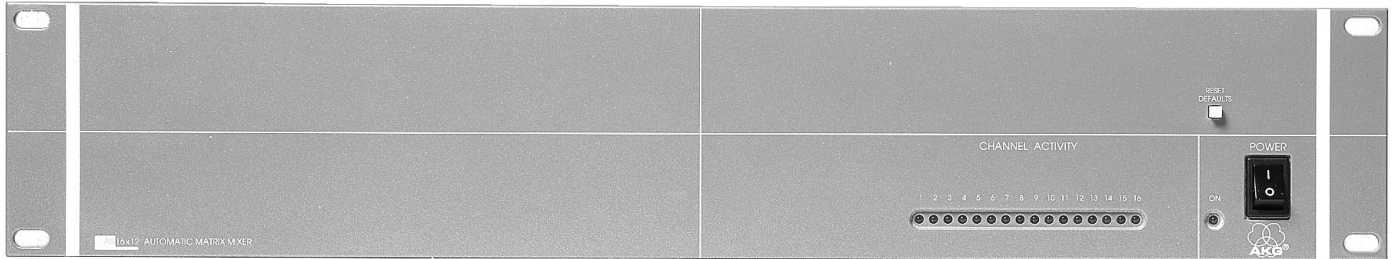




H A Harman International Company

AS 16x12

Automatic Matrix Mixer



Description

The AS 16x12 combines a sophisticated 16-channel automatic microphone mixer with a 16 x 12 programmable matrix mixer in a two-space 19" rack mount package. Versatile control options and built-in conveniences place the AS 16x12 in a class all its own. Setup and operation is simplified with the supplied LecNet™ software and RS-232 serial computer interface. The AS 16x12 is ideal for courtrooms, boardrooms, learning centers, conference centers, teleconferencing, auditoriums, worship centers and many other applications where automatic mixing, NOM attenuation, and multiple mixing and routing are required.

The combination of matrix mixing and automatic mixing provides an outstanding improvement in sound quality. "Mix-minus" sound reinforcement, multi-channel recording and separate media feeds can all be accomplished simultaneously with a single AS 16x12 mixer. The mixing algorithm and routing options are also very beneficial when used with a digital hybrid for teleconferencing.

The AS 16x12 features the Adaptive Proportional Gain* mixing algorithm, a unique process that adjusts the gain applied to each input channel after comparing that individual channel level with an overall reference level. The reference level is a mix of all active channels, so the algorithm automatically adapts to varying background noise levels in the room. In addition, a history is kept regarding which channel has been the most active for the longest time period and a slight preference (auto skew) is given to that channel. The control signal that adjusts the algorithm is processed through a voice filter to keep non-speech sounds from influencing the mix and NOM attenuation. The result is very simple setup and adjustment and superb audio quality in any environment.

The input section of the AS 16x12 provides 16 low noise preamps for microphone or line level, balanced or unbalanced inputs, plus tone controls for each input channel. Preamp gains of 0 dB, 30 dB, and 50 dB accommodate any line or mic level source. Input gain can be trimmed from -63 dB to +15dB in 1 dB increments using the supplied software.

Following the input section is a high quality 16 x 12 full crosspoint matrix mixer. Any combination of inputs may be routed to any combination of outputs. Input crosspoint gains are adjustable in 5 dB increments.

Output channel gain can be adjusted from -68 dB to +10 dB in 1 dB increments. Four of the 12 outputs have a MIC/LINE selector switch. The LINE position drives other line level equipment while the MIC position is optimized for recording and other mic level applications.

The AS 16x12 provides 17 programmable control inputs and 19 programmable control logic outputs. The programmable inputs may be set up to control input/output gain, input/output

muting, preset recall, or room boundary combining. The programmable outputs may be set up to indicate either channel activity or the current state of a programmable input.

A built-in noise generator is provided for sound masking applications such as bench conferences in courtrooms or for assistance in sound system set up.

