



POUDRE SCHOOL DISTRICT R-1

INVITATION FOR BIDS

**FOSSIL RIDGE HIGH SCHOOL
STADIUM AND VARSITY BASEBALL FIELD
SOUND SYSTEMS**

IFB 22-345-002

BID SCHEDULE

IFB Posted to BidNet	May 12, 2022
Pre-bid Site Visit	May 19, 2022 – 5:30 p.m. MST
Questions Due	May 20, 2022 – 2 p.m. MST
IFB Closing Date	May 27, 2022 – 2 p.m. MST

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FRHS STADIUM & VARSITY BASEBALL FIELD SOUND SYSTEM IFB 22-345-002

Poudre School District (“the District”) is requesting bids from professional and qualified contractors to remove the existing sound system equipment, as well as design, supply and install new sound systems in the Fossil Ridge High School (“FRHS”) stadium and varsity baseball field as specified in this Invitation for Bids (“IFB”).

The District shall provide copies of this IFB to contractors through the Rocky Mountain E-Purchasing System electronic solicitation platform, <http://www.RockyMountainBidSystem.com> (“BidNet”), where registered contractors are required to submit their electronic bid responses.

Contractors planning to submit bids are encouraged to be represented at the pre-bid site visit on Thursday, May 19, 2022. The pre-bid site visit will begin at 5:30 p.m. MST at the front office of Fossil Ridge High School (5400 Ziegler Road, Fort Collins, 80528).

Questions regarding this IFB must be in writing and directed to the District through the BidNet platform any time after the issuance of this IFB through and including 2:00 p.m. MST on May 20, 2022. Questions received after the deadline date and time and/or not submitted electronically through the BidNet platform may not be addressed. Questions submitted, as well as the District’s response thereto, shall be provided in an addendum through BidNet.

Note: Questions must be submitted individually. Multiple questions per entry will not be answered.

The District will only accept and consider electronically submitted bids. Bids must be submitted and received in BidNet’s electronic solicitation portal by 2:00 p.m. MST on May 27, 2022. At that time, the submission portal will close, and no further submittals will be allowed.

District staff shall review the bids received in response to this IFB during the bid consideration period commencing on May 27, 2022. During the bid consideration period, the District may ask questions of and/or request additional information from contractors who have submitted bids.

During the solicitation process and until an award has been announced, communication regarding this IFB will only be permitted with the Procurement Agent named below. Communication with a district employee other than the Procurement Agent named below may disqualify your bid from consideration.

Sales Prohibited/Conflict of Interest: No officer, employee, or member of the School Board, shall have a financial interest in the sale to the school district of any real or personal property, equipment, material, supplies or services where such officer or employee exercises directly or indirectly any decision-making authority concerning such sale or any supervisory authority over the services to be rendered. This rule also applies to subcontracts with the District.

Soliciting or accepting any gift, gratuity favor, entertainment, kickback, or any items of monetary value from any person who has or is seeking to do business with the District is prohibited.

Collusive or sham bids: Any bid deemed to be collusive, or a sham bid will be rejected and reported to authorities as such. Your authorized signature on the bid assures that such bid is genuine and is not a collusive or sham bid.

The District reserves the right to reject any and all bids and to waive any irregularities or informalities.

Sincerely,
Karen Wailly
Senior Procurement Agent

1.0 BACKGROUND

The District is a high-performing district, covering more than 1,800 square miles in northern Colorado with diverse school settings. The District's instructional program is centered around District Ends, under the Policy Governance model, developed to support a comprehensive curriculum.

While more than 70% of District families choose to send their children to their neighborhood school, the District does support school choice and offers a wide spectrum of educational programs to fit any child's needs. Program options include International Baccalaureate, Core Knowledge, Bilingual/Dual Language Immersion, Hybrid/Online, Expeditionary Learning, Science, Technology, Engineering and Math (STEM) along with extra-curriculars and athletics.

The District has two LEED certified school buildings and over 30 Energy Star awards and supports operational sustainability in all areas of work.

Our Schools:

- 32 elementary schools
- 10 middle schools
- 4 comprehensive high schools
- 2 combination middle/high schools opening Fall 2022
- 6 option (100% choice) schools
- 3 alternative high schools
- 5 charter schools
- 1 online school

The District is fully accredited by the Colorado Department of Education Accreditation and Accountability Unit and is subject to periodic monitoring to ensure continued compliance with accreditation standards.

2.0 GENERAL TERMS AND CONDITIONS

- 2.1 This is a solicitation for an offer and is not an offer to contract for goods or services.
- 2.2 Prospective contractor (“Contractor”) must provide all requested information. Failure to do so may result in rejection of the bid at the option of the District.
- 2.3 Bids must meet or exceed specifications contained in this document.
- 2.4 The District is exempt from city, county, state, and federal sales/excise taxes. Tax exempt certificates will be issued upon request.
- 2.5 Submission of a bid is deemed as acceptance of all terms, conditions and specifications contained in the District's solicitation package. Any proposed modification must be accepted in writing by the District prior to award of the contract.
- 2.6 Contractor, its employees, representatives, and subcontractors agree to abide by all applicable federal, state, and local codes, laws, rules, and regulations.
- 2.7 The successful Contractor shall furnish all supplies, which conform to all applicable safety codes and regulations.
- 2.8 Information and materials submitted in response to this solicitation may be considered public records subject to disclosure under the Colorado Open Records Act ("CORA"), C.R.S. §§ 24-72-200.1 to -205.5. Information and materials that Contractor believes are confidential and not subject to disclosure under CORA must be submitted separately with a citation to the section of CORA and any other relevant law under which Contractor believes they are confidential. The District, not Contractor, shall determine whether information and materials so identified will be withheld as confidential, but will inform Contractor in advance of disclosure to give it an opportunity to take legal action to protect its interests vis-à-vis the party making the CORA request.
- 2.9 Bids shall contain a signature of an authorized representative in the space provided on the Bid Certification Form. Failure to properly sign the bid may invalidate same and it may not be considered for award.
- 2.10 The accuracy of the solicitation is the sole responsibility of the Contractor. No changes in the bid shall be allowed after the submission deadline, except when the Contractor can show clear and convincing evidence that an unintentional factual mistake was made, including the nature of the mistake.

- 2.11 For services requiring Contractor's presence on District property and the project site, the Contractor must provide proof of insurance that meets the insurance requirements stated in Section 8.0 of this document.
- 2.12 The successful Contractor is not permitted to transfer any interest in the project whether by assignment or otherwise, without prior written consent of the Strategic Sourcing Department.
- 2.13 Contractors are required to submit the name, address, phone number, email address and contact person of at least three (3) Colorado school gymnasium references for which your company has completed similar services, as those requested in this IFB, in the past 18 months.
- 2.14 Contractor must note in the solicitation response any intent to use subcontractors. The subcontractor's name, address, phone number and three client references, along with the type of work to be performed must be included. Use of subcontractors may be considered as a factor in the District's evaluation process. If the Contractor fails to notify the District of its intent to use subcontractors in the bid submittal, the bid may be considered a void offer. Subcontractors will be allowed only by written permission of the District. The Contractor agrees that it is fully responsible to the District for the acts or omissions of its subcontractors, or any persons employed by them, in the same way as it is for the acts and omissions of persons directly employed by the Contractor. Nothing contained in the contract, or any subcontract shall create any contractual relation between any subcontractor and the District.
- 2.15 The District reserves the right to reject any bid or any part thereof, to waive any formalities, and further, to award the bid to the responsible Contractor as deemed in the best interest of the District.
- 2.16 There is no expressed or implied obligation for the District to reimburse responding firms for any expenses incurred in preparing bids in response to this request.
- 2.17 Responses to this solicitation will be independently evaluated by an evaluation committee to be established for such purpose.
- 2.18 Bids submitted will be evaluated using pre-determined objective rating criteria. Those that are clearly non-responsive to the stated requirements may be eliminated prior to the evaluation. Prior to bid submission, Contractors are encouraged to check the BidNet website to ensure additional requirements are incorporated into its submissions.
 - 2.18.1 Contractor is responsible for monitoring the BidNet website for any additional requirements, addenda, and award information.

- 2.19 The District reserves the right to negotiate further with one or more Contractor or to request additional information. The District may make such inquiries and conduct such investigations as it deems necessary to determine the qualifications and ability of the Contractor to provide the services called for under the IFB and/or represented in the Contractor's response. Contractors shall timely provide information to the District in connection with such inquiries and investigations. Contractors may be asked to give presentations to the District regarding their bids.
- 2.20 Should the District determine, in its sole discretion, that only one Contractor is fully qualified or that one Contractor is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that Contractor.
- 2.21 In the event the District has reasonable grounds to believe that any individual assigned to perform work under this solicitation has a criminal record, is a registered sex offender, is under the influence of alcohol or other substance, has exhibited violence or based upon other information the District deems reliable; the District may exclude such individual from any school building or grounds or impose reasonable conditions upon such individual's presence upon any school premises. In the judgment of the District, if a contract cannot be performed because of such action, the contract may be terminated.
- 2.22 The final award and contract start date is contingent upon a successfully negotiated and fully executed contract between the District and the recommended Contractor. The District intends for the contract to continue in full force and effect through June 30, 2023, unless terminated by the District earlier as provided in Section 2.24 below.
- 2.23 Notwithstanding any other term or provision of this IFB, the District's obligations hereunder are expressly subject to its budgeting and appropriation of sufficient funds for each fiscal year (July 1 - June 30) a contract is in effect. In no event shall the District's obligations in a contract constitute a multiple-fiscal year direct or indirect debt or other financial obligation under Article X, Section 20(4)(b) of the Colorado Constitution.
- 2.24 Notwithstanding the planned term of a contract and/or any extensions thereof as provided above, the District may terminate the contract at any time in its sole discretion for any reason, with or without cause, upon written notice served on the Contractor no less than thirty (30) days prior to the date of termination. In the event of such early termination by the District, the Contractor shall be paid up to the date of termination for services performed under and in accordance with this contract.
- 2.25 Independent Contractor. The Contractor shall provide the services as an independent service contractor of the District. As such, the Contractor shall have the right to determine how and by whom the services will be provided, subject to and consistent with the terms and conditions of this solicitation.

2.25.1 The Contractor shall be exclusively responsible for: (a) all compensation, employment tax withholdings and payments, and all fringe benefits for its employees in full compliance with all applicable federal, state and local laws; (b) all insurance coverages and benefits for its employees in full compliance with all applicable federal, state and local laws, including but not limited to pension or retirement benefits, workers' compensation, unemployment compensation, and Social Security benefits; and (c) all payments to its Contractors and subcontractors for goods and/or services directly or indirectly related to this solicitation.

2.25.2 Nothing in this solicitation or as a result of this solicitation shall be construed as creating a single enterprise, partnership, joint venture or employer-employee relationship between a future Contractor and the District. The future Contractor will not be considered a partner, agent or representative of the District and will not represent itself to be a partner, agent, or representative of the District. The District is not a partner, agent or representative of any future Contractor and shall not represent itself to be a partner, agent, or representative of the Contractor.

2.26 Certification Regarding Illegal Aliens

2.26.1 The Contractor certifies, represents, warrants, and agrees that it will not knowingly employ or contract with an illegal alien to provide services under this contract and will not enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor will not knowingly employ or contract with an illegal alien to provide services under this contract. The Contractor also certifies, represents, warrants and agrees that it will confirm the employment eligibility of all its employees who are newly hired for employment to provide services under this contract through the Contractor's participation in either: (a) the E-Verify Program created under federal law and jointly administered by the Department of Homeland Security and the Social Security Administration; or (b) the Colorado Department of Labor and Employment Program ("Department Program") established pursuant to C.R.S. § 8-17.5-102(5)(c).

2.26.2 The Contractor shall not use either the E-Verify Program or the Department Program procedures to undertake pre-employment screening of job applicants while this contract is being performed. If the Contractor obtains actual knowledge that a subcontractor providing services under this contract knowingly employs or contracts with an illegal alien, the Contractor shall notify the subcontractor and the District within three (3) days that the Contractor has such actual knowledge and terminate the subcontract within three (3) days of providing the notice if the subcontractor has not stopped employing or contracting with the illegal

alien. The Contractor shall comply with any reasonable request made by the Department of Labor and Employment in the course of an investigation undertaken pursuant to the authority of C.R.S. § 8-17.5-102(5). If the Contractor participates in the Department Program, it shall: (a) notify the District and the Department of Labor and Employment of such participation as required by law; and (b) within twenty (20) days after hiring an employee to provide services under this contract, provide to the District a written notarized copy of an affirmation that it has examined the legal work status of such employee, retained file copies of the documents required by 8 U.S.C. § 1324a, and not altered or falsified the identification documents for such employee.

2.27 Qualifications of Contractor

- 2.27.1 The District may make such reasonable investigations as deemed proper and necessary to determine the ability of the Contractor to perform the work and the Contractor shall furnish to the District all such information and data as may be requested for this purpose.
- 2.27.2 The District further reserves the right to reject any bid if the evidence submitted by, or investigations of, such Contractor fails to satisfy the District that such Contractor is properly qualified to carry out the obligations of the contract and to complete the work/furnish the item(s) contemplated therein.

2.28 Miscellaneous

- 2.28.1 Once the evaluation is complete and the Intent to Award has been issued to the recommended Contractor, the recommended Contractor will work with the District's Contract Administrator to successfully negotiate a contract.
- 2.28.2 **Governing Law.** A contract resulting from this solicitation shall be governed by and construed in accordance with the laws of the State of Colorado. Venue for any and all legal action regarding or arising out of transactions covered herein shall be solely in the District Court in and for Larimer County, State of Colorado.
- 2.28.3 **Equal Opportunity.** The successful firm agrees not to refuse to hire, discharge, promote, demote, or to otherwise discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, national origin, ancestry, or physical handicap.
- 2.28.4 **Appeal of Award.** Contractor may appeal the award by submitting a written request for re-consideration to the District's Strategic Sourcing

department within seventy-two (72) hours after receipt of the notice of award.

2.28.5 In the event the awarded Contractor defaults on its contract or the contract is terminated for cause due to performance, the District reserves the right to re-procure the Services from the next lowest Contractor or from other sources during the remaining term of the terminated/defaulted contract. Under this arrangement, the District shall charge the awarded Contractor any differences between its price and the price to be paid to the next lowest Contractor, as well as any costs associated with the re-solicitation effort which resulted from such default or termination.

2.28.6 This solicitation does not commit the District to award a contract or to pay any costs incurred in the preparation of a bid or to procure a contract for the services. The District reserves the right to accept or reject any or all bids received as a result of this request or to cancel in part or in its entirety this solicitation if it is deemed to be in the best interest of the District. The District reserves the right to accept any portion of the bid, or the entire bid as deemed in the best interest of the District.

2.28.7 Variances. Contractor must indicate any variances to the specifications and terms and conditions, no matter how slight. If variations are not stated in the Contractor's response, it shall be construed that the bid fully complies with the specifications and terms and conditions. Notwithstanding the above, it is hereby agreed and understood that the District reserves the right to reject these variations if they individually or, as a whole, do not meet the standards established in the specifications.

2.28.8 Sustainability. The District is committed to be a responsible steward of our natural resources and believes that public education should provide leadership in developing an ethic of sustainability in all its practices. In the District we have both Energy Conservation and Waste Management policies and espouse these values, making environmental stewardship and integral part of the physical plant operation.

2.29 Warranties

2.29.1 Notwithstanding prior acceptance of Services by the District, the Contractor shall expressly warrant all delivered Services provided, as properly functioning at the start of operations and compliant with the terms of the contract and industry standards thereafter. The warranty period will begin at the time the Services have been formally accepted in writing by the District.

2.29.2 During the warranty period, the Contractor shall be responsible and bear all costs to correct any problems, defects and/or deficiencies reported which do not meet the specifications set forth in the contract.

- 2.29.3 The Contractor will correct all defects and/or deficiencies associated with the contract and replace incorrect or defective Services within five (5) business days of written notification from the District to the Contractor. If, within five (5) business days after written notice by the District to the Contractor, the Contractor has not corrected all defects and/or deficiencies, the District may correct all defects and/or deficiencies at the Contractor's expense.
- 2.29.4 Contractor warrants that all Services furnished under the contract shall be merchantable and shall be safe and appropriate for the purpose for which Services of like kind are normally used. If Contractor knows or has reason to know the particular purpose for which the District intends to use the Service, Contractor warrants that such Services shall be fit for that particular purpose. Contractor agrees to promptly replace or correct all defects and/or deficiencies in any Service not conforming to the foregoing warranties, without expense to the District, provided the District elects to allow Contractor the opportunity to do so.
- 2.29.5 Defects and/or deficiencies properly noted in writing to the Contractor before expiration of the warranty period will be fully covered regardless of such expiration.
- 2.29.6 In the case of emergency, repairs and/or replacement may be made without notice being given to the Contractor if determined by the District that delay would cause certain loss or damage. The Contractor shall pay the cost of these emergency repairs and/or replacements. Contractor shall, upon District request, provide proof as to the kind and quality of materials and equipment. Contracted work shall, likewise, be free of defects and in conformance with industry standards. Contractor also warrants that its workers will be sufficiently skilled to produce high quality work, free of faults and defects. Work not conforming to these requirements, including unauthorized substitutions, may be considered defective. Contractor further warrants that the construction processes and methods employed to perform the work shall be suitable for the results required and expected. If the Contractor proposes to use an unproved and untried method, process or product, the District must be advised of the bid in writing and give approval. The District may permit experimentation but may require special guarantees by the Contractor to cover the experimental work.
- 2.29.7 By acceptance of a contract as a result of this IFB, in addition to the guarantees and warranties provided by law, Contractor expressly guarantees and warrants as follows:
- a. That the articles to be delivered hereunder will be manufactured, sold and/or installed in compliance with the provisions of all applicable Federal, State and Local laws and regulations.

- b. That nothing contained herein shall exclude or affect the operation of any implied warranties otherwise arising in favor of the District.

2.30 The use of manufacturer name, brand, make or catalog designation in specifying an item does not restrict Contractor to the manufacturer, brand, make or catalog designation identification. It is the intention of the District only to establish a grade or quality and/or performance equivalence of the item desired and is not intended to rule out other brands or makes of equality. Where a product description is a manufacturer's name, the Contractor may submit a proposed equivalent product by other manufacturers for review. The item on which bids are submitted must be of such character, quality and/or performance equivalence that it will serve as that specified. In submitting bids on an item other than as specified, Contractor shall furnish complete data and identification with respect to the alternate item they propose to furnish. Consideration will be given to bids submitted on alternate items to the extent that such action is deemed to serve the best interests of the District. The burden of proof as to the comparative quality and suitability of alternative products shall be on the Contractor. If the Contractor does not indicate that the item it proposes to furnish is other than specified, it will be construed to mean that the Contractor shall furnish the exact item described. The District shall be the sole judge as to the comparative quality and suitability of alternative products and its decision shall be final.

3.0 SPECIFIC CONDITIONS

- 3.1 Health Standards. The Service Provider shall have and maintain a set of protocols and guidelines to meet evolving health and safety requirements and implement communicable diseases protocols, which shall follow guidance and orders from state and/or local public health officials and shall be no less strict than the District's protocols.
 - 3.1.1 Service Provider shall ensure all individuals providing Services under this agreement for the Service Provider wear appropriate personal protective equipment at all times while on District property.
 - 3.1.2 If the District is directed, or the District determines to limit or restrict access to any or all of its facilities or District Location due to a public health or safety concern, the District may, at its discretion, temporarily delay or stop Service Provider's services, with or without prior notice.
- 3.2 The successful Contractor will be required to enter into and sign a formal agreement with the District. The agreement language will control over any language contained within this IFB that conflicts with the signed and fully executed agreement.

- 3.2.1 In the case of conflicts between the IFB and any referenced bid documents, the more stringent requirements shall govern. In all cases, the Contractor is responsible for notifying the District of the conflict.
- 3.3 The District is committed to be a responsible steward of its natural resources and believes that public education should provide leadership in developing an ethic of sustainability in all its practices. In the District we have both Energy Conservation and Waste Management policies and espouse these values, making environmental stewardship an integral part of the physical plant operation.
- 3.4 During the performance of this agreement, the Contractor agrees to provide a “drug-free workplace.” For the purposes of this section, a “drug-free workplace” means a site for the performance of work done in connection with a specific agreement awarded to the Contractor. The Contractor’s employees are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession, or use of any controlled substance during the performance of this agreement.
- 3.5 If the Contractor experiences a back order of items from its Supplier or Distributor, the Contractor shall ensure that such back orders are filled within a reasonable period. The Contractor shall not invoice PSD for back ordered items until items are delivered and accepted by PSD authorized representative. PSD shall determine what constitutes a reasonable period and may verbally cancel back orders, seek the items from another Contractor, and charge the Contractor for any re-procurement costs.
- 3.6 Work schedule shall be coordinated between the Contractor and District Project Manager.
- 3.6.1 All work will be performed in accordance with accepted standards for work of a similar nature.
- 3.6.2 Services will be provided as established by Purchase Order.
- 3.7 Inspection of the work shall not relieve the Contractor of any obligation to fulfill the agreement as prescribed. Work not meeting specifications shall be corrected, at Contractor’s expense, and unsuitable work may be rejected, notwithstanding that such work had been previously inspected by the District Project Manager.
- 3.7.1 Receipt of pertinent documentation and final inspection of finished product by the District Project Manager are required prior to release of final payment to the awarded Contractor.
- 3.8 Any measurements referenced may be approximations. Contractors are responsible for obtaining exact measurements – ‘Verify in Field’ (V.I.F).
- 3.9 Upon request, Contractor shall supply a list of employees working on these projects.

- 3.10 Proof of materials cost shall be provided upon request.
- 3.11 The District will provide access to the premises and related facilities during the project work for regular working hours or outside regular working hours and days as requested by the District.
- 3.12 The District will respond in a timely manner to requests by the Contractor in cases where there are ambiguities in the work to be performed or resources to be supplied by the District that are not available.

4.0 CONTRACTOR RESPONSIBILITIES

- 4.1 Contractor shall furnish all labor, materials, and equipment necessary for satisfactory contract performance.
- 4.2 Upon request, Contractor will provide proof that it possesses adequate and sufficient equipment and resources to perform quality service and to commence work once the agreement has been fully executed.
- 4.3 Contractor is responsible for all site cleanup, to include trash removal. The buildings and property of the District shall be left in an acceptable as found condition. At completion, the Contractor shall thoroughly clean up all areas where work has been involved as mutually agreed upon with the District Project Manager.
 - 4.3.1 Contractor shall not use District sanitary facilities, trash receptacles, roll offs, supplies, tools, or equipment. The Contractor shall haul away all debris and trash to an off-site location.
- 4.4 The Contractor is responsible for disposing environmentally hazardous waste materials in a manner that is consistent with regulations stipulated by the United States Environmental Protection Agency (EPA) as well as with any state or locally prescribed procedures.
- 4.5 Contractor is solely responsible for the safety of its work, materials, equipment, tools, etc. on the site and shall, if deemed necessary or expedient, employ, at its own expense, the services of a competent watchman. The District disclaims all responsibility for the safety of the work, materials, equipment tools, etc. or for any damage, which may be done to same due to theft, or any other cause until such time as the District formally accepts the completed work.
- 4.6 Contractor is responsible for providing a clean and safe environment surrounding the work area at all times, including, if necessary, fencing of equipment, storage, and work area.
- 4.7 Contractor agrees that it is fully responsible to the District for the acts or omissions of its subcontractors or of persons employed by them, in the same way as it is for the

acts and omissions of persons directly employed by the Contractor. Nothing contained in the agreement, or any subcontract shall create any contractual relation between any subcontractor and the District.

- 4.8 Project estimates, schedules, work activity, other trades not included in the agreement, inspections, and payment requests must be approved by the District Project Manager.
- 4.9 Upon issuance of a purchase order, the Contractor shall adhere to the specified start and completion timeline stated on the purchase order and/or executed agreement. Failure to complete the projects within the stated dates could result in termination of the agreement by the District.
- 4.10 Contractor shall visit the project sites prior to commencement of work to verify working area project scope and safety issues.
- 4.11 Contractor shall furnish all required personal safety equipment.
- 4.12 Contractor shall promptly repair, replace, or otherwise correct any of its workmanship and any parts, materials, components, equipment, or other items in the work which contain faults or defects, whether such failures are observed by the District or Contractor before or after completion. The Contractor shall bear all costs of correcting such work covered by the warranties.
- 4.13 Contractor, at its own expense, shall repair or replace any damages to any equipment, facilities or other personal or real property owned or leased by the District which is damaged as a result of any such fault or defect, at no cost to the District.
- 4.14 Contractor is responsible for providing and using protective floor decking while operating lift equipment.
- 4.15 Contractor is responsible for monitoring the BidNet website for any additional requirements, addenda, and award information.

5.0 PROJECT SCOPE AND SPECIFICATIONS

- 5.1 Sound system specifications are identified in Exhibit A.
- 5.2 Equipment specifications are identified in Exhibit B.
- 5.3 The successful Contractor shall provide training to District personnel.
- 5.4 The project start date is July 8, 2022. Project completion date is August 12, 2022.

6.0 EVALUATION AND AWARD OF AGREEMENT

6.1 Award shall be made to the most responsive and responsible Contractor meeting the specifications and deemed to be in the best interest of the District. Final evaluation may be based on, but not limited to price, delivery time, adherence to specifications, and previous experience with similar projects.

6.1.1 Those bids that are clearly non-responsive to the stated requirements may be eliminated prior to evaluation.

6.1.2 Amendments or clarifications to the submitted bids not requested by the District will not be accepted, nor considered in awarding the agreement.

7.0 PERFORMANCE BOND

7.1 Colorado State Statutes require a Performance Bond on public projects more than \$50,000.00. Contractor is required to post bond, executed by a surety company authorized to do business in the State of Colorado, upon notification of award. Performance Bond will each be equal to 100% of agreement price and must remain in effect until completion of agreement.

7.2 The Performance Bond shall be written on AIA A312 Performance Bond Form, as issued by The American Institute of Architects. Date of bond shall coincide with the date of the agreement between the District and Contractor. Substitute form may not be used.

8.0 INSURANCE

Contractor shall procure and maintain the required insurance specified below for the duration of this Agreement, which insurance shall be written for not less than the amounts specified or greater if required by law. The District's receipt of a Certificate of Insurance from the Contractor with limits and or coverages that do not meet the requirements does not waive the requirements and the Contractor shall still be responsible for the limits and coverages stated in this Agreement. Specified coverages and amounts may be provided by a combination of a primary policy plus an umbrella or following form excess policy. All insurance shall be with a carrier licensed in the state of Colorado and shall have a minimum A.M. Best rating of A-VII. Contractor shall furnish the District's Director of Records and Risk Management with certificates of the required insurance prior to the District's approval and signing of this Agreement, and with renewal certificates prior to the expiration of any required insurance that expires during the term of this Agreement. Memorandums of Insurance will not be accepted. Certificates of Insurance and all communication regarding insurance shall be sent to:

Poudre School District
Attention: Risk Management
2407 Laporte Ave
Ft. Collins, CO 80521

Please Email Certificate to: COI@psdschools.org

Any insurance and/or self-insurance carried by the District is excess of the coverage extended to the District by Contractor. Contractor shall provide at least thirty (30) days' advance written notice to the District prior to cancellation, change of coverage, or non-renewal. The insurance requirements specified in this section shall not reduce the indemnification liability that Contractor has assumed in section 8.1.

Commercial General Liability

Minimum Limits

- Each Occurrence Limit \$2,000,000
- General Aggregate \$3,000,000
- Products/Completed Operations Aggregate \$2,000,000
- Personal/Advertising Injury \$2,000,000
- Fire Damage (Any One Fire) \$50,000
- Medical Payments (Any One Person) \$5,000
- The policy shall provide for Bodily Injury and Property Damage, Premises and Operations, Products/Completed Operations, Personal/Advertising Injury, and liability assumed under an Insured Contract (including defense costs).
- Coverage must be written on an “occurrence” basis.
- Poudre School District R-1 and its elected officials, employees, agents, and volunteers shall be named as an additional insured or covered as an additional insured by way of a blanket endorsement and shall be insured to the full limits of liability purchased by the Provider even if those limits of liability are in excess of those required by this Agreement.
- The policy shall cover the Contractor’s completed operations and that coverage shall be kept in place for up to the statute of repose.

Professional Liability

Minimum Limits

- Each Occurrence or Wrongful Act Limit \$1,000,000
- Annual Aggregate Limit \$3,000,000
- In the event that the Professional Liability insurance required by this Agreement is written on a claims-made basis Provider warrants that any retroactive date under the policy shall precede the effective date of this Agreement and that either continuous coverage will be maintained, or an extended discovery period will be exercised for a period of three (3) years beginning at the time work under this Agreement is completed.
- Provider must provide evidence of the extended reporting period coverage at the end of the project and before all final payments to the Provider is made.

The policy shall include a waiver of subrogation in favor of Poudre School District R-1.

Crime Coverage (for Agreements allowing privileged access to network systems, valuable property, or sensitive data)

Minimum Limits

Per Loss \$1,000,000

The policy shall include:

- Coverage for all directors, officers, agents, and employees of the Supplier.
- Employee dishonesty, forgery and alteration, monies and securities, and computer (cyber) crime.
- Extended theft and mysterious disappearance.
- The policy shall not contain a condition requiring an arrest and conviction.
- Policy must be endorsed to cover Third Party Fidelity and include Poudre School District R-1 as a Loss Payee.

Contractor's Pollution Liability, Including Errors, and Omissions (If work involves potential pollution risk or losses caused by pollution conditions, including asbestos).

For losses caused by pollution conditions including coverage for bodily injury, property damage, (including natural resource damage), cleanup costs, removal, storage, disposal, and or use of the pollutant; and defense costs, including costs and expenses incurred in the investigation, defense, or settlement of claims. Coverage shall apply to the sudden and gradual pollution conditions resulting from the escape or release of smoke, vapors, fumes, acids alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants (including asbestos). and cleanup costs that arise from the operations of the Contractor as described in the Scope of Services section of this Agreement.

Minimum Limits

- Per Loss \$5,000,000
- Products/Completed Operations Aggregate \$5,000,000
- The policy shall provide for protection against claims for third-party bodily injury, property damage, or environmental damage caused by pollution conditions resulting from the Contractor’s contracting activities for which the Contractor is legally liable.
- The policy shall provide for cleanup costs when mandated by governmental entities, when required by law, or as a result of third-party claims.
- The policy shall be endorsed to include the following additional insured language: “Poudre School District R-1, its elected officials, employees, agents, and volunteers shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor” and shall be insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this agreement. Copy of policy endorsement must be attached to the Certificate of Insurance.
- Contractor warrants that any retroactive date under the policy shall precede the effective date of this Agreement; and that either continuous coverage will be maintained, or an extended discovery period will be exercised for a period of three (3) years beginning at the time work under this Agreement is completed.

Commercial Automobile Liability Providing Coverage for Owned, Non-Owned, and Leased or Hired Vehicles

- Bodily Injury & Property Damage Combined Single Limit Minimum \$1,000,000

- If Contractor operates vehicles in performing any services under this agreement, the policy shall be endorsed to include the following additional insured language: “Poudre School District R-1, its elected officials, employees, agents, and volunteers shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor” and shall be insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this agreement. Copy of policy endorsement must be attached to the Certificate of Insurance.

Workers’ Compensation and Employers’ Liability

If Contractor is exempt under the Colorado Workers’ Compensation Act, this requirement will be waived if proof a current Workers’ Compensation Coverage Rejection is on file with the Colorado Department of Labor and Employment, Division of Worker’s Compensation and a copy is submitted to the District.

Minimum Limits

- State of Colorado Statutory
- Employer’s Liability \$100,000 Each Accident
\$500,000 Disease – Policy Limit
\$100,000 Disease – Each Employee
- Waiver of subrogation in favor of Poudre School District R-1.

8.1 Indemnification. Contractor shall indemnify and hold harmless the District and the District’s Board members, employees, representatives, and agents from and against any and all liability arising from any suit, action, grievance, charge or proceeding brought in connection with or related to Contractor’s operations, provision of Services and/or conduct of any of its employees, volunteers, agents, or representatives. The indemnification and hold harmless obligation hereunder shall include all attorney fees, costs and expenses incurred by the District and/or the District’s Board members, employees, representatives and/or agents in defense of said suits, actions, grievances, charges and/or proceedings. Nothing in this section or otherwise in this Agreement shall be construed in any way or applied in any manner as a compromise or waiver of the District’s rights and protections under the Colorado Constitution or the Colorado Governmental Immunity Act.

9.0 REFERENCES

References are required. List three (3) references for which your company has completed similar services for projects of similar scope. Colorado K-12 public school references are preferred.

9.1 Company Name _____
Address _____
Contact Person _____
Telephone _____
Email _____
Describe type of work/service performed or items supplied _____

9.2 Company Name _____
Address _____
Contact Person _____
Telephone _____
Email _____
Describe type of work/service performed or items supplied _____

9.3 Company Name _____
Address _____
Contact Person _____
Telephone _____
Email _____
Describe type of work/service performed or items supplied _____

10.0 BID PRICING

FRHS Stadium \$ _____

FRHS Varsity Baseball Field \$ _____

GRAND TOTAL \$ _____

- 10.1 Elaborate on your company’s experience with sound system design and installation.
- 10.2 Provide information regarding your company’s resources to complete the Project(s) within the specified timeframe.
- 10.3 Provide product information for all proposed equipment separated by area.
- 10.4 Provide warranty information for all proposed equipment.
- 10.5 Provide the lead time on proposed equipment.
- 10.6 Describe your training process.
- 10.7 **Confirmation of Addenda receipt.** It is the responsibility of the Contractor to confirm all project Addenda have been received.

