VMDA-SUM8

(Document P/N **821649** Rev-**A**)

Analog/Digital Summing Audio Monitor

with Eight Analog Inputs on DB-25, Eight AES/EBU Inputs
on Four BNC, 8-Channels summed to Mono or Stereo,
Eight Volume Controls, Eight Digital/Analog switches,
Stereo Speakers, Power LED, and Headphone Jack

User Manual

CONTENTS

Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched, particularly at plugs convenience receptacles and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) Do not expose this apparatus to rain or moisture.
16) The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

CAUTION!

In products featuring an audio amplifier and speakers, the surface at the side of the unit, where the audio amplifier heat sink is internally attached, may get very hot after extended operation. When operating the unit excercise caution when touching this surface and ensure that external materials which may be adversely affected by heat are not in contact with it. There is a Hot Surface label (see diagram) attached to the aforementioned surface of the product.

Introduction

Congratulations on your selection of a Wohler Technologies product. We are confident it represents the best performance and value available, and we guarantee your satisfaction with it.

If you have questions or comments you may contact us at:

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Section 1

General Features and Specifications

Description

Features

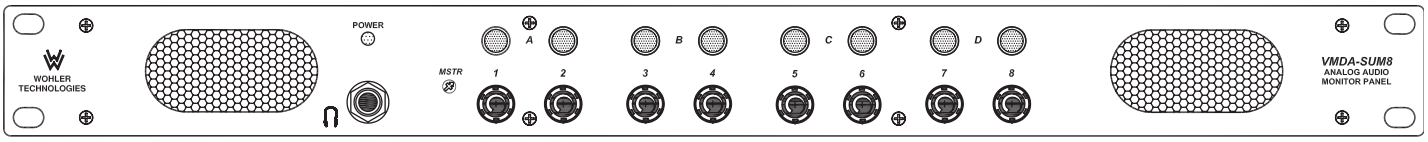
Applications

General Specifications

Installation

VMDA-SUM8

Analog/Digital Summing Audio Monitor



VMDA-SUM8 Front Panel

Description

The **VMDA-SUM8** analog/digital summing audio monitor provides self-powered, stereo or monaural monitoring in a single (1U) industry standard rack-space mount with a depth of only 4.5 inches. A total of eight monaural or four stereo channels may be summed together and monitored from the two speakers on the front panel. The user may select either digital AES/EBU or standard analog audio input sources for each of the eight input channels to be monitored.

The unit may be configured for stereo (four stereo channels) or monaural (eight mono channels) operation by setting an internal jumper. In stereo mode, input channels 1, 3, 5, and 7 are summed to the left speaker and channels 2, 4, 6, and 8 are summed to the right speaker. In mono mode all eight channels are summed monaurally across both speaker channels. Eight volume controls on the front panel allow seperate adjustment of each channel in the summing mix and a recessed trim pot on the front panel serves as a master volume control for all eight selected channels. The front panel also features a power indication LED and headphone output jack.

The rear panel features the analog inputs on a DB-25 connector and the AES digital inputs on four female BNC connectors. Termination is selectable for each of the four digital inputs. The unit is powered by an included external power supply.

Features

- Eight channels summed together and monitored simultaneously through two speakers
- Seperate volume control for each of the eight channels
- Master volume control trim-pot
- Selectable stereo (chan. 1,3,5,7 from left and chan.2, 4, 6, 8 from right) or mono operation
- Selectable analog or AES/EBU digital inputs for each of eight input channels
- LED indication of input signal type (digital or analog)
- LED indication of digital input signal lock status
- Analog inputs on a DB-25 connector
- Digital inputs on four female BNC connectors
- Termination select for each digital input connector
- Gain calibration adjustment of digital input signal pairs
- Headphone output jack
- Fits in a 1U standard 19" rack space with a depth of only 4.5"
- Minimal power dissipation for a low operating temperature
- Low power consumption
- Power indication LED
- External power supply

Applications

The **VMDA-SUM8** unit is ideally suited for use in VTR bays, mobile production vehicles, teleconferencing installations, multimedia systems, satellite links and cable TV facilities, and on-air radio studios. Designed and manufactured in the U.S., the **VMDA-SUM8** is backed by a strong warranty and a satisfaction guaranteed return policy.

