

Signal-Processing Modules

When signal-processing output modules are installed into the Power Vector's last two module bays, they automatically insert themselves into the mix bus signal path leading to the power amplifier stage. When two of these output modules are installed, their effects are cascaded with the second to last bay's module processing the signal first and then passing it to the module in the last bay. Two benefits are gained by this innovation: (1) the effects insert jacks are still available for use by external processing equipment, (2) the signal-processing output modules act on the signal on the raw mix bus signal before any other user controls, like master volume, bass, and treble, can affect it. This then ensures that signal level dependent processors, such as the CMP1R Compressor / Limiter and the ANS1R Ambient Noise Sensor modules, perform as intended regardless of front panel control changes.

Remote Volume Control

The master volume control is motorized. By using a motor to physically move the control knob, a new level of remote control adjustability is achieved.

Regardless of where the master volume control is set on the amplifier, the remote can move it up or down. Since the remote control signal is now the drive signal to the motor, noise on the remote control leads cannot mix in with the amplifier signals. This gives the Power Vector a fully functional and clean way of remotely controlling overall system level.

Traditionally, remote volume control was accomplished by having the remote control vary an analog control signal to an opto-resistor in the amplifier. This opto-resistor would further attenuate the signal level in the amplifier, based on the remote control setting. This approach has two drawbacks: (1) the maximum volume that can be achieved by the master volume control setting on the amplifier, or vice-versa depending on how the amplifier was designed. The remote could lower volume, but could not further increase it, (2) the control signal, because it is analog, is vulnerable to noise. If a 60 Hz hum was picked up by the long remote volume leads, it could cause the opto-resistor to modulate the volume level at the hum frequency.

Accessories

PVSC
Power Vector Security Cover

RVCP
Remote Volume Control Panel

RPK87
Rack Mounting Kit

PVMC
Module Security Cover

MODULAR AMPLIFIERS

Power Vector Modular Amplifiers V35, V60, V100, V150, V250

WALL-MOUNTABLE version
on Page 38

MIXER version
on Page 46

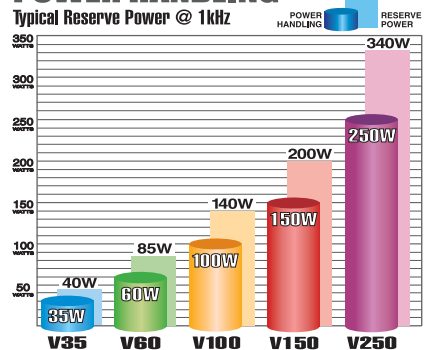


Bogen's Power Vector modular input amplifier series offers a wide range of power levels from which to choose, with five models ranging from 35W to 250W. The amplifiers are designed to work with both high- (70V/25V) and low- (4/8-ohm) impedance speaker systems. Each model includes eight module bays for 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 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 (modules sold separately)
- Wide selection of advanced input modules
- 2 module bays capable of handling signal-processing output modules
- 4 levels of priority between modules
- 11-segment LED output level meter with Average and Peak switch
- Motorized master volume control that can be remotely operated (requires RVCP)
- Bass and treble controls
- Two-color LED for each channel indicates signal active/signal clipping
- Lockable switch permits user to select either transformer-coupled outputs or a direct low-impedance output
- Mute control mutes all audio from the mixer section of the amplifier
- Bass and treble control bypass switch
- 125 Hz Low Cut feature
- 2 rack spaces high (3-1/2")
- Signal-processing insert jacks allow external equipment to be inserted between the pre-amp output and the power amp input
- 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
- Security cover to protect volume, bass, and treble controls (PVSC, sold separately)
- Module security cover prevents tampering with module controls (PVMC, sold separately)
- Rack mountable (mounting kit RPK87, sold separately)

POWER HANDLING



MODULES

Input & Signal Processing Modules- See Pages 37 & 38



Rear View

ALL MODULES SOLD SEPARATELY

Technical Specifications, Dimensions, and Weights can be found on Page 79

ADVANCED INPUT MODULES

Input Modules (Output Modules on Page 38)

Bogen's advanced plug-in input modules provide a wide range of functions to support a variety of applications. *(Shipping weight: 1 lb. each)*

STEREO AUX INPUT - SAX1R

Unbalanced Stereo 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

MONO AUX INPUT - MAX1R

Unbalanced Mono 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 connector

BRIDGING INPUT - BRG1R

Daisy Chain Multiple Amplifier Inputs



- Gain/Trim control
- Ground isolated input to eliminate ground loop
- Input signal available at buffered output
- Priority assignable
- Variable ducking level when muted
- Fade back from mute
- Buffered output not muted
- Bus assignable
- RCA input and output connector

TRANSFORMER-BALANCED INPUT - TBL1S

Transformer-Balanced AUX 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

TONE GENERATOR - TNG1S

Multiple 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



www.bogen.com/tones

REMOTE VOLUME CONTROL

LINE/MIC INPUTS - LMM1S, LMR1S

Actively Balanced Emulated Transformer Inputs



LMR1S
with Remote Volume Control



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
- Mutable by higher priority modules

MICROPHONE INPUTS - MIC1S, MIC1X

Low-impedance, Transformer-balanced Microphone Inputs



MIC1S



MIC1X

- 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*)

MICROPHONE INPUTS - MIC2S, MIC2X

Low-impedance, Electronic-balanced Microphone Inputs



MIC2S



MIC2X

- 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*)

TELEPHONE INPUT - TEL1S

Interfaces to Telephone System's Loop Start/Ground Start Trunks or Paging Ports



- 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

Accessories

PRS48

48V DC Power Supply



Accessories

MA3
Module Adapter



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

ADVANCED OUTPUT MODULES

Signal-Processing Output Modules (Input Modules on Page 37)

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.

