

SGI™ HD GVO Owner's Guide

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Record of Revision

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About This Guide

Welcome to High Definition Graphics to Video Output (HD GVO) for the SGI Onyx2 and Onyx 3000 systems!

This guide shows you how to set up your Onyx2 or Onyx 3000 system for High Definition or Standard Definition serial video output by connecting your TMDS Video Output (TVO) board to the SGI Video Breakout Box (VBOB).

This guide includes the following chapters:

- Chapter 1, "TMDS Video Output Overview," describes the TVO board assembly.
- Chapter 2, "HD GVO Cabling Configurations," describes the various TVO board cabling configurations.
- Chapter 3, "HD GVO Software Configuration and Troubleshooting," explains how to configure the required software and how to troubleshoot possible problems.

This guide also explains how to:

- Use the TVO board.
- Use the required software to configure the HD GVO options.
- Reconfigure the HD GVO system cabling for different levels of functionality.
- Audit the system to check TVO graphics.

The following documents provide additional information about Onyx2 and Onyx 3000 systems:

- *InfiniteReality Video Format Combiner User's Guide* (P/N 007-3279-00x)
- *Origin and Onyx2 Theory of Operations Manual* (P/N 007-3439-00x)
- *Onyx2 Deskside Workstation Owner's Guide* (P/N 007-3454-00x)
- *Onyx2 Rackmount Owner's Guide*, (P/N 007-3457-00x)
- *SGI Onyx 3000 Series Graphics System Hardware Owner's Guide* (P/N 007-4264-00x)

You can access the above documents in the SGI Technical Publications Library, at the following URL:

<http://techpubs.sgi.com/library/>

Conventions

This guide uses the following conventions:

- Document titles are in *italics*.
- References to chapters and sections within this guide are in quotation marks.
- Characters that you type on your keyboard are in **Courier bold**.
- Procedures are explained in numbered steps. When necessary, an explanation follows the step.
- Software menu selections and buttons are in **bold**.

Product Support

SGI provides a comprehensive range of product support for its products. If you are in North America, contact the Technical Assistance Center at 1-800-800-4SGI or your authorized service provider. If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, please tell us. Be sure to include the title and document number of the manual with your comments. (Online, the document number is located in the front matter of the manual. In printed manuals, the document number is located at the bottom of each page.)

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TMDS Video Output Overview

This chapter provides an overview of the DG5-2 with TMDS Video Output (TVO) daughterboard.

Product Description

The TVO daughterboard attaches to a DG5-2 board, which installs in the Onyx2 or Onyx 3000 series graphics module in the same way (and same location) as a standard DG5-2 board. The TVO board provides specialized, high-resolution, digital imagery capabilities for Onyx2 and Onyx 3000 systems. The DG5-2 transmits digital pixel information to the TVO board, which outputs this data via Transition Minimized Differential Signaling (TMDS). When you connect the TVO board to the TMDS connectors on the SGI Video Breakout Box (VBOB), you have a complete High Definition Graphics Video Output (HD GVO) system. With this system, you can use the Onyx2 or Onyx 3000 to convert graphics data to both High Definition and Standard Definition serial digital video. Two TMDS cables, a BNC timing reference cable, and a 75 ohm terminator are included with the board.

HD GVO provides you with the following capabilities:

- Real-time graphics-to-video High Definition output of images in the graphics pipe (a subset of ATSC Table 3 - minimally 720p, and 1080i 59.94 Hz).
- Real-time graphics-to-video Standard Definition output of images in the graphics pipe (CCIR-601 pixels and NTSC or PAL timing).
- Alpha or key output in both High Definition and Standard Definition video.
- Genlock capability for multi-pipe operation and synchronized video streaming.

Note: The TVO board is initially configured by an SGI field installer when the Onyx2 or Onyx 3000 system is installed or when it is upgraded. Any reconfiguration should be carefully considered.

Figure 1-1 shows the DG5-2/TVO board assembly and its connectors. For cabling instructions, see Chapter 2. For software configuration information, see Chapter 3. For technical questions, see “Product Support” on page x.