General Specifications

AES/EBU Inputs:	Four unbalanced inputs on BNC
Digital Input Termination:	75 Ohms
Digital Input Sampling Rate:	Auto detection between 32 - 96 kHz
Digital Input Level for Full Output:	-20 dBfs
Analog Inputs:	Eight balanced inputs on DB-25
Analog Input Impedance:	100K ohms balanced
Analog Input Level for Full Output:	0 dBv
Hum and Noise:	Better than -70 dB below full output
Electrical Distortion:	<0.3% below limiting threshold
Acoustical Frequency Response:	300 Hz to 10k Hz (+/- 6 dB)
Acoustical Distortion:	Typically <2% at operating levels below limiting threshold, 300 Hz to 10k Hz
Peak Acoustical Output:	@ 2 feet 80 dB SPL
Power:	External 24 volt supply, 100 to 240 VAC, 50/60 Hz, CE and UL approved
Power Consumption:	45 Watts
Dimensions:	1.75 x 19 x 4.5 inches
Weight:	6.8 lbs.
Magnetic Shielding:	<2 gauss any adjacent surface

Units are designed to meet, at time of manufacture, all currently applicable product safety and EMC requirements, such as those of CE. Features and specifications subject to improvement without notice.

Installation

Mounting

The unit should be mounted where convenient for operating persons, ideally at approximately ear level for best high frequency response. Its superior magnetic shielding eliminates concerns about locating it adjacent to most types of CRT monitors, including even high-resolution color monitors.

Heat Dissipation

Heat dissipated by the speaker amps is conducted directly to the left side of the chassis; no special considerations for cooling are necessary as long as the ambient temperature inside the rack area does not exceed approximately 40°C (104°F).

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.), in the rack may be serious enough to interfere with the unit's sound quality out in the listening area. The use of thin card stock and/or felt or foam weather-stripping type materials between adjacent vibrating surfaces, or tying up loose cables, etc., may be required to stop vibrations external to the unit.

Mechanical Bracing

The chassis is securely attached to the front panel at eight points along its surface, not just at the four corners of the chassis ears. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Audio Connections

Connection of the audio feeds is straightforward. Please refer to the system interconnect block diagram on page **15** for clarification of the general signal paths into and out of the **VMDA-SUM8** unit.

Care should be exercised to avoid mismatched cable types and other similar causes of undesired reflections in RF signal systems.

Electrical Interference

As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry common is connected to the chassis.

AC Power

The units AC mains connection is via an external 24V power supply connected between the unit and mains power. The external 24V power supply is a self-resetting sealed type, with automatic over-voltage and over-current shutdown. There is no user-replaceable fuse in either the primary or secondary circuit of this power supply.

Section 2

Operation

Front Panel Features

Rear Panel Features

Front Panel Features

Please refer to **Figure-2a** on the facing page to familiarize yourself with the front panel features of the **VMDA-SUM8** unit. The following sections describe these functions and are referenced, by number, to **Figure-2a**.

1 Speaker (Left and Right)

The **VMDA-SUM8** internal speaker system is comprised of two mid-range speakers capable of stereo or mono reproduction.

2 Headphone output Connector

Select the headphone audio sources as you would for the internal speakers. When you plug in headphones, the speakers will mute. This jack accepts a standard 1/4" phone type stereo plug.

3 Power LED

This LED glows GREEN to indicate that the mains powered external 24V power supply is connected to the power connector (**Item B**, page **10**) on the rear panel.

4 Master Volume Control

Turning this recessed trim-pot clock-wise increases the volume of the entire mix; when turned counter-clockwise it is decreased. Note that this control comes *after* the mix as set by the individual **Input Source Volume Controls** (**Item 5**), so that the volume balance between channels (the mix) is maintained throughout master volume adjustment. Factory setting is full volume.

5 Input Source Volume Control (1-8)

Each of these volume controls affects the loudness of only the selected audio source for the channel it is associated with (**1-8**). Channel numbers are silk-screened above each control. When the unit is set for **mono** operation, all channels are summed together (at their respective levels) monaurally across both speakers. When set for **stereo** operation the *left* speaker reproduces the mix of channels **1**, **3**, **5**, and **7** and the *right* speaker reproduces the mix of channels **2**, **4**, **6**, and **8**. Mono or stereo operation is selected by placing the 4-wire audio harness on one of two headers internal to the unit. See page **14** for setting instructions.

