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August 28, 2007

Subject: Letter of Clarification No. 2  
Audio Equipment & Sound System Package  
for the Convention & Entertainment Department

Reference: ITB No. S12-N22573

To: All Prospective Suppliers:

This Letter of Clarification is issued for the following reasons:

- To revise the above referenced solicitation as follows:
  - 1) Replace Section B - Part II Specifications with the "Revised Section B - Part II Specifications" attached.
  - 2) Note:  
Two (2 ea.) power supply units are to be supplied with each Digital Mixing Console per these specifications.
  - 3) Note:  
Bidder must submit with its bid an itemized price list sheet indicating the specific unit cost for each component/equipment specified.

This Letter of Clarification shall automatically become a part of the bid documents and shall supersede any previous specification(s) and/or provision(s) in conflict with the Letter(s) of Clarification. It is the responsibility of the bidder to ensure that it has obtained all such letter(s). By submitting a bid on this project, bidder shall be deemed to have received all Letter(s) of Clarification and to have incorporated them into this bid.

If you have any questions or if further clarification is needed regarding this Invitation to Bid, please contact me.

A handwritten signature in black ink, appearing to read "Martin L. King".

*Martin L. King*  
Sr. Staff Analyst  
713.437.6142

A small, stylized handwritten mark or signature, possibly initials, located to the left of the name Martin L. King.

Council Members: Toni Lawrence Jarvis Johnson Anne Clutterbuck Ada Edwards Addie Wiseman M.J. Khan, P.E. Pam Holm  
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**(REVISED)**

**SECTION B  
PART II SPECIFICATIONS  
FOR  
SOUND SYSTEM PACKAGE FOR THE WORTHAM THEATER CENTER**

**1.0 SCOPE:**

The intent of this specification is to provide certain sound equipment to be installed by the Wortham Center Operating Company at the Wortham Theater Center. This sound equipment is intended to replace the existing theater sound system equipment, which is an excess of ten years old. The furnishing and delivery of all equipment specified herein shall be the sole responsibility of the successful bidder. Each bidder must provide with their bid a detailed list of the equipment to be furnished. If the equipment to be furnished is not the referenced model specified in the bid packet, then bidder must provide documentation listing the manufacturer name, model number and detailed specifications for each component. The successful bidder shall provide an electronic file with a detailed list of all supplied equipment, including manufacturer name, model number, quantity, warranty period and serial numbers, where applicable.

**2.0 SOUND SYSTEM COMPONENTS:**

**2.1 DIGITAL SOUND MIXING CONSOLE:** Quantity

Digital Mixing Console	2
Power Supplies	4
Power Supply Cables	4
Console Lighting Kit	2
Castered Road Case	2
Operation and Instruction Manuals/CDs	5

**2.2 MICROPHONE STANDS:**

Short Tripod w/Boom	20
Tall Tripod w/Boom	10
Telescoping Boom	10
Tall Weighted Base	10

**2.3 TWO-WAY LOUDSPEAKERS (FRONT FILLS):**

Two-Way Loudspeakers (Front Fills)	10
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**2.4 AUDIO SPLITTER W/FAN OUTS:**

Three way (48x10) Audio Splitter	1
25 ft. Fanouts	2
50 ft. Fanouts	2
50 ft. Fanout Extension	2

**2.5 AUDIO SNAKES:**

25 ft. x 12-pair Audio Drop Snake	5
50 ft. x 12-pair Audio Drop Snakes	5
75 ft. x 12-pair Audio Drop Snakes	2

**2.0 SOUND SYSTEM COMPONENTS: (Cont.)**

**2.6 MINIATURE CONDENSER MICROPHONES: Quantity**

Omni-directional Miniature Condenser Microphones (Black)	20
Omni-directional Miniature Condenser Microphones (Flesh)	10

**2.7 SUBWOOFERS:**

Dual 18" Subwoofers	2
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**2.8 FULL RANGE LOUDSPEAKERS:**

Self-Powered Loudspeakers	4
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**2.9 MICROPHONE CABLES:**

15 feet	30
25 feet	30
50 feet	30

**3.0 COMPONENT 1:**

Contractor shall supply two (2 ea.) **Digital Sound Mixing Console**, complete with two (2) power supplies, two (2) power supply link cables, console lighting kit, road case w/casters, and three (3) operation and instruction manuals/CDs. The successful bidder shall provide an experienced and qualified sound technician for two (2) onsite training classes. Training classes shall be a minimum four hours in length and not be held on the same day.

