking over. If, for example the Core experiences a failure, the backup core automatically takes over ensuring continued flawless operation.

Q-Sys is a powerful and reliable unified system that features rock-solid performance backed by the unrivaled service and support QSC has built its reputation on. For more information please visit [www.qscaudio.com/products/network/Q-Sys](http://www.qscaudio.com/products/network/Q-Sys).

# I/O Frame | Specifications



## System Hardware

## I/O Frame

Description	System audio input and output device
Front Panel Controls	LCD page forward momentary switch Unit ID button momentary switch Clear settings momentary switch
Front Panel Card Receptacle	–
Front Panel Indicators	Power On: Blue LED Device Status: Tri-color LED Audio Signal: Five tri-color LEDs/per I/O card slot 240 x 64 monochrome LCD graphics display
Rear Panel Connectors	RS-232: DE-9 (male 9-pin D shell connector) GPIO A: DA-15 (female 15-pin D shell connector) Q-Sys Network LAN A: RJ45 1000 MBps only Q-Sys Network LAN B: RJ45 1000 MBps only
I/O Capacity	Up to 16 x 16. Requires purchase of I/O cards.
Line Voltage Requirements	100 VAC – 240 VAC, 50 – 60 Hz
Current Draw	625 mA (120V mains)
Thermal	205 BTU/h (typical)
Dimensions (HWD)	1.75" x 19" x 15" (44.45 mm x 482.6 mm x 381 mm)
Accessories Included	6 ft UL/CSA/IEC line cord • User manual • Optional audio I/O ship kit

As part of QSC's ongoing commitment to product development, specifications are subject to change without notice.



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I/O Frame Spec Sheet 12/21/12



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This guide will walk you through available resources for using the integrated control functionality within Q-SYS



### Conference Room Sample Designs

QSC offers sample designs for common conference room scenarios, which are preinstalled along with Q-SYS Designer Software. They provide a good starting point for a medium conference room, including suggested I/O configuration, gain structure, EQ blocks, VoIP and a basic user control interface.

Learn more: [Conference Room Default Design](#)



### Third-party Device Integration

Q-SYS offers a library of third-party control plugins for a number of common devices that can be quickly added to your system design via Designer Asset Manager, a cloud-based tool available with Q-SYS Designer Software. Learn about some of the available plugins: [QSC Partner Page](#).



### Command Buttons

Use the Command Buttons control component to send simple, one-way communication strings (via TCP, UDP or Serial) to a third-party device.

Learn more: [Command Buttons](#)



### Scripting Engine

The Q-SYS Scripting Engine allows you to create custom scripts using modern, accessible scripting languages, including Lua. QSC offers a free, two-part training series on Q-SYS Control, including online and hands-on classroom training.

Learn more: [Q-SYS Training](#)



### Block Controller

Block Controller is a visual coding tool that uses interlocking, graphical blocks to let you quickly build control scripts without any programming knowledge.

Learn more: [Block Controller](#)



### Building Custom UCIs

Whether you need to control native or third-party devices, Q-SYS makes it easy to build custom user control interfaces (UCIs) for your customers. With simple drag-and-drop controls, there is no need for any programming experience. Learn more: [UCI Creation and Management](#)



## DN-700C

### Network CD / Media Player with Digital Audio Output and RS-232c

#### Key Features:

- Streams audio over the network (DLNA)
- Supports playback of CD-DA, WAV, AIFF, MP3 & AAC files
- USB device (mass storage class) and iPod playback
- Large, bright OLED display
- Balanced XLR audio output
- AES/EBU digital format output
- Supports external control operation via IP Control (Ethernet), RS-232c, GPIO, and IR
- Extended control via Ethernet using its improved web-GUI 'Web Remote' and/or included DENON Professional Product Manager software (PC/Mac)
- 20 Hot Starts
- Supports the Denon Professional Pitch Control App (available from the App Store™)
- Pitch control playback allows adjustment of the playback speed between -16% to +16% in 0.1% steps
- End Monitor and User-selectable Finish Mode features
- 1RU/1HE Rackmount Size
- Detachable, IEC-weighted AC inlet

#### Overview:

The DN-700C is designed to be fully functional as a broadcast/professional installation quality network CD and

#### Specifications:

- Digital Audio System
  - System: Network CD / Media Player
  - Compatible media: CD Media, USB flash memory, USB HDD, iPod
  - Playable formats, file systems: CD
    - CD-DA (CD Text), CD-ROM (ISO9660)
    - USB: FAT16 / FAT32 / HFS+
  - Playable WAV Format
    - Extension: WAV, AIFF, AIF
    - Resolution: 16 / 24-bit
    - Sampling Frequency: 96, 48, 44.1kHz
  - Playable MP3 Format
    - Extension: MP3
    - Bit rate: 32–320kbps, VBR
    - Sampling Frequency: 48, 44.1kHz
  - Playable AAC Format
    - Extension: M4A
    - Compression method: AAC-LC
    - Bit rate: 64–320kbps, VBR
    - Sampling frequency: 48, 44.1kHz
  - Number of channels: 2 (stereo), 1 (mono)
  - Audio frequency characteristics: 20 Hz – 20 kHz (+0.5dB)
  - S/N ratio: More than 105dB (A-Weighted)
  - Total harmonic distortion Less than 0.005%
  - Dynamic range: More than 105dB (For 24-bit WAV playback)
  - Channel separation: Less than –106dB

media player with the option of multiple audio sources.

Housed in a 1RU rack-mountable chassis, the DN-700C Network Media / CD Player's core features are focused on true audio source versatility and immediate access to pro performance and high-quality audio at the touch of a button. Complete with a front USB port for mass storage devices and iPod® playback offers connectivity to the latest sources of music files including .wav, .mp3, .wma, .aiff, .m4a & .aac, as well as a slot-loading CD mechanism for playback of mp3 CDs and CD-DA (.cda).

The DN-700C can be controlled using a variety of remote control interfaces for varying install and broadcast situations. From IR remote control, parallel (GPIO), RS-232c serial control and even control via a network with the built-in Web-GUI. This improved web-based interface allows a user full control of the DN-700C, from setup menus to transport control and even hot start playback— even from mobile browsers. This provides complete access to a player located in remote areas or when the installation is not always easily accessible.

The front panel is designed for convenient use in professional installation and broadcast environments where ease of access to the audio source and transport controls is imperative, and further includes; five front panel hot start buttons that provide direct access to specific audio files, cue to audio, program playback and a bright OLED display with 'end monitor' and 'finish mode' features to signal the end of the audio track.

Denon Professional's Product Manager Software is included with the DN-700C for single point control of multiple players from a PC/Mac over the network. Complete with full access to the Web Remote as well as unique power on/off capabilities that allow power on and power off sequences to be programmed remotely for single units or multiple units in groups.

- Variable pitch width: -16% - +16%
- Variable trim adjustment width: +2.0dB
- Output
  - 0dBu=0.775Vrms, 0dBV=1.0Vrms
  - Balanced Analog Out L/R
    - Type: XLR (1:GND, 2:HOT, 3:Cold)
    - Load impedance: Over 600Ω
    - Output level: 8.23 dBu (Max. 24 dBu)/ at 600Ω
  - Unbalanced Analog Out L/R
    - Type: RCA terminal
    - Load impedance: Over 10kΩ
    - Output level: 2 Vrms (Max 10dBV)/ at 10kΩ
  - Balanced Digital Out
    - Type: XLR (1:GND, 2:HOT, 3:Cold)
    - Output impedance: 110Ω
    - Standard output level: 3.5 Vp-p
    - Format: IEC-60958 (AES/EBU)
  - Unbalanced Digital Output
    - Type: RCA terminal
    - Output impedance: 75Ω
    - Standard output level: 0.5 Vp-p
    - Format: IEC-60958 (Coaxial)
  - Headphone output
    - 20 mW / 32Ω
- Environmental Conditions
  - Operational temperature: 5 to 35°C (41 to 95°F)
  - Operational humidity: 25 to 85% (no condensation)
  - Storage temperature: -20 to 60°C (-4 to 140°F)
- General
  - Power consumption: 30W, 0.4W (standby)
  - Power supply
    - AC 120V, 60Hz (USA and Canada models)
    - AC 230V, 50/60Hz (European, U.K. and Asia Pacific models)
    - AC 100V, 50/60Hz (Japan model)
  - Dimensions (width x depth x height, with rack ears)
    - 19.00" x 12.78" x 1.73" (483 mm x 325 mm x 44 mm)
  - Weight
    - 9 lbs 0.62 oz (4.1 kg)
- Others
  - Maximum storage capacity: Up to 2 TB
  - Maximum file size: 4 GB
  - Maximum number of files: 2000 files (for 1 folder)
  - Maximum number of folders: 1000 folders
  - Maximum number of folder hierarchies: 8 (under the root directory)
  - Maximum number of marks: 30 per file
  - Maximum file name length: 255 characters
  - Maximum folder name length: 255 characters
  - Maximum preset name length: 8 characters
  - Maximum machine ID name length: 8 characters



Balanced and unbalanced audio outputs make it easy to integrate into any installation, and there is a USB port for firmware updates. The display brightness is adjustable, and the operation can be switched from stereo to mono. An IR remote is included.

- ANT: Loop antenna
- DAB/DAB+ Section
  - Frequency Range: 174.928 - 239.200 MHz (Band III)
  - Sensitivity: 100 dBm
  - Signal to Noise Ratio: > 70 dB
  - Frequency Response: 20 - 20 kHz (±3 dB)
  - Stereo Separation: @ 1 kHz > 60 dB
  - Antenna Input Impedance: 75 Ω
- Environmental
  - Operating Temperature: 5 °C to 35 °C
  - Storage Temperature: -20 °C to +60 °C
  - Operating Humidity: 25 – 85%, no condensation
- General
  - Supply Voltage: 115V or 230V, 50 - 60Hz (Voltage Select Switch)
  - Dimensions: 19 x 1.7 x 7.9" (482 x 43 x 200mm)
  - Weight: 5.5 lbs (2.5 kg)



Motivate your Team, Fans and Sponsors.  
Click Effects ProAudio Rocks the House

The #1 Selling In-Game  
Audio Presentation System

# PROAUDIO

PRODUCT INFORMATION SHEET

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## THE #1 SELLING IN-GAME AUDIO PRESENTATION SYSTEM

Click Effects ProAudio is the most unique, powerful and dependable game-day presentation tool available! Chosen by hundreds of professional and scholastic sports venues world-wide, from the singing of the National Anthem to the final play of the game.

\* ProAudio supports Windows 7 Vista & Windows 10 Operating Systems.



# MOTIVATE YOUR TEAM, FANS AND SPONSORS. PROAUDIO ROCKS THE HOUSE!

ProAudio, part of ChyronHego's Click Effects line of solutions for sports stadium presentations and broadcasts, is driven by an extremely intuitive user interface. Regardless of the technical expertise of your staff, you can be ready for almost any event in no time at all.

Adding ProAudio to your production is easy. ProAudio is offered as a turnkey rack mount chassis, laptop, or software-only installation. Pick the method that works best for you.



# KEY FEATURES

- Broadcast quality playback
- Batch capture MP3/WAV/WMA files
- Generate sponsor play logs
- Play activity reporting
- 5000+ on-screen buttons
- Non-linear wave editor
- Assignable hot keys
- Available in software-only, turnkey laptop, or turnkey rack-mount systems



# TECHNICAL SPECIFICATIONS

## OPERATING SYSTEM REQUIREMENTS

- Windows 10 (Pro only)
- Windows 8
- Windows 7
- Windows Vista
- Windows XP (32-bit only)
- **Monitor Resolution:**  
1024x768 minimum resolution

## OUTPUT

- **Line Outputs:**  
2x ¼" TRS Balanced + 2x TCA
- **Level:** +16dBu maximum (¼" TRS)
- **Impedance:** 1k Ohm balanced,  
500 Ohm unbalanced
- **D/A - A/D Sample Rate:**  
44.1kHz or 48kHz (user setting)
- **Headphone Output:**  
1x ⅛" stereo jack

## LINE INPUT

- **Inputs:**  
2x ¼" TRS balanced or unbalanced
- **Input Impedance:** 20k Ohm  
balanced, 10k Ohm unbalanced
- **Maximum Input Level:** +12dBu
- **Frequency Response:**  
+0, -0.2dB 20Hz-20kHz, ref 1kHz

## MICROPHONE INPUT

- **Inputs:** 1x female XLR pin2 hot
- **Input Impedance:**  
600 Ohm balanced
- **Gain:** +50dB
- **Maximum Input Level:** +10dBu
- **Frequency Response:**  
+0, -0.5dB 20Hz-20kHz, ref 1kHz

## AUDIO DEVICE

- **USB Type A Socket:**  
version 1.1 (version 1.1 hubs  
are not supported)
- **Power Requirements:**  
USB powered

## ABOUT CHYRONHEGO

ChyronHego, a portfolio company of Vector Capital, is a global leader in products, services, and solutions for the broadcast and sports industries. Specializing in live television, news, and sports production, ChyronHego offers some of the industry's most widely deployed solutions — including Lyric®, the world's most popular broadcast graphics creation and playout offering; the all-new CAMIO® Universe newsroom workflow; and TRACAB® Optical Tracking, the global leader in optical sports tracking systems as well as Click Effects, the most proven and versatile stadium broadcast family of graphics products. Headquartered in Melville, New York, ChyronHego also has offices in the Czech Republic, Denmark, Finland, Germany, Mexico, the Netherlands, Norway, Singapore, Slovak Republic, Sweden, and the United Kingdom.

For more information on ChyronHego, visit [www.chyronhego.com](http://www.chyronhego.com).

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## Overview

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Distilling core features and performance from the CL series into an all-in-one digital mixing console that is ideal for a wide range of applications such as live sound reinforcement, corporate events, and fixed installations, the QL5 Digital Mixing Console features a 32 + 2 fader configuration in a compact unit that can handle big applications when required.



Rear Panel

## Features

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- 32 + 2 fader configuration adapts to a wide range of channel layouts.
- Compact console with large-scale capabilities.
- Input channels: 64 mono, 8 stereo.
- Busses: 16 mix, 8 matrix (Input to Matrix supported).
- Local I/O: 32 in, 16 out.
- Built-in Dugan automixer provides optimum channel balance while allowing the operator to concentrate fully on optimizing the overall sound.
- A large touch-panel display, selected channel controls, and a “Touch and Turn” knob make up an intuitive, efficient control interface.
- Extensive built-in input and output capacity that can handle a variety of applications without the need for stage boxes or other external equipment.
- Built-in Dante networking allows for flexible system expansion.
- Up to 24 R series I/O rack units can be connected to each console.
- An innovative “Port to Port” feature allows the console to function as a remote I/O device for any other QL or CL console.
- “Gain Compensation” allows multiple consoles to share and control the same I/O unit.
- Virtual “Premium Rack” with VCM models of the renowned RND Portico 5033 equalizer and Portico 5043 compressor/limiter, plus other VCM equalizers, compressors, and studio-quality effects.
- Virtual “Effect Rack” allows simultaneous use of up to 8 effects from a selection of 46 ambience effects and 8 insertion effects.
- Virtual “GEQ Rack” allows graphic EQ or 8-band PEQ to be inserted into the output buses as required for room equalization and other functions.
- Seamlessly integrated remote control and offline editing via an Apple iPad® or other computing device.
- CL series compatibility: data exchange capability between QL and CL consoles.
- Direct 2-track recording to standard USB flash drives, or serious multitrack recording to a DAW via Dante.
- Multitrack recordings can be used for “virtual sound checks” when performers aren’t available.
- Dual Mini-YGDAI card slots provide easy I/O expansion as well as extra processing capabilities.
- Other features: comprehensive Fader Bank section with recallable four custom banks, editable channel names and colors, user defined keys and on-screen user defined knobs, 300 scene memories, input and output delays, ample EQ and dynamics processing, 16 DCA groups, 8 mute groups, 5-in/5-out GPI interface, multiple user key sets, on-screen help, and more.

# Specifications

1/2

## Functional Specifications

<b>Mixing Capacity</b>	Input Mixing Channels	64 mono + 8 stereo	<b>Input Channel Functions</b>	Pan	CENTER NOMINAL or LR NOMINAL for monaural input channels in V3.1 or later
	Mix Buses	16		DCA Group	16 (Output DCA support in V3.0 or later)
	Matrices	8 (Input to Matrix supported)		DCA Rollout	No
	Stereo Buses	1		MUTE Group	8
	Mono Buses	1		Number of Inserts	2
	Cue Bus	1 (Second Cue Bus supported in V4.0 or later)		Direct Out	Yes
<b>Local Connectors</b>	Analog Input	32	<b>Output Channel Functions</b>	PEQ	4 Band Full PEQ (RTA overlay support in V3.0 or later, New EQ Algorithms support in V4.0 or later)
	Analog Output	16		GEQ	Virtual Rack
	MY Slots	2		Dynamics 1	Compressor / Expander / Compander-H / Compander-S
	Dante I/O	Primary / Secondary		Output Channel Delay	No
	Digital Out	1 (AES/EBU)		MUTE Group	8
	GPI	5 in/ 5out		Number of Inserts	2
	Word Clock I/O	In / Out	<b>Premium Rack</b>	Number of Premium Racks	8
	MIDI I/O	In / Out		Mountable Device	RND Portico5033 / RND Portico5043 / U76 / Opt-2A / EQ-1A / Dynamic EQ / Buss Comp 369 (V3.0 or later) / MBC4 (V4.0 or later)
	USB	1 (File Save/Load, 2 Track Rec/Play)	<b>Effect Rack</b>	Number of Effect Racks	8
	External Redundant PSU	No		Number of Effect Programs	54
	Meter Bridge	No		Mountable Device	Effect / 31BandGEQ / Flex15GEQ / 8Band PEQ (V3.0 or later)
	Ethernet	Yes	<b>GEQ Rack</b>	Number of GEQ Racks	8
	Lamp	2		Mountable Device	31BandGEQ / Flex15GEQ / Dugan Automixer / 8Band PEQ (V3.0 or later) (RTA overlay support in V3.0 or later, GEQ gain control from the TOUCH AND TURN knob in V4.0 or later)
	Talkback In	No	<b>Dante</b>	Number of I/O Channels	64 in / 64 out
	Foot Switch	No		Dante Patch from Console	Yes
	Video Out	No	<b>Recording</b>	USB Memory Recording	Yes
	TC In	No		DVS Recording	Yes (DVS and Nuendo Live bundled)
	Fault Output	No	<b>Broadcast Functions</b>	5.1 Surround Panning	Yes (V3.0 or later)
Phones	1	Surround Monitor		Yes (V3.0 or later)	
AC Inlet	1 (V-Lock Type)	Mix Minus		Yes (V3.0 or later)	
		L-Mono / R-Mono / LR-Mono		Yes (V3.0 or later)	
<b>Scene Memory</b>	Number of Scenes	300	<b>Monitor</b>	Solo Mode	Yes (V4.0 or later)
	Recall Safe	Yes		Oscillator	Sine Wave 1ch / Sine Wave 2ch (V3.0 or later) / Pink Noise / Burst Noise
	Focus Recall	Yes	<b>Other Functions</b>	Port to Port	Yes
	Fade Time	Yes (0s ~ 60s)		Dual Console	No
	Preview	Yes		Timecode Reader/Display	No
	Selective Load / Save	Yes		Timecode Chase (Event List)	No
	Global Paste	Yes		GPI/MIDI	Yes
	Event List	No		Wireless Mic Monitoring	Yes
	Overlay	No		RTA	Yes (V3.0 or later)
	Isolate	No		Output Port Delay	Yes (0ms ~ 1000ms, frame delay support in V3.0)
Tactile Control Keys	No (on-screen)				
<b>Input Channel Functions</b>	Gain Compensation	Yes			
	Silk	No			
	Digital Gain	Yes (-96dB ~ +24dB)			
	ATT	-96dB ~ 0dB			
	HPF	20Hz ~ 600Hz, -6 or -12dB/oct Selectable			
	PEQ	4 Band Full PEQ (RTA overlay support in V3.0 or later, New EQ Algorithms support in V4.0 or later)			
	Dynamics 1	Gate / Ducking / Compressor / Expander (Key-in Filter on the Compressor and Expander in V4.0 or later)			
	Dynamics 2	Compressor / Compander-H / Compander-S / De-esser			
	Input Delay	Yes (0ms ~ 1000ms, frame delay support in V3.0 or later)			

Continued on page 3

## Specifications

2/2

<b>Other Functions</b>	Cascade	Yes
	User Level	Yes
	Help File	Yes
	Channel Link	Yes (Output Channel Link support in V3.0 or later)
<b>User Interface</b>	Display	10 inch Touch Panel
	Faders	32 + 2
	Selected Channel Encoders	Gain, HPF, PEQ (controls for a selected band), Dynamics 1/2(Threshold only), Pan
	Channel Encoder	No
	Channel Name / Color Display	Yes
	Custom Fader Banks	Yes (customized for each fader section)
	User Defined Keys	12 (x 4 banks in V3.0 or later)
	User Defined Knobs	4 (on-screen)
	Touch and Turn Knob	Yes
	Monitor Level Knob	Yes (on-screen)
<b>Software</b>	Editor	QL Editor (Win/Mac, CSV files import/export in QL Editor V4.0.0 or later)
	StageMix	QL StageMix (iPad app)
	MonitorMix	Yes (V4.00 or later)
	Nuendo Live: Control integration	Yes
	Console File Converter	Yes (Win/Mac)

## General Specifications

<b>Sampling frequency rate</b>	Internal: 44.1kHz, 48kHz External: 44.1kHz (+4.1667%, +0.1%, -0.1%, -4.0%) ±200ppm 48kHz (+4.1667%, +0.1%, -0.1%, -4.0%) ±200ppm
<b>Signal Delay</b>	Less than 2.5 ms OMNI IN to OMNI OUT (@fs=48kHz)
<b>Fader</b>	100mm motorized, Resolution=1024steps +10dB to -138dB, -∞dB all faders
<b>Total harmonic distortion*1</b> INPUT to OMNI OUT Input Gain=Min.	Less than 0.05% 20Hz to 20kHz @+4dBu into 600Ω
<b>Frequency response</b> CH INPUT to OMNI OUT	+0.5, -1.5dB 20Hz to 20kHz, refer to +4dBu output @1kHz, INPUT to OMNI OUT
<b>Dynamic range</b> (maximum level to noise level)	112dB typ., DA Converter, 108dB typ., INPUT to OMNI OUT, Input Gain = Min.
<b>Hum &amp; noise level*2</b> (20Hz to 20kHz), Rs=150Ω	-128dBu Equivalent input noise, Input Gain=Max., -88dBu Residual output noise, ST master off
<b>Crosstalk</b> (@1kHz) Input Gain=Min.	-100dB*3, Adjacent INPUT/OMNI OUT channels
<b>Phantom Power</b>	+48V
<b>Power requirements</b>	AC100V-240V, 50/60Hz
<b>Power consumption</b>	200W
<b>Dimensions (W x H x D)</b>	828mm x 272mm x 563mm (32.6" x 10.7" x 22.2")
<b>Weight</b>	21.8kg (48.1lbs)

\*1 Total harmonic distortion is measured with a 18dB/Oct filter @80kHz.

\*2 Hum & noise level is measured with a 6dB/oct filter @12.7kHz; equivalent to 20kHz filter with infinite dB/Oct attenuation.

\*3 Crosstalk is measured with a 30 dB/octave filter @22kHz.

## Analog Input Specifications

Input terminal	GAIN	Actual source impedance	For use with nominal	Input level			Connector
				Sensitivity	Nominal	Max. before clip	
INPUT 1-32	+66dB	7.5kΩ	50-600Ω Mics & 600Ω Lines	-82dBu	-62dBu	-42dBu	XLR3-31 type*
	-6dB			-10dBu	+10dBu	+30dBu	

## Analog Output Specifications

Output terminal	Actual source impedance	For use with nominal	GAIN SW	Output terminals		Connector
				Nominal	Max. before clip	
OMNI OUT 1-16	75Ω	600Ω Lines	+24dB +18dB	+4dBu -2dBu	vt+24dBu +18dBu	XLR3-32 type*
PHONES	15Ω	8Ω Phones	—	75mW	150mW	ST Phone Jack**
		40Ω Phones	—	65mW	150mW	

## Digital I/O Specifications

Terminal	Format	Data length	Level	Audio	Connector
Primary/Secondary	Dante	24bit or 32bit	1000Base-T	64ch Input /64ch Output @48kHz <sup>1</sup>	etherCON Cat5e

## Digital Output Specifications

Terminal	Format	Data length	Level	Connector
DIGITAL OUT	AES/EBU	AES/EBU Professional Use	24bit	RS422 XLR3-32 type*

## I/O Slot (1-2) Specifications

A Mini-YGDAI card can be inserted into slots 1-2. Only slot 1 supports serial interfaces.

## Control I/O Specifications

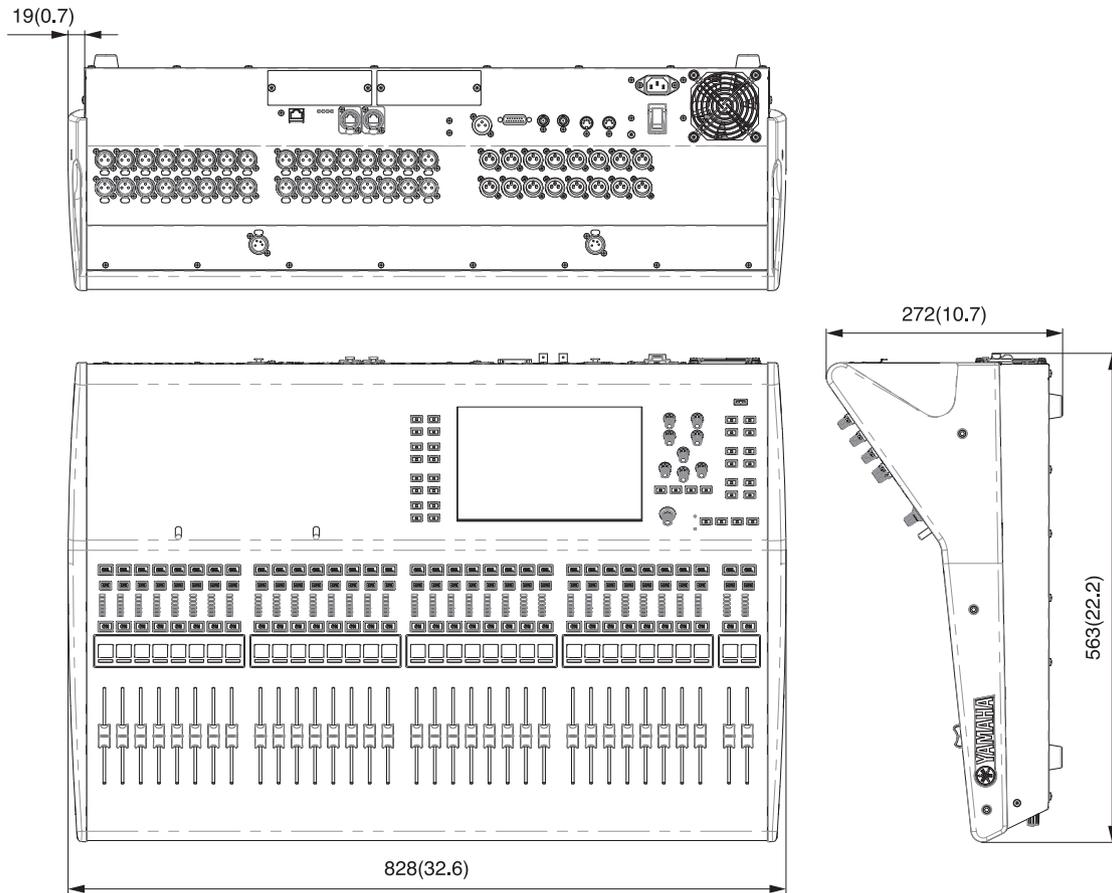
Terminal	Format	Level	Connector
MIDI	IN	MIDI	DIN Connector 5P
	OUT	MIDI	DIN Connector 5P
WORD CLOCK	IN	—	T TL / 75Ω terminated
	OUT	—	T TL / 75Ω
GPI (5IN/5OUT)	—	—	D Sub Connector 15P (Female) <sup>1</sup>
NET WORK	IEEE802.3	10BASE-T/100Base-T X	RJ-45
LAMP (x2)	—	0V - 12V	XLR-4-31 type <sup>2</sup>
USB HOST	USB 2.0	—	USB A Connector (Female)

\*1 Input pin: T TL level, w/ internal pull-up (47kΩ) Output pin: Open drain output (Vmax=12V, maximum sink current /pin=-75mA)

Power supply pin: Output voltage Vp=5V, Max. output current =300mA

\*2 4 pin=+12V, 3 pin=GND, Lamp nominal power: 5W, Brightness (voltage) can be adjusted from the software.

## Dimensions



Unit: mm (inch)

## Options

- |                  |            |
|------------------|------------|
| • Gooseneck Lamp | LA1L       |
| • I/O Rack       | Rio3224-D  |
| • I/O Rack       | Rio1608-D  |
| • Input Rack     | Ri8-D      |
| • Output Rack    | Ro8-D      |
| • I/O Rack       | RMio64-D   |
| • I/O Rack       | RSio64-D   |
| • L2 Switch      | SWP1-8     |
| • L2 Switch      | SWP1-8MMF  |
| • L2 Switch      | SWP1-16MMF |

## Software

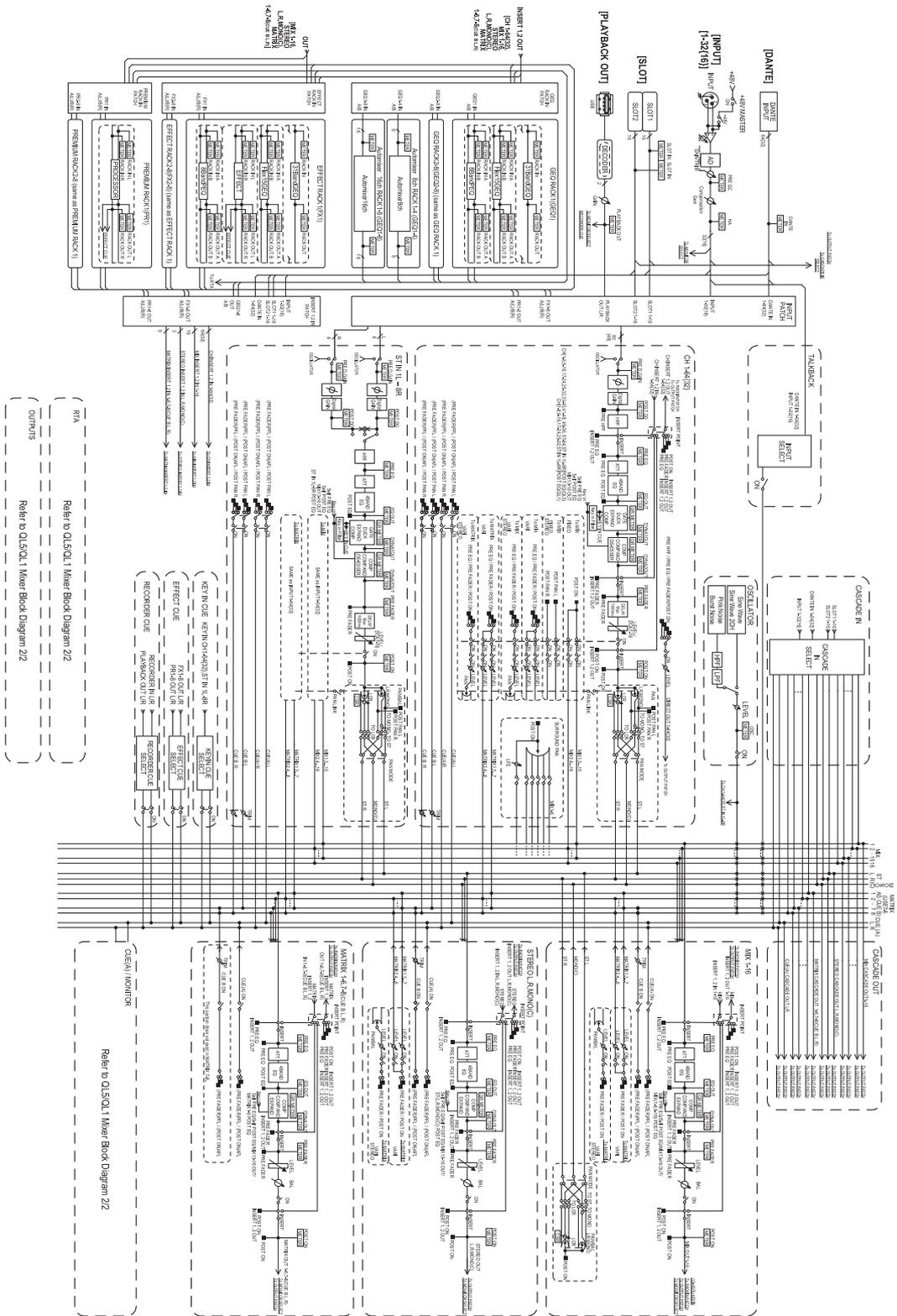
- QL Editor
- QL StageMix
- MonitorMix
- Yamaha Console File Converter
- Steinberg Nuendo Live

## Architectural and Engineering Specifications

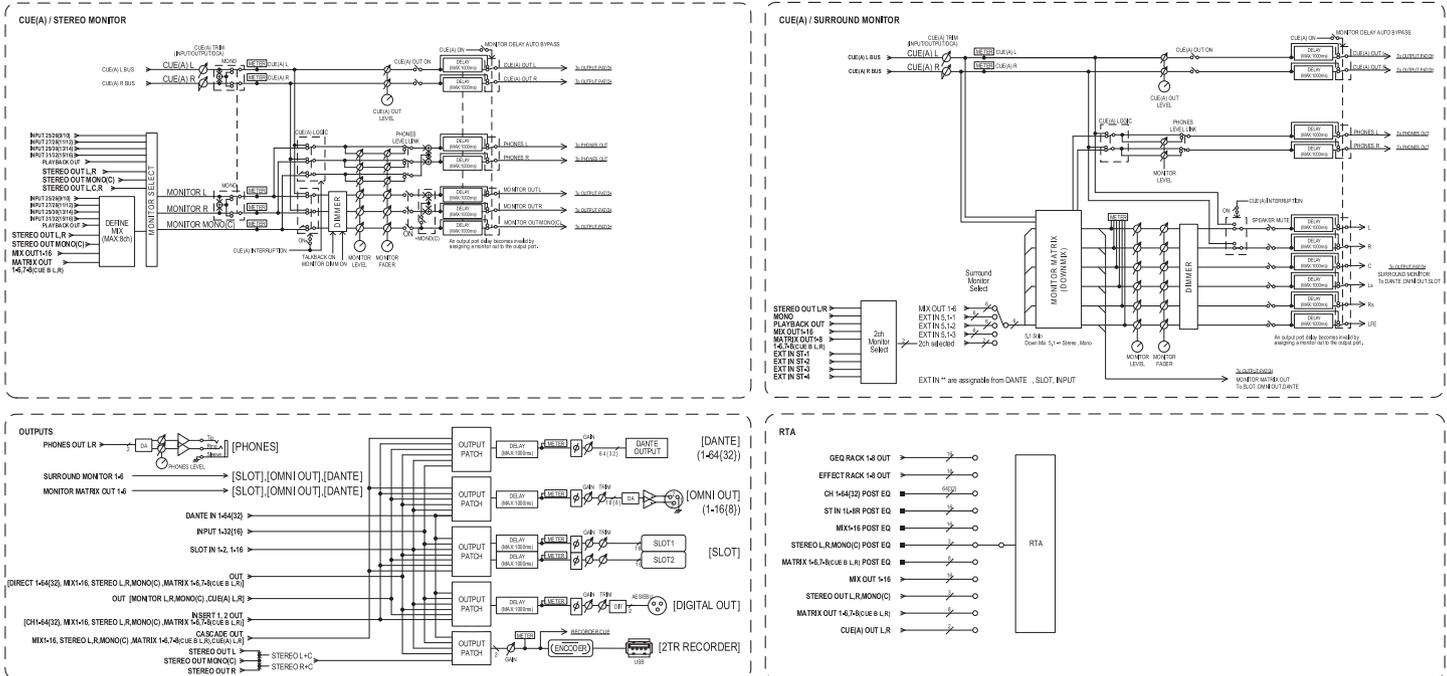
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The Yamaha QL5 shall be a compact all-in-one Digital Mixing Console that is suitable for a wide range of application including live sound reinforcement, corporate events, and fixed installations. It shall include Dante connectivity as standard to allow flexible system configuration in combination with R series I/O rack units. With 32 + 2 (master) faders it shall provide a mixing capacity of up to 64 mono and 8 stereo inputs, 16 mix buses, and 8 matrix buses (supporting input to matrix). All channel EQ shall allow selection of four different EQ algorithms. 8 Premium Racks shall allow use of a range of software sound processors and effects, including the Rupert Neve Designs Portico 5033 EQ. 8 additional effect racks shall allow use of 54 effect programs. A GEQ rack shall provide graphic EQ facilities as well as use of Automatic Mixer functionality developed in cooperation with Dan Dugan Sound Design. The mixing console shall be compatible with QL Editor, QL StageMix, MonitorMix, and other Yamaha support software running on external computing devices. Physical controllers other than faders shall include the Selected Channel controllers and 12 User Defined Keys. Local I/O shall include 32 microphone/line inputs, 16 line outputs, AES/EBU output, 2 Mini YGDAI slots, GPI ports (5 in/5 out), word clock I/O, MIDI I/O, network port, and USB port. Dimensions shall be 828 (W) x 272 (H) x 563 (D) mm. Weight shall be 21.8 kg.

# Block Diagrams



# Block Diagrams



\*All information subject to change without notice.  
 \*All trademarks and registered trademarks are property of their respective owners.  
 Created in March, 2017

# MSP Series

## Powered Monitor Speaker

### MSP7 STUDIO



MSP7 STUDIO Rear Panel



### MSP5 STUDIO



MSP5 STUDIO Rear Panel



### SW10 STUDIO



SW10 STUDIO Rear Panel



### MSP3



MSP3 Rear Panel



## Refined Monitoring Precision.

### MSP7 STUDIO

- 2-way bass-reflex bi-amplified near field studio monitor
- 6.5" cone woofer and 1" titanium dome high-frequency unit delivers 45Hz- 40kHz frequency response.
- 130 watts (LF 80W + HF 50W) dynamic bi-amplified power
- XLR balanced input
- Advanced magnetic structure design
- One-piece molded enclosure with rounded baffle
- 31 positions level control facilitates precise overall system level matching
- Low cut switch and trim control (High/Low)
- Full magnetic shielding

#### OPTIONS (MSP7 STUDIO)

BWS50-190/260 Wall Bracket

### MSP5 STUDIO

- 2-way bas-reflex bi-amplified near field studio monitor
- 5" cone woofer and 1" titanium dome high-frequency unit delivers 50Hz- 40kHz frequency response.
- 67 watts (LF 40W + HF 27W) dynamic bi-amplified power
- XLR balanced input and 1/4" unbalanced input
- Advanced magnetic structure design
- One-piece molded enclosure with rounded baffle
- 31 positions level control facilitates precise overall system level matching
- TRIM control(High/Low)
- Full magnetic shielding

#### OPTIONS (MSP5 STUDIO)

BCS20-150/210 Ceiling Bracket

### SW10 STUDIO

- 10" Bass-reflex powered subwoofer delivers solid 25Hz- 150Hz frequency response.
- 180 watts dynamic power
- XLR balanced inputs (L/R/SUBWOOFER)
- XLR balanced outputs(L/R/SUBWOOFER) parallel connection with input signals
- Level control facilitates precise system level controls.
- LPF controls (40-120 Hz, 80Hz at center click)
- Phase switch simplifies phase alignment.
- Full magnetic shielding

### MSP3

- A compact monitoring speaker with high sound quality
- 10 watts dynamic power
- 3 inputs: mic x 1 (phone), line x 2 (phone & RCA)
- Tone control (high/low).
- Line output for expanding your speaker system
- Options for convenient stand or wall mounting (sold separately).

#### OPTIONS (MSP3)

BCS20-150/210  
Ceiling Bracket

BWS20-120/190  
Wall Bracket

BAS10  
Free-Angle Clamp

BMS-10A  
Mic Stand Adaptor

## SPECIFICATIONS

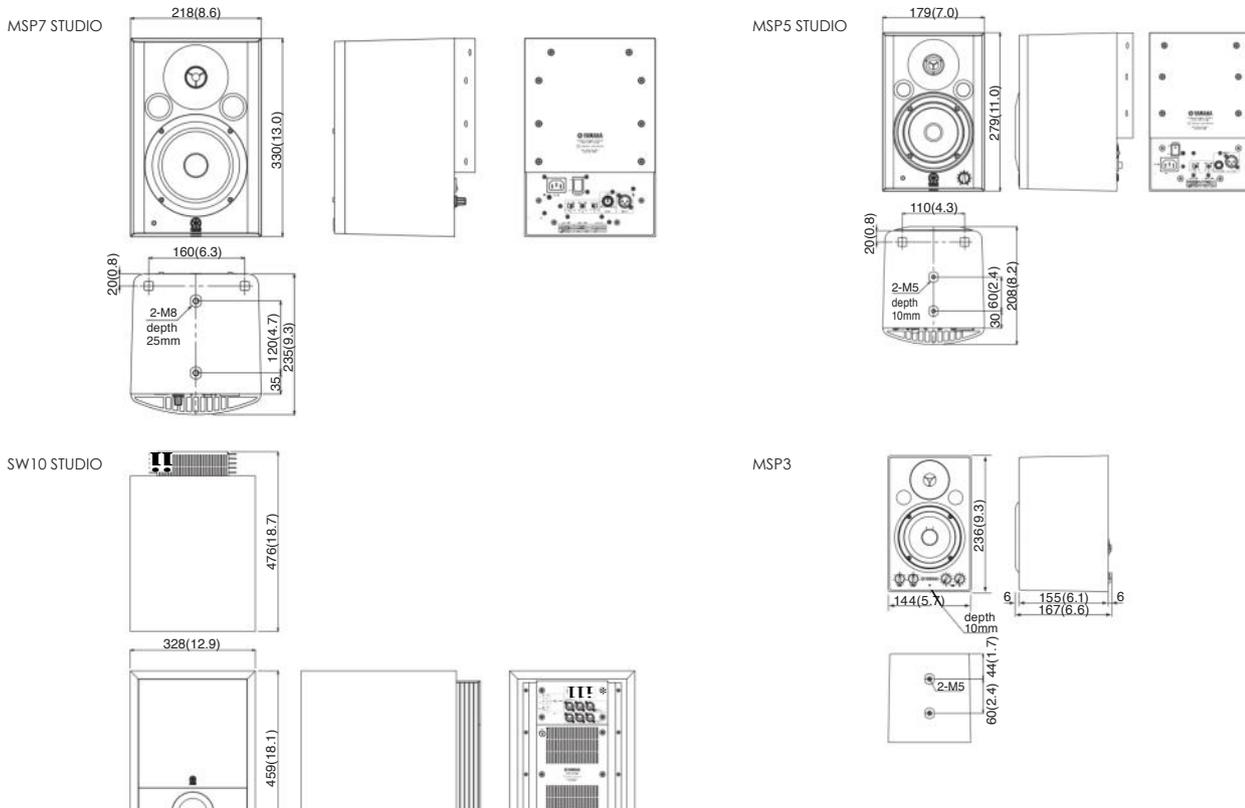
Model		MSP7 STUDIO	MSP5 STUDIO	SW10 STUDIO	MSP3	
<b>GENERAL</b>	<b>Type</b>	Bi-amp 2-way powered speaker	Bi-amp 2-way powered speaker	Powered subwoofer	2-way powered speaker	
	<b>Crossover Frequency</b>	2.5 kHz LF:30dB/oct, HF:30dB/oct	2.5 kHz LF:24dB/oct, HF:24dB/oct	-	4.0kHz	
	<b>Overall Frequency Response</b>	45Hz-40kHz (-10dB)	50Hz-40kHz (-10dB)	25Hz-150Hz (-10dB)	65Hz to 22kHz (-10dB)	
	<b>Maximum Output Level</b>	106dB, 1m on Axis	101dB, 1m on Axis	111dB, 1m on Axis	98dB, 1m on Axis	
	<b>Dimensions (W x H x D)</b>	218 x 330 x 235mm (8.6" x 13.0" x 9.3")	179 x 279 x 208mm (7.0" x 11.0" x 8.2")	328 x 459 x 476mm (12.9" x 18.1" x 18.7")	144 x 236 x 167mm (5.7" x 9.3" x 6.6")	
	<b>Weight</b>	12.2kg (26.9lbs)	7.9kg (17.4lbs)	26.5kg (58.4lbs)	4.4kg (9.7lbs)	
	<b>Magnetic Shielding</b>	Yes	Yes	Yes (None covered type)	Yes	
<b>Speaker Section</b>	<b>Components</b>	<b>LF</b>	6.5" cone	5" cone	10" cone	
		<b>HF</b>	1.0" Titanium dome	1.0" Titanium dome	-	4" (10cm) cone
	<b>Enclosure</b>	<b>Type</b>	Bass-Reflex	Bass-Reflex	Bass-Reflex	Bass-Reflex
	<b>Material</b>	PP	PP	MDF	PP	
<b>Amplifier Section</b>	<b>Output Power*</b>	<b>LF</b>	80W THD = 0.05%, RL = 4Ω	40W THD = 0.02%, RL = 4Ω	180W f = 100Hz, THD = 1%, RL = 8Ω	20W f = 1kHz, THD = 0.1%, RL = 4Ω
		<b>HF</b>	50W THD = 0.05%, RL = 6Ω	27 W THD = 0.02%, RL = 6Ω	-	-
	<b>S/N, IHF-A filter</b>	≥99dB, LEVEL = Max	≥94dB, LEVEL = Max	≥100dB, LEVEL = Max	-10dB/Line1: (RCA phone unbalanced)	
	<b>Input Sensitivity</b>	<b>XLR 3-31</b>	+4dBu, LEVEL = Center -6dBu, LEVEL = Max	+4dBu, LEVEL = Center -6dBu, LEVEL = Max	+4dBu, LEVEL = Center -6dBu, LEVEL = Max	+4dBu / Line2
		<b>PHONE</b>	-	10dBu, LEVEL = Cente -20dBu, LEVEL = Max	-	+4dBu / Line2
	<b>Input Connectors, Impedance</b>	XLR-3-31 (balanced), 10kΩ	XLR-3-31 (balanced), 10kΩ PHONE (unbalanced), 10kΩ	XLR-3-31 x 3 (balanced), 10kΩ	Line1: (RCA phone, unbalanced),10kΩ Line2: (XLR3-31, Phone, balanced, parallel),10kΩ	
	<b>Output Connectors</b>	-	-	XLR-3-32 x 3 (balanced), Parallel connection with input	-	
	<b>Controls</b>	<b>Level Control</b>	31 positions detent type VR (Min = ∞Attenuation)	31 positions detent type VR (Min = ∞Attenuation)	Center click VR (Min = ∞Attenuation)	Level control for Line1 & Line2
		<b>LOW CUT Switch</b>	FLAT/80Hz (12dB/oct)/100Hz (12dB/oct)	-	-	-
		<b>HIGH TRIM</b>	+1.5/0/-1.5dB at 15kHz	+1.5/0/-1.5dB at 15kHz	-	-3.0dB to +3.0dB at 10kHz
		<b>LOW TRIM</b>	+1.5/0/-1.5/-3dB at 45Hz	+1.5/0/-1.5/-3dB at 60Hz	-	-3.0dB to +3.0dB at 100Hz
		<b>POWER Switch</b>	On / Off	On / Off	On / Off	On / Off
		<b>PHASE Switch</b>	-	-	Normal / Reverse	-
		<b>LPF control</b>	-	-	40-120Hz, 80Hz at Center Click	-
	<b>Indicators</b>	<b>LED</b>	Power ON: Green LED Clipping: Red LED	Power ON: Green LED Clipping: Red LED	Power ON: Green LED Clipping: Red LED	Power on: Green LED
	<b>Power Consumption</b>	100W	60W	160W	30W	

\* These specifications apply to rated power supplies of 100, 120, 230 and 240 V.