Note that the **Input Source Volume Controls** are positioned so that when operating the unit in **stereo** mode, the volume controls for channels **1/2**, **3/4**, **5/6**, **7/8** are arranged in four left/right pairs. These pairs also correspond to the **AES** input channel pair designations of **A**, **B**, **C**, and **D**.

Digital Gain Calibration for each of the eight **AES** audio source channels is adjustable, allowing calibation relative to the **analog** input levels. Digital gain calibration is accomplished by adjusting eight trim-pots internal to the unit. Digital gain calibration is factory set at **-20 dBfs** digital to **+4 dBu** analog for all eight channels. See page **14** for setting instructions.

A **Mute on Data** feature is available allowing the unit to mute any of the four **AES** inputs when a datastream (i.e. DOLBY) is detected at the **AES** input. Factory setting is for this feature to be activated. See page **14** for setting instructions.

The unit may be configured (with internal jumpers) to mute the **AES** input(s) and indicate an error (**A/D Input Select Button** glows RED on front panel) when a **set validity bit** is detected at the input(s). Factory setting is for this feature to *not* be activated. See page **14** for setting instructions.

6 A/D Input Select Buttons and AES Input/Lock Indication LEDs (1-8)

Each of these buttons is used to select the source signal for the associated channel. Channel numbers are silk-screened below each button. Each button features an integrated bi-color LED (GREEN/RED) used for button status indication. When an **analog** source is selected, the button is unlit. When a *locked* **AES** source is selected the button glows GREEN. When the selected **AES** source is *unlocked*, the button will glow RED. Refer to the chart below for button LED indication.

Selected Source	Button LED Indication
Analog	Button unlit
AES (Locked)	Button glows GREEN
AES (Unlocked)	Button glows RED

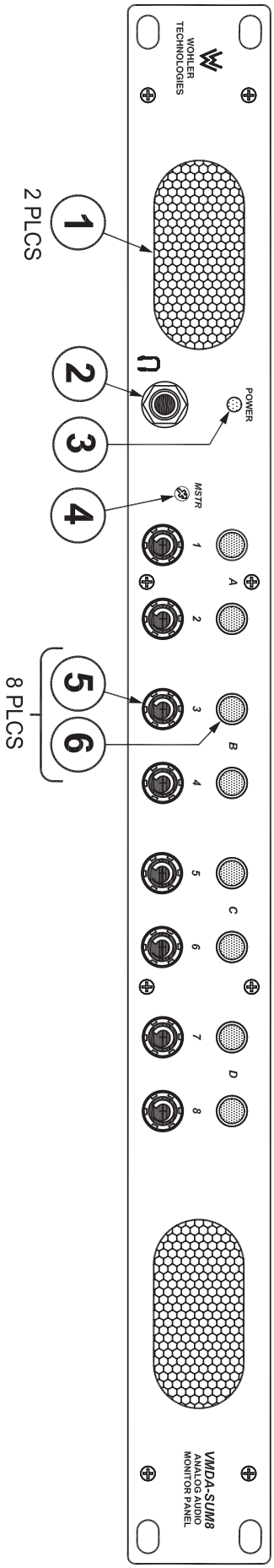


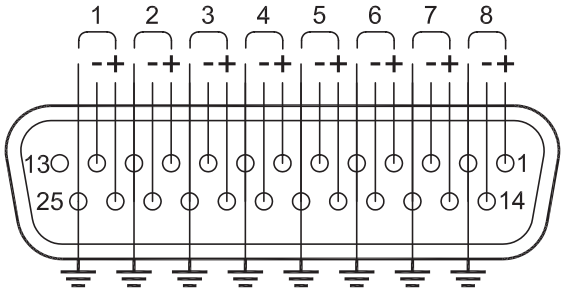
Figure-2a: Front Panel Features

Rear Panel Features

Please refer to **Figure-2b** on the facing page to familiarize yourself with the rear panel features of the **VMDA-SUM8** unit. The following sections describe these features and are referenced, by letter, to **Figure-2b**.