RELAY INPUT/OUTPUT - RIO1S



- Transformer-isolated, balanced line-level input
- 600-ohm or 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

AMBIENT NOISE SENSOR - ANS1R



ANS1R
with 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
- Connect up to 4 sensor mics (*1 included*)
- Mutable input (*lowest priority only*)
- RCA connectors

Accessories

ANS500M Sensor Microphone

(One included; additional available)



COMPRESSOR LIMITER - CMP1R



- Compressor Ratio control
- Threshold control
- Make-up Gain control
- Bypass switch
- Unbalanced input
- Gradual fade back from mute
- Mutable input (*lowest priority only*)
- RCA connector

PARAMETRIC EQUALIZER - PEQ1R



- 2 full parametric bands
- Frequency control
- 'Q' bandwidth control
- Gain control
- Bass and Treble control
- Unbalanced input
- Bypass switch
- Mutable input (*lowest priority only*)
- Gradual fade back from mute
- RCA connector

MODULAR AMPLIFIERS

Wall-Mount Power Vector Amplifiers WV100, WV150, WV250

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 modules and up to 8 input modules
- Wide selection of advanced input and signal-processing output 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
- Motorized master volume control, with optional accessory RVCP for remote operation
- External mute control
- Bass and treble controls with center detent
- 125 Hz Low Cut switch
- Tone control bypass switch
- Optionally installable front-mounted input combo jack with 1/4" stereo phone and female XLR capabilities for connection to user-supplied modules
- Thermal, short-circuit, and overload protection
- Thermally controlled 3-speed fan
- UL and CSA listed
- Components required for installation: Door (*WMAD*) and Back Box (*BBF or BBS*), both sold separately
- Modules required, but sold separately



RACK-MOUNTABLE
version
on Page 36

Technical Specifications, Dimensions,
and Weights can be found on Page 79

Accessories

RVCP
Remote Volume
Control Panel



Components

NOTE: These items are required for installation: BBF or BBS, and one WMAD.



BBF
Flush-Mount
Back Box



BBS
Surface-Mount
Back Box



WMAD
Front Cover/
Door

MODULES



Input Modules-
See Page 37
Output Modules-
See Above

PUBLIC ADDRESS AMPLIFIERS

Gold Seal Series Amplifiers

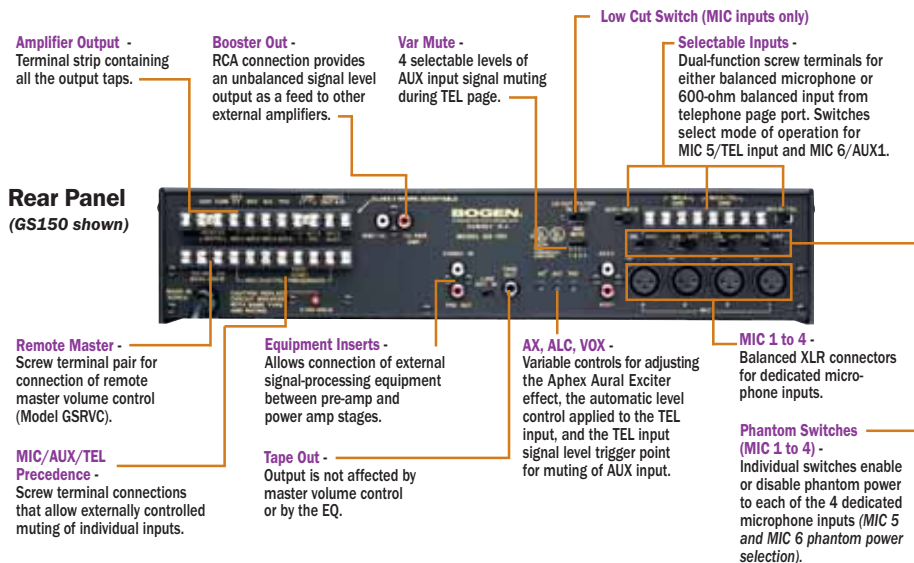
GS35, GS60, GS100, GS150, GS250



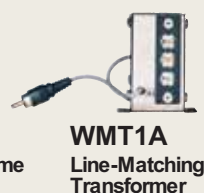
Gold Seal Series amplifiers were designed with the sound contractor in mind, offering professional performance and installation convenience. Each Gold Seal Series amplifier offers a unique combination of built-in features, ultra-high reliability, and extensive input flexibility and input options.

Product Features:

- 35-, 60-, 100-, 150-, and 250-watt models
- 7 inputs: 4 MIC (Lo-Z), 1 AUX (Hi-Z), 1 MIC/TEL, 1 MIC/AUX
- 4-ohm, 8-ohm, 25V, 25VCT, and 70V outputs
- Dual-function, 10-band graphic equalizer (acoustic EQ/feedback control)
- True loudness contour function
- Aphex® Aural Exciter for improved intelligibility
- Automatic level control
- Switchable phantom power supply
- Variable AUX input muting
- Remote master volume control capability
- Input muting via contact on all inputs
- Voice-activated AUX muting on TEL input
- AUX fade-back after TEL page
- Pre-amp out/power amp in connections
- Booster amp output connection
- Tape output connection
- Low Cut filter for MIC channels
- Thermal and overload protection
- 3-speed cooling fan (GS250 only)
- Rack-mountable w/accessory mounting kit (2 rack spaces)
- UL and CSA listed



Accessories



Dual Band EQ

The unique dual-function equalizer can be used for acoustic shaping or for feedback control.