The modifications to the bid documents noted in the Addenda issued by the District have been considered and costs are incorporated in the pricing above.

Q&A/Addendum # ____ Dated _____ Signature _____

Q&A/Addendum # ____ Dated _____ Signature _____

10.8 Schedule Confirmation

The undersigned Contractor understands the project start date to be July 8, 2022 and agrees to achieve completion of the project by August 12, 2022.

Company Name _____

11.0 BID CERTIFICATION FORM

Bids must be submitted and received in BidNet’s electronic solicitation portal on or before 2:00 p.m. MST on May 27, 2022.

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the company issuing this bid and that all information provided in the bid is true and accurate.
- He/she has read the conditions and technical specifications, which were made available to the company in conjunction with this solicitation, and fully understands and accepts these terms unless specific variations have been expressly listed in the bid.
- The company will adhere to all terms and conditions and provide, at a minimum, all services as expressed in the solicitation and/or the company’s bid responding to the solicitation.
- The company meets or exceeds all the required criteria as specified by this solicitation, or if not, has submitted a Justification for Consideration addressing any failure to meet the criteria.
- The company’s bid is being offered independently of any other Contractor and in full compliance with the terms specified in sections 2.0 and 3.0 of the solicitation.
- The company will accept any awards made to it, contingent on agreement negotiation, as a result of this solicitation for a minimum of ninety (90) calendar days following the date and time of the solicitation opening.

Company Name _____

Mailing address _____

Signature of Agent _____

Printed Name _____

Title _____

E-mail address _____

Phone number _____

Contact Person _____

(If different from Agent – include e-mail address and phone number)

NOTE: Bids submitted without the signature of an authorized agent of the company may be considered non-responsive and ineligible for award.

EXHIBIT A: SOUND SYSTEM SPECIFICATIONS

SECTION 27 41 16

AUDIO VIDEO SYSTEMS AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Contract Documents
1. The General and Special Conditions are hereby made a part of this Section. Where requirements of this Section are at odds with requirements stated in any Special or Supplementary Conditions, the more stringent requirements shall apply.
 2. The Contract Documents are complementary and are intended to include or imply all items required for the proper execution and completion of the work. Any item or work required by the Specification or other portion of the Contract Documents, but not shown on the drawings, or shown on the drawings but not described in the Specification, shall be provided and installed by the Contractor as if shown or mentioned in both.
 3. The Consultant may furnish additional instruction or clarification necessary for the proper execution of the work. Instructions or clarifications shall be consistent with the Contract Documents or agreed upon modifications thereof, and inferable therefrom. In giving instruction or clarification, only the Contracting Officer shall have the authority to make minor changes in the work that will not entail an increase in the Contract price or time.
 4. Copies of drawings and specifications regardless of how furnished are the property of the Owner, and are not to be used on any other work or project. No contract documents may be released for publication or to any other party without the written consent of the Owner and Consultant.
- B. Scope of Work
1. Work under this Contract includes the following spaces/systems:
 - a. Classroom AV Systems – ~~rough in only~~ [PR-09R1]
 - b. Conference Rooms
 - c. Huddle Spaces and Other Collaboration Areas
 - d. High School Competition Gym
 - e. Auxiliary Gym
 - f. Wrestling and Weight Rooms
 - g. Proscenium Theater
 - h. TV Studio
 - i. Commons Spaces
 - j. Athletic Fields [ASI-002]
 2. Refer to "Appendix A: AV Systems Functional Description" for a complete and detailed description of the A/V Systems and associated functional requirements.
 3. Work under this Contract includes all labor, materials, tools and equipment, transportation services, supervision, coordination, etc., necessary to complete the installation of high quality A/V Systems and Control Systems, in excellent working order, as described in these specifications and the associated drawings and in accordance with good engineering practice, and to maintain the systems throughout the Warranty period.
 4. The systems defined herein shall be called "A/V Systems" and shall include, but are not limited to, the following major items:
 - a. Audio mixers, equalizers, amplifiers, program sources, digital recording devices, microphones and other signal processing equipment;
 - b. Loudspeakers and loudspeaker mounting, aiming, rigging, and support hardware;
 - c. Video switching, video over IP transmitters/receivers, video display equipment, video conferencing systems, cameras, and other video playback devices.
 - d. Audio Video and Control Network equipment;
 - e. Control equipment;
 - f. Equipment racks, cabinetry, and furniture;
 - g. System accessories;

2. In the event that a Consultant is not a participant in this project after award of contract, all references to "Consultant" in this document shall be replaced with "Owner."

F. Questions

1. Submit questions about the Drawings and Specification to the Consultant in writing.

G. Related Requirements

1. Section 27 41 60 – Audio DSP Configuration
2. Section 27 41 70 – Audio Video Control System Programming

1.2 REFERENCES

A. Definitions

1. A/V System: A set of specified individual components (audio, video, control, and networking equipment as well as associated hardware and wiring) designed and configured to operate and one comprehensive system for the conveyance of audio/video content to an audience. A/V Systems may include, but are not limited to, the following major items:
 - a. Audio mixers, equalizers, amplifiers, program sources, digital recording devices, microphones and other signal processing equipment;
 - b. Loudspeakers and loudspeaker mounting, aiming, rigging, and support hardware;
 - c. Video switching, video over IP transmitters/receivers, video display equipment, video conferencing systems, cameras, and other video playback devices.
 - d. Network equipment;
 - e. Control equipment;
 - f. Equipment racks, cabinetry, and furniture;
 - g. System accessories;
 - h. Cable, connectors, adapters, plates, panels, transformers, and other interface devices.
2. Owner: The designated responsible party with authority to make final decisions on contract and technical issues, and provide final acceptance of the A/V Systems. May also include designated representatives and/or subordinates as part of a larger "Owner Team" such as End-users, Facility Managers, A/V Technology Managers, Building Committees, Purchasing Agents and/or Contract Representatives.
 - a. Poudre School District
3. Architect: The "Architect" referred to in this specification is the entity who has been hired to design and specify the physical environment the AV systems is to be installed within (e.g., the building, facility, room, and/or space). The architect is generally responsible for hiring and managing the various entities that constitute the design team (architects, engineers, consultants, etc.).
 - a. RB+B
4. Consultant: The "Consultant" referred to in this specification is the entity who has been hired to design and specify the AV System as well as work with other design team members and well as contractors/trades to ensure proper collaboration
 - a. K2, LLC
5. Contractor: The "Contractor" referred to in this specification is the A/V Systems Contractor selected by the Owner, through competitive bidding or negotiation, to provide the A/V systems described by this specification, and to whom a contract has been awarded to do so.
6. Masculine Pronoun: In all cases where a masculine pronoun is used within these specifications, the pronoun is used in the interest of simplicity of syntax, and the reference shall be interpreted as genderless.

B. Reference Standards

1. The workmanship and installation of the audio video systems and equipment shall adhere to industry best practices, AVIXA standards, and all national and local codes.
2. The following documents, or the versions closest in time prior to the release of this specification, shall form a part of this specification to the extent specified herein. Where the requirements of these documents conflict with the instructions herein, the requirements of this specification shall govern.
 - a. National Fire Protection Association (N.F.P.A.) National Electrical Code (NEC).

- b. Electronics Industry Association/Telecommunications Industry Association (EIA)/TIA) Standards.
 - c. International Telecommunications Union (ITU) Standards.
 - d. Society of Motion Picture and Television Engineers (SMPTE) Standards.
 - e. Audio Engineering Society (AES) Standards.
 - f. American National Standards Institute (ANSI)
 - g. Building Seismic Safety Council (B.S.S.C.)
- C. Other Reference Standards
- 1. Shields and Grounds: Safety, Power Mains, Studio, Cable and Equipment, (special excerpt) The June 1995 issue of the Journal of the Audio Engineering Society.
 - 2. Grounding and Shielding Techniques in Instrumentation, by Ralph Morrison, published by John Wiley and Sons, Inc.; 3rd edition (March, 1986) ISBN: 0471838055
 - 3. Sound Reinforcement Handbook, by Gary Davis and Ralph Jones, published by Hal Leonard Publishing Corporation; 2nd edition (March 1, 1990) ISBN: 0881889008
 - 4. DOJ 28 CFR Part 36, Appendix A to Part 36 - Standards for Accessible Design: Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 - 5. A Clean Audio Installation Guide, Allen H Burdick, Benchmark Media Systems, Inc., (800) 262-4675, (available on the World Wide Web at <http://www.benchmarkmedia.com/>);
 - 6. Audio System Design and Installation, Phillip Giddings, Butterworth-Heinemann; Reissue edition (July, 1990) ISBN: 0672226723
 - 7. Sound System Engineering (2nd Edition), Don & Carolyn Davis, Focal Press; 2 edition (May 19, 1997) ISBN: 0240803051

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination
- 1. Coordinate work with Owner personnel involved in this project, Consultant, representatives and employees/subcontractors employed of/by Owner, including electricians and the scheduled work of other trades.
 - 2. Cooperate with all trades present on the project, so that lost time, work stoppages, interference, and work inefficiencies do not occur.
 - 3. Assure labor "harmony" among personnel and subcontractors, and with other trades associated with construction, delivery, installation, and testing of the facility.
 - 4. Failures in coordination shall not be a reason for additional payment to correct omissions or errors.
 - 5. Coordinate the electrical and conduit requirements of this contract, and verify that all power, conduit, non-specialty boxes required for this contract is in the General/Electrical Contractor's scope of work. If there is a discrepancy between this contract and the Electrician's scope of work, notify the Owner and the Consultant, and request clarification or modification of the Contracts to achieve coordination.
 - a. Any discrepancy does not relieve the A/V System Contractor from responsibility for a complete working system, and coordination with the electricians and representatives of the Owner in the course of his or her installation is required to achieve a correct conduit system.
 - b. It is the Contractor's responsibility to verify that all conduits, junction boxes, raceways, and back boxes will be of the proper size and type to meet the project requirements.
- B. Pre-installation Meetings
- 1. Meet with the Owner on the site and reach a written understanding regarding project conditions outside the A/V Systems Contractor's scope of work which will impact the timely completion of this contract.
 - 2. Items that must be coordinated include a schedule of access to equipment room and other areas where access will be required; security of the equipment room; secure storage for equipment and tools on site; cleanliness of the equipment room including both trash and dust; HVAC for the equipment room; technical power in the equipment room and other required locations; conduit and junction box completion; any wire pulling needed for this contract but not provided by the A/V Systems Contractor; any and all job site conditions that

- may impact the timely completion of this contract or its conclusion in excellent condition; and any and all other work that must be provided by others that is required for the timely completion of this contract or its conclusion in excellent condition.
3. Develop an agreed timeline for all the above items, showing the last acceptable completion date for each item, and signed by the Owner and the representative of the A/V Systems Contractor.
 4. The Electrical Contractor for this project (if required) will be the in-house electricians or other subcontractor designated by the Owner or the Owner's Representative. The Contractor shall meet with the Owner's designated electrician and present them with a copy of the signed and approved timeline. Discuss the electrical issues on the timeline and make sure the time requirements are understood by the General Contractor, Electrical Contractor, and Owner.
 5. Meet with any other contractor whose work will impact the performance of this contract, and coordinate as outlined above.
- C. Sequencing
1. As required, sequence work with the Owner and all trades present on the project.
 2. Notify the Owner and/or Owner's Representative immediately of any issues of sequencing so that lost time, work stoppages, interference, and work inefficiencies do not occur.
- D. Scheduling
1. Coordinate and schedule all on-site activities with the Owner.
 2. A/V System Contractor shall work and complete all on-site tasks in accordance with the access to the site provided by the Owner.

1.4 SUBMITTALS

- A. General
1. Submit A/V System product information, shop drawings, and samples to the Consultant for review. Begin submittals not later than ten (10) days after the date of Contract execution; failure to comply with this requirement shall be cause for cancellation of the contract, on the basis the selected Contractor does not have the ability or intention to comply with the specifications or schedule. Submit product data binders and submittal drawing information in not more than three submittals. If any submittal drawings are rejected, correct and resubmit within five (5) working days.
 2. Obtain approval prior to ordering material or fabrication. Ordering, receipt, or assembly of any equipment before approval is done entirely at the risk of the Contractor, and any rework required is not a valid cause for delay to the project or additional cost to the Owner.
- B. Product Data
1. Product data submittals to be submitted for review according to general project requirements. The Contractor shall utilize the project information management system (PIM). If hard copies are required, see specific submittal requirements below. The Contractor shall verify the project requirements before providing product data submittals for review.
 2. Provide product data submittal as a single submittal for review.
 - a. Provide product data submittal for Consultant review organized with logical and consistent formatting such as font choice, font size, margins, page headers and footers showing project, spec section, date, page numbering, etc.
 - b. Provide title sheet with Project Name, Owner, Specification Section, Date of Submittal, AV Contractor contact information, and any other pertinent project information.
 - c. Provide a table of contents (TOC) outlining major sections as noted below. Include operable bookmarks and page numbers for major sections.
 - d. Provide clear section labels and page breaks for each major section such that it is clear when one section ends and another starts.
 - e. Organize product data submittal into the following six (6) major sections.
 - f. Section I
 - 1) Provide a complete bill of materials (BOM) in spreadsheet format of all major and minor products, hardware, and materials to be provided. Logically group

- according to specification format—as provided in appendix/appendices. Include any additional or ancillary items not shown in specification required for a complete and working system.
- 2) See “Appendix Z: FORMATTING REQUIREMENTS FOR SUBMITTALS” for layout and formatting requirements.
- g. Section II
- 1) Provide the manufacturer's product data sheet or specification sheet for all equipment and materials contained in this specification.
 - 2) Organize and present the manufacturers' product data sheets as provided in Section One BOM order. Full line catalogs, short form catalogs, user manuals, web prints, product pictures with little or no technical data, and unreadable photocopies are not acceptable.
 - 3) Remove extraneous and/or blank pages with no useful information.
 - 4) Remove any repeated information in non-English languages.
 - 5) If no specification sheet is available, excerpts from larger manufacturer information documents are acceptable. Adhere to the guidelines outlined above. Keep information provided relevant to pertinent technical data only and as brief as possible.
- h. Section III
- 1) Provide in spreadsheet format proposed project install cables and associated connectors. Provide the make, model, and the specific use conditions applicable to each cable type and associated connector. Provide ONLY the cables and connectors to be used for the project. “Typical” or “Standard” cable types and connectors shall be rejected and required for resubmission.
 - 2) See “Appendix Z: FORMATTING REQUIREMENTS FOR SUBMITTALS” for layout and formatting requirements.
 - 3) Provide the manufacturer's product literature for all cables and connectors.
 - 4) Organize and present the manufacturers' product data sheets as provided in Section Three project cable types and connectors spreadsheet order. Full line catalogs, short form catalogs, user manuals, web prints, product pictures with little or no technical data, and unreadable photocopies are not acceptable.
 - 5) Remove extraneous and/or blank pages with no useful information.
 - 6) Remove any repeated information in non-English languages.
 - 7) If no specification sheet is available, excerpts from larger manufacturer information documents are acceptable. Adhere to the guidelines outlined above. Keep information provided relevant to pertinent technical data only and as brief as possible.
 - 8) Specifically note any proposed substitutions. NOTE: Submittal of proposed substitution does not guarantee acceptance by Consultant. All substitutions are subject to approval. Ordering, receipt, or installation of any cabling prior to approval is done entirely at the risk of the Contractor. Any rework, removable, and or re-installation required is not a valid cause for delay to the project or additional cost to the Owner.
- i. Section IV
- 1) Provide the manufacturer's product literature for any products which are proposed substitutes to the equipment contained in this specification. Full line catalogs, short form catalogs, user manuals, product pictures with little or no technical data, and unreadable photocopies are not acceptable. *NOTE: Submittal of proposed substitution does not guarantee acceptance by Consultant. All substitutions are subject to approval and ordering, receipt, or installation of any equipment prior to approval is done entirely at the risk of the Contractor. Any rework, removable, and or re-installation required is not a valid cause for delay to the project or additional cost to the Owner.*
 - 2) Remove extraneous and/or blank pages with no useful information.
 - 3) Remove any repeated information in non-English languages.

- 4) If no specification sheet is available, excerpts from larger manufacturer documents are acceptable. Adhere to guidelines outlined above and keep information provided relevant to pertinent technical data only and as brief as possible.
- j. Section V
 - 1) Provide a list showing coordination of selected frequencies for all wireless microphone systems. When multiple frequency block is available from a manufacturer, note the manufacturer's recommended block selection based on RF frequency coordination with TV channels and/or other local interference.
- k. Section VI
 - 1) Provide a schedule of finishes indicating proposed materials and color selections for all custom or exposed items subject to Owner's selection and approval not explicitly noted in the BOM.
- 3. Electronic Submittal Requirements
 - a. Submit one (1) portable document format (.PDF) file organized as outlined above.
 - b. Provide operable bookmarks for major sections outlined above.
- 4. Hard Copy Submittal Requirements (**only if required**)
 - a. Submit three (3) copies organized as outlined above.
 - b. Utilize three-ring binders not exceeding 3" spine size, with clear vinyl pockets on cover and spine.
 - c. Provide title sheets for cover and spine identifying the project and the system, room, or area covered by the submittal.
 - d. Print title sheets in ink (pen plotter, inkjet or laser printer) on heavy paper sized to fill the entire pocket.
 - e. Provide tabbed dividers for major sections outlined above.
- C. Shop Drawings
 - 1. Shop drawings to be submitted for review according to general project requirements: project information management system (PIM) or hardcopy. AV Contractor to verify project requirements before providing shop drawings submittals for review.
 - 2. Minimum drawing sheet size: 24" x 36" (Arch D).
 - 3. Execute drawings at an appropriate scale, but not smaller than 1/8" = 1'-0", utilizing architectural scale factors exclusively.
 - 4. Title, number, and note the scale on each drawing.
 - 5. Submit one (1) electronic reproducible set (portable document format .PDF) and three (3) paper sets of drawings (**only paper sets IF REQUIRED**).
 - 6. Submittal drawings shall contain sufficient information to describe the work to be performed, or the item to be manufactured, and to thoroughly and completely guide installers, technicians, and manufacturers in the assembly of the system element.
 - 7. Drawings shall include but not necessarily be limited to the following:
 - a. Cover Sheet
 - 1) Provide a cover sheet that includes general project information, drawing release, date, project engineer (and/or draftsman), sheet index, and AV Contractor contact information.
 - b. Legend and General Notes
 - 1) Provide a legend and general notes clearly showing symbols and other abbreviations used. Include details clearly showing and dimensioning cable preparation details for each cable and connector utilized in the system.
 - 2) Provide a complete labeling approach, including the proposed lettering/numbering scheme and data format that cable log will be supplied in. Include representative equipment labeling sizes, styles, and numbering.
 - a) Follow AVIXA F501.01:2015 Cable Labeling for Audiovisual Systems standard.
 - 3) Provide a schedule (table) clearly showing the installed cable types and connectors to be used for the project. Provide information related to the

make, model, plenum/non-plenum, and field conditions under each cable is to be specifically used.

- a) Show ONLY the cables and connectors to be actually supplied and utilized on the project. Tables that are the "Typical" or "Standard" cable and connector types by the AV Contractor shall be rejected and shall be required for resubmission.
 - c. Floor Plans and Reflected Ceiling Plans
 - 1) Provide architecturally scaled floor plans and reflected ceiling plans that show the location of all AV equipment, racks, consoles, millwork, etc. Include device names and pertinent installation details.
 - d. Sections and Elevations
 - 1) Provide architecturally scaled sections and elevations that show the location of all AV equipment, racks, consoles, millwork, etc. Include device names and pertinent installation details.
 - 2) Include detailed drawings of loudspeaker installation, showing the location, orientation, and support and aiming system for each case. Verify load ratings of all hanging components including attachment hardware.
 - 3) Include detailed drawings of video equipment installation (e.g., projection screens, video projector mounting, LCD television mounting, etc.), showing the location, orientation, and support system for each case. Verify load ratings of all hanging/installation components including attachment hardware.
 - e. Wiring diagrams
 - 1) Provide complete, detailed wiring diagrams for all systems, based on the contract drawings, but with the addition of:
 - a) Cable types, identification, and color codes
 - b) Cable numbers (as detailed above).
 - c) Details of connections, both at equipment and between equipment racks and furniture and wiring in the building
 - d) Application of connector models and types
 - e) Comply with AES, ANSI, IEC, and ISO recommendations and standards.
 - f) Schematic drawings of any custom circuitry or equipment modifications, including connector pinouts and component part lists.
 - f. Patch Panels and Custom Plates and Panels
 - 1) Provide shop drawings of actual machine shop drawings since plates and panels are to be fabricated exactly as shown on the submittal drawings. If discrepancies are discovered by the Contractor due to errors or modification of a manufactured product, these must be called to the attention of the Consultant and propose their resolution on the Submittal Drawings.
 - 2) Engraving details and requirements for patch panel and rack labels.
 - 3) Finishes/Colors
 - g. Rack Elevations
 - 1) Provide vertical elevation drawings for all equipment racks regardless of size showing all major equipment, shelves, drawers, vents, and other rack mount hardware.
 - 2) Provide dimensions, wire routing, cabling, and support details, AC power outlet and ground buss locations, location of transformers, relays, accessories, etc.
 - h. Consoles, Enclosures, Tables, and Supports
 - 1) Provide detailed construction drawings of cabinetwork and metalwork, including materials, finishes, adhesives, and fasteners.
8. References may be made in specification paragraphs to a requirement for submittal drawings for that particular item. Such references do not define the only items requiring submittal drawings.

9. Do not consider the Consultant's review of submittals to be exhaustive or complete in every detail. Approval of shop drawings and submittals indicates only the acceptance of the manufacturer, model, materials, general design or method of construction, and quality.
 10. Requirements, arrangements, quantities, and installation must comply with the contract documents unless specifically approved to the contrary. Submittal approval does not relieve the Contractor of responsibility for errors in dimensions, details, sizes, fit, etc., or for coordinating items with actual building conditions and dimensions.
 11. Submittals which, in the Consultant's opinion, are incomplete, deviate significantly from the requirements of the Contract Documents, or contain numerous errors, will be rejected and returned without review for rework and resubmittal.
- D. Samples
1. Provide product samples as required herein or as requested by Consultant, Architect, or Owner.
 2. Submit electronic copies of any custom programming including source code. Include printed copies of all control screens, wiring pages, etc.
- E. Delegated Design Submittals
1. Include delegated design submittals for any systems or sub-systems that are not specifically designed by the A/V contractor but are required for review and approval. For example, this might include:
 - a. Manufacturer designs for induction loop hearing assist systems
 - b. Loudspeaker System or Room EASE (or other acoustic) models
 - c. Structural engineering designs for loudspeaker hanging hardware
- F. Test and Evaluation Reports
1. Shop Testing
 - a. A/V equipment racks shall be populated, wired, and tested to the fullest extent possible in the Contractor's shop prior to shipping to the job site.
 - b. When applicable, measure, and record the DC resistance between the racks ground bus bar and the chassis of all rack-mounted components. Also measure and record the DC resistance between the rack ground bus bar and the signal common for all components.
 2. Field Testing
 - a. Before delivery of equipment to the job site, submit any test reports for all measurements specified under Shop Testing above.
 - b. Before delivery to the job site, submit photographs depicting the quality of wiring and grounding within equipment racks.
 - c. Immediately after installation, submit photographs showing cable entries and terminations within equipment racks, enclosures and pedestals at the job site.
 - d. All loudspeakers and loudspeaker assemblies shall be tested by the Contractor in the Contractor's shop before delivery to the site.
 - e. Make all equipment including loudspeakers available for testing by the Consultant on the site before installation
- G. Questions
1. Submit questions about the Drawings and Specification to the Consultant in writing.
- 1.5 CLOSEOUT SUBMITTALS**
- A. Maintenance Contracts
1. Provide in writing any maintenance contracts included in the project.
- B. Operation and Maintenance Data
1. Prepare Operation and Maintenance manuals as outlined below. Directly submit one (1) PDF copy of each manual to the Consultant for review at least ten days prior to acceptance testing. After review, make corrections and additions required by the Consultant. After approval, deliver two (2) approved printed copies of the System Reference Manual to the Owner unless otherwise directed by the General Project Requirements or the Owner or the Owner's Representative.

- a. Assume the intended reader of the manual to be technically inexperienced and unfamiliar with the facility.
 - b. Utilize three-ring binders not exceeding 3" spine size, with full-size clear vinyl pockets on front cover and spine.
 - c. Provide title sheets for both cover and spine identifying the project and the system, room, or area covered by that manual; title sheets shall be printed in ink on heavy paper and fill the entire cover or spine pocket.
 - d. Divide the manual into two or more binders
 - 1) Part I shall consist of the Systems Reference Manual
 - 2) Part II shall consist of the Maintenance Manual(s)
 - 3) Part III shall consist of the Warranty Reference
 - 4) The first section of each binder shall be a Table of Contents
 - 5) Provide tabular dividers on heavy paper with permanent laser printed legends for the sections identified below.
 - 6) Correct and update the System Reference and Maintenance Manuals, if necessary, according to the Consultant's instructions after acceptance testing.
 - 7) Provide DVD or CD-ROM (unless otherwise requested by the Owner) copies of any training sessions for later review by the operators and maintenance staff
2. System Reference Manual (Part I)
- a. System Description
 - 1) Provide a typed description of each system including key features and operational concepts (e.g., remote control features, switching or routing functions, patch points, mixing and linking capabilities).
 - b. System Operation and Instructions
 - 1) Provide a "quick set-up" instructions (per space or system) oriented at inexperienced users under time pressure.
 - 2) Provide a "typical procedures" instructions (per space or system) for the operation of the equipment.
 - 3) Provide a "complete procedures" for the operation of the equipment as a system, organized by subsystem or activity.
 - c. Equipment Settings
 - 1) Provide a list of the settings of all semi-fixed controls, as finalized after Acceptance Testing. When these settings are in a software format, include software files with settings saved on them. Indicate the name of the product that the file is associated with and all file names on a label physically attached to all software provided.
 - d. As-Built Drawings
 - 1) Include corrected (as-built) wiring diagrams of each major subsystem, including plans showing locations and circuit numbers for all system outlets and receptacles, mounting and other pertinent details of the system installation, based on the contract drawings, at a reduced scale easy to handle but fully legible. Normal maximum drawing size: 24" x 36". Provide one additional full size bound set separately, as well as one electronic set in portable document format (.PDF) format for Owner and Consultant
 - 2) Provide an additional set of reduced-size drawings placed in a pocket folder attached to the equipment rack for convenient future reference.
 - e. Manufacturers' Operation Manuals
 - 1) Provide manufacturer's instruction manuals for all items of equipment, incorporating manufacturer's warranty statements. Provide printed original manuals, not photocopies, unless more copies of a manual are required than the number of units in the total system. For custom circuits or modifications, provide a thorough description of the purpose, function, specifications, and operation.
 - f. Other Data

- 1) Provide any other pertinent data generated during the project or required for future service.
3. Maintenance Manual (Part II)
 - a. Contractor's Warranty
 - 1) Include a clear statement of the terms and period of the Contractor's warranty; Contractor's service department phone and facsimile number(s) and hours; maintenance schedule; description of products recommended or provided for maintenance purposes; and instructions for the proper use of maintenance products.
 - b. Equipment List
 - 1) Provide a comprehensive list of all equipment by subsystem, tabulating the manufacturer, model, serial number, physical location, and wiring diagram drawing number and code.
 - c. Manufacturers' service manuals
 - 1) Provide manufacturers' service manuals for all major equipment items. For custom circuits or modifications, provide a thorough description of the purpose, function, specifications, and operation.
 - d. Performance Test Reports
 - 1) Include a copy system startup test report generated meeting the requirements outlined in Section 3 of this Specification, and test results generated during Commissioning of the system.
 - e. Maintenance Schedule
 - 1) Provide a recommended preventative maintenance schedule with reference to the applicable pages in the manufacturer's maintenance manuals. Where inadequate information is provided by the manufacturer, provide the information necessary for proper maintenance.
4. Warranty Documentation (Part III)
 - a. Contractor's Warranty
 - 1) Include a clear statement of the terms and period of the Contractor's warranty; Contractor's service department phone and facsimile number(s) and hours; maintenance schedule; description of products recommended or provided for maintenance purposes; and instructions for the proper use of maintenance products.
 - b. Manufacturers' Warranty
 - 1) Provide a list of the various manufacturer's warranties for all the major equipment.
- C. Record Documentation
 1. Keep a complete set of documents - contract and approved submittal - on the job, note any changes made during installation.
 2. Provide a corrected set of as-built shop drawings in PDF format showing the work as installed, with input and output levels noted, for review and inclusion in the Closeout Submittals.
- D. Software
 1. Provide a properly licensed working copy of the latest version of any and all contractor-provided software required to operate or configure the systems specified herein shall be a part of the system supplied. This includes, but is not limited to, all software, firmware and hardware required for configuration, adjustment, diagnosis and repair.
 2. Software shall be fully documented, and that documentation shall be included.
 3. The Owner shall retain ownership of all software. This includes both out of the box software and custom scripting and control software as well as the associated source code.
 4. Software shall be included in its "installable" state on industry standard CD-ROM, USB flash drive, or another appropriate format. Back-up of the working software may be provided as an additional inclusion. Disk images are unacceptable.
- E. Logins and Passwords

1. Provide any logins and password required for the operation, maintenance, or modification of the AV Systems. This includes, but is not limited to, both hardware as well as software.
 - a. Audio DSP
 - b. Control Systems
 - c. Network Switches and Wireless Access Points
 - d. Configuration and Maintenance Computers
 - e. Touch Panel PIN numbers.
 - f. Any other password protected equipment.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts

1. The specification may list extra quantities over and above those needed for the installation. Such extra quantities are intended as Owner's on-site spares and are to be turned over to the owner during the training session. Spares may include fuses, lamps, power supplies, hard drives (pre-loaded with all software), rack screws, connectors, phoenix connectors, etc.

B. Keys

1. Submit in triplicate all keys required for access to, and operation of, the systems.

C. Tools

1. The specification may list tools that are to be provided and turned over to the owner during the training session. Tools may include crimpers (both ratchets and dies), adjustment tools, extraction tools, etc.
 - a. Provide manufacturer's storage case if applicable.

1.7 QUALITY ASSURANCE

A. Qualifications

1. The A/V system described in the Specification is a complex system requiring the services of a trained and experienced specialty contractor with the resources to carry out the project in a timely and professional manner.
2. A/V Contractor shall be a member of the AVIXA AV Provider of Excellence Program (APEX) or equivalent AV industry quality program.
3. A/V Integrator's project team members shall be recognized by the AVIXA certification process, and the team shall possess certifications by percentage of team members.
 - a. Engineers required CTS-D 30% or a minimum of one (1), CTS 70%
 - b. Supervisors required CTS-I 30% or a minimum of one (1), CTS 70%
 - c. Technicians and other installers CTS-I 10% or a minimum of one (1), CTS 40%, AVIXA Recognized AV Technologist 50%.
 - d. No technical staff may be without at least the AVIXA Recognized AV technologist certificate or equivalent independent qualification
4. Unless specifically pre-qualified for the project (see Part 3.1), the A/V Contractor shall demonstrate previous experience in the engineering and installation of A/V systems for similar projects and provide the following information with their proposal.
 - a. AV project team resumes.
 - b. AV project team industry qualifications and certificates.
 - c. AV project team organizational chart
 - d. Corporate AV industry membership certificates.
 - e. Five (5) project references with telephone and e-mail contact information for past completed projects of a similar nature. This shall include both examples of previous work through photographs and example submittals.
 - f. Sample shop drawings—schematic and layout
 - g. Sample photographs from past projects including front and rear rack assemblies.
 - h. Details of the A/V Contractor's workshop(s).
 - i. List of the A/V Contractor's workshop tools and test equipment.

