HD9626DSK
High Definition Downstream Keyer Series

Instruction Manual

IMPORTANT SAFETY INSTRUCTIONS

⚡	The lightning flash with an arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated "Dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
!	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.

- Read these instructions
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

WARNING TO REDUCE THE RISK OF FIRE OR ELECTRIC – SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
WARNING DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT.
WARNING TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.
WARNING THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First revision	Mar 2006
1.1	Updated diagrams for the device.	Oct 2006
1.2	Updated block diagram and DCP diagram. Updated DCP and Firmware Upgrade Information. Minor corrections throughout manual.	Feb 2007
1.2.1	Updated Key Offset Value	May 2008
1.3	Modified GPIOs	Nov 2008
1.4	Removed references to 480p/59.94 & 480p/60 throughout manual.	Oct 2010

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CHAPTER 1
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1. OVERVIEW

1.1. OVERVIEW

The Evertz HD9626DSK Downstream Keyer system incorporates the latest technology to provide an advanced fully digital Keyer. The Evertz HD9626DSK Downstream Keyer is ideal for bug keying, side-by-side comparison applications, and much more. The system also features letter boxing, a safe area/safe title, wipes, and fades. The Evertz HD9626DSK Downstream Keyer consists of a 1RU frame with front panel control, optional remote control panel, and GPI control for stored presets. The HD9626DSK provides storage and retrieval capabilities of several user setups and presets. Evertz automation protocol allows control from 3 party sources for lifeline monitoring as well as function control. Contact your Automation provider for driver availability.

Features:
- Program output video bypass failure protection for on-air applications (optional)
- Both mix and additive keying modes provided
- Auto-timing HDTV key, fill, and background inputs (up to 1 line)
- GPI and RS-232/422 inputs for fade/transition control
- Internal black generator for fade to black applications
- Built-in letter box generator for non 16x9 aspect ratio cropping
- Safe area/ safe title marker on preview channel
- Control of key gain, offset, and key inversion are provided
- 12 bit processing linear keying providing high quality results for both transparency and soft edges
- Full control and status is provided from front panel display, remote panel or automation
- Level triggered programmable GPIs
- User programmable presets are provided
- Automation Support
- Standard HD preview output
- Active Temperature Monitoring
- Power Voltage Monitoring
- Optional rack mount or desktop remote control panel
- Optional secondary redundant power supply
- Optional bypass relay for program output
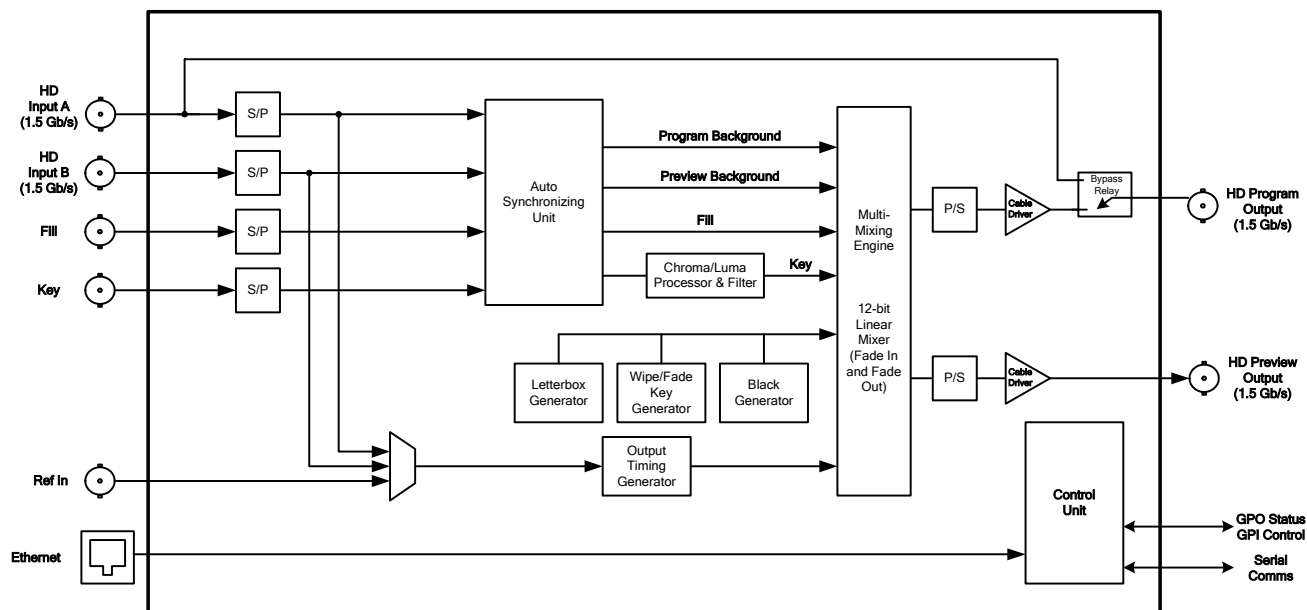
Figure 1-1: HD9626DSK Downstream Keyer Block Diagram

1.2. HOW TO USE THIS MANUAL

This manual is organized into 5 chapters: Overview, Installation, Operation using Front Panel Controls, Operation using DCP, and Technical Description. The overview section contains a brief overview of the operation and features of the HD9626DSK, as well as a glossary to define concepts and terms used throughout the remainder of the manual. We highly recommend taking the time to become familiar with the terms and concepts described in this chapter before proceeding further into the manual.

Chapter 2 provides a detailed description of the rear panel connectors, and how the HD9626DSK should be connected into your system.

Chapter 3 describes how to operate the HD9626DSK using the Front Panel Controls and menu system. This chapter also describes how to operate the HD9626DSK using the Rack Mount Control Panel (RCP). The RCP is optional and only ships with orders purchased with this option. The RCP option is not field upgradeable, if you wish to operate the unit with the RCP option, and you did not specify this at the time you placed your order, you will be required to send your unit back to the factory for a retrofit.

Chapter 4 describes how to operate the HD9626DSK using the Desktop Control Panel (DCP). The DCP is optional and only ships with orders purchased with this option. The DCP option is not field upgradeable, if you wish to operate the unit with the DCP option, and you did not specify this at the time you placed your order, you will be required to send your unit back to the factory for a retrofit.

Chapter 5 provides technical specifications and instructions on how to update the firmware in the HD9626DSK.

Items of special note are indicated with a double box like this.

1.3. DEFINITIONS

4:2:2   The sampling ratio used in the HDTV digital video signal. For every 4 samples of luminance there are 2 samples each of R-Y (Red minus Luminance) and B-Y (Blue minus luminance).

16x9   A wide screen television format such as HDTV in which the aspect ratio of the screen is 16 units wide by 9 high as opposed to the 4x3 of normal TV.

AES/EBU: (Sometimes abbreviated as AES) Refers to the digital audio standard (AES3-1992) set by the Audio Engineering Society and European Broadcast Union and used by most forms of digital audio from CDs to professional digital video.

Aspect Ratio: The ratio of width to height in a picture. Theatre screens generally have an aspect ratio of 1.85 to 1, widescreen TV (16x9) is 1.77 to 1, and normal TV (4x3) is 1.33 to 1.

CCIR (International Radio Consultative Committee)   An international standards committee. (This organization is now known as ITU.)

CCIR-601: See ITU-R601.

Cliff Effect: (also referred to as the 'digital cliff') This is a phenomenon found in digital video systems that describes the sudden deterioration of picture quality when due to excessive bit errors, often caused by excessive cable lengths. The digital signal will be perfect even though one of its signal parameters is approaching or passing the specified limits. At a given moment however, the parameter will reach a point where the data can no longer be interpreted correctly, and the picture will be totally unrecognizable.

Component Analog: The non-encoded output of a camera, video tape recorder, etc., consisting of the three primary colour signals: red, green, and blue (RGB) that together convey all necessary picture information. In some component video formats these three components have been translated into a luminance signal and two colour difference signals, for example Y, B-Y, R-Y.

Component Digital: A digital representation of a component analog signal set, most often Y, B-Y, R-Y. The encoding parameters are specified by ITU-R709 for HDTV signals. SMPTE 274M and SMPTE 296M specify the parallel interface.

Composite Analog: An encoded video signal, such as NTSC or PAL video that includes horizontal and vertical synchronizing information.

Composite Digital: A digitally encoded video signal, such as NTSC or PAL video that includes horizontal and vertical synchronizing information.

D1:   A component digital video recording format that uses data conforming to the ITU-R601 standard. Records on 19 mm magnetic tape. (Often used incorrectly to refer to component digital video.)

D2:   A composite digital video recording format that uses data conforming to SMPTE 244M. Records on 19 mm magnetic tape. (Often used incorrectly to refer to composite digital video.)

D3:   A composite digital video recording format that uses data conforming to SMPTE 244M. Records on 1/2" magnetic tape.

D5:   A component digital video recording format that uses data conforming to the ITU-R601 standard. Records on 1/2" magnetic tape.

HD-D5: A component digital video recording format that uses data conforming to the ITU-R709 standard. Records on 1/2" magnetic tape.

Drop Frame: In NTSC systems, where the frame rate is 29.97002618 frames per second, the drop frame mode permits time of day indexing of the frame numbers by dropping certain frame numbers. Specifically, frames 0, and 1 at the beginning of each minute except minutes 0, 10, 20, 30, 40, & 50, are omitted, to compensate for an approximate timing error of 108 frames (3 seconds 18 frames) per hour. A flag bit is set in the time code to signal when the drop frame mode is in effect.

