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MultiBuffer™ DS-1
User Manual
Including
Envoy™ Mac Application,
Envoy™ PC Application
and Unix Control

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Serial Box Convertors

For high quality conversion between all analog formats and serial digital component, Serial Box offers the ideal way to drive picture monitors, waveform monitors, switchers, VTRs and DDRs. All Serial Box Convertors feature full 10 bit processing in YUV color space conversion for the most accurate output signal possible.

Catalyst CV™ Networkable Switcher & Keyer

Catalyst has all the switching and keying power needed in a traditional environment, including Linear, Luminance, Chroma and Additive keying. Ethernet connectivity for workstation interface and one-setup graphics keying makes it perfect in graphic suites, telecine and post, stand-alone or downstream, for 10 bit serial component applications.

Networkable Video Gateway for Mac/PC/SGI

Use the Multibuffer™ DS-1 Video Gateway for flawless graphics transfers between the computer and the video world. As an ethernet networkable device it is available as a resource to all workstations in your facility. Video and Alpha (key) are automatically sent to independent, simultaneous outputs, providing full support of graphics keying in editing and on-air environments.

TBC Control Systems

TBC Controllers offer simplicity that revolutionizes your tape system by controlling video, chroma, setup, hue and timing of digital and analog VTRs, TBCs, and Frame Syncs. Built-in networkability means any size system can be achieved with control of any VTR from any control panel.

Carbon™O2 Video I/O Stuff

Carbon™ provides analog video and key inputs and outputs for the Silicon Graphics O2 workstation. Carbon is great for using O2 in an analog environment with a beta deck or other analog gear. Its built in key channel enables the O2 to integrate into broadcast and post environments.

For more information on Ensemble products, contact us at:

Ensemble Designs PO Box 993 Grass Valley CA 95945 USA
tel: (530) 478-1830 fax: (530) 478-1832
email: info@endes.com   www.ensembledesigns.com

PREFACE

This manual provides complete application, installation, setup and user information for the MultiBuffer DS-1 Networkable Video Gateway. It also includes complete information on using Envoy Mac and Envoy PC control applications and a section covering Unix control.

The manual is divided into the following sections:

Overview

This section describes the main uses of MultiBuffer DS-1 and gives examples of common applications.

Installation

Installation of MultiBuffer DS-1 to external video and networking devices and setting the frame front panel controls for system parameters are covered in this section.

Control with Envoy Mac Software

Control of MultiBuffer DS-1 with Ensemble's Envoy Mac software (v3.0 or later) is provided in this section.

Control with Envoy PC Software

Control of MultiBuffer DS-1 with Ensemble's Envoy PC software (v1.4.2 or later) is provided in this section.

Control With SGI or Unix Platforms

Using an SGI/Unix workstation to control MultiBuffer DS-1 is described in this section.

Troubleshooting

This section gives MultiBuffer DS-1 troubleshooting tips.

Product Specifications

Complete product specifications are provided in this section.

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MULTIBUFFER DS-1 OVERVIEW

The MultiBuffer DS-1 is the perfect video gateway for transferring graphics between your computers and the video world. Flawless transfers are possible with utilization of sophisticated transcoding algorithms for taking computer based images into 601 component digital at full 10-bit resolution. Uncompromised picture quality is guaranteed by precision color space conversions between the computer work of RGB and digital video's Y, R-Y, B-Y (also called YUV). Accurate conversions are ensured every time with the uncompressed digital video path and 16-bit computation.

As a networkable device, the The MultiBuffer DS-1 connects easily to an existing Ethernet network, making it available to all computers and workstations in your facility. No video plug-in cards are needed. and any computer can use this system, even a laptop. Support of TCP/IP and Appletalk/Ethernet enables full platform independence and simultaneous support of multiple computers.

Access by any workstation or computer to the MultiBuffer DS-1 is possible through Envoy Mac, Envoy PC or UNIX commands. Full control of Input Selection, Freeze, Timing Control and Output Routing are accessed directly from the desktop.

MultiBuffer DS-1 can have up to 4 live digital inputs, 4 digital outputs, and 4 internal SmartStore™ FrameBuffers. Serial digital inputs and outputs make integration into a component digital suite simple. In conjunction with the MultiBuffer DS-1, Ensemble's Serial Box™ Digital and Analog Converters offer multiple solutions for interfacing to all types of video environments.

Signal routing in the MultiBuffer DS-1 is flexible with a 12x14 internal routing switcher, providing a complete interconnect between inputs, outputs and framebuffers. Simultaneous output of video and key (alpha) signals essential for proper keying are also provided.

The MultiBuffer DS-1 genlocks to analog color black, composite sync or 601 digital sources. The output timing of each SmartStore FrameBuffer is independently adjustable. Selectable frame or field playback of captured images is provided.

With the optional Catalyst Switcher upgrade, you can add complete keying capability to the MultiBuffer DS-1. The Catalyst CV Combiner module plugs into the video board inside the MultiBuffer chassis. Catalyst can use both the internal framebuffers and live video sources for background and key material.It can be used as a production switcher with traditional cut, mix and wipe functionality.

Programmable logic and innovative software keeps the MultiBuffer DS-1 flexible, ensuring a long life in every facility.

MultiBuffer DS-1 Networkable Video Gateway

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Applications

Moving graphics from your computer or client's files to 601 video is a simple process with the MultiBuffer DS-1 as shown in the figure below. Video and Key from the MultiBuffer DS-1 can be fed to your router, production switcher or paint system eliminating the need to tie up your DDR to transfer stills. Video stills can be captured and accessed easily from any computer in your facility.
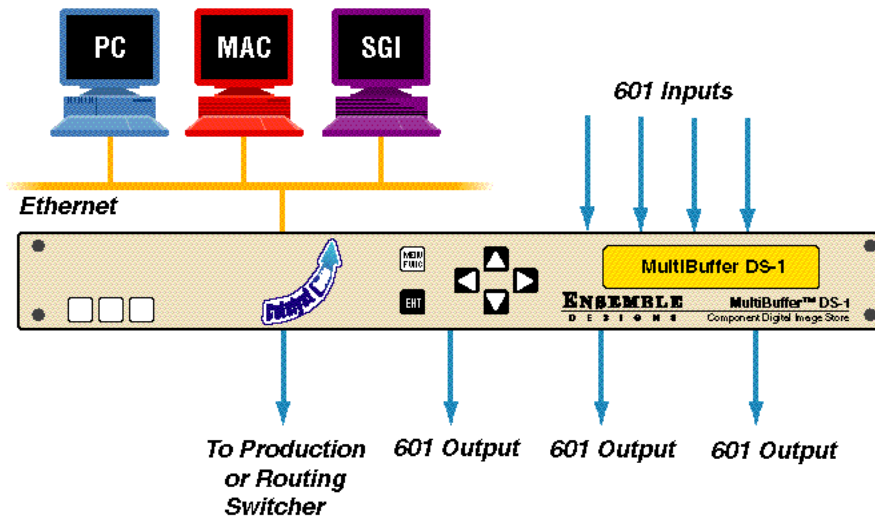
Networking MultiBuffer DS-1 Application

You can create a powerful still store system by combining the MultiBuffer DS-1 and a workstation with your graphics stored on a hard drive. The intuitive front end and industry standard computer tools for browsing and sequencing make saving and retrieving graphics a natural extension of the MultiBuffer DS-1.

The MultiBuffer DS-1 combined with a workstation is a flexible and cost effective alternative to dedicated character generator with the added advantage of virtually limitless typefaces.

Use the MultiBuffer DS-1 for calibrating your computers and your video equipment with the built-in test signal generator.

The MultiBuffer DS-1 is right at home on virtual sets. With up to four frames of delay, timing issues are easily resolved. Add the Catalyst option for a complete switcher and chroma keying solution.

INSTALLATION

The MultiBuffer DS-1 frame electronics is 1 rack unit, 19" wide, 1.75" high and 17" deep and weighs 12 pounds. Rack ears are included and screw onto the sides of the frame chassis for rack mounting. Rear rack supports are also included. Power specifications are 100-230 VAC, 50/60 Hz, 60 VA. CE Compliant where required.

The external connections to the MultiBuffer DS-1 backplane are explained in the following sections. The backplane is illustrated on the next page.

Inputs

The MultiBuffer DS-1 can have up to 4 Serial Digital 259M inputs with reclocked active loopback outputs. All inputs have an 8 line autotime window. The system comes standard with 2 inputs.

Connect the desired sources to the active Serial Component Input BNCs on the back of the frame electronics. (Inputs 1 and 2 are standard, inputs 3 and 4 are optional). Catalyst accepts serial digital SMPTE 259M video. Use 75 ohm coaxial cable for connecting the inputs.

Outputs

The MultiBuffer DS-1 can have up to 4 independent Serial Digital 259M output channels, each with an additional buffered output.

Connect the active Serial Component Output BNCs to the desired output destination. (Outputs 1 and 2 are standard, outputs 3 and 4 are optional). Outputs can be fed to any device that accepts serial digital video SMPTE 259M video. Use 75 ohm coaxial cable to connect the outputs.

MultiBuffer DS-1 Backplane

Buffers

The MultiBuffer DS-1 can have up to 4 internal SmartStore™ FrameBuffers installed. Two buffers are standard and two are optional.

Each buffer holds 1 frame of video and can be frozen or unfrozen. The video in a buffer can come from 3 sources; a digital video input, via ethernet from a workstation, or an internal test pattern. Also, the MultiBuffer DS-1's internal routing system allows routing of one buffer to another, which can be helpful for special timing needs. Each buffer can be independently timed and can provide up to 1 frame of delay as needed. (For most applications, buffers do not need to be timed.)

Reference Inputs

There are four sync reference source choices available as listed below:

- Analog A

- Analog B

- Digital Input #1

- Freerun

One of these sources must be chosen as the sync reference in the Genlock & Timing selection through the front panel controls explained in the next section.

Analog Reference A or B

Two BNCs are available on the back of the frame for use with analog reference signals. The analog reference signal must contain composite H and V sync, at any level from 300 mV to 4 V peak-to-peak. Standard color black from a Sync Pulse generator is a good choice for a reference source.

The two BNCs can be set for a standard loop-through mode or for each BNC to be an independent reference input. Internal jumpers on the main video board must be set to configure these two connectors as either high-impedance loop-through or independent, internally terminated inputs. The jumpers are set at the factory for loop-through mode.

If you desire to use the independent mode, remove the top cover of the frame electronics and locate the jumpers, J9 and J10, located at the rear of the main circuit board behind the Ref A and B BNCs. Move the jumpers to the right most two pins as illustrated in the figure below.

DETAIL

SIDE VIEW OF JUMPERS J9 AND J10

MOVE JUMPERS TO RIGHT TWO PINS FOR INDEPENDENT REF A AND B

REF B REF A

J10 J9
SEE DETAIL ABOVE

TOP VIEW OF INSIDE REAR OF FRAME ELECTRONICS
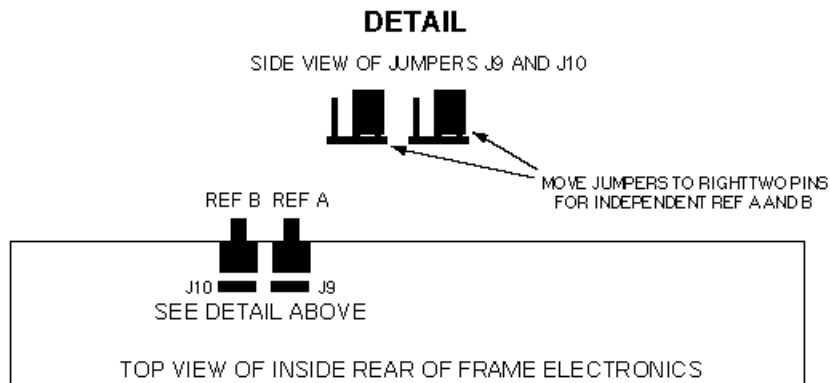
Jumpering for Independent Mode

To use the loop-through mode, connect the analog reference signal to one of the BNCs and loop through to the next device. You will need to set the Genlock Source to Analog Ref A or B when setting the front panel controls in the next section.

If you have set the jumpers for two independent inputs, you can feed two different reference signals to the Analog Ref A and B (such as 525 and 625) and in the next section, set the Genlock Source for either A or B depending on which reference signal you want to use.

Digital Input #1

When genlocked to Digital Input #1, the 27 MHz clock and Horizontal and Vertical timing are derived from the input signal feeding Digital Input #1. For this setting, choose Digital Input 1 under the Genlock Timing menu. (Note that an external digital signal input must be connected to Input #1 for this setting.)

Freerun

When freerun is selected, an internal sync generator, driven by the internal 27 MHz crystal oscillator, provides the reference signal. No cabling is required. Select Freerun under the Genlock Timing menu for this setting.

Editor Port

The editor port uses a standard 9-pin D connector and is used with the optional Catalyst module if installed.