\* Specifications and appearance subject to change without notice.

## DIMENSIONS

unit : mm (inch)





#### Configuration:

LP-41-072-01 Intelligent DSP RF Receiver  
12-Pack (72 MHz)

#### Product Overview:

Ideal for large venues, conferences, and other spaces that need to immediately make assistive listening available to a large audience, the LP-41-072 Intelligent DSP RF Receiver 12-Pack makes it possible to provide more visitors, customers, and clients with an exceptional audio experience.

Each pack includes twelve (12) of our LR-4200-072 digital RF receivers, which feature Listen Technologies' unique DSP SQ (TM) noise reduction technology, an OLED display, dual 3.5 mm output jacks, and more. Each receiver is also equipped with a micro USB connection for fast, easy firmware updates with free [iDSP software](#), as well as charging and set up.

Expand your 72 MHz assistive listening system's capabilities and make sure that industry-leading audio is available for everyone with the LP-41-072 Intelligent DSP RF Receiver 12-Pack from Listen Technologies.

#### Highlights:

- Includes twelve (12) LR-4200-072 industry leading RF receivers, integrated neck loops/lanyards, universal ear speakers, and a 12-unit charging tray
- Advanced DSP SQ (TM) noise reduction technology provides 20 dB less noise than other listening devices
- Smallest device of its kind is easy to carry, wear, and use
- OLED display provides easy channel selection, programming, and battery level monitoring
- Environmentally friendly rechargeable batteries for extended use, easy charging, and long life

#### Includes:

Twelve (12) LR-4200-072-P1 Intelligent DSP RF Receiver Package 1 (72 MHz)\*

One (1) LA-381-01 Intelligent 12-Unit Charging Tray (North America) \*The LR-4200-072-P1 comes with an ear phone/neck loop lanyard, universal ear speaker, quick start guide and a non-proprietary field replaceable Lithium-ion battery.



**Configuration:**

LT-800-072-01 Stationary RF Transmitter (72 MHz) (North America)

**Product Overview:**

Offering outstanding audio clarity, digital signal strength, and 57 selectable channels, the LT-800 is a perfect RF transmitter choice for a wide range of applications. Connected to your main audio system, the LT-800 broadcasts strong, reliable audio to both belt pack receivers and stationary receivers, ideal for providing listeners with the best possible assistive listening experience.

**Highlights:**

- Look & Listen (TM) LCD display for quick channel, programming, and channel lock status information
- Balanced and unbalanced audio inputs allow for use with any audio source
- Built-in auto processor optimizes audio (voice or music) prior to transmission
- 57 available, selectable channels
- VU level meter and test tone for simple installation and set up
- 30-day, no-obligation demonstration available for your venue or business

**Includes:**

- One (1) LT-800 Stationary RF Transmitter (72 MHz)
- One (1) LA-207 Power Supply for LT-800
- One (1) Line Cord
- One (1) Quick reference card

Product Specification: Stationary RF Transmitter (72 MHz)	
<b>Audio</b>	
Frequency Response	50 Hz - 15 kHz ( $\pm 3$ dB)
Signal-to-Noise Ratio	SQ enabled 80 dB, SQ disabled 60 dB
Audio Input 1	Rear panel, one (1) Female XLR or 1/4 in combo connector, balanced, 0 / -55 dBu (line/mic) nominal input level adjustable, -30 / +21 dBu (line/mic) maximum input level, impedance 20k / 1k ohm (line/mic), phantom power +12 VDC
Audio Input 2	Rear panel, two (2) phono connectors, unbalanced, -10 / +10 dBu nominal input level adjustable, +30 dBu maximum, impedance 100k ohm
Audio Processing	Compression can be turned on/off, slope internally adjustable from 1:1 to 4:1, default 2:1
Contour	Cuts and boosts frequencies above 5 kHz
Distortion	< 2% total harmonic distortion (THD) at 80% deviation
Audio Output	Input 1 and input 2, mixed output (rear panel), two (2) phono connectors, unbalanced, -10 dBu nominal output level, +15 dBu maximum, impedance 10 ohm
Headphone Output	Front panel, one (1) 3.5 mm (0.14 in.) stereo connector, unbalanced, adjustable output level, +3 dBu maximum, impedance 10 ohm

Product Specification: Stationary RF Transmitter (72 MHz)	
<b>Controls</b>	
User Controls	Front Panel: Power, test tone on/off, channel up/down, input levels, mix level, contour, monitor volume control Rear Panel: Input 1 Level, (Line, Mic, Mic-Phantom Power), Input 2 level (-10 / +10 dBu), RF power level (low, mid, high)
Internal Adjustments	Compression ratio for audio processor
Programming	SQ on/off, process on/off, channel lock
<b>Indicators</b>	
LCD	Channel designation, lock status, RF power level, programming (front panel)
Audio Input Status LEDs	Indicates Input 1, Input 2, and Mix audio levels; 10 segment LED's (8 green, 2 red)
Processing	Indicated by a green LED when on (front panel)
Test Tone	Red LED illuminates when test tone is enabled.
RF Power	Indicated on the LCD (low, mid, high)
<b>RF</b>	
Frequency Range	72.025 - 75.950 MHz
Number of Channels	17 wide band, 40 narrow band
Frequency Accuracy	± .005% stability +32 <sup>Δ</sup> to +122 SF (Q <sup>9</sup> to +50 QQ)
Antenna Type	Various antennas available
Transmitter Stability	50 PPM
Transmission Range	Up to 305 m (1,000 ft.)
Antenna Connector	BNC
Output Power	80,000 uV at 3 m
Number of Simultaneous Transmitters	6
<b>Power</b>	
Power Supply	In line power supply, Listen part number LA-207 (Line cord is determined by the each Country's AC power standards)
Power Supply Input	100-240 VAC, 50-60 Hz, 0.4 A
Power Supply Output	12 VDC, 1.3 A, 15.6 W
Power Supply Connector	0.02 in (5.0 mm) OD, 0.01 in. (2.5 mm) ID, barrel type
Compliance	UL, CE, GS, TÜV, RoHS
<b>Physical</b>	
Width	21.5 cm (8.50 in.)
Height	4.5 cm (1.75 in.)
Depth	23 cm (9.13 in.)
Color	Black with grey silk screening
Unit Weight with Power Supply	1.6 kg (3.5 lbs.)
Shipping Weight	2.7 kg (6.0 lbs.)
Rack Mounting	One (1) rack space height, 1/2 rack space wide. One (1) or two (2) transmitters can be mounted in one rack space, optional rack mount (LA-326)
Weight	1.2 kg (2.6 lbs.)

Product Specification: Stationary RF Transmitter (72 MHz)	
<b>Environmental</b>	
Temperature - Operation	-10 °C (14 QF) to +40 °C (104 QF)
Temperature - Storage	-20 °C (-4 QF) to +50 °C (122 QF)
Relative Humidity	0 to 95% relative humidity, non condensing
<b>Compliance</b>	
Safety	RoHS
RF	FCC Part 15, Part 90, Industry Canada

# Online RT / RTX

From Orion Power Systems

True Online Power Protection from 1000VA to 3000VA



**Orion Power Systems Online RT/RTX Series provides the ultimate in power quality, manageability, and flexibility.**

### **Ideally suited for:**

- Medical and lab equipment
- Data processing
- Network closets
- VOIP and Telecom
- Security recording devices

## **Product Snapshot**

---

<b>Power Rating</b>	1000VA/800W 1500VA/1200W 2000VA/1600W 3000VA/2400W
<b>Input Voltage Range</b>	55-150 VAC $\pm$ 5%
<b>Output Voltage Range</b>	100*/110*/115*/120 VAC
<b>Frequency (HZ)</b>	40Hz ~ 70Hz
<b>Topology</b>	True On-line Double Conversion
<b>Configuration</b>	Rack (2U) / Tower – pedestal and rack mount kit included

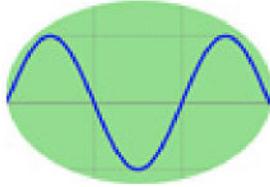
## **Key Features**

- Rotating LCD display includes battery time remaining indicator, much more
- Remote control load segment allows remote rebooting of devices
- Automatic maintenance reminders reduce field failures
- Flexible form factor allows rack mounted or tower deployment
- Stay informed with Free monitoring software or optional SNMP management
- RTX version has available add-on battery modules
- 37 Month Plus Gold Warranty included standard
- Lifetime \$ 150,000 Equipment Protection Policy



## Ultimate Power Quality

Ensure your sensitive equipment lasts longer and is more reliable by supplying it with quality power. The Online RT/RTX series uses double conversion technology to regulate voltage +/- 1% and outputs a pure sine wave. During a power outage, there is no transfer time when going to battery power.



## Advanced Communications

Online RT/RTX features advanced SNMP communications. SNMP Monitoring includes

- Voltage in/out
- Battery Time remaining
- Power logs
- UPS specific information
- Remote outlet control

Receive alerts for via text or email for the following:

- On battery
- Battery Fail
- Battery change due
- UPS warranty expired
- .. much more is available



## LCD Display

State of the Art LCD display rotates to accommodate tower or rack mount installations. Provides real time status information and allows configuration of ups setup parameters. LCD display reports Volts in, Volts out, runtime remaining in minutes, percentage load, and more.



## Hot Swappable Batteries

Maintenance is easy and inexpensive with user replaceable, hot-swappable battery trays. Save money on maintenance by using in-house personnel to change batteries when necessary.



## Online RT / RTX Adapts to Your Needs

- Tower or Rack-mount installation
- With RTX models, Add backup time when needed with extended battery modules
- Load shedding allows shutdown of non-critical equipment in prolonged outages
- Adjustable output voltage to 100/110/115/120/127

### Online RT/RTX Runtime Chart ( EBM only applies to RTX model)

Model	Load				Model	Load			
	25%	50%	75%	100%		25%	50%	75%	100%
DC1000RT / RTX	30	12	7	4	DC2000RT / RTX	29	12	7	4
+ 1 EBM	97.2	45.6	24.9	16.3	+ 1 EBM	66	32	18	12
+ 2 EBM	181.2	85.92	59.6	35.3	+ 2 EBM	143	72	49	31
+ 3 EBM	267.4	128.4	80.9	63.3	+ 3 EBM	224	109	72	54
+ 4 EBM	354.8	173.2	107.8	77.9	+ 4 EBM	306	153	94	70
<b>Model</b>	<b>25%</b>	<b>50%</b>	<b>75%</b>	<b>100%</b>	<b>Model</b>	<b>25%</b>	<b>50%</b>	<b>75%</b>	<b>100%</b>
DC1500RT / RTX	29	12	7	4	DC3000RT / RTX	36	13	7	4
+ 1 EBM	99.5	45.6	26.0	16.3	+ 1 EBM	70	32	18	12
+ 2 EBM	186.9	90.4	59.6	35.3	+ 2 EBM	148	75	49	31
+ 3 EBM	276.5	131.8	80.9	63.3	+ 3 EBM	233	111	74	55
+ 4 EBM	367.2	177.7	110.4	77.9	+ 4 EBM	318	154	95	72

Notes: Online RT does not accept external battery packs. Online RTX is designed to accept up to 4 external battery packs.

## Online RT / RTX Model Selection Guide : 120V 50/60HZ

Model #	Rating (VA/Watts)	Input	Output Receptacles	Dim. HxWxD (in.)	Weight (lbs.)
DC1000RT	1000/800	5-15P	(6) 5-15R	3.5 (2U) x 18 x 15	30
DC1500RT	1500/1200	5-15P	(6) 5-15R	3.5 (2U) x 18 x 19	42
DC2000RT	2000/1600	5-20P	(8) 5-20R	3.5 (2U) x 18 x 24	48
DC3000RT	3000/2400	L5-30P	(4)5-20R (1) L5-30R	3.5 (2U) x 18 x 24	66
DC1000RTX	1000/800	5-15P	(6) 5-15R	3.5 (2U) x 18 x 15	30
DC1500RTX	1500/1200	5-15P	(6) 5-15R	3.5 (2U) x 18 x 19	42
DC2000RTX	2000/1600	5-20P	(8) 5-20R	3.5 (2U) x 18 x 24	48
DC3000RTX	3000/2400	L5-30P	(4)5-20R (1) L5-30R	3.5 (2U) x 18 x 24	66

### Extended Battery Modules for RTX Models

DC1000RTXEEM	For 1000 VA	N/A	N/A	3.5 (2U) x 18 x 15	40
DC1500RTXEEM	For 1500 VA	N/A	N/A	3.5 (2U) x 18 x 15	46
DC2000RTXEEM	For 2000 VA	N/A	N/A	3.5 (2U) x 18 x 19	66
DC3000RTXEEM	For 3000 VA	N/A	N/A	3.5 (2U) x 18 x 24	86
OPS-RaiIkit	N/A	N/A	N/A	N/A	3
OPS-SNMP3-WEBCARD	N/A	N/A	N/A	N/A	3

## Specifications:

### Electrical Input

<b>Nominal Voltage</b>	120V
<b>Voltage Range</b>	55-150 VAC ± 5%
<b>Frequency (HZ)</b>	40Hz ~ 70Hz
<b>Power Factor</b>	> .99 (Full Load)

### Electrical Output

<b>Output Voltage</b>	115V, adjustable to 100/110/115/120/127
<b>Voltage Regulation</b>	≤± 1%
<b>Frequency (HZ)</b>	±0.1% (0.05~0.06Hz) unless synchronized to line
<b>Power Factor</b>	> .99 (Full Load)
<b>Load Segments</b>	Remote controlled load segment
<b>Wave Form</b>	True Sine Wave

### Communications

<b>Interface Type</b>	1 *USB port+ 1*RS-232 port
<b>SNMP(optional)</b>	Power management from SNMP manager and Web browser
<b>Monitoring / Shutdown Software</b>	Windows Vista/7/8, Linux, etc. Included at no charge.

### Environmental

Operation Temperature	0-40 C
Noise Level	< 50dBA
Relative Humidity	0 to 90% (without condensation)

### Standards and Certification

Markings	UL 1778 – tested by TUV , FCC
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## Industry Leading Warranty and Protection



### Orion Power Systems 37 Month Plus Gold Warranty

Orion Power Systems offers the longest standard warranty in the industry – an exclusive 37 month electronics / 24 month battery warranty (24 month electronics without registration). Not only that – it is a no-hassle warranty. If a ups system fails – simply call tech support and we will immediately send a replacement. Put the non-functional ups in the box and Orion will pick it up. Orion pays shipping both ways.



### Lifetime \$ 150,000 Load Protection Guarantee

Protect your valuable equipment with \$ 150,000 coverage protection from spikes, surges, and transients. Unlike many other manufacturers of ups systems, Orion Power Systems guarantee is good for the lifetime of the UPS.



### Orion Power Systems, Inc.

3811 University Blvd. W Suite 3

Jacksonville, FL 32217

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# SHURE®

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ULX-D® Wireless Systems



# ULX-D® DIGITAL WIRELESS SYSTEMS

Shure ULX-D® Digital Wireless offers uncompromising 24-bit audio clarity and extremely efficient RF performance with single, dual, and quad channel receivers for any size professional sound reinforcement application. Generations ahead of any other available system in its class, ULX-D brings a new level of performance to professional sound reinforcement.

## Uncompromising Professional Digital Wireless

- 24-bit/48 kHz digital audio that delivers incredibly clear and accurate sound reproduction
- 20 Hz – 20 kHz frequency range with flat response
- Greater than 120 dB dynamic range
- Wide selection of trusted Shure Microphones
- Available in UHF, VHF and ISM (900MHz) Frequency Bands

## Extremely Efficient and Reliable RF Performance

- Up to 64 MHz overall tuning range (region dependent)
- Up to 17 active transmitters in one 6 MHz TV channel (22 on an 8 MHz TV channel)
- High Density mode enables up to 47 active transmitters in one 6 MHz TV channel
- Rock-solid signal stability with no audio artifacts over the entire 100 meter range
- Optimized scanning automatically finds, prioritizes, and selects the cleanest frequencies available

## Scalable, Intelligent Hardware

- Single (half-rack), Dual and Quad (full-rack) receiver form factors
- AES 256-bit encryption equipped for secure wireless transmission
- Dante™ digital networked audio over Ethernet
- Wireless Workbench® 6 compatible for advanced coordination, monitoring and control; features Site Survey tool for scanning frequencies in the 902-928 MHz ISM band
- Compatible with the Shure SB900A Rechargeable Battery and SBC chargers

### APPLICATIONS

Installed Audio

Critical Audio  
Performances

High channel counts

Secure presentations

### PRODUCT HIGHLIGHTS

24-bit/48 kHz Digital  
Wireless Audio

High Density Mode

Single, Dual, and Quad  
Channel Receivers

Advanced  
Rechargeability

Dante™ Networked  
Audio over Ethernet

# System Specifications

RF Carrier Range	174–216 MHz, 470–865 MHz, 1492–1525 MHz, 1785–1805 MHz <i>Note: Varies by region (See Frequency Range and Output Power table)</i>
Working Range	100 m (328 ft) <i>Note: Actual range depends on RF signal absorption, reflection and interference.</i>
RF Tuning Step Size	25 kHz, varies by region
Image Rejection	>70 dB, typical
RF Sensitivity	-98 dBm at 10 <sup>-5</sup> BER
Latency	<2.9 ms
Audio Frequency Response	ULXD1: 20 Hz – 20 kHz (±1 dB) ULXD2: 30 Hz – 20 kHz (±1 dB) <i>Note: Dependent on microphone type</i>
Audio Dynamic Range System Gain @ +10	XLR Analog Output: >120 dB, A-weighted Dante Digital Output (Dual and Quad receivers): 130 dB (typical), A-weighted
Total Harmonic Distortion -12 dBFS input, System Gain @ +10	<0.1%
System Audio Polarity	Positive pressure on microphone diaphragm produces positive voltage on pin 2 (with respect to pin 3 of XLR output) and the tip of the 6.35 mm (1/4-inch) output.
Operating Temperature Range	-18 °C (0 °F) to 50 °C (122 °F) <i>Note: Battery characteristics may limit this range.</i>
Storage Temperature Range	-29 °C (-20 °F) to 74 °C (165 °F) <i>Note: Battery characteristics may limit this range.</i>

## Frequency Range

Band	Range (MHz)	Transmitter Output (mW)
V50	174 to 216	1/10/20
V51	174 to 216	1/10/20
G50	470 to 534	1/10/20
G51	470 to 534	1/10/20
G52	479 to 534	1/10
H50	534 to 598	
H51	534 to 598	1/10/20
H52	534 to 565	1/10
J50	572 to 636	1/10/20
K51	606 to 670	1/10
L50	632 to 696	1/10/20
L51	632 to 696	1/10/20
P51	710 to 782	1/10/20
R51	800 to 810	1/10/20
JB (Tx only)	806 to 810	1/10
AB (Rx and Tx)	770 to 810	"A" band (770.250-805.750): 1/10/20 "B" band (806.125-809.750): 1/10
Q51	794 to 806	1/10/20
X52	902 to 928	1/10/20
X50	925 to 932	1/10
X51	925 to 937.5	1/10
X52	902 to 928	0.25/10/20
X53	902 to 907.5; 915 to 928	0.25/10/20
X54	915 to 928	0.25/10/20
Z16	1240 to 1260	1/10/20

\*Note: Not all frequencies available in all regions. Contact your authorized Shure dealer for availability.

## Furnished Accessories

All Systems	
PS41US*	Power supply
95T9279*	1/2 Wave Receiver Antenna (2)
95K2035	2' BNC Cable (2)
98A8994	BNC Bulkhead Adapter (2)
90AZ8100	Rackmount Hardware kit
95A16941	5' ethernet cable
80B8201	2 x AA batteries (bodypack systems)
Handheld Systems	
95T9279	Microphone Clip (handheld systems)
95B2313	Handheld Zipper Bag (bodypack systems)
Bodypack Systems	
95G9043*	Bodypack Antenna
95A2313	Bodypack Zipper Bag (bodypack systems)

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### NOTE:

This Radio equipment is intended for use in musical professional entertainment and similar applications. This Radio apparatus may be capable of operating on some frequencies not authorized in your region. Please contact your national authority to obtain information on authorized frequencies and RF power levels for wireless microphone products.

## Rechargeable Power Management (sold separately)

### SB900A Rechargeable Battery

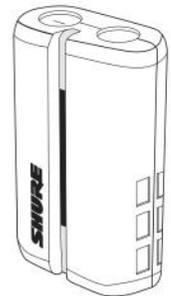
ULX-D transmitters are compatible with the SB900A lithium-ion rechargeable battery, which provides over 12 hours of continuous use and precise tracking of remaining life and charge cycle details.

### SBC200 Dual Docking Recharging Station

This compact and portable unit charges batteries while in transmitters or out. Up to 4 SBC200's can be chained together to run off one power supply.

### SBC800 Eight Battery Recharging Station

This compact and portable unit charges up to 8 SB900A batteries to full capacity within 3 hours, with status LEDs to indicate power levels. SB900A batteries fit securely in the charger for easy, efficient storage and transport.



## Battery Runtimes (Note: Frequency Band Dependent)

Battery Type	1 mW	10 mW	20 mW
SB900A	>11 hours	>11 hours	>7 hours
Alkaline	<11 hours	<11 hours	<5.5 hours
NiMH	<11 hours	<11 hours	<8 hours
Li-primary	12.5-18 hours	12.5-18 hours	9.5-12 hours

# Component Specifications

## ULXD4 Digital Wireless Receiver

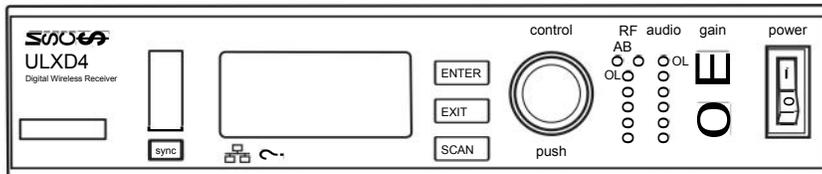
### Overview

The Shure ULXD4 is a half-rack wireless receiver for use with ULX-D® Digital Wireless Systems. With an expansive set of professional features, including 24-bit/48kHz digital audio quality, efficient and intelligent RF performance, and AES 256-bit encryption, ULX-D offers uncompromising wireless tailored for professional sound reinforcement.

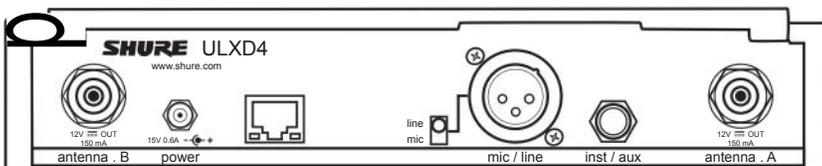
- Up to 64 MHz tuning range
- Predictive switching diversity
- Intelligent scanning automatically finds and deploys the cleanest frequencies to transmitters over IR sync
- Interference detection and alerts provided on both the receiver and WWB6
- Front panel gain adjustment buttons provide up to 60 dB additional gain
- AES 256-bit encryption-enabled for applications where secure transmission is needed
- Ethernet networking for streamlined setup across multiple receivers, WWB6 integration (coming soon), and AMX/Crestion control
- Support for frequency coordination with Axient Spectrum Manager (coming soon)
- Rugged metal chassis
- Intuitive front panel LCD menu and controls
- Easily readable Upgraded LCD with adjustable contrast and brightness
- Audio and RF LED meters with peak indicator
- Front panel lockout
- XLR and ¼" outputs
- Remoteable ½ wave antennas
- Furnished rack hardware

### Product Specifications

Dimensions	197 mm x 171 mm x 42 mm (7.75 in. x 6.75 in. x 1.65 in.), H x W x D
Weight	913 g (2.0 lbs), without antennas
Housing	Galvanized Steel
<b>RF Input</b>	
Spurious Rejection	>80 dB, typical
Connector Type	BNC
Impedance	50 Ω
Bias Voltage	12 - 13 V DC, 170 mA maximum, per antenna
<b>Audio Output</b>	
Gain Adjustment Range	-18 to +42 dB in 1 dB steps (plus Mute setting)
Configuration	1/4" (6.35 mm): Impedance balanced (Tip=audio, Ring=no audio, Sleeve=ground) XLR: Balanced (1=ground, 2=audio +, 3=audio -)
Impedance	1/4" (6.35 mm): 100 Ω (50 Ω Unbalanced) XLR: 100 Ω
Full Scale Output	1/4" (6.35 mm): +12 dBV XLR: LINE setting= +18 dBV, MIC setting= -12 dBV
Mic/Line Switch	30 dB pad
Phantom Power Protection	1/4" (6.35 mm): Yes XLR: Yes
<b>Networking</b>	
Power Over Ethernet (PoE)	No, protected
Network Interface	Single Port Ethernet 10/100 Mbps
Network Addressing Capability	DHCP or Manual IP address
Maximum Ethernet Cable Length	100 m (328 ft)



ULXD4 Front Panel



ULXD4 Back Panel

# Component Specifications

## ULXD4D Dual Channel Digital Wireless Receiver

### Overview

The Shure ULXD4D Dual Channel Digital Wireless Receiver offers two channels of uncompromising audio quality, RF signal stability, and advanced setup features in a space-efficient single rack unit. Digital wireless processing delivers premium 24-bit/48 kHz audio and RF spectrum efficiencies that dramatically increase the number of available compatible channels. With an expansive set of enhanced features including AES 256-bit encryption for security and Dante™ digital networking for audio over Ethernet, the ULXD4D brings a new level of performance to professional sound reinforcement.

- Two receivers in a rugged 1RU metal chassis with internal power supply
- Individual gain controls, LED meters, and XLR outputs for each channel
- Up to 64 MHz tuning range (region dependent)
- Digital predictive switching diversity
- High Density mode optimizes ULX-D systems to simultaneously operate significantly more channels in applications up to 30 meters
- RF cascade ports allow distribution of RF signal to another unit
- Optimized scanning automatically finds, prioritizes, and deploys the cleanest frequencies to transmitters over IR sync
- Bodypack Frequency Diversity ensures uninterrupted audio for mission-critical applications
- AES 256-bit encryption-enabled for secure transmission
- Audio summing routes both audio channels to each XLR receiver output
- Dante™ digital networked audio over Ethernet
- Up to 60 dB independently adjustable gain for each channel
- Ethernet networking for streamlined frequency coordination and deployment across multiple receivers
- Wireless Workbench® 6 (WWB6) software integration for advanced coordination, monitoring, and control
- Interference detection and alerts provided on both the receiver and WWB6
- AMX®/Crestron® control
- AXT600 Axient® Spectrum Manager compatible
- Intuitive front panel LCD menu and controls with lockout feature
- Audio and RF LED meters with peak indicator
- XLR connectors with switchable mic/line output level
- Remotable ½ wave antennas

### Product Specifications

Dimensions	44 mm × 482 mm × 274 mm (1.73 in. × 18.97 in. × 10.79 in.), H × W × D
Weight	3.36 kg (7.4 lbs), without antennas
Housing	Steel; Extruded Aluminum
Power Requirements	100 to 240 V AC, 50-60 Hz, 0.26 A max.

#### RF Input

Spurious Rejection	>80 dB, typical
Connector Type	BNC
Impedance	50 Ω
Bias Voltage	12–13 V DC, 150 mA maximum, per antenna

#### Audio Output

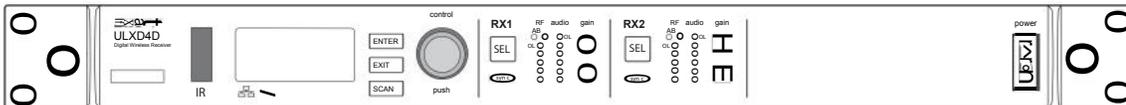
Gain Adjustment Range	–18 to +42 dB in 1 dB steps (plus Mute setting)
Configuration	XLR: Balanced (1=ground, 2=audio +, 3=audio –)
Impedance	100 Ω
Full Scale Output	LINE setting= +18 dBV, MIC setting= –12 dBV
Mic/Line Switch	30 dB pad
Phantom Power Protection	Yes

#### Networking

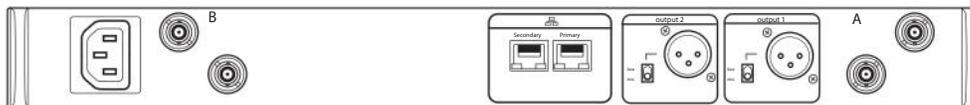
Network Interface	Dual Port Ethernet 10/100 Mbps, 1 Gbps
Network Addressing Capability	DHCP or Manual IP address
Maximum Ethernet Cable Length	100 m (328 ft)

#### Cascade Output

Connector Type	BNC: For connection of 1 additional receiver
Configuration	Unbalanced, passive
Impedance	50 Ω
Insertion Loss	0 dB



ULXD4D Front Panel



ULXD4D Back Panel

# Component Specifications

## ULXD4Q Quad Channel Digital Wireless Receiver

### Overview

The Shure ULXD4Q Quad Channel Digital Wireless Receiver offers four channels of uncompromising audio quality, RF signal stability, and advanced setup features in a space-efficient single rack unit. Digital wireless processing delivers premium 24-bit/48 kHz audio and RF spectrum efficiencies that dramatically increase the number of available compatible channels. With an expansive set of enhanced features including AES 256-bit encryption for security and Dante™ digital networking for audio over Ethernet, the ULXD4Q delivers the most wireless performance per square inch.

- Four receivers in a rugged 1RU metal chassis with internal power supply
- Individual gain controls, LED meters, and XLR outputs for each channel
- Up to 64 MHz tuning range (region dependent)
- Digital predictive switching diversity
- High Density mode optimizes ULX-D systems to simultaneously operate significantly more channels in applications up to 30 meters
- RF cascade ports allow distribution of RF signal to another unit
- Optimized scanning automatically finds, prioritizes, and deploys the cleanest frequencies to transmitters over IR sync
- Bodypack Frequency Diversity ensures uninterrupted audio for mission-critical applications
- AES 256-bit encryption-enabled for secure transmission
- Audio summing routes two or more audio channels to combinations of receiver outputs. Use each channel's gain adjustment to reach the desired mix.
- Dante™ digital networked audio over Ethernet Two receivers in a rugged 1RU metal chassis with internal power supply
- Individual gain controls, LED meters, and XLR outputs for each channel
- Ethernet networking for streamlined frequency coordination and deployment across multiple receivers
- Interference detection and alerts provided on both the receiver and WWB6
- Up to 60 dB independently adjustable gain for each channel
- Wireless Workbench® 6 software integration for advanced coordination, monitoring, and control AMX/Crestron control
- Compatible with the AXT600 Axient™ Spectrum Manager
- Intuitive front panel LCD menu and controls with lockout feature
- Upgraded LCD with adjustable contrast and brightness
- Audio and RF LED meters with peak indicator
- Switchable mic/line output level
- Remoteable ½ wave antennas

### Product Specifications

Dimensions	44 mm x 482 mm x 274 mm (1.73 in. x 18.97 in. x 10.79 in.), H x W x D
Weight	3.45 Kg (7.6 lbs), without antennas
Housing	Steel; Extruded Aluminum
Power Requirements	100 to 240 V AC, 50–60 Hz, 0.32 A max.

#### RF Input

Spurious Rejection	>80 dB, typical
Connector Type	BNC
Impedance	50 Ω
Bias Voltage	12 - 13 V DC, 150 mA maximum, per antenna

#### Audio Output

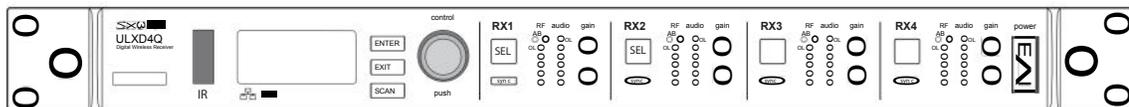
Gain Adjustment Range	-18 to +42 dB in 1 dB steps (plus Mute setting)
Configuration	XLR: Balanced (1=ground, 2=audio +, 3=audio -)
Impedance	100 Ω
Full Scale Output	LINE setting= +18 dBV, MIC setting= -12 dBV
Mic/Line Switch	30 dB pad
Phantom Power Protection	Yes

#### Networking

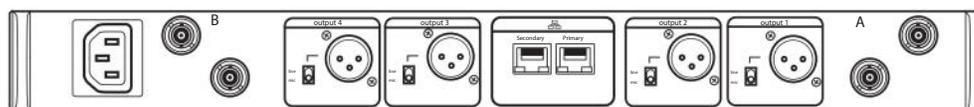
Network Interface	Dual Port Ethernet 10/100 Mbps, 1 Gbps
Network Addressing Capability	DHCP or Manual IP address
Maximum Ethernet Cable Length	100 m (328 ft)

#### Cascade Output

Connector Type	BNC: For connection of 1 additional receiver
Configuration	Unbalanced, passive
Impedance	50 Ω
Insertion Loss	0 dB



ULXD4Q Front Panel



ULXD4Q Back Panel

# Component Specifications

## ULXD2 Wireless Handheld Transmitter

### Overview

The Shure ULXD2 is a handheld wireless transmitter compatible with ULX-D® Digital Wireless Systems. Offering premium 20 Hz – 20 kHz audio quality, advanced rechargeability options, and a wide selection of interchangeable Shure microphone heads, the ULXD2 delivers uncompromising wireless performance for professional sound reinforcement applications. The ULXD2 is offered with SM58®, SM86, SM87A, Beta 58A®, Beta 87A, and Beta 87C.

- 30 Hz to 20 kHz range with flat frequency response (actual response is microphone dependent)
- Interchangeable Shure microphone cartridges, including the legendary SM58®
- >120 dB dynamic range
- 1, 10, and 20 mW selectable RF output power
- 5 segment battery fuel gauge
- Shure lithium-ion rechargeable battery pack provides up to 12 hours of battery life, precision metering, and zero memory effect
- Up to 11 hours continuous use with 2 × AA batteries
- Backlit LCD with easy to navigate menu and controls
- 100 meter (300 ft) operating range
- Rugged metal construction
- Frequency and power lockout

### Product Specifications

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or LR6 AA batteries 1.5 V
Battery Runtime @ 10 mW	Shure SB900A: >11 hours Alkaline: 11 hours <i>See Battery Runtime Chart</i>
Dimensions	256 mm x 51 mm (10.1 in. x 2.0 in.) L x Dia. V50, V51 Bands: 278 mm x 51 mm (10.9 in. x 2.0 in.) L x Dia.
Weight	340 g (12.0 oz.), without batteries V50, V51 Bands: 348 g (12.3 oz.), without batteries
Housing	Machined aluminum

#### Audio Input

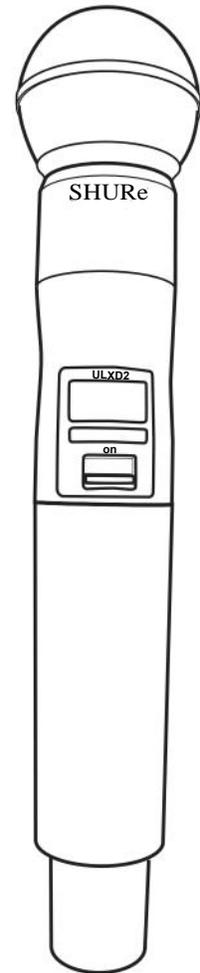
Configuration	Unbalanced
Maximum Input Level 1 kHz at 1% THD	145 dB SPL (SM58), typical <i>Note: Dependent on microphone type</i>
Preamplifier Equivalent Input Noise (EIN) System Gain Setting ≥ +20	120 dBV, A-weighted, typical

#### RF Output

Antenna Type	Integrated Single Band Helical
Occupied Bandwidth	<200 kHz
Modulation Type	Shure Proprietary Digital
Power	1 mW, 10 mW, 20 mW <i>See Frequency Range and Output Power table, varies by region</i>

### Microphone Options

ULXD2/SM58	ULXD2 Handheld Transmitter with SM58® Cardioid Microphone
ULXD2/SM86	ULXD2 Handheld Transmitter with SM86 Cardioid Microphone
ULXD2/SM87A	ULXD2 Handheld Transmitter with SM87A Supercardioid Microphone
ULXD2/BETA 58	ULXD2 Handheld Transmitter with Beta®58A Supercardioid Microphone
ULXD2/BETA 87A	ULXD2 Handheld Transmitter with Beta®87A Supercardioid Microphone
ULXD2/BETA 87C	ULXD2 Handheld Transmitter with Beta®87C Cardioid Microphone
ULXD2/KSM9	ULXD2 Handheld Transmitter with KSM9 Dual-Pattern Condenser Vocal Microphone
ULXD/KSM9HS	ULXD2 Handheld Transmitter with KSM9HS Dual-Pattern Condenser Vocal Microphone
ULXD2/K8B	ULXD2 Handheld Transmitter with KSM8 Duality™ Dual-Diaphragm Cardioid Dynamic Microphone (Black)
ULXD2/K8N	ULXD2 Handheld Transmitter with KSM8 Duality™ Dual-Diaphragm Cardioid Dynamic Microphone (Nickel)



ULXD2  
Wireless Handheld Transmitter

# Component Specifications

## ULXD1 Wireless Bodypack Transmitter

### Overview

The ULXD1 is a wireless bodypack transmitter compatible with ULX-D® Digital Systems. With a rugged yet lightweight aluminum case, the ULXD1 delivers uncompromising audio quality and RF performance, AES 256-bit encryption for secure transmission, and advanced rechargeability options for professional sound reinforcement applications.

- 20 Hz to 20 kHz range with flat frequency response (actual response is microphone dependent)
- AES 256-bit encryption-enabled for applications where secure transmission is needed
- >120 dB dynamic range
- 1, 10, and 20 mW selectable RF output power
- 5 segment battery fuel gauge
- Shure lithium-ion rechargeable battery pack provides up to 12 hours of battery life, precision metering, and zero memory effect
- Up to 11 hours continuous use with 2 x AA batteries
- Backlit LCD with easy to navigate menu and controls
- Available with TA4M and LEMO3 input connectors
- 100 meter (300 ft) operating range
- Rugged metal construction
- Frequency and power lockout

### Product Specifications

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or AA batteries
Battery Runtime @ 10 mW	Shure SB900A: >11 hours Alkaline: 11 hours <i>See Battery Runtime Chart</i>
Dimensions	86 mm x 66 mm x 23 mm (3.4 in. x 2.6 in. x 0.9 in.) H x W x D
Weight	142 g (5.0 oz.), without batteries
Housing	Cast aluminum

#### Audio Input

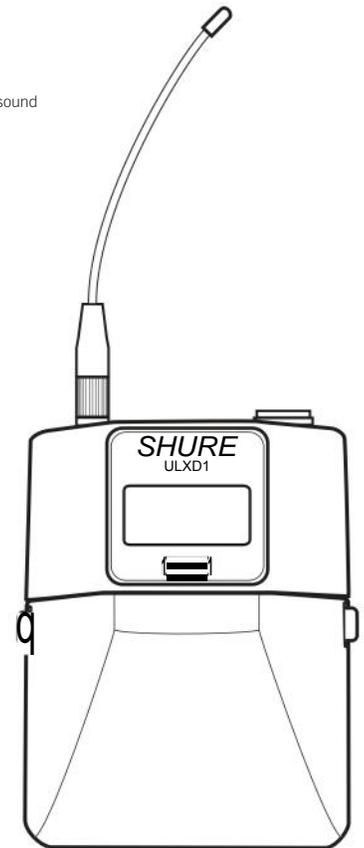
Connector	4-Pin male mini connector (TA4M) LEMO3 connector
Configuration	Unbalanced
Impedance	1 M $\Omega$
Maximum Input Level 1 kHz at 1% THD	Pad Off: 8.5 dBV (7.5 Vpp) Pad On: 20.5 dBV (30 Vpp)
Preampifier Equivalent Input Noise (EIN) System Gain Setting $\geq$ +20	120 dBV, A-weighted, typical

#### RF Output

Connector	SMA
Antenna Type	1/4 wave
Impedance	50 $\Omega$
Occupied Bandwidth	<200 kHz
Modulation Type	Shure Proprietary Digital
Power	1 mW, 10 mW, 20 mW <i>See Frequency Range and Output Power table, varies by region</i>

### Microphone Options (see catalog for more)

WL93	WL93 condenser capsule, omnidirectional lavalier mic
WL183	WL183 condenser capsule, omnidirectional lavalier mic
WL184	WL184 condenser capsule, supercardioid lavalier mic
WL185	WL185 condenser capsule, cardioid lavalier mic
WL50	WL50 condenser capsule, omnidirectional lavalier mic
WL51	WL51 condenser capsule, cardioid lavalier mic
SM31FH	SM31FH condenser capsule, moisture repellent cardioid headset mic
SM35	SM35 condenser capsule, cardioid headset mic
WCM16	WCM16 condenser capsule, hypercardioid headworn mic
WBH53	WBH53 condenser capsule, omnidirectional headworn mic
WBH54	WBH54 condenser capsule, supercardioid headworn mic
WB98H/C	WB98H/C condenser capsule, cardioid instrument clip mic



ULXD1  
Wireless Bodypack Transmitter

# Component Specifications

## ULXD8 Wireless Gooseneck Base Transmitter

### Overview

The ULXD8 Gooseneck Base Transmitter offers a low-profile boundary form factor that is ideal for meetings and events where quick setup and teardown is important. With long transmission range (up to 300 feet/91 meters) and a wide selection of antenna distribution components, the ULXD8 is easily and efficiently scalable for use in very large meetings at conference and convention centers. A choice of rechargeable battery pack or standard AA batteries provide all-day runtime.

- Available in UHF TV band
- AES 256-bit encryption for secure transmission
- Convenient gooseneck form factor for meetings and events where quick setup and teardown is important
- Designed for use with Shure Microflex MX405, MX410 and MX415 gooseneck microphones
- Very short latency (<3 msec)
- Long transmission range (up to 300 feet / 100 meters)
- Rechargeable SB900A battery pack provides up to 9 hours of battery life
- Standard AA alkaline batteries are additional power options
- SBC450 (4-bay) and SBC850 (8-bay) Networked Charging Stations for docked charging of 4 or 8 ULXD8 transmitters
- Configurable Mute button (Toggle, Push-to-Mute, Push-to-Talk, disabled) and Mute LED behavior
- Adjustable RF power, high-pass filter, and power lock settings

### Product Specifications

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or AA batteries
Battery Runtime @ 10 mW	Shure SB900A: Up to 9 hours Alkaline: Up to 8 hours 20 minutes <i>Note: See Battery Runtime chart</i>
Dimensions	137 mm x 78 mm x 41 mm (5.4 in. x 3.1 in. x 1.6 in.) H x W x D
Weight	293 g (10.3 oz.), with 2 AA batteries
Housing	Molded Plastic

#### Audio Input

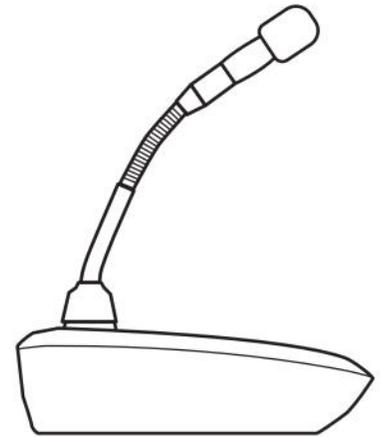
Connector	6-pin connector for Shure MX405/MX410/MX415
Configuration	Unbalanced
Impedance	>20 kΩ

#### RF Output

Antenna Type	Integrated PIFA
Impedance	50 Ω
Occupied Bandwidth	<200 kHz
Modulation Type	Shure Proprietary Digital
Power	1 mW, 10 mW, 20 mW <i>See Frequency Range and Output Power table, varies by region</i>

### Microphone Options (see catalog for more)

MX405LP/C	5" Cardioid Gooseneck Microphone
MX405LP/S	5" Supercardioid Gooseneck Microphone
MX405RLP/N	5" Gooseneck with Red Top LED (no cartridge)
MX410LP/C	10" Cardioid Gooseneck Microphone
MX410LP/S	10" Supercardioid Gooseneck Microphone
MX410RLP/N	10" Gooseneck with Red Top LED (no cartridge)
MX410LPDF/C	10" Cardioid Dualflex Gooseneck Microphone
MX410LPDF/S	10" Supercardioid Dualflex Gooseneck Microphone
MX410RLPDF/N	10" Dualflex Gooseneck with Red Top LED (no cartridge)
MX410RLPDF/C	10" Cardioid Dualflex Gooseneck Microphone with Red Top LED
MX410RLPDF/S	10" Supercardioid Dualflex Gooseneck Microphone with Red Top LED
MX415LP/C	15" Cardioid Gooseneck Microphone
MX415LP/S	15" Supercardioid Gooseneck Microphone
MX415RLP/N	15" Gooseneck with Red Top LED (no cartridge)
MX415LPDF/C	15" Cardioid Dualflex Gooseneck Microphone
MX415LPDF/S	15" Supercardioid Dualflex Gooseneck Microphone
MX415RLPDF/N	15" Dualflex Gooseneck with Red Top LED (no cartridge)
MX415RLPDF/C	15" Cardioid Dualflex Gooseneck Microphone with Red Top LED
MX415RLPDF/S	15" Supercardioid Dualflex Gooseneck Microphone with Red Top LED



ULXD8  
Wireless Gooseneck Base Transmitter

# Component Specifications

## ULXD6 Wireless Boundary Transmitter

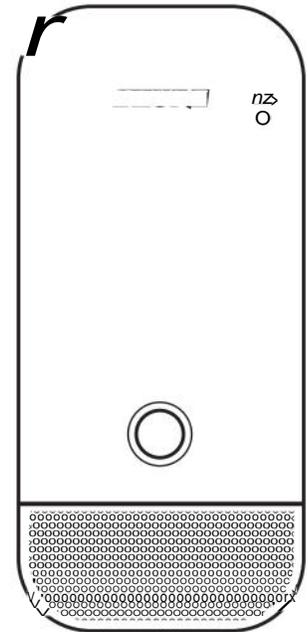
### Overview

The ULXD6 Boundary Microphone Transmitter offers a low-profile boundary form factor that is ideal for meetings and events where quick setup and teardown is important. With long transmission range (up to 300 feet/91 meters) and a wide selection of antenna distribution components, the ULXD6 is easily and efficiently scalable for use in very large meetings at conference and convention centers. A choice of rechargeable battery pack or standard AA batteries provide all-day runtime.

