

Galileo™ 601 and Indy Video 601™ Option Owner's Guide

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Introduction

Congratulations on buying the 601 Option™ digital breakout box and welcome to the world of digital video! The 601 Option, in conjunction with Galileo Video™ or Indy Video™, gives you two digital video channels and two analog channels. This lets you use your workstation to send and receive composite, S-Video, component analog, and digital video signals so you can create high quality video.

The Galileo 601 Option requires an Indigo²™ workstation with the Galileo Video board installed. For software requirements see the software release notes on the CD.

The Indy Video 601 Option requires an Indy™ workstation with the Indy Video and Cosmo Compress™ boards installed. For software requirements see the software release notes on the CD.

Multimedia Software

You can use the 601 Option in conjunction with a number of multimedia applications available from Silicon Graphics and from third-party vendors:

Capture, MovieMaker, MoviePlayer

Use the media tools that are shipped standard with Silicon Graphics systems to create and edit your own video recordings. From the Find toolchest, choose "Media Tools." See the *Media Tools User's Guide* in IRIS InSight or the online help for more user information about each of the tools.

Video Panel Use the Video Panel to adjust the software to reflect your video hardware configuration. From the Find toolchest, choose "Control Panels" and double-click the *videopanel* icon. See Chapter 4, "Sending and Receiving Video Signals" in this manual and the Video Panel online help for more user information.

video software tools
Use the video software tools documented in Chapter 5, "Using Video Software" in this manual to demonstrate the capabilities of your video hardware.

third-party software
See the documentation shipped with those products for information on how to use them in conjunction with the 601 Option.

IRIS Digital Media Libraries (VL)
The IRIS Digital Media Libraries 2.0 contains the video library programming environment. Use it to program the 601 Option.

dmplay and dmrecord utilities
Use these utilities to record and play JPEG movies through the Cosmo Compress board. See the documentation with the Cosmo Commpress software.

What This Book Contains

Chapter 2, “Setting Up the System,” describes the 601 option components and tells you where to find information on installing the software. It also tells you how to set up the rack mount option, if you are using a rack mount unit, and how to power up the system.

Chapter 3, “Using the Breakout Box,” contains a diagram of the breakout box and describes how to connect it to your video hardware.

Chapter 4, “Sending and Receiving Video Signals,” tells you how to use the Video Panel to adjust the software to send and receive video signals.

Chapter 5, “Using Video Software,” describes the suite of video tools that let you view incoming video in a window, save it to disk, and send it to videotape.

Conventions

This Owner’s Guide uses these conventions:

- References to documents are in *italics*.
- References to other chapters and sections within this guide are in quotation marks.
- Names of onscreen buttons are in *italics*.
- Commands that users are asked to type in a Unix shell are shown in **courier** font.
- Names of menu choices are in quotation marks.
- Steps to perform tasks are in numbered sentences. When a numbered step needs more explanation, the explanation follows the step and is preceded by a square bullet. For example:
 1. Drag the box around the screen to encompass the area of the screen you want to send.
 - To drag the box, place the cursor on one of the sides of the box and press and hold down the left mouse button. The box turns red.
 - Holding down the mouse button, move the cursor to move the box.

Product Support

When you purchased your system, you may have purchased a support program from either Silicon Graphics, Inc., or a vendor who supplies software. Whenever you encounter any problems that you cannot solve using the methods in this chapter, contact the organization from which you purchased the support program.

If you would like support for your Silicon Graphics products, contact your service provider.

Setting Up the System

This chapter tells you how to prepare the workstation and then set up the 601 Option digital breakout box. It contains these sections:

- Checking Option Components
- Preparing the System
- Connecting the Galileo 601 Breakout Box to an Indigo² Workstation
- Connecting the Indy Video 601 Breakout Box to an Indy Workstation
- Powering Up the System

Checking Option Components

Figure 2-1 shows the parts included with the Galileo 601 Option and the Indy Video 601 Option. You may receive one or more CDs that contain the latest operating system. Contact your service provider if any of the pieces is missing or damaged.

