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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Mar 01
1.1	Added information for 7702AR-2 and 7705AR-LTC-2 versions	July 01
1.2	Added information for 7705AR-LTC versions Corrected pinout of DB25 on 7705AR version	Aug 01
1.2.1	Corrected LED descriptions	Aug 01
1.3	LTC Output included in all units	Oct 01
1.4	Added information for 7705AR-8 version	Jul 02
1.4.1	Corrected LTC Out in Table 1 and updated laser warnings	Aug 05
1.4.2	Fixed typos and formatting	Nov 08

WARNING

Never look directly into an optical fiber. Non-reversible damage to the eye can occur in a matter of milliseconds.

1. OVERVIEW

The 7705AR series AES Audio Receiver Demultiplexors and 7705AT series AES Audio Transmitter Multiplexors provide an economical method of transmitting up to six AES audio signals (twelve mono), one RS-232/422 control signal, and Linear Time Code (LTC) or eight AES audio signals (sixteen mono) using a single wavelength on a fiber optic cable, with minimum latency. AES audio reclocking is provided on the 7705AR for jitter reduction. The 7705AR series modules are available in 3 different versions to meet a variety of applications. Two versions have six single-ended AES audio outputs, an LTC output and one uni-directional RS-232/422 output while the third has eight single-ended AES audio outputs.

Model	AES Audio Outputs		LTC Output	RS232/422	Slots
	Number	Connector			
7705AR	6	DB 25	1	1	1
7705AR-2	6	BNC	1	1	2
7705AR-8	8	DB 25	---	---	1

Features:

- Six channel versions have six single-ended AES audio outputs with one balanced linear time code output and uni-directional RS-232/422 data output
- Eight channel version has eight single-ended AES audio outputs
- Supports SMPTE compliant AES audio signals with 48KHz or 96KHz sampling rate
- Low channel latency for 7705AT/AR pair
- Provides reclocking on AES outputs
- Monitoring of AES audio via stereo head phone jack and pushbutton channel selector at card edge
- Supports multi-mode or single-mode fiber
- Fully hot-swappable from front of frame with no fiber or data channel disconnect required
- SC/PC, ST/PC or FC/PC connector options
- Card edge LEDS indicate module health, valid link, data error, AES channels present
- Tally output on Frame Status bus upon loss of input signal

