Pipeline Article

SGI Digital Media Option Board Overview

This article provides an overview of the digital media option boards that are currently supported on SGI® workstations and servers. These options are discussed on a platform-by-platform basis.

The article provides links and references to detailed information for each option, including feature lists for each board and IRIX® operating system digital media software utilities or programming interfaces that are used with this hardware.

Table 1 shows the digital media hardware options that are currently available and supported for SGI workstations and servers.

Table 1 Digital Media Options

Option board	Platform					Video					Audio		API		
	SGI® 3000 Family	SGI® 2000 Series	Octane2™	Octane®	O2® and O2+™	Standard Definition (NTSC/PAL)	High Definition	Analog Video I/O	Digital Video I/O	IEEE 1394 DV	Analog Audio I/O	Digital Audio I/O	Video Library (VL)	Audio Library (AL)	dmSDK and OpenML™
DMediaPro™ DM3	X,1, 2					X	X		X						X
HD I/O (High Definition option)	X,1, 2	X,3					X		X,4				X		
DIVO	X,1, 2	X,3				X			X				X		
DIVO-DVC	X,1, 2	X,3				X			X	5			X		
DMediaPro™ DM2			X			X	X		X						X
Octane® Digital Video				X		X			X				X		
Octane® Personal Video				X		X		X					X		
Octane® Compression				X		X		X					X, 9		

Table 1 Digital Media Options (continued)

Option board	Platform					Video					Audio		API		
	SGI® 3000 Family	SGI® 2000 Series	Octane2™	Octane®	O2® and O2+™	Standard Definition (NTSC/PAL)	High Definition	Analog Video I/O	Digital Video I/O	IEEE 1394 DV	Analog Audio I/O	Digital Audio I/O	Video Library (VL)	Audio Library (AL)	dmSDK and OpenML™
O2® Digital Video (AV2)					X	X			X		X		X	X	
O2® Analog Video (AV1)					X	X		X			X		X	X	
PCI IEEE 1394 Option					X	X				X		X, 6	7	7	
PCI Digital Audio Option	X	X	X,8	X,8	X							X		X	

1 – SGI 3000 family servers require an X-brick for these option boards.

2 – XIO™ option boards are not supported on SGI® Onyx® or Origin® 300 systems.

3 – XIO option boards can be installed in an SGI® Origin® 200 server with the addition of the GIGAchannel™ option.

4 – The HD I/O option board inputs and outputs digital video in parallel format, and it generally requires parallel/serial converters to interface with most other high-definition video peripheral devices.

5 – The DIVO-DVC option board can play and record the DVCPRO video format, but it is not an IEEE 1394 device.

6 – Digital audio I/O capabilities are embedded in video I/O stream.

7 – The IEEE option board uses the AVC programming library.

8 – This board requires the addition of a PCI card cage option for Octane or Octane2.

9 – The SGI Compression Library (CL) is used for compression and decompression of image and video data.

No video I/O option boards are available for SGI Onyx 300 and Origin 300 systems because the X-brick is not supported on those platforms.

SGI 3000 Family Systems

Several digital media options are available for SGI® Onyx® 3000 and Origin® 3000 series systems, as described in the following subsections.

DMediaPro DM3

The DMediaPro DM3 board is a half-height XIO option board that, along with the SGI video break-out box (VBOB), provides both standard- and high-definition serial digital video I/O in a single package. Another version of this board, the DMediaPro DM2 board, is available for the Silicon Graphics® Octane2™ platform. The two boards are identical except for the mechanisms that connect the boards to their respective platforms. Figure 1 shows a DM2 board with the VBOB.

The DM3 board installs in the X-brick of SGI 3000 family systems. You can install multiple boards in a system; however, each X-brick supports only one DM3 board.

