Digital Media Connections

Document Number 007-3525-001

CONTRIBUTORS

Written by Carolyn Curtis
Illustrated by Cheri Brown, Carolyn Curtis, and Kirk Knapp
Production by Kirsten Johnson
Engineering contributions by Kirk Knapp, William Warner, Reed Lawson, Robert Marinelli, and Joe Wang
St Peter's Basilica image courtesy of ENEL SpA and InfoByte SpA. Disk Thrower image courtesy of Xavier Berenguer, Animatica.

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THE FOLLOWING INFORMATION APPLIES ONLY TO THE SILICON GRAPHICS DIGITAL VIDEO OPTION BOARD (DIVO).

FCC Warning

This equipment has been tested and found compliant 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 the user will be required to correct the interference at his own expense.

Attention

This product requires the use of external shielded cables in order to maintain compliance pursuant to Part 15 of the FCC Rules.

International Special Committee on Radio Interference (CISPR)

This equipment has been tested to and is in compliance with the Class A limits per CISPR publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment; Germany's BZT Class A limits for Information Technology Equipment; and Japan's VCCI Class 1 limits.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Attention

Le présent appareil numérique n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur les interferences radioélectriques établi par le Ministère des Communications du Canada.

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VCCI Class 1 Statement for Japan

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従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。
取扱説明書に従って正しい取り扱いをして下さい。

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About This Document

A wide variety of audio and video formats and connector types is in use today. A subset of these is supported by the Silicon Graphics® Onyx2™ and Origin2000™ systems and their video and audio hardware and options.

Devices using the same connector types or formats can typically be connected directly without special intermediate hardware. Other devices can be connected through third-party components that bridge the differences between them.

This document gives information on some of the third-party components that solve such connection problems. It focuses on connecting to the DIVO (Digital Video Option) board and DG5-2/GVO option board:

- parallel digital video in/out
- component and composite analog video in/out

It also gives information on connecting to the audio built into the BaseIO (Media I/O) card, which is standard in Onyx2 systems and optional in Origin servers:

- ADAT® open optical interface (in/out)
- AES3-1992 (also called AES/EBU) in/out
- stereo analog audio in/out

This document focuses on the connection problems that are the most likely to be encountered; it cannot cover all possible situations. It provides neither a complete nor a recommended list of useful components, and does not specifically recommend the components listed. Factors such as technical features, availability, or local conditions can determine the connection solutions best for the situation. However, the industry-recognized products listed in this document should perform adequately. Many of the components listed in this document are or have been in use at Silicon Graphics.

Besides the components listed here, other products within the same manufacturer's product lines, as well as products from other manufacturers, can also solve the connection problems. Furthermore, you can use third-party video and audio cards (such as PCI cards) to solve input/output needs. These cards have their own supported formats and connector types. Where the connector types are the same as those covered in this document, the information in this document applies.

Audience

This document is written for the person using video I/O hardware, such as the DIVO and GVO video boards, or audio I/O hardware with Silicon Graphics workstations and servers, such as Onyx2 and Origin2000 systems.

Many current Silicon Graphics owner's guides, programming guides, and user's guides are available through the World Wide Web: http://www.sgi.com/.

Structure of This Document

This document contains the following chapters:

- Chapter 1, "Video," illustrates connections to video equipment, lists equipment, and gives information for equipment suppliers.
- Chapter 2, "Audio," illustrates connections to audio equipment, lists equipment, and gives information for equipment suppliers.

Standards

The following video standards are mentioned in this document:

CCIR 601	Serial digital video (4:2:2); supports NTSC and PAL timing on DIVO and GVO, 8- and 10-bit components
SMPTE 272M	Serial digital video with support for embedded audio

The following audio standards are mentioned in this document:

ADAT	Open interface created by Alesis® Corporation, carrying eight channels of digital audio, each up to 24 bits at 48,000 samples per second on plastic optical fiber.
AES3-1992	Also referred to as AES/EBU (Audio Engineering Society/European Broadcast Union). The data format used on the two-channel digital audio input and output BNCs. It includes • AES3-1992: the standard for the data format used on the two-channel digital audio input and output BNC connector, transmitting over 110-Ohm balanced twisted pair with XLR connectors • AES-3id-1995: transmission method used by the AES3-1992 standard, over 75-Ohm coaxial cable with BNC connectors • IEC958 channel coding: consumer-grade channel coding used on optical connectors in two-channel mode

The following terms are equivalent in this document:

- CCIR 601
- serial digital video
- 4:2:2

This document refers to this format as CCIR 601.

Note: **Helvetica Bold** font is used for labels on hardware, such as the names of connectors.

Chapter 1

Video

This chapter explains

- "DIVO and GVO Panels"
- "CCIR 601 to DIVO IN"
- "DIVO OUT/GVO OUT to CCIR 601"
- "Dual-Link Serial Digital Video to DIVO IN"
- "DIVO OUT/GVO OUT to Dual-Link Serial"
- "Parallel Digital Video Single-Link to DIVO IN"
- "Parallel Digital Video Dual-Link to DIVO IN"
- "DIVO OUT/GVO OUT to Parallel Digital Video Single-Link"
- "DIVO OUT/GVO OUT to Parallel Digital Video Dual-Link"
- "Component Analog to DIVO IN (Serial Digital)"
- "DIVO OUT/GVO OUT to Component Analog (Serial Digital)"
- "Composite Analog to DIVO IN"
- "DIVO OUT/GVO OUT to Composite Analog"
- "Third-Party Suppliers"

DIVO and GVO Panels

Figure 1-1 shows connectors on the DIVO I/O panel. To aid reading the connector labels, this figure shows the panel sideways.

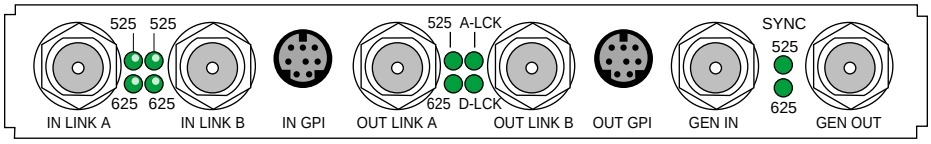

Figure 1-1 DIVO Ports

The DIVO board's XIO interface transmits the video signals between the connectors and system main memory.

Figure 1-2 shows connectors on the DG5-2/GVO I/O panel. This panel has the connectors for the DG5-2 board and its daughter board, the GVO. The GVO is available only as a daughter board for the DG5-2.

Note: For brevity, the DG5-2/GVO panel is referred to as the GVO panel in the rest of this chapter.

The connectors on the left in Figure 1-2 are actually DG5 connectors; the GVO board itself has only two connectors, labeled **601 A Link** and **601 B Link**. These are outputs, corresponding to **OUT LINK A** and **OUT LINK B** on the DIVO board.

Note: All DIVO and GVO BNCs are 75-ohm.

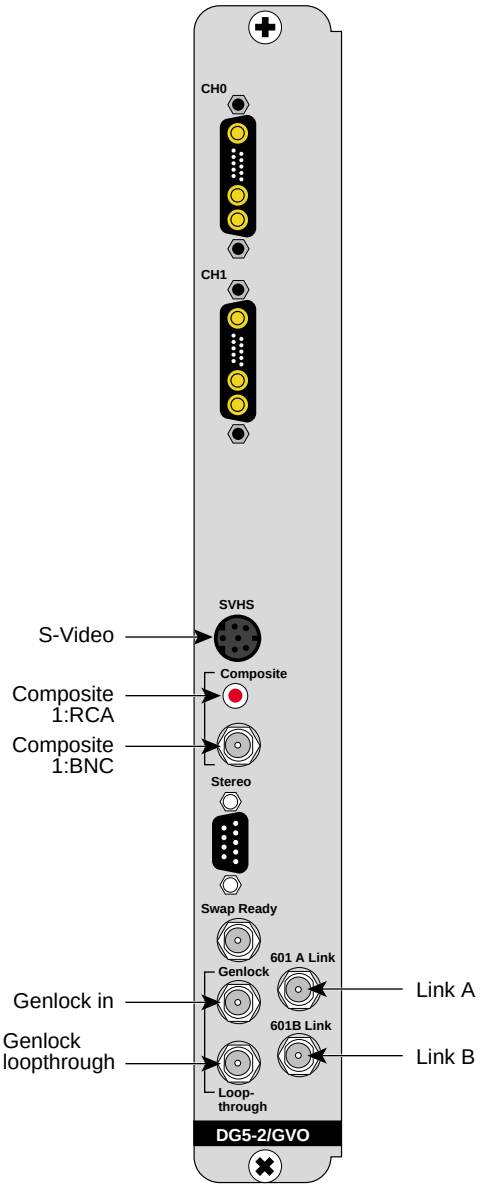

Figure 1-2 DG5-2/GVO Video Connectors

CCIR 601 to DIVO IN

Figure 1-3 shows connection between CCIR 601 (4:2:2, serial digital interface) and DIVO **IN LINK A**, plus house genlock in. These connections are directly attached cables from the external devices to the DIVO connectors. The genlock connection is optional.

