

Digital Media Connections

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THE FOLLOWING INFORMATION APPLIES ONLY TO THE SILICON GRAPHICS DIVO AND DIVO-DVC OPTION BOARDS.

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.

European Union Statement

This device complies with the European Directives listed on the “Declaration of Conformity” which is included with each product. The CE mark insignia displayed on the device is an indication of conformity to the aforementioned European requirements.



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.

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

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

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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 and DIVO-DVC option boards and the DG5-2/GVO option board:

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

Equipment used with the breakout cables supplied with the HD I/O option board is also covered.

This guide also includes 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, DIVO-DVC, GVO, and HD I/O option boards, or audio I/O hardware with Silicon Graphics workstations and servers, such as Onyx2 and Origin2000 systems.

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, DIVO-DVC, 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 <ul style="list-style-type: none">• 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.

Because the DIVO and DIVO-DVC options share most features, this guide refers to both these options at once. Specifically:

- The options are referred to as DIVO/DIVO-DVC in references to features common to both, such as the I/O panel.
- The options are referred to as DIVO and DIVO-DVC in references to both options.

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

Other Documents

Many current Silicon Graphics owner's guides, programming guides, and user's guides are available online in the following locations:

- IRIS InSight Library: from the Toolchest, choose Help > Online Books > SGI EndUser or SGI Admin, and select the applicable owner's or hardware guide.
- Technical Publications Library: if you have access to the Internet, enter the following URL in your Web browser location window:
<http://techpubs.sgi.com/library/>

Once you are in the library, choose Catalogs > Hardware Catalog > and look under the Owner's Guides for the applicable owner's guide.

Video

This chapter explains

- “DIVO/DIVO-DVC and GVO Panels” on page 2
- “CCIR 601 to DIVO/DIVO-DVC IN” on page 4
- “DIVO/DIVO-DVC OUT/GVO OUT to CCIR 601” on page 5
- “Dual-Link Serial Digital Video to DIVO/DIVO-DVC IN” on page 6
- “DIVO/DIVO-DVC OUT or GVO OUT to Dual-Link Serial” on page 7
- “Parallel Digital Video Single-Link to DIVO/DIVO-DVC IN” on page 8
- “Parallel Digital Video Dual-Link to DIVO/DIVO-DVC IN” on page 9
- “DIVO/DIVO-DVC OUT and GVO OUT to Parallel Digital Video Single-Link” on page 10
- “Serial Data Transport Interface (SDTI) to DIVO/DIVO-DVC IN” on page 12
- “DIVO/DIVO-DVC OUT to SDTI” on page 13
- “DIVO/DIVO-DVC OUT and GVO OUT to Parallel Digital Video Dual-Link” on page 14
- “Component Analog to DIVO/DIVO-DVC IN (Serial Digital)” on page 16
- “DIVO/DIVO-DVC OUT and GVO OUT to Component Analog (Serial Digital)” on page 17
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- “Serial/Parallel and Analog/Digital Converters to and From HD I/O” on page 21
- “Third-Party Suppliers” on page 24

DIVO/DIVO-DVC and GVO Panels

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

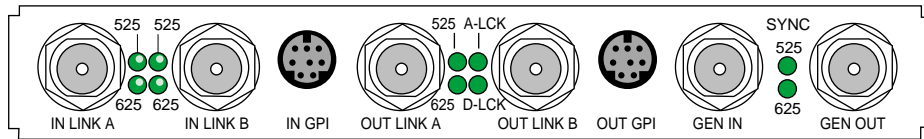


Figure 1-1 DIVO/DIVO-DVC Ports

The DIVO/DIVO-DVC 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 or DIVO-DVC board.

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

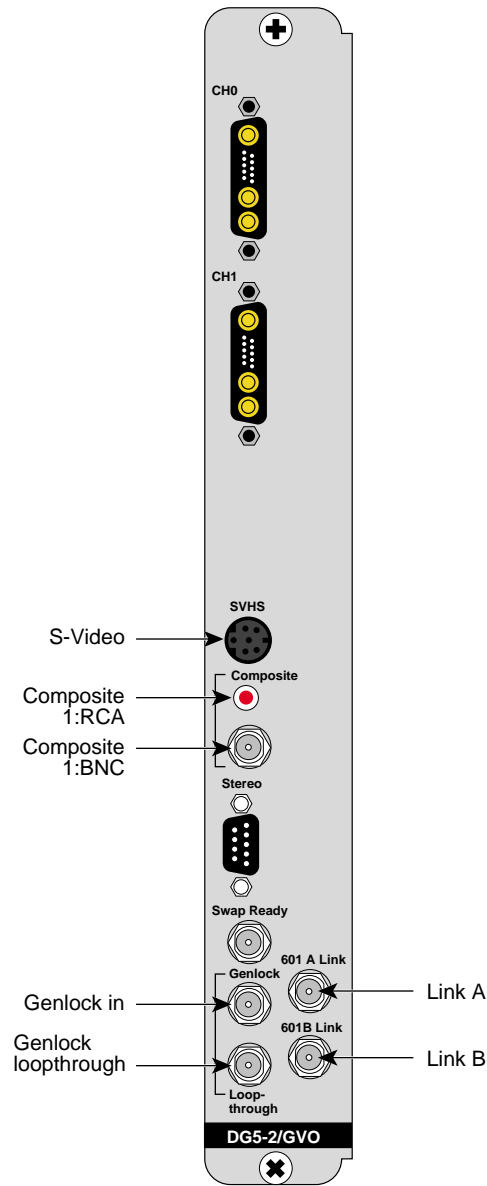


Figure 1-2 DG5-2/GVO Video Connectors

CCIR 601 to DIVO/DIVO-DVC IN

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

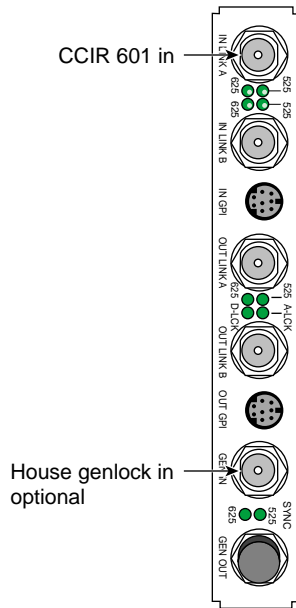


Figure 1-3 CCIR 601 to DIVO/DIVO-DVC IN

DIVO/DIVO-DVC OUT/GVO OUT to CCIR 601

Figure 1-4 shows the connection between DIVO/DIVO-DVC **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/DIVO-DVC or GVO connector and the external video device.

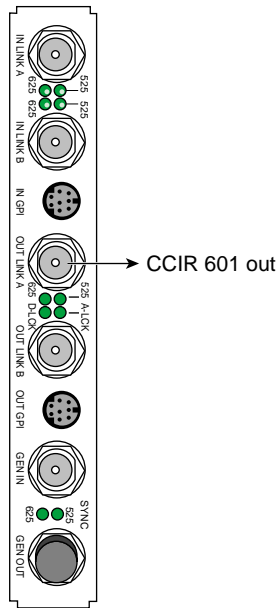


Figure 1-4 DIVO/DIVO-DVC OUT to CCIR 601

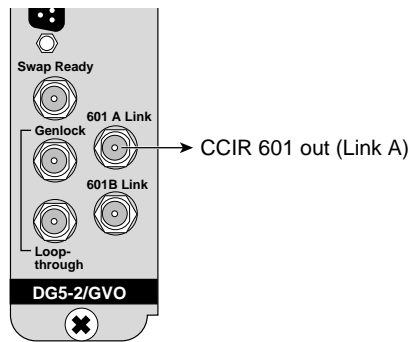


Figure 1-5 DIVO/DIVO-DVC OUT to CCIR 601 and GVO OUT to CCIR 601

Dual-Link Serial Digital Video to DIVO/DIVO-DVC IN

Figure 1-6 shows connections between both DIVO/DIVO-DVC **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/DIVO-DVC connectors and the external video devices. The genlock connection is optional.

