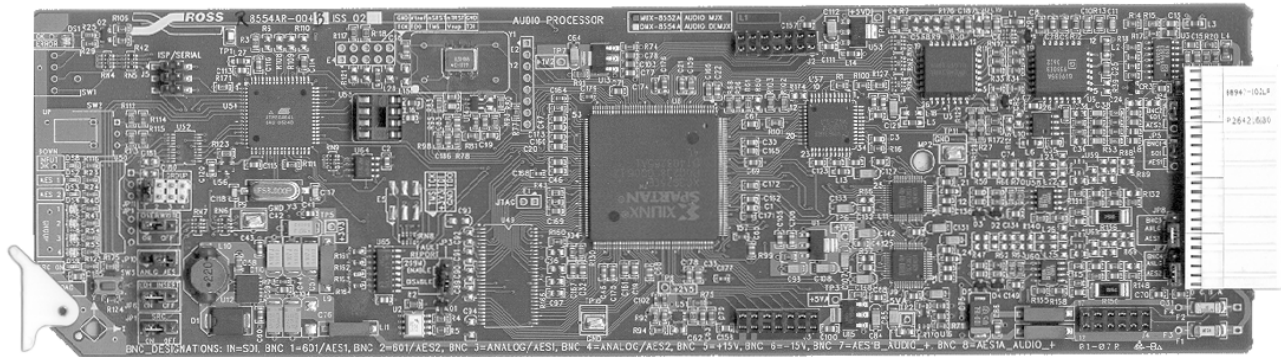


MUX-8552A(-C)

AES/EBU Embedder/Multiplexer

User Manual



Ross Part Number: 8552ADR-004

Issue: 01

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

- Ross Part Number: **8552ADR-004**
- Document Issue: **01**
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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 numérique 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

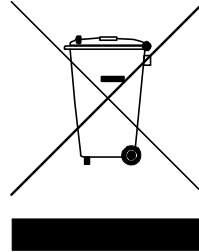
Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products 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.



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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 embedder. 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 AES3id and SMPTE 276M 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 305m 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 present in the outgoing SDI stream. The ability to overwrite an incoming group is available through jumper selection. The MUX-8552A can report a variety of AES signal errors including: no lock, biphasic 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 analog audio connector adapter. This 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 embed digital audio in an SDI facility. Designed and manufactured to meet the highest quality broadcast industry standards, the RossGear MUX-8552A is an ideal, cost effective solution for digital and analog audio multiplexing requirements in your facility.

The MUX-8552A also fits Leitch* 6800 series frames.

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 analog audio connector adapter is a broadcast quality modular product used to allow four analog audio channels to be embedded into a 525 or 625 SDI stream. The AAM-8552A is a daughter card that plugs onto the top of the MUX-8552A RossGear AES multiplexer card. The CON-8552 is a connector adaptor that attaches 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. Coarse level adjustment jumpers (18dB or 24dB) and fine adjustment potentiometers are provided to precisely match the converter to your facility's house reference audio level.

The MUX-8552A-C 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-C 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 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 input video format detection
- AES sample rate conversion
- Jumper selectable EDH insertion
- Auto cable equalization up to 305m 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 2001
- 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
 - 24-bit ADC resolution
 - Selectable maximum input level from -15dBu to -27dBu
 - ± 0.05 dB frequency response 20 Hz to 22 kHz
 - 5-year warranty
- CON-8552 analog audio connector adapter
 - 2 balanced analog stereo input channels
 - 5-year warranty
 - Compatible with Ross DFR-8110A-C and DFR-8104A-C frames

Functional Block Diagram

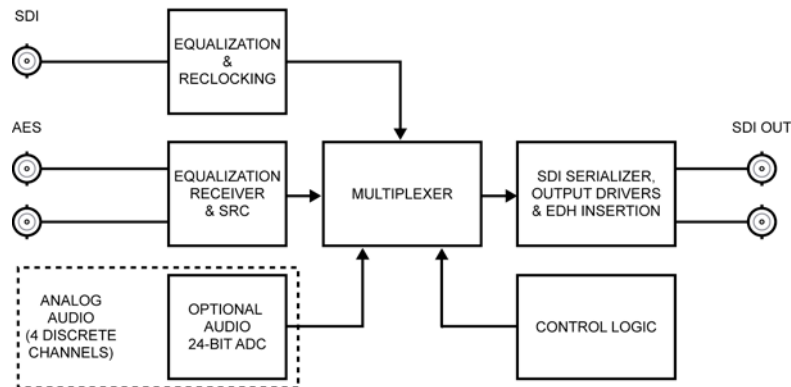


Figure 1. Simplified Block Diagram of MUX-8552A(-C)

