

# Input Modules

## Models

**BAL2S, LMM1S, LMR1S,  
MAX1R, MIC1S, MIC2S,  
MIC1X, MIC2X, SAX1R,  
TBL1S, TEL1S, TNG1S**



## DESCRIPTION

Bogen's advanced plug-in modules provide a wide range of functions to support a variety of applications.

These modules support different signal-source requirements, including the ability to interface to balanced and unbalanced high- and low-level inputs, stereo or mono, telco systems, and microphones.

## FEATURES

### BALANCED (BAL2S)

*Stereo, balanced input module*

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

### LINE/MIC (LMM1S, LMR1S)

*LINE/MIC level input modules*

- Gain control
- Bass & Treble controls
- Actively-balanced input
- LINE/MIC Attenuator switch
- Gating w/Threshold & Duration
- 24V Phantom power supply
- 4 Priority levels
- Bus assignable
- Built-in limiter w/ LED (LMR1S)
- Remote control volume option (LMR1S)
- Single-gang remote control panel included (LMR1S)
- Remote distance up to 2,000 Ft. (LMR1S)
- Screw terminal connectors

### MICROPHONES (MIC1S, MIC1X)

*Transformer-balanced, low-impedance microphone input modules*

- Gain/Trim control
- Bass & Treble controls
- Noise gate w/Threshold & Duration
- Limiter w/Threshold control
- Limiter activity LED
- 24V Phantom power
- Mute send & receive
- 4 Priority levels
- Bus assignable
- Balanced, transformer-isolated
- Screw terminal (MIC1S); XLR connector (MIC1X) models

### MICROPHONES (MIC2S, MIC2X)

*Electronic-balanced, low-impedance microphone input modules*

- Gain/Trim control
- High Cut/Low Cut controls
- Voice Enhancement control
- Noise gate w/Threshold control
- Limiter w/Threshold control
- 24V Phantom power
- Mute send & receive
- 4 Priority levels
- Bus assignable
- Electronically balanced
- Screw terminal (MIC2S); XLR connector (MIC2X) models

### MONO, STEREO AUX (MAX1R, SAX1R)

*Unbalanced input modules*

- Gain/Trim control
- Bass & Treble controls
- Gating w/Threshold & Duration
- Mute send & receive
- Variable ducking level when muted/gated
- Fade back from mute/gate
- 4 Priority levels
- Bus assignable
- Stereo to mono summing option (SAX1R)
- RCA connectors

### TRANSFORMER-BALANCED (TBL1S)

*Transformer-balanced AUX input module*

- Transformer-isolated line-level input
- Gain/Trim control
- Bass & Treble controls
- Gating w/Threshold & Duration
- Mute send & receive
- Variable ducking level when muted/gated
- Fade back from mute/gate
- 4 Priority levels
- Bus assignable
- Pluggable screw terminal connections

### TELEPHONE (TEL1S)

*Telephone interface input module*

- Loop start or ground start trunk interfacing (requires external power supply)
- Dry loop interface to paging ports
- Audio-activated paging in dry loop
- Gain/Trim control
- Limiter
- Noise gate w/Threshold & Duration
- Mute send & receive
- 4 Priority levels
- Bus assignable
- Transformer-isolated
- Screw terminal connections

### TONE GENERATOR (TNG1S)

*Multiple tone generator input module*

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

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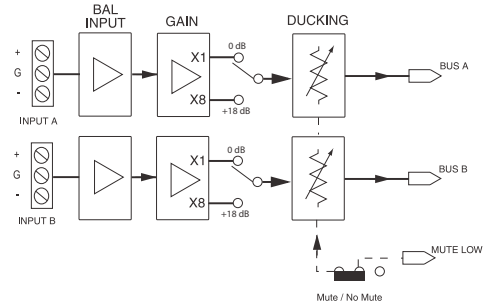
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**Balanced Input Module (BAL2S)**

Gain 0 dB (or +18 dB; switch selectable per channel)  
 Frequency Response +0/-3 dB, 5 Hz-100 kHz  
 S/N (20 Hz - 20 kHz) -100 dBV  
 Distortion < 0.005%, 20 Hz-20 kHz  
 Input Impedance 10k ohms (unbalanced)  
 20k ohms (balanced)  
 Ducking (level) -10 dB to -48 dB  
 CMRR > 80 dB @ 1 kHz  
 Controls Ducking  
 Priority Lowest or none  
 Connector 6-position barrier strip  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2.8 oz.

