

BOGEN[®]

SYSTEM DESIGN & BUYING GUIDE



IP-BASED PAGING & AUDIO DISTRIBUTION · ANALOG SOUND SYSTEMS
SPEAKERS · AMPLIFIERS · MIXERS · INTERCOMS · MICROPHONES
MUSIC & INPUT SOURCES · SYSTEM DESIGN GUIDE

FAITHFULLY SERVING OUR CUSTOMERS OVER THE DECADES...



2019

CONTINUING THE SAME COMMITMENT TO EXCELLENCE TODAY AND IN THE FUTURE.



Mahwah, NJ



Orlando, FL



Memphis, TN

ABOUT BOGEN

Our Story...

For more than 87 years, Bogen Communications, Inc. has been a leading provider of commercial amplifiers, speakers, and intercom systems for music, paging, and educational applications. Founded in 1932, Bogen Communications is a privately held company that is dedicated to providing superior sound reinforcement products and has won the continued loyalty of an ever-increasing network of distributors, dealers, contractors, and installers worldwide.

Our Facilities...

After starting out in the early 1930's in Lower Manhattan, NYC, Bogen Communications has continually upgraded our building needs to facilities in Northern New Jersey. Even today our Executive, Accounting, and Sales functions are housed in a suite of offices located in Mahwah, NJ.

Five years ago, we moved our Engineering and Research & Development functions to Orlando, FL. This location provides our creative Tech Team with spacious and collaboration-friendly space suitable for development of advanced audio products. The Engineering Department is focused on developing highly flexible system solutions to fulfill the evolving technology needs of Bogen's customer base. The Orlando space also includes a Conference Center and sophisticated Demo Room in which product trainings, demonstrations and events can be held for dealers and customers interested in the Bogen, as well as our Apogee and NEAR brands.

We also relocated Bogen's Warehousing, Manufacturing, Factory Service, and Quality Assurance facility to Memphis, TN. Memphis is a major hub for rail, water, air and road transportation modes, which allows for even greater flexibility in customer shipments, including the ability to make any next-day emergency product shipments to our customers.

Our Commitment...

When you order from us, you can do so confidently knowing that Bogen's experience and innovative technology will provide your customers with equipment they will appreciate and be pleased with well into the future. Our overriding goal is to satisfy you by providing quality products that are easy to design, easy to order, easy to install, and easy to use.

BOGEN[®]
COMMUNICATIONS, INC.

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NYQUIST™ IP-BASED PAGING/AUDIO DISTRIBUTION



BOGEN® C4000 SERIES NYQUIST™

Software-based Commercial Paging Solutions

The Bogen C4000 Series, powered by Nyquist, is a software-based solution for commercial paging and music distribution applications that demand a high degree of scalability and flexibility. The heart of the C4000 solution is a powerful, state-of-the-art system controller with an easy to use web-based graphical user interface (GUI) that is accessible from any PC, tablet, or mobile device. Built-in, commercially licensed, Internet radio-based streaming audio services are perfect for background music applications. Feature-rich, purpose-built appliances provide audio mixing, amplification, and distribution, as well as the ability to easily integrate with third-party devices and systems, such as PBXs, access control, and fire alarm.

The C4000 solution can be scaled to support a wide mix of audio sources, end-points, and zones. The C4000 software can be easily upgraded over time to add new features and capabilities to address ever-changing customer needs, environments, and technology.



SYSTEM FEATURES:

- Intuitive graphical user interface that is accessible from any web-enabled device
- Networked paging amplifiers and intercom modules
- Networked Matrix Mixer Pre-Amplifier
- Powerful integrated DSP capabilities
- Built-in streaming Internet radio and access to subscription-based music services
- Map-based interactive paging (optional)
- Text-to-Speech based announcements (optional)
- Virtually unlimited scalability

The C4000 Series is built upon Bogen's award winning Nyquist software-based IP communications platform, which provides users with unparalleled flexibility and scalability. The C4000 Series is perfectly designed to work within the following environments:

**OFFICES • RETAIL OUTLETS • RESTAURANT & BARS • WAREHOUSES • TRANSPORTATION HUBS
INDUSTRIAL/MANUFACTURING FACILITIES • PUBLIC & PRIVATE INSTITUTIONS**

NYQUIST System Controller

Model NQ-SYSCTRL

Bogen's Nyquist System Controller offers contractors a cost-effective means to deploy the Nyquist C4000 solution using a state-of-the-art processing platform pre-installed with the operating system and C4000 application software. The Nyquist System Controller facilitates quick installs and offers high-performance operation for even the largest Nyquist C4000 system configurations.

PRODUCT FEATURES:

- Configuration and management via a web-based graphical user interface
- Remotely administrable from any PC/MAC, tablet, or mobile device
- Wizard-based Setup Assistant for quick and easy installation
- High-performance design capable of supporting even the largest C4000 applications
- Dual RJ45 10/100/1000 Mbps NICs for separate C4000 network and Internet access
- Front panel power status LED
- Small 1/2 rack, 1RU footprint for easy rack or wall mount
- Fan-less, convection air-cooled design for quiet, maintenance free operation



NQ-SYSCTRL

ACCESSORIES (SOLD SEPARATELY)

NQ-RMK01
1U Rack Mount Kit, Type 2

NQ-RMK03
1U-2U Rack Mount Kit, Type 3

NQ-RMK04
Appliance Joining Bracket

NYQUIST™ IP-BASED PAGING/AUDIO DISTRIBUTION

Networked 2-Channel & 4-Channel Audio Powered Amplifiers

Models **NQ-A2300, NQ-A2120, NQ-A2060, NQ-A4300, NQ-A4120, NQ-A4060**

Bogen's Nyquist based networked audio power amplifiers offer cost-effective performance for permanent installations and commercial sound, and are designed to meet the rigorous requirements of today's sophisticated sound systems. Designed with the commercial sound contractor in mind, they offer state-of-the-art, built-in DSP software for extensive and comprehensive signal processing, which turns the amplifier into a complete audio solution. These amplifiers are available in 2-channel and 4-channel models ranging from 120 watts to 1200 watts, each with the same features to provide power and performance, no matter how large or small the application.

In addition to their extensive flexibility, the Nyquist networked audio power amplifiers use the latest in Class D amplifier technology and provide unparalleled sonic quality, exceptional reliability, and reduced heat output for increased operating efficiency.

PRODUCT FEATURES:

- Dedicated Balanced Line Input(s) (both Phoenix plug & XLR)
- Line Input(s) can be routed-out over the network
- Network-based audio input (paging, audio distribution)
- GUI based DSP control
 - 16-band Graphic Equalizer
 - Signal Present and Clip Monitor
 - Adjustable High-Low Pass, & Bandpass Filters
 - Noise Gate/Compressor/Limiter
 - 7-band Parametric Equalizer
- 4 ohm, 8 ohm, 25V, and 70V output configurations
- Switch selectable 2-channel or 1-channel bridged operation on 2-channel models
- Switch selectable 4-channel, 2-channel bridged, 2-channel/1-channel bridged operation on 4-channel models
- Safety: CAN/CSA C22.2 No. 62368-1:2014; UL62368-1:2014; EN 62368-1:2014
- EMC: FCC Part 15b Class A; ICES-003, Issue 6: 2016; EN 55032:2012; EN 55035:2017

NQ-A2120, NQ-A2060



NQ-A2300



NQ-A4300, NQ-A4120, NQ-A4060

ACCESSORIES
(SOLD SEPARATELY)

NQ-RMK01
1U Rack Mount Kit,
Type 1

NQ-RMK03
1U-2U Rack Mount Kit,
Type 3

NQ-RMK04
Appliance Joining
Bracket

Plenum-Rated VoIP Intercom Module

Model **NQ-GA10P**

Bogen's plenum-rated Nyquist VoIP intercom module offers a convenient and cost-effective means of transforming any low-impedance analog speaker into a full-featured Power-over-Ethernet (PoE) IP speaker. It utilizes the latest technology to deliver superior audio quality, making it perfect for IP paging and audio distribution, while the built-in talkback capability allows it to be used in VoIP intercom applications. In addition to its wide-ranging flexibility, the intercom module uses the latest in Class D amplifier technology and provide unmatched sonic quality, exceptional reliability, and reduced power consumption to permit standalone PoE operation over the local network.

PRODUCT FEATURES:

- PoE 802.3af compliant
- Low-impedance (8 ohm) speaker output
- Network-based audio output (paging, intercom, audio distribution)
- 10W @ 8-ohm power output
- Audio input that can be routed anywhere over Bogen's Nyquist network
- DSP-based noise rejection and voice bandwidth optimization
- Web-based configuration
- Analog Call Switch support (Bogen CA15C or equivalent)
- Digital Call Switch support (Bogen NQ-E7020)
- Push-to-Talk (PTT) Microphone support
- In-wall, in-ceiling, shelf, or device mountable UL 2043 plenum-rated package
- Optional 48VDC External Power Supply (PS4815W; sold separately)



NQ-GA10P

ACCESSORIES
(SOLD SEPARATELY)

NQ-RMK03
1U-2U Rack Mount Kit, Type 3

NQ-RMK04
Appliance Joining Bracket

PS4815W
Wall Plug Power Adapter

NYQUIST™ IP-BASED PAGING/AUDIO DISTRIBUTION

4-Channel Matrix Mixer Pre-Amplifier

Model NQ-P0100

Bogen's Nyquist networked 4-Channel Matrix Mixer Pre-Amplifier (MMPA) offers cost-effective performance for permanent installations and commercial sound and is designed to meet the rigorous requirements of today's sophisticated sound systems. Developed with the commercial sound contractor in mind, the MMPA provides unparalleled flexibility and versatility without the need for add-on modules. It includes an embedded pro-audio DSP for extensive and comprehensive signal processing – allowing users to skillfully manage and mix multiple audio input channels. The resulting audio signal mix can be directed to the MMPA's line out, or streamed over the Nyquist network where it can be used for audio distribution to one or more zones.

The MMPA fits a wide range of commercial audio applications that require multi-zone paging and/or background music distribution at businesses, restaurants, retail stores, industrial facilities, and many other venues.

PRODUCT FEATURES:

- 4- MIC/Line Inputs
 - CH1-CH4 configurable balanced/unbalanced inputs via 3 XLR and 4 screw-terminal connections
 - CH4 can be configured to support Push-to-Talk Mic applications
 - Mic inputs can be configured to supply Phantom Power when needed
 - CH1 can alternately be configured as an AES3 digital input
- Web-based DSP control
 - 16-band Graphic Equalizer
 - Signal Present and Clip Monitor
 - Adjustable High Pass, Low Pass, and Bandpass Filters
 - Noise Gate/Compressor/Limiter
 - 7-band Parametric Equalizer
- Mixed signal can be routed to Line Out or over the Nyquist network
- Nyquist network-based audio input (paging, audio distribution)
- Line-Level Monitor Output to drive input to "legacy" (i.e., non-Nyquist) amplifiers
- Safety: CAN/CSA C22.2 No. 62368-1:2014; UL62368-1:2014; EN 62368-1:2014
- EMC: FCC Part 15b Class A; ICES-003, Issue 6: 2016; EN 55032:2012; EN 55035:2017
- Wall, rack, or shelf mountable: 8.0" W x 1.70" H x 8.6" D (2" H with rubber feet installed)



NQ-P0100

ACCESSORIES

(SOLD SEPARATELY)

NQ-RMK01

1U Rack Mount Kit, Type 2

NQ-RMK03

1U-2U Rack Mount Kit, Type 3

NQ-RMK04

Appliance Joining Bracket

VoIP Speakers

Models NQ-S1810WT, NQ-S1810CT

Bogen's Nyquist Series NQ-S1810WT VoIP Wall Baffle Speaker and NQ-S1810CT VoIP Ceiling Speaker provide superior HD audio quality and seamless integration into the C4000 ecosystem. There is no need for external amplifiers, traditional intercom wiring, or transformer taps to manually set or adjust. Connect the speakers via Cat5 to a PoE Switch or PoE Injector, and they are ready to operate. Volume is controlled via the C4000's web-based user interface.

As one would expect from Bogen, the HD audio quality is superb, with excellent incoming and outgoing intelligibility. Many two-way speakers use the speaker itself as the microphone, resulting in poor talkback audio quality. The Nyquist Series VoIP speakers use a separate purpose-built MEMS microphone to achieve superior talkback audio.

PRODUCT FEATURES:

- 10/100 Ethernet connection
- PoE Class-3 – no local power required, IEEE 802.3af compliant
- DHCP deployment for easy installation
- Pre-assembled for easy installation
- 10W integrated amplifier
- MEMS digital microphone for superior talkback audio
- CAN Bus 2.0 Interface connects to Nyquist Digital Call Switches
- 9.2" W x 5.2" D x 10" H

NQ-S1810CT



NQ-S1810WT

ACCESSORIES

(SOLD SEPARATELY)

TB8
Tile
Bridge

RE84
Ceiling
Enclosure

MR8
Mounting
Ring

NYQUIST™ IP-BASED PAGING/AUDIO DISTRIBUTION

Input/Output Controller

Model NQ-E7010

The **NQ-E7010** Input/Output Controller appliance provides eight dry contact closure inputs to monitor events/triggers from third-party systems/devices such as fire alarms, lockdown buttons, and sensors. It provides eight open-collector type relay driver outputs to initiate actions such as clock correction (e.g., generating sync pulses) on third-party systems and devices. The outputs can also be configured via the C4000 system software to respond to contact closure inputs from the same I/O Controller or others associated with the C4000 system.

PRODUCT FEATURES:

- 10/100 Ethernet
- PoE Class-3 (IEEE 802.3af compliant)
 - Optional 48 VDC 15W power supply
- 8 dry contact closure inputs (with 1 ground per 4 inputs)
- 8 relay driver outputs (500mA max per ground sink)
- USB 2.0 host port, Type A connector (future use)
- May be wall or shelf mounted:
 - 5.6" W x 5.4" D x 1.7" H
 - (2" H with rubber feet installed)
- Weight 1.95 lb. / 0.885kg

NQ-E7010



ACCESSORIES

(SOLD SEPARATELY)

NQ-RMK01

1U Rack Mount Kit, Type 1

NQ-RMK02

1U Rack Mount Kit, Type 2

PS4815W

Wall Plug Power Adapter

Digital Call Switch

Model NQ-E7020

With the **NQ-E7020** Digital Call Switch (DCS), users can initiate a normal, urgent, or emergency call from any location in conjunction with an associated Nyquist VoIP intercom speaker (including traditional analog speakers converted to VoIP using the NQ-GA10P VoIP Intercom Module). This single-gang box type wall-mounted switch uses a full spectrum LED ring to confirm user actions, to indicate status (for example, changing color from solid color to blinking), or to acknowledge a button press when a user initiates a call or when a call has been terminated. The switch utilizes a capacitive touch sensor with no moving parts to jam or fail.

PRODUCT FEATURES:

- CAN Bus 2.0 Interface
- Capacitive touch sensor
- Full-spectrum LED ring indicates status and provides user feedback
- Single gang box, low voltage installation
- Includes matching white decora style plate
- Weight 0.2 lb. / 0.091kg
- Software defined button behavior
 - Supports standard Normal/Emergency, Urgent/Emergency, and Emergency call-in modes
 - Each of the standard call-in modes also supports Privacy Mode
 - Can support room check-in when a facility is in Lockdown (future software release)

NQ-E7020



VoIP Phone—LCD Display

Model NQ-T1000

The Bogen **NQ-T1000** VoIP staff phone (by Yealink) for use with Nyquist C4000 offers a 132x64 pixel, backlit graphical LCD display that is crisp, clear, and easy-to-use. The NQ-T1000 is a cost-effective, VoIP phone that offers rich visual information and HD Voice. It has dual 10/100 Mbps network ports with integrated PoE support for today's modern networks.

KEY FEATURES & BENEFITS:

- **HD Audio** - HD Voice refers to the combination of the phone's software and hardware design and the implementation of wideband technology to maximize acoustic performance.
- **Enhanced Call Management** - Supports numerous productivity-enhancing features, such as busy lamp field, call park, call pickup, call forward, call transfer, and 3-way conference.
- **Efficient Installation and Provisioning** - Integrated IEEE 802.3af Power-over-Ethernet (PoE) capability allows easy deployment with centralized powering and backup.
- **Secure Transport and Interoperability** - The NQ-T1000 uses SIP over Transport Layer Security (TLS/SSL), which is the latest network security technology.



NQ-T1000

C4000-Series Software License Descriptions

All Nyquist C4000 software licenses are perpetual and do not expire (i.e., no annual license renewal fees). Optional Software Update Subscriptions are available to allow customers to keep their C4000 system up-to-date with the latest features and functionality.

SYSTEM SOFTWARE BUNDLES

NQ-C4000-B1 C4000 System Software License – Bundle 1

- Supports up to 3 Paging Zones.
- Includes licensing for 10 Concurrent Calls*.
- Includes a 3-year subscription to software updates, which encompasses bug fixes, feature enhancements, and all standard new features.

NQ-C4000-B3 C4000 System Software License – Bundle 3

- Supports up to 24 Paging Zones.
- Includes licensing for 10 Concurrent Calls*.
- Includes a 3-year subscription to software updates, which encompasses bug fixes, feature enhancements, and all standard new features.

NQ-C4000-B2 C4000 System Software License – Bundle 2

- Supports up to 9 Paging Zones.
- Includes licensing for 10 Concurrent Calls*.
- Includes a 3-year subscription to software updates, which encompasses bug fixes, feature enhancements, and all standard new features.

NQ-C4000-B4 C4000 System Software License – Bundle 4

- Supports a virtually unlimited number of Paging Zones.
- Includes licensing for 10 Concurrent Calls*.
- Includes a 3-year subscription to software updates, which encompasses bug fixes, feature enhancements, and all standard new features.

*Concurrent Calls are synonymous with simultaneous "talk paths" through the system. Additional Concurrent Call Licenses (CCLs) are available in expansion packs of 10 (See NQ-C4000CCLX section in "System Options and Add-Ons").

The following features/actions each consume one or more Concurrent Call Licenses when in-use:

All Call (1) • Emergency All Call (1) • Multi-Site All Call (1) • Multi-Site Emergency All Call (1) • Zone Page (1) • Intercom Call (1) • Station-to-Station Call (1)
Recording an announcement (1) • Scheduled Events (e.g., Bells, Tones, Announcements) (1 per active event) • Retrieving a voice mail message (1) • DISA Station Monitoring (2)
Audio Distribution (1 momentarily during each start/stop of an audio distribution stream) • Call Monitoring/Recording (1 in addition to the 1 for the call itself)

SYSTEM SOFTWARE UPDATE SUBSCRIPTION RENEWALS

NQ-C4SWUP3YRB1 3-Year Extended System Software Updates – Bundle 1

- Extends the current Software Update Subscription (SUS) expiration date of a Bundle-1 system by 3-years (e.g., if the system's current SUS expiration is 3/31/2022, installing this license key will extend it to 3/31/2025).
- SUS encompass bug fixes, feature enhancements, and all standard new features introduced in subsequent releases of the product.
- Any hardware that may be associated with a new feature is excluded and would need to be purchased separately.

NQ-C4SWUP3YRB2 3-Year Extended System Software Updates – Bundle 2

- Extends the current SUS expiration date of a Bundle-2 system (including systems upgraded to a Bundle-2 configuration using the NQ-C4000-B12UP upgrade option) by 3-years (e.g., if the system's current SUS expiration is 3/31/2022, installing this license key will extend it to 3/31/2025).
- SUS encompass bug fixes, feature enhancements, and all standard new features introduced in subsequent releases of the product.
- Any hardware that may be associated with a new feature is excluded and would need to be purchased separately.

NQ-C4SWUP3YRB3 3-Year Extended System Software Updates – Bundle 3

- Extends the current SUS expiration date of a Bundle-3 system (including systems upgraded to a Bundle-3 configuration using the NQ-C4000-B23UP upgrade option) by 3-years (e.g., if the system's current SUS expiration is 3/31/2022, installing this license key will extend it to 3/31/2025).
- SUS encompass bug fixes, feature enhancements, and all standard new features introduced in subsequent releases of the product.
- Any hardware that may be associated with a new feature is excluded and would need to be purchased separately.

NQ-C4SWUP3YRB4 3-Year Extended System Software Updates – Bundle 4

- Extends the current SUS expiration date of a Bundle-4 system (including systems upgraded to a Bundle-4 configuration using the NQ-C4000-B34UP upgrade option) by 3-years (e.g., if the system's current SUS expiration is 3/31/2022, installing this license key will extend it to 3/31/2025).
- SUS encompass bug fixes, feature enhancements, and all standard new features introduced in subsequent releases of the product.
- Any hardware that may be associated with a new feature is excluded and would need to be purchased separately.

SYSTEM OPTIONS & ADD-ONS

NQ-C4000PZK C4000 Series System Software - Paging Zone License Expansion Pk.

- Increases the current zone count of any Bundle-1, Bundle-2, or Bundle-3 system by 3-zones, allowing any of these systems to be grown/expanded in 3-zone increments (e.g., if a Bundle-2 system's current zone count is 9, installing this upgrade will increase it by 3 to 12-zones).

NQ-C4000CCLX C4000 Series System Software - Concurrent Call License Expansion Pk.

- All C4000 system bundles include licensing for 10 concurrent calls. This license expansion pack increases the Concurrent Call License (CCL) limit of any system by 10 calls, allowing the concurrent call handling capacity of any size system to be expanded in 10-call increments (e.g., if a system's current CCL limit is 10 calls, installing this expansion license will increase it by 10 to 20 concurrent calls).

NQ-C4000ICL C4000 Series System Software - Intercom Call License

- Intercom calling is disabled by default on every C4000 system. Installing this license enables intercom calling (i.e., talk back operation) between any two applicable Nyquist devices (VoIP phones, VoIP speakers, VoIP Intercom Modules, Web UI dashboard, etc.). Each NQ-C4000ICL license key installed/added to a system incrementally increases the concurrent Intercom Call limit by 1. For example, installing 3 NQ-C4000ICL licenses will permit up to 3 concurrent intercom calls on a system. Note: The Intercom Call limit can never exceed the system's maximum CCL limit (ref. the NQ-C4000CCLX license description above).

NQ-C4000QPL C4000 Series System Software - Queued Paging/Page Stacking License

- Queued Paging/Page Stacking is disabled by default on every C4000 system. In addition to allowing multiple users to simultaneously page to the same zone or zones (e.g., in airport terminals, etc.), Queued Paging is an effective way to eliminate feedback in areas where a paging device (e.g., phone, microphone, etc.) may be in close proximity to speakers receiving the page. Installing this license enables Queued Paging/Page Stacking on the system and allows the user to create 1 page stacking queue. Each NQ-C4000QPL license key installed/added to a system incrementally increases the page stacking queue limit by 1. For example, installing 3 NQ-C4000QPL licenses will permit up to 3 page stacking queues to be created on a system.

NQ-C4000TTS C4000 Series System Software - Text-to-Speech License

- This is a one-time, system-wide license required to enable TTS-based announcements & messaging within a C4000 system.

NQ-C4000MBP C4000 Series System Software - Map Based Paging License

- This is a one-time, system-wide license required to enable interactive map based paging within a C4000 system.

NQ-C4000BXI C4000 Series System Software - PBX Integration Services

- This is not a S/W license, but rather the part number to use when placing an order to schedule Bogen Technical Support phone and remote desktop assistance if needed when attempting to connect the C4000 with a customer's PBX/iPBX/Hosted VoIP service using SIP, FXO, or FXS integration.

SOFTWARE BUNDLES UPGRADES

NQ-C4000-B12UP C4000 Series System Software License Bundle Upgrade – B1-B2

- Upgrades a Bundle-1 system to a Bundle-2 configuration by increasing the current zone count of the Bundle-1 system by 6-zones (e.g., if a Bundle-1 system's current zone count is 3, installing this upgrade will increase it by 9 zones).
- Extends the current SUS expiration date by 1 year (e.g., if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023).

NQ-C4000-B23UP C4000 Series System Software License Bundle Upgrade – B2-B3

- Upgrades a Bundle-2 system to a Bundle-3 configuration by increasing the current zone count of the Bundle-2 system by 15-zones (e.g., if a Bundle-2 system's current zone count is 9, installing this upgrade will increase it to 24 zones).
- Extends the current SUS expiration date by 1 year (e.g., if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023).

NQ-C4000-B34UP C4000 Series System Software License Bundle Upgrade – B3-B4

- Upgrades a Bundle-3 system to a Bundle-4 configuration by increasing the current zone count of the Bundle-3 system to virtually unlimited zones (e.g., if a Bundle-3 system's current zone count is 24, installing this upgrade will enable it to support a virtually unlimited number of zones).
- Extends the current SUS expiration date by 1 year (e.g., if the system's current SUS expiration is 3/31/2022, installing this upgrade will extend it to 3/31/2023).

HIGH-PERFORMANCE LOUDSPEAKERS

APOGEE Professional Loudspeakers

Models AMT-15, AMT-12



AMT-15

AMT-12

The Apogee AMT-15 and AMT-12 loudspeakers are designed to deliver high-output music and sound reinforcement in a sleek, cost-effective package

PRODUCT FEATURES:

- Molded polypropylene construction
- Heavy gauge steel grilles with powder-coated finish
- Large, high-sensitivity woofers
- Ferrofluid-cooled and damped, high-output titanium alloy compression drivers
- Up to 300W power handling capability for AMT-15; 200W for AMT-12
- Rich, dynamic bass response
- Top-side sockets to receive speaker feet for stacking
- Lightweight with integral carrying handle molded into speaker housing
- Two combo input connectors: 1/4" Phone and Speakon™
- Smooth, precise passive crossover



Model	Drivers	Frequency Response	Sensitivity	Dispersion	Impedance	Power Handling	Dimensions	Product Weight
AMT-15	15" Woofer; 45mm Compression Driver	50 Hz - 20 kHz	98 dB (1W @ 1m)	Horizontal: 65 degrees	8-ohm	300 watts	19" W x 27" H x 15" D	47 lb.
AMT-12	12" Woofer; 45mm Compression Driver	60 Hz - 20 kHz	96 dB (1W @ 1m)	Vertical: 65 degrees	8-ohm	200 watts	16-1/4" W x 23" H x 13" D	37 lb.

ACCESSORIES
(SOLD SEPARATELY)
See Page 67

SIGNATURE SERIES Foreground Loudspeakers

Models S5T, S4T

Signature Series S5T & S4T Loudspeakers are compact, versatile, and feature unique driver technologies, which produce impeccable sound quality. With their compact form factor, these speakers are an excellent fit for most indoor environments or protected outdoor locations.

PRODUCT FEATURES:

- High-sensitivity and exceptional power handling
- Hemispherical mounting system makes it simple to mount
- MLS™ Ferrofluid voice coil centering replaces distortion-causing mechanical spider and seals magnet gap
- Low-resonance cabinet structure
- Precisely designed low-frequency tuning for proper balance
- Advanced polymer compound cone surrounds resist UV rays, chemicals, and salt spray
- Aluminum-alloy & titanium cones, UV-protected ABS cabinets
- Powder-coated aluminum grilles and mounting brackets
- Pressure clamping input terminals for quick installation



2 COLOR CHOICES*

BLACK OFF-WHITE

*Actual color may vary from these catalog colors.

Model**	Drivers	Frequency Response (-10dB)*	Sensitivity (1W @ 1m)	Dispersion	Power Handling	Dimensions	Product Weight
S4T	HF: 1" Nominal Dia. LF: 4-1/2" Nominal Dia.	58 Hz- 18 kHz	86 dB SPL	Hor.: 150° Ver.: 120°	75W @ 8Ω or 16, 8, 4, 2, & 1W @ 70V	5-1/4" W x 8-1/4" H x 5-3/8" D <small>(without bracket)</small> 5-1/4" W x 8-1/4" H x 7-3/8" D <small>(with bracket)</small>	6 lb.
S5T	HF: 1" Horn-Loaded LF: 5-1/4" Nominal Dia.	48 Hz- 17 kHz	89 dB SPL	Hor.: 130° Ver.: 110°	150W @ 8Ω or 32, 16, 8, 4, 2, & 1W @ 70V	6-7/8" W x 9-3/4" H x 6-1/8" D <small>(without bracket)</small> 6-7/8" W x 9-3/4" H x 8-1/8" D <small>(with bracket)</small>	9 lb.

* Half Space Response

** Colors specified by adding suffix to Model number: B (black) or W (white)

ALL-WEATHER SPEAKERS

A-SERIES Loudspeakers

Models A8T, A6T, A2T

A-Series Loudspeakers set the standard for smooth, accurate sound, attractive appearance, constant and reliable high performance, and rugged construction. Metal Diaphragm Technology (MDT) ensures speaker cone stability in all environmental conditions. Magnetic Liquid Suspension (MLS) is a Ferrofluid seal around the magnet gap and voice coil that provides protection from moisture and corrosion, as well as perfect voice coil alignment.

PRODUCT FEATURES:

- Reduced distortion at all output levels
- Unsurpassed sound quality
- Completely weatherproof, fully-sealed cabinet for indoor and outdoor applications
- Withstands harsh weather conditions including sun, wind, rain, freezing temperatures, ice, and snow
- Corrosion-resistant mounting hardware
- Dual-layer aluminum voice coils, combined with Ferrofluid, provide efficient heat-sinking under long-term, high power situations



A8T



A6T

A2T

ACCESSORIES (SOLD SEPARATELY)

ASTB4
Terminal Block
Protective Cover

TMA812
Tilt Mount Adapter
(for A8T model only)

A-SERIES High-Output, Long Throw Loudspeaker

Model A12

The **A12 High-Output, Long-Throw Loudspeaker** provides deep, rich bass and smooth highs. A high-powered speaker that projects well in "far-field" applications as well as in more intimate settings. A built-in transformer means one speaker will work with 70V or 16-ohm systems. Dual metal-alloy mid/bass drivers and a Mylar high-frequency compression driver combine to minimize distortion and provide precise sound reproduction at any volume level.

PRODUCT FEATURES:

- Dual 6-1/2" LF driver with horn-loaded HF driver
- Dual metal-alloy MDT™ mid/bass speaker cones are extremely stable in all environments
- MLS™ Ferrofluid voice coil suspension replaces distortion-causing mechanical spider
- Rigid MDT diaphragm design delivers clear sound & low distortion
- Dual-layer voice coil with separate inner and outer windings for improved thermal path
- Horn-loaded compression driver features Mylar diaphragm for long-term, consistent performance
- Vented cabinet with specially-designed vent covers that resist water entry
- Improved compound rubber surrounds resist UV rays, chemicals, and salt spray
- Gold-plated, rustproof input connectors
- Optional multi-angle tilting bracket for pole/wall mounting



A12



ACCESSORY (SOLD SEPARATELY)

TMA812
Tilt Mount
Adapter

Model*	Frequency Response	Sensitivity (1W@1m)	Dispersion	Impedance	Power Handling	Design Type	Dimensions	Product Weight
A2T*	55 Hz-20 kHz	88 dBspl	Horiz. 80°; Vert. 80°	70V	16 watts (16W, 8W, 4W tap settings)	Coaxial	9" W x 8" dia. x 8-1/4" D (with bracket)	10 lb.
A6T*	50 Hz-20 kHz	89 dBspl	Horiz. 110°; Vert. 45°up/35°down	70V	32 watts (32W, 16W, 8W tap settings)	2-way	13-7/8" W x 7-1/8" H x 7-3/4" D (with bracket)	12 lb.
A8T*	45 Hz-20 kHz	91 dBspl	Horiz. 100°; Vert. 35°up/45°down	70V	64 watts (64W, 32W, 16W tap settings)	2-way	17-7/8" W x 10-1/4" H x 10" D (with bracket)	20 lb.
A12	55 Hz-17.5 kHz	94.5 dBspl	Horiz. 90°; Vert. 45°	16-ohm/ 70V	225W at 16-ohm, 128W at 70V (128W, 64W, 32W, 16W, 8W tap settings)	2-way, 3-Driver	10-1/4" W x 17-7/8" H x 11-3/4" D	22 lb.

* Model Colors specified by adding suffix to Model number: BLK (black) or WHT (white); i.e. A6TBLK or A6TWHT

ORBIT SERIES SPEAKERS

ORBIT OPS1 Pendant Ceiling Speakers

Models OPS1B, OPS1W

Orbit Pendant Speakers provide an ideal sound solution for open space environments that require clear, quality sound evenly distributed throughout the area. These speakers offer a pleasing industrial design and mount from above.

PRODUCT FEATURES:

- Specially designed to provide full-range bass in open space environments
- Easy-to-use cable suspension system includes three suspension cables with attached forged eyebolts
- Large cabinet volume and computer-matched venting system for superior bass output
- Snap-lock input connector for easy wiring to drop cables
- Low-resonance cabinet structure
- Threaded brass insert point for optional safety cable eyebolt
- Color-matched suspension cables and hardware
- Powder-coated, perforated sturdy steel grille
- Available in both dark gray and white textured, paintable finish



ACCESSORIES (SOLD SEPARATELY)

CK10
Cable Kit;
Silver

CK10B
Cable Kit;
Black

CK10W
Cable Kit;
White

2 COLOR CHOICES*



DARK GRAY



WHITE

*Actual color may vary from these catalog colors.

PRODUCT FEATURES FOR BOTH OPS1 & OCS1 MODELS:

- 140-degree wide-dispersion coaxial driver for broad, even coverage
- Stable, high-definition metal-alloy woofer cone
- 6-1/2" MDT metal-alloy cone delivers detailed sound; 3/4" polycarbonate tweeter
- MLS voice coil centering system
- Sensitivity: 89.5 dBspl
- Extremely good off-axis response
- For 16-ohm, 70V, and 100V systems
- Frequency response: 45 Hz to 19 kHz
- Fire-rated (UL 94V0) ABS baffle
- High-efficiency drivers deliver superior performance
- Connector provides loop-through to the next speaker
- Listed to UL Standard 60065 for U.S. and Canada

Impedance	Power Handling	Dimensions	Product Weight
16 ohms	100W	OCS1 12-3/8" dia. x 12" D OPS1 14" dia. x 9-1/4" D	10 lb.
70V	32, 16, 8, 4, 2, & 1 W taps		
100V	32, 16, 8, 4, & 2 W taps		

ORBIT OCS1 Ceiling Speakers

Models OCS1B, OCS1W

Orbit Ceiling Speakers are the ideal choice for installations where the quality of music and vocal reinforcement are both crucial.