Figure 1 DM2 and VBOB

The DM3 board connects to the VBOB via a pair of low-voltage differential signaling (LVDS) cables. The VBOB has all of the physical connections for routing video and genlock signals to and from the DMediaPro board, and it includes the following video connections via BNC:

- Two standard-definition serial digital inputs (Link A and Link B)

- Four standard-definition serial digital outputs (two for Link A, two for Link B)

- Standard-definition genlock input

- Standard-definition genlock loopthrough

- Two high-definition serial digital inputs (Link A and Link B)

- Four high-definition serial digital outputs (two for Link A, two for Link B)

- High-definition genlock input

- High-definition genlock loopthrough

For detailed information on the DM3 board and VBOB, including features, specifications, and supported formats, refer to the following publications:

- SGI DMediaPro Datasheet (PDF)

    http://www.sgi.com/Products/PDF/3033.pdf

- *Pipeline*: [Sep/Oct 2001] *Introducing the SGI DMediaPro Video Option Boards*

    http://support.sgi.com/irix/content
    pipeline/html/20010501dmedia.html

The following documents are also available for this board:

- *SGI DMediaPro DM2/DM3 Board Owner's Guide*, SGI document number 007-4317-001

- *SGI DMediaPro DM2/DM3 Board OpenML Media Library Owner's Guide*, SGI document number 007-4505-001

You can access these documents from the SGI Technical Publications Library at the following URL:

http://techpubs.sgi.com

Drivers for the DM2/DM3 boards are available for IRIX 6.5.11 operating system (OS) and later. The current software version is DMediaPro DM2/DM3 dmSDK Execution Environment 1.1 for IRIX 6.5 OS. This software is available on the CD (SGI CD number 812-1083-00x) that is included with the board.

The DMediaPro DM2 and DM3 boards are the first boards from SGI to use the Digital Media Software Development Kit (dmSDK) and OpenML. The *Digital Media Software Development Kit Programmer's Guide*, SGI document number 007-4280-001, provides information on using dmSDK for programming. This publication is available from the SGI Technical Publications Library.

High Definition I/O (HD I/O) Option Board

The HD I/O board is a half-height XIO option board that provides real-time high-definition video input and output in multiple formats. The board provides a parallel video interface for input and output based on the SMPTE 274M standard. Figure 2 shows the HD I/O board.
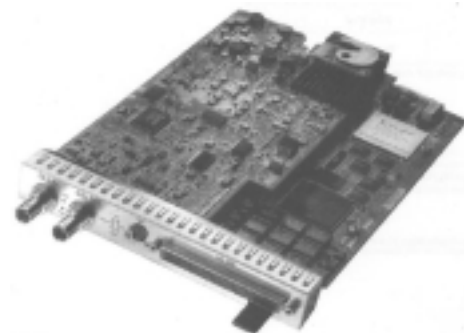

Figure 2 HD I/O Board

The board installs in the X-brick of SGI 3000 family systems. You can install multiple HD I/O boards in a system, but SGI supports only one per X-brick.

SGI provides two cables with this board, one each for the Panasonic® and Philips® pinouts. In many cases, third- party parallel-to-serial or serial-to-parallel conversion equipment is needed to interface this board with other third-party high-definition video equipment that uses a serial digital interface.

For more detailed information on the capabilities of this board, refer to the following information:

- *SGI Digital Media information for SGI 2000 and SGI 3000 Series*

  `http://www.sgi.com/peripher-als/digital_media/hardware.html`

- *Pipeline*: [Nov/Dec 99] *Introducing the HD I/O Option Board*

  `http://support.sgi.com/irix/content/pipe-line/html/19990601HDIO.html`

The following documents are also available for this board:

- *HD I/O Option Board Owner's Guide*, SGI document number 007-3968-003

- *Digital Media Connections*, SGI document number 007-3525-003

You can access these documents from the SGI Technical Publications Library at the following URL:

`http://techpubs.sgi.com`

Drivers for the HD I/O option board are available for IRIX 6.5.4 OS and later. The current software version is HD I/O Software 1.2. This software is available on the CD (SGI CD number 812-0958-004) included with the board.