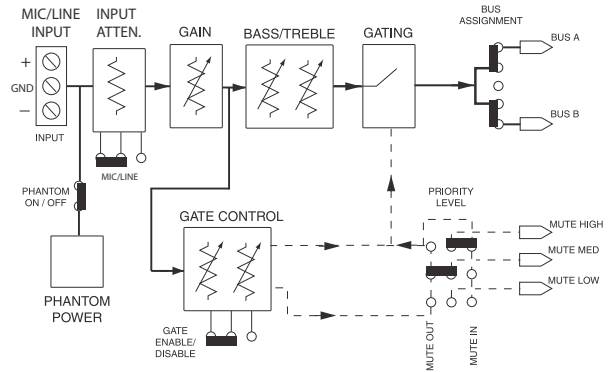


All measurements at 0 dB gain.



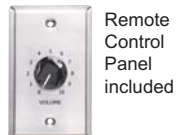
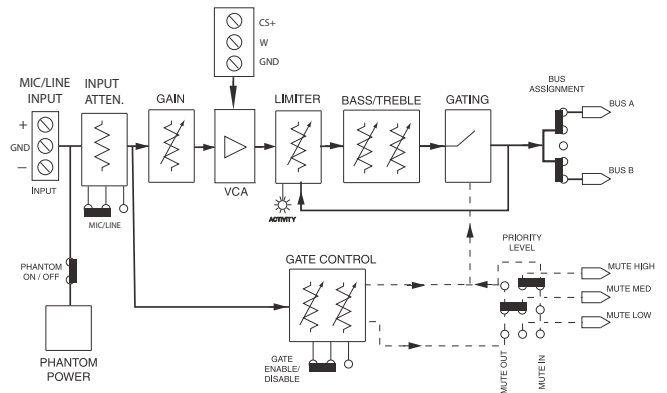
**LINE/MIC Input Module (LMM1S)**

Gain 18 dB to 60 dB (MIC)  
 -2 dB to 40 dB (LINE)  
 Frequency Response 20 Hz to 50 kHz (+0/-3 dB)  
 S/N (20 Hz - 20 kHz) -76 dBV @ 60 dB gain  
 Distortion < 0.01%  
 Input Impedance 15K LINE mode  
 2K MIC mode  
 Gate Threshold 2 to 25mV @ min. gain  
 Gate Duration 0.5s to 5s  
 Priority Four levels  
 Tone ± 10 dB @ 100 Hz & 10 kHz  
 CMRR > 80 dB @ 1 kHz  
 Controls Gain, Bass, Treble,  
 Threshold, Duration  
 Connector Pluggable Euro Screw Type  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2.2 oz.



**LINE/MIC Input Module (LMR1S)**

Gain 18 dB to 60 dB (MIC)  
 -2 dB to 40 dB (LINE)  
 Frequency Response 20 Hz to 50 kHz (+0/-3 dB)  
 S/N (20 Hz - 20 kHz) -74 dBV @ 60 dB gain  
 Distortion < 0.03%  
 Input Impedance 15K LINE mode  
 2K MIC mode  
 Gate Threshold 2 to 25mV @ min. gain  
 Gate Duration 0.5s to 5s  
 Priority Four levels  
 Tone ± 10 dB @ 100 Hz & 10 kHz  
 CMRR > 80 dB @ 1 kHz  
 Controls Gain, Bass, Treble,  
 Limit, Threshold, Duration  
 Limit (threshold) -16 dBV to off  
 Remote Voltage 0 to 4.5V DC  
 Remote Loop Current 0.5mA  
 Max. Distance 200 Ft. (2 Conductor), 2,000 Ft. (3 Conductor Shielded)  
 Connector Fixed Euro Screw Type  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2.6 oz.



