

**CLASSROOM AUDIO SYSTEM****PART 1. GENERAL****1.1 OVERALL SYSTEM DESCRIPTION**

- A. The Classroom Audio System must have specifications and features that are equivalent to the Lightspeed 955 Classroom Audio System including the following:
1. Audio amplifier with integrated Access Technology 2-way wireless audio communication
  2. Wireless transmission range: up to 200 ft (600m) open field
  3. Up to two microphones for whole room instruction, team-teaching or student sharing
  4. Pendant-style Flexmike® classroom microphone with audio input utilizing Access Technology (1.9 GHz) for transmission. IR not acceptable.
  5. Optional Sharemike™ handheld microphone student pass-around use.
  6. Four stereo audio inputs with master volume control
  7. Optional PageFirst emergency page priority
  8. One audio output with level control
  9. Tone Control
  10. Two speaker outputs to power a total of 1-4 speakers
  11. Multiple speaker(s) options with mounting hardware and plenum-rated wire (see specifications) to best fit the needs of every classroom configuration
  12. Optional wireless Media Connector utilizing Access Technology for wireless integration of up to 4 additional devices
  13. Optional Activate Charging Station with Access Technology, Bluetooth and Wireless Media Connectivity for integration with mobile devices and laptops:
    - a. Includes 2 channels of 2-way Bluetooth Audio
    - b. 4 audio input connections, 2 audio outputs with volume controls
    - c. Cradle charging for 2 pendant microphones, eight (8) 2-way audio Pods
    - d. USB ports to charge up to four (4) additional 2-way audio Pods
    - e. Bluetooth connection with Activate mobile app for control, streaming and audio/video recording of classroom instruction and interaction
    - f. Mobile device control of system volume levels, Activate Pod selection, and advanced system settings.
  14. Optional Activate Pods with 2-way audio communication featuring the following functionality:
    - a. Integrated speaker and microphone to enable 2-way communication between the teacher and each small group
    - b. Wireless audio communication and battery power for maximum portability.
    - c. Up to 12 speaker Pods can be connected to 955 for each small student group.
    - d. Enables student sharing directly from the Pods so students can be clearly heard by the whole class.
    - e. Must include a call button allowing students to notify the teacher when they need assistance.
  15. Optional handheld remote control to select and direct communication with small Activate Pods volume levels when mobile device is not present

- B. The amplifier 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™ detects that signal and immediately mutes the 955 Access audio amplifier.
- C. 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.
- D. 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.
- E. Systems utilizing Infrared (IR) or 2.4 GHz wireless transmission are unacceptable due to the possibility of interference with wireless networks and other classroom technologies.
- F. The system shall carry a standard warranty equivalent to the Lightspeed 5-year Warranty.

## 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
- 2. Substitutions must be in full compliance to specifications as written

- 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. Daily Use Guide
6. Manufacturer's warranty documents
7. Manufacturer's parts lists
8. Product serial numbers

#### 1.4 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).

#### 1.5 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. Manufacturer 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, amplifier, 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.
  2. Warranty Period: Five years commencing on Date of Substantial Completion.

## **PART 2. PRODUCTS**

### 2.1 955 ACCESS AUDIO AMPLIFIER AND WIRELESS RECEIVER/TRANSMITTER SPECIFICATIONS

- A. Wireless communication: Access Technology (1.9 GHz + RF4CE)
- B. Wireless transmission range: up to 200 ft (60m) open field
- C. Power output: 40 Watts Total (20 W / Channel)
- D. Frequency response: 120 Hz to 7 kHz
- E. Power supply (UL Listed): 24V/2.5A
- F. Signal-to-noise: >60 dB
- G. Total Harmonic Distortion: <1% @ 40 Watts (20W / Channel)
- H. Automatic power on when Flexmike is powered on and linked
- I. Speaker load impedance: 4Ω / Output
- J. Dimensions (W x D x H): 7.6" x 5" x 1.13" (193 x 127 x 29mm)

- K. Weight: 9.5 oz. (269g)
- L. Controls:
  - 1. (1) Power button with LED
  - 2. (1) Microphone volume control
  - 3. (1) Audio input volume control
  - 4. (1) Audio output level control
  - 5. Page mute (PageFirst™) sensitivity level control
  - 6. Tone control
- M. Connections:
  - 1. (1) 6-pin euro-block connector
  - 2. (1) Mixed audio output (3.5mm)
  - 3. (1) DC Power input
  - 4. (4) Audio inputs (3.5mm)
  - 5. Page mute (PageFirst™) Euro-block
- N. Device Registration: push button for transmitter(s), remote(s), Activate Pods

