

FrontRow ToGo Bid Specifications

PART 1 - GENERAL

1.1 STANDARDS, CODES, REFERENCES, AND REGULATORY REQUIREMENTS

- A. Federal Communications Commission
- B. Food & Drug Administration
- C. US Federal and State Hazardous Metal and Material Environmental Laws
- D. National Fire Protection Association standards
- E. National Electric Code/Life Safety Code
- F. ANSI S12.60:2002 Acoustic Performance Criteria, Design Requirements, Guidelines for Schools
- G. Federal, State and Local Administrative Codes
- H. Federal, State & Local Building Codes

1.2 SUMMARY

A. Classroom Sound Field Systems:

1. Provide a Sound Field System to serve each classroom. A wireless teacher microphone shall provide amplification of the teacher's voice.
2. The Sound Field System shall include all components and accessories needed to provide amplification of the teacher's voice in all classrooms for:
 - a. Improved academic achievement
 - b. Decreased distractibility and increased on-task behavior
 - c. Increased attention to verbal instruction and activities and improved understanding
 - d. Decreased number of requests for repetition
 - e. Decreased test taking time
 - f. Improved spelling ability under degraded listening conditions
 - g. Increased word recognition ability
 - h. Improved test scores
 - i. Increased language growth, especially for non-English speaking students
 - j. Improved ease of teaching
 - k. Reduced vocal strain and fatigue for teachers
3. The Sound Field System receiver/speaker unit shall have a user-replaceable internal Nickel Metal-Hydride rechargeable battery which will power the receiver/speaker unit when unplugged from an AC power source, allowing the Sound Field System to be portable.
4. The Sound Field System shall have been cleared by the US Food and Drug Administration (FDA) as suitable for use by children with normal hearing and hearing impairment.
5. The Sound Field System shall have been underwritten by Educational Underwriters (EdU) as a research-based technology which supports the intent of school administrators' efforts in meeting the No Child Left Behind Act of 2002.
6. The Sound Field System shall be manufactured using a lead-free process and be substantially free of six hazardous substances, i.e., four heavy metals: lead (Pb), mercury, cadmium, hexavalent chromium, and two brominated flame retardants: polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE).
7. The Sound Field System supports the efforts of the U.S. Green Building Council to advance buildings that are environmentally responsible and supports the LEED Certification Program for

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Schools.

1.3 REFERENCES

- A. Language, Speech & Hearing Services in Schools – July 1997
"Hearing and listening in a typical classroom"
Catherine V. Palmer, PhD, University of Pittsburg
SUMMARY: The use of a wireless microphone by the teacher and loudspeakers placed appropriately in the room may result in reduced student fatigue, increased on-task student behavior, improved classroom management, and decreased teacher vocal fatigue.
- B. American Journal of Audiology – Volume 12 – December 2003 - ASHA
Speech Perception Benefits from Sound Field FM Amplification
Lisa Lucks Mendel, Richard A. Roberts & Julie H Walton
SUMMARY: A 2 year study on the positive effects of Phonic Ear EasyListener Sound Field FM amplification on speech perception performance in classrooms.
- C. American Journal of Audiology – Volume 11 – December 2002 - ASHA
Background Noise Levels and Reverberation Times in Unoccupied Classrooms: Predictions and Measurements
Heather A. Knecht, Peggy B. Nelson & Lawrence L. Feth
SUMMARY: The purpose of this study was to evaluate the extent of the problem of noise and reverberation in schools.
- D. Journal of Speech, Language, and Hearing Research – Volume 45 – October 2002 - ASHA
Intelligibility of Modified Speech for Young Listeners with Normal and Impaired Hearing
Rosalie M. Uchanski, Ann E. Geers & Anthanassios Protopapas
SUMMARY: Examination of whether the benefits of modified speech could be extended to provide intelligibility improvements for all children.
- E. The MARRS Project: Mainstream Amplification Resource Room Study – 1978-1981
Sarff, Ray, & Bagwell, 1981; Ray, Sarff, & Glassford, 1984
SUMMARY: National Diffusion Network (NDN) project that uses a wireless FM microphone system for Sound Field amplification of the teacher's voice to enhance oral instruction, lessen teacher voice fatigue, and improve student academic achievement. This has been validated by the U.S. Department of Education.
- F. Testing a Possible Cause of Reduced Ability of Children to Process Speech in Noise - 2003
Clinical Trial studied the relationship of the efferent auditory neural system to the ability to process speech in noise. National Institute on Deafness and Other Communication Disorders - 11/03/2003