PRODUCT FEATURES:

- Computer-matched venting system and large back can provide exceptionally full bass output
- Easy wiring with snap-on connector
- Front-mounted tap selector under grille
- Attachment point for seismic (safety) cable
- Input terminal cover knockouts provide protection for connections
- Heavy-gauge steel back can
- Integral swing-out clamps secure installation in the ceiling
- Attractive heavy-gauge steel grille assembly with fine perforations
- Available in black and white textured, paintable finish
- Complies with UL-2043



ACCESSORIES (SOLD SEPARATELY)

CK10
Cable Kit;
Silver

CK10B
Cable Kit;
Black

CK10W
Cable Kit;
White

TBCR
Tile Bridge Ceiling
Support Ring

2 COLOR CHOICES*



BLACK



WHITE

*Actual color may vary from these catalog colors.

CEILING SPEAKERS

Mini-Pendant Ceiling Speakers

Models MPS1B/W, MPS2B/W

The Bogen MPS1 and MPS2 Mini-Pendant Speakers are an excellent choice for high ceiling and open space environments.

PRODUCT FEATURES:

- Wide dispersion 4-1/2" driver for broad, even coverage; superb off-axis response
- High-power handling capability for foreground sound/high-ambient noise environments
- Central attachment point for suspension and second point provided for safety cable
- Selectable power taps via rear-mounted control; 32, 16, 8, 4, 2, 1 watts @ 70V
- Low-resonance cabinet structure improves mid-range clarity
- Computer-matched venting system for extended bass output
- High-efficiency drivers deliver superior performance
- For 70V and 16-ohm low-impedance systems
- Quick and easy wiring with snap-on connector
- Simple single point suspension method
- Powder-coated perforated steel grille, available in black or white finish

Model	Impedance	Sensitivity (1W @ 1m)	Frequency Response (-10 dB)	Dimensions	Product Weight
MPS1	Low (16 ohms)/ High (70V)	86 dB (Avg. 100 Hz-10 kHz)	50 Hz-14 kHz	10" dia. x 7-7/8" H	4.5 lb.
MPS2	Low (16 ohms)/ High (70V)	87 dB (Avg. 100 Hz-15 kHz)	50 Hz-22 kHz		



2 COLOR CHOICES*

BLACK

WHITE

ACCESSORIES
(SOLD SEPARATELY)

CK10B Cable Kit; Black	CK10W Cable Kit; White
-------------------------------------	-------------------------------------

Foreground Speaker

Models FG15B, FG15W

The FG15B/W 2-way speaker is designed to deliver high-quality, wide frequency response audio in a compact cabinet. This speaker is perfect for supplying foreground as well as background music.

PRODUCT FEATURES:

- 15-watt models
- Smooth, wide frequency response
- Compact and rugged plastic cabinets
- Works with both 70V and 8-ohm speaker systems
- U-Mounting bracket included
- Rotary switch-selected power rating for 70V systems
- Available in black (B) and off-white (W)



2 COLOR CHOICES*

BLACK

OFF-WHITE

Model	Maximum Power Capacity (Watts)	Frequency Response	Sensitivity (dBspl @ 1W)	Dispersion Angle (degrees)	Dimensions	Product Weight
SCW20	20	80 Hz - 14 kHz	100	Vert: 45, Hor: 90	7-1/2" W x 20" H x 5" D	10 lb.
SCW35	35	70 Hz - 16 kHz	105	Vert: 25, Hor: 120	9-1/2" W x 42" H x 6" D	21 lb.

Let Us Design Your System... **For FREE!!!**

BOGEN FREE DESIGN SERVICE

See Page 66 For Details

CEILING SPEAKERS

Hi-Fidelity Ceiling Speakers Models HFCS1 & HFCS1LP

Bogen's coaxial and 2-way, High-Fidelity Ceiling Speakers deliver unsurpassed performance and value.



PRODUCT FEATURES:

- Installs into a variety of ceiling environments including suspended ceilings and hard-surfaced ceilings
- Large steel back can for extended bass response (HFCS1)
- Low-profile housing allows greater range of installation depths (HFCS1LP)
- Computer-matched venting system for excellent bass output
- Wide dispersion coaxial driver provides broad, even coverage
- Easy-to-install mounting system for a variety of ceiling types
- High power handling for foreground sound
- Selectable power taps via front-mounted rotary control under grille
- Excellent off-axis response, smooth contouring
- Easy wiring with 4-terminal snap-on input connector (providing loop-through)
- 3/4" durable polycarbonate tweeter cone
- 6-1/2" highly stable polypropylene cone
- Sensitivity: 89 dBspl @ 1W/1m
- Available in black or white
- Attachment point for seismic cable
- Listed to UL Standard 60065 for U.S. & Canada
- Fire-rated (94VO) ABS baffle

ACCESSORIES (SOLD SEPARATELY)

TBCR
Tile Bridge Ceiling Support Ring

CK10
Cable Kit- Silver

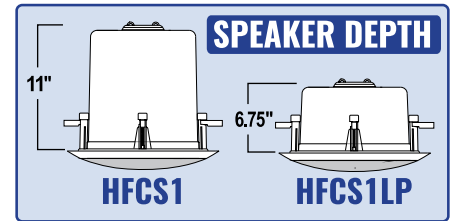
2 COLOR CHOICES*

BLACK

WHITE

*Actual colors may vary from these catalog colors.

Model	Impedance	Power Handling	Frequency Response	Dimensions	Product Weight
HFCS1/ HFCS1LP	16 ohms	75W	HFCS1: 65 Hz-19 kHz	HFCS1: 12-5/16" dia. x 12" D	HFCS1: 9 lb.
	70V	32, 16, 8, 4, 2, & 1 W taps			
	100V	32, 16, 8, 4, & 2 W taps	HFCS1LP: 78 Hz-19 kHz	HFCS1LP: 12-5/16" dia. x 7-3/4" D	HFCS1LP: 8 lb.



Hi-Fidelity, Small Footprint Ceiling Speaker Model HFSF1

The Bogen HFSF1 Small-Footprint Ceiling Speaker delivers superior sound in a very compact enclosure. The speaker is unobtrusive at only 7-1/4" in diameter, and mounts easily in all types of ceilings including existing hard-surface types and suspended ceilings.

The low-distortion, coaxial-design speaker, coupled with a computer-matched venting system, delivers superb fidelity for music as well as high intelligibility for voice reinforcement. Coupled with the Bogen CSUB Ceiling Subwoofer, it provides the perfect solution for environments that require the highest-quality sound with minimal visual impact.



HFSF1

PRODUCT FEATURES:

- Superior sound in a very compact enclosure
- Wide-dispersion coaxial driver for broad, even coverage; superb off-axis response
- Small footprint, visually appealing
- Only 6-1/4" diameter ceiling opening required
- Installs in wide range of ceiling types
- For 70V and low-impedance systems
- Selectable power taps via control mounted under grille; 16, 8, 4, 2, 1 watts at 70V
- 16-ohm selector position for low-impedance systems
- Quick wiring with removable plug-in connector providing loop-through terminals
- Attachment point for seismic safety cable
- Input terminal cover with conduit knockout
- Fire-rated (94VO) ABS baffle
- Compound rubber surround for lasting performance year after year
- Integral mounting clamps tighten quickly and firmly
- Tile bridge (TBSF) accessory recommended for suspended ceiling installations
- Off-white, paintable finish
- Listed to UL Standard 60065

ACCESSORIES (SOLD SEPARATELY)

TBSF
Tile Bridge Ceiling Support Ring

CK10
Cable Kit; Silver

Impedance	Power Handling	Sensitivity	Frequency Response	Dimensions	Product Weight
16-ohm Nominal	50W (16-ohm)	86 dBspl @ 1W/1m	78 Hz -20 kHz	7-1/4" dia. x 7-1/2" D	4.5 lb.
70V Settings	16, 8, 4, 2, 1W taps (70V)				

CEILING SPEAKERS ASSEMBLIES

Models SEC4T, S86T725PG8W(U) & Variations, S810T725PG8W(U) & Variations



SEC4T



**S86T725PG8W(U)
& Variations**



**S810T725PG8W(U)
& Variations**

Bogen's SEC4T Compact Ceiling Speaker Assembly consists of a 4" cone speaker pre-assembled onto a 7-1/4" steel ceiling grille, painted with bright-white enamel finish.

Both the S86 & S810 Ceiling Speaker Assemblies consist of an 8" cone speaker pre-assembled on to a 13" steel ceiling grille painted with off-white (PG8W) or bright white (PG8U) enamel. Options for these assemblies are recessed volume control (VR), volume control with knob (VK), and rear-mounted screw terminal strip for power taps (BR).

PRODUCT FEATURES:

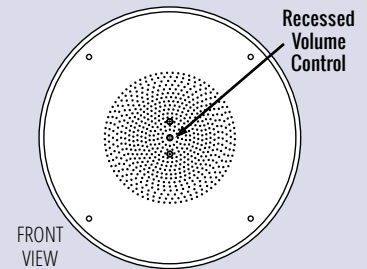
- 4-watt capacity /4-watt transformer
- 8" cone speaker (S86 & S810) and 4" cone speaker (SEC4T) provides excellent audio quality
- 6 different power taps available (4, 2, 1, 1/2, 1/4, 1/8 W)
- Pre-assembled for faster installation
- S86/S810 available in off-white (W) or bright white (U) enamel over steel grille; SEC4T is available in bright white only
- Works with both 70V and 25V amplifier outputs
- Some S86/S810 models available with recessed volume control knob (see chart below)
- Screw terminals (BR models only)

Model	Dimensions:
S86/S810	13" dia. x 3-1/4" D
SEC4T	7-1/8" dia. x 3" D

Ceiling Speaker Assembly Variations

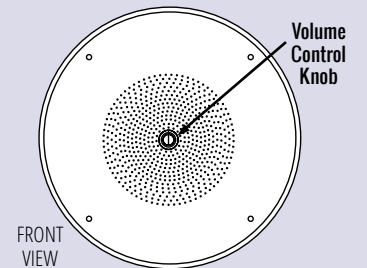
Bogen ceiling speaker assemblies consist of an 8" cone speaker (S86 or S810) mounted in an enamel, steel-finished ceiling grille (PG8W or PG8U) with a transformer (T725). The assemblies are available in several options, as outlined here:

**Recessed Volume Control
S86/S810T725PG8WVR**



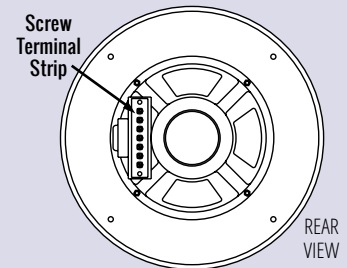
FRONT VIEW

**Volume Control Knob
S86/S810T725PG8WVK**



FRONT VIEW

**Screw Terminal Strip
S86T725PG8WBR**



REAR VIEW

Model	Magnet Weight	Frequency Response	Sensitivity (4ft./1W)	No Volume Control	Recessed Volume Control (VR)	Volume Control w/ Knob (VK)	Screw Terminals (BR)	Shipping Weight (6/carton)	
S86T725PG8W	6 oz.	50 Hz-12 kHz	95 dBspl	●				27 lb. / carton	
S86T725PG8WVR					●				
S86T725PG8WVK						●			
S86T725PG8WBR				●			●		28 lb. / carton
S86T725PG8WBRVR					●		●	●	
S86T725PG8WBRVK						●	●	●	
S810T725PG8W	10 oz.	70 Hz-15 kHz	96 dBspl	●				30 lb. / carton	
S810T725PG8WVR					●				
S810T725PG8WVK						●			
SEC4T	4 oz.	75 Hz-20 kHz	86 dBspl (1W @ 1m)	●				19 lb. / 10 per carton	

For Bright White versions of the above models, replace the "W" in each model number with a "U".

2 COLOR CHOICES
S86 & S810 Speaker Grilles available in Bright White ("U" versions) and Off-White ("W" versions)

ACCESSORIES (SOLD SEPARATELY)	
RE84 Ceiling Speaker Enclosure	MR8 Mounting Ring
TB8 Ceiling Tile Bridge	TBSF Tile Bridge (for SEC4T only)

DROP-IN CEILING SPEAKERS

Drop-In Ceiling Speakers

Bogen's **Drop-In Ceiling Speakers** are full-range loudspeakers that allow fast and simple installation, which saves time, effort, and cost. Depending on whether your ceiling grid is 2' x 2' or 2' x 4', the speaker can be dropped directly into place, or you can simply make a single cut to the ceiling tile, place the tile support rail, and then insert the speaker into position.

Models **CSD2X2(U)**, **CSD2X2VR(U)**

70V and 25V Operation

- 2 ft. X 2 ft. with back can enclosure
- 4-watt, 70V/25V transformer
- 4, 2, 1, 1/2, & 1/4-watt tap settings; selectable by rotary switch
- 8" main cone with secondary high-frequency cone; 10 oz. magnet weight
- Plenum-rated—meets the requirements of UL standard 2043 for smoke and heat release
- Fully enclosed, industrial grade steel construction
- Front-mounted, recessed volume control versions available (VR)
- Listed to UL Standard 60065 for U.S. & Canada; and UL Standard 1480 for U.S.



Models **CSD2X2L(U)**

Low-impedance (8-ohm) Operation

- 2 ft. X 2 ft. with back can enclosure
- Low-impedance: 8-ohm speaker, 15W maximum power
- 4, 2, 1, 1/2, & 1/4-watt tap settings; selectable by rotary switch
- Fully enclosed, industrial grade steel construction
- 8" main cone with secondary high-frequency cone; 10 oz. magnet weight
- Plenum-rated — meets the requirements of UL standard 2043 for smoke and heat release
- Listed to UL Standard 60065 for U.S. & Canada; and UL Standard 1480 for U.S.



Models **CSD1X2(U)**, **CSD1X2VR(U)**

70V and 25V Operation

- 1 ft. X 2 ft. with back can enclosure
- 4-watt, 70V/25V transformer
- 4, 2, 1, 1/2, & 1/4-watt tap settings; selectable by rotary switch
- Fully enclosed, industrial grade steel construction
- 8" main cone with secondary high-frequency cone; 10 oz. magnet weight
- Plenum-rated — meets the requirements of UL standard 2043 for smoke/heat release
- Front-mounted, recessed volume control versions available (VR)
- Listed to UL Standard 60065 for U.S. & Canada; and UL Standard 1480 for U.S.



Model	Speaker Size		Grille Color		Impedance		Speaker Back Can	Recessed Volume Control (VR)
	1 ft. x 2 ft.	2 ft. x 2 ft.	Off-white	Bright White (U)	70V/25V (4W max.)	8-ohm (L) (15W max.)		
CSD1X2	●		●		●		●	
CSD1X2U	●			●	●		●	
CSD1X2VR	●		●		●		●	●
CSD1X2VRU	●			●	●		●	●
CSD2X2		●	●		●		●	
CSD2X2U		●		●	●		●	
CSD2X2VR		●	●		●		●	●
CSD2X2VRU		●		●	●		●	●
CSD2X2L		●	●			●	●	
CSD2X2LU		●		●		●	●	

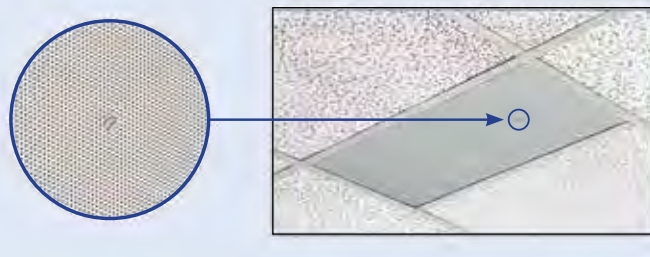
ALL DROP-IN SPEAKERS FEATURE:

- Finely perforated grille over entire front of speaker
- Tile Support Rail crossbar (included) for use with 2' x 4' and 2' x 2' suspended tile ceilings
- Bright white ("U" versions) or off-white grille finish
- Seismic attachment points

Available in Off-White and Bright White (U)
(for Bright White versions add a "U" to end of model number)

Model	Dimensions	Product Weight
CSD1X2/VR	12-1/4" W x 5" H x 24" D	10 lb.
CSD2X2/VR/L	24" W x 4-7/8" H x 24" D	12 lb.

VR Versions (with front-mounted recessed volume control)



CEILING/WALL-MOUNT SPEAKERS

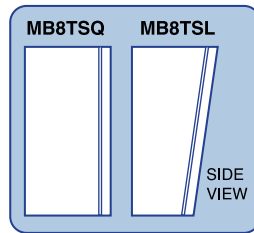
Metal Box Speakers

Models **MB8TSL/MB8TSLVR**, **MB8TSQ/MB8TSQVR**

Bogen's **Metal Box Speakers** feature all-steel construction, surface-mounted enclosure with an 8" cone loudspeaker and 4-watt 70V/25V transformer. The MB8TSL is designed primarily for wall mounting, and its face is angled downward 12.5 degrees. The MB8TSQ is suitable for ceiling or wall mounting. "VR" versions include a recessed volume control.

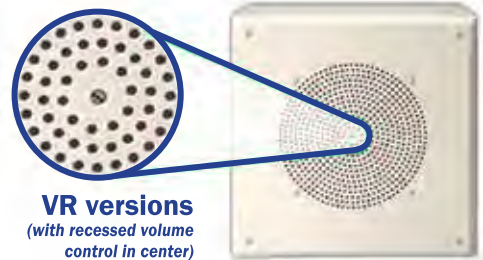
PRODUCT FEATURES:

- Rugged all-steel, surface-mounted, off-white painted enclosure
- Full-range 8" cone speaker for excellent intelligibility
- Compatible with 70V/25V amplifier systems
- 4-watt maximum power
- 6 power taps available (4, 2, 1, 1/2, 1/4, 1/8 watts)
- Mounting hardware included
- Wiremold® knockouts
- "VR" versions include a recessed volume control



MB8TSL

MB8TSQ



VR versions
(with recessed volume control in center)

Models	Front Panel Design	Frequency Response	Sensitivity (dBspl@1W)	Dimensions	Product Weight
MB8TSL/VR	Slant/Angle	110 Hz -15 kHz	96	11-5/8" W x 11-3/8" H x 5-3/8" D <i>(Top Dimension)</i> 11-5/8" W x 11-3/8" H x 2-3/4" D <i>(Bottom Dimension)</i>	9 lb.
MB8TSQ/VR	Square/Flat	110 Hz -15 kHz	96	11-5/8" W x 11-5/8" H x 4-1/4" D	9 lb.

Wiremold® is a registered trademark of Wiremold/Legrand.

Wall Baffle Speakers

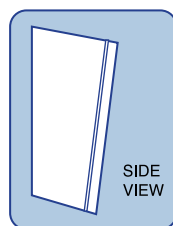
Models **WBS8T725**, **WBS8T725V**, **WBS8T725BR**, **WBS8T725BRV**, and **WBS810T725**

Bogen **Wall Baffle Speakers** consist of 8" cone speakers (S86 or S810) pre-assembled into a simulated walnut-finished wooden enclosure with a black grille cloth on front. These wall baffles are handsomely styled and ruggedly built with 3/8" particle board reinforced at the corners.

Designed for wall mounting, the face is angled downward 13.5 degrees. Recessed volume control and terminal strip are available options on the WBS8T725 model.

PRODUCT FEATURES:

- 4-watt capacity
- 6 power taps available (4, 2, 1, 1/2, 1/4, 1/8 watts)
- Simulated walnut finish
- Works with both 70V and 25V amplifier outputs
- Pre-assembled for faster installation
- 8" cone speaker for excellent audio quality
- 6 oz. or 10 oz. magnet weights
- Recessed volume control available (V models only)
- Screw terminals available (BR models only)
- Easy wall-mount installation
- Mounting hardware included



WBS8T725

Dimensions
9-1/2" W x 9-1/2" H x 5-1/4" D (3-1/4" D @ bottom)

Model	Magnet Weight	Frequency Response	Sensitivity (4ft./1W)	No Volume Control	Recessed Volume Control (V)	Screw Terminals (BR)	Shipping Weight (4/carton)
WBS8T725	6 oz.	50 Hz-12 kHz	95 dBspl	●			18 lb. / carton
WBS8T725V					●		
WBS8T725BR				●		●	
WBS8T725BRV					●	●	
WBS810T725	10 oz.	70 Hz-15 kHz	96 dBspl	●			20 lb. / carton

HORN LOUDSPEAKERS

Models **SP58A, SP158A, SP308A, SPT5A, SPT15A, SPT30A, BDT30A, IH8A, KFLDS30T**



Bogen's Horn Loudspeakers offer high efficiency and excellent intelligibility. Rotary switch-selected power taps make any installation quick and easy. The SPT & BDT models are compatible with 70V and 25V paging systems; SP models are 8-ohm versions. The KFLDS30T Horn is a 70V/25V wide dispersion, high-intelligibility, reentrant type loudspeaker. The IH8A is an all-purpose paging horn.

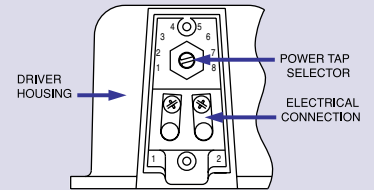
PRODUCT FEATURES:

- Maximum speaker power capacities of 7.5, 15, and 30 watts
- Rotary switch-selected power taps on transformer models
- Constant voltage (70V/25V) and 8-ohm versions
- Tilt and swivel base for easy positioning
- Sturdy, all-metal construction with mocha enamel finish (KFLDS30T horn flare is constructed of polycarbonate)
- Weatherproof design
- Twin reentrant horns for bi-directional projection (BDT30A only)
- KFLDS30T provides wide-angle projection with a rotatable horn flare

*Some assembly required

Special Protection

The SPT15A, SPT30A, BDT30A & KFLDS30T use a cast aluminum end bell specially designed to make them weather-proof. A rotary selector switch is used to set the specific power tap for the speaker. This switch's entry into the end bell is sealed by a special mounting nut with an integral O-ring. A removable plastic panel protects both the rotary switch and the electrical connections. This panel provides a narrow opening for the speaker wires to exit, reducing the chance of water infiltration.



Tilt & Swivel Base

Bogen's 15- and 30-watt horns include a unique and easy-to-use tilt and swivel mounting base that provides nearly 180 degrees of tilt and a full 360-degrees of swivel. A single wing nut locks in the angle of the speaker. Loosening the wing nut frees the speaker in each rotational axis, making it fast and easy to precisely aim the speakers where the sound is needed. The base provides three holes for screw mounting and a slot to allow strapping the speakers to beams. The actual mounting base can easily be removed so that the base can be installed separately. The speakers can then be attached to the bases at a later time.

Model	Max Power Capacity (Watts)	Frequency Response	Sensitivity (dBspl, 1W @ 4ft.)	Max Sound Level (dBspl, full power @ 4ft.)	Power Taps (Watts)		Low-Impedance 8-ohm	Dispersion Angle (degrees)	Connection	Dimensions	Product Weight
					70V	25V					
SPT5A	7.5	250 Hz-14 kHz	96	105	7.5, 5, 2.5, 1.25, 0.65	1, 0.62, 0.31	No	120°	Wire Lead	6" dia. x 4" D	1.5 lb.
SP58A					N/A	N/A	Yes				
SPT15A	15	275 Hz-14 kHz	109	121	15, 7.5, 3.8, 1.8, 0.9	15, 7.5, 1.8, 0.94, 0.46	No	110°	Screw Terminal	9" dia. x 9-1/4" D	4 lb.
SP158A					N/A	N/A	Yes				3 lb.
SPT30A	30	225 Hz-14 kHz	110	125	30, 15, 7.5, 3.7, 1.8	15, 7.5, 3.7, 1.8	No	100°	Screw Terminal	11" dia. x 10-1/2" D	6 lb.
SP308A					N/A	N/A	Yes				5 lb.
BDT30A	30	225 Hz-14 kHz	106**	121**	30, 15, 7.5, 3.7, 1.8	15, 7.5, 3.7, 1.8	No	100°**	Screw Terminal	9-5/8" dia. x 12-1/8" D**	7 lb.
IH8A	15	350 Hz-14 kHz	108	120	N/A	N/A	Yes	130°	Wire Lead	6-1/4" dia. x 6" D	2.5 lb.
KFLDS30T	30	300 Hz-12 kHz	104	119	30, 15, 7.5, 3.7, 1.8	15, 7.5, 3.7, 1.8, 0.9, 0.5, 0.25	No	70°(Vert.) 95°(Horiz.)	Screw Terminal	14-3/8" W x 8-1/4" H x 12-7/8" D	6 lb.

** Each Horn

ACCESSORIES (SOLD SEPARATELY)

BC1
Beam Clamp

HSES10
Horn Speaker Electrical Box Strap (pack of 10; not for SP58A & SPT5A)

TCSPT1
Terminal Cover for Conduit (BDT30A, KFLDS30T, SP158A, SP308A, SPT15A, & SPT30A)

SPEAKERS/ATTENUATORS

Flange-Mounted Horn Speaker

Model FMH15T

The Bogen FMH15T is a flange-mounted, high-intelligibility, reentrant-type loudspeaker. Its sturdy, weatherproof, vandal-resistant, all-metal construction is ideal for indoor and outdoor use. It has a built-in tap selector switch for selecting the speaker power in 70V or 25V constant-voltage systems.

PRODUCT FEATURES:

- Excellent efficiency and voice intelligibility
- Weather-sealed tap selector switch
- 15 watts max. @ 70V or 25V
- Select flush (BBFM6) or surface (BBSM6) mount enclosure for installation (each sold separately)
- Vandal-resistant accessory components for hostile-environment applications
- Heavy-duty cast aluminum grille (SGHD8) and adapter ring (FMHAR8) installation accessories
- All-metal with black enamel finish



ACCESSORIES (SOLD SEPARATELY)

BBSM6
Surface-Mount
Enclosure
(11" W x 11" H x 6" D)

BBFM6
Flush-Mount
Enclosure
(9-7/8" W x 9-7/8" H x 6" D)

SGHD8
Heavy-Duty Grille
(11" W x 11" H x 1/2" D)

FMHAR8
Adapter Ring

Power Taps (Watts)		Frequency Response	Sensitivity (dBspl @ 1W)	Dispersion Angle	Dimensions	Product Weight
70V	25V					
15, 7.5, 3.6, 1.8, 0.9	15, 7.0, 1.8, 0.9, 0.5, 0.25, 0.125	600Hz -14 kHz	104	100°	6-7/8" dia. x 5-1/2" D	3 lb.

Vandal-Resistant Speaker

Model VRS1

This Vandal-Resistant Speaker assembly ensure that sound communication gets through reliably, despite being located in environments susceptible to damage and destruction. The assembly includes a 3" plastic cone speaker, securely located and protected behind steel barriers.

PRODUCT FEATURES:

- Withstands attempts at vandalism in hostile environments
- Grille openings are cross-positioned so that nothing can enter the speaker, not even the smallest or sharpest objects
- Unbreakable metal call button
- Optional low-impedance, 8-ohm speaker operation
- 1/2-Watt speaker power on 25V speaker line
- 3" Weather-resistant cone speaker
- Mounts with one-way security screws (included)



Dimensions	Product Weight
5-1/2" W x 7-3/4" H x 2.5" D	2.5 lb.

Attenuator Speaker Series

Models AT35A, AT10A, ATP35, ATP10

Both Attenuator Series (AT and ATP) allow the output level of a group of loudspeakers to be set from a wall-mounted volume control without affecting overall amplifier volume settings. The ATP-Series also has a priority bypass function that overrides the volume control knob to provide full volume audio to the speakers.

PRODUCT FEATURES:

- Adjusts loudspeaker output levels on 25V & 70V systems
- 2 models control up to 35-watt or 10-watt speaker systems
- Priority override of volume/Emergency Bypass feature (ATP models)
- 10 attenuation steps and an off setting
- Mounts in standard electrical box; single (AT10A, ATP10) or double (AT35A, ATP35)
- Simple connections



Model	Power Rating	Gang Box	Emergency Bypass	Dimensions*	Product Weight
AT10A	10 watts	Single		2-3/4" W x 4-1/2" H x 2-3/4" D	13 oz.
AT35A	35 watts	Dual		4-5/8" W x 4-5/8" H x 3" D	14 oz.
ATP10	10 watts	Single	●	2-3/4" W x 4-1/2" H x 2-5/8" D	13 oz.
ATP35	35 watts	Dual	●	4-5/8" W x 4-5/8" H x 3" D	14 oz.

*Depth from front of plate

EASY INSTALL® SPEAKERS

Surface-Mount Ceiling Speakers

Models SM1EZ, SM4T

Easy Install Speakers drastically cut system installation time because each speaker can be completely installed—mounted in the ceiling, secured, and connected—in less than a minute! This versatile speaker carries voice messages with clarity anywhere dependable communication is required. It can be installed in any suspended ceiling with ceiling tiles—quick, easy, and trouble-free. Compatible with both 70V and 25V systems.



PRODUCT FEATURES:

- **Installs in Seconds.** Each speaker assembly is specially designed for immediate installation as soon as you take it out of the box. Complete installation takes less than a minute.
- **No-Tool Installation.** No tools needed; everything you need is right in the box.
- **Contemporary, Low-Profile Design.** Looks good in any environment.
- **No Clean Up.** Installation means piercing ceiling tiles, NOT cutting them. So, there's virtually no mess and no ceiling tile pieces to clean up.

Model Variations:

- **SM1EZ** is a one-watt, single tap speaker.
- **SM4T** is a four-watt, multi-tap speaker with settings of 4, 2, 1, 1/2, & 1/4 watts. Settings are rotary switch selectable (no transformer wires to deal with).

Complies with NFPA National code 160b that allows speakers to be installed in plenums and other air handling spaces. Complies with UL-2043.

INSTALLS IN SECONDS!



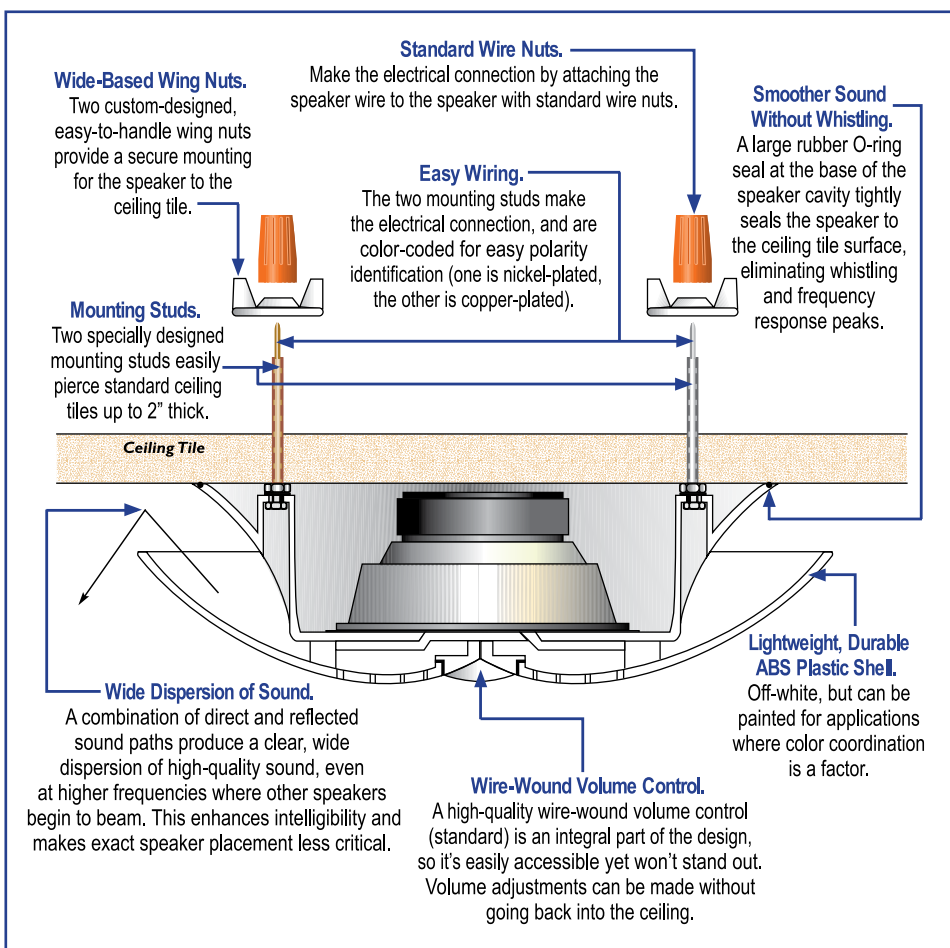
A The speaker's two specially designed mounting studs easily pierce through the ceiling tile.



B Two (2) wide-based wing nuts secure the speaker assembly to the ceiling tile.



C Two (2) standard wire nuts connect the speaker wires to the mounting studs, making the electrical connection. That's all it takes!



Dimensions:	9-1/2" diameter
Depth:	3" (from tile surface)
Frequency Response:	125 Hz – 15 kHz
Sensitivity:	90 dBspl (1 watt @ 1 meter)
Product Weight:	2 lb. each
Shipping Weight:	15 lb./carton (5/carton)

ACCESSORY
(SOLD SEPARATELY)

SMTB
Tile Bridge

EASY DESIGN™ SPEAKERS

Ceiling Speaker

Model CS1EZ

Bogen's CS1EZ is a pre-assembled ceiling speaker comprised of an 8" cone speaker and steel ceiling grille painted with enamel. The CS1EZ includes a volume control knob and rear-mounted screw terminal board for easier electrical connection.



PRODUCT FEATURES:

- 1-watt, single-tap design
- Screw terminal connections for fast installation
- Designed for 70V amplifier output
- 8" cone speaker for excellent audio quality
- Heavy-duty, wire-wound volume control with knob
- 50 Hz-12 kHz frequency response
- 95 dBspl @ 4 ft. /1W input sensitivity
- Off-white finish

Dimensions	Product Weight
13" dia. x 3-1/4" D	3 lb.