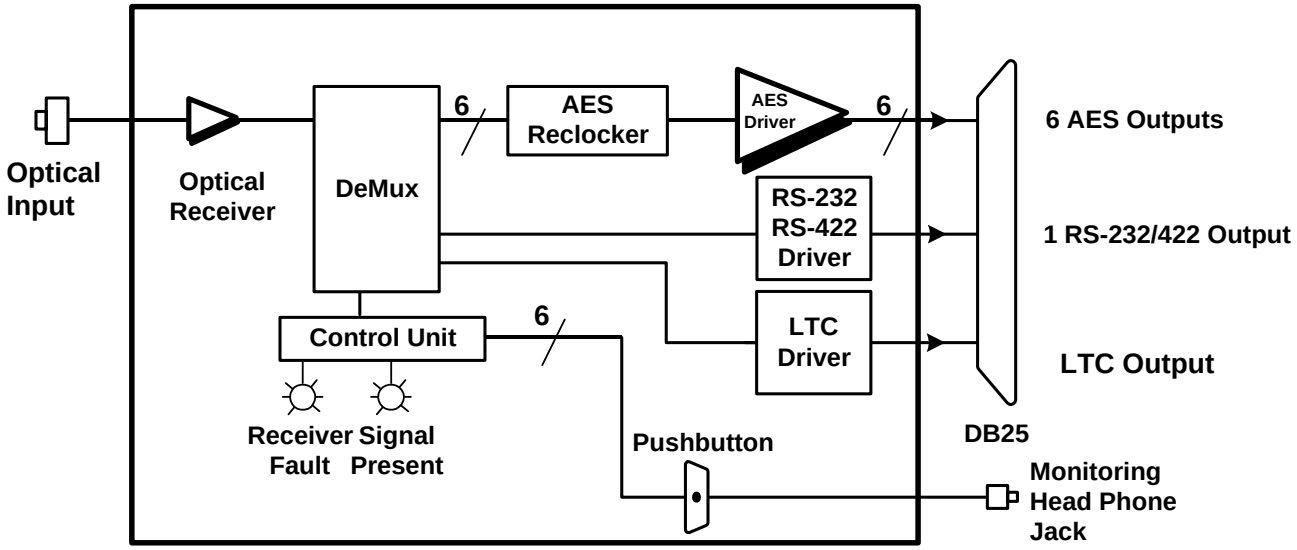

Figure 1-1: 7705AR Block Diagram

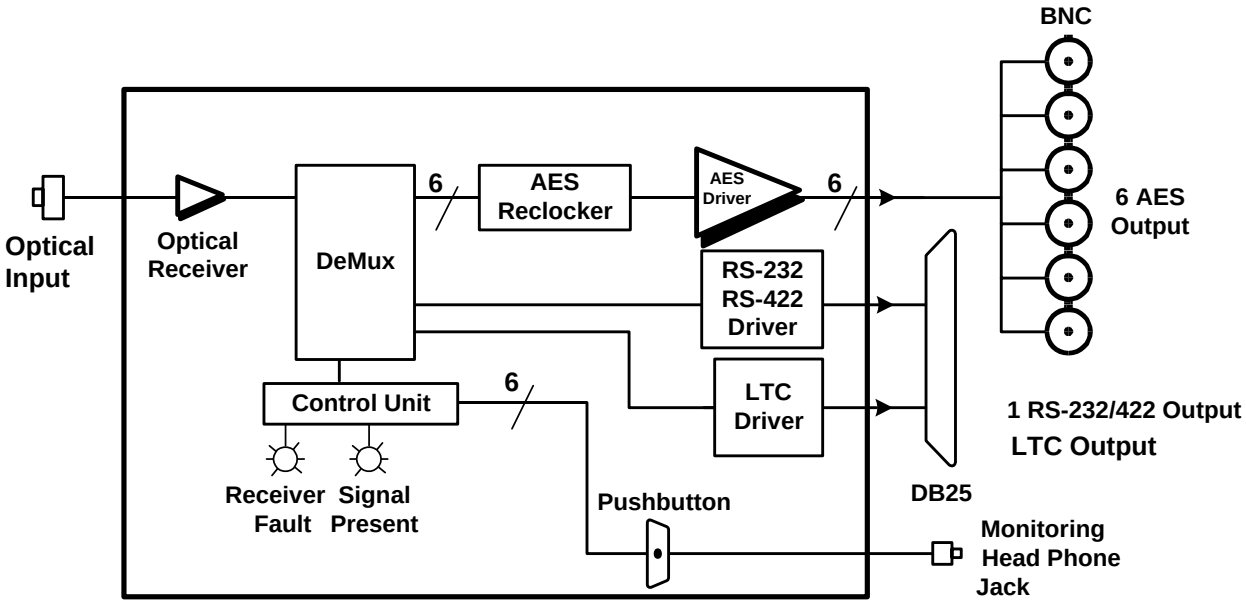

Figure 1-2: 7705AR-2 Block Diagram

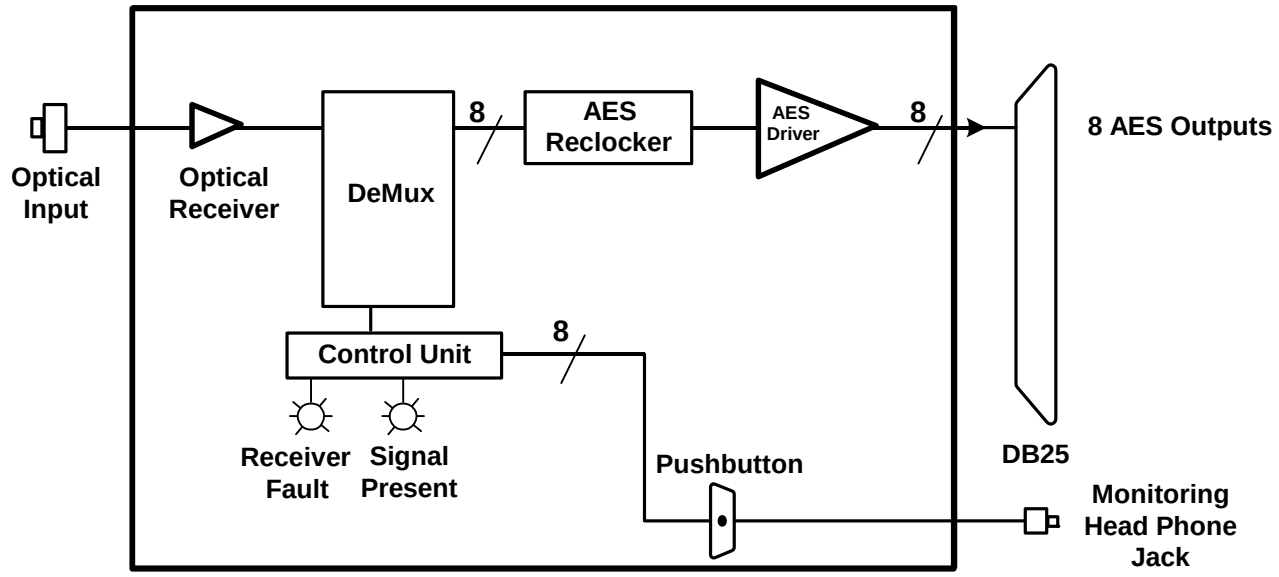

Figure 1-3: 7705AR-8 Block Diagram

2. INSTALLATION

The one slot 7705AR and 7705AR-8 versions come with a companion rear plate that has a 25 pin female D connector and one SC/PC (shown), ST/PC or FC/PC optical connector. The two slot 7705AR-2 version also has 6 BNC connectors for the audio. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

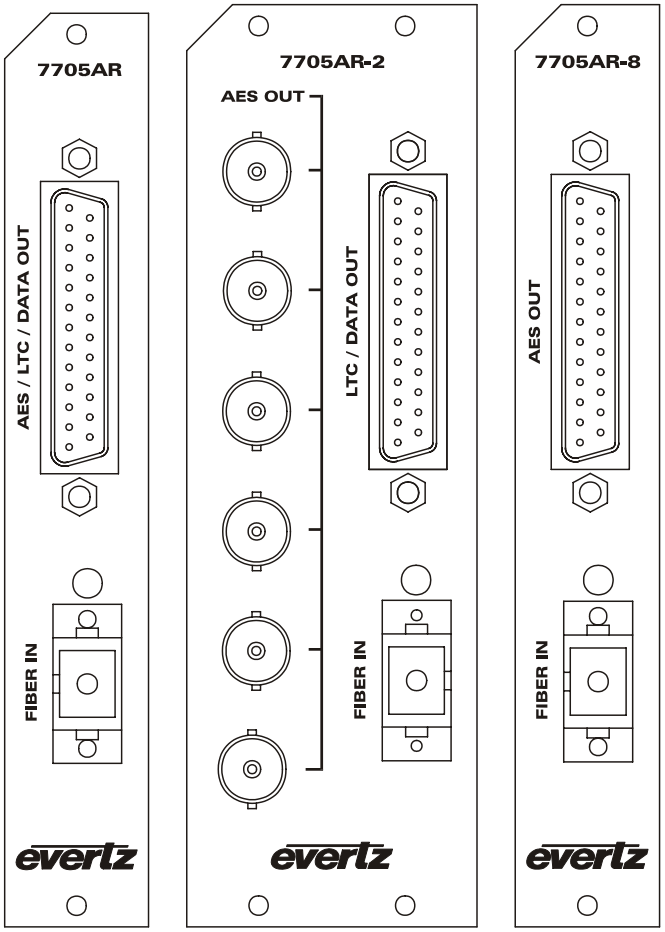

Figure 2-1: 7705AR Rear Panels

2.1. AES AUDIO AND RS-232/422 SERIAL PORT CONNECTIONS

The specific connector configuration depends on the version of the module that you have.

AES OUT: On the 7705AR-2 there are 6 BNC connectors for connection of 6 unbalanced AES channels. On the 7705AR-8 there is a 25 Pin D connector for connection of 8 unbalanced AES channels. Table 2-1 shows the pin definitions of the AES OUT connector.

AES/DATA/LTC OUT: On the 7705AR there is a 25 Pin D connector for connection of 6 unbalanced AES channels, 1 RS-232/RS-422 data channel, and one differential time code channel. The serial port portion of the connector consists of 2 out pins and 1 ground pin. The SEL 4 jumper located at the rear of the module determines whether the port will be operated as a balanced RS422 Transmit channel, or one RS-232 Transmit channel (See section 5.2 for location of the SEL jumper).

Table 2-1 shows the pin definitions for each version of the modules.

DATA/LTC OUT: On the 7705AR-2 there is a 25 Pin D connector for connection of one RS-232/RS-422 data channel, and one differential time code channel. The serial port portion of the connector consists of 2 output pins and 1 ground pin. The SEL 4 jumper located at the rear of the module determines whether the port will be operated as a balanced RS-422 Transmit channel, or one RS-232 Transmit channel (See section 5.2 for location of the SEL jumper). Table 2-1 shows the pin definitions for each version of the modules.