- 3.1 Reference Model: Yamaha Model #PM5D Mixing Console
- o w/Yamaha Model #PW800W Power Supply (2 ea.)
  - o w/Yamaha Power Suplí Link Cable PSL120 (2 ea.)

**MINIMUM GENERAL SPECIFICATIONS:**

Internal Processing	32-bit (Accumulator 58-bit)	
Sampling Frequency	Internal	44.1 kHz, 48kHz, 88.2kHz, 96kHz
	External	Normal rate: 44.1kHz (-10%) — 48kHz (+6%) Double rate: 88.2kHz (-10%) — 96kHz (+6%)
Signal Delay	Less Than 2.3ms INPUT to STEREO A, B (@ Fs = 48kHz) Less Than 1.15ms INPUT to STEREO A, B (@ Fs = 96kHz)	
Fader	Motorized, Stroke: 100mm All Faders	
Fader Resolution	+10 – -138, -∞dB (1024 steps) All Faders	
Signal Delay	Less Than 2.3 ms INPUT to STEREO A,B (@Fs = 48 kHz) Less Than 1.15 ms INPUT to STEREO A,B (@Fs = 96 kHz)	
Frequency Response	PM5D	0.5, -1.5dB 20Hz – 20kHz @1kHz into 600Ω INPUT 1 - 48 ch to STEREO A,B OUT (@Sampling frequency = 44.1kHz or 48kHz) 0.5, -2dB 20Hz – 40kHz @1kHz into 600Ω INPUT 1 – 48 ch to STEREO A,B OUT (@Sampling frequency = 96kHz)
Maximum Voltage Gain	84 dB INPUT1-48 to Each Output	

### 3.0 **COMPONENT 1: (Cont.)**

#### **MINIMUM GENERAL SPECIFICATIONS: (Cont.)**

Maximum Voltage Gain @ 1kHz	84dB INPUT 1 – 48 to Each Output
Crosstalk @ 1kHz	-80dB Adjacent Input 1 – 48 -80dB Input to Output
Dimensions	W x D x H (mm) 1551 x 950 x 283
Included Accessories	Owners Manual Gooseneck Lamps (3 ea.) Power Supply PW800W Connection Cable Studio Manager CD-ROM Studio Manager Installation Guide

### 4.0 **COMPONENT 2:**

Contractor shall supply a total of fifty - (50 each) **Microphone Stands**, including all standard accessories with the following features and specifications:

4.1 Reference Model: Konig & Meyer Model #25910B (20 Ea.)

- Short Tripod w/Boom
- Die-cast base with folding legs
- Complete with fixed length boom arm
- Black in color

4.2 Reference Model: Konig & Meyer Model #21090B (10 Ea.)

- Tall Tripod w/Boom
- Die-cast base with folding legs
- Complete with boom arm
- Black in color

4.3 Reference Model: Konig & Meyer Model #21110B (10 Ea.)

- T-Bar locking handle
- Telescoping 18" to 32"
- Black in color

4.4 Reference Model: Ultimate Model #MC-07B (10 Ea.)

- Tall weighted base
- Stackable
- Height adjustable 35" to 64"
- Black in color

### 5.0 **COMPONENT 3:**

Contractor shall supply a total of ten - (10 each) **Two-Way Loudspeakers (Front Fills)**, complete with an operation/instruction manual for each enclosure. Each loudspeaker shall be a two-way, full range system (passive LF/HF crossover) in a compact vented trapezoidal enclosure. Each loudspeaker shall include two 6.5" woofers, a 1" exit compression driver on a Wave Guide Plate T and have 100 x 80 coverage pattern.

5.1 Reference Model: Eastern Acoustic Works (EAW) Model #JF80z (10 each)

- System Configuration: Two-way full range
- LF Subsystem & Loading: Two 6.5-inch cones, sealed
- HF Subsystem & Loading: One 1-inch exit compression driver on WGPT
- Operating Mode: Passive only

## 5.0 **COMPONENT 3:** (Cont.)

5.1 Reference Model: Eastern Acoustic Works (EAW) Model #JF80z (10 each)

- Frequency Response: (+/- 3 db) 85 Hz to 18 kHz
- Frequency Response: (-10db) 50 Hz
- Nominal Input Impedance: 8 ohms
- Power: 460 watts
- Enclosure Material: Exterior grade Baltic birch plywood
- Finish: War resistant textured black paint
- Grille: Powder coated perforated steel
- Connector : Two Neutrik NL4 Speakon; One 2-contact terminal strip
- Suspension Hardware: Two 1/4-20 mounting/suspension points  
Four 5/16-18 mounting points  
Two 5/16-18 mounting points (standard adapter)
- Height: 20.93 inches
- Front Width: 7.81 inches
- Rear Width: 4.50 inches
- Depth: 9.75 inches
- Net Weight: 28.0 pounds