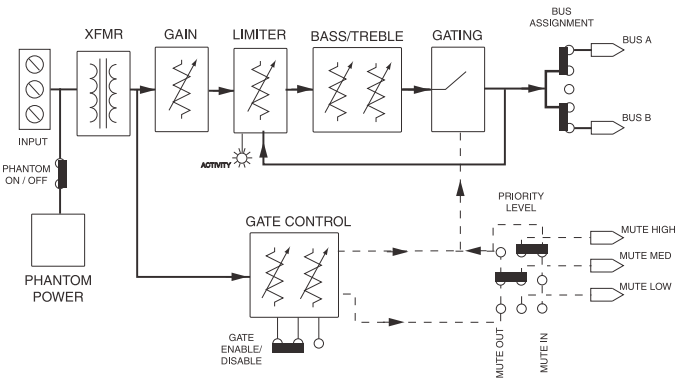
Remote Control Panel included



### Microphone Input Module (MIC1S)

Gain 28 dB to 62 dB  
 Frequency Response +0/-3 dB, 10 Hz-20 kHz  
 S/N (20 Hz - 20 kHz) -71 dBV @ 60 dB gain, -131 dBV EIN  
 Distortion < 0.5%, 20 Hz-20 kHz  
 Input Impedance 500 ohms  
 Tone  $\pm 10$  dB @ 100 Hz & 10 kHz  
 Limit (threshold) -10 dBV to off  
 Gate Threshold 3 mV to 30 mV  
 Gate Duration 0.5s to 5s  
 CMRR > 80 dB @ 1 kHz  
 Priority Four levels  
 Phantom Power 24V DC (defeatable)  
 Controls Gain, Bass, Treble, Limit, Gate Threshold, Gate Duration

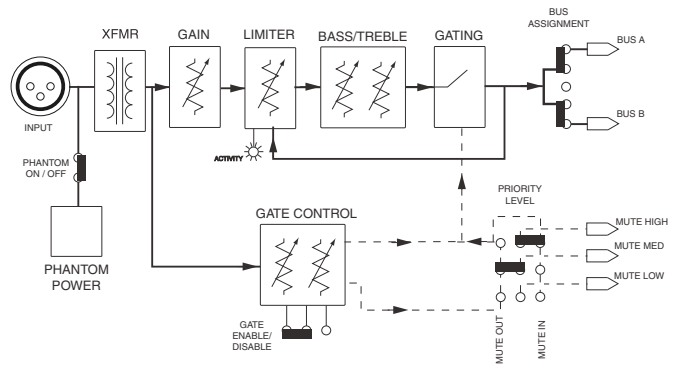
Connector Screw Terminal  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 3.6 oz.



### Microphone Input Module (MIC1X)

Gain 28 dB to 62 dB  
 Frequency Response +0/-3 dB, 10 Hz-20 kHz  
 S/N (20 Hz - 20 kHz) -71 dBV @ 60 dB gain, -131 dBV EIN  
 Distortion < 0.5%, 20 Hz-20 kHz  
 Input Impedance 500 ohms  
 Tone  $\pm 10$  dB @ 100 Hz & 10 kHz  
 Limit (threshold) -10 dBV to off  
 Gate Threshold 3 mV to 30 mV  
 Gate Duration 0.5s to 5s  
 CMRR > 80 dB @ 1 kHz  
 Priority Four levels  
 Phantom Power 24V DC (defeatable)  
 Controls Gain, Bass, Treble, Limit, Gate Threshold, Gate Duration