ACCESSORIES (SOLD SEPARATELY)	TB8 Tile Bridge	RE84 Ceiling Enclosure	MR8 Mounting Ring
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Horn Loudspeakers

Models HS30EZ, HS15EZ, HS7EZ

Bogen's line of Easy Design Horn Loudspeakers are made of weatherproof all-metal construction, thereby making them ideal for both indoor and outdoor use in industrial plants, warehouses, schools, construction sites, and recreational areas. All models come with swivel and tilt mounting bases for greater flexibility in setting the angle of projection.



PRODUCT FEATURES:

- 7.5-, 15-, and 30-watt models
- Single-tap design
- HS7EZ features 12" lead wire for electrical connections
- HS15EZ and HS30EZ feature screw terminal connections for fast installation
- Designed for 70V amplifier outputs
- Weatherproof design
- Stepped attenuator volume control
- Tilt and swivel mounting base for flexibility in coverage
- Textured mocha enamel

Model	Frequency Response	Sensitivity	Dispersion	Dimensions	Product Weight
HS7EZ	250 Hz - 14 kHz	105 dBspl (4 ft./7.5W) input (@1 kHz)	120°	6" dia. x 4" D	2 lb.
HS15EZ	275 Hz - 14 kHz	121 dBspl (4 ft./15W) input (@1 kHz)	110°	9" dia. x 9-1/4" D	4 lb.
HS30EZ	225 Hz - 14 kHz	125 dBspl (4 ft./30W) input (@1 kHz)	100°	11" dia. x 10-1/2" D	6 lb.

ACCESSORIES (SOLD SEPARATELY)

BC1
Beam Clamp

HSES10
Horn Speaker
Electrical Box Strap

TCSPT1
Terminal Cover for Conduit

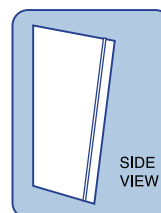
Wall Baffle Speaker

Model WB1EZ

The WB1EZ comes pre-assembled with an 8" cone speaker enclosed in a simulated walnut-finished wooden enclosure with a black grille cloth on front and a recessed volume control.

PRODUCT FEATURES:

- 1-watt, single-tap design
- Screw terminal connections for fast installation
- Designed for 70V amplifier output
- 8" cone speaker for excellent audio quality
- Recessed volume control
- Designed for easy wall-mount installation; face has 13.5 degree downward angle
- 50 Hz-12 kHz frequency response
- 95 dBspl @ 4ft./1W input sensitivity



Dimensions	Product Weight
9-1/2" W x 9-1/2" H x 5-1/4" D (3-1/4" D @ bottom)	4 lb.

EASY DESIGN™ GUIDE

What Is Easy Design?

1
Select the Correct Type
of Speaker for the Job
(see chart below)

2
Determine the Number
of Speakers Required
(see charts on pages 20-22)

3
Select the Amplifier
for the System
(see page 23)

Armed with just 3 pieces of information, you can quickly create a bill of materials for speaker paging jobs. Bogen's Easy Design line of products was created specifically to make the design process easier and less time consuming for the installer.

You supply some basic pieces of information – type of application, dimensions of the area to be covered, ambient noise level, and ceiling height*. Then, a few simple and direct charts will immediately provide you with the best type of speaker to use, the number of speakers needed, and the amplifier power required for the job.

Each speaker in the Easy Design line is designed with a single power tap and a volume control. Any paging system you create

using the Easy Design products will be flexible, robust, and powerful. If noise levels increase in the future, just turn up the volume controls on the speakers – the amplifier will not overload!

You get all the benefits of a 70V central-amplified system – full power capability, high-quality sound and performance, 2-wire installation, long speaker runs, flexibility in amplifier location, no distributed power supplies – and now, super simple system design (we've eliminated the multiple power taps). Easy Design speakers have the high quality and reliability that you expect from Bogen.

* Not all dimensions are needed for all speaker types. Refer to Section 2 for specific dimensions for each speaker.

1 Selecting Correct Speaker Type

- Determine the ambient noise level and type of environment in which the speakers will be installed.
- Then select the speaker(s) best suited for the area.

EXAMPLE:

- The ambient noise level in a machine shop in an industrial area is 90 dB. By referring to the chart, you will find that the HS30EZ horn loudspeaker is best suited for this environment.

For applications with mixed noise levels, such as a location with quiet waiting rooms, medium noise level office areas, and very noisy manufacturing, select an appropriate speaker type for each different area.

Once you have selected the speaker type(s), the next step is to determine how many speakers you will need to cover the area sufficiently.

SPEAKER MODELS		CS1EZ, SM1EZ, WB1EZ <small>see charts on pages 20 & 22</small>	HS7EZ <small>see chart on page 21</small>	HS15EZ, HS30EZ <small>see charts on page 21</small>
TYPICAL AMBIENT NOISE LEVEL	TYPICAL ENVIRONMENTS			
VERY HIGH NOISE 85-95 dB <small>Speech Almost Impossible To Hear</small>	<ul style="list-style-type: none"> • Construction Site • Loud Machine Shop • Noisy Manufacturing • Printing Shop 			
HIGH NOISE 75-85 dB <small>Speech Is Difficult To Hear</small>	<ul style="list-style-type: none"> • Assembly Line • Crowded Transit Waiting Area • Machine/Print Shop • Shipping Warehouse • Supermarket (Peak) • Very Noisy Bar or Restaurant 			
MEDIUM NOISE 65-75 dB <small>Must Raise Voice To Be Heard</small>	<ul style="list-style-type: none"> • Bank/Public Area • Transit Waiting Area • Department Store • Noisy Office Setting • Supermarket (Normal) • Bar or Restaurant 			
LOW NOISE 55-65 dB <small>Speech Is Easy To Hear</small>	<ul style="list-style-type: none"> • Conversational Speech • Doctor's Office • Hospital • Hotel Lobby • Quiet Office • Quiet Bar or Restaurant 			

NOW, TURN TO PAGES 20-22 TO DETERMINE THE NUMBER OF SPEAKERS NEEDED.

EASY DESIGN™ GUIDE

2 Determining the Number of Ceiling Speakers Required

Ceiling Speaker

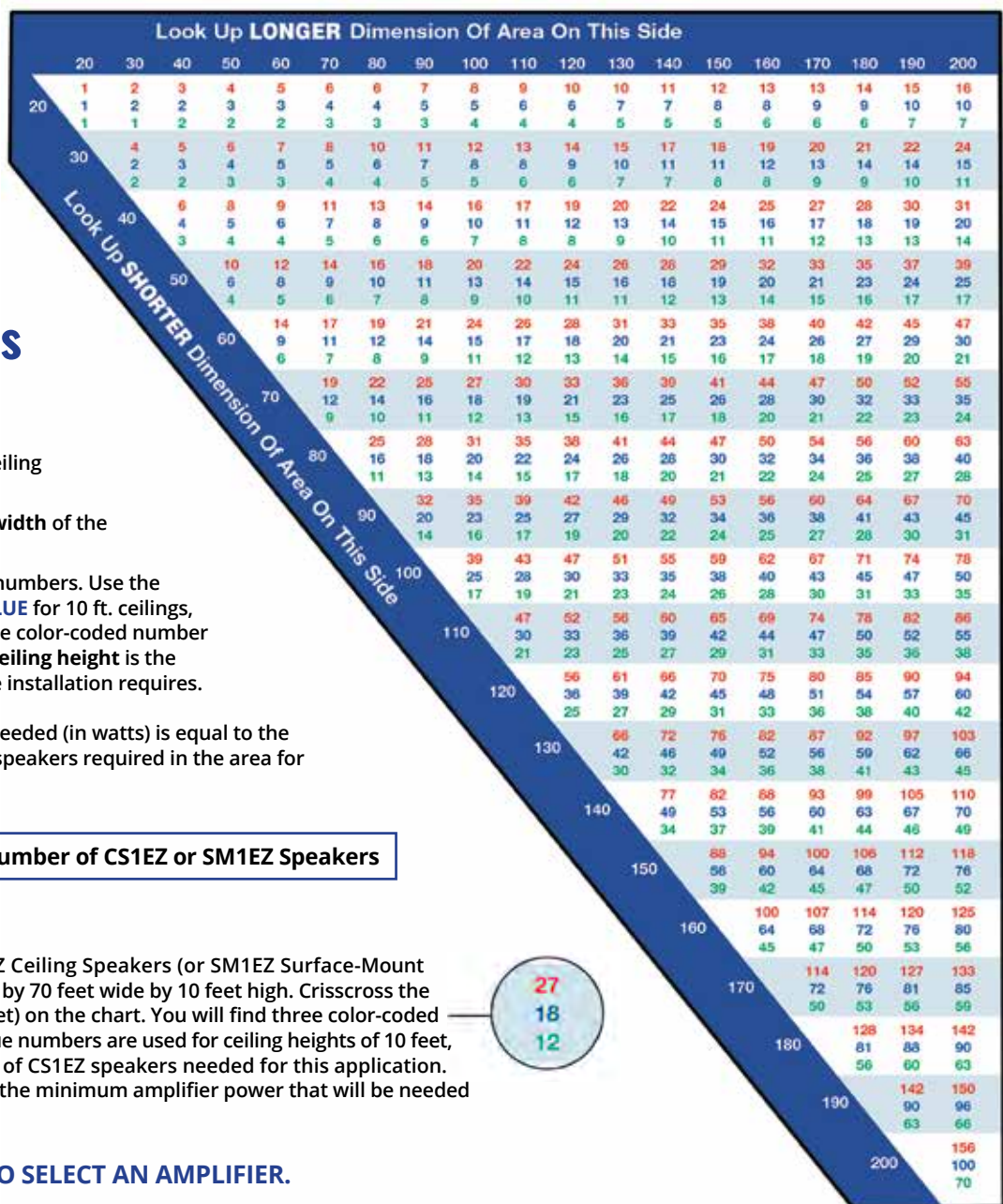
Model CS1EZ

Surface-Mount Ceiling Speaker

Model SM1EZ



Use the below chart to determine the number of CS1EZ Ceiling Speakers and/or SM1EZ Surface-Mount Ceiling Speakers a particular installation will require, based on the dimensions of the area and the ceiling height.



Ceiling Speakers (CS1EZ, SM1EZ)

- Obtain the length, width, and ceiling height of the area.
- Look up where the length and width of the area meet on the chart.
- You will find three color-coded numbers. Use the RED number for 8 ft. ceilings, BLUE for 10 ft. ceilings, and GREEN for 12 ft. ceilings. The color-coded number that corresponds to the area's ceiling height is the general number of speakers the installation requires.

The minimum amplifier power needed (in watts) is equal to the total number of CS1EZ or SM1EZ speakers required in the area for uniform coverage.

Amplifier Power (min.) = Number of CS1EZ or SM1EZ Speakers

EXAMPLE:

A typical office area, using CS1EZ Ceiling Speakers (or SM1EZ Surface-Mount Ceiling Speakers), is 100 feet long by 70 feet wide by 10 feet high. Crisscross the length (100 feet) and width (70 feet) on the chart. You will find three color-coded numbers: 27, 18, and 12. Since blue numbers are used for ceiling heights of 10 feet, 18 is the recommended quantity of CS1EZ speakers needed for this application. This number (18) also represents the minimum amplifier power that will be needed (in watts) for this area.

NOW, TURN TO PAGE 23 TO SELECT AN AMPLIFIER.

EASY DESIGN™ GUIDE

Horn Loudspeakers

- Obtain the **square footage** of the area to be covered and its ambient noise level.
- Where the area's square footage intersects the area's **ambient noise level**, you will find two numbers.

The number in **GREEN** is the typical number of horn loudspeakers the installation requires. Additional speakers may be needed in areas that have obstructions, like shelving, that block sound dispersion.

The number in **RED** is the **minimum amplifier power** needed (in watts) for the installation.

$$\text{Amplifier Power (min.)} = \text{Number in RED}$$

EXAMPLE:

A factory has 35,000 square feet of open area and an average ambient noise level of 80 dB. Thus, it will require HS15EZ Horn Loudspeakers. Using the chart for the HS15EZ speaker, criss-cross the square footage and the ambient noise level. The number of horn loudspeakers needed for an installation is shown in **GREEN** and the minimum amplifier power for this number of speakers is shown in **RED**. As you can see, 6 speakers are needed for this application and the minimum amplifier power needed is 90 watts.



Model HS30EZ Use this chart to determine the number of HS30EZ Horn Loudspeakers a particular installation will require, based on the size of the area and the ambient noise level of the environment.

HORN QTY. & MIN. POWER (WATTS) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																				
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
85-95 dB Very High Noise – speech almost impossible	HORNS	1	2	3	4	6	7	8	9	10	11	12	13	14	16	17	18	19	20	21	22
	POWER	30	60	90	120	180	210	240	270	300	330	360	390	420	480	510	540	570	600	630	660

GREEN represents the number of speakers.
RED represents the minimum amplifier power required.

NOTE: For applications over 100dB, contact Bogen FREE DESIGN SERVICE for assistance.



Model HS15EZ Use this chart to determine the number of HS15EZ Horn Loudspeakers a particular installation will require, based on the size of the area and the ambient noise level of the environment.

HORN QTY. & MIN. POWER (WATTS) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																				
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
75-85 dB High Noise – speech is difficult	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	POWER	15	30	45	60	75	75	90	105	120	135	150	150	165	180	195	210	225	225	240	255
85-95 dB Very High Noise – speech almost impossible	HORNS	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	POWER	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600

GREEN represents the number of speakers.
RED represents the minimum amplifier power required.



Model HS7EZ Use this chart to determine the number of HS7EZ Horn Loudspeakers a particular installation will require, based on the size of the area and the ambient noise level of the environment.

HORN QTY. & MIN. POWER (WATTS) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																				
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
55-65 dB Low Noise – speech is easy	HORNS	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
	POWER	8	8	15	15	23	23	30	30	38	38	45	45	53	53	60	60	68	68	75	75
65-75 dB Medium Noise – must raise voice to be heard	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	POWER	8	15	23	30	38	38	45	53	60	68	75	75	83	90	98	105	113	113	120	128

GREEN represents the number of speakers.
RED represents the minimum amplifier power required.

NOW, TURN TO PAGE 23 TO SELECT AN AMPLIFIER.





Let Us Design Your System... For FREE!!!

BOGEN FREE DESIGN SERVICE

See Page 66 For Details

EASY DESIGN™ GUIDE

2 Determining the Number of Wall Baffle Speakers Required

Wall Baffle Speaker

Model WB1EZ

Use the below chart to determine the number of WB1EZ speakers a particular installation will require, based on the dimensions of the area.



Wall Baffle Speaker (WB1EZ)

- Obtain the **length** and **width** of the area.
- Where the length and width of the area crisscross on the chart, you will find the typical **number of speakers** that the installation requires.

The minimum amplifier power needed (in watts) is equal to the total number of WB1EZ speakers required in the area for uniform coverage.

$$\text{Amplifier Power (min.)} = \text{Number of WB1EZ Speakers}$$

Example:

An area's dimensions are 150 ft. long by 110 ft. wide. Crisscross these two dimensions on the chart and you will find that 28 WB1EZ Wall Baffle Speakers are needed for this application. This number (28) is also the minimum amplifier power needed (in watts) for this area.

Look Up **LONGER** Dimension Of Area On This Side

	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
20	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	6
30		2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
40			3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13
50				4	5	6	7	8	8	9	10	11	12	12	13	14	15	16	17
60					6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
70						8	9	11	12	13	14	15	16	18	19	20	21	22	23
80							11	12	13	15	16	17	19	20	21	23	24	25	27
90								14	15	16	18	20	21	23	24	26	27	28	30
100									17	18	20	22	23	25	27	28	30	32	33
110										20	22	24	26	28	29	31	33	35	37
120											24	26	28	30	32	34	36	38	40
130												28	30	33	35	37	39	42	44
140													33	35	37	40	42	45	47
150														33	40	43	45	48	50
160															43	45	48	51	52
170																48	52	54	56
180																	54	58	60
190																		60	64
200																			66

Look Up **SHORTER** Dimension Of Area On This Side

Mixed Speaker Type Applications

For applications with more than one type of speaker:

- Determine the number of speakers and the minimum amplifier power needed for each type of speaker separately.
- Add together the minimum amplifier power needed for each type of speaker to obtain the minimum amplifier power needed for the entire application.

Example:

An application requires 10 SM1EZ Surface-Mount Ceiling Speakers (minimum amplifier power needed is 10 watts), 5 HS15EZ Horn Loudspeakers (minimum amplifier power needed is 75 watts), and 10 WB1EZ Wall Baffle Speakers (minimum amplifier power needed is 10 watts). Add together the minimum amplifier power needed for each type of speaker: 10 watts + 75 watts + 10 watts. The sum is 95 watts. This is the minimum amplifier power needed (in watts) for the entire application.

NOW, TURN TO PAGE 23 TO SELECT AN AMPLIFIER.

EASY DESIGN™ GUIDE

3 Selecting an Amplifier

Once you determine the number of speakers and the minimum amplifier power for the installation, you are ready to select the system amplifier. A 70V paging amplifier is very easy to select.

- Locate amplifiers on the chart on page 69 that have a **wattage equal to or higher** than the minimum amplifier power of your application. (Amplifiers with power capacities greater than this number will not damage the speakers. The extra power available is simply not used.)
- Determine the **amplifier features** needed for the application (see the *Site Survey Check List* on page 61 and the *Amplifier Features Chart* on page 69).
- Using the chart on page 69, **find an amplifier** that offers these features. As long as the wattage of the selected amplifier is equal to or higher than the minimum amplifier power, the amplifier will work well for the application.

If you think the application's system may need to expand in the future (this is often the case with new constructions and relocating companies), you may want to select an amplifier with a greater power capacity now.

EXAMPLE :

An application requiring 18 CS1EZ Ceiling Speakers requires a minimum amplifier power of 18 watts, so an amplifier with a power rating of 18 watts minimum is needed. Now, look at the chart on page 69 to determine which amplifiers provide the necessary wattage to drive the speakers as well as provide the amplifier features that are most appropriate for the installation. Since the minimum wattage needed is 18, the amplifier with the lowest power usable for this installation is 20 watts (model C20). However, if the C20 does not have the features required for the application, such as bass and treble controls, you can select any amplifier of greater wattage that offers the specific features. For instance, you might select the TPU35B or C35. Both of these amplifiers have a higher wattage than the application's minimum amplifier power needed and provide the desired features because they have bass and treble controls. Either of these amplifiers will work well for this application. Plus, there is room to expand the system on a 35W or higher amplifier without the need to purchase an additional amplifier in the future.

The Amplifier Features Chart outlines the features and power ratings of Bogen amplifiers that can be used for a variety of application needs. For complete chart, see page 69.

A POWER

Locate a power rating that is higher than the application requires (allowing for future system expansion).

B FEATURES

Find the amplifier features that the application requires.

Amplifier Output Power Rating/ Channel	Model Numbers	Amplifier Channels		Input Types			Signal Processing					Music Mixing			Mounting Options				Catalog Page Number			
		TEL Input* 600 ohm balanced	MIC Input** 1/2" balanced	AMP Input*** 1/4" Unbalanced	Balanced Inputs 1/2"	Modular Inputs	Audio Enhancement	Loadless Control	AFC	EQ	Bass/Treble	Tone Control	Variable Mute	Audio Mute	Musical Mute	Night Filter	Remote Volume	Output Meter		Wall Mount	Shelf Mount	Rack Mount
10W	C10	1	1	2(1)	0(1)																	33
15W	TPU15A	1	1		1																	39
20W	C20	1	1	2(1)	0(1)																	33
35W	C35	1	1	2(1)	1(2)																	33
35W	GS35B	1	0(1)	6(4)	1(2)																	33
35W	TPU35B	1	1	1	1																	39
35W	V35	1				8																36
40W	...	1				3†																34

C MODEL NUMBERS

Select the amplifier model(s) best suited for your application.

D REFERENCE PAGE

Turn to the page number indicated for more information about the product you need.

REFER TO CHART ON PAGE 69

SELF-AMPLIFIED (24V) SYSTEMS



Bogen introduces the next generation in self-amplified (24V) paging equipment. Only Bogen offers high-efficiency horn speakers that use digital switching amplifiers and constant dispersion horn technology, single- and multi-zone telephone paging interfaces that provide a new level of features and flexibility with programmable AUX relay contacts and installer programmable dialing codes, and an extensive line of 24V switching power supplies with secure mounting holsters and pluggable screw terminal connectors on models above 1 amp.

To locate **Bogen's Self-Amplified (24V) Paging Products**, simply look for the upward-pointing **GREEN** triangles and the downward-pointing **RED** triangles. The numbers inside the triangles indicate **Current Units**, which determine how much power that product provides to or consumes from the system.

	Provides System Current		Consumes System Current		No Draw on the System
--	--	--	--	--	--------------------------------------

Other products such as telephone interfaces, buffered level controls, and 24V power supplies that are well suited for use in self-amplified paging systems carry these same icons for easy identification. Suitable products that neither provide nor consume power are shown with the neutral **GRAY** icon with a zero inside it.

For more information on understanding **Current Units** for your system, see page 57.

Getting Started

1. **Select Your Self-Amplified Speaker Type**
(Use this chart)
2. **Select a Telephone Interface**
(pages 31 - 32)
3. **Select Your Power Supplies**
(page 30)

SPEAKER MODELS		ACD2X2, AMBS, ASM1, ASWB1, ASWG1, ASWG1DK <small>see charts on page 25</small>	SAH5, SAH5A <small>see chart on page 28</small>	SAH15, SAH30, AH15A <small>see charts on pages 28 & 29</small>
TYPICAL AMBIENT NOISE LEVEL	TYPICAL ENVIRONMENTS			
VERY HIGH NOISE 85-95 dB <small>Speech Almost Impossible To Hear</small>	<ul style="list-style-type: none"> • Construction Site • Loud Machine Shop • Noisy Manufacturing • Printing Shop 			
HIGH NOISE 75-85 dB <small>Speech Is Difficult To Hear</small>	<ul style="list-style-type: none"> • Assembly Line • Crowded Transit Waiting Area • Machine/Print Shop • Shipping Warehouse • Supermarket (Peak) • Very Noisy Bar or Restaurant 			
MEDIUM NOISE 65-75 dB <small>Must Raise Voice To Be Heard</small>	<ul style="list-style-type: none"> • Bank/Public Area • Transit Waiting Area • Department Store • Noisy Office Setting • Supermarket (Normal) • Bar or Restaurant 			
LOW NOISE 55-65 dB <small>Speech Is Easy To Hear</small>	<ul style="list-style-type: none"> • Conversational Speech • Doctor's Office • Hospital • Hotel Lobby • Quiet Office • Quiet Bar or Restaurant 			

SELF-AMPLIFIED CEILING SPEAKERS

Drop-In Ceiling Speakers

Models **ACD2X2**,
ACD2X2U

The **ACD2X2** full-range speaker is quick and easy to install. Simply wire it and drop it into place. This saves installation time, effort, and cost.



Tile Support Rail Included



PRODUCT FEATURES:

- 2' x 2' design fits into 2' x 2' and 2' x 4' suspended ceiling tile spaces (tile support rail included for 2' x 4' ceilings)
- Finely perforated grille covers entire front of speaker panel
- Fully enclosed, industrial-grade steel construction
- Front-mounted, recessed volume control
- Self-contained 1-watt amplifier
- 8" main cone speaker, with secondary cone
- Non-reflective finish, off-white (ACD2X2) or bright white (ACD2X2U)
- Listed to UL Standard 60065 for U.S. & Canada
- Complies with UL-2043

Dimensions:	23-7/8" W x 5" H x 23-7/8" D
Product Weight:	12 lb. each

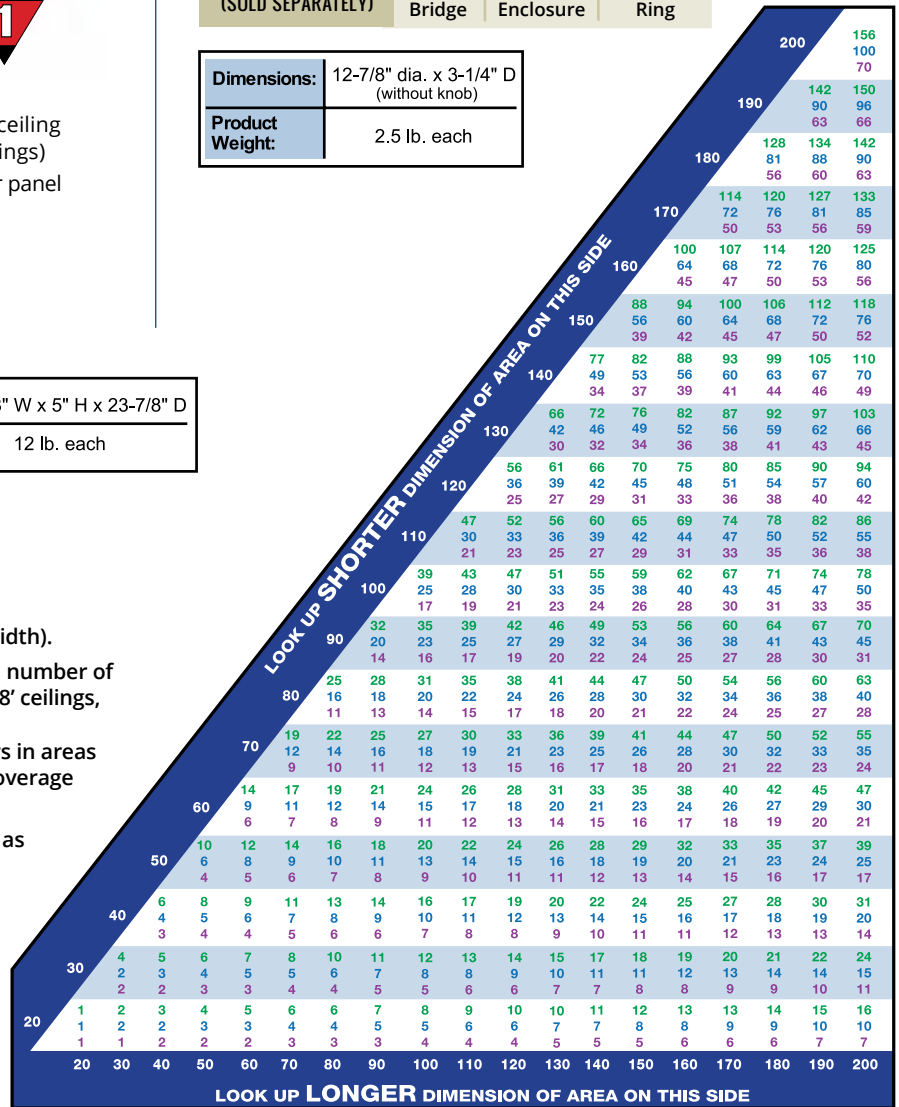
Determine Speaker Quantity

Using the chart:

1. Locate the dimensions of the room (length and width).
2. Where these two measurements meet will be the number of speakers required. Use the number in GREEN for 8' ceilings, BLUE for 10' ceilings, and PURPLE for 12' ceilings. (You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)
3. The number of Current Units needed is the same as the number of speakers (1W models, ACD2X2(U), ASWG1/DK, ASUG1/DK, ASM1, AMBSL/Q1).

Current Units (min.) =
Number of Ceiling Speakers

GREEN for 8 ft. Ceiling
BLUE for 10 ft. Ceiling
PURPLE for 12 ft. Ceiling



Ceiling Speaker Assemblies

Models **ASWG1**, **ASUG1**, **ASWG1DK**,
ASUGDK1

These traditional style, recessed ceiling speakers are available with a fixed or detachable volume control knob.

PRODUCT FEATURES:

- 8" cone speaker
- Front-mounted volume control with knob (Knob is detachable on "DK" versions)
- Steel grille with enamel finish, off-white ("W" versions) or bright white ("U" versions)
- Self-contained 1-watt amplifier
- 90° dispersion pattern



ASWG1,
ASUG1



ASWG1DK,
ASUGDK1
(w/detachable volume knob)

ACCESSORIES (SOLD SEPARATELY)	TB8 Tile Bridge	RE84 Ceiling Enclosure	MR8 Mounting Ring
---	---------------------------	----------------------------------	-----------------------------

Dimensions:	12-7/8" dia. x 3-1/4" D (without knob)
Product Weight:	2.5 lb. each

SELF-AMPLIFIED CEILING/SURFACE-MOUNT SPEAKERS

Easy Install® Ceiling Speakers

Model ASM1

Bogen's Self-Amplified Easy Install Speakers can be installed in a ceiling tile in less than a minute in any drop ceiling with standard ceiling tiles. Installation is a simple, three-step process that requires no tools. Simply pierce the ceiling tile with the specially-designed studs, use wing nuts to secure the speaker to the ceiling, and fasten wire nuts to make the 24V DC power and audio connections.

PRODUCT FEATURES:

- Installs in less than a minute
- No-tool installation eliminates need to cut ceiling tiles
- Built-in 1-watt amplifier
- Direct and reflected sound paths create wide dispersion angle
- Lightweight and durable, off-white plastic shell with paintable finish
- Contemporary, low-profile design
- O-ring seal prevents whistling and ensures smoother sound without peaks
- Front-mounted volume control
- Complies with NFPA National Code 160b for installation in plenums and other air handling spaces
- Complies with UL-2043



ASM1

ACCESSORY
(SOLD SEPARATELY) **SMTB**
Tile Bridge

Frequency Response	Maximum dBspl	Depth	Dimensions	Product Weight
125 Hz - 15 kHz	90	3" from tile surface	9-1/2" diameter	2 lb.

Metal Box Speakers

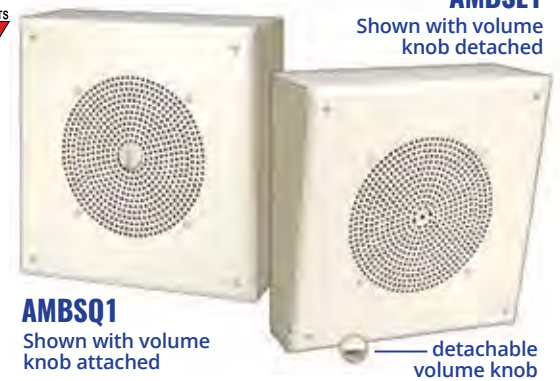
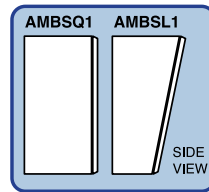
Models AMBSQ1, AMBSL1

Bogen's Self-Amplified Metal Box Speakers are available in two models, AMBSQ1 and AMBSL1, and are suitable for both ceiling and wall mounting.

PRODUCT FEATURES:

- Rugged all-steel, surface-mounted, off-white painted enclosure
- Speaker front is available flat (AMBSQ1) or angled downward by 12.5 degrees for wall mounting (AMBSL1)
- Full-range 8" cone loudspeaker for excellent intelligibility
- Built-in volume control with detachable knob
- Self-contained 1-watt amplifier
- Wiremold® knockouts
- Mounting hardware included

Wiremold® is a registered trademark of Wiremold/Legrand.



AMBSL1

Shown with volume knob detached

AMBSQ1

Shown with volume knob attached

detachable volume knob

Models	Front Panel Design	Frequency Response	Maximum dBspl	Dimensions	Product Weight
AMBSL1	Slant/Angle	110 Hz -15 kHz	92	11-5/8" W x 11-3/8" H x 5-3/8" D <i>(Top Dimension)</i> 11-5/8" W x 11-3/8" H x 3-1/8" D <i>(Bottom Dimension)</i>	9 lb.
AMBSQ1	Square/Flat	110 Hz -15 kHz	92	11-5/8" W x 11-5/8" H x 4-1/4" D	9 lb.

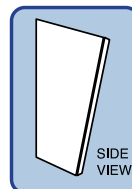
Wall Baffle Speakers

Model ASWB1

The ASWB1 Wall Baffle Speaker is an 8", cone-type loudspeaker, complete with a built-in amplifier and volume control, designed for telephone paging applications. It is engineered to provide excellent sound quality and trouble-free operation.

PRODUCT FEATURES:

- Self-contained 1-watt amplifier
- Simulated walnut finish, black grille cloth front
- Sloping front panel (13.5 degrees) provides enhanced downward dispersion
- Easy wall-mount installation (mounting hardware included)
- Built-in volume control
- 8" main cone speaker
- 90° dispersion pattern



ASWB1

Dimensions:	9-1/2" W x 9-1/2" H x 5-1/4" D
Product Weight:	4 lb.

SELF-AMPLIFIED HORN SPEAKERS

High-Efficiency, Digital Switching Horn Loudspeakers

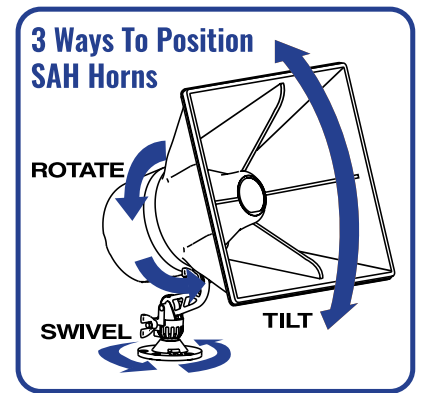
Models **SAH30** (30W) ^{CURRENT UNITS} **-17**, **SAH15** (15W) ^{CURRENT UNITS} **-9**, **SAH5** (5W) ^{CURRENT UNITS} **-4**

Using digital switching amplifier technology, these **Self-Amplified Horn Loudspeakers** provide unprecedented low DC current draw and heat dissipation, allowing them to use fewer power supplies, run on longer cable runs, and work at higher ambient temperatures than conventional analog self-amplified horn speakers. The shape of the horn's flare provides a controlled dispersion of sound for better intelligibility. The horn can be rotated on its axis, offering wide dispersion patterns vertically or horizontally, depending on its position. In addition, these weatherproof, plastic horns are extremely durable and rugged. They can be used in any environment, indoors or outdoors, without affecting sound quality.