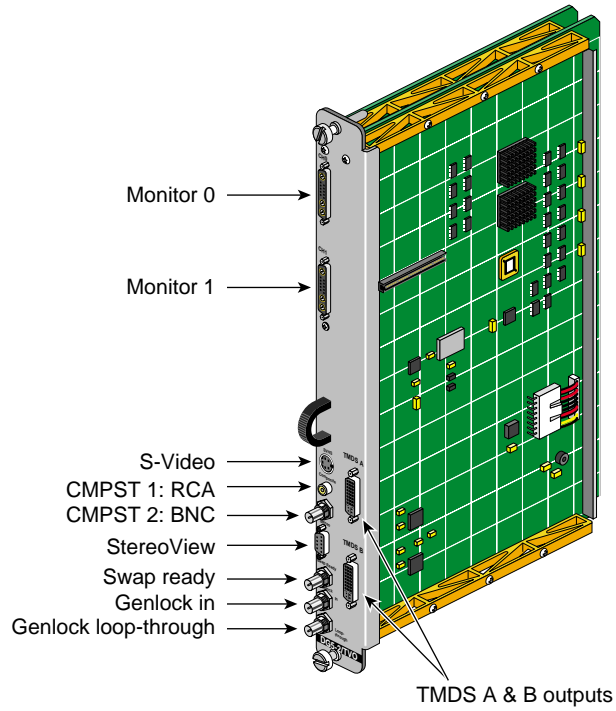


Figure 1-1 DG5-2/TVO Board Assembly

Restrictions and Important Notes

Note the following:

- The TVO board requires IRIX 6.5.10 (with patch) or later. Early shipments include the required IRIX 6.5.10 patch on a CD. If you are running IRIX 6.5.10, give this CD to your SGI Installer or System Administrator to install the required patch. If you are running later versions of IRIX, do not install this patch.
- The TVO board option is *not* compatible with the Onyx2 DDO2 (also called DVP2) option. You can use these two options in the same Onyx2 rack system, but they cannot share the same graphics pipe and you cannot interconnect them.

HD GVO Cabling Configurations

This chapter shows you how to connect the DG5-2/TVO board to VBOB for High Definition or Standard Definition graphics video output and genlock synchronization.

Connecting DG5-2/TVO to VBOB

To display graphics images in High Definition or Standard Definition video, follow these steps:

1. Connect one end of the TMDS A cable (black cable with white connector on each end) to the TVO board's TMDS A connector. Attach the other end of this cable to the VBOB TMDS A connector, as shown in Figure 2-1.
2. Connect one end of the TMDS B cable (black cable with black connector on each end) to TVO board's TMDS B connector. Attach the other end of this cable to the VBOB TMDS B connector.
3. Connect one end of the BNC Timing Reference cable to the VBOB Timing Out connector. Attach the other end of this cable to the TVO board's Genlock in connector.
4. Connect the 75 Ohm terminator to the Genlock loop-through connector on the TVO board.