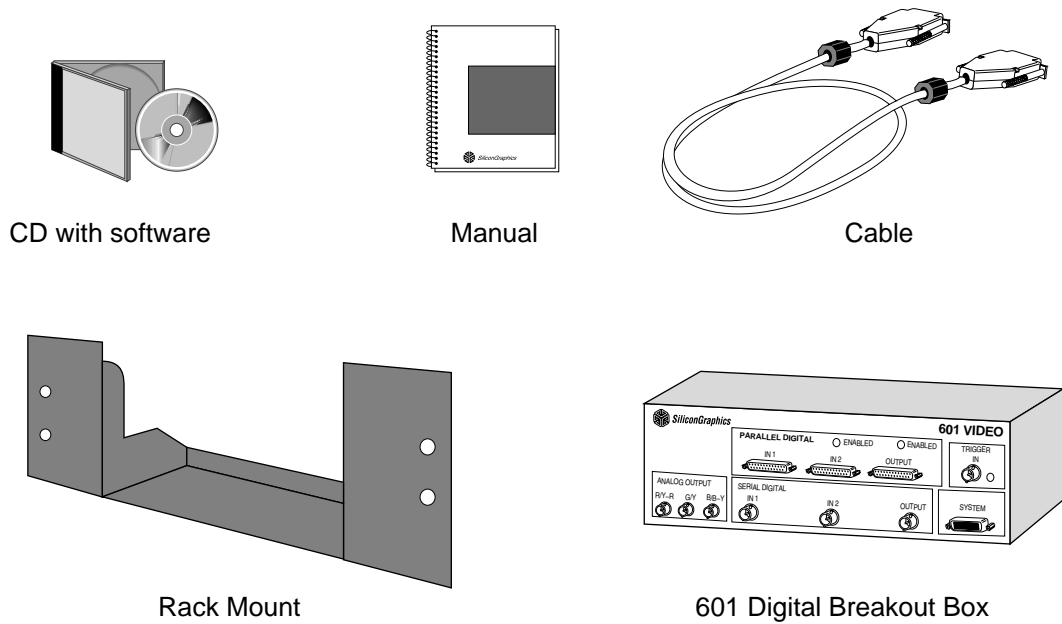


Figure 2-1 Galileo 601 and Indy Video 601 Option Components

Note: For the Galileo 601 Option, the power cable is ordered as a separate item.

Preparing the System

The 601 Option breakout box requires certain hardware and software. See the appropriate section below for your workstation.

Indigo² Workstation and the Galileo 601 Option

To use the Galileo 601 option, your Indigo² workstation must be running the required level of IRIX. See the release notes on the IRIX CD for more information. Galileo Video software and hardware must also be installed.

- For directions on how to install the IRIX operating system software, see the *IRIS Software Installation Guide*.
- For directions on how to install the Galileo Video software, see the CD that is shipped with Galileo Video.
- For directions on how to install the Galileo Video hardware, see the *Galileo Video, Indigo² Video, and Indy Video Owner's Guide*.
- To connect the Galileo Video Option breakout box, go to Chapter 2, "Connecting the Galileo 601 Breakout Box to an Indigo2 Workstation"

Indy Workstation and the Indy Video 601 Option

To use the Indy Video 601 option, your Indy workstation must be running the required level of IRIX. See the release notes on the IRIX CD for more information. The Indy Video 601 board, Cosmo Compress board, and Indy Video 601 software must also be installed.

- For directions on how to use Software Manager to install the IRIX operating system, see the software release notes on the IRIX 5.3 CD and the *Personal System Administration Guide* in IRIS InSight.
- For directions on how to install the Indy Video 601 software, see the software release notes on the CD shipped with the Indy Video 601 option.
- For directions on how to install the Cosmo Compress board, see the flier that came with the Cosmo Compress board. For more detailed instructions, see the *Indy Workstation Owner's Guide*.

- To connect the Indy Video 601 Option breakout box, go to “Connecting the Indy Video 601 Breakout Box to an Indy Workstation” on page 9.

Connecting the Galileo 601 Breakout Box to an Indigo² Workstation

Follow the directions in this section to connect the digital breakout box to the Galileo Video board in your Indigo². If you are installing the breakout box in a rack mount unit, see the next section, “Setting Up the Rack Mount Option” on page 10.