## 2.2 FLEXMIKE PENDANT-STYLE MICROPHONE / TRANSMITTER

- A. Description: the pendant-style Flexmike transmitter shall contain microphone volume control on the unit allowing users to adjust volume level from anywhere in the classroom. The Flexmike shall be capable of being worn around a teacher's neck as a hands-free microphone via the lavalier cord or to be used as a handheld student pass-around microphone. The Flexmike must be rechargeable via cradle charger, computer, or Activate Bluetooth Charging Station and must have alkaline charge protection.
- B. Lanyard: adjustable length with magnetic clasp
- C. Wireless communication: Access Technology (1.9 GHz)
- D. Transmission range: up to 200 ft (60m)
- E. Audio distortion: <1%
- F. Integrated microphone type: uni-directional electret
- G. Audio input: 3.5mm
- H. Earbud output: 3.5mm (for monitoring optional Activate Pods)
- I. Push button volume control: +/- 6dB (total range = 12 dB)
- J. Power: on/off/mute button
- K. Battery Power: 2.4V NiMH battery pack
- L. Battery run time: 8 hours (fully charged)
- M. Charging: Integrated battery charger. The 5V power can be supplied via a cradle charger (charges two Flexmike transmitters)
- N. Alkaline Charge Protection: Yes

- O. USB Audio: interface with computer USB audio while charging
- P. Registration: push button for registration with 955 Access
- Q. Dimensions (L x W x H): 2.9" x 1.1" x 1.0" (74 x 28 x 25mm)
- R. Weight: 1.8 oz (51g)

### 2.3 OPTIONAL SHAREMIKE WIRELESS HANDHELD MICROPHONE

- A. Description: handheld wireless microphone for student pass-around use
- B. Wireless communication: Access Technology (1.9 GHz)
- C. Transmission range: up to 200 ft (60m)
- D. Audio distortion: <1%
- E. Integrated microphone type: uni-directional electret
- F. Auxiliary Input: 3.5mm
- G. Power: on/off/mute button
- H. Battery Power: 2 AA NiMH rechargeable battery pack
- I. Battery run time: up to 8 hours (fully charged)
- J. Charging: 5V USB; 3.5mm DC jack
- K. Alkaline Charge Protection: Yes
- L. Registration: push button for registration with 955 Access
- M. Dimensions (L x W x D): 8.25" x 1.3 x 1.3" (209 x 33 x 33mm)
- N. Weight (with batteries): 7.9 oz (224g)

### 2.4 OPTIONAL WIRELESS MEDIA CONNECTOR

- A. Description: Integrates with classroom audio sources to send the audio wirelessly to the 955 Access system anywhere in the room.
- B. Wireless communication: Access Technology (1.9 GHz)
- C. Transmission range: up to 200 ft (60m)
- D. Audio Inputs: (4) 3.5mm stereo jacks connect to classroom audio sources.
- E. Audio Outputs: (2) 3.5mm jack with volume control
- F. (1) Microphone volume control
- G. (1) Audio input volume control
- H. (1) Audio output volume control
- I. (1) Power button with LED
- J. (1) Tone control
- K. (1) Registration button with Registration LED and linked LED
- L. Audio frequency response: 80 Hz to 7 kHz  $\pm$ 3 dB

- M. Audio distortion: <1%
- N. DC Power Input: USB 5V/0.2A (type micro-B)
- O. Mounting: table-top or wall
- P. Dimensions (W x D x H): 7.6”x 4.1”x 1.1” (193 x 104 x 28mm)