- Available in UHF TV band
- AES 256-bit encryption for secure transmission
- Low-profile boundary form factor for meetings and events where quick setup and teardown is important
- Very short latency (<3 msec)
- Long transmission range (up to 300 feet / 100 meters)
- SB900A rechargeable battery pack provides up to 9 hours of battery life
- Standard AA alkaline batteries are additional power options
- SBC450 (4-bay) and SBC850 (8-bay) Networked Charging Stations for docked charging of 4 or 8 ULXD6 transmitters
- Configurable Mute button (Toggle, Push-to-Mute, Push-to-Talk, disabled) and Mute LED behavior
- Adjustable RF power, high-pass filter, and power lock settings

### Product Specifications

Gain Offset Range	0 to 21 dB (in 3 dB steps)
Battery Type	Shure SB900A Rechargeable Li-Ion or AA batteries 1.5 V
Battery Runtime @ 10 mW	Shure SB900: Up to 9 hours 20 minutes AA batteries: Up to 8 hours 40 minutes <i>See Battery Runtime Chart</i>
Dimensions	114 mm × 62 mm × 34 mm (4.5 in. × 2.4 in. × 1.4 in.) H x W x D
Weight	241 g with AA batteries
Housing	Molded Plastic
<b>Audio Input</b>	
Connector	6-pin connector for Shure MX405/MX410/MX415
Configuration	Unbalanced
Impedance	>20 kΩ
<b>RF Output</b>	
Antenna Type	Integrated PIFA
Impedance	50 Ω
Occupied Bandwidth	<200 kHz
Modulation Type	Shure proprietary digital
Power	1 mW, 10 mW, 20 mW <i>See Frequency Range and Output Power table, varies by region</i>



ULXD6  
Wireless Boundary Transmitter

# Component Specifications

## SBC250, SBC450 & SBC850 Networked Docking Stations

### Overview

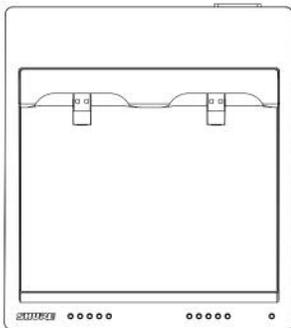
2-bay, 4-bay, and 8-bay Networked Docking Stations charges up to 2, 4, or 8 ULXD6 or ULXD8 transmitters that are equipped with the SB900A rechargeable battery. The transmitters simply slide into the charger; no need to remove the SB900A battery. When the stations are connected to a network, charging status of transmitters can be viewed remotely and settings or firmware can be updated while transmitters are docked, using Shure Wireless Workbench, SystemOn software or third-party room control systems.

### Product Specifications

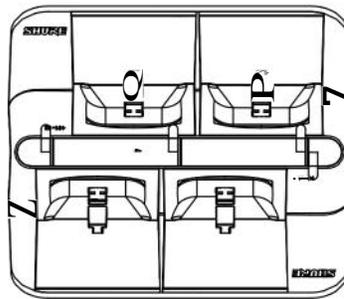
Charge Time	ULXD6 and ULXD8 15 minutes = 1 hour runtime; 1 hour = 50% charged; 3 hours = 100% charged.
Network Interface	10/100 Mbps Ethernet;
Power Requirement	SBC250 100 - 240V AC @ 0.35 A maximum, 50/60 Hz SBC450/SBC850 15 V DC @ 4.0 A maximum, supplied by external power supply (tip positive)
Housing	SBC250 Molded Plastic, Sheet Metal SBC450/SBC850 Molded Plastic, Cast Zinc Alloy
Dimensions	SBC250 215 mm x 191 mm x 62.5 mm (8.46 in. x 7.52 in. x 2.44 in.), H x W x D SBC450 82.1 mm x 224.4 mm x 192 mm (3.23 in. x 8.83 in. x 7.56 in.), H x W x D SBC850 82.1 mm x 392 mm x 192 mm (3.23 in. x 15.43 in. x 7.56 in.), H x W x D
Weight	SBC250 2.7 kg (5.95 lbs) SBC450 1.59 kg (3.51 lbs) SBC850 2.67 kg (5.89 lbs)
Operating Temperature Range	0 °C (32 °F) to 45 °C (113 °F)
Storage Temperature Range	-29 °C (-20 °F) to 74 °C (165 °F)

### Available Models

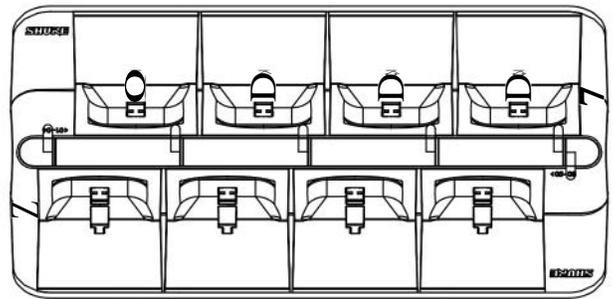
<b>SBC250</b>	Networked Docking Station, 2 Ports
<b>SBC450</b>	Networked Docking Station, 4 Ports
<b>SBC850</b>	Networked Docking Station, 8 Ports



SBC250  
Networked Docking Station



SBC450  
Networked Docking Station



SBC850  
Networked Docking Station

### MODEL MX183, MX184, MX185 MICROPHONES



### OVERVIEW

Models MX183, MX184, and MX185 are wired lavalier electret condenser microphones designed for speech and vocal pickup, general purpose sound reinforcement, recording, and remote monitoring applications. They can be clipped

to neckties, lapels, and other articles of clothing. Interchangeable cartridges make it possible to easily reconfigure microphone coverage as the need arises.

### FEATURES

- Wide dynamic range and frequency response for accurate sound reproduction across the audio spectrum
- Interchangeable cartridges that provide an optimal choice for each application
- Rotatable tie-clip that pivots in 90° increments for placement flexibility
- Supplied snap-fit foam windscreen that controls breath noise and stays on securely
- Balanced, transformerless output for increased immunity to noise over long cable runs
- Supplied dual tie clip holds two microphones for dual miking applications

### MODEL VARIATIONS

**MX183 (Omnidirectional):** Provides low handling noise. Pickup angle = 360°.

**MX184 (Supercardioid):** Provides high rejection of ambient noise and narrow pickup angle. Use of windscreen highly

recommended. Pickup angle (–3 dB) = 115°.

**MX185 (Cardioid):** Provides good rejection of ambient noise. Use of windscreen highly recommended. Pickup angle (–3 dB) = 130°.

### SPECIFICATIONS

#### Type

Condenser (electret bias)

#### Frequency Response

See Figure 2  
50 to 17,000 Hz

#### Polar Pattern

See Figure 3  
MX183: Omnidirectional  
MX184: Supercardioid  
MX185: Cardioid

#### Output Impedance

EIA rated at 150 Ω (180 Ω actual)

#### Open Circuit Sensitivity (at 1 kHz, ref. 1V/Pascal\*)

MX183: –27.5 dB (42.2 mV)  
MX184: –33.5 dB (21.1 mV)  
MX185: –35.0 dB (17.0 mV)

\*1 Pascal = 94 dB SPL

#### Max SPL (1kHz at 1%THD, 1 kΩ load)

MX183: 116.7 dB  
MX184: 122.7 dB  
MX185: 124.2 dB

#### Equivalent Output Noise (A-weighted)

MX183: 20.5 dB  
MX184: 26.5 dB  
MX185: 28.0 dB

#### Signal to Noise Ratio (referenced at 94 dB SPL)

MX183: 73.5 dB  
MX184: 67.5 dB  
MX185: 66.0 dB

#### Dynamic Range at 1 kΩ load

96.2 dB

#### Power Requirements

11 to 52 Vdc phantom, 2.0 mA

**Common Mode Rejection**

45.0 dB minimum

**Polarity**

Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector.

**Environmental Conditions**

Operating Temperature Range: -18° to 57° C (0° to 135° F)

Storage Temperature Range: -29° to 74° C (-20° to 165° F)

**Cable**

Shielded 1.2 meter (4 ft.) cable terminated with a 4-Pin Female Mini Connector (TA4F)

**Dimensions**

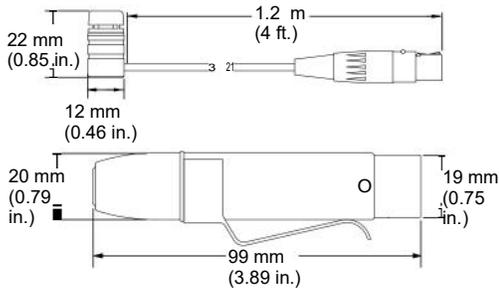
See Figure 1

**CERTIFICATION**

Eligible to bear CE Marking. Conforms to European EMC Directive 89/336/EEC. Meets applicable tests and performance criteria in European Standard EN55103 (1996) parts 1 and 2, for residential (E1) and light industrial (E2) environments.

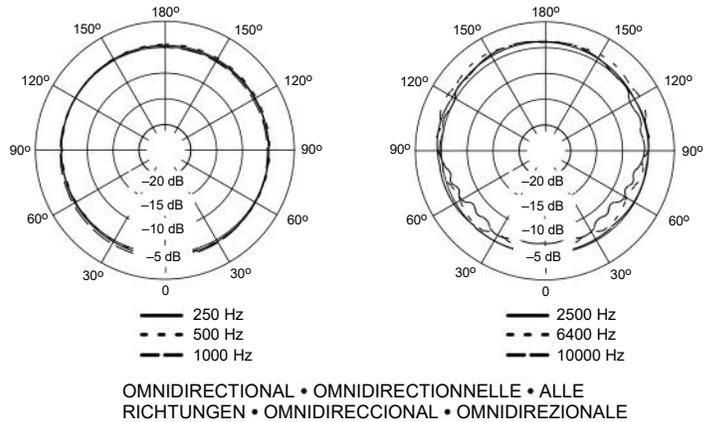
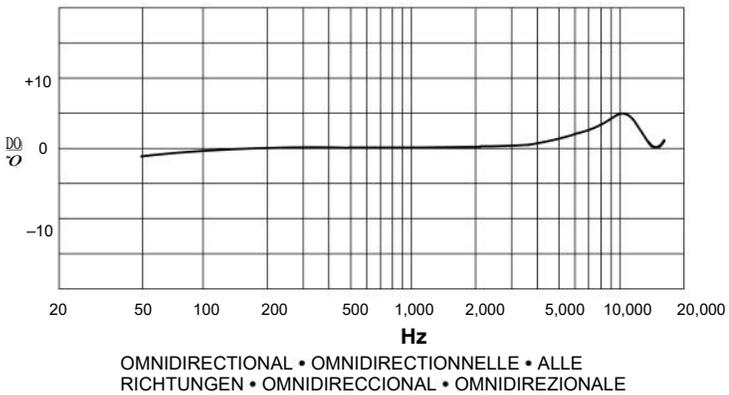
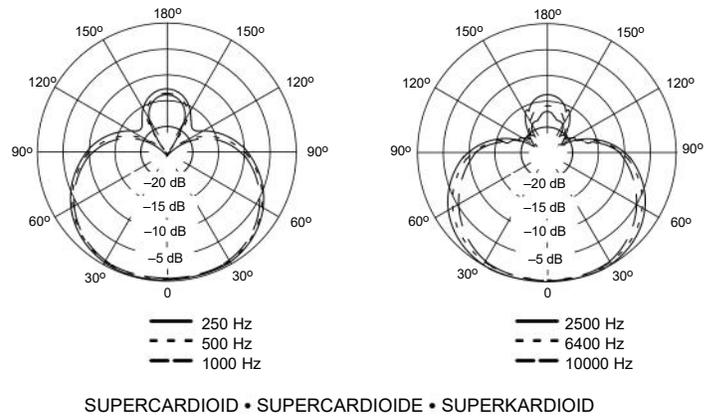
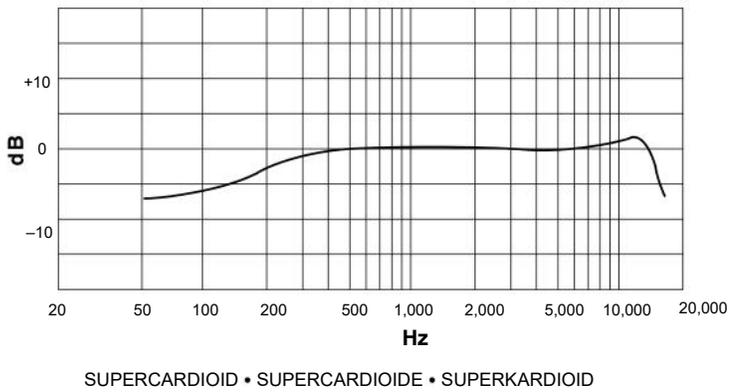
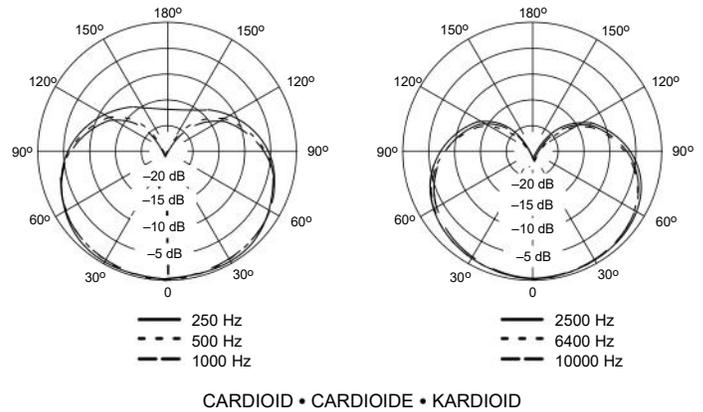
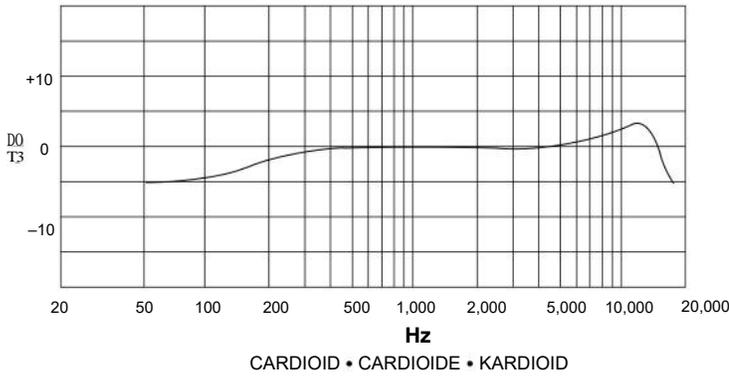
**REPLACEMENT PARTS**

Omnidirectional Cartridge	R183B
Supercardioid Cartridge	R184B
Cardioid Cartridge	R185B
Preamp Kit (Phantom)	RK183PK
Battery/Phantom Powered Preamplifier	MX1BP
Snap-Fit Windscreens (4 per pkg.)	RK183WS
Small Foam Windscreens (4 per pkg.)	RK261WS
Tie Clips (2 per pkg.)	RK183T1
Dual Tie Clip	RK183T2
4-Pin Female Mini Connector (TA4F)	WA330
Replacement Cable	C122



DIMENSIONS

**FIGURE 1**



TYPICAL FREQUENCY RESPONSE  
 COURBE DE RÉPONSE TYPIQUE  
 TYPISCHER FREQUENZGANG  
 RESPUESTA DE FRECUENCIA TIPICA  
 RISPOSTA IN FREQUENZA TIPICA

**FIGURE 2 • ABBILDUNG 1 • FIGURA 1**

TYPICAL POLAR PATTERNS  
 COURBES DE DIRECTIVITÉ TYPQUES  
 TYPISCHE POLARMUSTER  
 PATRONES DE CAPTACION POLAR TIPICOS  
 DIAGRAMMI POLARI TIPICI

**FIGURE 3 • ABBILDUNG 2 • FIGURA 2**

### General Description

The WA661 and WA662 provide an easy-access, tactile feedback switch for muting lavalier and headset microphones that connect to wireless bodypack transmitters.

- For microphones with TA4F connectors
- Two-position toggle switch with tactile feedback
- Robust, reversible metal belt clip
- No electrical switch noise
- >100 dB of attenuation for mute
- Passes bias voltage to power microphones

### Model Variations

The WA661 has a single output. The WA662 features two output connectors for redundant transmitter and frequency diversity applications.

### Instructions for Use

Use the switch with a wireless microphone system. Connect the microphone to the input on the switch and connect the output cable to a bodypack transmitter. For the WA662, connect each of the two output cables to a different bodypack for redundant transmitter and frequency diversity applications.

### Specifications

#### Connector Type

Input	TA4M
Output	TA4F

#### Switch

Two-position toggle mute switch

#### Cable

56cm (22 inch), two-conductor, double-serve stranded shielding

#### Housing

Machined aluminum

#### Dimensions

39 x 92 x 28 mm (H x W x D)

#### Weight

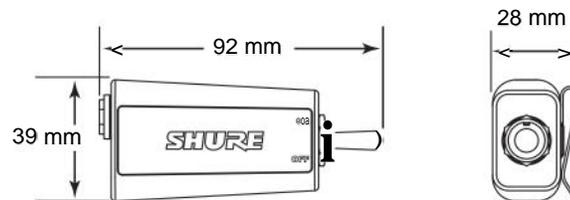
	Net	Packaged
WA661	121 g (4.3 oz.)	196 g (6.9 oz.)
WA662	136 g (4.8 oz.)	211 g (7.4 oz.)



WA661



WA662



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## IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Allow sufficient distances for adequate ventilation and install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as open flames, radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not place any open flame sources on the product.
9. DO NOT defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.
12. USE only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
16. The MAINS plug or an appliance coupler shall remain readily operable.
17. The airborne noise of the Apparatus does not exceed 70dB (A).
18. Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.
19. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
20. Do not attempt to modify this product. Doing so could result in personal injury and/or product failure.
21. Operate this product within its specified operating temperature range.



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

**WARNING:** Voltages in this equipment are hazardous to life. No user-serviceable parts inside. Refer all servicing to qualified service personnel. The safety certifications do not apply when the operating voltage is changed from the factory setting.

**Caution:** Do not transport chargers with batteries inserted.

**Warning:** Do not charge batteries in enclosed spaces without proper ventilation.



## Important Product Information

### WARNING

- Battery packs may explode or release toxic materials. Risk of fire or burns. Do not open, crush, modify, disassemble, heat above 140°F (60°C), or incinerate.
- Follow instructions from manufacturer
- Only use Shure charger to recharge Shure rechargeable batteries
- **WARNING:** Danger of explosion if battery incorrectly replaced. Replace only with same or equivalent type.
- Never put batteries in mouth. If swallowed, contact your physician or local poison control center
- Do not short circuit; may cause burns or catch fire
- Do not charge or use battery packs other than Shure rechargeable batteries

- Dispose of battery packs properly. Check with local vendor for proper disposal of used battery packs.
- Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like

### Note:

- This equipment is intended to be used in professional audio applications.
- EMC conformance is based on the use of supplied and recommended cable types. The use of other cable types may degrade EMC performance.
- Use this battery charger only with the Shure charging modules and battery packs for which it is designed. Use with other than the specified modules and battery packs may increase the risk of fire or explosion.
- Changes or modifications not expressly approved by Shure Incorporated could void your authority to operate this equipment.

## SBC800 Charger

The SBC800 cradle charger holds eight SB900 batteries and is designed to fit into a rackmount drawer. It may be used in any appropriate location with adequate space and ventilation.

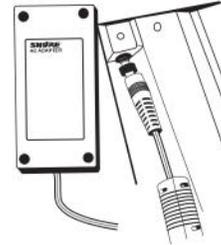
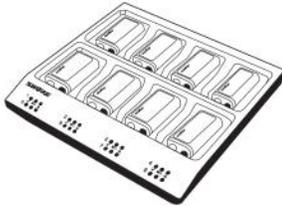
## Features

- Charge up to eight SB900 batteries
- Cable routing for better wire management
- LED icons for battery status

## Included Components

- SBC800 Charger
- PS60 Power Supply

SB900 batteries not included.

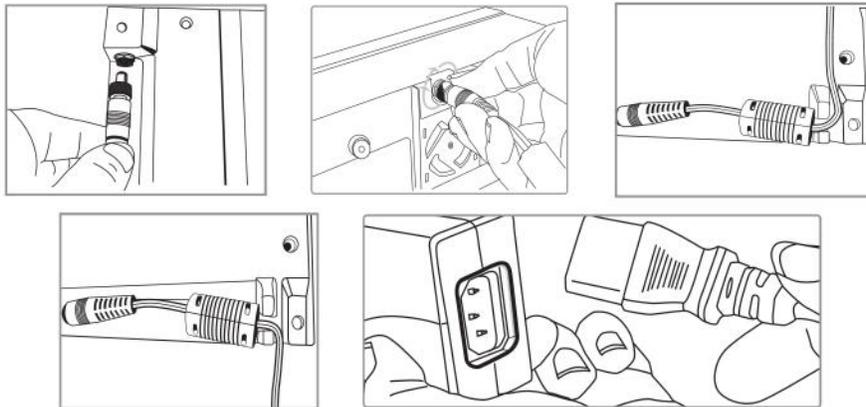


## Power

1. Connect DC power cable to input jack on bottom of charger. Finger tighten lock nut for a secure connection.
2. Route the cable along the desired channel and press into place to secure.
3. Connect power cable to AC Adapter.

### WARNING:

- Do not use pliers or any other tools to tighten lock nut. DC power cable must be attached before charger unit is installed.
- Do not plug in power supply unit until DC connection and charger are in place.
- After securing the charger, plug the power cable into a properly grounded outlet.



The SBC800 has no power switch. When plugged in, the charger is ready. The LEDs illuminate after batteries are inserted.

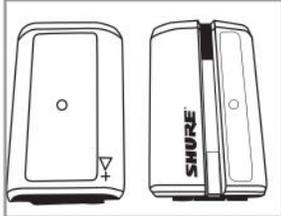
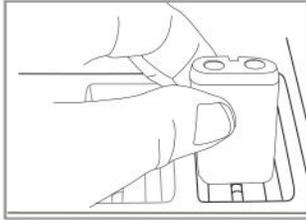
## Charging

To charge, place batteries into the charging bays with slotted sides down. The LEDs illuminate to indicate battery status.

Description	LED	Color	State
Ready for Use	✓	Green	Charged (99-100%)
	✓	Green and Red	Charging (90-99%)
Charging	p	Red	Charging (0- 90%)
Warning	▲	Yellow	Battery cannot be charged*

\* Battery might be too hot or too cold to take a charge.

**Note:** Store batteries in the charger or in a proper container. To protect terminals from shorting, DO NOT place batteries in a box or pocket with metal objects such as nails, screws, or keys.



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## Specifications

### Charge Current

0.75 mA

### Charge Time

50%≈1 hour; 100%≈3 hours

### External Power Supply

PS60

### Power Requirements

15 V DC, 3.33 Amax.

### Dimensions

40 mm x 189.5 mm x 181 mm (1.6 in. x 7.1.4 in. x 7.1in.), H x Wx D

### Weight

540 g(19 oz.)

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## Certifications

This product meets the Essential Requirements of all relevant European directives and is eligible for CE marking.

The CE Declaration of Conformity can be obtained from:  
[www.shure.com/europe/compliance](http://www.shure.com/europe/compliance)

Authorized European representative:  
Shure Europe GmbH  
Headquarters Europe, Middle East & Africa  
Department: EMEA Approval  
Jakob-Dieffenbacher-Str. 12  
75031 Eppingen, Germany  
Phone: +49-7262-92 49 0  
Fax: +49-7262-92 49 11 4  
Email: [info@shure.de](mailto:info@shure.de)

---

## General Description

The SB900A is a rechargeable lithium-ion battery for use with the SBC800 charger and products that specify its use.

---

## Inserting the Battery into the Charger

Place the battery into the charger, slotted side down.

---

## WARNING

- Battery packs may explode or release toxic materials. Risk of fire or burns. Do not open, crush, modify, disassemble, heat above 140°F (60°C), or incinerate
- Follow instructions from manufacturer
- Never put batteries in mouth. If swallowed, contact your physician or local poison control center
- Do not short circuit; may cause burns or catch fire
- Do not charge or use battery packs with other than specified Shure products
- Dispose of battery packs properly. Check with local vendor for proper disposal of used battery packs

### Storing Batteries

If batteries are to be stored for more than eight days, they should be placed into a temperature controlled storage area. Recommended battery storage temperature is 10 to 25°C (50 to 77°F).

---

### Charge Voltage

4.2 V (±0.05 V)

### Charge Current

750 mA

### Nominal Voltage

3.7 V

### Nominal Capacity

1320 mAh

### Housing

Lexan (Molded Polycarbonate)

### Charging Temperature Range

0°C to 45°C

### Weight

0.045 kg

### Dimensions

50 x 32 x 18 mm, H x W x D

---

## Certifications

This product meets the Essential Requirements of all relevant European directives and is eligible for CE marking.

Please follow your regional recycling scheme for batteries, packaging, and electronic waste.

The CE Declaration of Conformity can be obtained from:  
[www.shure.com/europe/compliance](http://www.shure.com/europe/compliance)

Authorized European representative:  
Shure Europe GmbH  
Headquarters Europe, Middle East & Africa  
Department: EMEA Approval  
Jakob-Dieffenbacher-Str. 12  
75031 Eppingen, Germany  
Phone: +49-7262-92 49 0  
Fax: +49-7262-92 49 11 4  
Email: [info@shure.de](mailto:info@shure.de)

**Note:** There is no mercury content in the product.

# SM58® Cardioid Dynamic Microphone

## Overview

The legendary SM58® is an industry-standard, highly versatile cardioid dynamic vocal microphone that is consistently the first choice of vocal performers around the globe. Even in extreme conditions, the SM58 is tailored to target the main sound source while minimizing background noise, delivering warm and clear vocal reproduction.

## Features

- Frequency response tailored for vocals, with brightened midrange and bass rolloff
- Uniform cardioid pickup pattern isolates the main sound source and minimizes background noise
- Pneumatic shock-mount system cuts down handling noise
- Effective, built-in spherical wind and pop filter
- Supplied with break-resistant stand adapter which rotates 180 degrees
- Legendary Shure quality, ruggedness and reliability
- Cardioid (unidirectional) dynamic
- Frequency response: 50 to 15,000 Hz

## Available Models

<b>SM58-LC</b>	Includes stand adapter and zippered pouch
<b>SM58-CN</b>	Includes 7.6 m XLR-male to XLR-female cable, swivel adapter and a zippered pouch
<b>SM58S</b>	Includes integrated on/off switch, swivel adapter and a zippered pouch

## Specifications

<b>Type</b>	Dynamic
<b>Frequency Response</b>	50 to 15,000 Hz
<b>Polar Pattern</b>	Cardioid
<b>Sensitivity</b> (at 1,000 Hz Open circuit voltage)	-54.5 dBV/Pa (1.85 mV) 1 Pa = 94 dB SPL
<b>Impedance</b>	Rated impedance is 150 Ω (300 Ω actual) for connection to microphone inputs rated low impedance
<b>Polarity</b>	Positive pressure on diaphragm produces positive voltage on pin 2 with respect to pin 3
<b>Case</b>	Dark gray, enamel-painted, die cast metal; matte-finished, silver colored, spherical steel mesh grille
<b>Connector</b>	Three-pin professional audio connector (male XLR type)
<b>Weight</b>	Net: 298 g
<b>Dimensions</b>	162 mm L x 51 mm W

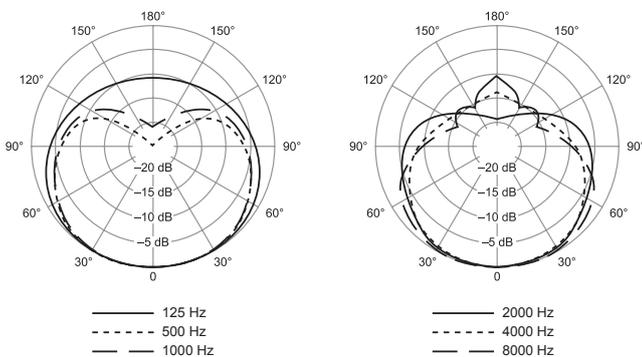


SM58

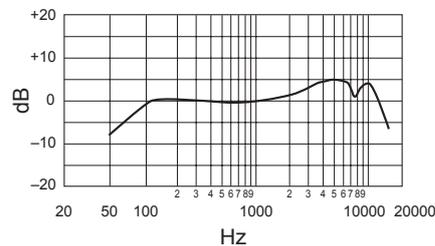
## Optional Accessories and Replacement Parts

<b>A58WS</b>	Windscreen	<b>A55M</b>	Isolation mount	<b>C25F</b>	7.6 m cable
<b>A25D</b>	Microphone clip	<b>A26M</b>	Dual mount	<b>RK143G</b>	Screen and grille
<b>R59</b>	Cartridge	<b>S37A, S39A</b>	Desk stand		

Polar Pattern  
Measured at 1000 Hz



Frequency Response



**SHURE**  
LEGENDARY  
PERFORMANCE™

RE20  
Variable-D®  
Dynamic Cardioid  
Microphone



## Key Features:

- Favorite of broadcast show hosts and voice-over studios
- Ideal for instrument recording, especially kick drums and acoustic guitars
- Studio condenser response yet no powering required and immune to overloading
- Large Acoustalloy diaphragm and low-mass aluminum voice-coil
- Dual-ported, continuously Variable-D® with minimal proximity effect
- Steel case and hum-bucking coil provide exceptional magnetic shielding



## General Description:

The Electro-Voice RE20 is a professional-quality dynamic cardioid microphone created specially for recording, broadcast and sound-reinforcement applications requiring essentially flat response over a very wide frequency range. The wide frequency response, coupled with excellent transient response, make the RE20 easily comparable to the finest condenser cardioid microphones and an easily operated "bass tilt down" switch corrects spectrum balance for use in long-reach situations or other applications where bass attenuation is needed.

A true cardioid microphone, the RE20 offers greatest rejection at 180° off axis - directly to the rear of the microphone. Pattern control is so consistent that the frequency response is nearly independent of angular location of the sound source, creating virtually no off-axis coloration, yet providing greatest possible rejection of unwanted sounds. An integral blast and wind filter covers each acoustic opening on the RE20. In recording sessions or on stage, singers can "close talk" the microphone, singing with their lips almost touching the grille screen with no worry of "P-pops" or excessive sibilance. Part of the filter also shock mounts the internal microphone element, reducing the transfer of vibrations from external sources. The exceptional performance of the RE20 is achieved by using a large Acoustalloy diaphragm in combination with an exceptionally low-mass aluminum voice coil. Using this diaphragm assembly, the RE20 is capable of reproducing extremely high sound pressure levels with no fear of the overload and distortion often experienced with phantom-powered condensers. The RE20 will also continue to function flawlessly in high humidity and elevated temperatures that would seriously degrade competitive condenser microphones. A massive steel housing and effective hum-bucking coil assure the RE20's resistance to magnetically induced hum and noise. This means the RE20 can be used successfully in situations where other microphones would experience unacceptable levels of hum and buzz.

## Technical Specifications:

Element Type:	Dynamic
Frequency Response:	45 Hz - 18,000 Hz
Polar Pattern:	Cardioid
Impedance:	150 ohms balanced
Sensitivity, Open Circuit Voltage, 1 kHz:	1.5 mV/pascal
Hum Pickup Level, typical (60 Hz/1 millioersted field):	-130 dBm
Polarity:	Pin 2 will be positive referenced to Pin 3 with positive pressure on diaphragm
Case Material:	Steel
Finish:	Fawn beige
Dimensions:	Length = 8.53" (216.7 mm) Widest Diameter = 2.14" (54.4 mm) Body Diameter = 1.94" (49.2 mm)
Net Weight:	1 lb, 10 oz (737 g)
Shipping Weight:	3 lb, 4 oz (1474 g)
Accessories Included:	81715 stand clamp
Optional Accessories:	309A shock-mounted stand adapter for use with floor stand or recording boom

By exploiting the strength of its steel housing and employing a mechanical nesting concept, EV designers have created an exceptionally rugged microphone with superior handling noise rejection ideally suited for professional uses.





# THS TALKBACK HEADPHONE SYSTEMS



## Introducing Whirlwind's THS Family of headphone boxes, a new level of control for broadcast announcers.

THS boxes are ergonomically designed to put the control buttons within easy reach of the announcer even while shuffling through stat sheets. The headphone amplifiers are designed to deliver powerful, undistorted audio that can be heard over an arena full of screaming fans. From our THS 1 to our THS 5, you'll find the right configuration to suit your broadcast announcer's needs. Check out the whole line on our website and find out which THS box is the one for you.

# whirlwind

MADE IN USA 

# Choose the THS Talkback Headphone System that works best for you!



## THS 1<sup>M</sup>

Left and right line level inputs with single stereo volume control

Additional mono Aux input with volume control

Momentary Push to Mute switch turns mic OFF while depressed

Mic is ON if power is disconnected

Footswitch jack for remote mic switching, footswitch not included



## THS 2

Left, Right and Mono line level inputs with individual volume controls

Latching Mic On switch with red LED indicates mic is ON

Momentary Cough switch mutes the mic while depressed

Mic stays ON if power is disconnected



## THS 3

Two line level inputs with Input Assign switches for routing to either or both ears

Separate left and right volume controls adjust the overall level of all inputs assigned to that ear

Latching Mic On switch with red LED indicates mic is ON

Momentary Cough switch mutes the mic while depressed

Momentary Talkback switch mutes the main mic out and activates the adjustable line level Talkback Out

Mic stays ON if power is disconnected with dynamic mics

Selectable phantom or "T" power for condenser mics



## THS 4

Two line level inputs with individual volume controls that feed left/right Assign Switches

and adjust each input's level to both ears equally

Latching Mic On switch with red LED indicates mic is ON

Momentary Cough switch mutes the mic while depressed

Momentary Talkback switch mutes the main mic out and activates the adjustable line level Talkback Out

Mic stays ON if power is disconnected with dynamic mics

Selectable phantom or "T" power for condenser mics



## THS 5

Two line level inputs with individual volume and pan controls for adjusting signal to left and right earpieces

Mic mix volume and pan controls for adding the local mic to headphone mix

Master headphone volume adjusts mix in both ears simultaneously

Latching Mic On switch with red LED indicates mic is ON

Momentary Cough switch mutes the mic while depressed

Momentary Talkback switch mutes the main mic out and activates the adjustable line level Talkback Out

Mic stays ON if power is disconnected with dynamic mics

Selectable phantom or "T" power for condenser mics



## THS 1<sup>T</sup>

Identical to the THS 1M except with a Momentary Push to Talk switch that turns the mic ON while depressed



## THS R

RTS® compatible 3 pin XLR input configured for "Wet" IFB

XLR pin 2 power and interrupt audio; pin 3 non-interrupt audio

Individual volume controls for interrupt and non-interrupt inputs

Input Assign switches route inputs to either or both ears

Momentary Cough switch mutes the mic while depressed

Momentary Talkback switch mutes the main mic out and activates the adjustable line level Talkback Out

Mic stays ON if power is disconnected with dynamic mics

Selectable phantom or "T" power for condenser mics

Transformer isolation on both inputs and talkback out

Powered with 24-30VDC from "Wet" IFB or external power adapter

MADE IN USA 



## PPB3-18MKIINO

**ProPatch® Professional Normals Out Patchbays, 2 x 48 bantam, QCP II, 18 in chassis**

### Product Classification

Brand	Pro Patch®
Product Series	ProPatch
Product Type	Copper patch panel
Regional Availability	North America

### Configuration Features

Number of Ports	96
Port Configuration	2 x 48
Front Connector Interface	Bantam jack
Preloaded	Yes
Rear Connector Interface	QCP II

### Dimensions

Depth	457.00 mm   17.99 in
Height	88.90 mm   3.50 in

### Mechanical Attachment

Mounting Style	Rack-Mount
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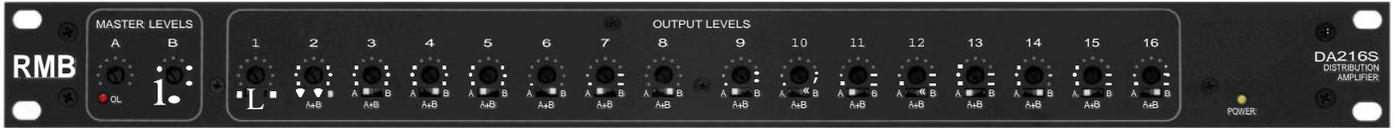
### Product Type Features

Rack Units	2.0
Jack Style	Bantam
Panel Type	Patch Panel
Polarity	Normals Out
Product Category	Broadcast Audio
Product Line	Broadcast
Size	Standard

### Regulatory Compliance/Certifications

**Agency**  
RoHS 2011/65/EU

**Classification**  
Compliant



## General Description

The Rane DA216S Distribution Amplifier is a two-input, sixteen-output splitter/distribution amplifier. The DA216S is capable of providing sixteen discrete balanced outputs from one or two balanced mic-level or line-level inputs. The level of each output is individually adjusted via one of the sixteen screwdriver Output Level controls on the front panel. *Each output may be assigned to either or both inputs via front panel accessible slide switches.*

The Master A and B Level controls affect the overall level of each input. In other words, they allow all assigned outputs to be turned up or down at once. LEDs indicate an Overload (OL) at either the inputs or at the internal gain stages.

Each input is set to either Mic or Line level via the rear panel Input Pad pushbutton. The separate Input Gain pushbutton

switches provide a microphone input with +60 or +40 dB of gain, or a line input with +20 or 0 dB of gain. With Input Gain, Master Levels and Output Levels, any reasonable input signal may be adjusted to a nominal +4 dBu and still have 17 dB of headroom. The Phantom Power switch provides +15 VDC for condenser microphones. *Any input assigned to line-level has this phantom voltage turned off automatically.* A rear-panel LED indicates when the Phantom Power is engaged.

Each output stage incorporates a high-current balanced output line driver for driving long lines with optimal performance.

The DA216S improves on the previous DA 216 model with an internal universal voltage power supply, operable nearly anywhere in the world (100-240 VAC).

## Features

- A, B, A&B Output Assign Switches
- Sixteen Balanced (Terminal) Outputs, Individually Assignable
- Two Balanced Inputs
- Studio Grade Low Noise Input Amp
- Input Overload Indicators
- Mic/Line Input Switches
- Gain Switches: 40/60 dB Mic, 0/20 dB Line
- Phantom Power Switch
- Master Input and Individual Output Level Controls
- Stable High-Current Line Drivers
- All Outputs Capable of Driving 600Ω Loads Simultaneously
- UL/CSA/CE Internal Universal Power Supply (100-240 VAC)

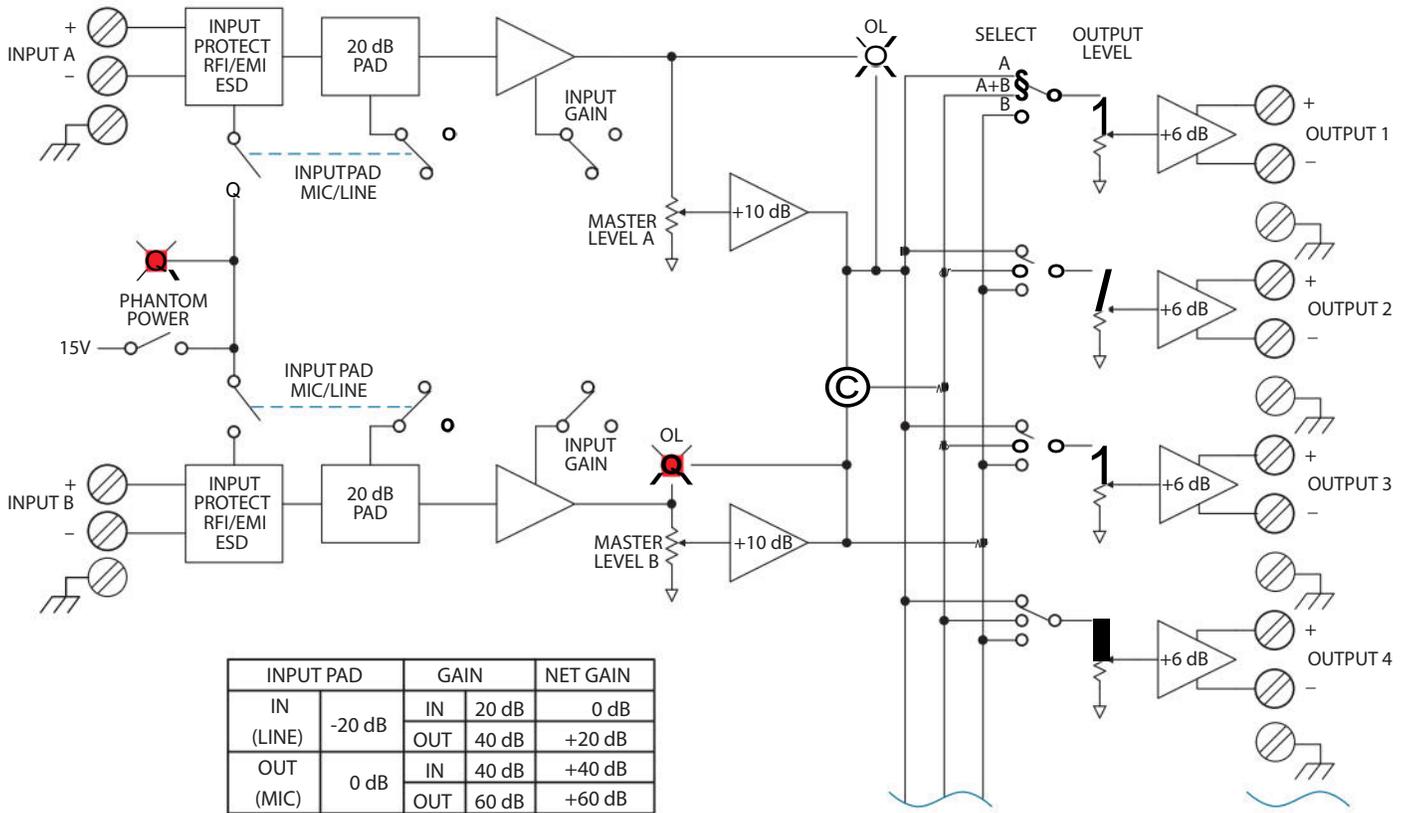
**Features and Specifications**

Parameter	Specification	Limit	Units	Conditions/Comments
Mic Input Impedance	1.82k	1%	Ω	Balanced 909 + 909
Line Input Impedance	17.9k	1%	Ω	Balanced 8.97k + 8.97k
Mic Gain Control	+40 & +60	±2	dB	2-position switch
Mic Pad	20	±2	dB	2-position switch
Line Gain Range	0 & +20	±2	dB	2-position switch
Overall Mic Gain	+56 & +76	±4	dB	All controls maximum
Overall Line Gain	+16 & +36	±4	dB	All controls maximum
Max Mic Input Level	-20	typ	dBu	Gain at 40 dB
Max Line Input Level	+21	typ	dBu	Gain at 0 dB
Overload LED	3 dB below clip	typ		Clip defined as 1% THD+N
Phantom Power	+15	±0.5	VDC	Phantom Power switch active
Output Impedance	200	1%	Ω	Balanced 100+100
Output Drive Level	+24	typ	dBu	600 Ω load
Output Cable Length	1500	max	feet	Belden 8451 or equivalent
Mic Equivalent Input Noise	-128	typ	dBu	Rs=150, gain=60 dB
Line Signal-To-Noise Ratio	100	min	dBV	gain=0 dB, re +4 dBu, 22 kHz BW
THD+Noise (Line Input)	0.005	typ	%	gain=0 dB, +4 dBu@1 kHz, 80 kHz BW
Frequency Response, Line	15-50 kHz	+0, -3	dB	0 dB Gain, 0 dBu Output
Frequency Response, Mic	15-50 kHz	+0, -3	dB	40 dB Gain, 0 dBu Output
Frequency Response, Mic	30-50 kHz	+0, -3	dB	60 dB Gain, 0 dBu Output
Crosstalk	80	typ	dB	+4 dBu Output, 1 kHz
Power Supply Requirement	100 to 240	10%	VAC	50/60 Hz, 7W
Unit: Conformity	CE, FCC, cULus			
Unit: Construction	All Steel			
.....Size	1.75"H x 19"W x 5.3"D (1U)			(4.4 cm x 48.3 cm x 13.3 cm)
.....Weight	4 lb			(1.9 kg)
Shipping: Size	4.25" x 20.3" x 13.75"			(11 cm x 52 cm x 35 cm)
.....Weight	7 lb			(3.2 kg)
<i>Note: 0 dBu=0.775 Vrms</i>				

# DA216S

## DISTRIBUTION AMPLIFIER

### Block Diagram



INPUT PAD		GAIN		NET GAIN
IN (LINE)	-20 dB	IN	20 dB	0 dB
		OUT	40 dB	+20 dB
OUT (MIC)	0 dB	IN	40 dB	+40 dB
		OUT	60 dB	+60 dB

TO OUTPUTS 5 - 16

### Applications

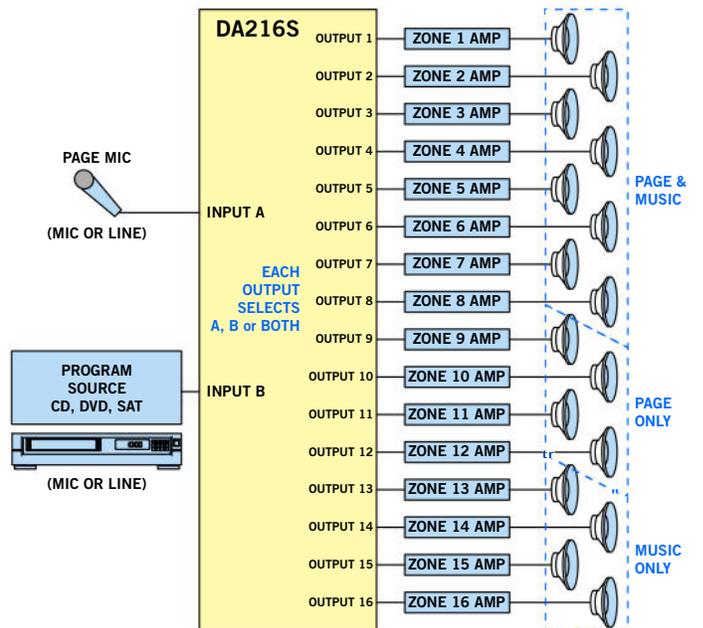
Use of the DA216S is straightforward. Connect balanced inputs and outputs to the Euroblocks, following the silk-screened labels. Wire range is #14 to #26 stranded or solid.

The diagram above shows the uncomplicated nature. Fully balanced low-noise mic preamplifiers receive the signal to be split or distributed. The Input Pad pushbuttons change the input gain range. Additional Gain pushbuttons increase either Mic or Line level inputs another +20 dB (see table above).

Keep an eye on the Overload indicators when setting the gain. Always use the most gain possible without causing the Overload indicator to light. Occasional flickering is permitted. Setting gain this way maintains the best signal-to-noise performance for the system. The Master Level controls allow level matching and balancing as required.

When operating unbalanced, a 6 dB loss of signal must be taken into account when setting the gain structure of the system. *When wiring an Output for unbalanced operation do not ground the unused terminal (i.e. usually the "-"). Unbalanced uses only the "+" and ground terminals.*

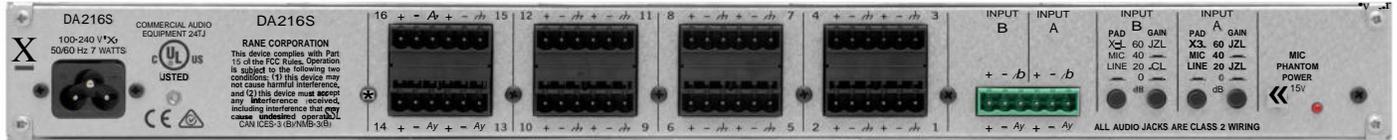
### Application Example



# DA216S

## DISTRIBUTION AMPLIFIER

### Rear Panel



### 32 Unbalanced Outputs

The (“-”) Output may also be used as an unbalanced line driver, albeit inverted. The balanced Input terminals of the next stage must be reversed (+) for (-) to correct for the inversion. This nets a total of 32 Outputs! However, the penalty for 32 outputs is that unbalanced operation will not drive long lines and individual control is lost.