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:



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:



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

This section provides instructions for connecting cables to the MUX-8552A when mounted in RossGear 8000 series Digital Products Frames. See the following frame rear panel diagram for BNC input and output designations:.

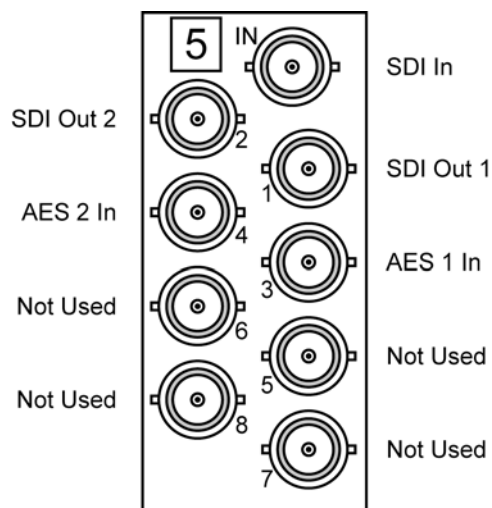


Figure 2. MUX-8552A BNC Designations for RossGear DFR-8110A (2RU frame)

AES Input

The MUX-8552A accommodates 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 Modulation) digital audio and not any form of compression, for example, 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 analog audio connector adapter onto the back of the Ross digital rack frame.
- attach the required SDI input and output BNC cables.

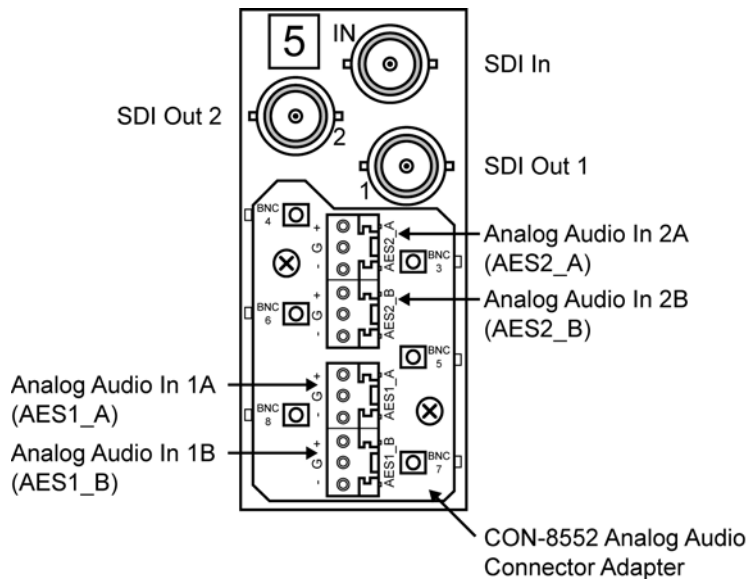


Figure 3. MUX-8552A-C BNC Designations for RossGear DFR-8110A (2RU frame)

Analog Cables

On the CON-8552 analog audio connector adapter, there are removable connectors for sockets Analog Audio IN- 1A, 1B, 2A, and 2B (labeled AES1_A, AES1_B, AES2_A, AES2_B on the adapter). Each connector has sockets for the positive, negative, and grounded wires of a balanced analog audio cable.