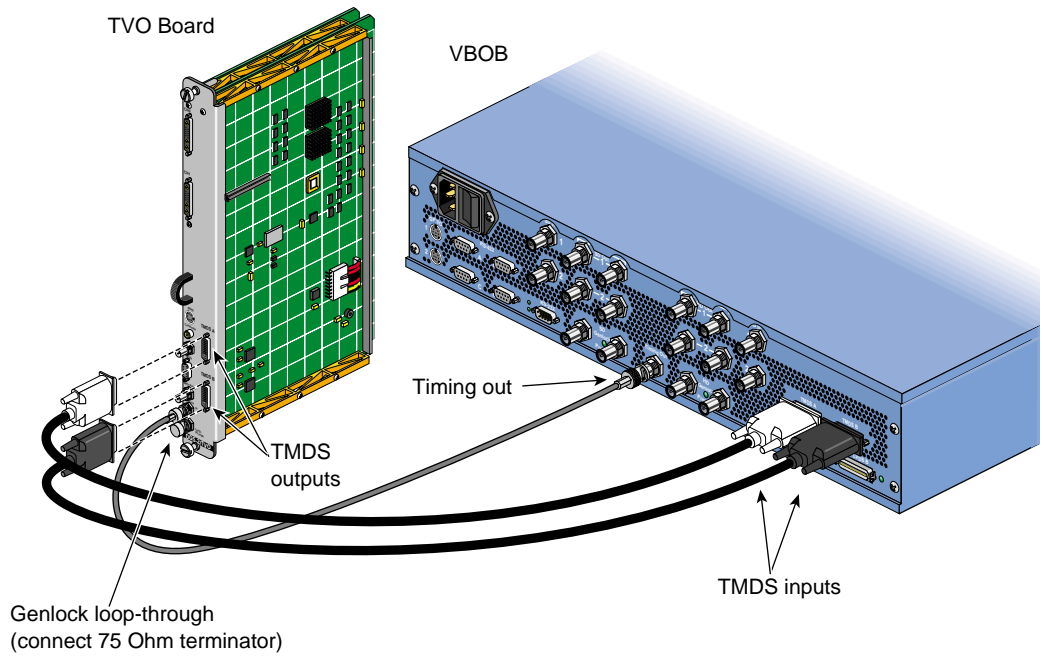


Figure 2-1 Connecting TVO to VBOB

Note: VBOB has two BNC connectors for each external HD and SD genlock. You can use either of these connectors as an input or a loop-through.

- After you complete the above connections, connect the required cable(s) from the VBOB HD out or SD out connector(s) to the desired High Definition or Standard Definition video device(s).

If you want to lock the output serial digital signals to an external genlock signal, connect an analog sync source to the VBOB HD genlock in or SD genlock BNC connectors (see Figure 2-2). If you are not using High Definition or Standard Definition genlock loop-throughs, attach a 75 ohm terminator to the appropriate connectors.

For complete details, see your *SGI Video Breakout Box Owner's Guide* (007-4243-00x).