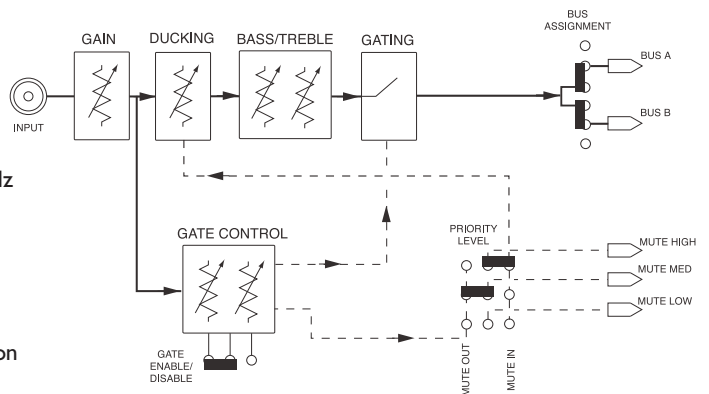
Connector XLR  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 3.6 oz.



### Mono Aux Input Module (MAX1R)

Gain -20 dB to 6 dB  
 Frequency Response +0/-3 dB, 5 Hz-100 kHz  
 S/N (20 Hz - 20 kHz) -100 dBV  
 Distortion < 0.005%, 20 Hz-20 kHz  
 Input Impedance 50k ohms  
 Tone  $\pm 10$  dB @ 100 Hz & 10 kHz  
 Ducking (level) -10 dB to -48 dB  
 Gate Threshold 3 mV to 30 mV  
 Gate Duration 0.5s to 5s  
 Priority Four levels  
 Controls Gain, Bass, Treble, Ducking, Gate Threshold, Gate Duration

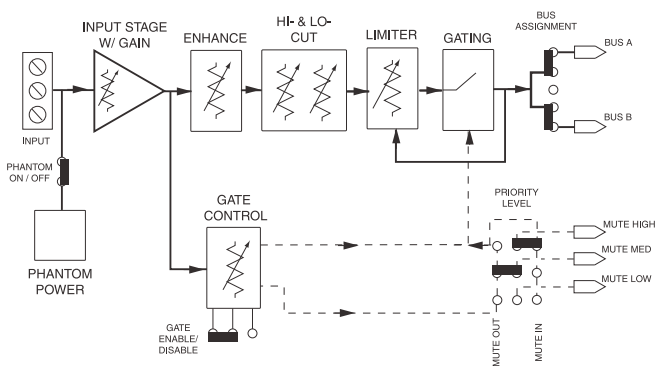
Connector RCA type  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2.6 oz.





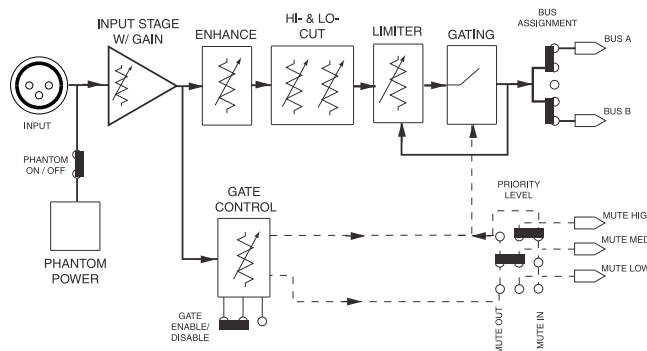
### Microphone Input Module (MIC2S)

**Gain** 18 dB to 62 dB  
**Frequency Response** +0/-3 dB, 10 Hz-40 kHz  
**S/N (20 Hz - 20 kHz)** -73 dBV @ 60 dB gain, -133 dBV EIN  
**Distortion** < 0.02%, 20 Hz-20 kHz  
**Input Impedance** 2K ohms  
**Tone** -10 dB @ 100 Hz & 3 kHz (cut only)  
**Limit (threshold)** -10 dBV to off  
**Gate Threshold** 3 mV to 30 mV  
**CMRR** > 80 dB @ 1 kHz  
**Priority** Four levels  
**Phantom Power** 24V DC (defeatable)  
**Controls** Gain, Low Cut, High Cut, Enhance, Limit, Gate Threshold  
**Connector** Screw Terminal  
**Dimensions** 1-3/8" W x 3-1/8" H x 3-1/2" D  
**Weight** 2.2 oz.