• **Acoustic Shaping** - Full range equalization is provided for correcting general frequency response issues that exist in the application venue. The full audio spectrum is covered on 1-octave centers with a boost/cut of 12 dB. In this mode, the equalizer can be used to compensate for room acoustics, or to satisfy the listening preference of the user.

• **Feedback Control** - In this mode, the equalizer's control range is reduced to cover only the lower half of the audio spectrum (where feedback howls occur), but the individual filters are now on closer 2/3-octave spacing. This allows narrower bands of frequencies to be controlled, which is particularly useful to reduce feedback of live sources that can increase the effective loudness the system can achieve.

Variable Music Mute

This feature allows control over the level of background music (fed though the AUX inputs) heard during a telephone page announcement. The convention used to be to completely mute background music during pages. The Gold Seal Series amplifiers provide full muting as well as no muting and intermediate attenuation levels of -10 dB and -21 dB. After the telephone page has ended, the background music smoothly fades back to its original level for a very professional sound.

Telephone Paging Control

Input 5 serves a dual function as either a balanced MIC input or a 600-ohm balanced telephone input. The TEL input includes both voice-activated triggering for muting the AUX inputs and automatic level control for providing constant paging level. ALC compensates for different voice levels and speaking styles of the individuals using the system. Controls are provided on the rear of the amplifier to adjust trigger threshold of the voice-activated muting so that it will not falsely trigger from noise on the input. An ALC adjustment is also provided to allow control over the amount of compression applied to loud signals to keep them at a nominal signal level.

Aphex Aural Exciter

Crisp, clean, intelligible sound is the goal of every paging system. The Aphex® Aural Exciter circuit, which was originally developed for the recording industry, 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 Aphex circuit adds back until optimum intelligibility is reached.

PUBLIC ADDRESS AMPLIFIERS

Classic Series Amplifiers



C10, C20, C10MOH, C20MOH



C35, C60, C100

The **Classic Series** mixer amplifiers provide mixing of microphones, telephone, and auxiliary sources. Output jacks allow a tape recorder or an additional booster amplifier to be connected. Bogen's Classic Series amplifiers offer high performance, flexibility, and reliability for most applications requiring a variety of inputs.

Product Features:

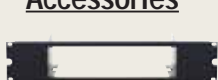
- 35-, 60-, and 100-watt models as well as 10- and 20-watt models w/ optional built-in MOH (*music-on-hold*) outputs
- 4 inputs (*C35/60/100 models*): 1 MIC (*Lo-Z*), 1 AUX (*Hi-Z*), 1 TEL, plus 1 selectable MIC or AUX
- 3 inputs (*all C10/C20 models*): 1 MIC (*Lo-Z*), 1 TEL, plus 1 selectable MIC or 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, 16-ohm, 25V, and 70V speaker systems
- Screw terminal connection for microphones
- MOH output: 600-ohm @ 1V, 8-ohm @ 1W, and output level control (*MOH models only*)
- No paging heard in MOH output (*MOH models only*)
- Input Sensitivity: 600 mV, MIC; 85 mV, AUX; 75 mV, TEL
- Thermal protection and electronic shutdown
- Output jack to connect a tape recorder or booster amplifier (*C35/60/100 models only*)
- Easy-to-understand and easy-to-operate controls
- Rack-mountable w/ accessory mounting kit (2 rack spaces)
- UL and CSA listed

Model	Number of Inputs	MIC precedence over AUX input(s)	Bass/Treble control	4-, 8-, 16-ohm, 25V, 70V speaker outputs	MOH Output Built-in	VOX muting of AUX input (TEL input only)	Variable VOX threshold	Tape/Booster Output
C35/60/100	4 – 1 MIC, 1 AUX, 1 TEL, 1 MIC/AUX	●	●	●		●	●	●
C10/C20	3 – 1 MIC, 1 TEL, 1 MIC/AUX	●	*	●		●	●	
C10MOH/C20MOH	3 – 1 MIC, 1 TEL, 1 MIC/AUX	●	*	●	●	●	●	

* Treble Cut only

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories



RPK35B
Rack Panel Kit
for C10(MOH)/
C20(MOH)
models



RPK50
Rack Panel Kit
for C35/60/100
models



WMK1
In-Wall
Mounting Kit
for C10(MOH)/
C20(MOH)



WMT1A
Matching
Transformer

UTILITY AMPLIFIERS



Utility Amplifier GA2

The **GA2** is a rugged, compact amplifier designed to meet the requirements of continuous low-power audio applications, especially telephone line "music-on-hold" amplification; to drive monitor speakers, headphones; or as a line amplifier.