The Silicon Graphics Video Library (VL) provides a programming interface for the HD I/O option board. For more information on programming with the Video Library, refer to the IRIX man pages for `Vlintro`(3dm) and the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

Digital Video Option Board (DIVO)

The DIVO option board is a half-height XIO video board that provides standard-definition serial digital (NTSC or PAL) video input and output (SMPTE 259M and ITU-R 601). Figure 3 shows the DIVO board.
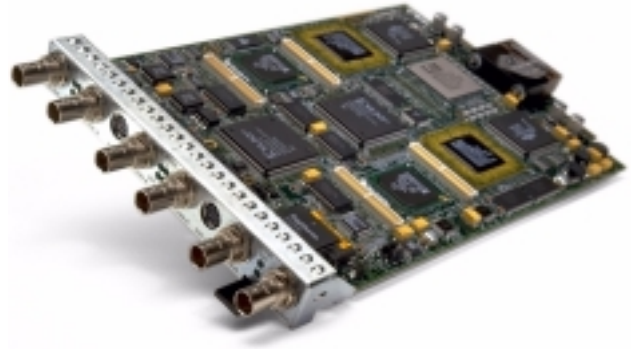

Figure 3 DIVO Board

The board installs in the X-brick on SGI 3000 family systems. You can install multiple DIVO boards in a system, but SGI supports only one per X-brick.

The DIVO board supports 8- and 10-bit signals, multiple packing modes, real-time color-space conversion between YUV and RGB, and dual-link streaming to and from system memory. For more details on the DIVO board capabilities, refer to the following URL:

`http://www.sgi.com/peripherals/digital_media/hardware.html`

Connections on the back of the board include two BNC connectors for serial digital input (Link A and Link B), two BNC connectors for output (Link A and Link B), two BNC connectors for genlock input and loopthrough, and two 8-pin connectors for General Purpose Interface (GPI) in and out.

The current software version for this board is DIVO 1.2, which is available on SGI CD number 812-0645-003. When you upgrade the system with any IRIX 6.5.*x* OS overlays, you must install additional upgrades for the DIVO subsystem in addition to this base software. You can find these upgrades in the `unbundled` directory on the last CD of any IRIX 6.5.*x* Overlay CD set.

Documentation for this board includes the following publications:

• *SGI DIVO Option and DIVO-DVC Option Owner's Guide*, SGI document number 007-3524-004

• *Digital Media Connections*, SGI Document Number 007-3525-003

You can access these documents from the SGI Technical Publications Library at the following URL:

`http://techpubs.sgi.com`

The Silicon Graphics Video Library (VL) provides a programming interface for the DIVO board. For more information on programming with the Video Library, refer to the IRIX man pages for `Vlintro`(3dm) and the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

DIVO-DVC Option Board

The DIVO-DVC option board is similar to the DIVO option board, including identical rear connections. Unlike the DIVO board, however, the DIVO-DVC board supports the DVCPRO format and supports compression from CCIR 601 to DIF (DVCPRO file format) on input and decompression from DIF to CCIR 601 on output. The DIVO-DVC board uses the base DIVO board with the addition of two daughtercards. Despite the additional daughtercards, the DIVO-DVC board fits into a single XIO slot.

Configuration issues, software drivers, and documentation are the same as those for the DIVO option.

PCI Digital Audio Option Board

The PCI Digital Audio option board is a half-size PCI board that provides multichannel digital audio expansion via the PCI bus for various SGI systems. It connects to consumer and professional audio and video equipment via industry-standard interfaces.

Figure 4 shows the PCI Digital Audio option board.

Figure 4 PCI Digital Audio Option Board

The Digital Audio option is available for the following systems:

• Silicon Graphics® O2® workstation

• Silicon Graphics® O2+™ workstation

• Silicon Graphics® Octane® workstation

• Silicon Graphics® Octane2™ workstation

• SGI® Origin® 200 server

• SGI® 2000 series servers

• SGI® Origin® 3000 series servers

• SGI® Onyx® 3000 series servers

In SGI 3000 family systems, the Digital Audio option board installs in the P-brick. You can install a maximum of six of these boards in an SGI 3000 family system.

Certain PCI Digital Audio Option boards are not compatible with all platforms. Refer to the *PCI Digital Audio Board Installation Guide,* SGI document number 007-3502-001 referenced below for more information on board part numbers and compatibility, or contact SGI Technical Support if you have any questions.

The Digital Audio option enables input and output of AES3-1997 professional 2-channel, 24-bit digital audio, S/PDIF consumer-level digital audio, and optical (ADAT) 8-channel, 24-bit digital audio at multiple sampling rates. You can lock the board to external video and audio equipment via an external genlock or system synchronization backbone.

