SECTION 16752 - ASSISTIVE LISTENING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF SECTION:

This section provides requirements for electronic Assistive Listening Systems (ALS) to assist perception by hearing impaired people of auditory material presented in areas of assembly.

1.2 GENERAL:

A. Complete and working assistive listening systems are required in all areas of assembly.

B. SUBMITTALS: The Constructor shall be required to submit descriptive data sheets for each type of product proposed, providing sufficient data to verify compliance with the specifications provided.

1.3 SYSTEM DESCRIPTION:

A. Each system shall include an FM transmitter with antenna(s) and two or more FM receivers, all operating in the 72 - 76 MHZ band. Both transmitters and receivers shall operate properly with FM receivers and transmitters, respectively, of other manufacturers listed below using the same frequency. These Standards require the provision of interoperable, industry standard type systems; proprietary systems are specifically not acceptable. Constructor required submittals shall include a complete description of all incompatibilities.

B. In areas with a sound reinforcement system, the assistive listening system shall retransmit the sound reinforcement system electrical output. In areas without a sound reinforcement system, the assistive listening system shall include a microphone system for voice input from live speakers.

C. The quantity of receivers provided shall not be less than 4% of the maximum occupancy of the area or two (2) whichever is greater.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCERS:

Siemens Hearing Instruments, Sennheiser, Williams Sound Corporation, Gentner Communications, Phonic Ear, Audiologic Engineering, Telex Communications. The general level of quality and service provided by these producers has been determined to be acceptable; it has not been verified that the product lines of all producers listed above include devices meeting these Standards. It is the responsibility of the Design Professional to specify that the Constructor is responsible to ensure that all materials proposed for use meet all requirements of these Standards.

2.2 TRANSMITTERS:

Transmitters shall output frequency modulated RF in the 72-76 MHz band with frequency stability and purity, deviation, power output and other characteristics as specified by the Federal Communications Commission (FCC) for unlicensed operation. Transmitter frequency deviation shall be 75 KHz nominal. Each transmitter shall have a minimum of six fixed, switch selectable, output frequencies. Selection shall be by use of a tool such as a screwdriver or other means designed to discourage frequency changes by unauthorized persons. Specifically describe frequency changing means in submittal. Controls shall include On-Off switch and LED type Power On indicator. Transmitter shall

be suitable for continuous operation on 120 VAC 60 Hz building power. Williams T-17 is acceptable.

2.3 RECEIVERS:

Pocket size rechargeable battery operated FM receiver with 1/8" or 3.5 mm earphone jack, ear bud type earphone, battery and charger. Antenna shall be internal to case or integral to the earphone cord. Separate or external antennas are not permitted. Dimensions shall not exceed 1" X 3" X 4"; weight with battery shall not exceed 4 ounces. Minimum audio output 50 mW with total harmonic distortion not exceeding 2.1% producing average SSPL90 of 135 dB or more from the earphone. Controls shall include On-Off, Volume, Channel and LED type Power On indicator. Provide automatic squelch, either manually adjustable or fixed at 10 microvolts RF input nominal. Williams PPA R7-6NA is acceptable.

2.4 RADIO FREQUENCIES:

The primary radio frequency in use at the University is 72.9 MHz. All systems shall operate at this frequency unless written permission is granted by the University to operate at one of the alternate frequencies of 72.1, 72.5, 74.7, 75.3 or 75.7 MHz. All receivers and transmitters shall be capable of operating on all of these frequencies with switch selection of the active frequency. Continuous tuning is not acceptable.

2.5 AUDIO FREQUENCIES:

System +/- 3 dB audio bandwidth, from microphone or transmitter input to earphone output, shall be 200 Hz - 8 KHz, minimum.

2.6 MICROPHONES:

Where a microphone system is required, provide lavaliere type with cable length sufficient to reach transmitter. If the assembly area is provided with a podium, provide a microphone on the podium with a cable and plug connecting it to a flush floor jack. The floor jack shall be cable connected to the transmitter input. Microphones shall be Shure, Dukane, or other if normally provided by ALS manufacturer with ALS transmitter proposed. Floor jacks shall be locking XLR type with stainless steel trim.

2.7 WIRING:

Conductors shall be insulated tinned copper shielded type cables for microphone ad auxiliary input circuits. Size of conductors shall be selected to minimize voltage drop and signal attenuation.

PART 3 - EXECUTION

3.1 WIRING:

Signal wiring shall be in metallic conduit dedicated to the assistive listening or sound reinforcement system and shall not be routed with power wiring. Install and connect in conformance with the producer's recommendations and wiring diagrams. All wiring shall be identified by being tagged, numbered and terminated on terminal blocks in the cabinets, in boxes, at equipment, and at devices.

3.2 TRANSMITTER:

A. Provide sufficient detail in the Contract Documents for proper installation of the transmitter, or require the Constructor to submit sketches showing the proposed installation location and details. The Constructor's proposal shall show permanent installation in a secure location

and shall be approved by the University before proceeding.

B. If the area of assembly has a sound reinforcement system, either existing or provided in the project, the transmitter shall be installed in the sound reinforcement system rack, if possible, or securely installed nearby. The Contract Documents shall not allow installation of the transmitter without providing fasteners securing it to the mounting surface, unless a specific reason not to provide fasteners is given by the Contract Documents.

3.3 RECEIVERS AND MICROPHONE:

Deliver to the University.

3.4 ADJUSTMENTS:

A. TESTING: The Contract Documents shall require the Constructor to deliver a complete and working system, which neither interferes with nor receives interference from other systems, whether new or existing. The Constructor shall be required to thoroughly test all systems involved and obtain satisfactory operation prior to Substantial Completion. Every transmitter and receiver provided shall be individually tested for proper operation on all six radio frequencies. Interference during testing is acceptable on all frequencies except the selected active frequency. The Constructor shall be required to demonstrate satisfactory operation at Substantial Completion Inspection.

B. ALTERNATIVE FREQUENCIES: Adjust power output, antenna radiation patterns and other system parameters as necessary to obtain continuous squelch break, full specified receiver audio output and full quieting throughout the area served while avoiding interference with adjacent systems. If interference free operation of new and existing systems cannot be achieved with the primary frequency, an alternative frequency shall be selected from a list provided in the specifications. If interference free operation cannot be obtained using any of those frequencies, the Constructor shall be required to obtain the services of an RF consulting engineer registered to practice in Florida to perform a complete frequency study of the affected area and prepare a report including certification that none of the alternative frequencies can be used and a recommendation of other alternative frequencies in the 72 - 76 MHZ band which will provide satisfactory operation. The Constructor shall provide the required study and equipment operating at the selected frequency at no change in the contract amount.

END OF SECTION