Diagnostic Port

The diagnostic port is not used at this time.

Control Panel

The control panel is available if you are using the optional Catalyst module.

Computer Network Connections

The MultiBuffer DS-1 frame supports 10 Mb Ethernet. Your MultiBuffer DS-1 frame has either a 15 pin AUI Ethernet connector or BNC (Thinnet), depending on how you ordered it.

Ethernet setup, including IP address management, and status checking is done through the front panel controls. Refer to the next section, **Frame Front Panel Operation** for more details.

To connect to the Ethernet port, refer to the instructions below.

10BaseT 15-pin AUI Connection

To use 10BaseT, an external transceiver must be installed to the 15-pin AUI connector (to the upper left of the LAN phone connections). Conventional 10BaseT cabling is then run from that transceiver to the hub serving the system. 10BaseT installations require a central hub to which each network device connects. A properly installed 10BaseT connection will illuminate the "link" indicator on the transceivers at the frame and at the hub.

Optionally, an Ethernet crossover cable can be connected between the MultiBuffer DS-1 workstation and the system device in lieu of a hub.

Thinnet BNC Connection

Thinnet cabling runs daisy-chain fashion to all devices on the network. The frame can be equipped with an optional single female BNC for connection to the network via a Female/Male/Female T-connector. 50 ohm coax (RG58) is run between each device, with a 50 ohm termination on the unused half of the T-connector at each end of the chain.

GPI/Remote

The GPI interface connector is a 15-pin male connector with the pinouts as shown in the figure below.

FRAME ELECTRONICS REAR
GPI REMOTE D CONNECTOR
15-PIN MALE
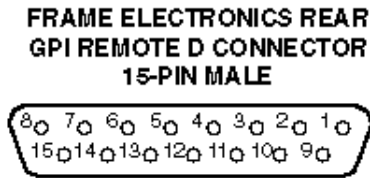
1	GPI IN 1	Toggles Buffer 1 Freeze
2	GPI IN 2	Toggles Buffer 2 Freeze
3	GPI IN 3	Toggles Buffer 3 Freeze
4	GPI IN 4	Toggles Buffer 4 Freeze
5*	GPI IN 5	Key Only, Out (Catalyst)
6*	GPI IN 6	Key Only, Mix (Catalyst)
7*	GPI IN 7	Bkgd Only, Out (Catalyst)
8*	GPI IN 8	Bkgd Only, mix (Catalyst)
9	GPI OUT 1	High when Buffer 1 is frozen
10	GPI OUT 2	High when Buffer 2 is frozen
11	GPI OUT 3	High when Buffer 3 is frozen
12	GPI OUT 4	High when Buffer 4 is frozen
13	GPI OUT 5	Programmable
14	GPI OUT 6	Programmable
15	GROUND	

* Applies to devices with 0.94b27 or later PROMs

GPI Connector Pinouts

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The following engineering points should be considered when connecting the GPI inputs and outputs:

1. GPI inputs are active low, sampled at the vertical interval.

2. GPI outputs require 470 ohms to LED when using a lamp driver.

3. When GPI Output is used as a logic output, do not use a pullup resistor. Use a 1N4148 diode in series with the load for isolation, with cathode towards the frame for active low.

4. GPI operation requires MultiBuffer DS-1 with 0.9.4b27 or later PROMs.

Frame Front Panel Operation

Setup of the frame system parameters is done through the front panel controls of the MultiBuffer DS-1 frame electronics. The top level menu choices for the parameters to be set are as follows:

- **Buffer Control**

- **Router Control**

- **Genlock and Timing**

- **Remote Port Mode**

- **Edit Port Mode**

- **Network Status**

A full menu tree describing each menu setting is provided in Appendix A of this manual.

The controls for setting the menu functions are located at the front of the MultiBuffer DS-1 frame as shown below. Each menu function is explained in detail in this section.
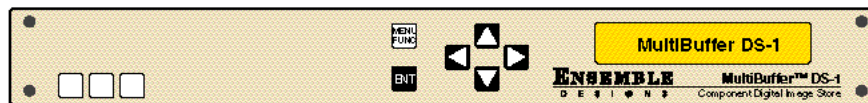
Frame Electronics Front Panel

To access the menus, press the **Menu Func** button so it is lit and observe the LCD display to the right. Use the **RIGHT**, **LEFT**, **UP** and **DOWN** arrow keys to scroll through and select the menu choices where instructed and use the **ENT** button to make your selection.

LCD Contrast Adjustment

To adjust the contrast of the LCD display, press and hold down the menu button and use the **UP** and **DOWN** arrow keys to adjust the light and dark contrast as desired.

Buffer Control

Each framebuffer can be set for the following parameters:

- **Make Test Patterns**

- **Freeze Control**

- **Buffer Timing**

- **Set Default**

Scroll to **Buffer Control** and then enter the desired function by pressing the **DOWN** arrow when it appears on the screen.

Make Test Patterns

If you would like a Test Pattern written into a buffer, select the **Make Test Patterns** selection and choose the Pattern Function from the following:

- **Make 442 Patterns**

- **Make 444 Patterns**

- **Set Pattern IDs**

Make 422 Patterns

Scroll to the **Buffer (1-4)** into which you would like to store the pattern and then scroll to the pattern you would like and press **ENTER**. There are 16 patterns available, refer to the foldout menu tree in Appendix A for a complete listing.

Make 444 Patterns

Two buffers are required to store a 444 pattern. Buffer pairs are selected in the menu. Scroll to the Buffer combination (Buffers 1 & 2, 2 & 3, 3 & 4, and 1 & 4) into which you would like to store the pattern and then scroll to the pattern you would like and press **ENTER**. There are 3 patterns available in this selection:

- **YCrCb Bars**
- **RGB Bars**
- **Pulse and Bars**

Set Pattern IDs

Each pattern can be embedded with a 4-digit text or number ID for identification. The ID can be positioned horizontally and vertically as desired. Set the pattern ID as follows:

Scroll to **Set Pattern IDs** with the **DOWN** arrow. To **Set ID Text** , use the **RIGHT** and **LEFT** arrows to scroll to each digit, then use the **UP** and **DOWN** arrows to select the desired character. Press ENTER to make your selection.

Then, to enable the ID, scroll to **Turn ID On or Off** and select **ON** or **OFF**.

You may then set the horizontal and vertical positioning of the ID. Scroll to **Set ID Vert Pos** and choose from the following vertical positions:

- **Top**
- **Top-Center**
- **Center**
- **Bottom Center**
- **Bottom**

Scroll to **Set ID Horiz Pos** and choose from the following horizontal positions if desired:

- **Left**
- **Center**
- **Right**

Freeze Control

The next function under the top level Buffer Control is **Freeze Control**. You may let video run through a buffer or freeze it at a desired point. Scroll to the desired buffer 1-4 then set the freeze control to ON if desired.

Buffer Timing

Generally, buffer timing does not need to be adjusted. H and V are generally both left at 0 which causes the buffer output to be in time with the reference.

In special cases, you may want to adjust buffer timing. This can be handy when routing an input through one or more buffers in order to achieve one or more frames of delay. A maximum of one frame of delay can be achieved per buffer.

Setting vertical timing to a negative number causes the buffer output to be early with respect to the reference. A positive number would result in the buffer output being later with respect to the reference. Vertical timing is adjusted in lines; horizontal timing is adjusted in clocks.

Scroll to **Buffer (1-4) V Timing** to make vertical timing adjustments.

Scroll to **Buffer (1-4) H Timing** to make horizontal adjustments.

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Set Default

After setting a buffer to **Freeze** or **Unfreeze** ,
selecting a test pattern (if **Freeze** was chosen) and
adjusting timing as needed, scroll to the desired
buffer and press **ENTER** to save these settings into
non-volatile memory.

Router Control

MultiBuffer DS-1 has a 12 x 14 internal routing switcher, this allows any input to feed any buffer or output and any buffer to feed any other buffer or output. Refer to the functional block diagram on the next page for a pictorial view of how the router processes signals throughout the system and to help you choose the routing setups.

Each source is assigned to a destination using this menu function. The menu tree in Appendix A shows a complete list of the source and destination choices.

Enter the **Router Control** menu, then use the **UP** and **DOWN** arrow keys to scroll to the source. Use the **RIGHT** and **LEFT** arrow to scroll to the desired destination for this source. Hit **ENTER** to make your selection. "Take" will briefly be displayed to confirm the routing change has occurred.

Genlock & Timing

This menu selection consists of the **Genlock Timing** and the **Line Standard** selections. As explained earlier in the Cabling section, the system must be genlocked to either an external analog house sync reference or Digital Input # 1 or it may freerun.

Scroll to the **Genlock Source** selection and choose the sync reference you will be using. Choose from **Analog Ref A**, **Analog Ref B**, **Digital Input #1** or **Freerun**. If you are not sure which reference to use, refer back to the **Reference Inputs** heading earlier in this section for an explanation.

Scroll to the **Line Standard** and select either **525** or **625** lines depending upon your line rate requirement.
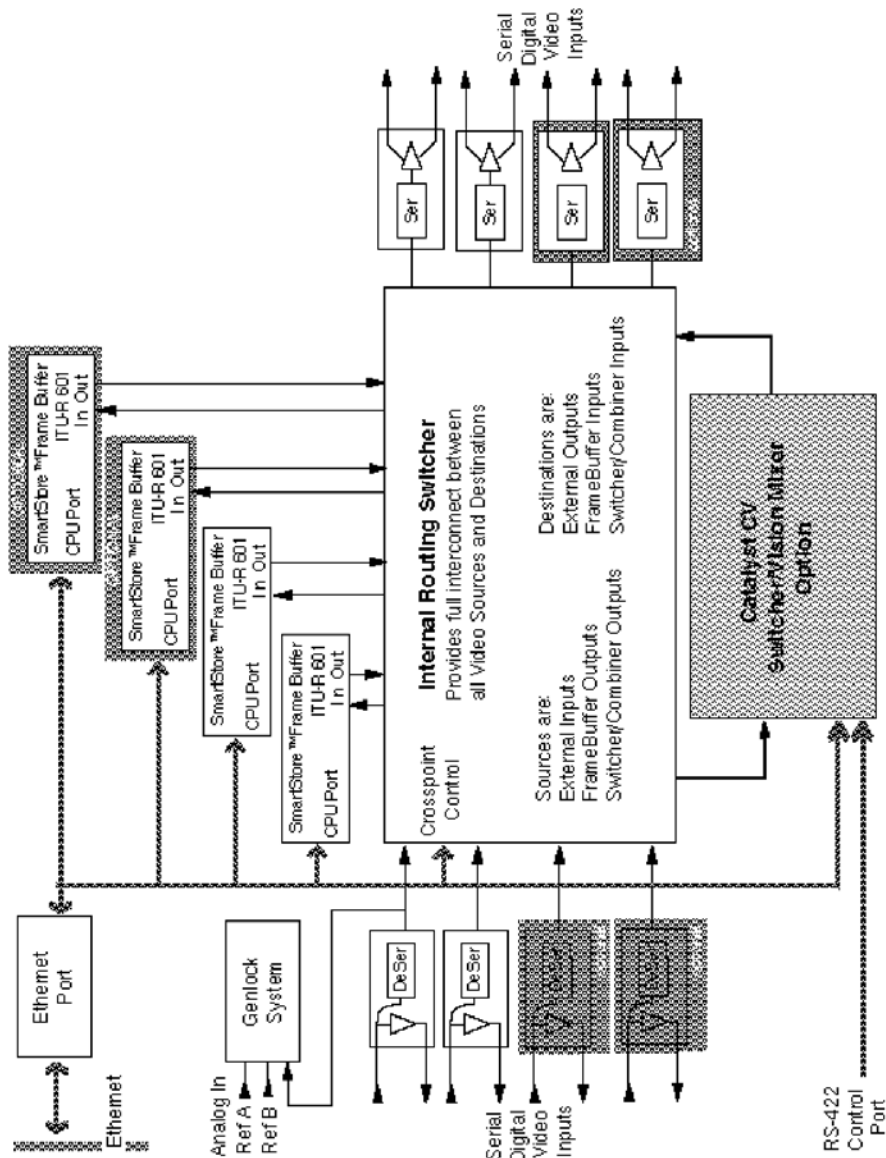
MultiBuffer DS-1 Functional Block Diagram

Remote Port Mode

This function defaults to GPI (Remote Port is not used).

Edit Port Mode

The Edit Port Mode is mainly used when the optional Catalyst module is installed. Use this function to set the desired protocol.

- **Off** (if the Edit Port will not be used)

- **Mac Remote** (if you are using Ensemble's InMotion Macintosh software)

- **Linc Peripheral** (If you are using an Abekas A83 Production Switcher. You must select a **LINC Address ID** from **1-32**)

- **GVG 200** (Emulates the Grass Valley 200 protocol).

