

IN-CEILING CLASSROOM AUDIO SYSTEM

1.1 REGULATORY REQUIREMENTS

- A. Conform to (applicable) (specify specific citations) building code for requirements applicable to work specified herein.
- B. Conform to appropriate sections of (specify) with regard to applicable requirements (specify).

1.2 QUALITY ASSURANCE

A. Qualifications

- 1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
 - a. Certificate: when requested, submit certificate indicating qualification.
- 2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.

B. Acceptable Manufacturers

- 1. Basis of Design: Lightspeed Technologies, 11509 SW Herman Road, Tualatin, OR 97062, PH 800-732-8999, FAX 503-684-3197

C. Manufacturer Testing: Manufacturer to provide quality assurance certification for each system and all of its components. A report for each system will be available upon request. Report will include serial numbers and pertinent testing data for all of the system functions.

D. Successful third party installation (when needed) will be supplied with necessary training to allow for product installation certification by Manufacturer and will be installed according to Lightspeed recommendations.

1.3 SUBMITTALS

A. General: Submit listed submittals in accordance with “Conditions of the Contract”.

B. Manufacturer’s data on all products including but not limited to:

- 1. Catalog cut sheets
- 2. Installation instructions
- 3. Typical wiring diagrams
- 4. Drawings showing speaker locations
- 5. Operation and maintenance manuals
- 6. Manufacturer’s warranty documents
- 7. Manufacturer’s parts lists
- 8. Product serial numbers

1.4 WARRANTY

A. Warranty: Refer to “Conditions of the Contract” for warranty and repair provisions.

B. Repair: Manufacturer shall offer repair service on all Classroom Audio components. Owner shall pre-pay shipping for all items returned to manufacturer for repair. The

Manufacturer shall repair or replace system components as specified under warranty. Manufacturer shall ship repaired components within five (5) working days of receipt. Items returned to Owner are shipped via the same method in which they were received.

- C. Manufacturer's Warranty: All the major system components (transmitters, receiver-amplifier, sensor, and speakers) must be warranted for five years against defects occurring while used in normal classroom instruction. The warranty shall be equivalent to a Lightspeed Technologies' Five-Year Warranty.
 - 1. Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.

1.5 OVERALL SYSTEM DESCRIPTION

- A. The system must have specifications and features that are equivalent to the Lightspeed Topcat[®] In-Ceiling Classroom Audio System including the following:
 - 1. All-in-one, in-ceiling audio system with integrated amplifier, speakers and wireless audio receiver/transmitter
 - 2. Two-way hybrid speaker system with exciter technology sound panel and low frequency cone driver
 - 3. Cross over technology to deliver high speech intelligibility and full range sound with even distribution throughout the classroom
 - 4. Up to 2 microphones for whole room instruction, team-teaching or student sharing
 - 5. Pendant-style Flexmike[®] classroom microphone with audio input utilizing Access Technology (1.9 GHz) for transmission. IR not acceptable
 - 6. Wireless Media Connector utilizing Access Technology (1.9 GHz) to integrate with and wirelessly transmit all classroom multimedia to be played through the Topcat
 - a. Includes 4 audio inputs with volume control
 - b. 2 audio outputs for ALD and/or recording with volume control
 - c. Tone control to remotely adjust bass/treble of Topcat
 - 7. Optional PageFirst emergency page priority
 - 8. In-Ceiling mounted
 - 9. Suitable for use in air-handling spaces (plenum-rated)
 - 10. Compatible with Flexcat speaker pods with 2-way audio communication
- B. The system must produce high speech intelligibility and full-range multimedia quality sound with excellent distribution throughout a classroom.
- C. The system must be capable to be installed in a classroom with no wires installed in or on the walls. The system must be fully operational without speaker wires or sensor cables.
- D. The system must be compatible and expandable to operate with 2-way small group speaker pods allowing interoperability between both small group and whole group instruction.
- E. The system shall carry a "No Audio Dropout Guarantee" between the wireless microphone and the sound system. The guarantee applies to operation in any room up to its expected range of 200 feet (assuming no walls). The guarantee does not extend into other rooms separated by walls as this can limit transmission range significantly. Should any dropout in audio transmission occur, the manufacturer will correct it at no additional charge.