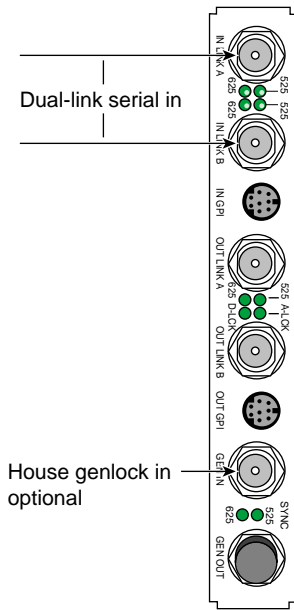


Figure 1-6 Dual-Link Serial to DIVO/DIVO-DVC IN

DIVO/DIVO-DVC OUT or GVO OUT to Dual-Link Serial

Figure 1-7 shows connections between both DIVO/DIVO-DVC **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/DIVO-DVC or GVO connectors and the external video devices.

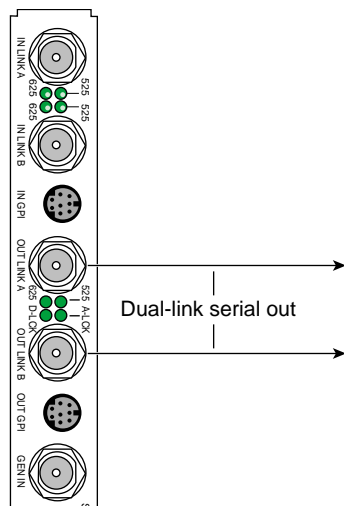


Figure 1-7 DIVO/DIVO-DVC OUT to Dual-Link Serial

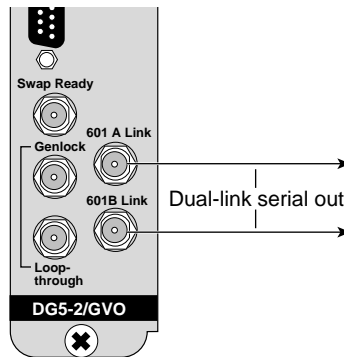


Figure 1-8 GVO OUT to Dual-Link Serial

Parallel Digital Video Single-Link to DIVO/DIVO-DVC IN

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

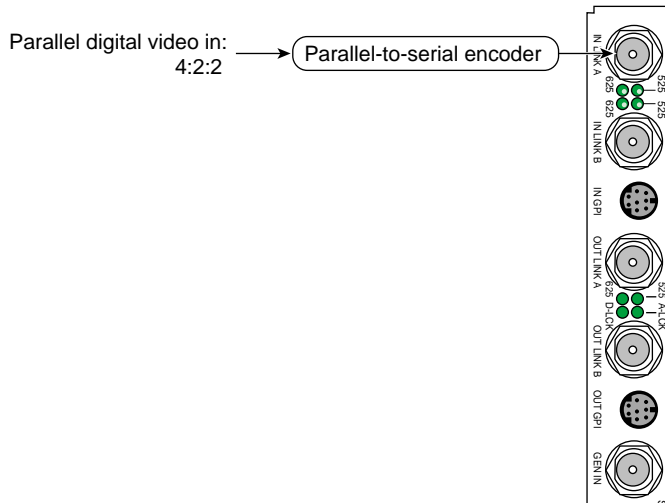


Figure 1-9 CCIR 601 Single-Link to DIVO/DIVO-DVC IN

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

Table 1-1 Parallel-to-Serial Encoders for DIVO/DIVO-DVC 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/DIVO-DVC IN

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

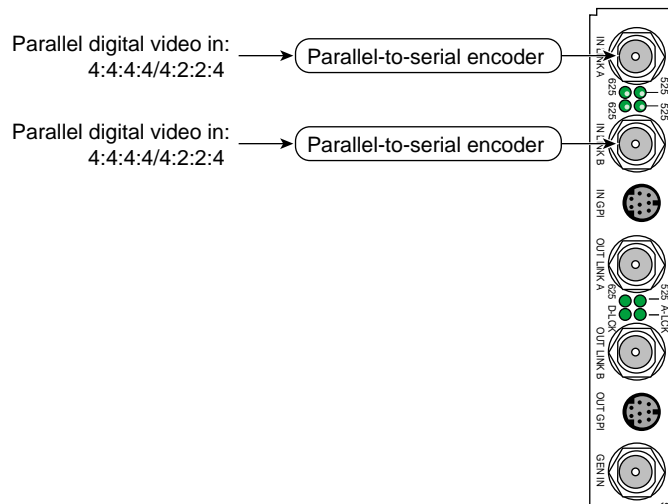


Figure 1-10 CCIR 601 (Parallel Digital Video Dual-Link to DIVO/DIVO-DVC IN

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

Table 1-2 Parallel-to-Serial Encoders for DIVO/DIVO-DVC 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/DIVO-DVC OUT and GVO OUT to Parallel Digital Video Single-Link

Figure 1-11 shows connections between DIVO/DIVO-DVC **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.

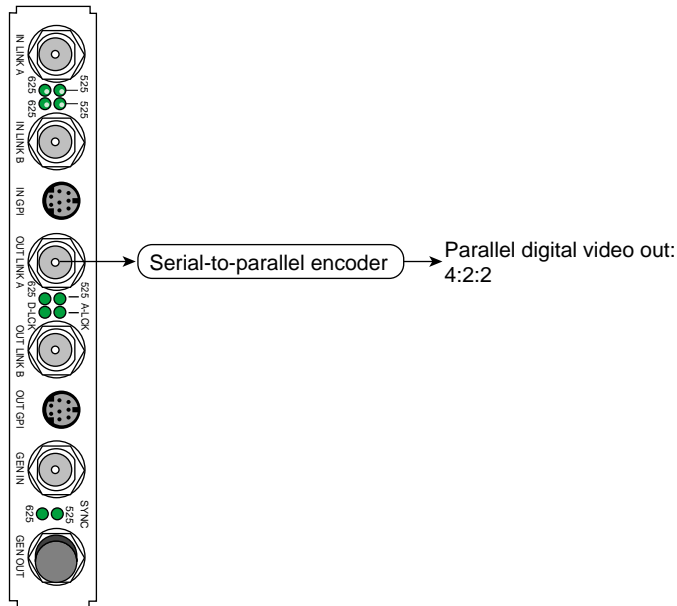


Figure 1-11 Parallel Digital Video Connections to DIVO/DIVO-DVC OUT

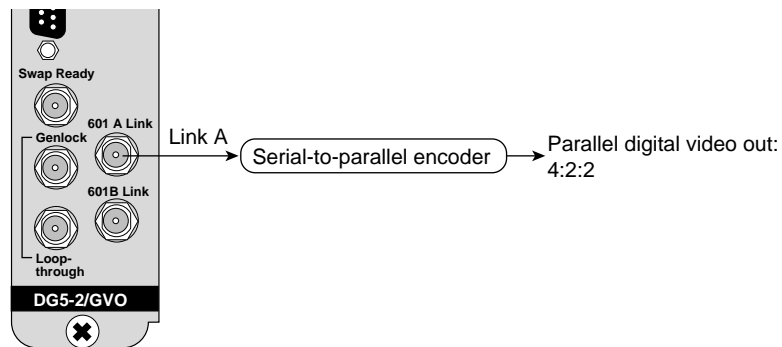


Figure 1-12 Parallel Digital Video Connections to GVO OUT

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

Table 1-3 Parallel Encoders for DIVO/DIVO-DVC 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

Serial Data Transport Interface (SDTI) to DIVO/DIVO-DVC IN

Figure 1-13 shows the connection between the DIVO and DIVO-DVC **IN LINK A** BNC and a Serial Data Transport Interface (SDTI) device.