Network Status

This top level menu provides 3 network status choices as shown below:

- **AppleTalk**

- **Ethernet**

- **Buffer Names**

If you are using LocalTalk, select **AppleTalk** to identify and initialize the AppleTalk node.

To check your Ethernet status, scroll to **Ethernet**. Press **ENTER** for the status of your Ethernet connection. It should read **Good Connection**. If it reads **No Transceiver** or **Bad Term**, check your Ethernet network for proper cables, connection, transceivers and terminations.

(**NOTE**: Be sure your workstation's Ethernet port is active.)

You can check the Ethertalk net and node addresses by scrolling to **Net** and **Node** under this menu. You can also identify the ethertalk **Zone** under this menu.

To set your Ethernet IP address, scroll to **IP Address** and enter the address (in base 10) and press **ENTER**.

In the **Buffer Names** menu, each buffer must be assigned a unique name. Use the **RIGHT** and **LEFT** arrows to move between each digit in the name and the **UP** and **DOWN** arrows to select the characters.

This completes the front panel control menu setups for the MultiBuffer DS-1.

CONTROL WITH ENVOY MACINTOSH SOFTWARE

Overview

The Envoy™ Digital Image Transporter (v3.0 or later) transforms Macintosh® computer graphics into ITU-R 601 Digital Component, NTSC Analog, or Digital Composite output for production work. Envoy utilizes precision numerical transcoding of the image, producing the same high quality result expected from expensive digital hardware encoders and transcoders. The transcoded image is then transmitted over Ethernet to a framebuffer in any of the MultiBuffer™ DS-1 or DS-2 devices in the facility.

Images that have been captured within any MultiBuffer may also be transferred back to Envoy over the network. The image is then decoded or transcoded using precision algorithms and may be saved either as a 32 bit PICT file or in its original digital component or encoded digital composite form. Since the entire path is digital, the encoded image can be sent back to the MultiBuffer without any loss or artifacts common with analog encoders, decoders, and transcoders.

Multiple buffers in the DS-1 and DS-2 allow simultaneous use of video and alpha (or key) signals for graphics layering in analog or digital production switchers.

The MultiBuffer DS-1 can run at 525 and 625 line rates. Envoy comes in two versions: Envoy 525 and Envoy 625. The MultiBuffer DS-1 can be used with Mac, Silicon Graphic and NT machines. Contact Ensemble Designs if you need a copy of Envoy PC or if you need Silicon Graphics interface information.

The MultiBuffer DS-2 runs in 525 only and can be used with Macintosh.

System Requirements

Envoy Software version 3.0 requires Apple's System 7.1 or newer. However, System 7.5 is required if you wish to take advantage of the Macintosh Drag and Drop features in Envoy. Envoy is Power PC compatible.

Envoy communicates with the MultiBuffer DS-1 over an AppleTalk™ network using either the Ethernet port or LocalTalk port on your Mac. In either case, the proper cabling is required to accomplish the interconnection.

Ethernet is standard on the MultiBuffer DS-1. It will have either a BNC for thinnet or an AUI connector and a transceiver for use with thinnet or 10BaseT.

It is also equipped with a dual, or looping, RJ-11 (modular phone) connector for using LocalTalk.

You may need a compatible transceiver for the Macintosh along with other cabling and terminations. These connectors, cables, and transceivers are readily available through catalogs and computer outlets, or contact us at Ensemble Designs if you need assistance.

Installation

Hardware

A simple Ethernet connection requires either an AAUI (Apple Attachment Unit Interface) for Macs with built-in Ethernet or an Ethernet card installed in the Mac. If you're not connecting to an existing Ethernet network, the simplest solution is to use ThinNet cabling (also referred to as 10Base2) which uses RG-58 cables between each device in a daisy-chain orientation. Each device is connected to the network using a BNC "T", with a 50W termination at each end of the network.

If your installation is more elaborate, or you have an existing AppleTalk™ system, refer to the documentation for the wiring system you are using or your network administrator. In all cases, the MultiBuffer can be regarded as just another network compatible device, one which already has either the RJ-11 or Ethernet connectors built in.

Alternately, you may use a Macintosh equipped with a LocalTalk interface node. The LocalTalk interface connects to the printer port of the Macintosh. This interface unit, which is also equipped with a dual RJ-11 connector, is interconnected to the MultiBuffer using ordinary modular phone cable. The unused RJ–11 connectors on the MultiBuffer and the LocalTalk interface should each be terminated with the 100 T resistors that are included.

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Software

> Envoy and supporting files are supplied on a high density 1.4MB 3.5" floppy disk. Make sure this disk is write protected and do not alter it in any way. The Envoy program file may be copied to any convenient location on your hard disk.

Using Envoy

To run Envoy, simply open (or double-click) the Envoy application icon. Envoy version 3.0 is completely self-contained and does not depend on any other files for its network access.

The first time you run Envoy, a preference file is created in your System folder that remembers most of the settings you select. This file is updated every time you leave Envoy so that your personal settings are automatically saved for the next time.

When Envoy is opened, an Envoy Picture window will appear, which will be blank if the Envoy application was launched without selecting a document. This window displays the picture currently in Envoy memory. Internally, the picture is always stored as a 484 x 640 (or 484 x 768 for digital composite or 487 x 720 for digital component) 32 bit image which includes 24 bits of RGB information and 8 bits of optional alpha information.

The Envoy Picture window size may be changed and placed at a convenient location on your screen - this does not change the internal storage of the image. The window may also be hidden by selecting **Hide Picture Window** from the **View** menu (or by just clicking in the window's close box). This simply hides the window and has no affect on the stored image. Refer to the section on The **Envoy Picture Window** for more information.

Primary and Alpha Buffers

Envoy defines a path to two default buffers, a Primary buffer, which receives the encoded or transcoded picture or video fill, and the Alpha buffer, which receives the monochrome, or key, portion of a picture. When capturing a picture, the 24 bit color image comes from the Primary buffer and the 8 bit alpha information comes from the Alpha buffer.

Selecting Default Buffers

Before sending a picture to a buffer, you need to select the default buffers for the application. To do this, choose **Select Buffers** from the **MultiBuffer** pulldown menu. A buffer selection dialog will appear, as shown below. This sets the default buffers that the Envoy pulldown menus use. The PhotoShop plug-in also looks at this default selection.
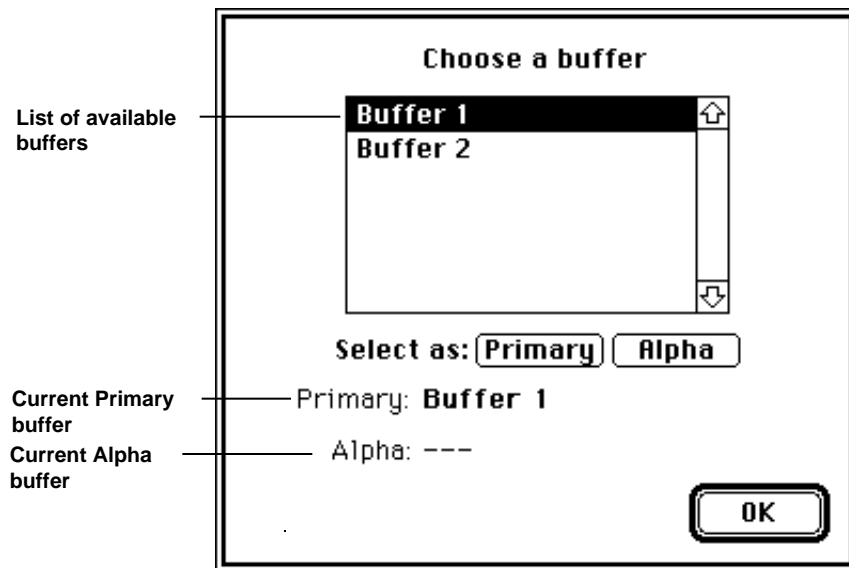
Default Buffer Selection Dialog Box

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Assuming at least one MultiBuffer is connected to your network, a list of all available buffers will appear. The current buffers, if already selected, are shown at the bottom.

To choose a new or different default buffer, first select the buffer from the list and then click on either the **Primary** (video fill) or **Alpha** (key) buttons. A connection to the buffer will be opened and, if there are no communications problems, that buffer will appear as the current default buffer.

NOTE: *You may also double-click a buffer in the list to select it as the Primary buffer or hold down the* **Option** *key and double-click a buffer to select it as the Alpha buffer.*

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BufferPorts

A BufferPort is a special Envoy window that can be placed anywhere on the screen. From **Desktop** , you can drag a PICT file, or an Envoy file, to any BufferPort and the picture will immediately be sent to the buffer defined by that port. Up to 20 different BufferPorts can be defined.

When the BufferPort is first created, it's displayed in it's small size, as shown in the top figure below. The BufferPort can be expanded by clicking on the small triangle which reveals the **Freeze** , **Capture** , and **Input** controls, as shown in the lower figure. Clicking the triangle again will shrink the BufferPort. To move the BufferPort, click anywhere in the shaded area of the window and drag it to the desired location.

Close box — Buffer 1 — Double-click name to change buffer
Click to expand → BufferPort
Normal BufferPort

Click to shrink → Buffer 1 — Drag anywhere in the shaded area to move the BufferPort
BufferPort
Click button to toggle Freeze — Freeze Capture — Click button to start Capture
Input A — Input Selector
Expanded BufferPort
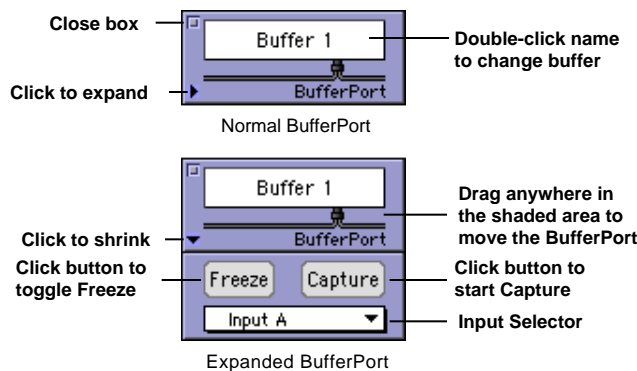
BufferPort Windows

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Working With BufferPorts

When the BufferPort is expanded as shown in the previous figure, the **Freeze** and **Capture** buttons and **Input** menu appear. The button will highlight to indicate the current Freeze state. Clicking on the **Capture** button starts a capture from the selected buffer.

NOTE: *Option-clicking the **Freeze** button will turn off the **Freeze** for 2 frames and then turn the **Freeze** back on, capturing the current input video of the MultiBuffer.*

Clicking on the **Input** pop-up menu presents a list of inputs that may be selected for the BufferPort's buffer and allows selection of any of those inputs. The MultiBuffer allows you to select any available input or another buffer.

Normally, the BufferPort only needs to be expanded when capturing pictures; otherwise, it can be left at the normal size.

To close a BufferPort, click the close box in the BufferPort window. This will permanently remove the BufferPort. Any BufferPorts remaining when you quit Envoy are saved and will return next time Envoy is run.

Creating a New BufferPort

To create a new BufferPort, select **New BufferPort** from the **File** pulldown menu. A window, similar to the one on the following page, will appear. This window allows you to assign a primary and an optional alpha buffer to a new BufferPort. Either select a buffer from the list and click on the Primary button or double-click a buffer selection to assign that buffer as the BufferPort's primary buffer.

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A BufferPort can also be assigned an alpha buffer. Selecting **Dual Port** will cause a second button and a line for the **Alpha** buffer to appear. To add an alpha buffer, either select a buffer from the list and click on the **Alpha** button or double-click a buffer selection while holding down the **Option** key.

Once the buffers are selected for the new BufferPort, click **OK** to create it. A new BufferPort will appear at the center of the screen.

If you need to change the buffer or buffers assigned to the BufferPort, double-click the buffer name on the BufferPort window. A **Select Buffer** window similar to the one below will appear and allow you to change the assigned buffer or add or remove an alpha channel.