B. Continuity of Supervision

1. The Contractor shall maintain the same individual in charge of work for the full duration of the project unless illness, loss of personnel, or other circumstances beyond the control of the Contractor intervene.
- C. Certifications
1. As required, all certifications shall be current, and the organization or individual(s) shall be in good standing with the certifying entity.
- D. Regulatory Requirements.
1. Obtain all permits necessary for the execution of any work pertaining to the installation or operation of any system equipment by the Owner. Comply with applicable federal, state, and local labor and union regulations.
 2. Execute all work in accordance with the National Electrical Code, the National Electrical Safety Code, the Life Safety Code, and all applicable federal, state, and local codes, laws, ordinances, regulations, and requirements including, but not limited to, those of OSHA, EEOC, ATBCB, ADA, ANSI, UL, and the FCC. If a conflict exists between the contract documents and any code or regulation and is reported to the Consultant sufficiently before bid opening, the Consultant will prepare the clarification required. Where a conflict is reported after the contract is awarded, propose a resolution of the conflict and, upon approval of the change, install the work
- E. Construction Observation
1. The failure of the Consultant or another representative of The Architect or Owner to condemn any defective work or material shall not release the Contractor from the obligation to at once tear out, remove, and replace the same at any time prior to final acceptance upon discovery of said defective work or material.
- F. Safety
1. Site Safety and Personal Protection Equipment
 - a. Contractor shall adhere to all site safety requirements as directed by the Owner, Owner's Representative, Building or Site Supervisor including, but not limited to general project safety training and/or site-specific training for possible contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards.
 - b. Contractor shall adhere to all PPE (personal protective equipment) requirements.
 - c. These requirements shall include, but not be limited to, any personnel assigned to the project that may perform work onsite including project engineers, project managers, installers, programmers, and/or other technicians.
 - d. Contractor shall keep all safety certifications in full force until all work is completed and accepted by the Owner.
 2. Seismic Safety
 - a. Observe mechanical and electrical support means of all installed equipment as required for the seismic hazard zone for this installation. Refer to Federal Emergency Management Agency (FEMA) Document 303: Recommended Provisions for Seismic Regulations for New Buildings and Other Structures. Also refer to any applicable local building codes.
 - b. All equipment racks are to be anchored with suitable anchors to meet safety standards.
 - c. Appropriate safety attachments as required for overhead mounting of devices.
 - d. Shock and/or vibration isolation of equipment or fixtures as required.
 3. Fiber Optic Cable Safety
 - a. The following warnings shall be posted on the job site: WARNING: PERMANENT EYE DAMAGE CAN RESULT FROM LOOKING DIRECTLY INTO A LIGHT BEAM GENERATED BY AN LED OR LASER SOURCE OR INTO THE END OF A CABLE FIBER CONNECTED TO ONE OR THESE SOURCES. CAUTION: LIGHT GENERATED BY THESE SOURCES MAY NOT BE VISIBLE, YET REMAIN HAZARDOUS TO THE EYE. LOOK FOR WARNING LABELS ON SOURCE DEVICES.
 - b. Observe all warning signs on equipment and all written safety precautions in the instruction manual or equipment technical manual.

- c. Always handle cable carefully to avoid personal injury. Care should be taken with individual fibers to prevent injury to the eyes or penetration of the fibers into the skin.
- 4. Asbestos Prohibition
 - a. No Asbestos containing materials shall be used under this section. The contractor shall ensure that all materials incorporated in the project are Asbestos free unless specifically authorized in writing by the Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements
 - 1. Coordinate with Owner's Representative for any equipment and materials to be delivered on site.
 - 2. All equipment shall be assembled in the Contractor's shop into equipment racks, furniture, or other assemblies, and fully wired and tested before delivery to the site.
 - 3. Do not ship, or cause to be shipped to the site, any material without first ensuring secure dust-free storage facilities are available, and HVAC system is operating.
- B. Storage and Handling Requirements
 - 1. Coordinate with Owner's Representative for any equipment and materials to be stored on site.
 - 2. Store and protect products and material in accordance with common sense and the manufacturer's recommendations, regardless of location.
 - 3. As needed, provide for a secure storage location for any products and materials stored on site.
- C. Waste Management
 - 1. Coordinate with the Owner, Owner's Representative, and/or Building Superintendent for the disposal of packaging as well as other debris and waste materials caused by the installation from the site to an approved common trash point or receptacle.
 - 2. Participate in any project construction and demolition waste management plans (CHPS).
 - 3. In lieu of any specific project construction and demolition waste management plans, the Contractor is encouraged to develop and maintain an AV waste management plan that diverts equipment packaging and construction waste away from landfills and towards recycling facilities (plastic, cardboard, paper, wood, steel, etc.). The intent shall be to reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.
 - 4. Keep work area neat and orderly and free from accumulation of waste materials.

1.9 FIELD CONDITIONS

- A. Ambient Conditions
 - 1. All locations where any portion of the equipment specified in this Section is installed must be temperature and humidity controlled, clean, and dust free.
 - 2. Conditions suitable for office work and equipment shall be acceptable.
 - 3. Do not power up equipment unless you have a source of clean technical power, and the HVAC system is operating correctly.
 - 4. Verify all conditions on the job site applicable to this work. Notify Owner and Consultant in writing of conflicts, discrepancies, or omissions promptly upon discovery.
 - 5. Specific items will dissipate heat and must be provided with additional airflow and cooling. Make sure adequate HVAC is supplied to equipment spaces to remove the heat generated on a year-round basis.
 - 6. The drawings diagrammatically show conduit, wiring, and arrangements of equipment fitting the space available without interference. If conditions exist at the job site which make it impossible or disadvantageous to install the work as shown, recommend solutions and/or submit drawings for approval showing how the work may be installed.
- B. Existing Conditions
 - 1. The system is designed to operate correctly given the current/designed physical and acoustic environment of the project site.

1.10 INSURANCE

- A. Insure materials against theft, vandalism, damage due to the elements, fire, etc., to their full value. Materials and the flawless condition of materials shall remain the responsibility of the A/V System Contractor until acceptance of the system by the Owner.
- B. Provide policies of insurance from reputable companies, in amounts sufficient to protect the Owner from any and all claims, actions, demands, losses, costs, judgments, or damages. The Contractor shall be required to adhere to the General Terms and Conditions and hold the project minimums as set forth by the contract documents. If not specifically called out, the following shall be the minimum amounts required:
 - 1. Workman's Compensation and Liability for all personnel as required by law.
 - 2. Motor Vehicle Liability, including coverage for owned, non-owned, and hired vehicles, with combined single limits of \$1,000,000 per occurrence.
 - 3. Commercial General Liability, including coverage for premises/operations and personal injury, with limits of \$1,000,000 per occurrence.
- C. Furnish certificate evidence of the insurance, and copies of policies, to the Owner prior to execution of a Contract.
- D. Keep insurance in full force until all work is completed and accepted by the Owner. Insurance shall be modified or canceled only on written notice to the Owner, given thirty (30) days in advance, with replacement policies going immediately into effect.

1.11 WARRANTY AND BOND

- A. Contractor's Warranty
 - 1. Labor and materials provided under this contract shall be warranted for one (1) year following the date of final acceptance to be free of defects and deficiencies, and to conform to the drawings and specifications as to kind, quality, function, and characteristics. Certain individual pieces of equipment may be covered for a longer period as provided in a specific manufacturer's warranty. Rectify defects occurring in labor or materials within the Warranty period by replacement or repair without charge. Projection lamps are excluded from this Warranty unless damage or failure is the result of defective material or workmanship covered by Warranty, or work performed under warranty.
 - 2. Within the warranty period, respond to service calls within twenty-four hours, and correct the problem within forty-eight hours if at all possible.
- B. Manufacturers' Warranty
 - 1. Register warranty in the Owner's name for any product with a manufacturer's warranty stipulated in the Contract Documents.
- C. Extended Correction Period
 - 1. Three months after final acceptance, the Owner reserves the right to direct additional minor changes to the control system software. Such changes shall be made without additional cost to the Owner.
- D. Bond Requirements
 - 1. TBD

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. New Products
 - 1. All flat-panel displays
- B. Existing Products
 - 1. N/A

2.2 EQUIPMENT

- A. Description
 - 1. See "APPENDIX A: A/V SYSTEMS FUNCTIONAL DESCRIPTION"
- B. Equipment
 - 1. See "APPENDIX B: A/V SYSTEMS EQUIPMENT LIST"
- C. Substitute Equipment

1. Materials and products specified herein establish the overall performance level as well as provide the physical appearance, component part quality, construction quality, and background of proven reliability desired by the Owner and therefore define the "minimum standards of quality" required for this project. Substitutions will generally not be considered unless the materials or products have been discontinued.
2. If equipment or material other than that specified is proposed, furnish the Consultant a written request including a detailed specification sheet and any samples or information required for evaluation. Samples of specified equipment may be required as well as the proposed substitute to facilitate comparison.
3. If required as a condition of accepting the proposed substitute, the Contractor shall Warranty the quality of the substitute item. Contractor shall recognize function, performance, appearance, size, utility of service, and accessory requirements are based upon the model or product cited in the specifications, and that if a substitute product varies in any respect and is approved, any additional cost incurred by such approval shall be borne by the Contractor;
4. Approval of a substitute, if and when given, does not relieve the Contractor, material/product supplier, or manufacturer of any responsibility whatsoever; but rather, they jointly assume the responsibility the material/product installed will meet the functions, intent, and performance required by the contract drawings and specifications;
5. Delay in the delivery of any substitute product or material shall not be cause for change to the construction schedule or completion date.
6. The drawings and specifications are based on specific equipment, processes, and arrangements. At no additional cost to the Owner, furnish accessories, parts, and equipment, and perform all work necessary, for the proper functioning and fit of any approved substitute item to the purpose, arrangement, and intent originally indicated.

2.3 ACCESSORIES

- A. Equipment lists may exclude minor components in the interest of conciseness and clarity. Where these components are integral to a functionally and aesthetically complete system, the Contractor shall without additional compensation provide them as outlined herein. This shall include manufacture's rack mount kits, power supplies, rack blank/vent panels, power distribution, cable management, etc.

PART 3 - EXECUTION

3.1 INSTALLERS

- A. General
 1. All installation work shall be performed by experienced AV Contractors skilled and practiced in the proper techniques required for the activity involved.
- B. Installer List
 1. The following is a list of Contractors pre-approved to provide and install the systems listed herein:
 - a. Keystone Digital
215 Jefferson St.
Ft. Collins, CO 80521
Tel. (303) 437-9080
 - b. Ford AV
4230 Carson St.
Denver, CO 80239
Tel. (720) 374-2345
 - c. AVI-SPL
7367 S. Revere Parkway, Unit 2B
Centennial, CO 80112
Tel. (303) 792-3090
- C. Substitution Limitations

1. Other Installers shall be considered acceptable provided they can demonstrate the qualifications outlined above. Refer to Part 1, Article "1.7 Quality Assurance", Paragraph "A. Qualifications."
2. Submittal of qualifications shall not mean acceptance or approval to bid on the systems defined herein.

3.2 EXAMINATION

- A. Verification of Conditions
 1. Verify all conditions on the job site applicable to this work. Notify Owner and Consultant in writing of conflicts, discrepancies, or omissions promptly upon discovery.
 2. All locations where any portion of the equipment specified in this Section is installed must be temperature and humidity controlled, clean, and dust free.
 3. If conditions exist at the job site which make it impossible or disadvantageous to install the work as shown, recommend solutions and/or submit drawings for approval showing how the work may be installed.
- B. Pre-installation Testing
 1. Install equipment into racks and furniture consoles and fully wire and test before delivery to the job site. If it is impractical to ship certain items installed in a console or rack, assemble, wire, and test in shop; then remove, ship separately, and reinstall at site.
 2. Permanently mount all equipment; no equipment shall be installed loose or secured or suspended only by signal or power cables.
 3. Panels or equipment mounted on rear rack rails shall not block clear access to the rear of any front mounted components or their wiring.
 4. Mount racks on rubber isolation mat (Mason Industries Super W Pad or equal) when installing on steel or concrete floors, unless the rack is to be equipped with wheels (casters).

3.3 PREPARATION

- A. Protection of In-Place Conditions
 1. The contractor shall make reasonable accommodation to protect the surrounding areas and surfaces during the installation of the A/V Systems.
 2. If the integrity of the surrounding areas and/or surfaces is in jeopardy, the A/V contractor shall notify the Owner or the Owner's Representative, Building or Site Supervisor immediately and coordinate an appropriate action plan to protect the surrounding areas from damage.
- B. Demolition/Removal
 1. Coordinate with the Owner or the Owner's Representative any requirements for the demolition/removal of existing A/V systems or equipment.
 2. Coordinate the storage of any identified equipment to be removed and reused for the project.

3.4 INSTALLATION

- A. General
 1. Execute all work in accordance with the NEC, NESC, and with all local and state codes, ordinances, and regulations.
 2. Coordinate work with all other trades to avoid causing delays in construction schedule. Expedite the delivery of equipment and materials and provide additional labor if required to meet the construction schedule.
 3. Mount all equipment to be installed over public areas in a manner adequate to support the equipment loads with a minimum 10:1 safety factor or as specified by the Owner, using methods approved by the Owner. Awarded contractor to comply with all safety requirements. Requirements to be supplied to AV Contractor upon award.
 4. Colors and finishes of all exposed and custom fabricated items and labels to blend in with the surroundings as approved by the Owner in the submittal process.
 5. Install equipment in accordance with manufacturers' recommendations. Ensure that levels and impedances are properly matched between components. Verify that projector distances and lenses are appropriate for the corresponding screen sizes.
- B. Mechanical

1. All equipment and enclosures shall be aligned, matched, true, plumb and square. All equipment, except portable equipment, shall be permanently attached and held firmly in place. Supports shall be designed to support loads with a safety factor of at least three, without sag or deflection.
2. Permanently mount all equipment; no equipment shall be installed loose or secured or suspended only by signal or power cables.
3. Panels or equipment mounted on rear rack rails shall not block clear access to the rear of any front mounted components or their wiring.
4. Mount racks on rubber isolation mat (Mason Industries Super W Pad or equal) when installing on steel or concrete floors, unless the rack is to be equipped with wheels (casters).
5. Provide ventilation adequate to keep the temperature within the rack(s) below 85 degrees F. Provide an approved low noise ventilation fan in each rack only if the temperature in the rack rises above 85 degrees when powered continuously for five hours.
6. Cover edges of cable pass-through holes in chassis, racks, boxes, etc., with rubber grommets or Brady GRNY nylon grommetting.

C. Wiring

1. Coordinate the final connection of power and ground wiring to junction box(es). Power and ground wiring shall be hardwired directly to power contactors and ground busses to ensure uninterrupted operation.
2. Execute wiring in strict adherence to the highest standards of acknowledged industry and professional practice.
3. Take whatever precautions are necessary to prevent and guard against electromagnetic and electrostatic hum. For permanently installed line level audio circuits, ground cable shields at the output of the source device and float at the input of the destination device. If RF interference is encountered, place an RC network between the floated shield and the input ground.
4. All wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and terminated by approved soldered or mechanical means. No bare wire ends are acceptable. Cables with wire shields, braid or wound, must use all the wire conductors for shield termination, and not just a drain wire or some of the shield strands. Connections not following this requirement will be rejected. Foil shielded cables only provided with a drain wire must use the drain wire for shield termination. Fold shields or drain wires not connected back over the cable jacket and cover with heat shrinkable tubing; do not cut off unused shields or drain wires. Dress the shield or drain wires with Teflon tubing, and install heat shrinkable tubing over the junction of the fanout and outer jacket.
5. Exercise care in wiring; damage to cables or equipment will not be accepted. Isolate cables of different signal types or levels, and separate, organize, and route cabling to prevent crosstalk or feedback oscillation in any amplifier section. In all cases, separate wiring for microphone signals, audio line level signals, loudspeakers, video, control, RF, and power into groups.
6. Rack Wiring. Contractor shall follow AVIXA F502.01:2018 "Rack Building for Audiovisual Systems" standard. Adhere to all cable management and signal separation recommendations/best practices. Run wiring vertically inside adequately sized plastic raceways, or employ an equivalent bundling and support system, to maintain a clear and organized appearance. Support all horizontal wiring using horizontal support bars as needed. Route AC cords directly to the side of the rack, under or over the equipment chassis, and then back to the power outlets, tying the excess cord only at the side of the rack. Organize cabling so that signal and AC cords are in the least possible proximity.
7. All wiring and connections shall be completely visible and labeled in the rack.
8. No splices shall exist in any length of cable run unless specifically shown on the contract drawings at a designated junction enclosure. All cables shall originate and terminate at active or passive devices. Where several devices are in close proximity, utilize approved housing-to-housing connectors and adapters; all such adapters shall be rotational.
9. Do not wire any cables with a polarity reversal between connectors, end for end, unless required by the manufacturer for operation. Connect all loudspeakers electrically in phase and of consistent polarity, using the same wire color code for loudspeaker wiring throughout

the project. Note that different manufacturers employ differing color coding conventions for driver terminals. Wire all drivers - cone, compression, ribbon, or any other type - so that a positive voltage at the power amplifier "+" terminal causes a positive acoustic pressure out of the driver/enclosure system.

10. For cables terminating at an interface or connection plate mounted on or in an enclosure, dress cables so as to allow removal of the plate from the enclosure and sufficient cable length for service or re-termination. In these circumstances, the plate shall set on the floor or freely swing clear.
11. Install cables without sharp bends or distortion. Where limited clearance prevents the manufacturer's recommended minimum bend radius from being observed, such as in junction boxes, provide a right angle or similar connector.
12. All expansion loops must be neat, and roughly the same size to provide for ease of servicing in the future.
13. In pulling cable, do not bend to less than the manufacturer's recommended radius. Employ temporary guides, sheaves, rollers, or other tools to prevent excessive tension or abrasion to the cable(s). Pull cable with tensions, tools, and lubricants recommended by the manufacturer.
14. Prepare television system semi-rigid cable in accordance with manufacturer's recommendations, with approved coring, cleaning, preparation and assembly tools. Do not score center conductor; utilize tubing cutters to trim the outer conductor. Completely deburr all conductors. Utilize approved center conductor cleaning tool; degrease the connector and cable prior to termination. Torque connectors to the manufacturer's recommended values.
15. All coaxial or triaxial video or RF connections to plates or panels in boxes, pedestals, racks or any similar location with limited clearance that would prevent that the associated cable manufacturer's minimum bend radius from being strictly observed shall be provided with the appropriate right angle or similar adapter as appropriate.
16. All cable installed under this specification which is to be terminated by others for "future" or Owner Furnished Equipment (OFE) in racks, shall be provided with ten (10) feet of slack when dressing to the location of future or OFE equipment. All cable installed under this specification which is to be terminated by others shall be provided with twenty (20) feet of slack when ending in a rack enclosure. All cable provided under this specifications, to be terminated by others, shall be provided with fifty (50) feet of slack when terminating in an equipment room without a clear point of demarcation, or in a group of racks where the destination is not known.
17. Fiber Optic Cables
 - a. Consult Sumitomo document #SP-F01-001, Issue 4 for installation guidelines.
 - b. All fiber splicing shall utilize the fusion splice method. The maximum allowable loss per fusion splice shall be 0.2 dB average.
 - c. The bend radius shall be no less than manufacturer's specifications.
 - d. The total degrees of turn shall be no more than the manufacturer's specifications.
 - e. The pull force shall be no more than the manufacturer's specifications.
 - f. When each cable reel arrives from the manufacturer, it shall have a Factory Lot test report attached to it. Factory Lot test reports, for example, Belden Wire & Cable Company Fiber Tracking System, shall be copied to the owner and their representatives upon acceptance of the cable on the site.
 - g. The use of the cable shall be tracked from the reel to each pull. Paperwork, in chart form, shall include the Reel Number, Code ID, and each conduit designator and description that includes cable from the specific reel.
 - h. Splices, terminations, and any patching shall take place after the location has been declared "Dust Free" or "Clean." Special care shall be taken to ensure the integrity of the fiber and connection(s) when these conditions cannot be met. Fiber found to be broken in the length of the run after the pull shall be deemed to be damaged during the installation process and replaced at the expense of the installer.
18. Network Wiring:

- a. Unless specifically called out for a connection, all data cabling is to be Unshielded Twisted Pair (UTP). The minimum acceptable performance rating for UTP and all associated connectors is Category 6 (CAT 6). All completed Links including all components making up a complete interconnection link between two Ethernet components shall be tested after installation and certified to meet or exceed CAT 6 Gigabit Ethernet performance requirements.
 - 1) Full test results for every complete Link, Permanent Link, and Patchcord must be made available in printed form as part of the Record Documentation before Acceptance Testing.
- b. No UTP cable may exceed 90 meters in length. All permanently installed UTP must be 4-pair solid wire and terminated according to the connector manufacturer's instructions in outlets certified as meeting CAT 6 or better specifications.
- c. In no circumstances may solid wire UTP be terminated in RJ-45 plugs not certified by the manufacturer specifically for solid wire.
- d. All UTP patch cords must be factory made and certified by their manufacturer as meeting at least CAT 6 performance. These patch cords must be made with 4 pair stranded wire. Unless otherwise noted, all patch cords must be provided with strain relief boots.
- e. All UTP wiring shall follow the EIA/TIA 568B color code.
- f. Under no circumstances may more than 1/2" of the pairs in a UTP be untwisted as terminated in a connector, nor may more than 1/2" of a pair be exposed past the end of the jacket of the UTP.
- g. Interconnections between Ethernet switches may require that the patch cord at one end be a crossover cable. If the switches in question require a crossover cable for proper operation, supply the appropriately wired cable at one end. All crossover cables must be prominently marked indicating they are not normal straight-through cables.
- h. All UTP cabling must be installed following industry standard minimum spacing requirements for specific electromagnetic interference sources as outlined in the NEC/NFPA 70 Article 800-52.
- i. Ordinary plastic cable ties are not permitted on all UTP cabling. Plastic cable ties or anything else that can pinch the jacket of the UTP must be avoided. Use Velcro strap type ties as required.
- j. UTP cables must never be combed out so neatly that they run parallel to each other. Such a practice can cause "alien crosstalk" between the cables that run next to each other. Instead let the UTP cables run with a loose and random lay.
- k. UTP cables must never be bundled snugly together.
- l. UTP cables installed in Conduit or other wire ways must never exceed 40% fill.
- m. UTP cables must never have more than 25 lbs. (or the manufacturer's maximum recommended pull force if lower) of force applied while pulling into conduit or at any other time during installation.
- n. UTP cables must never be bent sharper than a 1" radius (2" diameter) bend even if straightened out afterward.

D. Connections

1. Microphone, Audio line, video, time code, MIDI, RF, and digital signal or control wiring shall be continuous and unbroken from connector plate/chassis to chassis/patch panel, unless a terminal, connector, or other splice is explicitly shown on the contract drawings.
2. Make all joints and connections with rosin core solder or with mechanical connectors approved by the Consultant.
3. Make all solder connections with rosin core solder; employ temperature controlled soldering irons of wattage appropriate to the specific work involved. Soldering guns or unregulated irons are unacceptable.
4. Where spade lugs are used, crimp properly with ratchet type tool. Spade lugs shall be gold or nickel plated to match the receiving binding post or terminal.
5. Conventional non-ratcheting crimping tools are not acceptable.

6. Where terminal blocks are used, utilize Phoenix Contact MBK 2.5/E or MBK 5/E mounted on NS 35/7.5 DIN mounting rails or approved equal. All terminal blocks shall be fully exposed, labeled, and mounted on 1/2" birch veneer plywood board primed and painted two coats latex enamel or rack panels.
7. Make all connections with connectors specified herein. Employ XLR and BNC connectors wherever possible in preference to screw terminals, terminal strips, or phono connectors. All connectors employed shall be designed specifically for the cable in use.
8. Make connections to loudspeaker transformers with properly sized closed end connectors crimped with factory approved ratchet type tools, or terminal blocks.
9. All coaxial connectors shall be installed using the appropriate hexagonal die crimp tool or compression crimp tool that is correct for the combination of cable and connector. Non-ratcheting type crimping tools are not acceptable; the presence of such tools on the job site shall be interpreted as evidence of mechanical connections made incorrectly, and provide sufficient grounds for rejection of all mechanical connections in the system.
10. "Electrical" adhesive backed tape is not acceptable for any purpose whatsoever. Adhesive cable tie anchors are only acceptable when employed for routing, not support; in any case, do not fasten anchors to any equipment chassis.
11. Do not employ connector adapters. Wire nut, "Scotchlock," or "Beanie" connectors are not acceptable for any purpose.

E. Labeling

1. Provide engraved plastic Lamicoid (or similar) identification labels at the front of all equipment mounted in racks. Install labels in a neat, plumb, square, and permanent manner. Mount labels on the equipment rack, not on the equipment, or on blank rack panels if so directed. Where the rack vertical frame has a slightly recessed mid-section, match label width to the recessed section width. Similarly, provide engraved labels at the rear only of equipment mounted in furniture consoles or frames. Equipment labels should have two items of information; the first identifying the equipment type, i.e., "POWER AMPLIFIER"; and the second showing the wiring diagram code, i.e., "AMP1-01".
2. Unless otherwise noted, engraving on plates, panels, and labels shall be 1/8" high, and the typeface, sans serif. Use white letter fill on dark panels or push-buttons, and black fill on stainless steel or brushed natural aluminum plates or light-colored push-buttons. Fill safety or operational warning labels orange.
3. Embossed labels are not acceptable for any purpose.
4. Label all cables except patch cords at both ends with self-laminating labels. Handwritten labels are not acceptable. Contractor shall follow AVIXA F501.01:2015 Cable Labeling for Audiovisual Systems standard. Locate labels within 2" of the connectors, consistent with regard to orientation, dress, and distance from the connector. For connections to in-room panels or floor boxes, label on cable should match panel engraving. For connections to portable equipment, label on cable should match device engraving.
5. Label each terminal strip with a unique identification code in addition to the numerical labels for each terminal (Phoenix Contact BN series). Show terminal strip codes on the system wiring diagrams.

3.5 RE-INSTALLATION

1. The process of acceptance testing may necessitate the moving or adjustment of certain components; perform without claim for additional payment.

3.6 FIELD QUALITY CONTROL

A. Field Tests and Inspections

1. Verify the following before beginning actual tests and adjustments on the system:
 - a. All electronic devices are properly grounded.
 - b. All powered devices have AC power from the proper circuit. All dedicated AC power circuits are properly wired, phased, and grounded.
 - c. Insulation and shrink tubing are present where required.
 - d. Dust, debris, solder splatter, etc. is removed.
 - e. All cable is dressed, routed, and labeled; all connections are properly made and consistent with regard to polarity.

2. Grounding System Tests.
 - a. Measure the DC resistance between the technical ground in any equipment rack or console and the main building ground. Resistance should be 0.15 ohms or less.
 - b. Verify that the Owner where applicable has connected the technical ground to building ground at only one location with 4 AWG or larger wire.
 - c. Measure the DC resistance between the signal ground at any connector plate and the conduit system.
 - d. Identify and correct any problems if within the A/V System scope of work; notify the Owner if a problem is in a related area of work.
 3. The system shall be completely free of hum, parasitic oscillation, ground loops, RF interference, and any audible noise and distortion problems.
- B. Non-Conforming Work
1. All identified non-conforming work shall be documented and remedied at no additional cost to the owner.
 2. Any non-conforming work shall be subject to additional verification prior to acceptance.

3.7 SYSTEM START-UP

- A. Audio System Tests
1. Perform the following tests and adjustments, supplying all test equipment required. Set for slow meter damping and A or Linear weighting as required. Document all tests and complete measurement results including wire number, date, test equipment used, operator, and test results. If any problems are detected in testing, correct the problem, and retest. Make corrections necessary to bring the system(s) into compliance with the specifications.
 - a. Test all cables as installed for shorts between conductors or to building ground and opens.
 - b. Measure the loop resistance of all loudspeaker cables.
 - c. Measure and record the impedance of each loudspeaker line circuit terminating at the equipment rack, with loudspeakers connected, over the entire frequency range from 20 Hz to 20 kHz.
 - d. Adjust the gain of each active device to provide an optimum signal-to-noise ratio and 18 to 20 dB headroom. Record input and output levels at each step in the signal chain.
 - e. Measure and record overall system hum and noise level of each mic or line amplifier with controls set so that -50 dBu microphone input or +4 dBu line level input would drive the system to full amplifier output. Terminate inputs with appropriately sized shielded resistors (150 ohms typical) for this test.
 - f. Measure and record system electrical frequency response for each input channel through power amplifier output with all filters and equalization bypassed in the DSP. Deviation shall not exceed $\pm .75\text{dB}$ within the range 20 Hz to 20 kHz.
 - g. Check system to assure freedom from oscillation or stray RF pickup. Check all inputs without signal and with 500 Hz sine wave driving system to full average output. Detect unwanted signals on an oscilloscope at rack termination and over single loudspeakers connected at the farthest distance from the rack for each loudspeaker line.
 - h. Apply a sinusoidal sweep signal to each loudspeaker system, sweeping from 50 to 5000 Hz at a level 10 dB below full amplifier output, and listen for rattles or objectionable noise. Correct any rattles or noise that is discovered.
 - i. Check the polarity of all loudspeakers with an electronic polarity checker, and by applying music program or pink noise signal to the system while walking through the transition areas of coverage from one loudspeaker to the next. The transition should be smooth with no apparent shift in source from one loudspeaker to the next.
 - j. Wireless Systems
 - 1) Ensure that all wireless systems operate on different frequencies from each other and from any other transmitters in the area.
 - 2) Coordinate frequency selection for compatibility with local RF environment.
- B. Video System Tests

1. Verify performance of all video connecting cables, as specified herein. Continuity tests are not acceptable. Document all tests and complete measurement results including wire number, date, test equipment used, operator, and test results. If any problems are detected in testing, correct the problem, and retest. Replace any defective cable without claim prior to continuing tests.
2. Perform video signal parameter tests on individual items of equipment, and the work as a whole in accordance with EIA, SMPTE and AES Recommended Practices and other recognized standards as listed under REFERENCES.
 - a. Projection Systems Performance
 - 1) Verify optical performance of projection devices to ANSI Standards using standard test signals connected directly to the device under adjustment.
 - 2) Set devices level and true prior to adjustment, and mark positions for future reference.
 - 3) Complete device's optical adjustments for focus, centering, geometry and registration prior to applying any electronic corrections.
 - 4) Do not under any circumstances apply corrections at signal sources to compensate for errors in device alignment or adjustment, or timing errors in source material.
 - 5) Set brightness and contrast using reference test signals connected directly to the device. Adjust grayscale and grayscale tracking using ramp or stair step test signals. Set overall brightness and contrast with pluge and white flag signal.
 - 6) Reconnect the projection devices to the system as a whole and verify performance of completed installations. Check that registration has not been affected by timing errors occurring elsewhere on all sources. Verify that source signal levels are consistent and match the reference levels set by the standard test signals. Correct any deficiencies noted.
 - 7) Record lamp operating hours at the conclusion of adjustments.
 - b. Video System Tests
 - 1) Test and document all links for compliance with SMPTE standards.
 - 2) Verify performance of all video cables to SMPTE digital video standards using a test signal (Color Bars) connected directly to the device under adjustment.
 - a) Use professional level 0.800 volt peak-to-peak digital video test source with digital test signals. Recommended Tektronix SPG700 with OPT SDI (provides 3G/HD/SD-SDI signal outputs).
 - b) Use professional waveform monitor with physical layer test abilities. Recommended Tektronix WFM2300 with Option 3G (provides 3G HD-SDI signal inputs).
 - 3) Perform Eye-pattern Testing
 - a) Verify cable length and cable loss. Compare measured cable loss to distance and manufacturer's stated performance of the entire video link (cable and connector).
 - b) Verify signal amplitude, risetime, and overshoot.
 - c) Eye-pattern shall be open (or equalized open) and symmetrical.
 - d) Observe any overshoot and undershoots on the eye display indicating improper termination
 - 4) SMPTE Digital Video Performance Standards
 - a) Analog NTSC Video: Test all links to SMPTE 259M standard.
 - b) SD-SDI (SMPTE 259M): 30 dB loss at 1/2 the data clock frequency (135 MHz)
 - c) HD-SDI/3G HD-SDI (SMPTE 292M/SMPTE 424M): 20 dB loss at 1/2 the data clock frequency (743 MHz/1.485 GHz).
 - d)
 - c. CATV System Tests
 - 1) Check all paths and outlets for appropriate compliance with the Performance Standards. Measure levels at all feeder termination points. Compare actual

values to design calculations and investigate any difference of more than 2 dB, rectify or justify these discrepancies to the satisfaction of the Owner. Document all tests and complete measurement results including wire number, date, test equipment used, operator, and test results. If any problems are detected in testing, correct the problem, and retest.

- 2) Television Distribution System amplitude standards:
 - a) Minimum visual sync-tip level: +3 dBmV
 - b) Maximum visual sync-tip level: +10 dBmV
- 3) CATV Cable Testing: Each Trunk Cable line shall be inspected for proper termination:
 - a) Using a standard TV receiver connected to each outlet, observe picture quality. No visible components of cross modulation (windshield wiper effect), ghosting, noise, or beat interference shall appear on the screen of the receiver tuned to any normal signal.
 - b) Carrier-to-noise test shall employ an approved field strength meter. Measurements shall be made at the termination of each Trunk Cable and system extremity. With the normal levels in the system, the field strength meter shall be tuned to the picture carrier of each channel in turn, and the meter reading noted. Tune the field strength meter to an unused portion of the spectrum within the passband, read the level of remaining noise in the absence of the signal and algebraically add the meter bandwidth correction factor. Record the difference between the two readings. Provide calculations or the manufacturer's data concerning the bandwidth correction factor.
 - c) System flatness, both forward and reverse, test shall employ an approved high-level sweep transmitter receiver pair. Sweep measurements shall be taken at the termination of every branch line termination in the system. Where possible, record sweep results by photographic or computer data logging means.

C. Fiber Optic Tests

1. An OTDR shall be used to check each strand for:
 - a. Loss per Unit Length: in dB.
 - b. Splice and Connector Evaluation.
 - c. Possible Fault Location.
2. Test results from the OTDR shall be bound and copied to the owner and their representatives. A strand-per-data file index shall be included.
3. Diligence shall be employed to produce efficient testing: i.e., connectors shall be checked with a microscope to determine whether a bad test run is a bad connector, bad termination, dirt, or a connector needing polishing.
4. Connectors shall remain capped or otherwise protected, when not in use.