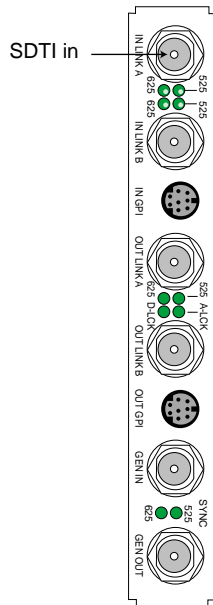


Figure 1-13 SDTI to DIVO/DIVO-DVC IN

You can connect a SMPTE 305M-compliant SDTI deck to **IN LINK A** to use SDTI on the DIVO or DIVO-DVC option board.

For more information on the SDTI standard, see “Serial Data Transport Interface (SDTI)” in Chapter 1 of the *DIVO Option and DIVO-DVC Option Owner’s Guide*.

DIVO/DIVO-DVC OUT to SDTI

Figure 1-14 shows the connection between the DIVO/DIVO-DVC **OUT LINK A** and an SDTI device.

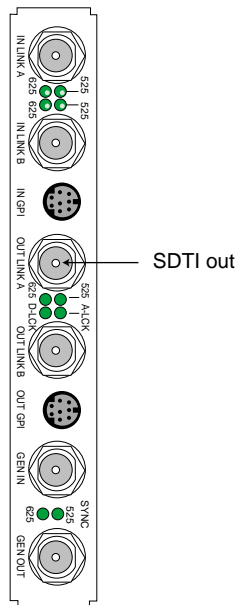


Figure 1-14 SDTI to DIVO/DIVO-DVC OUT

You can connect a SMPTE 305M-compliant SDTI deck to **OUT LINK A** to use SDTI on the DIVO or DIVO-DVC option board.

For more information on the SDTI standard, see “Serial Data Transport Interface (SDTI)” in Chapter 1 of the *DIVO Option and DIVO-DVC Option Owner’s Guide*.

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

Figure 1-15 shows connections between both DIVO/DIVO-DVC **OUT** BNCs and parallel digital video 4:2:2:4/4:4:4:4 (dual-link) devices; Figure 1-16 shows connections between both GVO **OUT** BNCs and parallel digital video 4:2:2:4/4:4:4:4 (dual-link) devices.

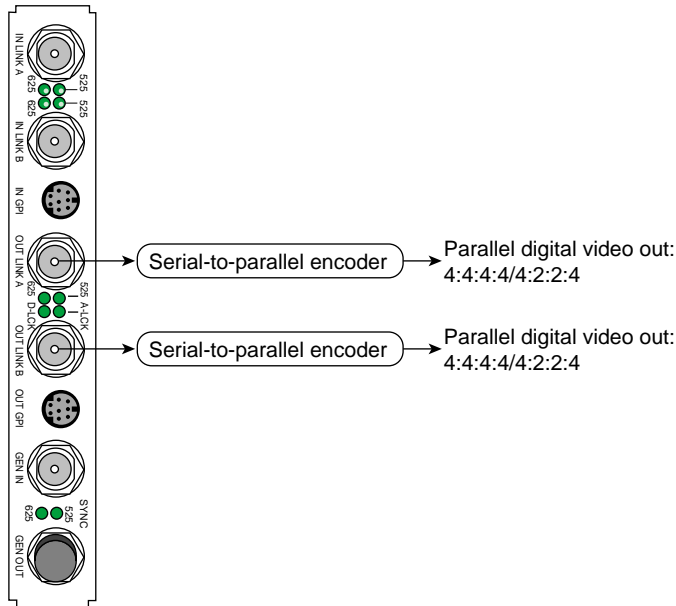


Figure 1-15 Parallel Digital Video Connections to DIVO/DIVO-DVC OUT

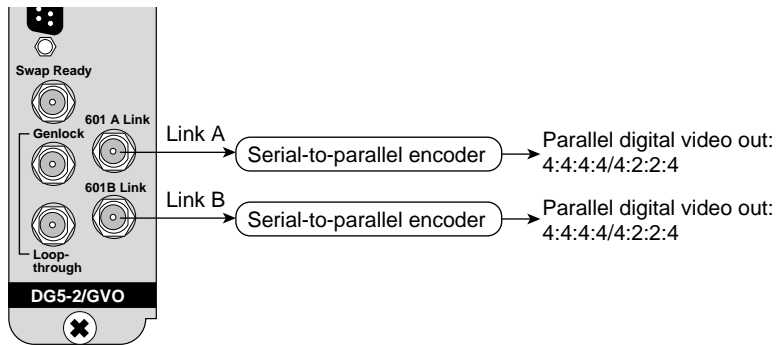


Figure 1-16 Parallel Digital Video Connections to GVO OUT

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

Table 1-4 Parallel Encoders for DIVO/DIVO-DVC 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/DIVO-DVC IN (Serial Digital)

Figure 1-17 shows a connection between DIVO/DIVO-DVC **IN LINK A** and component analog to serial digital (such as Betacam).

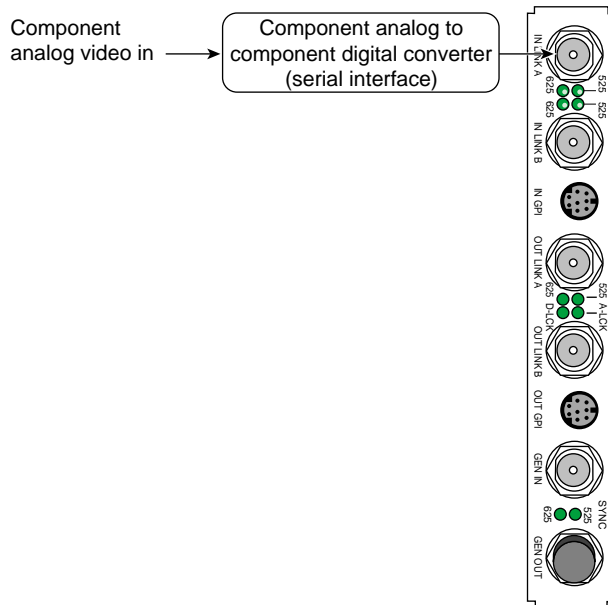


Figure 1-17 Component Analog Connections to DIVO/DIVO-DVC IN

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

Table 1-5 Component Analog Converters for DIVO/DIVO-DVC 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/DIVO-DVC OUT and GVO OUT to Component Analog (Serial Digital)

Figure 1-18 shows a connection between DIVO/DIVO-DVC **OUT LINK A** and component analog (such as Betacam); Figure 1-19 shows a connection between GVO **OUT LINK A** and component analog.