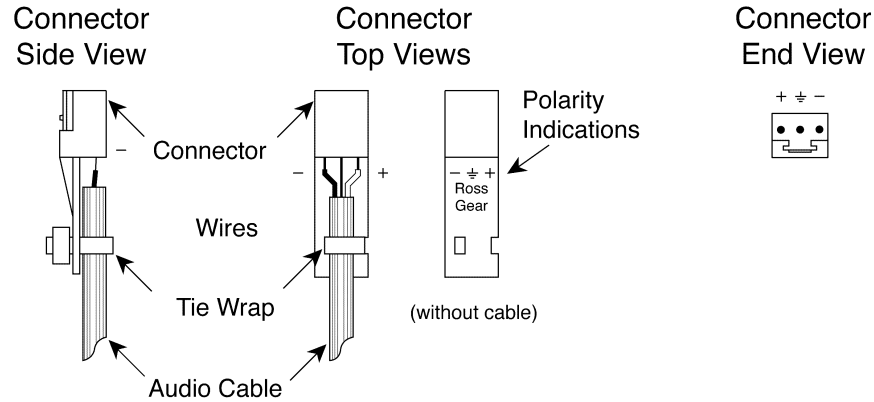


Figure 4. Connector Wiring for CON-8552 Analog Audio Connector Adapter Input Sockets

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 analog audio connector adapter.

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.

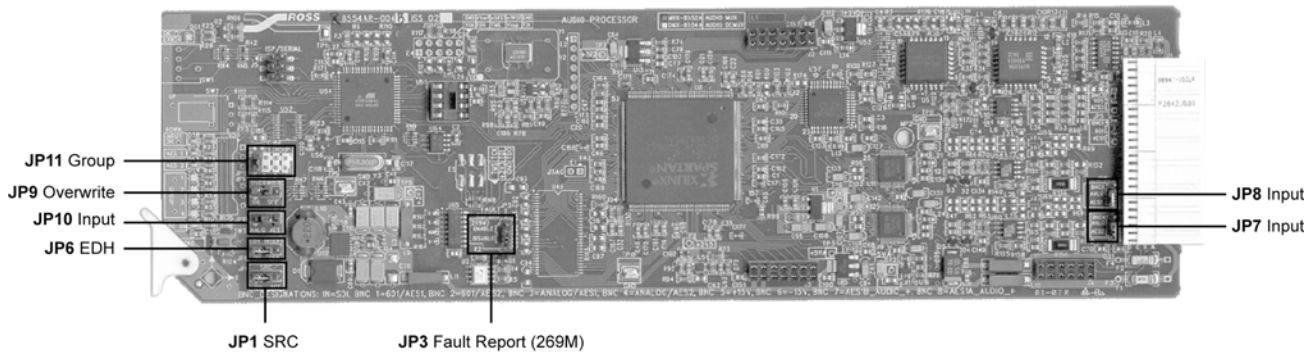


Figure 5. MUX-8552A Jumper Locations

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 complete overwrite of the selected AES group. The default is **ON**.

- **ON** — This enables the audio inputs to the MUX-8552 to completely overwrite existing embedded audio data present on the SDI input, for the selected group.
If no pre-existing audio data is embedded in the SDI video stream, the MUX-8552 will embed the audio to the selected group.
- **OFF** — If there is pre-existing audio on the **JP11** selected group, the card enables that audio to pass unaltered and does not insert audio.

If there is no pre-existing audio on the **JP11** selected group, the card inserts 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, **ENABLE** or **DISABLE**, via **JP3**. The default is **ENABLE**.

Refer to Chapter 4, “SMPTE 269M Fault Reporting” for information 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.