To set up the digital breakout box follow these steps:

1. Find a suitable location for your Galileo 601 Option breakout box.
The digital video cable is about 8 feet long so the workstation and the breakout box must be fairly close to one another.
2. Connect the 60-pin digital video cable to the digital port on the back of the Galileo Video board, as shown in Figure 2-2.

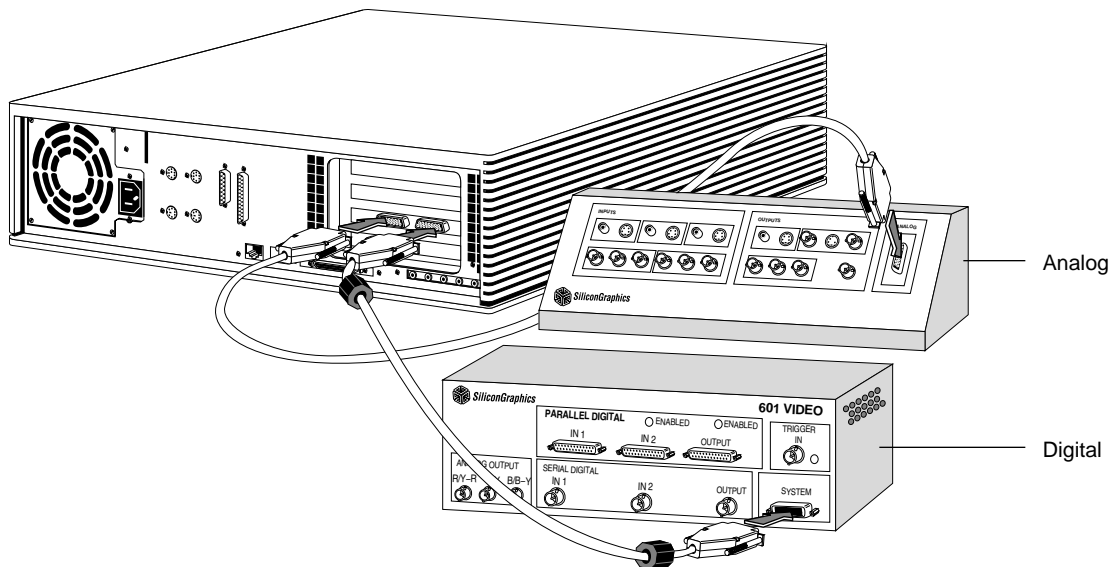


Figure 2-2 Connecting the Galileo 601 Digital Breakout Box to Galileo Video in an Indigo² Workstation

3. Connect the other end of the cable to the port labelled **SYSTEM** on the front panel of the Galileo 601 breakout box.

Note: Be careful with the cable as the pins tend to bend easily.

4. Connect the power cable to the back of the breakout box and to a grounded AC outlet or power strip.

Connecting the Indy Video 601 Breakout Box to an Indy Workstation

Follow the directions in this section to connect the Indy Video 601 digital breakout box to the Cosmo Compress board in your Indy workstation. If you are installing the breakout box in a rack mount unit, see the next section, "Setting Up the Rack Mount Option" on page 10.

To set up the digital breakout box follow these steps:

1. Find a suitable location for your Indy Video 601 Option breakout box.

The digital video cable is about 8 feet long so the workstation and the breakout box must be fairly close to one another.

2. Connect the 60-pin digital video cable to the port on the back of the Cosmo Compress board, as shown in Figure 2-3.

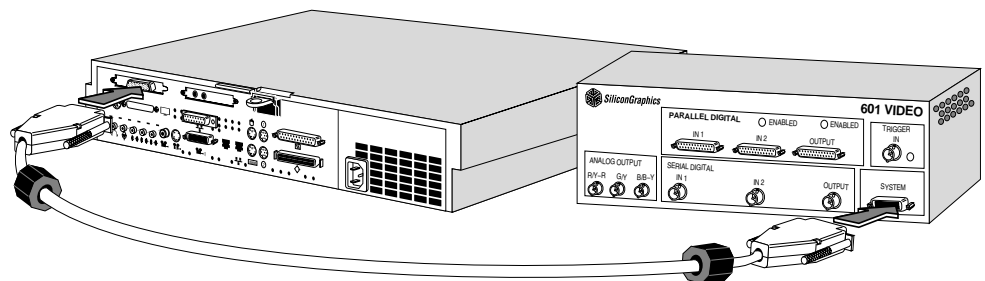


Figure 2-3 Connecting the Indy Video 601 Breakout Box to the Indy Workstation

3. Connect the other end of the cable to the port labelled **SYSTEM** on the front panel of the Indy Video 601 breakout box.