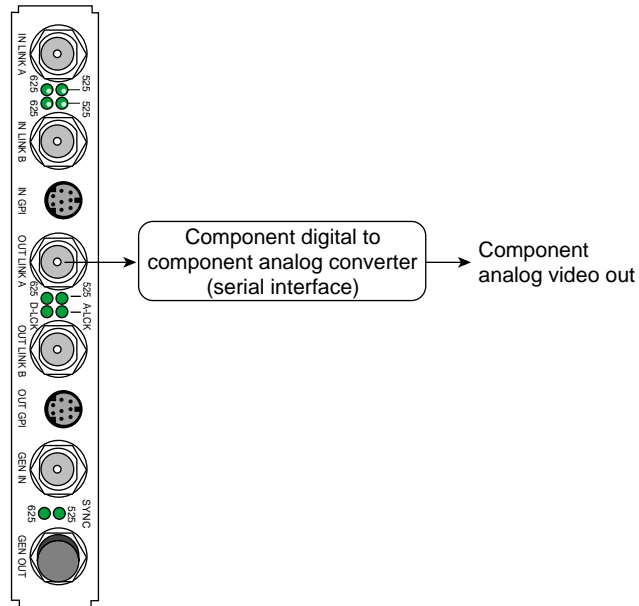


Figure 1-18 CCIR 601 (Serial Digital Interface) Connections to DIVO/DIVO-DVC OUT

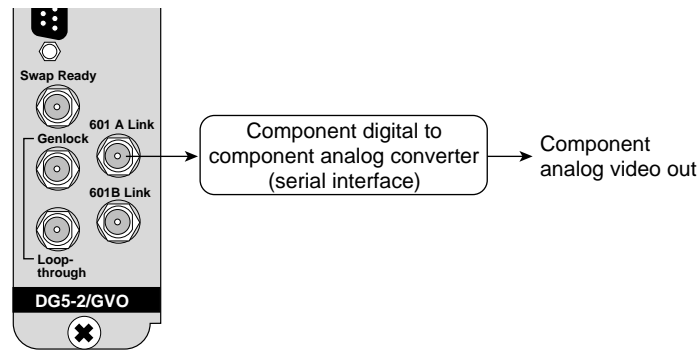


Figure 1-19 CCIR 601 (Serial Digital Interface) Connections to GVO OUT

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

Table 1-6 Component Analog Converters for DIVO/DIVO-DVC 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/DIVO-DVC IN

Figure 1-20 shows a connection between DIVO/DIVO-DVC **IN LINK A** and composite analog (NTSC/PAL).

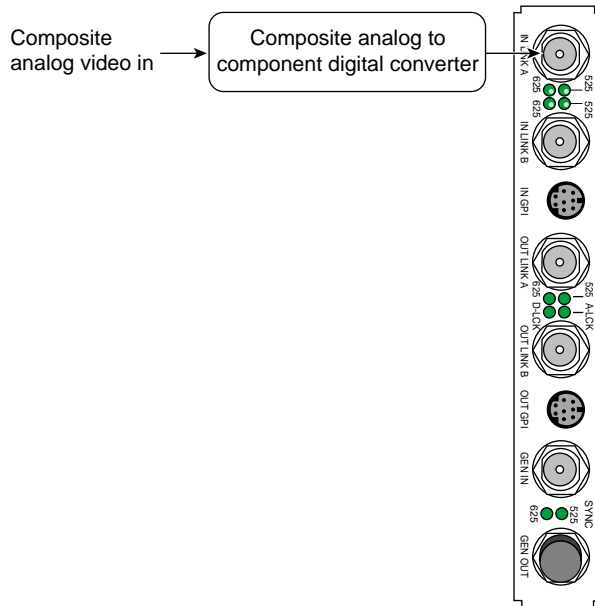


Figure 1-20 CCIR 601 (Serial Digital Interface) Connections to DIVO/DIVO-DVC IN

Table 1-7 summarizes possible suppliers of this equipment.

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

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/DIVO-DVC OUT and GVO OUT to Composite Analog

Figure 1-21 shows a connection between DIVO/DIVO-DVC **OUT LINK A** and composite analog (NTSC/PAL); Figure 1-22 shows a connection between GVO **OUT LINK A** and composite analog (NTSC/PAL).

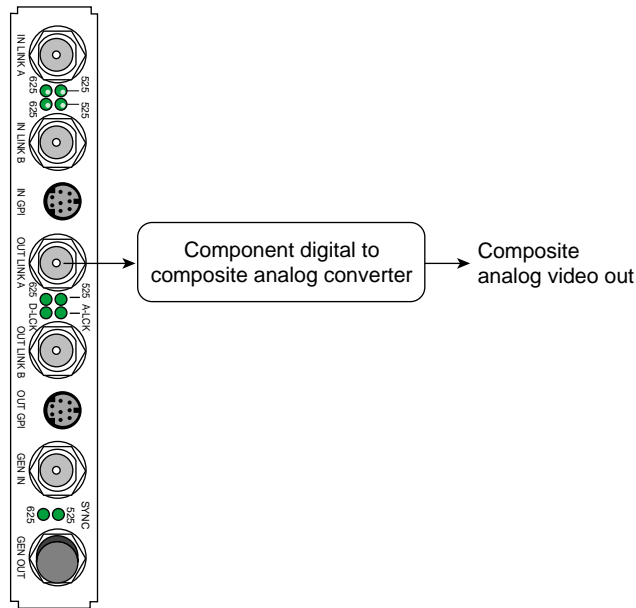


Figure 1-21 Composite Analog Connection to DIVO/DIVO-DVC OUT

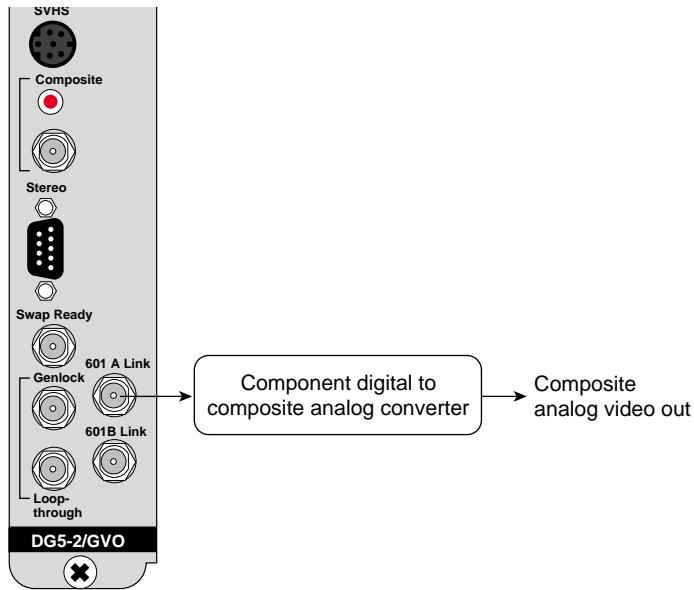


Figure 1-22 Composite Analog Connection to GVO OUT

Table 1-8 summarizes possible suppliers of this equipment.

Table 1-8 Composite Analog (NTSC/PAL) to DIVO/DIVO-DVC 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

Serial/Parallel and Analog/Digital Converters to and From HD I/O

Figure 1-23 shows the two multiheaded cables included with the board; each has four 50-pin connectors for link A input, link B input, link A output, and link B output. The 50-pin connectors differ for each type of cable, following the Panasonic and Philips 50-pin video equipment interface standard.

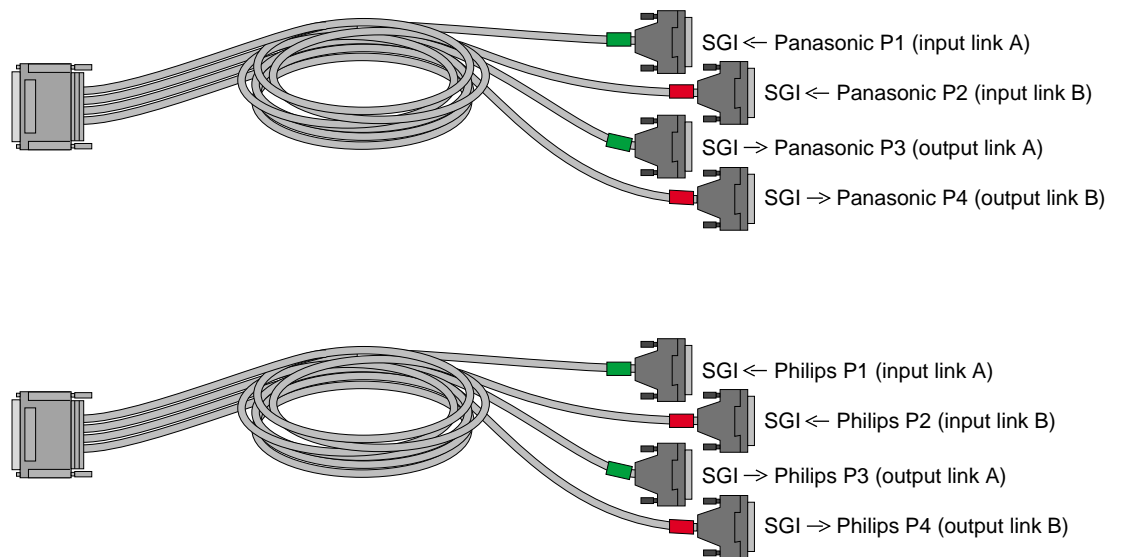


Figure 1-23 HD I/O Cables

See "HD I/O Panel and Cable" in Chapter 1 of the *HD I/O Option Board Owner's Guide* for more information on the cables included with the option.