Connections on the back of the board include two optical (ADAT) connections for input and output and a DB-15 connector for the included BNC breakout cable, which has four BNC connections for AES digital audio input and output and for genlock input and loopthrough.

Documentation for this board includes the *PCI Digital Audio Board Installation Guide* (SGI document number 007-3502-003), which is available from the SGI Technical Publications Library at:

`http://techpubs.sgi.com`

Software drivers for this board are available on the Digital Audio Option 1.0 CD (SGI CD number 812-0621-001) that is included with the board.

The Silicon Graphics Audio Library (AL) provides a programming interface for controlling the audio I/O capabilities of this board. For more information on the Silicon Graphics Audio Library, refer to the IRIX `alIntro`(3dm) man page. Refer to the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library, for detailed information on programming with the Audio Library.

SGI 2000 Series Systems

SGI 2000 series systems and SGI® Origin® 200 GIGAchannel™ servers can use most of the digital media option boards that the SGI 3000 family systems use, with the exception of the DMediaPro DM3 option board.

Onyx 2000 series systems have audio capabilities built into the base I/O board of every system. The base I/O board includes both analog and digital audio inputs and outputs, which are accessible on the back of the system. It also has four RCA connectors for left and right analog audio input and output, two BNC connectors for AES digital audio I/O, and two optical (ADAT) connectors for 8-channel digital audio I/O.

High Definition I/O (HD I/O) Option Board

The HD I/O option board for SGI 2000 series systems is the same board that is available for SGI 3000 family

systems. Refer to the information in the previous "SGI 3000 Family Systems" section for more information and links regarding this board.

You can install multiple HD I/O boards on SGI 2000 series systems—with the following caveats:

- Systems must run HD I/O software version 1.1 or later.

- Node boards on the system must have revision 2.4 Hub chips, which are associated with 400-MHz R12000™ processors.

- You can install up to four HD I/O boards per module (one board for every two 400-MHz R12000 CPUs) when the boards are operated one at a time.

- Only one HD I/O board is supported per module when the boards are intended for simultaneous use.

Digital Video Option Board (DIVO) and DIVO-DVC

The DIVO and DIVO-DVC option boards for SGI 2000 series systems are the same boards that are also available for SGI 3000 family systems. Refer to the information in the previous "SGI 3000 Family Systems" section for more information and links regarding these boards.

Multiple DIVO/DIVO-DVC boards are supported on SGI 2000 series systems (and Origin 200 GIGAchannel servers). Silicon Graphics® Onyx2® workstations support a maximum of four DIVO boards, and SGI 2000 series systems support a maximum of eight boards. Contact your local SGI office with questions regarding configuration requirements for multiple-board systems.

PCI Digital Audio Option Board

The PCI Digital Audio option board for SGI 2000 series systems (and Origin 200 servers) is the same board that is available for SGI 3000 series systems. Refer to the information in the "SGI 3000 Family Systems" section for more information and links regarding this board.

SGI 2000 series configurations support up to eight Digital Audio options.

Octane2

The base Octane2 workstation has both analog and digital audio inputs and outputs that are accessible on the back of the system module. The workstation has four RCA connectors for left and right analog audio input and output, two RCA connectors for AES digital audio I/O, and two optical (ADAT) connectors for 8-channel digital audio I/O.

DMediaPro DM2

The only video option available for the Octane2 is the DMediaPro DM2 board, which along with the SGI Video Break Out Box (VBOB), provides both standard- and high-definition serial digital video I/O in a single package. You can install the DM2 board in Octane2 workstations with V10 or V12 graphics only. Minimum requirements include a 400-MHz processor and 256 MB of system memory.

The DM2 board is functionally equivalent to the DMediaPro DM3 board that was described previously, except that—due to hardware limitations of the Octane2—the DM2 supports only 8-bit 4:4:4 RGB sampling and does not support 4:4:4:4 RGBA sampling (whereas the DM3 supports 8- or 10-bit 4:4:4 RGB and 4:4:4:4 RGBA). The two boards are physically identical except for the mechanisms that connect the boards to their respective platforms. Refer to the links mentioned in the DMediaPro DM3 section of this article for more information on the DM2 board and VBOB.