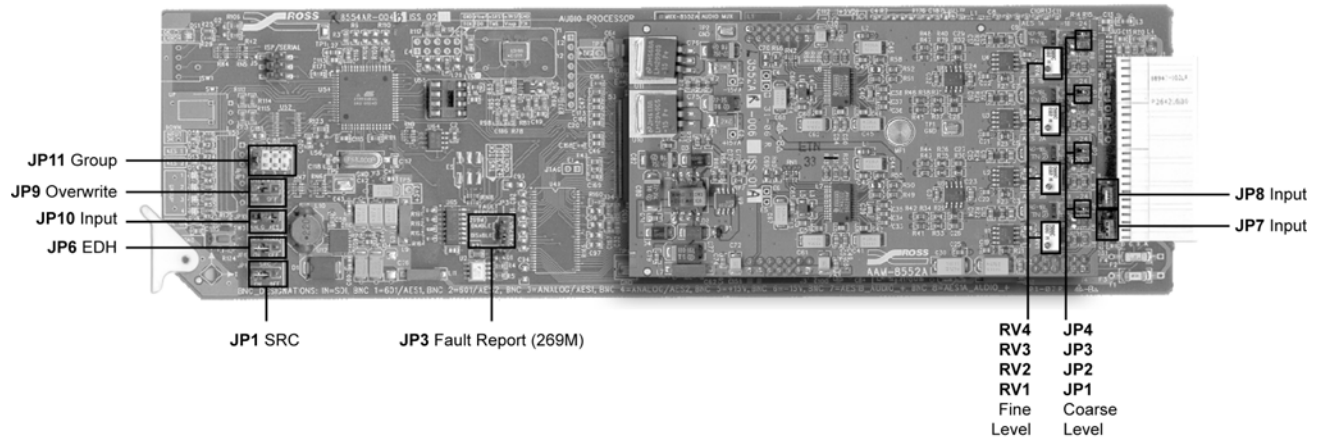


Figure 6. MUX-8552A-C Jumper Locations

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

On the MUX-8552A card, select the AES group to embed: group **1**, **2**, **3**, or **4** via **JP11**. The default is **1**.

Overwrite – JP9

On the MUX-8552A card, select Overwrite **ON** or **OFF** via **JP9**, to enable the complete overwrite of the selected AES group. The default is **ON**.

- **ON** — This enables the audio inputs to the MUX-8552 to completely overwrite existing embedded audio data present on the SDI input, for the selected group.
If no pre-existing audio data is embedded in the SDI video stream, the MUX-8552 embeds the audio to the selected group.
- **OFF** — If there is pre-existing audio on the **JP11** selected group, the card enables that audio to pass unaltered and does not insert audio.
If there is no pre-existing audio on the **JP11** selected group, the card inserts new audio.

Coarse Analog Input Levels – JP1, JP2, JP3, JP4

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

- **JP4** selects for AES1_A.
- **JP3** selects for AES2_A.
- **JP2** selects for AES1_B.
- **JP1** selects for AES2_B.

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, **ENABLE** or **DISABLE**, via **JP3**. The default is **ENABLE**.

Refer to Chapter 4, “**SMPTE 269M Fault Reporting**” 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 AES1_A
- **RV3** for AES1_B
- **RV2** for AES2_A
- **RV1** for AES2_B

These potentiometers provide a 7dB range of adjustment on the **-18dB** jumper setting and a 5dB range of adjustment on the **-24dB** 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 “**Optional Equipment**” section in this manual for details.

LEDs

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

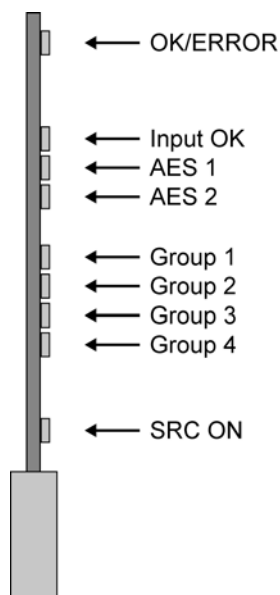


Figure 7. Card-edge LEDs

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
OK/ERROR	Green	When lit green, this LED indicates a valid audio and video input signal(s) and the card is configured properly.
	Red	When lit red, this LED indicates one or more of the following errors: <ul style="list-style-type: none"> 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.
	Flashing Red	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 JP9 being set to overwrite
	Flashing Red/Green	When flashing red and green, this LED indicates an AES problem is detected, and audio will still be embedded.

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: <ul style="list-style-type: none"> Indicates presence of a valid AES input signal Shows that the incoming signal is sampled at 48kHz
	Flashing Green	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: <ul style="list-style-type: none"> CRC Error – There is an error in the CRC calculation Validity – The integrity of the AES input signal is in question Sample Slip – The AES sample is repeated/dropped due to improper timing Coding – Bi-phase coding violation Parity Error – There was a parity error Rate Error – The Sample Rate does not equal 48kHz, and SRC is OFF.
	Off	When not lit, this LED indicates that there is no AES signal present.
AES 2	Green	When lit, this LED: <ul style="list-style-type: none"> Indicates presence of a valid AES input signal Shows that the incoming signal is sampled at 48kHz
	Flashing Green	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: <ul style="list-style-type: none"> CRC Error – There is an error in the CRC calculation Validity – The integrity of the AES input signal is in question Sample Slip – The AES sample is repeated/dropped due to improper timing Coding – Bi-phase coding violation Parity Error – There was a parity error Rate Error – The Sample Rate does not equal 48kHz, and SRC is OFF.
	Off	When not lit, this LED indicates that there is no AES signal present.
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 1 in the SDI output of the card.
	Flashing Yellow/Green	When flashing yellow and green, this LED indicates that the pre-existing audio in Group 1 is being overwritten.