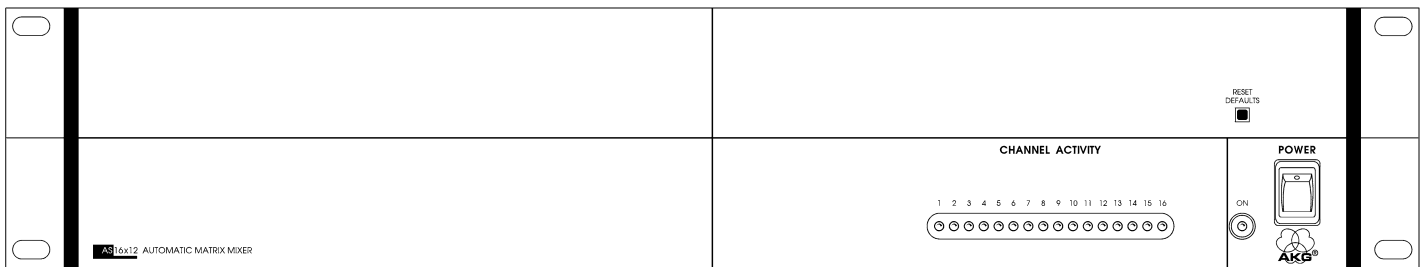
Fifteen nonvolatile memories are used to store multiple configurations. Memory presets are instantly recalled via momentary contacts at rear panel connectors, or via serial control.

Additional inputs may be added to the AS 16x12 matrix by stacking multiple units. The AUDIO EXPANSION IN and AUDIO EXPANSION OUT ports allow expansion of the input capability of the system through 30-pin connectors on the rear panel.

**See references on back page*

Features

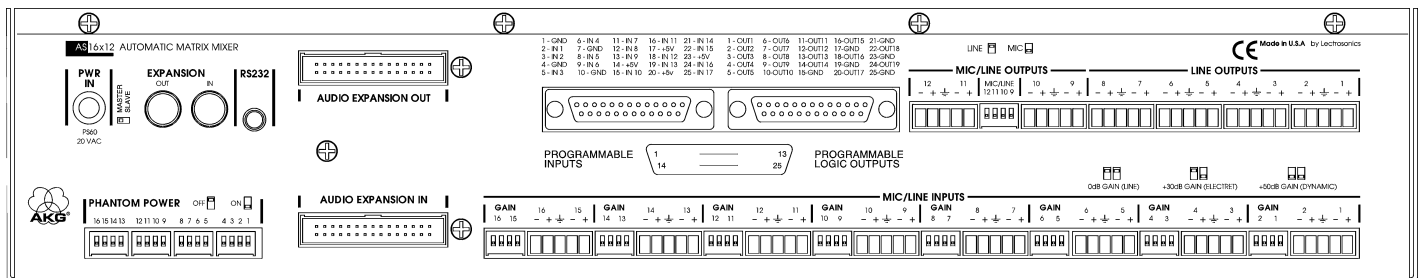
- **16 channel automatic microphone mixer plus expansion port and noise generator**
- **16 x 12 programmable matrix mixer**
- **HF cut and boost and LF cut controls in every channel**
- **8 assignable NOM Buses**
- **17 programmable inputs**
- **19 programmable logic outputs**
- **Built-in 4 room combining capability**
- **Expandable if more channels needed**
- **Software for Windows® operating systems**
- **2 rack space**
- **RS-232 controllable - AMX® and Crestron™ compatible**



Front Panel

The chassis of the AS 16x12 is a 2 RU machined aluminum design. An external power supply is used to move the mass and weight outside of the chassis to simplify rack mounting. No significant heat is generated inside the unit, so the unit can be placed anywhere in a standard rack mount without special ventilation requirements.

The LED display indicates the channel activity and status as the mixer is operating. The factory default configuration can be restored by holding in the "RESET DEFAULTS" button while turning the power on.



Rear Panel

MIC/LINE INPUTS 1-16 - Accepts balanced or unbalanced signal. Fully balanced differential input, RF filtered.