For additional information on the digital media capabilities of the Octane2 workstation, refer to *Silicon Graphics Octane2 Digital Media* at the following URL:

```
http://www.sgi.com/workstations/octane2/dig
_media.html
```

PCI Digital Audio Option

If your Octane2 workstation requires additional audio I/O channels, you can install up to three Digital Audio option PCI boards on Octane2 workstations that are configured with the PCI card cage option. Refer to the information in the "SGI 3000 Family Systems" section for more information and links regarding this board.

Octane

The Octane workstation has the same base audio capabilities as the Octane2 workstation, and like the Octane2, it can use up to three PCI Digital Audio option boards if it is configured with the PCI card cage. The two platforms do not, however, use the same video I/O options, and the DMediaPro DM2 board cannot be installed in the Octane workstation.

Octane Digital Video

The Octane Digital Video board works with Octane systems that have SI, SSI, and MXI graphics board sets. It adds ITU-R 601/SMPTE-259M digital video I/O capabilities (NTSC and PAL) to the Octane workstation. It can also be used with the Octane compression option to provide two channels of compressed analog video I/O. Figure 5 shows the Octane Digital Video board.

Figure 5 Octane Digital Video Board

This board installs in the upper right quadrant (slot B) of the Octane XIO module. The board comes with three flex cables that attach to the graphics board in slot A.

You can access the two input, two output, and genlock (BNC) connectors for video I/O via the back of the Octane. This board supports the following formats: two channels YUV 4:2:2 (8- or 10-bit), one channel YUVA 4:2:2:4 (8- or 10-bit), or one channel YUVA 4:4:4:4 (8- or 10-bit).

Documentation for this board includes the following:

• *Octane Digital Video Programmer's Guide*, SGI document number 007-3513-001

• *Octane Digital Video and Compression Installation Guide*, SGI document number 007-3466-001

You can access these documents from the SGI Technical Publications Library at the following URL:

`http://techpubs.sgi.com`

The drivers ship on the Octane/Impact Video for IRIX 6.5 CD (SGI CD number 812-0787-001) that is included with the board. When you upgrade the system with any IRIX 6.5.*x* overlays, you must also install upgrades for the Octane Digital Video board. You can find these upgrades in the `unbundled` directory on the last CD of any IRIX 6.5.*x* Overlay CD set.

The Silicon Graphics Video Library (VL) provides a programming interface for controlling this board. For more information on programming with the Video Library, refer to the IRIX man pages for `Vlintro`(3dm) and the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

Octane Personal Video

The Octane Personal Video board, also referred to as EVO, adds analog composite and S-Video I/O capabilities (NTSC and PAL) to the Octane workstation. This board also includes connectors that can be used with the O2Cam™ digital video camera. Figure 6 shows the Octane Personal Video board and a digital camera.
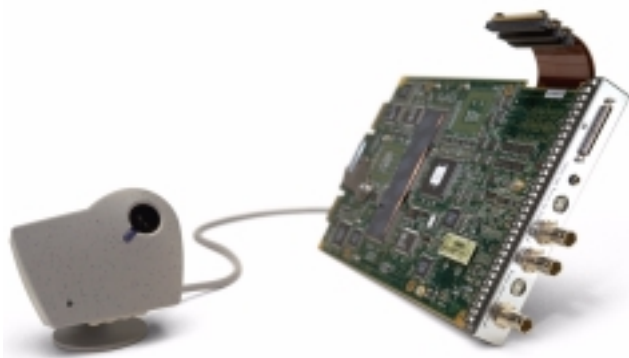

Figure 6 Octane Personal Video Board

The board installs in the same manner as the Octane Digital Video board: in the upper right quadrant (slot B) of the Octane XIO module.

You cannot install the Octane Personal Video board and the Octane Digital Video board on the same system.

The board includes three flex cables that attach to the graphics board in slot A. The S-Video and composite (BNC) connectors for video I/O are accessed via the back of the Octane.