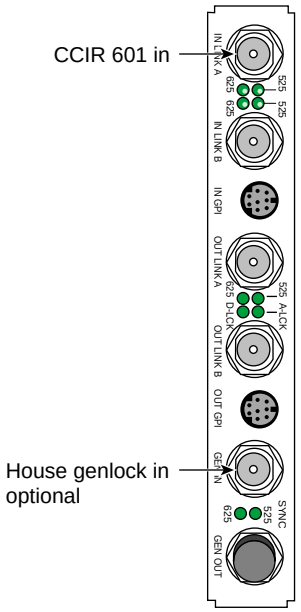

Figure 1-3 CCIR 601 to DIVO IN

DIVO OUT/GVO OUT to CCIR 601

Figure 1-4 shows the connection between DIVO **OUT LINK A** and CCIR 601; Figure 1-5 shows the connection between GVO **OUT LINK A** and CCIR 601. This connection is a direct cable between the DIVO or GVO connector and the external video device.

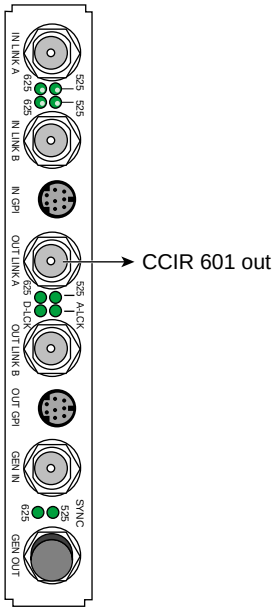

Figure 1-4 DIVO OUT to CCIR 601

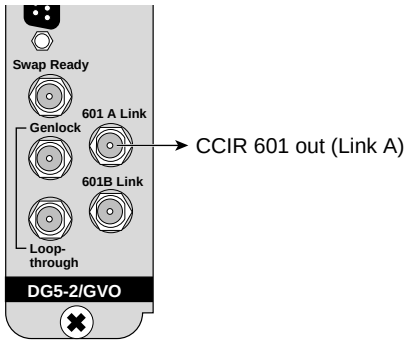

Figure 1-5 DIVO OUT to CCIR 601 and GVO OUT to CCIR 601

Dual-Link Serial Digital Video to DIVO IN

Figure 1-6 shows connections between both DIVO **IN** BNCs and a dual-link serial digital interface (4:2:2:4/4:4:4:4), plus house genlock. These connections are directly attached cables between the DIVO connectors and the external video devices. The genlock connection is optional.

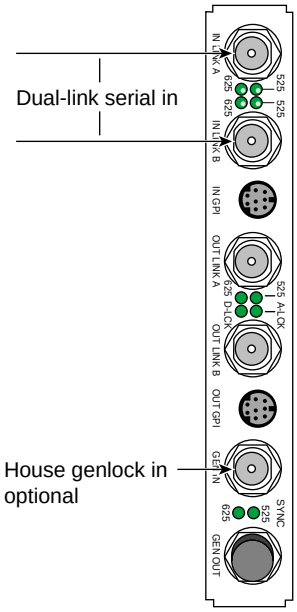

Figure 1-6 Dual-Link Serial to DIVO IN

DIVO OUT/GVO OUT to Dual-Link Serial

Figure 1-7 shows connections between both DIVO **OUT** BNCs and a dual-link (4:2:2:4/4:4:4:4) serial digital interface; Figure 1-8 shows connections between both GVO **OUT** BNCs and a dual-link (4:2:2:4/4:4:4:4) serial digital interface. These connections are directly attached cables between the DIVO or GVO connectors and the external video devices.

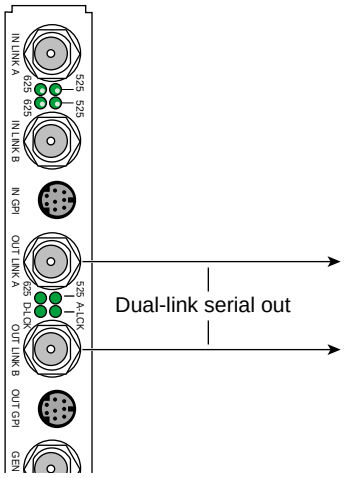

Figure 1-7 DIVO OUT to Dual-Link Serial

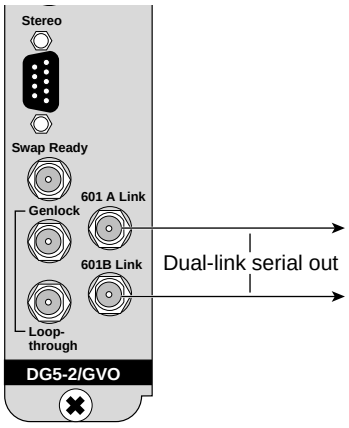

Figure 1-8 GVO OUT to Dual-Link Serial

Parallel Digital Video Single-Link to DIVO IN

Figure 1-9 shows connections between DIVO **IN LINK A** and a parallel digital video 4:2:2 (single-link) device.

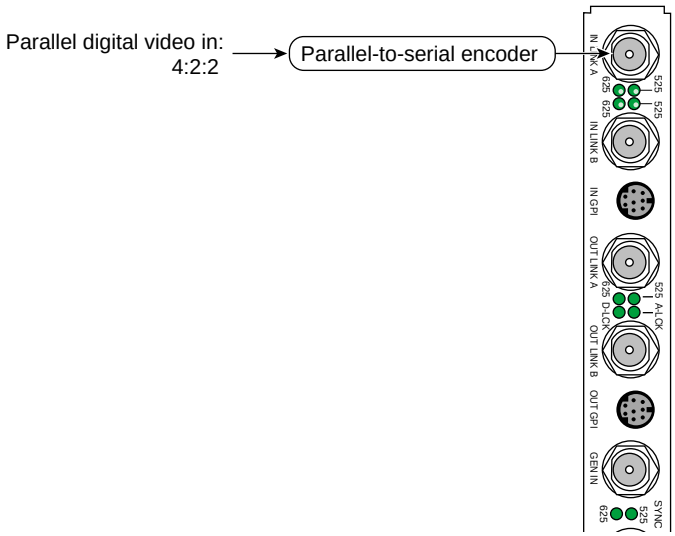

Figure 1-9 CCIR 601 Single-Link to DIVO IN

Table 1-1 summarizes some parallel-to-serial encoders for DIVO **IN**.

Table 1-1 Parallel-to-Serial Encoders for DIVO IN Connections

Function	Manufacturer	Product	Web Site
Encodes parallel digital to serial digital; use two for dual-link	Miranda	SER-100E + power supply or SER-FRA (SER-WSA = 110V power supply) (SER-WSE = 220V power supply)	www.miranda.com
Rackmount frame with power supply for up to six SER-100E and/or SER-100D	Miranda	SER-FRA	www.miranda.com
Encodes parallel digital to serial digital; use two for dual-link	Leitch	VPS-7000/7001	www.leitch.com

Parallel Digital Video Dual-Link to DIVO IN

Figure 1-10 shows connections between both DIVO **IN** BNCs and parallel digital video 4:2:2:4/4:4:4:4 (dual-link) encoders.

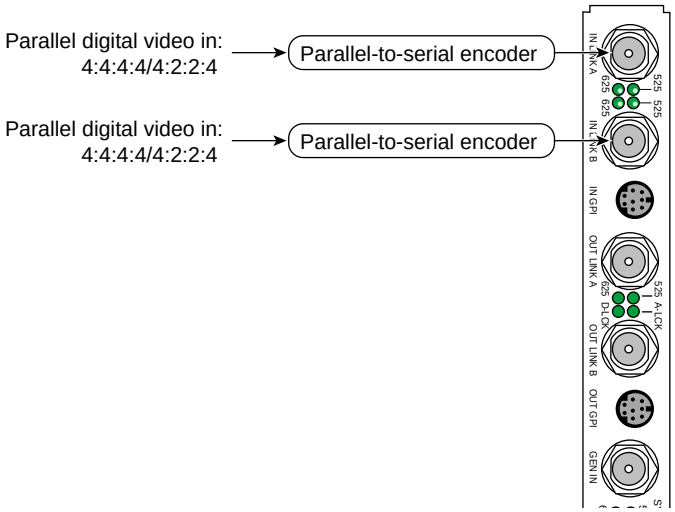

Figure 1-10 CCIR 601 (Parallel Digital Video Dual-Link to DIVO IN

Table 1-2 summarizes some parallel-to-serial encoders for DIVO **IN**.