D. Network Tests

1. Check all paths and outlets for appropriate compliance with the Performance Standards. Document all tests and complete measurement results including wire number, date, test equipment used, operator, and test results. If any problems are detected in testing, correct the problem, and retest.
2. Certify all data cables to Category 6 (Draft 9a) or better using a tester capable of 350 MHz measurements such as Fluke DSP-4300, Agilent WireScope 350 or equivalent.

E. Report

1. Upon completion of the initial tests and adjustments, submit a written report of tests to the Consultant along with all documents, diagrams, and record drawings required herein. The Report shall include the date of each test, pertinent conditions such as control settings, etc., test circuit, and test equipment employed. In addition, submit written notification that the installation has been completed in accordance with the requirements of the Contract Documents, and is ready for acceptance testing.

3.8 COMMISSIONING

- A. Provide the following test equipment on site and available to the Consultant during commissioning. Assure scaffolding or other temporary access equipment is in place if needed for inspection.
1. Tools, including screwdrivers, pliers, cutters, wire strippers, nut drivers, ratchet crimpers, heat gun, controlled temperature soldering unit, ladders, flashlights, measuring tapes, electric drills, long and short precision levels, etc.
 2. Sound Pressure Level Meter. The meter shall meet ANSI S1.4 1971 Type 1 standards, with an octave band filter set and A, C, and Linear weighting filters. Provide stand for Type 1 microphone, and cables and interfaces to allow it to be used with the sound level meter, time windowed acoustical measurement system, or STI measurement device.
 3. Portable Audio Spectrum Analyzer. Handheld unit with graphical display and internal filter sets for standard third-octave band response measurements.
 4. Sine Wave Generator. Output: +4 dBu, 5 Hz to 50,000 Hz with less than 0.03 % THD into any load.
 5. Pink Noise Source. Equal energy per octave bandwidth over the band 20 - 20,000 Hz, ± 1 dB (long-term average) at 0 dBu output. Stability: ± 2 dB per day.
 6. Multimeter. Measurement range, DC to 100,000 Hz, true RMS reading, 100 mV to 300 V, 10 ma to 10A, direct dB reading, frequency counter. Acceptable: Fluke 8060A or equal.
 7. Headphones.
 8. Programmable Video and Audio Test Generator with SDI/HD-SDI Output.
 - a. SDI/HD-SDI, RGBHV, component video, S-video, and composite video output.
 - b. Video test patterns including multiple crosshatch patterns, color bars, PLUGE, crop patterns, geometry, grayscale, and alternating pixel patterns, as well as flat field, window, checkerboard, hum bar, and Patented CTF Contrast Transfer Function patterns with adjustable levels.
 - c. Selectable output rates, including high-resolution computer-video, HDTV, and NTSC/PAL video.
 - d. Audio test signals including sine waves, square waves, pink noise, white noise, polarity, frequency sweeps, and sine wave bursts with selectable frequencies and output levels.
 - e. Acceptable: Extron VTG 400D or equal.
 9. Programmable Video and Audio Test Generator with DVI-D/HDMI Output
 - a. DVI, RGBHV, component video, S-video, and composite video output.
 - b. Displays native resolution of the DVI device when new EDID data is received.
 - c. Video test patterns including multiple crosshatch patterns, color bars, PLUGE, crop patterns, geometry, grayscale, and alternating pixel patterns, as well as flat field, window, checkerboard, hum bar, and Patented CTF Contrast Transfer Function patterns with adjustable levels.
 - d. Selectable output rates, including high-resolution computer-video, HDTV, and NTSC/PAL video.
 - e. Audio test signals including sine waves, square waves, pink noise, white noise, polarity, frequency sweeps, and sine wave bursts with selectable frequencies and output levels.
 - f. Acceptable: Extron VTG 400DVI or equal.
 10. Portable Video and Audio Generator and HDMI Analyzer.
 - a. HDMI Tx/Rx enabled testing of HDMI sink/source devices up to 300MHz.
 - b. Test analog RGB video for PCs.
 - c. HDMI 2.0 4:2:0 Testing. Generator patterns with 4:2:0 pixel encoding with 4K formats at 60Hz.
 - d. HDCP Verification. Show HDCP test on the sink. Show each of the key steps in authentication.
 - e. EDID Verification. Read sink EDID in human text, run partial EDID compliance test.
 - f. Aux Channel Monitoring. View hot plug events, EDID exchange, HDCP transactions and CEC message exchange with sink.
 - g. Status bar showing HDMI Out status.

- h. Cable & Link Test (loopback).
 - i. 7" color touch screen.
 - j. Acceptable: Quantum Data 780B with Aux Channel Emulation and Network Analyzer optional feature package.
- 11. Adapter and test lead kit to allow any of the above to be connected to any circuit or connector in the system.
- 12. Wire number machine as used to produce all the wire numbers for the project.
- B. Have on site during acceptance testing all parts and components that may be required to make system repairs and minor modifications to bring the system in the Consultant's opinion into compliance with the Specification. At a minimum these parts shall include:
 - 1. All types of connectors used in the system. Plus, straight and right angle XLR 3, 4, and 5 pin connectors of both sexes, straight and right angle ¼" phone 3 conductor connectors of both sexes, RCA connectors of both sexes, "F" connectors, and BNC connectors, even if not used in the system.
 - 2. All types of wire used in the system.
 - 3. All types of hardware used in the system, plus an assorted hardware kit.
 - 4. All types of fuses used by equipment in the system.
- C. Commissioning will include the operation of each major system and any other components deemed necessary. The contractor will assist in this testing and provide the test equipment specified herein. Contractor shall provide at least one technician available for the entire commissioning period, at any time of the day, to assist in tests, adjustments, and final modifications. Furnish all labor, tools, and material required to make any necessary repairs, corrections, or adjustments.
- D. In the event the need for further adjustment or work becomes evident during acceptance testing, the Contractor will continue his work with a full labor complement until the system is acceptable, at no addition to the contract price. If approval is delayed because of defective equipment, or failure of equipment or installation to meet the requirements of these specifications, the Contractor will pay for additional time and expenses of the Consultant at the Consultant's standard rate in effect at that time, during an extension of the acceptance testing period.

3.9 CLEANING

- A. Remove all unnecessary tools and equipment, unused materials, packing materials, and debris from each area where Work has been completed unless designated for storage.
- B. Clean all areas around system equipment and be sure that the inside of each equipment rack is free of wire stripping and other debris.

3.10 CLOSEOUT ACTIVITIES

- A. Demonstration
 - 1. Upon completion of the Work, the Owner may elect to verify test data as part of the acceptance procedure. Provide personnel and equipment, at the convenience of the Owner, to reasonably demonstrate system performance and to assist with such tests without additional cost to the Owner.
- B. Training
 - 1. Provide eighteen (18) hours instruction to Owner designated personnel on the use and operation of the system. This training must be provided in accordance with a schedule acceptable to the Owner. The instructor should be fully knowledgeable and qualified in system operation. The System Reference Manuals should be complete, approved, and on-site at the time of this instruction.
- C. First Use
 - 1. The A/V Contractor shall provide a person familiar with the system to be present at the first formal use of the system.

3.11 PROTECTION

- A. The contractor shall make reasonable accommodation to protect the A/V equipment and completed work after installation, but prior to acceptance by the Owner.

- B. When the integrity of the installation is in jeopardy, the A/V contractor shall notify the Owner or the Owner's Representative, Building or Site Supervisor immediately.
- C. Protection methods shall include, but not be limited to, the wrapping or "bagging" (in plastic) and/or the temporary removal of major equipment, wiring, and portable equipment.

3.12 ATTACHMENTS

- A. None

END OF SECTION

APPENDIX A: AUDIO VIDEO SYSTEMS FUNCTIONAL DESCRIPTION

Classroom AV Systems

~~The classroom AV system is rough in only. The classroom equipment package will be issued separately with the Intercom/PA system. [PR-09R1]~~

The classroom AV design centers around an owner-furnished, touch-interactive, wall-mounted display with one wired input (HDMI/USB) below the display and a wireless content sharing gateway for BYOD content. The local input panel will also include an audio return channel for connection of portable hearing assist systems should the classrooms be outfitted with voice lift.

The Contractor is responsible for integrating the OFE display with voicelift/intercom system which is provided under separate specification. [PR-09R1].

Enhancements/Exclusions

Music Classrooms will include a stereo microphone and Hard Disk recorder for capturing rehearsals as well as an input for a wired microphone input for the ensemble director. Digital tie-lines to the recording room are included. Primary video displays in the music classroom are CFCI projectors and screens.

The Forum/Collaboration room shall be designed as a large lecture hall with enhanced audio, two larger video displays and enhanced video routing and control capabilities.

Conference and Collaboration

Large Conference Room (4 Total)

Conference rooms are designed for presentations and collaboration among larger groups of people as well as video conferencing. These conference rooms will include an OFE, wall-mounted interactive display of appropriate size to the room with on-board computer for content management and access to soft codecs such as Skype, WebEx, etc. Additional video inputs include a wired connection at the conference table and BYOD capability.

Huddle Spaces and Other Collaboration Areas (22 Total)

Huddle Spaces include a wall-mounted display and wired video input below.

Displays in the Student Activity Commons will also serve as digital signage locations when not being actively used as a collaboration space.

Integrated Public Address, Intercom and Clock Systems

~~The Public address system is currently rough in only pending final manufacturer selection.~~

~~The clock, bell, public address and intercom systems shall be merged onto a single IP platform for unified management and control. This allows for timely communication to the entire school at once, to specific areas of the school or individual classrooms with a simple user-facing control interface.~~

~~Loudspeakers located throughout the common areas serve as destinations for background music, school bell, audio relay from the theaters and gymnasiums and pages and emergency messaging. Each classroom shall include a clock with a connection to the IP time sever and a loudspeaker with integrated microphone for bi-directional communication with the central office.~~

~~Paging to the system is initiated at designated page stations to be coordinated with the district, smartphone app and through integration with the school phone system (if compatible).~~

~~Visual paging is also included to all classroom displays and common area digital signage locations. Paging strobes may be included in labs with higher noise levels.~~

~~This system shall allow for automation of events such as half day bell schedules and nightly shut off. [PR-09-R1].~~

High School Competition Gym

The High School Competition Gym is programmed primarily to host physical education classes and athletic events with secondary uses to include speech-driven events and other presentations. The AV system is designed to support these events. An overhead loudspeaker system will provide even audio coverage across the entire floor area, separated into three zones (center court, home bleachers, away bleachers). These zones can be turned on and off separately, based upon the use of the room. Primary connections include one panel in the bleachers at the scorer's table for microphone, data and other connections as well as several, smaller wall-recessed plug boxes distributed around the room. A wall plate with Bluetooth and 3.5mm audio connections allows for the connection of BYOD (Bring Your Own Device) equipment for audio playback in the room for classroom use. A basic announcement/music playback system is provided for use during sporting events.

As the largest assembly space on campus, the gym will be outfitted with a portable projector and projection screen of appropriate size and brightness to host all-school presentations and gatherings. Four wireless microphones are included that can be assigned to either the Main or Aux Gym via rack-mounted touch panel.

A High Definition camera and microphone, will be mounted in the Gym to provide audio and video feeds to the campus-wide AV distribution system

Volume control and source selection for classroom use is provided for with a button control panel to be flush mounted into the wall at a location to be coordinated. An RF-Based assisted listening system is included for ADA compliance.

Auxiliary Gym

The Middle School Competition (MS) Gym serves a similar primary function as the High School Gym and will share a similar design with the following exceptions:

- The MS Gym is not designed as a presentation space and will not have a dedicated projector and screen.
- The MS Gym audio system will have two zones rather than three – one for the competition court and one for the bleachers/secondary court.

Wrestling and Weight Rooms

The Wrestling and Weight Rooms are programmed for local music playback only. They will have distributed 70 volt loudspeakers, Bluetooth and 3.5mm audio connections for BYOD content, and wall-mounted volume control.

Proscenium Theatre

The Proscenium Theatre is designed to host events including lectures, music concerts, drama, musical theatre as well as instructional use.

The current scope of the project includes a complement of loudspeakers, amplifiers, microphones, and a digital audio mixing console. A basic microphone package shall include both wired and wireless

microphones necessary for presentations, assemblies, plays, instrumental, and vocal performances. In addition, for compliance with ADA requirements, the A/V system shall include a hearing assistance system.

Loudspeaker Systems

It is the intent that the space be outfitted with a sound reinforcement system that serves the needs of both educational and dramatic/musical performances. To this end, a left/center/right loudspeaker system is included. Additional delay loudspeakers provide additional clarity at the extents of main array coverage. Subwoofers are included to extend the low frequency response of the loudspeaker system.

Patch points for portable front fill loudspeakers are included.

Four additional portable loudspeakers shall be supplied for performer stage monitoring as well as for teaching/rehearsal purposes. When used as floor monitors the loudspeakers would be set on the floor in a temporary manner and aimed at the performers. It shall also be possible to use portable pole tripod stands and put the monitors offstage for side stage monitoring for larger performing groups. During educational sessions and rehearsals the loudspeakers could be similarly placed on portable pole mount stands or brought to the audience/gathering area for use as a portable PA system.

Mixing Console and Signal Processing

A new 32 channel digital mixing console with onboard digital effects will be provided when the need for more hands-on control of the audio system is required. A digital stagebox, located in the stage area, collects audio signals from around the stage and sends them to the mixing console which can be located either in the control booth, or at the back of the auditorium when critical listening is required.

It is the intent that the audio systems be operable in two modes: Manual and Automatic. In "Manual" mode the audio mixing console is required for the mixing of all audio signals. In "Automatic" mode, the audio system shall permit the wireless and several designated wired microphones to be directly patched to the digital signal processor for microphone auto-mixing during events where only a few wired microphones are required and a sound engineer may not be present—such as a school assembly or other simple presentation. In this mode the audio system shall not require the front of house console.

For mode selection and basic volume control in "automix" mode, a wall mount control panel is provided. The volume control will allow the main loudspeaker volume to be adjusted without the need of the mixing console.

An additional output from the digital signal processor for a RF-based hearing assist system shall be provided as well. The output shall be equalized and optimized for maximum clarity and intelligibility.

Audio Equipment and Ancillary Systems

K2 recommends four channels of wireless microphones, each with a hand-held transmitter and a body-pack style transmitter for flexibility. Additional wired microphones, selected based on the needs of the program, as well as cables, stands and other accessories shall be provided.

For stereo recording of concerts and other events a simple stereo microphone shall be installed above the main performance space and/or audience/gathering area. The microphone will be used to record the performances to a solid state media recorder, located in the audio rack, for archival purposes. This microphone shall also feed the backstage and common-area audio systems.

A production intercom system shall be provided to facilitate crew communication. Plug boxes shall be distributed throughout the stage, and in theatre support spaces.

Video Presentation System

It is the intent that the video presentation systems be permanently installed and utilized during assemblies, lectures, presentations, and other possible community events. The system shall consist of a permanently installed motorized front projection screen and a projector to be mounted in an enclosed space along the back wall of the auditorium. The projection screen shall be of a size appropriate to the space and installed in a location that permits viewing from the primary audience area.

The video projector for the space shall be selected based on the size of the screen and for the various ambient light conditions. It is recommended that the projector shall have a 1920x1200 pixel resolution and have a minimum brightness of 15,000 ANSI lumens. This requirement will permit for high definition projection as well as an acceptable brightness level in various lighting conditions. Various lighting conditions may exist based on the type of events being held in the space—presentation, assembly, community event, etc.

A camera, located at the rear of the auditorium provides production video feeds to backstage and other areas of the theatre as required, as well as the lobby.

Inputs to the video system shall be located at various locations around the performance space as well as the control booth. It is the intent to create a highly flexible video presentation system that will permit video presentations for a variety of locations and uses.

Control Systems

It is the intent that the audio video systems be supported by a basic control system. The control system shall consist of a basic control panel and a rack mount control system processor. It is the intent to provide a user interface that permit the basic operation of the A/V systems such as: system on/off, system manual/automatic mode, source selection, and volume up/down/mute.

Support Spaces

Program audio from the room microphone will be combined with audio from dedicated theatre paging stations to feed loudspeakers in the dressing rooms and other backstage areas for show monitoring. Audio, Video and Data connection panels will be located in adjacent spaces, such as the scene shop and band room that may be used in support of productions.

Auditorium Infrastructure

The specified infrastructure of the new audio and video systems shall consist of multiple input/output panels located strategically throughout the space. The panels shall support microphone/line inputs, audio outputs, unshielded twisted pair (UTP) cable, and video. All of the boxes shall have multiple conduits for signal separation and shall run back to a series of collector boxes and patch panels located in the audio equipment room (TBD location).

In the audio equipment room there shall be rack mount patch panels that represent all of the microphone and RJ-45 (UTP) field connections from the various input/output panels. Signals and panels shall be separated by type for ease of patching.

Three flush mount floor boxes shall be installed on the performance area apron for the purposes of pugging in a microphone during basic lectures, assemblies, or presentations using a podium.

Recording Studio

The Recording Studio serves as an instructional audio recording studio and lab, allowing students to create, edit, manipulate, and produce audio art for classroom work or broadcast.

The recording studio does not have a dedicated “live room”, but instead has digital audio connections to the Band Room and analog connections to the adjacent practice room which can all be used as live rooms for recording, depending on ensemble size. Additionally, the studio has digital audio connections

to the Proscenium theatre for recording. All equipment other than infrastructure/backbone is owner provided.

TV Studio

The Television Studio is used primarily for students' practical application of the video broadcast arts. The space is a working, instructional lab with modern broadcast tools and equipment that will allow students to record to disk for editing and production or broadcast live to the school's internal video network including classrooms and common areas.

The AV scope includes distributed plug boxes and patching infrastructure. Broadcast equipment is owner furnished. AV contractor to integrate OFE equipment .

Common Spaces

Digital signage locations shall be coordinated with the owner and architect, though are likely limited to major building entries, Student Activity Commons areas and lobbies adjacent to gyms and theatres. Digital signage locations are provided as rough-in only pending PA/Intercom selection.

Cafeteria Commons

The cafeteria commons will have overhead loudspeakers for background music, paging, etc. as well as a local audio microphone for announcements or other small-scale events. A large format projection screen is included at the stair to be used with the portable projector included in the gym package.

END OF APPENDIX A

APPENDIX B: AUDIO VIDEO SYSTEMS EQUIPMENT LIST

CLASSROOMS – Quantity per room [PR-09-R1]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
INPUT PANEL [PR-09-R1]	CUSTOM	BY CONTRACTOR	LI	1
DISPLAY MOUNT [PR-09-R1][ASI-019]	CHIEF	LSM4U	TV	0
INSTALL OFE DISPLAY MOUNT [ASI-019R1]	VIDEOSECU	MP804B		1
INTEGRATE OFE DISPLAY [PR-09-R1]	CUSTOM	BY CONTRACTOR	OFE-TV-XX	1

ORCHESTRA [A121]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
AUDIO				
ROOM MICROPHONE	SHURE	VP-88	RMC-01	1
SOLID STATE RECORDER	DENON	DN-300RMKII	SSR-01	1
SURFACE MOUNT LOUDSPEAKER	QSC	AD-S8T	SLS-XX	2
POWER AMPLIFIER	QSC	SPA2-200	AMP5-01	1
DSP	QSC	I/O8-FLEX	DSP-C-01	1
RACK MOUNT MIXER	ALESIS	MULTIMIX 10 WIRELESS	MIX-01	1
VIDEO				
PROJECTOR	PANASONIC	PT-MZ570	PJ-01	1
PROJECTOR MOUNT	CUSTOM	BY CONTRACTOR	--	1
PROJECTION SCREEN - 130"	DA-LITE	34492L	SCR-01	1
PROJECTION SCREEN MOUNT	CUSTOM	BY CONTRACTOR	--	1
PRESENTATION SWITCHER W/ HDBT RECEIVER	ATLONA	AT-UHD-SW-510W-KIT	PSW-01	1
RACK MOUNT KIT FOR SWITCHER	ATLONA	AT-UHD-SW-510W-RM	--	
HDMI EXTENDER KIT	ATLONA	AT-HDVS-210H-TX-WP-KIT	HDBT-TX/RX-01	1
RACK/CONTROL				
EQUIPMENT RACK	MID ATLANTIC	DWR-16-17	ERM-XX	1
VENTED FRONT DOOR	MID ATLANTIC	VFD-16	--	1
EQUIPMENT RACK HORIZONTAL POWER STRIP (15A)	MID ATLANTIC	PD-915R	PSTRIP	1

CONTROL PANEL	QSC	TSC-55W-G2	TP-01	1
2-CHANNEL RELAY	WINFORD	RLY202-12V-DIN	REL-XX	1

BAND [A128] & CHOIR [A206] — Quantities per room [ASI-002]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
AUDIO				
ROOM MICROPHONE	SHURE	VP-88	RMC-01	1
SOLID STATE RECORDER	DENON	DN-300RMKII	SSR-01	1
SURFACE MOUNT LOUDSPEAKER	QSC	AD-S8T	SLS-XX	2
POWER AMPLIFIER	QSC	SPA2-200	AMP5-01	1
DSP	QSC	I/O8-FLEX	DSP-C-01	1
RACK MOUNT MIXER	ALESIS	MULTIMIX 10 WIRELESS	MIX-01	1
VIDEO				
PROJECTOR	PANASONIC	PT-MZ570	PJ-01	1
PROJECTOR MOUNT	CUSTOM	BY CONTRACTOR	--	1
PROJECTION SCREEN - 130"	DA-LITE	34492L	SCR-01	1
PROJECTION SCREEN MOUNT	CUSTOM	BY CONTRACTOR	--	1
PRESENTATION SWITCHER W/ HDBT RECEIVER	ATLONA	AT-UHD-SW-510W-KIT	PSW-01	1
RACK MOUNT KIT FOR SWITCHER	ATLONA	AT-UHD-SW-510W-RM	--	
HDMI EXTENDER KIT	ATLONA	AT-HDVS-210H-TX-WP-KIT	HDBT-TX/RX-01	1
RACK/CONTROL				
EQUIPMENT RACK	MID ATLANTIC	DWR-16-17	ERM-XX	1
VENTED FRONT DOOR	MID ATLANTIC	VFD-16	--	1
EQUIPMENT RACK HORIZONTAL POWER STRIP (15A)	MID ATLANTIC	PD-915R	PSTRIP	1
CONTROL PANEL	QSC	TSC-55W-G2	TP-01	1
2-CHANNEL RELAY	WINFORD	RLY202-12V-DIN	REL-XX	1

CHOIR [A206] [ASI-002] - ONLY CHANGES FROM ABOVE ARE BOLDED

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
AUDIO				
ROOM MICROPHONE	SHURE	VP-88	RMC-01	1
SOLID STATE RECORDER	DENON	DN-300RMKII	SSR-01	1
SURFACE MOUNT LOUDSPEAKER	QSC	AD-S8T	SLS-XX	2
POWER AMPLIFIER	QSC	SPA2-200	AMP5-01	1
DSP	QSC	I/O8-FLEX	DSP-C-01	1
RACK MOUNT MIXER	ALESIS	MULTIMIX 10 WIRELESS	MIX-01	1
VIDEO				
PROJECTOR [ASI-002]	PANASONIC	PT-MZ570	PJ-01	0
SHORT-THROW PROJECTOR [ASI-002]	EPSON	POWERLITE 700U	PJ-01	1
PROJECTOR MOUNT	CUSTOM	BY CONTRACTOR	--	1
PROJECTION SCREEN – 130" [ASI-002]	DA-LITE	34492L	SCR-01	0
PROJECTION SCREEN – 16:10 – 109" DIAG. – 1.1 GAIN [ASI-002]	DA-LITE	21806LSR	SCR-01	1
PROJECTION SCREEN MOUNT	CUSTOM	BY CONTRACTOR	--	1
PRESENTATION SWITCHER W/ HDBT RECEIVER	ATLONA	AT-UHD-SW-510W-KIT	PSW-01	1
RACK MOUNT KIT FOR SWITCHER	ATLONA	AT-UHD-SW-510W-RM	--	
HDMI EXTENDER KIT	ATLONA	AT-HDVS-210H-TX-WP-KIT	HDBT-TX/RX-01	1
RACK/CONTROL				
EQUIPMENT RACK	MID ATLANTIC	DWR-16-17	ERM-XX	1
VENTED FRONT DOOR	MID ATLANTIC	VFD-16	--	1
EQUIPMENT RACK HORIZONTAL POWER STRIP (15A)	MID ATLANTIC	PD-915R	PSTRIP	1
CONTROL PANEL	QSC	TSC-55W-G2	TP-01	1
2-CHANNEL RELAY	WINFORD	RLY202-12V-DIN	REL-XX	1

CONFERENCE ROOMS (4 TOTAL)

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
INTEGRATE OFE DISPLAY	OFE	TBD	OFE-TV	1
INSTALL OFE DISPLAY MOUNT [ASI-019R1]	VIDEOSECU	MP804B		4
DISPLAY MOUNT [ASI-019R1]	VIDEOSECU	MP804B		0
DISPLAY BACK BOX	CHIEF	PAC 526F(X)P4		1
HDMI EXENDER/RECEIVER	ATLONA	AT-OME-EK-KIT	HDMI-TX/RX-XX	1

BREAKOUT SPACES (22 TOTAL)

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
INPUT PANEL	CUSTOM	BY CONTRACTOR	LIB	1
DISPLAY MOUNT [PR-09-R1][ASI-019]	CHIEF	LSM1U	TVB	0
INSTALL OFE DISPLAY MOUNT [ASI-019R1]	VIDEOSECU	MP804B		1
INTEGRATE OFE DISPLAY	CUSTOM	BY CONTRACTOR	OFE-TV-XX	1

FORUM [B202]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
ROOM EQUIPMENT				
PROJECTOR	PANASONIC	PT-MZ570	PJ-XX	2
PROJECTOR MOUNT	CUSTOM	BY CONTRACTOR		2
PROJECTION SCREEN - 130"	DA-LITE	34492L	SCR-XX	2
PROJECTION SCREEN MOUNT	CUSTOM	BY CONTRACTOR		2
SURFACE MOUNT LOUDSPEAKER	QSC	AD-S8T	SLS-XX	2
CEILING LOUDSPEAKER [RFI-1389]	QSC	AC-C6T	S	6
CEILING LOUDSPEAKER [RFI-1389]	INNOVOX	SL-MICRO	S	2
LECTERN EQUIPMENT				
POWER AMPLIFIER [RFI-1389]	JBL	CSA 1120Z	AMP-FRM	1
LECTERN	SPECTRUM INDUSTRIES	PER TA703	LECTERN	1
PRESENTATION SWITCHER	CRESTRON	DMPS3-300-C	DMPS-01	1
INTEGRATE OFE COMPUTER	CUSTOM	BY CONTRACTOR	OFE-CPU-01	1
BLU-RAY PLAYER	DENON	DN-500BD	BDP-01	1

CONFIDENCE MONITOR - 19"	CONTRACTOR PROPOSE		MON-01	1
WIRELESS MICROPHONE SYSTEM	SHURE	SLX14/85	WL-01	1
POWER AMPLIFIER	QSC	SPA2-200	AMP5-01	1
TOUCHPANEL	CRESTRON	TSW-760	TP-01	1
CONTROL SWITCH	CRESTRON	CEN-SW-POE-5	AVCSW-01	1
EQUIPMENT RACK HORIZONTAL POWER STRIP (15A)	MID ATLANTIC	PD-915R	PSTRIP	1

ATHLETICS WING

AUDIO				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
MAIN GYM				
LOUDSPEAKER - BLEACHER	COMMUNITY	IP8-1122/64	LSF-XX	6
LOUDSPEAKER RIGGING	CUSTOM	BY CONTRACTOR		6
LOUDSPEAKER - GYM FLOOR	COMMUNITY	R.5-99	LSB-XX	6
LOUDSPEAKER RIGGING	CUSTOM	BY CONTRACTOR		6
SUBWOOFER	COMMUNITY	V2-215S	SUB-01	1
SUBWOOFER MOUNTING	CUSTOM	BY CONTRACTOR		1
ROOM MICROPHONE	AKG	PZM-11		1
BYOD INTERFACE	ATTEROTECH	unD6IO-BT	BT-XX	1
SCORERS TABLE INTERFACE	ATTEROTECH	unA6IO	XLR-IN-XX	1
DIGITAL VOLUME CONTROL	ATTEROTECH	AXON C1	CP1-XX	1
MIC AND BYOD INTERFACE	ATTEROTECH	unA6IO	IP2-02	1
WIRELESS MICROPHONE SYSTEM	SHURE	SLX24/SM58	WL-XX	2
ANTENNA COMBINE	RF VENUE	4 ZONE	ANTC-01	1
ANTENNA DISTRIBUTION	RF VENUE	DISTRO4	ANT-D-01	1
ANTENNA AMPLIFIER	SHURE	UA834WB		A/R
AUX GYM				
LOUDSPEAKER - BLEACHER	COMMUNITY	V2-3264	LSB-XX	2
LOUDSPEAKER RIGGING	CUSTOM	BY CONTRACTOR		2
LOUDSPEAKER - GYM FLOOR	COMMUNITY	R.5-99	LSF-XX	6
LOUDSPEAKER RIGGING	CUSTOM	BY CONTRACTOR		6
SUBWOOFER	COMMUNITY	V2-215S	SUB-01	1
SUBWOOFER MOUNTING	CUSTOM	BY CONTRACTOR		1

ROOM MICROPHONE	AKG	PZM-11		1
BYOD INTERFACE	ATTEROTECH	unD6IO-BT	BT-XX	1
SCORERS TABLE INTERFACE	ATTEROTECH	unA6IO	XLR-IN-XX	1
DIGITAL VOLUME CONTROL	ATTEROTECH	AXON C1	CP1-XX	1
MIC AND BYOD INTERFACE	ATTEROTECH	unA6IO	IP2-01	1
WIRELESS MICROPHONE SYSTEM	SHURE	SLX24/SM58	WL-XX	2
ANTENNA AMPLIFIER	SHURE	UA834WB		A/R
SHARED PROCESSING AND AMPLIFICATION				
DIGITAL SIGNAL PROCESSOR	QSC	CORE110f	DSP-XX	1
DSP UCI DEPLOYMENT LICENSE	QSC	SL-QUD-110-P		1
POWER AMPLIFIER - 8 CH X 1000W	QSC	CX-Qn 8K8	AMP8K8-XX	1
POWER AMPLIFIER - 4 CH X 2000W	QSC	CX-Qn 8K4	AMP8K4-XX	1
POWER AMPLIFIER - 4 CH X 500W	QSC	CX-Qn 2K4	AMP2K4-XX	1
PORTABLE ANNOUCE SYSTEM (SHARED)				
SCORERS TABLE MICROPHONE	SHURE	SM58		1
MICROPHONE STAND	ATLAS	DS5E		1
ANNOUNCER INTERFACE	WHIRLWIND	PODMIXAI		1
MICROPHONE CABLE - 25'	WHIRLWIND	MK25		1
MICROPHONE CABLE - 6'	WHIRLWIND	MK6		1
ASSISTED LISTENING SYSTEM				
ASSISTED LISTENING TRANSMITTER	LISTEN TECH	LT-800-072-01	ALS-XX	2
REMOTE ANTENNA	LISTEN TECH	LA-123		2
RECEIVER KIT - 6 PACK WITH CHARGING [ASI-019]	LISTEN TECH	LP-40-072-01		0
RECEIVER KIT - 12 PACK WITH CHARGING [ASI-019]	LISTEN TECH	LP-41-072-01		5
SIGNAGE KIT	LISTEN TECH	LA-304		2
VIDEO				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
MAIN GYM				
3G-SDI CAMERA	MARSHALL	CV343-CS	CAM-02	1

3G-SDI CAMERA -LENS (TBD)	MARSHALL	VS-M226-A		1
3G-SDI CAMERA - CAMERA HOUSING	MARSHALL	CV-H20-HF		1
AUX GYM				
3G-SDI CAMERA	MARSHALL	CV343-CS	CAM-01	1
3G-SDI CAMERA -LENS (TBD)	MARSHALL	VS-M226-A		1
3G-SDI CAMERA - CAMERA HOUSING	MARSHALL	CV-H20-HF		1
SHARED PROCESSING				
VIDEO OVER IP ENCODER	AMX	NMX-ENC-N1134A	IP-ENC-XX	2
HARD DISK RECORDER	BLACK MAGIC	HYPERDECK STUDIO MINI	VTR-01	1
SD CARD FOR RECORDER - 128 GB	SANDISK	EXTREME PRO 128GB		2
PORTABLE PROJECTION SYSTEM				
PORTABLE PROJECTION SCREEN (16:10 - 189" DIAG.)	DALITE	NSCH100X160		1
PROJECTOR (WUXGA - 10K LUMEN - 1 DLP) [ASI-002]	PANASONIC	PT-RZ970		0
PROJECTOR (WUXGA - 12K LUMEN - 1 DLP) [ASI-002]	PANASONIC	PT-RZ120		1
HDMI CABLE - 12'	EXTRON	HDMI ULTRA/12'		1
PROJECTOR CART	ULINE	H-5003		1
CONTROL AND NETWORKING				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
28-PORT ETHERNET SWITCH - GIGABIT w/POE+ & 2 SFP 1G/2 SFP+ 10G UPLINK PORTS	D-LINK	DGS-1510-28P	LAN-SW-XX	1
MINI-GBIC MODULE - 10GBASE-SR SFP+ TRANSCEIVER - MULTI MODE (80m)	D-LINK	DEM-431XT-DD		1
WIRELESS ACCESS POINT w/DHCP WIRELESS SERVER	TRENDNET	TEW-812DRU	AV-WAP-XX	1
1x24-PORT CAT6 PATCH PANEL w/DESIGNATION STRIP - 110 PUNCHDOWN, UNSHIELDED, 1RU	BITTREE	DSGIGE124D	LAN-PP-XX	1
CAT6 SNAGLESS PATCH CORD - 24" UNSHIELDED BLACK	CABLES2GO	#03981		20
CONTROL INTERFACE	QSC	TSC-80W-G2	TP-01	1
SURFACE MOUNT FIBER ENCLOSURE	PANDUIT	CBX4WH-AY	FIB-PP-XX	1

