Ross Video Limited

MUX-8552A(-C)

AES/EBU Embedder/Multiplexer

User Manual

ROSS

Cool Practical Technology™

MUX-8552A • AES/EBU Embedder/Multiplexer User Manual

- Ross Part Number: **8552ADR-004**
- Document Issue: **01**
- Printed in Canada.

The information contained in this User Manual is subject to change without notice or obligation.

Copyright

Notice

Trademarks

Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the "Important Safety Instructions" listed below so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these Specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning
The symbol with the word **"Warning"** within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

Caution
The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Notice
The symbol with the word "**Notice**" within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.

ESD Susceptibility
This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions

Caution
This product is intended to be a component product of the RossGear 8000A series frame. Refer to the RossGear 8000A series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as it's component products.

Warning
Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.

Warning
Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Notice

Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numerique de classe "A" est conforme à la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.

Notice

This is a Class A product. In domestic environments this product may cause radio interference in which case the user may have to take adequate measures.

Maintenance/User Serviceable Parts

Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. Refer to the section, "**Warranty and Repair Policy**" in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.
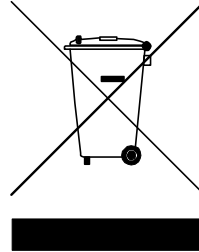
If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

Contents

Service Information 6-1

Ordering Information 7-1

Introduction

In This Chapter

This chapter contains the following sections:

- A Word of Thanks
- MUX-8552A Overview
- MUX-8552A-C Overview
- Features
- Functional Block Diagram
- Documentation Terms

A Word of Thanks

Congratulations on purchasing the Ross Video **MUX-8552A**, **AES/EBU Embedder/Multiplexer**. The MUX-8552A family is part of a full line of RossGear Digital products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new MUX-8552A fits into your overall working environment. Equally pleasing is the product quality, reliability, and functionality. Thank you for joining the ever-growing group of worldwide satisfied Ross Video customers!

We recommend that you read the sections in this User Manual that are relevant to your particular card(s) before installation. In this way you will ensure its proper integration into your facility and maximize the features and functionality of the card.

This manual provides installation and operational instructions for both the MUX-8552A and the MUX-8552A-C versions. Should you have a question pertaining to the operation of your MUX-8552A or MUX-8552A-C, please contact us at the numbers listed on the back cover of this publication. Our technical support staff is always available for consultation, training, or service.

MUX-8552A Overview

The RossGear MUX-8552A AES/EBU Embedder/Multiplexer is a broadcast quality modular product used to write 20-bit AES audio streams (SMPTE 272M-A) to a 525 or 625 standard 270MB/s SDI video signal. The MUX-8552A will embed two 48kHz AES-3id streams (1 group) and output two copies of the embedded SDI signal. The RossGear MUX-8552A is for use in 75-ohm coaxial SMPTE 276M and AES-3id systems.

An SDI signal and 1 or 2 AES-3id signals are input through BNC connectors on the rear of the frame. The MUX-8552A accepts both 525 and 625 format (SMPTE 259M-C) signals at 270Mb/s. Visual indicators on the card edge provide indication of the presence of SDI and AES inputs. The MUX-8552A provides automatic equalization for 300m of Belden 8281 cable. Two SDI outputs are provided.

The MUX-8552A can embed one AES group into any one of the four AES groups available. The group to be embedded is selected via a card edge jumper. Front panel LED's provide information on which groups are already present in the incoming SDI stream. The ability to overwrite an incoming group is available through jumper selection. The MUX-8552A has been designed with the ability to report a variety of AES signal errors including: no lock, biphase coding, parity, CRC check, sample slip, and validity errors. These errors are indicated on a card edge (Error) LED. In addition, there is SMPTE 269M fault reporting output to the backplane of the Ross digital rack frame.

The MUX-8552A is also available as the MUX-8552A-C version. The C version comes pre-assembled from the factory with the AAM-8552A A/D daughter card, and the CON-8552 companion rear connector module, which provides four balanced analog audio inputs instead of the AES digital audio inputs.

The MUX-8552A fits into the Ross DFR-8110A or DFR-8104A digital frames. It provides system builders the ability to easily distribute embedded digital audio in an SDI facility. The MUX-8552A is part of a growing line of RossGear AES solutions, including distribution, conversion and monitoring. The MUX-8552A also fits Leitch[*] 6800 series frames.

Designed and manufactured to meet the highest quality broadcast industry standards, the RossGear MUX-8552A is an ideal, cost effective solution for digital audio embedding.

MUX-8552A-C Overview

The RossGear MUX-8552A-C version, which comprises the MUX-8552A, the AAM-8552A (daughter card), and the companion CON-8552 (connector adapter), is a broadcast quality modular product used to allow four analog audio inputs to be embedded into a 525 or 625 SDI stream. The AAM-8552A is a sub-module daughter card that plugs onto the top of the MUX-8552A RossGear AES multiplexer card. The CON-8552 is a plug-on connector to the BNC module that connects to the rear of the Ross DFR-8110A or DFR-8104A digital frame.