Figure 1-24 diagrams example connections between serializers and the HD I/O board.

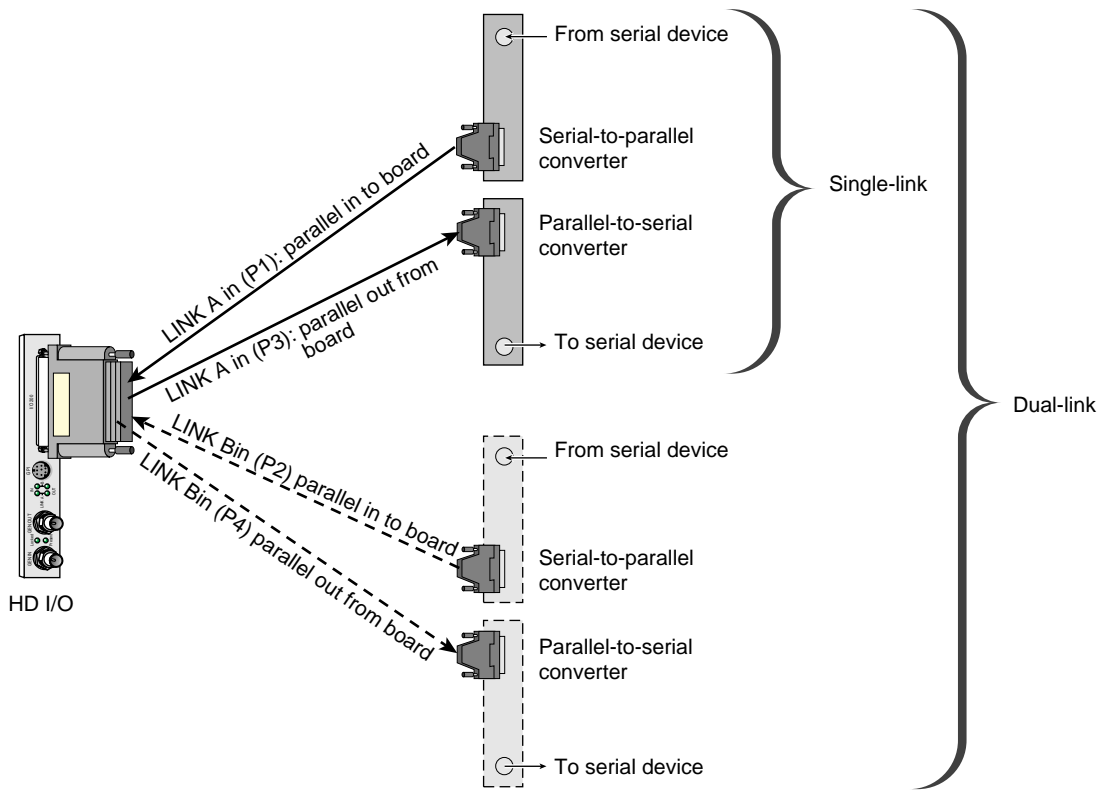


Figure 1-24 HD I/O and Serializers Example Cabling

Table 1-9 summarizes possible suppliers of this equipment.

Table 1-9 Serializers and Converters for HD I/O Option

Conversion	Product	Manufacturer	Web Site
Serial to parallel	SPC-292M	YEM	http://www.yem.co.jp
	AJ-HSP500	Panasonic	http://www.panasonic.co/broadcast , http://www.panasonic.co.jp
Parallel to serial	PSC-292M	YEM	http://www.yem.co.jp
	AJ-SDA500	Panasonic	http://www.panasonic.com/broadcast , http://www.panasonic.co.jp
Combination serial to parallel, parallel to serial	PSP-292M	YEM	http://www.yem.co.jp
Analog to digital	ADC-292M	YEM	http://www.yem.co.jp
Digital to analog	AJ-HDA500	Panasonic	http://www.panasonic.com/broadcast , http://www.panasonic.co.jp
	DAC-292M	YEM	http://www.yem.co.jp

Third-Party Suppliers

Table 1-10 summarizes contact information for video equipment manufacturers listed in this chapter.

Table 1-10 Video Equipment Manufacturer Contact Information

Category	Information
Manufacturer	Accom, Inc.
Address	1490 O'Brien Drive Menlo Park, CA 94025 USA
Telephone	650-328-3818
Fax	650-327-2511
Web site	www.accom.com
Manufacturer	Leitch Incorporated
Address	920 Corporate Lane Chesapeake, VA 23320 USA
Telephone	800-231-9673; 888-231-9673; 757-548-2300
Fax	757-548-4088
Web site	www.leitch.com
Manufacturer	Miranda Technologies, Inc.
Address	2323 Halpern Montreal, Quebec, Canada, H4S 1S3
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

Table 1-10 (continued) Video Equipment Manufacturer Contact Information

Category	Information
Manufacturer	Panasonic Broadcast and Digital Systems Co.
Address	3330 Cahuenga Blvd. West Los Angeles CA 90068
Telephone	323-436-3500
Web site	http://www.panasonic.com/broadcast http://www.panasonic.co.jp
Manufacturer	YEM America Inc.
Address	734 Silver Spur Road #203 Rolling Hills Estates, CA 90274
Telephone	310-544-9343
Fax	310-544-9363
	YEM Inc.
Address	1-3-33, Okata Atsugi-city, Kanagawa 243-0021, Japan
Telephone	0462(28)8883
Fax	0462-28-3044
Web site	http://www.yem.co.jp

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. The DIVO and DIVO-DVC option boards support audio embedded in video; they also support video through the DIVO or DIVO-DVC board synchronized with audio going through the BaseIO board (SMPTE 272M). In each case, the video goes through the DIVO or DIVO-DVC 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.