GAIN SELECTION SWITCHES 1-16 - Allows input channel gain to be set. 0dB gain, for line level sources, is set when both switches of the pair are in the up position. 30dB gain, typically for high output (electret) microphones, is set when the left switch is in the up position and the right switch is in the down position. 50dB gain, used for low output (dynamic) microphones, is set when both switches are in the down position.

LINE OUTPUTS 1-12 - Provide balanced system outputs. The Line Outputs may also be used in an unbalanced mode by connecting the "+" terminal of the Line Output to the signal lead of the unbalanced device, and the ground terminal of the Line Output to the ground of the unbalanced device.

MIC/LINE SWITCHES 9-12 - Introduces 40dB of attenuation into the associated line outputs 9-12. This yields the appropriate signal levels to interface with mic level devices.

PROGRAMMABLE INPUTS - Allows remote control of a number of AS16x12 functions. Each of the 17 programmable inputs can utilize either continuous DC voltages (0VDC-5VDC) or contact closures, depending on the particular function chosen. For continuous voltages, either a 10K Ohm linear pot or an adjustable DC control voltage may be used. The volume control action is internally scaled in software, giving an "audio-taper" characteristic to a linear pot. When using a DC control voltage, the control constant is 0.167V/dB (or 6dB/V) from 0V to 5V. At 0V, the channel is turned completely off. The control voltage should not exceed 5V.

PROGRAMMABLE OUTPUTS - Allows indication of either channel activity or programmable input states. Each of the 19 programmable outputs is the electronic equivalent of a contact closure. The logic output will sink up to 100mA at voltages up to 40VDC, however, the total current draw of all logic outputs should not exceed 100mA if the internal +5V supply is used.

AUDIO EXPANSION IN/OUT - Allows multiple AS 16x12 mixers to be linked together when more than 16 inputs are needed. In multiple mixer setups, one AS 16x12 is set to be the MASTER, and all others are set to be SLAVES. The AUDIO EXPANSION OUT on the SLAVE unit is connected to the AUDIO EXPANSION IN on the MASTER unit. Multiple SLAVE units are connected in a like manner.

RS-232 SERIAL PORT - Provides access to and control of some of the operational features of the AS 16x12. The port is compatible with the serial port of a PC, or other controllers with RS-232 type serial ports.