FIBER MODULE	PANDUIT	CMDSLCZBU		2
ENCLOSURE BLANKS	PANDUIT	CMBBL-X		2
LC/LC PATCH CORD - 2M AQUA (OM3)	PANDUIT	FX2ERLNLNSNM00 2		1
RELAYS	CUSTOM	BY CONTRACTOR		A/R
EQUIPMENT RACK				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
WALL MOUNT RACK				
35RU EQUIPMENT RACK - 26" DEPTH	MID ATLANTIC	DWR-35-26	ER3	1
35RU EQUIPMENT RACK - MID RAIL	MID ATLANTIC	DWR-RR-35		1
35RU EQUIPMENT RACK - WORK LIGHT	MID ATLANTIC	WL-60		1
35RU EQUIPMENT RACK - VENTED FRONT DOOR	MID ATLANTIC	VFD-35		1
35RU EQUIPMENT RACK - FAN KIT	MID ATLANTIC	DWR-FK22		1
RACK POWER				
9 OUTLET 15A RACKMOUNT POWER SUPPLY	MID ATLANTIC	PDC-915R-6	PSTRIP-CC-XX	1
RACK MOUNT UPS - 1000VA/600W (15A)	MID ATLANTIC	UPS-S1000R	UPS-XX	1
RACK ACCESSORIES (AS REQUIRED)				
EQUIPMENT RACK BLANK PANELS	MID ATLANTIC	EB SERIES	BLANK	A/R
EQUIPMENT RACK VENT PANELS	MID ATLANTIC	VTB SERIES	VENT	A/R
EQUIPMENT RACK SHELVES (STANDARD)	MID ATLANTIC	U SERIES	SHELF	A/R
EQUIPMENT RACK SHELVES (VENTED)	MID ATLANTIC	UV SERIES	VENTED SHELF	A/R
EQUIPMENT RACK UTILITY DRAWERS	MID ATLANTIC	UD SERIES	DRAWER	A/R
EQUIPMENT RACK BRUSHED GROMMET PANEL	MID ATLANTIC	BR SERIES	BRUSH PANEL	A/R
EQUIPMENT RACK HORIZONTAL CABLE MANAGER w/COVER	MID ATLANTIC	PCHM SERIES	CABLE MANAGER	A/R
EQUIPMENT RACK COPPER BUS BAR	MID ATLANTIC	BB SERIES	BUSS BAR	A/R
STUDIOS				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY

FITNESS STUDIO [H106]				
BYOD INTERFACE	ATTEROTECH	unA6IO-BT	BT-XX	1
DIGITAL VOLUME CONTROL	ATTEROTECH	AXON C1	CP1-XX	1
LOUDSPEAKER	COMMUNITY	CS6	LSW-XX	6
FLEX STUDIO [H107]				
BYOD INTERFACE	ATTEROTECH	unA6IO-BT	BT-XX	1
DIGITAL VOLUME CONTROL	ATTEROTECH	AXON C1	CP1-XX	1
LOUDSPEAKER	COMMUNITY	CS6	LSW-XX	6

AUDITORIUM [A106]

AUDIO				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
LOUDSPEAKERS				
LEFT RIGHT LOUDSPEAKER	D&B AUDIOTECHNIK	E12	LS1-XX	2
LOUDSPEAKER FLYING BRACKET	D&B AUDIOTECHNIK	Z5352		2
CENTER LOUDSPEAKER	D&B AUDIOTECHNIK	E12-D	LS2-01	1
LOUDSPEAKER HORIZONTAL BRACKET	D&B AUDIOTECHNIK	Z5353		1
SUBWOOFER	D&B AUDIOTECHNIK	18S-SUB	SUB-XX	2
SUBWOOFER MOUNTING BRACKET	D&B AUDIOTECHNIK	Z5410		2
DELAY LOUDSPEAKER	D&B AUDIOTECHNIK	8S	LSD-XX	2
DELAY HORIZONTAL BRACKET	D&B AUDIOTECHNIK	Z5408		2
SIGNAL PROCESSING AND AMPLIFICATION				
MIXING CONSOLE	ALLEN & HEATH	SQ-7		1
CONSOLE DUST COVER	ALLEN & HEATH	AP11334		1
DANTE CARD FOR MIXING CONSOLE	ALLEN & HEATH	SQ-DANTE		1
DIGITAL STAGE BOX - INSTALL	ALLEN & HEATH	DT168	SB-XX	2
STAGEBOX RACK KIT	ALLEN & HEATH	AB168-RK10		1
DIGITAL SIGNAL PROCESSOR	QSC	CORE110f	DSP-XX	1
DSP CHANNEL EXPANDER	QSC	I/O-8 FLEX	DSP-EX-01	1

DSP UCI DEPLOYMENT LICENSE	QSC	SL-QUD-110-P		1
SCRIPTING LICENSE	QSC	SL-QSE-110-P		1
POWER AMPLIFIER	D&B AUDIOTECHNIK	30D	AMP1-01	1
POWER AMPLIFIER	D&B AUDIOTECHNIK	10D	AMP2-01	1
PATCHABLE AMPLIFIER	QSC	CXD4.2	AMP3-01	1
PLAYBACK AND RECORDING (PORTABLE RACK)				
PORTABLE PLAYBACK RACK	GATOR CASES	GR-6S		1
CD/USB PLAYER/RECORDER	TASCAM	SS-CDR250N		1
PLAYBACK COMPUTER (21.5" DISPLAY/3+ GHz QUAD i5/16GB RAM/500 GB HDD)	APPLE	MAC MINI		1
24" CLASS MONITOR	ACER	SA230		1
KEYBOARD/MOUSE	LOGITECH	MK200		1
SHOW CONTROL SOFTWARE	FIGURE 53	Q-LAB 4 AUDIO		1
RACK MOUNT POWER SUPPLY	FURMAN	PL-8C		1
DANTE VIRTUAL SOUND CARD	AUDINATE	VIRTUAL SOUND CARD		1
INTERCOM				
2-CHANNEL MAIN STATION	CLEARCOM	MS-702	ICMS-01	1
2-CHANNEL REMOTE STATION	CLEARCOM	RM-702	ICRS-01	1
1-CHANNEL WIRED BELTPACK	CLEARCOM	RS-701		6
2-CHANNEL WIRED BELTPACK	CLEARCOM	RS-702		2
HEADSET - SINGLE MUFF	CLEARCOM	CC-110		7
DUAL CHANNEL ADAPTER	CLEARCOM	YC-36		2
PORTABLE INTERCOM CABLE - 25'	WHIRLWIND	MK425-BLUE		9
PORTABLE INTERCOM CABLE - 10'	WHIRLWIND	MK410-BLUE		3
GOOSENECK MICROPHONE	CLEARCOM	GM-9		2
INSTALLED ASSISTED LISTENING SYSTEM				
ASSISTED LISTENING TRANSMITTER	LISTEN TECH	LT-800-072-01	ALS-01	1
REMOTE ANTENNA	LISTEN TECH	LA-123		1
RECEIVER KIT - 12 PACK WITH CHARGING	LISTEN TECH	LP-41-072-01		1
SIGNAGE KIT	LISTEN TECH	LA-304		1

PROGRAM AUDIO				
CEILING RECESSED LOUDSPEAKER [ASI-002]	QSC	AC-C6T	S1/BLS-XX	14
SURFACE MOUNT LOUDSPEAKER	QSC	AC-S6T	S	1
VOLUME CONTROL - 35 WATT – PRIORITY [ASI-002]	ATLAS	AT-35-PA	VC/VCB	4
ROOM MICROPHONE	SHURE	VP88	RM-01	1
MICROPHONE MOUNTING	CUSTOM	BY CONTRACTOR		1
POWER AMPLIFIER - 70V - 2 CHANNEL	QSC	SPA2-60	AMP4-XX	2
SOLID STATE RECORDER	TASCAM	SS-CDR250N	SSR-01	1
MICROPHONES, CABLES AND STANDS				
WIRELESS RECEIVER	SHURE	ULXD4Q	WL-01	4
HANDHELD TRANSMITTER	SHURE	ULXD2/SM58		4
BODYPACK TRANSMITTER	SHURE	ULXD1		4
LAVALIER MICROPHONE (CONFIRM COLOR W/ OWNER)	COUNTRYMAN	B3		4
ACTIVE DIRECTIONAL ANTENNA	SHURE	UA874	ANT-01	1
DIRECTIONAL ANTENNA	SHURE	PA805	ANT-02	1
MICROPHONE - DYNAMIC - SWITCHED	SHURE	PGA48-LC		1
MICROPHONE - DYNAMIC - CARDIOID - INSTRUMENT	SHURE	SM57-LC		4
MICROPHONE - DYNAMIC - CARDIOID - VOCAL	SHURE	SM58-LC		4
MICROPHONE - CONDENSER - BOUNDARY	AKG	PCC-160		5
MICROPHONE - DRUM KIT	AKG	DRUM SET SESSION 1		1
MICROPHONE - CONDENSER - CHORAL	RODE	NT5-MATCHED PAIR		1
DIRECT BOX	WHIRLWIND	IMP 2		4
PC DIRECT BOX	WHIRLWIND	PCDI		1
INSTRUMENT CABLE	WHIRLWIND	L06		4
MICROPHONE CABLE - 10'	WHIRLWIND	MK410-BLACK		10
MICROPHONE CABLE - 25'	WHIRLWIND	MK425-BLACK		12
MICROPHONE CABLE - 50'	WHIRLWIND	MK450-BLACK		4
MICROPHONE STAND - DESKTOP	ON-STAGE STANDS	MS7920B		2
MICROPHONE STAND	ON-STAGE STANDS	MS7701B		12
PORTABLE LOUDSPEAKER	QSC	E110		4

PORTABLE LOUDSPEAKER	RENKUS HEINZ	CX61		3
LOUDSPEAKER STANDS	ON-STAGE STANDS	SPK-2000SET		1
LOUDSPEAKER STAND PACKAGE	ON-STAGE STANDS	SSP7900		1
LOUDSPEAKER CABLE - 25'	WHIRLWIND	SK525G12		4
LOUDSPEAKER CABLE 50'	WHIRLWIND	SK550G12		2
RIP TIE - 1"x6" MICROPHONE CABLE ORGANIZER - BLACK 10 PACK	RIP-TIE	H-06-010-BK		3
RIP TIE - 1"x9" MICROPHONE CABLE ORGANIZER - BLACK 10 PACK	RIP-TIE	H-09-010-BK		1
PATCH AND INFRASTRUCTURE				
XLRm PATCH PANEL (ER1)	BITTREE	SBCCRB01	XLRm-PP-XX	2
16-XLRm/XLRf ALTERNATING TO E3 PATCH PANEL	BITTREE	SBCCRB25	XLRmf-PP-XX	4
E3F TO (2) E3M 3" "Y" CABLE	BITTREE	E3YM		32
XLR PATCH CABLE -3'	WHIRLWIND	MK403NP		40
PATCH CABLE HOLDER	BITTREE	PCHA		2
2x48 1.5RU BANTAM AUDIO PATCH BAY (ER2)	BITTREE	B96DC-NNAIH/E3 M2OU12B	AUD-PP-01	1
TT PATCH CABLE - 3' - BLACK	BITTREE	BPC3600-110		12
AMPLIFIER OUTPUT PANEL	NEUTRIK	NZP1RU-8	AMP-PP-01	1
LOUDSPEAKER LOCATION PANEL	NEUTRIK	NZP1RU-12	SPK-PP-XX	2
LOUDSPEAKER PATCH CABLE - 3'	NEUTRIK	SK5003G12		8
VIDEO				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
INPUTS				
CAMERA -SDI - BODY ONLY	MARSHALL	CV343-CS	CAM-01	1
CAMERA LENS	MARSHALL	VS-M2812-2		1
CAMERA MOUNTING	CUSTOM	BY CONTRACTOR		1
BLU-RAY PLAYER	DENON	DN-500BD	BDP-01	1
CONTROL AND ROUTING				
VIDEO SWITCHER	ATLONA	AT-UHD-SW-510W	VSW-01	1
IP VIDEO ENCODER	AMX	NMX-ENC-N1122A	IPV-ENC-XX	3

PORTABLE ENCODER RACK	GATOR CASES	G-TOUR 4UHR		1
RACK DRAWER	GATOR CASES	GRW-HALFRKDRW2		1
1X6 3G-SDI DA	AJA	3GDA	VID-DA-XX	2
SDI-AUDIO EMBED	AJA	3G-AMA	AUD-SDI-XX	1
1x24 BNC BULKHEAD PATCH PANEL	BITTREE	BH-B124A1B12	VID-PP-XX	2
HD-SDI PATCH CABLE - 2.5' - BLACK	BLUE JEANS CABLE	1505F-2.5FT-BNC/BNC-BLK		6
ENDPOINTS				
IP VIDEO DECODER	AMX	NMX-DEC-N1222	IPV-DEC-XX	1
PROJECTOR - WUXGA - 10,000LUMEN (NO LENS)	PANASONIC	PT-MZ16KL	PJ-01	1
PROJECTOR LENS	PANASONIC	TBD		1
PROJECTOR MOUNTING	CUSTOM	BY CONTRACTOR		1
MOTORIZED PROJECTION SCREEN (16:10 - 307" DIAG)	DRAPER	114618	SCR-XX	1
PROJECTION SCREEN MOUNTING	CUSTOM	BY CONTRACTOR		1
SDI-HDMI CONVERTER	AJA	HI5-3G	SDI-HDMI-XX	3
VIDEO RECORDER	BLACK MAGIC	HYPERDECK STUDIO MINI	VTR-01	1
PORTABLE VIDEO CABLES				
HDMI CABLE - 6'	CONTRACTOR PROPOSE			1
DISPLAYPORT CABLE - 6'	CONTRACTOR PROPOSE			1
1/8" STEREO AUDIO CABLE - 6'	CONTRACTOR PROPOSE			1
HD-SDI CABLE - 12'	BELDEN	AA11505FA1012E		4
CONTROL AND NETWORKING [PR 62]				
28-PORT ETHERNET SWITCH - GIGABIT w/POE+ & 2 SFP 1G/2 SFP+ 10G UPLINK PORTS	D-LINK	DGS-1510-28P	AVSW-XX	2
MINI-GBIC MODULE - 10GBASE-SR SFP+ TRANSCEIVER - MULTI MODE (80m)	D-LINK	DEM-431XT-DD		3
WIRELESS ACCESS POINT w/DHCP WIRELESS SERVER	TRENDNET	TEW-812DRU	WAP-XX	1
1x24-PORT CAT6 PATCH PANEL w/DESIGNATION STRIP - 110 PUNCHDOWN, UNSHIELDED, 1RU	BITTREE	DSGIGE124D	DAT-PP-01	1

1x24-PORT CAT6 PATCH PANEL w/DESIGNATION STRIP - MODULAR KEYSTONE, SHIELDED, 1RU	BITTREE	DSKP124B-C6FS	SDAT-PP-01	2
CAT6 SNAGLESS PATCH CORD - 24" UNSHIELDED BLACK	CABLES2GO	#03981		24
CAT6 SNAGLESS PATCH CORD - 24" SHIELDED GREEN	CABLES2GO	#00826		16
PATCH CBLE HOLDER	BITTREE	PCHA		1
SURFACE MOUNT FIBER ENCLOSURE	PANDUIT	CBX4WH-AY		2
FIBER MODULE	PANDUIT	CMDSLCZBU		6
ENCLOSURE BLANKS	PANDUIT	CMBBL-X		2
LC/LC PATCH CORD - 1M AQUA (OM3)	PANDUIT	FX2ERLNLNSNM001		4
8" TOUCHPANEL CONTROLLER (THEATER RACK)	QSC	TSC-80W-G2-BK	TP-01	1
8" TOUCHPANLE W/ TABLETOP KIT	QSC	TSC-80tW-G2-BK	TP-P-01	1
PORTABLE CAT6 CABLE 25'	CABLES2GO	CONTRACTOR PROPOSE		6
PORTABLE CAT6 CABLE 50'	CABLES2GO	CONTRACTOR PROPOSE		2
EQUIPMENT RACKS				
DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
CONTROL BOOTH RACK				
40RU EQUIPMENT RACK - 28" DEPTH	MID ATLANTIC	SR-40-28	ER2	1
40RU EQUIPMENT RACK - MID RAIL	MID ATLANTIC	DWR-RR-40		1
40RU EQUIPMENT RACK - WORK LIGHT	MID ATLANTIC	WL-60		1
40RU EQUIPMENT RACK - VENTED FRONT DOOR	MID ATLANTIC	VFD-40		1
STAGE RACK				
35RU EQUIPMENT RACK - 26" DEPTH	MID ATLANTIC	DWR-35-26	ER1	1
35RU EQUIPMENT RACK - MID RAIL	MID ATLANTIC	DWR-RR-35		1
35RU EQUIPMENT RACK - WORK LIGHT	MID ATLANTIC	WL-60		1
35RU EQUIPMENT RACK - VENTED FRONT DOOR	MID ATLANTIC	VFD-35		1
RACK POWER				

CONTACT CONTROL HORIZONTAL POWER STRIP	MID ATLANTIC	PDC-915R-6	PSTRIP-CC-XX	3
RACK MOUNT UPS - 1000VA/600W (15A)	MID ATLANTIC	UPS-S1000R	UPS-XX	2
RACK ACCESSORIES (AS REQUIRED)				
EQUIPMENT RACK BLANK PANELS	MID ATLANTIC	EB SERIES	BLANK	A/R
EQUIPMENT RACK VENT PANELS	MID ATLANTIC	VTB SERIES	VENT	A/R
EQUIPMENT RACK SHELVES (STANDARD)	MID ATLANTIC	U SERIES	SHELF	A/R
EQUIPMENT RACK SHELVES (VENTED)	MID ATLANTIC	UV SERIES	VENTED SHELF	A/R
EQUIPMENT RACK UTILITY DRAWERS	MID ATLANTIC	UD SERIES	DRAWER	A/R
EQUIPMENT RACK BRUSHED GROMMET PANEL	MID ATLANTIC	BR SERIES	BRUSH PANEL	A/R
EQUIPMENT RACK HORIZONTAL CABLE MANAGER w/COVER	MID ATLANTIC	PCHM SERIES	CABLE MANAGER	A/R
EQUIPMENT RACK COPPER BUS BAR	MID ATLANTIC	BB SERIES	BUSS BAR	A/R
RACK MOUNT LAMP - DUAL	LITTLELITE	RL-10-D-LED	RML-XX	2
4-CHANNEL RELAY	WINFORD	RLY204-12V-DIN	REL-XX	A/R

RECORDING [A208]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
EQUIPMENT RACK	MID ATLANTIC	DLBX	ERR	1
28-PORT ETHERNET SWITCH - GIGABIT w/POE+ & 2 SFP 1G/2 SFP+ 10G UPLINK PORTS	D-LINK	DGS-1510-28P	AVSW-04	1
1x24-PORT CAT6 PATCH PANEL w/DESIGNATION STRIP - 110 PUNCHDOWN, UNSHIELDED, 1RU	BITTREE	DSGIGE124D	DAT-PP-01	1
CAT6 SNAGLESS PATCH CORD - 24" UNSHIELDED BLACK	CABLES2GO	#03981		24
XLR PATCH PANEL	NEUTRIK	NZP1RU-8	MIC-PP-01	1

TV STUDIO [D115]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
TV STUDIO TRANSFER RACK				
12RU WALL MOUNT RACK - 12" DEEP	MID ATLANTIC	SWR-12-12	TVS	1
ANGLED RACK PANEL - 12 D-SHELL CUTOUTS	NEUTRIK	NZP1RU-12	TVS-PP-01	4

EQUIPMENT RACK BLANK PANELS	MID ATLANTIC	EB SERIES	BLANK	A/R
TV STUDIO EQUIPMENT RACK				
24RU PIVOTING WALL MOUNT RACK	MID ATLANTIC	SR-24-28	ERT	1
VENTED FRONT DOOR	MID ATLANTIC	VFD-24		1
XLRm PATCH PANEL	BITTREE	SBCCRB01	XLRm-PP-XX	1
XLRf PATCH PANEL	BITTREE	SBCCRB02	XLRf-PP-01	1
1x24 BNC BULKHEAD PATCH PANEL	BITTREE	BH-B124A1B12	VID-PP-XX	1
1x24-PORT CAT6 PATCH PANEL w/DESIGNATION STRIP - 110 PUNCHDOWN, UNSHIELDED, 1RU	BITTREE	DSGIGE124D	NET-PP-01	1
ANGLED RACK PANEL - 12 D-SHELL CUTOUTS	NEUTRIK	NZP1RU-12	DMX-PP-01	1
ANGLED RACK PANEL - 12 D-SHELL CUTOUTS	NEUTRIK	NZP1RU-12	FIB-PP-01	1

PAGING SYSTEM INTEGRATION

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
SURFACE MOUNT FIBER ENCLOSURE	PANDUIT	CBX4WH-AY		1
FIBER MODULE	PANDUIT	CMDSLCZBU		4
LC/LC PATCH CORD - 1M AQUA (OM3)	PANDUIT	FX2ERLNLNSNM001		2
DSP CHANNEL EXPANDER	QSC	I/O-8 FLEX	DSP-EX-01	1
28-PORT ETHERNET SWITCH - GIGABIT w/POE+ & 2 SFP 1G/2 SFP+ 10G UPLINK PORTS	D-LINK	DGS-1510-28P	AVSW-XX	1
MINI-GBIC MODULE - 10GBASE-SR SFP+ TRANSCEIVER - MULTI MODE (80m)	D-LINK	DEM-431XT-DD		2

BASEBALL FIELDS (QUANTITY SHOWN PER FIELD – 2 FIELDS TOTAL) [ASI-002]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
MICROPHONE	SHURE	SM58-LC	--	1
15' XLR CABLE	WHIRLWIND	MK15	--	1
MICROPHONE STAND	ATLAS	DS5E	--	1
WIRELESS MICROPHONE SYSTEM	SHURE	GLX-D24R/SM58	WL-XX	1
MIXING CONSOLE	SOUNDCRAFT	SIGNATURE 10	MXR-XX	1

DIGITAL SIGNAL PROCESSOR	DBX	DRIVERACK PA2	DSP-XX	1
POWER AMPLIFIER - 4-CHANNEL X 600W	CROWN	CDI 4 600	AMP1-XX	1
LOUDSPEAKER - 8'	JBL	AWC82	SPK1-XX	1
LOUDSPEAKER 12"	JBL	AWC129	SPK2-XX	2
EQUIPMENT RACK	MIDDLE ATLANTIC	DTRK-718	ERB	1
POWER SUPPLY	FURMAN	PL-8C	P-STRIP	1
2-RU DRAWER	MIDDLE ATLANTIC	UD-2	DRAWER	1
ASSISTED LISTENING TRANSMITTER [ASI-019]	LISTEN TECH	LT-800-072-01	ALS-XX	1
TOP-MOUNT ANTENNA [ASI-019]	LISTEN TECH	LA-101		1

FOOTBALL FIELD [ASI-002]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
MICROPHONE	SHURE	SM58-LC	--	1
15' XLR CABLE	WHIRLWIND	MK15	--	1
MICROPHONE STAND	ATLAS	DS5E	--	1
WIRELESS MICROPHONE SYSTEM	SHURE	GLX-D24R/SM58	WL-XX	1
MIXING CONSOLE	SOUNDCRAFT	SIGNATURE 10	MXR-XX	1
DIGITAL SIGNAL PROCESSOR	DBX	DRIVERACK PA2	DSP-XX	1
POWER AMPLIFIER - 4-CHANNEL X 600W	CROWN	CDI 4 600	AMP1-XX	1
POWER AMPLIFIER - 2-CHANNEL X 1200W	CROWN	CDI 2 1200	AMP2-01	1
LOUDSPEAKER - 8'	JBL	AWC82	SPK1-XX	1
LOUDSPEAKER 12"	JBL	AWC129	SPK2-XX	2
LOUDSPEAKER - 12" - HIGH OUTPUT	JBL	AW295	SPK3-XX	2
EQUIPMENT RACK	MIDDLE ATLANTIC	DTRK-1018	ERF	1
POWER SUPPLY	FURMAN	PL-8C	P-STRIP	1
2-RU DRAWER	MIDDLE ATLANTIC	UD-2	DRAWER	1
ASSISTED LISTENING TRANSMITTER [ASI-019]	LISTEN TECH	LT-800-072-01	ALS-XX	1
TOP-MOUNT ANTENNA [ASI-019]	LISTEN TECH	LA-101		1

COMMONS VIDEO [ASI-002]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
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PROJECTION SCREEN - (16:10) 226" DIAG. - 1.3 GAIN – PROVIDE 3' OF BLACK DROP	DALITE	24848L	PJC	1
ZOOM LENS FOR PROJECTOR (3.58- 5.45:1)	PANASONIC	ET-DLE350	--	1

DIGITAL SIGNAGE [ASI-019]

DESCRIPTION	MAKE	MODEL	DEVICE ID	QTY
INSTALL OFE TV [ASI-019R1]	OFE	TBD		12
INSTALL OFE DISPLAY MOUNT [ASI-019R1]	VIDEOSECU	MP804B		9
COMMONS DISPLAY MOUNT – TILTING [ASI-019]	CHEIF	LTM1U		3
DIGITAL SIGNAGE PLAYER W/ HDMI INPUT [ASI-019R1]	BRIGHTSIGN	XT1144		12
INPUT PANEL [ASI-019]	CUSTOM	BY CONTRACTOR	LID	3

END OF APPENDIX B

EXHIBIT B: EQUIPMENT

Technical Specifications

DEM-436XT-BXD

DEM-436XT-BXU



Standard		IEEE-802.3ae, 10GBASE-LR	IEEE-802.3ae, 10GBASE-LR
Standard	Standard Compliance	IEEE-802.3ae, 10GBASE-LR	IEEE-802.3ae, 10GBASE-LR
	Form Factor Type	SFP+	SFP+
	Fibre Channel FC-PI Standard	N/A	N/A
	Fiber Media Support	Multi-Mode	Single-Mode
	Distance Capacity	20 km	20 km
Features	Hot Pluggable	✓	✓
	MSA Compliant	✓	✓
	RoHS Compliant	✓	✓
Speed	Speed	10 Gbps	10 Gbps
Interface	Connector	Simplex LC Connector	Simplex LC Connector
	Single/Bi-Directional	WDM Bi-directional	WDM Bi-directional
	Wavelength	TX: 1330 nm, RX: 1270 nm	TX: 1270 nm, RX: 1330 nm
	Output Optical Power (TX Optical Power)	Max.: 0.5 dBm Min.: -5.2 dBm	Max.: 0.5 dBm Min.: -5.2 dBm
	Input Optical Power (RX Optical Power)	Max.: 0.5 dBm Min.: -12.5 dBm	Max.: 0.5 dBm Min.: -12.5 dBm
	Sensitivity	-12.5 dBm	-12.5 dBm
	Cable Type	Single-mode 9/125 um fiber	Single-mode 9/125 um fiber
Operating	Power	3.3 V	3.3 V
	Maximum Input Current	3.3 V: 300 mA	3.3 V: 300 mA
	Minimum Power Budget	7.3 dB	7.3 dB
	Maximum Power Budget	13 dB	13 dB
	Heat Generated	3.6 kJ/h	3.6 kJ/h
Reliability	MTBF (Hours)	1,920,000	1,920,000
Function	DDM (Digital Diagnostics Monitoring)	—	—
Physical and Environment	Operating Temperature	-40 to 85 °C	-40 to 85 °C
	Storage Temperature	-40 to 85 °C	-40 to 85 °C
	Operating Humidity	5 to 85%	5 to 85%
	Storage Humidity	5 to 95%	5 to 95%
	Dimension (W x D x H)	(0.58 x 2.22 x 0.47 inches) Compliant with SFF8432, 14.8 x 56.5 x 11.85 mm	(0.58 x 2.22 x 0.47 inches) Compliant with SFF8432, 14.8 x 56.5 x 11.85 mm
	Weight	22 g (0.05 lbs)	22 g (0.05 lbs)
	Bail Latch Color	Blue	Blue
Emission (EMI) and Safety	EMI	CE, FCC, VCCI	CE, FCC, VCCI
	Safety	UL, TUV, CDRH	UL, TUV, CDRH



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 Release 01 (October 2011)

Model	Manufacturer	Description	Qty	
		FOOTBALL FIELD		
SM58LC	SHURE	MICROPHONE, CARDIOID DYNAMIC WIRED	1	
MK415	WHIRLWIND	CABLE, 15' XLR MICROPHONE	1	
DS5E	ATLAS/SOUNDOLIER	STAND, MICROPHONE DESK STAND	1	
GLXD24R/SM58-Z2	SHURE	WIRELESS MICROPHONE SYSTEM WITH SM 58 MICROPHONE	1	
5049551	SOUNDCRAFT	SIGNATURE 10 US MIXING SYSTEM	1	
5065069	SOUNDCRAFT	SIGNATURE 10 RACKMOUNT KIT	1	no spec sheet
PA2	DBX PROFESSIONAL PRODUCTS	PA MANAGEMENT SYSTEM, 2X6	1	
AWC82	JBL	SPEAKER, 8" 2-WAY, ALL-WEATHER CO-AX - LT GRAY	1	
AWC129	JBL	SPEAKER, 12" 2-WAY, ALL-WEATHER CO-AX - LIGHT GRAY	2	
DTRK-1018	MIDDLE ATLANTIC	RACK, 10 SPACE, 18D DESKTOP W/OUT DRS	1	
PL-8C	FURMAN SOUND	Advanced Rack Mount Power Conditioner	1	
UD2	MIDDLE ATLANTIC	2 SPACE (3 1/2") UTILITY DRAWER, BLACK POWDER COAT FINISH	1	
NCDI4X600-U-US	CROWN INTERNATIONAL	AMPLIFIER, DRIVECORE CDI 4X600	1	Spec sheet is shared
NCDI2X12-U-US	CROWN INTERNATIONAL	AMPLIFIER, DRIVECORE CDI 2X1200	1	
AW295	JBL	SPEAKER, 12" 2-WAY, HIGH OUTPUT FULL-RANGE AE SERIES (GRAY)	2	
LT-800-072-01	Listen Tech	STATIONARY RF TRANSMITTER (72 MHZ)	1	
LP-40-072-01	Listen Tech	INTELLIGENT DSP RF RECEIVER 6-PACK (72 MHZ)	1	
LA-304	Listen Tech	Assistive Listening Notification Signage Kit	1	
LA-101	Listen Tech	Top Mount Antenna	1	
Model	Manufacturer	Description	Qty	
		BASEBALL FIELDS (x2)		
SM58LC	SHURE	MICROPHONE, CARDIOID DYNAMIC WIRED	2	Duplicate
MK415	WHIRLWIND	CABLE, 15' XLR MICROPHONE BLACK	2	Duplicate
DS5E	ATLAS/SOUNDOLIER	STAND, MICROPHONE DESK STAND	2	Duplicate
GLXD24R/SM58-Z2	SHURE	WIRELESS MICROPHONE SYSTEM WITH SM 58 MICROPHONE	2	Duplicate
5049551	SOUNDCRAFT	SIGNATURE 10 US MIXING SYSTEM	2	Duplicate
5065069	SOUNDCRAFT	SIGNATURE 10 RACKMOUNT KIT	2	Duplicate
PA2	DBX PROFESSIONAL PRODUCTS	PA MANAGEMENT SYSTEM, 2X6	2	Duplicate
AWC82	JBL	SPEAKER, 8" 2-WAY, ALL-WEATHER CO-AX - LT GRAY	2	Duplicate
AWC129	JBL	SPEAKER, 12" 2-WAY, ALL-WEATHER CO-AX - LIGHT GRAY	4	Duplicate
PL-8C	FURMAN SOUND	Advanced Rack Mount Power Conditioner	2	Duplicate
DTRK-718	MIDDLE ATLANTIC	RACK, 7 SPACE, 18D DESKTOP W/OUT DOORS (BLACK)	2	Spec sheet is shared
UD2	MIDDLE ATLANTIC	2 SPACE (3 1/2") UTILITY DRAWER, BLACK POWDER COAT FINISH	2	Duplicate
NCDI4X600-U-US	CROWN INTERNATIONAL	AMPLIFIER, DRIVECORE CDI 4X600	2	Duplicate
LT-800-072-01	Listen Tech	STATIONARY RF TRANSMITTER (72 MHZ)	2	Duplicate
LP-40-072-01	Listen Tech	INTELLIGENT DSP RF RECEIVER 6-PACK (72 MHZ)	2	Duplicate
LA-304	Listen Tech	Assistive Listening Notification Signage Kit	2	Duplicate
LA-101	Listen Tech	Top Mount Antenna	2	Duplicate

Product Specifications

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

SM58-LC	Includes Stand Adapter and Zippered Pouch
SM58-CN	Includes 7.6 m (25 ft) XLR-Male to XLR-Female Cable, Swivel Adapter and a Zippered Pouch
SM58S	Includes Integrated On/Off Switch, Swivel Adapter and a Zippered Pouch

Specifications

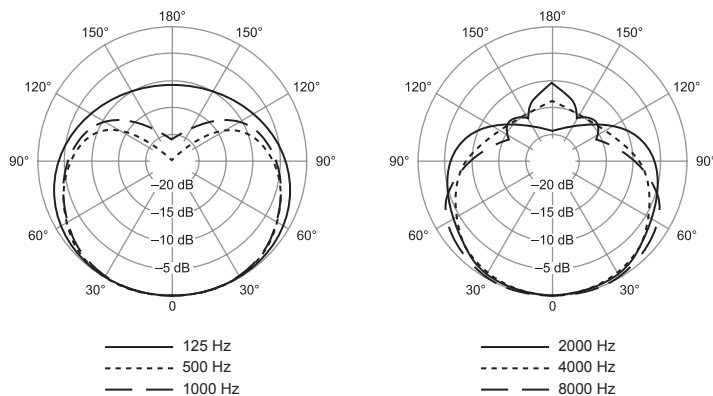
Type	Dynamic
Frequency Response	50 to 15,000 Hz
Polar Pattern	Cardioid
Sensitivity (at 1,000 Hz Open Circuit Voltage)	-54.5 dBV/Pa (1.85 mV) 1 Pa = 94 dB SPL
Impedance	Rated impedance is 150Ω (300Ω actual) for connection to microphone inputs rated low impedance
Polarity	Positive pressure on diaphragm produces positive voltage on pin 2 with respect to pin 3.
Case	Dark gray, enamel-painted, die cast metal; matte-finished, silver colored, spherical steel mesh grille
Connector	Three-pin professional audio connector (male XLR type)
Connector	Three-pin professional audio connector (male XLR type)
Net Weight	298 grams (10.5 oz)
Dimensions	162 mm (6-3/8 in.) L x 51 mm (2 in.) W



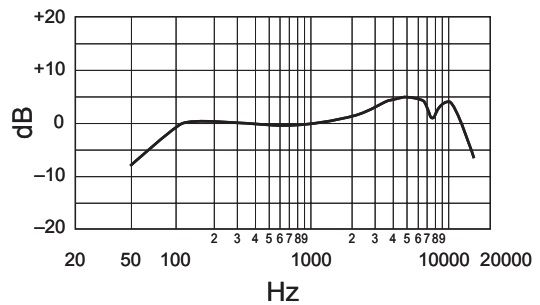
SM58

Optional Accessories and Replacement Parts

A58WS	Windscreen	A55M	Isolation Mount	C25F	7.6 m Cable (25 ft)
A25D	Microphone Clip	A26M	Dual Mount	RK143G	Screen and Grille
R59	Cartridge	S37A, S39A	Desk Stand		



Polar Pattern



Frequency Response



Whirlwind

MK4 Series Cable

15 ft

[HOME](#) > [CATALOG](#) > [PRE-WIRED CABLES](#) > [MICROPHONE](#) > [MK4 SERIES](#)



MK4 Series

Part number: MK4 + (Length)

Whirlwind MK Series mic cables are built with Accusonic+2 cable and fitted with Whirlwind XLR connectors to ensure superior cable performance year after year.

