

MASTERFORMAT™ 2004 EDITION SECTIONS  
27 51 19 – SOUND MASKING SYSTEMS  
27 51 13 – PAGING SYSTEMS

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NOTE TO SPECIFIER: This section is based on products manufactured by Dynasound, Inc:

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## 1. PART ONE – GENERAL

### 1.1. RELATED DOCUMENTS

- A. The General Conditions and Requirements, Special Provisions, of any larger body of specifications, of which this specification may be a part, are hereby made a part of this specification.

### 1.2. SUMMARY

- A. **This specification includes speakers, audio components and cabling required for an under-floor sound masking, paging system utilizing 70.7 volt distribution.** See alternate specifications for IP addressable network systems, or overhead or in-ceiling sound masking systems.

### 1.3. REFERENCES

- A. UL6500 - Standard for Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use  
B. UL 2043 - Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; 1996  
C. UL1480 - Standard for Safety Speakers for Fire Alarm, Emergency, and Commercial and Professional Use  
D. ASTM E 1374-02 - Standard Guide for Open Office Acoustics and Applicable ASTM Standards  
E. ASTM E 1573-02 - Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels  
F. ASTM E 1130-02e1 - Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index

### 1.4. PERFORMANCE REQUIREMENTS

#### A. General Performance

1. The intent of this specification is to provide a centralized sound masking and paging system incorporating speakers installed below a raised access floor. Systems using "direct field" speakers are not acceptable.
2. The sound masking generators and paging mixers shall be controllable from an attached computer. Windows based software shall be provided.
3. Every speaker must incorporate a rotary control for making per speaker volume adjustments.

#### B. Sound Masking Performance

1. The system shall use DSP technology for sound masking generation and equalization of the sound masking signals.
2. All sound masking generators shall incorporate 1/3 octave band equalization from 125 Hz. to 10000 Hz. Each generator shall also incorporate a dedicated high pass and low pass filter with configurable slope.

3. Each rack mounted, centrally located soundmasking generator shall incorporate four non-coherent sound masking generators.
  4. The masking volume shall be digitally adjustable in 0.5 dBA increments over a range of 35 dBA to 85 dBA @ 1m.
  5. The sound masking processor shall be a Dynasound DS3008 sound masking and paging processor.
- C. Paging Performance
1. The system shall use DSP technology for equalization of the paging signals.
  2. The analog page interface shall accept eight (8) balanced line-level audio inputs and provide octave band equalization and compression for each input.
  3. The paging volume shall be digitally adjustable in 0.5 dBA increments over a range of 35 dBA to 85 dBA @ 1m.
  4. The paging processor shall be a Dynasound DS3008 sound masking and paging processor
- D. Automatic Level Control
1. The system shall provide a timer function allowing audio levels to be automatically controlled according to a calendar-based user defined schedule.
  2. The system shall provide automatic daylight saving time adjustments.
  3. The system shall provide a transition process that automatically increases the masking volume over a period of time according to a programmed schedule.
  4. The system shall allow for up to four independent timer zones per programmable timer.
  5. The system shall allow independent timer schedules for each day of the week.
  6. The system shall allow user defined rates of volume adjustment and attenuation levels.
  7. The programmable level controller shall be a Dynasound DS1404.

## **1.5. SUBMITTALS**

- A. Product Data: Manufacturer's specifications and installation instructions
- B. System Design: Schematics of the system showing quantity and location of components and related cabling
- C. Warranty Documents: Warranty documents covering the system components.

## **1.6. QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum of 10 years manufacturing sound masking systems.
- B. Installer Qualifications: Approved by manufacturer representative and are trained with the specified products or have demonstrated experience with the installation of similar products.
- C. Uses industry standard network switches and cabling and methodology.

## **1.7. DELIVERY, STORAGE AND HANDLING**

- A. Protect from moisture during shipping, storage and handling.
- B. Deliver in manufacturer's original unopened and undamaged packages with manufacturer's labels legible and intact.
- C. Inspect manufacturer's packages upon receipt.
- D. Handle packages carefully.

## **1.8. WARRANTY AND MAINTENANCE**

- A. Provide a written warranty that products installed shall be free from defects in parts or assembly for a 5-year period from date of installation.

## 2. PART TWO – PRODUCTS

### 2.1. MANUFACTURERS

- A. Acceptable Manufacturer: Dynasound, Inc, 6439 Atlantic Blvd. Norcross, GA. 30071.  
Toll Free: 800.989.6275. Tel: 770.242.8176 Fax: 770.242.8858 Web: [www.soundmasking.com](http://www.soundmasking.com)
- B. Substitutions: Centralized soundmasking system components with equal specifications may be substituted pending approval.