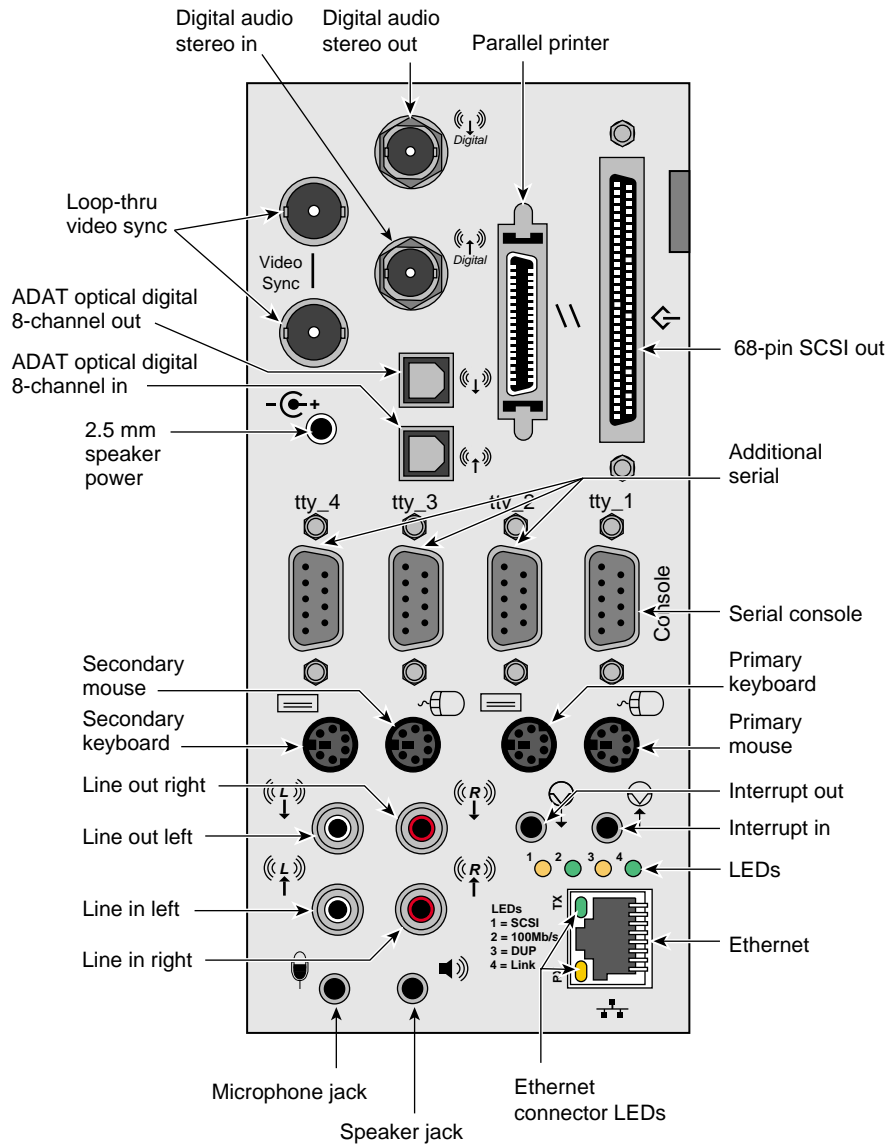


Figure 2-1 BaseIO Assembly (IO6G) Panel

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 or DIVO-DVC board), use a common sync source connected to either BaseIO **Video Sync** connector and the board's **GEN IN** connector.
- If you are not syncing audio to the DIVO or DIVO-DVC 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 or DIVO-DVC board does not provide sync out. Its **GEN IN** and **GEN OUT** connectors are passive loophrough inputs only; **GEN OUT** is a loophrough of **GEN IN**. Syncing either board 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.

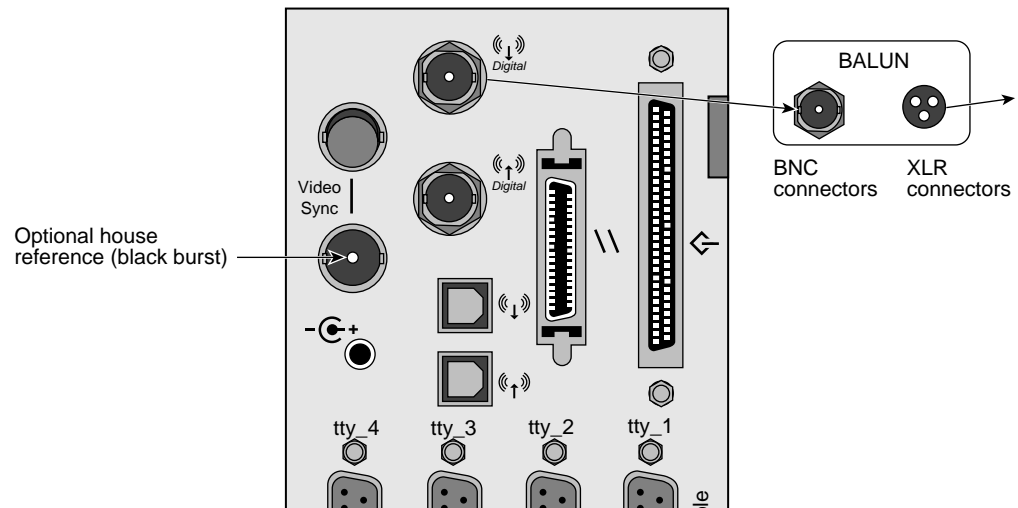


Figure 2-2 BaseIO AES3-1992 BNC OUT to AES3-1992 XLR

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

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.

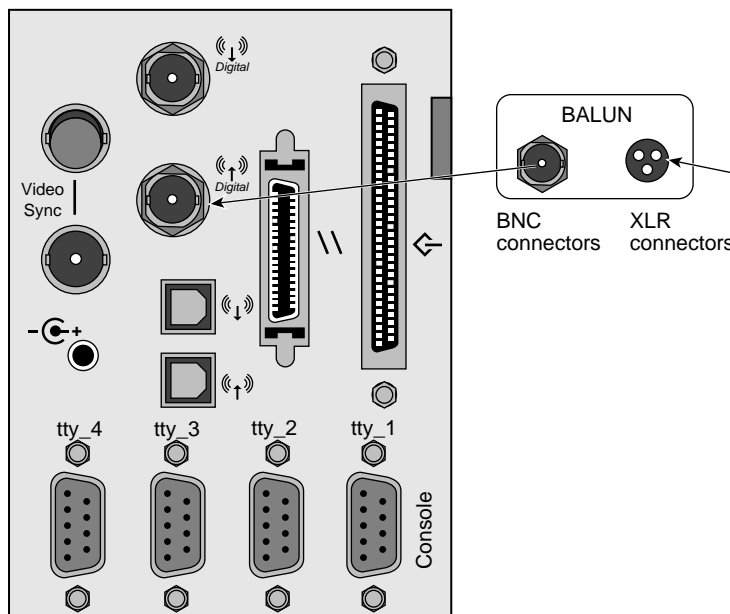


Figure 2-3 AES3-1992 XLR to BaseIO AES3-1992 In

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.

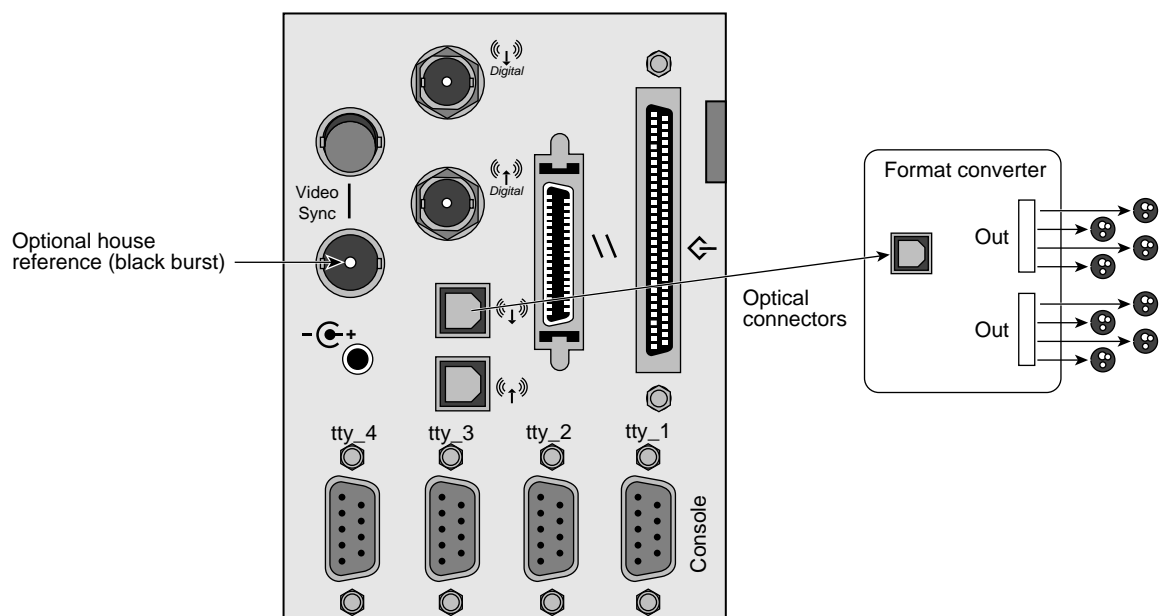


Figure 2-4 ADAT Out to XLR Converter (AES3-1992)

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.