PRODUCT FEATURES:

- 5-, 15-, and 30-watt models with built-in amplifiers
- All models operate from 24V DC power source
- Digital switching amplifier technology greatly reduces current consumption when compared to conventional analog self-amplified horn loudspeakers
- Low heat dissipation of the digital switching amplifier allows units to operate with continuous background music and in higher ambient temperatures than conventional analog amplifiers
- Excellent extended frequency response from 1.6" diameter voice coil and 90 mm, 12-ounce magnet structure (SAH5/15), or 100mm, 16-ounce magnet structure (SAH30)
- Rotatable horn allows for the use of a wider (120°) vertical or horizontal dispersion pattern
- Predictable dispersion pattern over the full frequency range ensures excellent intelligibility and ease of layout
- Removable access cover protects terminals and volume control
- Weatherproof, UV-protected mocha finish plastic housing
- Simple, secure, cast aluminum swivel mount
- Screw terminal strip for easy wire connections
- Electrical box mounting strap included

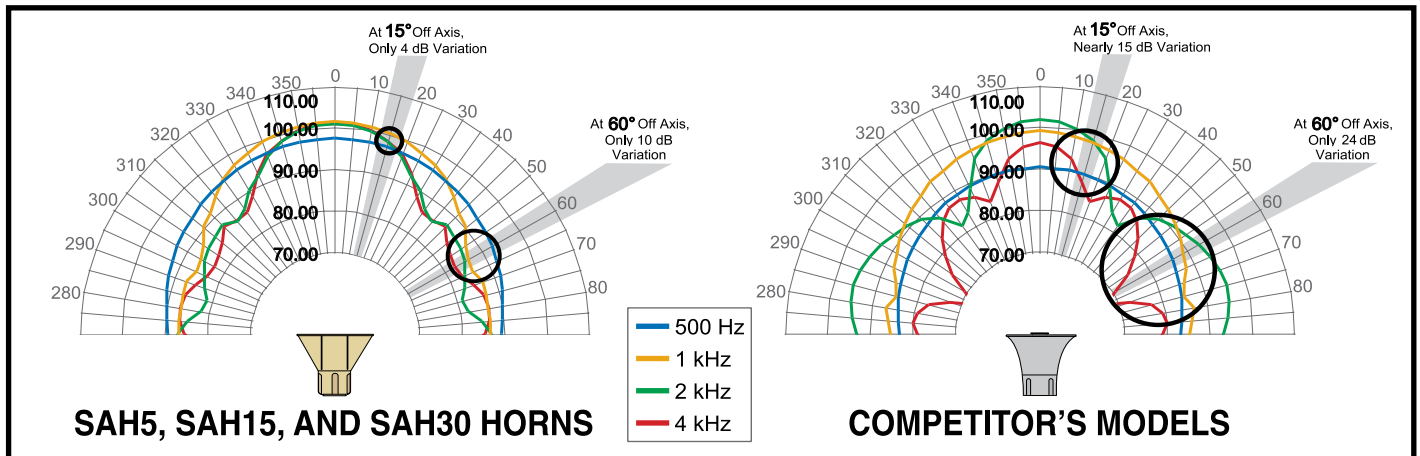


ACCESSORY **BC1**
(SOLD SEPARATELY) Beam Clamp

Models	Maximum Power Level	Frequency Response	Maximum dBspl	Dimensions	Product Weight
SAH5	5 watts	275 Hz -14 kHz	119	10-5/8" W x 12" H x 11-1/2" D	6 lb.
SAH15	15 watts		124		
SAH30	30 watts		127		

Controlled Dispersion

Many horns in the market disperse sound frequencies in a wild and uncontrolled manner. This reduces intelligibility and causes inconsistent sound quality over the horn's coverage angle. Bogen's SAH horns benefit from Bogen's long history as a commercial and pro audio company. Bogen's SAH horns disperse the various frequencies that make up the sound of a page in a very carefully controlled manner. This means that the listener hears clean, crisp intelligible pages over the full coverage area of the horn.



*4 kHz is a particularly important frequency for voice intelligibility

SELF-AMPLIFIED HORN SPEAKERS

Determine Speaker Quantity

Choose the chart below that corresponds to the speaker you will use (SAH30, SAH15, or SAH5):

1. Choose the level of ambient noise in the area to be covered.
2. Locate the area's square footage.
3. Where these two measurements meet are two numbers. The number in **GREEN** is the number of speakers required. The number in **RED** is the number of **Current Units** needed for that many speakers. (You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)

Current Units (min.) = Number in **RED**

Model SAH30



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
85-95 dB Very High Noise - speech almost impossible	HORNS 1	HORNS 2	HORNS 3	HORNS 4	HORNS 6	HORNS 7	HORNS 8	HORNS 9	HORNS 10	HORNS 11	HORNS 12	HORNS 13	HORNS 14	HORNS 16	HORNS 17	HORNS 18	HORNS 19	HORNS 20	HORNS 21	HORNS 22
	CU 17	CU 34	CU 51	CU 68	CU 102	CU 119	CU 136	CU 153	CU 170	CU 187	CU 204	CU 221	CU 238	CU 272	CU 289	CU 306	CU 323	CU 340	CU 357	CU 374

Model SAH15



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
75-85 dB High Noise - speech is difficult	HORNS 1	HORNS 2	HORNS 3	HORNS 4	HORNS 5	HORNS 5	HORNS 6	HORNS 7	HORNS 8	HORNS 9	HORNS 10	HORNS 10	HORNS 11	HORNS 12	HORNS 13	HORNS 14	HORNS 15	HORNS 15	HORNS 16	HORNS 17
	CU 9	CU 18	CU 27	CU 36	CU 45	CU 45	CU 54	CU 63	CU 72	CU 81	CU 90	CU 90	CU 99	CU 108	CU 117	CU 126	CU 135	CU 135	CU 144	CU 153
85-95 dB Very High Noise - speech almost impossible	HORNS 2	HORNS 4	HORNS 6	HORNS 8	HORNS 10	HORNS 12	HORNS 14	HORNS 16	HORNS 18	HORNS 20	HORNS 22	HORNS 24	HORNS 26	HORNS 28	HORNS 30	HORNS 32	HORNS 34	HORNS 36	HORNS 38	HORNS 40
	CU 18	CU 36	CU 54	CU 72	CU 90	CU 108	CU 126	CU 144	CU 162	CU 180	CU 198	CU 216	CU 234	CU 252	CU 270	CU 288	CU 306	CU 324	CU 342	CU 360

Model SAH5

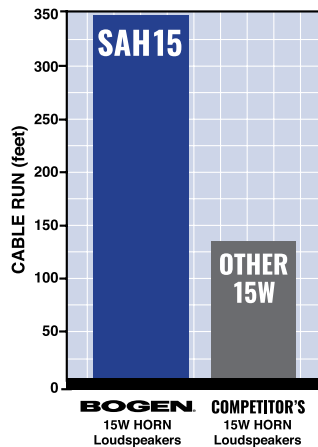


HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
55-65 dB Low Noise - speech is easy	HORNS 1	HORNS 1	HORNS 2	HORNS 2	HORNS 3	HORNS 3	HORNS 4	HORNS 4	HORNS 5	HORNS 5	HORNS 6	HORNS 6	HORNS 7	HORNS 7	HORNS 8	HORNS 8	HORNS 9	HORNS 9	HORNS 10	HORNS 10
	CU 4	CU 4	CU 8	CU 8	CU 12	CU 12	CU 16	CU 16	CU 20	CU 20	CU 24	CU 24	CU 28	CU 28	CU 32	CU 32	CU 36	CU 36	CU 40	CU 40
65-75 dB Medium Noise - must raise voice to be heard	HORNS 1	HORNS 2	HORNS 3	HORNS 4	HORNS 5	HORNS 5	HORNS 6	HORNS 7	HORNS 8	HORNS 9	HORNS 10	HORNS 10	HORNS 11	HORNS 12	HORNS 13	HORNS 14	HORNS 15	HORNS 15	HORNS 16	HORNS 17
	CU 4	CU 8	CU 12	CU 16	CU 20	CU 20	CU 24	CU 28	CU 32	CU 36	CU 40	CU 40	CU 44	CU 48	CU 52	CU 56	CU 60	CU 60	CU 64	CU 68

Lower Currents = Lower Voltage Drops

Bogen's SAH self-amplified horn speakers consume significantly less current than equivalently sized conventional analog self-amplified horns. Lower current draw means less voltage drop and longer cable runs than those allowed by conventional analog self-amplified horns. This allows more flexibility as to where you mount your power supplies and how many individual power supplies need to be installed.

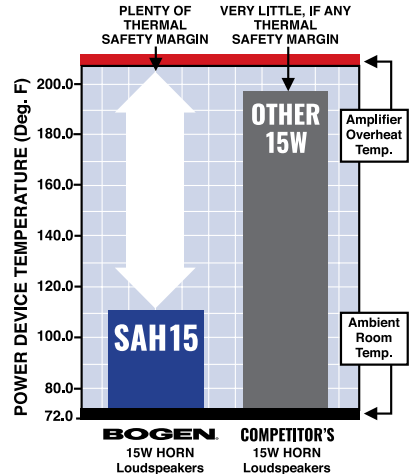
Voltage Drop Comparison
(1-Horn at end of cable - 24 ga.)



Thermally Rugged

By virtue of its high efficiency digital switching technology, the SAH self-amplified horn speaker's amplifier produces very little wasted heat. Lower amplifier operating temperatures mean these horns can work harder in higher temperature environments than conventional analog self-amplified horns. Lower operating temperatures also mean less stress on critical internal components and better reliability. Continuous background music is easy for these cool-running horns.

Temperature Comparison
(@ 1/3 Max. Power)

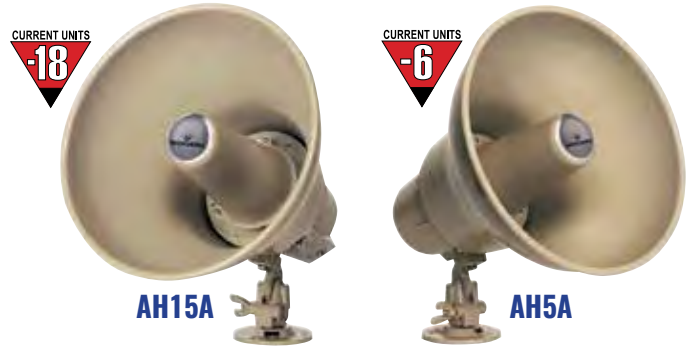


SELF-AMPLIFIED METAL HORN SPEAKERS

Traditional Metal Horn Speakers

Models **AH15A** (15W), **AH5A** (5W)

The AH5A and AH15A Metal Horn Speakers are rugged, self-contained amplified paging horn assemblies that can be used for high noise paging areas indoors as well as for outdoor use. Their sturdy, weatherproof, all-metal construction allows them to withstand any environment while continuing to provide excellent audio intelligibility for paging and background music.



PRODUCT FEATURES:

- 5- and 15-watt models with built-in amplifiers
- Screwdriver-adjustable volume controls
- Universal tilt-and-swivel mount
- Banding slots secure horns to beams and pillars
- 4-conductor, color-coded cable for quick connections to audio and power sources
- Plastic cover protects volume control and provides cable strain relief
- Self-aligning, field-replaceable diaphragm
- Weatherproof, all-aluminum housing
- Speaker and brackets have textured mocha enamel finish
- 110° dispersion pattern

Dimensions	Product Weight
9" dia. x 9-1/4" "D	4 lb. each

ACCESSORIES (SOLD SEPARATELY)	BC1 Beam Clamp	TCSPT1 Terminal Cover For Conduit	HSES10 Horn Speaker Electrical Box Strap (Pack of 10)
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Determine Speaker Quantity

Choose the chart below that corresponds to the speaker you will use (AH15A or AH5A):

1. Choose the level of ambient noise in the area to be covered.
2. Locate the area's square footage.
3. Where these two measurements meet are two numbers. The number in **GREEN** is the number of speakers required. The number in **RED** is the number of Current Units needed for that many speakers. (You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)

Current Units (min.) = Number in RED

Model AH15A



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
75-85 dB High Noise – speech is difficult HORNS CU	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	18	36	54	72	90	90	108	126	144	162	180	180	198	216	234	252	270	270	288	306
85-95 dB Very High Noise – speech almost impossible HORNS CU	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	36	72	108	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720

Model AH5A



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
55-65 dB Low Noise – speech is easy HORNS CU	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
	6	6	12	12	18	18	24	24	30	30	36	36	42	42	48	48	54	54	60	60
65-75 dB Medium Noise – must raise voice to be heard HORNS CU	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	6	12	18	24	30	30	36	42	48	54	60	60	66	72	78	84	90	90	96	102

POWER SUPPLIES

24V Switch-Mode and Linear

Models **SPS2466, SPS2425, SPS2410, SPS2406, PRS2403R**



- PRODUCT FEATURES:**
- Specially designed for use with 24V Bogen equipment
 - Wide range of current outputs
 - UL and C-UL listed

Model	Ratings	Mounting	Connections	Dimensions	Product Weight
SPS2466	24V DC @ 6.6A	Holster	Pluggable Terminal Strip	2-7/8" W x 6-3/4" H x 1-5/8" D	2 lb.
SPS2425	24V DC @ 2.50A	Holster	Pluggable Terminal Strip	3" W x 5-3/4" H x 1-3/4" D	2 lb.
SPS2410	24V DC @ 1.00A	Holster	Pluggable Terminal Strip	2-1/2" W x 4-1/4" H x 1-1/4" D	2 lb.
SPS2406	24V DC @ 0.60A	Receptacle	Wires, Barrel-Type	2" W x 3-3/8" H x 1-1/4" D	2 lb.
PRS2403R	24V DC @ 0.30A	Plug-In	Wires, Barrel-Type	2-1/4" W x 3-1/4" H x 2" D	1 lb.

General Power Supplies

Models **PRS40C, PRS48, PCMPS2**

These Power Supplies are designed to supply low voltage DC requirements. Corded or outlet mounted.

- PRODUCT FEATURES:**
- Specially designed for use with Bogen equipment
 - Wide range of voltages and current outputs
 - UL and C-UL listed



Model	Output	120V AC Input Style	Output Connections	Dimensions	Product Weight
PRS40C	12V DC @ 0.3A	Plug-in	Barrel Connector	2" W x 2-3/8" H x 1-5/8" D	1 lb.
PRS48	48V DC @ 0.1A	Plug-in	Screw Terminals	2-1/2" W x 3" H x 2" D	1 lb.
PCMPS2	12V DC @ 1.5A	Plug-in	Barrel Connector	2-1/4" W x 4" H x 1-3/8" D	1 lb.

Loop Start Interface/Power Supply

Model **PRSLI**

The **PRSLI** functions as both a 24V DC power supply and a loop start interface for small paging systems.

- PRODUCT FEATURES:**
- 24V Talk battery supply for loop start ports
 - Buffered audio output for up to 25 self-amplified speakers
 - 450 mA, 24V DC power supply for external equipment

- Integral flanges and rubber feet for wall or shelf mounting
- 6-terminal barrier strip
- UL and C-UL listed



Dimensions:	2-3/4" W x 4-1/2" H x 2-1/2" D
Product Weight:	3 lb.

SINGLE-/MULTI-ZONE TELEPHONE INTERFACE

Single-Zone Universal Telephone Interface

Model UTI1

Bogen's UTI1 is a single-zone telephone interface that is compatible with all standard analog port types. A background music (BGM) input with variable muting coordinates music and page announcements. An additional audio output provides a "page only" function (no BGM) for application flexibility. A built-in 24V DC, 1A power supply is provided for powering amplified speakers. Paging volume controls are provided for each of the outputs. Contact-triggered tones and night ring signals, as well as programmable AUX relay contacts, are all programmed using DTMF tones through the dual-purpose override input.



PRODUCT FEATURES:

- Emergency override and general paging
- Interfaces to Loop Start, Ground Start, Analog Station, and Page Ports (with or without contact closure activation)
- Background music (BGM) input with level control and variable muting
- Separate Page and BGM and Page Only
- Level control for each output
- 24V DC, 1A power supply
- 150 Speaker T/R drive capacity per output
- Page level limiter with active indicator
- Override input (loop start or page port)
- Programmable timeout for station mode
- Tone burst (2 to 7 sec), chime, and slow whoop tone selections
- Microcontroller operated, DTMF programmable
- Night ring tone or chime selection
- Programming through override jack
- Wall-mount design
- FCC Part 68 Registered
- Listed to UL Standard 60950 for U.S. and Canada



ACCESSORY (SOLD SEPARATELY)	RPKUT11 Security Cover and Rack Mount Kit (sold as a set)	
Power Requirements	Dimensions	Product Weight
120V AC, 0.5A	12-1/4" W X 5-1/4" H X 2-1/2" D (without rack mount kit)	5 lb.

Multi-Zone Universal Telephone Interface

Model UTI312



Bogen's UTI312 is a multi-zone paging controller with universal telephone interface. It is expandable from 3 to 12 zones in 3-zone increments using ZX3 expansion modules. Each zone has its own buffered paging output (150 speaker drive capacity) with volume control, a C-form relay contact and "zone active" indicator. Each module includes a pluggable 24V DC power distribution terminal strip and pluggable terminal strips for each zone. A built-in 24V DC, 1A power supply is provided for powering amplified speakers. Two background music (BGM) inputs with volume controls provide each zone with a choice of BGM sources or no BGM. Two tone triggers are available as well as a 90V night ringer input. Separate volume controls for the night ring and tone triggers, along with an adjustable page level limiter, make it easy to set appropriate levels.

Powerful software features provide the UTI312 enormous flexibility for demanding applications. 2-, 3-, 4-, or 5-digit dialing plans allow the UTI312 to fit into any dialing structure. Twenty-four zone groups, zone groups for each tone input and night ring as well as a zone group for the override input, provide plenty of installer flexibility.

PRODUCT FEATURES:

- Expandable from 3 to 12 zones (in 3-zone increments using ZX3 modules)
- One-way paging only
- Interfaces to Loop Start, Ground Start, Analog Station, and Page Ports (with or without contact closure activation)
- 2 Background music (BGM) inputs
- BGM sources assignable per zone
- Level control for each zone output
- 150 Speaker T/R drive capacity per zone
- Programmable AUX Relay
- Override input (loop start or page port)
- Auto select paging zone group
- 2-, 3-, 4-, or 5-digit dialing plans
- Microcontroller operated, DTMF programmable
- Programmable trunk port timeout
- Responds to CPC disconnect signal
- Separate override, all-call, tone trigger, night ring, and code call zone groups
- Contact and 90V Night Ring inputs
- 24 User-assignable zone groups
- FCC Part 68 Registered
- Listed to UL Standard 60950 for U.S. and Canada



ACCESSORY (SOLD SEPARATELY)
ZX3 Module 3-Zone Plug-In Expansion Module (one included w/UTI312)

Power Requirements	Dimensions	Product Weight
120V AC, 0.75A	16-3/8" W x 3-1/2" H x 4-7/8" D (without mounting flanges) 19" W (with mounting flanges)	8 lb.

TELEPHONE ACCESS MODULE/LEVEL CONTROLS

Telephone Access Module

Models TAMB2, TAMB2PS

The **TAMB2** interfaces a telephone system with a paging system allowing announcements to be made through any telephone. Any of three types of analog ports can be connected using the TAMB2: loop start trunk, ground start trunk, and station port (90V ring up). It is indispensable for any telephone paging application because it eliminates the possibility of mismatching paging interfaces and port types. The **TAMB2PS** includes power supply.



PRODUCT FEATURES:

- 600-ohm output
- Built-in confirmation tone indicating access to paging system
- Built-in pre-announce tone produced over paging system before announcement
- Adjustable tone volume
- Works with one-way and two-way zones
- VOX and default timers operate independently
- Trunk Timer feature prevents system blockage
- 1 C-Form (N.O. and N.C.) contact pair available for operating external equipment
- Trunk Timer feature prevents system blockage
- FCC Part 68 Registered
- Listed to UL Standard 60950 for U.S. and Canada



ACCESSORIES (SOLD SEPARATELY)

PRS2403
24V DC Power Supply
(included with TAMB2PS)

PRLSI
Power Supply
(24V DC)

RPK91
Rack
Mount Kit

Power Requirements*	Dimensions	Product Weight
24V DC @ 150mA	8-1/2" W x 1-3/4" H x 3" D	2 lb.

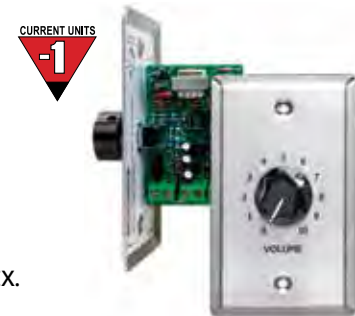
* Included with TAMB2PS

Buffer/Expander/Volume Level Control

Model BUFEX

Used with 24V systems, the **BUFEX** is a multi-purpose device that can work as a volume control for a network of speakers and as a buffer that can drive up to 150 speakers. It also functions as a system expander when connecting to 100V, 70V, and 25V speaker systems.

To address the needs of emergency announcements, the **BUFEX** has a Bypass feature that allows emergency announcements to be heard at high levels regardless of the volume setting on the **BUFEX**. The **BUFEX** contains a Bypass Trim feature that allows some adjustment to the Bypass level.



PRODUCT FEATURES:

- Local volume control for a group of speakers
- Provides buffering for up to 150 self-amplified speakers
- Allows self-amplified speakers to work with 100V/70V/25V systems, expanding existing systems
- Continuously variable attenuator
- Rugged and attractive stainless steel wall plate with engraved lettering
- Easy and secure terminal strip connections
- Jumper selectable 100V, 70V, or 25V speaker selections as well as T/R
- Bypass trim allows a max. 12 dB attenuation over bypass announcements
- Bypass feature overrides local volume setting for high importance messages
- Mounts in single gang wall box

Dimensions	Product Weight
2-7/8" W x 4-5/8" H x 2-1/2" D	3 oz.

Signal Level Control

Model SLC

The **SLC** provides a simple and cost effective way to remotely control the volume level of a network of up to 150 speakers. Simply wire in series with the audio feed to the desired group of amplified speakers. The **SLC** is designed for 24V systems.



PRODUCT FEATURES:

- Continuously variable attenuator
- Rugged and attractive stainless steel wall plate with engraved lettering
- Mounts in single gang wall box
- Easy and secure terminal strip connections
- Passive (requires no DC power)

Dimensions	Product Weight
2-7/8" W x 4-5/8" H x 2" D	2 oz.

PAGING CONTROL MODULES

Zone Paging System

Model PCM2000

The **PCM2000** Zone Paging System provides robust zone paging for applications requiring 1 to 99 zones and up to 32 paging zone groups. Its multi-function modules ensure flexibility and future expansion with minimum time and expense.

PAGING :

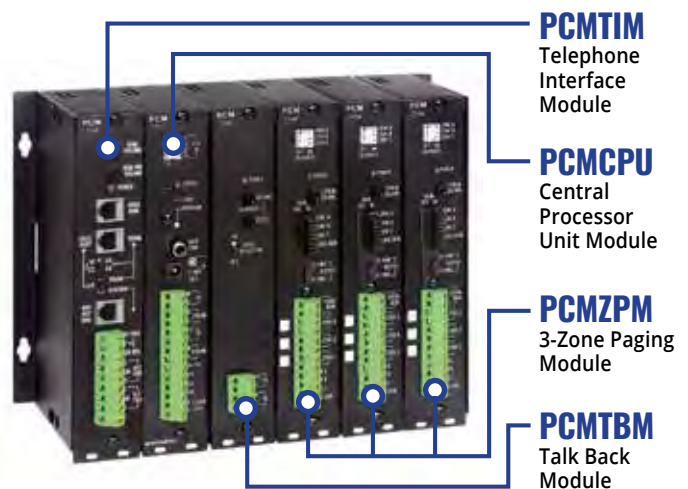
- Allows for 1 to 99 paging zones in 3-zone increments
- Up to 32 programmable paging zone groups
- Emergency All-Zone Override Paging input
- All-Call function can be disabled
- 250-watt power handling capacity (separate amplifier required)
- Works with systems that are central- or self-amplified, or mixed
- Drives up to 40 self-amplified speakers per zone module in low-power mode

INSTALLATION :

- Operates with 70V and self-amplified (24V) paging systems
- Future expandability up to 99 paging zones using 10 PCM2000 slave assemblies
- Universal Telephone Interface allows simple connection to loop and ground start trunks, to PBX or KEY paging ports, and to analog 90V station lines
- Easy connections using standard RJ11 and Euro-style terminal blocks
- Relay driver outputs mirror the operation of each paging zone to control external equipment
- Two C-form relay contacts change state when system is activated to control external equipment
- A setup tone can be produced by the system to check system operation and volume levels
- Easy programming of system features through the telephone
- System programming can be reset to factory defaults
- Wall-mountable (brackets included)
- FCC Part 68 Registered
- Listed to UL Standard 60950 for U.S. and Canada

BACKGROUND MUSIC :

- No interruption of background music in zone not being paged (two amplifiers required)
- Inhibit background music in any zone
- Zone modules can accept separate background music sources



PCM2000 System – Shown with modules for a 9-Zone Paging System
Works with both central- and self-amplified systems

NIGHT RINGER :

- Night Ring activated from 90V ring signal or contact closure
- Night Ring tone can be selected as either simulated ringer sound or chime
- Night Ring tone can be directed to a specific group of zones
- RJ11 input connector

CODE CALLING :

- Night Ring activated from 90V ring signal or contact closure
- Night Ring tone can be selected as either simulated ringer sound or chime
- Night Ring tone can be directed to a specific group of zones
- RJ11 input connector

SIGNAL TONES :

- Contact closure input controlled tone annunciation
- Tone signaling can be directed into a specific group of zones
- Tone can be selected as tone burst, chime, or 4 quick beeps
- Tone can be selected to follow state of contact closure input or preset burst length

Number of Modules Required For Zone Paging Applications:

	Total Number of Zones in System										
	3	6	9	12	15	18	21	24	27	More Than 27 Zones	99 Zones
PCMTIM	← 1 Module Required For Each Total System →										
PCMCPU*	1		2			3			1 PCMCPU for every 9 Zones		11
PCMZPM	1	2	3	4	5	6	7	8	9	1 PCMZPM for every 3 Zones	
PCMTBM	← 1 Module Required For Each Total System (optional module for talk back or time tone options) →										

*Note: One PCMP52 Power Supply (not included) is required for each PCMCPU Module.

PAGING CONTROL MODULES

TIME TONES* :

- Built-in real-time clock
- Controls up to 8 time-triggered tone-signaled events
- Each time-triggered event's tone can be directed to a specific group of zones
- Time-triggered tone burst length adjustable (2-8 seconds) or chime tone
- Simple programming of times/events through the telephone
- Master clock synchronization ability

TWO-WAY COMMUNICATIONS* :

- Provides hands-free, 2-way talk back communications in 70V paging system (amplifier required)
- Zones can be individually set to be talk back or one-way only
- "Privacy Beep" can be enabled in talk back zones to prevent eavesdropping

* Requires PCMTBM Module



PCM2000 ACCESSORIES

(SOLD SEPARATELY)

RPK88

Rack Mount Kit

Module housing for 10 modules max. with 12 wiring saddles, knockouts for wire access, and 8 mounting brackets.

RPK84

Rack Mount Kit

2 panel adapter, 6 modules max.

PCMPS2

Power Supply (12V DC)

System	Power Requirements	Audio Power Capability*	Operating Current	Dimensions	Product Weight
PCM2000	12V DC@1.5A Power Supply (not included – PCMPS2 recommended)	250W (9-zone system)	1.5A max. (9-zone system)	1-1/2" W x 7-1/2" H x 4-1/4" D, each module	1 lb., each module

* Separate Amplifier Required

Also Available...

PCM2000 Configuration Guide

Our PCM2000 system configuration guide will assist you in designing zone paging applications. It illustrates many popular applications for the PCM2000. This valuable guide is available for download from our website.

Pre-Assembled Zone Paging System

Model PCMSYS3

The PCMSYS3 is a pre-assembled and tested 3-zone PCM system with a PCMPS2 power supply. Use it right out of the box for 1- to 3-zone applications or expand it with other PCM modules.

Ready-To-Go, right out of the box!

- 1 - PCMTIM
Telephone Interface Module
- 1 - PCMCPU
Central Processor Module
- 1 - PCMZPM
3-Zone Paging Module
- 1 - PCMPS2
System Power Supply



EXPANSION :

- Add PCMZPM modules for up to 9 zones
- Add PCMTBM module for talk back and realtime clock/tone applications
- Add satellite assemblies for up to 99 zones

To Order a PCM2000 System select from the following modules:

PCMTIM

Telephone Interface Module

A universal interface connects to any type of telephone port, rapidly and trouble-free. Provides input for night ringer and emergency page override. One required per system.



PCMCPU

Central Processor Unit Module

The PCMCPU controls system operation and holds all programmed parameters. One required for every 3 PCMZPM modules (9 paging zones).



PCMZPM

3-Zone Paging Module

The 3-Zone module provides 3 paging zone outputs. Increase system capacity by adding additional modules, up to 3 zones at a time. The zone outputs can drive 70V or self-amplified speaker systems. Relay driver outputs mirror the state of each paging zone to control external equipment. If desired, the system-wide background music can be disconnected and a separate music source can be connected to any PCMZPM module. Background music can also be inhibited in any zone. One for every 3 paging zones.



PCMTBM

Talk Back Module (optional)

Allows 2-way, hands-free talk back communications throughout the paging system. The built-in real-time clock allows up to 8 user-scheduled time tones to be emitted in a specific group of zones. The clock can be synchronized with an external master clock. Only one PCMTBM is required for the entire system when needed.



PUBLIC ADDRESS AMPLIFIERS

Gold Seal Series D Mixer-Amplifiers

Models **GS500D, GS250D, GS150D, GS100D, GS60D, GS35D**



The **Gold Seal Series D** mixer amplifiers are designed to meet the rigorous requirements of today's sophisticated sound systems. They combine unique features with ultra high reliability and professional performance. These amplifiers are available in 500, 250, 150, 100, 60, and 35 watt models, each with exactly the same features to provide power and performance no matter how large or small the application.

In addition to their extensive flexibility, the Gold Seal Series amplifiers provide a combination of features not found in other commercial amplifiers. These amplifiers also offer Class D Amplification for increased operating efficiency.

PRODUCT FEATURES:

- 4 dedicated MIC inputs
- 1 selectable MIC/TEL input
- 1 selectable MIC/AUX input
- 1 dedicated AUX input
- 4-ohm, 8-ohm, 25V, 25VCT, and 70V transformer-coupled outputs
- Rack mountable – 2RU package
- Dual-function, 10-band graphic equalizer (Acoustic EQ or Feedback Control modes)
- True loudness contour function
- Audio Enhancement circuit for improved intelligibility
- Switchable phantom power supply (13V DC)
- Variable AUX input muting
- Remote master volume control capability
- Automatic level control
- Input muting via contact on inputs
- Voice activated AUX muting on TEL input
- AUX fade back after TEL page
- Booster amp output connection
- Pre-amp Out/Power Amp In “insert” connections
- Tape output connection
- Balanced line driver output (using WMT1A accessory; sold separately)
- Low-cut filter for MIC channels
- Listed to UL Standard 60065 for U.S. and Canada

ACCESSORIES
(SOLD SEPARATELY)

GSRPK
Rack Panel
Mounting Kit

GSRVC
Remote Volume
Control

WMT1A
Line-Matching
Transformer

Classic Series Mixer-Amplifiers

Models **C100, C60, C35, C20, C10**

The **Classic Series** mixer-amplifiers provide mixing of microphones, telephone, and auxiliary sources. Bogen's Classic Series amplifiers offer high performance, flexibility, and reliability for most applications requiring a variety of inputs.

PRODUCT FEATURES:

- 100-, 60-, and 35-watt models as well as 20- and 10-watt models
- 4 inputs (C35/60/100 models): 1 MIC (Lo-Z), 1 AUX (Hi-Z), 1 TEL, plus 1 selectable MIC or AUX
- 3 inputs (all C10/C20 models): 1 MIC (Lo-Z), 1 TEL, plus 1 selectable MIC or AUX
- AUX muting w/ external contact closure or automatic w/ TEL
- TEL input voice-activated (VOX) mute over AUX input
- Variable threshold for voice-activated AUX mute
- Separate volume controls for each input plus overall bass and treble (C35/60/100 models) or tone (all C10/20 models)
- Outputs for 4-ohm, 8-ohm (not C100 model), 16-ohm, 25V, and 70V speaker systems
- Screw terminal connection for microphones
- Input Sensitivity: 600 μ V, MIC; 85 mV, AUX; 75 mV, TEL
- Thermal protection and electronic shutdown
- Record output jack (C35/60/100 only)
- Listed to UL Standard 60065 for U.S. and Canada



C100, C60, C35



C20, C10

Model	Number of Inputs	MIC precedence over AUX input(s)	Bass/Treble control	4-, 16-ohm, 25V, 70V speaker outputs	8-ohm speaker outputs	VOX muting of AUX input (TEL input only)	Variable VOX threshold	Tape/Booster Output
C100	4 – 1 MIC, 1 AUX, 1 TEL, 1 MIC/AUX	●	●	●		●	●	●
C35/C60	4 – 1 MIC, 1 AUX, 1 TEL, 1 MIC/AUX	●	●	●	●	●	●	●
C10/C20	3 – 1 MIC, 1 TEL, 1 MIC/AUX	●	*	●	●	●	●	

* Treble Cut only

ACCESSORIES
(SOLD SEPARATELY)

RPK35B
Rack Panel Kit
(C20/10 Models)

RPK50
Rack Panel Kit
(C100/C60/C35 Models)

WMK1
In-Wall Mount Kit
(C20/10 Models)

WMT1A
Line-Matching
Transformer

DUAL-CHANNEL POWER AMPLIFIERS

Black Max™ Power Amplifiers

Models X600, X450, X300



Bogen's Black Max amplifiers are designed to provide maximum performance in constant voltage speaker systems. Dual 70V transformerless outputs deliver exceptionally clean audio to speaker systems requiring two channels of audio up to 600W per channel in a single package.