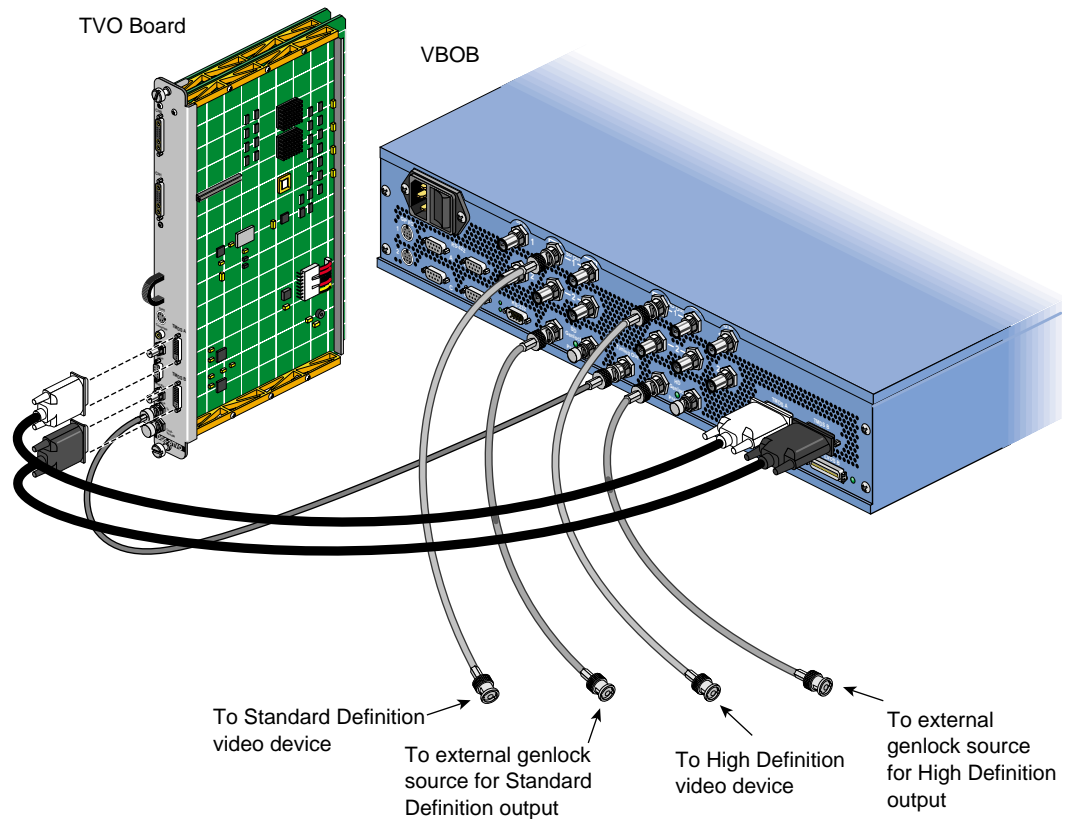


Figure 2-2 High Definition/Standard Definition Video and Genlock Connections

HD GVO Software Configuration and Troubleshooting

This chapter shows you how to configure the TVO board for High Definition Graphics Video Output (HD GVO). It also shows you how to identify and resolve possible problems. The examples below are not based on installations at any SGI customer site.

Configuring High Definition Graphics Video Output

1. Display the Video Format Combiner window, by opening a UNIX shell and entering the following line:

```
/usr/gfx/ircombine -gui
```

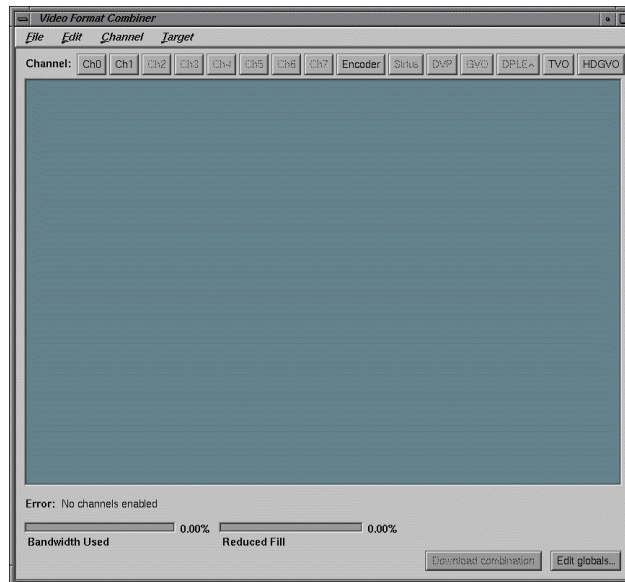


Figure 3-1 Video Format Combiner Window

2. Double-click the **Channel 0** button in the Video Format Combiner window.
The Select Format window appears, where you select the desired video format, as shown in the example in Figure 3-2.

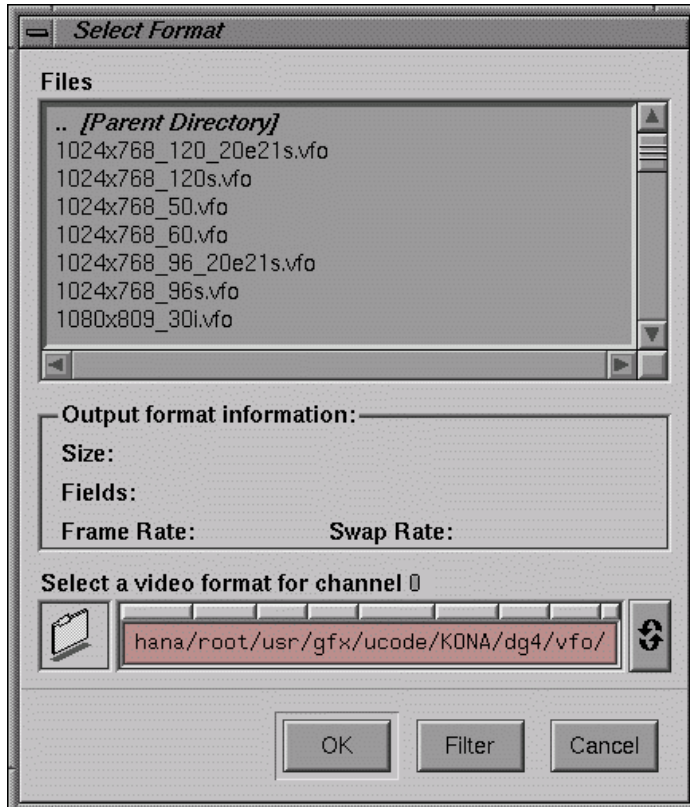


Figure 3-2 Select Format Window

3. Select the desired video format at 60 Hz for channel 0 (for a high-resolution monitor), then click the **OK** button.
4. Double-click the **HDGVO** button in the Video Format Combiner window.
HDGVO automatically configures a 1920 x 1080 display resolution, which is indicated in the lower left corner of the Video Format Combiner window (see Figure 3-5).