LED	Color	Display and Description
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 in Group 2 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 in Group 3 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 in Group 4 is being overwritten.
SRC ON	Yellow	When lit, this LED indicates that sample rate conversion (SRC) is ON .

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:

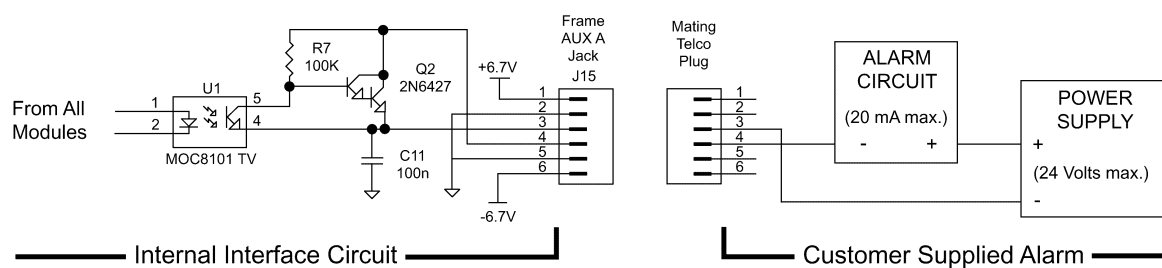


Figure 8. SMPTE 269M Alarm Reporting: Internal interface and typical connections

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.

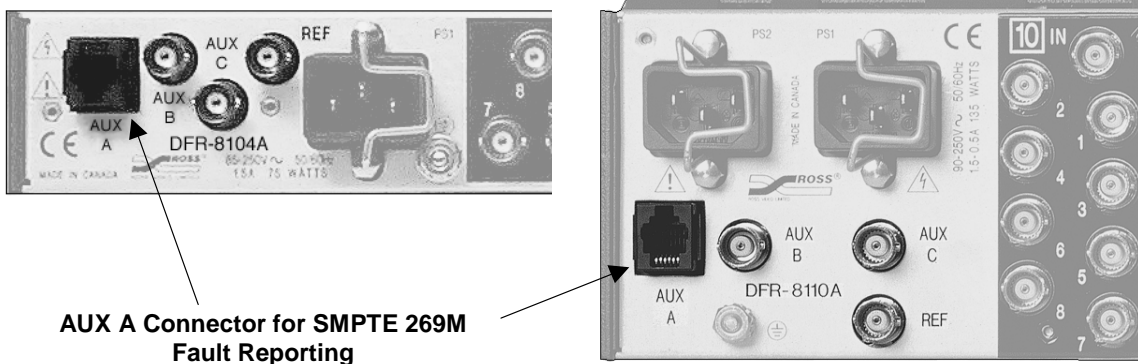


Figure 9. SMPTE 269M Alarm Reporting Frame Connections

Details

The fault report contacts are closed when the card detects an internal failure or a power loss condition. The fault report pulses 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**”.

Upgrades

In This Chapter

This chapter provides instructions to properly upgrade your MUX-8552A for the following:

- Software Upgrade
- Firmware Upgrade

This chapter contains the following sections:

- Equipment Supplied
- Upgrade Procedures

To order any MUX-8552A Upgrade kit, contact Ross Video Technical Support.