Documentation for this board includes the following:

• *Octane Personal Video Programmer's Guide*, SGI document number 007-3595-001

• *Octane Personal Video Installation Guide*, SGI document number 007-3545-002

You can access these documents from the SGI Technical Publications Library at the following URL:

`http://techpubs.sgi.com`

Board drivers ship on the Octane Personal Video for IRIX 6.5 CD (SGI CD number 812-0705-002) that is included with the board. When you upgrade the system with any IRIX 6.5.*x* overlays, you must also install upgrades for the Octane Personal Video board. You can find these upgrades in the `unbundled` directory on the last CD of any IRIX 6.5.*x* Overlay CD set.

The Silicon Graphics Video Library (VL) provides a programming interface for controlling this board. For more information on programming with the Video Library, refer to the IRIX man pages for `Vlintro`(3dm) and the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

Octane Compression

The Octane Compression option board adds analog video I/O (composite or S-video) with genlock, compression, and decompression to the Octane workstation. You can install this board alone or in addition to the Octane Digital Video board. It includes flex cables that connect the Compression board to the Digital Video

board when both options are installed. The Octane Compression board installs in slot B on the back of the workstation when it is used alone or in slot C when it is connected to the Octane Digital Video board. Figure 7 shows the Octane Compression board.

Figure 7 Octane Compression Board

Documentation for this board includes the *Octane Compression Programmer's Guide* (SGI document number 007-3514-001), which you can find in the SGI Technical Publications Library:

`http://techpubs.sgi.com`

The board drivers ship on the Octane/Impact Compression for IRIX 6.5 CD (SGI CD number 812-0622-002) that is included with the board. When you upgrade the system with any IRIX 6.5.*x* overlays, you must also install upgrades for the Octane Compression board. You can find these upgrades in the `unbundled` directory on the last CD of any IRIX 6.5.*x* Overlay CD set.

The Silicon Graphics Video Library (VL) provides a programming interface for controlling this board. The SGI Compression Library (CL) is used to compress and decompress the video information. For more information on programming with the video and compression libraries, refer to the IRIX man pages for `VLintro`(3dm) and `CLintro`(3dm) and to the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

SGI O2 and O2+

The SGI O2 and O2+ workstations use a unified memory architecture and dedicated hardware for image and video processing to enable digital media content creation and manipulation via option boards.

For detailed information regarding the digital media capabilities of the O2 platform, refer to the *O2 Digital Media White Paper*, which is available at the following URL:

`http://www.sgi.com/o2/o2dm.html`

These workstations support several option boards that enable analog, digital, or IEEE 1394 (FireWire®) digital video I/O. They also support the PCI Digital Audio Option board. The same video and audio I/O option boards work on both the O2 and O2+ platforms.

O2 Base Capability

The O2 and O2+ base systems ship with an audio-only module that provides analog audio I/O capabilities. This module plugs into the rear right-hand option slot, and the audio I/O connectors are accessible via the side-panel opening in the O2 chassis. The board has six connectors: four RCA connectors provide left and right audio input and output, and two mini-phono jacks provide a mono or stereo microphone input and stereo headphone output.

Board drivers are included in the `dmedia_eoe` software subsystem for the IRIX 6.3 and 6.5/6.5.*x* operating systems and are installed by default.

The Silicon Graphics Audio Library (AL) provides a programming interface for controlling the audio I/O capabilities of the O2 platform. For more information on the Silicon Graphics Audio Library, refer to the IRIX `alIntro`(3dm) man page. Detailed information on programming with the Audio Library can be found in the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library:

`http://techpubs.sgi.com`

O2 Digital Video Option Board

The O2 Digital Video Option board, also referred to as the AV2 board, provides serial digital video I/O capabilities (NTSC and PAL) for the O2 workstation. This option also includes the analog audio I/O interfaces that the audio-only board provides. This board plugs into the rear right-hand option slot of the O2 workstation. The audio connectors are accessible via the side panel opening in the O2 chassis, along with a 9-pin DB-9 connector for the dongle that is included with this option board. This dongle provides BNC breakout connections for genlock input and output as well as for GPI input and output. Figure 8 shows the O2 Digital Video Option board.

Figure 8 O2 Digital Video Option Board

Four BNC connectors on the rear of the board provide two independent 4:2:2, 8- or 10-bit ITU-R BT.602-4 serial digital input streams and a single output stream. The output stream can be viewed on either output or separated in hardware to provide simultaneous video and alpha channel outputs.