The AAM-8552A uses state of the art analog to digital converters that provide 24-bit resolution. A coarse level adjustment (headroom) jumper (18dB or 24dB) and fine adjustment potentiometers (+/-3dB, one for each channel) on the AAM-8552A, are provided to precisely match the converter to your facility's house reference audio level.

The AAM-8552A / CON-8552 is part of a growing line of RossGear AES solutions, including distribution, conversion and monitoring. Designed and manufactured to meet the highest quality broadcast industry standards, the RossGear MUX-8552A / AAM-8552A / CON-8552 is an ideal, cost effective solution for digital and analog audio multiplexing requirements in your facility.

---

[*] Leitch is a trademark of Leitch Technology Corporation

Features

The **MUX-8552A AES/EBU Embedder/Multiplexer** is part of a full line of RossGear digital and analog distribution products engineered to satisfy the highest quality broadcast standards and the most demanding requirements of your facility. The following features make the **MUX-8552A** the most versatile AES/EBU Embedder/Multiplexer card for your professional audio-video requirements:

MUX-8552A Features

- Compliance with SMPTE 272M-A 48kHz 20-bit
- Automatic 525/625 format detection
- AES synchronization
- AES sample rate conversion
- Jumper selectable EDH insertion
- Auto cable equalization for 300m of Belden 8281
- Visual indication of signal presence
- Visual indication of an error condition
- Visual indication of AES groups present
- SMPTE fault reporting in accordance with SMPTE 269M
- Conformity to AES-3id 1995
- Two SDI video outputs
- 5-year warranty
- Compatible with Ross 8100 series and Leitch 6800 series frames

MUX-8552A-C Features

- AAM-8552A daughter card
  - Compliance with SMPTE 272M-A 48kHz 20-bit AES/EBU audio
  - 24-bit ADC resolution
  - Selectable maximum input level from +15dBu to +27dBu
  - $\pm$ 0.05 dB frequency response 20 Hz to 22 kHz
  - 5-year warranty
- CON-8552 analog audio input adaptor
  - 2 balanced analog stereo input channels
  - 5-year warranty
  - Compatible with Ross DFR-8110A-C and DFR-8104A-C frames

Functional Block Diagram
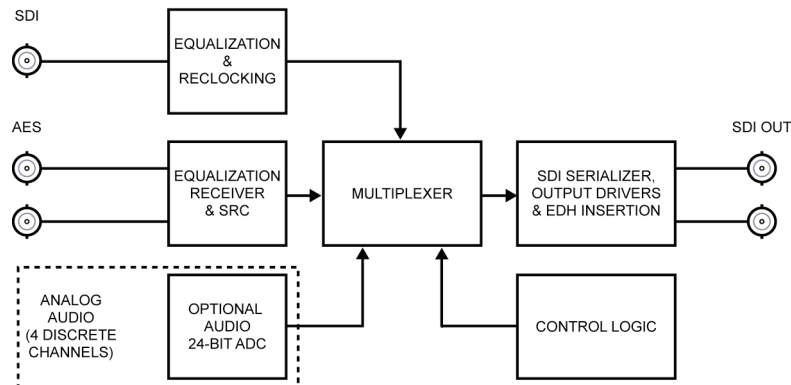
Figure 1. Simplified Block Diagram of MUX-8552A(-C)

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the **DFR-8104A** and **DFR-8110A** frames that house the **MUX-8552A** card.

- All references to the **DFR-8104A** and **DFR-8110A** also include the **DFR-8104A-C** and **DFR-8110A-C** versions with the cooling fan option. See the respective User Manuals for details.

- "**Operator**" and "**User**" both refer to the person who uses the **MUX-8552A**.

- "**Board**", "**Card**", and "**Module**" all refer to the **MUX-8552A** board itself, including all components and switches.

- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in which the **MUX-8552A** operates.

- "**525-line mode**" refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.

- "**625-line mode**" refers to broadcast situations using **PAL-B** composite (analog) signal reference inputs. All references to **PAL** in this manual imply that **PAL-B** is being used.

Installation and Setup

In This Chapter

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Board Installation
- BNC Labels
- MUX-8552A Cable Connections
- MUX-8552A-C Cable Connections

Static Discharge

Whenever handling the MUX-8552A and other related equipment, please observe all static discharge precautions as described in the following note:

ESD Susceptibility

> Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Unpacking

Unpack each MUX-8552A from the shipping container and check the contents to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Board Installation

Note the following points when installing the configured MUX-8552A card in a RossGear 8000 or 8000A series digital distribution frame:

⚠️ **Notice**

The MUX-8552A-C card configuration must be installed in a Ross Video 8000A series digital distribution frame with a cooling module option installed.

- Refer to the User Manual of the RossGear 8000 or 8000A series frame, to ensure that the frame is properly installed according to instructions. If this module is to be installed in any compatible frame other than a Ross Video product, refer to the manual that came with your frame, for specific instructions.

- Please note that heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using convection cooling.

- After selecting the desired frame installation slot, hold the MUX-8552A card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plug is properly seated.