Note: Be careful with the cable as the pins tend to bend easily.

4. Connect the power cable to the back of the breakout box and to a grounded AC outlet or power strip.

Setting Up the Rack Mount Option

Follow the directions in this section to set up the breakout box in a rack mount unit. The bracket included with this option is designed to fit into a standard 19-inch rack mount unit.

There are two ways to install the bracket in a rack mount unit. You can install it so the breakout box protrudes from the front of the unit, or so the breakout box is flush with the front of the unit. Both ways are shown in Figure 2-4.

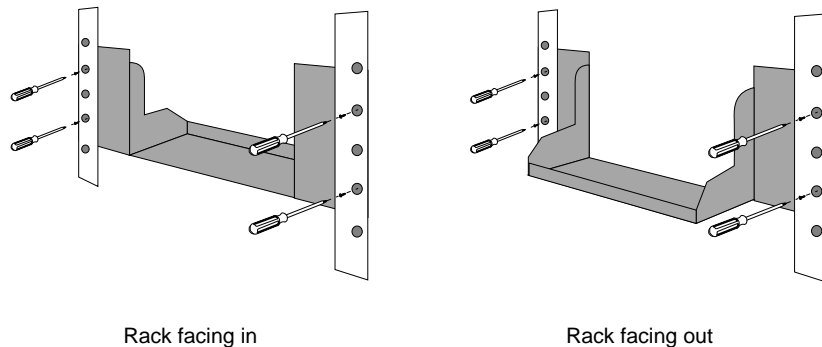


Figure 2-4 Setting up the breakout box in a rack mount unit

To install the bracket in a rack mount unit follow these steps:

1. Use mounting screws to attach the bracket to the unit. These screws are usually provided with the rack mount unit.
2. Remove the screws that attach the rubber feet to the bottom of the breakout box. You'll use these in step 5.

3. Place the rubber feet in the bottom of the bracket in each of the four hollowed areas.
4. Place the breakout box in the unit. You can place it so either the connectors or the power switch face you.
5. From underneath the bracket, use the same screws removed in step 2 to connect the bracket and the rubber feet to the breakout box.
6. Connect the cables according to the instructions in “Connecting the Galileo 601 Breakout Box to an Indigo2 Workstation” on page 8”.

Powering Up the System

Follow these steps to power on the system:

Note: It’s important that you turn on the breakout box *before* turning on the workstation, because the workstation looks for the new hardware during its start-up sequence.

1. Turn on the digital 601 breakout box.
2. Press and release the power button on the workstation to turn on the power.
3. After the power-on diagnostics run, the system boots up and brings you to the login screen.
4. Login to your account.

For more information on how to turn on the workstation and log into your user account, see your workstation’s *Owner’s Guide*.

The next chapter contains information on how to use the breakout box. See Chapter 5, “Using Video Software,” for information on using the video software tools, such as *videoout*, to test the installation.

Using the Breakout Box

This chapter contains these sections:

- Breakout Box Layout
- Connecting Galileo 601 to a Digital Betacam™ Deck
- Helpful Hints for Using the Breakout Box

Breakout Box Layout

The 601 Option digital breakout box is shown in Figure 3-1.