[DOWNLOAD/VIEW HI-RES IMAGES](#)

Description

MK cables are extremely flexible, resistant to handling microphonics and reliable under the roughest conditions. Accusonic+2 features finely stranded center conductors and braided shield for superior noise rejection. Stock lengths are 3, 6, 10, 15, 20, 25, 30, 50, and 100 ft., custom lengths available on a special order basis. The model number is formed by MK4 + cable length. For example: MK450. (Featuring limited lifetime warranty*)

*Does not apply to defects or damage resulting from normal wear and tear, abuse, abnormal use or modifications or repairs not authorized by Whirlwind.



DS Series Mic Stands

Desk and Banquet Stands



DS2



DS5



DS7(E)



DS14

Features

- Versatile Stands Fulfill Functional and Aesthetic Miking Requirements for Microphone Placement
- Quality Construction Assures Extended Service and Quality Appearance
- Weighted Bases Provide Maximum Stability

Applications

Atlas Sound microphone stands meet functional and aesthetic requirements for microphone support and placement within contemporary and traditional decors. The extensive selection includes models for use on banquet and meeting room consoles, court room and dispatcher desks, sports/recreation booths, church pulpits, and telephone switchboards. High-stability units are also suited for application in various sound reinforcement systems, as well as broadcast and recording studios.

General Description

Atlas Sound brand microphone desk stands assure optimum stability and "like new" appearance for many years of service. Chrome and ebony finished bases are attractively styled and present a quality appearance for traditional and contemporary decors. Microphone placement and positioning is enhanced by the "locking nut" feature which securely fastens adapters and holders to the desk stands. The seamless tubing is $\frac{5}{8}$ " cold rolled steel and terminates in the industry standard $\frac{5}{8}$ " - 27 thread pattern for use with microphone accessories. Fixed-height stand selection includes Models DS2, DS5(E), and DS14. Adjustable-height stand Model DS7(E) features the wearproof, Atlas Sound grip-action clutch for positive locking control.

DS2 Low silhouette stand features an integral tension variable mount to reduce conductivity of external mechanical vibrations. High-stability, die-cast metal base with protective pads includes notched area for convenient placement of cards or pens. Fixed-height tubing is chrome plated. Base is supplied in non-reflective ebony.

DS5/DS5E Fixed-height stands include traditional, circular cast iron base and chrome-plated tubing for application with any standard microphone. DS5 features chrome plated tubing, DS5E is finished in ebony epoxy.

DS7/DS7E Versatile stands may be adjusted from 8" – 13" and include a grip-action clutch and ebony-finished cast iron base. DS-7 features chrome-plated tubing; DS7E is supplied with non-reflective ebony tubing.

DS14 Professionally styled stand includes die-cast "wishbone" shaped base. Finished in ebony and features 3" high chrome tubing.

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Specifications

DS2

Base	6" L x 4" W
Stand Height	4"
Base Material	Cast Zinc
Base Finish	Ebony
Tube Finish	Chrome
Weight	2 lbs. (1kg)

DS5

Base	6" Diameter
Stand Height	5"
Base Material	Cast Iron
Base Finish	Ebony
Tube Finish	Chrome
Weight	3 lbs. (1.4kg)

DS5E

Base	6" Diameter
Stand Height	5"
Base Material	Cast Iron
Base Finish	Ebony
Tube Finish	Ebony
Weight	3 lbs. (1.4kg)

DS7

Base	6" Diameter
Stand Height	8" - 13"
Base Material	Cast Iron
Base Finish	Ebony
Tube Finish	Chrome
Weight	3 lbs. (1.4kg)

DS7E

Base	6" Diameter
Stand Height	8" - 13"
Base Material	Cast Iron
Base Finish	Ebony
Tube Finish	Ebony
Weight	3 lbs. (1.4kg)

DS14

Base	Wishbone
Stand Height	3"
Base Material	Cast Iron
Base Finish	Ebony
Tube Finish	Chrome
Weight	1 lbs. (1kg)

System Specifications

Compatibility

Operate up to 9 compatible systems in typical setting, up to 11 maximum under ideal conditions

System Operating Range

Indoors: Up to 100 feet (30 m) typical, with a maximum of 200 feet (60 m) under ideal conditions
Outdoors: Up to 65 feet (20 m) typical, with a maximum of 165 feet (50 m) under ideal conditions

Transmit Mode

Shure GLX-D Proprietary Digital

Audio Frequency Response

20 Hz – 20 kHz

Note: Dependent on microphone type

Dynamic Range

120 dB, A-weighted

Latency

Groups 1 and A: 4.0 ms

Groups 2, 3, 4 and B: 7.3 ms

RF Sensitivity

-88 dBm, typical

Total Harmonic Distortion

0.2%, typical

RF Output Power

10 mW E.I.R.P. max

Operating Temperature Range

-18 °C (0 °F) to 57 °C (135 °F)

Note: Battery characteristics may limit this range.

Storage Temperature Range

-29 °C (-20 °F) to 74 °C (165 °F)

Polarity

Positive pressure on microphone diaphragm (or positive voltage applied to tip of WA302 phone plug) produces positive voltage on pin 2 (with respect to pin 3 of low-impedance output) and the tip of the high impedance 1/4-inch output.

Battery Life

Up to 16 hours

NOTE: All Specifications are subject to change. Performance may vary depending on country regulations and operating environment.

Frequency Manager, Receiver & Antenna Specifications

(Note: All preliminary specifications are subject to change.)

UA846Z2 Frequency Manager

Power Requirements

15 VDC

DC Output

15 VDC (x6)

Output Current

Combined total from all DC outputs
3.8 A, maximum

Operating Temperature Range

-18 °C to 63 °C (0 °F to 145 °F)

Dimensions

45 × 483 × 192 mm
(1.8 × 19 × 7.6 in.) H × W × D

Net Weight

1.63 kg (3.6 lbs)

RF Input

Connector Type

Reverse SMA

RF Frequency Range

2400 to 2483.5 MHz

Receiver Port Isolation

35 dB, typical

Impedance

50 Ω

Maximum Antenna Input Power

-10 dBm

Maximum Receiver Port Input Power

+15 dBm

RF Output

Connector Type

Reverse SMA

RF Frequency Range

2400 to 2483.5 MHz

Output Intercept Point (OIP3)

48 dBm, typical

Impedance

50 Ω

Reverse Isolation

Output to Input

35 dB, typical

Gain

Input to any output port

-3 to 0 dB

GLXD4R Rack Mount Receiver

Dimensions

42 × 197 × 163 mm
(1.7 × 7.8 × 6.4 in.)
H × W × D

Weight

907.2 g (32 oz.) without batteries

Housing

Steel

Power Requirements

14 to 18 VDC (tip positive with respect to ring) 550 mA

Spurious Rejection

>35 dB, typical

Gain Adjustment Range

-18 to 42 dB in 1 dB steps

Phantom Power Protection

Yes

Mic/Line Switch

30 dB Pad

Receiver Antenna Input

Impedance

50 Ω

Antenna Type

½ Wave Sleeve Dipole

Maximum Input Level

-20 dBm

Audio Output	XLR Output	6.35 mm (1/4") Output
Configuration	Balanced	Impedance balanced
Impedance	100 Ω	100 Ω (50 Ω, Unbalanced)
Full-Scale Output	LINE setting +18 dBV, MIC setting -12 dBV	+12 dBV
Pin Assignments	1=ground 2=hot 3=cold	Tip=audio Ring=no audio Sleeve=ground

PA805Z2-RSMA Passive Directional Antenna

Frequency Range

<2:1 Voltage Standing Wave Ration (VSWR)
2050 to 2700 MHz

Antenna Gain

@ 2.45 GHz, typical
8 dBi

3 dB Horizontal Beam Width

100 degrees

Efficiency

@ 2.45 GHz, typical
89%

Impedance

50 Ω

Polarization

Linear

Front-to-back ratio

@ 2.45 GHz, typical
24 dB

Connector Type

Reverse SMA

Dimensions

105 × 164 × 27.5 mm
(4.1 × 6.5 × 1.1 in.) H × W × D

Net Weight

2.5 oz. (70 g)

Transmitter Specifications

GLXD1 Bodypack Transmitter

Dimensions

90.4 × 64.5 × 22.9 mm
(3.56 × 2.54 × 0.90 in.), H × W × D

Power Requirements

3.7 V Rechargeable Li-Ion

Housing

Cast Metal, Black Powdercoat

Input Impedance

900 kΩ

RF Output Power

10 mW E.I.R.P. max

Transmitter Input

Connector

4-Pin male mini connector (TA4M)

Configuration

Unbalanced

Maximum Input Level

(1 kHz at 1% THD) +8.4 dBV (7.5 V_{p-p})

Antenna Type

Internal Monopole

Pin Assignments

TA4M

1: Ground (cable shield)

2: +5 V Bias

3: Audio

4: Tied through active load to ground

(On instrument adapter

cable, pin 4 floats)

GLXD2 Handheld Transmitter

Dimensions

(SM58)
252 × 51 mm (9.9 × 2.0 in.) L × Dia.

Weight

(SM58, without batteries)
267 g (9.4 oz.)

Power Requirements

3.7 V Rechargeable Li-Ion

RF Output Power

10 mW E.I.R.P. max

Maximum Input Level

145 dB SPL

Housing

Molded Plastic

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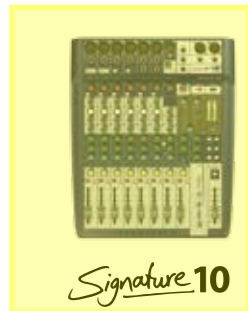
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www.shureasia.com

Signature



Signature 10



Signature 12



Signature 16



Signature 22

	Signature 10	Signature 12	Signature 16	Signature 22
Channels	10	12	16	22
Soundcraft® Ghost Preamps	6	8	12	16
Soundcraft® Saphyre EQ	3-band (1 band of swept mids)	3-band (1 band of swept mids)	4-band (2 bands of swept mids)	4-band (2 bands of swept mids)
dbx® Limiters on inputs	2	2	4	8
Lexicon® Effects	Single Engine	Single Engine	Single Engine	Dual Engine
USB Interface	2-in/2-out	2-in/2-out (14-in/12-out on 12 MTK)	2-in/2-out	2-in/2-out (24-in/22-out on 22 MTK)
Auxes	3	3	4	5
Subgroups	0	2 mono/1 stereo	4 mono/2 stereo	4 mono/2 stereo
Faders	60mm	60mm	100mm	100mm

Also available: Signature Series Multi-track versions with multi-channel ultra-low latency USB audio interface -



Signature 12
MULTI-TRACK



Signature 22
MULTI-TRACK

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Cranborne House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JN, UK
T: +44 (0)1707 665000 F: +44 (0)1707 660742 E: soundcraft@harman.com
Soundcraft USA, 8500 Balboa Boulevard, Northridge, CA 91329, USA
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Signature

Soundcraft
by HARMAN

www.soundcraft.com

Part No: 5055924 E & OE 01/2015

Analogue Mixers with legendary
Soundcraft®, Lexicon®
and dbx® signal processing

Soundcraft

Compact analogue mixing - your Signature sound



Signature

Drawing on over 40 years experience in live sound mixing, the Signature Series combines a superb analogue control surface with the unrivalled British sound of Soundcraft in a powerful, compact, professionally spec'd mixer.

Built tough for trouble-free performance night-after-night, Signature Series mixers deliver great sounding results thanks to high-grade Ghost® preamps, the most musical EQ in the business, pristine Lexicon® effects and powerful dbx® dynamics - all designed to let you discover your Signature sound.

The legendary British sound



From humble beginnings in London more than 40 years ago and still designed and engineered in the UK, Soundcraft defined the term 'British sound' in live sound mixing consoles. Acclaimed Ghost mic preamps and our Sapphyre® 'British' equaliser ensure the Signature range carries the Soundcraft signature sound today.

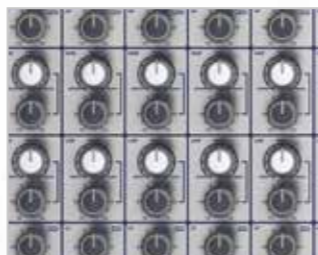
Iconic Soundcraft® Ghost Mic Preamps



It's no secret that great sound starts with a great microphone preamp.

Inheriting technology from our top-of-the-line professional consoles, our acclaimed Ghost mic preamp delivers stunning audio fidelity and class-leading performance, with high headroom, wide dynamic range and superb signal to noise ratio.

Soundcraft® Sapphyre British EQ



To get every element sounding great in your mix, from the kick drum to the lead vocal, you need a great EQ.

Famed for its musical sound and unmistakable 'British' quality, Signature Series mixers feature our highly regarded Sapphyre® EQ. Signature 10 & 12 feature a 3-band EQ with sweepable mid. Signature 16 & 22 feature a 4-band EQ with dual-sweepable mid bands.

Flexible Soundcraft® GB audio routing



Giving you maximum flexibility, Signature Series mixers feature comprehensive Soundcraft® GB Series audio routing with flexible pre/post switching on each Aux and subgroups with powerful routing and switching options as well as dedicated outputs.

Built tough for the long haul



We understand the importance of reliability. Every night, Soundcraft consoles run the biggest shows in the world. With a robust metal construction and premium-quality components, Signature Series mixers are built to withstand the rigours of extensive use and deliver years of maintenance-free operation.

Easy playback and recording via USB



Includes Ableton Live Lite

Enabling simple playback and recording, Signature Series mixers are loaded with a 2-channel USB audio interface, ideal for playing music from a computer and capturing a stereo mix of a live performance or rehearsal. Signature Series mixers also include Ableton Live 9 Lite DAW software. MTK models feature multi-channel, ultra-low latency USB audio interface.

Switchable Hi-Z instrument inputs



Eliminate fuss by connecting instruments direct to your mixer.

Removing the need for DI boxes or additional hardware, Signature Series mixers make it simple to get a great instrument channel sound using the switchable Hi-Z inputs, optimised for acoustic guitars, electric guitars and basses.

Award-winning Lexicon® effects



Need effects? You've got Lexicon®.

With the Signature Series you don't just get generic, dull processing algorithms. The Lexicon® Effects Engine (Dual-Effects Engines on Signature 22 and 22 MTK) powers your mix with studio-grade Reverbs, Delays, Choruses and Modulations, designed to add a truly professional edge to your productions.

Key features

- High-Performance 10-, 12-, 16- and 22-input small format analogue mixers with onboard effects
- Iconic Soundcraft® Ghost mic preamps with ultra-low noise performance
- Renowned Soundcraft® Sapphyre British EQ with sweepable mid-bands per channel
- Lexicon® Effects Engine featuring award-winning Reverbs, Delays, Choruses and Modulations
- dbx® Limiters (High-ratio Compressors) on input channels
- 2-in/2-out USB audio playback and recording
- Switchable Hi-Z inputs for guitars, basses and other instruments
- Hi-Pass Filters (low-cut) and 48V Phantom Power on all mic channels
- Comprehensive Soundcraft® GB Series audio routing
- Smooth premium-quality faders
- Robust metal construction for tour-grade build quality and reliability
- Internal universal power supply



Powered by **Ghost** MIC PREAMP, **Sapphyre** ASYMMETRIC EQ, **dbx** BROADBAND LIMITER, **lexicon** FX PROCESSOR, **GB** AUDIO ROUTING

Soundcraft

Specifications **DBX_PA2V_PA Management System****ANALOG INPUTS**

Number of Inputs:	2 line inputs, 1 RTA mic input
Connectors:	2 female XLR line inputs, 1 female XLR RTA mic input
Type:	Electronically balanced/RF filtered
Impedance:	> 50 k Ω
Max Input Level (line inputs):	> +20 dBu
CMRR:	> 45 dB
RTA Mic Preamp Phantom Power:	+15 VDC

ANALOG OUTPUTS

Number of Outputs:	6 line outputs
Connectors:	Male XLR
Type:	Electronically balanced, RF filtered
Impedance:	120 Ω
Max Output Level:	+20 dBu
Alignment Delay:	Up to 10ms per output channel pair

A/D PERFORMANCE

A/D Converter:	24-bit with dbx Type IV™ Conversion System
A/D Dynamic Range:	112 dB A-weighted, 110 dB unweighted
Type IV Dynamic Range:	123 dB with transient material, A-weighted, 22kHz BW; 121 dB with transient material, unweighted, 22kHz BW; 115 dB typical with program material, A-weighted, 22kHz BW

D/A PERFORMANCE

D/A Converter:	24-bit
D/A Dynamic Range:	112 dB A-weighted, 110 dB unweighted

SYSTEM PERFORMANCE

Internal Processing Wordlength:	32-bit floating point
Sample Rate:	48 kHz
Dynamic Range:	110 dB A-weighted 107 dB unweighted
THD+Noise:	0.003% typical at +4 dBu, 1 kHz, 0 dB input gain
Frequency Response:	20 Hz – 20 kHz, +0 /- 0.5 dB
Interchannel Crosstalk:	< -110 dB, -120 dB typical (input-to-output: < -100 dB)
Latency:	Input to output: 1.847 ms

POWER SUPPLY

Operating Voltage:	100-120 VAC 50/60 Hz or 220-240 VAC 50/60 Hz
Power Consumption:	22 Watts

PHYSICAL

Unit Weight:	5.25 lbs. (2.4 kg)
Shipping Weight:	6.75 lbs. (3.1 kg)
Dimensions:	1.75" (H) x 5.75" (D) x 19" (W) 4.4cm (H) x 14.6cm (D) x 48.26cm (W)

Specifications are subject to change without notice.

Professional Series

Key Features:

- ▶ Highly weather-resistant IP56 rating
- ▶ Consistent 120° x 120° broadband pattern control
- ▶ Components:
 - 200 mm (8 in) woofer with Kevlar-reinforced cone and 50 mm (2 in) voice coil.
 - 25 mm (1 in) exit compression driver with unique patented design and high temperature polymer diaphragm.
- ▶ Extraordinary clarity for speech, with extended frequency response for music.
- ▶ Advanced high-slope crossover network for constant coverage and smooth, natural midrange.
- ▶ 250 Watt power handling (average continuous pink noise) with high sensitivity provides high SPL capability.
- ▶ High-power passive crossover network.
- ▶ Overload protection
- ▶ 80 Hz – 20 kHz frequency response.
- ▶ 200 Watt 70V/100V multi-tap (built-in transformer) or direct 8Ω low-impedance.

Applications:

The AWC82 is a compact, coaxial-driver, 2-way, highly weather-resistant full-range loudspeaker system which is ideal for speech and music-fill in a wide variety of applications, including sports facilities, racetracks, stadiums, fairgrounds, rodeos, skating rinks, themed entertainment venues, cruise ships, water parks, outdoor background music/paging systems, swimming pools, and a wide variety of other outdoor or indoor venue types.

The AWC82 is comprised of a high-power coaxial 200 mm (8 in) low frequency driver and 25 mm (1 in) high frequency compression driver. The co-axial design utilizes a unique tapered pole-piece design and transitions to the cone of the low frequency driver as a large diameter pattern control horn for the high frequencies, both eliminating high-frequency beaming which is common among this category of speaker and extending pattern control to the lowest possible frequencies. The result is a coaxial speaker with wide, extremely consistent 120° coverage on a broadband basis.

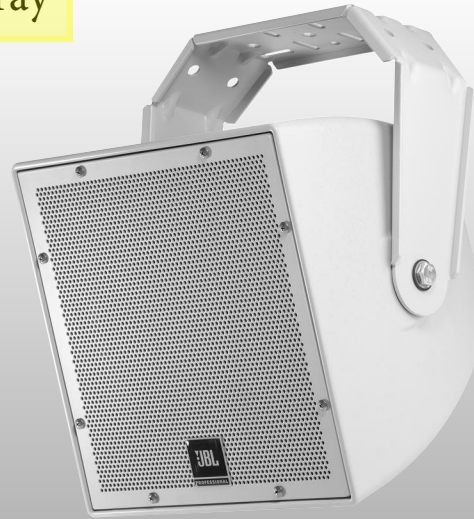
Component features include a Kevlar-reinforced low frequency cone for reliability, well-damped surround for smooth frequency response, high temperature voice coil and a reduced distortion design through saturated-gap magnet geometry. The high frequency compression driver features a unique patented design, high temperature polymer diaphragm, and fluid-cooling for high output levels with low distortion.

The paintable enclosure is constructed of thick, ABS plus fiberglass and is heavily braced to maximize low-frequency performance. The corrosion-resistant zinc-rich extra-thick powder coated steel grille is backed with open cell foam and high thread-count mesh, providing excellent protection in the harshest environments. The system is rated IP-56, per IEC529 when installed at minimum 5° down-tilt.

The system is equipped with a 200W 70V/100V multi-tap transformer. Connection is made via outdoor-rated terminals in a recessed terminal cup. A protective terminal compartment cover is included, along with gland nut, which forms a water-tight seal with round-jacketed cable having outside diameter between 4 mm (0.16 in) and 9 mm (0.36 in).

A heavy-duty weather-capable zinc-rich, thick powder coated U-type mounting bracket is included.

Light Gray



Specifications:

System:	
Frequency Range (-10 dB):	80 Hz – 20 kHz
Frequency Response (±3 dB):	100 Hz – 20 kHz
Coverage Pattern ¹ :	120° x 120°
Directivity Factor:	8.1 (1 k – 16 kHz)
Directivity Index (DI):	8.4 dB (1 k – 16 kHz)
Long-Term System Power Rating (IEC) ² :	250 W 2 hrs. 200 W 100 hrs
Sensitivity (2.83V @ 1m):	94 dB (Ave. 100 Hz – 20 kHz)
Maximum SPL:	Direct 8Ω: 118 dB (peaks of 124 dB) 200 W Tap: 117 dB
Crossover Network:	1.8 kHz, 3rd order (18 dB/oct) high-pass plus conjugate to HF, 2nd order low-pass to LF
Nominal Impedance:	8 ohms
Transformer Taps:	70V: 200W, 100W, 50W, 25W 100V: 200W, 100W, 50W
Transducers:	
Low Frequency Driver:	Kevlar-reinforced cone with weather treatment, 50 mm (2 in) voice coil.
High Frequency Driver:	25 mm (1 in) diaphragm and voice coil diameter, high temperature polymer diaphragm, patented design, fluid-cooling.
HF Driver Protection:	Minimum audibility SonicGuard™ HF overload protection
Physical:	
Enclosure:	ABS with Glass enclosure
Attachment:	Two M10 (fine-thread) points for included U-bracket. M6 secondary safety attachment point on back panel.
Grille:	Corrosion-resistant zinc-rich extra-thick powder coated steel grille, 3-layer assembly with foam and woven poly mesh backing.
Input Connection:	CE-compliant covered barrier strip terminals. Barrier terminals accept up to 8 mm outside 4 mm inside open-lug (#6 or #8) plus bare wire up to 2.5 mm ² (12 AWG) wire or spade lugs. Terminal compartment cover equipped with gland nut that forms water-tight seal with round-jacketed cables with outside diameters between 4.0 mm (0.16") and 9.0 mm (0.36")
Environmental:	IP56 per IEC529, with a minimum 5° downward aiming angle. Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV, and ASTM G85 for salt spray (168 hrs).
Dimensions:	300 x 300 x 305 mm (11.8 x 11.8 x 12.0), cabinet 331 mm (13.0 in) including gland nut 359 mm (14.2 in) including bracket extending to back
Colors:	Available in gray (similar to Pantone 420C) and black (-BK)
Net Weight:	9.8 kg (21.5 lb), 11.6 kg (25.5 lb) with U-bracket
Shipping Weight:	14.1 kg (31.0 lb)
Included Accessories:	U-bracket, matches loudspeaker color (gray or black), zinc-rich extra-thick powder coated, steel.

¹ Full-space (free-field)

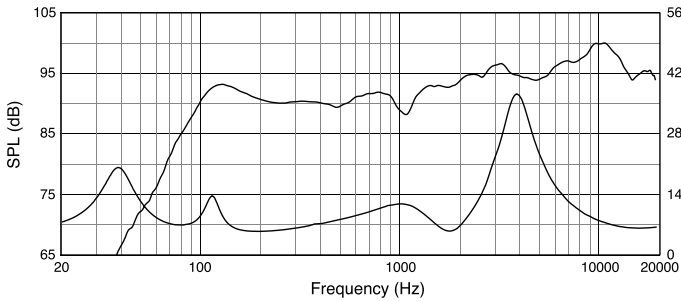
² Average 1 kHz to 10 kHz

³ IEC standard, full bandwidth pink noise with 6 dB crest factor.

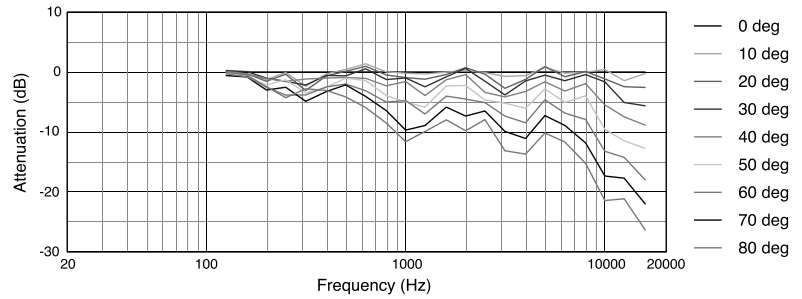
⁴ Calculated based on power rating and measured full-space sensitivity.

▶ AWC82 All-Weather Compact 2-Way Coaxial Loudspeaker with 8" LF

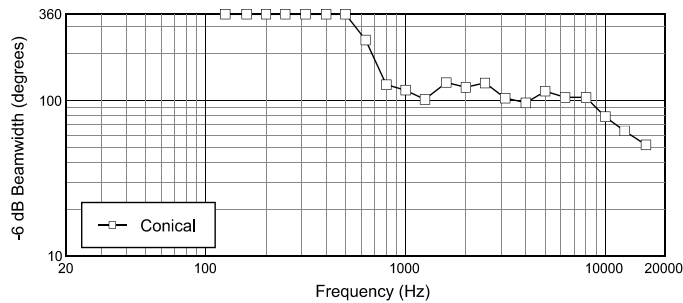
Frequency Response and Impedance



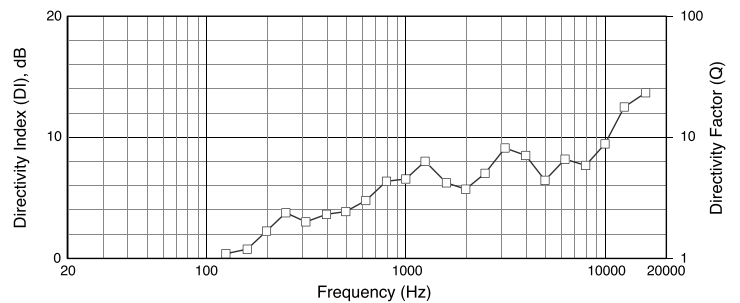
Off-Axis Frequency Response



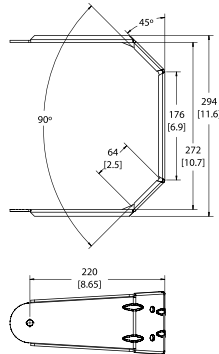
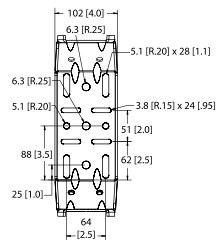
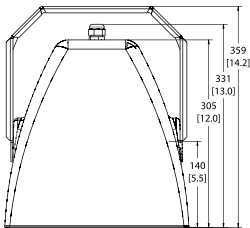
Beamwidth



Directivity Index:

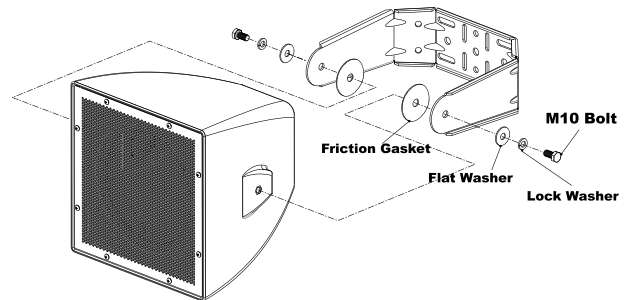


Dimensions

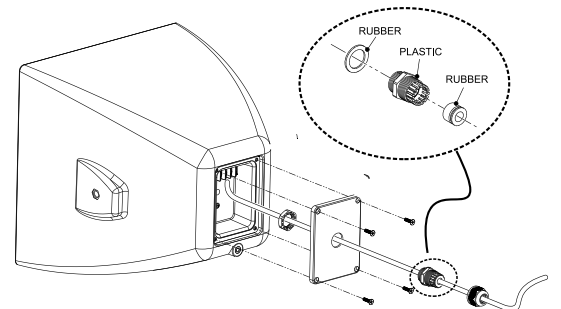
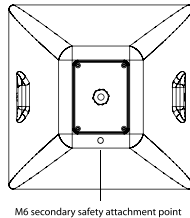
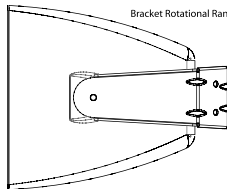
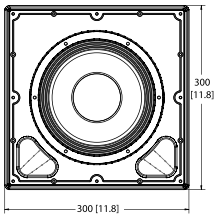


Dimensions in mm (in)

Attaching U-Bracket to Cabinet



Terminal Compartment



Gland nut for round jacketed cable between 4.0mm (0.16") and 9.0mm (0.36") O.D.



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SS AWC82
CRP
12/12

Professional Series

Key Features:

- ▶ Highly weather-resistant IP56 rating
- ▶ Consistent 90° x 90° broadband pattern control
- ▶ Components:
 - 300 mm (12 in) woofer with Kevlar-reinforced cone and 75 mm (3 in) voice coil.
 - 25 mm (1 in) exit compression driver with unique patented design and high temperature polymer diaphragm.
- ▶ Extraordinary clarity for speech, with extended frequency response for music.
- ▶ Advanced high-slope crossover network for constant coverage and smooth, natural midrange.
- ▶ 400 Watt power handling (average continuous pink noise) with high sensitivity provides high SPL capability.
- ▶ High-power passive crossover network.
- ▶ Overload protection
- ▶ 55 Hz – 20 kHz frequency response.
- ▶ 200 Watt 70V/100V multi-tap (built-in transformer) or direct 8Ω low-impedance.