BNC Labels

Affix the supplied BNC label, as per the included instructions, to the BNC area on the rear of the rack frame.

MUX-8552A Cable Connections

The following section provides instructions for cable connections when mounting the MUX-8552A in a RossGear 8000 or 8000A series Digital Distribution Frame. If this card is installed in a compatible distribution frame other than a Ross frame, note that the cable designations may vary.

Use the diagram below to attach the required BNC cables such as the SDI input and output, AES input and output streams.
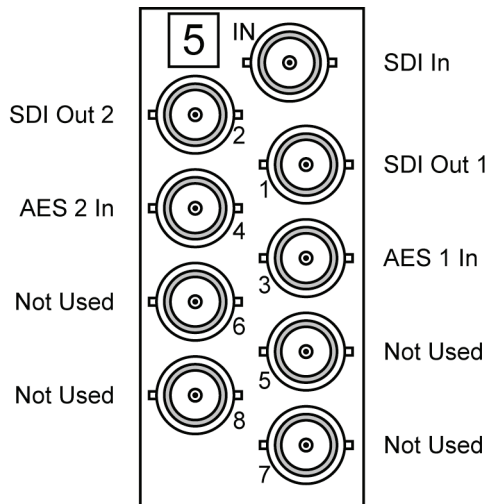
Figure 2. MUX-8552A BNC Designations for RossGear DFR-8110A (2RU frame)

AES Input

The MUX-8552A can accommodate two synchronous AES-3id input streams at 48 kHz or any asynchronous AES stream from 20kHz to 103kHz with sample rate conversion (SRC) enabled. SRC should only be used with PCM (Pulse Code mOdulate) digiatal audio and not any form of conpression ie. Dolby.

MUX-8552A-C Cable Connections

The following section provides instructions for cable connections when mounting the MUX-8552A-C in a RossGear 8000 or 8000A series Digital Distribution Frame.

Use the diagram below for guidelines to:

- install the CON-8552 rear audio sub module onto the back of the Ross digital rack frame.

- attach the required SDI input and output BNC cables.
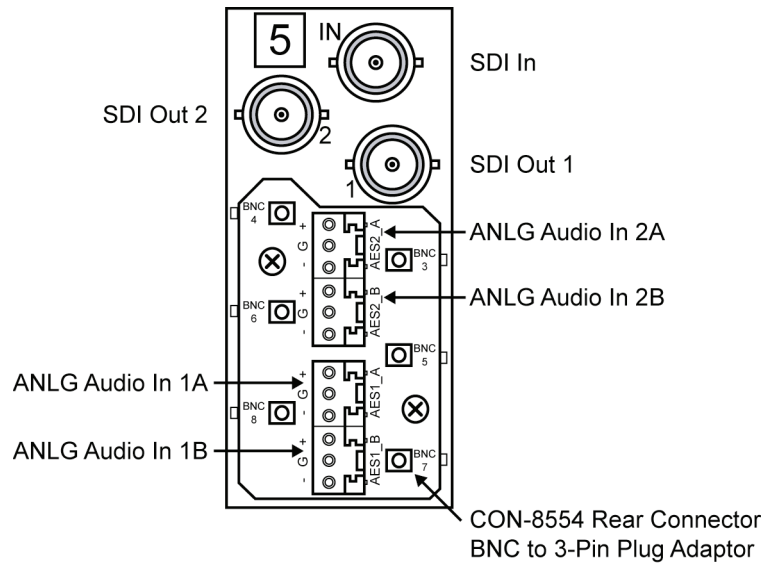
Figure 3. MUX-8552A-C BNC Designations for RossGear DFR-8110A (2RU frame)

Analog Cables

On the CON-8552 adapter, there are removable connectors for sockets Analog Audio IN- 1A, 1B, 2A, and 2B. Each connector has sockets for the positive, negative, and grounded wires of a balanced analog audio cable.

Wire the external cables to the terminal block connectors as outlined in the diagram and procedure below.
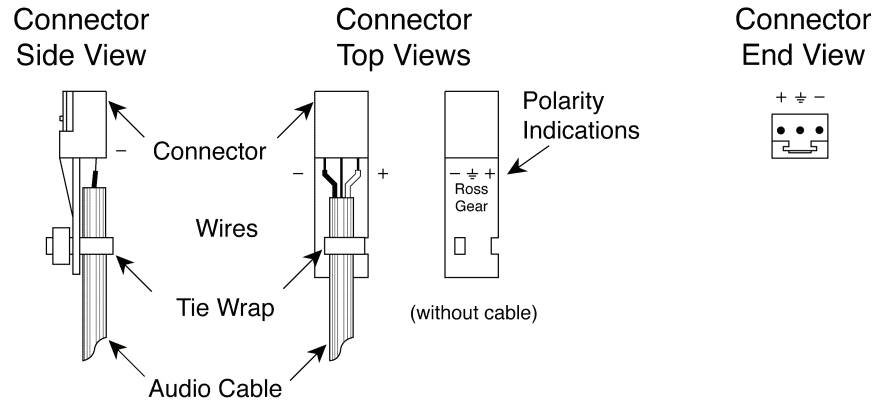
Figure 4. Connector Wiring for CON-8552 Input Sockets

Use the following procedure to wire the external cables to the terminal block connectors:

1. Insert an analog audio wire to the designated polarity slot on the connector.
2. Use a tweaker screwdriver to tighten the corresponding screw on the underside of the connector.
3. Repeat steps 1 and 2 for each wire on each connector.