- F. The system shall carry a standard warranty equivalent to the Lightspeed 5-year Warranty.

1.6 OWNER INSTRUCTION

- A. Owner's Instruction: user-training will be performed by the manufacturer's local representative. The training will include the research and benefits of classroom amplification, system operation, simple troubleshooting guidelines, and incorporating the classroom amplification into teaching styles. The manufacturer will also provide additional training in trouble-shooting techniques and product return procedures to one specified person per campus. This service shall be rendered to the Owner at no additional cost.
- B. Instruction materials and detailed Owner's manual shall be provided to cover operational and basic maintenance procedures.

PART 2. PRODUCTS

2.1 IN-CEILING CLASSROOM AUDIO SYSTEM SPECIFICATIONS

A. Overall System:

1. Power output: 20 Watts rms
2. Acoustic Frequency response: 60 Hz to 18 kHz -10dB
3. AC Mains Power Input: 100-240V ~ 50/60Hz 1.5A
4. DC Power Input: 24V/2.5A
5. Signal-to-noise: 60 dB
6. Total Harmonic Distortion: <1%, 10 W
7. Wireless Communication: Access Technology (1.9 GHz + RF4CE)
8. Automatic power on when Flexmike is powered on and linked
9. Dimensions (W x D x H): 24" x 12" x 3.7" (Removable side spacers to fit international ceiling grids; 595mm x 295mm x 94mm)
10. Weight: 13.5 lbs (6.1 kg)
11. Controls:
 - a. (1) Microphone volume control
 - b. (1) Tone control
 - c. (1) Audio input volume control
 - d. (1) PageFirst sensitivity adjustment
12. Connections:
 - a. (1) Direct AC mains power input
 - b. (1) Optional DC Power Input
 - c. (1) Audio input
 - d. (1) Optional Page mute (PageFirst™) input (Euro-block)
13. Device Registration: push button for transmitter(s), remote(s), speaker pods
14. Wireless audio range: up to 200 feet
15. Integrated 2-Way Hybrid Speaker System:
 - a. Description: exciter technology sound panel plus low frequency cone driver
 - b. Integrated cross-over technology
 - c. Panel Size: 13.75" x 6.75"

- d. Cone Driver Size: 5.25"
 - e. Overall Frequency Response: 60 Hz to 18 kHz -10dB
 - f. Impedance: 8 Ω
 - g. Power Handling: 25 W
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- B. The in-ceiling classroom audio system shall use bi-directional wireless Access Technology to communicate with up to two wireless microphones.
 - C. The in-ceiling classroom audio system shall use bi-directional wireless Access Technology to integrate with other audio sources in the classroom.
 - D. The in-ceiling classroom audio system shall use bi-directional wireless Access Technology to send a mixed audio output to a media connector located at a convenient/student accessible location in the classroom.
 - E. The in-ceiling classroom audio system shall use bi-directional wireless Access Technology to communicate with up to 6 optional tabletop speaker pods available to facilitate small group instruction.
 - F. The all-in-one system must contain a Page mute function (PageFirst™) that passively detects the audio signal of a page coming through the PA system without compromising system performance or voiding warranties. As an audio signal is sent to the PA speaker, the PageFirst passive sensor clip detects that signal and immediately mutes the Topcat.

2.2 WIRELESS MEDIA CONNECTOR

- A. Description: Wireless audio transmitter/receiver to integrate with classroom audio sources and send/receive the wireless to the Topcat system in the ceiling.
- B. Wireless Communication: Access Technology (1.9 GHz)
- C. Audio Inputs: (4) 3.5mm stereo jacks connect to classroom audio sources.
- D. Audio Outputs: (2) 3.5mm jack with volume control
- E. (1) Microphone volume control
- F. (1) Audio input volume control
- G. (1) Audio output volume control
- H. (1) Power button with LED
- I. (1) Tone control
- J. (1) Registration button with Registration LED and linked LED
- K. Audio frequency response: 80 Hz to 7 kHz \pm 3 dB
- L. Audio distortion: <1%
- M. DC Power Input: USB 5V/0.2A (type micro-B)
- N. Mounting: table-top or wall
- O. Dimensions (W x D x H): 7.6"x 4.1"x 1.1" (193 x 104 x 28mm)