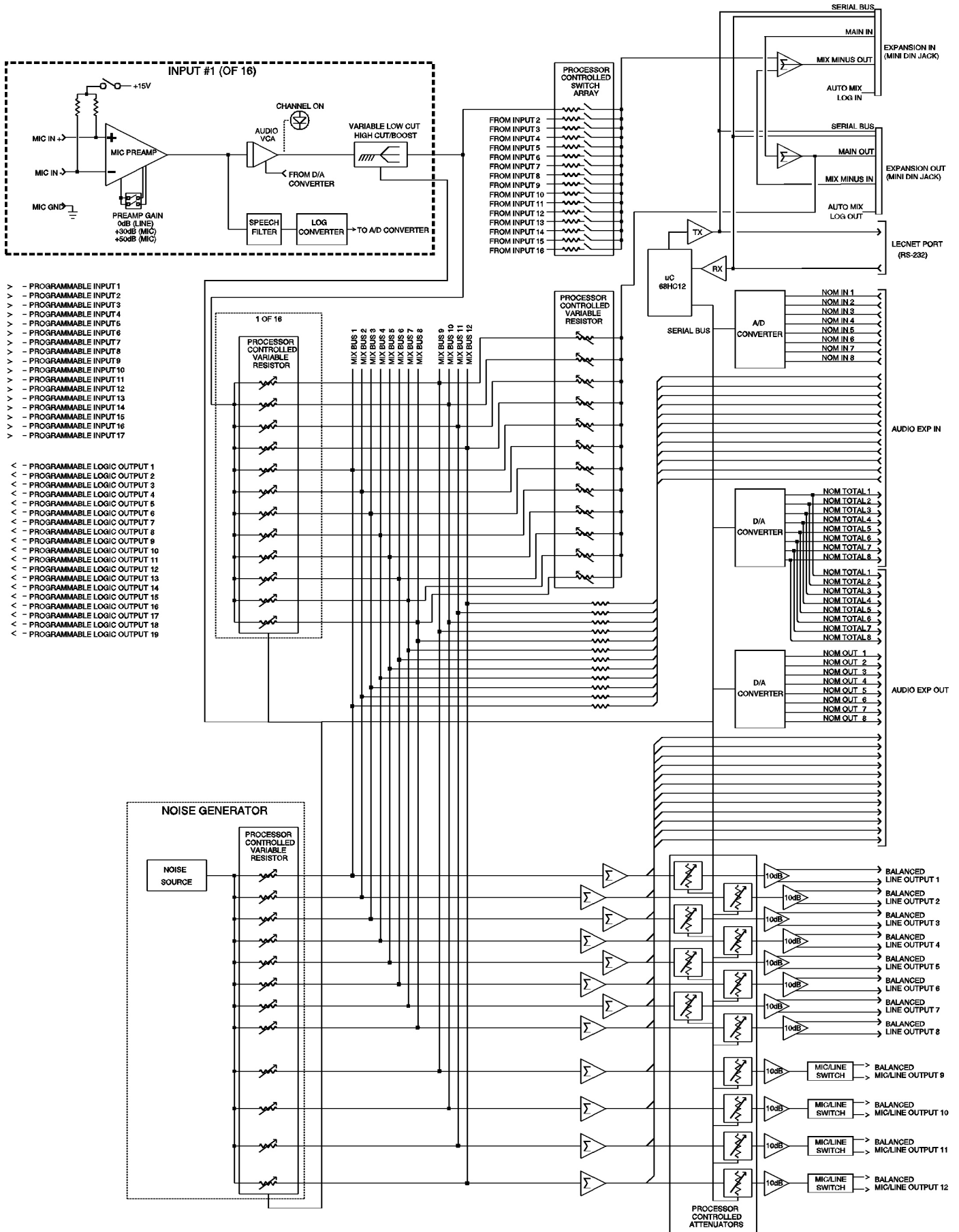
EXPANSION IN/OUT (8-pin mini DIN jacks) - Allows other LecNet™ devices to be connected to the AS16x12. Also used when multiple AS 16x12 mixers are connected together to bus the RS-232 serial connection between multiple LecNet™ units.

MASTER/SLAVE SWITCH - Sets the AS 16x12 for use as a Master device or a Slave device. An AS 16x12 mixer used by itself should be set for MASTER mode operation.

PWR IN - 16.5V AC powers the mixer. The PS60 or PS60E power supply is provided with the mixer.

PHANTOM POWER SWITCHES - Each channel can be set to provide +15V phantom power.

AS 16x12 BLOCK DIAGRAM



Architects and Engineers Specifications

The automatic microphone mixer shall incorporate an adaptive proportional gain mixing technique and automatic skewing between input channels to minimize comb filtering. The mixer shall contain sixteen input channels, be software controlled and have no user accessible controls. Each input shall be electronically balanced and be capable of receiving mic or line level input signals. HF and LF controls and phantom power shall be provided for each input. Each input shall be capable of being routed to any combination of 12 mix busses. Mix busses 1 - 8 shall terminate in electronically balanced line level outputs. Mix busses 9 - 12 shall terminate in electronically balanced switchable mic/line outputs. Expansion ports shall provide IO access to the 12 mix busses. The

mixer shall be controllable via an RS-232 serial port and shall adhere to the LecNet™ communication protocol. A noise generator shall be included and may be routed to any combination of the 12 mix busses. The mixer shall meet the following performance criteria. Frequency response: 20 Hz - 20 kHz. THD < 0.1% @ 0 dBu output. IMD < 0.1% @ 0 dBu output. Input Impedance: > 2.5K ohm. Maximum Input Level: +20 dBu @ 0 dB setting; -10 dBu @ +30 dB setting; -30 dBu @ +50 dB setting. Equivalent Input Noise: -126 dB @ +50 dB gain. Maximum Output Level: +26 dBu. Maximum Gain: 81 dB (input to output). The mixer shall be rack mountable and occupy 2 RU. The automatic microphone mixer shall be the AKG Acoustics Model AS 16x12.