EBU (European Broadcasting Union):   An organisation of European broadcasters that among other activities provides technical recommendations for the 625/50 line television systems.

Embedded Audio: Digital audio is multiplexed onto a serial digital video data stream.

ITU: The United Nations regulatory body governing all forms of communications.   ITU-R (previously CCIR) regulates the radio frequency spectrum, while ITU-T (previously CCITT) deals with the telecommunications standards.

ITU-R601: An international standard for standard definition component digital television from which was derived SMPTE 125M and EBU 3246-E standards.   ITU-R601 defines the sampling systems, matrix values and filter characteristics for Y, B-Y, R-Y and RGB component digital television signals.

ITU-R709: An international standard for High definition component digital television from which was derived SMPTE 274M and SMPTE 296M standards.   ITU-R709 defines the sampling systems, matrix values and filter characteristics for Y, B-Y, R-Y and RGB component digital television signals.

Letterbox: Placing a wide screen image on a conventional TV by placing black bands at the top and bottom of the screen.

Linear Time Code: (Also known as Longitudinal Time Code) A digital code used for timing and control purposes on videotape and associated audio tape machines. It is recorded on a linear track with audio characteristics and is referred to as LTC. Each 80-bit code word is associated with one television frame, and consists of 26 time bits, 6 flag bits, 32 user bits and 16 sync bits. This time code may run at 24, 25 or 30 frames per second depending on the video format. See also SMPTE 12M

LTC: See Linear Time Code

NTSC: National Television Standards Committee established the television and video standard in use in the United States, Canada, Japan and several other countries. NTSC video consists of 525 horizontal lines at a field rate of approximately 60 fields per second. (Two fields equal one complete Frame). Only 487 of these lines are used for picture. The rest are used for sync or extra information such as VITC and Closed Captioning.

PAL: Phase Alternating Line. PAL is the television and video standard in use in most of Europe. Consists of 625 horizontal lines at a field rate of 50 fields per second. (Two fields equals one complete Frame). Only 576 of these lines are used for picture. The rest are used for sync or extra information such as VITC and Teletext.

Pixel: The smallest distinguishable and resolvable area in a video image. A single point on the screen. In digital video, a single sample of the picture. Derived from the words *picture element*.

Serial Digital: Digital information that is transmitted in serial form. Often used informally to refer to serial digital television signals.

SMPTE (Society of Motion Picture and Television Engineers): A professional organisation that recommends standards for the film and television industries.

SMPTE 12M: The SMPTE standard for Time and address code. SMPTE 12M defines the parameters required for both linear and vertical interval time codes.

SMPTE 272M: The SMPTE standard for embedding audio in serial digital standard definition (SMPTE 259M) video signals.

SMPTE 274M: The SMPTE standard for bit parallel digital interface for high definition component video signals with an active picture of 1080 lines x 1920 pixels.

SMPTE 292M: The SMPTE standard for high definition serial digital component interfaces.

SMPTE 296M: The SMPTE standard for bit parallel digital interface for high definition component video signals with an active picture of 720 lines x 1280 pixels.

SMPTE 299M: The SMPTE standard for embedding audio in serial digital high definition (SMPTE 292M) video signals.

SMPTE RP188: The SMPTE recommended practice for embedding SMPTE 12M timecode into ancillary data packets in serial digital video signals.

TRS: Timing reference signals used in composite digital systems. (It is four words long).

TRS-ID: Abbreviation for "Timing Reference Signal Identification". A reference signal used to maintain timing in composite digital systems. (It is four words long.)

1.4.   GETTING HELP

The documentation included with your Downstream Keyer includes installation instructions, operating information for each hardware and software feature, and troubleshooting information. Additional documentation, white papers, FAQs are provided on the Evertz web site as they become available.

If you require Technical support from the factory you can contact our technical support department by one of the following methods.

Email	mailto:service@evertz.com
Phone	**+1 (905) 335-7570**
Fax	**+1 (905) 335-7571**

Please include a detailed description of the problem you are having, the model number of your unit, serial number and Build Number. The Build Number can be obtained from the "On Screen Menu" system. Press "Setup" then select "General" then select "Update Code".

You can also consult the FTP site (**http://www.evertz.com/ftp.html**) on our web page for the latest patches, upgrades and lists of Frequently Asked Questions.

CHAPTER 2
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2. INSTALLATION

2.1. REAR PANEL OVERVIEW

Figure 2-1 shows the rear panel of the HD9626DSK high definition keyer unit. Sections 2.1.1 to 2.1.5 describe the specific video and control signals that should be connected to the Downstream Keyer unit.
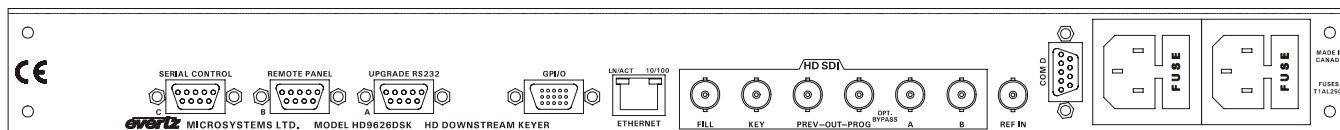
Figure 2-1: HD9626DSK Rear Panel

2.1.1. HD SDI Digital Video Connections

A and B: These BNC connectors are the program HD SDI inputs to the keyer unit.

FILL and KEY: These BNC connectors are the key and fill HD SDI inputs to the keyer unit.

PREVIEW OUT: This output BNC connector is the serial component SMPTE 292M preview video output from the keyer unit. This preview output connector is normally connected to an HD SDI preview monitor. This output is not bypass protected.
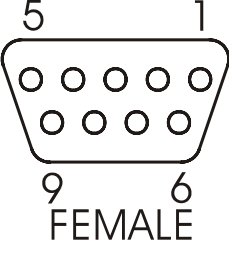
PROGRAM OUT: This output BNC connector is the serial component SMPTE 292M program video output from the keyer unit. Connect this output to the next video device in your output path. When the optional bypass relay is fitted (+ HBP option) this output is protected by a bypass relay to the adjacent **A** input BNC. When the bypass relay is activated on power loss to the keyer, the **HD SDI PROGRAM OUT** BNC will be a direct relay connection to the **A** BNC.

2.1.2. Reference Video Connections

REF IN: This is a 75 ohm terminated input for connecting an analog video or tri-level sync (high definition units only) reference. Connect the **REF IN** connector to the reference input sync. The *REFERENCE* menu is used to select the correct type of video reference being used.
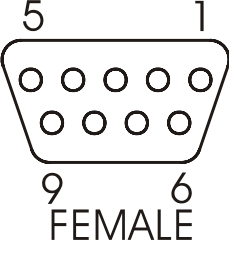
2.1.3. Serial I/O Connections

UPGRADE RS232 (A): This 9 pin female 'D' connector provides an RS-232 serial interface for connection to a computer and is used for firmware upgrades to the HD9626DSK. The pin definitions are shown in Table 2-1. See section 5.2 for more information on upgrading firmware.

Pin #	Name	Description
1	GND	Chassis ground
2	TxD	RS-232 Transmit Output
3	RxD	RS-232 Receive Input
4		
5	Sig Gnd	RS-232 Signal Ground
6		
7	RTS	RS-232 RTS Input
8	CTS	RS-232 CTS Output
9		

Table 2-1: Upgrade RS232 Port A Pin Definitions

REMOTE PANEL (B): This 9 pin female D connector provides an RS-422 serial interface for connection to the optional Rack Mount Remote Control Panel (RCP) or Desktop Remote Control Panel (DCP) supplied with the keyer package. This port is wired as a SMPTE 207M Tributary as shown in Table 2-2. See section 2.4 for information on connecting the Evertz remote control panel. This DB9 connector will only be installed if you purchased either of these options.

Pin #	Name	Description
1	GND	Chassis ground
2	Tx-	RS-422 Tx-(A) Output
3	Rx+	RS-422 Rx+(B) Input
4	GND	
5		
6	GND	
7	Tx+	RS-422 Tx+(B) Output
8	Rx-	RS-422 Rx-(A) Input
9	GND	

Table 2-2: Remote Panel Port Pin Definitions

SERIAL CONTROL C: This 9 pin female D connector provides an RS-422 or RS-232 serial interface used for controlling the unit through automation. Operational mode (422 or 232) can be set from the front panel. Default mode from the factory is RS-422.

COM D: This 9 pin female D connector provides a serial interface designed for connection to Automation Systems including the Evertz MetaCast 2 software. Reconfiguring jumper J20 on the 7700FC card can change this port to run in either RS422 or RS232 mode, which is inside the unit. When it is set for the RS-232 mode of operation the port has the same pinout as Port A (shown in Table 2-1). When it is set for the RS-422 mode of operation the port has the pinout shown in Table 2-3.

The RS-422 pinout for the COM D port is not a standard SMPTE RS422 pinout. You will have to make a custom cable in order to use this port in the RS422 configuration.
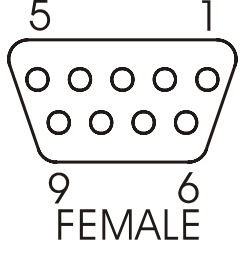
Pin #	Name	Description
1	GND	Chassis ground
2	Tx-	RS-422 Tx-(A) Output
3	Rx-	RS-422 Rx-(A) Input
4		
5	GND	
6		
7	Rx+	RS-422 Rx+(B) Input
8	Tx+	RS-422 Tx+(B) Output
9	GND	

Table 2-3: Serial Port D – RS422 Pin Definitions

As multiple devices can be connected to this port, the function of the port must be configured using the *Setup* menu. See section 3.5.6 for more information on configuring Port D.