A Analog Input Connector

This DB-25 connector accepts eight channels of standard analog audio signals and is configured for balanced 100k Ohm impedance connections. For channel and pin-out information of this connector, refer to the diagram below or to the silk-screened diagram at the *right* of rear panel.



B Power Connector

Attach the included external 24V power supply between this connector and mains power connector. The Power LED on the front panel (**Item 3**, page **8**) will glow GREEN to indicate operating voltages are present. For polarity orientation, refer to the silk-screened diagram to the *right* of the connector.

C AES Input Connector (A-D)

These four female BNC connectors accept two channels each (eight channels total) of **AES/EBU** digital audio signals and are configured for unbalanced **75 Ohm** impedance connections. These input connectors are referred to as **A**, **B**, **C**, and **D** from left to right (see silk-screened diagram at *left* of rear panel). Each of the inputs provides the following channels:

Input **A** - Channels **1/2**
Input **B** - Channels **3/4**
Input **C** - Channels **5/6**
Input **D** - Channels **7/8**

D AES Input Termination Select Switch (A-D)

These two 2-position DIP switch modules allow termination selection for each of the four **AES** inputs (**Item C**). Each switch affects the connector to which it is closest. If an input is connected to downsream equipment, remove its termination by placing the associated switch in the *up* (**OFF**) position. If *not* connected, apply termination by placing its switch in the *down* (**ON**) position. For settings, you can also refer to the diagram silk-screened to the *left* of the AES input connectors.

