FreeSpace®
E-4 System

General Description

The Bose® FreeSpace® E-4 system is a four-channel digital signal processor and 400-watt power amplifier for 70/100V business applications.

Freespace system Installer™ software, included with each unit, makes it easy to configure and service the E-4 system.

With capacity for four source inputs, including two Line In, one Mic/Line and one Page/Mic/Line, the E-4 system provides the inputs needed for most business music installations.

Its proprietary power-sharing amplifier dynamically shares 400 watts across 4 output channels ranging from as low as 1W to as high as 400W. For example, if you have a two-zone system that requires 5 watts in Zone 1 and 395 watts in Zone 2, the FreeSpace E-4 system distributes the power based on those needs.

As a single component, the E-4 provides the processing and control features required for one-to-four zone business music applications. These features include:

- **Auto Volume**: Offers dynamic control of individual zone volume levels to compensate for changes in background noise level. Auto Volume requires the use of the FreeSpace E-4 System Auto Volume Mic Kit.

- **Scheduling**: Allows programming of the E-4 system for automated on/off, volume, and source changes according to time of day or day of week.

- **Opti-Voice® paging**: Provides the appropriate sound level regardless of variations in speech projection.

- **Source Leveling**: Automates system compensation for variations in source input levels.

- **Dynamic Equalization**: Maintains tonal balance at all listening levels.

### Technical Information

#### Power Amp Specifications

**Power Output**
Total shared power available for all channels: 400W
Maximum power per channel: 400W

**Output Configurations**
70.7V or 100V nominal

**Frequency Response**
20 Hz to 20 kHz ±3dB

**Channel Separation**
>70dB @ 1 kHz

**THD**
<1.0% at rated power, 0.1% at half rated power

**Signal-to-Noise Ratio**
>97dB, A-weighted

**Slew Rate**
20V/µs

#### DSP Specifications

**Sample Rate**
44.1 kHz

**A to D Conversion**
24-bit, 128x oversampling

**D to A Conversion**
24-bit, 128x oversampling

#### Rear Panel Inputs, Outputs, and Controls

**Audio Inputs**
- **Line Level Inputs**
  Type: Unbalanced RCA connectors summed to mono
  Sensitivity: -20 dBV to +20 dBV
  Impedance: 25K Ohms
  Input Clip Level: +17 dBV

**Mic Level Inputs**
Type: Balanced Euroblock connectors
Sensitivity: -60 dBV to 0 dBV
Impedance: 3.3K Ohms
Input Clip Level: +17 dBV

**Direct Input**
Type: Balanced Euroblock connectors
Input Sensitivity: 0 dBV
Input Impedance: 2.5K Ohms
Input Clip Level: +6 dBV

**Sense Mic Inputs**
ZONE 1 – 4: Euroblock connector

**Power Amplifier Outputs**
(70V or 100V only)
Zone Out 1 – 4: Inverted Euroblock connector

**Audio Outputs**
- Music on Hold/PBX Output: Euroblock connector
- Zone 4 – Line Out: Euroblock connector

**Output Configuration**
70V or 100V: switch

**AC Power Consumption**
60W or less at idle
200W with musical program
600W at maximum continuous rated power (1 kHz, sine wave input) 70V or 100V mode

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*Tested with AES 17 low-pass filter.
**Technical Information...continued**

<table>
<thead>
<tr>
<th><strong>Power Requirements (±10%)</strong></th>
<th><strong>Size (H x W x D)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>120 VAC/50-60 Hz</td>
<td>5.25&quot; (3U) x 17.25&quot; x 15.5&quot;</td>
</tr>
<tr>
<td>220 VAC/50-60 Hz</td>
<td>(13.3 cm x 43.8 cm x 39.4 cm)</td>
</tr>
<tr>
<td>240 VAC/50-60 Hz</td>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td>100 VAC/50-60 Hz</td>
<td>30 lb (13.6 kg)</td>
</tr>
</tbody>
</table>

**Fusing/Protection**
120V: T6.25A, 250V rated
240V: T3.15A, L250V

**E-4 System Engineers’ and Architects’ Specifications**

The system shall use a digital signal processing architecture running at a 44.1 kHz sample rate. The frequency response shall be from 20 Hz to 20 kHz (±3dB). The signal-to-noise ratio shall be greater than 100dB A-weighted.

The power amplifier section shall deliver 400W of maximum power with less than 1.0% THD from 20 Hz to 20 kHz (±3dB). Channel separation shall be >70dB, 20 Hz to 20 kHz.

The system shall consume power of 60 watts or less at idle, 200 watts with musical program, 600 watts at maximum continuous rated power (1 kHz, sine wave input) 70V or 100V mode.

The system shall run the following algorithm and controls:
- Input Gain
- Input Trim
- Source Leveling
- Mic/Line/Page Assignment
- Opti-Voice® paging
- Signal Routing
- Auto Volume Setup
- Scheduling
- Dynamic EQ
- Music on Hold
- Room EQ
- Loudspeaker EQ for Bose® speaker products
- Output Level Control Scheduling
- Limiting
- System Diagnostics

The system shall weigh 30 lb (13.6 kg).