2.1.4. GPI/O Connections

GPI/O: This 15 pin female high density 'D' connector contains several general-purpose control inputs and outputs. The inputs are used to connect manual or automatic triggers for the display or insertion of media. The outputs provide feedback on internal unit status of the downstream keyer. The connector is used to provide Preset selection commands to the DSK. See section 2.7 for information on connecting the general-purpose inputs and outputs. For information on the GPI and GPO functions see the *Preset* menu item in the *Setup* menu (see section 3.9).
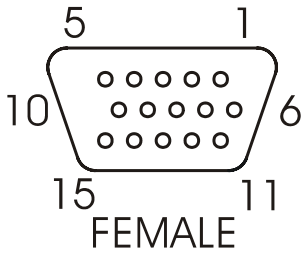
Pin #	Name	Description
1	GND	Chassis ground
2	GPO 2	General purpose output 2
3	GPO 1	General purpose output 1
4	GPO 3	General purpose output 3
5	GPIC	General purpose input Load assigned preset
6	GPO 4	General purpose output 4
7	GPIF	General purpose input Load assigned preset
8	GPIA	General purpose input Load assigned preset
9	GPID	General purpose input Load assigned preset
10	GP+3.3V	+3.3V from general purpose interface board
11	GPIH	General purpose input Load assigned preset
12	GPIE	General purpose input Load assigned preset
13	GPIG	General purpose input Load assigned preset
14	GPIB	General purpose input Load assigned preset
15	Vext	External voltage source for GPI's

Table 2-4: GPI/O Connector Pin Definitions

2.1.5. Ethernet Network Connections

ETHERNET: This RJ-45 connector is an Ethernet Port used for high-speed firmware upgrades. See section 2.6 for information on connecting to an Ethernet network. See section 3.5.5 in the *General* menu descriptions for information on configuring the network addresses for the downstream keyer.

2.1.6. Power Connections

The keyer has one or two (redundant supply is optional) universal power supplies that operate on 115 or 230 Volts at 50/60 Hz AC.

2.2.   MOUNTING

The HD9626DSK unit is equipped with rack mounting angles and fits into a standard 19 inches by 1.75 inches (483 mm x 45 mm) rack space. The optional Desktop Remote Control Panel (DCP) is designed to be mounted on a control panel desk and is fitted with rubber feet to keep it from sliding on the desktop.

2.3.   POWER REQUIREMENTS

The HD9626DSK unit has a universal power supply that operates on either 115 Volts or 230 Volts at 50 Hz or 60 Hz AC. The power supply auto switches between the voltages. Power should be applied by connecting a 3-wire grounding type power supply cord to the power entry module on the rear panel. The power cord should be a minimum of 18 AWG wire size; type SVT marked VW-1, maximum 2.5 m in length. If the units are fitted with the redundant power supply there will be an additional IEC-320 connector on the rear panel.

A second redundant power supply is optional and operates in conjunction with the original power supply.

The power entry module combines a standard power inlet connector, two 5 x 20 mm fuse holders and an EMI line filter.

> **CAUTION – These servicing instructions are for use by qualified service personnel only. To reduce risk of electric shock, do not perform any servicing instructions in this section of the manual unless you are qualified to do so.**

2.4.   CONNECTING THE REMOTE CONTROL PANEL

The HD9626DSK Downstream Keyer is available with a rack mountable control panel (RCP) or desktop remote control panel (DCP).   The remote control panel is connected to the **REMOTE PANEL** connector on the keyer unit using the straight-through cable provided. For longer distances, simply make your own cable of the required length according to the diagram in Table 2-5. Communications to the remote panel is through a standard straight-through RS-422 connection, so the panel can be located up to 1000 feet from the main electronics unit.
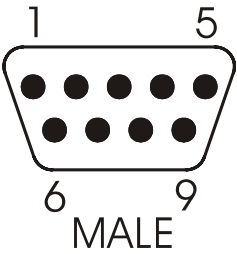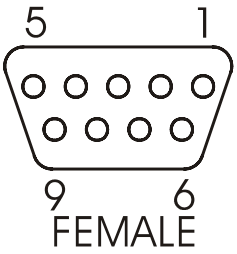
HD9626DSK End				Remote Panel End		
	9 pin D Male	**Pin**	**Belden 9729**	**9 pin D Female**	**Pin**	
		1			1	
	Tx-	2	-------1a------	Rx-	2	
	Rx+	3	-------2b------	Tx+	3	
	Rx Gnd	4	---drain 2----	Rx Gnd	4	
		5				
	Tx Gnd	6	---drain 1----	Tx Gnd	6	
	Tx+	7	-------1b-----	Rx+	7	
	Rx-	8	-------2a------	Tx-	8	
		9			9	
	Frame Gnd	Shield	---drain 1----	Frame Gnd	Shield	

Table 2-5: Remote Control Panel Extender Cable

2.5. CONNECTING THE VIDEO

2.5.1. High Definition Video Inputs

The HD9626DSK supports high definition digital video in the formats shown in Table 2-6. The video standard must be set manually to match the incoming video type using the *Video Standard* menu item on the *General* menu (see section 3.5.1).

Common Name	Pixels / Active Lines	Frame Rate	Progressive /Interlace	SMPTE Standard	Valid Genlock Types
1080i/60	1920 x 1080	30	I	274M	PAL
1080i/59.94	1920 x 1080	29.97 (30/1.001)	I	274M	NTSC
1080i/50	1920 x 1080	25	I	274M	PAL
720p/59.94	1280 x 720	59.94 (60/1.001)	P	296M	NTSC
1080p/24sF	1920 x 1080	24	P (sF)	274M	PAL
1080p/23.98sF	1920 x 1080	23.98 (24/1.001)	P (sF)	274M	NTSC
720p/60	1280 x 720	60	P	296M	PAL
720p/59.94	1280 x 720	59.94 (60/1.001)	P	296M	NTSC

Table 2-6: Video Input Formats

2.5.2. High Definition Video Outputs

The **PROG** output contains the video output from the program bus and should be connected to the main broadcast chain of your plant. The **PROG** output may be protected by an optional bypass relay (+HBP option). When the relay is active, the **PROG** output is directly connected to the **A** input.

The **PREV** output contains the video output from the preview bus and will typically be connected to an HD SDI monitor to allow the user to view the preview output before it goes on air. If your unit is fitted with the optional bypass relay (+HBP option), then when the relay is active, the **PREV** output will not have any video on it.
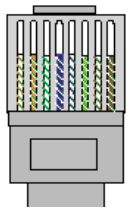
2.5.3. Genlock Reference

For proper switching of the video and audio signals an analog video genlock reference must be supplied. Connect a composite analog NTSC or PAL colour black video signal to the REF IN connector on the downstream keyer unit. Make sure that the signal type is correct for the video standard in use. (See Table 2-6.)

2.6. CONNECTING TO AN ETHERNET NETWORK

The HD9626DSK is designed for use with either 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) also known as *Fast Ethernet*, twisted pair Ethernet cabling systems. When connecting for 10Base-T systems, category 3, 4, or 5 UTP cable as well as EIA/TIA – 568 100Ω STP cable may be used. When connecting for 100Base-TX systems, category 5 UTP cable is required. The cable must be "straight through" with a RJ-45 connector at each end. Make the network connection by plugging one end of the cable into the RJ-45 receptacle of the HD9626DSK and the other end into a port of the supporting network hub.

The "straight-through" RJ-45 cable can be purchased or can be constructed using the pinout information in Table 2-7. A colour code wiring table is provided in Table 2-7 for the current RJ 45 standards (AT&T 258A or EIA/TIA 258B colour coding shown). Also refer to the notes following the table for additional wiring guide information.

Pin 1	Pin #	Signal	EIA/TIA 568A	AT&T 258A or EIA/TIA 568B	10BaseT or 100BaseT
	1	Transmit +	White/Green	White/Orange	X
	2	Transmit –	Green/White or White	Orange/White or Orange	X
	3	Receive +	White/Orange	White/Green	X
	4	N/A	Blue/White or Blue	Blue/White or Blue	Not used (required)
	5	N/A	White/Blue	White/Blue	Not used (required)
	6	Receive –	Orange/White or Orange	Green/White or Green	X
	7	N/A	White/Brown	White/Brown	Not used (required)
	8	N/A	Brown/White or Brown	Brown/White or Brown	Not used (required)

Table 2-7: Standard RJ45 Wiring Colour Codes

Note the following cabling information for this wiring guide:
- Only two pairs of wires are used in the 8-pin RJ 45 connector to carry Ethernet signals.
- Even though pins 4, 5, 7 and 8 are not used, it is mandatory that they be present in the cable.
- 10BaseT and 100BaseTx use the same pins, a crossover cable made for one will also work with the other.
- Pairs may be solid colours and not have a stripe.
- Category 5 cable must use Category 5 rated connectors.

The maximum cable run between the downstream keyer and the supporting hub is 300 ft (90 m). The maximum combined cable runs between any two end points (i.e. downstream keyer and PC/laptop via network hub) is 675 feet (205 m).

Devices on the Ethernet network continually monitor the receive data path for activity as a means of checking that the link is working correctly. When the network is idle, the devices also send a link test signal to one another to verify link integrity. The downstream keyer rear panel is fitted with two LEDs to monitor the Ethernet connection.

10/100:   This Amber LED is ON when a 100Base-TX link is last detected. The LED is OFF when a 10Base-T link is last detected (the LINK LED is ON). Upon power-up, the LED is OFF as the last detected rate is not known and therefore defaults to the 10Base-T state until rate detection is completed.