1.4 APPLICATION:

- a. A Sound Field System shall be installed in all classrooms.
- b. A typical classroom shall contain one body-worn teacher transmitter with boom microphone, one handheld student transmitter/microphone, one 2-unit transmitter "drop-in" charger, and one 2-channel receiver/speaker unit, placed in the appropriate position, according to the manufacturer's recommendation, to provide even sound distribution regardless of the arrangement of teacher and students.

A. Description:

- c. For each location, the Contractor shall furnish and install a complete wireless Sound Field System. The System shall include but not be limited to (per System):

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- i. One body-worn teacher transmitter (925T) with boom microphone
 - ii. One handheld student transmitter/microphone (925H)
 - iii. One 2-unit transmitter “drop-in” charger (925C), which can accommodate two transmitter/microphones (two 925T or two 925H or one 925T + one 925H)
 - iv. One 2-channel receiver/speaker unit (925RS)
- d. Receiver/speaker unit (925RS) may be mounted to the wall using only the manufacturer’s wall-mount brackets or left free standing using only the manufacturer’s table stand
 - e. The System is to include all equipment, materials, labor, and training as required to install and test a complete and operating System as described herein.
- B. Contractor shall follow installation instructions provided by the manufacturer. Installation drawings shall show the location and general arrangement of equipment, electrical systems and related items. They shall be followed as closely as elements of the construction will permit.
 - C. Examine the installation drawings and verify the conditions governing the work on the job site. Arrange accordingly junction boxes and accessories as may be required to meet such conditions.
 - D. Deviations from the installation drawings, with the exception of minor changes in routing and other such incidental charges that do not affect the functioning or serviceability of the Systems, shall not be made without the written approval of the Engineer.

1.3 GENERAL REQUIREMENTS

- A. All bids shall be based on the equipment as specified herein or listed equal.
- B. The catalog numbers and model designations for the classroom Sound Field Systems are that of FrontRow (a division of Phonic Ear), 2080 Lakeville Hwy, Petaluma, CA 94954, Telephone 800-227-0735, Fax 707-769-9624.
- C. All miscellaneous equipment required for a complete, professional installation shall be included in the base bid. No allowances for any additional equipment, hardware, cabling, or miscellaneous will be considered unless specifically excluded from the base bid.
- D. All work materials shall be removed at the end of the work day and the work area left in the same condition as found.
- E. The work herein specified shall be performed by fully competent workmen, in a thorough manner. All materials furnished by the Contractor shall be new, and all work shall be completed to the satisfaction of the Architect/Engineer.
- F. The receiver/speaker unit (925RS) shall be held firmly in place using only the manufacturer’s wall-mount brackets or the manufacturer’s table stand.
- G. The Contractor must take such precautions as are necessary to guard against electromagnetic and electrostatic hum, to supply adequate ventilation, and to install the equipment so as to provide maximum safety to the person who operates it.
- H. The Contractor shall plan and document a “Frequency Allocation Plan”, which assigns frequencies for each transmitter (925T, 925H) and receiver/speaker unit (925RS) to decrease the possibility of interference.

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- I. Care shall be exercised in connecting cables and auxiliary cords so as to avoid damage (e.g., stapling, pinching, excessive bending) and to the equipment.