Specifications & Features

Mic/Line Input

Type:	Electronically balanced and RF filtered
Impedance:	Greater than 2.5K, any gain setting
Input Gain Settings:	0dB, +30dB, +50dB
Input Gain Range:	+15dB to -63dB, plus mute
EIN, 20-20KHz:	-126dBu (+50dB gain)
Maximum Input Level:	+20dBu at 0dB gain -10dBu at +30dB gain -30dBu at +50dB gain

Tone Controls:

Lo-cut:	6dB/oct @ 75, 90, 110, 130, 190, 280 and 600 Hz
HF shelving control:	Turnover frequency 1kHz; +/- 3dB, +/- 6dB, +/- 8dB (at 10 kHz)

Line Outputs:

Outputs 1-8:	200 Ohms balanced, 100 Ohms unbalanced
Outputs 9-12:	Line mode - 520 Ohms balanced, 260 Ohms unbalanced. Mic mode - 125 Ohms balanced or unbalanced
Output Gain Range:	+10dB to -68dB, 1dB steps, plus mute
Max output level:	+26dBu, 10k load in Line mode; -16dBu, 10k load in Mic mode

Matrix Crosspoints:

Matrix Crosspoint Gain Settings:	-15dB, -10dB, -5dB, 0dB, +3dB, +6dB, off
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*References from page 1

US Patent Numbers: 5,414,776 and 5,402,500

Windows® is a registered trademark of Microsoft Corp.

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Crestron™ is a trademark of Crestron Electronics, Inc.

Programmable Inputs

Analog Voltage Range:	0VDC - 5VDC
Analog Control:	0dB to -30dB plus off control range; 156mV/dB control sensitivity
Logic Control:	Active Low

Programmable Outputs

Logic Control:	Active low
Max sink current:	100 mA
Max supply voltage:	40VDC

Serial Communication (RS-232):

9600 baud, 8 data bits,
no parity, 1 stop bit

Default LecNet address:

13 9

Maximum System Gain: 81dB (Input to Main Out)

System Frequency Response:

20Hz to 20kHz, +/- 1dB (at 0dB in/out)

System THD:

Less than 0.1%, any gain setting,
0dBu out

System IMD:

Less than 0.1%, any gain setting,
0dBu out

Phantom Power:

Selectable by channel, +15V, short circuit
current 6.5mA each from the
“+” and “-” inputs

Power Consumption:

25 Watts max at 16.5VAC (1.5A max.)

Weight:

7 lbs.

Dimensions:

19"wide x 3.5"high x 8"deep

Limited Warranty

Valid only in the United States. AKG Acoustics warrants AKG products against defects in material or workmanship for a period of two years from the date of original purchase for use, and agrees to repair or, at our option, replace any defective unit without charge for either parts or labor. Important: This warranty does not cover damage resulting from accident, misuse or abuse, lack of reasonable care, the affixing of any attachment not provided with the product, loss of parts or connecting the product to any but the specified receptacles. This warranty is void unless service or repairs are performed by an authorized service center. No responsibility is assumed for any special, incidental

or consequential damages. However, the limitation of any right or remedy shall not be effective where such is prohibited or restricted by law. Simply take or ship your AKG product prepaid to our service department. Be sure to include your sales slip as proof of purchase date. (We will not repair transit damage under the no-charge terms of this warranty.) Note: No other warranty, written or oral is authorized by AKG Acoustics, Inc. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above exclusions and limitation may not apply to you.

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