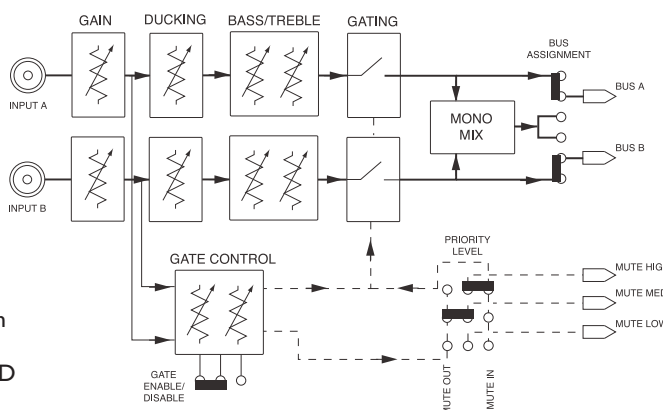
### Microphone Input Module (MIC2X)

**Gain** 18 dB to 62 dB  
**Frequency Response** +0/-3 dB, 10 Hz - 40 kHz  
**S/N (20 Hz - 20 kHz)** -73 dBV @ 60 dB gain, -133 dBV EIN  
**Distortion** < 0.02%, 20 Hz - 20 kHz  
**Input Impedance** 2K ohms  
**Tone** -10 dB @ 100 Hz & 3 kHz (cut only)  
**Limit (threshold)** -10 dBV to off  
**Gate Threshold** 3 mV to 30 mV  
**CMRR** > 80 dB @ 1 kHz  
**Priority** Four levels  
**Phantom Power** 24V DC (defeatable)  
**Controls** Gain, Low Cut, High Cut, Enhance, Limit, Gate Threshold  
**Connector** XLR  
**Dimensions** 1-3/8" W x 3-1/8" H x 3-1/2" D  
**Weight** 2.2 oz.



### Stereo Aux Input Module (SAX1R)

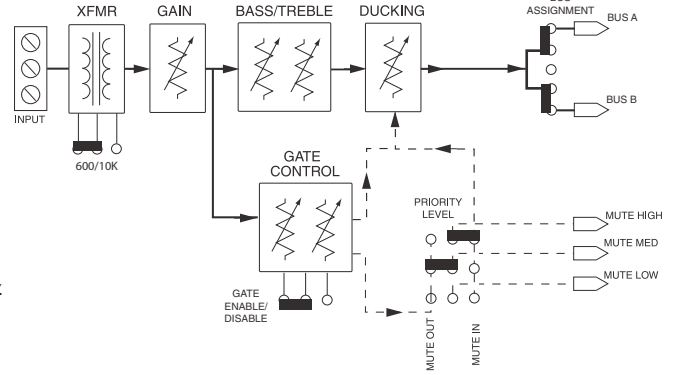
**Gain** -20 dB to 6 dB  
**Frequency Response** +0/-3 dB, 5 Hz - 100 kHz  
**S/N (20 Hz - 20 kHz)** -100 dBV  
**Distortion** < 0.005%, 20 Hz - 20 kHz  
**Input Impedance** 50k ohms  
**Tone** ±10 dB @ 100 Hz & 10 kHz  
**Ducking (level)** -10 dB to -48 dB  
**Gate Threshold** 3 mV to 30 mV  
**Gate Duration** 0.5s to 5s  
**Priority** Four levels  
**Controls** Gain, Bass, Treble, Ducking, Gate Threshold, Gate Duration  
**Connector** RCA type  
**Dimensions** 1-3/8" W x 3-1/8" H x 3-1/2" D  
**Weight** 2.6 oz.