Equipment Supplied

- 1 MUX-8552A User Manual
- Required upgrade chip(s)

Upgrade Procedures

This section contains procedures for the following upgrade options:

- Chip Removal
- Software or Firmware Upgrade

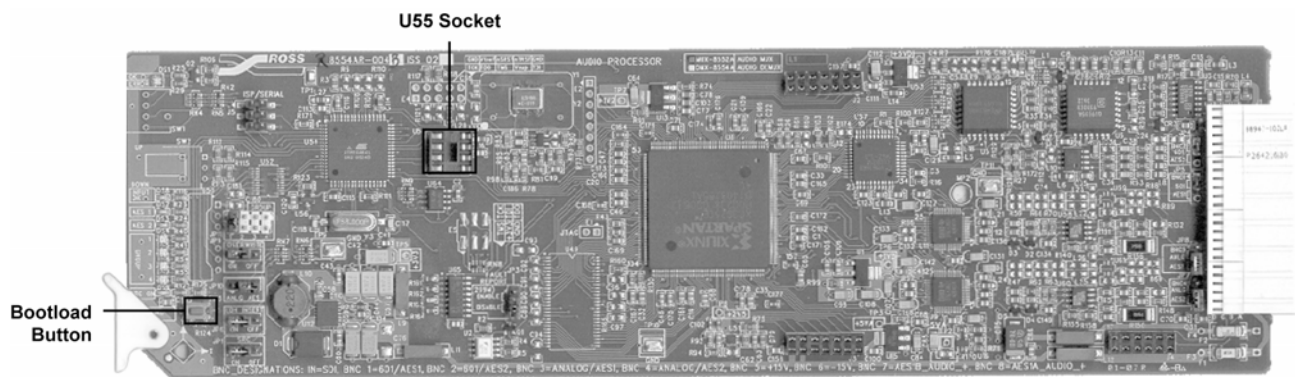


Figure 10 – MUX-8552A Upgrade Socket and Label Locations

Chip Removal

For all possible upgrades to the MUX-8552A use socket **U55**. If there is a chip already inserted into **U55**, remove it as in the following procedure:

1. With the card out of the frame, refer to Figure 10 and the card labeling to locate chip socket **U55**.
2. Use a tong-type IC chip removal tool (not supplied) to grab the chip by the unlegged ends and gently pry the chip out of the socket.
3. Store the chip in a labeled static free container.

Software or Firmware Upgrade

This procedure applies to any software or firmware upgrade you may perform on the MUX-8552A. If you are upgrading multiple cards, repeat this procedure for each card to be upgraded.

1. With the card out of the frame, refer to Figure 10 and the card labeling to locate the **U55** socket.
2. If the socket is occupied, complete the **Chip Removal** procedure.
3. Carefully remove the new chip from the packaging.
4. Align the new chip over the socket with the keyed sides together and the legs over the socket holes.
5. Gently and firmly press the chip into the socket.
6. Press the **Bootload** button while inserting the card into the powered frame and wait for the upgrade to start. Alternately, you can insert the card and power up the frame if it is off.

When the green **OK LED** starts flashing, the upgrade is in progress and you can release the **Bootload** button.

The **OK LED** flashes at various rates throughout the upgrade. The upgrade is done when the LED stops flashing.

7. Remove the card from the frame and complete the **Chip Removal** procedure on the previous page.

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 305m (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	920 ns
	Rise / Fall Time (20% - 80%)	750ps typical
	DC Offset	<50mV
	Signal Level	800mV, ± 10%
	Overshoot	<10%
AES Input	Number of Inputs	2 AES-3id (1 group)
	Connector	BNC
	Input 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 Analog Audio Connector Adapter
	Input Impedance	>20K Ω
	Maximum Input Level	+ 15 to +27dBu
Performance	Input Level Range	+15 to +27dBu
	Frequency Response	± 0.05 dB 22Hz - 20kHz @ Fs = 48kHz
	Signal to Noise Ratio	101dB 102dB 'A' weighted 107dB CCITT weighting
	THD	>100dB
	IMD	<0.003% (-90dB) @ -20dBFS SMPTE/DIN two-tone test
	Phase Linearity	1.2° @ 20kHz
	Amplitude Linearity	0.6dB @ -100dBFS
	Crosstalk	-100dB
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	0-1	Digital Audio Reference Signal	Not a Reference (0)
	2	Reserved	0
	3-6	Sampling Frequency	Not Indicated (0000)
	7	Sampling Frequency Scaling Flag	No Scaling (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

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.

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 analog audio connector adapter)
- **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)

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

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