Product Features:

- 1.5-watt utility amplifier
- 1 input: AUX (Hi-Z)
- 8-ohm or 600-ohm outputs
- 200 Hz - 15 kHz frequency response
- 50 mV sensitivity
- Volume control
- 120V AC operation
- 4W power consumption
- 5-1/2 ft. AC power cord included
- Wall-mountable design
- UL listed

Accessories



WMT1A
Matching
Transformer

Technical Specifications, Dimensions, and Weights can be found on Page 79



Utility Amplifier GA6A

The **GA6A** is a dual-input amplifier with a wide variety of smaller applications including background music, relaying communication from one room to another, or sound reinforcement.

Product Features:

- 6-watt utility amplifier
- 2 inputs: 1 MIC (Lo-Z), 1 AUX (Hi-Z)
- 8-ohm, 25V, or 70V outputs
- 30 Hz - 12 kHz frequency response
- Sensitivity: 0.3 mV, MIC; 0.2V, AUX
- Thermal and over-current circuit breakers
- Adjustable tone control
- 16W power consumption
- UL listed

TELEPHONE PAGING AMPLIFIERS

TPU250



TPU35B, TPU60B, TPU100B



TPU100B shown

TPU15A



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

Product Features:

- 15-, 35-, 60-, 100- and 250-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)
- Sensitivity: 0.3 mV, MIC; -20 dBm, TEL; 85 mV, AUX
- 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 (TPU-B models only)
- Music input - mutable by external contact closure (TPU-B models only) 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 (TPU-B and TPU250 models only) 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)
- TPU250 designed to rack mount directly, no kit necessary
- Easily accessible, recessed front-panel controls (TPU-B models only) for setting volume, muting, music, etc.
- RCA jacks provided to allow amplifier bridging to double the number of amplifier inputs and outputs (TPU-B models only); a TPU250 can only be bridged with one other TPU250
- Thermal and electronic overload protection (TPU-B models only), resettable circuit breaker (except TPU250), Slo-Blo fuse on TPU250

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

* Treble Cut only

Technical Specifications, Dimensions, and Weights can be found on Page 79

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 TAMB. 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.

Aphex® Aural Exciter

Crisp, clean, intelligible sound is the goal of every paging system. The Aphex® Aural Exciter circuit, which was originally developed for the recording industry, 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 Aphex® 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



WMT1A
Line-Matching
Transformer



RPK82
Rack Mounting Kit
(TPU-Bs only)

DUAL-CHANNEL POWER AMPLIFIERS

Black Max™ Power Amplifiers X300, X450, X600

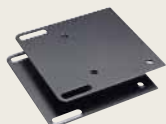


Bogen's **Black Max** amplifiers are designed to provide maximum performance in constant voltage speaker systems. Dual 70V transformerless outputs deliver exceptionally clean audio to speaker systems requiring two channels of audio up to 600W per channel, in a single package. High-efficiency class H 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 of other Black Max amplifiers
- Pluggable terminal strip for sequencing wiring
- Rear-mounted 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 ($\pm 10\%$)
- Heavy-gauge steel chassis with cast aluminum front panel
- Rear-mounted volume controls
- Mounts in 2 rack spaces (3- $\frac{1}{2}$ ") directly stackable without need for extra space above or below
- 2 independent, continuously variable cooling fans for dependable and quiet operation
- Easily removable front fan grilles with filters

Accessories



RPK86
Rear Rack
Mounting Kit

Inside the Black Max™ X600



14 Large Output
Transistors Per Channel
for Extra Reliability



74,600µf of Capacitance
Creates Enormous Amounts of
Reserve Energy



The Black Max™ Transformer
Weighs in at 17 lb. with
2 kVA of Power



Two Independent Variable
Speed Fans Provide for
Quiet Cooling



Two Custom Extruded Heat
Sinks Provide Heat Transfer
from Output Transistors

Technical Specifications, Dimensions,
and Weights can be found on Page 79

DUAL-CHANNEL POWER AMPLIFIERS

M-Class Amplifiers M300, M450, M600



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.

Product Features:

- 3 Mono power levels: 600W, 900W, or 1200W for 70V speaker systems
- 3 Stereo power levels: 300W, 450W, or 600W 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 (in mono modes)
- Post- and Pre-EQ Output Feeds (summed mono out in stereo mode)
- DC, overload, short circuit, and thermal protection circuits
- Clip limiting circuits for speaker protection
- Power-saving Sleep Mode for intermittent use
- Status, Signal, and Clip/Limit indicators
- Back-Slope AC voltage stabilization for dependable performance over varying AC line voltages
- Recessed volume control knobs
- Mounts in 2 rack spaces (3-1/2") directly stackable
- 2 Independent, continuously variable cooling fans
- Easily removable front fan grilles with filters
- Stable into 2-ohm loads

70V Speaker Output -

For 70V constant voltage speaker systems. Provides a single channel of amplification.

Low Cut Filter Switch - Select a low-frequency roll-off of 65 Hz or 125 Hz for transformer-coupled and horn speakers. Flat position allows full low-frequency performance.

Module Bay - The unit can accept one or two Bogen input modules. Each amplifier comes with a balanced, high-impedance stereo input module.

Cooling Fans - Two independent, variable-speed cooling fans respond only as needed to keep the amplifiers cool and reduce dust build-up.

Rear Panel



Low-Impedance Outputs - For 4- to 8-ohm speaker loads. Unit is stable into loads as low as 2 ohms.

Channel Balance Control (In Dual Mono operation mode) - Allows the output level of one channel to be lower than the other channel's output level.

Effects Loop - Provides insert point for outboard signal-processing equipment when the amplifier is in either 70V Mono or Dual Mono modes (modular inputs are in a 2:1 mixer configuration).