Table 1-2 Parallel-to-Serial Encoders for DIVO IN Connections

Function	Manufacturer	Product	Web Site
Encodes parallel digital to serial digital; use two for dual-link	Miranda	SER-100E + power supply or SER-FRA (SER-WSA = 110V power supply) (SER-WSE = 220V power supply)	www.miranda.com
Rackmount frame with power supply for up to six SER-100E and/or SER-100D	Miranda	SER-FRA	www.miranda.com
Encodes parallel digital to serial digital; use two for dual-link	Leitch	VPS-7000/7001	www.leitch.com

DIVO OUT/GVO OUT to Parallel Digital Video Single-Link

Figure 1-11 shows connections between DIVO **OUT LINK A** and parallel digital video single-link devices; Figure 1-12 shows connections between GVO **OUT LINK A** and parallel digital video single-link devices.

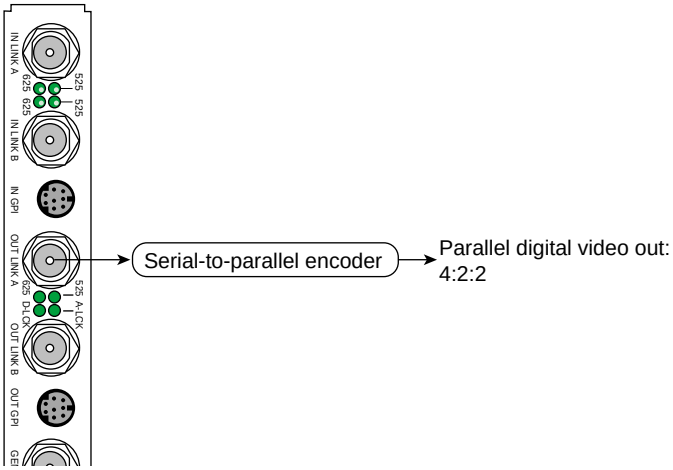

Figure 1-11 Parallel Digital Video Connections to DIVO OUT

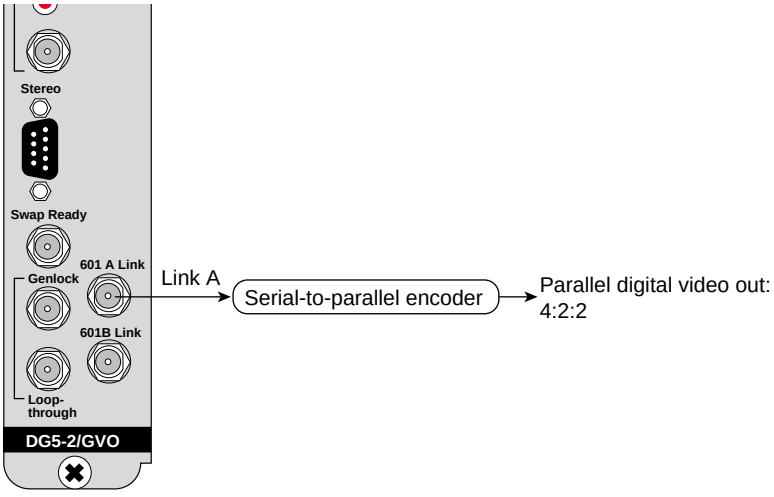

Figure 1-12 Parallel Digital Video Connections t to GVO OUT

Table 1-3 summarizes some parallel encoders for DIVO or GVO **OUT**.

Table 1-3 Parallel Encoders for DIVO or GVO OUT Connections

Function	Manufacturer	Product	Web Site
Decodes serial into parallel	Miranda	SER-100D + power supply or SER-FRA (SER-WSA = 110V power supply) (SER-WSE = 220V power supply)	www.miranda.com
Rackmount frame with power supply for up to six SER-100E and/or SER-100D	Miranda	SER-FRA	www.miranda.com
Decodes serial into parallel	Leitch	VPS-7000/7001	www.leitch.com/leitch/products/sfc/digital.html

DIVO OUT/GVO OUT to Parallel Digital Video Dual-Link

Figure 1-13 shows connections between both DIVO **OUT** BNCs and parallel digital video 4:2:2:4/4:4:4:4 (dual-link) devices; Figure 1-14 shows connections between both GVO **OUT** BNCs and parallel digital video 4:2:2:4/4:4:4:4 (dual-link) devices.

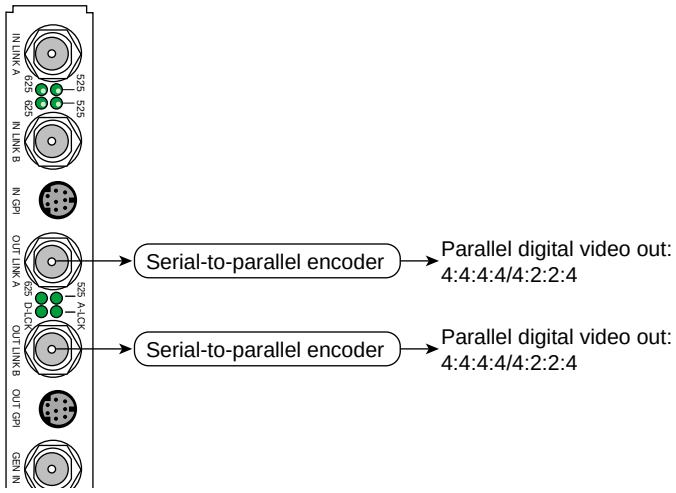

Figure 1-13 Parallel Digital Video Connections to DIVO OUT

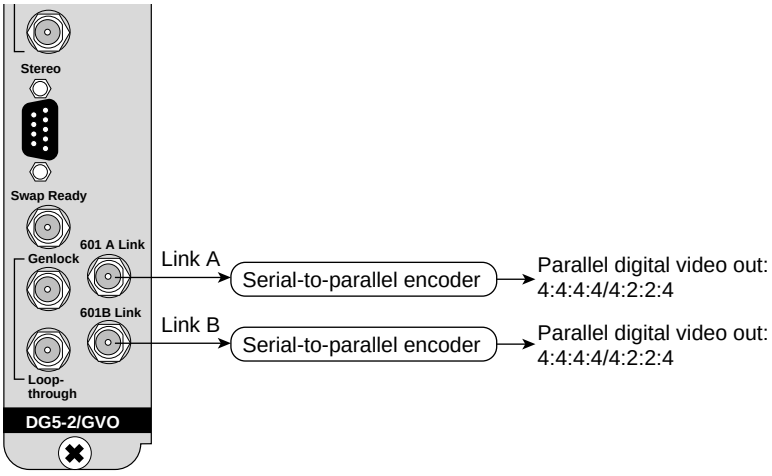

Figure 1-14 Parallel Digital Video Connections to GVO OUT

Table 1-4 summarizes some parallel encoders for DIVO or GVO **OUT**.

Table 1-4 Parallel Encoders for DIVO or GVO OUT Connections

Function	Manufacturer	Product	Web Site
Decodes serial into parallel; use two for dual-link	Miranda	SER-100D + power supply or SER-FRA (SER-WSA = 110V power supply) (SER-WSE = 220V power supply)	www.miranda.com
Rackmount frame with power supply for up to six SER-100E and/or SER-100D	Miranda	SER-FRA	www.miranda.com
Decodes serial into parallel	Leitch	VPS-7000/7001	www.leitch.com/leitch/products/sfc/digital.html

Component Analog to DIVO IN (Serial Digital)

Figure 1-15 shows a connection between DIVO **IN LINK A** and component analog to serial digital (such as Betacam®).

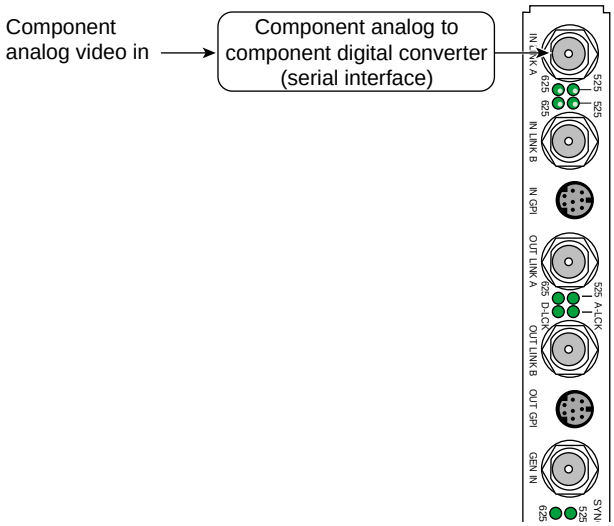

Figure 1-15 Component Analog Connections to DIVO IN

Table 1-5 summarizes some suppliers of component analog converters for DIVO **IN**.