Choose a buffer port

List of available buffers

Buffer 1
Buffer 2

Select as: [Primary]

BufferPort's Primary buffer — Primary: **Buffer 1**

Click here to include Alpha buffer — ☐ **Dual Port**   [OK]
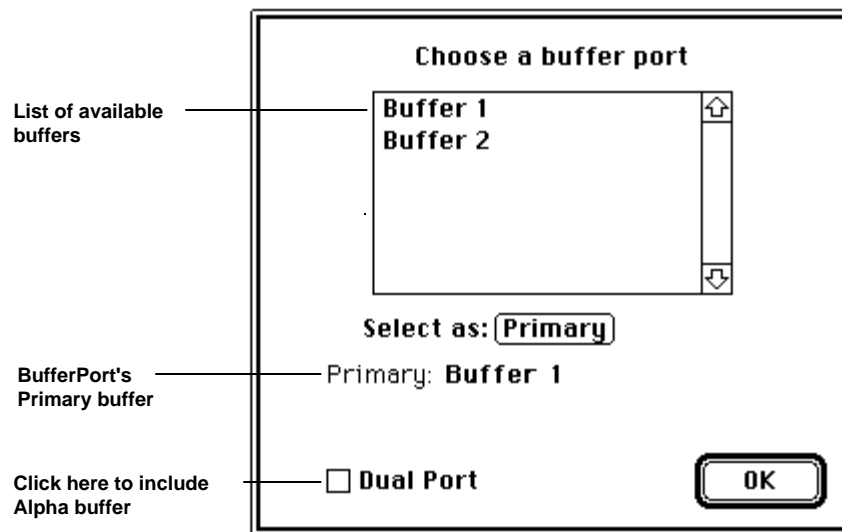
Create or Change BufferPort Window

Dragging a PICT or Envoy File to a BufferPort

Sending a picture to a BufferPort takes advantage of Macintosh Drag and Drop. Locate the PICT or Envoy component or composite file you wish to transfer, and drag it onto the BufferPort representing that buffer you wish to send it to.

When the file is dragged onto the BufferPort, the buffer's name will highlight indicating it recognizes the file. Dropping the file on the BufferPort will then immediately start a transfer to its assigned buffer. If the BufferPort is set up as a DualPort, then the alpha portion of the file (PICT files only) will be sent to the alpha buffer selected for that BufferPort.

If you don't need to view the file you're sending, you can speed up the transfer by first closing the Envoy Picture window. This reduces the need to display the picture, especially if the Envoy Picture window is reduced in size.

The most efficient transfer occurs when using an Envoy Encoded or Component picture. Since this file already has the transcoded image, it saves a considerable amount of time by not having to expand, filter, and encode/transcode the RGB picture. Just drop the Envoy picture file onto a BufferPort and it will start transferring immediately.

Note that the transfer may take place in the background. You may click on an Envoy window to bring Envoy to the front and see the transfer status box, although this isn't necessary.

Capturing an Image from a BufferPort

To capture a picture from a BufferPort, first expand the **BufferPort** window. You can use the **Freeze** button if necessary to freeze the desired image. Then, press the **Capture** button to start the transfer of the image from the MultiBuffer to Envoy. When the transfer is completed, the image will be transcoded and shown in the Envoy **Picture** window just like a capture from the default primary buffer.

A captured image can be saved just like any other Envoy picture. Refer to **Saving a Captured Picture** for more information.

Loading a Picture

Before a picture can be sent from Envoy to the MultiBuffer, it first needs to be loaded into memory. Envoy can read either a PICT file or an Envoy Component (DS-1) file, which is a previously saved pre-transcoded digital component image, or an Envoy Encoded (DS-2) file, which is a previously saved pre-encoded digital composite image. There are many ways to load an Envoy picture file or a PICT image. Any of these methods replaces the current picture with the one you're loading:

Selecting Open... from the File menu: A standard Open File dialog will appear allowing you to load any PICT file or Envoy Picture file.

Double-clicking a picture file in Finder. The image in the file will be loaded by Envoy only if it was saved by Envoy. Otherwise, the application creating it will be opened.

Dragging a picture file in Finder onto the Envoy application icon: This will load the picture from the selected file. Only PICT files or Envoy Picture files will be recognized.

Dragging a picture file from Finder into the Envoy Picture window: This will load the image from the selected file. Only PICT files or Envoy Picture files will be recognized.

Dragging an image from another Drag and Drop aware application into the Envoy Picture window: The image will be copied into Envoy. Refer to documentation for the graphic application you're using to see if they support Macintosh Drag and Drop and the picture selection process.

Dragging a picture file from the Finder or a picture image from another application onto a BufferPort. Refer to the section on the BufferPort for more information.

Pasting a PICT image into the Envoy Picture window: If you already have the picture you want to use in the Clipboard, first select the Envoy Picture window to make it active, then select Paste from the Edit menu and the picture will be centered and pasted into the window.

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Picture Size and Envoy

For 525/NTSC Applications

A MultiBuffer digital component picture buffer allows for an active image area of 487 lines high by 720 pixels wide. However, since a standard NTSC picture has an aspect ratio of 3:4, this results in pixels that are not square. If you were to load in a 484 x 720 (or 768 for DS-2) picture and send it to the MultiBuffer, the resulting video would be compressed horizontally.

To overcome this problem, Envoy accepts a 484 x 640 picture and will automatically expand it horizontally to fill in the 720 (for DS-1) or 768 (for DS-2) pixels. This resulting video will therefore have the exact same aspect ratio as the Mac picture you created. When capturing images from the DS-1, Envoy performs the reverse process and compresses the 720/768 pixels down to 640.

Envoy can also work directly with 487 x 720 (for DS-1) and 484 x 768 (for DS-2) pictures which it will transfer directly to or from the MultiBuffer. This is sometimes useful if the image is already expanded, such as one that has been captured and needs to be sent back out again without any compression/expansion artifacts.

For 625 and PAL applications

Envoy 625, an alternate version of Envoy for Macintosh, is used for 625/PAL applications on the MultiBuffer DS-1 only. It does not perform auto-resizing so images should be created in 640 x 480 or 720 x 576.

You can tell Envoy which size picture to expect by selecting the picture **Width** in the **View** menu. Normally, 640 should be selected, which tells Envoy

to expand the picture when loading it. If 720/768 is selected, the picture will not be adjusted as it's sent to the MultiBuffer. Note that you must set this size before you load the picture - the internal storage of the picture will stay the same if you change this setting after the image is loaded.

NOTE: *Sending a 768 pixel image to a DS-1 component buffer is allowed, but requires Envoy to first compress it to 640 pixels and then back up to the size required for the format.*

When a picture is loaded that is larger than 486 x 640, 487 x 720, or 486 x 768, Envoy will automatically crop the image to fit the specified size. Each side is cropped evenly so that the image will remain centered.

Pictures that are smaller than the specified size are also centered, with the border filled to white. A special mode, **Auto EdgeMatch**, will automatically fill in the border on the top, bottom, and both sides with either black or the predominant color for that edge of the picture. **Auto EdgeMatch** is selected in the **View** menu and, like the size selection, only affects pictures as they are loaded into memory.

The Envoy Picture Window

The picture currently loaded into Envoy memory is displayed in the **Envoy Picture** window. Internally, the picture is stored as a 487 x 720 or 484 x 768 pixel image with 24 bits of precision (plus an 8 bit alpha channel). However, the window displays the image in whatever mode your monitor supports.

If you don't have a monitor capable of a 24 bit display, you can enhance the image by selecting **Dither** in the **View** menu. This setting only affects

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the display in the **Envoy Picture** window - it has no effect on the internal image to be sent to the MultiBuffer, which is always encoded from the full 24 bit RGB picture.

To view the alpha component of the picture, select **Show Alpha** from the **View** menu. If there is any alpha information in your picture, it will be shown as a grey-scale image. Extra memory is used while in this mode, so it is best if the view is not left in **Show Alpha** mode. Note that there is no edge-matching of the alpha image.

The **Envoy Picture** window can be re-sized and moved to any part of the screen using the standard Macintosh grow or zoom capabilities. When the window is shrunk, the displayed image will be scaled down accordingly. The aspect ratio of the window will always stay the same at any size.

Selecting a 720 or 768 window picture width will change this aspect ratio to show the image accurately in either setting. Sizing the window using either of these methods has no effect on the internally stored image, although the width setting will affect how the next picture is loaded, as described in the previous section.

To hide the **Envoy Picture** window, either select **Hide Picture Window** from the **View** menu or click on the close box of the window. Hiding the window does not affect the internal image. To show the window again, select **Show Picture Window** from the **View** menu.

You can clear the **Envoy Picture**, including the internal image in memory, by selecting **Clear** in the **Edit** menu.

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All the settings in the **View** menu, along with the position and size of the **Envoy Picture** window, are saved when you quit Envoy and will be restored next time Envoy is launched.

Sending the Picture Using Pulldown Menus

An alternate method of sending a picture besides using a BufferPort, is to select **Send Picture** in the **MultiBuffer** menu. Once the desired picture is loaded into Envoy, you can send it to the MultiBuffer selected as the primary buffer by. using this function. A status box (illustrated below) will appear indicating the destination buffer and will display the progress of the picture transmission. You can stop the picture transmission at any time by clicking on the **Stop** button.

Send Picture Status Box

If the picture also contains alpha (key) information, then select **Send Picture & Alpha** from the **MultiBuffer** menu. The alpha channel will be sent to the buffer selected as the alpha buffer after the RBG picture is sent to the primary buffer. If you wish to only send the alpha channel, then select **Send Alpha Only** .

To send the monochrome content of the picture to the MultiBuffer, select **Send Y Only** from the

MultiBuffer   menu. This sends the luminance component of the picture to the primary buffer.

Note: *If you hold the Option key down while you select one of the* **Send** *functions, the image is sent to the other channel. The encoded image will be sent to the alpha buffer and the alpha component will be sent to the primary buffer.*

Adjusting the Digital Encoder/Transcoder

Envoy uses a high precision digital encoder/transcoder and filters to convert the RGB information contained in the picture to the digital composite or component format. You can modify some of the encoder parameters by selecting **Send Setup** from the **MultiBuffer**   menu as shown below.

Note: *Setup level only appears when a DS-2 buffer is selected as the Primary buffer. Setup level is not applicable for DS-1.*
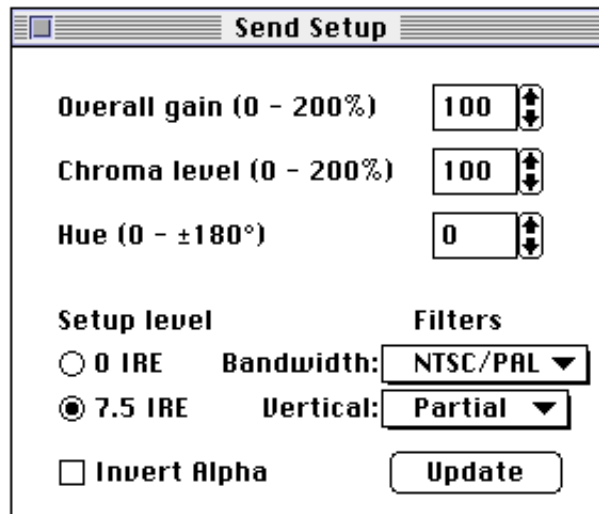
Send Setup Window

The **Gain** and **Chroma Gain** can be set from 0 to 200 percent of unity gain. Note that a very high gain setting can result in clipping. Also, setting the chroma gain beyond 75% may result in illegal NTSC colors.

The **Invert Alpha** check box will reverse the levels sent to the alpha channel. The black areas of the image as seen on the Mac screen will be translated to white and the white areas to black.

Envoy utilizes two digital filters. The **Filter** affects the horizontal domain of the picture and has separate luminance and chroma filtering for optimum frequency response. It has three possible settings: **Off,** which removes all horizontal filtering (which may create an illegal NTSC picture); **NTSC/PAL** which filters the picture for proper NTSC or PAL output; and **Low Pass**, which provides an extra amount of filtering to remove edging effects from some pictures.

The **Vertical Filter** provides for filtering in the vertical domain to reduce the effect of converting a high resolution Macintosh picture to an interlaced NTSC image. The three settings are: **Off**, which turns off all vertical filtering; **Partial**, which provides some filtering in the vertical domain; and **Full**, which provides full vertical filtering to eliminate any inter-field flicker that may result from alternate vertical lines in the original picture.

Note: *If you send a picture to the MultiBuffer that was previously transferred from the MultiBuffer, turn both filters **off** - extra filtering should not be required unless you've modified the picture with extra graphics.*

Capturing a Picture Using Pulldown Menus

An alternate method to using BufferPorts to capture a picture is to us the **Capture Picture** from the **MultiBuffer** pulldown menu. A picture that has been frozen in the MultiBuffer can be transferred to Envoy by selecting this function. The entire 2 field digital component or 4 field digital composite image from the buffer selected as the primary channel will be transferred into Envoy and then decoded and displayed in the **Envoy Picture** window. While the image is being transferred, a status box (illustrated below) will appear to indicate the progress of the transfer.
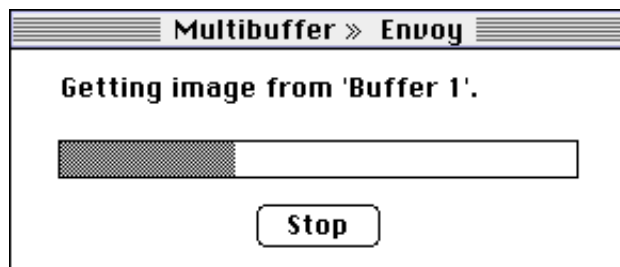
Capture Picture Transfer Status Box

To retrieve alpha information, select **Capture Alpha** from the **MultiBuffer** menu. The image from the buffer selected as the alpha channel will be transferred into Envoy and the luminance information from that image will be stored in the alpha component of the **Envoy Picture**. To view the alpha channel of the Envoy Picture, select **Show Alpha** from the **View** menu.