## 2.5 OPTIONAL ACTIVATE CHARGING STATION WITH ACCESS TECHNOLOGY, BLUETOOTH AND WIRELESS MEDIA CONNECTIVITY

- A. Description: Device charging station with wireless audio and Bluetooth connectivity. Activate utilizes 2-way audio communication to integrate audio sources and mobile devices with 955 anywhere in the room.
  - 1. Integration with Activate mobile app for control, streaming and audio/video recording of classroom instruction and interaction.
  - 2. Mobile device control of system volume levels, Activate Pod selection, and advanced system settings.
- B. Mobile app functionality: Bluetooth interface with companion mobile application with the following functionality:
  - 1. Control and connect to small group 2-way audio Pods
  - 2. Adjust system audio levels and tone control
  - 3. Mobile device audio streaming from audio books, podcasts, music, etc.
  - 4. Audio/video recording synched with microphone and Pod audio
  - 5. Enable advanced system features
- C. Wireless Communication: Access Technology (1.9 GHz + RF4CE), Bluetooth audio (2 channels), Bluetooth LE (2 channels)
- D. Wireless range: Up to 200 ft. (60m) from 955, up to 100 ft. (30m) from mobile device.
- E. Audio frequency response: 80 Hz to 7 kHz  $\pm$ 3 dB
- F. Audio distortion: <1%
- G. Cradle charging: 2 Flexmikes; 8 Pods
- H. USB charging ports: Two (2) 5V/0.3A charging for Pods, remotes, or Sharemikes; Two (2) 5V/1.0A charging for mobile devices or Pods.
- I. DC Power Input: 24V/1.75A
- J. Auxiliary Power Input: 5V USB from portable power source (no device charging)
- K. Audio Inputs: (4) 3.5mm stereo jacks with volume control
- L. Bluetooth Audio: (2) independent 2-way Bluetooth audio channels
- M. Audio Outputs: (2) 3.5mm jack with volume control
- N. Volume controls: Master microphone, audio input, audio output with 10-segment level indicator
- O. Device Pairing: (2) push buttons for Bluetooth device pairing, (1) push button for Access device registration
- P. Mounting: table-top

- Q. Dimensions (W x D x H): 13.3”x 5.9”x 1.9” (340 x 150 x 52mm)
- R. Weight: 1.85 lbs. (0.84kg)

## 2.6 OPTIONAL 2-WAY AUDIO PODS FOR SMALL GROUPS

- A. Description: 2-way audio Pod with integrated speaker and microphones. Up to 12 Pods can be connected to a single audio system
- B. Wireless Communication: Access Technology (1.9 GHz)
- C. Wireless range: Up to 200 ft. (60m) from 955; up to 100 ft. (30m) with walls
- D. Integrated speaker: 1” high output speaker
- E. Power output: 1 Watt per Pod speaker
- F. Integrated microphones: Two (2) Omni-directional electret with noise rejection
- G. Headphone output: 3.5mm
- H. Controls: Power on/off button, volume up/down buttons, teacher call button
- I. Battery power: 2.5V NiMH rechargeable battery pack
- J. Battery charging: 2 contact for cradle charging + 5V/0.3A micro-USB
- K. Battery life: 10+ hours (fully charged)
- L. Dimensions: 5.2” x 2.1” 1.1” (132 x 54 x 28mm)
- M. Weight: 6.4 oz. (181g)

## 2.7 OPTIONAL HANDHELD REMOTE (1-2)

- A. Description: Handheld remote control to select and direct communication with small student groups
- B. Battery Power: 2.4V NiMH battery pack
- C. Charging: 5V USB
- D. Wireless communication: Access Technology (RF4CE)
- E. Controls: Pod selection 1-6; whole class selection; microphone mute; earbud volume
- F. Registration: push button and LED for registration with 955
- G. Dimensions (L x W x H): 4.25” x 2.0” x 1.0” (108 x 51 x 25mm)
- H. Weight: 3.4 oz (98g)

## 2.8 SPEAKERS

Lightspeed has multiple speaker packages available to fit the varying characteristics of different classrooms. Please select one speaker choice from below:

- A. TCQ Multimedia Ceiling Speaker (one speaker for rooms of 1200 sq. ft. or less)
  - 1. Description: two-way hybrid speaker system with exciter technology sound panel and low frequency cone driver
  - 2. Panel Size: 13.75” x 6.75”