1.4 QUALITY ASSURANCE

- A. The Contractor shall be an established communications and electronics Contractor that has had and currently maintains a locally run and operated business for at least five years. The Contractor shall utilize a duly authorized distributor of the equipment supplied for this project location with full Manufacturer's warranty privileges.
- B. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code" including, but not limited to:
 1. Article 250, Grounding.
 2. Article 300, Part A. Wiring Method.
 3. Article 310, Conductors for General Wiring.
 4. Article 725, Remote Control, Signaling Circuits.
 5. Article 800, Communication Circuits.
- C. EIA Compliance: Comply with the following Electronics Industries Association Standards:
 1. Sound Systems, EIA-160.
 2. Loudspeakers, Dynamic Magnetic Structures, and Impedance, EIA-299-A.
 3. Racks, Panels, and Associated Equipment, EIA-310-A.
 4. Amplifiers for Sound Equipment, SE-101-A.
 5. Speakers for Sound Equipment, SE-103.
- D. The Manufacturer shall offer service for System.
- E. The Manufacturer shall be responsible for providing all specified equipment and mentioned services for all equipment as specified herein.
- F. The Contractor, at a minimum, upon the completion of the installation of a FrontRow Sound Field System, assure the installation was performed per the installation instructions and test the system by powering up the receiver/speaker unit (925RS), turning on the transmitters (925T, 925H) and speaking into the microphones to verify speech is being transmitted.

1.5 PROJECT RECORD DOCUMENTS

- A. Include operator instructions for each required mode of operation, routine troubleshooting procedures, Manufacturer's operation and maintenance manual for each item of equipment and accessory, and routine cleaning methods and materials. The Contractor shall record the following information for each classroom installation: who installed the system, date of installation, equipment serial numbers, frequencies allocated per classroom, and verification that section 1.5, (G) of this bid specification was executed properly.

1.6 IN-SERVICE TRAINING

- A. Upon completion of installation, the Manufacturer shall provide initial in-service training with this System. These sessions shall be broken into segments that will facilitate the training of individual users in the operation of this System as directed by the Owner.

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- B. Operators Manuals and Users Guides shall be provided at the time of the first training.

1.7 WARRANTY

- A. The Manufacturer shall provide a 5-year limited warranty and/or a concurrent 1-year limited warranty that the equipment to be new and free from defects in material and workmanship, and will, within the specified terms of the limited warranty, repair or replace any equipment found to be defective.

PART 2- PRODUCTS

2.1 SOUND FIELD SYSTEM

- A. The system shall include:

- i. One 16-frequency, body-worn teacher transmitter (925T), with 2 AA NiMH rechargeable batteries and belt
- ii. One boom-microphone, to be used with the 925T
- iii. One 2-channel, 16-frequency, receiver/speaker unit (925RS), with internal NiMH rechargeable battery and internal switching power supply and AC power cord.
- iv. One, 16-frequency, handheld student transmitter/microphone (925H), with 2 AA NiMH rechargeable batteries
- v. One 2-unit transmitter charger (925C), which can accommodate two transmitter/microphones (two 925T or two 925H or one 925T + one 925H) with UL-rated switching power supply
- vi. Two auxiliary input/output cords for 925RS
- vii. Two volume locks for 925RS
- viii. One antenna for 925RS
- ix. One wall-mount bracket kit for 925RS
- x. One table stand for 925RS

- B. Receiver/Speaker Unit (925RS):

1. Carrier Frequency Range: 216.025 – 216.875MHz (16 frequencies)
2. Transmission type: FM
3. Output Power: Maximum 36W RMS @ 2 speakers x 4Ω
4. Number of speakers per receiver/speaker Unit: 2
5. Frequency Response: 100Hz to 9kHz (at rated output)
6. Power Requirements:
 - a. AC 110-200V, ~50-6-Hz, 1A max
 - b. Internal NiMH rechargeable battery, user replaceable
 - i. Battery operating time: 8 hours
7. Auxiliary Input: one 3.5mm mono, with volume control
8. Auxiliary Output: one 3.5mm mono with volume control
9. Speech reinforcement: one three-position switch to progressively emphasize higher-frequency speech sounds (OptiVoice)
10. Controls:
 - a. Power switch
 - b. Two on/off/volume controls (channel A and channel B)
 - c. One auxiliary audio input volume control
 - d. One auxiliary audio output volume control
 - e. One 3-position OptiVoice selector
 - f. Two frequency selectors (8-frequencies for channel A and 8 frequencies for channel B)
 - g. System shall not have a master volume control
 - h. System shall not have a 3 or 8 band equalizer
11. LED indicators