### Architectural Specifications

The distribution amplifier shall have two (2) inputs and sixteen (16) outputs. The unit shall be capable of mono (16 mono outputs) or stereo operation (8 stereo outputs) via front panel switches. Each output shall be assignable to either or both of the master inputs.

Each input shall be microphone or line level switchable by means of rear panel switches. Additional 20 dB gain switches shall be built-in for each input, applicable to either a mic or line level signal. Each input shall have a front panel screwdriver level adjustment. 15V phantom power shall be provided via a rear panel switch for microphone inputs.

Each output shall have a front panel screwdriver adjustment. Inputs and outputs shall be active balanced screw terminal connectors.

The unit shall be capable of operation by means of its own built-in universal power supply operating at 100-240 VAC and meet CE requirements. The unit shall be UL and cUL listed. The unit shall be entirely constructed from cold-rolled steel.

*The unit shall be a Rane DA216S Distribution Amplifier.*

# whirlwind

## MK Series Mic Cable Specifications

### Cable

Model	No. of Conductors	Conductor Gauge & Stranding	Shield Type & % Coverage	Overall Diameter (inches)	Nominal Cap. <sup>1</sup> (pf/ft.)	Nominal Cap. <sup>2</sup> (pf/ft.)	Jacket Thickness (inches)	Insulation Thickness (inches)	Weight per 100 ft. (lbs.)
<b>WMKPVC</b> Whirlwind Exclusive Accusonic+2: Heavy duty, flexible two conductor cable with polyethylene insulation and black PVC jacket.	2	22 26x36	B.C. Braid 78% .	.245	19	35	.045	.018	3.2

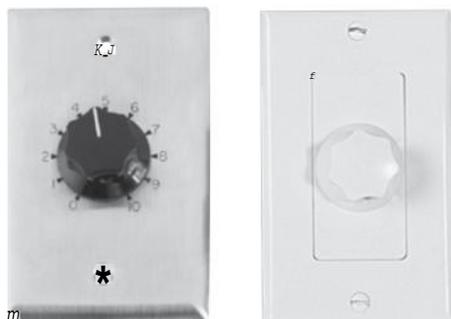
### Connectors

- 1) Whirlwind WI3M male XLR
- 1) Whirlwind WI3F female XLR



# Commercial Attenuators

## AT Series, E408 Series



### Features

- Models Feature a Range of Attenuation Steps (1.5dB or 3dB Steps) as Well as Continuous to Meet Application and Budget Requirements
- Wall Plates are Stainless Steel with Stamped and Filled or Screen Printed Dial Scale, and a Skirted Black Knob (White and Ivory Plastic Plates with Matching Skirted Knobs Also Available in Decora Style-D Series Only)
- Popular Rack Mount Attenuator Versions are Available on the AT and E408 Series for Mounting on to Blank Panels in Equipment Cabinets
- All AT Models Mount into Most 1-Gang E.O. Boxes. (2¾" Deep)
- AT and E408 Series are UL Listed

### General Description

AT Series Industry Standard Auto Transformer. High-quality auto transformer series provides the advantages of excellent frequency response, low insertion loss and reliable performance for volume control application in 25V/70.7V systems. Attenuation is accomplished in ten make before break steps plus positive Off position. (No stop between maximum and Off position to prevent switch damage). Contacts are silver plated for noise-free operation. Features a removable terminal block. Includes stainless steel plate, with stamped and filled or screen printed dial scale and a skirted black knob. (White and ivory plastic plates with matching skirted knobs also available in Decora style-see AT model

E408 Auto Transformer with Precision Level Control. Specially designed for attenuation in masking and sound reinforcement systems where fine tuning of level control is required. Employs a ten-position, non-shorting rotary switch without stop. Attenuation rate is 1.5dB per step. (All other specifications are the same as the AT Series including the UL listing).

PA Series Priority Paging Option. Priority paging feature by-passes the effect of the attenuator to provide program level selection of individual emergency and paging signals at the amplifier. Option is available on all AT attenuators. The SPDT relay is operated with 24VDC at 10mA. Includes protective relay cover to ensure lasting trouble-free performance. Terminations to the relay and attenuator are made via a removable terminal block. (All other specifications except for dimensions are the same as selected AT models).

RM Series Rack Mount Option. For attenuation convenience of rack-mounted equipment in cabinets and consoles, the AT, E408 Series attenuators are available without mounting plate for rack panel installation. Attractive matte black polycarbonate dial scale overlay with adhesive backing replaces the mounting plate. Includes skirted black knob. Overlay size is 29 square (51mm). (To order, simply add RM after the selected attenuator model number. Example: AT10-RM or AT10-PARM.) (Dial scale overlays to retrofit existing installations are available, see Model HX23.)



E408-100



RM Series

### Replacement Knobs



HX22-W

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## Specifications

### AT10-(PA)

Power Rating *	10 Watts
UL Listing	
Attenuation Per Step	3dB
Total Attenuation	33dB**
Insertion Loss	.4dB
Plate Size	1 gang
Resistance	None

### AT35-(PA)

Power Rating *	35 Watts
UL Listing	
Attenuation Per Step	3dB
Total Attenuation	27dB
Insertion Loss	.6dB
Plate Size	1 gang
Resistance	None

### AT100-(PA)

Power Rating *	100 Watts
UL Listing	
Attenuation Per Step	3dB
Total Attenuation	27dB
Insertion Loss	.6dB
Plate Size	1 gang
Resistance	None

### E408-100

Power Rating *	100 Watts
UL Listing	
Attenuation Per Step	1.5dB
Total Attenuation	15dB
Insertion Loss	.6dB
Plate Size	1 gang
Resistance	None

\* Continuous  
 \*\* These units have two steps of 6dB before off position.

Note: Attenuation curve is steeper for a 25-volt line

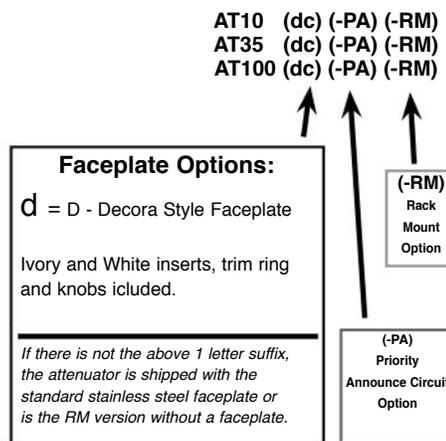
## Architect and Engineer Specifications

AT Series Attenuator(s) shall be Atlas Sound AT Series Model \_\_\_\_\_ auto transformer or approved equal. The power rating shall be \_\_\_\_\_ and attenuation range shall be \_\_\_\_\_dB. Attenuation per step for AT-\_\_\_\_ shall be 8 steps of 3dB and 6dB each for the last two positions. Attenuator shall be a step type control with a positive off position. There shall be no stop between the maximum and off positions (AT Series only). Switch shall have silver plated contacts to eliminate noise and contact loss. All terminations must be made via a removable terminal block. Unit(s) shall be supplied with one of the following single gang face plates to be noted by model number suffix: Standard stainless steel faceplate (with dial scale to indicate attenuator position), Decora style plastic face plate-Ivory color, Decora style plastic face plate-White color. All models are designed to mount in a standard E.O. box.

E408 UL Listed attenuator shall be Atlas Sound Model E408-100 auto transformer or approved equal. The power rating shall be 100W. The attenuation per step shall be 1.5dB. Unit shall be a step type control with a positive off position. There shall be no stop between the maximum and off positions. Switch shall have silver plated contacts to eliminate noise and contact loss. The attenuator shall be mounted to a standard gang stainless steel wall plate which mounts to a standard E.O. box.

RM Option Attenuator shall be Atlas Sound Model \_\_\_\_\_ [(AT, E408 (-RM))] or approved equal. Face plate shall be replaced by an adhesive matte black polycarbonate dial scale escutcheon for attachment to a rack mount panel. Escutcheon size shall be 2" SQ.

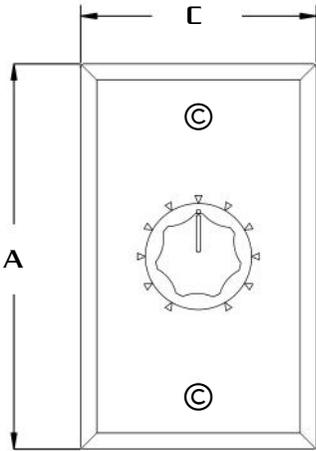
PA Option Specified AT Series attenuators include a priority relay. Relay shall be an SPDT, 24 VDC type securely mounted to the attenuator assembly wired at the factory. Relay shall include a protective cover.



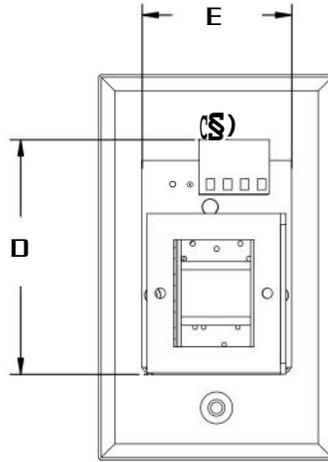
## AT Series

### Dimensional Specifications Plate Mounted Attenuators

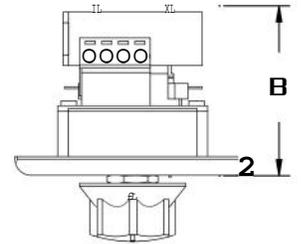
MODEL	A	B	C	D	E
AT10	4½"	2⅛"	2¾"	2¾"	1¾"
AT10-PA	4½"	2⅛"	2¾"	2¾"	1¾"
AT35	4½"	2⅛"	2¾"	2¾"	1¾"
AT35-PA	4½"	2⅛"	2¾"	2¾"	1¾"
AT100	4½"	2½"	2¾"	2¾"	1¾"
AT100-PA	4½"	2½"	2¾"	2¾"	1¾"
E408-100	4½"	2⅝"	2¾"	2¾"	1¾"



Front



Back



Tbp

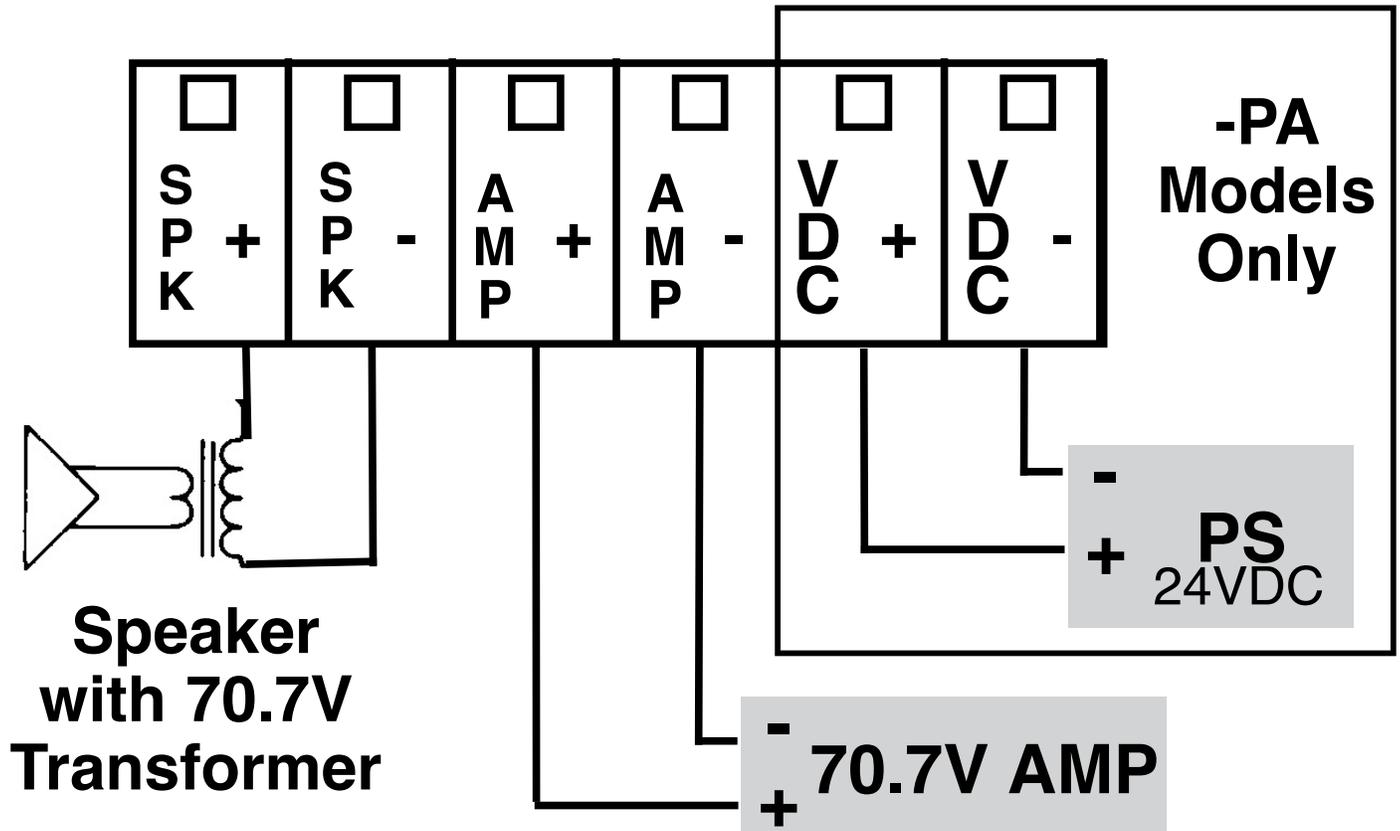
## WIRING - AT Series

Each terminal will hold up to 2-16AWG stranded wire.

For larger wires or home run situations, a small length of wire and a wire nut are recommended.

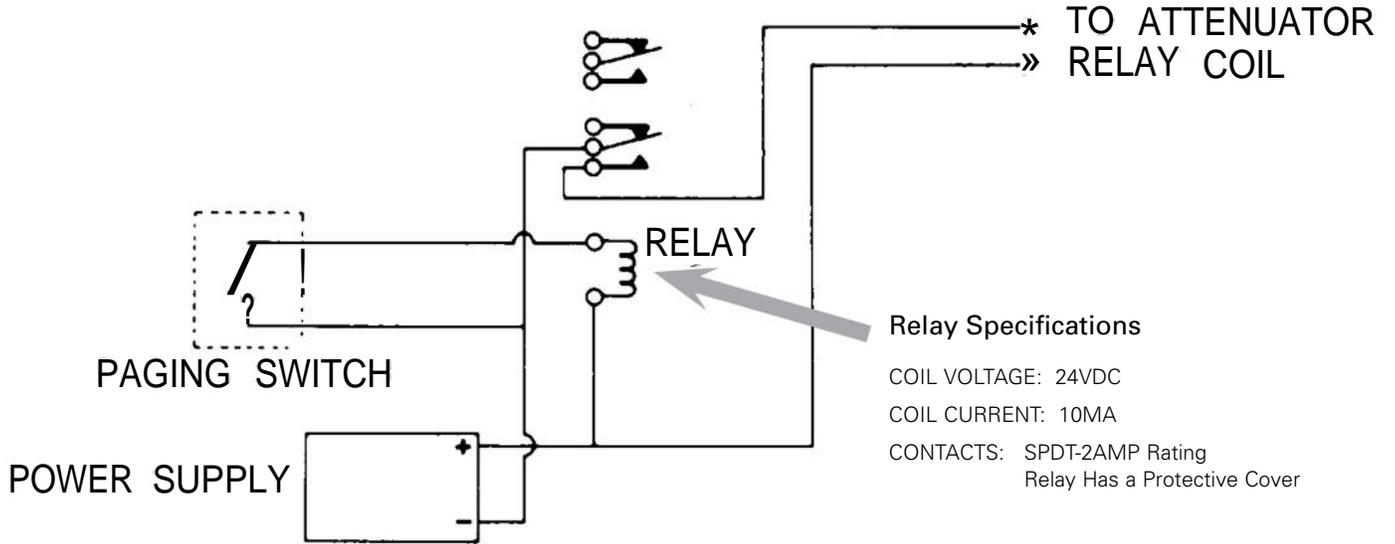
Attach wire according to label on terminal block as shown below (Non-PA Models will not have the "VDC+" and "VDC-" terminals).

\* Install the unit with the terminal block on top. This will ensure that the off position is on the bottom.



# Wiring - (-Pa) Priority Attenuators

## Power Switching Req. For - Pa Attenuators





# SH96HO Loudspeaker

## KEY FEATURES:

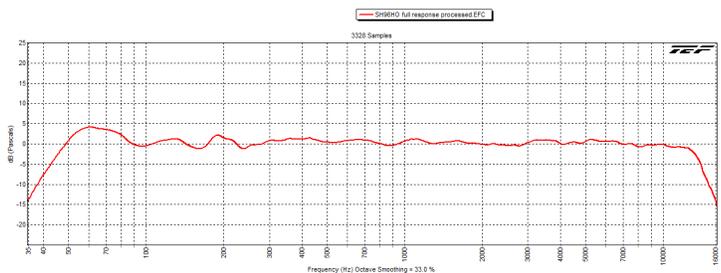
- ▶ Synergy Horn Technology
- ▶ 11 horn loaded drivers
- ▶ 90 x 60 degree coverage
- ▶ Bi-amped Only Operation

The SH96HO is a 3-way loudspeaker design housing 4 x 15" LF drivers, 6 x 4" MF drivers and 1 x 1.4" exit HF compression driver, all mounted within a 45" x 26" horn. Thoughtfully placed drivers within the horn, in unison with a synergy crossover network, allow for proper phase alignment between frequency bands. This permits the physically separated bands to combine and emerge from the horn in synchrony, greatly reducing off axis distortions in frequency response, allowing for greater clarity at long distances. Furthermore, out of band harmonic distortion is reduced by the use of acoustic low pass filters on the lows and mids.



The 13 ply Baltic Birch used throughout the enclosure is encased in Polyurea for protection from impact and atmospheric conditions, and a strengthened outdoor finish is available for long term exposure to rain and sunlight. Install and touring versions of the SH96HO's are equipped with eighteen 3/8" rig points; however, touring models also include built on casters and six handles for easy movement.

SH96HO full response processed  
8/18/2019 10:52:05 PM



Operating Frequency Range \_\_\_\_\_ 45Hz - 13.5KHz -3dB  
 \_\_\_\_\_ 38Hz - 15KHz - 10dB

Coverage Pattern \_\_\_\_\_ 90 x 60

Sensitivity \_\_\_\_\_ 105dB (measured as 2.83V @1m distance)

Maximum Output \_\_\_\_\_ 133dB SPL Cont. | 139dB SPL Peak

M Noise \_\_\_\_\_ 134dB SPL Cont. | 147dB SPL Peak

Power Handling \_\_\_\_\_ Low 2800 Watts Cont., 11,200 Watts Peak  
 \_\_\_\_\_ M/H 800 Watts Cont. 3,200 Watts Peak

Recomended Power Amp \_\_\_\_\_ DNA 20K4 Pro

Impedance \_\_\_\_\_ Low 2 or 8 Ohm selectable | M/H 4 Ohm

Drivers \_\_\_\_\_ Low 4x15", Mid 6x 4", High 1x1.4"

Input Connections \_\_\_\_\_ 2x NL4

Enclosure Material \_\_\_\_\_ 18mm Baltic Birch, polyurea coated

Weight \_\_\_\_\_ 265 lbs

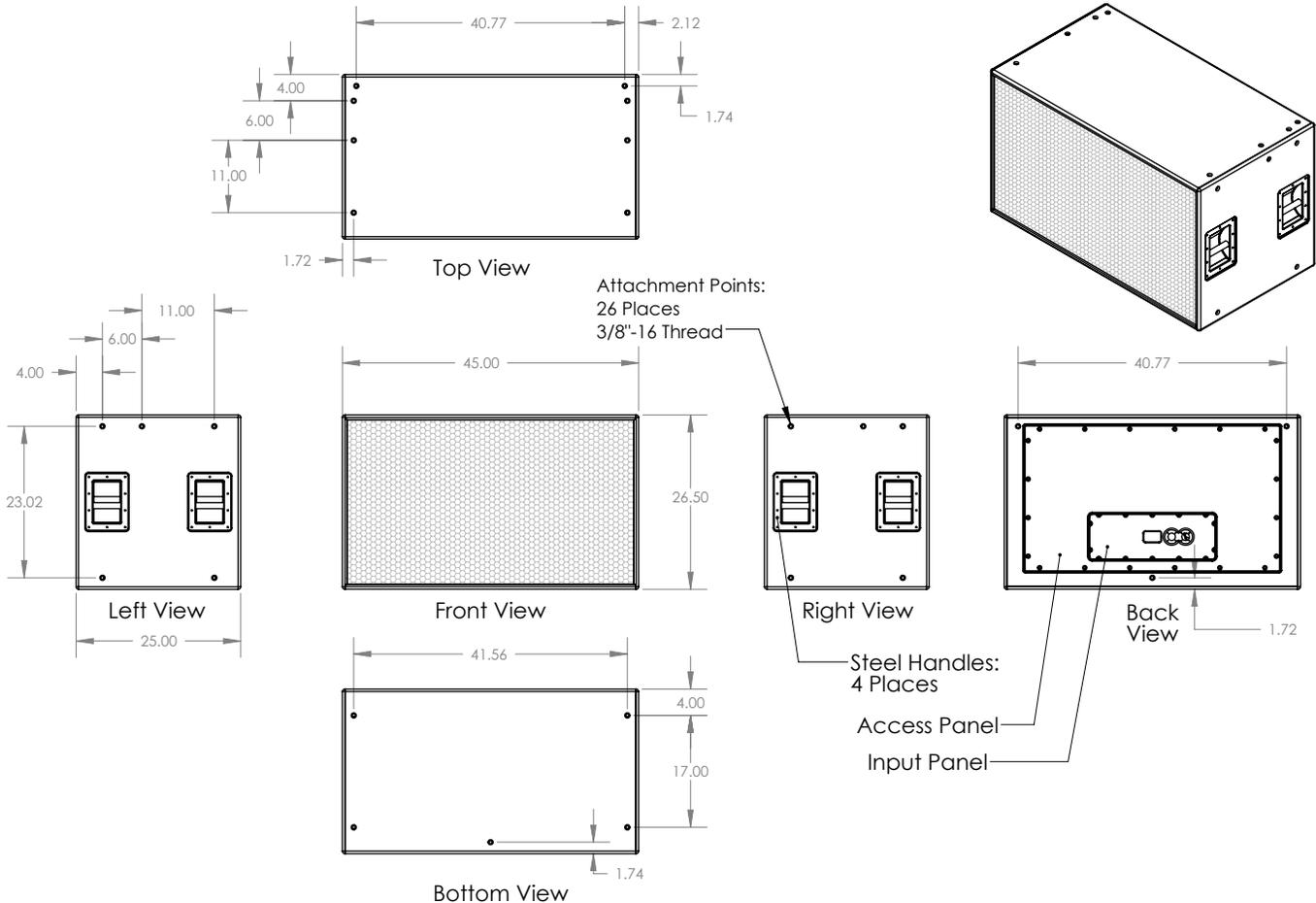
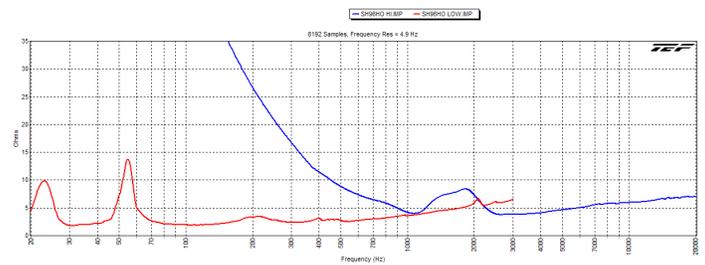
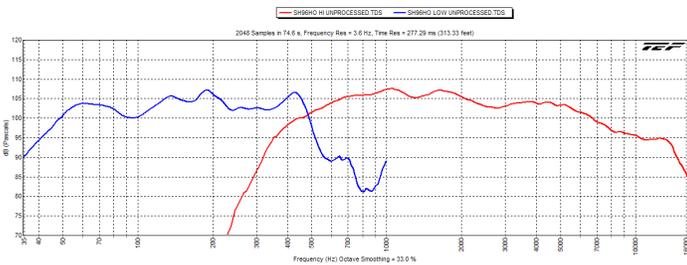
Dimensions \_\_\_\_\_ 26.5 x 45 x 25 in. / 67.31 x 114.3 x 63.5 cm.



# SH96HO Loudspeaker

## ARCHITECT/ENGINEERS SPECS

The loudspeaker shall utilize 4 - 15" woofers, 6 - 4" mid frequency drivers and 1 x 1.4" high frequency driver in a single enclosure. The coverage pattern shall be 90° horizontal x 60° vertical. The loudspeaker shall have an operating range of +/- 3 dB 45 Hz - 13.5 kHz. Sensitivity of 105 dB SPL @ 1m. Output of 133 dB SPL/139 dB SPL Peak. Power handling shall be 2800 Watts continuous LF, 800 Watts continuous Mid/High. The impedance shall be selectable 2 or 8 ohms. The loudspeaker shall be constructed of 13 ply Baltic birch, water resistant Polyurea coated, properly braced for the intended use and a rugged steel grill. The connectors shall be Neutrik NL4. The Loudspeaker shall be the Danley Sound Labs SH96HO.



## KEY FEATURES:

- ▶ Tapped Horn Technology
- ▶ Incredible Output to Size/Weight/Price Ratio

The TH118 is a subwoofer that is useful for both indoor and outdoor applications. The tapped horn design takes full advantage of the driver element by doubling up on its output ability. The result is more volume from less input. Combine that attribute with the high-power handling of the driver and you have one of the most powerful subwoofers in the market. In many cases a single TH118 will take the place of 2 standard 2x18" front loaded cabinets. So, the overall cost and physical size is reduced-along with less amplifiers needed to achieve a particular loudness. The interlocking skids on top and bottom allow it to be stacked for even greater output.



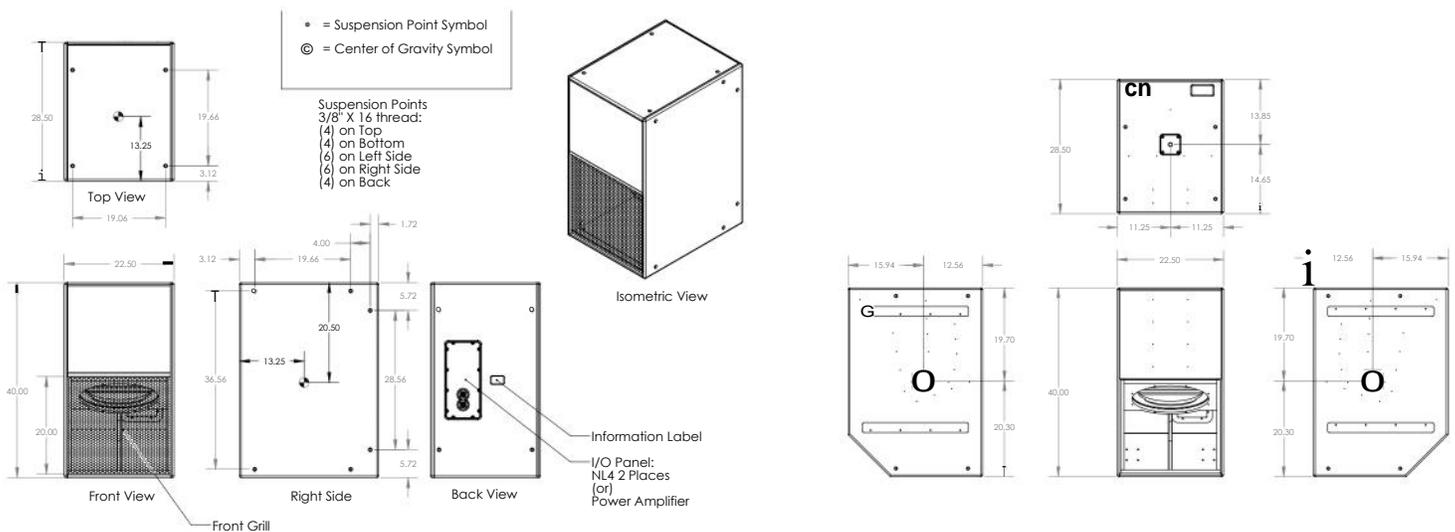
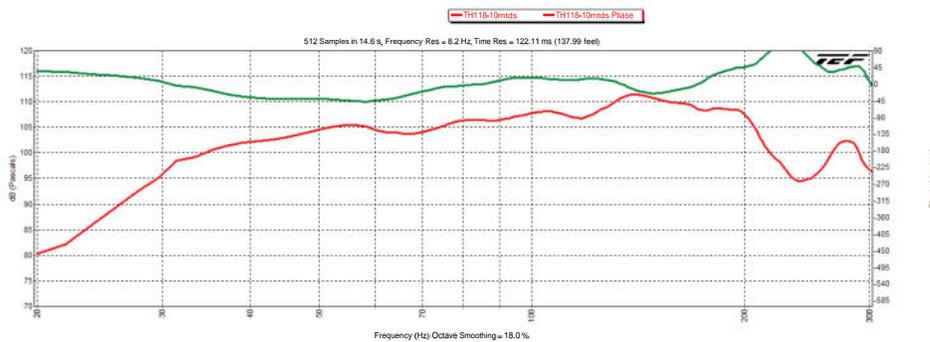
## APPLICATIONS:

- ▶ Nightclubs
- ▶ Concert Venues
- ▶ Outdoor Concerts
- ▶ Sports Facilities
- ▶ Athletic complexes

Operating Frequency Range-----	37Hz -213Hz -4dB
-----	-----29Hz - 300Hz -10dB
Sensitivity-----	108dB (measured as 2.83V referenced to 1m by 28.3V @10m distance)
Maximum Output-----	134 dB SPL Cont., 140 dB SPL Peak
-----	----- 141dB continuous/147dB peak at 141Hz
Power Handling-----	1700 Watts Cont., 6800 Watts Peak
Recommended Amplifier Power-----	----- 3400 Watts
Impedance-----	----- 4 Ohm
Recommended Processing-----	----- 30 Hz high pass @ 24 dB / Butterworth
Drivers -----	----- 1x 18" Woofer
Input Connections -----	----- 2x NL4
Enclosure Material -----	----- 13 ply, 18mm Baltic Birch, polyurea coated
Weight -----	----- 160lbs
Dimensions-----	-----40" x 28.5" x 22.5"

## ARCHITECT/ENGINEERS SPECS

The subwoofer shall utilize the tapped patented enclosure. The coverage pattern shall be omnidirectional. The subwoofer shall have an operating range of 29Hz -300Hz -10dB. Sensitivity of 105 dB SPL (measured at 2.83V referenced to 1m by 28.3V @10m distance). Output of 134 dB SPL Program/140 dB SPL Peak. Power handling shall be 1700 Watts cont. or 6800 Watts peak. The subwoofer shall be constructed of 13 ply, 18mm Baltic Birch, polyurea coated. The subwoofer shall be the Danley Sound Labs TH118.





# Control® 67HC/T Narrow-Coverage, High Ceiling Pendant Loudspeaker with RBI

## Professional Series

### Key Features:

- ▶ JBL's exclusive conical Radiation Boundary Integrator® (RBI) technology provides 75° coverage, for clarity in high-ceiling and reverberant locations.
- ▶ Coaxial design featuring 165 mm (6½ in) woofer and 25 mm (1 in) soft-dome tweeter.
- ▶ Extremely smooth frequency response and superb high fidelity sound reproduction.
- ▶ Hanging hardware with 4.5 m (15 foot) galvanized steel cable and easy to adjust clamp
- ▶ Stylish design, available in black or white (-WH).
- ▶ UL listed (speaker and hanging cable system).
- ▶ 8 ohm and 70V/100V operation.

### Applications:

The Control 67HC/T is a high output, full-range, two-way pendant-type loudspeaker that provides superb sound reproduction and very consistent, narrow coverage for rooms with open architecture ceilings and other locations where a pendant form factor is desired. The well-controlled narrow coverage is ideal for improved voice intelligibility and musical clarity in high-ceiling venues or in rooms with difficult acoustics such as convention centers, transit centers, exhibit venues and hotel atrium areas.

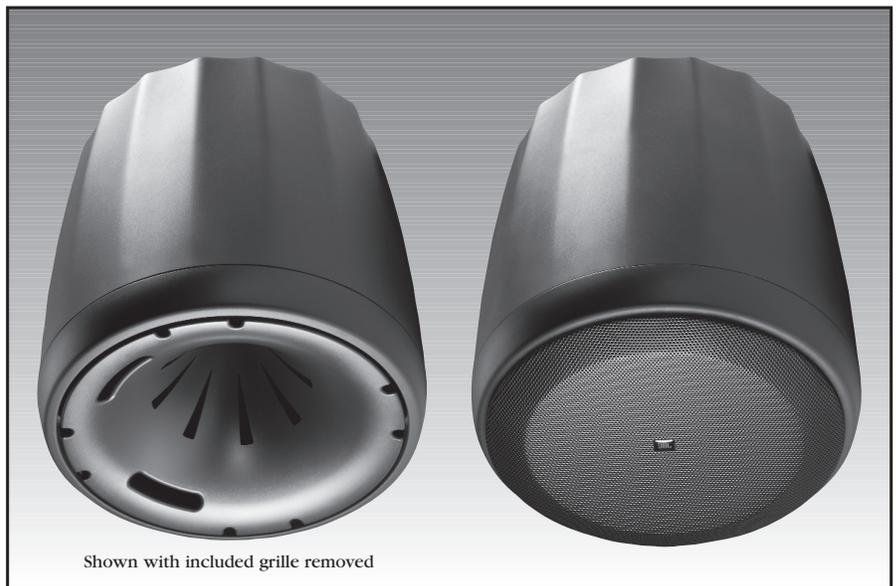
JBL's patent-pending Radiation Boundary Integrator® (RBI) technology, adapted from the groundbreaking VERTEC™ Series of line array loudspeakers, delivers consistent coverage of the listening area. Combining an extra-large 295 mm (11.6 in) diameter waveguide with low-frequency projection apertures, the two coaxially-mounted drivers provide a seamless integration of coverage, resulting in extremely even pattern control and coverage where all listeners hear a consistent, high-fidelity sound quality.

The Control 67HC/T includes a single-point mounting system for easy and secure suspension in open-ceiling applications. Two complete hanging cable systems are included, providing both main and safety suspension cables. Include are extra-long 4.5 m (15 foot) high tensile galvanized steel wire rope having spring clips for the loudspeaker end of the cable and UL listed cable fasteners for infinitely adjustable suspension height.

The system's 165 mm (6½ in) low-frequency driver features a polypropylene-coated cone and 25 mm (1 in) copper voice coil with vented fiberglass resin coil-former for high power handling and improved long-term reliability. The coaxially-mounted 25 mm (1 in) textile soft-dome high frequency driver features internal damping for smooth extended response, along with an aluminum voice coil former and neodymium magnet assembly with ferro-fluid cooling, for high-fidelity sound quality with enhanced long-term sound level capability.

The Control 67HC/T contains a high-quality 60 Watt multi-tap transformer for use on 70V/100V distributed loudspeaker lines, and is switchable for 8-ohm voice-coil direct operation.

Euro-style clip-in connectors allow for easy wiring. For protected outdoor applications, rubber boots are included to cover the input connectors, and an optional terminal cover is available for harsher locations.



Shown with included grille removed

### Specifications:

<b>System:</b>	
Frequency Response (-10 dB):	75 Hz – 17 kHz
Frequency Range (±3 dB):	110 Hz – 16 kHz
Power Capacity:	75 Watts Continuous Pink Noise Power (with 300 Watts peaks) 150 Watts Continuous Program Power
Nominal Sensitivity:	93 dB
Nominal Coverage Angle:	75° (+15°/-20°)
Directivity (Q):	10.4
Directivity Index (DI):	9.8 dB
Rated Maximum SPL @ 1m:	112 dB continuous pink noise, 118 dB peak
Rated Impedance:	8 ohms
Transformer Taps:	70V: 60W, 30W, 15W & 7.5W 100V: 60W, 30W, 15W
Transformer Insertion Loss:	0.5 dB @ 7.5 W, 0.5 dB @ 15 W, 0.6 dB @ 30 W, 0.7 dB @ 60 W
<b>Transducer:</b>	
LF Driver:	165 mm (6.5 in) polypropylene-coated paper with pure butyl rubber surround, 25 mm (1 in) copper voice coil, vented fiberglass resin voice coil-former
HF Driver:	25 mm (1.0 in) textile soft-dome, neodymium magnet assembly, ferro-fluid cooling, aluminum voice coil former
<b>Enclosure:</b>	
Enclosure Material:	High impact polystyrene
Grille:	Zinc-plated steel grille with powder-coat finish, foam backing (removable for painting)
Environmental:	Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV. IP44 capability per IEC 529 – splashproof rating.
Termination:	Two removable locking euro-block 2-pin connectors with screw-down terminals for bare wire. Connectors paralleled for input and loop-thru. Max. wire 12 AWG (2.5 mm <sup>2</sup> ). Rubber terminal covers included.
Suspension:	Two identical suspension systems (one as main suspension cable and the other as safety cable), each consisting of 4.5 m (15 ft) long 2 mm (0.077 in) high-tensile galvanized-steel wire rope suspension cable with spring-clips for clipping onto the loudspeaker bracket and Gripple™ brand adjustable-height cable fasteners for infinitely adjustable height. Cables have SWL rating of 45 kg (99 lb).
Safety Agency Ratings:	Speaker listed per UL1480, transformer registered per UL1876. In accordance with IEC60849/EN60849. Suspension system and Gripple®-brand cable fastener listed per UL1598 and UL2239, TUV, and CSA Class 3426-01 & Class 3426-81.
Dimensions:	333 mm (13.1 in) diameter x 344 mm (13.6 in) height to top of cabinet. 369 mm (14.5 in) to top of suspension bracket.
Net Weight (ea):	5.9 kg (13 lbs)
Shipping Weight (pair):	14.1 kg (31 lbs)
Included Accessories:	Two suspension cable systems (see "Suspension", above), two 2-pin removable locking euro-block connectors, two rubber covers for euro-block connectors.
Optional Accessories:	MTC-PC60HC top panel / terminal cover
Colors:	Available in black or white (-WH). Paintable.

<sup>1</sup> Full-space (suspended)

<sup>2</sup> Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB peak-to-average crest factor for 100 hours continuously. Continuous Program power is a conservative expression of the system's ability to handle normal speech and music program material and is defined as 3 dB above the Continuous Pink Noise rating.

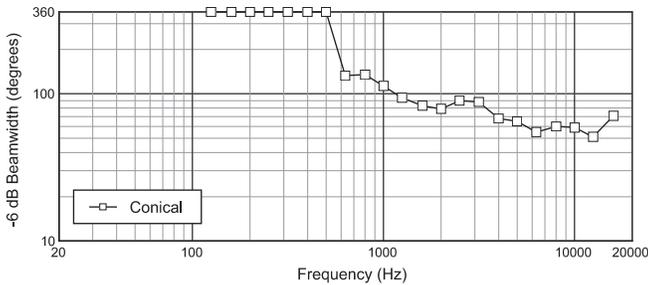
<sup>3</sup> Full-space (suspend in free air), average 1.5 kHz to 10 kHz.

JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

# ► Control 67HC/T Narrow-Coverage, High Ceiling Pendant Loudspeaker with RBI

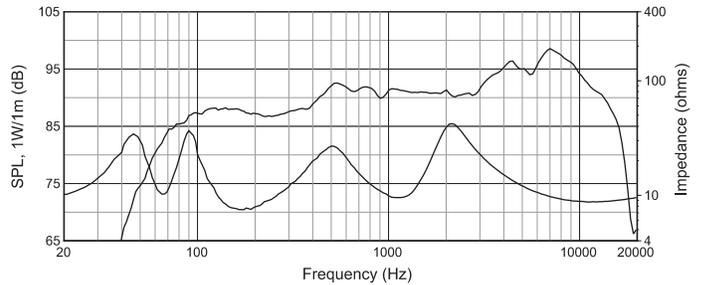
## Beamwidth:

-6 dB coverage by frequency

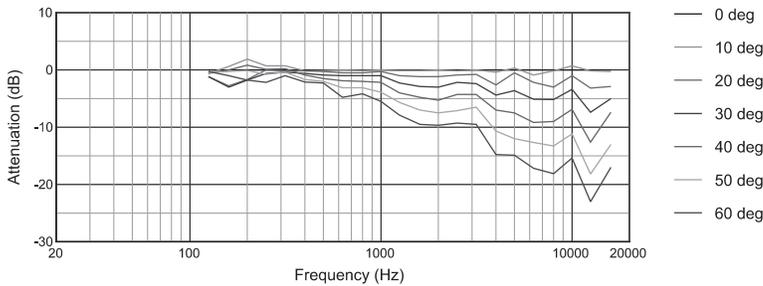


## Frequency Response:

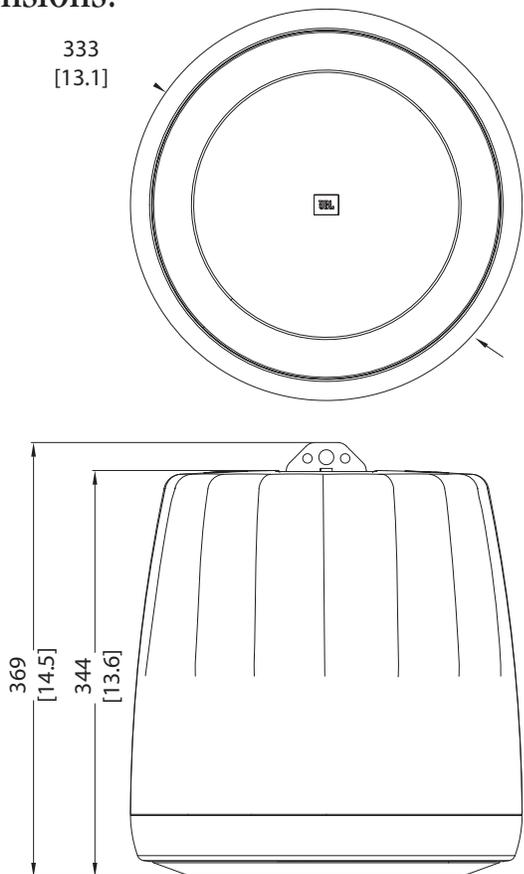
Full-space, 8 ohm, 10° off-axis (typical for coverage area)



## Off-Axis Frequency Response:



## Dimensions:



Dimensions in mm (in)



JBL Professional  
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Northridge, California 91329 U.S.A.

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[www.jblpro.com](http://www.jblpro.com)

SS C67HC  
CRP  
08/10

# Control® 24C/CT

Professional Series – Background/Foreground Ceiling Speaker



## Key Features:

- Coaxially mounted 100 mm (4 in) woofer with butyl rubber surround and 19 mm (¾ in) titanium coated diffraction-loaded tweeter
- High power, wide frequency response and low distortion for high sound level capability
- Wide coverage allows fewer speakers, reducing the cost of the installed sound system without sacrificing performance
- JBL's exclusive SonicGuard™ overload protection allows higher operational levels and improved system reliability (24C only)
- Packaged with grille, backcan and tile rails for fast installation and easy dealer stocking



Included grille not shown

## Description:

The Control 24C is a compact ceiling speaker providing premium performance in background, foreground and music-plus-paging sound systems. The Control 24C is perfectly suited for a wide variety of applications from professional offices and airports to restaurants and specialty retail stores. High power handling, wide frequency response and low distortion make the Control 24C ideal for sound systems requiring a higher fidelity sound from ceiling loudspeakers. The premium performance capability ensures excellent sound character, providing pleasant, enveloping sound throughout the listening area.

The Control 24C's 16 ohm impedance allows use of multiple speakers in parallel without having to use a more expensive constant voltage distributed system. The optional Control 24CT version includes a multitap transformer for 70V/100V systems.

JBL's exclusive SonicGuard overload protection is a non-invasive

## Specifications:

System	
Frequency Range (-10 dB) <sup>1</sup>	80 Hz – 20 kHz
Power Capacity <sup>2</sup>	80W Continuous Program Power 40W Continuous Pink Noise
Nominal Sensitivity <sup>3</sup>	86 dB SPL @ 1 m (3.3 ft)
Nominal Coverage Angle <sup>4</sup>	130° conical coverage
Directivity Factor (Q)	2.4 averaged 500 Hz to 4 kHz
Directivity Index (DI)	3.8 averaged 500 Hz to 4 kHz
Rated Maximum SPL	102 dB @ 1 m (3.3 ft)
Nominal Impedance (24C)	16 ohms (Min Z 16.1 Ω @ 320 Hz)
Transformer Taps (24CT)	070V: 30W, 15W, 7.5W & 3.7W taps 100V: 30W, 15W, & 7.5W taps
Transducers	
Low Frequency	100 mm (4.0 in) Polypropylene-coated, 1" coil on aluminum former
High Frequency	19 mm (0.75 in) Titanium coated polyester
Physical	
Enclosure	Backcan: Formed steel Baffle/Rim: Medium impact polystyrene, fire rated UL94V-0
Overload Protection	Full-range power limiting to protect network and transducers. (On Control 24C, not on Control 24CT)
Termination	Removable locking connector with screw-down terminals. 2 input terminals and 2 loop-thru output terminals. Max. wire size 12 AWG (2.5 mm <sup>2</sup> ).

loudspeaker protection system that is inaudible to the listener, ensuring reliability while providing full fidelity sound. The computer-optimized ported enclosure delivers warm, smooth bass response. Low frequency output can be further augmented with the addition of one of the Control Contractor subwoofer models.

The 100 mm (4 in) woofer features a polypropylene-coated cone and pure butyl rubber surround for long life, even in high humidity environments. An aluminum voice coil former provides extra cooling for greater long-term power handling.

The coaxially mounted 19 mm (¾ in) titanium coated tweeter provides crisp, clear highs. Diffraction-loading of the tweeter provides wide, even coverage of the listening area. The extremely broad 130° coverage pattern allows for fewer speakers to be used, making for a simpler and less expensive installation.

Safety Agency Rating	Suitable for use in air handling spaces per UL1480, UL2043, NFPA90 & NFPA 70. S7232/UL Listed, Signaling Speaker. Transformer UL registered per UL1876. In accordance with IEC60849/EN60849.
Outside Dimensions (H x Dia)	200 x 195 mm (7.9 x 7.7 in) 184 mm (7.2 in) front of ceiling tile to back of backcan
Cutout Size	168 mm (6.6 in)
Net Weight (each)	2.7 kg (6 lb) 1 CT: 3.5 kg (8 lb)
Shipping Weight (pair)	6.4 kg (15 lb) CT: 8.0 kg (18 lb)
Included Accessories	» C-shaped support backing plate » 2 tile support rails (fits both 2 x 4 ft or 600 x 1200 mm tiles) » Cutout template » Paint shield » Removable locking wiring connector

<sup>1</sup> Half-space (flush mounted in ceiling)

<sup>2</sup> Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB crest factor for 100 hours continuously. Continuous Program power is a conservative expression of the system's ability to handle normal speech and music program material and is defined as 3 dB above the Continuous Pink Noise Rating.