3. Woofer: 6.5" driver
  4. Frequency Response: 60 Hz – 18 kHz  $\pm$  10dB
  5. Impedance: 8  $\Omega$
  6. Power Handling: 15 W RMS
  7. Enclosure: 12" x 24" x 3" UL Listed plenum-rated enclosure (UL 2043) suitable for use in air handling spaces
  8. Weight: 12.5 pounds
- B. DRQ Ceiling Speaker (four speakers for rooms of 1600 sq. ft. or less)
1. Description: two-way speaker system
  2. Driver Size: 6.5" driver; 1" tweeter
  3. Frequency Response: 40 Hz – 20 kHz  $\pm$  6dB
  4. Impedance: 8  $\Omega$
  5. Power Handling: 30 W
  6. Enclosure: white ABS ceiling-mount housing with metal grille; ABS back-enclosure
  7. Cut out diameter: 8.15"
  8. Tile Support: 20-gauge metal tile bridge
- C. WMQ Wall-mount Speaker (four speakers for rooms of 1600 sq. ft. or less)
1. Description: two-way speaker system
  2. Driver Size: 4" with 1" tweeter
  3. Frequency Response: 60 Hz – 20 kHz  $\pm$  6dB
  4. Impedance: 8  $\Omega$
  5. Power Handling: 30 W
  6. Enclosure: white ABS enclosure with steel mesh grille
- D. 4JCS Plenum-Rated Ceiling Speaker (four speakers for rooms of 1600 sq. ft. or less)
1. Description: Coaxial speaker system
  2. Driver Size: 6.5" driver; 1" tweeter
  3. Frequency Response: 60 Hz – 20 kHz
  4. Impedance: 8  $\Omega$
  5. Power Handling: 25 W
  6. Enclosure: white powder coat finish with metal grill; UL Listed categories UEAY and UUMV enclosure assembly. Complies with safety standards UL1480 and UL2043
  7. Cut out diameter: 7"
  8. Tile Support: 20-gauge metal tile bridge

## 2.9 REGULATORY AND CERTIFICATIONS

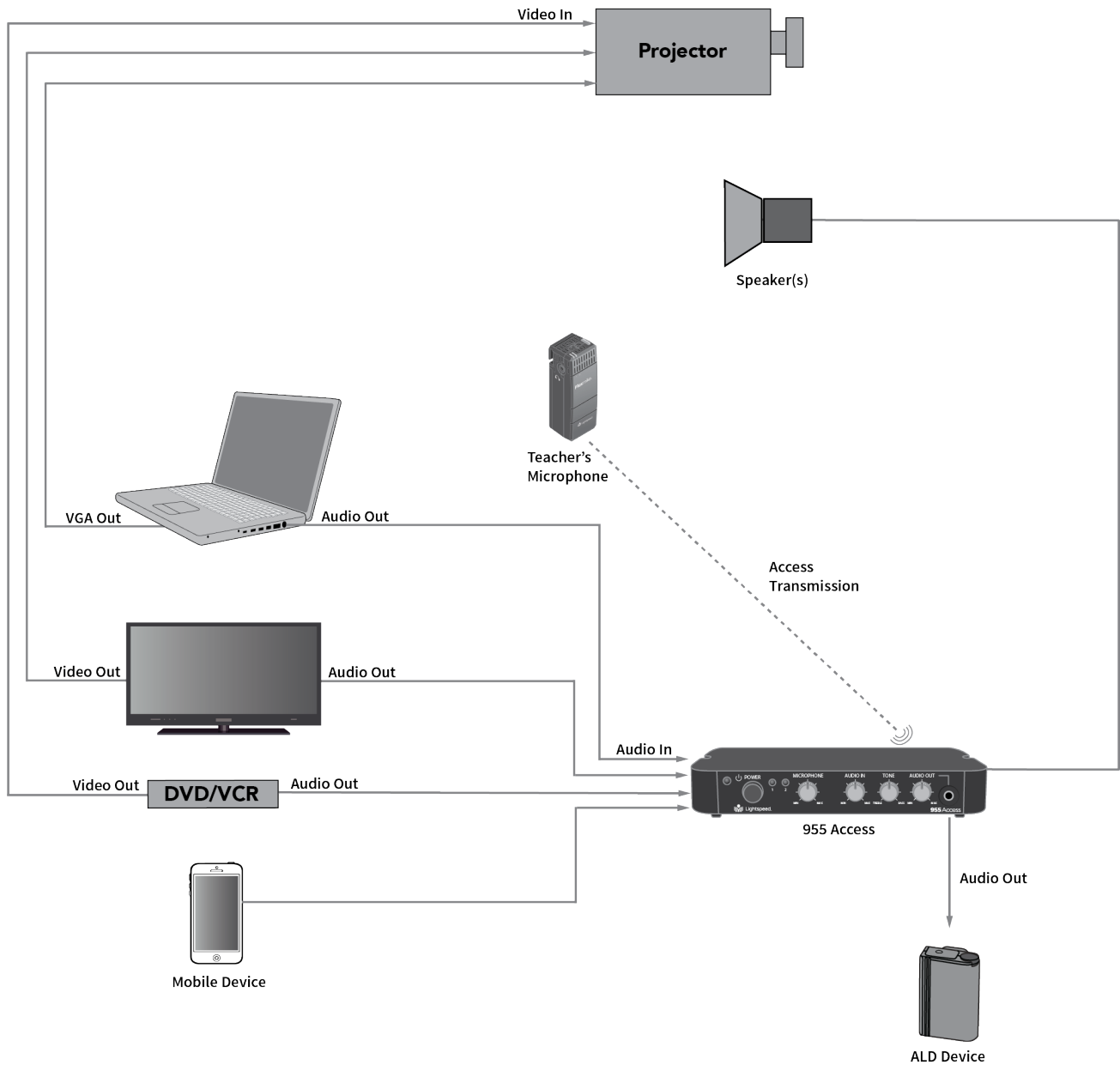
- A. The classroom audio system and its components shall be manufactured using lead-free processes and free of other materials harmful to the environment (RoHS and WEEE compliant).
- B. The classroom audio system and its components shall be listed to UL/CUL standards and requirements for electrical safety by Underwriters Laboratories Inc.
- C. The classroom audio system and its components shall be CE Certified and conform with the essential requirements of the following European Union Directives: 2014/30 EU Electromagnetic Compatibility (EMC), 2014/35/EU Low Voltage Directive (LVD) and RED 2014/53/EU.