Table 1-5 Component Analog Converters for DIVO IN Connections

Function	Manufacturer	Product	Web Site
Component analog to serial digital	Leitch	3501AD/CDC3501	www.leitch.com
Component analog to serial digital	Nova	ASD-1	www.nova-sys.com
Component analog to serial digital	Miranda	ASD-100	www.miranda.com

DIVO OUT/GVO OUT to Component Analog (Serial Digital)

Figure 1-16 shows a connection between DIVO **OUT LINK A** and component analog (such as Betacam); Figure 1-17 shows a connection between GVO **OUT LINK A** and component analog.

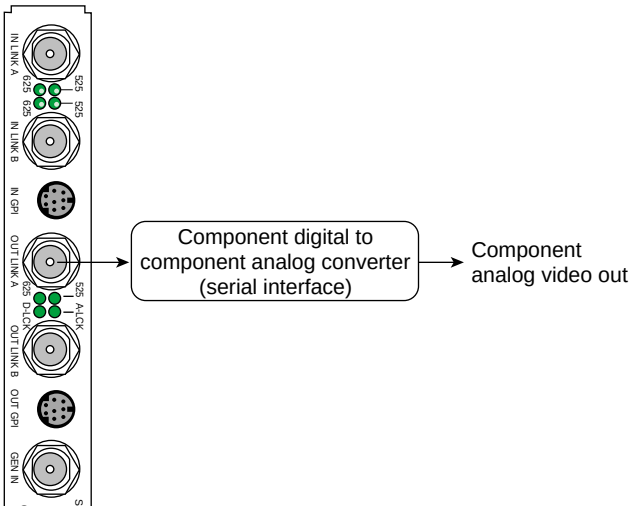

Figure 1-16 CCIR 601 (Serial Digital Interface) Connections to DIVO OUT

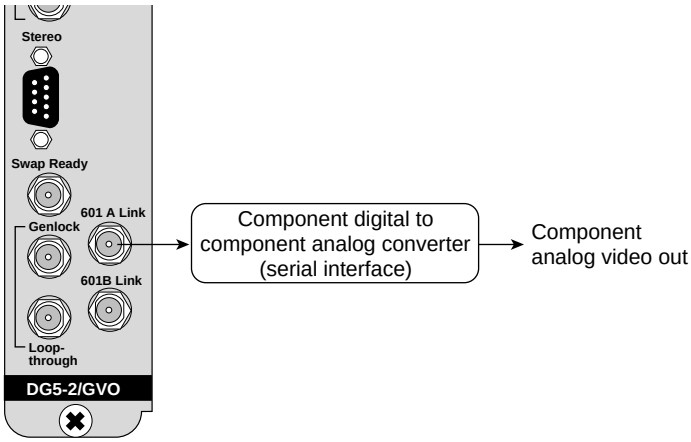

Figure 1-17 CCIR 601 (Serial Digital Interface) Connections to GVO OUT

Table 1-6 summarizes some suppliers of component analog converters for DIVO or GVO **OUT**.

Table 1-6 Component Analog Converters for DIVO OUT or GVO OUT Connections

Function	Manufacturer	Product	Web Site
Serial digital to component analog	Leitch	3501DA/CDC3501	www.leitch.com
Serial digital to component analog	Nova	SDA-1	www.nova-sys.com
Serial digital to analog video	Miranda	SDM-110	www.miranda.com

Composite Analog to DIVO IN

Figure 1-18 shows a connection between DIVO **IN LINK A** and composite analog (NTSC/PAL).

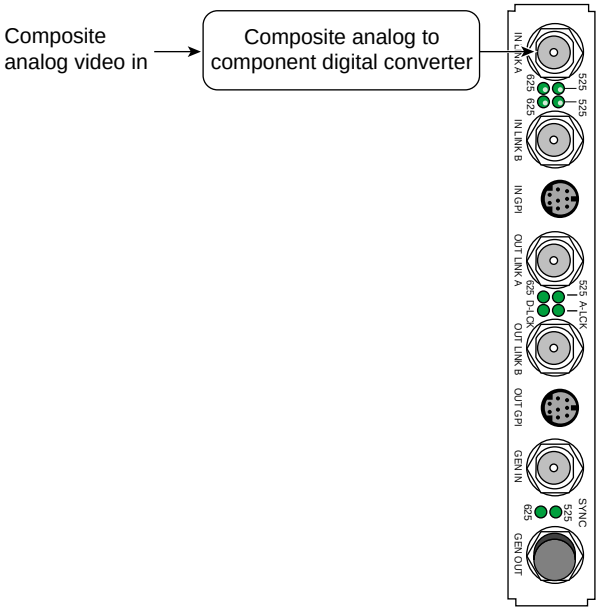

Figure 1-18 CCIR 601 (Serial Digital Interface) Connections to DIVO IN

Table 1-7 summarizes possible suppliers of this equipment.

Table 1-7 Composite Analog (NTSC/PAL) to DIVO

Function	Manufacturer	Product	Web Site
Composite analog to serial digital	Leitch	DEC-3610N-AS	www.leitch.com
Composite analog to serial digital	Accom	C-Bridge DEC	www.accom.com
Composite analog to serial digital	Nova	ASD-2	www.nova-sys.com
Composite analog to serial digital	Miranda	ASD-201i	www.miranda.com

DIVO OUT/GVO OUT to Composite Analog

Figure 1-19 shows a connection between DIVO **OUT LINK A** and composite analog (NTSC/PAL); Figure 1-20 shows a connection between GVO **OUT LINK A** and composite analog (NTSC/PAL).

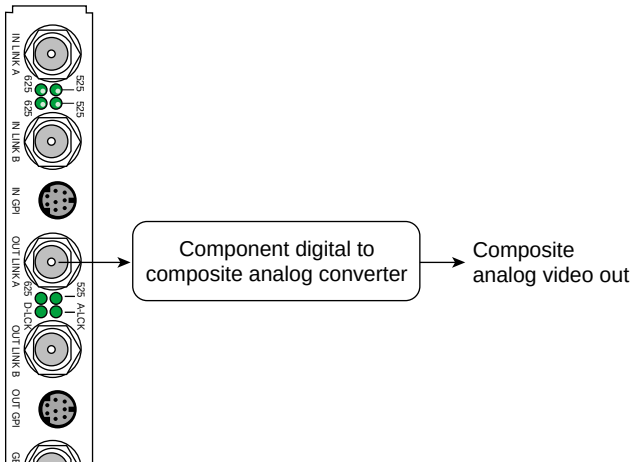

Figure 1-19 Composite Analog Connection to DIVO OUT

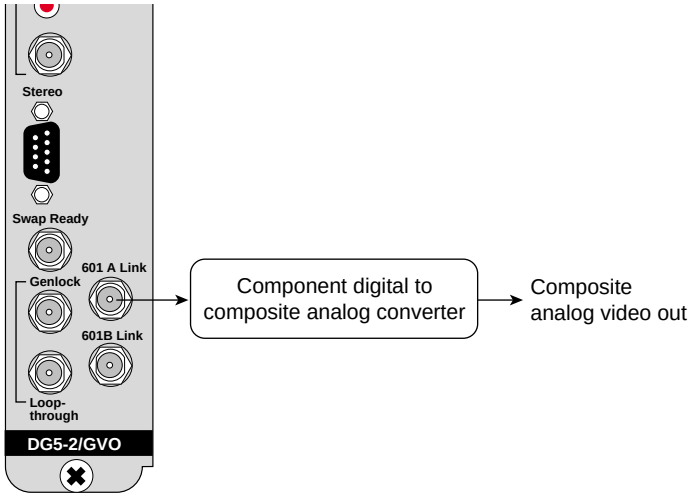

Figure 1-20 Composite Analog Connection to GVO OUT

Table 1-8 summarizes possible suppliers of this equipment.

Table 1-8 Composite Analog (NTSC/PAL) to DIVO or GVO OUT

Function	Manufacturer	Product	Web Site
Serial digital to composite analog	Leitch	CES-3501	www.leitch.com
Serial digital to composite analog	Nova	SDA-2	www.nova-sys.com
Serial digital to composite analog	Miranda	SDM-201i	www.miranda.com
Serial digital to composite analog or D2	Accom	D-Bridge 122	www.accom.com

Third-Party Suppliers

Table 1-9 summarizes contact information for video equipment manufacturers listed in this chapter.