<sup>3</sup> Half-space (in ceiling), average 100 Hz to 10 kHz

<sup>4</sup> 500 Hz to 4 kHz

JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

# Control® 24C/CT

## Professional Series – Background/Foreground Ceiling Speaker



Input connection is conveniently provided on a removable locking connector (included), providing secure connection via screw-down terminals and allowing a system to be prewired before installing the speaker for fast snap-on convenience. Separate connector terminals are available for the input and for the loop-through wires, making it easy to jumper the speaker signal to additional speakers. The input terminal plate provides strain relief for either bare wire, plenum cable or 1/2-inch conduit (12 mm I.D.). The terminal box is securely enclosed to meet safety codes.

The speaker trim and grille are paintable to match any decor. A paint shield is provided for covering the drivers while painting the rim.

Installation of the Control 24C is quick and easy. The loudspeaker is packaged complete with the backcan, grille, support backing bracket and tile rails.

The entire installation can be accomplished without requiring access above the ceiling. A template is provided for marking the cutout. An innovative C-shaped support backing plate can be installed from below through the cutout to reinforce the top of the ceiling material. Tile bridge rails are included which can be screwed onto the C-plate to extend

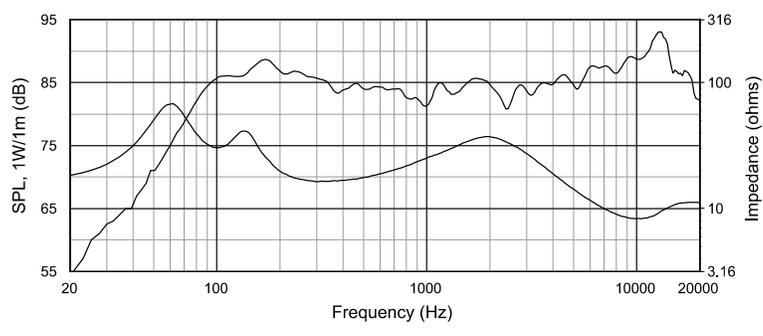
support to the T-channel grid in suspended ceiling installations. After the speaker is fitted through the cutout, it is held securely in place via three mounting tabs which tighten onto the C-plate, if used, or directly onto the ceiling material.

The Control 24C backcan is made of formed steel and the speaker is suitable for use in air handling spaces, per U.L.-2043. An attachment loop is provided on the backcan for cabling to the building structure as a secondary support in seismic areas or where required by code.

The optional Control 24CT includes a 30W multitap transformer for use in either 70.7V or 100V distributed-line systems. The transformer effectively limits the power to the speaker, so SonicGuard is not included in the Control 24CT. Taps are selected with a rotary switch conveniently located on the front panel, but protected under the grille, so that the speaker does not have to be removed to adjust tap settings.

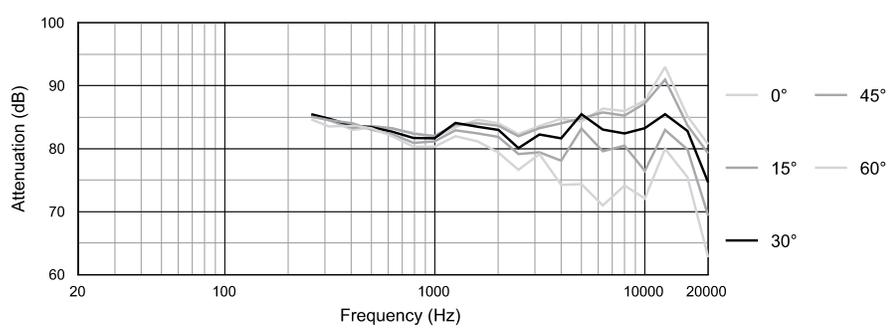
All JBL Control Contractor loudspeakers—both ceiling speakers and surface-mount models—are designed with a similar sonic signature, allowing for mixing and matching of the various models within an application, providing a similar tonal character throughout the entire listening area.

### Frequency Response:



Measured on-axis with a distance referenced to 1 meter at 1 watt; shown as a half-space (2pi) environment

### Off Axis Frequency Response (1/3 Oct Avg):

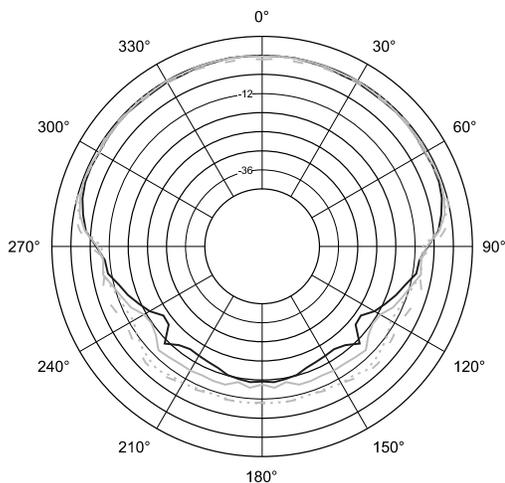


# Control<sup>®</sup> 24C/CT

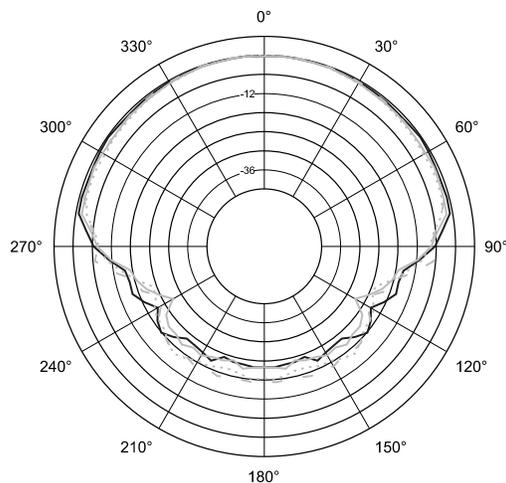
Professional Series – Background/Foreground Ceiling Speaker



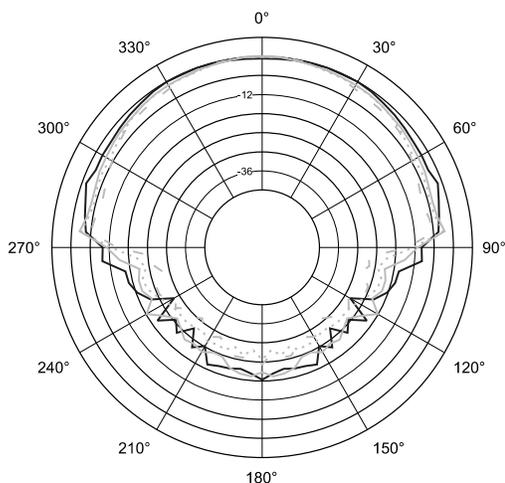
## 1/3 Octave Polars:



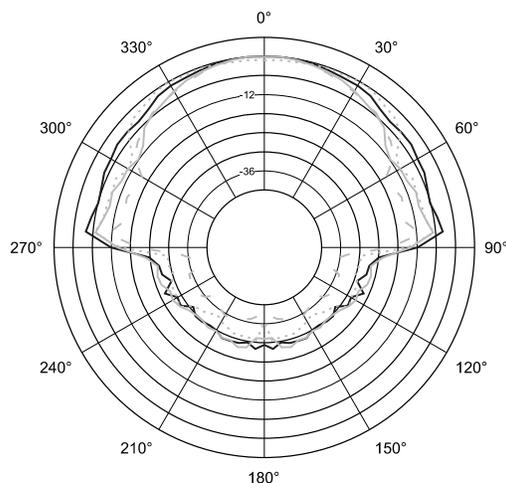
- 200Hz
- 250Hz
- 315Hz
- - - 400Hz



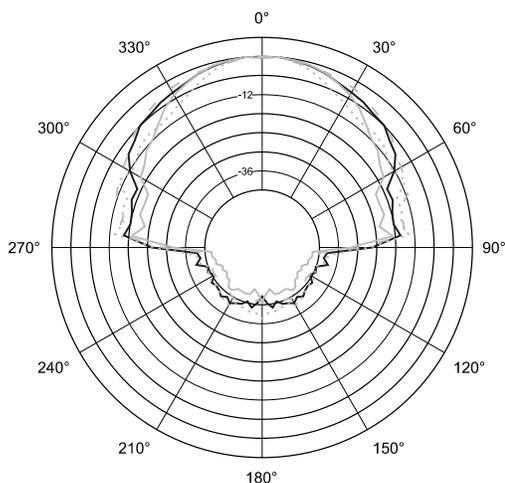
- 500Hz
- 630Hz
- 800Hz
- - - 1kHz



- 1.25kHz
- 1.6kHz
- 2kHz
- - - 2.5kHz



- 3.15kHz
- 4kHz
- 5kHz
- - - 6.3kHz



- 8kHz
- 10kHz
- 12.5kHz
- - - 16kHz

# Control® 24C/CT

Professional Series – Background/Foreground Ceiling Speaker



## Architectural Specifications:

The loudspeaker shall be of in-ceiling design, consisting of a 100 mm (4 in) low frequency transducer, a coaxially-mounted 19 mm (¾ in) high frequency transducer, and frequency dividing network installed in a ported enclosure. The low frequency voice coil shall be 25 mm (1 in) in diameter and the coil former shall be of aluminum for maximum heat dissipation.

Performance specifications of a typical production unit shall be as follows: Measured sensitivity (SPL at 1 m [3.3ft] with 4V input, averaged from 100 Hz to 10 kHz) shall be at least 86 dB-SPL. Usable frequency response shall extend from 80 Hz to 20 kHz (10 dB below rated sensitivity in half-space) with no external equalization. Rated power shall be at least 40 watts continuous pink noise power, defined as conforming to international standard IEC268-5 (shaped pink noise with peak-to-average ratio of 6 dB) for a period of 100 continuous hours.

The system shall be protected against damage from occasional overpowering via full range series lamps that limit the power to the network and transducers (Control 24C, not Control 24CT). The high frequency transducer shall be horn-loaded to more evenly cover a minimum 130° polar conical coverage area.

The backcan shall be constructed of formed steel and the baffle of UL94V-0 fire rated medium impact polystyrene. An enclosed terminal box shall be included providing strain relief for use with either plenum-

rated wire, ½ in (13 mm inside diameter) conduit, or flexible conduit up to 22 mm (in) outside diameter. The external wiring shall be accomplished via a removable lockable wiring connector with screw-down terminals to provide both secure wire termination and prewiring capability before loudspeaker installation. An attachment loop shall be provided on the back panel for cabling to building structure as a secondary support point.

The system shall include a support backing plate to reinforce the ceiling material and tile support rails for use on either 2 x 4 ft or 600 x 1200 mm suspended ceiling tiles and which can all be installed from beneath the ceiling tile.

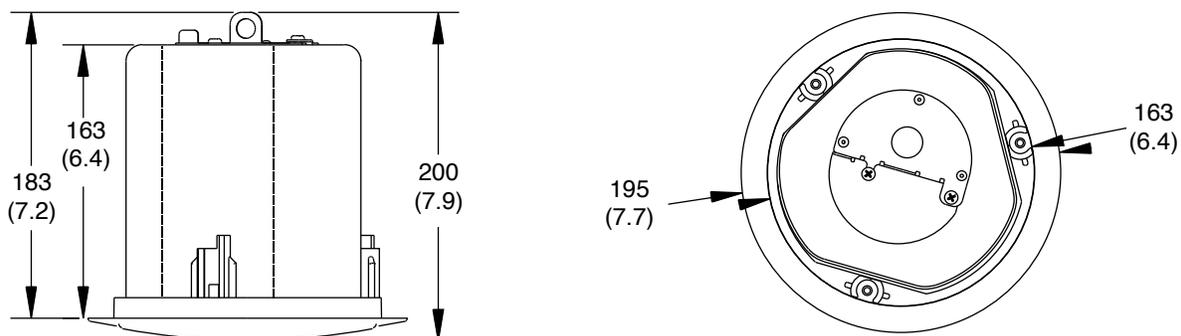
Overall front face diameter shall not exceed 195 mm (7.7 in), overall depth from the bottom of the ceiling shall not exceed 183 mm (7.2 in), and shall weigh no more than 2.7 kg (6 lb).

Control 24C: Nominal impedance shall be 16 ohms. Control 24CT: The loudspeaker shall be equipped with transformer for use in either 70.7 or 100V distributed-line speaker systems, with taps selectable by rotary switch located on the front panel so that the speaker does not have to be removed to adjust tap settings. Taps shall be nominally 30W @ 70V, 15W @ 70V (30W @ 100V), 7.5W @ 70V (15W @ 100V), and 3.7W @ 70V (7.5W @ 100V).

The loudspeaker shall be the JBL Model Control 24C (Control 24CT).

## Mounting Dimensions:

Dimensions in mm (inches)





# Control® 67P/T Full-Range Pendant Loudspeaker with RBI

## Professional Series

### Key Features:

- ▶ JBL's exclusive conical Radiation Boundary Integrator® (RBI) technology provides consistent and wide 120° coverage of the listening area.
- ▶ Coaxial design featuring 165 mm (6½ in) woofer and 25 mm (1 in) soft-dome tweeter.
- ▶ Hanging hardware with 4.5 m (15 foot) galvanized steel cable and easy to adjust clamp.
- ▶ Stylish design, available in black or white (-WH).
- ▶ UL listed (speaker and hanging cable system).
- ▶ 8 ohm and 70V/100V operation.

### Applications:

The Control 67P/T is a high output, full-range, two-way pendant-type loudspeaker that provides superb sound reproduction and very consistent, wide coverage for rooms with open architecture ceilings and other locations where a pendant form factor is desired.

JBL's patent-pending Radiation Boundary Integrator® (RBI) technology, adapted from the groundbreaking VERTEC™ Series of line array loudspeakers, delivers consistent coverage of the listening area. Combining an extra-large 280 mm (11 in) diameter waveguide with low-frequency projection apertures, the two coaxially-mounted drivers provide a seamless integration of coverage, resulting in extremely even pattern control and coverage where all listeners hear a consistent, high-fidelity sound quality. The wide 120° coverage pattern allows for the use of fewer speakers, reducing the cost of the installed system without sacrificing performance.

Excellent sound quality coupled with stylish design and easy installation makes the Control 67P/T ideal for a wide variety of applications including retail, restaurants, hotels, casinos, fitness centers, convention centers, exhibit spaces, conference rooms, atriums, museums, transit centers and other open-ceiling applications.

The Control 67P/T includes a single-point mounting system for easy and secure suspension in open-ceiling applications. Two complete hanging cable systems are included, providing both main and safety suspension cables. Include are extra-long 4.5 m (15 foot) high tensile galvanized steel wire rope having spring clips for the loudspeaker end of the cable and UL listed cable fasteners for infinitely adjustable suspension height.

The system's 165 mm (6½ in) low-frequency driver features a polypropylene-coated cone and 25 mm (1 in) copper voice coil with vented fiberglass resin coil-former for high power handling and improved long-term reliability. The coaxially-mounted 25 mm (1 in) textile soft-dome high frequency driver features internal damping for smooth extended response, along with an aluminum voice coil former and neodymium magnet assembly with ferro-fluid cooling, for high-fidelity sound quality with enhanced long-term sound level capability.

The Control 67P/T contains a high-quality 60 Watt multi-tap transformer for use on 70V/100V distributed loudspeaker lines, and is switchable for 8-ohm voice-coil direct operation.

Euro-style clip-in connectors allow for easy wiring. For protected outdoor applications, rubber boots are included to cover the input connectors, and an optional terminal cover is available for harsher locations.



Shown with included grille removed

### Specifications:

<b>System:</b>	
Frequency Response (-10 dB):	58 Hz – 18 kHz
Frequency Range (±3 dB):	78 Hz – 16 kHz
Power Capacity <sup>2</sup> :	75 Watts Continuous Pink Noise Power (with 300 Watts peaks) 150 Watts Continuous Program Power
Nominal Sensitivity:	90 dB
Nominal Coverage Angle <sup>3</sup> :	120° (+20°/-15°)
Directivity (Q):	5.7
Directivity Index (DI):	7.5 dB
Rated Maximum SPL @ 1m:	109 dB continuous pink noise, 115 dB peak
Rated Impedance:	8 ohms
Transformer Taps:	70V: 60W, 30W, 15W & 7.5W 100V: 60W, 30W, 15W
Transformer Insertion Loss:	0.5 dB @ 7.5 W, 0.5 dB @ 15 W, 0.6 dB @ 30 W, 0.7 dB @ 60 W
<b>Transducer:</b>	
LF Driver:	165 mm (6.5 in) polypropylene-coated paper with pure butyl rubber surround, 25 mm (1 in) copper voice coil, vented fiberglass resin voice coil-former
HF Driver:	25 mm (1.0 in) textile soft-dome, neodymium magnet assembly, ferro-fluid cooling, aluminum voice coil former
<b>Enclosure:</b>	
Enclosure Material:	High impact polystyrene
Grille:	Zinc-plated steel grille with powder-coat finish, foam backing (removable for painting)
Environmental:	Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV. IP44 capability per IEC 529 – splashproof rating.
Termination:	Two removable locking euro-block 2-pin connectors with screw-down terminals for bare wire. Connectors paralleled for input and loop-thru. Max. wire 12 AWG (2.5 mm <sup>2</sup> ). Rubber terminal covers included.
Suspension:	Two identical suspension systems (one as main suspension cable and the other as safety cable), each consisting of 4.5 m (15 ft) long 2 mm (0.077 in) high-tensile galvanized-steel wire rope suspension cable with spring-clips for clipping onto the loudspeaker bracket and Gripple™ brand adjustable-height cable fasteners for infinitely adjustable height. Cables have SWL rating of 45 kg (99 lb).
Safety Agency Ratings:	Speaker listed per UL1480, transformer registered per UL1876. In accordance with IEC60849/EN60849. Suspension system and Gripple™-brand cable fastener listed per UL1598 and UL2239, TUV, and CSA Class 3426-01 & Class 3426-81.
Dimensions:	312 mm (12.3 in) diameter x 330 mm (13.0 in) height to top of cabinet. 350 mm (13.8 in) to top of suspension bracket.
Net Weight (ea):	5.2 kg (11.5 lbs)
Shipping Weight (pair):	12.3 kg (27 lbs)
Included Accessories:	Two suspension cable systems (see "Suspension", above), two 2-pin removable locking euro-block connectors, two rubber covers for euro-block connectors.
Optional Accessories:	MTC-PC60 top panel / terminal cover
Colors:	Available in black or white (-WH). Paintable.

<sup>1</sup> Full-space (suspended)

<sup>2</sup> Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB peak-to-average crest factor for 100 hours continuously. Continuous Program power is a conservative expression of the system's ability to handle normal speech and music program material and is defined as 3 dB above the Continuous Pink Noise rating.

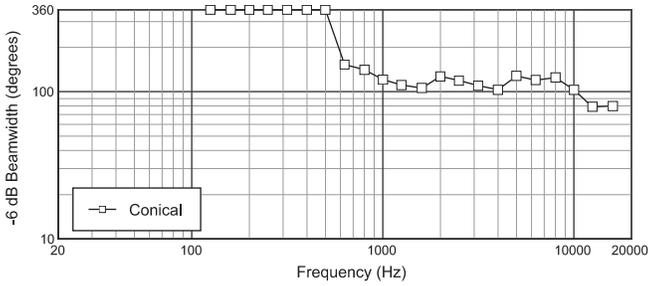
<sup>3</sup> Full-space (suspend in free air), average 1 kHz to 10 kHz.

JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

# ► Control 67P/T Full-Range Pendant Loudspeaker with RBI

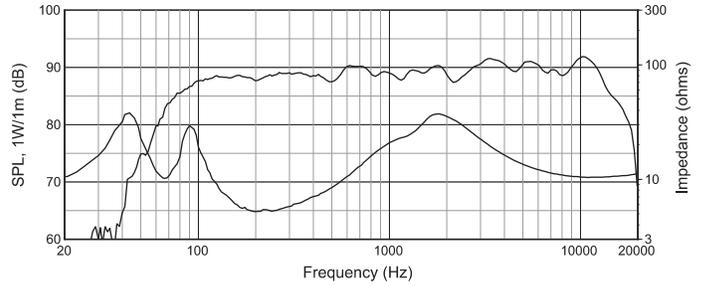
## Beamwidth:

-6 dB coverage by frequency

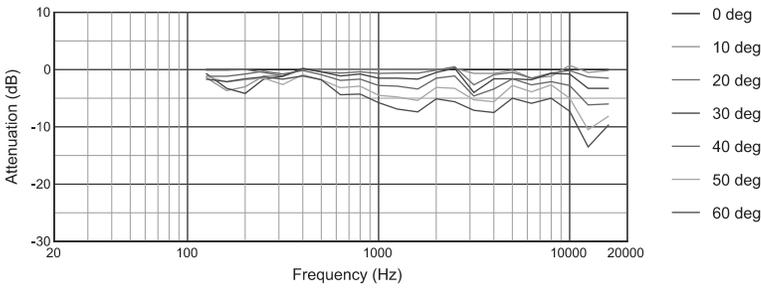


## Frequency Response:

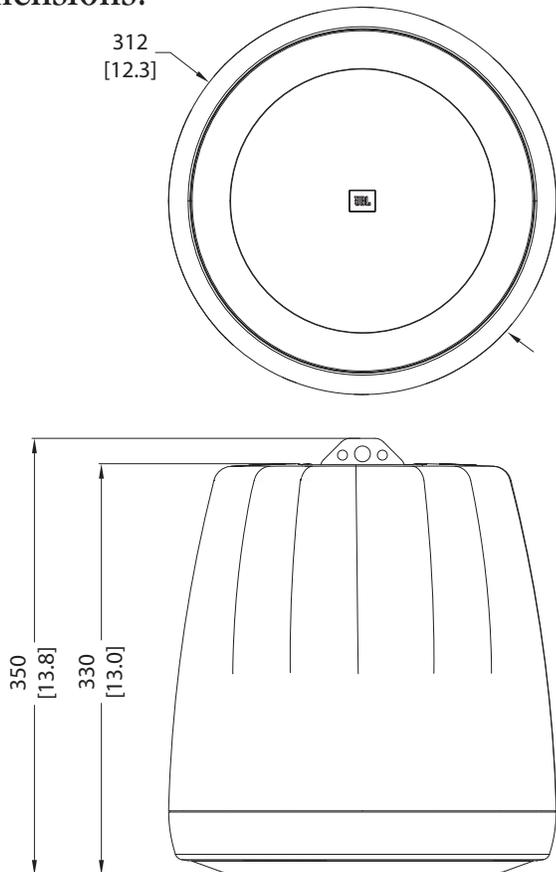
Full-space, 8 ohm, 10° off-axis (typical for coverage area)



## Off-Axis Frequency Response:



## Dimensions:



Dimensions in mm (in)



JBL Professional  
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**JBL**

# Control<sup>®</sup> 60PS/T

## Pendant Subwoofer with Crossover

### Professional Series

### Key Features:

- ▶ High impact, 150 Watt direct radiating pendant subwoofer with built-in passive crossover for up to four satellite speakers.
- ▶ 200 mm (8 in) long-excursion driver.
- ▶ 8 ohm (150 Watt) and 70V/100V (100 Watt) operation.
- ▶ Hanging hardware with 4.5 m (15 foot) galvanized steel cable and easy to adjust clamp.
- ▶ Stylish design, available in black or white (-WH).
- ▶ UL listed (speaker and hanging cable system).

### Applications:

The Control 60PS/T pendant subwoofer loudspeaker provides bass extension and high impact for high-fidelity sound systems in a wide variety of applications including restaurants, retail stores, music cafes, health clubs, theme bars, leisure venues, and other locations where full-range high fidelity foreground/background music systems are utilized. Featuring 150 Watt power handling and low distortion, the long-excursion 200 mm (8 in) low frequency driver features butyl rubber surround for well-damped, tight sound quality and long-term reliability, and a polypropylene-coated cone for humidity protection. The high-temperature 50 mm (2 in) voice coil and low-mass fiberglass coil former ensure good bass transient response and excellent stability under high power, high duty-cycle, working conditions.

The Control 60PS/T may be driven by itself (or with other subwoofers) on an amplifier channel, sending it either a signal that has been actively low-passed earlier in the signal chain via DSP or a full-range signal, utilizing the built-in passive 125 Hz low-pass filter. The included passive crossover also provides high-passed satellite outputs for use with either two or four satellite loudspeakers (not for one or three satellite speakers), resulting in a full-range, wide-bandwidth, passively-crossed, mono subwoofer-satellite system. Using the built-in passive crossover is best suited for satellite speakers with sensitivities in the 82 dB to 86 dB (2.83V @ 1m) range, resulting in a well-balanced overall frequency response.

A 100 Watt multi-tap, wide-bandwidth, low-saturation transformer allows the speaker to be used on either a 70V/100V distributed speaker system or as a direct low-impedance 8Ω speaker. If satellite speakers are used on the 70V/100V settings, the satellite speakers should be low-impedance (8Ω to 16Ω each).

A loop out connector is provided on the subwoofer for looping the full-range input signal to other loudspeakers or to other subwoofer/satellite systems. Rubber boot covers for each locking connector protect the terminals and the optional MTC-PC60 full-top cover accessory adds additional terminal protection for when using outdoors.



### Specifications:

<b>System:</b>	
Frequency Range (-10 dB):	42 Hz – 350 Hz
Frequency Response (± 3 dB):	55 Hz – 125 Hz
Power Capacity:	300 Watts Continuous Program Power, 100 hrs 150 Watts Continuous Pink Noise, 100 hrs
Nominal Sensitivity (2.83V/1m):	88 dB
Rated Maximum SPL:	107 dB @ 1 m (3.3 ft) average, 113 dB peak
Rated Impedance:	8 ohms
Transformer Taps:	110W, 55W, 30W (& 15W@70V). Set via rotary tap-selector switch (70V/100V taps along with direct 8Ω setting) on top terminal panel
Transformer Insertion Loss:	0.98 dB @ 15W, 0.99 dB @ 30W, 0.94 dB @ 55W, 1.10 @ 110W
Standalone Hookup:	Connect to Input connector; built-in low-pass filter permanently engaged. Loop Out in parallel with Input connector (pre low-pass filter) for sending to additional speakers.
Subwoofer-Satellite Hookup:	For either two or four satellite speakers (not for one or three satellite speakers). With two satellite speakers, must connect to Sat 1 and Sat 2 terminals only (NC to Sat 3 and Sat 4 terminals). Satellite outputs high-passed. Suggested satellite speakers include Control 62P (pendant), Control 52 (surface-mount on-wall) and Control 42C (in-ceiling). Satellite speakers to be low-Z type (8 to 16Ω) regardless whether tap selector is set to low-Z or 70V/100V. Loop Out in parallel with Input connector (pre low-pass filter) for sending to additional speakers.
<b>Transducer:</b>	200mm (8 in) polypropylene-coated paper cone with butyl rubber surround, 50 mm (2 in) high-temperature copper voice coil, vented fiberglass resin voice coil former.
<b>Enclosure:</b>	
Enclosure Material:	High impact polystyrene
Grille:	Zinc-plated steel grille with powder-coat finish, foam backing (grille and grille backing are removable for painting)
Environmental:	Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV. IP44 capability per IEC 529 – splash-proof rating
Termination:	Six removable locking 2-pin connectors with screw-down terminals. Input, Loop Out, Sat 1, Sat 2, Sat 3, Sat 4. Max wire 12 AWG (2.5 mm <sup>2</sup> ). Rubber terminal covers included.
Suspension:	Two identical suspension cable systems (one as main suspension cable and the other as safety cable), each consisting of 4.5 m (15 ft) long, 2 mm (0.077 in) high-tensile galvanized-steel wire rope suspension cable with spring-clips for clipping onto the loudspeaker bracket and Gripple <sup>™</sup> brand adjustable-height cable fasteners for infinitely adjustable height. Cable has SWL rating of 45 kg (99 lb).
Safety Agency:	Speaker listed per UL1480 (UEAY), transformer registered per UL1876. In accordance with IEC60849/EN60849. Suspension system and Gripple <sup>®</sup> -brand cable fastener listed per UL1598 and UL2239, TUV, and CSA Class 3426-01 & Class 3426-81.
Dimensions:	333 mm (13.1 in) diameter, 344 mm (13.6 in) height to top of cabinet. 369 mm (14.5 in) to top of suspension bracket.
Net Weight:	7.6 kg (16.7 lb)
Shipping Weight:	17.6 kg (38.7 lbs) per pair-packed carton
Included Accessories:	Two suspension cable systems (see “suspension”, above), six removable locking 2-pin euro-block connectors, six rubber cover boots for euro-block connectors.
Optional Accessories:	MTC-PC60 full top panel / terminal cover. Wire access holes in plastic cover to be drilled by installer to suit the number and dimensions of wire.
Colors:	Available in black or white (-WH). Paintable.

<sup>1</sup> Full-space (suspended)

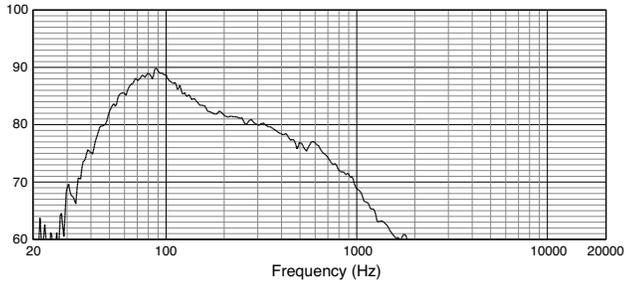
<sup>2</sup> Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB crest factor for 100 hours continuously. Continuous Program power is conservative expression of the system's ability to handle normal speech and music program material, and is defined as 3 dB above the Continuous Pink Noise Rating.

JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

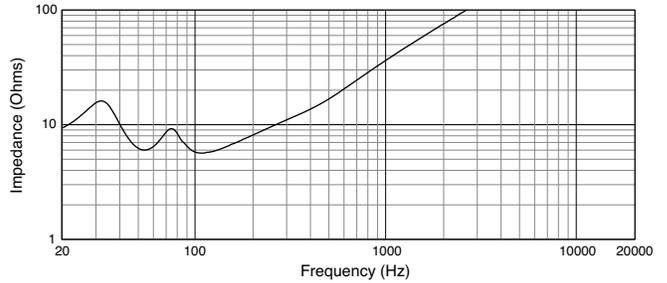
# ► Control 60PS/T 8" Pendant Sub-Woofer with Crossover

## Frequency Response:

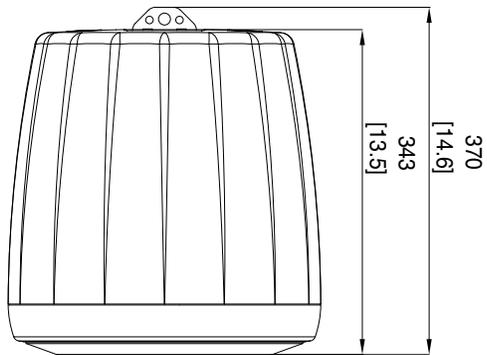
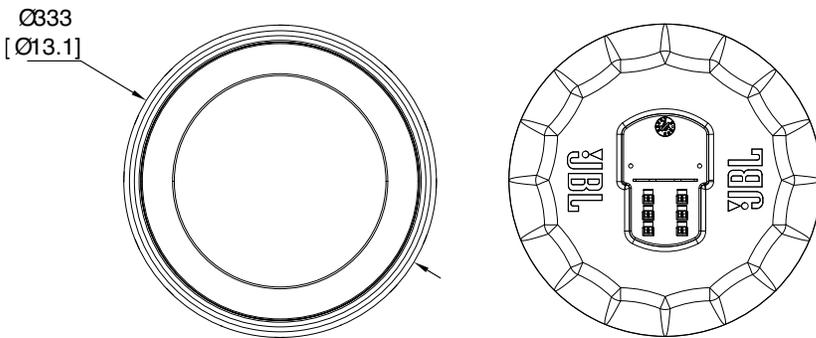
Full Space (4π), suspended



## Impedance:

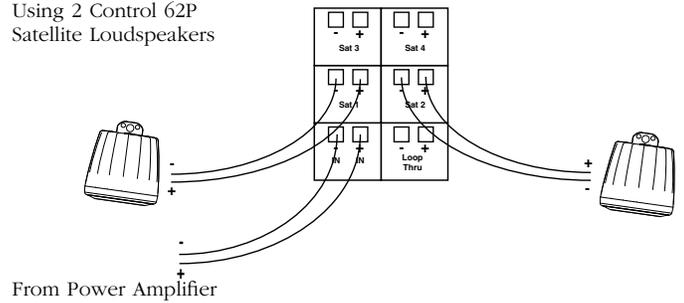


## Dimensions:

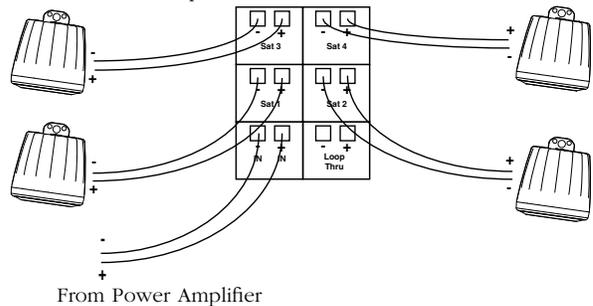


Dimensions in mm (in)

Using 2 Control 62P Satellite Loudspeakers



Using Four Control 62P Satellite Loudspeakers



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## CONTROL CRV

### Key Features:

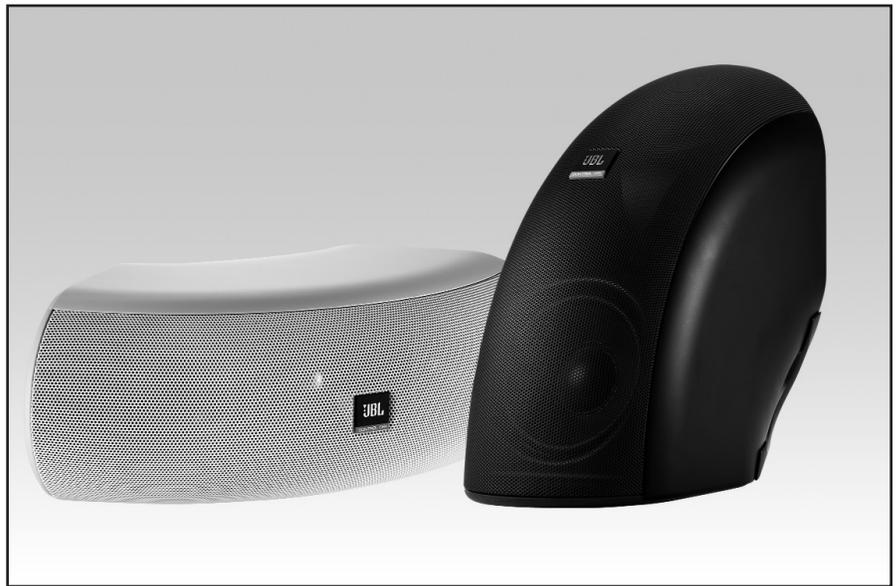
- ▶ Components: Dual 100 mm (4 in) woofers and 19 mm (¾ in) titanium-laminate tweeter.
- ▶ Outdoor rated to IP-34 (per IEC 529).
- ▶ Built-in 70V/100V multi-tap transformer for distributed loudspeaker lines, plus 4 ohm direct capability.
- ▶ Unique, contemporary, curved design with versatile mounting configurations.
- ▶ Professional-quality input terminals.
- ▶ Superb sound quality

### Overview:

The Control CRV brings high design and versatility to commercial applications such as restaurants, retail stores, lounges, theme bars, music cafes, hotels, boardrooms, boutiques, museums, leisure venues, outdoors, upscale lobbies, and other foreground and background music and paging applications that require a fashionable look with superb sound quality.

Dual 100 mm (4 in) woofers feature Polyplas™ cones for durability, large 32 mm (1½ in) voice coils wound on vented aluminum formers for high power handling, and dual neodymium magnets for high output with low harmonic distortion. The 19 mm (¾ in) tweeter features a titanium-laminate dome tweeter, a shielded neodymium magnet, and Ferrofluid® cooling for maximum power handling and reduced thermal compression. A bi-radial waveguide reduces high frequency variations in the frequency response across the listening area. The advanced high-slope crossover network (36 dB per octave high-pass to the tweeter and 18 dB per octave low-pass to the woofers) provides natural midrange sound quality along with smooth pattern coverage in the crossover region.

JBL Control CRV speakers are exceedingly versatile, with multiple installation possibilities. The JBL Control CRV speaker can be wall-mounted aimed straight out from the wall, angled down at a 45° aiming axis, mounted spanning the junction of a wall and ceiling, or spanning the junction of a wall and another wall. At a junction, the unique curved shape of the speaker couples well with both boundary surfaces, forming a dual ground plane configuration which increases the acoustic length of the speaker, providing additional spaciousness to the sound character and increased bass output. In addition, two or three Control CRV speakers can be joined together to create loudspeaker solutions for a wide variety of coverage, appearance and mounting requirements. Using the optional PMB pole-mount bracket, four speakers can be joined together and suspended by a ceiling fan pole to form a cluster module with 360° horizontal coverage.



Available in either black or white (-WH), both colors are outdoor capable to IP-34 (per IEC 529), utilizing stainless steel screws, professional outdoor-rated screw-down terminals, and screened ports to prevent ingress of pests.

### Specifications:

Frequency Range (-10dB):	80 Hz – 20 kHz (half-space, on-wall) 60 Hz – 20 kHz (quarter space, at two-wall junction)
Power Handling <sup>1</sup> :	75 W Continuous Pink Noise, 2 hrs 60 W Continuous Pink Noise, 100 hrs 150 W Continuous Program Power 300 W Continuous Peak Power
Nominal Sensitivity <sup>2</sup> :	89 dB
Maximum SPL @ 1m <sup>3</sup> :	108 dB continuous average long-term (peaks of 114 dB)
Nominal Coverage Angle:	105° horizontal x 80° vertical (2 kHz - 16 kHz, speaker in vertical orientation)
DI:	8.6 dB (2 kHz - 16 kHz)
Q:	7.4 (2 kHz - 16 kHz),
Nominal Impedance:	4 Ohms
Minimum Impedance:	4.0 Ohms @ 320 Hz
Crossover Frequency and Type:	2 kHz – 36dB/octave tweeter; 18dB/octave woofers
Transformer Taps:	30 W, 15 W, 7.5 W at both 70 V and 100 V (plus 3.8 W at 70 V only) Thru position is 4 ohms
<b>Transducers:</b>	
Low-Frequency Transducers:	Dual 4" (100 mm) PolyPlas™ shielded woofer with dual neodymium magnets and 32 mm (1.25 in) voice coil on a vented aluminum former.
High-Frequency Transducer:	3/4" (19 mm) Titanium-laminate dome tweeter, shielded neodymium magnet Ferrofluid® cooling.
<b>Physical:</b>	
Enclosure Material:	ABS
Ports:	Screened to protect against ingress of pests
Environmental:	IP-34 rating, per IEC529. Exceeds MilSpec 810 for humidity, salt spray, temperature & UV. Passes Mil-Std-202F for salt spray
Termination:	Screw-down terminal strip, nickel plated metal screws/washers. Accepts up to 9 mm outside 4 mm inside open lug (#6, #8, or #10 lug) plus bare wire up to 12 AWG / 2.5 mm <sup>2</sup> .
Safety Agency Rating:	Transformer is UL registered per UL1876.
Colors:	Black or white (-WH)
Dimensions:	364 mm (14.4 in) wide, 251 mm (9.9 in) max depth including wall bracket, 262 mm (10.3 in) side depth, 127 mm (5 in) height
Net Weight (ea):	3.2 kg (7.0 lbs)
Included Accessories:	Corner/wall-mount bracket with cap, screws, and trim covers
Optional Accessories:	PMB-BK and PMB-WH (white) Pole-Mount Bracket for 4-speaker 360° hanging pendant cluster

<sup>1</sup>Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB crest factor for 100 hours continuously. Continuous Program Power is a conservative expression of the system's ability to handle normal speech and music program material and is defined as 3 dB above the Continuous Pink Noise Rating.

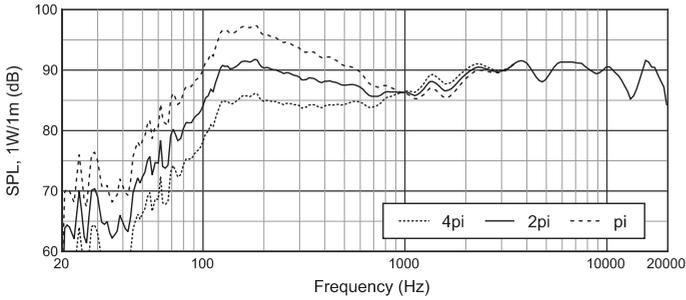
<sup>2</sup>Half-space

<sup>3</sup>Calculated from sensitivity and power handling. Power compression not considered.

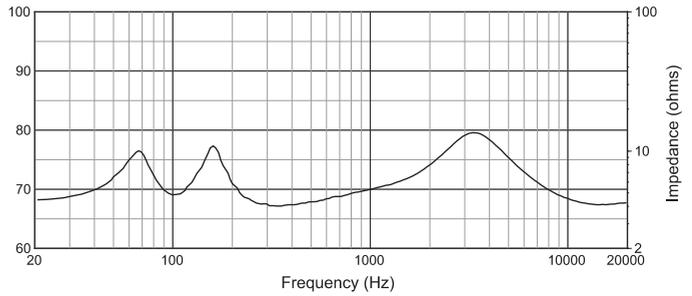
# ► Control CRV Versatile High Design Indoor/Outdoor Loudspeaker

## Frequency Response:

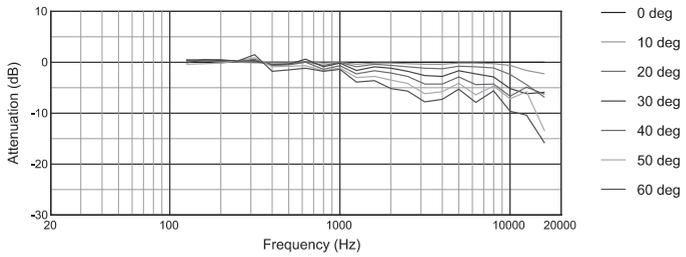
Free-Space (4- $\pi$ ), Half-Space (on-wall, 2- $\pi$ ), and Quarter-Space (junction of two walls,  $\pi$ )



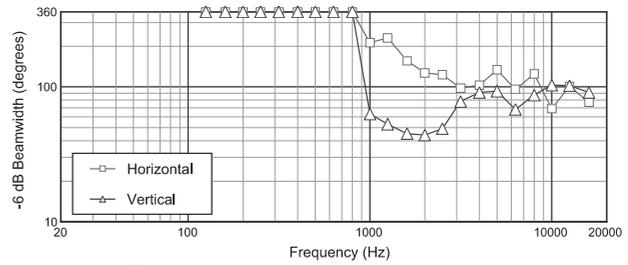
## Impedance:



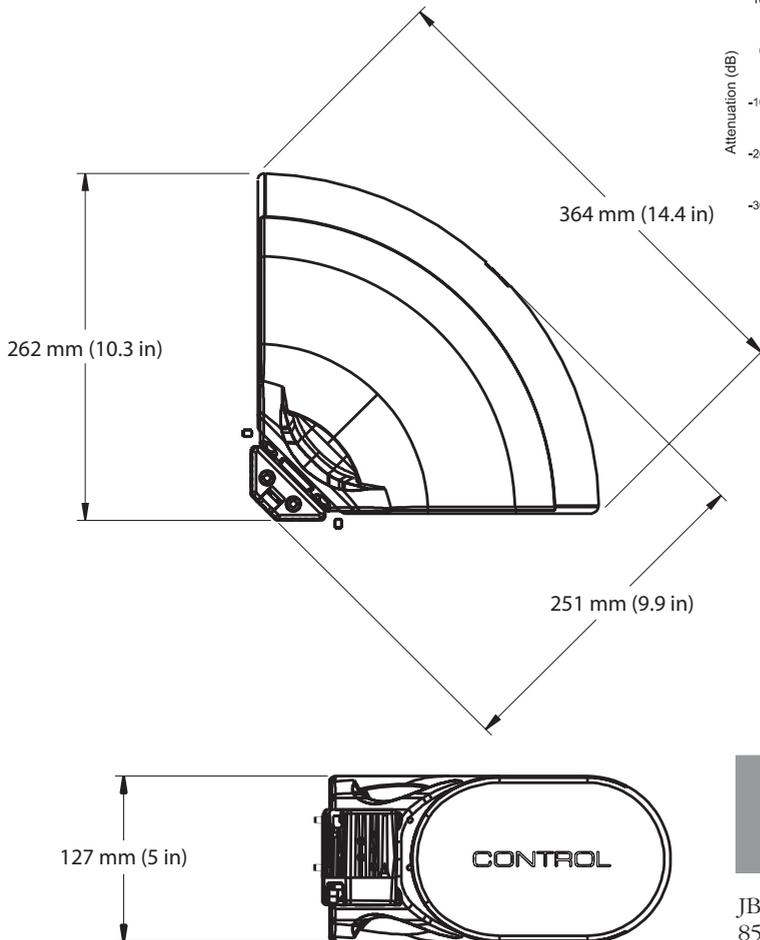
## Horizontal Off-Axis Frequency Response:



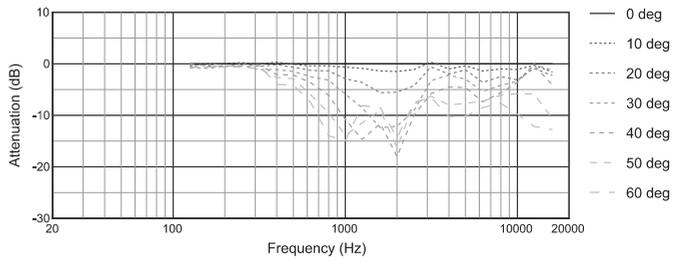
## Beamwidth:



## Dimensions:



## Vertical Off-Axis Frequency Response:



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Northridge, California 91329 U.S.A.

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07/09

# Control® 25-1

Professional Series – Compact Indoor/Outdoor Background/Foreground Speaker



## Key Features:

- Components:
  - 5-¼" woofer with woven fiberglass cone
  - ¾" PEI diaphragm tweeter with fluid cooling
- Contemporary, high-design appearance
- Built-in InvisiBall® mounting hardware, plus available U-bracket
- Weather resistant enclosure and transducers
- Wide 100° x 100° coverage
- 100W power handling (200W program) in direct 8Ω setting, plus built-in 30W 70V/100V multi-tap transformer
- High fidelity sound character with broad frequency response of 60 Hz – 20 kHz



## Description:

The Control 25-1 is a two-way 5" speaker with rich sonic character, wide coverage, consistent dispersion, versatile mounting, and a contemporary high-design look that fits into a wide range of decors. This makes Control 25-1 an excellent choice for a wide variety of applications, including retail stores, restaurants, health clubs, theme parks, educational facilities, hospitality, music cafes, leisure venues, and anywhere where a top quality high-output indoor/ outdoor foreground/background music (and/or paging) speaker is required.

The unique InvisiBall mounting hardware is included with each system, making short work of permanent installation. The InvisiBall mounting method provides a high degree of both vertical and horizontal rotation, and because InvisiBall adjustments are made through a hidden access behind the logo badge, the grille never needs to be removed, and there exists a high degree of theft deterrence as well. Integrated M6 mounting points for an optional U-bracket adds to the installation versatility.