Note: *If you hold the Option key down while you select either of these* **Capture** *functions, the image is retrieved from the other channel.*

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Adjusting the Digital Decoder/Transcoder

After an image is captured, the two field digital component (or four field digital composite) image data is held in a special buffer within Envoy. After the transfer, it is automatically decoded (or transcoded) into a 24 bit picture and displayed in the Envoy Picture window. You can change the decoding/transcoding parameters and convert the image again by using the **Capture Setup** window. Select **Capture Setup** from the **MultiBuffer** menu to bring up the window, as shown below.

The **Capture Setup** window allows you to adjust **Gain**, **Chroma** level and **Offset** level. In addition, you can specify which fields are transcoded and what to extract from the digital data.
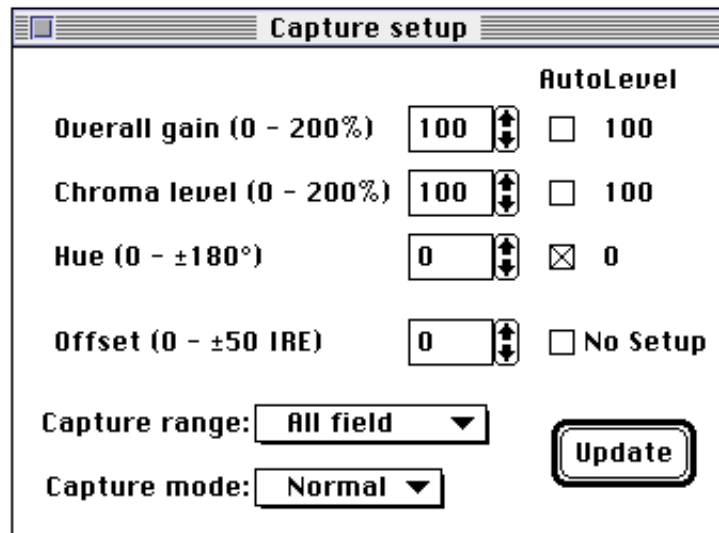
Capture Setup Window

Overall Gain adjusts both the luminance and chroma values of the resulting 24 bit RGB picture.

The **Offset** level adjusts the post-transcoder offset of the entire image and is useful for adjusting the black level of the picture.

The parameters of these adjustments can be changed by either clicking on the up/down arrows or by selecting the parameter value and entering in a new value. Parameters must be within the range indicated in parenthesis.

The **Capture Range** pop-up menu allows you to choose which fields will be used for decoding/transcoding of the image.

The **Capture Mode** pop-up menu changes the way the digital image is transcoded into the resultant RGB picture. **Normal** mode decodes/transcodes the image into a full color 24 bit RGB picture. Best results are obtained when using the **All Field Decode** Range. **Mono** mode extracts just the luminance information and creates a grey-scale image.

If the last image retrieved was an alpha channel (using **Capture Alpha**), then the decoder always uses the Mono mode.

Once you have modified the parameters, click on the **Update** button to decode the image saved in the MultiBuffer into the Envoy Picture window. This can be repeated until the picture has the desired color quality.

Saving the Captured Picture

To save the current Envoy Picture, select **Save as** from the **File** menu. The **Save** dialog allows you to save the picture in the following file formats:

- 32 bit PICT file (which includes the alpha channel)

- Envoy Component Picture file (for MultiBuffer DS-1)

- Envoy Encoded Picture (for MultiBuffer DS-2)

Saving it as a PICT file allows you to display or modify the file by using any other Macintosh application that supports pictures.

If you don't need to modify the picture, but wish to save it for later loading and transfer back to the MultiBuffer, you may wish to save it as an Envoy Component or composite file, which saves the raw digital composite or component information. This method allows you to save images without any loss as it completely skips the decode/encode/transcode process and will return the exact image information when you send it back to the MultiBuffer. Note that none of the settings in the **Capture Setup** apply when saved in this form since the image is never decoded or transcoded.

Icons of the files saved with Envoy will show a thumbnail of the picture you saved. For Envoy Component files, a tiny C appears in the lower right corner to help identify the file type.

Copying the Picture to the Clipboard

You can copy all or part of the Envoy Picture to the clipboard, which can be later pasted into another application, by selecting **Copy** in the **Edit** menu.

You can also select a portion of the Envoy Picture for copying by holding the Option key and dragging a selection rectangle in the Envoy Picture window. The copy function will then copy only the contents of the selection rectangle.

### Dragging the Picture to Another Application or Desktop

You can drag the Envoy Picture to the Finder or other applications that support Drag and Drop. Simply click anywhere in the Envoy Picture window and drag the picture to the desired location. Only those applications whose windows highlight while dragging the picture over them can accept the PICT image.

Envoy Preferences

There are a few user settings available to allow customization of Envoy. Selecting **Preferences** from the **File** menu brings up a window (see below) that allows changing these settings.

Network size

This allows you to set Envoy's internal network timing and transfer characteristics to the best setting for your network configuration.

Network size: Medium ▼

☒ Auto-view picture window
☐ Send document when opened

[Cancel] [[OK]]
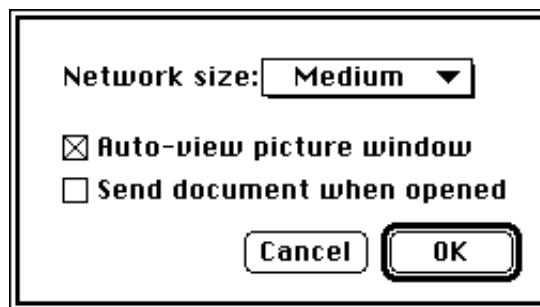
Envoy Preferences Window

Use the following guidelines when making this setting:

Small is best when you just have one or two Macs connected to one or two MultiBuffers without any other devices on your network.

Medium should be used if there are other devices on your network, such as Laser printers and other Macs not using the Multibuffers. Medium is also appropriate if you have any routers or bridges on a small network.

Large is best if your network contains many (>30) other Macs or there are quite a few routers (more than two zones) in your network. Also, this setting may work best if using a LocalTalk to Ethernet bridge for transferring pictures to a MultiBuffer.

Auto-view picture window

This setting determines whether the Envoy Picture window will be automatically shown (if hidden) after executing certain functions. When checked, the window will become visible when opening an Envoy picture file from Finder or after a capture (including a BufferPort capture). Otherwise, it will stay hidden.

Send document when opened

When set, a picture will be automatically sent to the primary buffer when opened using any method described earlier. This is useful if you want to simply double-click a picture file in Finder and have it opened and sent automatically.
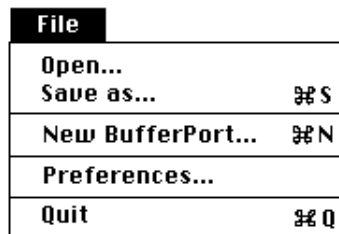
Envoy Reference

Apple Menu
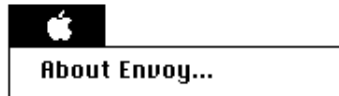
About Envoy...

This will display the current version of Envoy along with the model and version numbers of the MultiBuffer assigned as the Primary buffer. If Envoy cannot connect to the primary buffer, then "---" is displayed instead of the version numbers. This provides a useful test of your network connection if you're having problems transferring a picture.

File Menu

Open...

Opens a PICT file or Envoy Picture file, reads the picture into memory and displays it in the Envoy Picture window. The original file remains untouched. If **Send document when opened** in the **Preference** window is checked, the picture is immediately sent to the primary default buffer.

Save As...

Saves the current Envoy Picture as either a 32 bit PICT file, Envoy Encoded Picture file (for DS-2) or

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an Envoy Component Picture file (for DS-1). If a selection box is active in the Envoy Picture, only that part is saved, otherwise the entire picture is saved.

New BufferPort...

Creates a new BufferPort. Refer to the section **Creating a New BufferPort** for more information.

Preferences...

Shows the Preference selection window. Refer to the section on Envoy Preferences for more information.

Quit

Quits the Envoy application. All settings, including those of the BufferPorts, are saved and will be restored next time Envoy is run.

Edit Menu

```
 Edit
 Undo            ⌘Z
 ─────────────────
 Cut             ⌘H
 Copy            ⌘C
 Paste           ⌘U
 Clear
```

Undo

Unused in the Envoy application.

Cut

Unused in the Envoy application.

Copy

This is active if the Envoy Picture window is visible and a picture has been loaded or captured into the

Envoy Picture window. It allows you to copy the current Envoy Picture into the Clipboard for transferring to other applications. It may require up to 800K of free Envoy application memory to perform the copy.
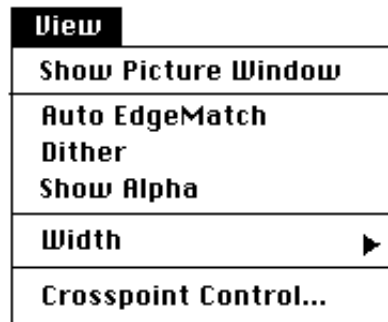
Paste

This is active if the Envoy Picture window is visible and there is a picture available in the Clipboard. The Clipboard picture will be pasted into the Envoy Picture.

Clear

This is active if the Envoy Picture window is visible and will clear the current picture.

View Menu

```
┌─────────────────────────────┐
│ View                        │
├─────────────────────────────┤
│  Show Picture Window        │
├─────────────────────────────┤
│  Auto EdgeMatch             │
│  Dither                     │
│  Show Alpha                 │
├─────────────────────────────┤
│  Width                    ▶ │
├─────────────────────────────┤
│  Crosspoint Control...      │
└─────────────────────────────┘
```

Show/Hide Picture Window

Shows or hides the Envoy Picture window. The window can also be hidden by clicking in its close box. When using BufferPorts, pictures will be transferred faster if the window is hidden.

Auto EdgeMatch

When checked, any edges from pictures that are smaller than the current window size will be filled with either the predominate color from each of the

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four edges, or black. This filling only occurs as a PICT file is opened.

Dither

When checked, the picture display will be enhanced when shown on monitors not equipped with 24 bit color. It has no effect on the image to be sent to the MultiBuffer.

Show Alpha

When checked, displays the contents of the alpha channel for the current picture. This may require up to 400K of free Envoy application memory.

Width

This allows the Envoy Picture window width to be changed to support the standard 640 pixel width of Mac images, the 720 pixel width of digital component images, or the 768 pixel width of digital composite images. Refer to the section **Envoy Picture Size** for more information.

Crosspoint Control...

This opens a **Crosspoint Control** window, which is only available when the Primary buffer is selected. It allows control of the internal crosspoints within the MultiBuffer. The window, similar to that shown below, may vary in appearance depending on the options installed in your MultiBuffer.
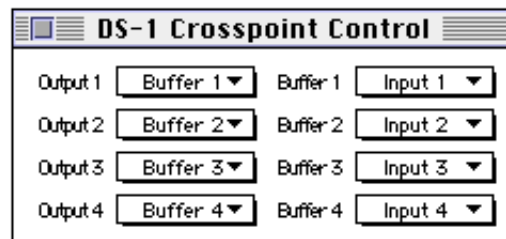
Each pop-up menu in the window represents a signal destination within the MultiBuffer. The current source for each destination is displayed in the pop-up menu. Clicking on any menu presents a list of sources available and allows selection of any source, allowing you to change the buffer inputs, output sources, and other internal signal paths within the MultiBuffer.

MultiBuffer Menu

```
┌─────────────────────────────┐
│ MultiBuffer                 │
├─────────────────────────────┤
│ Send Picture            ⌘ F │
├─────────────────────────────┤
│ Send Picture & Alpha        │
│ Send Alpha Only             │
│ Send Y Only                 │
│ Send Setup...               │
├─────────────────────────────┤
│ Capture Picture         ⌘ G │
│ Capture Alpha               │
│ Capture Setup...            │
├─────────────────────────────┤
│ Select Buffers...           │
└─────────────────────────────┘
```

Send Picture

Sends the current Envoy Picture to the primary buffer.

Send Picture & Alpha

Sends the current Envoy Picture to the primary buffer followed by the alpha component of the Envoy Picture to the alpha buffer.

Send Alpha Only

Sends the alpha component of the current Envoy Picture to the alpha buffer.

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Send Y Only

Sends the luminance component of the Envoy
Picture to the primary buffer.

Send Setup...

Displays the **Send Setup** window, which allows
modification of the Envoy digital
encoder/transcoder parameters. Refer to **Adjusting
the Digital Encoder/Transcoder** for more
information.

Capture Picture

Retrieves the image from the primary buffer of the
MultiBuffer and decodes or transcodes it into the
24 bit RGB Envoy Picture.