LN/ACT: This dual purpose Green LED indicates that the HD9626DSK has established a valid linkage to its hub, and whether the HD9626DSK is sending or receiving data. This LED will be ON when the HD9626DSK has established a good link to its supporting hub. The ON LED is a good indication that the segment is wired correctly. The LED will BLINK when the HD9626DSK is sending or receiving data. The LED will be OFF if there is no valid connection.

2.7.   CONNECTING THE GENERAL PURPOSE INPUTS AND OUTPUTS

Figure 2-2 shows a simplified schematic diagram of the GPIO circuitry. The user can connect GP+3.3V supplied from the keyer unit into the Vext pin to provide power to the GPIO Opto-isolator circuitry. In this configuration the user can activate GPIs simply by connecting the GPI input pins to Ground (see Figure 2-3). This can be done with a button, switch, relay or an open collector transistor. The GPO's are active low and require an external pull up resistor (see Figure 2-5). 3.3 volts is available to the user to be used for driving external circuitry. Care must be taken to limit the load to 0.5W so there is no affect on the power supply source on the unit.

> ✍   **Warning: Do not connect GP+3.3V from one unit to another unit's GP+3.3V output.**

Alternately, the user can connect an external power source for the Opto-isolator circuitry. The Vext voltage must be greater than the voltage supplied to GPI by at least 3v. Figure 2-4 and Figure 2-6 show how to wire the GPIs and GPOs from an external power supply.

The tally outputs are active low and require an external pull up (10k Ohm) resistor to the Vext pin. When active, the output will go low and is able to sink up to 10mA. When inactive, the signal will go high (to the voltage applied to the Vext pin). Do not attempt to source more than 100µA from the output.

Table 2-8 shows the maximum limits that the user must adhere to so that no circuitry is damaged.

Description	Name	Value
Maximum GP+3.3V current load	$I_{GP+3.3V}$ max	100 mA
Minimum input voltage for a high	V_{gpi} high min	3 V
Maximum input voltage for a low	V_{gpi} low max	0.8 V
Maximum GPO sink current	I_{gpo} max	25 mA

Table 2-8: GPIO Maximum Ratings

All GPI inputs are level triggered. Lowering the GPI input to a potential below Vext will select the allocated preset definition. The 8 GPIs (A through H) can be used to activate various functions such as logo control, voiceover, transition, etc. If multiple inputs are active both commands are ignored until a single input is recognized.

The GPI to logo allocation is programmable from the front panel of the HD9626DSK. (See section 3.9.5).
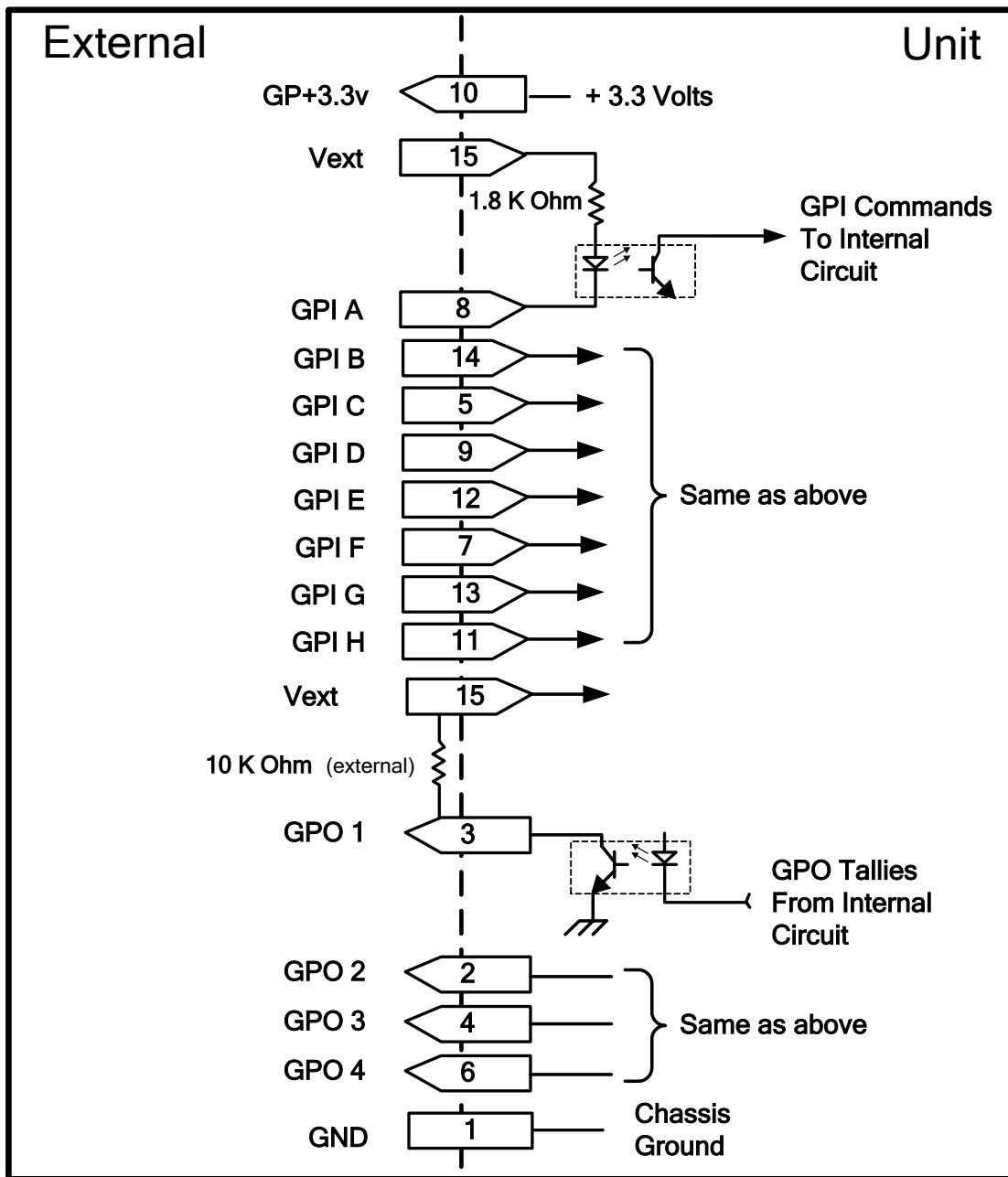
Figure 2-2: Keyer GPIO Opto-Isolator Circuitry
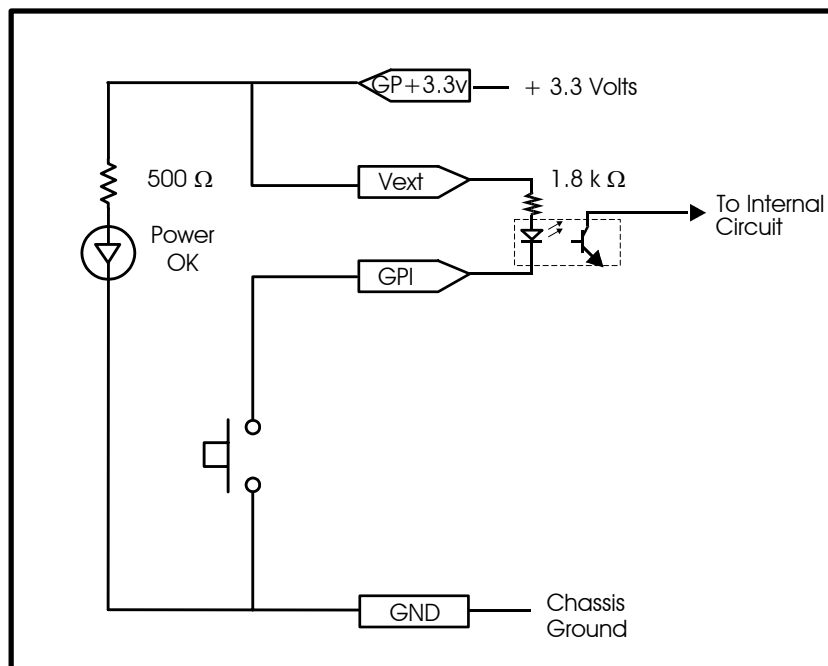
Figure 2-3: Powering the General Purpose Input Opto-Isolators from the Unit
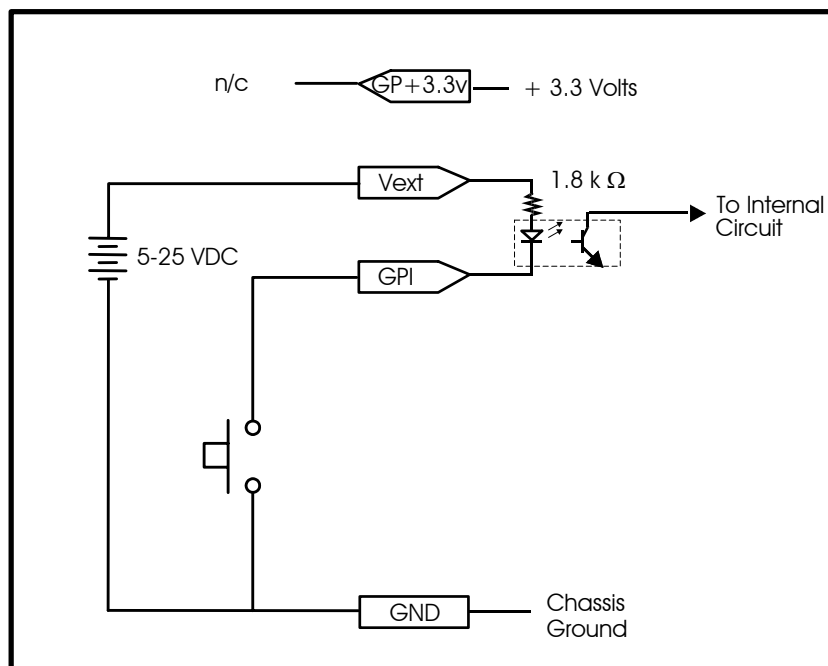
Figure 2-4: Powering the General Purpose Input Opto-Isolators from an External Power Supply
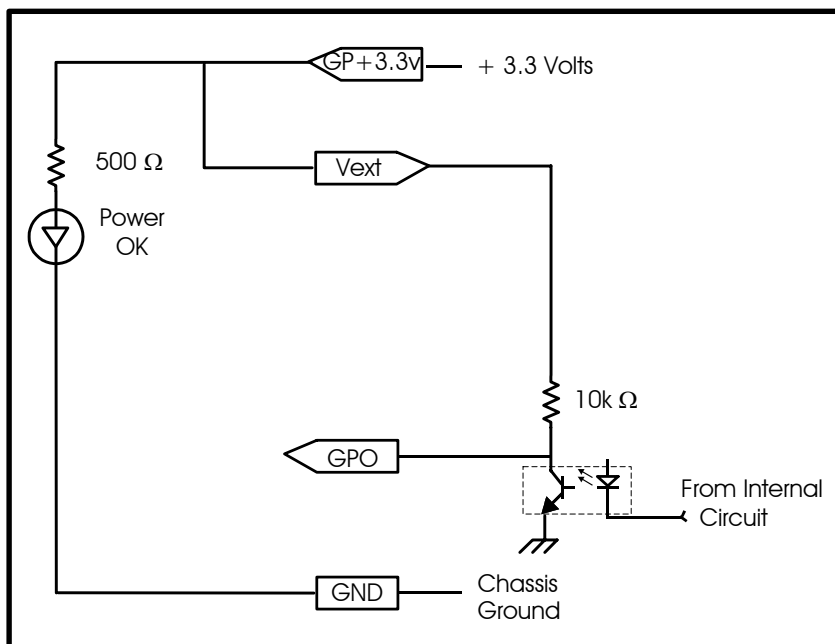
Figure 2-5: Powering the General Purpose Output Opto-Isolators from the Unit
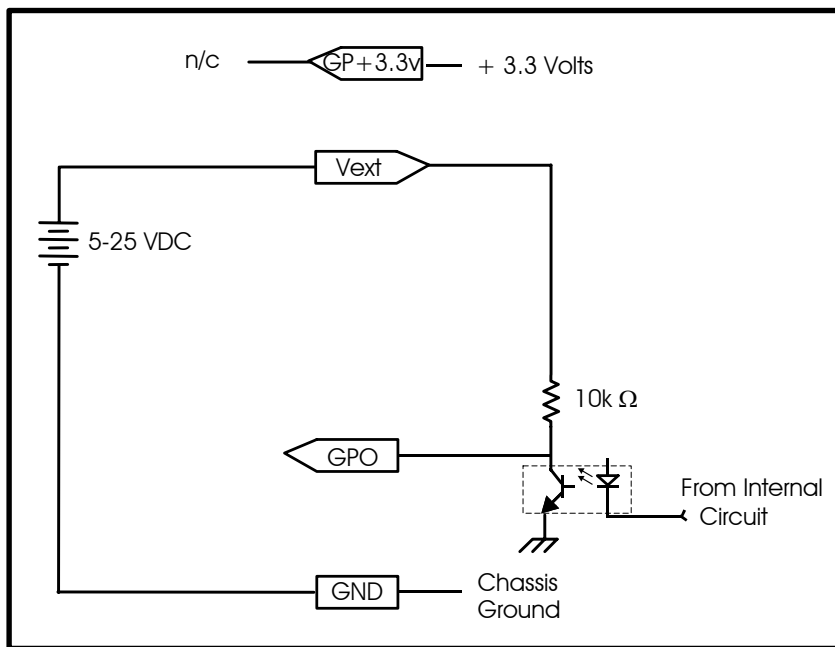
Figure 2-6: Powering the General Purpose Output Opto-Isolators from an External Power Supply