The LF driver's woven fiberglass cone provides durability and weather capable performance. The light weight high temperature fiberglass voice coil former and high temperature voice coil wire ensure high sensitivity and high power handling, while also providing stable performance under long-term high-power working conditions. The pure butyl rubber surround delivers clean sound and robust operation. JBL's WeatherEdge™ is a seamless, rubberized extension of the woofer surround that provides added protection to critical transducer elements. Cone geometry is optimized for smooth frequency response and consistent off-axis performance, while an FEA-optimized motor construction and linear suspension spider helps to lower harmonic distortion.

The HF driver's low viscosity ferro-magnetic fluid increases voice coil cooling for higher long-term power handling. The softened PEI diaphragm delivers a smooth and pure high frequency sound quality. The light weight Kapton™ voice coil former increases durability while providing better high frequency response extension. All these factors also contribute toward making the driver especially rugged for outdoors and other stressful applications.

In addition to the driver designs contributing toward a high degree of weather resistance, the cabinet provides excellent endurance against sun, salt and moisture. Grilles are heavily zinc-plated and finished in a tough, high-grade powder coating for rust resistance. The optional MTC-25WMG WeatherMax™ grilles are available for especially difficult environments and to break up driving rain. Connection is made via weather-capable screw-down terminals. The optional MTC-PC2 and MTC-PC3 panel covers are available to protect the terminal compartment, providing a water-tight sealed gland-nut entrance (when used with round-jacketed cable within the specified diameter range).

The frequency response is extremely smooth, resulting in a very natural sound character, and the response extends down to 60 Hz, providing strong bass capability. The system is capable of handling 100 watts continuous pink noise (200 watts program) at its 8 ohm setting and is also equipped with a built-in 30W 70V/100V multi-tap transformer for operation on distributed speaker lines. The combination of high sensitivity and power handling provides high Max SPL of 110 dB.

The Control 25-1 readily accepts a variety of paints and finishes to match any décor. Available in black or white (-WH).

# Control® 25-1

## Professional Series – Compact Indoor/Outdoor Background/Foreground Speaker



### Specifications:

<b>System</b>	
Frequency Range (-10 dB) <sup>1</sup>	60 Hz – 20 kHz
Frequency Response (+/-3 dB)	85 Hz – 17 kHz
Power Rating <sup>2</sup>	200W Continuous Program (2 hrs) 100W (400W peak) Continuous Pink Noise (2 hrs) 75W (300W peak) Continuous Pink Noise (100 hrs)
Maximum Input Voltage	25.3 V RMS (2 hrs), 50.6 V peak
Maximum SPL <sup>3</sup>	110 dB average Continuous Pink Noise (116 dB peak)
Sensitivity <sup>4</sup>	90 dB, 1W/1m (averaged 100 Hz – 10 kHz)
Coverage Angle <sup>5</sup>	100° x 100°
Directivity Factor (Q)	6.04 (averaged 1 kHz – 16 kHz)
Directivity Index (DI)	7.6 dB (averaged 1 kHz – 16 kHz)
Nominal Impedance	8 ohms (THRU setting)
Crossover Type	2nd order low-pass, 3rd order high-pass
<b>Circuitry</b>	
Transformer Taps	70V: 30W, 15W, 7.5W, 3.7W 100V: 30W, 15W, 7.5W Insertion Loss <0.94 dB at any tap setting Thru Setting: 8Ω nominal
Recommended Protective High-Pass <sup>6</sup>	60 Hz high-pass (24 dB/oct) (for 8Ω operation and for all 70V/100V tap settings)
<b>Transducers</b>	
Low Frequency	135 mm (5.25 in), woven-fiberglass cone with pure butyl rubber surround with Weather-Edge frame protection, high-temp fiberglass voice coil former, high-temp voice coil wire, optimized cone geometry, linear suspension spider, and FEA optimized motor structure.
High Frequency	19 mm (0.75 in) PEI diaphragm, low-viscosity ferro-magnetic fluid, and lightweight Kapton™ voice coil former.
<b>Physical</b>	
Enclosure Material	High Impact Polystyrene (HIPS), painted with highly-UV resistant paint on white (-WH) version for maximum UV fade resistance.
Grille	Highly zinc-plated, finished in durable TGIC polyester powder coating. MTC-25WMG-1 (&-WH) available with Weather-Max™ multi-layer foam and tight-weave mesh vapor barrier backing.
Installation	InvisiBall wall-mounting system included. Two 6 mm attachment points (on top and bottom) for optional MTC-25UB-1 (&-WH) U-bracket. Secondary safety attachment loop point on back panel.

Environmental	IP-44 per IEC529 (IP-55 when installed with the optional MTC-25WMG-1 WeatherMax™ grille and either MTC-PC2 or MTC-PC3 panel cover.) Exceeds MilSpec 810 for humidity, salt-spray, temperature & UV. Passes MilStd-202F for salt spray and ASTM G85 for acid-air plus salt spray. Optional MTC-25WMG-1 WeatherMax™ grille for breaking up driving rain and for especially difficult environments.
Termination	Screw-down terminal strip, zinc-plated copper based, nickel-plated metal screws and washers. Accepts up to 9 mm outside 4 mm inside open lugs (#6, #8, or #10 lug), plus bare wire (up to 12 AWG / 2.5 mm <sup>2</sup> ). Optional MTC-PC2 and MTC-PC3 protective panel covers available to provide sealed entrance for additional weather protection.
Agency Rating	ROHS-compliant; Transformer UL Recognized per UL1876
Colors	Black (RAL9004) or white (-WH, RAL9016)
Dimensions (H x W x D) <sup>7</sup>	243 x 188 x 145 mm (9.6 x 7.4 x 5.7 in); 203 mm (8.0 in) deep total when mounted on InvisiBall wall-mount bracket.
Net Weight (each)	3.4 kg (7.5 lb)
Shipping Weight (pair)	8.16 kg (18 lb)
Included Accessories	InvisiBall™ wall-mounting system), 6 mm x 100 mm hex key
Optional Accessories	» MTC-25UB-1 – Yolk-type U-bracket (&-WH) » MTC-25WMG-1 – WeatherMax grille with backing (&-WH) » MTC-28/25CM – Ceiling-Mount InvisiBall adapter (&-WH)

<sup>1</sup> In half-space (on-wall, 2pi)

<sup>2</sup> At 8Ω setting. Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB crest factor. Continuous Program Power is defined as 3 dB above the Continuous Pink Noise Rating and is a conservative expression of the system's ability to handle normal speech and music program material.

<sup>3</sup> Calculated from sensitivity and power handling, exclusive of power compression, at THRU setting

<sup>4</sup> Half-space (on-wall), averaged 100 Hz – 10 kHz, 2.83V

<sup>5</sup> Coverage angle (-6 dB), average between 1 kHz and 12 kHz

<sup>6</sup> For protection against driving below resonant frequency and to keep transformer out of saturation

<sup>7</sup> In vertical orientation

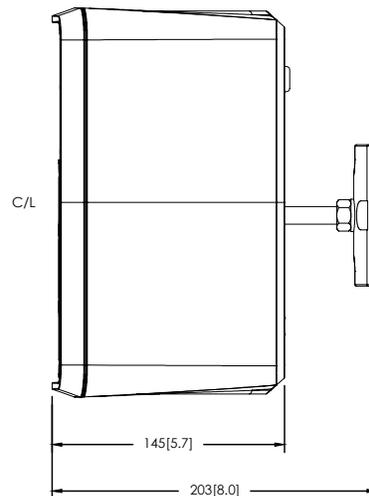
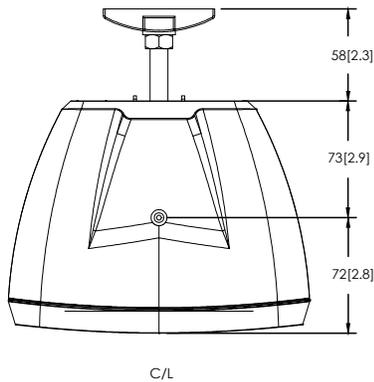
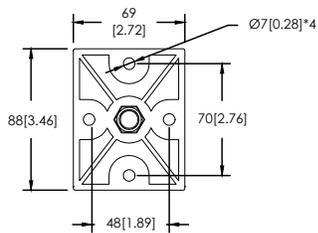
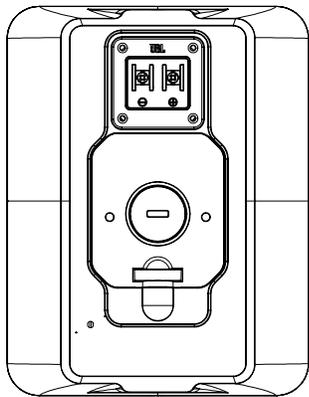
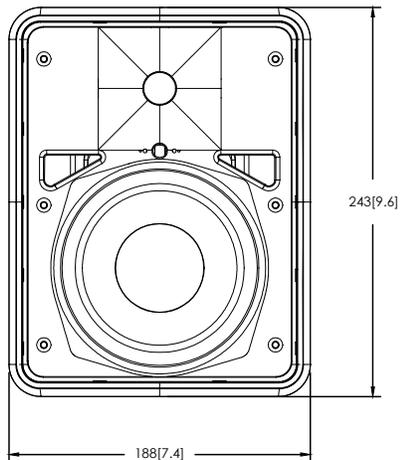
# Control® 25-1

Professional Series – Compact Indoor/Outdoor Background/Foreground Speaker

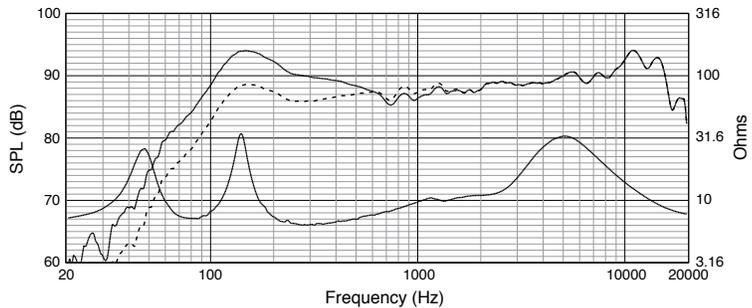


## Mounting Dimensions:

Dimensions in mm (inches)

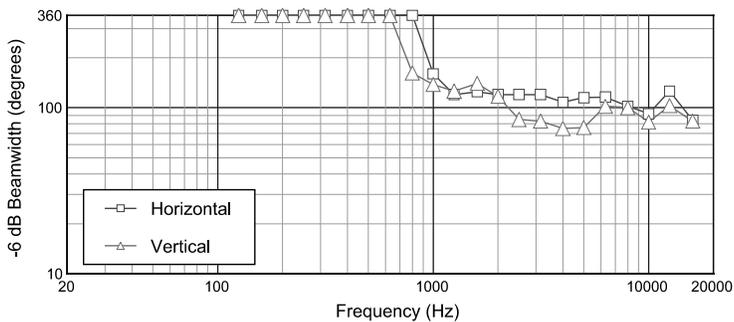


## Frequency Response:



On-axis in half-space (2pi, solid line) and full-space (4pi, dotted line) at thru (8Ω) setting; input impedance (lower solid line)

## Beamwidth vs. Frequency:





# CONTROL 64P/T

Compact Full-Range Pendant Loudspeaker

Professional Series

## Features:

- ▶ 100 mm (4 in) full-range driver with polypropylene-coated cone and 20 mm (0.8 in) high temperature voice coil.
- ▶ Hanging hardware with 4.5 m (15 foot) galvanized steel cable and easy to adjust clamp.
- ▶ Stylish design, available in black or white (-WH).
- ▶ UL listed (speaker and hanging cable system).
- ▶ 8Ω and 70V/100V operation



## Applications:

The Control 64P/T is a compact full-range, pendant-type loudspeaker that provides superb sound reproduction for rooms with open architecture ceilings and other locations where a pendant form factor is desired.

The 120° coverage pattern (average mid-range coverage) distributes the sound broadly for the listening space.

Stylish design and easy installation makes the Control 64P/T ideal for a wide variety of applications including retail, restaurants, hotels, casinos, fitness centers, convention centers, exhibit spaces, conference rooms, atriums, museums, transit centers and other open-ceiling applications.

The Control 64P/T includes a single-point mounting system for easy and secure suspension in open-ceiling applications. Two complete hanging cable systems are included, providing both main and safety suspension cables.

Include are extra-long 4.5 m (15 foot) high tensile galvanized steel wire rope having spring clips for the loudspeaker end of the cable and UL listed cable fasteners for infinitely adjustable suspension height.

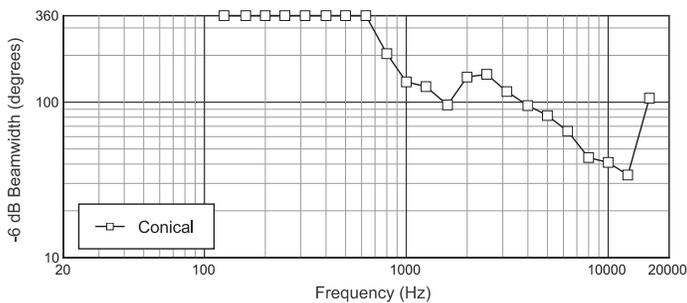
The system's 100 mm (4 in) full-range driver features a polypropylene-coated cone and 20 mm (0.8 in) high temperature copper voice coil for high power handling and improved long-term reliability.

The Control 64P/T contains a high-quality 30 Watt multi-tap transformer for use on 70V/100V distributed loudspeaker lines, and is switchable for 8-ohm voice-coil direct operation.

Euro-style clip-in connectors allow for easy wiring. For protected outdoor applications, rubber boots are included to cover the input connectors, and an optional terminal cover is available for harsher locations.

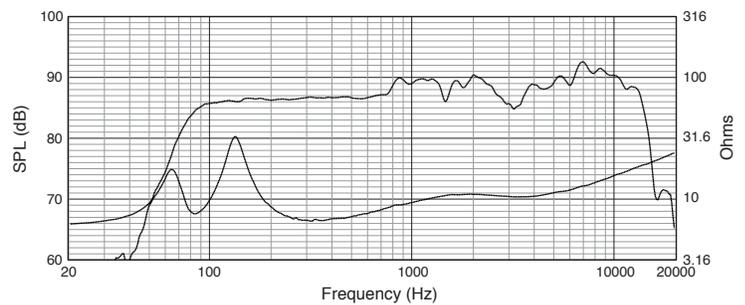
## Beamwidth:

-6 dB coverage by frequency



## Frequency Response:

Full-space, 8Ω, Impedance



# ▶ CONTROL 64P/T Compact Full-Range Pendant Loudspeaker

## Specifications:

Frequency Response (-10 dB) <sup>1</sup> :	65 Hz - 15 kHz
Frequency Response (+/-3 dB) <sup>1</sup> :	85Hz - 14 kHz
Power Rating <sup>2</sup> :	100 W Continuous Program (2 hrs) 50 W (200W peak), Continuous Pink Noise (2 hrs) 40 W (160W peak) Continuous Pink Noise (100 hrs)
Maximum Input Voltage:	18.2 V RMS (2 hrs), 36.4 V peak
Nominal Sensitivity:	88 dB Nominal
Coverage Angle <sup>3</sup> :	120° (averaged 1 kHz to 4 kHz)
Directivity (Q) <sup>3</sup> :	6.2
Directivity Index (DI) <sup>3</sup> :	7.3dB (averaged 1kHz – 16kHz)
Rated Maximum SPL @ 1m:	105 dB continuous pink noise, 111 dB peak
Rated Impedance:	8Ω
Transformer Taps:	70V: 30W, 15W, 7.5W & 3.7W 100V: 30W, 15W, 7.5W
Transformer Insertion Loss:	0.94dB @ 3.7W, 0.89dB @ 7.5W, 0.83dB @ 15W, 0.94dB @ 30W
<b>Transducer:</b>	
Driver:	100 mm (4 in) polypropylene-coated paper with cloth surround, 20 mm (0.8 in) copper voice coil
<b>Enclosure:</b>	
Enclosure Material:	High impact polystyrene
Grille:	Zinc-plated steel grille with powder-coat finish, foam backing (removable for painting)
Environmental:	Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV. IP44 capability per IEC 529 – splash-proof rating.
Termination:	Two removable locking euro-block 2-pin connectors with screw-down terminals for bare wire. Connectors paralleled for input and loop-thru. Max. wire 12 AWG (2.5 mm <sup>2</sup> ). Rubber terminal covers included.
Suspension:	Two identical suspension systems (one as main suspension cable and the other as safety cable), each consisting of 4.5 m (15 ft) long 2 mm (0.077 in) high-tensile galvanized-steel wire rope suspension cable with spring-clips for clipping onto the loudspeaker bracket and Gripple™ brand adjustable-height cable fasteners for infinitely adjustable height. Cables have SWL rating of 45 kg (99 lb).
Safety Agency Ratings:	Speaker listed per UL1480, transformer registered per UL1876. In accordance with IEC60849/EN60849. Suspension system and Gripple®-brand cable fastener listed per UL1598 and UL2239, TUV, and CSA Class 3426-01 & Class 3426-81.
Dimensions:	234 mm (9.3 in) diameter x 259 mm (10.2 in) height to top of cabinet. 279 mm (11.0 in) to top of suspension bracket.
Net Weight (ea):	2.35 kg (5.2 lbs)
Shipping Weight (pair):	6.07 kg (13.4 lbs)
Included Accessories:	Two suspension cable systems (see "Suspension", above), two 2-pin removable locking euro-block connectors, two rubber covers for euro-block connectors.
Optional Accessories:	MTC-PC60 top panel / terminal cover
Colors:	Available in black or white (-WH). Paintable

<sup>1</sup> Full-space (suspended)

<sup>2</sup> At 8Ω setting. Continuous Pink Noise rating is IEC-shaped pink noise with a 6 dB crest factor. Continuous Program Power is defined as 3 dB above the Continuous Pink Noise Rating and is a conservative expression of the system's ability to handle normal speech and music program material.

<sup>3</sup> Calculated from sensitivity and power handling, exclusive of power compression, at THRU setting.

<sup>4</sup> Half-space (on-wall) averaged 100 Hz – 10 kHz, 2.83V.

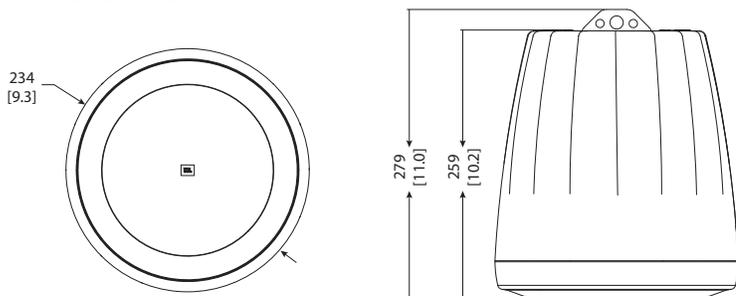
<sup>5</sup> Coverage angle (-6 dB) average between 600 Hz and 12 kHz.

<sup>6</sup> For protection against driving below resonant frequency and to keep transformer out of saturation.

<sup>7</sup> In vertical orientation

JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

## Dimensions:



Dimensions in mm [inches]



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Northridge, California 91329 U.S.A.

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www.jblpro.com

# DNA Pro series

20K4 • 10K4



The culmination of five years intensive effort, the Danley Sound Labs DNA series amplifiers represent the leading edge of amplifier design. In a straightforward robust package, they surpass similar products in power delivery, sonic performance and efficiency.

Spanning 10,000 to 20,000 Watts RMS output power, all models share a high end specification with generous power reserves. The integrated state of the art DSP being the perfect complement to the world's finest loudspeaker systems.

This truly revolutionary amplifier platform provides a logical front panel user interface and powerful Ethernet based remote control. Both provide access to all features allowing rapid system configuration with full performance monitoring and analytics.



- Four channels of sonically pure Class D amplification
- Unique, precise digital signal processing
- Over designed switch mode power supply
- 10,000 & 20,000 watts RMS total output
- Analog, AES3 and Dante™ digital network audio inputs
- Full front panel user interface
- Ethernet network software for system operation and monitoring
- DSP Drive Modules for loudspeaker processing
- Powerful grouping for multi-layer EQ and effective control of large systems

# DNA Pro series

20K4 • 10K4

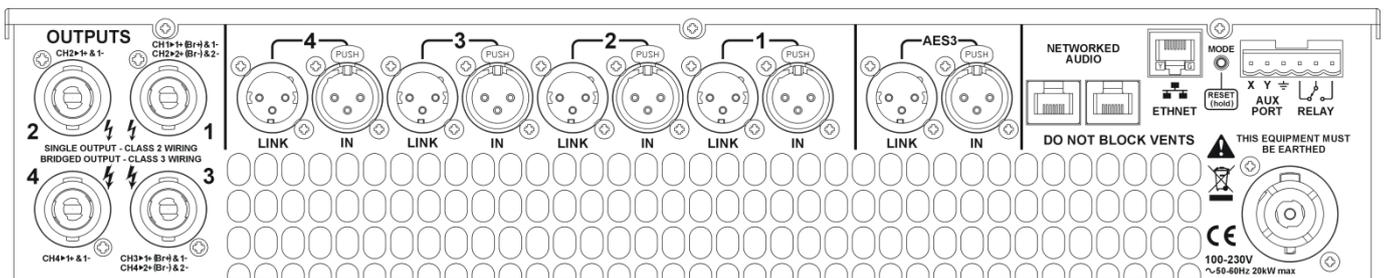


## General Specifications

Amplifier topology	Class D
Number of channels	Four
Total power output, all channels driven	20,000 and 10,000 Watts RMS
Audio inputs	4x Analog, 2x AES3 and 4x Dante™ (factory fitted option)
Digital Signal Processing	High performance DSP processing on all inputs and outputs
Control, monitoring and system status alarms	Ethernet network Volt-free relay and contact closure port
Power-save modes	Standby after user defined time, instant wake up on audio (less than 1ms) Deep ECO sleep after user defined time, wake up on command (30 seconds)
System sleep and wakeup	Front panel switch, network command, and audio detection

## Power Output

Model	20K4	10K4
Power specification	RMS output power per channel, all channels driven with continuous program material and a nominal ambient temperature of 40degC / 105degF	
Crest Factor of 4 (12dB), 2-Ohm nominal load	5,000W	2,500W
Crest Factor of 2.8 (9dB), 4-Ohm nominal load	3,000W	2,500W
Crest Factor of 2 (6dB), 8-Ohm nominal load	1,500W	1,500W
Bridged, per channel pair, 4-Ohm nominal load	10,000W	5,000W
100V line operation, Crest Factor 4 (12dB)	5,000W	3,000W
70V line operation, Crest Factor 4 (12dB)	3,500W	2,500W
25V line operation, Crest Factor 4 (12dB)	1,250W	885W



# DNA Pro series

20K4 • 10K4



## Audio Performance

Amplifier topology	Proprietary High Performance Class D
Amplifier modulation scheme	Low feedback, multiple loop, with feed-forward error correction
Dynamic range to amplifier output	Analog input, better than 113dBA typical AES / Dante™ input, better than 114dBA typical
Gain (with all DSP level controls set to 0dB)	32dB
Frequency response, 4 Ohm load	Less than 7Hz to greater than 30kHz, -2.5dB points
Total harmonic distortion, THD	Less than 0.05% typical, 1kHz signal, AES17 filter, 4 Ohm load
Inter-channel crosstalk, worst case combination	Better than -85dBr at 1kHz and -75dBr at 10kHz
Maximum analog input level	+20dBu
Analog input sensitivity range for full output	0dBu to +20dBu, continuously adjustable
Analog input and link	Input 20k Ohm, electronically balanced, link directly connected to analog input
Analog ground scheme	AES48 standard compliant
AES3 input	Transformer isolated with unique active cable equalisation for extended range
AES3 link	Active AES3 signal regeneration. Automatic direct bypass to the AES3 input ensuring the audio signal will still flow even when the amplifier is powered down
AES3 supported sampling rates	24kHz to 192kHz (auto locking)

## Digital Signal Processing

Resolution	40 bit, proprietary algorithms
Sample rate	96kHz throughout
Physical inputs to DSP drive modules	4x analog, 2x AES & 4x Dante™ inputs can be routed to four DSP drive modules
Drive module input processing	Input signal routing, delay, gain, high pass filter, polarity, mute <b>EQ:</b> 2x low shelf, 6x parametric, and high FIR shelving filter
Drive module output processing	Source, delay, gain, polarity, mute, high pass and low pass crossover filters, VX limiters <b>EQ:</b> low shelf, 8x parametric / all pass, and high shelf filters
Preset management	10 snapshots for device wide setup, 50 presets for loudspeaker settings Presets can be recalled to sets of outputs or individual outputs as required
<b>Unique high performance processing</b>	
Overlays	Twelve additional independent overlays of EQ, Delay and Gain Flexible grouping for effective control of many amplifier channels in large systems
Class leading VX limiters	See the 'speaker protection systems' section
Hardman crossover filters	Better out of band rejection than Linkwitz-Riley
LIR crossover filters	Linear Phase alignments without the compromises of FIR filters

## Power Supply

Topology (main power supply)	3rd generation high performance Series Resonant
Topology (auxiliary and standby supplies)	Low quiescent Eco-Flyback
Internally stored energy	Greater than 600 Joules
Nominal mains input voltage range	85V to 240V Power supply automatically detects voltage and configures accordingly
Mains input frequency range	47Hz to 63Hz
Mains inrush current (max for <10ms)	6A at 115V and 12A at 230V

# DNA Pro series

20K4 • 10K4



## Mains Current and Thermal Dissipation

### DNA 20K4 Pro

Sleep Mode (slow wake up)					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
4.5	0.4	0.2	4.5	15	4

Standby Mode (fast wake up)					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
60	1.0	0.5	60	205	52

Running with no audio signal					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
195	2.9	1.5	195	665	168

Running in 2 Ohm Mode* (all channels driven)							
Load (Ohms)	Signal Duty & Crest Factor	Input Power (Watts)	Current Draw (Amps)		Thermal Dissipation		
			120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
2	1/8, CF=4.0 (12dB)	3000	33.5**	17.5	500	1706	430
4	1/4, CF=2.8 (9dB)	3475	38.8**	20.3	475	1621	408
4	1/8, CF=4.0 (12dB)	1780	19.7	10.3	280	955	241
8	1/4, CF=2.8 (9dB)	1750	19.2	10.0	250	853	215
8	1/8, CF=4 (12dB)	975	11	5.8	225	767	193

### NOTES:

- The amplifier was configured to have no audio processing
- Measurements were performed with a Hameg HM8115-2 power analyzer
- All measurements were done at 230 VAC, 50 Hz
- The Current Draw figures for 120 VAC are calculated
- \* The DNA 20K4 Pro does not have 4 & 8 Ohm Low Z modes
- \*\* The EBP limiter should be set to 30A, but will not activate on any sensible program material

# DNA Pro series

20K4 • 10K4



## Mains Current and Thermal Dissipation

### DNA 10K4 Pro

Sleep Mode (slow wake up)					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
4.5	0.4	0.2	4.5	15	4

Standby Mode (fast wake up)					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
60	1.0	0.5	60	205	52

Running with no audio signal					
AC Mains Power Draw (Watts)	Current Draw (Amps)		Thermal Dissipation		
	120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
195	2.9	1.5	195	665	168

Running with audio signal (all channels driven)								
Load Mode	Load (Ohms)	Signal Duty & Crest Factor	Input Power (Watts)	Current Draw (Amps)		Thermal Dissipation		
				120 VAC	230 VAC	Watts	BTU/Hr	Kcal/Hr
2 Ohm	2	1/8, CF=4.0 (12dB)	1600	19.2	10.0	350	1194	301
2 Ohm	4	1/4, CF=2.8 (9dB)	1560	18.7	9.8	310	1058	267
2 Ohm	4	1/8, CF=4.0 (12dB)	875	11.1	5.8	250	853	215
4 Ohm	4	1/4, CF=2.8 (9dB)	2920	31.1	16.2	420	1133	361
4 Ohm	4	1/8, CF=4 (12dB)	1550	19.2	10.0	300	1024	258
4 Ohm	8	1/4, CF=2.8 (9dB)	1535	18.4	9.6	285	973	245
4 Ohm	8	1/8, CF=4.0 (12dB)	864	10.9	5.7	239	816	206
8 Ohm	8	1/4, CF=2.8 (9dB)	1800	21.1	11.0	300	1024	258
8 Ohm	8	1/8, CF=4.0 (12dB)	975	11.5	6.0	225	768	193

### NOTES:

- The amplifier was configured to have no audio processing
- Measurements were performed with a Hameg HM8115-2 power analyzer
- All measurements were done at 230 VAC, 50 Hz
- The Current Draw figures for 120 VAC are calculated

# DNA Pro series

20K4 • 10K4



## Protections Systems

Under all circumstances the control and protection systems will endeavour to deliver the maximum power possible for a given set of conditions, applying limiters only in extreme circumstances. Muting will only occur when a dangerous situation is detected, normal operation automatically resuming when the condition clears.

System protection	Speaker protection
Excessive power supply current or amplifier output current	Sustained clipping prevention
Excessive temperature per sub system: PSU, amplifier and DSP	DC offset protection
Mains voltage within acceptable limits	Excessive HF energy (VHF) limiter
Internal power rails producing correct output	
Fans operating at correct speed	<b>VX audio output limiters</b>
	Vx provides a linear phase virtual crossover and two limiter paths on each output. This unique system delivers effective protection for systems that incorporate passive crossovers.
<b>Power distribution protection systems</b>	Vx Limit    Multiband peak limiter, two per output
Mains inrush current limiting for soft start and anti-surge	Vx Max    Multiband overshoot limiter, two per output
Mains average current limiting for mains breaker management	X-Max    Driver excursion limiter
Randomized initialization when remotely powered up	T-Max    Driver thermal limiter (long term power limiter)
<b>Monitoring, measurements recorded against time</b>	<b>Monitoring, device statistics and counters</b>
Supply current	Number of power cycles counted
Supply voltage	Number of mains brownout events counted
Thermal Capacity	Fan speeds continuously monitored
Each driver current	Fan under-speed events counted
Each driver impedance	Various protection mute events counted
Protection limiting for each output	Driver Impedance continuously monitored
An inbuilt alarm and notification system to indicate problems to remote devices either via the network or the Volt-free changeover relay contacts accessibly on the rear panel.	

## Physical

Cooling	Dual vari-speed fans, front to back airflow. Washable, tool less change filter media.
Analog IN and LINK	4x female and 4x male Neutrik™ XLR
AES3 dual channel IN and LINK	1x female and 1x male Neutrik™ XLR
Amplifiers output	4x Neutrik Speakon™ NL4 connectors
Mains input connector	Neutrik 32A Powercon™
Dante Primary and Secondary	2x Shielded RJ45
Relay output & contact closure inputs	Phoenix pluggable terminal block (supplied)
Front panel display (backlit)	Graphical, high contrast, daylight visible
Front panel encoders	Two, detented, velocity sensitive
Front panel push buttons	Large, tactile, illuminated
LED indicators	Bright, easily differentiated
Enclosure	Standard 19" 2U (88mm), 357mm (14") deep with handles and optional rear support
Net Weight	12.5kg (27.5 pounds).



*All models include an integrated security cover for tamper-proof installations*

The 4-channel CX amplifiers give you four channels in only two rack spaces, without compromising on power. Choose from three models, a direct 70 volt model and two low-impedance versions. Each model is equipped with exclusive QSC PowerLight™ switching power supply technology to virtually eliminate noise and hum. With high-output power, versatile loading options, high-thermal capacity and unmatched reliability, the CX Series is the perfect solution to any permanently installed sound system.

### Features

- Three models that range in power from 170 watts to 450 watts per channel
- Compact size – all models only 2 RU and 14" deep for reduced rack cost and floor space
- Channels 1&2 and 3&4 bridgeable for maximum flexibility
- Active Inrush Limiting eliminates AC inrush current, removing the need for expensive power sequencers
- HD15 DataPort connector for QSControl computer control
- Custom integrated security cover for tamper-proof installations
- Variable speed fan for low noise
- 1 dB detented gain controls for fast and accurate gain settings
- Detachable Euro-style input connectors
- DIP switch control for clip limiters, high-pass filters, bridge-mono and parallel operation
- Exclusive PowerLight switch-mode power supply technology for high performance and compact size
- Selectable high-pass filters protect speakers and prevent speaker transformer saturation with minimal effect on program material (33 Hz or 75 Hz on CX254 and CX404, 50 Hz or 75 Hz on CX204V)
- Comprehensive front panel indicators including signal, clip, protect and QSC's exclusive bridge-mono and parallel input LEDs
- Barrier strip output connector
- Comprehensive protection circuitry including DC, infrasonic, thermal overload and short circuit protection
- High-performance Class AB+B complementary bipolar output circuitry
- Lightweight – all models only 21 pounds (9.5 kg) for easier racking and shipping
- 3-year warranty plus optional 3-year extended service contract

### CX 4-channel Amplifiers

Model	70V	Watts per channel		
		8Ω	4Ω	2Ω
CX254	–	170	250	450*
CX404	–	250	400**	–
CX204V	200	–	–	–

20 Hz – 20 kHz, 0.05% THD

\*1 kHz, 1% THD

\*\*1 kHz, 0.1% THD

	<b>CX254</b>	<b>CX404</b>	<b>CX204V</b>
Stereo Mode (all channels driven)		Continuous average output power per channel	
8Ω / 20 Hz – 20 kHz / 0.05% THD	170 W	250 W	–
4Ω / 20 Hz – 20 kHz / 0.05% THD	250 W	400 W (0.1% THD, 1 kHz)	–
2Ω / 1 kHz / 1% THD	450 W	–	–
70V / 20 Hz – 20 kHz / 0.05% THD	–	–	200 W
70V / 1 kHz / 0.05% THD	–	–	220 W
70V / 1 kHz / 1% THD	–	–	300 W
Bridge-Mono Mode		Bridge-mono mode operation	
16Ω / 20 Hz – 20 kHz / 0.1% THD	340 W	500 W	–
8Ω / 20 Hz – 20 kHz / 0.1% THD	500 W	800 W (0.1% THD, 1 kHz)	–
4Ω / 1 kHz / 1% THD	900 W	–	–
140V / 20 Hz – 20 kHz / 0.1% THD	–	–	400 W
140V / 1 kHz / 0.05% THD	–	–	440 W
140V / 1 kHz / 1% THD	–	–	600 W
Noise (20 Hz - 20 kHz)	-106 dB	-106 dB	-105 dB
Input Sensitivity	1.22 Vrms	1.22 Vrms	1.26 Vrms
Gain	29 dB at 8Ω	31 dB at 8Ω	35 dB at 70.7V
Input Clipping	10 Vrms (+22 dBu)	10 Vrms (+22 dBu)	10 Vrms (+22 dBu)
Output Circuitry	Class AB+B	Class AB+B	Class AB+B
Distortion (SMPTE-IM)	< 0.01%	< 0.01%	< 0.02%
Distortion (typical)			
20 Hz – 20 kHz: 10 dB below rated power	< 0.01% THD		
1.0 kHz and below: full rated power	< 0.01% THD		
Frequency Response	20 Hz - 20 kHz, ± 0.2 dB   8 Hz - 50 kHz, + 0/-3 dB		
Damping Factor	> 500 (1 kHz and below)		
Input Impedance	6k ohms unbalanced, 12k ohms balanced		
Cooling	Variable-speed fan / rear-to-front air flow through tunnel heat sink		
Connectors	Input: 3 position Euro style detachable barrier block, Ch 1, 2, 3 & 4 DataPort: HD-15 Connector, Ch 1+2, Ch 3+4 Output: Six-position barrier strip with dual channel and bridge mono connections, Ch 1+2, Ch 3+4		
Controls	Front: AC switch, Ch 1, 2, 3 & 4 gain knobs Rear: DIP switch for Ch 1, 2, 3 & 4, clip limiter on/off, LF filter on/off, LF filter freq select 33 Hz or 75 Hz CX254 and CX 404: 50 Hz or 75 Hz CX204V: inputs parallel or stereo, bridge mode		
Indicators	Parallel Inputs: Yellow LED / Bridged: Yellow LED/ Power-on: Green LED Clip-Prot: Red LED / Level -10dB: Green LED / Level -20dB: Green LED / Signal -35dB: Green LED (1 per channel)		
Amplifier Protection	Full short circuit, open circuit, thermal, ultrasonic, and RF protection. Stable into reactive or mismatched loads		
Load Protection	On/off muting, DC-fault power supply shutdown		
Dimensions (HWD)	3.5" (8.9 cm) 2 RU x 19" (48.3 cm) rack mounting x 14" (35.6 cm) from front mounting rails		
Weight - Net / Shipping	21 lb (9.5 kg) / 27 lb (12.3 kg)		
Power Requirements	100, 120, 230 VAC, 50 – 60 Hz (configured at factory)		
120V Current Consumption*	Idle	0.7 A	0.7 A
1/8 power pink noise (typical of program material at maximum unclipped power)	8Ω	5.8 A	8.1 A
	4Ω	9.2 A	12.4 A
	2Ω	14.3 A	NR
	70V	–	–
1/3 power pink noise (typical of program material with severe clipping)	8Ω	8.8 A	12.2 A
	4Ω	14.2 A	19.3 A
	2Ω	21.7 A	NR
	70V	–	–
			12.7 A

\* Multiply currents by 0.5 for 230V units



Specifications subject to change without notice.

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CX 4-channel Spec Sheet - 06/04/08



Designed for permanently installed sound systems where rackspace is at a premium, QSC's CX108V and CX168 provide unprecedented levels of channel density for multi-channel amplifiers. The CX108V and CX168 provide 100 watts per channel at 70 volts and 90 watts per channel at 8 ohms respectively. With both models, each pair of channels may be bridged to configure these amplifiers as 4, 5, 6 or 7 channel units. Like the entire CX Series, the 8 channel models feature DataPorts for remote amplifier management or signal processing, incorporate QSC's legendary PowerLight™ technology, and deliver our unmatched reputation for quality and reliability.

QSC's PowerLight technology takes your audio to an entirely new level. Delivering tighter bass and clean, transparent highs, PowerLight also cuts waste heat, boosts reliability, and eliminates unwanted noise and hum. PowerLight is a revolutionary switching power supply technology that provides ample current to the audio power circuitry by charging the supply rails over 200,000 times per second through an ultra-low noise impedance circuit. Unlike amplifiers that use conventional supplies, the audio signal is never starved prematurely and remains crisp and clean.

### CX 8-channel Amplifiers

Model	70V*	Watts per channel	
		8Ω	4Ω**
CX168	—	8 x 90	8 x 130
CX108V	8 x 100	—	—

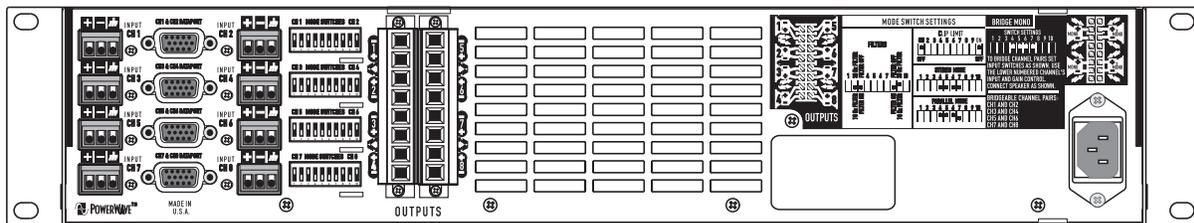
20 Hz – 20 kHz, 0.05%THD  
 \* 20 Hz – 20 kHz, 0.2%THD  
 \*\*20 Hz – 20 kHz, 0.1%THD

### Features

- 100 watts per channel at 70 volts (CX108V)
- 90 watts per channel at 8 ohms and 130 watts per channel at 4 ohms (CX168)
- Compact size – only two rack spaces and 14" deep for reduced rack space
- Channel pairs bridgeable for maximum flexibility
- Exclusive PowerLight switch-mode power supply technology for high performance and compact size
- Active inrush limiting eliminates AC inrush current, removing the need for expensive power sequencers
- Four HD15 DataPorts (one per channel pair) for QSControl computer control or QSC's signal processing accessories
- Custom integrated gain control security cover for tamper proof installations
- 1 dB recessed detented gain controls for fast and accurate settings
- Detachable Euro-style input and output connectors
- DIP switch control for clip limiters, high-pass filters, bridge-mono and parallel operation
- Selectable high-pass filters protect speakers and prevent speaker transformer saturation with minimal effect on program material (50 Hz or 75 Hz; CX108V) (33 Hz or 70 Hz; CX168)
- Comprehensive front panel indicators including signal, clip, bridge mono and parallel-input LEDs
- Fully protected – including DC, infrasonic and ultrasonic, thermal overload and short circuit protection
- High-performance Class AB+B complementary bipolar output circuitry
- Lightweight – only 21 pounds (9.5 kg) for easier racking and shipping
- 3-year warranty plus optional 3-year extended service contract

	CX168	CX108V
Stereo Mode (all channels driven)	Continuous average output power per channel	
8Ω / 20 Hz – 20 kHz / 0.05% THD	90 W	–
4Ω / 20 Hz – 20 kHz / 0.1% THD	130 W	–
Midband Ratings	All channels driven	Single channel
8Ω / 1 kHz / 0.1% THD	100 W	120 W
4Ω / 1 kHz / 0.1% THD	140 W	180 W
70V / 20 Hz – 20 kHz / 0.2% THD	–	100 W
Bridge-Mono Mode	Bridge-mono mode operation	
16Ω / 20 Hz – 20 kHz / 0.1% THD	180 W	–
8Ω / 20 Hz – 20 kHz / 0.1% THD	260 W	–
140V / 20 Hz – 20 kHz / 0.2% THD	–	200 W
Signal to Noise (20 Hz – 20 kHz)	-107 dB	-100 dB
Input Sensitivity	1.35 Vrms at 8Ω	1.26 Vrms at 70V
Voltage Gain	20x (26 dB)	56x (35 dB)
Input Clipping	6 Vrms (+18 dBu)	6 Vrms (+18 dBu)
Output Circuitry	Class AB+B	Class AB+B
Frequency Response	20 Hz – 20 kHz, +0.2 dB   8 Hz – 50 kHz, +0/-3 dB	20 Hz – 20 kHz, +0.4 dB   8 Hz – 70 kHz, +0/-3 dB
Damping Factor	> 200 (5 kHz and below)	> 500 (5 kHz and below)
Input Impedance	6k ohms unbalanced, 22k ohms balanced	6k ohms unbalanced, 22k ohms balanced
Distortion (SMPTE-IM)	< 0.02%	
Distortion (typical)		
20 Hz – 20 kHz: 10 dB below rated power	< 0.1% THD	
1.0 kHz and below: full rated power	< 0.03% THD	
Cooling	Variable-speed fan / rear-to-front air flow through tunnel heat sink	
Connectors	Input: 3-pin Euro-style detachable terminal blocks (one per channel) DataPort: HD-15 connector (Ch. 1+2, 3+4, 5+6, 7+8) Output: two 8-pin Euro-style detachable terminal blocks	
Controls	Front: AC switch, Ch. 1, 2, 3, 4, 5, 6, 7 & 8 gain knobs Rear: DIP switches for Ch. 1 - 8, clip limiter on/off, LF filter on/off, LF filter freq select 33 or 70 Hz for CX168 LF filter freq select 50 or 75 Hz for CX108V, inputs parallel or stereo; bridge mode	
Indicators	Power-On: Green LED / Parallel inputs: Orange LED (1 per channel pair) / Signal -35 dB: Green LED (1 per channel) Bridged: Yellow LED (1 per channel pair) / Clip: Red LED (1 per channel)	
Amplifier Protection	Full short circuit, open circuit, thermal, ultrasonic, and RF protection. Stable into reactive or mismatched loads	
Load Protection	On/off muting, individual channel DC fault blocking	
Dimensions (HWD)	3.5" (8.9 cm) 2 RU x 19" (48.3 cm) rack mounting x 14" (35.6 cm) from front mounting rails	
Weight - Net / Shipping	21 lb (9.5 kg) / 27 lb (12.3 kg)	
Power Requirements	100, 120, 230 VAC, 50 – 60 Hz (configured at factory)	
120V Current Consumption*	Idle	0.6 A
1/8 power pink noise (typical of program material at maximum unclipped power)	8Ω	6.2 A
	4Ω	9.2 A
	70V	–
1/3 power pink noise (typical of program material with severe clipping)	8Ω	9.2 A
	4Ω	14.2 A
	70V	–
		9.4 A

\* Multiply currents by 0.5 for 230V units



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CX 8-channel Spec Sheet - 06/04/08


**Middle Atlantic Products**

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**EIA/TIA Compliant**
**SEISMIC CERTIFIED**
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# WRK Series Enclosure

The WRK Series 19" gangable enclosure accommodates large cable bundles

## Features

- Fully welded construction provides the following weight capacities - UL Listed load capacity: 2,500 lbs - Static load capacity: 10,000 lbs. - Seismic certified load capacity: 900 lbs.
- 1/8" thick structural steel internal braces
- 24-1/4" OD width, available 27-5/8" or 32-5/8" OD depth
- 1/2", 3/4", 1" & 1-1/2" electrical knockouts on split rear plates top & bottom, easily removable for cable pass-through, top plates additionally include UHF / VHF knockouts
- 2 extra-wide pairs of 11-gauge 10-32 threaded rackrail with numbered rackspace increments
- Optional solid, fully vented, plexi & vented plexi doors
- Open top with configurable top panel options
- Durable black textured powder coat finish
- Seismic certified (when used with WRK-Z4 option) with an Ip value of 1.5
- UL Listed in the US and Canada



WRK-44-32

### Enclosure Accessories

ADDITIONAL RACKRAIL KIT  
 CASTER BASE  
 COPPER BUSS BAR  
 CRATING SERVICE  
 DOCUMENT POCKET  
 DOOR LATCH  
 GANGING HARDWARE  
 INNER PLATFORM BASE  
 LEVELING FEET  
 TOUCH-UP PAINT  
 SEISMIC FLOOR ANCHOR BRACKETS  
 CONFIGURABLE TOPS  
 TOP RAILS  
 UNIVERSAL FRONT DOORS  
 UNIVERSAL VENTED REAR DOORS  
 for details - see Master Catalog or visit [middleatlantic.com](http://middleatlantic.com)

## Architects' and Engineers' Specifications

EIA compliant 19" gangable equipment rack shall be Middle Atlantic Products model # WRK-\_\_\_ (see chart for available models). Overall dimensions of rack shall be \_\_\_" H x 24-1/4" W x \_\_\_" D (refer to chart). Useable height shall be \_\_\_ rackspace, useable depth shall be \_\_\_" (refer to chart). Fully welded construction shall provide a static load capacity of 10,000 lbs. and a UL Listed 2,500 lb. weight capacity. Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel welded to integral structural side panels of 16-gauge steel giving an 1/8" thick structure, all structural elements shall be finished in a durable black powder coat. Rack shall include locking, latching rear door. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing. Finished in black e-coat with numbered rackspace. Top and bottom of rack shall have a vertical slotted vent pattern. Rack shall have removable split rear knockout panels with 1/2", 3/4", 1", and 1-1/2" electrical knockouts installed in base, and removable split rear knockout panels with 1/2", 3/4", 1", and 1-1/2" electrical knockouts, and BNC knockouts for UHF/VHF antennae installed in top. Grounding and bonding stud shall be 1/4-20 threaded, installed in base of enclosure. WRK Series enclosures shall satisfy the 2007 & 2010 CBC; 2006, 2009 & 2012 IBC; ASCE 7-05 (2005 Edition) & ASCE 7-10 (2010 Edition) and the 2006 & 2009 editions of NFPA 5000 for use in areas of high seismicity, Seismic Use Group III, Zone 4 or Seismic Design Category (SDC) "D" with lateral force requirements for protecting 900 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with WRK-Z4 seismic floor anchor bracket. Rack shall be UL Listed in the US and Canada. Rack shall be GREENGUARD Gold Certified. Rack shall be RoHS EU Directive 2002/95/EC compliant. Rack shall be manufactured by an ISO 9001 and ISO 14001 registered company. Rack shall be warranted to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack.