Operational Mode Selector - Choose one of three settings to meet application needs: 70V Mono, Dual Mono (4-ohm), or Stereo (4-ohm). See the sidebar on this page for description of operating modes.

Output Feeds - In mono modes, the connectors provide output signal feeds both before and after any outboard signal-processing. In stereo mode, the Pre-EQ connector provides mono mix output of the stereo input signal.

Technical Specifications, Dimensions, and Weights can be found on Page 79

MODULES



Input Modules - See Page 37

Accessories



RPK86 Rear Rack Mounting Kit



PVMC Module Security Cover

Modular Amplifier

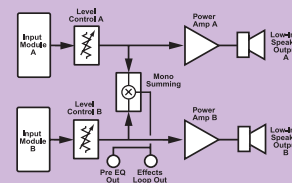
The M-Class Series of amplifiers are modular amps that can accept up to two input modules per unit. These modules offer a cost effective and convenient way to add a variety of features to a system. A balanced line input module (BAL2S) is shipped with each unit. See page 37.

Modes of Operation

Each model includes a 3-position switch that can be set to one of three modes of operation: Stereo mode, 70V Mono mode, or Dual Mono mode.

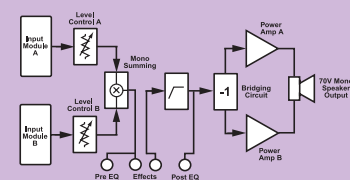
• Stereo

In this mode, the amp supplies two independent channels of low-impedance amplification. These channels can be used to supply left and right audio for stereo installations of 2 separate zones of amplification with different audio programs.



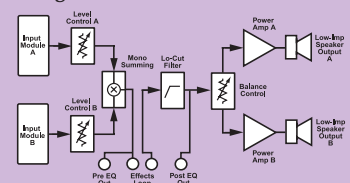
• 70V Mono

In this mode, the amp supplies a single channel of amplification. This mode also mixes the signals from each input module into a mono program. By assigning each module to a different bus, a 2:1 mixer is formed with the front-mounted level controls adjusting the mix. In addition, one module can be set to mute the other when it is active, thereby providing an effective paging system.



• Dual Mono

This mode is similar to the 70V Mono mode except that in this mode the amp supplies two channels of low-impedance amplification. This mode still mixes the input signal from the different modules but a Channel Balance control is provided to adjust the output levels of one channel against the other.



Heavy-Duty Operation

The HTA line of amplifiers are designed to be workhorses. Large heat sinks and huge transformers allow these amplifiers to supply continuous, full (RMS) power to loads, even at high ambient temperatures - up to 120° F. The HTA amplifiers are convection-cooled, so they provide the ultimate in set-and-forget operation.

More amazing than the heavy-duty capability of the HTA amplifiers is the quality of the output. The frequency response will remain within +/- 1 dB and have less than 0.5% distortion over the entire audio range (20 Hz - 20 kHz). What is so special about this? The output is transformer-coupled. Few transformer-isolated amplifiers can even come close to these specifications. An enormous output transformer using proprietary coil winding techniques is what allows the HTA to reach this level of performance.

A Power MOSFET output stage completes the extremely reliable and durable performance of these amplifiers. This type of transistor does not suffer from many of the failure modes of the more typical transistors (bi-polar types). The result is an amplifier that can operate reliably at full power, continuously, in 120° F ambient temperatures and supply transformer-isolated, high-quality, full bandwidth (20 Hz - 20 kHz) audio.

MONO-CHANNEL POWER AMPLIFIERS



HTA125A, HTA250A

The HTA Series high-performance power amplifiers can safely drive loads continuously at full (RMS) power, in ambient temperatures of up to 120° F. Overload protection includes an electronic shutdown circuit and a thermal breaker.

Product Features:

- 125- and 250-watt models
- Designed for continuous operation at rated power, up to 120° F
- 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
- Input sensitivity: Hi-Z, 500 mV; Lo-Z, 100 mV (HTA125A), 150 mV (HTA250A)
- Power Consumption: 260W (HTA125A); 520W (HTA250A)
- 4- and 8-ohm, 25V and 70V outputs
- Line bridging (*driving multiple amplifiers*) is possible w/ an accessory transformer (TL100)
- 19" rack-mount design (3 rack spaces)

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories



TL100
1:1 Bridging
Transformer



TL600
600-ohm
Impedance-Matching
Transformer



WMT1A
Matching
Transformer



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 with accessory mounting kit: RPK53 (2 rack spaces)
- UL and CSA listed



MT250D

The MT250D is a highly versatile, high-power performer, delivering 250 watts of power with battery backup capability.