If you want another output format, select **Channel > Attributes** from the menu bar at the top of the Video Format Combiner window.

The HDGVO Attributes window appears, as shown in the example in Figure 3-3.

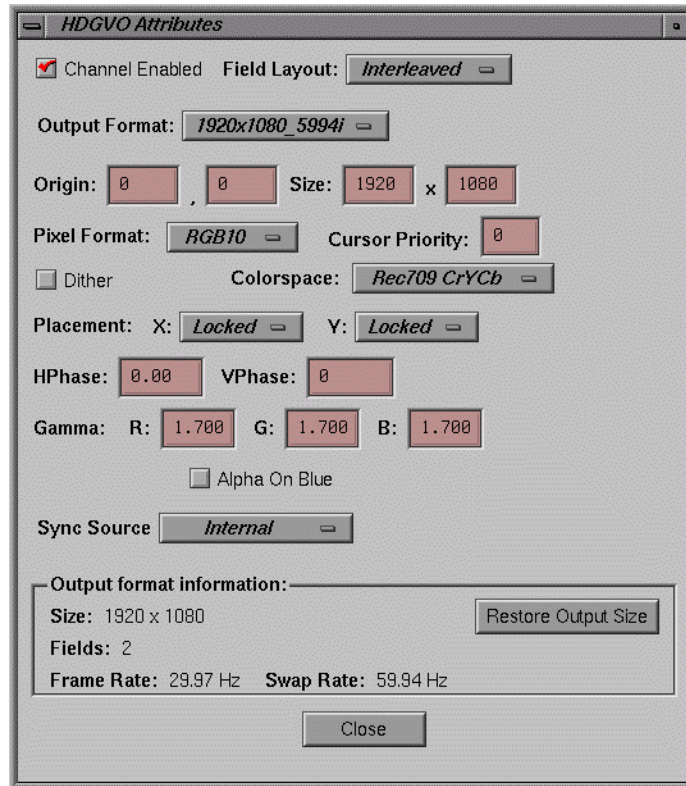


Figure 3-3 HDGVO Attributes Window

5. Click the **Output Format** button in the HDGVO Attributes window, then choose the desired output format.
6. Click the **Colorspace** button and choose the desired colorspace.

If you want alpha output from VBOB, you must click the **Pixel Format** button, and select RGBA10.

For descriptions of other fields in the HDGVO Attributes window, see the *Infinite Reality Video Format Combiner User's Guide* (007-3279-00x).

7. Click the VBOB **Sync Source** button, choose a VBOB Sync Source (either *Internal* for stand-alone operation or *Locked* to an external source), and then click the **Close** button.

For more information on the VBOB Sync Source options, see your *SGI Video Breakout Box User's Guide* (007-4243-00x).

8. Click the **Edit Globals** button in the lower right corner of the Video Format Combiner window.

The Combination Attributes window appears.

The default Sync Source is Internal.

9. Click the **Sync Source** button, and choose **External**, as shown in Figure 3-4.

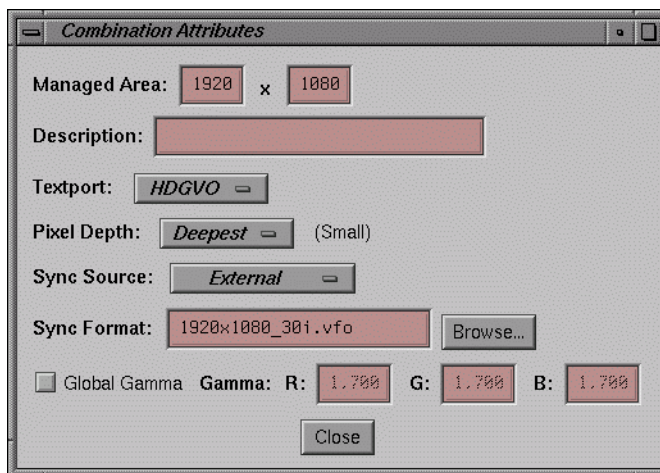


Figure 3-4 Combination Attributes Window (after choosing External as the Sync Source)