High-efficiency class H amplifier design and the auto-sleep feature aid in reducing power consumption on continuously-powered systems. Rear-mounted volume controls, independent low cut filters on each input, and pluggable input terminal strips were specifically designed for the fixed install market. Built-in power sequencing for multiple Black Max amplifiers combats current in-rush problems of large audio systems. Massive power toroid and heat sinks; heavy 14-gauge chassis; patented Back-Slope™ AC voltage stabilization; clip limiters; and DC voltage, over-current, and thermal protection circuits make the Black Max both an efficient and reliable workhorse amplifier.

PRODUCT FEATURES:

- Dual 70V amplifier channels
- 300W, 450W, or 600W per channel for 70V speaker systems
- Low noise, low distortion, and high slew rate
- High-efficiency Class H amplifier design
- Transformerless direct drive outputs
- Electronically balanced high-impedance inputs
- Pluggable terminal strips for input connections
- Independent low cut filters for each channel
- Built-in power sequencing with other Black Max amplifiers
- Pluggable terminal strip for sequencing wiring
- Rear panel power sequencing status indicator
- DC, overload, short circuit, and thermal protection circuits
- Clip limiting circuits for speaker protection
- Power-saving sleep mode for intermittent use applications
- Status, Signal, and Limit indicators
- Back-Slope AC voltage stabilization for dependable performance over varying AC line voltages (±10%)
- Heavy-gauge steel chassis with cast aluminum front panel
- Rear-mounted volume controls
- Mounts in 2 rack spaces (3-1/2") directly stackable without need for extra space above or below
- 2 independent, continuously variable cooling fans for dependable and quiet operation
- Listed to UL Standard 60065 for U.S. and Canada

ACCESSORY
(SOLD SEPARATELY)
RPK86
Rear Rack
Mounting Kit

COMPACT AMPLIFIERS

CC-Series Compact Mixer-Amplifiers

Models CC4021, CC4041

The CC-Series consists of two compact mixer-amplifiers, CC4021 and CC4041, each providing 40 watts of output power. The features available and number of inputs vary per model. Each unit measures 2 rack spaces in height but only 8-1/4" wide, allowing 2 units to be placed side-by-side without requiring additional rack spaces.

PRODUCT FEATURES:

- 40 watts of output power
- Individual volume control for each Input
- Compatible with 70V, 25V, 4-ohm, and 8-ohm systems
- MOH source selectable from Media Player or Input 4
- 2 levels of priority: TEL is 1st priority, Input 1 is 2nd priority
- Individual phantom power for MIC inputs
- Audio-activated & Defeatable muting
- Bass and treble controls
- Peak and signal indicators
- External 24V DC supply input
- Listed to UL Standard 60065 for U.S. and Canada



ACCESSORY
(SOLD SEPARATELY) **RPK93**
Rack Mount Kit

Model	Total Number of Inputs	Number of MIC/Line Inputs (balanced)	Number of AUX Inputs (unbalanced)	Audio-activated Muting Priority Levels	Dimensions	Product Weight
CC4021	2	1	1	1	8-1/4" W x 3-1/2" H x 10-3/8" D	11 lb.
CC4041	4	3	1	1		11 lb.

MONO-CHANNEL POWER AMPLIFIERS

Mono Power Amplifier

Models HTA250A, HTA125A

The HTA Series high-performance power amplifiers can safely drive loads continuously at full (RMS) power. Overload protection includes an electronic shutdown circuit and a thermal breaker.



PRODUCT FEATURES:

- 250- and 125-watt models available
- Convection-cooled
- Power MOSFET output circuitry
- Thermal protection and automatic electronic overload protection
- Hi-Z unbalanced and Lo-Z balanced or unbalanced input w/ accessory transformer (TL600)
- Internal Low Cut filter switch
- 90 dB signal-to-noise
- 4- and 8-ohm, 25V, 25VCT and 70V outputs
- Input sensitivity: Hi-Z, 500 mV; Lo-Z, 150 mV (HTA250A); 150 mV (HTA125A)
- Power Consumption: 520W (HTA250A); 260W (HTA125A)
- Line bridging (driving multiple amplifiers) is possible w/ an accessory transformer (TL100)
- 19" rack-mount design (3 rack spaces)
- Listed to UL Standard 60065 for U.S. and Canada

ACCESSORIES (SOLD SEPARATELY)

WMT1A
Line-Matching
Transformer

TL100
1:1 Bridging
Transformer

TL600
600-ohm Impedance-
Matching Transformer

Mono Power Amplifier

Model BPA60

The BPA60 supplies 60 watts of power amplification for professional and commercial sound systems requiring continuous high-quality sound.



PRODUCT FEATURES:

- 60 watts
- 1 input: Hi-Z unbalanced
- Lo-Z balanced input with accessory transformer
- Input level control and low cut filter switch
- 8-ohm/25V, 16-ohm, 25VCT, and 70V outputs
- Sensitivity: 300mV, Hi-Z; 75mV, Lo-Z
- Resettable circuit breaker and thermal protection
- Operates with 25V and 70V systems
- 120V AC, 60 Hz, 180W @ full rated output
- Rack-mountable (kit sold separately)
- Listed to UL Standard 60065 for U.S. and Canada

ACCESSORIES (SOLD SEPARATELY)

RPK53
Rack Panel
Kit

TL100
1:1 Bridging
Transformer

TL600
600-ohm Impedance-
Matching Transformer

AMPLIFIER MONITOR

Automatic Failure Detector/Substitutor

Model AFDS2

The AFDS2 continuously supervises the operation of any main power amplifier and its standby amplifier in a sound system. If a fault is detected on the main amplifier causing a loss of as little as 2 dB, the AFDS2 automatically switches operation to the standby amplifier. When the fault to the main amplifier is corrected, operation is automatically switched back to the main amplifier. Operates with both 25V and 70v systems.



PRODUCT FEATURES:

- Monitors both main and standby power amplifiers
- 40 kHz Supervision frequency
- Automatically transfers operation to standby power amplifier
- LEDs and fault alert tone notify user of a 2 dB (adjustable up to 12 dB) drop in either amplifier's output
- Screw terminal or phono jack connections
- Rear-panel adjustable controls for oscillator levels and detector sensitivities

Power Requirements	Dimensions	Product Weight
120V AC, 15W or 12V DC @ 0.5A	19" W x 3-1/2" H x 7-1/2" D	8 lb.

MODULAR AMPLIFIERS

Power Vector Modular Mixer-Amplifiers

Models **V250, V150, V100, V60, V35**



Bogen's **Power Vector** modular input mixer-amplifier series offers a wide range of power levels from which to choose with five models ranging from 35W to 250W. The amplifiers are designed to work with both high- (70V/25V) and low- (4/8-ohm) impedance speaker systems. Each model includes eight module bays for input modules and allows up to four levels of priority between modules. Two module bays are also capable of accepting signal-processing output modules. Each input channel has an associated signal/clip LED for signal status. An 11-segment LED output meter monitors output signal level, which can be controlled by the Remote Volume Control Panel (RVCP, sold separately). Modules are required, but sold separately.

PRODUCT FEATURES:

- 5 models ranging from 35W to 250W, each with a large power reserve
- Capable of handling 70V, 25V, 8-ohm, and 4-ohm speaker loads
- 8 input module bays
- 2 module bays capable of handling signal-processing output modules
- 4 levels of priority between modules
- 11-segment LED output level meter with Average/Peak switch
- Motorized master volume control that can be remotely operated (requires RVCP)
- Two-color LED for each channel indicates signal active/signal clipping
- Bass and treble controls (bypassable)
- Master mute control mutes all audio from the mixer section of the amplifier
- 125 Hz Low Cut feature
- Signal-processing insert jacks
- Pre-EQ unbalanced buffer output signal "post" all unit controls, but "pre" any external signal-processing equipment connected
- Grounded, unswitched AC convenience receptacle with a 500W maximum capacity provided for external equipment
- Rack mountable (RPK87 sold separately)
- Listed to UL Standard 60065 for U.S. and Canada

Wide selection of Advanced Input & Signal Processing Output Modules are available (sold separately)

ACCESSORIES

(SOLD SEPARATELY)

PVMC
Module
Security Cover

PVSC
Power Vector
Security Cover

RVCP
Remote Volume
Control Panel

RPK87
Rack
Mounting Kit

Wall-Mount Power Vector Modular Mixer-Amplifiers

Models **WV250, WV150, WV100**

The **Wall-Mount Power Vector** Series combines up to 8 modular inputs and signal-processing outputs to meet various application requirements. The amplifier's convenient and efficient wall-mount design provides a protected and accessible audio system in a permanent and inconspicuous mounting.

PRODUCT FEATURES:

- 100-, 150-, and 250-watt models; each with large power reserve
- 8 module input bays, accepts up to 2 signal-processing output and 8 input modules
- Four priority levels between modules
- 4-ohm, 8-ohm, 25V, and 70V outputs
- Secure, permanent wall mounting (in-wall with BBF or surface-mount with BBS)
- 11-segment LED output level meter registers Peak or Average output
- Adjustable output level limiter with active indicator
- Front-mounted tape output provides unbalanced signal level output
- Independent volume controls for each input
- External mute control
- Motorized master volume control, with optional RVCP for remote operation
- Bass and treble controls with center detent
- 125 Hz Low Cut switch
- Tone control bypass switch
- Thermal, short-circuit, and overload protection
- Thermally controlled 3-speed fan
- Listed to UL Standard 60065 for U.S. and Canada



(Wall Mount Power Vector shown with WMAD Component)

Wide selection of Advanced Input & Signal Processing Output Modules are available (sold separately)



REQUIRED COMPONENTS
(SOLD SEPARATELY)

BBF
FLUSH-MOUNT
BACK BOX

BBS
SURFACE-MOUNT
BACK BOX

WMAD
FRONT COVER/
DOOR

MODULAR AMPLIFIERS

M-Class Amplifiers

Models M600, M450, M300

Bogen's M-Class amplifiers provide professional sound installers with exactly what they need from an amplifier: 3 modes of operation — stereo (4-ohm), 70V mono, dual mono (4-ohm); 2 bays for a variety of input modules; up to 600W/ch stereo (4-ohm) or 1200W of 70V mono power; massive power toroid and heat sinks; heavy 14-gauge chassis; patented Back-Slope™ AC voltage stabilization; clip limiters; and DC voltage, over-current, and thermal protection circuits.



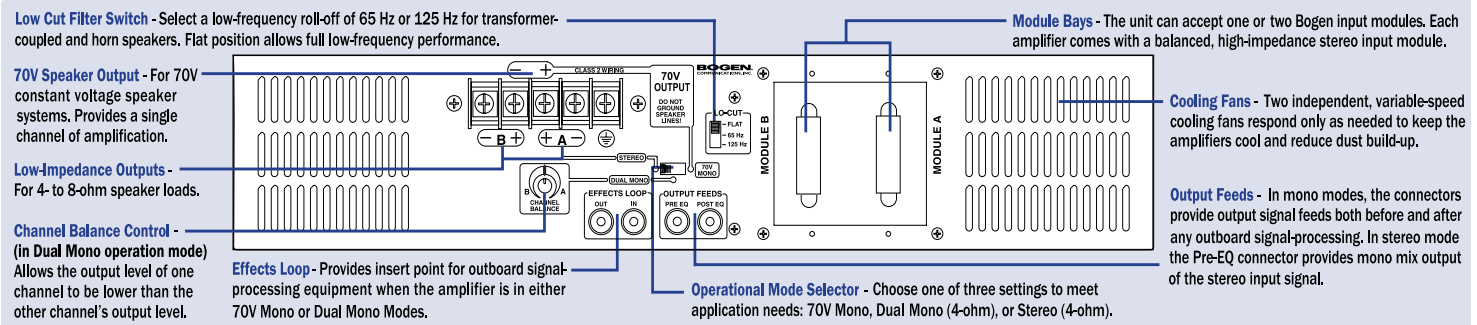
ACCESSORIES (SOLD SEPARATELY)

RPK35B
Rear Rack
Mount Kit

PVMC
Module
Security Cover

PRODUCT FEATURES:

- 3 mono power levels: 120W, 900W, or 600W for 70V speaker systems
- 3 stereo power levels: 600W, 450W, or 300W per channel @ 4 ohms
- 3 modes of operation to choose from: Stereo (4-ohm), Dual Mono (4-ohm), or 70V Mono
- 2 module input bays for flexible modular input capability
- Low noise, low distortion, and high slew rate
- Professional, high-impedance, balanced stereo input module included (BAL2S)
- 3 selectable low-frequency roll-off choices
- 2:1 mixer function when in mono modes
- Insert connections for outboard equipment
- Post- and pre-EQ Output Feeds
- DC, overload, short circuit, and thermal protection circuits
- Power-saving Sleep Mode
- Clip limiting circuits for speaker protection
- Status, Signal, and Clip/Limit indicators
- Back-Slope AC voltage stabilization for varying AC line voltages
- Recessed volume control knobs
- 2 independent, continuously variable cooling fans
- Listed to UL Standard 60065 for U.S. & Canada



ADVANCED SIGNAL PROCESSING OUTPUT MODULES

Plug-In Signal-Processing Output Modules

Bogen's plug-in signal-processing output modules automatically insert themselves into the mix bus signal path leading to the power amplifier stage when installed. (Shipping weight: 1 lb. each.)

Model **RI01S** - Relay Input/Output



- Transformer-isolated, balanced line-level input
- 600-ohm/10k jumper-selectable input impedance
- 8-ohm, 750mW output
- Input and output level controls
- Relay responds to selectable priority level
- External control of priority muting
- N.O. or N.C. relay contacts
- Input can be muted from higher priority modules, with signal fade back
- Output can gate with relay priority level
- Screw terminal strips
- RJ11 connection with line output and dedicated N.O. relay contact

Model **ANS1R** - Ambient Noise Sensor



ANS500M
Sensor
Microphone

- Maximum Gain control
- Ramp Speed control
- Activity Threshold control
- Ambient MIC input threshold control
- Stereo AUX input (summed mono)
- AUX level input control
- Gradual fade back from mute
- Mutable input (lowest priority only)
- RCA connectors
- ANS500M Sensor Mic included

ADVANCED INPUT MODULES

Input Modules

Advanced plug-in Input Modules provide a wide range of functions to support a variety of applications. (Shipping weight: 1 lb. each)

Models LMM1S, LMR1S - Line/MIC Inputs



LMM1S

- Input level controlled by remote panel or direct voltage (LMR1S)
- Wall Plate Control included (with LMR1S only)
- Limiter with LED activity indicator (LMR1S)
- Line/MIC gain switch
- Gain/Trim control
- Bass & Treble controls
- Noise gate w/threshold control
- Fade back from mute
- 24V phantom power
- Priority & bus assignments
- Screw terminal input
- Mutes lower priority modules



LMR1S
(with Remote Volume Control)



Model BAL2S - Balanced Input



- Stereo, high-impedance, electronically balanced inputs
- Professional-quality, low noise performance
- Selectable gain of 0 or 18 dB
- Compatible w/telephone system page ports
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Screw terminal connections

Model MAX1R - Mono AUX Input



- Gain/Trim control
- Bass & Treble controls
- Gate feature mutes lower priority modules
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Bus assignable
- RCA connectors

Models MIC1S, MIC1X - Microphone Inputs



MIC1S

- Gain/Trim control
- Bass & Treble controls
- Noise gate w/Threshold & Duration control
- Limiter w/Threshold control
- 24V Phantom power
- Priority & Bus assignable
- Balanced, transformer-isolated
- Screw terminals (MIC1S); XLR connector (MIC1X)



MIC1X

Model SAX1R - Stereo AUX Input



- Gain/Trim control
- Bass & Treble controls
- Gate feature mutes lower priority modules
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Stereo-to-mono summing option
- Bus assignable
- RCA connectors

Models MIC2S, MIC2X - Microphone Inputs



MIC2S

- Gain/Trim control
- High Cut/Low Cut controls
- Enhance control
- Noise gate w/Threshold control
- Limiter w/Threshold control
- 24V Phantom power
- Priority & Bus assignable
- Screw terminals (MIC2S); XLR connector (MIC2X)



MIC2X

Model TBL1S - Transformer Balanced Input



- Gain/Trim control
- Bass & Treble controls
- Transformer-isolated, dual-impedance, line-level input
- Variable ducking level when muted
- Mute send & receive
- Fade back from mute
- Mute send threshold & duration adjustments
- Priority & Bus assignable
- Pluggable screw terminal connections

Model TEL1S - Telephone Input



- Loop start or ground start trunk interfacing
- Dry loop interface to paging ports
- Audio-activated paging in dry loop
- Gain/Trim control; Noise gate & Limiter
- Mutes lower priority modules
- Mutable by higher priority modules
- Bus assignable & Transformer-isolated
- Screw terminal connections

PRS48
48V DC
Power
Supply

Model TNG1S - Tone Generator Input



- Level control
- Select 4 of 8 tones to trigger
- Burst/steady, slow whoop, siren, mechanical bell, Klaxon, night ringer, double chime, & doorbell tones
- Momentary & continuous playback modes
- Microprocessor-controlled
- Priority assignable
- Mute send & receive
- Screw terminal trigger connections



ACCESSORY
(SOLD SEPARATELY)

MA3 Module Adapter

Adapts Modules for use with D-Series, WMA, and DPA Amps

TELEPHONE PAGING AMPLIFIERS

TPU Series Mixer-Amplifiers

Models TPU250, TPU100B, TPU60B, TPU35B, TPU15A



TPU250



TPU100B, TPU60B, TPU35B



TPU15A

Bogen's TPU Series of mixer-amplifiers are the ideal choice within the telephone paging industry. There are 5 models to choose from, ranging in power from 15 watts to 250 watts, and each model provides signal-activated, automatic muting of background music during a telephone page, and gradual return of music following a page.

PRODUCT FEATURES:

- 250-, 100-, 60-, 35- and 15-watt models specially designed for telephone paging systems
- 3 inputs on TPU250 and TPU-B models: 1 TEL, 1 MIC (Lo-Z), 1 AUX (Hi-Z)
- 2 inputs on TPU15A: 1 TEL, 1 AUX (Hi-Z)
- 600-ohm balanced TEL input for direct connection to page ports and adapters
- TEL input has Automatic Level Control (ALC) for constant page announcement level
- Separate MIC input for a low-impedance push-to-talk microphone (excluding TPU15A model)
- Audio enhancement circuitry (excluding TPU15A model)
- Music input - mutable by external contact closure (excluding TPU15A model) or activity on TEL input
- Separate volume controls for mic, paging, background music, and night ringer
- Built-in night ringer can be activated from 90V ring signal (excluding TPU15A model) or external contact closure
- 25V and 70V constant-voltage outputs, balanced and unbalanced; also 8-ohm on TPU15A
- Wall-mount design provides minimum protrusion from backboard
- TPU-B models may be rack-mounted using RPK82 rack mounting kit (sold separately)
- TPU15A and TPU250 designed to rack mount directly, no kit necessary
- Easily accessible, recessed front-panel controls (excluding TPU15A model) for setting volume, muting, music, etc.
- RCA jacks provided to allow amplifier bridging to double the number of amplifier inputs and outputs (excluding TPU15A model); a TPU250 can only be bridged with one other TPU250
- Thermal and electronic overload protection (excluding TPU15A model), resettable circuit breaker (except TPU250), Slo-Blo fuse on TPU250
- Listed to UL Standard 60065 for U.S. and Canada

Specialized Telephone Input

The TPU-Series' 600-ohm transformer balanced input is perfectly suited to connect to paging ports and paging adapters such as Bogen's TAMB2. Here are a few specially designed features:

- The background music will mute whenever paging activity is present on the telephone input, even if control contacts are not available. (Separate mute control contacts are also available.)
- To avoid problems with noise on the lines falsely muting the background music, a built-in VOX threshold control (not on TPU15A) lets you decide what's a real signal and what's noise.
- Because not everyone speaks at the same level, the Automatic Level Control feature keeps loud voices from booming out of the paging system's speakers.

Audio Enhancement

Crisp, clean, intelligible sound is the goal of every paging system. The audio enhancement circuit adds back the high frequency harmonics that are lost through the handsets and speakers. With one simple control, you can adjust the amount of high frequency content the audio enhancement circuit adds back until optimum intelligibility is reached.

Variable Music Mute

Add some polish to announcements by using the TPU's built-in variable mute feature. Variable mute allows you to control the level of the music heard in the background during a page. It's fully adjustable from no muting of music to full suppression of music. The TPU also gracefully fades the muted music back in after the page is finished for a smooth, professional sound (not available on TPU15A).

Bridging

Bridging two TPU amplifiers permits them to be used in tandem with one another to increase the total output power of the system, thereby permitting additional speakers to be added. For example, when two 250-watt amplifiers are bridged, the total output capacity of the system is 500 watts. Also, both amplifiers will receive the same input signal, amplify it, and deliver it to the speaker loads connected to each amplifier (not available on TPU15A).

ACCESSORIES (SOLD SEPARATELY)

- RPK35B**
Rack Panel Kit
(TPU-B Models)
- WMT1A**
Line-Matching
Transformer

Model	Output Power (Watts)	Inputs			Adjustable Mute Threshold	Automatic Level Control	Bass/Treble Controls	Peak Level LED	Adjustable Mute Level	Fade Back From Mute	Audio Enhancement	Night Ringer		Outputs					
		Telephone	Music	Microphone								90V Activation	Contact Closure	70V	25V	25VCT	8 Ohms	16 Ohms	
TPU250	250	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPU100B	100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPU60B	60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPU35B	35	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TPU15A	15	●	●		●		*	●				●	●	●		●			

* Treble Cut only

MIXERS

Power Vector Mixer

Model VMIX



This 8-channel **Power Vector** mixer/pre-amplifier offers a wide variety of operational features and functions for superior audio performance. Eight module bays accept plug-in modules, allowing up to four levels of priority between modules. Security covers for both the front and rear of the unit prevent tampering with settings. For large applications, several Power Vector Mixers can be bridged together.

PRODUCT FEATURES:

- Wide selection of plug-in modules (sold separately)
- 8 module bays
- 2 module bays capable of handling signal-processing plug-in output modules
- 4 levels of priority between modules
- 8 inputs, with independent volume controls for each
- LED signal/clip indicator for each channel
- Bass and treble controls
- 11-segment LED output level meter monitors the output level of the mixer with Avg./Peak switch
- Balanced transformer-isolated output
- Balanced output signal level switch (-50, -10, and +4 dBμ)
- Unbalanced signal output jack
- Join multiple Power Vector mixers together using bridging jack and mute terminals
- Motorized master volume control that can be remotely operated (with RVCP Remote Volume Control Panel, sold separately)
- 125 Hz Low Cut feature
- Tone control bypass switch
- Module security cover prevents tampering with module controls (PVMC, 8 included)
- Resettable circuit breaker
- Security cover to protect front controls and allow access to installer selected controls (PVSC, sold separately)
- Listed to UL Standard 60065 for U.S. and Canada

Wide selection of Advanced Input & Signal Processing Output Modules are available (sold separately)

ACCESSORIES (SOLD SEPARATELY)	
PVMC Module Security Cover	PVSC Power Vector Security Cover
RVCP Remote Volume Control Panel	RPK87 Rack Mounting Kit

Output Level Meter	Frequency Response	Output Impedance	Signal-To-Noise Ratio	Dimensions	Product Weight
11 Segments	±1 dB (20 Hz-20 kHz) balanced-out	100 ohms, unbalanced; 50 ohms @ +4 dBμ, 600 ohms @ -10 dBμ, 5 ohms @ -50 dBμ, balanced	-99 dB, fundamental	17-1/4" W x 3-7/8" H x 14-3/4" D	15 lb.

MIC/LINE Mixer

Model CAM8PRO



The Bogen **CAM8PRO** is an 8-input, dual-bus MIC/Line mixer that combines superb performance with a generous array of simple-to-use features in a single rack space design. It features 8 independently assignable inputs switchable between MIC and Line. Each input has a trim control, a switchable low cut filter, and a Main/Auxiliary bus output selector. Phantom Power can be universally applied to all MIC-selected inputs for condenser microphones. The CAM8PRO also features a built-in Compressor/Limiter with adjustable Threshold and Ratio Controls, a Bar Graph Output Meter that indicates input signal levels, and a headphone jack. External power supply included.

PRODUCT FEATURES:

- 8 independently assignable inputs
- Dual-bus design with Main/AUX output selector for each input
- Pluggable terminal strip connections
- Balanced inputs and outputs
- Direct bus connection for cascading multiple mixers
- MIC/Line switch for each input and Main output
- Low Cut Filter for each input
- Switchable Phantom Power for condenser MIC inputs
- Output Level Control knob for Main and AUX outputs
- Gain/Trim Control for each input
- Compressor/Limiter (Main output; bypassable)
- Adjustable Threshold and Ratio Controls
- LED Bar Graph Output Meter (Peak or Average)
- Headphone Output

Inputs	Phantom Power/Voltage	Bridging Input	Compressor/Limiter	Output Level Meter	Frequency Response	MIC Equiv. Input Noise	MIC/AUX Input Impedance	Signal-To-Noise Ratio	Output Impedance	Crosstalk (adjacent channels)	Dimensions	Product Weight
8	30V DC	●	●	● (8 segments)	±1 dB, 20 Hz-20 kHz	-129 dBV	3.5k/15k ohms	90 dB	220-ohm unbalanced, 440-ohm balanced	> -90 dB	19" W x 1-3/4" H x 7-1/2" D	7 lb.

AUDIO PROCESSOR

Universal Audio Processor

Model CORE



The Bogen CORE is a highly versatile digital mixer/processor designed for small to medium installations. Flexible hardware configurations, in blocks of 4: for 4 in/12 out, 8 in/8 out, etc. The CORE's PC-based software allows for design, downloading, reversal of in-box designs, and live monitoring, calibration, and routing. Three system hardware configurations are available: CORE8X8 (8 inputs, 8 outputs), CORE4X12 (4 inputs, 12 outputs), and CORE12X4 (12 inputs, 4 outputs).

PRODUCT FEATURES:

- Configurable using PC/laptop software
- Programmable, scalable front panel knobs for analog control functions
- Full DSP drag-and-drop component library
- Third-party control via RS-232 serial and Ethernet
- Stack up to 12 units to increase number of inputs and outputs
- Listed to CE and UL standards

HARDWARE COMPONENTS:

- Main Frame: 4 slots for input/output cards, 16 TTL/Analog Inputs, 8 TTL Outputs, RS485, RS232 Port, Ethernet Port
- Output Card: 4 channels with individual overload indicator, mute, meter, signal present, level control, and adjustable overload threshold
- Input Card: 4 balanced audio input channels with individual bypass, mute, -66 dB to 0 dB sensitivity select, phantom power, mute, RTO (route to output), VU meter, signal present, level control, and adjustable overload threshold

SOFTWARE COMPONENTS:

- Auto Gate, Noise Sensing, Compressor, Comp-limiter, Expander, and Ducker
- Equalizers: Mono and Stereo GEQ (1 Octave, 2/3 Octave, 1/3 Octave), Mono and Stereo PEQ (2, 4, 6, 8, 10, 16 bands)
- Dynamic Feedback Control
- Programmable Level Controls
- Provides up to 53 minutes of digital audio WAV file storage, triggered via calendar-based schedule or dry contact; 2 separate messages can be simultaneously output to independent zones
- Mixers: Auto, Matrix, Standard, and Room Combiner
- Noise Generators: White, Pink, Tone
- Page Control Module: for zone paging applications
- Create custom control interface screens via integral

ACCESSORIES
(SOLD SEPARATELY)
see Page 68

Dimensions	Product Weight
17-1/8" W x 1-3/4" H x 11-5/8" D	8 lb.

MESSAGING & CALL STACKING

Messaging/Call Stacking System

Model BOMDMU



Bogen's BOMDMU is a comprehensive system that provides page stacking, feedback elimination or pre-recorded messaging, and background music control in a single device.

PRODUCT FEATURES:

- 3 channel page stacker
- Record and temporarily store up to 16 pages or 4 minutes of audio per channel
- Feedback elimination; opens loop between input microphone and speakers
- Priority input with immediate, real-time access to paging system; overrides background music, stacking and messaging functions
- Record and play up to 99 messages or 8 minutes of audio
- Message triggering via start input or host telephone system workstation
- Background music input
- Station or Dry Loop/Loop Start operation
- DTMF support for zoning
- 12V DC @ 1 Amp power supply included

Power Requirements	Dimensions	Product Weight
12V DC @ 1 A (included)	19" W x 1-3/4" H x 7" D	5.5 lb.

Pre-record Messages for Use in Emergencies

It is imperative that directives communicated using a public announcement system during an emergency are clear, concise, and worded so as to not cause panic or confusion. It is difficult to imagine all these criteria being met at the time an emergency is occurring. The individual making the announcement may themselves be shaken, confused, or not sure what to say.

Directive Announcements

The BOMDMU allows up to 99 messages (up to 8 minutes total in length) to be recorded in advance. These directives can include vacate the building, secure your location in the building, relocate to a particular area, etc. in cases of fire, an intruder, storm, etc. Since the individual who is aware of the emergency (and the appropriate message content that needs to be announced) is likely required to attend to the emergency situation rather than making announcements, it is best that such announcements be recorded in advance and played by an authorized individual. Messages can also be recorded in multiple languages.

AMBIENT NOISE SENSOR

Model ANS501

The Ambient Noise Sensor System electronically adjusts the level of a page or background music in applications where ambient noise levels are continuously changing. The ANS501 ensures that page announcements or background music are intelligible even during periods of high ambient noise levels. The system includes a sensor microphone module (ANS500M) that monitors the ambient noise level and a 12V DC power supply.

PRODUCT FEATURES:

- Automatically adjusts paging level as ambient noise levels rise and fall
- Balanced and unbalanced input and output
- AUX inputs bypass gain control feature
- Unbalanced stereo AUX inputs (summed mono)
- Supports up to 4 sensor microphones (one ANS500M included) wired in parallel for large areas
- Sensor microphones can be located up to 2,000 feet from control unit
- Only 2 wires needed for connection of sensor microphones
- Microphone module includes an adjustable mounting bracket for precise positioning
- Connects easily between pre-amp and power amp or to amplifier insert jacks
- Sensitivity and max boost control
- Adjustable ramp speed



ANS501

ANS500M
(Sensor MIC, one included)

ACCESSORY
(SOLD SEPARATELY) **ANS500M**
Sensor Microphone

Power Requirements	Dimensions	Product Weight
12V DC Power Supply (included)	Control Unit: 5-1/4" W x 3" H x 1-1/4" D Sensor Microphone: 2" W x 2-1/8" H x 7/8" D	1 lb. 4 oz.

NIGHT RINGER

Model NR100

The NR100 converts any paging system into an after hours night bell alert system. The NR100 connects to the paging system's amplifier and emits a ringer tone through the paging system's speakers, thus eliminating the need for loud old-fashioned bells positioned throughout a facility. The NR100 is an efficient and easy way to alert security or personnel of incoming calls during non-business hours.

PRODUCT FEATURES:

- Responds to 90V ring signals or external contact closures
- Produces dual-frequency electronic ringer tone
- Easily connects to any paging system
- Automatically mutes background music while ringing
- Ringer volume control
- Compact size
- Low current draw
- No maintenance



ACCESSORY
(SOLD SEPARATELY) **PRS2403**
24V DC Power Supply

Power Requirements	Dimensions	Product Weight
External 24V DC @ 25 mA, power supply (not included)	5-1/4" W x 3-1/4" H x 1-1/4" D	1 lb.

VOICE-ACTIVATED RELAY

Model VAR1

The VAR1 is a relay device that monitors audio activity over a wide range of input voltages and operates two sets of C-Form relay contacts in response to detected activity. The VAR1 can be used to detect voltages as low as signals directly from a microphone or as high as signals from 70V speaker systems. A low-level output of the detected audio, transformer-isolated from the input, is also available for use with other equipment. The VAR1 can also be used as a balanced, low-impedance MIC pre-amp.

PRODUCT FEATURES:

- Two sets of C-Form (both N.O. and N.C.) relay contacts respond to audio activity
- 4 levels of input signals: microphone, 600-ohm line, and 25V and 70V speaker systems
- Built-in balanced, low noise, high gain microphone pre-amp
- A transformer-isolated, 600-ohm small signal level output of detected audio available
- Works with self-amplified or central-amplified paging systems
- Separate microphone pre-amp gain control
- Adjustable release delay - 0.25s to 25s
- Trigger threshold adjustment
- Relay active indicator light



ACCESSORY
(SOLD SEPARATELY) **PRS40C**
12V DC Power Supply

Power Requirements	Dimensions	Product Weight
External 12V to 24V DC @ 100 mA (not included)	5-3/8" W x 3-7/8" H x 1-3/8" D	1 lb.

DIGITAL FEEDBACK TERMINATION

Model DFT120

The **DFT120** eliminates the acoustical feedback loop created by the telephone handset and the paging speaker while providing high- capacity, high-quality recording and playback of audio pages.

PRODUCT FEATURES:

- High sampling rate for excellent playback quality
- Record a message while another is being played
- Stacks up to 16 messages for playback
- 240 seconds of total audio memory
- Automatic or externally controlled unit operation for recording, play, and stop
- Activates recording by loop start trunk, 4-wire dry loop, audio trigger, or DTMF
- Digital recording and playback of pages, 60-second maximum message length
- Adjustable delay between messages
- Message repeat, abort, stop, and pre-page tone option
- 8- or 600-ohm output impedances
- Zone control DTMF tones stripped from message and regenerated
- Volume control
- Adapter included



ACCESSORY
(SOLD SEPARATELY) **TAMB2**
Telephone
Access Module

Power Requirements	Dimensions	Product Weight
12V Power Supply (included)	10" W x 6-3/4" H x 1-1/2" D	3 lb.

TONE GENERATOR

Model TG4C

The **TG4C** is designed to produce four different types of tones for use as alarm or announcement signals in paging systems. An audio signal can be routed through the TG4C to allow easy installation in paging systems. During generation of the tones, the routed audio will be suppressed.