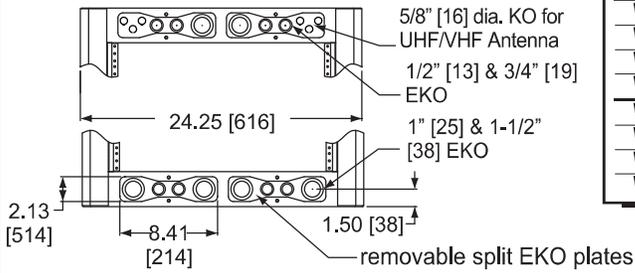
### OPTIONS

- Front doors shall be reinforced steel, model # FD-XX (solid), VFD-XX (vented, 25% open area), LVFD-XX (vented, 64% open area), PFD-XX(plexi), PVFD-44 (vented plexi) (X=# of rackspace of WRK rack)
- Vented steel rear doors shall be model # MW-VRD-44 (vented, top and bottom), MW-LVRD-XX (vented 64% open area-excludes 24 and 37 space rack), (X=# of rackspace of WRK rack), MW-CLVRD-44 (split rear door, vented, 79% open area)
- Removable keylocked side panels shall be model # SPN-XX-YY (X = # of rackspace, Y = cabinet depth)
- Top panels multiple styles available in model # MW-ST (solid), #MW-10FT (10" fan), MW-4FT (four 4-1/2" fans), MW-6FT (three 6" fans), MW-VT (vented) and MW-LA (accepts 6" & 12" wide cable ladders) see A&E spec 96-01063 for more details
- Caster base, four casters shall have a total weight capacity of 1300 lbs, model # CBS-WRK-YY (Y= cabinet depth)
- Inner platform base (inset base w/out casters) model # BS-WRK-YY (Y= cabinet depth)
- Leveling feet model # LF, shall be 3/8" threaded steel, adjustable from top or bottom, adds 1/4" min. to 1" max. to rack overall height
- Additional rail kit, 11-gauge, 10-32 threaded, sold in pairs, hardware included, model # WRK-RRXX (X= # of rackspace)
- AXS slide out option available (See AXS Spec sheet 96-052S)

**CUSTOMIZABLE SPECIFICATION CLIPS AVAILABLE AT MIDDLEATLANTIC.COM**

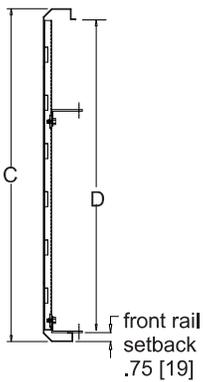
# WRK basic dimensions

REAR VIEW, TOP & BOTTOM

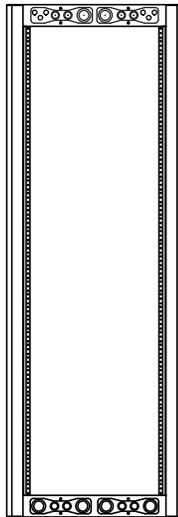


Part #	A OVERALL HEIGHT	B USEABLE HEIGHT	C OVERALL DEPTH	D USEABLE DEPTH	E BASE OPENING DEPTH
WRK-44-27	83.13 [2111]	77.13 [1959]	27.63 [702]	25.75 [654]	24.50 [622]
WRK-40-27	76.13 [1934]	70.13 [1781]	27.63 [702]	25.75 [654]	24.50 [622]
WRK-37-27	70.88 [1800]	64.88 [1648]	27.63 [702]	25.75 [654]	24.50 [622]
WRK-24-27	48.13 [1222]	42.13 [1070]	27.63 [702]	25.75 [654]	24.50 [622]
WRK-44-32	83.13 [2111]	77.13 [1959]	32.63 [829]	30.75 [781]	29.50 [749]
WRK-40-32	76.13 [1934]	70.13 [1781]	32.63 [829]	30.75 [781]	29.50 [749]
WRK-37-32	70.88 [1800]	64.88 [1648]	32.63 [829]	30.75 [781]	29.50 [749]
WRK-24-32	48.13 [1222]	42.13 [1070]	32.63 [829]	30.75 [781]	29.50 [749]

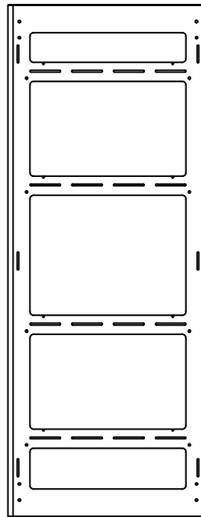
TOP SIDE SECTIONAL VIEW



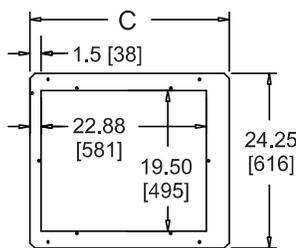
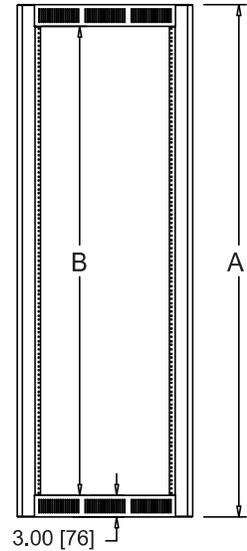
REAR VIEW



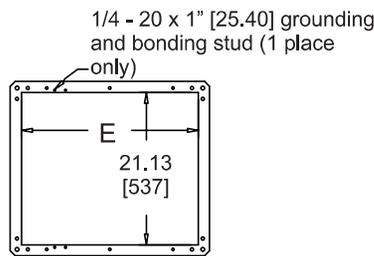
SIDE VIEW



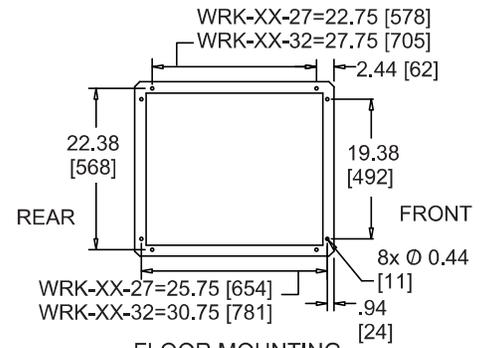
FRONT VIEW



TOP VIEW



BOTTOM VIEW



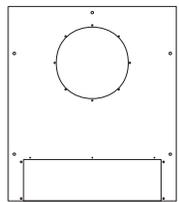
FLOOR MOUNTING LOCATIONS

All dimensions in inches unless otherwise noted [All dimensions in brackets are in millimeters]

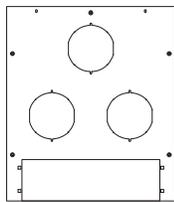


## TOP OPTIONS

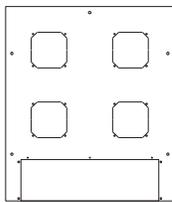
( removable plate opening accommodates 2 space panel )



MW-10FT accepts 10" fan  
MW-10FT-550CFM includes 10" fan  
MW-10FT-FC includes 10" fan and fan controller

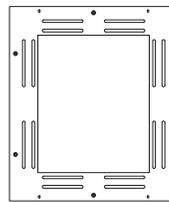


MW-6FT accepts 6" fans  
MW-6FT-660CFM includes 6" fans

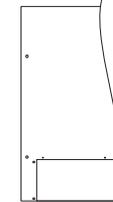


MW-4FT accepts 4-1/2" fans  
MW-4FT-380CFM includes 4-1/2" fans  
MW-4QFT-FC includes 4-1/2" quiet fans and fan controller

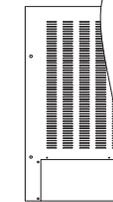
accommodates 12" and 6" width cable ladders



MW-LA accepts 6", 9" and 12" width cable ladder



MW-ST solid



MW-VT slot vent



MW-LVT 64% open area

# PDT Series

## thin power distribution

high density power strips feature a slim, low-profile design

### features:

- Slim low-profile design requires minimum space
- Up to 20 outlets depending on model
- Lightweight aluminum chassis
- Field configurable single or dual circuits available in both 15 & 20 amp models
- Field configurable isolated ground models available
- Models available with remote notification of surge protection status
- Models available with local amp metering
- Mounting hardware included
- Corded models include 9' or 20' SignalSAFE™ power cord terminated with NEMA 5-15P / 5-20P / L5-20P plug depending on model
- Black anodized finish
- Top feed models available
- ETL Listed in the US and Canada



### specifications:

High density thin power distribution shall be Middle Atlantic Products model # PDT-\_\_\_-\_\_\_ with \_\_\_ outlets and \_\_\_ amps (refer to chart). Thin power distribution shall be \_\_\_ long (refer to chart) x 1" deep x 1.9" (20 amp models) or 1.3" (15 amp models) wide. J-Box shall be 2.1" deep X \_\_\_" (refer to chart). Thin power distribution shall feature \_\_\_ NEMA 5-15R / 5-20R outlets (refer to chart). Corded power strip include \_\_\_ amp protection and mounting hardware (refer to chart). Corded models shall be terminated with 9' or 20' SignalSAFE™ power cord and NEMA 5-15P / 5-20P / L5-20P plug (refer to chart). Thin power distribution shall be available with remote notification of surge protection (refer to chart). Thin power distribution shall be available with local amp metering (refer to chart). PDT Series shall feature a black anodized finish. Regular and top feed models shall be provided to accommodate installations where ground prongs must be positioned at the top of each outlet. PDT Series with J-Box shall feature field configurable single or dual circuits available in both 15 & 20 amp models. PDT Series with J-Box shall feature field configurable isolated ground models. PDT shall include a permanently installed supplementary grounding and bonding stud. PDT Series shall be ETL listed to UL Standard 1363 in the US and to CAN/CSA C22.2 #21 in Canada. PDT shall be RoHS EU Directive 2002/95/EC compliant. PDT shall be manufactured by an ISO 9001 registered company. PDT shall be warranted to be free from defects in material or workmanship under normal use and conditions for a period of three years.

Customizable specification clips available at [middleatlantic.com](http://middleatlantic.com)



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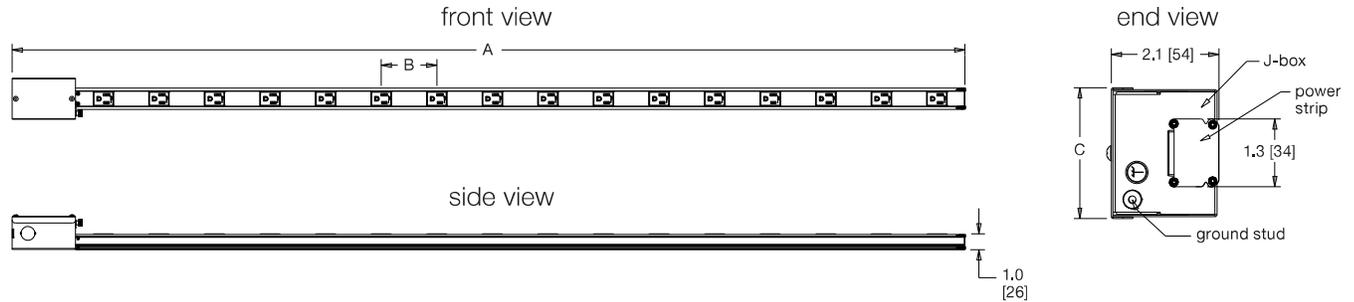
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96-01031 / rev d / 4-24-18

# PDT Series

## 15 Amp basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



- Notes:  
 1) On corded models allow for a minimum of 2 [51] cord bending space  
 2) PDT series include SignalSAFE™ power cord technology

Part #	A Overall Length	B Outlet Spacing	C Width	# of Outlets	Ammeter	Surge Protection	Cord Length/Termination	Outlet Type	Circuit	Isolated Tech. Ground	Overcurrent Protection	J-Box/Cord Location
PDT-615C	29.5 [749]	4.33 [110]	1.58 [40]	6	none	single stage	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-615C-NS	29.5 [749]	4.33 [110]	1.58 [40]	6	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-NS	37.71 [958]	3.50 [89]	1.58 [40]	10	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-NS20	37.71 [958]	3.50 [89]	1.58 [40]	10	none	none	20' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-RN	37.75 [959]	2.62 [67]	1.58 [40]	10	none	2 stage surge w/status notification	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-M-NS	37.75 [959]	2.62 [67]	1.58 [40]	10	yes	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X615S	30.00 [762]	2.14 [55]	2.58 [66]	12	none	single stage	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-1415C	59.5 [1511]	4.00 [102]	1.58 [40]	14	none	single stage	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1415C-NS	59.5 [1511]	4.00 [102]	1.58 [40]	14	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1615C-NS	33.50 [851]	1.82 [46]	1.58 [40]	16	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X815	60.00 [1524]	3.50 [89]	2.58 [66]	16	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-2015C-M-NS	72.72 [1847]	3.09 [79]	1.58 [40]	20	yes	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2015C-RN	72.72 [1847]	3.09 [79]	1.58 [40]	20	none	2 stage surge w/status notification	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2015C-NS	72.72 [1847]	3.50 [89]	1.58 [40]	20	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X1015	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-2X1015T	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	top
PDT-2X1015TS	72.75 [1848]	3.50 [89]	1.58 [40]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	top

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	CX254	CX404	CX204V
Stereo Mode (all channels driven)		Continuous average output power per channel	
8Ω / 20 Hz – 20 kHz / 0.05% THD	170 W	250 W	–
4Ω / 20 Hz – 20 kHz / 0.05% THD	250 W	400 W (0.1% THD, 1 kHz)	–
2Ω / 1 kHz / 1% THD	450 W	–	–
70V / 20 Hz – 20 kHz / 0.05% THD	–	–	200 W
70V / 1 kHz / 0.05% THD	–	–	220 W
70V / 1 kHz / 1% THD	–	–	300 W
Bridge-Mono Mode		Bridge-mono mode operation	
16Ω / 20 Hz – 20 kHz / 0.1% THD	340 W	500 W	–
8Ω / 20 Hz – 20 kHz / 0.1% THD	500 W	800 W (0.1% THD, 1 kHz)	–
4Ω / 1 kHz / 1% THD	900 W	–	–
140V / 20 Hz – 20 kHz / 0.1% THD	–	–	400 W
140V / 1 kHz / 0.05% THD	–	–	440 W
140V / 1 kHz / 1% THD	–	–	600 W
Noise (20 Hz - 20 kHz)	-106 dB	-106 dB	-105 dB
Input Sensitivity	1.22 Vrms	1.22 Vrms	1.26 Vrms
Gain	29 dB at 8Ω	31 dB at 8Ω	35 dB at 70.7V
Input Clipping	10 Vrms (+22 dBu)	10 Vrms (+22 dBu)	10 Vrms (+22 dBu)
Output Circuitry	Class AB+B	Class AB+B	Class AB+B
Distortion (SMPTE-IM)	< 0.01%	< 0.01%	< 0.02%
Distortion (typical)			
20 Hz – 20 kHz: 10 dB below rated power	< 0.01% THD		
1.0 kHz and below: full rated power	< 0.01% THD		
Frequency Response	20 Hz - 20 kHz, ± 0.2 dB   8 Hz - 50 kHz, + 0/-3 dB		
Damping Factor	> 500 (1 kHz and below)		
Input Impedance	6k ohms unbalanced, 12k ohms balanced		
Cooling	Variable-speed fan / rear-to-front air flow through tunnel heat sink		
Connectors	Input: 3 position Euro style detachable barrier block, Ch 1, 2, 3 & 4 DataPort: HD-15 Connector, Ch 1+2, Ch 3+4 Output: Six-position barrier strip with dual channel and bridge mono connections, Ch 1+2, Ch 3+4		
Controls	Front: AC switch, Ch 1, 2, 3 & 4 gain knobs Rear: DIP switch for Ch 1, 2, 3 & 4, clip limiter on/off, LF filter on/off, LF filter freq select 33 Hz or 75 Hz CX254 and CX 404: 50 Hz or 75 Hz CX204V: inputs parallel or stereo, bridge mode		
Indicators	Parallel Inputs: Yellow LED / Bridged: Yellow LED/ Power-on: Green LED Clip-Prot: Red LED / Level -10dB: Green LED / Level -20dB: Green LED / Signal -35dB: Green LED (1 per channel)		
Amplifier Protection	Full short circuit, open circuit, thermal, ultrasonic, and RF protection. Stable into reactive or mismatched loads		
Load Protection	On/off muting, DC-fault power supply shutdown		
Dimensions (HWD)	3.5" (8.9 cm) 2 RU x 19" (48.3 cm) rack mounting x 14" (35.6 cm) from front mounting rails		
Weight - Net / Shipping	21 lb (9.5 kg) / 27 lb (12.3 kg)		
Power Requirements	100, 120, 230 VAC, 50 – 60 Hz (configured at factory)		
120V Current Consumption*	Idle	0.7 A	0.7 A
1/8 power pink noise (typical of program material at maximum unclipped power)	8Ω	5.8 A	8.1 A
	4Ω	9.2 A	12.4 A
	2Ω	14.3 A	NR
	70V	–	–
1/3 power pink noise (typical of program material with severe clipping)	8Ω	8.8 A	12.2 A
	4Ω	14.2 A	19.3 A
	2Ω	21.7 A	NR
	70V	–	–
			12.7 A

\* Multiply currents by 0.5 for 230V units



Specifications subject to change without notice.

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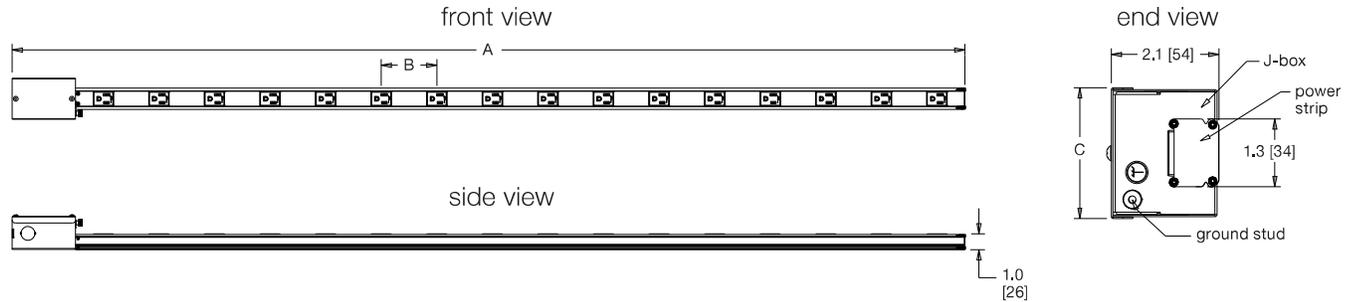
1675 MacArthur Boulevard • Costa Mesa, CA 92626 • Ph: 800/854-4079 or 714/957-7100 • Fax: 714/754-6174

CX 4-channel Spec Sheet - 06/04/08

# PDT Series

## 15 Amp basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



- Notes:
- 1) On corded models allow for a minimum of 2 [51] cord bending space
  - 2) PDT series include SignalSAFE™ power cord technology

Part #	A Overall Length	B Outlet Spacing	C Width	# of Outlets	Ammeter	Surge Protection	Cord Length/ Termination	Outlet Type	Circuit	Isolated Tech. Ground	Overcurrent Protection	J-Box/Cord Location
PDT-615C	29.5 [749]	4.33 [110]	1.58 [40]	6	none	single stage	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-615C-NS	29.5 [749]	4.33 [110]	1.58 [40]	6	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-NS	37.71 [958]	3.50 [89]	1.58 [40]	10	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-NS20	37.71 [958]	3.50 [89]	1.58 [40]	10	none	none	20' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-RN	37.75 [959]	2.62 [67]	1.58 [40]	10	none	2 stage surge w/status notification	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1015C-M-NS	37.75 [959]	2.62 [67]	1.58 [40]	10	yes	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X615S	30.00 [762]	2.14 [55]	2.58 [66]	12	none	single stage	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-1415C	59.5 [1511]	4.00 [102]	1.58 [40]	14	none	single stage	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1415C-NS	59.5 [1511]	4.00 [102]	1.58 [40]	14	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-1615C-NS	33.50 [851]	1.82 [46]	1.58 [40]	16	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X815	60.00 [1524]	3.50 [89]	2.58 [66]	16	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-2015C-M-NS	72.72 [1847]	3.09 [79]	1.58 [40]	20	yes	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2015C-RN	72.72 [1847]	3.09 [79]	1.58 [40]	20	none	2 stage surge w/status notification	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2015C-NS	72.72 [1847]	3.50 [89]	1.58 [40]	20	none	none	9' cord w/NEMA 5-15P plug	5-15R	1	no	circuit breaker	bottom
PDT-2X1015	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	bottom
PDT-2X1015T	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	top
PDT-2X1015TS	72.75 [1848]	3.50 [89]	1.58 [40]	20	none	none	j-box	5-15R	1 or 2 (field config)	field config	none	top

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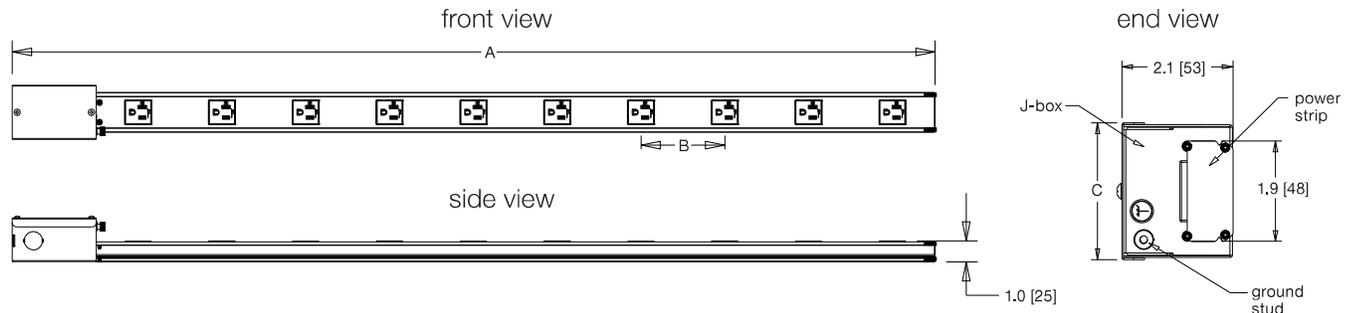
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# PDT Series

## 20 Amp basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



- Notes:
- 1) On corded models allow for a minimum of 2 [51] cord bending space
  - 2) PDT series include SignalSAFE™ power cord technology

Part #	A Overall Length	B Outlet Spacing	C Width	# of Outlets	Ammeter	Surge Protection	Cord Length/ Termination	Outlet Type	Circuit	Isolated Tech. Ground	Overcurrent Protection	J-Box/Cord Location
PDT-620C-NS	29.5 [749]	4.33 [110]	2.13 [54]	6	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X320	30.00 [762]	4.33 [110]	2.58 [66]	6	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X520	44.00 [1118]	4.00 [102]	2.58 [66]	10	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-1020C-NS	37.75 [959]	3.50 [89]	2.13 [54]	10	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-1220C-NS	59.5 [1511]	4.66 [118]	2.13 [54]	12	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X820	60.00 [1524]	3.5 [89]	2.58 [66]	16	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-1620C-NS	33.5 [851]	1.82 [46]	2.13 [54]	16	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-NS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-RN	72.75 [1848]	3.09 [79]	2.13 [54]	20	none	2 stage surge w/ status notification	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-M-NS	72.75 [1848]	3.09 [79]	2.13 [54]	20	yes	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020TL-NS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	9' cord w/NEMA L5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020TL-M-NS	72.75 [1848]	3.09 [79]	2.13 [54]	20	yes	none	9' cord w/NEMA L5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X1020	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X1020T	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	top
PDT-2X1020S	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X1020TS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	top

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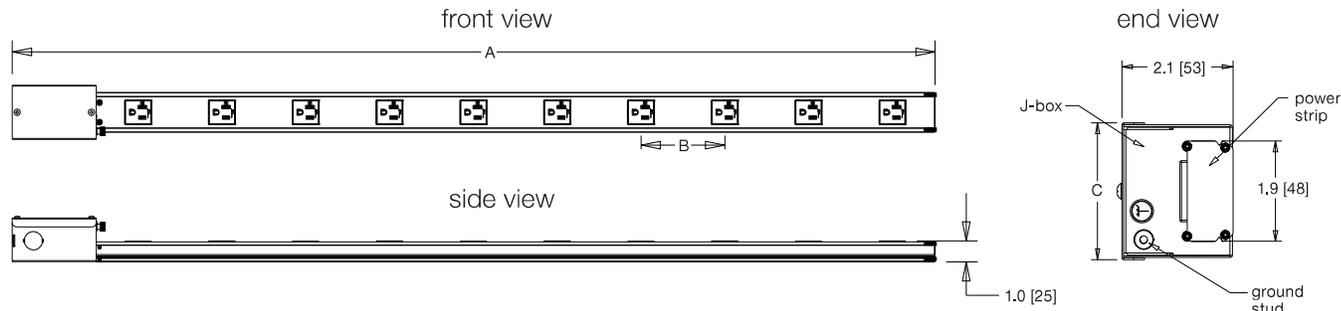
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# PDT Series

## 20 Amp basic dimensions

all dimensions in inches unless otherwise noted [all dimensions in brackets are in millimeters]



- Notes:
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Part #	A Overall Length	B Outlet Spacing	C Width	# of Outlets	Ammeter	Surge Protection	Cord Length/ Termination	Outlet Type	Circuit	Isolated Tech. Ground	Overcurrent Protection	J-Box/Cord Location
PDT-620C-NS	29.5 [749]	4.33 [110]	2.13 [54]	6	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X320	30.00 [762]	4.33 [110]	2.58 [66]	6	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X520	44.00 [1118]	4.00 [102]	2.58 [66]	10	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-1020C-NS	37.75 [959]	3.50 [89]	2.13 [54]	10	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-1220C-NS	59.5 [1511]	4.66 [118]	2.13 [54]	12	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X820	60.00 [1524]	3.5 [89]	2.58 [66]	16	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-1620C-NS	33.5 [851]	1.82 [46]	2.13 [54]	16	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-NS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-RN	72.75 [1848]	3.09 [79]	2.13 [54]	20	none	2 stage surge w/ status notification	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020C-M-NS	72.75 [1848]	3.09 [79]	2.13 [54]	20	yes	none	9' cord w/NEMA 5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020TL-NS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	9' cord w/NEMA L5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2020TL-M-NS	72.75 [1848]	3.09 [79]	2.13 [54]	20	yes	none	9' cord w/NEMA L5-20P plug	5-20R	1	no	circuit breaker	bottom
PDT-2X1020	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X1020T	73.25 [1861]	3.50 [89]	2.58 [66]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	top
PDT-2X1020S	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	bottom
PDT-2X1020TS	72.75 [1848]	3.50 [89]	2.13 [54]	20	none	none	j-box	5-20R	1 or 2 (field config)	field config	none	top

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## STAGE SOUND, INC. WARRANTY STATEMENT

- We warrant all equipment, materials, and labor provided by Stage Sound to be free of defects for one full year. Unless otherwise stated, all equipment provided by Stage Sound will be new and will include the manufacturers' warranties. Please note the following exceptions and modifications: This warranty specifically excludes the replacement of lamps and bulbs (see additional warranty information below), remedy for damage or defect caused by abuse, modifications not executed by Stage Sound, improper or insufficient maintenance, improper operation, normal wear and tear under normal usage, or failure of, or caused by preexisting wiring and equipment. Stage Sound is not liable for incidental, consequential or special damages caused by defects in or failures of the system.
- All lamps / bulbs used in lighting, video, or other equipment will typically have a manufacturers' "rated lamp life". However, this rated life represents an estimate of the "half life" of that lamp, or the time when 50% of these types of lamps will have burned out. This is not a guarantee of how long a particular lamp will last - some will last longer, some won't last as long. Stage Sound guarantees that all lamps and bulbs in our installations will be operational at the time the system is placed into service or demonstrated and signed off on by the owner's representative, but we do not warrantee that any lamps will last the full "rated life" of that lamp type.
- Any additional equipment warranty provided by the manufacturers would cover repairs made at Stage Sound or at the manufacturers' repair facility. Note that any service calls to diagnose, repair, or replace any components or wiring after the first year would not be covered by Stage Sound's or the manufacturers' warranty and would be billed at our prevailing service rate.
- In the event of any system failure, Stage Sound will make every effort to perform any necessary service in a timely fashion. In this instance "timely fashion" means we will make every effort to get the system up and running within two days after notification of the problem. Rush and emergency rates are available upon request.
- If, in the event of any system failure, we cannot repair or replace (at our discretion) any defective equipment in a timely fashion, we will provide a free loaner to keep the system functioning while necessary repairs are made. Any service call labor (after the first year) and non-warranty repair costs will be billed accordingly. This free loaner policy will remain in effect during the life of the equipment (defined as 10 years after completion of the installation). The free loaner policy specifically excludes DJ and effects lighting units, video and projection equipment, used equipment purchased from us, multi-track recording devices, tape players and recorders, CD players, and expendable items.
- If any equipment were to exhibit an unusually high incidence of failure, Stage Sound would replace that equipment (during the full one-year or manufacturers' warranty period, whichever is longer).
- All velour, muslin, or other cotton curtains are specifically excluded from any warranty if the ambient relative humidity in the room or around the curtains is greater than 65% for more than a 12-hour period.



## **TENTATIVE SCHEDULE**

For scheduling, we will work with your owner representative of general contractor to work whatever schedule is best for the project and keeps the overall construction schedule moving forward. We have the benefit of having over 30 highly skilled audio-video professionals in full-time employ on our team (across our Design & Installation, Concert Production, and Retail Sales divisions), and we can share resources among the three departments to keep projects moving as required.



November 13, 2019

ADDENDUM NO.: One

TO ALL OFFERORS:

REFERENCE: Request for Proposal No: **RFP# SCK-1065**  
Dated: November 13, 2019  
Commodity: Atlantic Union Bank Center – Audio Systems  
RFP Closing On: **\*\*NOVEMBER 20<sup>TH</sup>, 2019 @ 2:30 PM\*\* (extended)**

Please note the clarifications and/or changes made on this proposal program:

1. **QUESTION: Where can we access Architectural and Electrical drawings including the Cable Tray Layout?**

ANSWER: Please email Savana Koteita at [koteitsc@jmu.edu](mailto:koteitsc@jmu.edu) for a link to access drawings.

2. **QUESTION: Is there a list for other system infrastructure needs (i.e. additional data cabling for Dante, etc)?**

ANSWER: No. See audio single lines.

3. **QUESTION: The design documentation references the possibility of substituting the Danley loudspeakers with either EAW or JBL. Is there a BOM for these alternate designs?**

ANSWER: No. These are approved manufacturers that must meet/exceed specified equipment in the base bid.

4. **QUESTION: Can we have access to any acoustical modeling files or aiming details for the arena loudspeaker system?**

ANSWER: It will be provided to the winning Contractor.

5. **QUESTION: The QSC TSC-47W-G2 is discontinued. Is the TSC-55W-G2 acceptable?**

ANSWER: Yes. This is an acceptable alternative.

6. **QUESTION: What are the bonding requirements for this project?**

ANSWER: There are no bonding requirements at this point.

7. **QUESTION: What is the purpose of the two Complex fiber snakes?**

MSC 5720  
752 Ott Street, Room 1042  
Wine Price Building  
Harrisonburg, VA 22807  
Office of 540.568.3145 Phone  
PROCUREMENT SERVICES 540.568.7936 Fax

ANSWER: They are not to be integrated. They are for portable applications.

8. **QUESTION: Is “free-run” plenum cable between speakers acceptable or will the contractor need to provide additional conduit?**

ANSWER: Conduit is required.

9. **QUESTION: Are there any BIM coordination requirements?**

ANSWER: No BIM requirements.

10. **QUESTION: In attachment E part 1.1 section Q, the system is listed as interfacing with fire alarm system and providing egress directions. Does this system therein need to be considered life safety and thereby follow NFPA Life Safety codes?**

ANSWER: Not required for general assembly sound systems.

11. **QUESTION: In Part VIII section JJ - Nonvisual access is called out. Has the head of using agency determined if the Technology will need to conform to this section for touchscreen user interfaces?**

ANSWER: Having access to the main operating system computer covers this.

12. **QUESTION: In Attachment E part 1.6 Section F it is notated that some gear may require Cover, Shafts or such. Can you detail what devices you would like to further restrict access to past room access control?**

ANSWER: No additional security is required.

Signify receipt of this addendum by initialing “*Addendum #1 \_\_\_\_\_*” on the signature page of your proposal.

Sincerely,

Savana Koteita  
Buyer Specialist  
Phone: (540-568-4280)

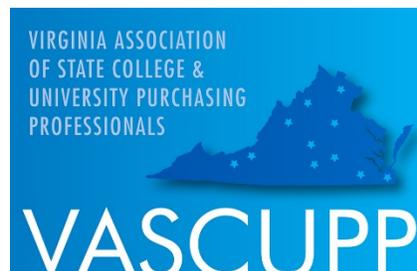


# Request for Proposal

## **RFP# SCK-1065**

**ATLANTIC UNION BANK CENTER  
– AUDIO SYSTEMS PACKAGE**

**October 18, 2019**



**REQUEST FOR PROPOSAL**  
**RFP# SCK-1065**

**Issue Date:** October 18, 2019  
**Title:** Atlantic Union Bank Center – Audio Systems Package  
**Issuing Agency:** Commonwealth of Virginia  
James Madison University  
Procurement Services MSC 5720  
752 Ott Street, Wine Price Building  
First Floor, Suite 1023  
Harrisonburg, VA 22807

**Period of Contract: From Date of Award Through Two (2) Years with the option to renew for eight (8) additional one year periods**

**Sealed Proposals Will Be Received Until 2:00 PM on November 15, 2019 for Furnishing The Services Described Herein.**

*SEALED PROPOSALS MAY BE MAILED, EXPRESS MAILED, OR HAND DELIVERED DIRECTLY TO THE ISSUING AGENCY SHOWN ABOVE.*

All Inquiries For Information And Clarification Should Be Directed To: Savana Koteita, Buyer Specialist, Procurement Services, [koteitsc@jmu.edu](mailto:koteitsc@jmu.edu); 540-568-4280; (Fax) 540-568-7935 not later than **November 15, 2019**.

**NOTE: THE SIGNED PROPOSAL AND ALL ATTACHMENTS SHALL BE RETURNED.**

In compliance with this Request for Proposal and to all the conditions imposed herein, the undersigned offers and agrees to furnish the goods/services in accordance with the attached signed proposal or as mutually agreed upon by subsequent negotiation.

Name and Address of Firm:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

By: \_\_\_\_\_  
*(Signature in Ink)*

Name: \_\_\_\_\_  
*(Please Print)*

Date: \_\_\_\_\_

Title: \_\_\_\_\_

Web Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Fax #: \_\_\_\_\_

ACKNOWLEDGE RECEIPT OF ADDENDUM: #1 \_\_\_\_\_ #2 \_\_\_\_\_ #3 \_\_\_\_\_ #4 \_\_\_\_\_ #5 \_\_\_\_\_ (please initial)

CONTRACTOR/SUBCONTRACTOR LICENSE REQUIREMENT: By my signature on this solicitation, I certify that this firm/individual and subcontractor is properly licensed for providing the goods/services specified. License # \_\_\_\_\_ Type \_\_\_\_\_

SMALL, WOMAN OR MINORITY OWNED BUSINESS:

YES;  NO; *IF YES* ⇒ ⇒  SMALL;  WOMAN;  MINORITY ***IF MINORITY***:  AA;  HA;  AsA;  NW;  Micro

**Note: This public body does not discriminate against faith-based organizations in accordance with the Code of Virginia, § 2.2-4343.1 or against an offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.**

# ***REQUEST FOR PROPOSAL***

*RFP # SCK-1065*

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	G. Audio Systems Pricing Form - attached as a separate Excel spreadsheet ( <b><i>All Offerors are required to complete</i></b> )		

## **I. PURPOSE**

The purpose of this Request for Proposal (RFP) is to solicit sealed proposals from qualified sources to enter into a contract to provide an Audio Systems Package for the Atlantic Bank Union Center for James Madison University (JMU), an agency of the Commonwealth of Virginia. Initial contract shall be for two (2) years with an option to renew for eight (8) additional one-year periods.

## **II. BACKGROUND**

James Madison University (JMU) is a comprehensive public institution in Harrisonburg, Virginia with an enrollment of approximately 22,000 students and 4,000 faculty and staff. Further information about the University may be found at the following website: <http://www.jmu.edu>. The University sponsors an 18-sport intercollegiate athletics program that competes at The Division I level of the National Collegiate Athletic Association. JMU is also affiliated with the Colonial Athletic Association, of which it was a charter member in 1985, and with the Eastern College Athletic Conference.

James Madison University has invested heavily in its athletics facilities, highlighted by Bridgeforth Stadium/Zane Showker Field. In 2020, the Atlantic Union Bank Center will complete construction as the 8,500-seat home of JMU men's and women's basketball while also serving as a destination for numerous campus and community events with seating capacity potential for 10,000 for certain special event configurations. More details on the Atlantic Union Bank Center can be found at <https://jmusports.com/feature/AtlanticUnionBankCenter>.

## **III. SMALL, WOMAN-OWNED AND MINORITY PARTICIPATION**

It is the policy of the Commonwealth of Virginia to contribute to the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities, and to encourage their participation in State procurement activities. The Commonwealth encourages contractors to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Attachment B contains information on reporting spend data with subcontractors.

## **IV. STATEMENT OF NEEDS**

With the upcoming debut of the Atlantic Union Bank Center, JMU seeks proposals for an Audio Systems Package. Project highlights can be found at: <https://jmusports.com/feature/AtlanticUnionBankCenter>.

### **A. GENERAL INFORMATION:**

1. This represents the minimum requirements to furnish a complete turnkey package as indicated in this and accompanying documents. The Contractor shall provide the work described in the RFP Documents on a 'turnkey basis.' Unless otherwise indicated, the work contemplated in this RFP includes manufacture, supply, delivery, installation, labor, tools, engineering, supervision, licenses, insurance, permits, related services (including design) and testing of all equipment, training and materials necessary to install and operate the audio systems as described in the RFP Documents, and more particularly in the technical specifications included in the RFP attachments.

2. Offerors responding to this RFP must provide pricing for a complete turnkey installation, including costing for the provision and installation of all items necessary to provide finished and fully operational systems. Materials, equipment and related services required for the provision and installation of such a system that are not expressly addressed in this RFP are understood to be the responsibility of the Offeror.
3. Offerors are clearly advised that any drawings, plans, charts or other materials, whether supplied by or on behalf of James Madison University, AJP, or third parties, describing aspects of the site provided as part of this document or otherwise are not to be considered as definitive or as a substitute for any information which would otherwise be obtained by the Offeror during negotiation.
4. Offerors must submit proposals for the complete package including all required equipment, installation and functional connection of all equipment as described in this document and related attachments. A proposal submitted in response to this RFP signifies the Offeror agrees to sell to the University the indicated products, in whole or in part, at the sole discretion of the University.
5. Contractor shall be responsible for day to day premises and facilities cleanup, including temporary storage, removal and disposal of debris, trash and rubbish caused by its employees, or installation material men or workmen. All tools, equipment and materials shall be secured upon completion of the day's work. Surplus materials shall be removed from the work site and stored in their appropriate location.
6. Contractor's personnel shall follow University standards and personal conduct codes while on the University's premises. A copy of those standards and codes can be found at the following link: <https://www.jmu.edu/JMUpolicy/policies/1317.shtml>. Personnel found violating these standards or regulations will be asked to leave the work site and shall not be allowed to return.
7. It is Contractor's responsibility to guarantee that all items of hardware, services rendered or working environments meet or exceed those requirements and guidelines established by the Occupational Safety and Health Act (OSHA).
8. Contractor shall warrant and guarantee to the University, without limitations or qualification, that all equipment, components, materials, workmanship and the system as an entity shall conform to and perform in accordance with local building codes.

**B. DELIVERY, STORAGE, AND SECURITY**

1. The Contractor shall provide pricing for each item to include delivery to the site for all system components and related materials.
2. The Contractor shall coordinate delivery with the University.
3. The Contractor shall unload, uncrate, assemble, and transport each component to its desired location for installation and install the system on-site in accordance with on-site regulations.
4. The Contractor shall be responsible for the cleanup and disposal of all packaging materials and debris.

5. The Contractor shall be responsible for providing any temporary on-site storage for equipment and materials unless adequate on-site storage is available from the University.
6. The University shall not be responsible for security or insurance related to said equipment or materials, even if stored on-site at locations designated or approved by the University.
7. Any temporary storage requirements must be coordinated with the University.

C. DEFINITIONS:

1. "Substantial Completion" – shall be defined as all work under the Contract has been substantially completed in accordance with the terms of the Contract and all displays are fully operational and ready for the intended use. Systems shall be installed, all rack equipment installed, all cabling completed, system has been commissioned and tested in accordance with applicable requirements of the Technical Specifications and the Contract. The project is ready for final punch list by the University and/or the University's designated representative.
2. "Final Completion" – shall be defined as all punch list items have been completed and all work under the Contract is ready for final acceptance by the University once three (3) consecutive problem free events have been completed as defined by Section 3.10.F of Attachment E.

D. RESPONSE REQUIRED BY OFFERORS

1. Describe in detail offeror's approach to provide the RFP parameters as laid out in the Scope of Work and Technical Specifications, Attachment E.
  - a. Provide the following: In addition to proposing specifically for what is specified in this RFP, the Offeror is encouraged to furnish alternative solutions that may satisfy or complement the solution proposed in this RFP.
  - b. Provide the following: Offerors are also encouraged to suggest alternative solutions that would reduce the overall cost without hindering the performance of the system from its intended use.
2. Describe all training options available (remote and/or on premises) for the duration of the contract in addition to training as outlined in 3.10 of Attachment E.
  - a. Provide pricing for hourly and daily rates (to include travel costs for on premises training) in X. Pricing Schedule.
3. Describe the procedures for obtaining services for all types of maintenance and applicable "escalation" procedures for providing additional assistance in diagnosing a failure that is not resolved in a timely manner, to include notification procedures and timing as well as what higher levels of assistance will be made available.
4. Provide a complete list of references for similar installations performed in the past three (3) years with name of facility, photo of installation, contact name, title, address and direct phone number.
5. Provide a formal list of intended design professionals, sub-contractors and suppliers, including primary place of business, and estimated dollar amount. Contractor,

subcontractors, and design professionals shall be licensed by appropriate Virginia authorities / board as appropriate and required by law. Proposals should include a statement indicating the licensing status of Contractor, subcontractors, and design professionals required to be licensed in Virginia and identified in your proposal

6. Provide an Equipment List with line item pricing (See Attachment G).
7. Provide product cut sheets and technical data for each item proposed.
8. Specify services provided as part of the required two (2) year parts and labor warranty.

E. TENTATIVE SCHEDULE

1. The University anticipates delivery and installation will be approximately July 2020, subject to change based on overall project schedule, to be coordinated and confirmed by the awarded vendor with the University and General Contractor. Describe, in detail, your ability to meet the tentative schedule provided.

## V. PROPOSAL PREPARATION AND SUBMISSION

A. GENERAL INSTRUCTIONS

**To ensure timely and adequate consideration of your proposal, offerors are to limit all contact, whether verbal or written, pertaining to this RFP to the James Madison University Procurement Office for the duration of this Proposal process. Failure to do so may jeopardize further consideration of Offeror's proposal.**

1. RFP Response: In order to be considered for selection, the **Offeror shall submit a complete response to this RFP**; and shall submit to the issuing Purchasing Agency:
  - a. **One (1) original and nine (9) copies** of the entire proposal, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 3.f. below.
  - b. **One (1) electronic copy in WORD format or searchable PDF (CD or flash drive)** of the entire proposal, INCLUDING ALL ATTACHMENTS. **Attachment G pricing should be returned as an Excel file on a CD or flash drive.** Any proprietary information should be clearly marked in accordance with 3.f. below.
  - c. Should the proposal contain **proprietary information**, provide **one (1) redacted hard copy** of the proposal and all attachments with **proprietary portions removed or blacked out**. This copy should be clearly marked "*Redacted Copy*" on the front cover. The classification of an entire proposal document, line item prices, and/or total proposal prices as proprietary or trade secrets is not acceptable. JMU shall not be responsible for the Contractor's failure to exclude proprietary information from this redacted copy.

No other distribution of the proposal shall be made by the Offeror.

2. The version of the solicitation issued by JMU Procurement Services, as amended by an addenda, is the mandatory controlling version of the document. Any modification of, or

additions to, the solicitation by the Offeror shall not modify the official version of the solicitation issued by JMU Procurement services unless accepted in writing by the University. Such modifications or additions to the solicitation by the Offeror may be cause for rejection of the proposal; however, JMU reserves the right to decide, on a case-by-case basis in its sole discretion, whether to reject such a proposal. If the modification or additions are not identified until after the award of the contract, the controlling version of the solicitation document shall still be the official state form issued by Procurement Services.

### 3. Proposal Preparation

- a. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in the purchasing agency requiring prompt submissions of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by the purchasing agency. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.
- b. Proposals shall be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.
- c. Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the paragraph number, sub letter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and sub letter should be repeated at the top of the next page. The proposal should contain a table of contents which cross references the RFP requirements. Information which the offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at the appropriate place or be attached at the end of the proposal and designated as additional material. Proposals that are not organized in this manner risk elimination from consideration if the evaluators are unable to find where the RFP requirements are specifically addressed.
- d. As used in this RFP, the terms “must”, “shall”, “should” and “may” identify the criticality of requirements. “Must” and “shall” identify requirements whose absence will have a major negative impact on the suitability of the proposed solution. Items labeled as “should” or “may” are highly desirable, although their absence will not have a large impact and would be useful, but are not necessary. Depending on the overall response to the RFP, some individual “must” and “shall” items may not be fully satisfied, but it is the intent to satisfy most, if not all, “must” and “shall” requirements. The inability of an offeror to satisfy a “must” or “shall” requirement does not automatically remove that offeror from consideration; however, it may seriously affect the overall rating of the offeror’ proposal.
- e. Each copy of the proposal should be bound or contained in a single volume where practical. All documentation submitted with the proposal should be contained in that single volume.
- f. Ownership of all data, materials and documentation originated and prepared for the State pursuant to the RFP shall belong exclusively to the State and be subject to public

inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by the offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the offeror must invoke the protection of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data is submitted. The written notice must specifically identify the data or materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret materials submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and will result in rejection and return of the proposal.

4. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to James Madison University. This provides an opportunity for the Offeror to clarify or elaborate on the proposal. This is a fact-finding and explanation session only and does not include negotiation. James Madison University will schedule the time and location of these presentations. Oral presentations are an option of the University and may or may not be conducted. Therefore, proposals should be complete.