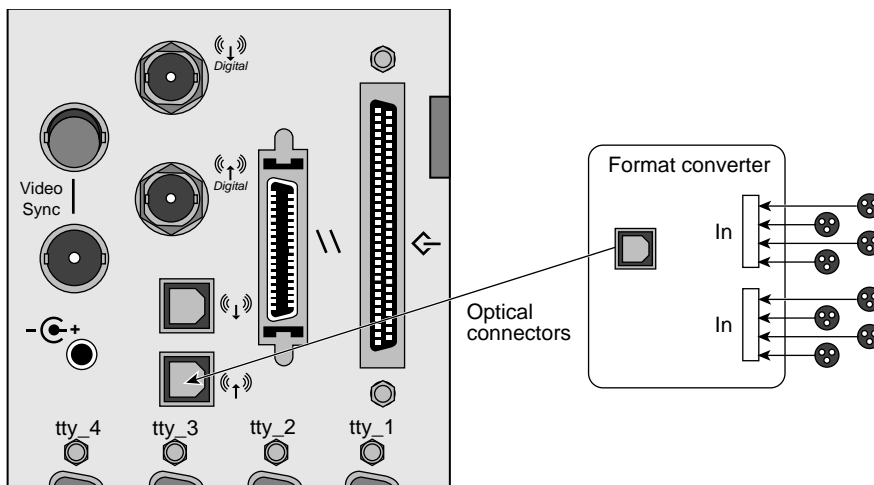


Figure 2-5 XLR (AES3-1992) to BaseIO ADAT In

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.

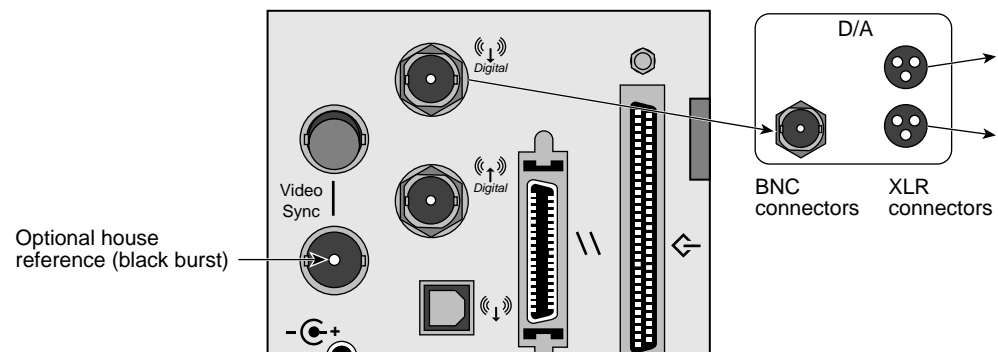


Figure 2-6 AES3-1992 BNC Out to Analog XLR

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.

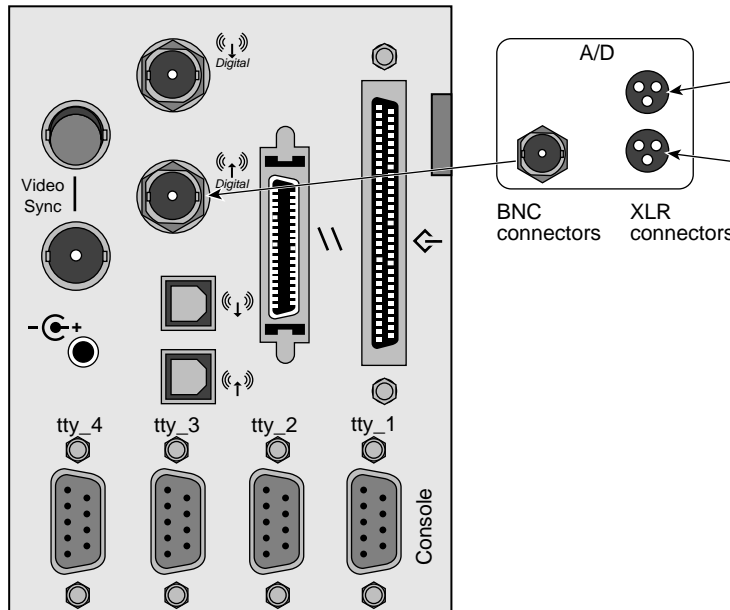


Figure 2-7 Analog XLR to AES3-1992 BNC In

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.

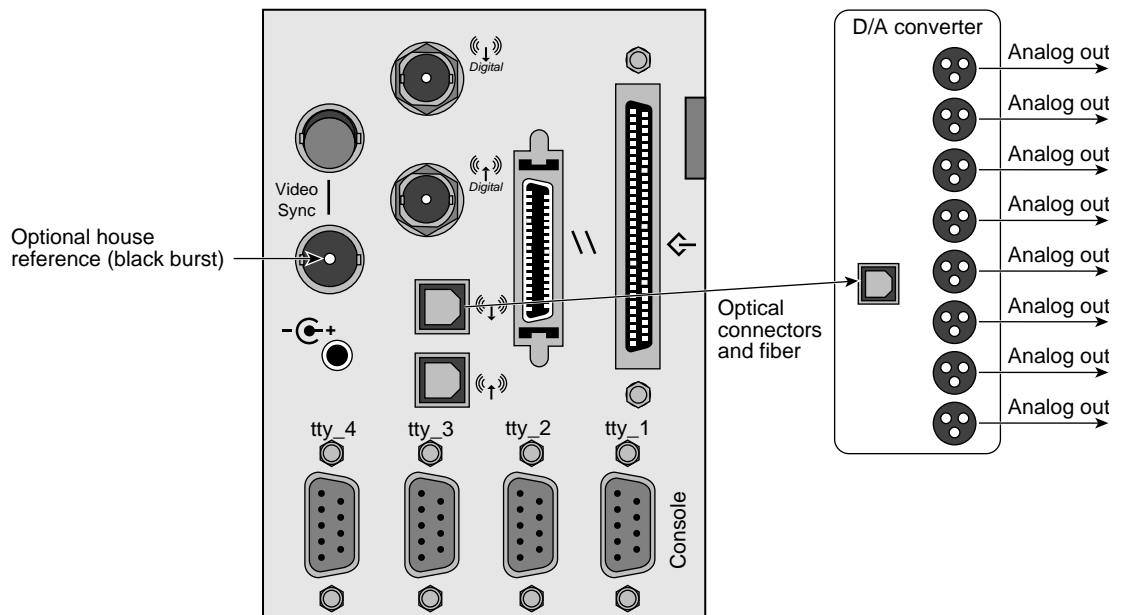


Figure 2-8 ADAT Out to Analog XLR

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.