10. In the *Sync Format* text field, enter the error message that appears in the *Error* field, located near the bottom of the Video Format Combiner window (see Figure 3-1).
11. Click the **Close** button.

The error message disappears, and <none> appears in its place, as shown in Figure 3-5.

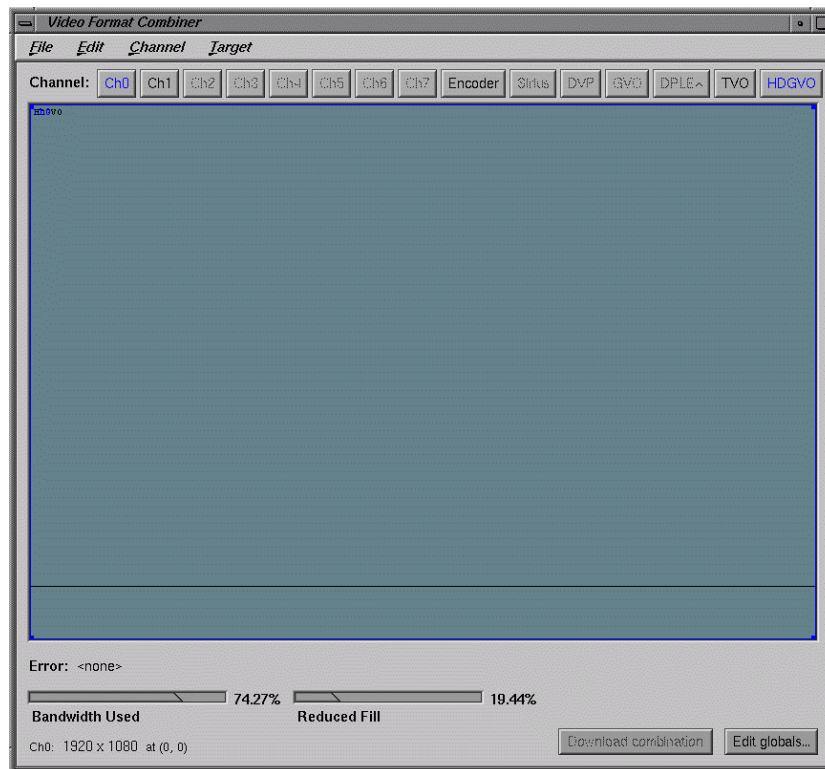


Figure 3-5 Video Format Combiner Window (after setting up HDGVO output)

12. Click the **Download Combination** button at the bottom of the Video Format Combiner window to build your video format combination.

For more information on downloading a combination, see the *Infinite Reality Video Format Combiner User's Guide (007-3279-00x)*.

13. Click the File menu, save the configuration, then click the **OK** button.

You can also choose **Save to EEPROM** in the File menu to save the configuration in the prom. Then the configuration is automatically loaded each time you boot your system.

Using `irsaudit` for Limited Checks

The `irsaudit` provides only a limited check on individual TVO boards. When you run `irsaudit`, the Window Manager should *not* be running, because `irsaudit` needs to directly control the graphics hardware. You can stop the Window Manager system using `/usr/gfx/stopgfx` from root. For more information on the Window Manager, see your *Desktop User's Guide* (007-1342-160 or later).

Note: You cannot run `irsaudit` from the Graphics Console.

You must have root privileges to run `irsaudit`. For more details, see the `irsaudit(1)` man page.

If you enter `irsaudit` with no arguments following the command, the system runs a standard set of tests that halts when a first failure is identified. This can be useful for testing the general state of a new or upgraded system.

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