Documentation for this board includes the *O2 Digital Video Installation Guide* (SGI document number 007-3616-001), which is available from the SGI Technical Publications Library:

http://techpubs.sgi.com

For more information on the O2 video capabilities refer to the IRIX man pages for O2Video(7) and mvp(3dm).

Board drivers are included in the dmedia_eoe software subsystem for the IRIX 6.3 and 6.5/6.5.*x* operating systems and are installed by default.

The Silicon Graphics Video Library (VL) provides a programming interface for controlling the video I/O capabilities of the O2 platform. For more information on programming with the Video Library, refer to the IRIX man pages for Vlintro(3dm) and the *IRIS Digital Media Programming Guide* (SGI document number 007-1799-060), which is available from the SGI Technical Publications Library.

O2 Analog Video Option Board

The O2 Analog Video Option board, also referred to as the AV1 board, adds composite and S-Video I/O capabilities (NTSC and PAL) to the O2 workstation. This option also includes the analog audio I/O interfaces that the audio-only board provides, and it provides a digital video input that you can use with the optional O2Cam digital video camera. The board plugs into the right-hand option slot on the back of the O2 workstation. The S-Video and composite (RCA) connectors for video I/O are accessed via the side panel opening in the O2 chassis and are located side-by-side with the audio inputs and outputs. The 69-pin digital video connector for the O2Cam digital video camera is located on the rear of the board, with an additional stereo headphone output jack.

You can genlock the board's video output to video entering any of the board's video inputs.

For more information on O2 video capabilities, refer to the IRIX man pages for O2Video(7) and mvp(3dm).

Drivers are included in the dmedia_eoe software subsystem for the IRIX 6.3 and 6.5/6.5.*x* operating systems and are installed by default.

O2 IEEE 1394 PCI Option Board

The O2 IEEE 1394 (FireWire) option board is also known as the DVLink board. This board installs in the PCI option slot of the O2 or O2+ workstation. The board enables input and output of real-time, frame accurate DV (digital video) and DVCPRO (NTSC and PAL) streams to and from IEEE 1394 compliant DV devices, including support for multiple DV streams in and out of an O2 system. The board enables a user to preview DV footage in real time and to extract still images from the

DV stream. Figure 9 shows the board.

Figure 9 DVLink Board

For more information on the capabilities of this board, refer to the following URL:

`http://www.sgi.com/o2/dvlink.html`

The O2 and O2+ workstations have a single PCI slot available; use of this option excludes use of any other PCI options available for the workstation, such as the Digital Audio Option.

The IEEE 1394 option board has three external 6-pin IEEE 1394 connectors and comes with two IEEE 1394 cables (one 6-pin-to-6-pin cable and one 6-pin-to-4-pin cable).

Drivers are available for IRIX 6.5.2 and later. The current software version is DVLink 1.1, which is available on the *DVLink (IEEE 1394) Execution Environment 1.1* CD, number 812-0891-002. The software includes the `dvlink` utility that enables control of devices connected to the IEEE 1394 option board via a graphical user interface.

A programming API can be found in the `ieee1394_dev` subsystem, which is installable from the CD mentioned previously. This interface is called the *AVC library* and is a set of C language functions that communicate with devices on the 1394 bus via a subset of the AV/C Digital Interface Command Set. The AVC library implements a subset of the IEC 61883 specification. For more information on the AVC library, refer to the IRIX man page for `avc(3dm)`. The Raw 1394 API is also installed when the `ieee1394_dev` subsystem is

installed; refer to the `raw1394(3dm)` man page for more information.

You can find documentation for the IEEE 1394 board in the *O2 DVLink - IEEE 1394 Option Board Installation and Owner's Guide* (SGI document number 007-3958-001), which is available from the SGI Technical Publications Library:

`http://techpubs.sgi.com`

PCI Digital Audio Option

The PCI Digital Audio Option board can be installed in O2 and O2+ workstations. Refer to the information in the "SGI 3000 Family Systems" section for more information and links regarding this board.

The O2 and O2+ workstations have a single PCI slot available; use of this option excludes the use of any other PCI options available for the workstation, such as the IEEE 1394 (FireWire) option.