#### B. SPECIFIC PROPOSAL INSTRUCTIONS

Proposals should be as thorough and detailed as possible so that James Madison University may properly evaluate your capabilities to provide the required services. Offerors are required to submit the following items as a complete proposal:

1. Return RFP cover sheet and all addenda acknowledgements, if any, signed and filled out as required.
2. Plan and methodology for providing the goods/services as described in Section IV. Statement of Needs of this Request for Proposal.
3. A written narrative statement to include, but not be limited to, the expertise, qualifications, and experience of the firm and resumes of specific personnel to be assigned to perform the work.
4. Offeror Data Sheet, included as *Attachment A* to this RFP.
5. Small Business Subcontracting Plan, included as *Attachment B* to this RFP. Offeror shall provide a Small Business Subcontracting plan which summarizes the planned utilization of Department of Small Business and Supplier Diversity (SBSD)-certified small businesses which include businesses owned by women and minorities, when they have received Department of Small Business and Supplier Diversity (SBSD) small business certification, under the contract to be awarded as a result of this solicitation. This is a requirement for all prime contracts in excess of \$100,000 unless no subcontracting opportunities exist.
6. Identify the amount of sales your company had during the last twelve months with each VASCUPP Member Institution. A list of VASCUPP Members can be found at: [www.VASCUPP.org](http://www.VASCUPP.org).
7. Proposed Cost. See Section X. Pricing Schedule of this Request for Proposal.

## VI. EVALUATION AND AWARD CRITERIA

### A. EVALUATION CRITERIA

Proposals shall be evaluated by James Madison University using the following criteria:

	<u>Points</u>
1. Quality of products/services offered and suitability for intended purposes	25
2. Qualifications and experience of Offeror in providing the goods/services	20
3. Specific plans or methodology to be used to perform the services	20
4. Participation of Small, Women-Owned, & Minority (SWaM) Businesses	10
5. Cost	25
	<hr/> 100

- B. AWARD TO MULTIPLE OFFERORS: Selection shall be made of two or more offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation factors included in the Request for Proposals, including price, if so stated in the Request for Proposals. Negotiations shall be conducted with the offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each offeror so selected, the agency shall select the offeror which, in its opinion, has made the best proposal, and shall award the contract to that offeror. The Commonwealth reserves the right to make multiple awards as a result of this solicitation. The Commonwealth may cancel this Request for Proposals or reject proposals at any time prior to an award, and is not required to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous. Should the Commonwealth determine in writing and in its sole discretion that only one offeror is fully qualified, or that one offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the contractor's proposal as negotiated.

## VII. GENERAL TERMS AND CONDITIONS

- A. PURCHASING MANUAL: This solicitation is subject to the provisions of the Commonwealth of Virginia's Purchasing Manual for Institutions of Higher Education and Their Vendors and any revisions thereto, which are hereby incorporated into this contract in their entirety. A copy of the manual is available for review at the purchasing office. In addition, the manual may be accessed electronically at <http://www.jmu.edu/procurement> or a copy can be obtained by calling Procurement Services at (540) 568-3145.
- B. APPLICABLE LAWS AND COURTS: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth. The Contractor shall comply with applicable federal, state and local laws and regulations.
- C. ANTI-DISCRIMINATION: By submitting their proposals, offerors certify to the Commonwealth that they will conform to the provisions of the Federal Civil Rights Act of

1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act and §10 of the Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 (available for review at <http://www.jmu.edu/procurement>). If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the contract on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender or national origin and shall be subject to the same rules as other organizations that contract with public bodies to account for the use of the funds provided; however, if the faith-based organization segregates public funds into separate accounts, only the accounts and programs funded with public funds shall be subject to audit by the public body. (*§6 of the Rules Governing Procurement*).

In every contract over \$10,000 the provisions in 1. and 2. below apply:

1. During the performance of this contract, the contractor agrees as follows:
  - a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
  - b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
  - c. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting these requirements.
2. The contractor will include the provisions of 1. Above in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

- D. ETHICS IN PUBLIC CONTRACTING: By submitting their proposals, offerors certify that their proposals are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor in connection with their proposal, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.
- E. IMMIGRATION REFORM AND CONTROL ACT OF 1986: By entering into a written contract with the Commonwealth of Virginia, the Contractor certifies that the Contractor does not, and shall not during the performance of the contract for goods and services in the Commonwealth, knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
- F. DEBARMENT STATUS: By submitting their proposals, offerors certify that they are not currently debarred by the Commonwealth of Virginia from submitting proposals on contracts

for the type of goods and/or services covered by this solicitation, nor are they an agent of any person or entity that is currently so debarred.

- G. ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the Commonwealth of Virginia all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the Commonwealth of Virginia under said contract.
- H. MANDATORY USE OF STATE FORM AND TERMS AND CONDITIONS RFPs: Failure to submit a proposal on the official state form provided for that purpose may be a cause for rejection of the proposal. Modification of or additions to the General Terms and Conditions of the solicitation may be cause for rejection of the proposal; however, the Commonwealth reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a proposal.
- I. CLARIFICATION OF TERMS: If any prospective offeror has questions about the specifications or other solicitation documents, the prospective offeror should contact the buyer whose name appears on the face of the solicitation no later than **November 4, 2019**. Any revisions to the solicitation will be made only by addendum issued by the buyer.
- J. PAYMENT:
  - 1. To Prime Contractor:
    - a. Invoices for items ordered, delivered and accepted shall be submitted by the contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the state contract number and/or purchase order number; social security number (for individual contractors) or the federal employer identification number (for proprietorships, partnerships, and corporations).
    - b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.
    - c. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the contractor at the contract price, regardless of which public agency is being billed.
    - d. The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail, or the date of offset when offset proceedings have been instituted as authorized under the Virginia Debt Collection Act.
    - e. Unreasonable Charges. Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced

charges are not reasonable, the Commonwealth shall promptly notify the contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification. The provisions of this section do not relieve an agency of its prompt payment obligations with respect to those charges which are not in dispute (*Rules Governing Procurement, Chapter 2, Exhibit J, Attachment 1 § 53; available for review at <http://www.jmu.edu/procurement>*).

2. To Subcontractors:
    - a. A contractor awarded a contract under this solicitation is hereby obligated:
      - (1) To pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the Commonwealth for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or
      - (2) To notify the agency and the subcontractors, in writing, of the contractor's intention to withhold payment and the reason.
    - b. The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the Commonwealth, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the Commonwealth.
  3. Each prime contractor who wins an award in which provision of a SWAM procurement plan is a condition to the award, shall deliver to the contracting agency or institution, on or before request for final payment, evidence and certification of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the SWAM procurement plan. Final payment under the contract in question may be withheld until such certification is delivered and, if necessary, confirmed by the agency or institution, or other appropriate penalties may be assessed in lieu of withholding such payment.
  4. The Commonwealth of Virginia encourages contractors and subcontractors to accept electronic and credit card payments.
- K. PRECEDENCE OF TERMS: Paragraphs A through J of these General Terms and Conditions and the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors, shall apply in all instances. In the event there is a conflict between any of the other General Terms and Conditions and any Special Terms and Conditions in this solicitation, the Special Terms and Conditions shall apply.
- L. QUALIFICATIONS OF OFFERORS: The Commonwealth may make such reasonable investigations as deemed proper and necessary to determine the ability of the offeror to perform the services/furnish the goods and the offeror shall furnish to the Commonwealth all such information and data for this purpose as may be requested. The Commonwealth reserves the right to inspect offeror's physical facilities prior to award to satisfy questions regarding the offeror's capabilities. The Commonwealth further reserves the right to reject any proposal if

the evidence submitted by, or investigations of, such offeror fails to satisfy the Commonwealth that such offeror is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.

- M. TESTING AND INSPECTION: The Commonwealth reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.
- N. ASSIGNMENT OF CONTRACT: A contract shall not be assignable by the contractor in whole or in part without the written consent of the Commonwealth.
- O. CHANGES TO THE CONTRACT: Changes can be made to the contract in any of the following ways:
1. The parties may agree in writing to modify the scope of the contract. An increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.
  2. The Purchasing Agency may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt. The contractor shall be compensated for any additional costs incurred as the result of such order and shall give the Purchasing Agency a credit for any savings. Said compensation shall be determined by one of the following methods:
    - a. By mutual agreement between the parties in writing; or
    - b. By agreeing upon a unit price or using a unit price set forth in the contract, if the work to be done can be expressed in units, and the contractor accounts for the number of units of work performed, subject to the Purchasing Agency's right to audit the contractor's records and/or to determine the correct number of units independently; or
    - c. By ordering the contractor to proceed with the work and keep a record of all costs incurred and savings realized. A markup for overhead and profit may be allowed if provided by the contract. The same markup shall be used for determining a decrease in price as the result of savings realized. The contractor shall present the Purchasing Agency with all vouchers and records of expenses incurred and savings realized. The Purchasing Agency shall have the right to audit the records of the contractor as it deems necessary to determine costs or savings. Any claim for an adjustment in price under this provision must be asserted by written notice to the Purchasing Agency within thirty (30) days from the date of receipt of the written order from the Purchasing Agency. If the parties fail to agree on an amount of adjustment, the question of an increase or decrease in the contract price or time for performance shall be resolved in accordance with the procedures for resolving disputes provided by the Disputes Clause of this contract or, if there is none, in accordance with the disputes provisions of the Commonwealth of Virginia Purchasing Manual for Institutions of Higher Education and their Vendors. Neither the existence of a claim nor a dispute resolution process, litigation or any other provision of this contract shall excuse the contractor from promptly complying with the changes ordered by the Purchasing Agency or with the performance of the contract generally.

- P. DEFAULT: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the Commonwealth, after due oral or written notice, may procure them from other sources and hold the contractor responsible for any resulting additional purchase and administrative costs. This remedy shall be in addition to any other remedies which the Commonwealth may have.
- Q. INSURANCE: By signing and submitting a proposal under this solicitation, the offeror certifies that if awarded the contract, it will have the following insurance coverage at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with § 25 of the Rules Governing Procurement – Chapter 2, Exhibit J, Attachment 1, and 65.2-800 et. Seq. of the Code of Virginia (available for review at <http://www.jmu.edu/procurement>) The offeror further certifies that the contractor and any subcontractors will maintain these insurance coverage during the entire term of the contract and that all insurance coverage will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

MINIMUM INSURANCE COVERAGES AND LIMITS REQUIRED FOR MOST CONTRACTS:

1. Workers' Compensation: Statutory requirements and benefits. Coverage is compulsory for employers of three or more employees, to include the employer. Contractors who fail to notify the Commonwealth of increases in the number of employees that change their workers' compensation requirement under the Code of Virginia during the course of the contract shall be in noncompliance with the contract.
  2. Employer's Liability: \$100,000
  3. Commercial General Liability: \$1,000,000 per occurrence and \$2,000,000 in the aggregate. Commercial General Liability is to include bodily injury and property damage, personal injury and advertising injury, products and completed operations coverage. The Commonwealth of Virginia must be named as an additional insured and so endorsed on the policy.
  4. Automobile Liability: \$1,000,000 combined single limit. *(Required only if a motor vehicle not owned by the Commonwealth is to be used in the contract. Contractor must assure that the required coverage is maintained by the Contractor (or third party owner of such motor vehicle.)*
- R. ANNOUNCEMENT OF AWARD: Upon the award or the announcement of the decision to award a contract over \$100,000, as a result of this solicitation, the purchasing agency will publicly post such notice on the DGS/DPS eVA web site ([www.eva.virginia.gov](http://www.eva.virginia.gov)) for a minimum of 10 days.
- S. DRUG-FREE WORKPLACE: During the performance of this contract, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, “drug-free workplace” means a site for the performance of work done in connection with a specific contract awarded to a contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

- T. NONDISCRIMINATION OF CONTRACTORS: An offeror, or contractor shall not be discriminated against in the solicitation or award of this contract because of race, religion, color, sex, national origin, age, disability, faith-based organizational status, any other basis prohibited by state law relating to discrimination in employment or because the offeror employs ex-offenders unless the state agency, department or institution has made a written determination that employing ex-offenders on the specific contract is not in its best interest. If the award of this contract is made to a faith-based organization and an individual, who applies for or receives goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the public body shall offer the individual, within a reasonable period of time after the date of his objection, access to equivalent goods, services, or disbursements from an alternative provider.
- U. eVA BUSINESS TO GOVERNMENT VENDOR REGISTRATION, CONTRACTS, AND ORDERS: The eVA Internet electronic procurement solution, website portal [www.eVA.virginia.gov](http://www.eVA.virginia.gov), streamlines and automates government purchasing activities in the Commonwealth. The eVA portal is the gateway for vendors to conduct business with state agencies and public bodies. All vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet procurement solution by completing the free eVA Vendor Registration. All offerors must register in eVA and pay the Vendor Transaction Fees specified below; failure to register will result in the proposal being rejected. Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:
- Vendor transaction fees are determined by the date the original purchase order is issued and the current fees are as follows:
1. For orders issued July 1, 2014 and after, the Vendor Transaction Fee is:
    - a. Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$500 per order.
    - b. Businesses that are not Department of Small Business and Supplier Diversity (SBSD) certified Small Businesses: 1% capped at \$1,500 per order.
  2. For orders issued prior to July 1, 2014 the vendor transaction fees can be found at [www.eVA.virginia.gov](http://www.eVA.virginia.gov).
  3. The specified vendor transaction fee will be invoiced by the Commonwealth of Virginia Department of General Services approximately 60 days after the corresponding purchase order is issued and payable 30 days after the invoice date. Any adjustments (increases/decreases) will be handled through purchase order changes.
- V. AVAILABILITY OF FUNDS: It is understood and agreed between the parties herein that the Commonwealth of Virginia shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

- W. PRICING CURRENCY: Unless stated otherwise in the solicitation, offerors shall state offered prices in U.S. dollars.
- X. E-VERIFY REQUIREMENT OF ANY CONTRACTOR: Any employer with more than an average of 50 employees for the previous 12 months entering into a contract in excess of \$50,000 with James Madison University to perform work or provide services pursuant to such contract shall register and participate in the E-Verify program to verify information and work authorization of its newly hired employees performing work pursuant to any awarded contract.
- Y. TAXES: Sales to the Commonwealth of Virginia are normally exempt from State sales tax. State sales and use tax certificates of exemption, Form ST-12, will be issued upon request. Deliveries against this contract shall usually be free of Federal excise and transportation taxes. The Commonwealth's excise tax exemption registration number is 54-73-0076K.
- Z. USE OF BRAND NAMES: Unless otherwise provided in this solicitation, the name of a certain brand, make or manufacturer does not restrict offerors to the specific brand, make or manufacturer named, but conveys the general style, type, character, and quality of the article desired. Any article which the public body, in its sole discretion, determines to be the equivalent of that specified, considering quality, workmanship, economy of operation, and suitability for the purpose intended, shall be accepted. The offeror is responsible to clearly and specifically identify the product being offered and to provide sufficient descriptive literature, catalog cuts and technical detail to enable the Commonwealth to determine if the product offered meets the requirements of the solicitation. This is required even if offering the exact brand, make or manufacturer specified. Normally in a competitive sealed solicitation only the information furnished with the proposal will be considered in the evaluation. Failure to furnish adequate data for evaluation purposes may result in declaring a proposal nonresponsive. Unless the offeror clearly indicates in its proposal that the product offered is an equivalent product, such proposal will be considered to offer the brand name product referenced in the solicitation.
- AA. TRANSPORTATION AND PACKAGING: By submitting their proposals, all Offerors certify and warrant that the price offered for FOB destination includes only the actual freight rate costs at the lowest and best rate and is based upon the actual weight of the goods to be shipped. Except as otherwise specified herein, standard commercial packaging, packing and shipping containers shall be used. All shipping containers shall be legibly marked or labeled on the outside with purchase order number, commodity description, and quantity.

## **VIII. SPECIAL TERMS AND CONDITIONS**

- A. ADVERTISING: In the event a contract is awarded for supplies, equipment, or services resulting from this proposal, no indication of such sales or services to James Madison University will be used in product literature or advertising. The contractor shall not state in any of its advertising or product literature that James Madison University has purchased or uses any of its products or services, and the contractor shall not include James Madison University in any client list in advertising and promotional materials.
- B. AUDIT: The Contractor hereby agrees to retain all books, records, systems, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. The Commonwealth of Virginia, its authorized agents, and/or State auditors shall have full access to and the right to examine any of said materials during said period.

- C. CANCELLATION OF CONTRACT: James Madison University reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.
- D. IDENTIFICATION OF PROPOSAL ENVELOPE: The signed proposal should be returned in a separate envelope or package, sealed and identified as follows:

From: \_\_\_\_\_

_____	_____	_____
Name of Offeror	Due Date	Time
_____		_____
Street or Box No.	RFP #	
_____		_____
City, State, Zip Code	RFP Title	
_____		
Name of Purchasing Officer:		

The envelope should be addressed as directed on the title page of the solicitation.

The Offeror takes the risk that if the envelope is not marked as described above, it may be inadvertently opened and the information compromised, which may cause the proposal to be disqualified. Proposals may be hand-delivered to the designated location in the office issuing the solicitation. No other correspondence or other proposals should be placed in the envelope.

- E. LATE PROPOSALS: To be considered for selection, proposals must be received by the issuing office by the designated date and hour. The official time used in the receipt of proposals is that time on the automatic time stamp machine in the issuing office. Proposals received in the issuing office after the date and hour designated are automatically non responsive and will not be considered. The University is not responsible for delays in the delivery of mail by the U.S. Postal Service, private couriers, or the intra university mail system. It is the sole responsibility of the Offeror to ensure that its proposal reaches the issuing office by the designated date and hour.
- F. UNDERSTANDING OF REQUIREMENTS: It is the responsibility of each offeror to inquire about and clarify any requirements of this solicitation that is not understood. The University will not be bound by oral explanations as to the meaning of specifications or language contained in this solicitation. Therefore, all inquiries deemed to be substantive in nature must be in writing and submitted to the responsible buyer in the Procurement Services Office. **Offerors are asked to include reference to RFP section, page, and item number in their questions when relevant.** Offerors must ensure that written inquiries reach the buyer by **November 4, 2019**. A copy of all queries and the respective response will be provided in the form of an addendum to all offerors who have indicated an interest in responding to this solicitation. Your signature on your Offer certifies that you fully understand all facets of this solicitation. These questions may be sent to the Buyer as referenced on the signature sheet.
- G. RENEWAL OF CONTRACT: This contract may be renewed by the Commonwealth for a period of eight (8) successive one year periods under the terms and conditions of the original contract except as stated in 1. and 2. below. Price increases may be negotiated only at the time of renewal. Written notice of the Commonwealth's intention to renew shall be given approximately 90 days prior to the expiration date of each contract period.

1. If the Commonwealth elects to exercise the option to renew the contract for an additional one-year period, the contract price(s) for the additional one year shall not exceed the contract price(s) of the original contract increased/decreased by no more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.
  2. If during any subsequent renewal periods, the Commonwealth elects to exercise the option to renew the contract, the contract price(s) for the subsequent renewal period shall not exceed the contract price(s) of the previous renewal period increased/decreased by more than the percentage increase/decrease of the other services category of the CPI-W section of the Consumer Price Index of the United States Bureau of Labor Statistics for the latest twelve months for which statistics are available.
- H. SUBMISSION OF INVOICES: All invoices shall be submitted within sixty days of contract term expiration for the initial contract period as well as for each subsequent contract renewal period. Any invoices submitted after the sixty day period will not be processed for payment.
- I. OPERATING VEHICLES ON JAMES MADISON UNIVERSITY CAMPUS: Operating vehicles on sidewalks, plazas, and areas heavily used by pedestrians is prohibited. In the unlikely event a driver should find it necessary to drive on James Madison University sidewalks, plazas, and areas heavily used by pedestrians, the driver must yield to pedestrians. For a complete list of parking regulations, please go to [www.jmu.edu/parking](http://www.jmu.edu/parking); or to acquire a service representative parking permit, contact Parking Services at 540.568.3300. The safety of our students, faculty and staff is of paramount importance to us. Accordingly, violators may be charged.
- J. COOPERATIVE PURCHASING / USE OF AGREEMENT BY THIRD PARTIES: It is the intent of this solicitation and resulting contract(s) to allow for cooperative procurement. Accordingly, any public body, (to include government/state agencies, political subdivisions, etc.), cooperative purchasing organizations, public or private health or educational institutions or any University related foundation and affiliated corporations may access any resulting contract if authorized by the Contractor.

Participation in this cooperative procurement is strictly voluntary. If authorized by the Contractor(s), the resultant contract(s) will be extended to the entities indicated above to purchase goods and services in accordance with contract terms. As a separate contractual relationship, the participating entity will place its own orders directly with the Contractor(s) and shall fully and independently administer its use of the contract(s) to include contractual disputes, invoicing and payments without direct administration from the University. No modification of this contract or execution of a separate agreement is required to participate; however, the participating entity and the Contractor may modify the terms and conditions of this contract to accommodate specific governing laws, regulations, policies, and business goals required by the participating entity. Any such modification will apply solely between the participating entity and the Contractor.

The Contractor will notify the University in writing of any such entities accessing this contract. The Contractor will provide semi-annual usage reports for all entities accessing the contract. The University shall not be held liable for any costs or damages incurred by any other participating entity as a result of any authorization by the Contractor to extend the contract. It is understood and agreed that the University is not responsible for the acts or omissions of any entity and will not be considered in default of the contract no matter the circumstances.

Use of this contract(s) does not preclude any participating entity from using other contracts or competitive processes as needed.

K. SMALL BUSINESS SUBCONTRACTING AND EVIDENCE OF COMPLIANCE:

1. It is the goal of the Commonwealth that 42% of its purchases are made from small businesses. This includes discretionary spending in prime contracts and subcontracts. All potential offerors are required to submit a Small Business Subcontracting Plan. Unless the offeror is registered as a Department of Small Business and Supplier Diversity (SBSD)-certified small business and where it is practicable for any portion of the awarded contract to be subcontracted to other suppliers, the contractor is encouraged to offer such subcontracting opportunities to SBSBD-certified small businesses. This shall not exclude SBSBD-certified women-owned and minority-owned businesses when they have received SBSBD small business certification. No offeror or subcontractor shall be considered a Small Business, a Women-Owned Business or a Minority-Owned Business unless certified as such by the Department of Small Business and Supplier Diversity (SBSD) by the due date for receipt of proposals. If small business subcontractors are used, the prime contractor agrees to report the use of small business subcontractors by providing the purchasing office at a minimum the following information: name of small business with the SBSBD certification number or FEIN, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product/service provided. **This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.**
2. Each prime contractor who wins an award in which provision of a small business subcontracting plan is a condition of the award, shall deliver to the contracting agency or institution with every request for payment, evidence of compliance (subject only to insubstantial shortfalls and to shortfalls arising from subcontractor default) with the small business subcontracting plan. **This information shall be submitted to: JMU Office of Procurement Services, SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.** When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm with the Department of Small Business and Supplier Diversity (SBSD) certification number or FEIN number, phone number, total dollar amount subcontracted, category type (small, women-owned, or minority-owned), and type of product or service provided. Payment(s) may be withheld until compliance with the plan is received and confirmed by the agency or institution. The agency or institution reserves the right to pursue other appropriate remedies to include, but not be limited to, termination for default.
3. Each prime contractor who wins an award valued over \$200,000 shall deliver to the contracting agency or institution with every request for payment, information on use of subcontractors that are not Department of Small Business and Supplier Diversity (SBSD)-certified small businesses. When such business has been subcontracted to these firms and upon completion of the contract, the contractor agrees to furnish the purchasing office at a minimum the following information: name of firm, phone number, FEIN number, total dollar amount subcontracted, and type of product or service provided. **This information shall be submitted to: JMU Office of Procurement Services, Attn: SWAM Subcontracting Compliance, MSC 5720, Harrisonburg, VA 22807.**

L. AUTHORIZATION TO CONDUCT BUSINESS IN THE COMMONWEALTH: A contractor organized as a stock or nonstock corporation, limited liability company, business trust, or

limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law. Any business entity described above that enters into a contract with a public body shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the contract. A public body may void any contract with a business entity if the business entity fails to remain in compliance with the provisions of this section.

- M. PUBLIC POSTING OF COOPERATIVE CONTRACTS: James Madison University maintains a web-based contracts database with a public gateway access. Any resulting cooperative contract/s to this solicitation will be posted to the publicly accessible website. Contents identified as proprietary information will not be made public.
- N. CRIMINAL BACKGROUND CHECKS OF PERSONNEL ASSIGNED BY CONTRACTOR TO PERFORM WORK ON JMU PROPERTY: The Contractor shall obtain criminal background checks on all of their contracted employees who will be assigned to perform services on James Madison University property. The results of the background checks will be directed solely to the Contractor. The Contractor bears responsibility for confirming to the University contract administrator that the background checks have been completed prior to work being performed by their employees or subcontractors. The Contractor shall only assign to work on the University campus those individuals whom it deems qualified and permissible based on the results of completed background checks. Notwithstanding any other provision herein, and to ensure the safety of students, faculty, staff and facilities, James Madison University reserves the right to approve or disapprove any contract employee that will work on JMU property. Disapproval by the University will solely apply to JMU property and should have no bearing on the Contractor's employment of an individual outside of James Madison University.
- O. INDEMNIFICATION: Contractor agrees to indemnify, defend and hold harmless the Commonwealth of Virginia, its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the contractor/any services of any kind or nature furnished by the contractor, provided that such liability is not attributable to the sole negligence of the using agency or to failure of the using agency to use the materials, goods, or equipment in the manner already and permanently described by the contractor on the materials, goods or equipment delivered.
- P. ADDITIONAL GOODS AND SERVICES: The University may acquire other goods or services that the supplier provides than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services under the same pricing, terms, and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services that are newly introduced during the term of this Agreement. Such additional goods and services will be provided to the University at favored nations pricing, terms, and conditions.
- Q. ELECTRICAL EQUIPMENT STANDARDS: All equipment/material shall conform to the latest issue of all applicable standards as established by National Electrical Manufacturer's Association (NEMA), American National Standards Institute (ANSI), and Occupational Safety & Health Administration (OSHA). All equipment and material, for which there are OSHA standards, shall bear an appropriate label of approval for use intended from a Nationally Recognized Testing Laboratory (NRTL).

- R. EXTRA CHARGES NOT ALLOWED: The pricing shall be for complete installation ready for the Commonwealth's use, and shall include all applicable freight and installation charges; extra charges will not be allowed.
- S. CONFIDENTIALITY (Commonwealth): The Commonwealth agrees that neither it nor its employees, representatives, or agents shall knowingly divulge any proprietary information with respect to the operation of the software, the technology embodied therein, or any other trade secret or proprietary information related thereto, except as specifically authorized by the contractor in writing or as required by the Freedom of Information Act or similar law. It shall be the contractor's responsibility to fully comply with § 11-52 D of the *Code of Virginia*. All trade secrets or proprietary information must be identified in writing or other tangible form and conspicuously labeled as "proprietary" either prior to or at the time of submission to the Commonwealth.
- T. LATEST SOFTWARE VERSION: Any software product(s) provided under the contract shall be the latest version available to the general public as of the due date of this solicitation.
- U. PRODUCT SUBSTITUTION: During the term of any contract resulting from this solicitation, the vendor is not authorized to substitute any item for that product and/or software identified in the solicitation without the prior written consent of the contracting officer whose name appears on the front of this solicitation, or their designee.
- V. QUALIFIED REPAIR PERSONNEL: All warranty or maintenance services to be performed on the items specified in this solicitation as well as any associated hardware or software shall be performed by qualified technicians properly authorized by the manufacturer to perform such services. The Commonwealth reserves the right to require proof of certification prior to award and at any time during the term of the contract.
- W. RELOCATION OF EQUIPMENT: Should it become necessary to move equipment covered by the contract to another location, the Commonwealth reserves the right to do so at its own expense. If contractor supervision is required, the Commonwealth will provide prior written notice of the move at least thirty days in advance, in which case the contractor shall provide the required services and be reasonably compensated by the Commonwealth. Both the compensation to be paid and any adjustment to the maintenance terms resulting from the move shall be as mutually agreed between the parties. Regular maintenance charges shall be suspended on the day the equipment is dismantled and resume once the equipment is again certified ready for operational use.
- X. RENEWAL OF MAINTENANCE: Maintenance of the hardware or software specified in the resultant contract may be renewed by the mutual written agreement of both parties for additional one-year periods, under the terms and conditions of the original contract except as noted herein. Price changes may be negotiated at time of renewal; however, in no case shall the maintenance costs for a succeeding one-year period exceed the prior year's contract price(s), increased or decreased by more than the percentage increase or decrease in the other services category of the CPI-W section of the US Bureau of Labor Statistics Consumer Price Index, for the latest twelve months for which statistics are available.
- Y. REPAIR PARTS: In the event that the performance of maintenance services under the contract results in a need to replace defective parts, such items may only be replaced by new parts. In no instance shall the contractor be permitted to replace defective items with refurbished, remanufactured, or surplus items without prior written authorization of the Commonwealth.

- Z. SERVICE PERIOD (EXTENDED): Due to the criticality of the applications for which the equipment and/or software is purchased, the contractor shall provide 24 hours a day, 7 days a week, maintenance support, including state holidays. On-site response time shall be within 12-24 hours following initial notification. All necessary repairs or corrections shall be completed within 72 hours of the initial notification.
- AA. SERVICE PERIOD (ROUTINE): Contractor shall provide 24-hour toll free phone support with a 24 hour return call response time. On-site maintenance services shall carry a 12-24 hour response time following initial notification and be available during the normal working hours of 8 A.M. to 5 P.M. Monday through Friday, excluding state holidays. All necessary repairs or corrections shall be completed within 72 hours of the initial notification.
- BB. SERVICE REPORTS: Upon completion of any maintenance call, the contractor shall provide the agency with a signed service report that includes, at a minimum: a general statement as to the problem, action taken, any materials or parts furnished or used, and the number of hours required to complete the repairs.
- CC. SOFTWARE UPGRADES: The Commonwealth shall be entitled to any and all upgraded versions of the software covered in the contract that becomes available from the contractor. The maximum charge for upgrade shall not exceed the total difference between the cost of the Commonwealth's current version and the price the contractor sells or licenses the upgraded software under similar circumstances.
- DD. SOURCE CODE: In the event the contractor ceases to maintain experienced staff and the resources needed to provide required software maintenance, the Commonwealth shall be entitled to have, use, and duplicate for its own use, a copy of the source code and associated documentation for the software products covered by the contract. Until such time as a complete copy of such material is provided, the Commonwealth shall have exclusive right to possess all physical embodiments of such contractor owned materials. The rights of the Commonwealth in this respect shall survive for a period of twenty years after the expiration or termination of the contract. All lease and royalty fees necessary to support this right are included in the initial license fee as contained in the pricing schedule.
- EE. TERM OF SOFTWARE LICENSE: Unless otherwise stated in the solicitation, the software license(s) identified in the pricing schedule shall be purchased on a perpetual basis and shall continue in perpetuity. However the Commonwealth reserves the right to terminate the license at any time, although the mere expiration or termination of this contract shall not be construed as an intent to terminate the license. All acquired license(s) shall be for use at any computing facilities, on any equipment, by any number of users, and for any purposes for which it is procured. The Commonwealth further reserves the right to transfer all rights under the license to another state agency to which some or all of its functions are transferred.
- FF. THIRD PARTY ACQUISITION OF SOFTWARE: The contractor shall notify the procuring agency in writing should the intellectual property, associated business, or all of its assets be acquired by a third party. The contractor further agrees that the contract's terms and conditions, including any and all license rights and related services, shall not be affected by the acquisition. Prior to completion of the acquisition, the contractor shall obtain, for the Commonwealth's benefit and deliver thereto, the assignee's agreement to fully honor the terms of the contract.
- GG. TITLE TO SOFTWARE: By submitting a proposal, the offeror represents and warrants that it is the sole owner of the software or, if not the owner, that it has received all legally required authorizations from the owner to license the software, has the full power to grant the rights required by this solicitation, and that neither the software nor its use in accordance with the

contract will violate or infringe upon any patent, copyright, trade secret, or any other property rights of another person or organization.

HH. WARRANTY AGAINST SHUTDOWN DEVICES: The contractor warrants that the equipment and software provided under the contract shall not contain any lock, counter, CPU reference, virus, worm, or other device capable of halting operations or erasing or altering data or programs. Contractor further warrants that neither it, nor its agents, employees, or subcontractors shall insert any shutdown device following delivery of the equipment and software.

II. WARRANTY: All materials and equipment shall be fully guaranteed against defects in material and workmanship for a period of 24 months following date of Final Acceptance. Should any defect be noted by the owner, the Purchasing Office will notify the contractor of such defect or non-conformance. Notification will state either (1) that the contractor shall replace or correct, or (2) the owner does not require replacement or correction, but an equitable adjustment to the contract price will be negotiated. If the contractor is required to correct or replace, it shall be at no cost to the Commonwealth and shall be subject to all provisions of this clause to the same extent as materials initially delivered. If the contractor fails or refuses to replace or correct the deficiency, the office issuing the purchase order may have the materials corrected or replaced with similar items and charge the contractor the costs occasioned thereby or obtain an equitable adjustment in the contract price.

JJ. NONVISUAL ACCESS TO TECHNOLOGY: All information technology which, pursuant to this Agreement, is purchased or upgraded by or for the use of any State agency or institution or political subdivision of the Commonwealth (the "Technology") shall comply with the following nonvisual access standards from the date of purchase or upgrade until the expiration of this Agreement:

- (i) effective, interactive control and use of the Technology shall be readily achievable by nonvisual means;
- (ii) the Technology equipped for nonvisual access shall be compatible with information technology used by other individuals with whom any blind or visually impaired user of the Technology interacts;
- (iii) nonvisual access technology shall be integrated into any networks used to share communications among employees, program participants or the public; and
- (iv) the technology for nonvisual access shall have the capability of providing equivalent access by nonvisual means to telecommunications or other interconnected network services used by persons who are not blind or visually impaired.

Compliance with the foregoing nonvisual access standards shall not be required if the head of the using agency, institution or political subdivision determines that (i) the Technology is not available with nonvisual access because the essential elements of the Technology are visual and (ii) nonvisual equivalence is not available.

Installation of hardware, software or peripheral devices used for nonvisual access is not required when the Technology is being used exclusively by individuals who are not blind or visually impaired, but applications programs and underlying operating systems (including the

format of the data) used for the manipulation and presentation of information shall permit the installation and effective use of nonvisual access software and peripheral devices.

If requested, the Contractor must provide a detailed explanation of how compliance with the foregoing nonvisual access standards is achieved and a validation of concept demonstration.

The requirements of this Paragraph shall be construed to achieve full compliance with the Information Technology Access Act, 2.2-3500 through 2.2-3504 of the *Code of Virginia*.

All information technology which, pursuant to this Agreement, is purchased or upgraded by or for the use of any Commonwealth agency or institution or political subdivision of the Commonwealth (the "Technology") shall comply with Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended. If requested, the Contractor must provide a detailed explanation of how compliance with Section 508 of the Rehabilitation Act is achieved and a validation of concept demonstration. (<http://www.section508.gov/>). The requirements of this Paragraph along with the Non-Visual Access to Technology Clause shall be construed to achieve full compliance with the Information Technology Access Act, §§2.2-3500 through 2.2-3504 of the *Code of Virginia*.

KK. **AS BUILT DRAWINGS:** The contractor shall provide the Commonwealth a clean set of reproducible "as built" drawings and wiring diagrams, marked to record all changes made during installation or construction. The contractor shall also provide the Commonwealth with maintenance manuals, parts lists and a copy of all warranties for all equipment. All "as built" drawings and wiring diagrams, maintenance manuals, parts lists and warranties shall be delivered to the Commonwealth upon completion of the work and prior to final payment.

LL. **CONTRACTOR REGISTRATION:** If a contract for construction, removal, repair or improvement of a building or other real property is for \$120,000 or more, or if the total value of all such contracts undertaken by offeror within any 12-month period is \$750,000 or more, the offeror is required under Title 54.1-1100, *Code of Virginia* (1950), as amended, to be licensed by the State Board of Contractors a "CLASS A CONTRACTOR." If such a contract is for \$10,000 or more but less than \$120,000, or if the total value of all such contracts undertaken by offeror within any 12-month period is \$150,000 or more, but less than \$750,000 or more, the offeror is required to be licensed as a "CLASS B CONTRACTOR." If such a contract is over \$1,000 but less than \$10,000, or if the contractor does less than \$150,000 in business in a 12-month period, the offeror is required to be licensed as a "CLASS C CONTRACTOR." The board shall require a master tradesmen license as a condition of licensure for electrical, plumbing and heating, ventilation and air conditioning contractors. The offeror shall place on the outside of the envelope containing the proposal and shall place in the proposal over his signature whichever of the following notations is appropriate, inserting his contractor license number:

Licensed Class A  
Virginia Contractor No. \_\_\_\_\_ Specialty \_\_\_\_\_  
Licensed Class B  
Virginia Contractor No. \_\_\_\_\_ Specialty \_\_\_\_\_  
Licensed Class C  
Virginia Contractor No. \_\_\_\_\_ Specialty \_\_\_\_\_

If the offeror shall fail to provide this information on his proposal or on the envelope containing the proposal and shall fail to promptly provide said contractor license number to the

Commonwealth in writing when requested to do so before or after the opening of proposals, he shall be deemed to be in violation of § 54.1-1115 of the *Code of Virginia* (1950), as amended, and his proposal will not be considered.

If an offeror shall fail to obtain the required license prior to submission of his proposal, the proposal shall not be considered.

- MM. DELIVERY AND STORAGE: It shall be the responsibility of the contractor to make all arrangements for delivery, unloading, receiving and storing materials in the building during installation. The owner will not assume any responsibility for receiving these shipments. Contractor shall check with the owner and make necessary arrangements for security and storage space in the building during installation.
- NN. FINAL INSPECTION: At the conclusion of the work, the contractor shall demonstrate to the authorized owner's representative that the work is fully operational and in compliance with contract specifications and codes. Any deficiencies shall be promptly and permanently corrected by the contractor at the contractor's sole expense prior to final acceptance of the work.
- OO. MAINTENANCE MANUALS: The contractor shall provide with each piece of equipment an operations and maintenance manual with wiring diagrams, parts list, and a copy of all warranties.
- GGG. WORK SITE DAMAGES: Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to the Commonwealth's satisfaction at the contractor's expense.
- HHH. INSTALLATION: All items must be assembled and set in place, ready for use. All crating and other debris must be removed from the premises.
- III. CONTRACTOR'S TITLE TO MATERIALS: No materials or supplies for the work shall be purchased by the contractor or by any subcontractor subject to any chattel mortgage or under a conditional sales or other agreement by which an interest is retained by the seller. The contractor warrants that he has clear title to all materials and supplies for which he invoices for payment.
- JJJ. PRIME CONTRACTOR RESPONSIBILITIES: The contractor shall be responsible for completely supervising and directing the work under this contract and all subcontractors that he may utilize, using his best skill and attention. Subcontractors who perform work under this contract shall be responsible to the prime contractor. The contractor agrees that he is as fully responsible for the acts and omissions of his subcontractors and of persons employed by them as he is for the acts and omissions of his own employees.
- KKK. SUBCONTRACTS: No portion of the work shall be subcontracted without prior written consent of the purchasing agency. In the event that the contractor desires to subcontract some part of the work specified herein, the contractor shall furnish the purchasing agency the names, qualifications and experience of their proposed subcontractors. The contractor shall, however, remain fully liable and responsible for the work to be done by its subcontractor(s) and shall assure compliance with all requirements of the contract.

- LLL. KEYS: If the Contractor is given keys for this project, it is the Contractor's responsibility to return the keys when the contract is terminated, as well as for the safekeeping of the keys during the contract period. The Contractor shall not loan or duplicate the keys. In the event the Contractor loses the keys, they will be charged for the replacement of the keys and any locks which are rekeyed or replaced.
- MMM. STANDARDS OF CONDUCT: The work site will be occupied by students and University Personnel during the times work is performed. Contractor and Contractor's personnel shall exercise a particularly high level of discipline, safety and cooperation at all times while on the job site. The Contractor shall be responsible for controlling employee conduct, for assuring that its employees are not boisterous or rude, and assuring that they are not engaging in any destructive or criminal activity.

## **IX. METHOD OF PAYMENT**

The contractor will be paid on the basis of invoices submitted in accordance with the solicitation and any negotiations. James Madison University recognizes the importance of expediting the payment process for our vendors and suppliers. We are asking our vendors and suppliers to enroll in the Wells Fargo Bank single use Commercial Card Number process or electronic deposit (ACH) to your bank account so that future payments are made electronically. Contractors signed up for the Wells Fargo Bank single use Commercial Card Number process will receive the benefit of being paid in Net 15 days. Additional information is available online at:

<http://www.jmu.edu/financeoffice/accounting-operations-disbursements/cash-investments/vendor-payment-methods.shtml>

## **X. PRICING SCHEDULE**

The offeror shall provide pricing for all products and services included in proposal indicating one-time and on-going costs. This includes pricing for items included in Section IV Statement of Needs as well as a completed copy of the attached Audio System Pricing Form (Attachment G, attached to posting as a separate Excel spreadsheet) both in print and accompanying your electronic submission (See Section V. Proposal Preparation and Submission).

Specify any associated charge card processing fees, if applicable, to be billed to the university.

Vendors shall provide their VISA registration number when indicating charge card processing fees. Any vendor requiring information on VISA registration may refer to

<https://usa.visa.com/support/small-business/regulations-fees.html> and for questions

<https://usa.visa.com/dam/VCOM/global/support-legal/documents/merchant-surcharging-qa-for-web.pdf>.

## **XI. ATTACHMENTS**

Attachment A: Offeror Data Sheet

Attachment B: Small, Women, and Minority-owned Business (SWaM) Utilization Plan

Attachment C: Standard Contract Sample

Attachment D: Zone Map

Attachment E: Scope of Work and Technical Specifications – attached as a separate PDF file

Attachment F: JMU Atlantic Union Bank Center AJP RFP Drawings – attached as a separate PDF file

Attachment G: Audio System Pricing Form - attached as a separate Excel spreadsheet (***All Offerors are required to complete***)

ATTACHMENT A

OFFEROR DATA SHEET

TO BE COMPLETED BY OFFEROR

1. QUALIFICATIONS OF OFFEROR: Offerors must have the capability and capacity in all respects to fully satisfy the contractual requirements.
2. YEARS IN BUSINESS: Indicate the length of time you have been in business providing these types of goods and services.

Years \_\_\_\_\_ Months \_\_\_\_\_

3. REFERENCES: Indicate below a listing of at least five (5) organizations, either commercial or governmental/educational, that your agency is servicing. Include the name and address of the person the purchasing agency has your permission to contact.

CLIENT	LENGTH OF SERVICE	ADDRESS	CONTACT PERSON/PHONE #
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4. List full names and addresses of Offeror and any branch offices which may be responsible for administering the contract.

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5. RELATIONSHIP WITH THE COMMONWEALTH OF VIRGINIA: Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the [CODE OF VIRGINIA](#), SECTION 2.2-3100 – 3131?

YES  NO

IF YES, EXPLAIN: \_\_\_\_\_

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## ATTACHMENT B

Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

**Offeror Name:** \_\_\_\_\_ **Preparer Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Is your firm a **Small Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Woman-owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Minority-Owned Business Enterprise** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

Is your firm a **Micro Business** certified by the Department of Small Business and Supplier Diversity (SBSD)? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, certification number: \_\_\_\_\_ Certification date: \_\_\_\_\_

**Instructions:** *Populate the table below to show your firm's plans for utilization of small, women-owned and minority-owned business enterprises in the performance of the contract. Describe plans to utilize SWAMs businesses as part of joint ventures, partnerships, subcontractors, suppliers, etc.*

**Small Business:** "Small business " means a business, independently owned or operated by one or more persons who are citizens of the United States or non-citizens who are in full compliance with United States immigration law, which, together with affiliates, has 250 or fewer employees, or average annual gross receipts of \$10 million or less averaged over the previous three years.

**Woman-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more women, and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified women-owned businesses are also a small business enterprise.**

**Minority-Owned Business Enterprise:** A business concern which is at least 51 percent owned by one or more minorities or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in which is owned by one or more minorities and whose management and daily business operations are controlled by one or more of such individuals. **For purposes of the SWAM Program, all certified minority-owned businesses are also a small business enterprise.**

**Micro Business** is a certified Small Business under the SWaM Program and has no more than twenty-five (25) employees AND no more than \$3 million in average annual revenue over the three-year period prior to their certification.

**All small, women, and minority owned businesses must be certified by the Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) to be counted in the SWAM program. Certification applications are available through SBSD at 800-223-0671 in Virginia, 804-786-6585 outside Virginia, or online at <http://www.sbsd.virginia.gov/> (Customer Service).**

***RETURN OF THIS PAGE IS REQUIRED***

**ATTACHMENT B (CNT'D)**  
 Small, Women and Minority-owned Businesses (SWaM) Utilization Plan

Procurement Name and Number: \_\_\_\_\_

Date Form Completed: \_\_\_\_\_

Listing of Sub-Contractors, to include, Small, Woman Owned and Minority Owned Businesses  
 for this Proposal and Subsequent Contract

Offeror / Proposer:

\_\_\_\_\_ Firm

\_\_\_\_\_ Address

\_\_\_\_\_ Contact Person/No.

Sub-Contractor's Name and Address	Contact Person & Phone Number	SBSD Certification Number	Services or Materials Provided	Total Subcontractor Contract Amount (to include change orders)	Total Dollars Paid Subcontractor to date (to be submitted with request for payment from JMU)

*(Form shall be submitted with proposal and if awarded, again with submission of each request for payment)*

***RETURN OF THIS PAGE IS REQUIRED***

ATTACHMENT C



COMMONWEALTH OF VIRGINIA  
STANDARD CONTRACT

Contract No. \_\_\_\_\_

This contract entered into this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_, by \_\_\_\_\_ hereinafter called the "Contractor" and Commonwealth of Virginia, James Madison University called the "Purchasing Agency".

WITNESSETH that the Contractor and the Purchasing Agency, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the services to the Purchasing Agency as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From \_\_\_\_\_ through \_\_\_\_\_

The contract documents shall consist of:

- (1) This signed form;
- (2) The following portions of the Request for Proposals dated \_\_\_\_\_:
  - (a) The Statement of Needs,
  - (b) The General Terms and Conditions,
  - (c) The Special Terms and Conditions together with any negotiated modifications of those Special Conditions;
  - (d) List each addendum that may be issued
  - (e) Scope of Work and Technical Specifications
- (3) The Contractor's Proposal dated \_\_\_\_\_ and the following negotiated modification to the Proposal, all of which documents are incorporated herein.
  - (a) Negotiations summary dated \_\_\_\_\_.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR:

PURCHASING AGENCY:

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Printed Name)

\_\_\_\_\_  
(Printed Name)

Title: \_\_\_\_\_

Title: \_\_\_\_\_

## ATTACHMENT D

### Zone Map



## Virginia Association of State College & University Purchasing Professionals (VASCUPP)

### List of member institutions by zones

<b><u>Zone 1</u></b> George Mason University (Fairfax)	<b><u>Zone 2</u></b> James Madison University (Harrisonburg)	<b><u>Zone 3</u></b> University of Virginia (Charlottesville)
<b><u>Zone 4</u></b> University of Mary Washington (Fredericksburg)	<b><u>Zone 5</u></b> College of William and Mary (Williamsburg) Old Dominion University (Norfolk)	<b><u>Zone 6</u></b> Virginia Commonwealth University (Richmond)
<b><u>Zone 7</u></b> Longwood University (Farmville)	<b><u>Zone 8</u></b> Virginia Military Institute (Lexington) Virginia Tech (Blacksburg) Radford University (Radford)	<b><u>Zone 9</u></b> University of Virginia - Wise (Wise)