Table 1-9 Video Equipment Manufacturer Contact Information

Category	Information
Manufacturer	Accom, Inc.
Address	1490 O'Brien Drive Menlo Park, CA 94025 USA
Telephone	415-328-3818
Fax	415-327-2511
Web site	www.accom.com
Manufacturer	Leitch Incorporated
Address	920 Corporate Lane Chesapeake, VA 23320 USA
Telephone	800-231-9673 or 757-548-2300
Fax	757-548-4088
Web site	www.leitch.com
Manufacturer	Miranda Technologies, Inc.
Address	8055 Trans-Canada St-Laurent, Quebec, Canada, H4S IS4
Telephone	514-333-1772
Fax	514-333-9828
Web site	www.miranda.com
Manufacturer	Nova Systems,
Address	50 Albany Turnpike Canton, CN 06019 USA
Telephone	860-693-0238
Fax	860-693-1497
Web site	www.nova-sys.com

Chapter 2

Audio

You may need to connect to audio devices that have different connector types, different audio data formats, or both. This chapter is designed to help you determine what you need. It discusses

- "Onyx2/Origin2000 Graphics BaseIO Board Panel"
- "External Devices: Digital"
- "External Devices: Analog"
- "Third-Party Suppliers"

Note: AES3-1992 is also called AES/EBU. See the release notes for your Silicon Graphics server for the latest information about compliance to specific standards.

Onyx2/Origin2000 Graphics BaseIO Board Panel

Figure 2-1 shows one version of the BaseIO (also known as the IO6G) board panel, the Onyx2 system's interface to external devices such as keyboards, mice, SCSI devices, audio devices, ASCII terminals, printers, and modems. This panel is standard in the Onyx2 chassis and is optional in the Origin2000 chassis.

All audio and video is transferred to and from main memory via the board's XIO interface. DIVO supports audio embedded in video; it also supports video through the DIVO board synchronized with audio going through the BaseIO board (SMPTE 272M). In each case, the video goes through the DIVO board, but the audio may or may not.

Note: If you disconnect a cable from a peripheral device, you should also disconnect it from the I/O connector on the I/O panel. Doing so helps prevent the system from picking up external electrical noise.

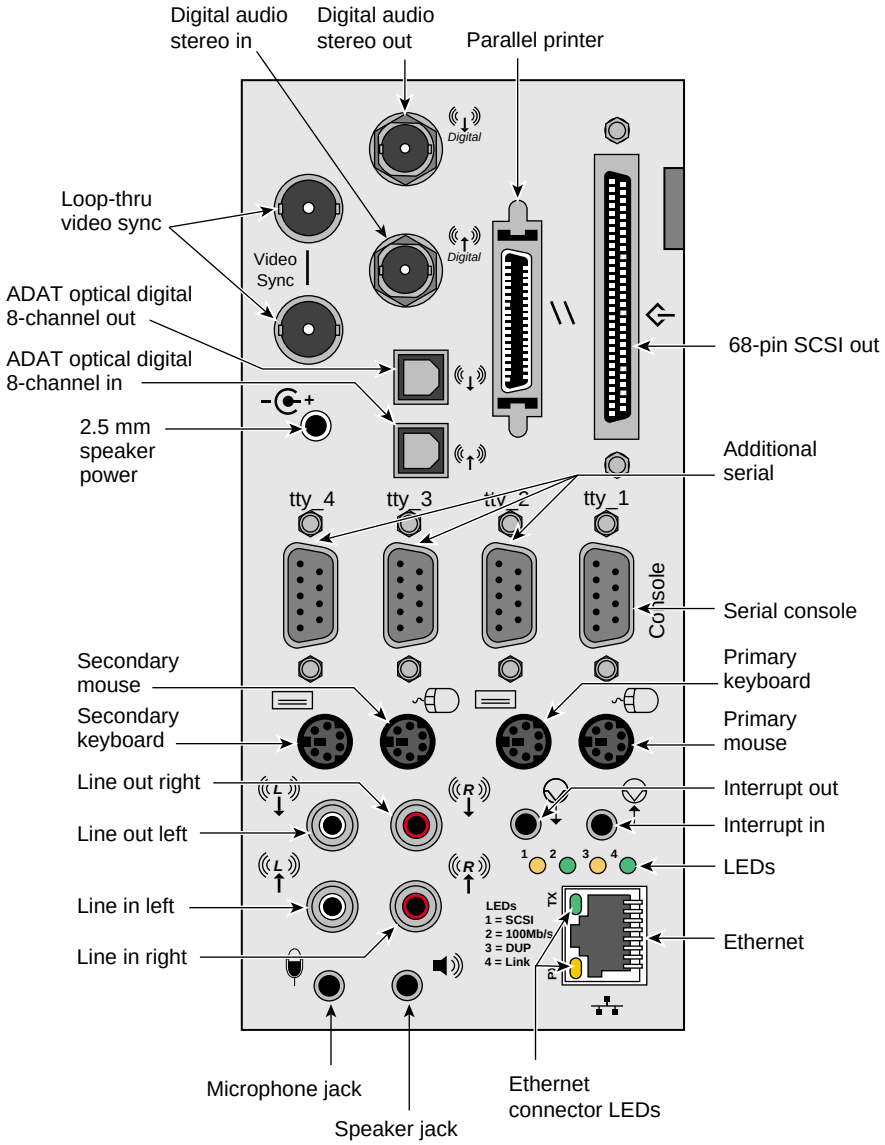

Figure 2-1 BaseIO Assembly (IO6G) Panel

Table 2-1 summarizes the BaseIO connector types and functions.

Table 2-1 BaseIO Panel Connectors

Description	Function	Type
Digital audio output and input (AES3-1992)	Audio output to digital audio device	BNC 75-ohm
Video sync loopthrough (two)	Video sync in/loopthrough	BNC 75-ohm
Single +10 V jack	Power for Silicon Graphics supplied speakers	2.5 mm tip-sleeve speaker power jack
ADAT output and input	24-bit digital eight-channel input; can also be used for consumer-grade two-channel SPDIF (Sony®/Philips® Digital Interface) digital audio	Optical
Audio line in plugs and out plugs	Analog stereo inputs and outputs, respectively	2.5 mm RCA-type (L & R)
Single-jack audio output	Analog headphone or Silicon Graphics-supplied speakers	3.5 mm tip-ring-sleeve jack
Single-jack audio input	Analog microphone input	3.5 mm tip-ring-sleeve jack
PC-compatible male serial ports	Serial RS-232 or 422 data transfer and receipt	9-Pin sub-D (1-4)
Mouse and keyboard connectors	Mouse and keyboard signals, respectively	6-Pin mini-DIN (1-2); PS/2-compatible
Parallel port	Parallel printer signals to and from external device	36-Pin IEEE 1284-C
FAST-20 SCSI or SCSI-2	Single-ended SCSI	68-Pin SCSI single-ended
Single jacks (two)	Interrupt in and interrupt out, respectively	3.5 mm tip-ring-sleeve jack
Ethernet	Ethernet	RJ-45

Note the following for synchronization:

- If you are syncing audio and video (that is, the audio on the BaseIO panel with the DIVO board), use a common sync source connected to either BaseIO **Video Sync** connector and the DIVO **GEN IN** connector.
- If you are not syncing audio to the DIVO board, but are syncing audio to another device, use a BaseIO **Video Sync** connector.
- If you use one BaseIO **Video Sync** connector, you must attach a 75-ohm terminator to the unused **Video Sync** connector.
- The DIVO board does not provide sync out. Its **GEN IN** and **GEN OUT** connectors are passive loopthrough inputs only; **GEN OUT** is a loopthrough of **GEN IN**. Syncing either DIVO or the BaseIO to each other or to external equipment requires an external source of video sync.

External Devices: Digital

This section discusses

- "BaseIO AES3-1992 Out BNC to AES3-1992 XLR (Digital to Digital)"
- "AES3-1992 XLR to BaseIO AES3-1992 In BNC (Digital to Digital)"
- "BaseIO ADAT Optical Out to AES3-1992 XLR (Digital to Digital)"
- "AES3-1992 XLR to BaseIO ADAT Optical In (Digital to Digital)"

BaseIO AES3-1992 Out BNC to AES3-1992 XLR (Digital to Digital)

Figure 2-2 shows cabling between the AES3-1992 out (upper) BNC on the BaseIO panel and an XLR balun connector for digital AES3-1992 output to XLR connections.

The balun (balance-unbalance) converters are passive devices for cabling different connector types while maintaining signal integrity; they are used in male-female pairs. These converters do not change the audio data format.