## 6.0 **COMPONENT 4:**

Contractor shall supply one - (1 each) **Audio Splitter w/Fan Outs** with the following features and specifications:

6.1 Reference Model: Whirlwind Model #Custom 3-Way (1 each)

- One main and two isolated outputs
- "MASS" 58 multi-pin connectors (W4CRP(O))
- 48 XLR inputs w/transformers & ground lifts
- 10 XLR returns
- Steel box w/black powder-coat finish

6.1 Reference Model: Whirlwind 25 ft. Fanouts Model #FM-48-10-XL-W4IRP(I)-25 (2 each)

- NEC CM rated multi-pair cable
- "MASS" 58 multi-pin inline connectors
- Kellm wire mesh strain relief
- Four foot channel fanout length
- Engraved lettering on connectors

6.1 Reference Model: Whirlwind 50 ft. Fanouts Model #FM-48-10-XL-W4IRP(I)-50 (2 each)

- NEC CM rated multi-pair cable
- "MASS" 58 multi-pin inline connectors
- Kellm wire mesh strain relief
- Four foot channel fanout length
- Engraved lettering on connectors

6.1 Reference Model: Whirlwind 50 ft. Fanout Extension Model #C-58-50-W4IRP(I)-W4IRP(O) (2 each)

- NEC CM rated multi-pair cable
- "MASS" 58 multi-pin inline connectors
- Kellm wire mesh strain relief

**7.0 COMPONENT 5:**

Contractor shall supply a total of twelve - (12 each) **Audio Snakes** with the following features and specifications:

7.1 Reference Model: Whirlwind Model #MS-12-M-NR-25 (5 each)

- 25 ft. x 12-pair Audio Drop Snake
- NEC CM rated multi-pair cable
- Engraved lettering on fanout connectors
- Kellem wire mesh strain relief
- Four foot fan length
- Steel box w/black powder-coated finish

7.2 Reference Model: Whirlwind Model #MS-12-M-NR-50 (5 each)

- 50 ft. x 12-pair Audio Drop Snake
- NEC CM rated multi-pair cable
- Engraved lettering on fanout connectors
- Kellem wire mesh strain relief
- Four foot fan length
- Steel box w/black powder-coated finish

7.3 Reference Model: Whirlwind Model #MS-12-M-NR-75 (2 each)

- 75 ft. x 12-pair Audio Drop Snake
- NEC CM rated multi-pair cable
- Engraved lettering on fanout connectors
- Kellem wire mesh strain relief
- Four foot fan length
- Steel box w/black powder-coated finish

**8.0 COMPONENT 6:**

Contractor shall supply a total of thirty - (30 each) **Omni-directional Miniature Condenser Microphones** which are humidity resistant and contain a double-vent moisture protection system. Miniature Condenser Microphones shall be wired with a TA3 type connector and have the following features and specifications:

8.1 Reference Model(s): DPA - Model #4061-BM (20 each)  
DPA - Model #4061-FM (10 each)

**MINIMUM GENERAL SPECIFICATIONS:**

Cartridge Type	Pre-polarized condenser element with vertical diaphragm
Principle of operation	Pressure
Frequency Range: Soft Boost Grid High Boost Grid	20 Hz-20 kHz ± 2 dB, 3 dB soft boost at 8-20 kHz 20 Hz-20 kHz ± 2 dB, 10 dB boost at 12 kHz
Cartridge lower limiting freq (-3 dB)	20 Hz
Directional characteristics	Omni-directional
Phase response	Not applicable
Sensitivity	Nominally 6 mV/Pa ± 3 dB at 1 kHz
Equivalent noise level A-weighted	26 dB(A) re. 20 µPa (max. 28 dB(A))

**8.0 COMPONENT 6: (Cont.)**

Equivalent noise level CCIR 468-1	38 dB(max. 40 dB)
Maximum sound pressure level	144 dB SPL before clipping
Total harmonic distortion	123 dB SPL peak (<1% THD), 120 dB SPL sine (<1% THD)
Preamplifier frequency range	20 Hz to 50 kHz (+0 dB/-3 dB)
Preamplifier output impedance	30-40 Ohm
Cable drive capability	Up to 300m (984 ft.)
Microphone Length	12.7mm (.5 in.)
Microphone Diameter	5.4mm (0.21 in.)
Weight	<7.5g (0.26 oz.) incl. cable & Switchcraft TA3 connector
Warranty	Standard manufacturer's warranty shall be provided