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CHAPTER 3
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Figures

Tables

3. HOW TO OPERATE THE DOWNSTREAM KEYER USING THE RACK MOUNT CONTROL PANEL

The standard HD9626DSK is a 1 RU chassis with an integrated front control panel. The HD9626DSK Downstream Keyer is also available as a 1 RU chassis with a separate 1 RU rack mountable or desktop remote control panel. This chapter describes the operation of the HD9626DSK using either the integrated control panel or the rack mount control panel. For information about controlling the HD9626DSK Downstream Keyer using the desktop control panel see section 4. For information about connecting the remote control panel to the HD9626DSK Downstream Keyer see section 2.4

3.1. AN OVERVIEW OF KEY AND DISPLAY FUNCTIONS
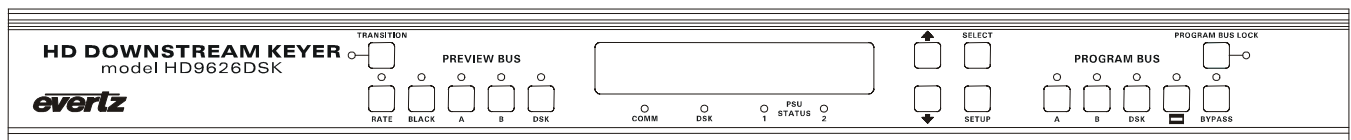
Figure 3-1: HD9626DSK Front Panel Layout

The front panel controls consist of a 16 digit alphanumeric display, 20 illuminated pushbuttons and 4 non-illuminated pushbuttons.

The illuminated keypad is used to provide control of the keyer and to switch the various input sources. The non-illuminated keypad is used to navigate the front panel *Setup* menu system, a quick and simple method of configuring the HD9626DSK keyer for your application.

3.1.1. Transition Button Group

TRANSITION: The **TRANSITION** button transfers the Preview bus material to the Program bus using a pre-configured transition type. The transition type is set in section 3.8.1. The **TRANSITION** button is similar to the TAKE command on other products.

RATE: The **RATE** button is used to recall a pre-configured transition rate. The transition rate defines the number of frames that a transition will take to complete. If the **RATE** button is not selected then a default CUT transition will occur.

3.1.2. The Preview Bus Button Group

This group of four buttons are used to select the source to put on the Preview bus. The Preview bus consists of four sources: Black, Input A, Input B, and DSK.

> ✎ The four buttons on the Preview Bus are MUTUALLY EXCLUSIVE. This means if one is selected, the others are automatically deselected from the Preview Bus.

BLACK: The **BLACK** button selects the internal Black Generator. If the **BLACK** button is selected, all the other sources are deselected on the Preview Bus.

INPUT A: The **A** button selects the video source from the **HD SDI INPUT A** and puts it on the Preview Bus.

INPUT B: The **B** button selects the video source from the **HD SDI INPUT B** and puts it on the Preview Bus.

DSK: The DSK button will display the background video with the selected FILL video mixed (based on the selected Key video) on the Preview Bus.

See section 3.7 for information about setting up the DSK MODE and other settings.

3.1.3. The Program Bus Button Group

This group of four buttons are used to select the source to put on the Program Bus. The Program Bus consists of four sources: Input A, Input B, DSK, and MATTE.

> **The four buttons on the Program Bus are MUTUALLY EXCLUSIVE. This means if one is selected, the others are automatically deselected from the Program Bus.**

INPUT A: The **A** button selects the video source from the **HD SDI INPUT A** and puts it on the Program Bus.

INPUT B: The **B** button selects the video source from the **HD SDI INPUT B** and puts it on the Program Bus.

DSK: The DSK button will display the background video with the selected FILL video mixed (based on the selected Key video) on the Program Bus. See section 3.7 for information about setting up the *DSK MODE* and other settings.

MATTE: The **MATTE** button selects the pre-configured MATTE. The MATTE function is configured in section 3.6. The MATTE is enabled and disabled in both the Preview and Program outputs.

3.1.4. Setup Button Group

SETUP: This button is used to enter the *Setup* menu, which is used to control various setup options to configure the operating modes of the unit (See section 3.3 for an overview of the *Setup* menu.) Once the user is in the *Setup* menu, this button is also used to back out of the menu selections to the next higher menu level or to exit the *Setup* menu and return to normal panel operation.

SELECT: When in the *Setup* menu, this button is used to choose a sub-menu and navigate to the next level down in the menu structure. Once the user is at the bottom level of the menu system it is also used to accept numeric values or to make the displayed menu choice the active value for that menu item.

↑, ↓   When in the *Setup* menu, the ↑ and ↓ arrow keys are used to move to various items at the current menu level in the menu system. The ↑ and ↓ arrow keys are also used to enter numeric values for menu choices at the bottom level of the menu system.

3.1.5. Control Button Group

PROGRAM BUS LOCK: The **PROGRAM BUS LOCK** button will lock the status of the output video. Transitions are enabled while the Program Bus Button Group is ignored (see section 3.1.3).

BYPASS: The **BYPASS** button will force the relay on the input of the I/O module to disengage. This will route the incoming video directly out through the relay bypass output connector. The LED above the **BYPASS** button illuminates to indicate that the unit is in manual Bypass. Pressing the **BYPASS** button once again energizes the relay allowing the input video to pass through the unit. The bypass relay will disengage if the frame loses power preserving the video output stream. Note: Only the bypass output connector is bypass relay protected, all other outputs will not function on a power loss. The bypass option must be purchased for HD9626DSK.