PRODUCT FEATURES:

- 4 types of tones: slow whoop, steady, pulsed alarm, and chime
- Choice of continuous generation of tone or two-burst operation (except for steady tone)
- Tones triggered by external contact closure (momentary or long duration)
- External audio signal can pass through the TG4C and is suppressed during tone generation
- Adjustable tone level and pitch
- 600-ohm output
- Tone generation reset available



LISTEN TO TONES ON OUR WEBSITE

ACCESSORIES
(SOLD SEPARATELY) **PRS40C**
12V DC
Power Supply **WMT1A**
Line-Matching
Transformer

Power Requirements	Dimensions	Product Weight
Wide power supply range, 12V to 48V DC @ 30 mA (power supply not included)	6-3/4" W x 5-3/4" H x 2" D	2 lb.

MATCHING TRANSFORMERS

Models WMT1A, WMT1AS

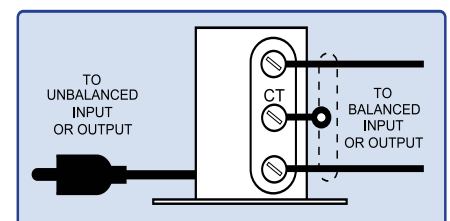
Models **WMT1A** and **WMT1AS** are general purpose matching transformers that allow proper connections between high (10k-ohm) and low (600-ohm) inputs and outputs. Both models can be used to balance an unbalanced line or provide isolation between two pieces of equipment. Both models can be configured to produce a balanced, microphone level signal from a line-level signal such as that from a pre-amp or music source. In addition, Model **WMT1AS** can adapt speaker level signals (25V/70V systems) to a level suitable for the AUX input of an amplifier.



PRODUCT FEATURES:

- Hi-Z, 10k-ohm primary impedance
- Lo-Z, 600-ohm secondary impedance, balanced with center tap
- Matches high-to-low impedance or low-to-high impedance
- Adapts line-level signals to microphone inputs
- RCA connector for Hi-Z side
- Screw terminals for Lo-Z side

Dimensions	Product Weight
2" W x 2-3/8" H x 1-1/4" D	4 oz.



MUSIC & INPUT SOURCES

Digital Stereo AM/FM Tuner

Model DST1



The **DST1** Digital Tuner incorporates a digital PLL-synthesized tuner for precise reception of FM and AM signals. The DST1 features the ability to store up to 60 total presets (FM and AM). It is designed for shelf- or rack-mounted installation and is one rack space (1 RU) high. Removable rack ears are included with the unit.

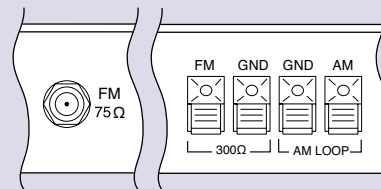
PRODUCT FEATURES:

- PLL-synthesized tuning with digital readout
- 60 Presets total (FM and AM) with scan feature
- Stereo and mono outputs
- Volume control (rear panel-mounted)
- Connectors for 75-ohm FM, 300-ohm FM, and AM loop antennas
- FM dipole and AM loop antennas included
- Bright alphanumeric, fluorescent display panel
- Operates from nominal 120V AC, 60 Hz
- Handheld remote control
- Stereo output cable
- Shelf- or rack-mounted installation, one rack space high (1 RU, removable rack ears included)
- Listed to UL Standard 60065 for U.S. and Canada



Antenna Connections

Anyone who has installed a tuner inside an industrial building knows that radio signals don't penetrate too far into these steel-laced structures. Because the DST1 is designed for industrial installations, it contains inputs for both external 300-ohm (twin line) and 75-ohm (coaxial) antenna feeds. The 75-ohm input uses an "F" connector and can receive feeds from antenna distribution systems or cable systems.



Whether sitting on a shelf or mounted in a rack, the DST1 is a great choice for an industrial grade tuner.

Power Requirements:	120V AC nominal @ 60Hz
Dimensions:	16-7/8" W x 1-3/4" H x 10" D
Product Weight:	5 lb.

Audio Source Player- CD/Media/Bluetooth Capable

Model PMD-526C



Bogen Model **PMD-526C**, by Marantz Professional, is a highly versatile yet affordable media player that excels in applications where users bring their own devices to the venue. The PMD-526C plays not only CD media but provides Bluetooth connectivity, USB playback, SD card functionality and a 3.5mm AUX input. The PMD-526C features Bluetooth Pairing, Front Panel Lock, Power On Play, direct access to tracks, memory of settings after loss of power, RS-232c control and balanced XLR output. The PMD-526C offers the kind of performance, build quality, and versatility that is difficult to find even on competitive units costing several hundreds of dollars more.

PRODUCT FEATURES:

- Bluetooth 4.0 pairing to (8) devices
- Slot-loading CD transport
- Playback from SD/SDHC media
- USB host port for file playback
- Pitch and Tempo Control
- 10-button direct track access
- 3.5mm AUX input for playback from portable players
- RS-232c control capable
- Balanced (XLR) and unbalanced (RCA) outputs
- Listed to UL Standard 60065 for US and Canada



Power Requirements:	100V-230 VAC @ 15W
Dimensions:	19" W x 1-3/4" H x 10" D
Product Weight:	6.4 lb.

MUSIC & PAGING SOURCE

6-Zone Music & Paging System

Model DRZ120



The DRZ120 is a unique, self-contained 6-zone music and paging system for small- to medium-sized applications. It combines a digital FM tuner/MP3 player with 7 MIC & LINE inputs. It has a 120-watt amplifier capable of driving 4-16 ohm or 70-volt speaker systems. The DRZ120 permits connection of up to six individual paging and music zones. The unit also features Bass and Treble controls and a 5-segment LED output signal level indicator. The built-in FM tuner uses a PLL synthesizer to provide accurate frequency selection. MP3 audio can be played from files (.mp3 & .wav) accessed via the USB or SD card slots on the front panel. The MIC1 Input can be set for VOX-activated override/muting of the other audio inputs. Also, there is a push-button activated Chime feature that produces a short, melodic series of four ascending bell-like alert tones which are played across all outputs.

PRODUCT FEATURES:

- Self-contained, 6-zone music and paging system with FM Tuner, MP3 Player, MIC, and LINE inputs
- 120-watt audio output (into 8-ohm)
- For use with 4-16 ohm or 70-volt systems
- Enable from 1-6 zones for music or paging
- 7 total audio inputs - MIC1-4, Line1-3
- MIC1 input uses a front 1/4" TRS connector for a balanced Lo-Z microphone
- MIC1 VOX-activated muting of all other audio inputs governed via a MUTE Control
- Built-in digital FM Tuner with PLL synthesizer provides accurate frequency selection
- Auto station search and manual tuning
- RCA inputs for LINE1-3
- 5-segment LED output level meter
- Back-lit tuner display, LCD
- FM 75Ω coaxial antenna connector
- Over 800 FM station presets
- Bass and Treble controls
- Chime button with priority output
- Infrared Remote Controller for FM tuner and MP3 player control:
 - Volume control
 - TUNER/MP3 select button
 - Preset and scan channel selection
 - USB/SD media select
 - MP3 play/pause/forward/ backward/ repeat options
 - EQ mode selection (none, Classic, Jazz, Rock, Bass & Pop)
- AUX post-mix LINE output
- Power-on LED indicator
- Rack-mountable with integral brackets
- Operates from nominal 120V AC, 60 Hz
- Listed to UL Standard 60065 for U.S. and Canada
- FCC Part 15 compliant

Power Requirements:	120V AC nominal @ 60Hz
Dimensions:	19-1/8" W x 3-1/2" H x 13-3/4" D
Product Weight:	25.2 lb.

DOOR PHONE

Analog Door Phone

Model ADP1

Bogen's ADP1 Door Phone provides convenient remote, hands-free two-way communication between two locations. Durable, weather-resistant, stainless steel construction protects against vandals and varying weather conditions.

PRODUCT FEATURES:

- Weather-resistant
- Vandal-resistant brushed stainless steel faceplate with mounting gasket and heavy-duty call button
- Suitable for indoor or outdoor station, door, or gate communication
- Push button initiates the call at remote location
- Connect directly to an analog PABX/KSU station programmed for ringdown operation
- Adjustable microphone and speaker volume
- Adjustable call timeout (15 seconds to 2 minutes)
- Call limit timer can be disabled
- Responds to CPC pulses
- Hands-free communications
- Auto-answer feature allows monitoring of remote location
- Powered by telephone line; no power supply needed
- Fits interior and exterior dual gang electrical boxes (user supplied)



Shown with bezel frame



Shown without bezel frame

Dimensions	Product Weight
5" W x 5" H x 1-7/8" D; 6-3/8" W x 6-3/8" H x 1-7/8" D (with bezel frame)	2 lb.

WIRELESS MICROPHONES

UHF PLL Single-Channel Diversity Wireless Microphone Systems

Models **UHF8011BP**, **UHF8011HH**

The **UHF8011BP** and **UHF8011HH** Wireless Microphone Systems offer users the freedom to move around while speaking. System choices consist of an 1,440-channel PLL single-channel UHF receiver coupled with either a body pack transmitter (**UHF8011BP**) with lavalier microphone, or a wireless handheld microphone (**UHF8011HH**)

PRODUCT FEATURES:

UDR8011 Single-Channel UHF PLL Receiver

- Offers 1,440 user-selectable frequencies in UHF 470-490 MHz band; 120 dB dynamic range; operation up to 500 feet line-of-sight
- Antenna diversity for maximum range and dropout protection, LCD screen, 1/4" unbalanced and XLR balanced outputs, noiseless transmitter ON/OFF switching, and digital level control for output
- Half-rack receiver design with detachable, rear dual antennas, powered by wall power adapter (included)
- Base unit: 8" W x 1-5/8" H x 6-1/2" D; 1 lb.
- Detachable Antenna: 12" long (fully extended); 4 oz.

UHT8011 Wireless Handheld Microphone

- Sleek housing with internal antenna for optimum aesthetics and durable long life
- Unidirectional dynamic cartridge for optimum sound, maximum feedback rejection, and minimal handling noise
- Audio mute switch allows convenient audio muting while leaving the transmitter "ON"
- LED and LCD display
- Convenient, economical operation with AA alkaline or NiMH batteries (2x)
- 10-1/2" long x 2" dia.; 10 oz.

UBP8011
Body Pack
Transmitter
(w/Lavalier Mic)

UDR8011
UHF PLL
Receiver Base

**NEW
ITEM!**



UHT8011
Wireless Handheld Microphone

UHF8011BP
— SYSTEM INCLUDES —
UBP8011 Body Pack Transmitter
UDR8011 UHF PLL Receiver Base

UHF8011HH
— SYSTEM INCLUDES —
UHT8011 Wireless Handheld Mic
UDR8011 UHF PLL Receiver Base

UBP8011 Body Pack Transmitter

- Audio mute switch allows convenient audio muting while leaving the transmitter "ON"
- LED and LCD display
- 4-Pin, Mini-XLR connection
- Convenient, economical operation with AA alkaline or NiMH batteries (2x)
- 2-1/4" W x 4" H x 1" D; 2.8 oz. (without batteries)
- Lavalier Mic: 5 ft. long cord; 0.6 oz.

ACCESSORIES (SOLD SEPARATELY)

BCLM1
Condenser
Lavalier Mic

RPK900
Single/Dual Unit
Rack Mount Kit

UHFADS
Antenna
Distribution System

UHFASA
Antenna Signal
Amplifier

UHFDCD
Dual Charging
Dock

UHFHSMB
Headset Mic
(Black)

UHFUDA
Unidirectional
Antenna



UHFHSMB
5" W x 5-1/4" H x 6" D / 12 oz.

BCLM1
0.5" dia. x 1" Mic; 5 ft. cable / 12 oz.

RPK900
19" W x 1-3/4" H x 4" D / 2 lb.

UHFASA
3" W x 3/4" H x 3" D / 2 lb.

UHFDCD
6-1/2" W x 3" H x 4" D / 4 lb.

UHFADS
19" W x 1-3/4" H x 10" D / 5 lb.

UHFUDA
14-1/4" W x 13-3/4" H x 1.5" D / 4 lb.

UHT8011 Handheld Microphone, UBP8011 Body Pack Transmitter, and UDR8011 UHF PLL Receiver Base all can be purchased separately as individual items/accessories.

MICROPHONES

Handhelds

Model HDU250

Professional Handheld Stage Microphone



The **HDU250** is a dynamic microphone that is ideal for acoustically demanding environments. It features a heavy zinc die cast case with a rigid, low noise cable-mount system and a lockable silent reed switch. *7" D x 2" dia.; 13 oz.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- High-output design with excellent gain before feedback
- High sound pressure capability without distortion
- 250-ohm low impedance
- Frequency response range of 50 Hz to 18 kHz
- Sensitivity of -72 dB +/- 3 dB
- Rubberized black finish; includes mic clip

Model HDU150

Handheld Stage Microphone



The **HDU150** is an attractive, dynamic, all-purpose microphone ideally suited for a wide variety of vocal and sound reinforcement applications. *6-1/2" D x 1-1/2" dia.; 13 oz.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- Wide dynamic range with minimum feedback
- Lockable, silent on/off reed switch
- 500-ohm impedance
- Frequency response range of 70 Hz to 15 kHz
- Sensitivity of -70 dB +/- 3 dB
- Rubberized black finish; includes mic clip

Model HDO150

Handheld Public Address Microphone



The **HDO100** is an attractive, dynamic microphone perfectly suited for public address applications and instrument sound reproduction. *6-1/2" D x 1-1/2" dia.; 13 oz.*

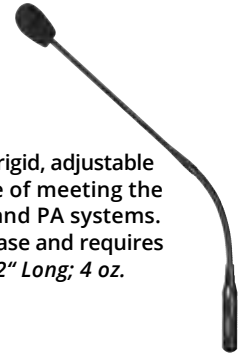
PRODUCT FEATURES:

- Omni-directional pickup pattern
- Low sensitivity to handling noise and stage vibrations
- Lockable, silent on/off reed switch
- 500-ohm impedance
- Frequency response range of 70 Hz to 15 kHz
- Sensitivity of -72 dB +/- 3 dB
- Rubberized black finish; includes mic clip

Goosenecks

Model GCU250

Condenser Gooseneck Microphone



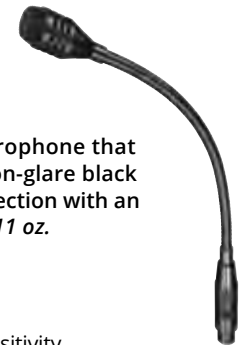
The **GCU250** is a high-performance, partially rigid, adjustable gooseneck condenser microphone capable of meeting the stringent demands of today's conference and PA systems. An integral XLR male connector mounting base and requires a 9V-52V DC phantom power source. *18-1/2" Long; 4 oz.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- Clean, accurate vocal reproduction with low ambient noise
- 250-ohm impedance
- Frequency response range of 50 Hz to 18 kHz
- Sensitivity of -65 dB +/- 3 dB
- Durable all-metal case with non-glare black finish
- 5-1/2" adjustable lower stalk, with 9-1/2" rigid upper section

Model GDU150

Dynamic Gooseneck Microphone



The **GDU150** is a dynamic, gooseneck microphone that features a durable all-metal case with a non-glare black finish. It has a 10" long, fully flexible neck section with an integral XLR mounting base. *16-3/4" Long; 11 oz.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- High sound pressure capability and low sensitivity
- 500-ohm impedance
- Frequency response range of 100 Hz to 12 kHz
- Sensitivity of -75 dB +/- 3 dB
- Silent push-on/push-off talk switch on base
- Integral multi-layer breath/wind filter, ruggedly built

Model MGN19A

Industrial Gooseneck Microphone



The **MGN19A** is a dynamic, push-button activated microphone designed for all industrial and commercial public address and paging applications. *23-1/2" Long; 1.25 lb.; 19" flexible neck w/mounting flange*

PRODUCT FEATURES:

- Omni-directional pickup pattern
- 400-ohm impedance
- Frequency response 50 Hz to 12 kHz, w/ 2 kHz boost
- Sensitivity of -76 dB +/- 3 dB
- Push-to-talk switch on mic housing
- Black-plated gooseneck with black plastic housing
- 4-conductor, 2-shielded cable included

MICROPHONES

Boundary

Model SCU250

Professional Boundary Microphone



The **SCU250** is an unobtrusive, surface-mount, boundary, condenser microphone ideal for meeting rooms, conferences, and stage productions where minimum visibility is ideal. It requires an external 9V to 52V DC phantom power supply. *2-3/4" W x 3/4" H x 3-1/4" D; 11 oz.*

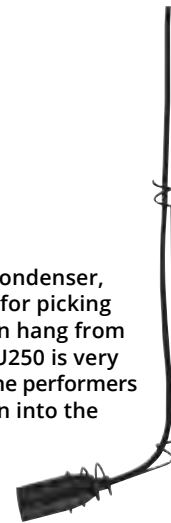
PRODUCT FEATURES:

- Cardioid pickup pattern
- Well suited for sound source and immediate surroundings
- Phantom power operated
- 250-ohm impedance
- Frequency response range of 20 Hz to 18 kHz
- Sensitivity of -58 dB +/- 3 dB
- Low-impedance balanced output
- Mounting keyways for hanging or for mounting surface
- Heavy-duty metal case; matte black finish
- 26-ft. long quad cable, attached

Overhead

Model WCU250

Professional Overhead Hanging Microphone



The overhead **WCU250** is a back electret condenser, professional microphone perfectly suited for picking up audio from large groups. Because it can hang from the ceiling and is compact in size, the WCU250 is very useful in minimizing visual distraction for the performers and the audience alike and limits intrusion into the working space. *1-1/4" D x 1/2" dia.; 5 oz.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- Clear, crisp sound with outstanding ambient noise isolation
- Phantom power operated
- 250-ohm impedance
- Frequency response range of 50 Hz to 18 kHz
- Sensitivity of -65 dB +/- 3 dB
- Integrated metal hanger; matte black finish; 20-ft. cable
- Stainless steel, adjustable black hanger

Desktop

Model DDU250

Dynamic Desktop Microphone



The **DDU250** is a high-quality, dynamic, gooseneck desktop microphone ideal for any PA system. The gooseneck permits the user to adjust the microphone's angle and height to suit the user's needs. *4-1/4" W x 18-1/4" H x 6-1/4" D; 3.5 lb.*

PRODUCT FEATURES:

- Cardioid pickup pattern
- Push-to-lock and push-to-talk switches
- Effective feedback control
- 16" long, fully flexible gooseneck stalk
- 10-ft. cable with external contact closure outputs for talk switches
- 500-ohm impedance
- Frequency response 100 Hz to 12 kHz
- Sensitivity of -76 dB +/- 3 dB

ACCESSORIES (SOLD SEPARATELY)

MC27
Microphone Clip
(for HD Handhelds)

WSGCU250
Mic Windscreen
(for GCU250)

SF4
Floor Base
Stand

SB6
Floor Boom
Stand

XLR25
Microphone
Cable

MAC
Microphone
Cable Assembly

MSM
Shock-Isolated
Microphone Base



MAC
25 feet long / 1 lb.



MSM
4-3/4" W x 1-3/4" H x 4" D / 6 oz.



XLR25
25 feet long / 12 oz.



SB6
34"-62" H adjustable,
30" boom arm / 6 lb.



MC27
1-3/4" W x 4-3/4" H x 2" D / 6 oz.



SF4
34"-62" H adjust.,
10" dia. base / 9 lb.

INTERCOMS

Desktop Intercoms

Models PI35A, SI35A

The SI35A and PI35A High-Powered Desktop Control Centers are dual-channel intercom and program distribution systems for applications with numerous locations, requiring maximum intelligibility of voice announcements and other sources.



PI35A



SI35A

PRODUCT FEATURES:

- Communicate with 25 to 75 rooms or remote locations, using up to three 25-room capacity room selector panels (PI35A – 25-room max.; SI35A – expand to 75-room max.)
- Distribute program material from microphones, CD player/tuner, or other background music sources, tone signals, and emergency announcements to all or select locations
- 5 inputs: 2- MIC (1 built-in console mic), 1- AUX (Hi-Z) unbalanced, 1- TEL, 1-25V booster amplifier
- Built-in 20W intercom amplifier and 35W program amplifier permit instant communication with any location without interrupting the distribution of program to other locations
- Built-in panel speaker to monitor program or listen to a station via intercom channel
- Instant Emergency/All-Call paging with a single push button
- Push-to-talk switch to communicate with selected intercom stations
- Station call-in announced with tone and an illuminated light
- Time signal tone activated from an external contact closure
- 25V balanced line output to drive a distributed speaker system
- Call-in switch can be used where call initiation is desired
- Privacy beep generation available to prevent eavesdropping
- External booster amplifier for when more than 35W is required
- Color-coded controls for easy operation
- 3-conductor, shielded 18, 20, or 22 AWG wire is recommended
- Sturdy desktop cabinet with simulated oak finish
- 15V DC phantom power supply

Power Requirements:	120V AC
Dimensions:	PI35A - 20-1/2" W x 8-1/2" H x 11" D SI35A - 20-1/2" W x 12" H x 11" D
Product Weight:	PI35A - 24 lb.; SI35A - 29 lb.

ACCESSORIES (SOLD SEPARATELY)	CA10A Call Switch, 2-Position	CA11A Call Privacy Switch, 2-Position	CA17 Call-In Switch, Push Button	DST1 Digital Stereo Tuner	DDU250 Desktop Paging Microphone	PMD-526C Audio Source Player
CONNECTOR KITS	2518 - 18-Gauge 2520 - 20-Gauge 2522 - 22-Gauge	SBA225 25-Station Selector Panel for SI35A	SCR25A Call-In Module for SI35A	TL156 Connection Kit Insertion Tool	WMT1A Line Matching Transformer	

Let Us Design Your System... For FREE!!!

BOGEN FREE DESIGN SERVICE

See Page 66 For Details



Bogen System Design Guide

**Design Your Own Systems • Learn Design Principles
Master the Basics of Paging System Technology
Understand the Benefits of both 70V and 24V Systems**

Bogen created the System Design Guide to help you to understand how a paging system works and how to set one up. It is filled with helpful information and reference material that is sure to help answer your questions about centralized 70V amplifier and 24V self-amplified systems and products, how and when to use them, and how to correctly set them up.

Actually, all you need to design a proper paging system is a few simple measurements. Then, follow the step-by-step process to select the type and quantity of system components needed. At any point, you can contact Bogen's Technical Support Department toll-free for assistance or take advantage of Bogen's Free Application Design Service.

Paging System Technology (Introduction)

70V Systems (Central Amplified)

**What Is a 70V System? • Why Use 70V Outputs? • What Makes a 70V Speaker?
Amplifier Output Types • Amplifier Input Types • Designing 70V Systems • Amplifier Selection**

24V Systems (Self-Amplified)

**What Is a Self-Amplified System? • Why Use Self-Amplified Technology?
What Makes a Self-Amplified Speaker? • Designing Self-Amplified Systems**

**Speaker Layout • Site Survey • Site Survey Checklist • Speaker Wiring • Speaker Phasing
Wire Types • Wire-Related Losses • Telephone Interfaces • Sound Pressure Levels Chart**

SYSTEM DESIGN GUIDE

Paging System Technology

The aim of a paging system is to deliver important audio announcements, at the proper level and with sufficient clarity, to people working in a facility and to make those announcements easily understood. The two most common ways to accomplish this are to use either 70V centralized amplifiers with passive speakers or self-amplified speakers operating from a 24V DC power supply.

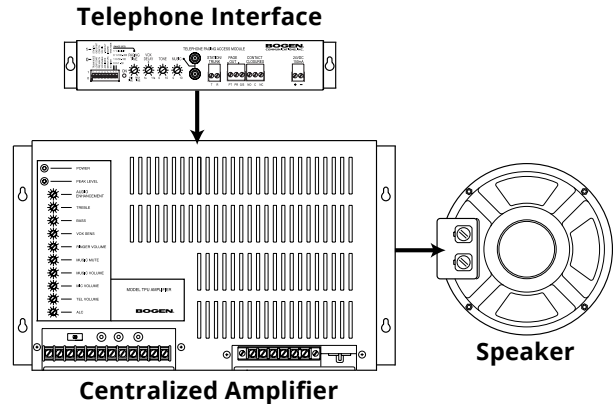
Pages 53-56 explain 70V systems and pages 57-58 explain self-amplified systems. Speaker layout, wiring methods, and phasing are the same for either technology and are covered on pages 59-65.

Central-Amplified Systems – pages 53-56
Self-Amplified Systems – pages 57-58

What Is A 70V System?

A 70V Paging System Consists Of:

- A **CENTRALIZED AMPLIFIER** that offers a variety of features to enhance voice and music reproduction as well as easy system expansion.
- **SPEAKERS** that connect with a simple 2-wire installation because the audio power is supplied from the centralized amplifier.
- An **INTERFACE DEVICE** that connects the paging system to the telephone system. (Depending on the telephone system and amplifier, an interface device may not be needed.)



Why Use 70V Outputs?

Low Currents Allow For Long Runs

Why do distributed sound systems use centralized amplifiers with 70V output signals? Because 70V systems can handle extremely long lengths of wire to connect the speakers to the amplifier, and they can power a large number of speakers in each system.

When sending power signals over long distances, it is important to minimize the amount of current flowing in the wire. High currents allow too much power, or electrical energy, to be wasted in wires in the form of heat.

The power (P) lost in the wire is related to the square of the current (I), so reducing the current in the wires a little reduces the power lost in them considerably. In fact, reducing the current flowing in a wire by a factor of 2 will reduce the power loss by a factor of 4.

$$P = I * R$$

Power Lost In Wires (Watts) = Current Flowing In Wire (Amps) * Resistance Of Wire (Ohms)

However, the power the load demands and the output level of the amplifier determine the amount of current that must flow in the speaker wires (Ohm's law in action).

$$I = P / V$$

Current Flowing In Wire (Amps) = Power Needed In Wires (Watts) / Amplifier Output Voltage (Volts)

So to lower the amount of power lost in the wires, increase the voltage that the amplifier uses to drive the load. By doing this, the current in the wires can be reduced while still supplying the same power to the load (for the same power P, any increase in V will lower I).

Of course, you cannot just change the voltage driving a load from one level to another without also making the load compatible with the new voltage level. To ensure compatibility, 70V systems use transformers on the speakers that change the high 70V amplifier output levels to lower levels that are compatible with typical 8-ohm speakers.

Easy To Control Speaker Power Draw

The output of a central paging amplifier is designed to limit the maximum output voltage that can be supplied to the speakers. This maximum output voltage remains the same regardless of the amplifier's power capacity. Because the output voltage is limited, speaker manufacturers can design products that consume a specific amount of power from the amplifier. This is beneficial in two ways.

First, the speakers will not consume more power than they are designed for so, they cannot blow out from using an amplifier that's too powerful. Second, since each speaker's power consumption is known, the correct amplifier power for the paging system is the total power consumed by all the speakers.

SYSTEM DESIGN GUIDE

What Makes A 70V Speaker?

Step-Down Transformer

70V paging speakers have a step-down transformer, which is used to convert the high-voltage/low-current amplifier signal of the central paging amplifier to the low-voltage/high-current signal that speakers use.



Taps

The primary side of the step-down transformer (the side that connects to the amplifier) has a number of connections (called taps or power taps) that can be used to select the peak power the speaker will consume from the amplifier.

Why Taps?

The selection of the power tap has an effect on both the amplifier power needed for the system and the volume of the speaker. The more power a speaker consumes, the louder the sound from the speaker. By tapping speakers for lower power in quiet areas and for higher power in noisier areas, you can control and balance the sound level of the paging system.

It is important that speakers be tapped correctly for the area that they will be used in. Setting all the speakers for the same power

regardless of the amount of the noise in different areas will cause balance problems. If the amplifier is adjusted to produce adequate paging levels in the noisy areas, the paging levels in the quiet areas will be too loud or vice versa. Selecting the proper tap setting is not difficult, but it does require knowing the level of ambient noise in different areas. (See Sound Pressure Levels Chart on page 66.) It is always better to use the next highest wattage tap if there is any doubt about the speaker being sufficiently loud for the area.

Of course, the best way to determine how effectively a system covers an area is to test it. Never install a paging system and leave the site without testing it. Sound adjustments or additional speakers may be needed. Some paging equipment, such as Bogen's PCM2000, UTI1, and UTI312 paging interfaces include a test tone that is sent to all speakers in the system so installers can check the system installation. For other systems, the installer can have pages made while he walks the area to listen for appropriate sound levels and uniform coverage of the system to find out if and where adjustments need to be made and to make sure that all speakers are properly connected.

Easy Design™ Without Taps

To make designing paging systems as easy as possible, Bogen offers a line of Easy Design™ speakers. These speakers do not require tapping and allow for on-the-fly adjustment of speaker paging levels. All that is needed to design a complete system are the dimensions of the different paging areas and the type of environment. With this basic information, you can use the Easy Design speaker line to quickly design a robust, professional, and powerful paging system. (See pages 17-23 for more information.)

Amplifier Output Types

70V Output

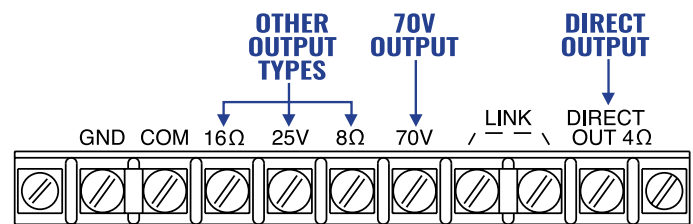
A 70V output is available on Bogen amplifiers and is the primary type of output for paging systems. A step-up output transformer in the amplifier provides the high 70V output signal. All speakers with step-down transformers (rated for 70V systems) are connected to this output.

Other Output Types (25V, 16- and 18-ohm)

There are a number of other standard speaker impedances that Bogen amplifiers can be connected to. These outputs provide the correct speaker signal level for different configurations of low-impedance speakers. The lower voltage (25V) output is provided on many Bogen amplifiers for use in paging installations that require a speaker voltage of less than 70V to meet building code requirements.

Direct Output

Direct outputs are used with low-impedance speakers. These outputs have an exceptional low frequency (bass) response, providing the fuller sound that low-impedance speakers can reproduce. Certain Bogen amplifiers, designed for general purpose sound reinforcement applications, include this feature, which allows the step-up output transformer to be bypassed for direct connection to the power amplifier's output.



SYSTEM DESIGN GUIDE

Amplifier Input Types

Auxiliary Input (AUX)

The Auxiliary input is the most common type of input used in paging. This input is designed to connect to most music sources, such as a CD player or tuner. Usually the connector for such an input is a Phono jack (also called an RCA jack). It connects to other equipment using standard audio cables.

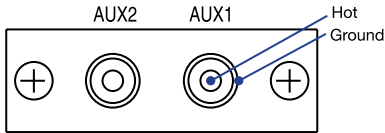


Photo (RCA) Input Jacks

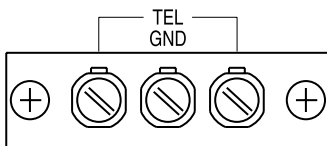
The AUX input has an outer connection that is directly connected to the equipment's ground and a center connection that is the "hot" input. AUX inputs, sometimes referred to as Hi-Z or high-impedance inputs, have a high input impedance so that they won't put too much of a load on the source equipment's output. This type of input is "unbalanced". You must use shielded cable with this type of input in order to avoid getting noise induced into the system.

Normally, connections between source equipment and the amplifier's AUX input should not be too long, about 6 feet. The problem with long connections is that the cable acts like an antenna, picking up any electrical noise in the area. The longer the cable, the more noise that is picked up.

Telephone Input (TEL)

The TEL input is so named because it was designed to be compatible with page port outputs of telephone systems. The TEL input is a 600-ohm transformer-coupled input that:

- Matches the impedance of the telephone port to provide proper interfacing
- Electrically isolates the amplifier from the PBX or Key System
- Provides a balanced input with a great deal of noise immunity



Telephone Input Screw Terminal

Bogen's TEL inputs do not have to be shielded, but it is always a good idea to provide more noise immunity. Normally a ground terminal is available on the input for the shield connection.) Higher noise immunity allows the amplifier to be located much farther away from the source equipment than what an unbalanced input will allow.

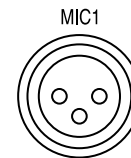
The input transformer is not designed to pass loop current from a telephone line. Any time you want to connect to a telephone station or trunk port, you will need to use a telephone interface module like the TAMB2, which converts the telephone signal into a "dry" audio signal compatible with the amplifier's TEL input.

Microphone Input (MIC)

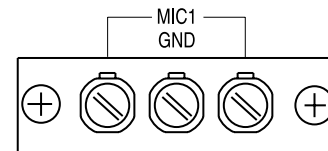
The traditional paging amplifier input is the Microphone input. MIC inputs were the primary announcement source until connection to the telephone system became possible. MIC inputs are still used in public address applications today.

When connected properly, a microphone can be hundreds of feet away from the amplifier and still provide clear, quiet audio.

MIC inputs are the most sensitive of all the amplifier inputs and tend to pick up the stray electrical noise in an area. To combat the noise pickup problem, MIC inputs are balanced. Just like TEL inputs, the balancing of the input provides a high level of noise immunity. MIC inputs are also made to have a fairly low input impedance, which makes it difficult for electrical noise to get induced. The low impedance effectively keeps down noise, which makes its signal level smaller.



Balanced Microphone XLR™ Connector



Balanced Microphone Screw Terminal

Microphone cable is always shielded. The input requires three connections – two for the balanced signal and one for the shield ground. You can reverse the balanced signal leads and the system will still work properly. However, if you improperly wire the ground connections, the amplifier can become unstable and start to oscillate. When this occurs, the amplifier may heat up enough to cause its protection circuits to shut it down or it may produce very distorted sound.

SYSTEM DESIGN GUIDE

Designing 70V Systems

1 Determining Quantities

To figure out how many speakers you need for your application, you only need the dimensions of the area in which the paging system will be installed.

- For Bogen's Easy Design™ line speakers, refer to the charts on pages 20-22.
- For speakers with multiple tap settings, refer to this section for information.