Product Features:

- 250 watts (RMS) continuous
- 1 input: Hi-Z unbalanced
- Lo-Z balanced input with accessory transformer
- 8-ohm, 25V, 25VCT, 70V, and 100V outputs
- Operates from 120V/240V AC or 24V back-up battery (*not included*)
- Battery-saver circuit reduces idle current
- UL listed
- Sensitivity: 1 volt @ full rated power, Hi-Z; 70-200mV, Lo-Z
- Protection against line surges, overloads, and abnormal heat build-up
- AC power consumption: 650 watts, full power; 30 watts, standby
- LED overload shutdown and illuminated power indicators
- Low Cut filter switch & input level control
- Rack-mountable (3 rack spaces)

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories



RPK53
Rack
Panel Kit
(BPA60 only)



TL100
1:1 Bridging
Transformer



TL600
600-ohm
Impedance-Matching
Transformer

PRO-MATRIX SERIES



Digitally Matrixed Pre-Amp PM3000

Digitally Matrixed Amplifier PM3180



Removable front panel for optional wall mounting (both models)

The Pro-Matrix products were developed expressly for the needs of restaurants, lounges, fitness centers and other venues that require numerous input sources but have areas with distinctly different audio requirements. The Pro-Matrix products provide 3 fully independent audio channels that can use any of the 6 different inputs in vastly different ways. The Pro-Matrix units are designed to be as easy for users to operate as a home stereo yet provide the installer a wide array of customizable features that are all password-protected from tampering.

General Features:

- 3 Independent audio channels
- Auto-switching of inputs based on custom assigned priorities and input audio activity
- 4 High-impedance, unbalanced auxiliary inputs
- 2 Microphone inputs; one input can be programmed to accept a telephone line for paging
- Auxiliary trim controls accommodate a wide range of auxiliary input signal levels
- Wireless infrared remote control unit
- Detachable front panel can be mounted up to 25 feet away from main unit using included accessory cable or up to 250 ft. with optional mounting kit (RMPWMK3)
- Output level metering for each audio channel
- Automatic fade-in of audio sources
- Automatic level control for microphones (selectable)
- Microphone page triggering by voice or switch (N.O. or N.C.)
- Phantom power for microphones (selectable)
- Rack-mountable with kit (RPK79)

PM3180 Features:

- 100-, 60-, and 20-watt amplifier channels
- 8-ohm, 70V, and 25V transformer-coupled outputs
- 4-ohm direct output
- Audio inserts for connection to external signal-processing equipment

PM3000 Features:

- 3 Pre-amp level outputs, both balanced and unbalanced
- Ground Lift switch

Installer Programmable Features:

- Easy to understand and operate
- Large 10-character alphanumeric display with prompted programming for quick setup
- Password-protected system settings for consistent, foolproof operation
- 6 user-assigned priority levels for inputs
- Each input can be assigned different priority levels for each of the 3 output channels
- Volume and tone control lockout, independently on each audio channel
- Configure microphone input (ALC, phantom power, VOX or contact triggered)
- Preset power-up levels of each input for volume, treble, and bass
- Programmable variable music mute levels during MIC or TEL page
- Preset bass and treble response of each input for each audio channel
- Limit maximum volume level a user can achieve, programmable for each audio channel
- Large display shows currently active input source
- Create custom names for input source display

User Features:

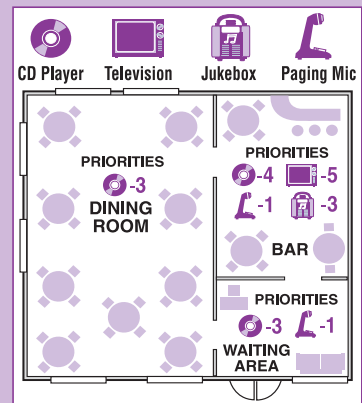
- Manual or automatic selection of input source
- Volume, bass, and treble controls for each audio channel

What Does The Pro-Matrix Do?

The Pro-Matrix products are ideally suited for restaurants and similar venues. They provide 4 AUX and 2 MIC inputs that can be distributed into 3 different zones. The Pro-Matrix automatically switches the different audio sources based on a preset, user-programmed priority hierarchy. This allows the correct audio to reach the correct areas without any user intervention, making operation ultra simple.

For example, suppose a restaurant has a dining area, lounge, and waiting area that are in need of the following audio sources:

- **The Dining Area** - Uninterrupted background music only, no other sources.
- **The Bar** - Hostess paging mic and either background music, jukebox, or TV audio.
- **The Waiting Area** - Hostess paging mic and background music only.



The Pro-Matrix adapts quickly to this situation. Connect each area to a different audio channel. Then connect the background music source, jukebox, and TV audio to the AUX inputs, and connect the hostess paging mic. The rest of the installation is completed using the detachable 10-character control panel. Using simple prompted programming, give each input the priority it should have relative to the other sources for each area. Undesired sources can be removed from the priority list in a particular area so they cannot cut in.

This flexible priority assignment allows all the sources needed in the lounge to be handled correctly and automatically, while the same source in the dining and waiting areas are automatically handled differently according to their needs.

In addition to flexible priority assignment of inputs, the Pro-Matrix has 10 different menus that allow control of a host of system operations from applying phantom power to mics to setting the muting level of music during mic pages and much more.

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories



RMPWMK3 Remote Wall Mounting Kit for Removable Front Panel



RPK79 Rack Mounting Kit

Flexible Output Levels

The VMIX was designed to make connections to other sound system components as easy as possible. Its transformer-balanced output provides ground loop isolation and high noise immunity when connected to other balanced inputs of downstream components. This output can provide 3 distinct output voltage ranges to accommodate just about any input type from a microphone input at -50 dB μ to a professional audio input requiring +4 dB μ , as well as a more common commercial level of -10 dB μ . Setting the proper output range is as easy as moving a slide switch. The VMIX provides a separate unbalanced RCA output, which makes simple equipment interconnects a snap.