3.1.6. Control Panel Status Indicators

The buttons in the Preview Bus and Program Bus groups are all fitted with internal status LEDs that illuminate to show operational status of the downstream keyer at a glance. In general, when a button is flashing on and off, it indicates that the associated function is active on the Preview Bus. In general, when a button is on solid, it indicates that the associated function is active on the Program Bus.

COMM: When illuminated, this LED indicates that the communications circuitry is active. The communications circuitry is active when one or more external applications are sending or receiving data from the DB9 connectors on the rear of the unit. Examples of external applications could be Automation systems or Monitoring devices.

DSK: This button LED indicates that the downstream keyer layer is enabled on the Preview Bus when it is flashing and is enabled on the Program Bus when it is on solid. When it is off, it indicates that the downstream keyer layer is disabled.

3.1.7. Electronics Unit Status Indicators

PSU STATUS 1, 2: These green LEDs indicate that the corresponding power supply is functioning normally. On units fitted with a single power supply the **PSU STATUS 2** LED will be off all the time.

3.1.8. Front Panel Display Functions

The 16 character alphanumeric display is used to show the *Setup* menu items to configure the unit.

3.2. AN OVERVIEW OF THE SETUP MENU SYSTEM

The *SETUP* menu system uses the 16 digit alphanumeric display and provides a quick, intuitive method of configuring the Router. The *SETUP* Menu contains items that pertain to the overall operation of the router. These items are normally only required to be set up at installation time, and do not pertain to the day-to-day operation of the unit. Figure 3-2 provides an overview of the *Setup* menu system.

GENERAL
├ **Select Standard**
├ **Reference Timing**
├ **Update Code**
├ **Output Mode**
├ **Network Info**
├ **Serial Control**
├ **COM D**
├ **COM E (net)**
├ **Genlock Status**
├ **Unit Name**
├ **Automation Debug**
└ **M2100 Auto Debug**

MATTE
├ **Matte On/Off**
├ **Aspect**
├ **Top**
└ **Bottom**

DSK
├ **Key Type**
├ **Key Gain**
├ **Key Offset**
└ **Key Threshold**

TRANSITION
├ **Transition Type**
├ **Transition Rate**
├ **Transition Swap**
└ **Transition Pause**

PRESET
├ **Recall Preset**
├ **Store Preset**
├ **Export Preset**
├ **Preset Source**
├ **GPI Setup**
└ **GPO Setup**

Figure 3-2: Overview of the Setup Menu

3.3. NAVIGATING THE SETUP MENU

To enter the *Setup* menu, press the **SETUP** button. This will bring the user to the main *Setup* menu where ⬆ & ⬇ buttons can be used to move up and down the list of available sub-menus. Top level menu items are shown in UPPERCASE on the display screen. Once you have chosen the desired sub-menu, press the **SELECT** button to select the next menu level.

Once in a sub-menu, there may be another menu layer (shown in Title Case), or there may be a list of parameters to adjust (shown in lower case). If there is another set of menu choices, use the ⬆ & ⬇ buttons to select the desired menu item and press the **SELECT** button. Continue this process until the bottom of the menu tree is reached and the list of parameters to be adjusted is shown.

To adjust any parameter, use the ⬆ & ⬇ buttons to move up or down the parameter list to the desired parameter. To view the possible values for that item, press the **SELECT** button. The current value for that parameter will be shown blinking. Pressing the ⬆ & ⬇ buttons allows the user to show the possible values for the selected parameter. The various parameter values that are not currently selected will NOT be blinking. Once you have reached the desired value, press the **SELECT** button to save your selection. The value shown will begin blinking; indicating that it is now the current value. To move up one level in the menu press the **SETUP** button.

Other parameters can be selected from that sub-menu by using the ⬆ & ⬇ buttons, followed by the **SELECT** button. Alternately you can move up one menu level by pressing the **SETUP** button.

Once all the desired changes have been made, press the **SETUP** button one or more times until it returns to the top of the Menu tree and exits the *Setup* menu.

Each of the menu items, with function explanations, is described in the following sections.

3.4. FRONT PANEL SETUP MENU – MAIN MENU

The Front panel *Setup* menu is arranged in a layered structure that groups similar configuration items together. The following section provides a brief description of the first level of menus that appear when you enter the menu. Selecting one of these items will take you to the next menu level. Sections 3.5 to 3.9 provide detailed descriptions of each of the sub-menus. The tables in these sections are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

GENERAL	This menu is used to set up the video standard, COM ports, network address, time and other miscellaneous settings, as well as to update firmware.
MATTE	This menu is used to configure the matte attributes.
DSK	This menu is used to configure the DSK functions – key type, gain, and thresholds.
TRANSITION	This menu is used to set up the transition type, rate and the unit's swap mode.
PRESET	This menu is used to save and recall user presets, and to configure the General Purpose inputs and outputs.

3.5. GENERAL CONFIGURATION ITEMS

The *GENERAL Setup* menu is used to set up various items related to the overall operation of the HD9626DSK such as Video standard, Time settings, Network info, COM port settings and firmware versions. Table 3-1 shows the items available in the *GENERAL Setup* menu. Sections 3.5.1 to 3.5.9 provide detailed information about each of the sub-menus.

Select Standard	Sets the video standard
Reference Timing	Configures the reference timing of the device
Update Code	Allows the user to upgrade the devices' firmware
Output Mode	Set the output behaviour of the device
Network Info	Configures the network settings
Serial Control	Configures the Serial Control port (cannot be modified)
Com D	Configures the Com D port
Com E (net)	Configures the virtual serial port (Com E)
Genlock status	Displays the status of the genlock
Unit Name	Sets the unit name when used with a M2100 control panel
Automation Debug	Debugging tool for the Evertz automation protocol
M2100 Auto Debug	Debugging tool for the M2100 automation protocol

Table 3-1: Top Level of the General Setup Menu

3.5.1. Selecting the Video Standard

```
GENERAL
  Select Standard
    1080i/59.94
    1080i/50
    720p/59.94
    720p/50
```

The *Select Standard* menu item is used to set the video standard in use.

Select *1080i/59.94* for operation with 1080i/59.94 video conforming to SMPTE 274M.

Select *1080i/50* for operation with 1080i/50 video conforming to SMPTE 274M.

Select *720p/59.94* for operation with 720p/59.94 video conforming to SMPTE 296M.

Select *720p/50* for operation with 720p/50 video conforming to SMPTE 296M.

3.5.2. Setting the Video Output Timing With Respect To Reference

```
GENERAL
  Reference Timing
    Type
      In Video
      In Genlock
```

This menu item allows the user to set the reference type. The downstream keyer can be referenced by the input video or by the source applied to the **REF IN** BNC.

```
GENERAL
  Reference Timing
    Timing
      0 to max
      samples
```

When the reference timing is set to *Input Video,* the user can adjust the timing of the output video with respect to the input video in samples per line.

The output stage of the downstream keyer contains a line buffer so that the output video can be timed with respect to the reference applied to the **REF IN**.

> ⚠ **The *H and V Phase Offset* adjustment is a REAL TIME ADJUSTMENT and will affect the output video timing immediately. These settings should not be adjusted when the output video is in the broadcast chain.**

```
GENERAL
  Reference Timing
    H: 0 to max samples
```

This menu item allows you to set the horizontal timing of the output video with respect to the genlock reference input. Setting this control to 0 keeps the output video in time with the genlock reference.

Increasing the value will delay the output video in one-sample increments. In order to advance the horizontal timing of the output video with respect to the genlock video, set the control to the maximum number of samples per line for the output video standard minus the number of samples that you wish to advance the output video. (E.g. for 1080i/59.94 output video the total number of samples per line is 2200, so to advance the output video 5 samples set the value to 2195.)

GENERAL
Reference Timing
V: 0 to max lines

This menu item allows you to set the vertical timing of the output video with respect to the genlock reference input. Setting this control to 0 keeps the output video in time with the genlock reference.

Increasing the value will delay the output video in one-line increments. In order to advance the vertical timing of the output video with respect to the genlock video, set the control to the maximum number of samples per line for the output video standard minus the number of samples that you wish to advance the output video. (E.g. for 1080i/59.94 output video the total number of samples per line is 2200, so to advance the output video 5 samples set the value to 2195.)

3.5.3. Viewing and Updating the Firmware Version

GENERAL
Update Code
1.0 build 100
boot 1.01
Upgrade firmware

The Update Code menu item allows the user to view the firmware version that is installed in the HD9626DSK and to update the firmware.

When you press the **SELECT** pushbutton, the display shows the software version which will look similar to the following:

```
1.0 build 100
```

Use the ⬆ or ⬇ pushbuttons to display the boot code version which will look similar to the following:

```
Boot 1.01
```

Select *Upgrade firmware* to upgrade the firmware in the HD9626DSK. For information on completing the firmware upgrade see the Firmware Upgrade section 5.2 of this manual.

3.5.4. Configuring the Output Mode for the Keyer

GENERAL
Output Mode
A/B Mix
Fill/B

The user can configure the downstream keyer to behave in two different modes.

A/B Mix: 2x1 downstream keyer with a DSK Program A and B

Fill/B: DSK mode (Fill is used, B is not used at all)

3.5.5. Setting Up the Units Network Addresses

The *Network Info* sub-menu of the *General* Setup menu is used to configure the unit for FTP uploads of firmware. In most cases you will only have to plug in your Ethernet cable and configure the network IP address (*A*) to contain an unused IP address in the valid range. Entries are made in standard IP address format. Please consult your Network administrator for IP address allocations, netmask and gateway requirements.