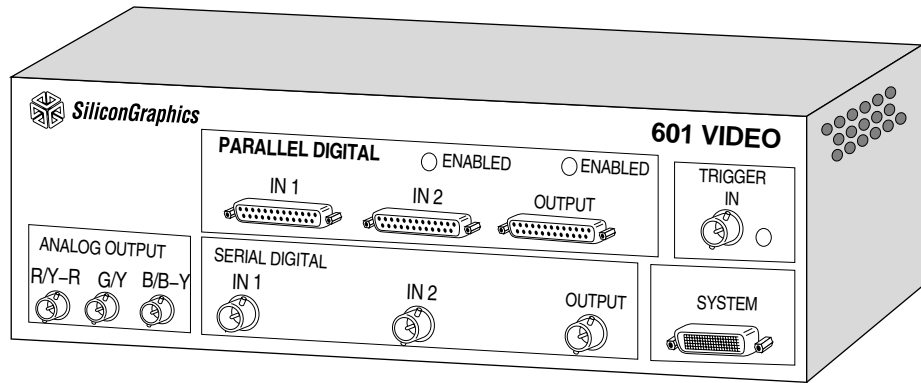


Figure 3-1 Digital Breakout Box Layout

There are two digital video channels on the 601 option: an input channel and a bidirectional channel. The input channel is connected to the Input 1 (**IN 1**) port. The bidirectional channel is connected to both the input 2 (**IN 2**) and the output (**OUTPUT**) ports. Only one or the other is active; Input 2 and Output do not work together. You can monitor incoming video on Input 2 by connecting a display device to the Output channel.

If you have equipment hooked up to the Input 2 port and the output port, software determines which port is enabled, based on which is selected first. For example, `videoout -o 2` sends video to the output port and disables input 2. Because input 2 and output share the same channel, they are both referred to as port 2 in software.

The list below contains descriptions of each of the ports on the breakout box:

- IN 1** Input 1 is always available in one of two formats: serial or parallel. Use the Video Panel to activate either serial or parallel format.

| | |
|----------------------|---|
| IN 2 | Software determines whether the Input 2 or Output port is activated. (See the explanation in the text above.) Use the Video Panel to activate serial or parallel formats. |
| OUTPUT | Serial and parallel formats are available simultaneously. |
| ENABLED | These LEDs indicate whether the input 2 port or the output port is activated. |
| TRIGGER IN | Connect to GPI output for frame accurate I/O. |
| SYSTEM | Connect to the Galileo or Indy Video board in the workstation. |
| ANALOG OUTPUT | The same data as digital output available in component analog format. |

See “Helpful Hints for Using the Breakout Box” on page 18 for a list of helpful reminders when using the 601 option.

Connecting Galileo 601 to a Digital Betacam™ Deck

Figure 3-2 portrays a typical Indigo² video configuration. In it you see the Galileo Video analog breakout box, the Galileo 601 Option digital breakout box, and a digital Betacam™ deck, connected to an Indigo² workstation to send and receive video signals.