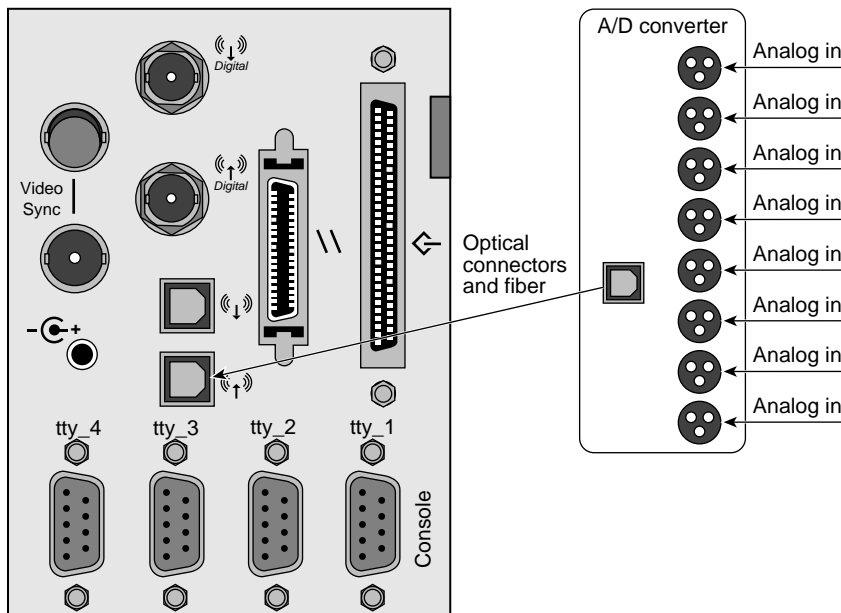


Figure 2-9 Analog XLR to ADAT In

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.

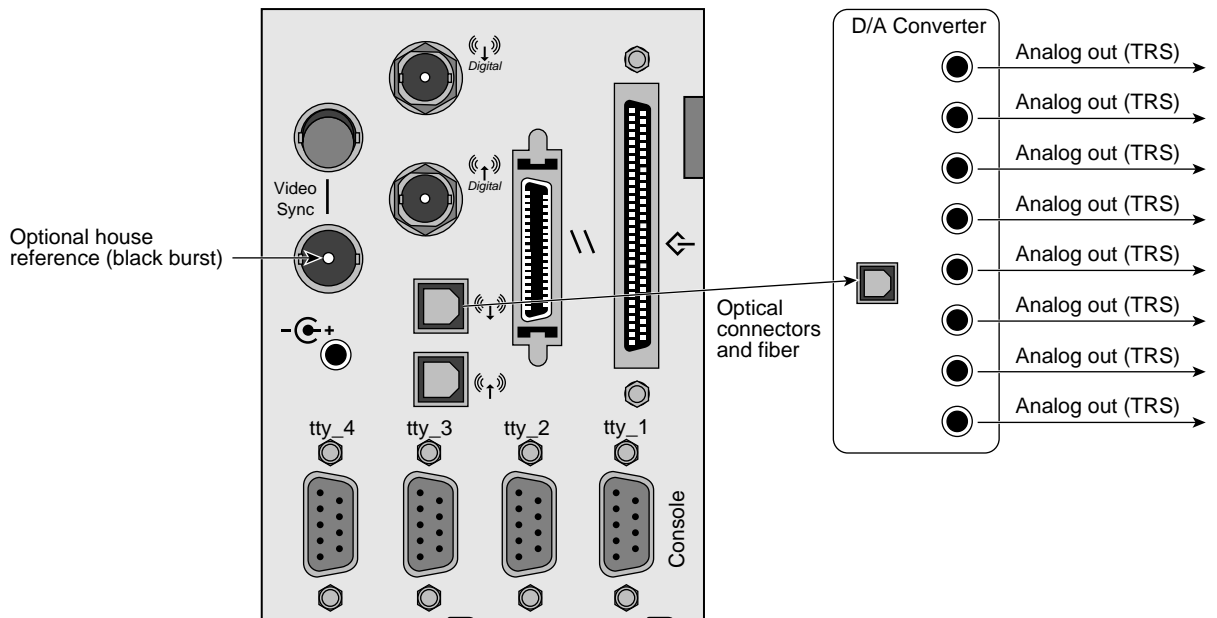


Figure 2-10 ADAT Out to TRS

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.

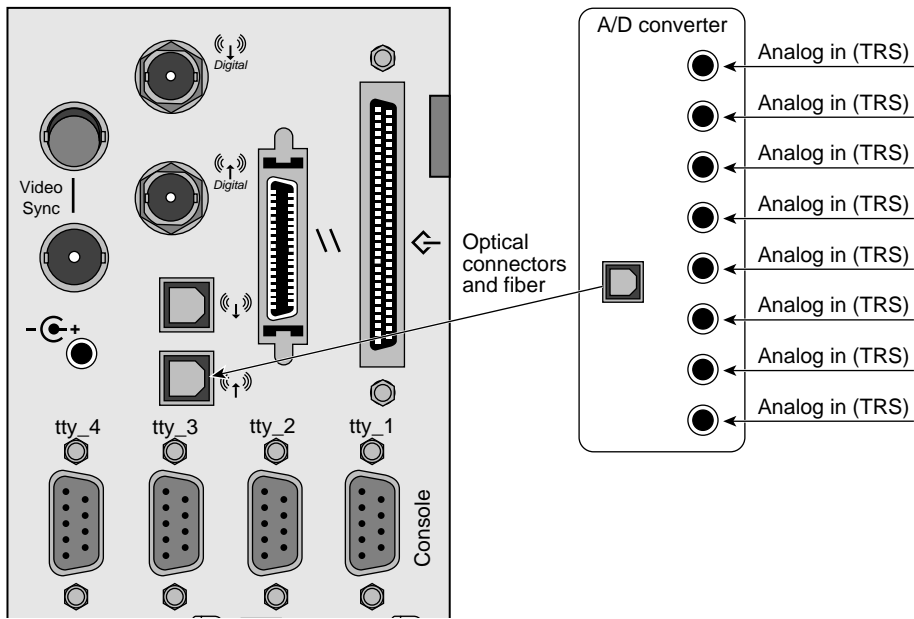


Figure 2-11 TRS to ADAT Out

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	650-324-4949; 800-752-8208
Fax	650-324-1608
Web site	www.etslan.com
Manufacturer	Graham-Patten Systems, Inc.
Address	P.O. Box 1960 Grass Valley, CA 95945 USA
Telephone	530-273-8412; 800-422-6662
Fax	530-273-7458
Web site	www.gpsys.com
Manufacturer	Grass Valley Group (a Tektronix Company)
Address	5161 Lankershim Blvd., Suite 100 North Hollywood, CA 91601 USA
Telephone	818-760-1699, 800-547-8949
Fax	818-760-2197
Web site	www.tek.com/VND/Products/Grass_Valley/
Manufacturer	Korg USA, Inc.
Address	316 South Service Road Melville, NY 11747-3201 USA
Telephone	516-333-9100
Fax	516-333-9108
Web site	www.korg.com

Table 2-10 (continued) Audio Equipment Manufacturer Contact Information

Category	Information
Manufacturer Address	Mytek Digital, Inc. PO Box 1023 New York City NY 10276 USA
Telephone	212-274-9191
Fax	212-686-4948
Web site	www.mytekdigital.com
Manufacturer Address	Otari Corporation 378 Vintage Park Drive Foster City, CA 94404 USA
Telephone	650-341-5900
Fax	650-341-7200
Web site	www.otari.com
Manufacturer Address	Sony Professional Audio 1 Sony Drive Park Ridge NJ 07656 USA
Telephone	800-222-7669
Web site	www.sel.sony.com
Manufacturer Address	Spectral, Incorporated 18800 142nd Ave. NE Woodinville, WA 98072 USA
Telephone	425-487-2931
Fax	425-487-3431
Web site	www.spectralinc.com
Manufacturer Address	Studer Professional Audio AG Althardstrasse 30 CH-8105 Regensdorf Switzerland
Telephone	+41-1-870-75-11
Fax	+41-1-840-47-37
Web site	www.studer.ch

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