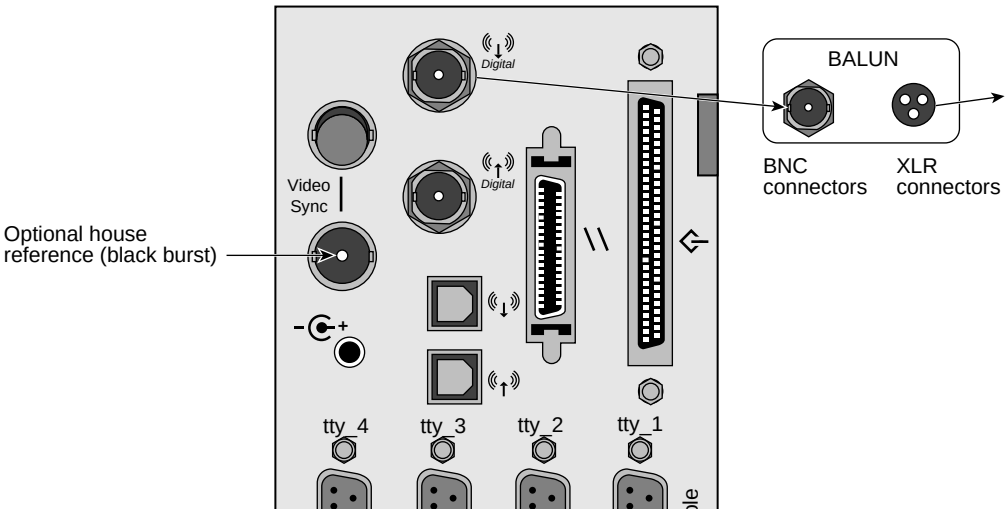

Figure 2-2 BaseIO AES3-1992 BNC OUT to AES3-1992 XLR

Note the following:

- Cabling is required to connect these baluns to BaseIO panel connectors. Use 75-ohm coax cable, not balanced cable, in accordance with AES-3id-1995.
- Connect the balun at the balanced (XLR) side of the cable.

Table 2-2 lists some suppliers of this equipment.

Table 2-2 AES3-1992 BNCs to AES3-1992 XLR Equipment Pairs

Manufacturer	Product	Web Site
Energy Transformation Systems	Male: PA-810 (no pad) Female: PA-811(no pad) Male: PA-813 (includes 10-dB attenuator) Female: PA-812 (includes 10-dB attenuator)	www.etslan.com
Graham-Patten Systems	Male: DATS21 Female: DATS10	www.gpsys.com/dats.html
Canare Cable, Inc.	Male: BCJ-XP-TRA Female: BCJ-XJ-AIOTR	www.canare.com/catalog.html

AES3-1992 XLR to BaseIO AES3-1992 In BNC (Digital to Digital)

Figure 2-3 shows cabling between XLR balun connectors for digital AES3-1992 input from XLR connections to the AES3-1992 in (lower) BNC on the BaseIO panel. The balun (balance-unbalance) converters are passive devices for cabling different connector types while maintaining signal integrity; they are used in male-female pairs. These converters do not change the audio data format.

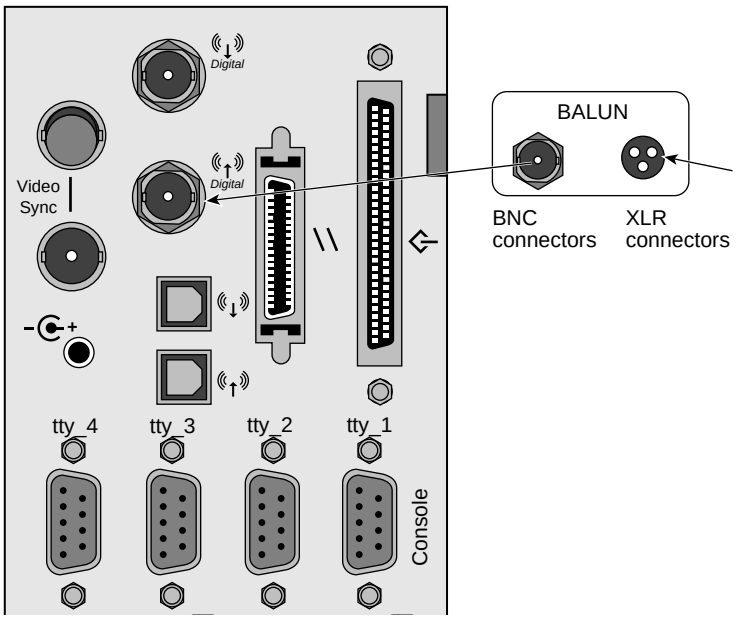

Figure 2-3 AES3-1992 XLR to BaseIO AES3-1992 In

Coax cabling is required to connect these baluns to BaseIO panel connectors.

See Table 2-2 for suppliers of this equipment.

BaseIO ADAT Optical Out to AES3-1992 XLR (Digital to Digital)

Figure 2-4 shows connections between the optical ADAT out (upper) connector on the Onyx2 BaseIO panel and XLR connectors. This converter supports up to four or up to eight XLR connectors, depending on the equipment. This connection does not change the audio data format (AES3), but does change the subcode (ancillary data), because ADAT and AES3 use different subcode formats.

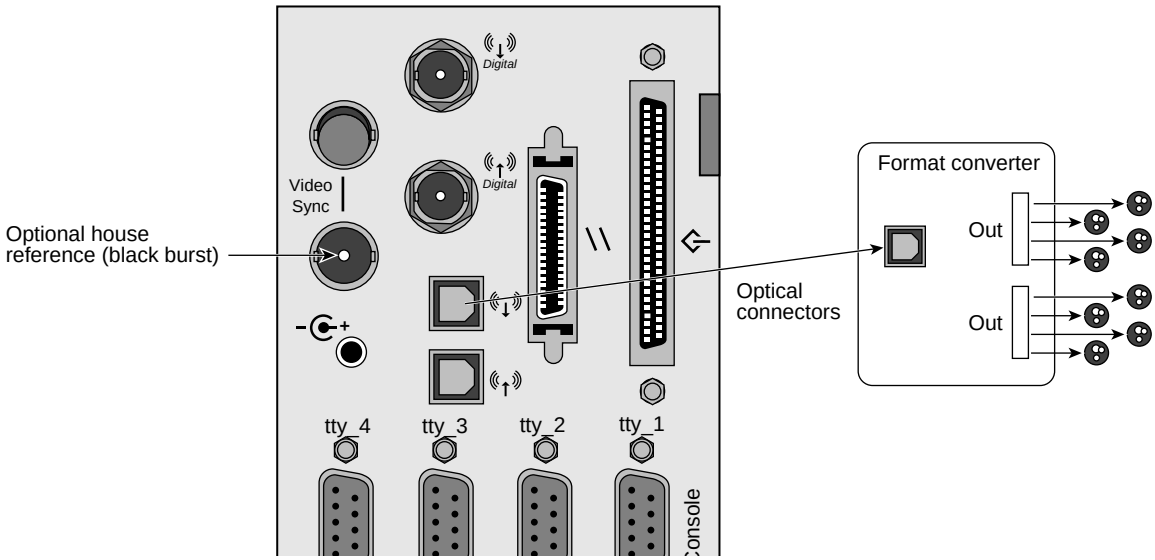

Figure 2-4 ADAT Out to XLR Converter (AES3-1992)

Table 2-3 lists some suppliers of this equipment.

Table 2-3 ADAT to XLR Format Converters (AES3-1992)

Manufacturer	Product	Web Site
Spectral	Translator Plus™ and XLR fanout adapter	www.spectralinc.com/products/translator/translator.htm
Otari Corporation	UFC-24/8®	www.otari.com/products/ufc24.htm

AES3-1992 XLR to BaseIO ADAT Optical In (Digital to Digital)

Figure 2-5 shows connections between XLR connectors and the optical ADAT in (lower) connector on the BaseIO panel. This converter supports up to four or up to eight XLR connectors, depending on the equipment. This connection does not change the audio data format (AES3), but does change the subcode (ancillary data), because ADAT and AES3 use different subcode formats.

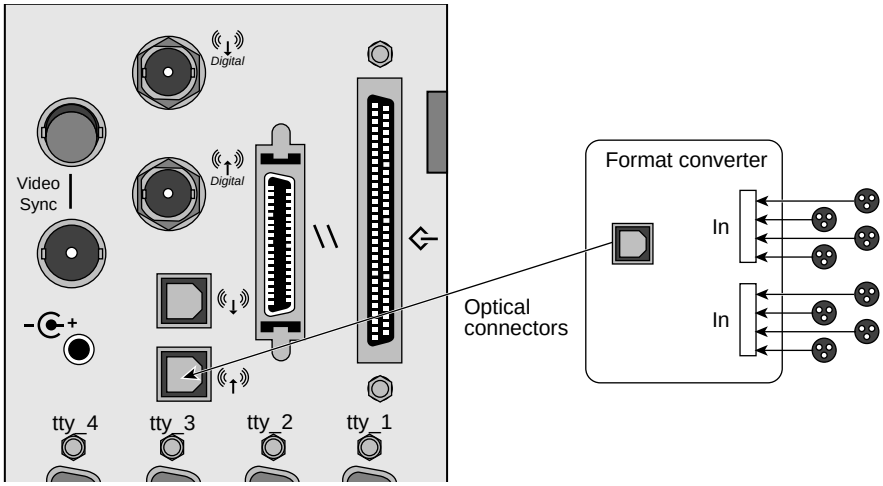

Figure 2-5 XLR (AES3-1992) to BaseIO ADAT In

See Table 2-3 for suppliers of this equipment.