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- a. One: battery charging indicator
 - b. One: Channel A on/signal reception indicator
 - c. One: Channel B on/signal reception indicator
12. Signal-to-noise from microphone to speaker output (including audio circuitry): >70dB
 13. Dimensions: 7.2 x 3.4 x 29.5 in
 14. Weight: 12.5lbs
 15. The receiver/speaker 925RS shall feature DūO Speaker Technology, two speakers contained in the receiver/speaker unit that are precisely aligned
 16. The Sound Field System shall be manufactured using a lead-free process and be free of hazardous metals and materials (RoHS compliant)
- C. Body-Worn Teacher Transmitter (925T):
1. Carrier Frequency Range: 216.025 – 216.875MHz (16 frequencies)
 2. Transmission type: FM
 3. Operating range: >110ft.
 4. RF output:<15mW
 5. Total Harmonic Distortion: <0.5%
 6. Controls
 - a. 3 position switch: on/mute/off
 - b. Frequency selector: 16 frequencies available
 7. LED Indicator:
 - a. One: power/low battery/mute
 8. Microphone input: 2.5mm
 9. Power: 2 AA rechargeable NiMH or alkaline (1.5V)
 10. SmartCharge technology (prevents damage from accidentally recharging alkaline batteries): Yes
 11. Operating time: 15 hours (alkaline); 12 hours (1600mAH NiMH)
 12. Weight: 1.8oz (without battery)
 13. Size: 2.5 x 3.5 x 1in.
 14. The transmitter shall be manufactured using a lead-free process and be free of hazardous metals and materials (RoHS compliant)
- D. Handheld Student Transmitter/Microphone (925H):
1. Carrier Frequency Range: 216.025 – 216.875MHz (16 frequencies)
 2. Transmission type: FM
 3. Operating range: >110ft.
 4. RF output:<15mW
 5. Total Harmonic Distortion: <0.5%
 6. Controls
 - a. 3 position switch on/mute/off
 - b. Frequency selector: 16 frequencies available
 7. LED indicator:
 - a. One: power/low battery/mute
 8. Power: 2 AA rechargeable NiMH or alkaline (1.5V)
 9. SmartCharge technology (prevents damage from accidentally recharging alkaline batteries): Yes
 10. Operating time: 15 hours (alkaline); 12 hours (1600mAH NiMH)
 11. Weight: 8.1oz. (with battery)
 12. Size: 2.1 x 9.3in.
 13. The transmitter shall be manufactured using a lead-free process and be free of hazardous metals and materials (RoHS compliant)
- E. Charging Stand (925C)
1. Type: 2 unit, drop-in
 2. Power Supply: UL listed AC adaptor (DC 12V/0.5A)
 3. LED indicators: charging/ready
 4. Dimensions: 9 x 1.9 x 5.3in.

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5. The charging stand shall be manufactured using a lead-free process and be free of known hazardous metals and materials (RoHS compliant)

2.2 RECEIVER/SPEAKER UNIT MOUNTING

- A. Receiver/speaker unit shall be mounted in one of two ways: either attached to a wall using the wall-mount brackets supplied by the Manufacturer or placed on an existing sturdy shelf or platform in the classroom using the table stand supplied by the manufacturer.

2.3 TESTING

- A. The Contractor shall demonstrate the System to operate in accordance with the requirements of these specifications as well as the Manufacturer's performance specifications. The test shall be performed in the presence of an authorized representative of the Owner.
- B. The Contractor shall plan and document a "Frequency Allocation Plan", which assigns frequencies for each transmitter/microphone and receiver/speaker unit to decrease the possibility of interference or inter-modulation between systems.
- C. Should such a demonstration of performance show that the Contractor has not properly balanced the System, the Contractor shall make all necessary changes or adjustments and conduct a second performance demonstration.
- D. Should a second performance demonstration fail, the Contractor agrees to correct the System deficiencies at no additional cost to the Owner.