- D. The classroom audio system and its components shall comply with Part 15 of the FCC rules as a Class B digital device (FCC Certified).

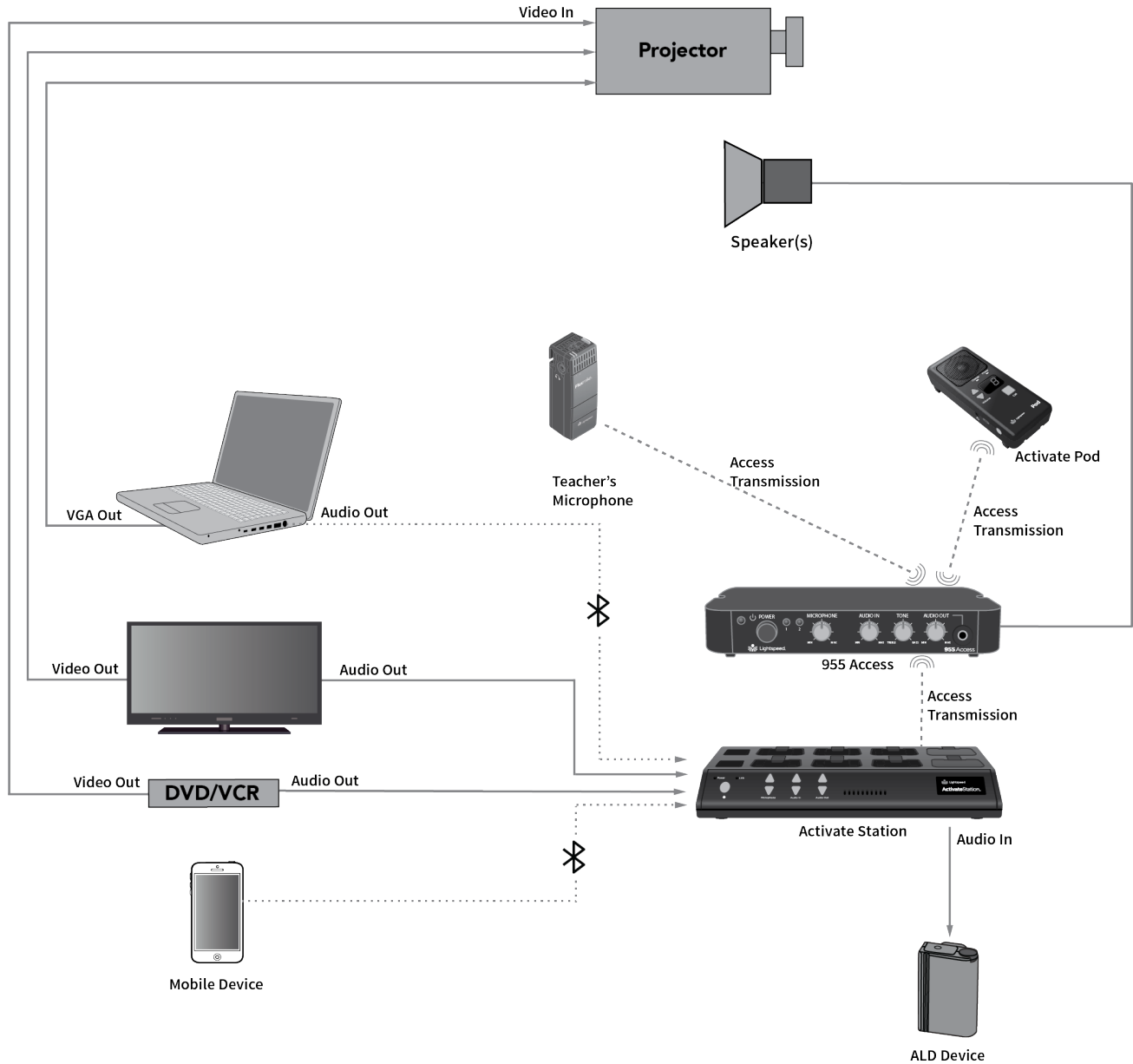
## 2.10 INTEGRATING THE 955 ACCESS WITH OTHER AUDIO SOURCES