External Devices: Analog

This section discusses

- "BaseIO AES3-1992 Out BNC to XLR (Digital-to Analog)"
- "XLR to BaseIO Panel AES3-1992 In BNC (Analog to Digital)"
- "BaseIO ADAT Optical Out to XLR (Digital to Analog)"
- "XLR to BaseIO ADAT Optical In (Analog to Digital)"
- "BaseIO Panel ADAT Out to Tip/Ring/Sleeve (Digital to Analog)"
- "TRS to BaseIO Panel ADAT In (Analog to Digital)"

BaseIO AES3-1992 Out BNC to XLR (Digital to Analog)

Figure 2-6 shows cabling between the AES3-1992 out (upper) BNC on the BaseIO panel and a digital/analog converter. This connection changes the format of the outgoing data from digital to analog.

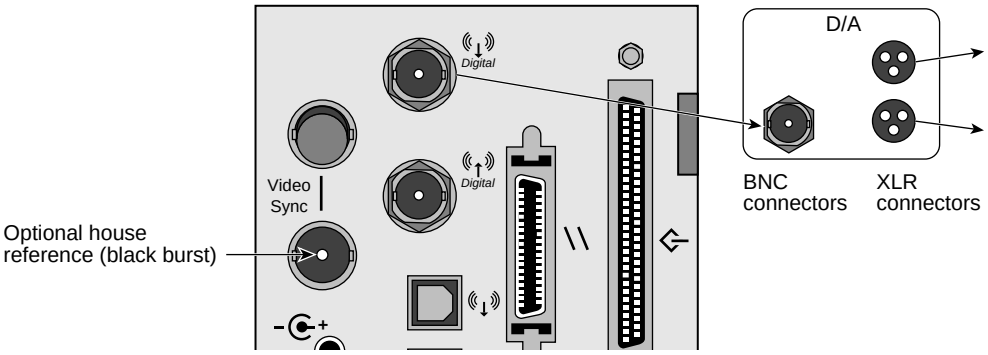

Figure 2-6 AES3-1992 BNC Out to Analog XLR

Table 2-4 lists some suppliers of this equipment.

Table 2-4 AES3-1992 Out BNC to Digital/Analog XLR Converter

Manufacturer	Product	Web Site
Spectral, Inc.	ADDA-2218™	www.spectralinc.com/products.htm
Grass Valley Group	M9402-B, M9422-B	www.tektronix.com/Grass_Valley/Products
Sony, Inc.	DABK 1512 (plugs into DAF-1500 8-slot box)	www.sel.sony.com/SEL/bppg/proaudio

Table 2-5 lists some suppliers of distribution amplifiers.

Table 2-5 Distribution Amplifiers

Manufacturer	Product	Web Site
Grass Valley Group	M9131 distribution amplifier M9131 fanout distribution amplifier	www.tektronix.com/ Grass_Valley/ Products
Sony, Inc.	BKPF-103 (plugs into 14-slot PFV-D100A box)	www.sel.sony.com

XLR to BaseIO Panel AES3-1992 In BNC (Analog to Digital)

Figure 2-7 shows cabling between an analog/digital converter and the AES3-1992 in (lower) BNC on the BaseIO panel. This connection changes the format of the incoming data from analog to digital.

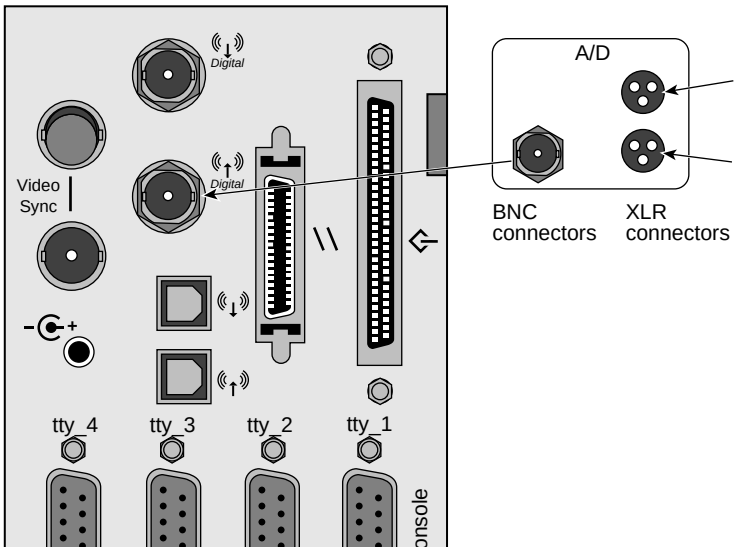

Figure 2-7 Analog XLR to AES3-1992 BNC In

Table 2-6 lists some suppliers of this equipment.

Table 2-6 Analog/Digital XLR Converter to AES3-1992 In BNC

Manufacturer	Product	Web Site
Spectral, Inc.	ADDA-2218	www.spectralinc.com/ products.htm
Grass Valley Group	M9401-B, M9421-B	www.tektronix.com/ Grass_Valley/Products
Sony	DABK 1512 (plugs into DAF-1500 8-slot box)	www.sel.sony.com/bppg/proaudio

BaseIO ADAT Optical Out to XLR (Digital to Analog)

Figure 2-8 shows connections between the ADAT out (upper) optical connector on the BaseIO panel and a digital/analog converter. This connection changes format from digital to analog. The equipment can have up to eight XLRs.

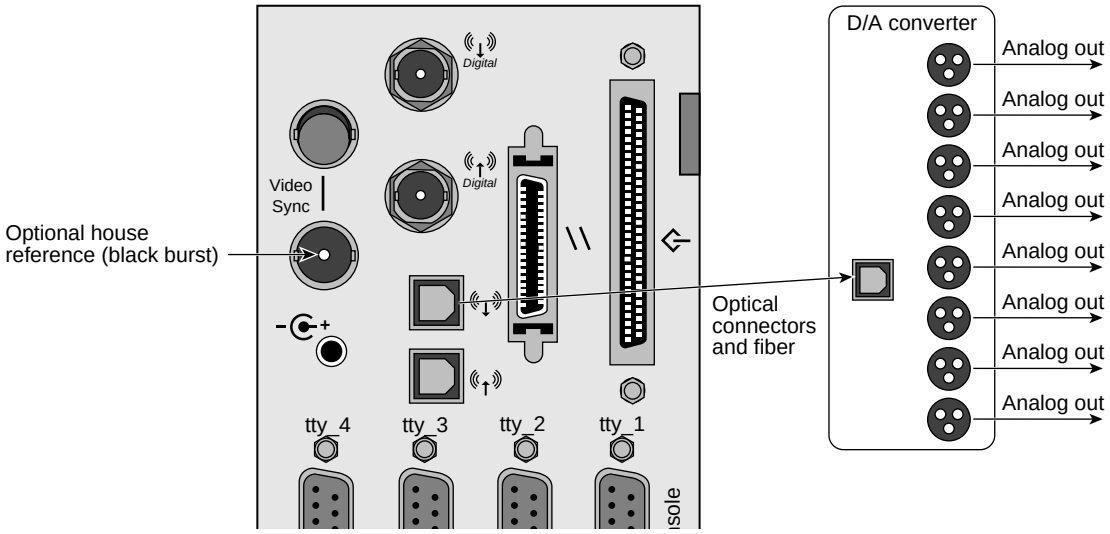

Figure 2-8 ADAT Out to Analog XLR

Table 2-7 lists some suppliers of this equipment.

Table 2-7 ADAT to D/A for XLR Connections

Manufacturer	Product	Web Site
Mytek Digital	8x20 DAC with ADAT option	www.mytekdigital.com/8x20.htm
Studer	D19 MultiDAC™	web.eunet.ch:80/studer/pages/ sales002.htm#D19-Series

XLR to BaseIO ADAT Optical In (Analog to Digital)

Figure 2-9 shows connections between an analog/digital converter and the ADAT in (lower) optical connector on the BaseIO panel. This connection changes format from analog to digital. The equipment can have up to eight XLRs.