Once the cables have been wired to the connectors, install the connectors to the sockets on the CON-8552 adapter so that the slotted tongue fits in the grooves on the adapter socket.

User Controls

In This Chapter

This chapter contains the following sections:

- MUX-8552A Jumper Locations
- MUX-8554A-C Jumper Locations
- MUX-8552A-C Gain Adjustment
- LEDs

MUX-8552A Jumper Locations

Use the following information to set jumpers based on your configuration requirements.

Figure 5. MUX-8552A Jumper Locations

Analog/AES Audio – JP7, JP8, JP10

Select **AES** on **JP7**, **JP8**, and **JP10** if the input is to be AES digital audio. The default is **AES**.

Group Select – JP11

Select the incoming AES group to embed: group **1, 2, 3,** or **4** via **JP11**. The default is **1**.

Overwrite – JP9

Select Overwrite **ON** or **OFF** via **JP9**, to allow the destructive overwrite of the selected AES group.

- **ON** — Overwrites the existing audio group. The default is **ON**.

- **OFF** — If there is pre-existing audio on the **JP11** selected group, the card will allow that audio to pass unaltered and will not insert audio. If there is no pre-existing audio on the **JP11** selected group, the card will insert new audio.

EDH Insertion – JP6

Select the EDH Insertion, **ON** or **OFF**, via **JP6**. The default is **ON**.

SMPTE Fault Reporting – JP3

Select SMPTE 269M Fault Reporting, **EN**ABLED or **DIS**ABLED, via **JP3**. The default is **EN**.
Refer to Chapter 3, "**SMPTE 269M Fault Reporting**", in this manual, for details on fault reporting.

SRC Select – JP1

Select SRC **ON** or **OFF**, via **JP1**, to enable the Sample Rate conversion. Select **ON** to enable the MUX-8552A to automatically synchronize and convert to 48kHz any AES input from 20kHz to 103kHz. The default is **ON**.

MUX-8552A-C Jumper Locations

Use the following information to set jumpers based on your configuration requirements.
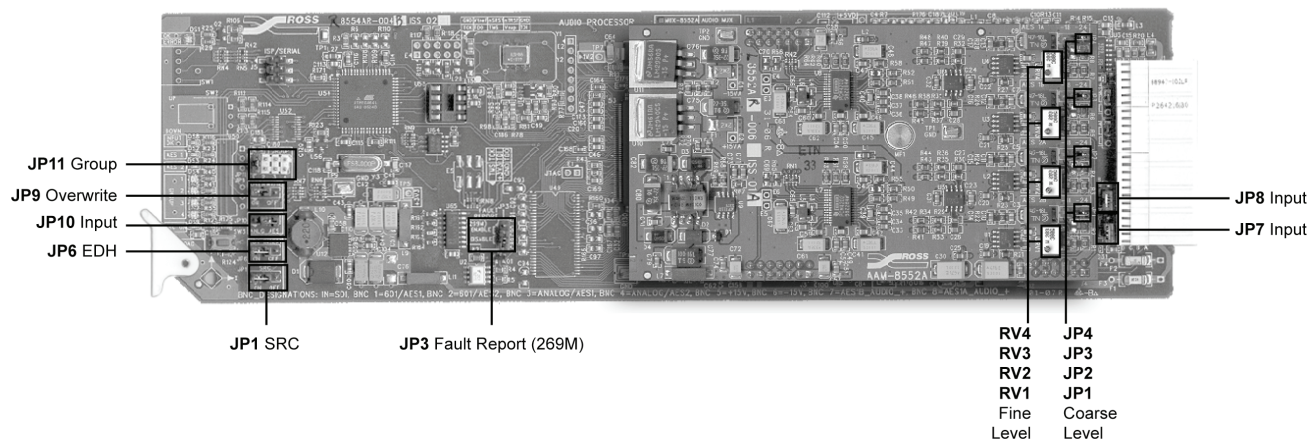
Figure 6. MUX-8552A-C Jumper Locations
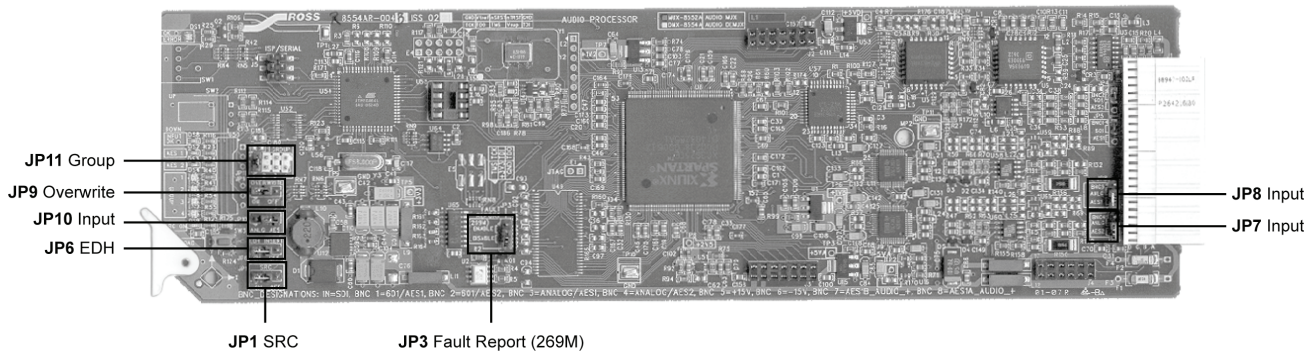
Analog/AES Audio – JP7, JP8, JP10