**General Description...continued**

- **Music on Hold**: Provides an output for simple integration into a phone system.
- **Room Equalization**: Provides easy adjustment of tonal balance in each zone.
- **Limiting**: Protects loudspeakers from unwanted transient power loads.
- **Signal Routing**: Allows for an input source to be routed to any of the four amplifier outputs.
- **System Diagnostics**: Generates an extensive error log and includes an easy-to-replace memory module to minimize downtime.
- **RS-232**: For connection to a PC.
- **Remote Power Sequencing**: Provides a contact closure input.
Rear Panel Features

1. Sense Microphone Inputs
2. Wall Plate Connections
3. Remote On/Off Input
4. Audio Source Connections
5. Music on Hold
6. Output Voltage Switch (70/100V)
7. Fuse Box with Voltage Selector
8. Power On/Off Switch
9. Amplifier Outputs
10. RS-232 System Control PC Input
11. Auxiliary Output/Control

E-4 System Accessories

**Optional Bose® accessories for the E-4 system**

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
<th>PC Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreeSpace® E-4 System Rack</td>
<td>One pair of rack ears</td>
<td>PC029858</td>
</tr>
<tr>
<td>Mount Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FreeSpace E-4 System User</td>
<td>Wall-mount keypad that fits into a standard single-gang junction box</td>
<td>PC029856 (US)</td>
</tr>
<tr>
<td>Interface Kit</td>
<td></td>
<td>PC029857 (Euro)</td>
</tr>
<tr>
<td>FreeSpace E-4 System Auto</td>
<td>Wall-mount keypad that fits into a standard single-gang junction box</td>
<td>PC030101 (US)</td>
</tr>
<tr>
<td>Volume Interface Kit</td>
<td></td>
<td>PC030102 (Euro)</td>
</tr>
<tr>
<td>FreeSpace E-4 System Auto</td>
<td>One sensing microphone for stand-alone use or installation in a standard</td>
<td>PC029859 (US)</td>
</tr>
<tr>
<td>Volume Mic Kit</td>
<td>single-gang junction box</td>
<td>PC029860 (Euro)</td>
</tr>
<tr>
<td>FreeSpace E-4 System Auto</td>
<td>Supplemental rear panel mating connectors and non-skid feet</td>
<td>PC030105</td>
</tr>
<tr>
<td>Accessory Kit</td>
<td></td>
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</tbody>
</table>

Safety and Regulatory Compliance


Warranty Information

The FreeSpace E-4 system is covered by a five-year transferable limited warranty.
70/100V Single-Zone Configuration Example

ZONE 1
Standard User Interface

source volume

ZONE OUT
ZONE 4
LINE OUT
DIRECT IN/CONTROL

SENSE MICROPHONES
ZONE 1 ZONE 2 ZONE 3 ZONE 4
WALL PLATE CONNECTIONS
REMOTE ON/OFF
LINE 2
MUSIC ON HOLD/ PBX OUT
PAGE/ MIC/ LINE 4
AUX MIC/ LINE 3
PAGE/MIC/ LINE 2
DIRECT IN/ CONTROL
LINE 1
AUDIOSOURCES

Requires the following connections:
WALL PLATE CONNECTION 1 ............ E-4 Standard User Interface
AUDIO SOURCE LINE 1 .................. Music Source
PAGE/MIC/LINE 4 ................... Paging Microphone
ZONE OUT 1 ............................ Two FreeSpace 3 Systems

Bose Corporation, Framingham, MA 01701-9168
Made in the U.S.A.
Requires the following connections:
SENSE MICROPHONE 1/2 ......................... E-4 Auto Volume Mic Kit
AUDIO SOURCE LINE 1 ............................. Music Source
AUDIO SOURCE LINE 2 ............................. TV Source
PAGE/MIC/LINE 4 .................................. Paging Microphone
WALL PLATE CONNECTION 1/2 .................. E-4 Auto Volume Interface
WALL PLATE CONNECTION 3/4 .................. E-4 Auto Volume Interface
ZONE OUT 1 – Dining Room ..................... Two FreeSpace 3 Systems
ZONE OUT 2 – Bar ................................. One FreeSpace 3 System
ZONE OUT 3 – Patio ............................... Four 302 loudspeakers
ZONE OUT 4 – Restroom .......................... Two Model 16 loudspeakers
Features and Control Settings (accessible using FreeSpace® system Installer™ software):
- Input Gain
- Input Trim EQ
- Source Leveling
- Mic/Line/Page Assignment
- Opti-Voice® paging
- Signal Routing
- Auto Volume
- Scheduling
- Dynamic EQ
- Music on Hold
- Room EQ
- Loudspeaker EQ for Bose® speaker products
- Output Level Control
- System Diagnostics

System requirements for Installer software:
- Hardware
  - Minimum 200 MHz Pentium®-based PC (400 MHz recommended)
  - 128MB free RAM (256MB recommended)
  - 16-bit audio sound card
  - 4x CD-ROM
  - 50MB free internal hard disk space
- Operating System(s)
  - Windows 98, Windows NT 4.0, Windows 2000, Windows ME
- Display
  - 800 x 600 resolution, 16-bit color (32-bit color recommended)

For further information, contact Bose Corporation Professional Systems Division. Or visit us on the web at http://pro.bose.com.

The Installer software makes it easy to configure the E-4 system, using a Windows PC. Installer software is a copyrighted application in Sound System Software (S™ software) from Bose. A copy of the Installer software is included in the box with each E-4 system.