Capture Alpha

Retrieves the image from the alpha buffer of the
MultiBuffer and decodes it into the 8 bit alpha
component of the Envoy Picture. To view the alpha
image, select **Show Alpha** in the **View** menu.

Capture Setup...

Brings up the **Capture Setup** window, which
allows modification of the Envoy digital
decoder/transcoder parameters. **Refer to
Adjusting the Digital Decoder/Transcoder** for
more information.

Select Buffers...

Lets you choose a different primary or alpha
default buffer. These buffers are the default source
or destination buffers for transfers from a pulldown
menu or plug-in.

Scripting With Envoy

Envoy supports AppleScript for automating tasks like batch transcodes from PICT to Envoy file format and still store operations. Some scripts are included on your Envoy installation disk. You can use these scripts as they are or modify them as needed.

Envoy Scripts

Included on the Envoy Mac disk are some AppleScripts which can be used with Envoy. These scripts are intended as models which you may modify to suit your needs. While each of these scripts has been used, please note that these scripts are samples and may not have been rigorously debugged.

If scripts are to be used the Envoy icon should be labeled "Envoy", as this is the name the scripts are expecting. In the **Scripts** folder are several scripts and "Uptime". Open your **Extensions** folder and drag "Uptime" on to the **Scripting Additions** icon to place it in that folder. This program is used to perform timing functions within the scripts.

Still Store Scripts

When a folder of files is dropped on a Still Store icon the files in the folder are transferred in alphabetical order to the MultiBuffer as the **Take** button is activated.

PICT Conversions

When a folder of files is dropped on a conversion icon the files in the folder are converted from PICT files to Envoy Component (YUV) for DS-1 or Envoy Encoded for DS-2.

DS-1 GPI Animation Layoff

Sends the contents of a folder to the primary buffer and generates a GPI #5 output after each transfer. The disk machine must be programmed to then record this frame and move ahead one frame.

Capture Frames

This script will capture a sequence of frames from an A62 disk recorder to your MultiBuffer DS-2 and save them to a numbered sequence of files. You will have to edit the script to provide the proper path to the folder where the files are to be saved:

set pathName **to** "GraphicsHD:Desktop Folder:Envoy Scripts:GetIt:" -- *folder name is "GetIt"*

DS-2 to A61

When a folder of files is dropped on the "DS2 to A61" icon the files in the folder are transferred in alphabetical order to the MultiBuffer DS-2. After each transfer an active low pulse of >50mS is output on pin 6 of the DS-2 GPI connector. Pin 6 is the Input A lamp indicator. The pulse is generated by switching the input from A to B to A. As the buffer is already frozen prior to this operation the switching of inputs has no effect on DS-2 operation.

The "DS2 to A61 w/alpha" script operates identically except that the GPI pulse is generated after transfer of the alpha channel to the 2nd buffer. Rather than make use of the GPI returned to the DS-2 from the A61, it was more straightforward to simply have the scripts delay for 3 seconds before transfer of the next picture to the MultiBuffer DS-2 begins to allow time for the A61 to complete recording of the frame. The scripts are commented, so you could edit the script to reduce this value if it is excessive.

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Envoy Dictionary For AppleScript

To see the Envoy dictionary on your Mac, open the **Script Editor** and go to the **Envoy Dictionary** .

Required Suite: *Terms that every application should support*

<u>**open:**</u> Open the specified object(s)

open alias -- *list of objects to open*

<u>**print:**</u> Print the specified object(s)

print alias -- *list of objects to print*

<u>**quit:**</u> Quit application

quit

<u>**run:**</u> Sent to an application when it is double-clicked

run

Envoy Suite: *Events supported by Envoy*

<u>**load:**</u> Load an image into Envoy.

load alias -- PICT or Envoy Encoded/Component file

[**send** boolean] -- Set to True to send the image to the MultiBuffer.

[**offset** point] -- Image offset - default will center the image.

[**EdgeMatch** boolean] -- Set to True to enable EdgeMatch or False to disable EdgeMatch.

[**compositing** boolean] -- Set to True to add this image on the old one (the old image is not erased).

[**transfer mode** small integer] -- Quickdraw transfer mode

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save: <u>Save an Envoy image</u>.

save alias

[**as type** picture file/Envoy encoded/Envoy component] -- Save the Envoy image as this file type.

[**replace** boolean] -- If True, an existing file will be replaced.

send: <u>Send image to MultiBuffer</u>.

send color/alpha/color and alpha/luminance/video buffer

[**to** string] -- Buffer name to send to.

[**in zone** string] -- The buffer's AppleTalk zone.

[**vertical filter** off/partial/full] -- Vertical filtering for this send.

[**unity** boolean] -- Set to True to set encoder settings to unity.

[**quiet** boolean] -- Set to True for a quiet transfer (no status window).

capture: <u>Capture image from MultiBuffer</u>.

capture color/alpha/color and alpha/luminance/video buffer

[**from** string] -- Buffer name to capture from.

[**in zone** string] -- The buffer's AppleTalk zone.

[**unity** boolean] -- Set to True to set decoder settings to unity.

[**quiet** boolean] -- Set to True for a quiet transfer (no status window).

stop transfer: <u>Stops a send or capture</u>.

stop transfer

buffer list: Returns a list of MultiBuffer buffer names.

buffer list

[**in zone** string] -- AppleTalk zone to search.

Result: string

primary buffer name: Returns the name of the primary buffer.

primary buffer name

Result: string

alpha buffer name: Returns the name of the alpha buffer.

alpha buffer name

Result: string

busy: Determines if the MultiBuffer is busy and cannot load, save, or transfer an image.

busy

Result: boolean -- Returns True if busy, False if free.

version: Return application version number.

version

Result: integer

buffer message: Send a message to the buffer.

buffer message string

[**to** string] -- Buffer name to send to.

[**in zone** string] -- The buffer's AppleTalk zone.

DS-1 Freeze commands for AppleScript

Command Format: **$0212 ZZ**

For **ZZ**: **Bit 0-3** 0

Bit 4 0 = Normal, 1 = Freeze

Bit 6 1 = Toggle Freeze state

Bit 7 1 = Capture - unfreeze for 1 frame then freeze

Message Format: buffer message {2, 18, nn} to "Buffer x"

Unfreeze   nn = 0

Freeze   nn = 16

Freeze toggle nn = 64

Capture   nn = 128   unfreeze for 1 frame then freeze

Example to freeze Buffer 2: buffer message {2, 18, 16} to "Buffer 2"

For more information on AppleScript, see your Mac OS docs called "Using AppleScript" or refer to Danny Goodman's "AppleScript Handbook", or Tom Trinko's "AppleScript for Dummies".

Troubleshooting Envoy Mac

This section gives some tips on specific troubleshooting for the Envoy software. For other troubleshooting tips, refer to the DS-1 Troubleshooting section in this manual or to the MultiBuffer DS-2 manual.

You get an alert: "Transfer failed" or other error message while transferring a picture to or from the MultiBuffer

Check your AppleTalk or EtherTalk network. Bad connections or heavy traffic can cause the transfer to become corrupt and stop the transfer. Check your network connection with the About Envoy... in the File menu. Check the **Network Status** menu on the front panel of your MultiBuffer.

You get an alert: "There is not enough application memory to complete this operation."

If this message should appear, try adding a few hundred K or more of memory allocation to Envoy by selecting the **Envoy** icon in **Finder**, then selecting **Get Info** from the **File** menu, and setting the **Preferred** size. Envoy cannot be running when this is set.

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Control with Envoy MacIntosh Software

CONTROL WITH ENVOY PC SOFTWARE

Overview

Envoy PC (v1.4.2 or later) is a version of Ensemble Designs Envoy software which provides transport of images via ethernet between a PC operating under Windows NT, Windows 95 or Windows 98 and the MultiBuffer DS-1. TCP/IP protocol is used to implement the Ethernet interface. Double clicking the **Envoy PC** icon starts the program and opens the **Main** window. Clicking the **Setup** button allows setting of the IP address of a DS-1 on the network. The default address in this window is 192.0.3.216, the same as the default address with which the DS-1 is shipped. If a single DS-1 is employed using its default address, it will not be necessary to change from the Envoy PC default address found in this window.

A file is viewed by selecting the file and clicking the **View File** button, or by simply double clicking the filename. The file can also be dragged and dropped onto the Envoy Picture window and it will be displayed there. A file is sent to a DS-1 buffer by selecting the file and clicking the associated **Send** button, or by dragging and dropping the file on the appropriate BufferPort. If the **Picture Window** is open this picture can be sent to the DS-1 by dragging it to a BufferPort and dropping it there.

Clicking the **Capture** button on the Main menu opens the Capture window. An image may be **Captured** from a DS-1 buffer by clicking the **Capture** button for the desired buffer. After the **Capture** completes, it will appear on the PC screen in the **Picture Window**, and can be saved by selecting **Save As** from the **File** menu.

As the DS-1 is a ITU-R601/SMPTE259M device it has a 720 pixel wide picture. Though our resizing algorithms are rigorous, there is always some small loss when a picture is resized, as picture information is either interpolated or extrapolated. Thus, working with 720 pixel width files will produce optimal quality when using the DS-1. However, the change is minimal and there will likely be many cases where the convenience of using 640 pixel width is the predominating factor.

Capture

Click **Capture** on the Main Menu and the **Capture** window opens. Clicking **Capture 1** , for example, initiates a capture from Buffer 1. The **Progress Bar** follows progress of the Capture. When the Capture is complete the captured is displayed in the **Envoy Picture Window** .

File Save

Opens the **File Save** menu. Filenames entered in the **Save As** box must have .YUV, .BMP or .TGA extensions. Upper or lower case may be used. The file is automatically saved in the format specified by the extension. Double clicking a filename in the **File List** box will cause the picture to be saved to that filename. The image saved will be the last file viewed in the Envoy Picture window.

Filters

Filters are provided and may be used to get rid of motion artifacts, or to minimize interfield flicker caused by single pixel horizontal lines. To apply a filter, select the desired function from the **View** menu. Filter status appears on the **Main Menu** in the area beneath the **Viewing Width** caption. The Field 1 or Field 2 filters cause a picture to be

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generated from a single field thus eliminating the flicker effect caused by having apparently unrelated information present in two fields of motion video. The missing field is interpolated from the Field 1 or Field 2 information.

Single pixel height horizontal lines tend to flicker as the line is turned off and on at field rate. In the **Partial Vertical** and **Full Vertical** filter modes information from the line above and the line below is added into the affected line to reduce the flicker effect.

All filtering is done in YUV color space. Thus, only Captured pictures or .YUV files will display the effect of filtering on the computer screen. .TGA and .BMP files will not display the effects of filtering on the computer screen, but the selected filter will be applied when the file is converted to YUV format for transmission to the DS-1. Effects of the filtering can be seen in the transferred picture at the DS-1 video output.

A picture that is Captured with a filter selected will display the effect of that filter on the computer screen, and the **Save** function will cause the filtered picture to be saved in the selected file format. If a file is Viewed with a filter applied, and then sent to the DS-1 via a drag and drop of the picture on to a BufferPort, the filtered picture will be transferred to the DS-1.

Freeze

Opens the Freeze Menu window. Allows **Unfreezing** or **Freezing** each of the buffers.

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Routing

Opens the **Routing** window. Routing combinations may be selected to switch input and output crosspoints. Each is enacted when the **Switch** button is clicked. When the window is opened, or when a Switch is made, the DS-1 is interrogated and its routing status is displayed in the **Routing** window.

Send Picture

In the **File List** box of the **Main Menu**, select a file. Either drag and drop it on one of the BufferPorts, or click Send 1, for example, after selecting the file. This will initiate a **Send to Buffer 1.** The **Progress Bar** indicates the progress of the Send. The picture in the **Picture Window** may also be dragged onto a buffer port and a **Send** will take place.

Sequences

The **Sequences** button allows for the **Send** or **Capture** of a series of pictures. You can use this capability with a GPI trigger of with a manual button within Envoy.

Using the DS-1's GPI interface to Capture from a Disk Recorder

The **Send Sequence** function may be used to animate a set of numbered files to a disk recorder, or DDR. These may be .YUV, .TGA or .BMP files, such as pix1.tga, pix2.tga, pix3.tga, etc. The disk recorder must first be programmed to record a frame upon receipt of a GPI, and advance to the next frame. Video is cabled from a DS-1 output to the disk recorder input, and a GPI interconnect cable is connected. The first file may be selected from the **File List Box** in the **Send Path** window,

or the file name can be typed into the **File to Send** text box.

Click **Continue** , then enter the **Number of Files to Send** . The **Start Transfers** button causes the first file to be sent, then GPI Output 5 of the DS-1 is pulsed low to tell the disk recorder to record the picture and advance to the next frame. The remainder of the files are automatically transferred in this manner. The GPI #5 Output appears on Pin 13 of the GPI connector on the rear panel of the DS-1.