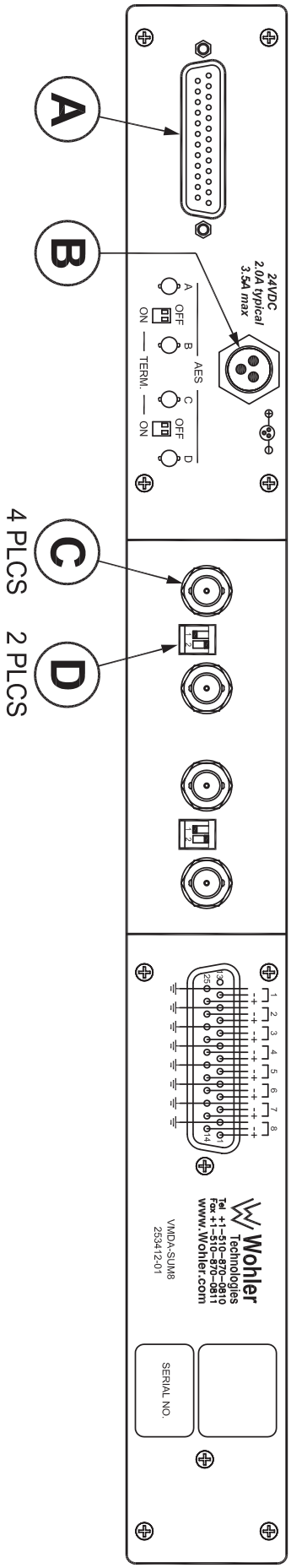


Figure-2b: Rear Panel Features

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Section 3

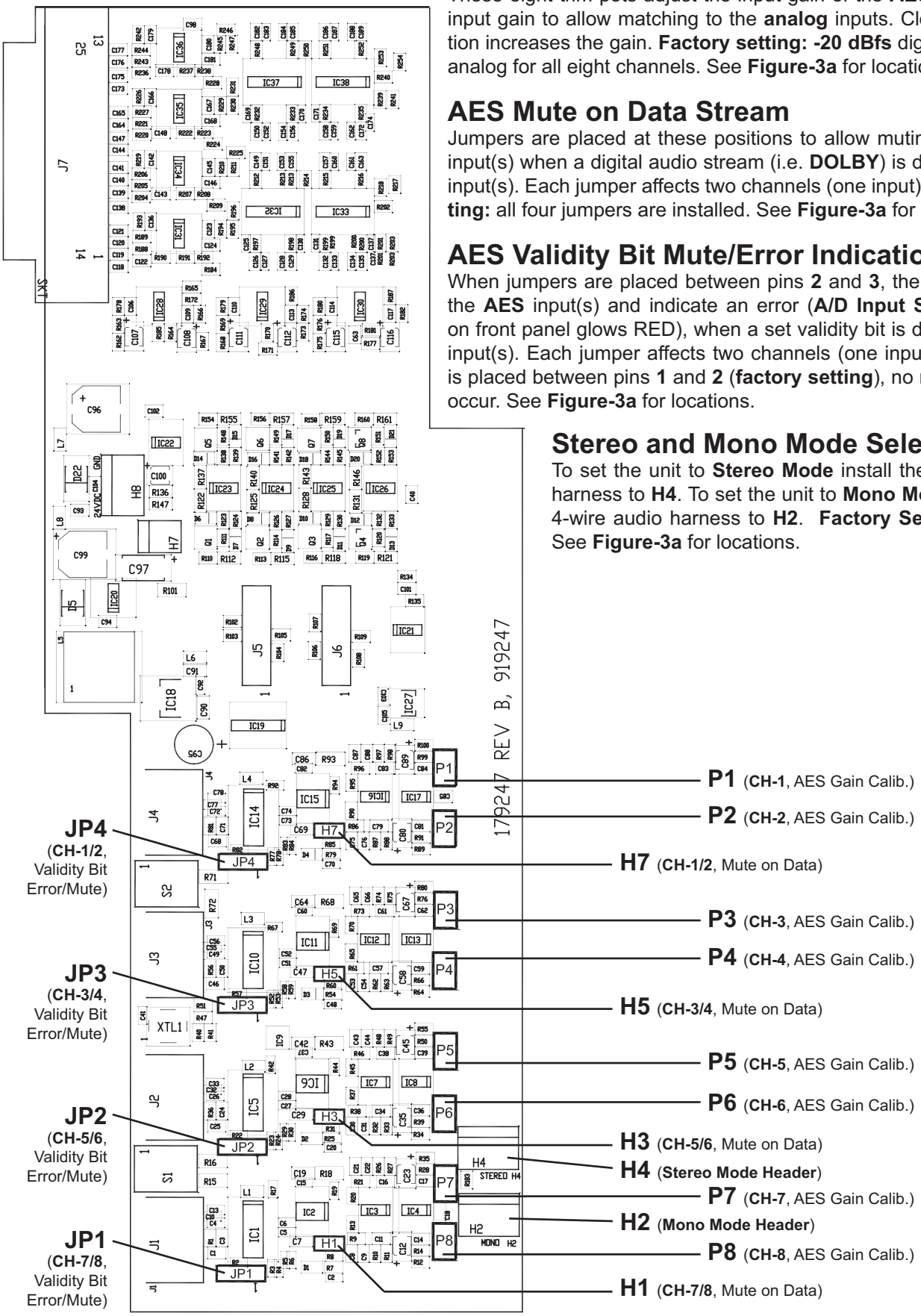
Technical Information

Gain Calibration, Mute on Data, V-Bit Error/Mute, and Mono/Stereo Settings

VMDA-SUM8 Inconnect Block Diagram

Gain Calibration, Mute on Data, V-Bit Error/Mute, and Stereo/Mono Settings

Figure-3a:
SUM8 Main PCB



AES Input Gain Calibration Adjustment

These eight trim pots adjust the input gain of the **AES** digital audio input gain to allow matching to the **analog** inputs. Clock-wise rotation increases the gain. **Factory setting: -20 dBfs** digital to **+4 dBu** analog for all eight channels. See **Figure-3a** for locations.

AES Mute on Data Stream

Jumpers are placed at these positions to allow muting of the **AES** input(s) when a digital audio stream (i.e. **DOLBY**) is detected at the input(s). Each jumper affects two channels (one input). **Factory setting:** all four jumpers are installed. See **Figure-3a** for locations.