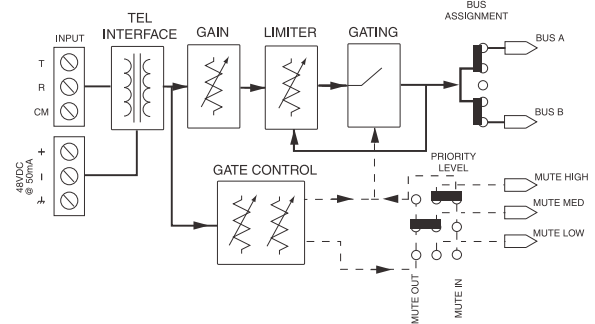
### Transformer-Balanced Input Module (TBL1S)

Gain -11 dB to +19 dB  
 Frequency Response 10 - 40 kHz (+0/-3 dB)  
 S/N (20 Hz - 20 kHz) -75 dBV  
 Distortion < 0.3%, 20 Hz - 20 kHz @ 1V  
 Input Impedance 10k ohms/600 ohms (jumper selectable)  
 Gate Threshold 5 mV to disable  
 Gate Duration 0.5s to 5s  
 Priority Four levels  
 Duck Level -10 dB to -72 dB  
 Tone +/- 10 dB @ 100 Hz & 10 kHz  
 CMRR > 80 dB @ 1 kHz  
 Controls Gain, Bass, Treble, Duck, Gate Threshold, Gate Duration  
 Connector Pluggable Euro Screw Type  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 3.8 oz.



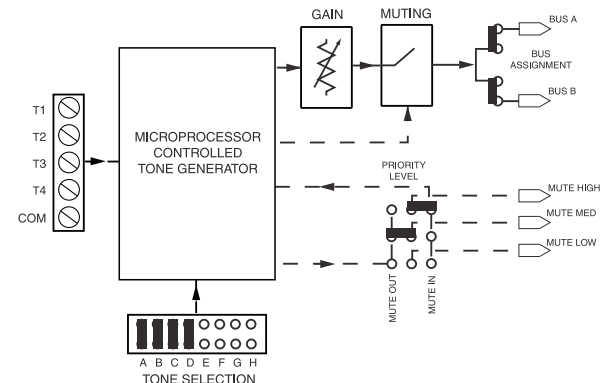
### Telephone Input Module (TEL1S)

Gain 0 dB to 30 dB  
 Frequency Response +0/-3 dB, 20 Hz - 20 kHz  
 S/N (20 Hz - 20 kHz) -90 dBV @ 30 dB of gain, -120 dBV EIN  
 Distortion < 0.1%, 20 Hz - 20 kHz  
 Input Impedance Dry loop 30k ohms, Wet loop 1k ohms  
 Limit (threshold) -10 dBV to off  
 Gate Threshold 3 mV to 30 mV  
 Gate Duration 0.5s to 5s  
 Priority Four levels  
 External Power 48V DC (for talk battery)  
 CMRR > 80 dB @ 1 kHz  
 Controls Gain, Limit, Gate Threshold, Gate Duration  
 Connector 6-position barrier strip  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2.8 oz.



### Tone Generator Input Module (TNG1S)

Max. Output Level 1.8V  
 Max. Contact Resist. 100 ohms  
 Tones 8 total, 4 selectable; 512 Hz Burst/steady, slow whoop, siren, mechanical bell, Klaxon, night ringer, double chime, & doorbell  
 Priority Four levels  
 Controls Level  
 Connector 5-position barrier strip  
 Dimensions 1-3/8" W x 3-1/8" H x 3-1/2" D  
 Weight 2 oz.



## A&E SPECIFICATIONS

**Balanced Input Module (BAL2S)** The BAL2S input module shall be a stereo, high-impedance, electronically-balanced input module. It shall be mutable by higher priority modules and shall feature an internal PCB jumper to enable or disable muting from the priority bus system. It shall have a continuously variable ducking control that will enable attenuation of the input signal from a minimum of 10 dB to a maximum of 48 dB relative to the normal unmuted condition. The module shall have a rapid mute when the mute function is activated and a gradual fade back from mute when the mute control is deactivated. Gain shall be switch selectable per channel and shall be 0 dB or +18 dB.