**9.0 COMPONENT 7:**

Contractor shall supply two (2 each) **Dual 18" Subwoofers** complete with an operation/instruction manual for each enclosure. Each subwoofer shall be a portable, direct radiating, high output, large-format subwoofer system proven in complementing high efficiency, full range loudspeakers with the following features and specifications:

9.1 Reference Model: Eastern Acoustic Works (EAW) #SB528zR (2 each)

**MINIMUM GENERAL SPECIFICATIONS:**

Operating Mode	Single amp/Dual amp
Operating Range	27 Hz to 147 Hz, +-3 dB
Beam Width	360 degrees (h & v)
Nominal Input Impedance	Single amp - 4 ohms; Dual amp - 8 ohms each
Power	1400 watts
Enclosure Material	Exterior grade Baltic birch plywood
Finish	Wear resistant textured black paint
Grille	Powder coated perforated steel
Connector	Two Neutrik NL4 Speakon; XLR
Height	29.75 inches
Width	50.25 inches
Depth	24.56 inches
Net Weight	220 pounds

**10.0 COMPONENT 8:**

Contractor shall supply four (4 each) **Self-Powered Loudspeakers** complete with an operation/instruction manual for each enclosure. Loudspeakers shall be phase-corrected reinforcement loudspeakers offering precise, low-Q coverage. Loudspeakers shall incorporate internal processing electronics and a two-channel amplifier. The crossover point shall be 700 Hz. Processing functions shall include equalization, phase correction, driver protection and signal division for the high-and low-frequency sections. Each amplifier channel shall be class AB/H with complimentary MOSFET output stages. Burst capability shall be 620 watts each channel with nominal 8-ohm resistive load. Distortion (THD, IM, TIM) shall not exceed 0.02 percent. Protection circuits shall include TruPower limiting with the following features and specifications:

10.1 Reference Model: Meyer Sound #CQ-1 (4 each)

## 10.0 **COMPONENT 8:** (Cont.)

10.1 Reference Model: Meyer Sound #CQ-1 (4 each)

### **MINIMUM GENERAL SPECIFICATIONS:**

Operating Frequency Range	35 Hz - 18 kHz
Frequency Response ( $\pm 4$ Db)	40 Hz to 16 kHz
Phase Response ( $\pm 90$ deg)	50 Hz to 16 kHz
Maximum Peak SPL	136 dB @ 1 meter
Dynamic Range	> 110 dB
Coverage	80 deg (h) x 40 deg (v)
LF Subsystem	One 15-inch cone driver, 3-inch voice coil
HF Subsystem	One 4-inch diaphragm driver, 4-inch voice coil, 1.5 inch throat
Power Handling	LF - 600 watts, HF - 250 watts
Enclosure Material	All birch plywood
Finish	Black textured
Grille	Perforated steel, covered by charcoal-grey foam
Connectors	Power - 250V AC NEMA L6-20; Audio - XLR
Height	30.0 inches
Front Width	21.0 inches
Rear Width	13.5 inches
Depth	22.2 inches
Net Weight	130 pounds

## 11.0 **COMPONENT 9:**

Contractor shall supply a total of ninety (90 each) **Microphone Cables** including the following features and specifications:

11.1 Reference Model: Pro Co Sound Model #Ameriquad AQ-15 (30 each)

- Low noise performance
- Quad construction
- 4 X 24 awg wire (black) with Kevlar reinforced core
- Neutrik NC3FX/MX-B Gold Contact, Black Shell XLR
- 20-year warranty

11.2 Reference Model: Pro Co Sound Model #Ameriquad AQ-25 (30 each)

- Low noise performance
- Quad construction
- 4 X 24 awg wire (black) with Kevlar reinforced core
- Neutrik NC3FX/MX-B Gold Contact, Black Shell XLR
- 20-year warranty

11.3 Reference Model: Pro Co Sound Model #Ameriquad AQ-50 (30 each)

- Low noise performance
- Quad construction
- 4 X 24 awg wire (black) with Kevlar reinforced core
- Neutrik NC3FX/MX-B Gold Contact, Black Shell XLR
- 20-year warranty