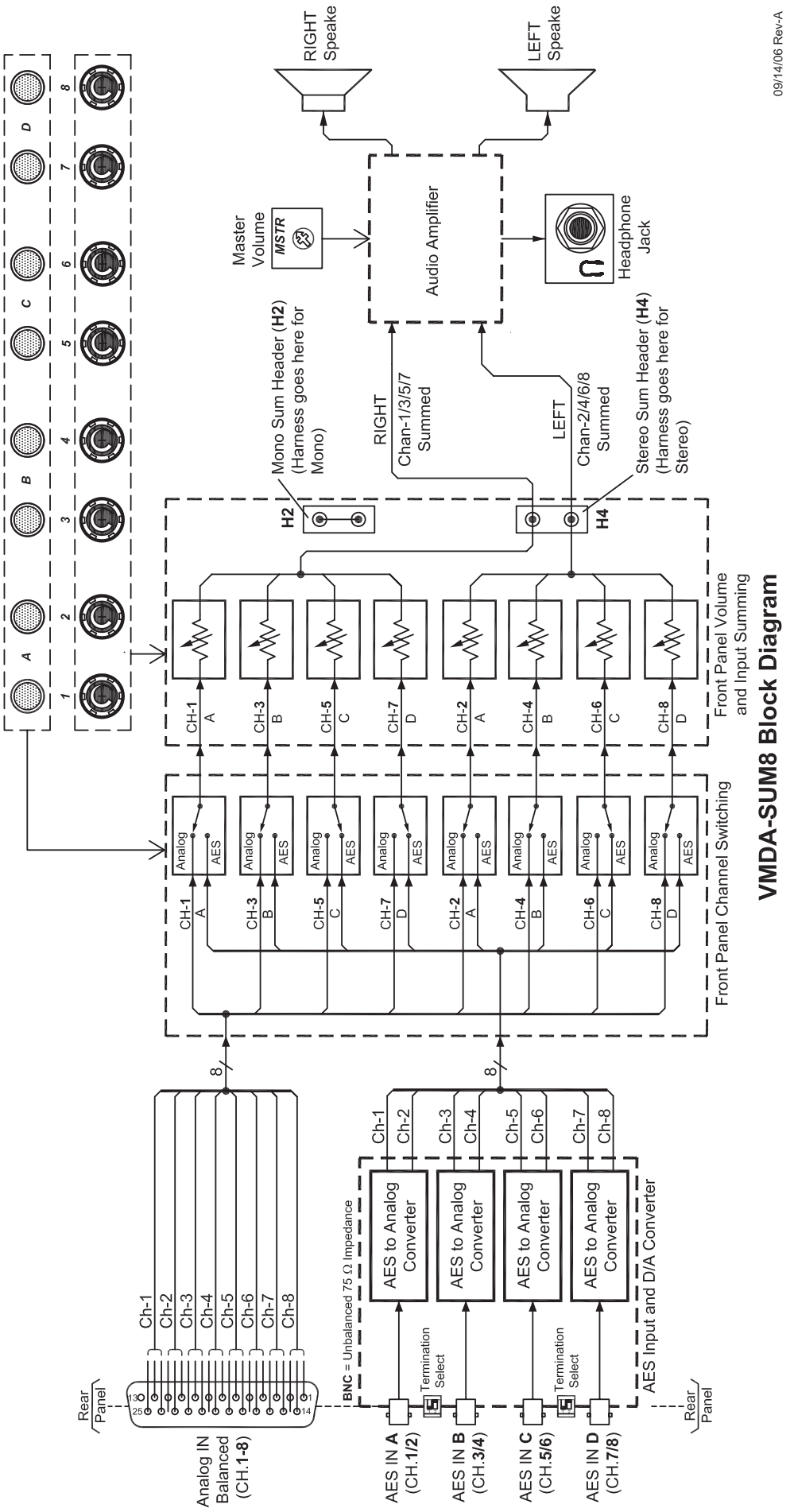
AES Validity Bit Mute/Error Indication

When jumpers are placed between pins **2** and **3**, the unit will mute the **AES** input(s) and indicate an error (**A/D Input Select Button** on front panel glows RED), when a set validity bit is detected at the input(s). Each jumper affects two channels (one input). If a jumper is placed between pins **1** and **2** (**factory setting**), no mute/error will occur. See **Figure-3a** for locations.

Stereo and Mono Mode Selection

To set the unit to **Stereo Mode** install the 4-wire audio harness to **H4**. To set the unit to **Mono Mode** install the 4-wire audio harness to **H2**. **Factory Setting:** Stereo. See **Figure-3a** for locations.

VMDA-SUM8 Interconnect Block-Diagram



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