Signal-Processing Modules

When signal-processing output modules are installed into the Power Vector's last two module bays, they automatically insert themselves into the mix bus signal path leading to the output stage. When two of these output modules are installed, their effects are cascaded with the second to last bay's module processing the signal first and then passing it to the module in the last bay. Two benefits are gained by this innovation: (1) the effects insert jacks are still available for use by external processing equipment, (2) the signal-processing output modules act on the signal on the raw mix bus signal before any other user controls, like master volume, bass, and treble can affect it. This then ensures that signal level dependent processors, such as the CMP1R Compressor/Limiter and the ANS1R Ambient Noise Sensor modules, perform as intended regardless of front panel control changes.

MODULAR MIXER

Power Vector Mixer VMIX



AMPLIFIED
VERSIONS
on
Pages 36 & 38

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
- 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 Peak Hold switch
- Balanced transformer-isolated output
- Balanced output signal level switch (-50, -10, and +4 dB μ)
- 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 (switch located in module bay 6)
- Tone control bypass switch (located in module bay 6)
- Module security cover prevents tampering with module controls (8 included)
- Resettable circuit breaker
- Grounded, unswitched AC convenience receptacle with a 500W maximum capacity provided for external equipment
- Power indicator
- Rack mountable (rack mounting kit RPK87, sold separately)
- Security cover to protect front controls and allows access to installer selected controls (sold separately)
- 3-year warranty

Accessories

PVMC
Module
Security Cover



PVSC
Power Vector
Security Cover



RVCP
Remote Volume
Control Panel



RPK87
Rack
Mounting Kit



MODULES



Input & Signal-
Processing Modules-
See Pages 37 & 38



Rear View

ALL MODULES
SOLD SEPARATELY

Technical Specifications for VMIX

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 dB μ , 600 ohms @ -10 dB μ , 5 ohms @ -50 dB μ , balanced	-99 dB, fundamental	16-1/2" W x 3-1/2" H x 12" D	18 lb.

MIXERS

MIC/LINE Mixers CAM8/CAM8PRO



The Bogen **CAM8** and **CAM8PRO** are 8-input, dual-bus MIC/Line mixers that combine superb performance with a generous array of simple-to-use features in a single rack space design. Both models feature 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 is provided for condenser microphones. Solidly engineered, the Bogen CAM8 and CAM8PRO mixers will provide many years of trouble-free operation.

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.

CAM8 & CAM8PRO Product Features:

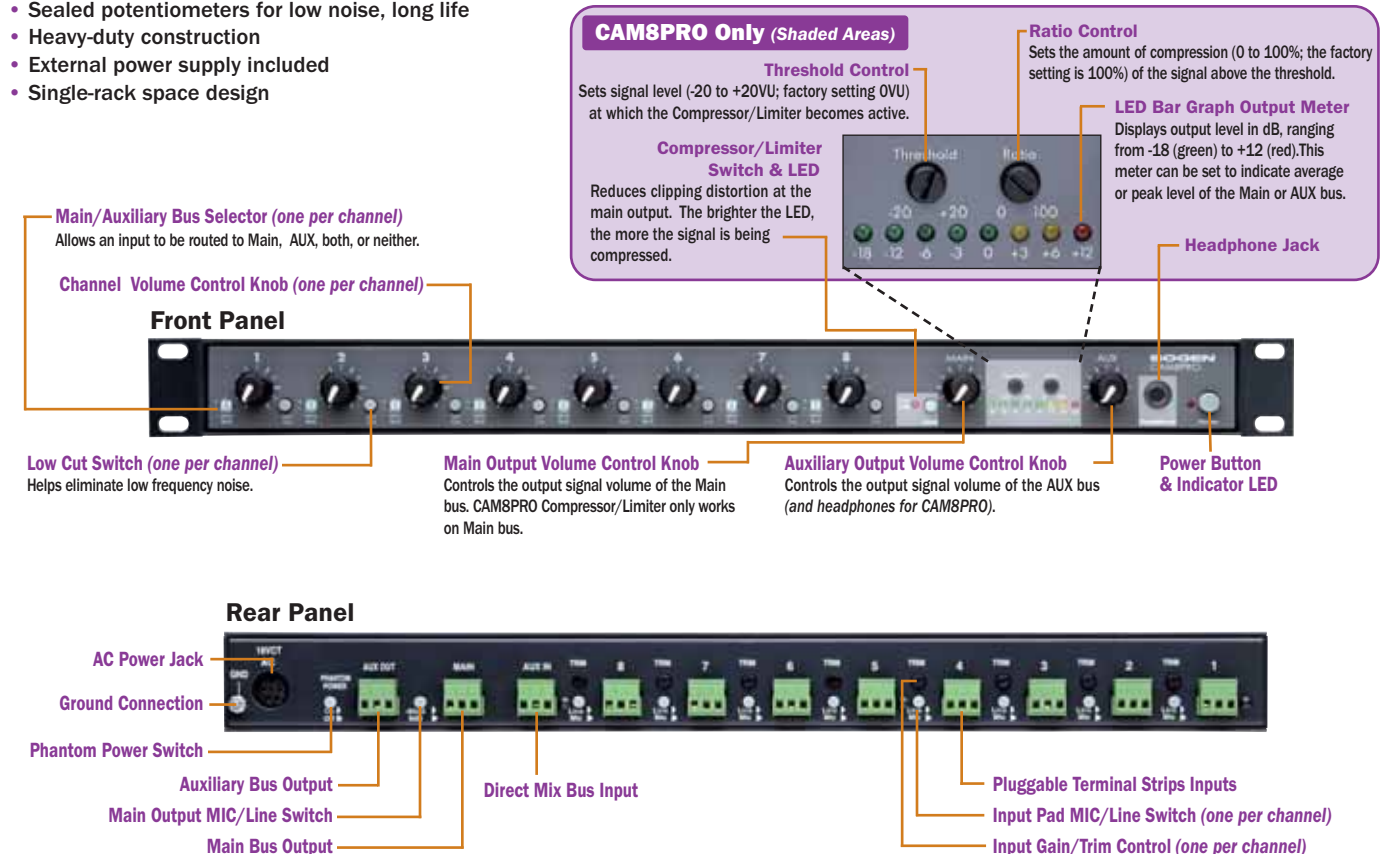
- 8 independently assignable inputs
- Dual-bus design with Main/AUX output selector for each input
- Pluggable terminal strip connections
- Separate Auxiliary input
- Balanced inputs and outputs
- Direct bus connection for cascading multiple mixers
- MIC/Line switch for each input and Main output
- Gain/Trim Control for each input
- Low Cut Filter for each input
- Switchable Phantom Power for condenser MIC inputs
- Input Level Control knob for each input
- Output Level Control knob for Main and AUX outputs
- Sealed potentiometers for low noise, long life
- Heavy-duty construction
- External power supply included
- Single-rack space design