On the MUX-8552A card, select **ANALOG** on **JP7**, **JP8**, and **JP10** if the input is to be analog audio. Note that you must have the AAM-8552A and CON-8552 installed to input four analog audio channels instead of two AES digital audio channels into the MUX. The default is **ANALOG**.

Group Select – JP11

Select the AES group to embed: group **1**, **2**, **3**, or **4** via **JP11**. The default is **1**.

Overwrite – JP9

Select Overwrite **ON** or **OFF** via **JP9**, to allow the destructive overwrite of the selected AES group.

- **ON** – Overwrites the existing audio group. The default is **ON**.

- **OFF** – If there is pre-existing audio on the **JP11** selected group, the card will allow that audio to pass unaltered and will not insert audio. If there is no pre-existing audio on the **JP11** selected group, the card will insert new audio.

Analog Input Levels – JP1, JP2, JP3, JP4

On the AAM-8552A daughter card, select the coarse analog audio input headroom level (**-18** or **-24**dB) for each channel using **JP1**, **JP2**, **JP3**, and **JP4**. The default is **–24dB**.

EDH Insertion – JP6

On the MUX-8552A card, select the EDH Insertion, **ON** or **OFF**, via **JP6**. The default is **ON**.

SMPTE Fault Reporting – JP3

On the MUX-8552A card, select SMPTE 269M Fault Reporting, **EN**ABLED or **DIS**ABLED, via **JP3**. The default is **EN**. Refer to Chapter 3, "**SMPTE 269M Fault Reporting**" in this manual, for details on fault reporting.

MUX-8552A-C Gain Adjustment

If necessary, use a tweaker screwdriver to adjust the fine analog audio input levels for each channel on the AAM-8552A. See Figure 6 for potentiometer locations. The potentiometer assignments are:

- **RV4** for **AES1A**
- **RV3** for **AES1B**
- **RV2** for **AES2A**
- **RV1** for **AES2B**

These potentiometers provide 9dB range of adjustment on the –18dBFS jumper setting and a 6dB range of adjustment on the –24dBFS jumper setting. Using these adjustments, the total headroom is adjustable over the –15 to –27dBFS range.

Note

All fine levels are factory set for unity gain and should not need adjusting.

An extender card is required (EXT-8100) to adjust potentiometer settings. Refer to the section, "**Optional Equipment**" in this manual, for details.

LEDs

When all jumper and cabling configuration is complete, apply the SDI video input signal. The group LEDs will indicate which groups have embedded audio.
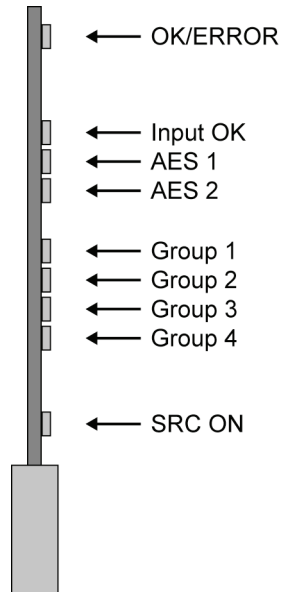

Figure 7. Card-edge LEDs

The front card edge has LEDs that display the status of input signals. The LED displays are described in the preceding figure and the following table:

Table 1. Status LED Descriptions

LED	Color	Display and Description
INPUT OK	Green	When lit, this LED indicates presence of a valid SDI input signal.
AES 1	Green	When lit, this LED: • Indicates presence of a valid AES input signal • Shows that the incoming signal is sampled at 48kHz When flashing, and the ERROR LED is also flashing, this LED indicates there is a problem with the AES 1 input signal. The AES input stream will continue to be embedded. However, one of the following problems has been encountered: a. **CRC Error** – There is an error in the CRC calculation b. **Validity** – The integrity of the AES input signal is in question c. **Sample Slip** – The AES sample is repeated/dropped due to improper timing d. **Coding** – Bi-phase coding violation e. **Parity Error** – There was a parity error f. **No Valid AES Input** g. **Rate Error** – The Sample Rate does not equal 48kHz When not lit, this LED indicates that there is no AES signal present.
AES 2	Green	When lit, this LED: • Indicates presence of a valid AES input signal • Shows that the incoming signal is sampled at 48kHz When flashing, and the ERROR LED is also flashing, this LED indicates there is a problem with the AES 2 input signal. The AES input stream will continue to be embedded. However, one of the following problems has been encountered: a. **CRC Error** – There is an error in the CRC calculation b. **Validity** – The integrity of the AES input signal is in question c. **Sample Slip** – The AES sample is repeated/dropped due to improper timing d. **Coding** – Bi-phase coding violation e. **Parity Error** – There was a parity error f. **No Valid AES Input** g. **Rate Error** – The Sample Rate does not equal 48kHz When not lit, this LED indicates that there is no AES signal present.
ERROR/OK	Green	When lit green, this LED indicates there is a valid audio and vido input signal(s) and the card is configured properly.
	Red	When lit red, this LED indicates one or more of the following errors: • Indicates AES is selected on jumper **JP10**, but neither AES input signal is present or valid. • Indicates no valid SDI input, or card not locked to SDI input. When flashing red, this LED indicates that group select jumper **JP11** is set to overwrite pre-existing audio on the selected AES group without jumper **JP7** being set to overwrite.

LED	Color	Display and Description
ERROR/OK	Flashing Red/Green	When flashing red and green, this LED indicates an AES problem is detected, and audio will still be embedded.
GROUP 1	Green	When lit green, this LED indicates that audio is being embedded on Group 1 where there is no pre-existing audio.
	Yellow	When lit yellow, this LED indicates the presence of Group 1in the SDI output of the card.
	Flashing Yellow/Green	When flashing yellow and green, this LED indicates that the pre-existing audio group is being overwritten.
GROUP 2	Green	When lit green, this LED indicates that audio is being embedded on Group 2 where there is no pre-existing audio.
	Yellow	When lit yellow, this LED indicates the presence of Group 2 in the SDI output of the card.
	Flashing Yellow/Green	When flashing yellow and green, this LED indicates that the pre-existing audio group is being overwritten.
GROUP 3	Green	When lit green, this LED indicates that audio is being embedded on Group 3 where there is no pre-existing audio.
	Yellow	When lit yellow, this LED indicates the presence of Group 3 in the SDI output of the card.
	Flashing Yellow/Green	When flashing yellow and green, this LED indicates that the pre-existing audio group is being overwritten.
GROUP 4	Green	When lit green, this LED indicates that audio is being embedded on Group 4 where there is no pre-existing audio.
	Yellow	When lit yellow, this LED indicates the presence of Group 4 in the SDI output of the card.
	Flashing Yellow/Green	When flashing yellow and green, this LED indicates that the pre-existing audio group is being overwritten.
SRC ON	Yellow	When lit, this LED indicates that jumper **JP1-SRC Select** is set to **ON** and the audio input is AES.

SMPTE 269M Fault Reporting

In This Chapter

This chapter contains the following sections:

- Overview

- Jumper Setup

- Frame Connections

- Details

Overview

The SMPTE 269M Fault Reporting system, also known as an SMPTE "alarm", provides indication if one or more frame modules encounter a fault or an abnormal condition. The MUX-8552A module provides a jumper to enable SMPTE 269M fault reporting. The card connects by means of an internal interface circuit to an auxiliary telco connector on RossGear 8000 and 8000A series frames. When the frame connection is interfaced with a customer-designed system of LEDs or audible alarms, faults can be traced to a specific frame when a card fault occurs within that frame.

The following diagram illustrates a general arrangement for SMPTE 269M alarm reporting:
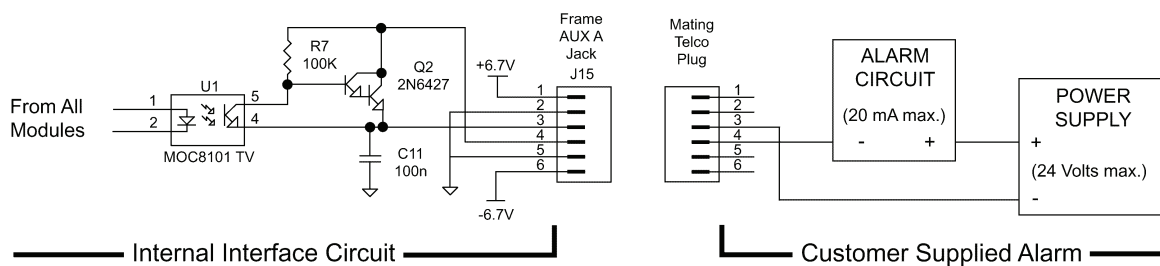

Figure 8. SMPTE 269M Alarm Reporting: Internal interface and typical connections

Jumper Setup

If fault reporting for the MUX-8552A is desired, use main card jumper **JP3 - 269M FAULT REPORT** to set up the card.