CEILING SPEAKERS

To determine the number of ceiling speakers your installation requires, divide the area's total square footage by the speaker coverage as indicated in this chart.

Ceiling Height (ft.)	Coverage (sq. ft.)
8	250
10	400
12	580
14	780

$$\text{TOTAL AREA (Sq. Ft.)} \div \text{SPEAKER COVERAGE} = \text{NUMBER OF SPEAKERS}$$

WALL BAFFLE SPEAKERS

To determine the number of wall baffle speakers your installation requires, divide the area's total square footage by 600 square feet.

Coverage is 600 sq. ft. per speakers

$$\text{TOTAL AREA (Sq. Ft.)} \div 600 \text{ Sq. Ft.} = \text{NUMBER OF SPEAKERS}$$

HORN LOUDSPEAKERS

To determine the number of horn loudspeakers your installation requires, divide the area's total square footage by the speaker coverage as indicated in the chart below.

See chart below

$$\text{TOTAL AREA (Sq. Ft.)} \div \text{SPEAKER COVERAGE} = \text{NUMBER OF SPEAKERS}$$

2 Determining Tap Settings

To determine tap settings, use the appropriate chart.

Recommended Ceiling Speaker Tap Settings

Ambient Noise Range	Ceiling Height (ft.)			
	8	10	12	14
Low Noise (55 dB - 65 dB)	1/2W* 1/4W**	1/2W* 1/4W**	1W	1W
Medium Noise (65 dB - 75 dB)	1W* 1/2W**	1W* 1/2W**	2W	4W
High Noise (75 dB - 85 dB)	4W			
Very High Noise (85 dB - 95 dB)				

*SM4T Tap Settings **S86/S810 Tap Settings

Recommended Wall Baffle Tap Settings

Ambient Noise Range	Tap Setting
Low Noise (55 dB - 65 dB)	1W
Medium Noise (65 dB - 75 dB)	4W
High Noise (75 dB - 85 dB)	
Very High Noise (85 dB - 95 dB)	

Recommended Horn Tap Settings

	Ambient Noise Range	Speaker Power Taps (Watts)	Coverage (sq. ft.)
SPT5A	Low Noise (55 dB - 65 dB)	1.25W	6,500
	Medium Noise (65 dB - 75 dB)	7.5W	6,500
SPT15A	Medium Noise (65 dB - 75 dB)	0.9W	7,000
	High Noise (75 dB - 85 dB)	3.8W	6,500
	Very High Noise (85 dB - 95 dB)	15W	2,500
SPT30A	High Noise (75 dB - 85 dB)	3.8W	7,000
	Very High Noise (85 dB - 95 dB)	30W	5,500

3 Determining Amplifier Power

To determine the total power your installation will require, simply multiply the number of speakers by the tap wattage.

$$\text{TOTAL SPEAKERS} \times \text{TAP WATTAGE} = \text{MINIMUM AMPLIFIER POWER}$$

Amplifier Input Types

Once you know the minimum amplifier power your system requires, refer to the Amplifier Charts on pages 69-70.

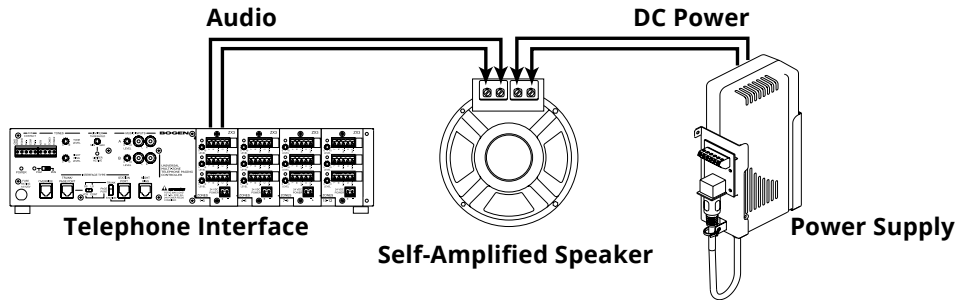
SYSTEM DESIGN GUIDE

What Is A Self-Amplified System?

Self-Amplified Paging Systems Consist of:

- **SELF-AMPLIFIED SPEAKERS** each contain an individual built-in miniature amplifier that drives the speaker directly. Each speaker requires 4 wires. Two wires supply the raw 24V DC voltage to power the speaker's internal amplifier, and another 2 wires supply the low-level audio paging signal to the amplifier's input. All amplified speakers contain volume controls to adjust output level.

- A **POWER SUPPLY** or multiple power supplies provide the raw 24V DC voltage that will power the amplifier built into each self-amplified speaker. Several power supplies can be located in convenient areas in the facility.
- An **INTERFACE DEVICE** that connects the paging system to background music sources and the telephone system and supplies a telephone level audio paging signal to all the speakers in the system. (Depending on the telephone system and number of speakers in the system, an interface device may not be needed.)



Why Self-Amplified Technology?

Low Signals Level Prevent Crosstalk

In certain installations, it may be desirable to use conductors in an existing telecommunication cable to deliver paging to different floors or areas in a facility. 70V amplifier signals would not be appropriate to run in the same cable with analog telephone signals since their high level could cause crosstalk in the other telephone circuits in the cable. Because the audio signal levels supplied to the inputs of the amplified speakers are similar in level to analog telephone levels, there will be no crosstalk of the paging system in the telephone lines.

The raw 24V DC power needed by the self-amplified speaker can also be carried in the telecom cable since it contains no interfering signals, but care must be exercised to make sure the length of cable will not cause too much voltage to be lost in the cable. (See Page 64 for more information.)

Convenient System Expansion

A self-amplified system can be expanded by adding extra speakers and power supplies as required. They are extremely scalable due to the fact that each speaker is an amplifier unto itself. It is also easy to connect additional power supplies where needed to power the speakers. In some instances, there may not be sufficient audio signal level available for the speaker's input. In these instances, a small buffer can be installed in line to boost the signal level.

Self-amplified speakers can also be used to expand 70V paging systems in cases where the added speakers would overload an existing central 70V amplifier. The same buffer that is used to boost signal level can be used to reduce the large 70V speaker signal to a level that is compatible with the input of self-amplified speakers. A suitable power supply can be located near the expansion speakers to power their internal amplifiers. This approach can be used instead of replacing the central 70V amplifier with a larger one to handle the extra speakers.

Cost Effective For Small Installation

Self-amplified speakers can be very cost effective in small systems since they provide scalability in small increments. The centralized amplifiers in 70V systems are typically available in set output power level steps that start at 6 or 10 watts and increment by 0 watts or more from model to next higher powered model. In small applications that require only a few watts of paging, the extra power capability of the 70V amplifiers may not be an advantage due to the higher cost associated with the amplifier's extra power, especially if it will not be used in the future.

Self-amplified systems can be designed with much smaller output level power steps so that only the necessary audio power is installed in the facility. This can result in a lower cost of equipment especially where the desired power level is considerably less than the smallest applicable 70V amplifier output level.

Understanding Current Units

Self-Amplified paging systems are made up of equipment that consume or provide operating current. To operate properly, the system needs to provide at least as much 24V current as it consumes.

Each product has a Current Units number. This number is either positive, negative, or zero to indicate how much current it provides to or consumes from the system.

Note: One Current Unit = 50 mA, 24V DC



SYSTEM DESIGN GUIDE

What Makes A Self-Amplified Speaker?

Built-In Amplifier

As the name suggests, all self-amplified speakers contain their own built-in, miniature amplifier. These amplifiers range in size from 1 watt, which are used on cone speakers, up to 30 watts, which are used on the SAH30 horn speakers.

Bogen's latest line of self-amplified horns use a revolutionary digital switching amplifier. Unlike conventional analog amplifiers, an amplifier that uses this advanced technology produces very little heat when it operates. It produces so little heat that all it needs to dissipate the waste heat are the copper interconnecting traces on the printed circuit board instead of the typical large aluminum heat sinks. Because it produces so little heat, it also draws considerably less power from the power supply. Why? Because it is not wasting half of the power supply energy it consumes as heat.

More typical in the industry are speakers that employ analog amplifiers, which produce considerable waste heat while operating. They typically release half the 24V power they consume in the form of heat, and heat is a major contributor to the failure of an amplifier.

The amplifiers in Bogen's AH series of self-amplified horns are analog but rid themselves of waste heat through their large cast aluminum end bell that works as an excellent heat sink, quickly and effectively removing excess heat. Competitive products using plastic end bells don't have this cooling advantage.

4 Wires

All self-amplified speakers require 4 wires to make the necessary connections. Two of the connections are used to provide 24V DC power to the built-in amplifier. The other connection pair to a self-amplified speaker is for the audio signal input.

The general audio signal level is the same as what you would find on any analog telephone line. The input is transformer balanced, also similar to the inputs found on telephone systems. The balanced nature of the input greatly reduces interference and noise caused by equipment running in the facility. The use of an actual transformer provides electrical isolation between the input leads and the actual amplifier, which protects it from ground loops and RF interference, and provides an all-around rugged input.

Designing Self-Amplified Systems

1

Determining Quantities

Figuring out how many speakers you need for your application is simple.

- For Bogen's Ceiling and Wall Baffle Speakers, you will need room dimensions.
- For Bogen's Horn Speakers, you will need room dimensions and ambient noise levels.

CEILING SPEAKERS

SELF-AMPLIFIED

To determine the number of ceiling speakers your installation requires, divide the area's total square footage by the speaker coverage as indicated in this chart.

Ceiling Height (ft.)	Coverage (sq. ft.)
8	250
10	400
12	580
14	780

$$\text{TOTAL AREA (Sq. Ft.)} \div \text{SPEAKER COVERAGE} = \text{NUMBER OF SPEAKERS}$$

WALL BAFFLE SPEAKERS

SELF-AMPLIFIED

To determine the number of wall baffle speakers your installation requires, divide the area's total square footage by 600 square feet.

Coverage is 600 sq. ft. per speakers

$$\text{TOTAL AREA (Sq. Ft.)} \div 600 \text{ Sq. Ft.} = \text{NUMBER OF SPEAKERS}$$

HORN LOUDSPEAKERS

SELF-AMPLIFIED

To determine the number of horn loudspeakers your installation requires, divide the area's total square footage by the speaker coverage as indicated in the chart below.




	Ambient Noise Range	Coverage (sq. ft.)	Volume Setting
SAH5, AH5A	Low Noise (55 dB - 65 dB)	8,050	LOW
	Medium Noise (65 dB - 75 dB)	6,955	HIGH
SAH15, AH15A	Medium Noise (65 dB - 75 dB)	6,955	LOW
	High Noise (75 dB - 85 dB)	6,500	MEDIUM
	Very High Noise (85 dB - 95 dB)	2,600	HIGH
SAH30	Very High Noise (85 dB - 95 dB)	5,500	HIGH

$$\text{TOTAL AREA (Sq. Ft.)} \div \text{SPEAKER COVERAGE} = \text{NUMBER OF SPEAKERS}$$

2

Determining Power Supply Capacity

To determine total 24V DC Power Supply size requirement, follow the steps below.

1. Add all the  numbers of the self-amplified speakers for the system and volume controls together.
2. Select a power supply (or power supplies) with a  number(s) equal to or greater than the total  amount for the system.

SYSTEM DESIGN GUIDE

Speaker Layout

The layout of the speakers should be planned before installation begins. The spacing of the speakers can be adjusted so that the speakers are evenly spaced in a row. Some adjustments may need to be made due to sound obstructions that may be in the area such as high shelving, cubicle walls, etc.

Ceiling Speakers

Layout starts in one corner of the area. The first speaker should be positioned from each wall a distance approximately equal to the ceiling height of the room (**dimension A**).

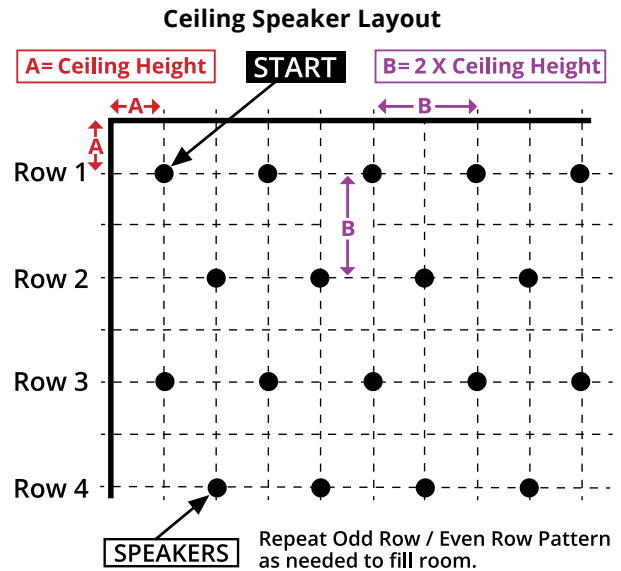
The next speaker in row 1 should be spaced a distance approximately equal to twice the height of the ceiling (**dimension B**). Each additional speaker in the row should use this same spacing.

Row 2 starts at twice the ceiling height distance (**B**) from row 1 and twice the ceiling height (**B**) from the wall. The other speakers in this row are also spaced at twice the ceiling height.

Row 3 is again spaced at twice the ceiling height (**B**) from the previous row. The first speaker starting this row is positioned at one ceiling height distance (**A**) from the wall (similar to row 1).

Continue this pattern of alternating rows until the room is covered.

The spacing of the speakers can be adjusted so that the speakers are evenly spaced in a row and are more aesthetically pleasing.



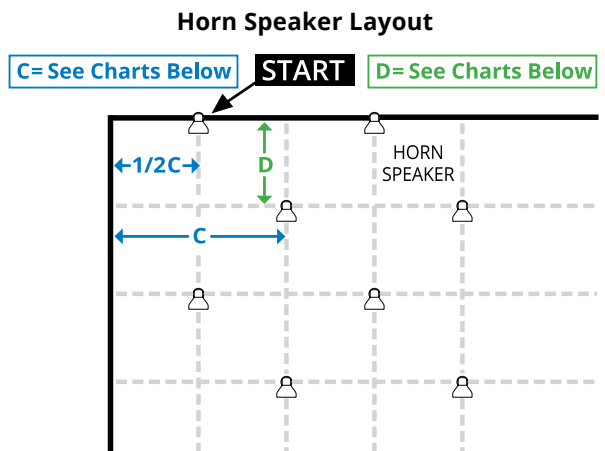
Horn Loudspeakers

Desired mounting height, barring obstructions, is 15 to 20 feet with the speakers angled downward toward the listening area and facing in the same direction. Follow the diagram for the layout of the horn speakers while using the charts below to define the lettered dimensions for each specific speaker.

Begin in one corner of the area. The first speaker in Row 1 is positioned a distance equivalent to ($1/2C$). The next speaker in Row 1 should be a distance equivalent to (**C**) from the first speaker. Each additional speaker in the row should use this same spacing. Row 2 starts at the indicated distance (**D**) from Row 1. Using the diagram as a guide, fill in the remaining rows in this same alternating pattern until the entire area is appropriately covered.

For areas that include high shelving or corridors, speakers should be installed so that they project down the aisles between the shelves or down through the corridors.

The spacing of the speakers can be adjusted so that the speakers are evenly spaced in a row.



NOTE: Each environment is unique. This layout plan is general in nature and may not be applicable for every installation.

	Ambient Noise Range	C	D	Volume Setting
HS7EZ	Low Noise (55 dB - 65 dB)	120 ft.	80 ft.	1/2 Rotation
	Medium Noise (65 dB - 75 dB)	100 ft.	60 ft.	Full Clockwise
HS15EZ	High Noise (75 dB - 85 dB)	100 ft.	60 ft.	1/2 Rotation
	Very High Noise (85 dB - 95 dB)	65 ft.	40 ft.	Full Clockwise
HS30EZ	Very High Noise (85 dB - 95 dB)	90 ft.	55 ft.	Full Clockwise

	Ambient Noise Range	C	D	Volume Setting
SAH5, AH5A	Low Noise (55 dB - 65 dB)	115 ft.	70 ft.	LOW
	Medium Noise (65 dB - 75 dB)	107 ft.	65 ft.	HIGH
SAH15, AH15A	Medium Noise (65 dB - 75 dB)	107 ft.	65 ft.	LOW
	High Noise (75 dB - 85 dB)	100 ft.	65 ft.	MEDIUM
	Very High Noise (85 dB - 95 dB)	65 ft.	40 ft.	HIGH
SAH30	Very High Noise (85 dB - 95 dB)	97 ft.	57 ft.	HIGH

	Ambient Noise Range	Speaker Power Taps (Watts)	C	D
SPT5A	Low Noise (55 dB - 65 dB)	1.25W	100 ft.	65 ft.
	Medium Noise (65 dB - 75 dB)	7.5W	100 ft.	65 ft.
SPT15A	Medium Noise (65 dB - 75 dB)	0.9W	105 ft.	67 ft.
	High Noise (75 dB - 85 dB)	3.8W	100 ft.	65 ft.
	Very High Noise (85 dB - 95 dB)	15W	63 ft.	40 ft.
SPT30A	High Noise (75 dB - 85 dB)	3.8W	103 ft.	68 ft.
	Very High Noise (85 dB - 95 dB)	30W	97 ft.	57 ft.

SYSTEM DESIGN GUIDE

Speaker Layout

Wall Baffle Speakers

The layout of the speakers should be planned prior to installation. Because wall baffle speakers are designed to project forward, it is best to aim them in the same direction as this provides for both greater coverage and clarity. You can use the building's roof pillars or other available supports for mounting the wall baffles. In some cases, it may be necessary to mount the wall baffles on opposing walls. In these cases, the speakers will project sound in opposing directions.

Chart for 70V & 25V passive speakers

Ambient Noise Range	Tap Setting
Low Noise (55 dB - 65 dB)	1W
Medium Noise (65 dB - 75 dB)	4W
High Noise (75 dB - 85 dB)	
Very High Noise (85 dB - 95 dB)	

Chart for 24V self-amplified speakers

Ambient Noise Range	Facing Speaker Distance	Volume
Low Noise (55 dB - 65 dB)	< 40 ft.	Med
	40 to 60 ft.	High

• HALLWAY/ROOMS

Wall baffle speakers work well with rooms and hallways that are 20' to 60' wide. Layout starts at one end of the hallway or room. The first speaker should be installed 10' from the end of the hallway or room. The next speaker, on that wall should be installed 20' from the first speaker, as should any additional speakers required to cover the length of the hallway or room.

The first speaker on the opposing wall should be installed 20' from the end of the hallway or room, thereby staggering the speakers. Each additional speaker should also be installed 20' apart from the previous one. (See Figure 1.)

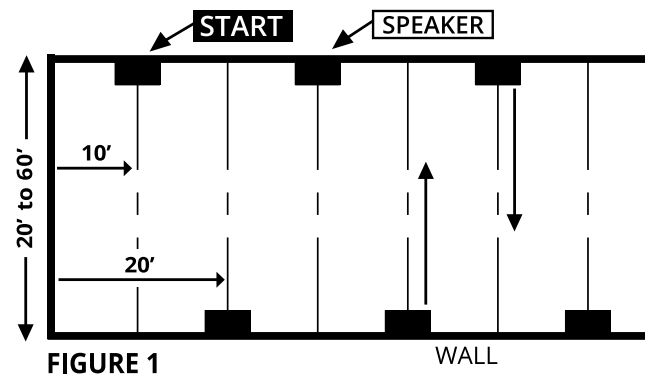


FIGURE 1

• OPEN AREA

The number of speakers needed to cover an open area and the layout of those speakers are contingent upon the availability of suitable mounting points in the area to be covered.

Layout starts in one corner of the room. The first speaker should be installed 10' from the corner of the room with each additional speaker in the first row installed in increments of 20' from the first. Based on Figure 2, install the next row of speakers 30' from the first row and 20' from the wall with increments of 20' between each speaker. The third row would follow the example of the first, and each additional row would continue this pattern of alternating rows until the whole area is covered. (See Figure 2.)

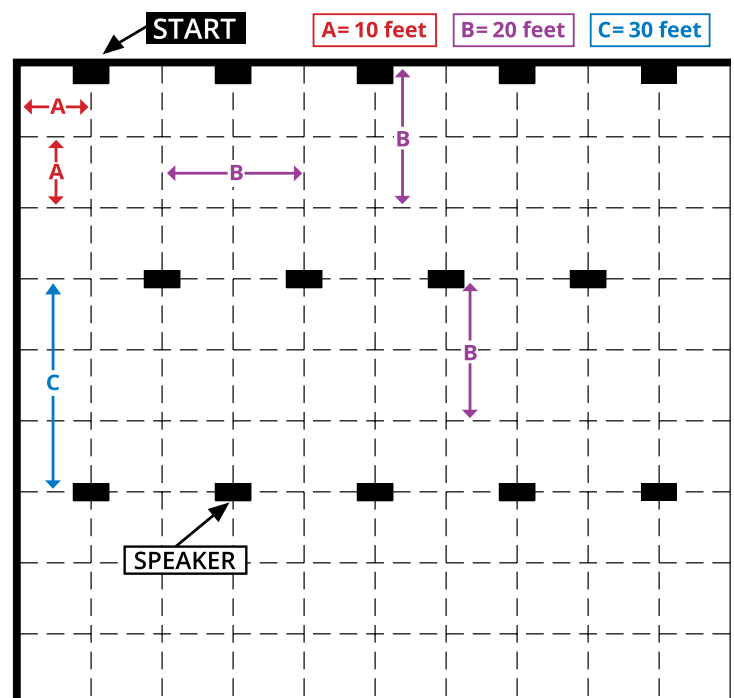


FIGURE 2

SYSTEM DESIGN GUIDE

Site Survey

Designing a system and determining an installation's requirements are quite simple. After you set up your first system, the steps will appear logical and soon the process will become routine. However, before you begin designing or quoting a job you will need some basic information regarding the site and the end-user's needs.

Use the Site Survey Check List below to ensure that you collect all the information you will need to complete the design of the paging system. When you have completed the check list, create a bill of material for the equipment you need for the installation's sound system. Refer to the Easy Design™ Guide (pages 19-23), page 56 for 70V systems, or page 58 for 24V systems.

Tools Needed (for Site Survey Check List below)

You will need to bring the following tools with you when you visit the installation site:

- Measuring wheel/tape measure
- Sound pressure meter
- Calculator
- Bogen Product catalog
- Photocopies of the Site Survey Check List

Obtain a copy of the floor plan, or create sketches of any areas that may require special design considerations (high shelving, speaker mounting locations, exposed beams, amplifier location, etc.).

A successful paging system depends on more than just understanding the physical requirements of the installation site; it also depends on knowing which special paging features the user will benefit from and use on a daily basis. These include zone paging, tone controls, night ringer, feedback elimination, ambient noise sensors, multiple inputs, etc.

Site Survey Check List

This Site Survey Check List will help to determine the paging system equipment needed for installations. Photocopy this page and bring it with you when you visit installation sites. You may require several copies of this chart for each installation.

Section I – SYSTEM NEEDS required for the installation.

Section II – SPECIFIC AREA NEEDS within the installation.

NOTE: Installations that contain areas with different style environments or sound levels may require Section II to be filled out separately for each area.

I. SYSTEM NEEDS

a. What Type of Telephone Port Will Be Available for Connection to the Paging System? (see page 65)

- Loop Start Ground Start Other: _____
 Page Port Analog Station Port

b. How Many MIC Inputs Are Needed? _____ (see page 55)

c. How Many AUX Inputs Are Needed? _____ (see page 55)

d. Is Zone Paging Required? Yes No (see pages 31, 33-34)
If yes, how many zones: _____

e. Is Talk Back Required? Yes No (see page 45)
If yes, in individual zones? Yes No (see pages 33-34)
If yes, system-wide (no zones)? Yes No (see page 45)

f. Is Group Paging Required? Yes No (see pages 33-34)

g. Are Time Tones Needed to Signal Shift Changes?
 Yes No (see pages 33-34)

h. How Can Headend Equipment Be Mounted?
 Rack Wall Shelf

i. System Features Needed:

- Automatic Level Control (ALC) Variable Loudness Contour Control
 Bass & Treble Controls Graphic Equalizer
 Automatic Mute Variable Mute
 MOH Output Manual Mute
 Audio Enhancement Night Ringer
 Subwoofer

j. Any Technology Preference?

- 70V Central Amplifier Self-Amplified 24V Equipment
 None

II. SPECIFIC AREA NEEDS

a. Area Name/Description: _____

b. Area Dimensions:

Length _____ ft. Width _____ ft.
Square Footage _____ sq. ft. Ceiling Height _____ ft.

c. Ambient Noise Level: _____ dB (to estimate, see chart on page 66)

d. Will There Be Large Changes in Ambient Noise Levels in the Area? Yes No (see pages 39-40, 44)

If yes, note range: _____ dB to _____ dB

e. Is Hearing Protection Worn On-Site? Yes No

f. Environment:

- Office/Professional/Retail Store Factory/Industrial
 Institutional/Remote Public Area Warehouse
 Aisles created by high storage racks Hallways
 Cafeteria/Break Room Auditorium
 Loading Docks/Outdoor Areas Other: _____

g. Where Will the Speakers Be Placed?

- Indoors Outdoors

h. How Can the Speakers Be Mounted?

- Suspended/Drop Ceiling* Wall**
 Beams, Columns, Other Structures Ground

* Make note of any changes in surfaces or positions for the speaker mounting.

** Make note of any changes in wall angles, surfaces, or height.

i. Are Volume Controls Mounted on Each Speaker Needed?

- Yes No

j. Are Wall-Mounted Attenuators Needed for Area's Volume Control? Yes No (see pages 16 & 32)

k. Is Feedback Elimination Equipment Needed?

- Yes No (see page 45)

l. Is Background Music Needed? Yes No

If yes, BGM source: (see page 46-47)

- Tuner • Antenna available for tuners? Yes No
 CD Player/Receiver Other: _____

To use Bogen's FREE DESIGN SERVICE, DO NOT use this checklist. Use the online form at: www.bogen.com/requestform.pdf

SYSTEM DESIGN GUIDE

Speaker Wiring

Speaker Wiring Patterns

Because distributed paging systems involve a great number of speakers and long distances, the manner in which the speakers are wired is of interest. Deciding on how to wire the speakers depends on whether separate zones of speakers are needed, how many lines back to the amplifier are reasonable, and how easy it will be to troubleshoot the system in the future.

How you wire a speaker system may require some tradeoffs. The simplest way is to parallel all the speakers on one very long run of wire. This approach leads to some problems. First, the amount of power lost in a long run of wire may not allow the required amount of 70V speaker signal, or 24V DC voltage for self-amplified paging systems, to get to the farthest speakers. Second, if there should be a short on the wire run, it would take down the entire run. In order to locate it, you would need to disconnect each speaker until the failed one is found.

Multiple Wire Runs

A more practical approach is to wire each row of speakers in an area together and run a lead wire from this row back to the amplifier. The objective is not to have so many speakers daisy-chained together that it makes troubleshooting impossible. Wire runs can be separated to determine in which run the problem exists.

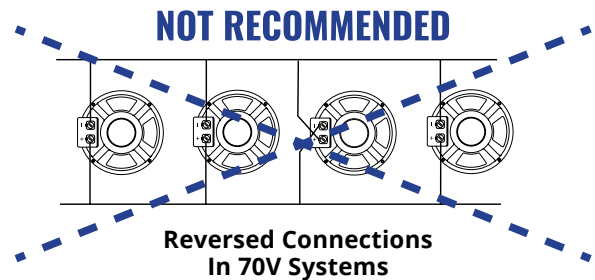
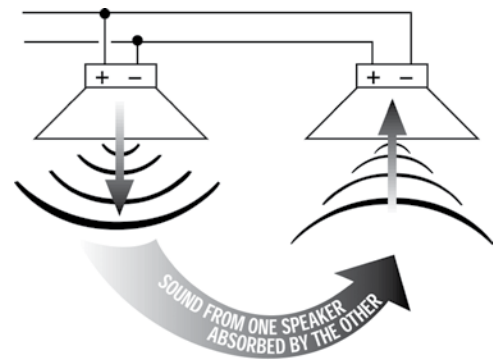
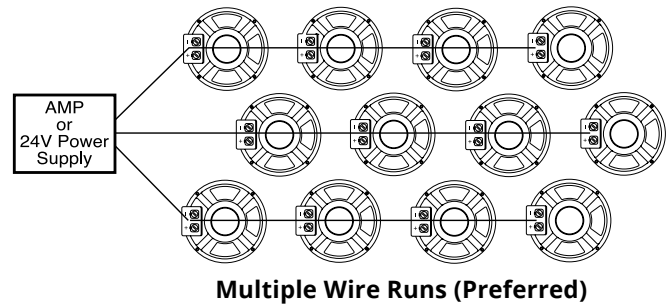
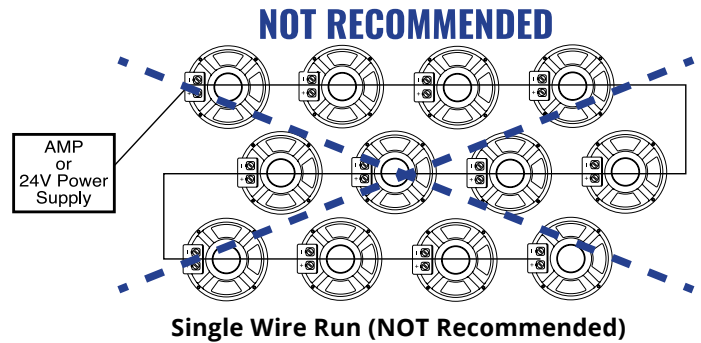
Speaker Wiring Patterns

As the voltage on a speaker changes from plus to minus, the speaker cone moves from pushing out to pulling in. If you reverse the polarity, the speaker responds in the opposite manner.

If a speaker is pushing out and an adjacent speaker is pulling in, some of the pressure caused by the speaker pushing out will be absorbed by the speaker pulling in. These two speakers are out of phase.

In a paging system, all the speakers should be in phase so that they all push out at the same time. Out of phase speakers operate perfectly well and will not cause any harm to a paging system, but will tend to diminish the bass response in the area around the out of phase speaker.

The important thing is to wire all the same polarity (+ or -) connections together. This will ensure that the speakers in the system all work in unison. All paging speaker connections have a polarity indicator. It may be a color code, plus (+) and minus (-) symbols, or a red dot.

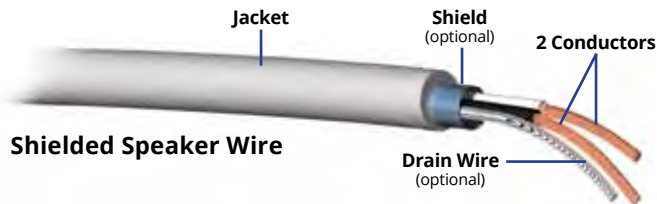


SYSTEM DESIGN GUIDE

Wire Types

Speaker Wire

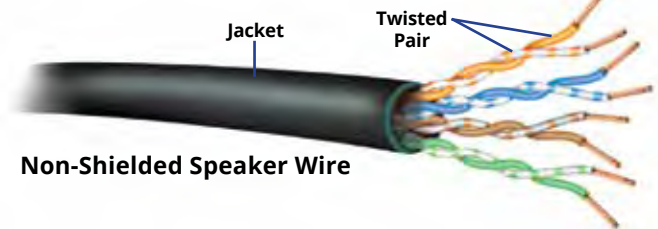
The speaker wire best suited for paging systems is 2 conductors in a jacket. The gauge of the conductors varies depending on the installation. In many instances, a shielded version of the speaker wire is used. The shield can be useful to help protect the conductors from receiving electrical interference from other electrical equipment in the area. The shield is particularly useful when speakers are to be used as microphones in talk back applications.



Shielded Speaker Wire

UTP

Unshielded Twisted Pair (UTP) wire has many uses but is most common in data and telecom installations. It uses solid conductors, typically 24 gauge. It has insulation to withstand voltages similar to speaker wire and can be used in 70V and self-amplified applications, as long as the thin gauge and the associated higher resistance is accounted for. Also because there is no shield, the use of UTP in talk back applications (where the speaker acts as a microphone) may lead to higher electrical noise on the talk back signal. There are normally several twisted pairs in a single cable and these can be paralleled to approximate lower gauge wires (see page 64).



Non-Shielded Speaker Wire

Shielded Cable

Shielded cable refers to any conductor (or conductors) wrapped in an electrically conductive shield. The two types of cable most prevalent for audio installations are:

- **SINGLE-CONDUCTOR SHIELDED CABLE**

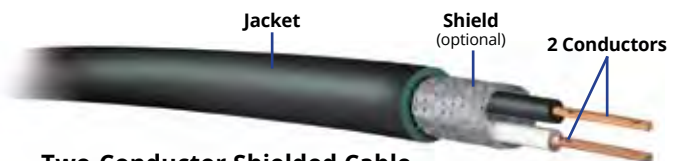
Single-conductor shielded cable is used to connect external equipment to the unbalanced AUX inputs of amplifiers. The center conductor carries the signal source and the shield carries the ground between the amplifier and external equipment. In addition to completing the ground return between the electrical equipment, the cable provides a large amount of noise and interference protection for the center conductor. The most common connector for this type of cable is the Phono connector (a.k.a. the RCA connector). The connector's center pin connects to the internal conductor and the skirt around the connector's perimeter connects to the shield of the cable.



Single Conductor Shielded Cable

- **TWO-CONDUCTOR SHIELDED CABLE**

Two-conductor shielded cable is typically used with balanced microphones. Two internal conductors are required for the low-impedance balanced microphones used in paging systems. The shield is wrapped around these conductors and provides the same protection against electrical interference and noise as single-conductor cable. Balanced microphone inputs provide a ground connection point for the shield. Without the ground connection, the shield would be ineffective. Some microphones with push-to-talk switches require two more conductors to carry the switch closure back to the amplifier. In this cable, the conductors for the switch closure are not wrapped in the shield but rather carried in the cable jacket outside of the shield. The most popular types of connectors for microphone cable are screw terminals and XLR connectors.