	Model					
Pin #	**7705AR**		**7705AR-8**		**7705AR-2**	
Sel 4	**RS232**	**RS422**	**RS232**	**RS422**	**RS232**	**RS422**
1	Ground	Ground	Ground	Ground	Ground	Ground
2	---	Tx + Out	AES Out 7	AES Out 7	---	Tx + Out
3	Tx Out	Tx – Out	AES Out 8	AES Out 8	Tx Out	Tx – Out
4	LTC + Out	LTC + Out	---	---	LTC + Out	LTC + Out
5	AES Out 5	AES Out 5	AES Out 5	AES Out 5	---	---
6	AES Out 6	AES Out 6	AES Out 6	AES Out 6	---	---
7	Ground	Ground	Ground	Ground	Ground	Ground
8	AES Out 3	AES Out 3	AES Out 3	AES Out 3	---	---
9	AES Out 4	AES Out 4	AES Out 4	AES Out 4	---	---
10	Ground	Ground	Ground	Ground	Ground	Ground
11	AES Out 1	AES Out 1	AES Out 1	AES Out 1	---	---
12	AES Out 2	AES Out 2	AES Out 2	AES Out 2	---	---
13	Ground	Ground	Ground	Ground	Ground	Ground
14	---	---	---	---	---	---
15	---	---	---	---	---	---
16	LTC - Out	LTC - Out	---	---	LTC - Out	LTC - Out
17	---	---	---	---	---	---
18	---	---	---	---	---	---
19	Ground	Ground	Ground	Ground	Ground	Ground
20	---	---	---	---	---	---
21	---	---	---	---	---	---
22	Ground	Ground	Ground	Ground	Ground	Ground
23	---	---	---	---	---	---
24	---	---	---	---	---	---
25	Ground	Ground	Ground	Ground	Ground	Ground

Table 2-1: DB25 Pin Connections

2.2. OPTICAL CONNECTIONS

FIBER IN: There is one SC/PC (shown), ST/PC or FC/PC female connector with the optical input to the 7705AR as shown in section 3.1. This connector should be connected to the FIBER OUT connector of a 7705AT module at the origination end with a suitable fiber optic cable. This wide band optical input accepts optical wavelengths of 1270nm to 1610nm, accommodating standard or CWDM transmission schemes. This input is compatible with multimode fiber when connected directly to a companion 7705AT card.

2.3. CARE AND HANDLING OF OPTICAL FIBER

Never touch the end face of an optical fiber. Always keep dust caps on optical fiber connectors when not connected and always remember to properly clean the optical end face of a connector before making a connection.

The transmission characteristics of the fiber are dependent on the shape of the optical core and therefore care must be taken to prevent fiber damage due to heavy objects or abrupt fiber bending. Evertz recommends that you maintain a minimum bending radius of 5 cm to avoid fiber-bending loss that will decrease the maximum attainable distance of the fiber cable. The Evertz fiber optic modules come with cable lockout devices, to prevent the user from damaging the fiber by installing a module into a slot in the frame that does not have a suitable I/O module. For further information about care and handling of fiber optic cable see section 3 of the Fiber Optics System Design chapter in the front of the binder.

3. SPECIFICATIONS

3.1. OPTICAL INPUT

Connector: SC/PC, ST/PC or FC/PC female housing
Input Optical Sensitivity: -27 dBm
Maximum Input Power: 0 dBm
Wavelength 1310 nm to 1610 nm
Fiber Size: 62 μm core / 125 μm overall

3.2. AES AUDIO OUTPUTS

Number of Outputs:
- **7705AR** 6
- **7705AR-2** 6
- **7705AR-8** 8

Standard: SMPTE 276M, single ended synchronous or asynchronous AES
Signal Level: 1V p-p ±0.1V
Connector:
- **7705AR:** Female DB-25
- **7705AR-2:** 6 BNC per IEC 61169-8 Annex A
- **7705AR-8:** Female DB-25

Sampling Rate: 48KHz or 96KHz
Impedance: 75 Ohms unbalanced

3.3. DATA OUTPUT (7705AR and 7705AR-2 ONLY)

Number of Ports: 1 uni-directional RS 232 or RS 422 – jumper selectable
Connector: Female DB-25
Baud Rate: Determined by incoming data up to 3 Mbaud

3.4. LTC OUTPUT (7705AR and 7705AR-2 ONLY)

Standard: SMPTE 12M
Connector: Female DB-25
Level: 1V p-p nominal
Rise/Fall Time: 40 ±10 μsec
Impedance: 110 ohm balanced

3.5. AUDIO MONITORING OUTPUT:

Connector: 3.5mm female audio jack
Channel Select: pushbutton select with LED indicator
Audio Level: user adjustable with card edge potentiometer

3.6. SYSTEM PERFORMANCE

Input to Output Latency: < 1μs

3.7. ELECTRICAL

Voltage:	+ 12VDC
Power:	6 Watts.
EMI/RFI:	Complies with FCC regulations for class A devices. Complies with EU EMC directive.