1. To access the jumper, remove the card from the frame by pressing down the white card ejector tab and pulling the card from the frame slot.
2. Observing all static discharge and handling precautions, place the card, with the components side facing up, on a clean flat surface.
3. To enable SMPTE fault reporting, set jumper **JP3** to the **ENABLE** position.
4. To disable SMPTE fault reporting, set jumper **JP3** to the **DISABLE** position.

Refer to Figure 5 "**MUX-8552A Jumper Locations**", for jumper location details.

Frame Connections

The SMPTE 269M Fault Reporting connection on RossGear 8000 series frames is provided by the auxiliary telco connector, **AUX A**, for interfacing with a customer-designed alarm system.

AUX A Connector for SMPTE 269M Fault Reporting
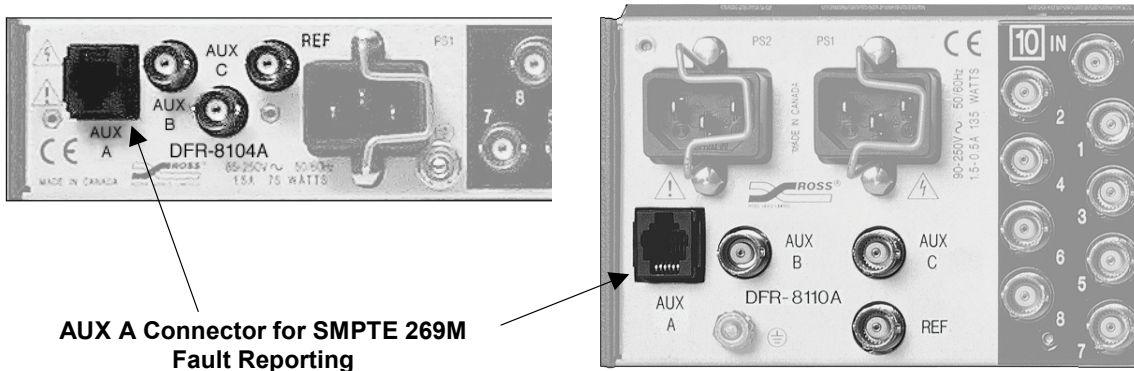
Figure 9. SMPTE 269M Alarm Reporting Frame Connections

Details

The fault report contacts are closed when the card detects an internal failure or a power loss condition. The fault report will pulse off for 1 to 2 ms about every 16ms if the SDI video input signal is missing, or if both AES signals are missing.

Some internal failures are:

- Failure of the card to initialize
- Failure in the fault reporting circuitry
- Failure to detect a valid video input signal to the card
- Failure to detect a valid AES input signal to the card with AES selected on **JP10**

For additional information on alarm system design, refer to the SMPTE document "***ANSI/SMPTE 269M – 1999***".

Specifications

In This Chapter

This chapter contains the following sections:

- MUX-8552A Technical Specifications

- AAM-8552A Technical Specifications

- Channel Status Data Table for Analog Mode

- Channel Status Data for AES Mode

MUX-8552A Technical Specifications

Table 2. MUX-8552A Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1 SMPTE 259M-C 270Mb/s
	Input Impedance	75Ω
	Connector	BNC
	Equalization	Automatic, up to 300m (1000') Belden 8281 cable
	Input Return Loss	>18dB to 270MHz
SDI Output	Number of Outputs	2 SMPTE 259M-C 270Mb/s
	Connector	BNC
	Output Impedance	75Ω
	Return Loss	>18dB to 270MHz
	Electrical Path Length	563 ns
	Rise / Fall Time	400-1000ps (20% - 80% amplitude)
	DC Offset	>50mV
	Signal Level	800mV, ± 10%
	Overshoot	<10%
AES Input	Number of Inputs	2 AES-3id (1 group)
	Connector	BNC
	Output Impedance	75Ω
	Input Resolution	20 bits
	Minimum Input	100mV p-p
	Maximum Input	2.5V p-p
	Sampling Rate	48kHz compliant with SMPTE 272M-A or any rate from 20kHz to 103kHz with SRC on
Environmental	Operating Range	5 °C – 40 °C ambient
Power Consumption	MUX-8552A (main board only)	3.3W
	MUX-8552A-C (main board and AAM-8552A and CON-8552)	6.6W

Specifications are subject to change without notice.

AAM-8552A Technical Specifications

Table 3. AAM-8552A Technical Specifications

Category	Parameter	Specification
Analog Audio Input	Number of Inputs	4 via CON-8552
	Connector	3-Pin Plug to BNC CON-8552 Adaptor Module
	Input Impedance	>20KΩ
	Maximum Input Level	+27dBu into 20kΩ
Performance	Input Level Range	+15 to +27dBu continuously variable via jumper and 12 turn pot
	Frequency Response	±0.05dB 22Hz - 20kHz @ Fs = 48kHz
	Signal to Noise Ratio	101dB 102dB 'A' weighted 108dB CCITT weighting 22Hz - 20kHz AES 17 filter @ 48kHz -20dBFS
	THD	>100dB @ -60dBFS
	IMD	<0.003% (-90dB) @ -20dBFS SMPTE/DIN two-tone test
	Phase Linearity	1.2º @ 20kHz
	Amplitude Linearity	0.6dB @ -100dBFS
	Crosstalk	-100dB
	Reference Levels	Headroom -27dBFS to -15dBFS
User-set Parameters	Headroom Select	24dB or 18dB
	Gain Adjustment	±3dB
Environmental	Operating Range	5 °C – 40 °C ambient

Specifications are subject to change without notice.