The **Capture Sequence** function provides for the saving of a series of frames as numbered .YUV, .TGA or .BMP files. The disk recorder must first be programmed to advance to the next frame upon receipt of a GPI, and to output that frame. Video is cabled from the disk recorder output to a DS-1 input, and a GPI interconnect cable is connected. The first file may be selected from the **File List Box** in the **Capture Path** window, or the file name can be typed into the **Save As** text box.

Click **Continue** , then enter the **Number of Pix to Get** . The **Start Transfers** button causes the DS-1 buffer to be unfrozen for 100mS, then the picture is transferred over Ethernet to the DS-1 buffer. It is saved to the selected file name and the file number is incremented. GPI Output 5 of the DS-1 is pulsed low to tell the disk recorder to advance to the next frame. The remainder of the frames are automatically transferred in this manner and saved as a numbered file sequence.

Manually capturing a sequence from any video source

Envoy PC can capture a sequence of images from any video source for frame reference and other applications. It will freeze a buffer, capture the image back into the workstation, then save the image in a numerical sequential file name.

To perform a manual capture, in the Envoy PC application go to the **Sequence** pulldown menu. Select **Capture** and a window will open.

Select **Single Capture** and choose the directory that you want to save to. Extensions that can be used are .yuv, .tga, and .bmp. Using the YUV file format eliminates the RGB colour space conversion and gives you the best quality for frame reference. Click the **Continue** button.

To capture and save images, press any key on the keyboard (except **space bar** , **enter** , and **return**), or use the mouse and click the **Next Transfer** button. Images will be named incrementally, ie: telecine1.yuv, telecine2.yuv, telecine3.yuv.

Setup

Opens a window which allows you to change the IP address. Enter the IP address of the MultiBuffer with which you wish to communicate. Note that the host computer and the DS-1 must have IP addresses with identical first 3 digits, or "dot numbers".

In **WinNT** the host computer IP address may be found by opening a DOS window and using the "**ipconfig** " command. If operating under Win95 or Win98, it is necessary to use Control Panels to find this network address information. The DS-1 IP address is found or changed in the Network menu,

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Ethernet sub-menu of the DS-1. To resume operation you must close the **Setup** window in Envoy PC before proceeding.

A DS-1 may be given a name and that name used in the Setup menu instead of the IP address if the Hosts file contains an entry to provide this translation.

In WinNT 4.0 this file is located as follows: **c:\WINNT\system32\drivers\etc\HOSTS**. In Win95 and Win98, a file named **Hosts.sam** is found in **c:\Windows**. The Hosts file may be edited with an ASCII word processor, such as Notepad or Wordpad and must be saved with no extension, simply the filename **HOSTS**.

Note that some word processors automatically add the extension **.txt** to a text file. In such a case, locate the file with the **Find** function, or with Explorer, and remove the extension.

If Explorer does not show file extensions, a setting under the Explorer **View** menu must be changed. Under **View.** click **Options**. The check box for **Hide Extensions for Known File Types** must be unchecked.

If, for example, these entries are added to the Hosts file:

192.0.3.216 1stDS1 # comment field

192.0.3.218 2ndDS1# comment field

then entering 2ndDS1 into the dialog box in the **Setup** menu will cause the DS-1 having IP address 192.0.3.218 to be the active DS-1 with which Envoy PC communicates. Using the Hosts file for translation can simplify selection of a DS-1 in

Envoy PC as the selection can then be made be by name rather than by address. Note that the "localhost" translation line must not be removed from the Hosts file or the system will not function.

Test Patterns

Opens the **Test Pattern** window. Allows loading of each Test Pattern to any buffer. Select the **Test Pattern** wanted and the **Buffer** to which to send it, and click the **Load** button.

Timing

Opens the **Timing** window. Inserting a number in the **V Phase** box and clicking the button changes the phase for this buffer to the new value. **H Phase** works in a similar manner. Allowable values are +/- 1700 for H Timing and +/-525 for V Timing.

View

Allows selection of native or 640 pixel widths. In native mode the picture is viewed in the width in which it arrives. A DS-1 Capture is seen as 720 pixel width. BMP and TGA files are displayed in 640, 720 or 768 widths, depending on how they were saved. If 640 pixel width is selected all input is converted to a 640 pixel wide picture for viewing. The is the proper width for the computer, thus circles on the video monitor appear round when viewed on the computer when Envoy PC is set to a 640 pixel viewing width. The **View** setting does not affect the width in which files are saved, only the way they appear on the PC screen.

Allow Resize causes the viewed picture to expand or contract to conform to the dimensions to which the Envoy Picture window has been sized. If **No Resize** is selected the displayed picture will be cropped if the Envoy Picture window is made

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smaller than the default picture size.

Allow Resize is useful when it is desired to see the full picture while having the Envoy Picture window take up less space on the desktop. The resizing can cause artifacts to appear on the viewed picture in the form of edges appearing less smooth than they actually are. This is not directly related to Envoy, but is produced by the resizing algorithm used in the PC. Select **No Resize** to get the most accurate view of the displayed picture.

TGA files with alpha

TGA files may be 24 bit format containing bitmapped picture information. A 32 bit TGA file also carries the alpha (hole cutter) channel along with the picture (fill) information. Envoy PC supports 24 and 32 bit TGA files in 640, 720 or 768 pixel widths. Double clicking the filename in the **File List** box, or clicking the **View File** button, allows viewing of the picture portion of the 32 bit TGA file.

The alpha may be viewed by clicking the **View Alpha** button. The operator can elect to Send just the picture portion of a 32 bit TGA file to the multibuffer, or both the picture and the alpha. This option is selected under the **File** menu.

If **Alpha Send** is selected a corresponding notation appears on the Envoy PC Main Menu beneath the **Viewing Width** . The alpha channel is sent to the next higher numbered buffer than the picture. Thus, if a 32 bit TGA file is sent to Buffer 1 the alpha channel will be sent to Buffer 2. If the 32 bit file is sent to Buffer 4 the alpha is sent to Buffer 1. The **Alpha Send** option has no effect on BMP files, YUV files, or 24 bit TGA files.

GPIs

When using the **Sequences** feature of Envoy PC, a GPI output from the DS-1 is used to signal the disk recorder to perform its next operation. For this usage GPI #5, which appears on pin 13 of the GPI connector on the rear panel of the DS-1, is used to control the disk recorder. Only pin 13 and pin 15, GND, need be connected for **Sequence** operation. Following is complete listing of the DS-1 GPI connections. (See also the **GPI** section in MultiBuffer DS-1 **Installation** earlier in this manual.)

DS-1 and CAT-CV GPI / Remote "D" Connector

Pin 1	GPI In 1	Toggles Buffer 1 Freeze
Pin 2	GPI In 2	Toggles Buffer 2 Freeze
Pin 3	GPI In 3	Toggles Buffer 3 Freeze
Pin 4	GPI In 4	Toggles Buffer 4 Freeze
Pin 5*	GPI In 5	Key Only, Cut
Pin 6*	GPI In 6	Key Only, Mix
Pin 7*	GPI In 7	Bkgd Only, Cut
Pin 8*	GPI In 8	Bkgd Only, Mix
Pin 9	GPI Out 1	High when Buffer 1 is frozen
Pin 10	GPI Out 2	High when Buffer 2 is frozen
Pin 11	GPI Out 3	High when Buffer 3 is frozen
Pin 12	GPI Out 4	High when Buffer 4 is frozen
Pin 13	GPI Out 5	programmable
Pin 14	GPI Out 6	programmable
Pin 15	Gnd	

* applies to CAT-CV with 0.9.4b27 or later PROMs

Notes:

1. GPI inputs are active low, sampled at vertical interval.

2. GPI Outputs require 470 ohms to LED when used as a lamp driver.

3. When GPI Output is used as a logic output do not use a pullup. Use a 1N4148 diode in series with the load for isolation, with cathode toward DS-1 for active low.

4. Requires firmware version 0.9.4b8 or later

Programmable GPI commands for 0.9.5.5 or later PROMs, functional with Unix or PC:

rsh/rlogin commands: sendgpi 5|6 high|low|pulsehigh|pulselow [duration]

to set programmable gpi '5' high, command is: sendgpi 5 high <cr>

to pulse gpi 6 low for 2 ticks (1 tick = 16.6 msec) : sendgpi 6 pulselow 2 <cr>

'sg' can be used as shorthand for 'sendgpi'

there is online help: sg ? <cr>

Envoy PC Troubleshooting

This section gives some tips on specific troubleshooting for the Envoy software. For other DS-1 troubleshooting tips, refer to the DS-1 Troubleshooting section at the end of this manual.

DS-1 stops functioning

If you try to send two messages to the DS1 at the same time or if an attempt is made to access a file that is in use, the DS-1 can lock up and fail to function. First, exit and restart Envoy PC.

If this does not solve the problem, it is then necessary to power the DS-1 down and back up to restore operation. The problem can be caused by trying to send a file while another **Send** or **Capture** is in progress.

Unable to Connect, Transfer Failure

Click the **Setup** button in the Envoy PC Main Menu to find the **Envoy IP address**. Using the **Menu** button on the DS-1 front panel, check the **IP address** of the **MultiBuffer**.

If they are different, change either IP address so they match. Note that the host computer and the DS-1 must have IP addresses with identical first 3 dot numbers.

From WinNT the host computer IP address may be found by opening a **DOS window** and using the "i**pconfig**" command.

If operating under Win95 or Win98 it is necessary to use **Control Panels** to find this network address information.

If the address is correct, the problem may be a bad network connection. Check the **Link LED** on the transceiver on the DS-1 and at the PC. Each should be lit. Check the Hub. The **Link Lights** associated with the PC and the DS-1 should be lit.

At the DS-1 use the **Menu Func** button and go to **Network Status**, then **Ethernet Status**. It should say **Good Connection**. If not, try **Initializing AppleTalk**, or power the DS-1 down and back up again. Note that Envoy has a 5 second timeout for making a connection to the DS-1. There is a 15 second timeout for loss of connection during a picture or data transfer.

Control with Envoy PC Software

MultiBuffer DS-1 can also be controlled by an SGI or Unix application through TCP/IP. The Ethernet Local Area Network (LAN) feature provides a straightforward means to transfer images with Silicon Graphics and Unix workstations. Using standardized commands already in use with other networked video devices, full control of MultiBuffer functions and image transfers in both directions can be integrated into the SGI/Unix environment.

Under TCP/IP, MultiBuffer acts as a server. This allows a user at an SGI/Unix station to connect in the same manner used to access a central fileserver or DDR. MultiBuffer DS-1 is given a user-assigned IP (Internet Protocol) address in the form 192.X.X.XX which provides a unique identification of the Frame Store on the network. The IP address for MultiBuffer DS-1 is added to the SGI/Unix **Network Hosts** list so that it can be referenced by a meaningful device name ("ds1" is used in the examples which follow).

In this section, user commands are shown in bolded text, system prompts and responses are shown in normal typeface.

Operational control of MultiBuffer is provided through the Unix **rlogin** (remote login) utility. The **rlogin** command lets you log into MultiBuffer just as you would any other server. **rsh** is also supported. When connected via rlogin, on-line help is provided on all of the commands available.

Images are transferred using the **rcp** (Remote Copy) utility. This command lets you transfer image files from a computer to MultiBuffer DS-1 and from the DS-1 to another computer. Both 8 bit YUV and 10 bit YUV files are accepted.

Getting Started

Set up a new host on the SGI/Unix workstation for the MultiBuffer DS-1; it could be called **"ds1"**, as in the examples given in this section.

Check the workstation to see what IP addresses are available and set the MultiBuffer DS-1's address as needed from the frame front panel, or just use the default address.

To set the MultiBuffer DS-1 IP address, go to the **Network Menu** and arrow through to the IP address. Press the down arrow to get to the menu for setting a new address. The address is shown and entered in Base10. Press **ENT** when done.

r Commands

These are the commands supported by the MultiBuffer DS-1 under the rlogin Unix Utility. Assuming that **'ds1'** has been referenced to the IP address of the MultiBuffer DS-1 in the **/etc/hosts** file of the user's machine, **rlogin** and **rsh** can be used with the commands below.

rlogin Usage

An rlogin connection to MultiBuffer DS-1 is generally established as follows:

sgi % **rlogin ds1**

Welcome to the MultiBuffer DS-1

ds1%

At this point a direct, fulltime connection has been established between the user's keyboard and the MultiBuffer DS-1. Using the command set described below, the operator has complete control over crosspoint routing, buffer freeze, timing, and

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other system parameters. The **'ds1%'** prompt indicates that communication is with the MultiBuffer DS-1, and no longer with the unix shell itself. An rlogin session is concluded by exiting, logging out, or typing cntl-D.

rsh Usage

For ease of issuing single commands and construction of scripts these commands can be issued singly through the **rsh** (remote shell) function under Unix. As an example, the rsh invocation of the freeze off command to buffer 1 would be as follows:

sgi % **rsh ds1 freeze off buffer 1**

Buffer 1 freeze off

sgi %

Commands

config

Syntax: config

Displays the option configuration of the DS-1 indicating the number of SmartStore frame buffers installed, the number of inputs (two are standard, any more are options), and the number of outputs (two are standard, any more are options).