### 2.2. SYSTEM COMPONENTS

General System Overview: The sound masking and paging system shall be a PoE networked system with eight digital network audio channels. The system shall be comprised of:

- a) rack mounted sound masking/paging/music processors (DS3008)
- b) rack mounted power amplifiers (DS1628)
- c) rack mounted programmable level controller (DS1404)
- d) rack mounted attenuators as required for zone level control (DSRMP)
- e) loudspeaker assemblies – dual horizontally opposed drivers (DS1390)
- f) cable assemblies

- A. Each rack mounted DS3008 sound masking / paging / music DSP shall provide:

- 1. Four (4) ea. DSP sound masking generators
- 2. Four (4) ea. DSP 1/3 octave band equalizers for sound masking
- 3. Four (4) ea. DSP configurable low pass and high pass filters
- 4. Eight (8) ea. balanced line level inputs via rear mounted pluggable connectors
- 5. Eight (8) ea. DSP one octave band input equalizers
- 6. Eight (8) ea. DSP input compressors
- 7. Eight (8) ea. balanced line level outputs via rear mounted pluggable connectors
- 8. Eight (8) ea. network digital audio output channels
- 9. Eight (8) ea. balanced analog output channels
- 10. Twelve input by eight output (12x8) DSP matrix mixer
- 11. Dimensions: Width 19.0 inches Height 1.75 inches; 1 RU
- 12. Network communication components
- 13. Device shall be ETL listed to conform to UL60065

- B. Each DS1625 Power Amplifier shall provide:

- 1. One (1) ea. Balanced line level input
- 2. One (1) ea. 70.7 volt 250 watt output
- 3. One (1) Selectable high pass filter
- 4. Class A/B operation
- 5. Power indicator
- 6. One Signal and overdrive indicator
- 7. Dimensions: Width 19.0 inches Height 3.00 inches; 2 RU
- 8. Device shall be UL listed to conform to UL60065

- C. Each DS1390 speaker assembly shall provide:

- 1. A connection to the speaker zone wiring with strain relief
- 2. Dual, horizontally opposed low profile drivers
- 3. single point attachment to under-floor pedestals
- 4. Overall dimensions: 5.25 inches x 6.25 inches x 1.80 inches tall
- 5. Speaker sensitivity: 90 dBA@1Watt, 1 meter pink noise
- 6. Speaker power rating: 10 watts RMS
- 7. Speaker frequency response: 125-10,000 Hz
- 8. Magnet size: 20 oz.
- 9. Speaker impedance: dual 8 ohms speakers with 70.7 volt matching transformer
- 10. Device shall be ETL listed to conform to UL1480, UL2043, CSA C22.2 60065

- D. Each DSRMP Attenuator Panel shall provide:
  - 1. Up to eight (8) 100 watt capacity 70.7 volt attenuators
  - 2. Rack mount panel
  - 3. Pluggable connectors for easy wiring
  - 4. Dimensions: Width 19.0 inches Height 3.00 inches; 2 RU
  
- E. Cable assemblies:
  - 1. Provide speaker connections to speaker controllers with two conductors, 18 A.W.G. copper stranded, plenum rated wire.

### **2.3. SOFTWARE CONTROL**

- A. The Windows® PC based software shall provide:
  - 1. The ability to adjust any individual speaker without affecting adjacent speakers
  - 2. The ability to define and adjust groups of speakers
  - 3. Sound masking volume and equalization
  - 4. Paging volume and equalization
  - 5. The ability to route any mix of eight network audio channels to any individual speaker
  - 6. The ability to create and adjust zones for paging and music
  - 7. Reporting of all system settings
  - 8. Backup and restore functions for all system settings
  - 9. Network diagnostics
  
- B. In addition to the provided software, all system functions shall be controllable via SNMP (simple network management protocol) to facilitate integration into other building control systems or end user systems.

## **3. PART THREE - EXECUTION**

### **3.1. SITE CONDITIONS**

- A. Verify facility conditions are suitable for the system installation.
- B. Verify the facility is constructed according to plans including wall locations, under-floor plenum barriers and plenum heights, air grills or other penetrations into the floor cavity.
- C. Verify that the location of any floor grates, or openings in the access floor are per plan.
- D. Verify floor perimeter is properly sealed.
- E. Ensure sufficient space and power for centrally located components is available as per plan and manufacturer's specifications.

### **3.2. PERMITS**

- A. Obtain necessary permits for installation work.

### **3.3. INSTALLATION**

- A. Follow all applicable codes for the area.
- B. Follow the system design for location of centralized equipment, speakers and wiring.
- C. Record any necessary changes to the system design on the plan

### **3.4. FIELD QUALITY CONTROL**

- A. Ensure that distance between the top of the loudspeaker and the deck meets manufacturer's minimum specifications
- B. Ensure that loudspeakers are not obstructed
- C. Ensure cables are properly supported and securely terminated

### **3.5. SOFTWARE CONFIGURATION AND ADJUSTMENT**

- A. Follow manufacturer's recommendations for system settings as found in the Dynasound Privacy Manager User Manual.

### **3.6. TESTING AND REPORTING**

- A. Test covered areas for desired spectrum and spatial uniformity
- B. Verify that all system audio functions and timers are correctly configured per plan

### **3.7. AS-BUILTS AND DOCUMENTATION**

- A. Provide detailed drawings showing all speaker locations and zones
- B. Provide all instruction and installation documents.
- C. Provide all close-out and warranty information