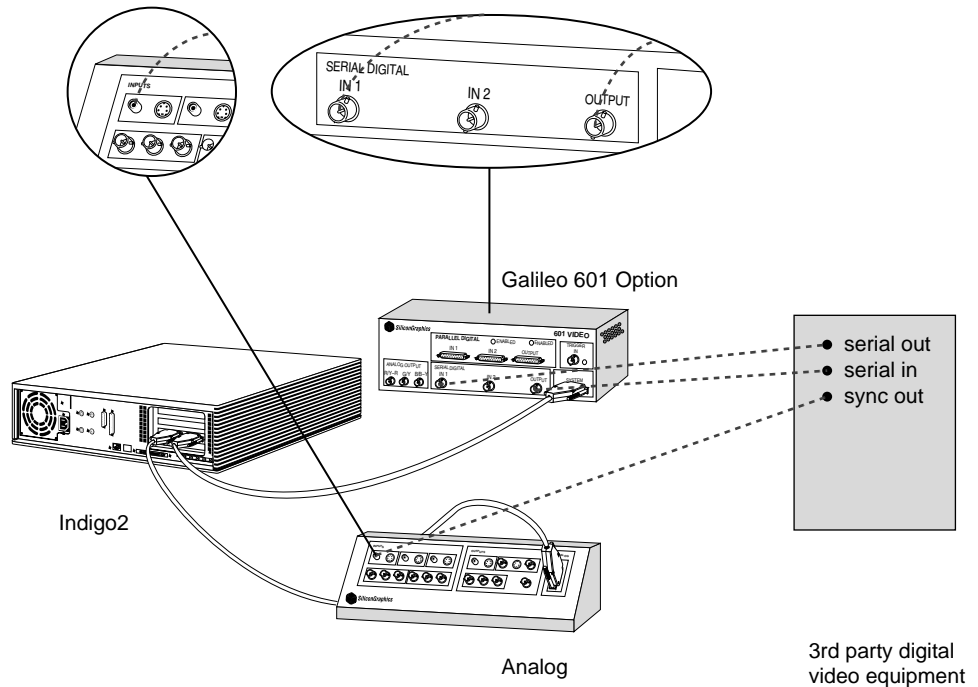


Figure 3-2 Digital Betacam Deck Connected to Indigo² with Galileo Video and Galileo 601 Options

Note: Although the power cords are not shown in Figure 3-2, the workstation, the Galileo 601 Option, and the digital Betacam deck are all connected to a power strip or AC outlet.

Connecting Indy Video 601 to a Digital Betacam Deck

Figure 3-2 shows a typical Indy video configuration. In it you see the Indy Video 601 Option digital breakout box and a digital Betacam™ deck, connected to an Indy workstation to send and receive video signals. Helpful Hints for Using the Breakout Box

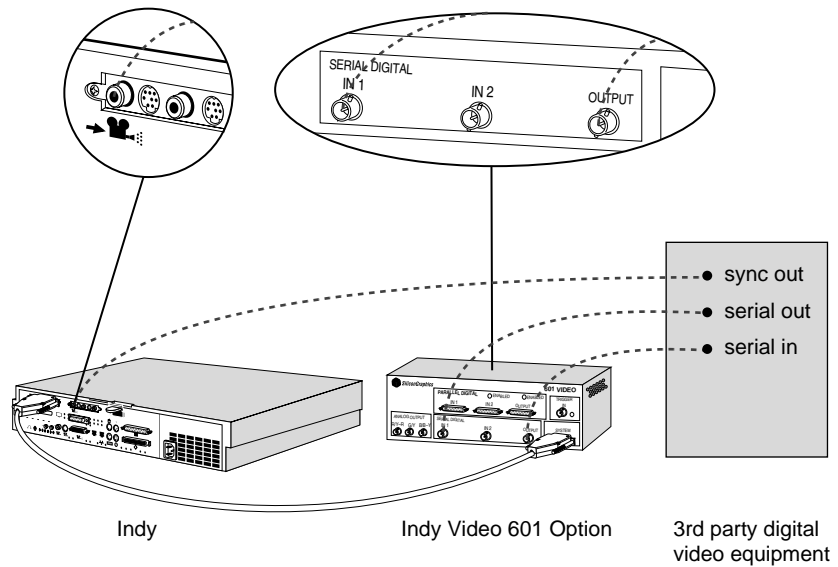


Figure 3-3 Digital Betacam Deck Connected to Indy with Indy Video 601

Note: Although the power cords are not shown in Figure 3-2, the workstation, the Indy Video 601 Option, and the digital Betacam deck are all connected to a power strip or AC outlet.

Helpful Hints for Using the Breakout Box

This is a list of hints that may be useful as you set up and use the 601 option.

Tip: Always turn on the 601 option breakout box *before* the workstation so that the workstation recognizes the 601 option.

- The Input 2 and Output ports share the same wiring and are referred to in software using the number "2". When using the video software tools, specify -o 2 for Output, although the hardware is only labelled **OUTPUT**.
- Although the Input 2 and Output ports share the same channel, when Input 2 is activated, the input signal is reflected onto the Output channel. If you connect a display device to the Output channel, you can monitor incoming video to the Input 2 channel. The **ENABLED** LEDs indicate which is active.
- The component analog signal is available through the port labelled **ANALOG OUTPUT**. It is an analog version of the digital Output port.
- Input 2 is disabled when using internal mode.

Sending and Receiving Video Signals

The sections below describe how to use the Video Panel to adjust the workstation to send signals to, or receive signals from, the digital breakout box.

- See “Preparing to Send Video Output” to *send* graphics from the workstation to a digital source.
- See “Preparing to Receive Video Input” to *receive* incoming video from a digital source.