Example: Request the configuration.

ds1% **config**

Configuration of this MultiBuffer DS-1 is:

2   SmartStore(tm) Frame Stores

3   Serial Digital Inputs

2   Serial Digital Outputs

ds1%

?

Syntax: ?

Displays the commands available under rlogin.

Example: Let's get some info

ds1% **?**

Commands for the MultiBuffer DS-1:

?	Display this menu
config	Display configuration of the DS-1
dm	Display the content of a specific memory location
exit	Exit remote login
freeze	Freeze a buffer
genlock	Display or set the genlock reference and line rate standard
help	Display this menu
hostaddress	Display the IP address of the DS-1
hostname	Display or set hostname within DS-1
hphase	Display or set the horizontal timing
info	Display DS-1 system information
logout	Exit remote login
mtp	Make Test Pattern in a Buffer
route	Queries and changes the DS-1's internal routing switcher
vphase	Display or set the vertical timing

ds1%

Note: Due to the way Unix treats 'rsh ds1 ?', the 'help' invocation of this command must be used.

help

Syntax: help

Displays the commands available under rlogin. This is the same as the '**?**' command.

exit

Syntax: exit or cntl-D

Exits this invocation of rlogin, and returns to work station operating system. (Note: logout is an equivalent command).

Example: Let's exit!

ds1% **exit**

sgi %

Note: This command is nonsensical under **rsh** since no login has actually taken place.

logout

Syntax: logout or cntl-D

Logout from DS-1 and return to work station operating system.

(**Note:** exit is an equivalent command).

Example: Let's logout!

ds1 % logout

sgi %

Note: This command is nonsensical under rsh since no login has actually taken place.

freeze

Syntax: freeze [1 | 2 | frame | off] buffer 1|2|3|4

Display or change freeze status of one of four frame buffers. The freeze status can be freeze field 1, freeze field 2, freeze frame, or freeze off.

Example: Query freeze status of Buffer 1, response is that buffer 2 is in full frame freeze.

ds1% freeze buffer 2

ds1% freeze frame buffer 2

Example: Unfreeze Buffer 1 (in terse form).

ds1% **f o b1**

Buffer 1 freeze off

ds1%

freeze 'space' function

Syntax: freeze space buffer 1|2|3|4

Turns on a single key mode to freeze and unfreeze a buffer. When the command is first issued this control mode is entered and a message is displayed prompting the user to use the space bar to toggle the freeze state of the buffer. The mode is exited by typing a carriage return.

Example: Enter freeze space mode for buffer 2 and toggle the freeze on and off, then exit.

ds1% **freeze space buffer 2**

Hit space bar to freeze and unfreeze buffer 2

buffer 2 freeze off   **<space>**

buffer 2 freeze frame   **<space>**

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buffer 2 freeze off	**<space>**
buffer 2 freeze frame	**<cr>**

ds1%

Note: This function works only in rlogin, not rsh.

hostaddress

Syntax: hostaddress [address (dotted decimal)]

Displays the IP address of the MultiBuffer DS-1.

Example: Query the IP address

ds1% **hostaddress**

Host Address of the DS-1 is: 192.0.3.216

ds1%

hostname

Syntax: hostname [name - string]

Display or set the hostname within the MultiBuffer DS-1. This name is used only as the rlogin prompt. The hostname can be set to match the workstation's hostname file. This is particularly useful if multiple MultiBuffers are used on a common network.

Example: Change the host name to '601'.

ds1% **hostname 601**

601%

hphase

Syntax: hphase buffer 1 | 2 | 3 | 4 [htiming val] Set or display the horizontal timing value for the selected buffer.

Example: display H phase value of Buffer 2

ds1% **hphase b2**

hphase buffer 2 is -162

Example: Set Buffer 1 Hphase to +24

ds1% **hphase b1 24**

vphase

Syntax: vphase buffer 1 | 2 | 3 | 4 [htiming val]

Set or display the vertical timing value for the selected buffer.

Example: display V phase value of Buffer 1

ds1% **vphase b1**

vphase buffer 1 is 3

Example: Set Buffer 1 Vphase to +24

ds1% **vphase b1 24**

vphase buffer 1 is 24

ds1%

info

Syntax: info [-e -t -i]

Display MultiBuffer DS-1 system information.

-e option provides information about Ensemble Designs

-t displays tcp connection parameters and status

-i displays ip connection parameters and status

Example: an example

ds1% **info -i**

<ip connection parameters displayed here>

ds1%

mtp

Syntax: mtp buffer [1 2 3 4] { pattern name }

This command causes a video test pattern to be created in the designated buffer. Valid pattern names are:

colorbar

crosshatch

safetitle

pulsebar

colorblack

Example: Cause crosshatch to appear in buffer 2

ds1% **mtp buffer 2 crosshatch**

ds1%

route

Syntax: route [source   destination]

Queries and changes the DS-1's internal routing switcher. When the command is invoked without any arguments, the entire state of the router is displayed. To make a crosspoint change, both a source and destination must be supplied.

The video sources are:

Input 1

Input 2

Input 3   (if option is installed)

Input 4   (if option is installed)

Buffer 1

Buffer 2

Buffer 3   (if option is installed)

Buffer 4   (if option is installed)

The destinations are:

Output 1

Output 2

Output 3   (if option is installed)

Output 4   (if option is installed)

Buffer 1

Buffer 2

Buffer 3   (if option is installed)

Buffer 4   (if option is installed)

Because the SmartStore frame buffers in the Multibuffer DS-1 have both an input and an output, they are simultaneously sources and destinations. Input x and Output y correspond to the

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serial digital inputs and outputs on the Catalyst chassis.

This command supports a terse syntax, where Output 2 shortens to o2.

The MultiBuffer DS-1 router is a fully populated x-y matrix, so any source can feed any destination.

Example:

1) Query router settings,

2) then connect Input 2 to Output 1

3) and connect Buffer 3 to Output 2 in terse mode

ds1% **route**

Source	>>	Destination
Input 1		Buffer 1
Input 2		Buffer 2
Buffer 1		Buffer 3
Input 3		Buffer 4
Input 3		Output 1
Buffer 2		Output 2
Buffer 3		Output 3
Input 1		Output 4

ds1% **route input 2 output 1**

Source	>>	Destination
Input 1		Buffer 1
Input 2		Buffer 2
Buffer 1		Buffer 3
Input 3		Buffer 4

Input 2	Output 1
Buffer 2	Output 2
Buffer 3	Output 3
Input 1	Output 4

ds1% **r b3 o2**

Source >>	Destination
Input 1	Buffer 1
Input 2	Buffer 2
Buffer 1	Buffer 3
Input 3	Buffer 4
Input 2	Output 1
Buffer 3	Output 2
Buffer 3	Output 3
Input 1	Output 4

ds1%

genlock

Syntax: genlock [ref]   [std]

Display or set the genlock reference and line rate standard.

Ref can take on:

ref a

ref b

input 1

freerun

Std can take on:

525

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Example: Set to Reference A genlock at 525 line rate

ds1% **genlock ref a 525**

ds1%

dm

Syntax: dm   [adr   count]

Displays contents of specified memory location(s). The beginning address, adr, is interpreted as a hexadecimal value. The count, also in hex, specifies the number of bytes to display. Count may not exceed $100, larger values will be automatically limited.

If the adr and count is omitted, the command will repeat the previous count, starting at the next location after the last dm command. This makes it easy to display a block of memory larger than $100.

Note: This command is not for novices. It allows unrestricted access to the processor's full address space. It can disturb system operation if a memory mapped IO register is read out of sequence. Additionally, since the full memory space is not used, it can trigger a bus error which is a fatal (though not necessarily tragic) circumstance. This command is provided for engineering purposes and it is described here only for completeness.

Example: Read $20 bytes starting at location $1F8B2

ds1% **dm 1F8B2   20**

1F8B2   12 34 56 78 3B 8A 91 FC 9B 3D 84 91 37 BA CD 81

1F8C2   95 78 CD 9B 3D 84 91 37 3D 84 12 34 56 78 38 B5

ds1%

rcp Commands

Remote copy, rcp, is used in the Unix Shell for transferring images between the SGI and MultiBuffer DS-1

Transferring YUV Pictures

To send a YUV picture from the SGI to buffer 1 in MultiBuffer DS-1, type this command in the shell:

rcp filename ds1:001

To capture a picture in the MultiBuffer DS-1 and copy it to the workstation in YUV format:

rcp ds1:001 filename

Transferring RGB Pictures

fromyuv and *toyuv* are utilities used with the DS-1 for transferring RGB graphics. They are readily available and are often used with other video equipment, such as disc recorders. They are already installed on many workstations, usually kept in /user/sbin.

To change a picture that was captured in YUV (the MultiBuffer DS-1's format) to RGB (the SGI's format and the one you can easily view on the SGI screen):**fromyuv existing.filename   new.filename**

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To change an RGB file to YUV:

toyuv   existing.filename   new.filename

Shell Scripts

Scripts can be created and iconized to simplify graphics transfers for both sending and capturing. Here are some examples:

SGI YUV File to DS1 YUV Script

For sending YUV files to MultiBuffer DS-1, create a script with vi or jot or another editor. Give the script a name such as **ds1buf1** :

jot ds1buf1

In the text editor window type:

rcp $1 ds1:001   where $1 is the temporary name for the picture

Then close the window. To check the permissions for this script:

ls -l   ds1buf1

Permissions may need to be changed to enable read and write in order to make the script executable:

chmod +x ds1buf1   where chmod is change mode

Drag the icon onto the desktop or where ever is convenient. Drag and drop a YUV file onto the icon and the picture will automatically send to the MultiBuffer DS-1.

SGI RGB File to DS1 YUV Script

For a script to drag and drop RGB files, follow the above steps and use this for the jot window:

toyuv $1 temp

rcp temp ds1:001

DS1 YUV to SGI RGB Script

For capturing RGB files, create a script.

Choose a shortened command such as *grab*. Type in the Unix Shell:

jot grab

In the text editor window type:

rcp ds1:001 tem

fromyuv temp $1

By typing grab filename in the Unix Shell, contents of MultiBuffer DS-1 Buffer 1 will be captured and become a file in the workstation directory currently in use.

MULTIBUFFER DS-1 TROUBLESHOOTING

If you are experiencing problems with MultiBuffer DS-1 operation, refer to the section below for some common troubleshooting tips.

Can't read LCD display on frame:

Adjust LCD display by pressing and holding down the menu button then use the **UP** and **DOWN** arrow keys to adjust the light and dark contrast as desired.

Green lines on the output or no output:

Double check how the frame is genlocked. Is it locked to an analog reference or to the digital input? Now check the Genlock and Timing menu on the frame. Be sure it is set correctly.

My Mac can't send pictures to the MultiBuffer DS-1:

Be sure the Mac is set to **Ethertalk** . Go to **Control Panels** under the Apple then to **AppleTalk** . Set the window to connect via Ethernet. Also check the MultiBuffer DS-1 IP address in the **Network** Menu.

My PC can't send pictures to the MultiBuffer DS-1:

Run Envoy PC and click the setup button. Enter the IP address and click **OK**.

MultiBuffer DS-1 Troubleshooting

PRODUCT SPECIFICATIONS

Inputs

> **Standard:** 2 Serial Digital SMPTE 259M inputs with reclocked active loopback outputs.
>
> **Optional:** 2 additional inputs
>
> Analog component and composite support with Ensemble Serial Box Converters

Outputs

> **Standard:** 2 routable output channels, 2 buffered outputs each, Serial Digital SMPTE 259M
>
> **Optional:** 2 additional outputs
>
> Analog component and composite support with Ensemble Serial Box Converters

Internal SmartStore™ FrameBuffers

> Standard: 2 SmartStore Digital Video Buffers
>
> Full 4:2:2, timeable output
>
> Input auto timing range: infinite
>
> Optional: 2 additional buffers

Internal Format

> 10 Bit ITU-R 601 with 16 bit internal processing

Serial Interface

> RS-422, DB 9 Connector, GV100/200 emulation

Genlock and Timing

> Genlock reference selectable between 2 analog reference inputs or digital video input #1
>
> Output timing of each buffer fully adjustable over complete frame

525/625 selectable

Ethernet

10 Mb Thinnet (10BaseT) or AUI

Upgradeable as options become available

Mechanical and Power

19" Wide, 1.75" High, 17" Deep;
483 Wide, 44.5 High, 432 mm Deep

Weight 12 lbs; 5.5 kilos

100-230 VAC

50/60 Hz

60VA

CE Compliant as requested

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