**LINE/MIC Input Module (LMM1S)** The LMM1S module shall be a LINE/MIC level input module. Input shall be via front-mounted screw terminals. It shall have an internal, 24V DC phantom power supply that is enabled by a PCB jumper. The module shall have a gain control that will allow gain to be adjusted from 18 dB to 60 dB in MIC position, or from -2 dB to 40 dB in LINE position. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of four priority levels. The module shall have an internal gating circuit with controls for threshold and duration. The module shall have bass and treble controls with cut and boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's output shall be assignable to either or both of two mixing buses.

**LINE/MIC Remote Input Module (LMR1S)** The LMR1S module shall be a LINE/MIC level input module with remote volume control capability. Input level control shall be by remote potentiometer or by direct voltage input (0 – 4.5V DC). Input shall be via front-mounted screw terminals. The LMR1S shall have an internal, 24V DC phantom power supply that is enabled by a PCB jumper. The module shall have a gain control that will allow gain to be adjusted from 18 dB to 60 dB in MIC position, or from -2 dB to 40 dB in LINE position. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of four priority levels. The module shall have an internal gating circuit with controls for threshold and duration. It shall have a built-in limiter to control the maximum output level of the module. The module shall have an LED to indicate limiter activity. The module shall have bass and treble controls with cut and boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's output shall be assignable to either or both of two mixing buses.

A Remote Volume Control Panel is included with the module. The panel shall be wall mountable and shall be able to control input level from a distance of up to 200 feet using a 2-conductor cable, or up to 2,000 feet using a 3-conductor shielded cable.

**Mono Aux Input Module (MAX1R)** The MAX1R module shall be a mono, high-impedance, unbalanced input module. The module shall have an RCA jack as its input connector. The module shall have a gain/trim control that will allow the gain to be adjusted from -20 dB to +6 dB relative to 0 dB nominal gain. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. It shall have a continuously variable ducking control that will enable attenuation of the input signal from a minimum of 10 dB to a maximum of 48 dB relative to the normal unmuted condition and a gradual fade back from mute when the mute or gate control is deactivated. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit, with controls for threshold and duration. The module shall have bass and treble controls with cut or boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's output shall be assignable to either or both of two mixing buses.

**Microphone Input Module (MIC1S)** The MIC1S module shall have a transformer-isolated, balanced input with screw terminal connector. It shall interface with low-impedance dynamic microphones. It shall also interface with electret condenser microphones and shall have an internal 24V DC phantom power supply to provide the bias supply that is enabled by a PCB jumper. The module shall have a gain control that will allow the gain to be adjusted from 28 dB to 62 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with controls for threshold and duration. It shall have a built-in limiter, with a threshold control, to limit the maximum output level of the module. A front panel LED will indicate limiter activity. The module shall have bass and treble controls with cut or boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's output shall be assignable to either or both of two mixing buses.

**Microphone Input Module (MIC1X)** The MIC1X module shall have a transformer-isolated, balanced input with XLR connector. It shall interface with low-impedance dynamic microphones. It shall also interface with electret condenser microphones and shall have an internal 24V DC phantom power supply to provide the bias supply that is enabled by a PCB jumper. The module shall have a gain control that will allow the gain to be adjusted from 28 dB to 62 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with controls for threshold and duration. It shall have a built-in limiter, with a threshold control, to limit the maximum output level of the module. A front panel LED will indicate limiter activity. The module shall have bass and treble controls with cut or boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's output shall be assignable to either or both of two mixing buses.

**Microphone Input Module (MIC2S)** The MIC2S module shall have an electronically-balanced input with screw terminal connector. It shall interface with low-impedance dynamic microphones. It shall also interface with electret condenser microphones and shall have an internal 24V DC phantom power supply to provide the bias supply that is enabled by a PCB jumper. The module shall have a gain control that will allow the gain to be adjusted from 18 dB to 62 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with a threshold control. It shall have a built-in limiter, with a threshold control, to limit the maximum output level of the module. The module shall have bass and treble controls with cut only of 10 dB at 100 Hz and 3 kHz, respectively. The module shall have a voice enhancement control for improving voice intelligibility. The module's output shall be assignable to either or both of two mixing buses.