To set the various *Network Info* parameters, press the **SELECT** button when the desired parameter is shown on the front panel display (indicated by the letter on the left side of the display). The left group of digits will be flashing to indicate that they are in entry mode. Use the ↑ or ↓ pushbuttons to change this group to the desired value. Then press the **SELECT** button and the next group of digits will be flashing to indicate that they are in entry mode. Set the remaining groups of digits in the same way. When you have entered the correct value for the right group of digits, press the **SELECT** button to set the parameter. The display will stop flashing to indicate that the parameter value has been set. The settings become active immediately after you exit the *Network Info* menu level. A reboot is not required.

3.5.5.1. Setting Up the IP Address

GENERAL
Network Info
A 196.168.1.1

This menu item sets the unique IP address of the HD9626DSK within the network. 192.168.1.XXX is an example of an IP address in a private (internal) network. If connecting multiple downstream keyers, take care not to use the same IP address for each.

3.5.5.2. Setting Up the Sub Net Mask

GENERAL
Network Info
M 255.255.255.0

This menu item sets the "subnet mask" of the network. Specifically, this parameter outlines all the IP addresses that can communicate with the HD9626DSK. This parameter is usually set to 255.255.255.0 for a private network. Normally you will not have to adjust this parameter from its default value.

3.5.5.3. Setting Up the Gateway

GENERAL
Network Info
G 192.168.1.1

This menu item identifies the IP address of the "gateway" (commonly referred to as the "firewall"). In its simplest sense the gateway could be the PC directly connected to the HD9626DSK and running the network application software (i.e. InstaLogo or Nomad). In a private network, this gateway could be identified as 192.168.1.YYY. Normally you will not have to adjust this parameter from its default value.

3.5.5.4. Displaying the Ethernet Hardware Address

GENERAL
Network Info
0:2:C5:01:03:E2

This menu item displays the Ethernet hardware address of the unit (which cannot be changed).

3.5.6. Setting the Serial Protocol for the Serial Ports

The serial ports on the HD9626DSK are used for various functions. The UPGRADE RS-232 (A) port is used for upgrading firmware and other utility functions. The REMOTE PANEL (B) port is used to connect the rack mount remote control panel. The SERIAL CONTROL (C) and the COM D port is programmable and can be used for a variety of functions.

GENERAL
  Serial Control
    None
    Automation
    Control Panel
    Console
    M2100_AUTO
    XY_AUTO

This menu item allows you to set the communications protocol that will be used on Serial Control (COM port C).

Select N*one* to disable the use of the COM C port.

Select *AUTOMATION* when you want to control the keyer using the Evertz automation protocol. This is the setting you should use when you are controlling the keyer from the Evertz MetaCast software.

The *Control Panel* and *Console* functions are dedicated to ports B and A respectively and cannot be selected for COM C. These items are included for information purposes only.

Select M*2100_AUTO* when you want to control the keyer using the Grass Valley M2100 automation protocol.

Select *XY_AUTO* when you want to control the keyer using the xy logo inserter automation protocol. Note that only logo functions of the keyer can be controlled using the xy protocol.

There are four settings that are used when the keyer is under automation control. See your automation vendor for information about the protocols that are supported.

GENERAL
  COM D
    None
    Automation
    Control Panel
    Console
    M2100_AUTO
    XY_AUTO

This menu item allows you to set the communications protocol that will be used on COM port D.

Select *None* to disable the use of the COM D port.

The *Control Panel* and *Console* functions are dedicated to ports B and A respectively and cannot be selected for COM D. These items are included for information purposes only.

Select *AUTOMATION* when you want to control the keyer using the Evertz automation protocol. This is the setting you should use when you are controlling the keyer from the Evertz MetaCast software.

Select M*2100_AUTO* when you want to control the keyer using the Grass Valley M2100 automation protocol.

Select *XY_AUTO* when you want to control the keyer using the xy logo inserter automation protocol. Note that only logo functions of the keyer can be controlled using the xy protocol.

There are four settings that are used when the keyer is under automation control. See your automation vendor for information about the protocols that are supported.

GENERAL
COM E (net)
None
Automation
Control Panel
Console
M2100_AUTO
XY_AUTO

This menu item allows you to set the communications protocol that will be used on the virtual serial port COM E. The use of a serial to Ethernet converter is required to use COM E.

The same functions are available for COM E as for COM D, however, it is not recommended to use COM E for any of the automation protocols since TCP/IP traffic does not guarantee frame accurate control.

3.5.7. Displaying the Genlock Status

GENERAL
Genlock Status
Ref is unlocked
Ref is locked

This menu item displays the status of the keyer in regards to genlock. The status will indicate whether the keyer is locked to reference or not.

3.5.8. Setting the M2100 Unit Name

GENERAL
Unit Name
EVZ1
…
EVZ8

This menu item allows the user to set the unit name required when the HD9626DSK is used in conjunction with a M2100 control panel. Each keyer connected to the panel must have a unique name assigned.

3.5.9. Automation Debug Functions

Two automation debug functions are provided in the *GENERAL* menu. One is for the Evertz automation protocol and is called *Automation Debug*. The other is for the M2100 automation protocol and is called *M2100 Auto Debug*. Both functions work in essentially the same way. When you turn on one of the automation debug functions, the data packets being received from the automation system are output to the Upgrade RS-232 serial port. To view the data, use a terminal program with the following settings: baud rate: 57600, data bits: 8, parity: none, stop bits: 2, flow control: none.

These functions are used to view the commands that are being sent by the automation system. If you are having problems with a unit that is being controlled from automation, Evertz service personnel may ask you to provide a capture of the data being output on the serial port when the debug function is turned on.

3.6. MATTE CONFIGURATION ITEMS

The HD9626DSK Downstream Keyer has a black overlay matte that blacks out video and produces a letterbox effect on the output video. The *MATTE Setup* menu is used to configure the matte that can be applied over the program video. Table 3-2 shows the items available in the *MATTE Setup* menu. Sections 3.6.1 to 3.6.3 provide detailed information about each of the sub-menus.

Matte On/Off	Selects whether the matte is being keyed over the video or not
Aspect	Sets the aspect ratio of the matte
Top	Sets the last line of the top matte in user defined aspect ratio mode
Bottom	Sets the first line of the bottom matte in user defined aspect ratio mode

Table 3-2: Top Level of Matte Setup Menu

3.6.1. Turning the Matte On and Off

MATTE
Matte On/Off
Matte: Enable
Matte: Disable

This menu item is used to turn the matte on and off.

Select *Enable* to turn on the black matte overlay. This matte is on the top layer of the keyer and will overwrite all the video on the respective lines of the active picture. The matte does not blank the lines in the vertical interval.

Select *Disable* to turn off the black matte overlay.

3.6.2. Setting the Matte Aspect Ratio

MATTE
Aspect
Aspect: 1.77
Aspect: 1.85
Aspect: 2.35

This menu item is used to set the aspect ratio of the matte.

There are three pre-defined aspect ratios available. When you select one of these aspect ratios the HD9626DSK will automatically set the *Matte Top* and *Matte Bottom* menu items.

In addition you can set a user-defined aspect ratio by manually changing the *Matte Top* and *Matte Bottom* menu items. See section 3.6.3.

3.6.3. Setting a User Defined Matte Aspect Ratio

There are two menu items that allow the user to define custom aspect ratios for the matte. Selecting a pre-defined aspect ratio will lose any changes you have made to the *Matte Top* and *Matte Bottom* menu items unless they are stored using the user presets. See section 3.9.

MATTE
Top
Top: 50

This menu item is used to set the bottom line of the top matte.

Use the ↑ or ↓ pushbuttons to change the line number to the desired value. Either field 1 or field 2 lines can be used.

MATTE
Bottom
Bottom: 233

This menu item is used to set the top line of the bottom matte.

Use the ↑ or ↓ pushbuttons to change the line number to the desired value. Either field 1 or field 2 lines can be used.

3.7. DOWNSTREAM KEYER CONFIGURATION ITEMS

The HD9626DSK Keyers allow you to key objects into the output video. The *DSK Setup* menu is used to configure the downstream keyer functions – key type, gain, and thresholds. Table 3-3 shows the items available in the *DSK Setup* menu. Sections 3.7.1 to 3.7.4 provide detailed information about each of the sub-menus.

Key Type	Selects whether the DSK will perform a self key or use the supplied key and fill signals
Key Gain	Adjusts the transparency of the keyed object with respect to the key input
Key Offset	Shifts the base level for the entire range of colour values with respect to the key input
Key Threshold	Sets the level of the signal where the self key will occur

Table 3-3: Top Level of the DSK Setup Menu

3.7.1. Setting the Downstream Key Type

DSK
  Key Type
    Type: input
    Type: self

This menu item is used to select whether the downstream keyer will use the key and fill input to perform the keying function or whether it will perform a self key.

Select *input* to use the key and fill inputs provided on video inputs 11 and 12 of the HD9626DSK respectively.

Select *self* to perform a hard self key using the threshold value set in the *Key Threshold* menu item.

3.7.2. Setting the Downstream Key Object Transparency

DSK
  Key Gain
    Gain: 100
    50 to 170

This menu item is used to modify the opacity (transparency) of the keyed object used in *input* key mode.

The *Key Gain* range of values from 50 to 170 (per thousand). This setting increases or decreases the entire range of colour with respect to the key input. This will render the fill as more or less pronounced respectively.