Applications:

The AWC129 is a compact, coaxial-driver, 2-way, highly weather-resistant full-range loudspeaker system which is ideal for speech and music in a wide variety of applications, including sports facilities, racetracks, stadiums, fairgrounds, rodeos, skating rinks, themed entertainment venues, cruise ships, water parks, outdoor background music/paging systems, swimming pools, and a wide variety of other outdoor or indoor venue types.

The AWC129 is comprised of a high-power coaxial 300 mm (12 in) low frequency driver and 25 mm (1 in) high frequency compression driver. The co-axial design utilizes a unique tapered pole-piece design and transitions to the cone of the low frequency driver as a large diameter pattern control horn for the high frequencies, both eliminating high-frequency beaming which is common among this category of speaker and extending pattern control to the lowest possible frequencies. The result is a coaxial speaker with wide, extremely consistent 90° coverage on a broadband basis.

Component features include a Kevlar-reinforced low frequency cone for reliability, well-damped surround for smooth frequency response, high temperature 75 mm (3 in) voice coil and a reduced distortion design through saturated-gap magnet geometry. The high frequency compression driver features a unique patented design, high temperature polymer diaphragm, and fluid-cooling for high output levels with low distortion.

The paintable enclosure is constructed of thick ABS plus fiberglass and is heavily braced to maximize low-frequency performance. The corrosion-resistant zinc-rich extra-thick powder coated steel grille is backed with open cell foam and high thread-count mesh, providing excellent protection in the harshest environments. The system is rated IP-56, per IEC529 when installed at minimum 5° down-tilt.

The system is equipped with a 200W 70V/100V multi-tap transformer. Connection is made via outdoor-rated terminals in a recessed terminal cup. A protective terminal compartment cover is included, along with gland nut, which forms a water-tight seal with round-jacketed cable having The high frequency compression driver features a unique patented design, high temperature polymer diaphragm, and fluid-cooling for high output levels with low distortion.

A heavy-duty weather-capable zinc-rich, thick powder coated U-type mounting bracket is included.

Light Gray



Specifications:

System:	
Frequency Range (-10 dB):	55 Hz – 20 kHz
Frequency Response (±3 dB):	80 Hz – 20 kHz
Coverage Pattern:	90° x 90°
Directivity Factor:	10.1 (1 k – 16 kHz)
Directivity Index (DI):	9.5 dB (1k – 16 kHz)
Long-Term System Power Rating (IEC):	400 W (1600 W peak), 2 hrs. 250 W (1000 W peak), 100 hrs
Sensitivity (2.83V @ 1m):	96 dB (Ave. 80 Hz – 20 kHz)
Maximum SPL:	Direct 8Ω: 122 dB (peaks of 128 dB) 200 W Tap: 119 dB
Crossover Network:	1.5 kHz, 3rd order (18 dB/oct) high-pass plus conjugate to HF, 2nd order low-pass to LF
Nominal Impedance:	8 ohms
Transformer Taps:	70V: 200W, 100W, 50W, 25W 100V: 200W, 100W, 50W
Transducers:	
Low Frequency Driver:	Kevlar-reinforced cone with weather treatment, 75 mm (3 in) voice coil.
High Frequency Driver:	25 mm (1 in) diaphragm and voice coil diameter, high temperature polymer diaphragm, patented design, fluid-cooling.
HF Driver Protection:	Minimum audibility SonicGuard™ HF overload protection
Physical:	
Enclosure:	ABS with Glass enclosure, heavily braced
Attachment:	Two M10 (fine-thread) points for included U-bracket. M6 secondary safety attachment point on back panel.
Grille:	Corrosion-resistant zinc-rich extra-thick powder coated steel grille, 3-layer assembly with foam and woven poly mesh backing.
Input Connection:	CE-compliant covered barrier strip terminals. Barrier terminals accept up to 8 mm outside 4 mm inside open-lug (#6 or #8) plus bare wire up to 2.5 mm ² (12 AWG) wire or spade lugs. Terminal compartment cover equipped with gland nut that forms water-tight seal with round-jacketed cables with outside diameters between 4.0 mm (0.16") and 9.0 mm (0.36")
Environmental:	IP56 per IEC529, with a minimum 5° downward aiming angle. Exceeds Mil Spec 810 for humidity, salt spray, temperature & UV, and ASTM G85 for salt spray (168 hrs).
Dimensions:	402 x 402 x 445 mm (15.8 x 15.8 x 17.5), cabinet 470 mm (18.5 in) depth with gland nut 542 mm (21.4 in) including bracket extending to back
Colors:	Available in gray (similar to Pantone 420C) and black (-BK)
Net Weight:	15.9 kg (35.0 lb), 18.9 kg (41.5 lb) with u-bracket
Shipping Weight:	23.4 kg (51.5 lbs)
Included Accessories:	U-bracket, matches loudspeaker color (gray or black), zinc-rich extra-thick powder coated, steel.

¹ Full-space (free-field)

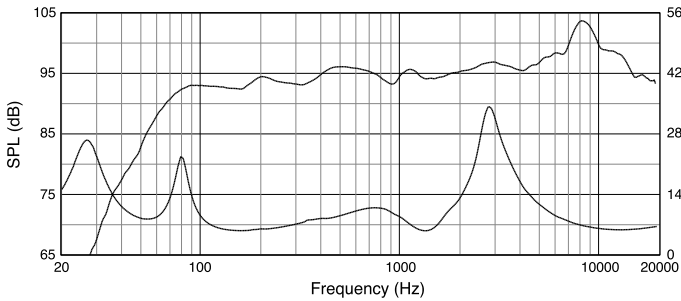
² Average 1 kHz to 10 kHz

³ IEC standard, full bandwidth pink noise with 6 dB crest factor.

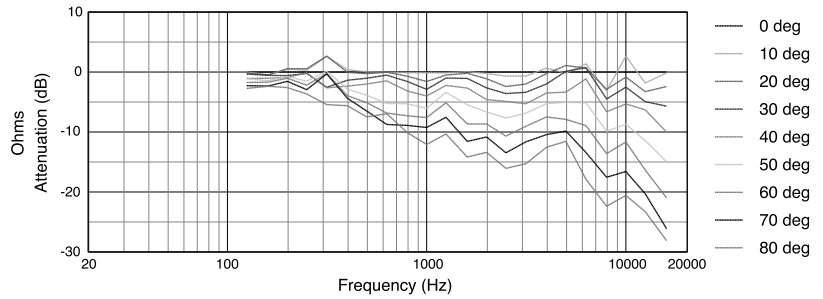
⁴ Calculated based on power rating and measured full-space sensitivity.

▶ AWC129 All-Weather Compact 2-Way Coaxial Loudspeaker with 12" LF

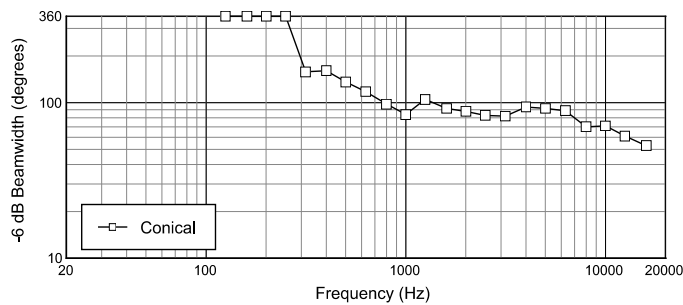
Frequency Response and Impedance



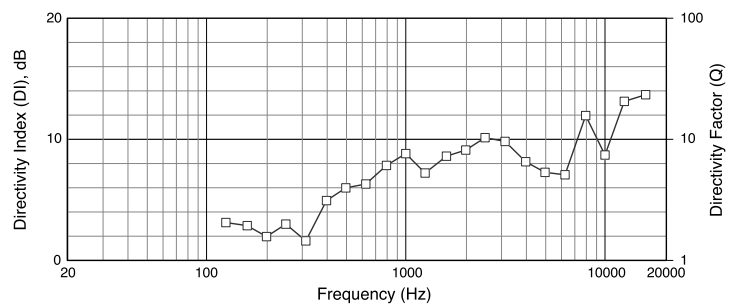
Off-Axis Frequency Response



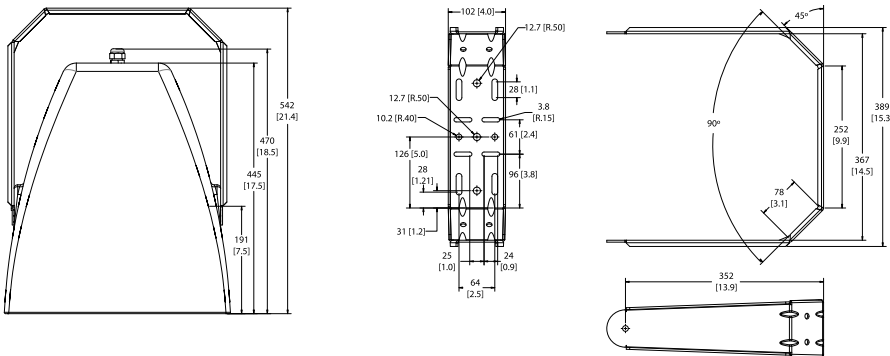
Beamwidth



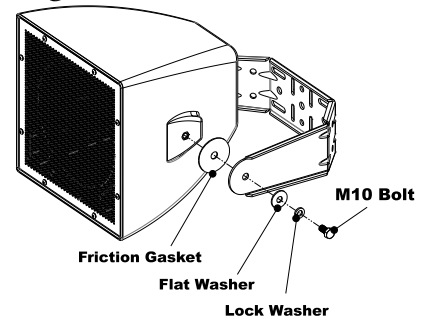
Directivity Index:



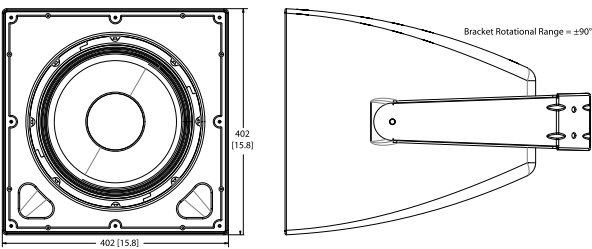
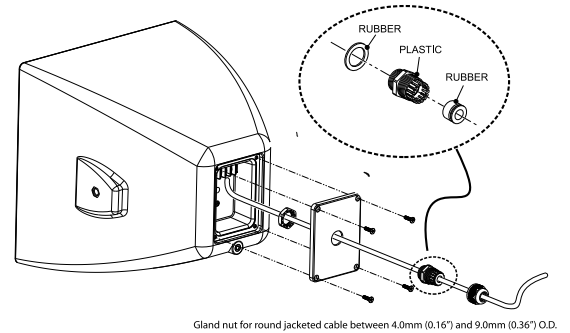
Dimensions



Attaching U-Bracket to Cabinet



Terminal Compartment



Dimensions in mm (in)



JBL Professional
8500 Balboa Boulevard, P.O. Box 2200
Northridge, California 91329 U.S.A.

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www.jblpro.com

SS AWC129
CRP
11/12



Middle Atlantic Products

EXCEPTIONAL SUPPORT & PROTECTION™

DTRK Series 19" Desktop Racks



EIA/TIA Compliant

UL LISTED

Attractive desktop and under-desk equipment mounting solution

Features

- Ships fully assembled
- Steel construction
- Vented and Plexi front doors available
- Brush Grommet rear access panel available
- Optional brackets provide compatibility with the patent-pending LeverLock™ tool free and hardware free internal device and cable management system accessories
- Optional casters for under-desk use
- UL Listed in the US and Canada



Architects and Engineers' Specifications

EIA compliant 19" desktop/under-desk equipment rack shall be Middle Atlantic Products model #DTRK-__18 (see chart for available models). Overall dimensions of DTRK shall be __"H x 21-3/8"W x 19-1/2"D (refer to chart). Useable height of DTRK shall be __ rackspace, useable depth shall be 18-1/2". DTRK shall come equipped with two pairs of steel rackrail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rackspace. Sides of DTRK shall feature vertical slotted vent pattern for ventilation. DTRK shall accept patent-pending LeverLock™ tool free and hardware free internal cable and device management system accessories when used with optional LL-DTRK adapter (10 space + only). DTRK shall be of fully welded construction. DTRK shall be finished in an environmentally friendly, durable metallic grey powdercoat. Fully welded construction shall provide a static capacity of 1,200 lbs. and a UL Listed load capacity of 300 lbs. DTRK shall be UL Listed in the US and Canada. DTRK shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. DTRK enclosure shall comply with the requirements of RoHS EU Directive 2002 / 95 / EC compliant. DTRK shall be manufactured by an ISO 9001 and ISO 14001 registered company. DTRK enclosure shall be warranted to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack.

FEATURED OPTIONS

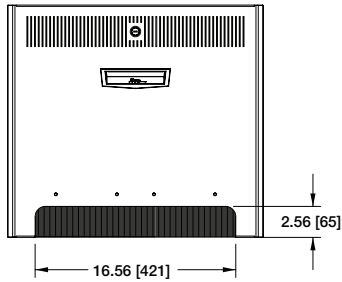
- LeverLock™ tool free and hardware free internal device and cable management system accessories shall be model # LL-XXYY (XX = type, YY = size, refer to middleatlantic.com for additional details)
- Front doors shall be model # DT-VFD-XX (vented), DT-PVFD-XX (plexi/vented)
- Solid rear access panel with brush cable entry shall be model # DT-RAPXX
- Commercial grade caster kit shall add 2-3/4" to overall height, include four casters with a 300 lb. weight capacity, and shall be model # DTRK-W
- Runner kit shall be 5-RS18

CUSTOMIZABLE SPECIFICATION CLIPS AVAILABLE AT MIDDLEATLANTIC.COM

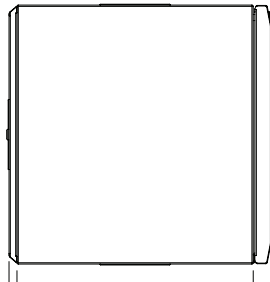
DTRK basic dimensions

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

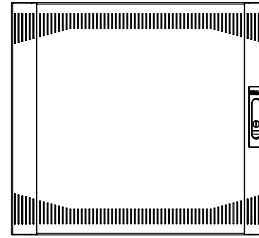
OPTIONAL REAR ACCESS PAN



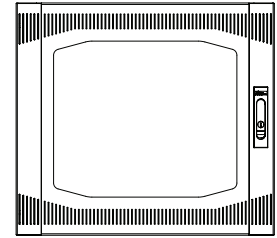
TOP VIEW



OPTIONAL VENTED FRONT DOOR

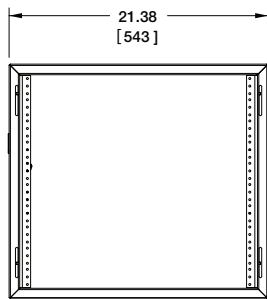


OPTIONAL PLEXI VENTED FRONT DOOR

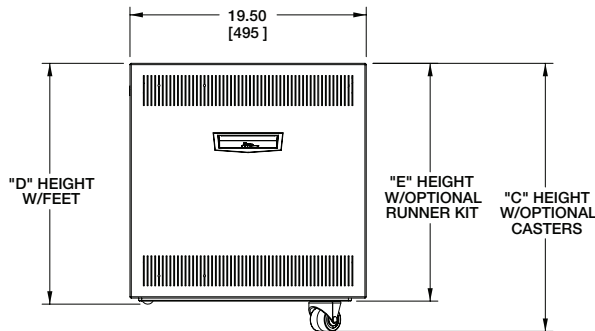


.66 [17]
(OPTIONAL REAR ACCESS PAN)

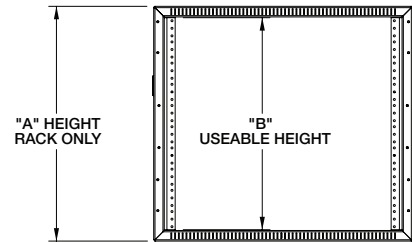
1.54 [39]
(OPTIONAL FRONT DOOR)



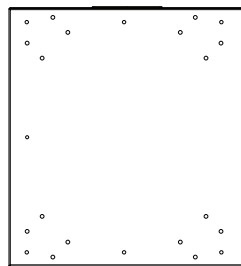
REAR VIEW



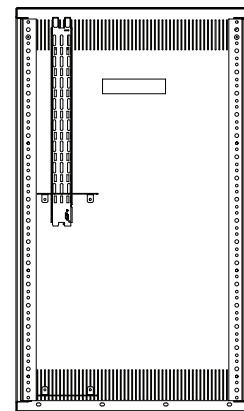
LEFT SIDE VIEW



FRONT VIEW



BOTTOM VIEW



OPTIONAL LEVERLOCK INSIDE VIEW

PART #	"A" HEIGHT RACK ONLY	"B" USEABLE HEIGHT	"C" HEIGHT w/CASTER ADDS 2.75 [70]	"D" HEIGHT w/ FEET ADDS .5 [13]	"E" HEIGHT w/ RUNNER KIT ADDS .25 [6]
Baseball DTRK-718	14.13 [359]	12.25 [311] (7 rackspaces)	16.88 [429]	14.63 [371]	14.38 [365]
Football DTRK-1018	19.38 [492]	17.5 [445] (10 rackspaces)	22.13 [562]	19.88 [505]	19.63 [498]
DTRK-1218	22.88 [581]	21.0 [533] (12 rackspaces)	25.63 [651]	23.38 [594]	23.13 [587]
DTRK-1418	26.38 [670]	24.50 [622] (14 rackspaces)	29.13 [740]	26.88 [683]	26.63 [676]
DTRK-1818	33.38 [848]	31.50 [800] (18 rackspaces)	36.13 [918]	33.88 [860]	33.63 [854]



PL-8C

CLASSIC SERIES POWER CONDITIONERS (15 AMP)



Furman brings together superior protection and outstanding performance in a sturdy, rack-mountable design. Classic Series Power Conditioners feature Series Multi-Stage Protection (SMP), Linear Filtering Technology (LiFT), Extreme Voltage Shutdown (EVS), and offer a new industrial design and full feature set engineered specifically for the A/V professional.



XX
PL-8 C FEATURES

- SMP** SERIES MULTI-STAGE PROTECTION: SURGE PROTECTION
- LiFT** LINEAR FILTERING TECHNOLOGY: NOISE FILTRATION
- EVS** EXTREME VOLTAGE SHUTDOWN: VOLTAGE PROTECTION
- PULL-OUT LIGHTS
- OK** DIAGNOSTIC LIGHTS
- ISOLATED BANKS
- WALL WART SPACING
- 15 A** 15 AMP RATING
- 9** NINE TOTAL OUTLETS
- BNC LAMP CONNECTOR



PL-PLUS C FEATURES

- SMP** SERIES MULTI-STAGE PROTECTION: SURGE PROTECTION
- LiFT** LINEAR FILTERING TECHNOLOGY: NOISE FILTRATION
- EVS** EXTREME VOLTAGE SHUTDOWN: VOLTAGE PROTECTION
- PULL-OUT LIGHTS
- LED VOLTMETER
- OK** DIAGNOSTIC LIGHTS
- ISOLATED BANKS
- WALL WART SPACING
- 15 A** 15 AMP RATING
- 9** NINE TOTAL OUTLETS
- BNC LAMP CONNECTOR



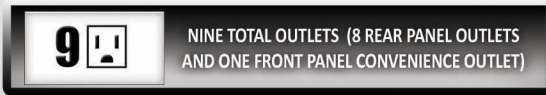
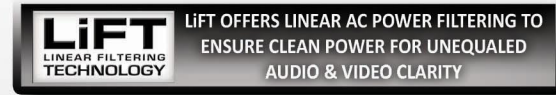
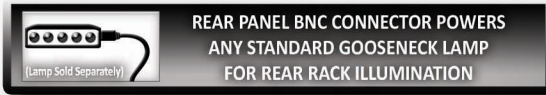
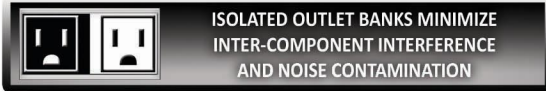
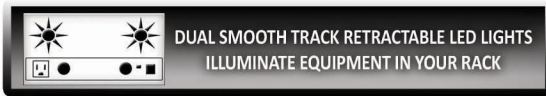
PL-PLUS DMC FEATURES

- SMP** SERIES MULTI-STAGE PROTECTION: SURGE PROTECTION
- LiFT** LINEAR FILTERING TECHNOLOGY: NOISE FILTRATION
- EVS** EXTREME VOLTAGE SHUTDOWN: VOLTAGE PROTECTION
- PULL-OUT LIGHTS
- 120V 4.0A** VOLTMETER/AMMETER
- OK** DIAGNOSTIC LIGHTS
- ISOLATED BANKS
- WALL WART SPACING
- 15 A** 15 AMP RATING
- 9** NINE TOTAL OUTLETS
- BNC LAMP CONNECTOR

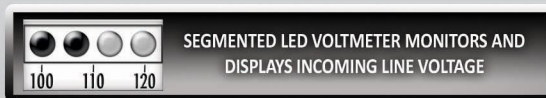


THE POWER OF **FURMAN** TECHNOLOGY

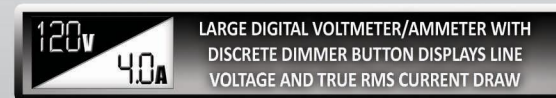
ALL CLASSIC MODELS FEATURE



ADDITIONAL PL-PLUS C FEATURES:



ADDITIONAL PL-PLUS DMC FEATURES:



CLASSIC SERIES REAR PANEL (ALL 15AMP MODELS)



CLASSIC SERIES SPECIFICATIONS

MAXIMUM OUTPUT CURRENT:
15 AMPS

LINE CORD:
CAPTIVE 3/14 AWG, 10 FT BLACK CORD WITH NEMA 15 PLUG

PULL OUT LIGHTS:
TWO MULTI-LED, DIMMABLE LAMPS

BNC SOCKET W/SWITCH:
REAR RACK LAMP, 12VAC 500MA MAX (LAMP NOT INCLUDED)

OPERATING VOLTAGE:
90 TO 139 VAC

OVER VOLTAGE SHUTDOWN:
140 VAC NOMINAL

SPIKE PROTECTION MODES:
LINE TO NEUTRAL, ZERO GROUND LEAKAGE

SPIKE CLAMPING VOLTAGE:
188 VAC PEAK @3,000 AMPS

RESPONSE TIME:
1 NANOSECOND

MAXIMUM SURGE CURRENT:
6,500 AMPS

NOISE ATTENUATION:
10 DB @ 10KHZ, 40 DB @ 100KHZ, 50 DB @500 KHZ

DIMENSIONS:
19" W x 10.5" D x 1.75" H

WEIGHT:
12 LBS.

POWER CONSUMPTION:
12 WATTS

UTILITY DRAWER, 2 RU

UD2 |



FEATURES & BENEFITS

The UD Series drawers offer an economical rack storage solution. Full extension ball bearing slides extend a full 14" to reveal inside dimensions measuring 15-7/8" wide by 14-1/2" deep. Each model comes with a face formed drawer pull. User-installed latch and keylock are available options. Black powder coat finish.



PRODUCT
ENVIRONMENTAL PROFILE

- Drawer has fully enclosed design to keep contents secure
- Shipped fully assembled and ready to install
- Steel construction with black powder coat finish
- Accepts optional user-installed keylock (KYLK) or latch (LATCH)

SPECIFICATIONS

GENERAL INFO

Finish: Black Powder Coat
UL Standards Tested: 1678

ASSEMBLY/INSTALLATION INFORMATION

Mounting Points: 2

LISTING AGENCIES/THIRD PARTY CERTIFICATIONS

RoHS: Yes
Greenguard: Yes

DIMENSIONS

Capacity Weight (US): 50
Depth (US): 15.85
Height (US): 3.5
Width (US): 19

Rack Units: 2

TECHNICAL INFORMATION

Static Load Capacity: 50

UL Load Capacity: 50

Material: Steel

4X600 & 2X12



Features

DriveCore™ Technology – Crown’s proprietary DriveCore technology eliminates hundreds of components within each amplifier, reducing the variability of component values, increasing reliability, resulting in incredible audio fidelity from an efficient design.

Network Control and Monitoring – Through HARMAN’s HiQnet Audio Architect software, the CDi DriveCore can be controlled, configured, and monitored through standard TCP/IQ network.

DSP – On-board Digital Signal Processor in each amplifier allows for custom configuration and includes these integrated features:

- Input Router
- Input Delay – Up to 1000ms
- Input Parametric EQ – 8 band
- Crossover
- Output Parametric EQ – 8 band
- Output Delay – Up to 100ms
- LevelMAX™ Limiter

BLU link (BL models only) – Both receive and send channels over HARMAN’s 256 channel, fault-tolerant audio BUS, BLU link.

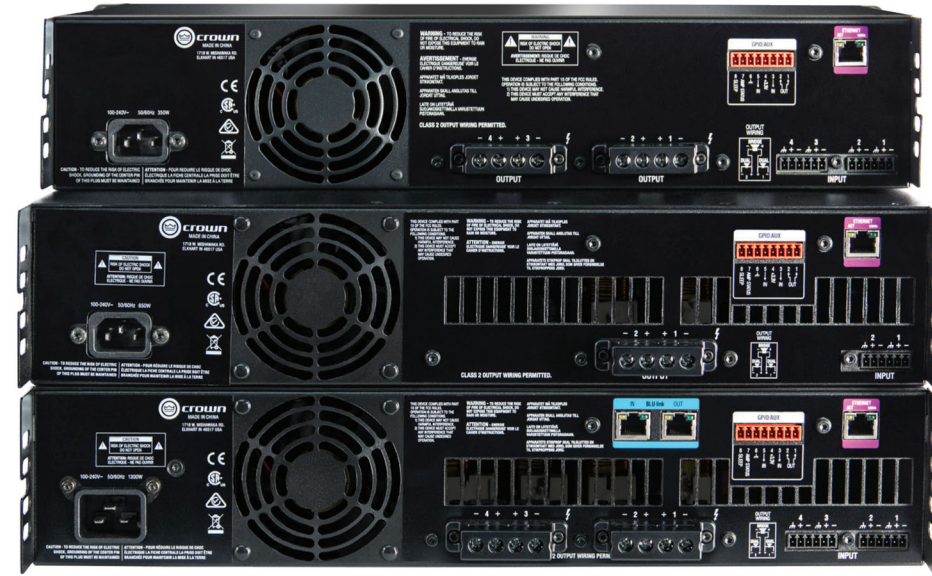
Direct Drive 70/100Vrms Output – Each output channel is capable of providing either 70V or 100V for high impedance applications.

Front-Panel Interface – Completely configure the amplifier using an intuitive front-panel interface.

GPIO/AUX Port – Recall presets, mute channels, monitor faults, power on/off the amplifier, and more through a combined GPIO/AUX Port.

Pre-loaded Speaker Tunings – For quicker and easier setup and installation.

CDI DriveCore™ Series



CDi DriveCore 4|600, 2|1200 and 4|1200BL models shown

Specifications

Input Sensitivity

Amp Model	8Ω			70Vrms			100Vrms		
	37dB Gain Mode	34dB Gain Mode	26dB Gain Mode	37dB Gain Mode	34dB Gain Mode	26dB Gain Mode	37dB Gain Mode	34dB Gain Mode	26dB Gain Mode
2 300 / 2 300BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)
4 300 / 4 300BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)
2 600 / 2 600BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)
XX 4 600 / 4 600BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)
XX 2 1200 / 2 1200BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV) 150W	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)
4 1200 / 4 1200BL	0.7Vrms (-0.8dBu, -3.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	2.5Vrms (10.2dBu, 8.0dBV)	1.0Vrms (2.2dBu, 0.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	3.5Vrms (13.2dBu, 11.0dBV)	1.4Vrms (5.2dBu, 3.0dBV)	2.0Vrms (8.2dBu, 6.0dBV)	5.0Vrms (16.2dBu, 14.0dBV)

CDI DriveCore™ Series



Output Power: Dual Mode – All Channels Driven

Amp Model	Channels	2Ω	4Ω	8Ω	16Ω	70Vrms	100Vrms
2 300 / 2 300BL	2	150W	300W	300W	150W	300W	300W
4 300 / 4 300BL	4	150W	300W	300W	150W	300W	300W
2 600 / 2 600BL	2	300W	600W	600W	300W	600W	600W
X 4 600 / 4 600BL	4	300W	600W	600W	300W	600W	600W
X 2 1200 / 2 1200BL	2	850W	1200W	1200W	600W	1200W	1200W
4 1200 / 4 1200BL	4	850W	1200W	1200W	600W	1200W	1200W

Minimum Guaranteed Power (1kHz, all channels driven, max distortion 0.5%, duration 0.5 seconds, 120 – 240Vrms –50/60Hz)

Output Power: Bridge Mono Mode – All Channels Driven

Amp Model	4Ω	8Ω	16Ω	140Vrms	200Vrms
2 300 / 2 300BL	300W	600W	600W	600W	600W
4 300 / 4 300BL	300W	600W	600W	600W	600W
2 600 / 2 600BL	600W	1200W	1200W	1200W	1200W
X 4 600 / 4 600BL	600W	1200W	1200W	1200W	1200W
X 2 1200 / 2 1200BL	1200W	2400W	2400W	2400W	2400W
4 1200 / 4 1200BL	1200W	2400W	2400W	2400W	2400W

Minimum Guaranteed Power (1kHz, all channels driven, max distortion 0.5%, duration 0.5 seconds, 120 – 240Vrms –50/60Hz)

CDI DriveCore™ Series

Performance Specifications

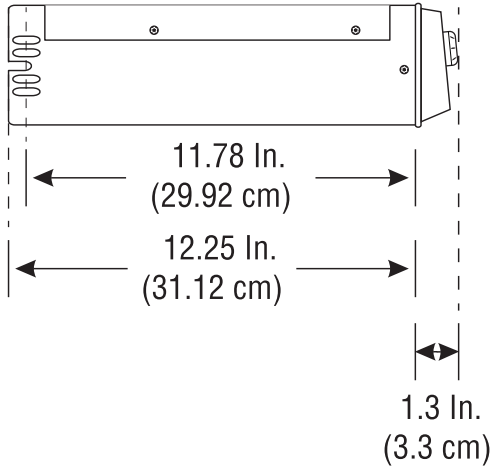
Specification Description	2 300 / 2 300BL	4 300 / 4 300BL	2 600 / 2 600BL	4 600 / 4 600BL	2 1200 / 2 1200BL	4 1200 / 4 1200BL
Digital Signal Processing	96kHz, 32-bit floating point	96kHz, 32-bit floating point	96kHz, 32-bit floating point	96kHz, 32-bit floating point	96kHz, 32-bit floating point	96kHz, 32-bit floating point
Voltage Gain (at maximum level setting) 4/8Ω, 70Vrms and 100Vrms Operation	34dB	34dB	34dB	34dB	34dB	34dB
Frequency Response (8Ω, 20Hz - 20kHz)	+/-0.5dB	+/-0.5dB	+/-0.5dB	±0.25dB	±0.25dB	±0.25dB
BLU link Signal-to-Noise Ratio (ref. rated power, 100V, 20Hz - 20kHz)	>108dB	>108dB	>108dB	>108dB	>108dB	>108dB
Total Harmonic Distortion (at full rated power, from 20Hz - 20kHz)	0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Analog Input Signal to Noise Ratio (ref. rated power, 100V, 20Hz - 20kHz)	>104dB	>104dB	>104dB	>104dB	>104dB	>104dB
Intermodulation Distortion (60Hz and 7kHz at 4:1, from -30dB to full rated power)	≤0.35%	≤0.35%	≤0.35%	≤0.35%	≤0.35%	≤0.35%
Damping Factor (20Hz to 100Hz)	>1000	>1000	>1000	>1000	>1000	>1000
Crosstalk (below rated power, 20Hz to 1kHz)	>80dB	>80dB	>80dB	>80dB	>80dB	>80dB
Common Mode Rejection (20Hz to 1kHz, typical)	>70dB	>70dB	>70dB	>70dB	>70dB	>70dB
DC Output Offset (with inputs shorted)	±10mV	±10mV	±10mV	±10mV	±10mV	±10mV
Input Impedance (Nominally balanced, nominally unbalanced)	20 kΩ balanced, 10 kΩ unbalanced	20 kΩ balanced, 10 kΩ unbalanced	20 kΩ balanced, 10 kΩ unbalanced	10 kΩ balanced, 5 kΩ unbalanced	10 kΩ balanced, 5 kΩ unbalanced	10 kΩ balanced, 5 kΩ unbalanced
Maximum Input Level (Low Amp Gain Mode)	+20dBu	+20dBu	+20dBu	+20dBu	+20dBu	+20dBu
Required AC Mains (±10%)	100V – 240V~ 50/60Hz	100V – 240V~ 50/60Hz	100V – 240V~ 50/60Hz	100V – 240V~ 50/60Hz	100V – 240V~ 50/60Hz	100V – 240V~ 50/60Hz
Cooling	Continuously variable speed forced air, front-to-back airflow	Continuously variable speed forced air, front-to-back airflow	Continuously variable speed forced air, front-to-back airflow	Continuously variable speed forced air, front-to-back airflow	Continuously variable speed forced air, front-to-back airflow	Continuously variable speed forced air, front-to-back airflow
Power Supply Connector	Standard IEC type 320 inlet for detachable connector 100 – 240V~	Standard IEC type 320 inlet for detachable connector 100 – 240V~	Standard IEC type 320 inlet for detachable connector 100 – 240V~	15A IEC connector, 100 – 240V	15A IEC connector, 100 – 240V	20A IEC connector, 100 – 240V
Load Impedance Stereo/Dual Mode	2Ω - 16Ω; 70Vrms and 100Vrms	2Ω - 16Ω; 70Vrms and 100Vrms	2Ω - 16Ω; 70Vrms and 100Vrms	2Ω - 16Ω; 70Vrms and 100Vrms	2Ω - 16Ω; 70Vrms and 100Vrms	2Ω - 16Ω; 70Vrms and 100Vrms
Load Impedance Bridge Mono	4Ω - 16Ω; 140Vrms and 200Vrms	4Ω - 16Ω; 140Vrms and 200Vrms	4Ω - 16Ω; 140Vrms and 200Vrms	4Ω - 16Ω; 140Vrms and 200Vrms	4Ω - 16Ω; 140Vrms and 200Vrms	4Ω - 16Ω; 140Vrms and 200Vrms
Maximum Fan Noise (re dB SPL @ 1M)	51dBA	51dBA	51dBA	51dBA	54 dBA	54dBA
Weight	14.56 lbs (6.6 kg)	16.13 lbs (7.31 kg)	14.56 lbs (6.6 kg)	16.3 lbs (7.39 kg)	17.2 lbs (7.8 kg)	20.1 lbs (9.12 kg)