2.3 FLEXMIKE PENDANT-STYLE MICROPHONE / TRANSMITTER

- A. Description: the pendant-style wireless microphone
- B. Lanyard: adjustable length with magnetic clasp
- C. Wireless communication: bi-directional Access Technology (1.9 GHz)
- D. Audio distortion: <1%
- E. Integrated microphone type: uni-directional electret
- F. Audio input: 3.5mm
- G. Earbud output: 3.5mm (for to monitor optional Flexcat pods)
- H. Push button volume control: +/- 6dB (total range = 12 dB)
- I. Power: on/off/mute button
- J. Battery Power: 2.4V NiMH battery pack
- K. Battery run time: 8 hours (fully charged)
- L. Charging: 5V USB; type micro B connector
- M. Alkaline Charge Protection: Yes
- N. USB Audio: interface with computer USB audio while charging
- O. Registration: push button for registration with Topcat
- P. Dimensions (L x W x H): 2.9" x 1.1" x 1.0" (74 x 28 x 25mm)
- Q. Weight: 1.8 oz (51g)

2.4 OPTIONAL SHAREMIKE HANDHELD MICROPHONE / TRANSMITTER

- A. Description: handheld wireless microphone
- B. Wireless communication: Access Technology (1.9 GHz)
- C. Audio distortion: <1%
- D. Integrated microphone type: uni-directional electret
- E. Auxiliary Input: 3.5mm
- F. Power: on/off/mute button
- G. Battery Power: 2 AA NiMH rechargeable battery pack
- H. Battery run time: up to 8 hours (fully charged)
- I. Charging: 5V USB; 3.5mm DC jack
- J. Alkaline Charge Protection: Yes
- K. Registration: push button for registration with Topcat
- L. Dimensions (L x W x H): 8.25" x 1.3" x 1.3"
- M. Weight (with batteries): 7.9 oz

2.5 REGULATORY AND CERTIFICATIONS

- A. The classroom audio system and its components shall be manufactured using lead-free processes and free of other materials harmful to the environment (RoHS and WEEE compliant).

- B. The classroom audio system and its components shall be listed to UL/CUL standards and requirements for electrical safety by Underwriters Laboratories Inc.
- C. The classroom audio system must be suitable for use in air handling spaces and carry appropriate certifications (UL 2043).
- D. The classroom audio system and its components shall be CE Certified and conform with the essential requirements of the following European Union Directives: 2004/108/EC Electromagnetic Compatibility (EMC) and 2006/95/EC Low Voltage Directive (LVD).
- E. The classroom audio system and its components shall comply with Part 15 of the FCC rules as a Class B digital device (FCC Certified).

PART 3. EXECUTION**3.1 SYSTEM PERFORMANCE**

- A. Install in accordance with Manufacturer's installation instructions.
- B. Final adjustment: Upon completion, the system shall be clean, adjusted and left in perfect operating condition. Transmitters shall be plugged in and charging and user manual should be left in a conspicuous place.
- C. Provisions: There shall be no audible components of hum, noise, or distortion.

3.2 INSTALLATION

- A. Provide and install Sound Reinforcement System in the locations shown on drawings as required.
- B. All equipment and enclosures described in this specification shall be permanently attached to the structure and held firmly in place. Supports shall be adequate to support their loads per manufacturers specifications.
- C. The process of testing the Audio Sound System may necessitate moving and adjusting certain component parts (ex. loud speakers). Contractor shall provide at no additional cost to the owner.
- D. Take precautions as necessary to prevent and guard against electromagnetic and electrostatic noise interference.
- E. Wireless Media Connector to be located per Owner's request. Contractor to ensure all Media Connectors are properly registered and all volume controls are set properly via a field test in every classroom. Ensure power is available for Media Connector.

3.3 INTEGRATING THE TOPCAT WITH OTHER AUDIO SOURCES

The wireless Media Connector must have four audio inputs to allow other audio sources to be wirelessly transmitted and played through the Topcat system. Computers, DVD/VCR's, TV's, CD's, MP3's etc. may be connected into the Media Connector using appropriate patch cords. The Media Connector must also receive audio back from the Topcate to output the mixed audio signal of both microphone channels and multimedia for recording purposes and interface with assistive listening devices. See the systems integration chart below.