CAM8PRO Added Features:

- Compressor/Limiter (Main output)
- Compressor/Limiter Bypass switch
- Adjustable Threshold and Ratio Controls
- LED Bar Graph Output Meter (Peak or Average)
- Headphone Output

Dimensions	Product Weight
19" W x 1-3/4" H x 7-1/2" D	9 lb.

See page 48
for CAM Mixers
Selection Chart.



MIXERS



MIC/LINE Mixers

CAM2 Mixer/Pre-Amplifier

The CAM2 is a 5-input mixer/pre-amplifier suitable for a wide variety of applications, particularly for expanding the number of inputs on Bogen or other public address amplifiers. The CAM2 provides four professional, low-impedance, balanced microphone inputs through XLR connectors and one auxiliary input.

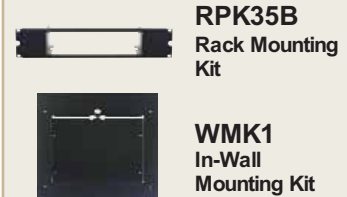
Individual phantom power switches for each input allow the use of both dynamic and condenser microphones on the same unit. A bridging input permits simple interconnection of multiple CAM2 mixers for system expansion without the need to sacrifice any mixer inputs. Clipping indicators for each input and an output level meter provide information to the system operator about sound integrity. Wide frequency response, low distortion, low noise, and high channel crosstalk isolation ensure superior sound quality. The CAM2's balanced mixer output can be switched between line level (+4 dBμ) or microphone level (-50 dBμ) for compatibility with a wide range of sound processing equipment.

Product Features:

- 4 Microphone inputs
- Low-impedance, balanced microphone inputs
- 1 High-impedance auxiliary input
- Low-noise, active mixing
- Master volume control
- Input clipping indicator for each channel
- 5-Segment LED output level meter
- XLR microphone input connectors
- Phantom power selectable per MIC input
- Unbalanced line-level output
- Balanced XLR output
- Illuminated power switch
- Switchable output level (+4/-50 dBμ)
- UL and C-UL listed
- Compact size
- Bridging input for connecting together multiple CAM2 mixers
- Rack- or wall-mounted with RPK35B or WMK1

Dimensions	Product Weight
11-3/8" W x 2-5/8" H x 7-3/8" D	3 lb.

Accessories



Output Level Switch -
Switch changes the nominal signal level of the XLR output from +4 dBμ to -50 dBμ.

Bridging -
The bridging jacks facilitate the connecting together of mixers to obtain additional inputs without using any of the CAM2's inputs.

Phantom Power -
The CAM2 provides power for electret condenser microphones. The Phantom ON/OFF switch controls the applications of DC voltage to each MIC input.

Rear Panel



Output XLR Connector -
Provides a balanced output compatible with most professional equipment.

Line Output Connector (Line Out) -
RCA jack provides unbalanced output signal compatible with most amplifiers, recording equipment, and other audio equipment. Not affected by Output Level switch.

Auxiliary Input (AUX In) -
A dedicated unbalanced auxiliary input for tuner, tape deck, CD player, etc.

MIC Inputs -
Balanced MIC level XLR inputs.

CAM MIXERS SELECTION CHART

Model	Inputs	Phantom Power/Voltage	Bridging Input	Clipping Indicator/Channel	Compressor/Limiter	Output Level Meter	Frequency Response	MIC Equiv. Input Noise	MIC/AUX Input Impedance	Signal-To-Noise Ratio	Output Impedance	Crosstalk (adjacent channels)	For Product Info, See:
CAM8	8	●	●	●	●	●	±1 dB, 20 Hz-20 kHz	-129 dBV	3.5k/20k ohms	90 dB	220-ohm unbalanced, 440-ohm balanced	> -90 dB	Page 47
CAM8PRO													
CAM2	5 (4 MIC, 1 AUX)	●	●	●		●	±1 dB, 20 Hz-20 kHz	-123 dBV	600/10k ohms	75 dB	140 ohms	> -90 dB	Above