Channel Status Data Table for Analog Mode

The following table indicates the channel status bit information when in Analog Mode or when SRC is set to **ON**.

Table 4. Channel Status Data

Byte	Bit	Function	Transmitted
0	0	Professional or Consumer use of Channel Status Block	Professional (1)
	1	Normal Audio or Non-Audio Mode	Normal Audio (0)
	2-4	Emphasis	No Emphasis (100)
	5	Source Sampling Rate	Locked (0)
	6-7	Sampling Rate	48kHz (01)
1	0-3	Channel Mode	2 channel stereo (0001)
	4-7	User Bit Mode	192-bit (0001)
2	0-2	Auxiliary Bit Usage	20-bit audio sample, Aux bits undefined (000)
	3-5	Sample Word Length	20- or 24-bits (101)
	6-7	Alignment Level	Not Indicated (00)
3	0-7	Multichannel Modes	Undefined (0)
4	0-7	AES 11 Sync Reference	Not a Reference (0)
5	0-7	Reserved	Unused (0)
6-9		ASCII Source ID	Unused (0)
10-13		ASCII Destination ID	Unused (0)
14-17		Local Sample Address	Unused (0)
18-21		Time of Day	Unused (0)
22	0-7	C data reliability	Reliable (0)
23	0-7	CRC	Calculated CRC

Channel Status Data for AES Mode

In AES Mode with SRC set to **OFF**, channel status and user bits come from the AES input stream and are embedded as they are received.

Service Information

In This Chapter

This chapter contains:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance of this RossGear product is not required. In the event of problems with your MUX-8552A, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your Ross Video products distributor, or Ross Video Technical Support department at the numbers listed under the "Contact Us" section at the end of this manual.

1. **Visual Review –** Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, the frame, and any associated peripheral equipment for signs of trouble.

2. **Power Check –** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.

3. **Reseat the Card in the Frame** – Eject the card and reinsert it in the frame.

4. **Check Control Settings –** Refer to the Installation and Operation sections of the manual and verify all user-component settings.

5. **Input Signal Status –** Verify that source equipment is operating correctly and that a valid signal is being supplied.

6. **Output Signal Path –** Verify that destination equipment is operating correctly and receiving a valid signal.

7. **Module Exchange** – Exchanging a suspect module with a module that is known to be working correctly is an efficient method for localizing problems to individual modules.

Warranty and Repair Policy

The RossGear MUX-8552A is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your RossGear MUX-8552A proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this RossGear MUX-8552A has failed after your warranty period has expired, we will repair your defective product for as long as suitable replacement components are available. You, the owner, will bear any labor and/or component costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This RossGear AES/EBU Embedder/Multiplexer User Manual provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the RossGear MUX-8552A are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your RossGear MUX-8552A, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your RossGear MUX-8552A. A temporary replacement module, if required, will be made available at a nominal charge. Any shipping costs incurred, will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited, will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of this equipment.

Ordering Information

In This Chapter

This chapter contains ordering information for the MUX-8552A and related products.

MUX-8552A and Related Products

Standard Equipment

- **MUX-8552A**, AES/EBU Embedder/Multiplexer
- **MUX-8552A-C**, AES/EBU Embedder/Multiplexer with Analog Inputs
  (AAM-8552A daughter-card and CON-8552 4-channel analog audio adaptor)
- **8552ADR-004**, AES/EBU Embedder/Multiplexer User Manual

Optional Equipment

- **8552ADR-004**, AES/EBU Embedder/Multiplexer User Manual (additional)
- **DFR-8104A** Digital Products Frame and Power Supply (PS-8102)
  (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8104A-C** Digital Products Frame with Cooling Fan Module
  and Power Supply (PS-8102)
  (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8110A** Digital Products Frame and Power Supply (PS-8102)
  (2RU, holds 10 modules, includes 1 power supply)
- **DFR-8110A-C** Digital Products Frame with Cooling Fan Module
  and Power Supply (PS-8102)
  (2RU, holds 10 modules, includes 1 power supply)
- **EXT-8100** Extender Board
  (module servicing extension)

Your **MUX-8552A, AES/EBU Embedder/Multiplexer** is a part of the RossGear family of products. Ross Video offers a full line of RossGear terminal equipment including distribution, conversion, monitoring, synchronizers, encoders, decoders, AES, keyers, switches, as well as analog audio and video products**.**

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

PHONE	**General Business Office and Technical Support**	613 • 652 • 4886
	After-hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	**General Information**	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	**Ross Video Limited**	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

Visit Us

Please visit us at our website for:

- Company information
- Related products and full product lines
- On-line catalog
- Trade show information
- News
- Testimonials

www.rossvideo.com