Two-Conductor Shielded Cable (Balanced MIC Cable)

SYSTEM DESIGN GUIDE

Wire-Related Losses

Wire is an important but often ignored component of a paging system. Because all wire has resistance, some of the voltage at the source is lost or dropped in the wire before it reaches the target destination. The amount of voltage lost in the wires is affected by the resistance or gauge of the wire and the current flowing in the wire. This is classic Ohm's law in action. If the drops in the cables are not anticipated, the final volume level at the passive speaker may not meet the requirement or, for a self-amplified speaker, there may not be enough DC voltage available to the speaker to allow the built-in amplifier to operate cleanly or at all.

There are different charts for centralized and self-amplified speakers to determine the maximum cable lengths that should be

allowed. In the case of central amplifier systems, try to keep the system power lost in the wires to 10% or less. However, less power at the speaker is the only negative effect larger losses have on the system. Clarity, intelligibility, and frequency response are unaffected by larger losses in the wiring of centrally amplified systems.

Self-amplified systems are particularly sensitive to losses in the wire, especially the amount of supply voltage that is lost in the wires on the way to the self-amplified speaker. When the drop in the wiring becomes too large, the speakers may begin to distort or stop functioning altogether. For this reason, it is important to adhere to the maximums shown in the tables below.

Wire Loss in Central Amplified Systems (70V & 25V)

Once you have an idea of how many speakers are to be wired together in a run, estimate how long the wire run will be from the first to the last speaker in each run. Include the lead-in wire length from the amplifier to the first speaker in each run in your overall run length. For each run, sum up the speaker power and cable lengths.

With that information, refer to the Wire Loss Chart to ensure that the wire gauge is sufficient to support the power and cable length for the run. It may be necessary to increase the wire gauge, split the speaker loads, or shorten the wire run lengths if they exceed the chart maximums.

70V WIRE LOSS CHART

Wire Gauge	70V - Load Power Per Wire Run (Watts)						
	5	10	15	30	50	100	200
16	10,000	7,000	4,600	2,300	1,400	700	350
18	9,000	4,500	2,800	1,400	830	415	205
20	5,500	2,700	1,800	900	540	270	135
22	3,400	1,700	1,100	550	330	115	60
24	2,100	1,000	700	350	210	105	50
Maximum Wire Run Cable Length (ft.) (10% of Power Lost in Wire)							

Shield/Stranded Cable Recommended

25V WIRE LOSS CHART

Wire Gauge	25V - Load Power Per Wire Run (Watts)						
	5	10	15	30	50	100	200
16	1,280	640	425	215	125	60	30
18	800	400	265	130	80	40	20
20	505	250	165	80	50	25	12
22	315	155	105	50	30	15	7
24	200	100	65	30	20	10	5
Maximum Wire Run Cable Length (ft.) (10% of Power Lost in Wire)							

Shield/Stranded Cable Recommended

Wire Loss and Voltage Drop In Self-Amplified Systems

The most important wiring consideration with self-amplified speakers is to ensure that there will be enough voltage available at each device to allow its internal amplifier to operate correctly. If too much voltage is dropped in the wires leading to a speaker, this may not be the case.

Once you have an idea of how many speakers are to be wired together in a run, estimate how long the wire run will be from the first to the last speaker in each run. Include the lead-in wire length from the power supply to the first speaker in each run. Also, sum up the CU ratings of all the speakers on the run.

With that information, refer to the Voltage Drop Chart to ensure that there are not too many speakers loading the wire used in the run or that the wire gauge is sufficient to support the power and cable length desired. To stay within the chart length limits, it may be necessary to either create a shorter run containing less speakers or double up on conductors in the cable to effectively lower the gauge of the supply wire. The Reducing Gauge Chart can be used to determine what effective gauge is achieved by doubling or tripling up on pairs in the cable.

VOLTAGE DROP CHART

			Wire Gauge (AWG)					
			26	24	22	20	18	16
Total CU (Current Units) on cable run	10	220	351	557	887	1413	2237	
	20	110	175	279	443	706	1118	
	30	73	117	186	296	471	746	
	40	55	88	139	222	353	559	
	50	44	70	111	177	283	447	
	60	37	58	93	148	235	373	
	70	31	50	80	127	202	320	
	80	28	44	70	111	177	280	
	90	24	39	62	99	157	249	
	100	22	35	56	89	141	224	
110	20	32	51	81	128	203		

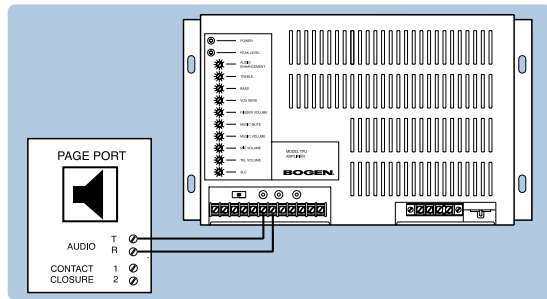
Maximum Wire Run Cable Length (ft.)

SYSTEM DESIGN GUIDE

Telephone Interfaces

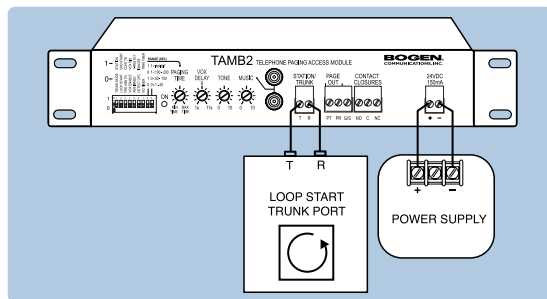
The most common way to make announcements over a paging system is through the telephone system. It is a convenient and readily available live input source. However, audio and telephone technologies are different. This sometimes makes it necessary to use an adapter to link the two systems together. There are many types of telephone ports possible in telephone switches. The four types presented here – **Page Port**, **Loop Start trunk**, **Ground Start trunk**, and **Analog ring-up station** – are the only ones Bogen recommends as interfaces to telephone systems. Other port types, and specifically digital station ports, are not suitable for connection to amplifiers and interface devices.

Page Ports



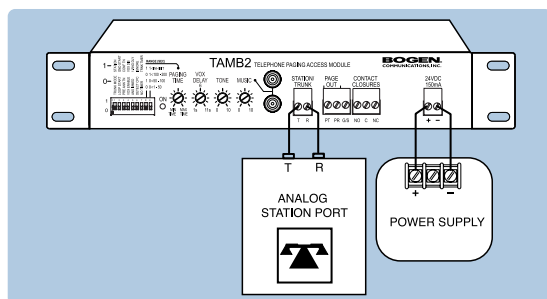
- Dedicated audio output available standard on most telephone systems
- Can be connected directly to the input of most amplifiers
- A 600-ohm dry audio signal and a normally open control contact closure
- Control contacts, if available, activate a page and typically control the muting of background music
- Some page ports provide only an audio pair, which requires audio equipment have voice-activated (VOX) functions such as background music muting
- Paging ports are not always bi-directional like telephone lines (bi-directionality is necessary when including talk back capability in a paging system)
- Not all paging ports will produce DTMF tones, which are necessary when using zone paging equipment

Loop and Ground Start



- The Loop Start, or CO port, is the most popular type of paging interface to use when a page port is not available or suitable
- A Ground Start trunk uses loop current but employs a request and acknowledgment handshake for making the initial connection
- An interface device is necessary when connecting a trunk to an amplifier
- When paging, an interface adapter detects the off-hook condition of the trunk and connects the amplifier to the trunk port through signal conditioning electronics
- When the trunk is released, the adapter detects the on-hook condition and immediately disconnects the amplifier from the trunk
- A pop at the end of a page is typically present due to the large change in telephone line voltage between on- and off-hook conditions

Analog Station



- An analog station allows interfacing when neither a paging port nor a trunk port is available
- Analog ring-up interfacing requires a more sophisticated interface than other methods
- The interface must detect a high-voltage ring signal and answer the call to start the page
- To determine when to disconnect a page, typically two system timers are used: one limits the maximum length of a page to ensure disconnection, the other senses audio activity and disconnects after a preset length of silence
- Many telephone switches now provide a calling party control (CPC) signal, which indicates to the interface that the caller has disconnected; Bogen interfaces disconnect immediately upon detecting a CPC signal

SYSTEM DESIGN GUIDE

Sound Pressure Levels Chart

Typical Ambient Noise Level			Typical Environments		
Very High Noise	85-95 dB	Speech Almost Impossible To Hear	Construction Site Loud Machine Shop	Noisy Manufacturing Printing Shop	95 dB
High Noise	75-85 dB	Speech is Difficult To Hear	Assembly Line Crowded Transit Station Machine Shop	Shipping/Warehouse Supermarket (Peak Time) Very Noisy Restaurant/Bar	85 dB
Medium Noise	65-75 dB	Must Raise Voice to be Heard	Bank/Public Area Department Store Noisy Office	Restaurant/Bar Supermarket Transit Station	75 dB
Low Noise	55-65 dB	Speech is Easy To Hear	Conversational Speech Doctor's Office Hospital	Hotel Lobby Quiet Office Very Quiet Restaurant/Bar	65 dB 55 dB

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- **CONNECTIVITY DRAWINGS**
- **SCOPE OF WORK**
- **DETAILED ASSUMPTIONS**
- **COMPLETE BILL OF MATERIALS** (blueprints must be supplied; AutoCAD® format files are preferred/accepted*)

How the Application Design Service works:

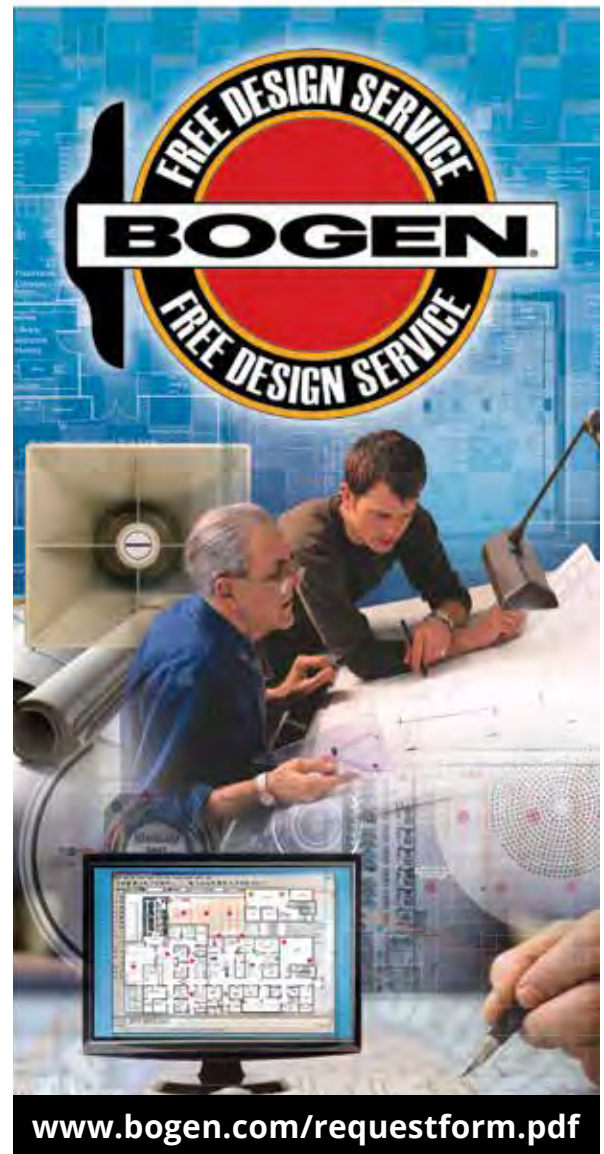
1. You provide the information concerning your project (see the Design Request Form on our site: www.bogen.com/requestform.pdf). For any large or complex applications, your local Bogen Field Sales Manager can visit the site for exact specifications.
2. Bogen will then provide you with a working technical bid response document and then all you have to do is deliver it. Then, a copy of the bid will also be sent to your local Bogen Field Sales Manager for immediate follow-up and to see if you have any questions or need additional assistance.

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ACCESSORIES

AMPLIFIERS

MODEL	DESCRIPTION	ASSOCIATED MODELS	DIMENSIONS / PROD. WT.	PAGE NO.
GSRVC	Remote Volume Control	Gold Seal Series Amps	2-3/4" W x 4-1/2" H x 1-3/8" D / 2 oz.	35
MA3	Module Adapter	D-Series, WMA, DPA Amps	Works w/advanced modules / 1 lb.	40
PVMC	Power Vector Module Cover	V-Series Amps, M-Class, VMIX	1-1/2" W x 3-1/8" H x 3/8" D / 1 oz.	38, 42
PVSC	Power Vector Security Cover	V-Series Amps, VMIX	15-1/2" W x 3-1/8" H x 1/2" D / 2 oz.	38, 42
RVCP	Remote Volume Control Panel	V- & WV-Series Amps, VMIX	1-3/4" W x 4" H / 2 oz.	38, 42
TL100	1:1 Ratio Plug-In Transformer	BPA60/HTA125A/HTA250A	1" dia. x 1-1/4" D / 1 oz.	37
TL600	Plug-In: 600-ohm Transformer	BPA60/HTA125A/HTA250A	1" dia. x 1-1/4" D / 1 oz.	37



MOUNTING / RIGGING / RACK KITS

MODEL	DESCRIPTION	ASSOCIATED MODELS	DIMENSIONS / PROD. WT.	PAGE NO.
108-2120	Yoke Assembly	AMT-12	24-1/2" W x 12" H x 3" D / 7 lb.	7
108-2150	Yoke Assembly	AMT-15	27-1/4" W x 13" H x 3" D / 8 lb.	7
109-2140	Rigging Beam Assembly	AMT Series	22" W x 3" H x 2" D / 15 lb.	7
109-2151	Rigging Kit	AMT Series	10" W x 1-1/2" H x 1/4" D / 2 lb.	7
BBF	Back Box for Flush Mounting	WV-Series	14-1/2" W x 24-3/4" H x 3-7/8" D / 2 lb.	38
BBFM6	Flush Mount Enclosure	FMH15T	9-7/8" W x 9-7/8" H x 6" D / 8 lb.	16
BBS	Back Box for Surface Mounting	WV-Series	16-1/4" W x 26-3/4" H x 3-7/8" D / 16 lb.	38
BBSM6	Surface Mount Enclosure	FMH15T	11" W x 11" H x 6" D / 11 lb.	16
BC1	Beam Clamp	Horn Loudspeakers	2-1/8" W x 2" H x 3/4" D / 6 oz.	15, 18, 27, 29
CK10	Cable Kit (Silver)	HFCS1/HFSF1/MPS1/MPS2/OCS1/OPS1	10 feet long / 4 oz.	9, 11
CK10B	Cable Kit (Black)	OPS1B/MPS1B/MPS2B	10 feet long / 4 oz.	9, 10
CK10W	Cable Kit (Off-White)	OPS1W/MPS1W/MPS2W	10 feet long / 4 oz.	9, 10
FMHAR8	Adapter Ring	FMH15T	7" dia. / 5 lb.	16
GSDRPK	Rack Kit	Gold Seal Series D Amps	1-1/4" W x 3-1/2" H x 10-1/4" D / 2 lb.	35
HSES10	Horn Speaker Electrical Box Strap	Horn Speakers**	1/2" W x 5-1/2" long / 3 oz.	15, 18, 29
MR8	Mounting Ring	S86, S810, CS1EZ, ASWG1/DK	12" dia. x 3/4" D / 15 lb.*	13, 12, 18, 25
RE84	Round Enclosure	S86, S810, CS1EZ, ASWG1/DK	12-1/4" dia. x 4-1/2" D / 24 lb.*	13, 12, 18, 25
RPK35B	Rack Panel Kit	C10/C20	19" W x 3-1/2" H x 6-1/2" D / 3 lb.	35
RPK50	Rack Mount Kit	C35/C60/C100	2-1/2" W x 3-1/2" H x 2-1/8" D / 10 oz.	35
RPK53	Rack Mount Kit	BPA60	2" W x 3-1/2" H x 1" D / 7 oz.	37
RPK82	Rack Mount Kit	TPU35B/60B/100B	3" W x 8-3/4" H / 14 oz.	41
RPK84	Rack Mount Kit	PCM2000	7" W x 8" H / 2 lb.	34
RPK86	Rear Rack Support Brackets	M-Class/Black Max Amplifiers	3-3/4" W x 3-1/2" H / 7 oz.	36
RPK87	Rack Mount Kit	V-Series, VMIX	1" W x 3-1/2" H x 3-3/4" D / 1 lb.	38, 42
RPK88	Rack Mount Kit	PCM2000	19" W x 10-1/2" H x 2" D / 3 lb.	34
RPK91	Rack Mount Kit	TAMB2/TAMB2PS	2 Pieces; 1 Rack Space / 7 oz.	32
RPK93	Rack Mount Kit	CC-Series	1-1/4" W x 3-1/2" H x 8-1/4" D / 2 lb.	36
RPKUT1	Rack Mount Kit/Security Cover	UT11	19" W x 5-1/4" H x 2-3/8" D / 2 lb.	31
SGHD8	Heavy-Duty Grille	FMH15T	11" W x 11" H x 1/2" D / 8 lb.	16
SMTB	Tile Bridge for Easy Install Speakers	ASM1, SM1EZ/SM4T	4-3/8" W x 1-1/4" H x 23-3/4" D / 5 lb.*	17, 26
TB8	Tile Bridge	S86, S810, CS1EZ, ASWG1/DK	23-3/4" W x 3/4" H x 14-1/2" D / 17 lb.*	3, 12, 18, 25
TBCR	Tile Bridge Support Ring	HFCS1/OCS1	17" W x 1-1/8" H x 24" D / 2 lb.	9, 11
TBSF	Tile Bridge	HFSF1, SEC4T	10" W x 1/2" H x 24" D / 14 oz.	11, 12
TCSPT1	Terminal Cover for Conduit	Horn Speakers***	1-3/4" W x 3" H x 1-1/4" D / 2 oz.	15, 18, 29
TMA812	Tilt Mount Adapter	A12 & A8	7" W x 4-3/4" H x 4-1/2" D / 2 lb.	8
WMAD	Door for WV-Series Amps	WV-Series	16-1/4" W x 26-3/4" H x 1" D / 9 lb.	38
WMK1	Wall Mounting Kit	C10/C20	14-1/2" W x 16" H x 4" D / 10 lb.	35



*Weight based on per carton. Check with Bogen for quantity per carton.

**Horn Speakers: AH5A, AH15A, BDT30A, HS15EZ, HS30EZ, IH8A, KFLDS30T, SP158A, SP308A, SPT15A, & SPT30A.

***Horn Speakers: AH5A, AH15A, BDT30A, HS15EZ, HS30EZ, KFLDS30T, SP158A, SP308A, SPT15A, & SPT30A.

ACCESSORIES

PAGING / INTERCOM

MODEL	DESCRIPTION	ASSOCIATED MODELS	DIMENSIONS / PROD. WT.	PAGE NO.
2518	18-Gauge Connector	PI35A/SI35A	5/8" W x 1/4" H x 3/4" D / 2 oz., 30	51
2520	20-Gauge Connector	PI35A/SI35A	5/8" W x 1/4" H x 3/4" D / 2 oz., 30	51
2522	22-Gauge Connector	PI35A/SI35A	5/8" W x 1/4" H x 3/4" D / 2 oz., 30	51
CA10A	Call-In Switch	PI35A/SI35A	2-3/4" W x 4-1/2" H x 2" D / 2 oz.	51
CA11A	Call Privacy Switch	PI35A/SI35A	2-3/4" W x 4-1/2" H x 1-3/4" D / 2 oz.	51
CA17	Call-In Switch	PI35A/SI35A	2-3/4" W x 4-1/2" H x 1" D / 1 oz.	51
CA21B	Call-In Switch	PI35A/SI35A	2-3/4" W x 4-1/2" H x 1" D / 1 oz.	--
PCMP52	12V DC/1.5A Power Supply	PCM2000	2-1/4" W x 4" H x 1-3/8" D / 1 lb.	51
SBA225	25-Key Station Panel Selector	SI35A	19" W x 1-3/4" H x 1-1/4" D / 2 lb.	51
SCR25A	Call-In Module	SBA225/SI35A	17" W x 1-1/4" H x 4" D / 2 lb.	51
TL156	Insertion Tool	PI35A/SI35A	2" W x 3-1/4" H x 1" D / 1 oz.	51



CORE AUDIO PROCESSOR

MODEL	DESCRIPTION	ASSOCIATED MODEL	DIMENSIONS / PROD. WT.	PAGE NO.
DSM2000	Desktop Paging Microphone	CORE	N/A / 2 lb.	43
JB	Junction Box	CORE	3" W x 3-3/8" H x 1" D / 0.1 lb.	43
NSM	Noise Sensing Microphone	CORE	2-1/2" dia. x 3-3/4" H / 0.1 lb.	43
PPM8	8-Button Paging Microphone	CORE	4-1/4" W x 8" H x 13 1/4" D / 1.4 lb	43
PPM8SP	8-Button Paging MIC w/Stack Paging	CORE	4-1/4" W x 8" H x 2" D / 1.4 lb	43
PPM8WJB	8-Button Paging MIC with JB	CORE	4-1/4" W x 8" H x 2" D / 1.4 lb.	43
PPM8WJBSP	PPM8WJBSP w/Page Stacking Chip	CORE	4-1/4" W x 8" H x 2" D / 1.4 lb.	43
PPMIT5	IP Touchscreen Paging Station	CORE	9-7/8" W x 13-3/4" H x 5-5/8" D / 2.4 lb	43
PPMKEYPAD	Additional Keypad	CORE	4-1/4" W x 8" H x 2" D / 1.4 lb	43
RAC5	Remote Analog Controller (5 sources)	CORE	2" W x 4-1/2" H x 2-3/4" D / 0.1 lb.	43
RAC8	Remote Analog Controller (8 sources)	CORE	2" W x 4-1/2" H x 2-3/4" D / 0.1 lb.	43
URC	Programmable Remote Controller	CORE	3-1/2" W x 3-1/2" H x 2" D / 0.1 lb.	43
URC200	IP-Based Remote Controller	CORE	5 1/2" W x 4-1/2" H x 1-1/2" D / 0.8 lb.	43



NYQUIST

MODEL	DESCRIPTION	ASSOCIATED MODELS	DIMENSIONS / PROD. WT.	PAGE NO.
NQ-RMK01	Rack Mount Kit, 1pc.	Nyquist Models	3-7/8" W x 1-3/4" H x 1-3/8" D / 0.5 lb.	1, 2, 3, 4
NQ-RMK02	Rack Mount Kit, 2pcs.	Nyquist Models	6-5/8" W x 1-3/4" H x 1-3/8" D / 0.5 lb.	4
NQ-RMK03	Rack Mount Kit, 2pc.	Nyquist Models	5-1/2" W x 1-3/4" H x 1-3/8" D / 0.5 lb.	1, 2, 3
NQ-RMK04	Rack Mount Kit, 1pc., (Brackets- 2pcs.)	Nyquist Models	1-3/8" W x 1-3/4" H x 8" D / 0.5 lb. 5/8" W x 1-1/2" H x 1-3/8" D / 0.5 lb.	1, 2, 3



MISC.

MODEL	DESCRIPTION	ASSOCIATED MODELS	DIMENSIONS / PROD. WT.	PAGE NO.
ASTB4	Electrical Cover	A2T, A6T, A8T	2-7/8" W x 1-7/8" H x 2-3/16" D / 2 oz.	8
SRCA6	Stereo 6 ft. RCA Cable	Music & Input Sources	6 feet long / 5 oz.	--
T725	Transformer, Speaker Matching 4-watt (Taps: 4, 2, 1, 1/2, 1/4, 1/8)	8-ohm Speakers	2-1/2" W x 1-1/4" H x 1-3/8" D / 6 oz.	--
T72510	Transformer, Speaker Matching 10-watt (Taps: 10, 5, 2-1/2, 1-1/4, 5/8)	8-ohm Speakers	3" W x 1-1/2" H x 1-1/2" D / 10 oz.	--



AMPLIFIER CHART

Bogen Amplifier Features Chart

Amplifier Output Power Rating/Channel	Model Numbers	Amplifier Channels	Input Types					Signal Processing					Music Muting			Night Ringer	Remote Volume	Output Meter	Mounting Options			Catalog Page Number									
			TEL Input* 600-ohm Balanced	MIC Inputs* 6-2 Balanced	AUX Inputs* Hi-Z Unbalanced Hi-Z	Balanced Inputs Hi-Z	Modular Inputs	Audio Enhancement	Loudness Contour	ALC	EQ	Bass/Treble	Tone Control	Variable Mute	Audio Mute				Manual Mute	Wall Mount	Shelf Mount		Rack Mount								
10W	C10	1	1	2(1)	0(1)					●					●						●	●	●	35							
15W	TPU15A	1	1		1										●								●	●	41						
20W	C20	1	1	2(1)	0(1)																		●	●	35						
35W	C35	1	1	2(1)	1(2)									●										●	●	35					
35W	GS35D	1	0(1)	6(4)	1(2)			●	●	●	●			●	●	●	●	●						●	●	35					
35W	TPU35B	1	1	1	1			●		●				●	●	●								●	●	41					
35W	V35	1	●	●	●	●	8			●	●			●	●				●	●				●	●	38					
40W	CC4021	1		1	1	1†									●										●	●	36				
40W	CC4041	1		3	1	3†									●											●	●	36			
60W	BPA60	1			●																					●	●	37			
60W	C60	1	1	2(1)	1(2)									●												●	●	35			
60W	GS60D	1	1	6(4)	1(2)			●	●	●	●			●	●	●										●	●	35			
60W	TPU60B	1	1	1	1			●		●				●	●	●	●	●								●	●	41			
60W	V60	1	●	●	●	●	8			●	●			●	●				●	●						●	●	38			
100W	C100	1	0(1)	2(1)	1(2)										●												●	●	35		
100W	GS100D	1	1	6(4)	1(2)			●	●	●	●			●	●	●											●	●	35		
100W	TPU100B	1	1	1	1			●		●				●	●	●	●	●									●	●	41		
100W	V100	1	●	●	●	●	8			●	●			●	●				●	●							●	●	38		
100W	WV100	1	●	●	●	●	8			●	●			●	●				●	●						●	●	38			
125W	HTA125A	1	●		●																							●	●	37	
150W	GS150D	1	0(1)	6(4)	1(2)			●	●	●	●			●	●	●												●	●	35	
150W	V150	1	●	●	●	●	8			●	●			●	●				●	●								●	●	40	
150W	WV150	1	●	●	●	●	8			●	●			●	●				●	●								●	●	38	
250W	GS250D	1	0(1)	6(4)	1(2)			●	●	●	●			●	●	●												●	●	35	
250W	HTA250A	1	●		●																								●	●	37
250W	TPU250	1	1	1	1			●		●				●	●	●	●	●										●	●	41	
250W	V250	1	●	●	●	●	8			●	●			●	●				●	●								●	●	38	
250W	WV250	1	●	●	●	●	8			●	●			●	●				●	●								●	●	38	
300/600W	M300	2/1	●	●	●	2†	2			●				●	●														●	●	39
300W	X300	1	●			2																							●	●	37
450/900W	M450	2/1	●	●	●	2†	2			●				●	●														●	●	41
450W	X450	1	●			2																							●	●	36
500W	GS500D	1	0(1)	6(4)	1(2)			●	●	●	●			●	●	●													●	●	35
600/1200W	M600	2/1	●	●	●	2†	2			●				●	●														●	●	39
600W	X600	1	●			2																							●	●	36

- Feature included
- Features determined by type of Module installed
- Balanced Input available with accessory plug-in transformer (TL100/600)
- Accessory Kit required for mounting
- Contact Closure activation only

* Some inputs are switch selectable. The number in parentheses shows the maximum number of inputs when switched
 † BAL2S Balanced Input module included standard; uses one modular input bay
 # Switch-selectable Input

Specifications subject to change without notice.

AMPLIFIER CHART

Bogen Amplifier Specifications Chart

Model Numbers	Output Power Rating/Channel	Channels	Frequency Response*	Distortion**	Speaker Outputs	AC Line Draw***	Dimensions	Product Weight
BP660	60W	1	20 Hz to 20 kHz	2% Max.	8-ohm/25V, 16-ohm, 25VCT, 70V	180W	15-1/4" W x 3-1/2" H x 8-3/4" D	16 lb.
C10	10W	1	70 Hz to 16 kHz	1% Max.	70V, 25V, 16-ohm, 8-ohm, 4-ohm	38W	11-3/8" W x 2-7/8" H x 7-3/8" D	5 lb.
C20	20W					50W		6 lb.
C35	35W	1	70 Hz to 16 kHz - Transformer 20 Hz to 20 kHz - Direct	1% Max.	70V, 25V, 16-ohm, 4-ohm - Direct; 8-ohm on C35 & C60	85W	14-1/2" W x 3-3/4" H x 11" D	15 lb.
C60	60W					148W		17 lb.
C100	100W					220W		19 lb.
CC4021/41	40W					1		80 Hz to 20 kHz
GS35D	35W	1	65 Hz to 20 kHz - Transformer 20 Hz to 20 kHz - Direct	0.5% Max.	70V, 25V, 25VCT, 8-ohm, 4-ohm	0.8A	16-1/2" W x 3-1/2" H x 13-1/2" D	12 lb.
GS60D	60W					1.3A		13 lb.
GS100D	100W					2.1A		15 lb.
GS150D	150W					2.5A		17 lb.
GS250D	250W					4.0A		18 lb.
GS500D	500W					6.5A		24 lb.
HTA125A	125W	1	20 Hz to 20 kHz	0.5% Max.	70V, 25V, 25VCT, 8-ohm, 4-ohm	260W	19" W x 5-1/4" H x 11" D	36 lb.
HTA250A	250W					520W		50 lb.
M300	300/600W	2 or 1	20 Hz to 20 kHz	0.5% Max.	4-ohm to 8-ohm (2 channel mode); 70V (1 channel mode)	12A	17" W x 3-1/2" H x 18-1/2" D (not including brackets)	41 lb.
M450	450/900W					15A		44 lb.
M600	600/1200W					20A		46 lb.
TPU15A	15W	1	70 Hz to 12 kHz	2% Max.	70V, 25V, 8-ohm	0.5A	11" W x 2-3/4" H x 2-3/8" D	4 lb.
TPU35B	35W		70 Hz to 15 kHz	1% Max.	70V, 25V, 25VCT, 16-ohm	0.75A	14-1/4" W x 8-3/8" H x 3-5/8" D	12 lb.
TPU60B	60W					1.5A		15 lb.
TPU100B	100W					2A		18 lb.
TPU250	250W					70V, 25V		5A
V35	35W	1	45 Hz to 20 kHz - Transformer 20 Hz to 20 kHz - Direct	0.5% Transformer; 0.1% Direct (max.)	70V, 25V, 8-ohm, 4-ohm direct	0.6A	17-1/4" W x 3-7/8" H x 14-3/4" D	22 lb.
V60	60W					1.3A		26 lb.
V100	100W					2.0A		28 lb.
V150	150W					3.5A		31 lb.
V250	250W					5.5A		32 lb.
WV100	100W					1		45 Hz to 20 kHz - Transformer 20 Hz to 20 kHz - Direct
WV150	150W	3.5A	29 lb.					
WV250	250W	5.5A	28 lb.					
X300	300/600W	2	20 Hz to 20 kHz	0.5% Max.	70V direct	12A	17" W x 3-1/2" H x 18-1/4" D (not including brackets)	41 lb.
X450	450/900W					15A		44 lb.
X600	600/1200W					20A		46 lb.

* @ -2dB FRP Transformer Output: @ FRP for Direct Outputs

** Bandwidth limited to Frequency Response

*** FRP @ 120VAC Line Voltage

Specifications subject to change without notice.

Nyquist Specifications Chart

Model Numbers	Power Output	Frequency Response @ 1W	Max. AC Current	Indicators	S/N Ratio (20k BW)	Dimensions	Product Weight
NQ-SYSCTRL	-----	-----	1.5A	Power LED (front); Network LEDs (rear)	-----	8" W x 1.7" H x 10.25" D	5 lb.
NQ-A4060	4 CH: 60W @ 25V/4Ω; 2 CH: 120W @ 70V/25V/8Ω	20 Hz to 20 kHz +/- 0.25 dB	4A	Status & Power LEDs (front); Network LEDs (rear)	97 dB	13" W x 3.4" H x 13.4" D	6.3 lb.
NQ-A4120	4 CH: 120W @ 25V/4Ω; 2 CH: 240W @ 70V/25V/8Ω		6A				6.3 lb.
NQ-A4300	4 CH: 300W @ 25V/4Ω; 2 CH: 600W @ 70V/25V/8Ω		12A				8.6 lb.
NQ-A2060	2 CH: 60W @ 25V/4Ω; 1 CH: 120W @ 70V/25V/8Ω	20 Hz to 20 kHz +/- 0.25 dB	2A	Status & Power LEDs (front); Network LEDs (rear)	97 dB	8" W x 1.7" H x 13.4" D	4.4 lb.
NQ-A2120	2 CH: 120W @ 25V/4Ω; 1 CH: 240W @ 70V/25V/8Ω		3A				4.4 lb.
NQ-A2300	2 CH: 60W @ 25V/4Ω; 1 CH: 120W @ 70V/25V/8Ω		6A				6.4 lb.
NQ-P0100	-----	-----	0.6A	Status/Power LEDs (front); Network LEDs (rear)	97 dB	8" W x 1.7" H x 8.6" D	2.6 lb.
NQ-GA10P	10W @ 8Ω	20 Hz to 20 kHz +/- 0.25 dB	-----	Status/Power/Network LEDs (front)	80 dB	3.75" W x 0.875" H x 6.2" D	0.7 lb.
NQ-E7010	External DC: 48-56V DC (5.5mm x 2.1mm Jack)	-----	-----	Status/Power/Network LEDs (front)	-----	5.6" W x 1.7" H x 5.4" D	1.95 lb.
NQ-E7020	-----	-----	-----	3-Individual Full Spectrum LEDs (front)	-----	1.5" W x 4.4" H x 1.15" D	0.2 lb.

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