Using House Sync

A word about house sync... House sync is a timing signal generated to synchronize video equipment in a post-production environment. Galileo Video and Indy Video can be used as the house sync source.

Using House Sync on Indigo² With Galileo Video

Connect the house sync signal to one of the three composite inputs on the *analog* Galileo breakout box. They are marked Comp1, Comp2, and Comp3. Alternatively, use the BNC connectors marked Y1, Y2, and R-Y2. Follow the directions in the sections below to adjust the Video Panel to acknowledge the house sync signal.

The Galileo 601 Option accommodates both parallel and serial equipment. If you have both types of equipment hooked up to the breakout box, toggle between the two by adjusting the settings in the Video Panel.

Using House Sync on Indy with Indy Video

Connect the house sync signal to one of the two composite inputs on the Indy video board. Follow the directions in the sections below to adjust the Video Panel to acknowledge the house sync signal.

The Indy Video 601 Option accommodates both parallel and serial equipment. If you have both types of equipment hooked up to the breakout box, toggle between the two by adjusting the settings in the Video Panel.

Preparing to Send Video Output

This section describes how to use the Video Panel to adjust for an outgoing video signal. For instance, you may be preparing to send graphics or video to a VCR. Follow these steps:

Note: Use the Help menu on the Video Panel for more information on using the Video Panel.

1. From the Find toolchest, select "Control Panels" and double-click the *videopanel* icon.
2. Select your input device from the Device menu. For instance, if you are using Indy Video, select "Galileo/Indy Video."

The Video Panel will change to reflect the option board choices.

3. In the Input Timing field, select "CCIR(525)" for NTSC timing, or "CCIR(625)" for PAL timing (choose the timing that matches your input source timing).
4. Set the Default In to match your input source (digital 1 or analog).
5. Set the Default Out to match your output source (digital or analog).
6. Set the sync mode to "internal" or "genlock".
Select "genlock" when you want to lock the output to house sync.
Select "internal" to make Galileo the house sync source.
7. If in genlock mode, select the correct composite sync source from the Genlock Src field. Also select a valid analog video source from the Analog Video Input field (even if it is a reference signal).

For example, for Galileo Video, if you connected the house sync signal to Comp 1 (or Y1) on the analog breakout box, choose “composite 1” from the Genlock Source field. For Indy Video 60l, if you connected the house sync signal to port 1 on the Indy Video board, choose “composite 1” from the Genlock Source field; if you connected it to port 2, choose “composite 2.”

8. Choose “Digital Video” from the Pro menu, then choose “All” from the rollover submenu.
 - Set Input1 and Input2 to the appropriate input ports (serial or parallel).
 - Set the vertical blanking mode to normal.
9. Now you are ready to send the graphics or video. For example:
 - To send graphics from the screen to digital video out, type in a shell:


```
videoout -o 2
```
 - To send single frames from the disk, type in a shell:


```
memtovid -o 2 -f filename -p
```

 (where *filename* is the name you choose for the file)

See Chapter 5, “Using Video Software,” for more information on how to use the *videoout* and *memtovid* command line tools. Also see the man pages.

Preparing to Receive Video Input

This section describes how to use the Video Panel to adjust for the video signal coming from a camera or VCR. Follow these steps:

Note: Use the Help menu on the Video Panel for more information on using the Video Panel.

1. From the Find toolchest, select “Control Panels” and double-click the *videopanel* icon.
2. In the Input Timing field, select “CCIR(525)” for NTSC timing, or “CCIR(625)” for PAL timing (choose the timing that matches your input source timing).

3. Select “slave,” “genlock,” or “internal” from the Sync field.
 - Select “slave” if you are saving single frames to disk.
 - Select “genlock” when you want to lock the output to house sync. Turn on Synchronizer Mode if the video input device is not locked to house sync.
 - Select “internal” to make Galileo the house sync source. Turn on Synchronizer Mode.

Note: Input 2 is disabled in internal mode.

4. If in genlock mode, select the composite source from the Genlock Src field.

For example, if you connected the house sync signal to Comp 1 (or Y1) on the analog breakout box, choose composite 1 from the field.