The 955 Access amplifier must have four audio inputs to allow other audio sources to be played through the system. Computers, laptops, DVD/VCR's, LCD displays, etc. may be connected into the 955 Access amplifier using appropriate patch cords. See the systems integration chart below.



## 2.11 955 ACCESS INTEGRATION USING ACTIVATE STATION

The wireless Activate Station must have four additional audio inputs plus 2 Bluetooth audio channels to allow other audio sources to be wirelessly transmitted and played through the 955 system. Computers, laptops, mobile devices, DVD/VCR's, LCD displays, etc. may be connected into the Activate Station via Bluetooth or using the appropriate patch cable. The Activate Station must also receive audio back from the 955 to output the mixed audio signal of both microphone channels as well as selected Pods for audio/video recording to the mobile device and interface with assistive listening devices. Activate Station must also communicate with mobile devices via Bluetooth LE for selection and control of small group audio Pods and system volume levels.



### **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 ADDITIONAL AS-BUILT DATA REQUIRED**

- A. Provide as-built conditions with final locations of ceiling-mounted speakers and audio amplifier; to include serial number for the equipment in each location.

### 3.3 INSTALLATION HARDWARE

- A. Amplifier: The 955 Access amplifier may be placed in any convenient location within the classroom.
  - 1. Tabletop: unit comes standard with rubber feet to conveniently sit on any tabletop, cabinet, bookshelf, etc.
  - 2. Wall-mounted: 955 Access may be wall-mounted using the molded screw flanges; appropriate mounting hardware should be purchased locally.
- B. Speakers: Various speaker options require specific installation methods. See specification sheet and installation instructions for specific speakers. Mounting: brackets shall be mounted, square and plumb, at the height and location recommended by the Manufacturer and in accordance with local building and electrical codes.

### 3.4 OWNER INSTRUCTION

- A. Owner's Instruction: user-training will be performed by the manufacturer's local representative. The training will include a video on the research and benefits of classroom Audio, system operation, simple troubleshooting guidelines, and incorporating the classroom Audio into different teaching styles. The manufacturer will also provide additional training in trouble-shooting techniques and product return procedures to one specified person per campus.
- B. A Daily Use Guide is included with system to provide information on how to use the system. In addition, instruction materials and detailed Owner's manual shall be available on manufacturer's website to cover complete operational and basic maintenance procedures.

### 3.5 CLEAN-UP

- A. Remove unused materials and debris from the work and storage areas. Leave areas in an undamaged and acceptable condition.
- B. Save the shipping boxes for the school to return product for service.