**Microphone Input Module (MIC2X)** The MIC2X module shall have an electronically-balanced input with XLR connector. It shall interface with low-impedance dynamic microphones. It shall also interface with electret condenser microphones and shall have an internal 24V DC phantom power supply to provide the bias supply that is enabled by a PCB jumper. The module shall have a gain control that will allow the gain to be adjusted from 18 dB to 62 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with a threshold control. It shall have a built-in limiter, with a threshold control, to limit the maximum output level of the module. The module shall have bass and treble controls with cut only of 10 dB at 100 Hz and 3 kHz, respectively. The module shall have a voice enhancement control for improving voice intelligibility. The module's output shall be assignable to either or both of two mixing buses.

**Stereo AUX Input Module (SAX1R)** The SAX1R module shall be a stereo, high-impedance, unbalanced input module. The module shall have two RCA jacks for its input connectors. The module shall have a gain/trim control that will allow the gain to be adjusted from -20 dB to +6 dB relative to 0 dB nominal gain. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. It shall have a continuously variable ducking control that will enable attenuation of the input signal from a minimum of 10 dB to a maximum of 48 dB relative to the normal unmuted condition and a gradual fade back from mute when the mute or gate control is deactivated. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit, with controls for threshold and duration. The module shall have bass and treble controls with cut or boost of 10 dB at 100 Hz and 10 kHz, respectively. The module's outputs shall be independently assignable to each of two mixing buses. The module shall allow stereo sources to be summed and sent mono to either or both of two mixing buses.

**Transformer-Balanced Input Module (TBL1S)** The TBL1S input module shall be a transformer-isolated, line-level, balanced input module. The module shall have a pluggable 3-pin screw terminal input barrier strip connector to make the input connection. The module shall have a jumper selectable input impedance of 600 ohms or 10k ohms. The module shall have a gain/trim control that will allow the gain to be adjusted from -11 dB to +19 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with controls for threshold and duration. It shall have a continuously variable ducking control that will enable attenuation of the input signal from a minimum of -10 dB to a maximum of -72 dB relative to the normal unmuted condition and a gradual fade back from mute when the mute or gate control is deactivated. The module's output shall be assignable to either or both of two mixing buses.

**Telephone Input Module (TEL1S)** The TEL1S module shall have a transformer-isolated, balanced input and configuration jumpers that will allow it to interface with both wet and dry loop telephone systems. In the dry loop mode, this module shall allow connections to page port systems. In the wet mode of operation, it shall allow connections to both ground start and loop start telephone systems. The module shall have a 6-pin screw terminal input barrier strip connector to make the input connection. The module shall provide for the connection of an external talk-battery power supply of 48V DC. The module shall have a gain control that will allow the gain to be adjusted from 0 dB to 30 dB. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a VOX/gating circuit to control muting of lower priority modules and its internal gating circuit with controls for threshold and duration. It shall have a built-in limiter, with a threshold control, to limit the maximum output level of the module. The module's output shall be assignable to either or both of two mixing buses.

**Tone Generator Input Module (TNG1S)** The TNG1S input module shall be a multiple tone generator input module. The module shall have a 5-pin screw terminal input barrier strip connector to make the trigger connections. The module shall include 8 tones: 512 Hz burst/steady, slow whoop, siren, mechanical bell, Klaxon, night ringer, double chime, and doorbell tones. The module shall permit 4 of the 8 tones to be triggered. Momentary and continuous playback modes shall be available. The module shall have a level control. It shall have the ability to mute lower priority modules and be muted by higher priority modules. The module shall be able to assume any of 4 priority levels. The module shall have a gradual fade back from mute when the mute control is deactivated. The module's output shall be assignable to either or both of two mixing buses.

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