5. If in slave or genlock mode, select the composite source from the Input field.
6. Select “Digital Video” from the ProPanel menu, then choose “All” from the rollover submenu. Set the Input1 and Input2 fields to the appropriate input port (serial or parallel).
7. Now you are ready to receive the graphics or video.
 - You can use either the *videoin* or *vintovout* command line tools.

The *videoin* tool is also available through the Utilities menu. See Chapter 5, “Using Video Software,” for more information.

Using Video Software

This chapter describes the video tools available from Silicon Graphics, Inc. It includes these sections:

- Displaying Video in a Window
- Sending Video In to Video Out
- Saving Single Frames to Disk
- Grabbing Single Frames From Disk

There are five tools you can use to demonstrate the capabilities of your video hardware:

| | |
|------------------|---|
| <i>memtovid</i> | sends single frames from disk to an output port. |
| <i>vidtomem</i> | saves a single frame from video input to disk. |
| <i>videoout</i> | sends graphics from a portion of the screen to video output port. |
| <i>vintovout</i> | receives video input and sends it to an output port. |
| <i>videoin</i> | displays video input in a window on the graphics screen. |

Use the tools described in this chapter with the `-v` flag to select inputs and the `-o` flag to select the outputs. For example, to display input from digital 1 and output it to digital 2 use the command: `vintovout -v 1 -o 2`. The defaults are always analog in and analog out.

Displaying Video in a Window

Use the *videoin* tool to display video coming into the workstation via a video input port on the graphics monitor. You can hook up digital equipment to one or both of the input ports and display video in up to two windows. Follow these steps:

1. Open the Video Panel.
2. Select "digital 1" or "digital 2" from the Default Input field.
3. Select "Live Video Input" from the Utilities menu. This runs the *videoin* tool.
4. A window outline appears attached to your cursor. Place the outline on the screen by clicking once with the mouse.
5. The incoming video is displayed in the window.

If you configured two digital input ports, repeat these same steps to display input from the second port.

Sending Video In to Video Out

The *vintovout* tool lets you send video coming in to the workstation directly to a device attached to an output port.

1. In a Unix shell, type

```
vintovout -v 1 -o 2
```

Note: This command sends the signal from digital input 1 directly to output.

A small rectangle appears attached to the cursor.

2. Move the cursor to where you want to place the rectangle. Click once with the left mouse button. The *Video I/O* button appears.
3. To quit, place the mouse over the *Video I/O* button and click and hold down the right mouse button. Choose "Quit" from the menu.

Sending Graphics to Video Out

Use the *videoout* tool to output a selection from the graphics monitor.

1. In a Unix shell, type

```
videoout -o 2
```

(The `-o 2` flag sends the signal to the output port.)

A small red rectangle appears attached to the cursor.

2. Place the rectangle by moving the mouse to the desired position onscreen and clicking the left mouse button.

The rectangle turns into a *Live Video Output* button. A white outline also appears in the upper left corner of the screen. The image in the box is what will be sent or viewed.

3. Drag the box around the screen to encompass the area of the screen you want to send.
 - To drag the box, place the cursor on one of the sides of the box and press and hold down the left mouse button. The box turns red.
 - Holding down the mouse button, move the cursor to move the box.
 - Release the cursor to place the window.
4. Move the cursor over the *Live Video Output* button and press and hold down the right mouse button.
5. Turn off Flicker Filter if you are displaying an antialiased image.
6. The live video gets sent to the output port.

Note: Full screen mode is not available when in CCIR(525/625) mode.

Saving Single Frames to Disk

Use the *vidtomem* command to save to disk an image being sent by a camera or VCR.

1. In a Unix shell, type

```
vidtomem -v 1 -f filename
```

2. Replace *filename* with a name you choose for the file.

A single frame of the incoming video gets saved to disk. The file is saved to *filename-00000.rgb*. The zeros are replaced by *00001* if you are saving sequences of frames. For example, use the command **vidtomem -v 1 -f filename -c 5** to capture 5 frames to disk.

Type: **ipaste filename** to display the captured frame in a window on the screen.

Grabbing Single Frames From Disk

Use the *mentovid* tool to send an image to the video output port.

1. In a Unix shell, type

```
mentovid -o 2 -f filename -p
```

2. Replace *filename* with a name you choose for the file.

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