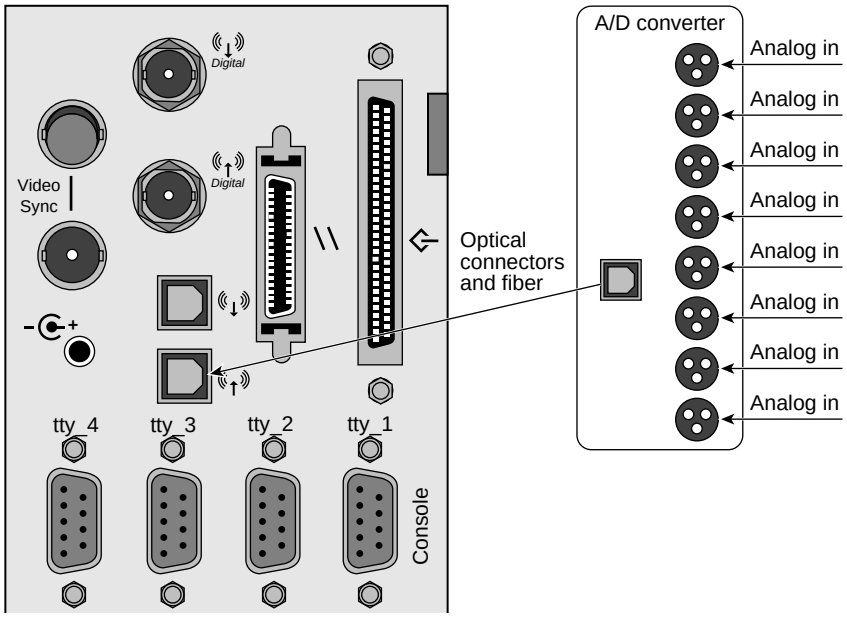

Figure 2-9 Analog XLR to ADAT In

Table 2-8 lists some suppliers of this equipment.

Table 2-8 ADAT to D/A for XLR Connections

Manufacturer	Product	Web Site
Korg	880A/D (TRS-style input; first two channels are XLR and TRS)	www.korg.net/pages/ eng/ eprod/edrs.htm
Studer	D19 MicAD™	web.eunet.ch:80/studer/pages/ sales001.htm#D19
Mytek Digital	8x20 DAC with ADAT option	www.mytekdigital.com/8x20.htm

BaseIO Panel ADAT Out to Tip/Ring/Sleeve (Digital to Analog)

Figure 2-10 shows connections between the ADAT out (upper) optical connector on the BaseIO panel and a tip/ring/sleeve (TRS) quarter-inch digital/analog converter. This connection changes format from digital to analog. The equipment can have up to eight connectors.

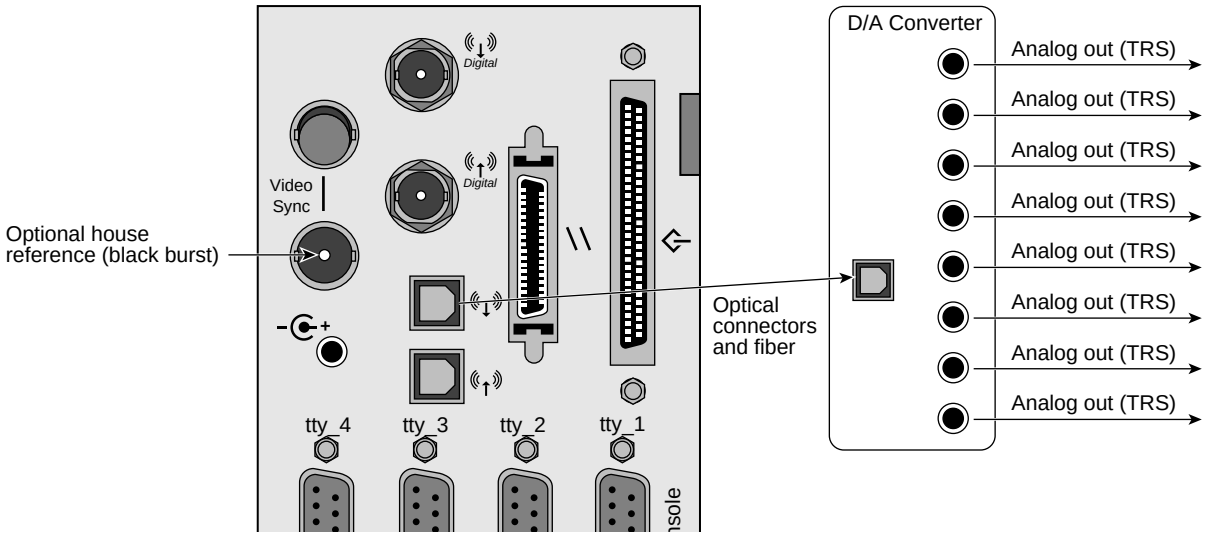

Figure 2-10 ADAT Out to TRS

Table 2-9 lists A/D and D/A converters.

Table 2-9 TRS A/D and D/A Converters

Manufacturer	Product	Web Site
Korg	880D/A	www.korg.net /pages/ eng/eprod/edrs.htm
Korg	880A/D	www.korg.net /pages/eng/eprod/edrs.htm

TRS to BaseIO Panel ADAT In (Analog to Digital)

Figure 2-11 shows connections between the ADAT in (lower) optical connector on the BaseIO panel and a tip/ring/sleeve (TRS) quarter-inch digital/analog converter. This connection changes format from analog to digital. The equipment can have up to eight connectors.

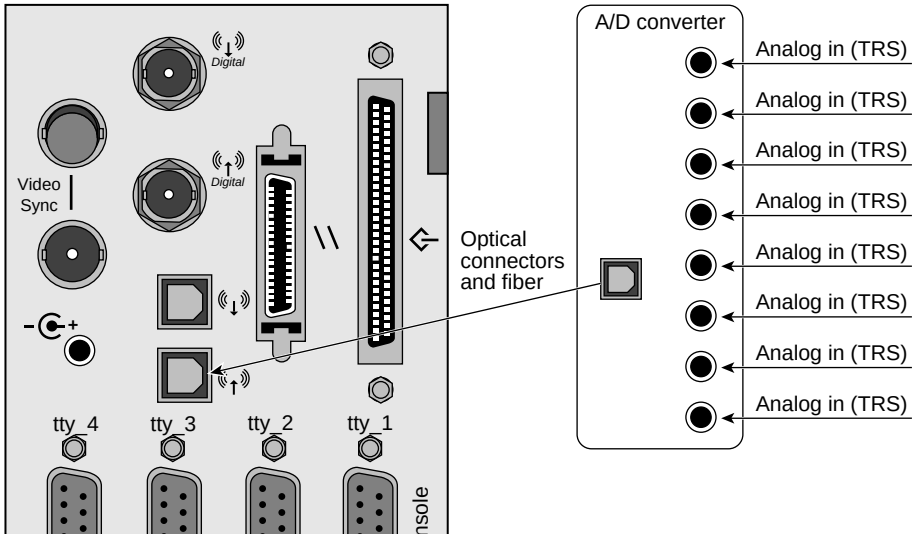

Figure 2-11 TRS to ADAT Out

See Table 2-9 for a supplier.

Third-Party Suppliers

Table 2-10 summarizes information for audio equipment manufacturers listed in this chapter.

Table 2-10 Audio Equipment Manufacturer Contact Information

Category	Information
Manufacturer	Canare Cable, Inc.
Address	531 5th Street, Unit A San Fernando, CA 91340 USA
Telephone	818-365-2446
Fax	818-365-0479
Web site	www.canare.com
Manufacturer	Energy Transformation Systems
Address	1394 Willow Rd. Menlo Park, CA 94025-1598 USA
Telephone	415-324-4949; 800-752-8208
Fax	415-324-1608
Web site	www.etslan.com
Manufacturer	Graham-Patten Systems, Inc.
Address	P.O. Box 1960 Grass Valley, CA 95945 USA
Telephone	916-273-8412; 800-422-6662
Fax	916-273-7458
Web site	www.gpsys.com
Manufacturer	Grass Valley Group (a Tektronix Company)
Address	PO Box 1114 Grass Valley, CA 95745 USA
Telephone	800-395-9478 ext. 901
Fax	
Web site	www.tektronix.com/Grass_Valley
Manufacturer	Korg USA, Inc.
Address	316 South Service Road Melville, NY 11747 USA
Telephone	516-333-9100
Fax	516-333-9108
Web site	www.korg.net

Table 2-10 Audio Equipment Manufacturer Contact Information

Category	Information
Manufacturer	Mytek Digital, Inc.
Address	PO Box 1023 New York City NY 10276 USA
Telephone	212-388-2677
Fax	212-686-4948
Web site	www.mytekdigital.com
Manufacturer	Otari Corporation
Address	378 Vintage Park Drive Foster City, CA 94404 USA
Telephone	415-341-5900
Fax	415-341-7200
Web site	www.otari.com
Manufacturer	Sony Professional Audio
Address	3 Paragon Drive Montvale, NJ 07645 USA
Telephone	201-930-1000
Fax	
Web site	www.sel.sony.com
Manufacturer	Spectral, Incorporated
Address	18800 142nd Ave. NE Woodinville, WA 98072 USA
Telephone	206-487-2931; 800-407-5832
Fax	206-487-3431
Web site	www.spectralinc.com
Manufacturer	Studer Professional Audio AG
Address	Althardstrasse 30 CH-8105 Regensdorf Switzerland
Telephone	+41-1-870-75-11
Fax	+41-1-840-47-37
Web site	web.eunet.ch:80/studer

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