3.8. PHYSICAL

7700 frame mounting:

Number of slots:

7705AR:	1
7705AR-2:	2
7705AR-8:	1

7701 frame mounting: 1 slot (all versions)

4. STATUS LEDS

4.1. MODULE STATUS LEDS

LOCAL FAULT (LD1): This Red LED will be On when there is insufficient optical input power or when there is a fault in the module power supply. When the FRAME STATUS jumper is set to the ON position the FRAME STATUS bus will also be asserted. (See section 5.1)

MODULE OK (LD6): This Green LED will be On when the module is operating properly.

LINK (LD3): This Amber LED will be On when there is a valid link established with a 7705AT at the origination end.

DATA ERROR (LD4): This Red LED will be On when there is invalid data received by the optical receiver.

4.2. AUDIO CHANNEL MONITOR LEDS

Six LEDs (eight on the 7705AT-8) located on the lower end of the module (opposite the headphone jack) indicate which AES channel is currently being monitored on the analog monitoring headphone jack. AES LED 1 is located closest to the center of the module. See section 5.3 for information about operating the audio monitor.

4.3. AES CHANNEL PRESENT LEDS

Six LEDs (eight on the 7705AT-8) located on the upper end of the module (opposite the 4 module status LEDS) indicate which AES channels are present on the incoming optical signal and are currently being output to the AES outputs. The AES 1 PRESENT LED is located closest to the top of the module.

5. JUMPERS AND USER ADJUSTMENTS

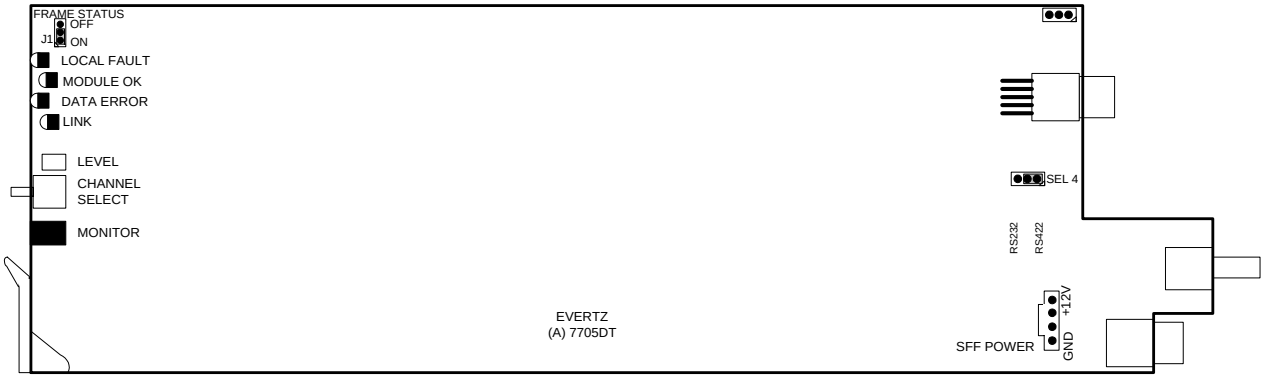

Figure 5-1: Jumper Locations

5.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper J1 located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

FRAME STATUS: To monitor faults on this module with the frame status indicators (on the Power Supply FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. (default)

When this jumper is installed in the Off position local faults on this module will not be monitored.

5.2. SELECTING THE DATA COMMUNICATIONS STANDARD (RS-232 OR RS-422)

Jumper SEL 4 located at the rear of the module is used to configure whether the data port will operate in the RS-232 or RS-422 standard. The data port on the 25 pin D connector consists of a pair of outputs and a ground as shown in Table 2-1.

SEL 4: To set the port outputs to operate in the RS-232 standard install the jumper in the RS-232 position.

To set the port outputs to operate in the RS-422 standard install the jumper in the RS-422 position.

5.3. MONITORING THE AES AUDIO

A stereo headphone jack located at the front of the module is used to monitor the individual AES channels. Six LEDs (eight on 7705AR-8) located on the bottom of the module opposite the headphone jack indicate the AES channel currently being monitored. The AES1 LED is closest to the center of the card. When the module powers up the audio monitor jack is turned off. Press the pushbutton to select AES1 channel pair for monitoring. The AES LED will come on. The monitoring volume level can be adjusted by turning the level potentiometer located beside the headphone jack. Press the pushbutton one or more times to monitor other AES channels. The appropriate LED will come on indicating which AES channel is currently being monitored.