CDI DriveCore™ Series

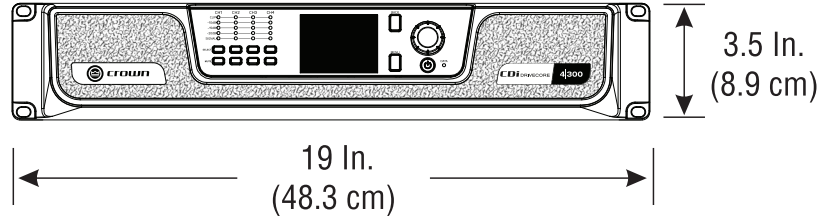
Dimensions

2|300 / 2|300BL / 4|300 / 4|300BL / 2|600 / 2|600BL / 4|600 / 4|600BL

Depth

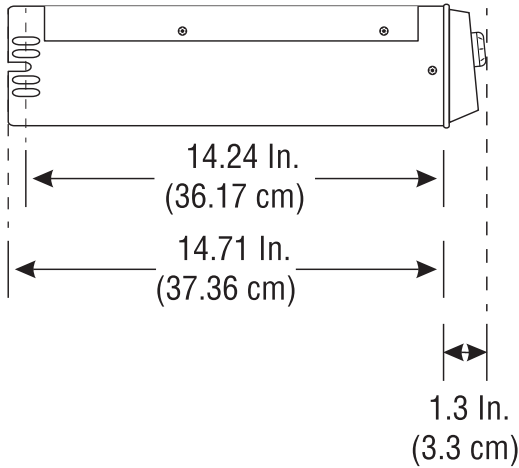


Width / Height

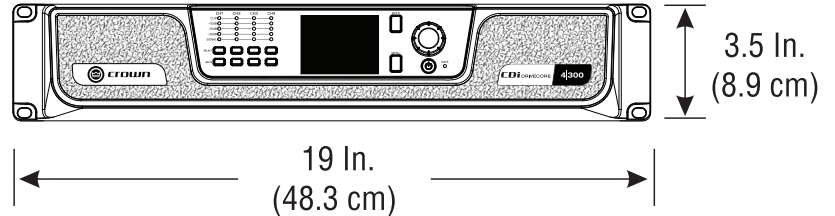


2|1200 / 2|1200BL / 4|1200 / 4|1200BL

Depth

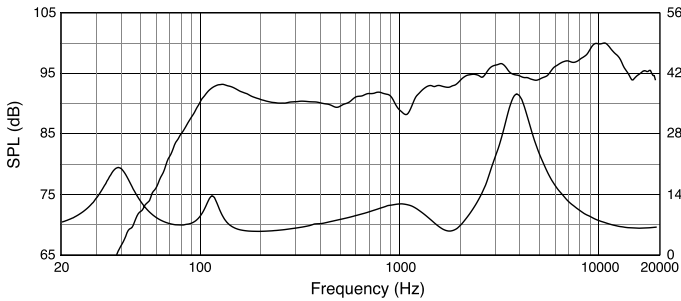


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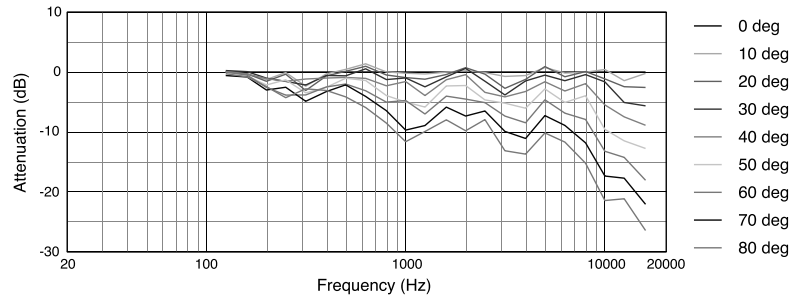


▶ AWC82 All-Weather Compact 2-Way Coaxial Loudspeaker with 8" LF

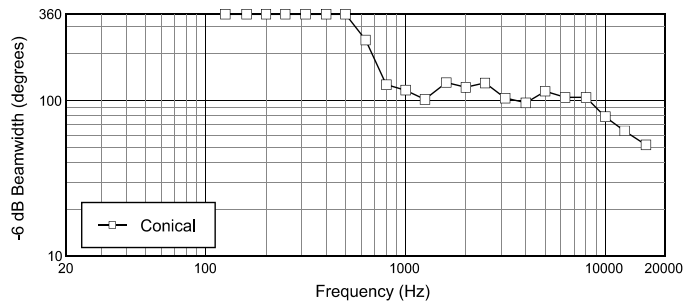
Frequency Response and Impedance



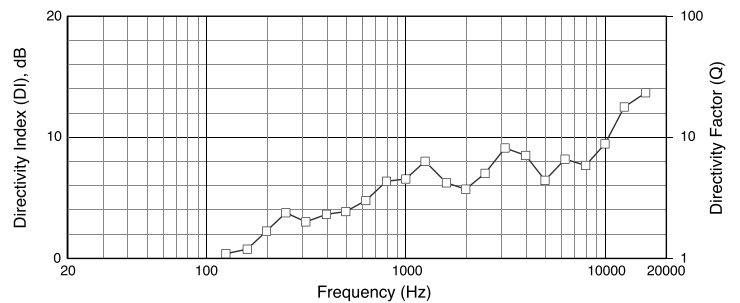
Off-Axis Frequency Response



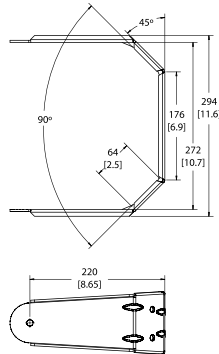
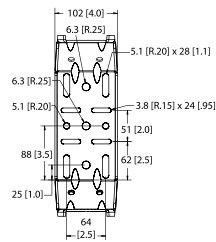
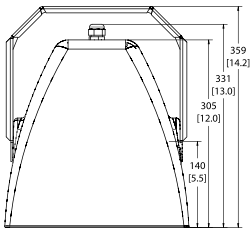
Beamwidth



Directivity Index:

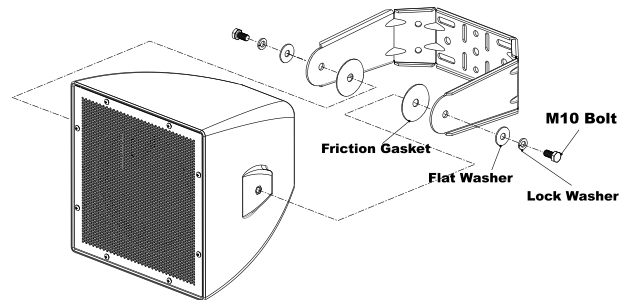


Dimensions

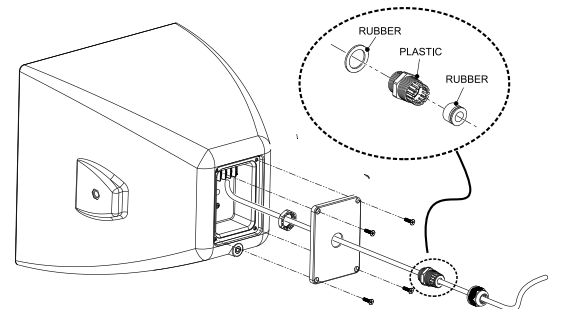
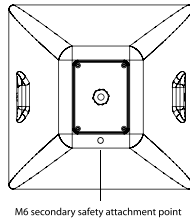
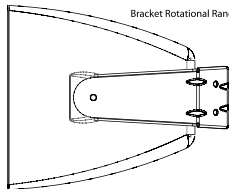
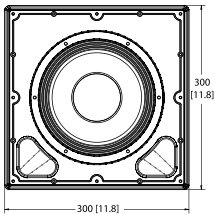


Dimensions in mm (in)

Attaching U-Bracket to Cabinet



Terminal Compartment



Gland nut for round jacketed cable between 4.0mm (0.16") and 9.0mm (0.36") O.D.



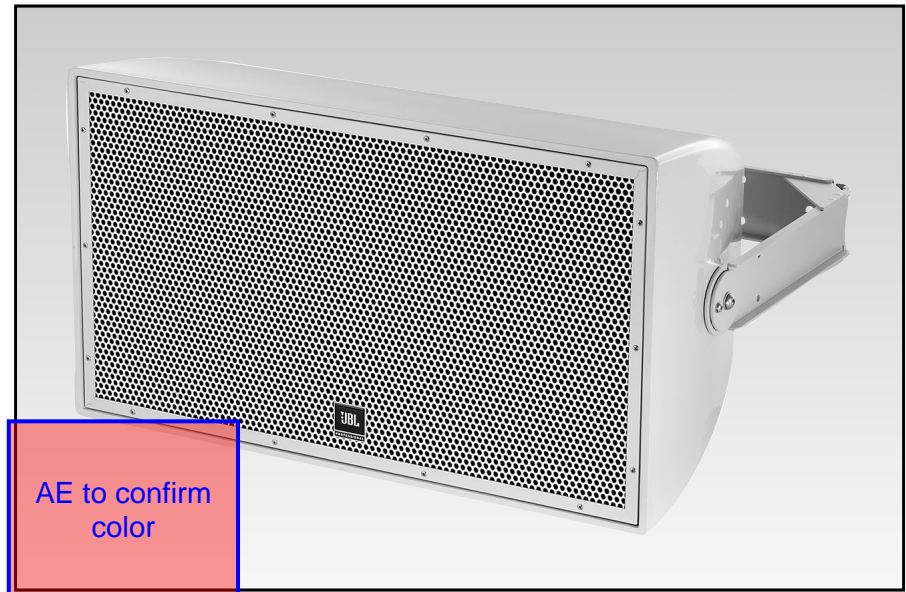
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SS AWC82
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Professional Series

Key Features:

- ▶ Weather-Resistant, All Fiberglass Enclosure
- ▶ 90° x 50° Coverage
- ▶ 2262H Differential Drive® Low-Frequency Driver
- ▶ 2432H High Frequency Compression Driver
- ▶ Large PT™ Progressive Transition waveguide for excellent pattern control and low distortion
- ▶ Rotatable wave guide for vertical or horizontal orientation
- ▶ Available in Gray and Black finish
- ▶ 400 W, 70/100V Transformer Included
- ▶ U-type Mounting Bracket Included



Applications:

- ▶ Sports Facilities
- ▶ Themed Entertainment Venues
- ▶ Outdoor Entertainment Centers
- ▶ Cruise Ships
- ▶ Water Parks

The AW295 is a high power, lightweight, 2-way, full-range loudspeaker system comprised of the JBL Differential Drive dual voice coil and dual magnetic gap 2262H 300 mm (12 in) low-frequency driver and 2432H high-frequency 38 mm (1.5 in) exit, 75 mm (3 in) voice-coil compression driver. The large format Progressive Transition wave-guide provides excellent 90° x 50° coverage. The waveguide is rotatable so the loudspeaker system can be used in either the vertical or horizontal orientation.

The enclosure is constructed of multilayer glass composite and is heavily braced to maximize low-frequency performance. The 16-gauge stainless steel grille, backed with open cell foam and stainless steel mesh, provides excellent protection in the harshest environments. The system can be operated as an 8-ohm device and is equipped with a 400W transformer for 70/100V applications.

A corrosion-resistant extra-thick zinc-plated polyester powder coated U-type mounting bracket is included.

The AW295 is part of JBL's AE Series, a versatile family of loudspeakers intended for a wide variety of applications.

Specifications:

System:	
Frequency Range (-10 dB):	43 Hz – 20 kHz
Frequency Response (±3 dB):	53 Hz – 18 kHz
Coverage Pattern:	90° x 50°, rotatable waveguide
Directivity Factor (Q):	12.6
Directivity Index (DI):	11 dB
Crossover Frequency:	1.3 kHz
Long-Term System Power Rating (IEC):	500 W (2000 W peak), 100 hrs
Maximum SPL:	126 dB-SPL cont avg (132 dB peak)
System Sensitivity (1W @ 1m):	98 dB SPL
70V / 100V Transformer Taps:	70V: 400 W, 200 W, 100W 100V: 400W, 200W
Transducers:	
<u>Low Frequency Driver:</u>	1 x JBL 2262H 300 mm (12 in) Differential Drive® driver with 75 mm (3 in) dual voice coil
Nominal Impedance:	8 ohms
Sensitivity ¹ (1W @ 1m, within operational band):	96 dB SPL
<u>High Frequency Driver:</u>	JBL 2432H, 38 mm (1.5 in) exit compression driver, 75 mm (3 in) voice coil
Nominal Impedance:	8 ohms
Sensitivity ² (1W @ 1m):	113 dB SPL
<u>Waveguide:</u>	PT-H95HF-1
Physical:	
Enclosure:	Hand-Laminated Fiberglass, gray gelcoat (similar to Pantone 420C), available in black (-BK)
Suspension Attachment:	2 x M10 for Included U-Bracket, 2 x M6 for aiming stabilization, 1 x M10 on rear for safety.
Grille:	Three layer grille assemblies consisting of 16-gauge powder coated stainless steel, backed with open cell foam and stainless steel mesh.
Input Connector:	CE-compliant covered barrier strip terminals. Barrier terminals accept up to 5.2 sq mm (10 AWG) wire or max width 9 mm (.375 in) spade lugs.
Environmental Specifications:	IP55C per IEC529.
Dimensions (H x W x D in horizontal cabinet orientation):	409 x 732 x 452 mm (16.1 x 28.8 x 17.8 in)
Net Weight:	25.2 kg (55.5 lb)

¹IEC standard, full bandwidth pink noise with 6 dB crest factor, 100 hours.

²Calculated based on power rating and sensitivity, exclusive of power compression.

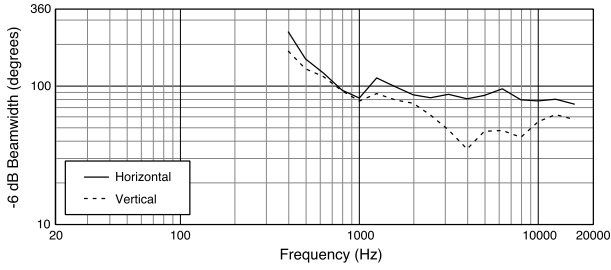
³Anechoic sensitivity in free field, no additional sensitivity gain from boundary loading.

⁴Per EN54-24 Components of voice alarm system - loudspeakers 70V/400W (35V RMS, 70V peak), 100V/400W (50V RMS, 100V peak)

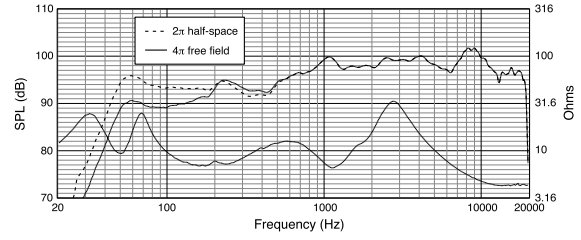
JBL continually engages in research related to product improvement. Changes introduced into existing products without notice are an expression of that philosophy.

▶ AW295 High Power 2-Way All Weather Loudspeaker with 1 x 12" LF & Rotatable Horn

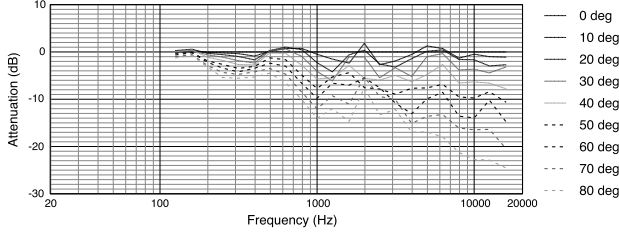
Beamwidth



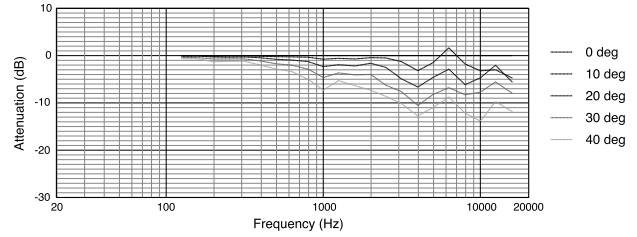
Frequency Response and Impedance



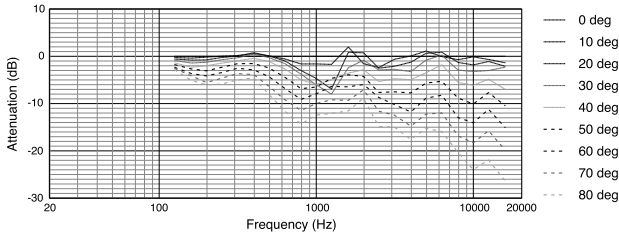
Horizontal Off-Axis Frequency Response Right



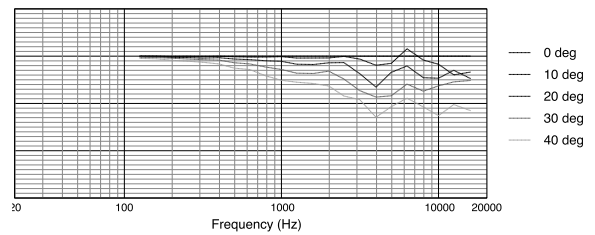
Vertical Up Off-Axis Frequency Response



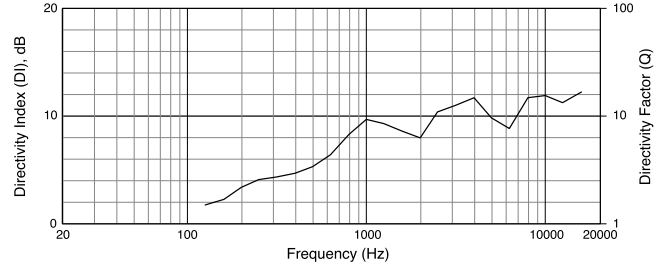
Horizontal Off-Axis Frequency Response Left



Vertical Down Off-Axis Frequency Response



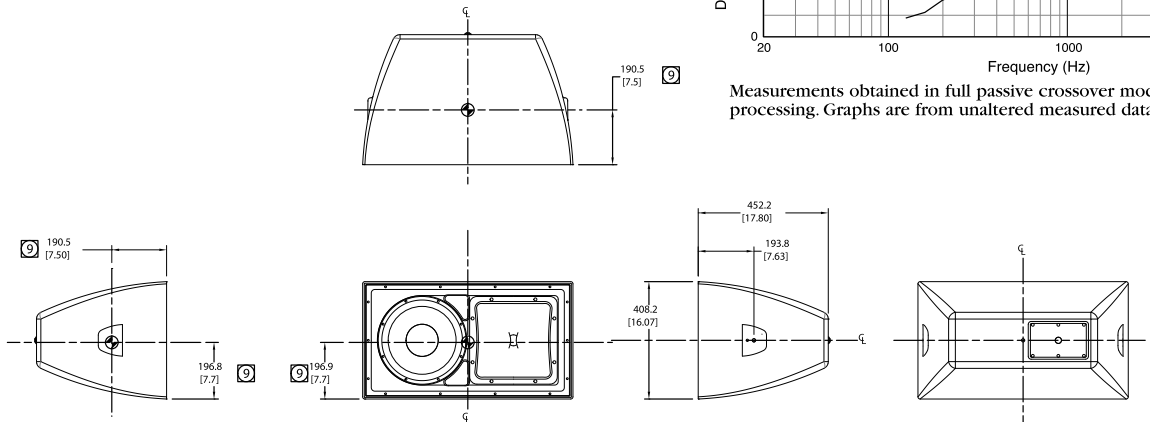
Directivity Index, Q



Dimensions

Dimensions in mm (in)

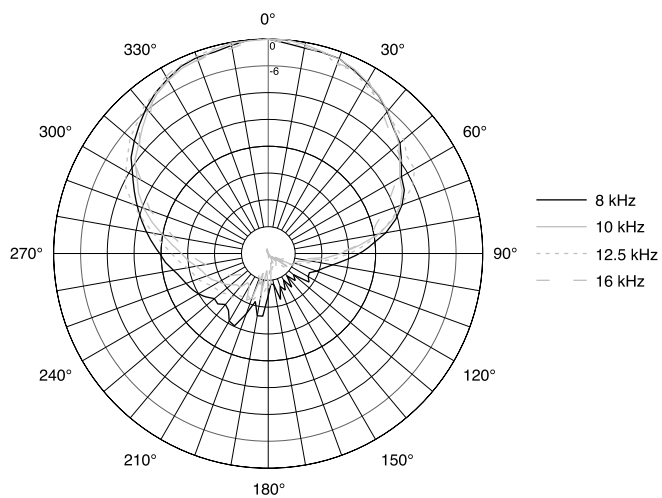
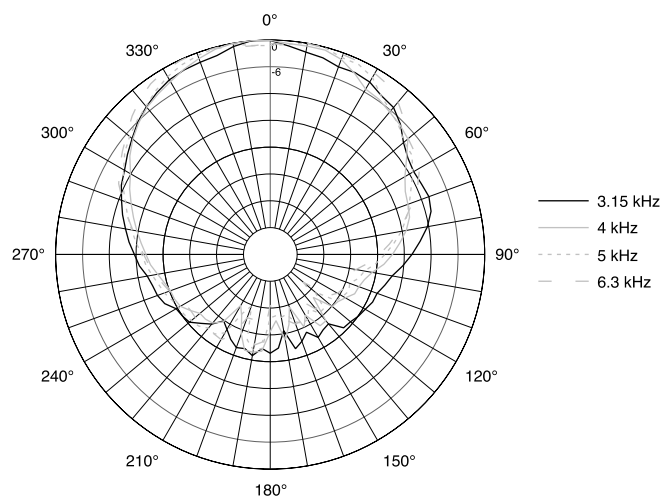
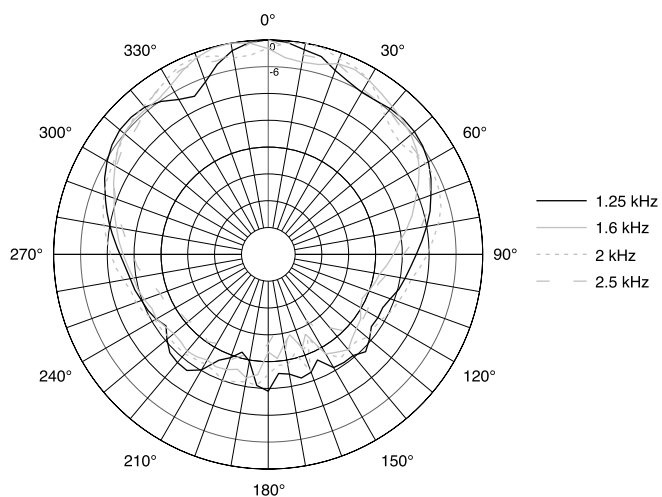
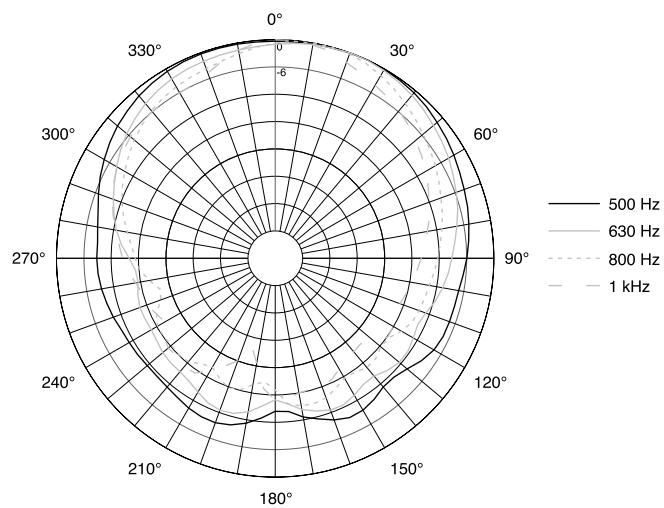
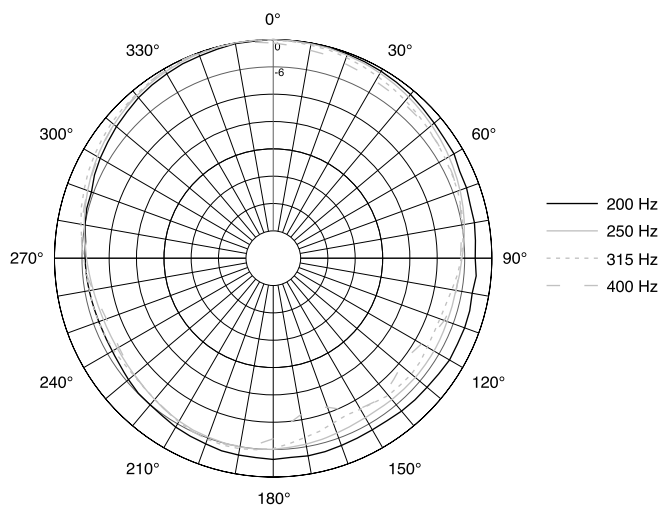
For more detailed dimensional information, refer to Application Data Sheet



Measurements obtained in full passive crossover mode with no signal processing. Graphs are from unaltered measured data.

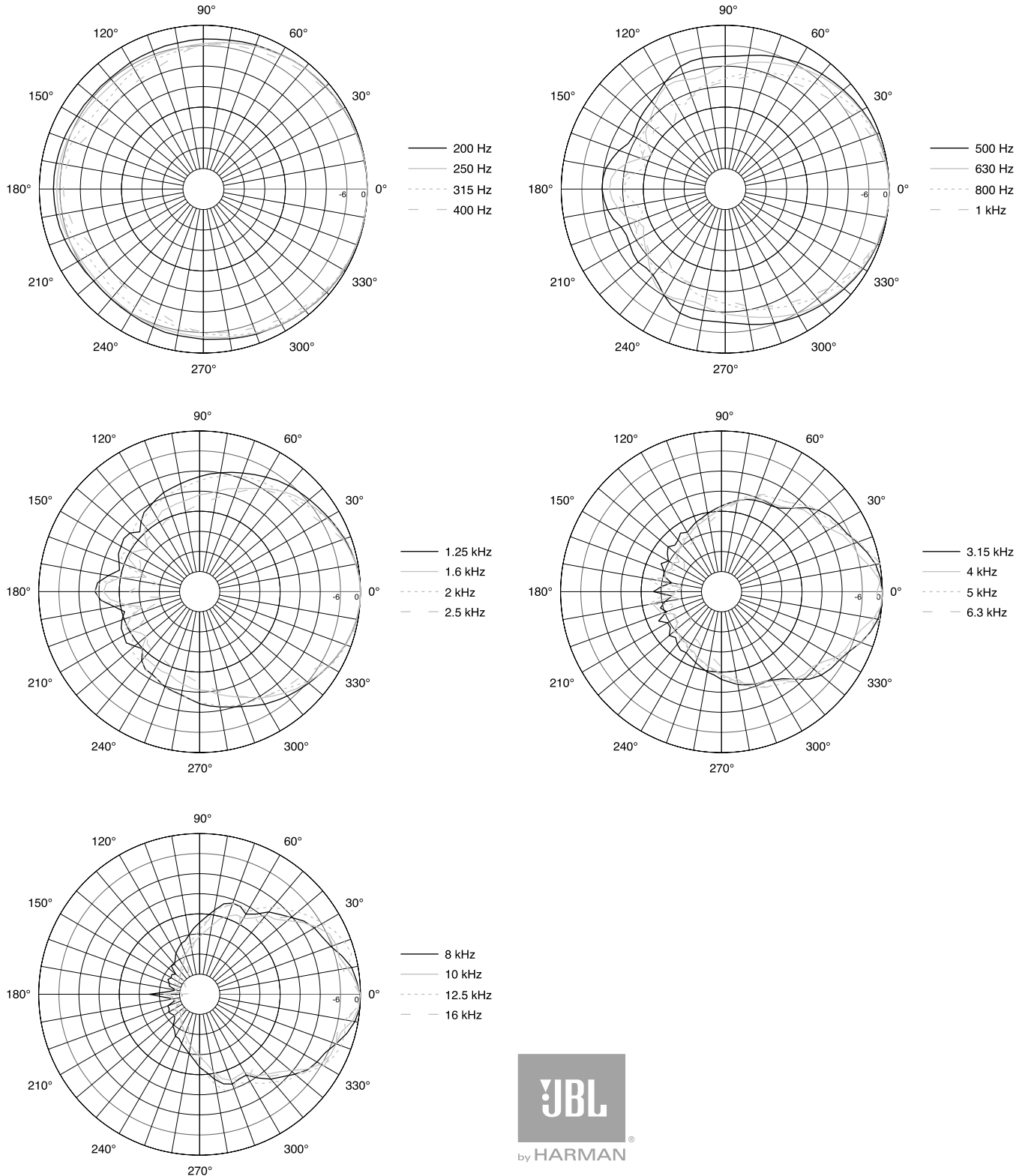
INDICATED DIMENSIONS ARE TO CENTER OF GRAVITY (CG)

Horizontal 1/3 Octave Polars



▶ AW295 High Power 2-Way All Weather Loudspeaker with 1 x 12" LF & Rotatable Horn

Vertical 1/3 Octave Polars



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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)	
Audio	
Frequency Response	50 Hz - 15 kHz (±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)	
Controls	
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
Indicators	
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)
RF	
Frequency Range	72.025 - 75.950 MHz
Number of Channels	17 wide band, 40 narrow band
Frequency Accuracy	± .005% stability +32° to +122 °F (0° to +50 °C)
Antenna Type	Various antennas available
Transmitter Stability	50 PPM
Transmission Range	Up to 305 m (1,000 ft.)
Antenna Connector	BNC, 50 Ohms (Use RG-58 < 100 ft or RG-8 > 100ft)
Output Power	80,000 uV at 3 m
Number of Simultaneous Transmitters	6
Power	
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
Physical	
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)	
Environmental	
Temperature - Operation	-10 °C (14 °F) to +40 °C (104 °F)
Temperature - Storage	-20 °C (-4 °F) to +50 °C (122 °F)
Relative Humidity	0 to 95% relative humidity, non condensing
Compliance	
Safety	RoHS
RF	FCC Part 15, Part 90, Industry Canada

Part is just based off
of previous rooms



Configuration:

LP-40-072-01 Intelligent DSP RF Receiver
6-Pack (72 MHz)

Product Overview:

For businesses, schools, or venues that need to add more capacity to their existing 72 MHz RF system, the LP-40-072 Intelligent DSP RF Receiver 6-Pack includes everything needed to provide more customers and clients with exceptional assistive listening audio performance.

Each pack includes six (6) 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.

Highlights:

- Includes six (6) LR-4200-072 industry leading RF receivers
- 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:

Six (6) 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.



Product Overview:

The LA-304 Assistive Listening Notification Signage Kit helps you achieve compliance with assistive listening regulations while also ensuring that visitors know about your system's availability. Each kit includes one (1) clearly printed plaque and one (1) window sticker, each of which is easily mounted in a convenient and highly visible location in your venue.

Highlights:

- Clearly communicates the availability of your assistive listening system
- Meets compliance requirements for assistive listening signage
- Includes hard placard sign and window cling for convenient placement

Includes:

One (1) Hard Plaque
 One (1) Static Cling Window Sticker

Product Specification: Assistive Listening Notification Signage Kit	
Physical	
Shipping Weight	1 lb. (0.5 kg)
Weight	6 oz. (170 g)
Dimensions	Hard Plaque: 7 in. (178 mm) x 10 in. (254 mm) Soft Cling: 7 in. (178 mm) x 10 in. (254 mm)