Use the ↑ or ↓ pushbuttons to change the *Key Gain* value. The default *Key Gain* value of 100 will leave the transparency of the keyed object unmodified from that defined by the key signal. Lowering the *Key Gain* value will reduce the opacity of the keyed object (i.e. make it more transparent). Increasing the *Key Gain* value will increase the opacity of the keyed object (i.e. make it less transparent).

3.7.3. Setting the Downstream Key Object Offset

```
DSK
   Key Offset
      Offset: -256
      -4096 to 4095
```

This menu item is used to modify the key offset value used in *input* key mode. This value is the level that will be considered as black on the key input, and should not normally be changed from its default value of -256.

The *Key Offset* ranges in value from -4096 to +4095. This setting shifts the colour values with respect to key input.

3.7.4. Setting the Downstream Self Key Threshold

```
DSK
   Key Threshold
      Thresh: 4
      4 to 1020
```

This menu item is used to modify the threshold value used in *Self Key* mode. The *Self Key* is a hard key based on the luminance value of the fill signal applied to video input 12. All luminance values that are above the *Key Threshold* will be keyed from the Fill signal. All values from the key that fall below the *Key Threshold* will be keyed from the background video.

The default value for the *Key Threshold* is 4, which is black. The *Key Threshold* ranges from 4 Black to 1020 White.

3.8.   TRANSITION CONFIGURATION ITEMS

The HD9626DSK Keyer can transition between the video sources using a variety of standard transition types. The *TRANSITION Setup* menu is used to configure the transition type, rate and swap mode. Table 3-4 shows the items available in the *TRANSITION Setup* menu. Sections 3.8.1 to 3.8.4 provide detailed information about each of the sub-menus.

Transition Type	Selects type of video transition
Transition Rate	Adjusts the rate of the video transition
Transition Swap	Selects whether the program and preview buses will swap after the transition
Transition Pause	Selects whether the transition can be paused

Table 3-4: Top Level of the Transition Setup Menu

3.8.1. Setting the Transition Type

```
TRANSITION
    Transition Type
        fade
        cut
        fade-cut
        fade-fade
        cut-fade
        diamond in
        diamond out
        circle in
        circle out
        box in
        box out
        TB split
        LR split
        TB curtain
        LR curtain
        TR box
        TL box
        BR right box
        BL box
        wipe xxx
```
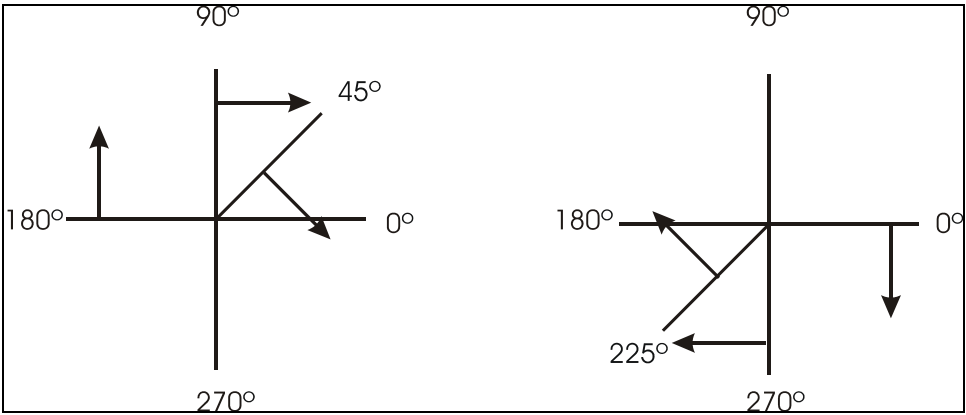
This menu item is used to select the type of transition you would like applied when the **TRANSITION** button is pressed. Transition effects only appear on the program output. Transitions on the Preview Output are always a Cut type performed at the end of the transition to program.

The *fade-cut, fade-fade,* and *cut-fade* transitions are two stage transitions. The transition shown first will be applied to the outgoing video, followed by the second transition. For example a *fade-fade* transition is a fade out to black followed by a fade in from black.

The numbers following the wipe patterns reference the angle of the wipe and direction of the wipe. Arrows indicate direction of wipe. For example a *Wipe 45* transition will start a 45 degree wipe that will progress from the top left of the screen to the bottom right of the screen.

3.8.2. Setting the Transition Rate

```
TRANSITION
    Transition Rate
        1 to 600
```

This menu item is used to set the time for the transition to complete. The duration is measured in frames.

Use the ⬆ or ⬇ pushbuttons to change the *Transition Rate* value and press the **SELECT** button.

3.8.3. Setting the Transition Swap Mode

```
TRANSITION
    Transition Swap
        Swap: Swap
        Swap: No Swap
```

This menu item is used to set the time for the transition to complete. The duration is measured in frames.

When set to *Swap* the input video and audio of the preview bus and the program bus will be swapped at the end of the transition. Logos and other media being keyed on the respective buses will also be swapped with the inputs.

When set to *No Swap* the input video and audio of the preview bus will be transferred to the program bus transition. Logos and other media being keyed on the preview bus will also be transferred to the program bus. The preview bus will remain unchanged.

3.8.4. Pausing a Transition

```
TRANSITION
    Transition Pause
        Pause: Off
        Pause: On
```

This menu item is used to set whether the Transition can be paused.

When set to *On*, the transition may be paused by pressing the **TRANSITION** button while the transition is being performed. To continue the transition, press the **TRANSITION** button again.

When set to *Off,* the transition cannot be paused.

3.9. PRESET CONFIGURATION ITEMS

The HD9626DSK keyer has 10 user presets that can store pre-defined configurations for such things as Matte settings, Transition settings and DSK settings. Therefore if you would like to store a preset that has a 2.35 matte applied, you must first configure the *Matte Aspect* and *Matte Enable* menu items, then store the preset at one of the user preset addresses. When presets are recalled, the settings are recalled to the preview bus and will not show on the program bus until the **TRANSITION** button is pressed, or a GPI trigger invokes the transition.

The *PRESET Setup* menu is used to store and recall user presets as well as configure the GPI and GPO functions. Table 3-5 shows the items available in the *PRESET Setup* menu. Sections 3.9.1 to 3.9.6 provide detailed information about each of the sub-menus.

> **After upgrading the HD9626DSK with new firmware, all presets should be recalled using the *Recall Preset* menu item, the values for new features must be set, and the preset must be saved again using the *Store Preset* menu item.**
>
> **IF THIS IS NOT DONE, OLD PRESETS COULD BE RECALLED WITH UNDESIRABLE SETTINGS.**

Recall Preset	Recalls 1 of the 10 user presets to the Preview bus
Store Preset	Stores the Program bus settings to 1 of the 10 user presets
Export Preset	Dumps the preset settings to the Upgrade RS-232 serial port
Preset Source	Selects whether the settings of the Preview bus or the Program bus will be saved as a preset
GPI Setup	Configures the General Purpose Inputs
GPO Setup	Configures the General Purpose Outputs

Table 3-5: Top Level of the Preset Setup Menu

3.9.1. Recalling a User Preset

```
PRESET
   Recall Preset
      Recall # 1
```

This menu item is used to recall 1 of the 10 user presets to the Preview bus.

Use the ⬆ or ⬇ pushbuttons to select the preset to recall. When you press the **SELECT** button the preset will be recalled to the preview bus overwriting the active settings. These settings will show on the program bus when the **TAKE** button is pressed, or a GPI trigger invokes the transition.

3.9.2. Storing a User Preset

```
PRESET
   Store Preset
      Store # 1
```

This menu item is used to store the preset settings to 1 of the 10 user presets.

Use the ⬆ or ⬇ pushbuttons to select the preset to save the settings to. When you press the **SELECT** button the settings will be saved overwriting any preset that was previously stored at that location.

3.9.3. Viewing the Preset Settings

```
PRESET
   Export Preset
      dump preset # 1
```

This menu item is used to dump the preset settings to the Upgrade RS-232 serial port.

Use the ⬆ or ⬇ pushbuttons to select the preset to dump. When you press the **SELECT** button the settings are output in readable text to the Upgrade RS-232 port. To view the settings, use a terminal program with the following configuration: baud rate: 57600, data bits: 8, parity: none, stop bits: 2.

This feature is used for information purposes only. The data cannot be used to send the preset to another unit.

3.9.4.   Selecting the Source of the Preset Settings

```
┌─────────────────────────┐
│ PRESET                  │
│   ┌─────────────────────┤
│   │ Preset Source       │
│   │   ┌─────────────────┤
│   │   │ store preview   │
│   │   │ store program   │
└───┴───┴─────────────────┘
```

This menu item is used to select the source of the preset settings.

Select *store preview* to use the preview bus as the source of the preset settings.

Select *store program* to use the program bus as the source of the preset settings.

3.9.5.   Configuring the GPI Inputs

The HD9626DSK Downstream Keyer is fitted with 8 general-purpose inputs (GPIs) that can be configured to trigger 2 different actions - *On Closure* and *On Open*. For example, the *On Closure* event can be used to load a preset and perform a transition to the program bus. The *On Open* event for the same GPI can be used to load a different user preset and perform a transition to the program bus. For each event, the user can configure a preset to load, transition to perform and logo to display.

3.9.5.1.   Selecting One of the GPI Inputs to Configure

```
┌─────────────────────────┐
│ PRESET                  │
│   ┌─────────────────────┤
│   │ GPI Setup           │
│   │   ┌─────────────────┤
│   │   │ GPI:A           │
│   │   │   ┌─────────────┤
│   │   │   │ GPI=A to H  │
└───┴───┴───┴─────────────┘
```

This menu item is used to select which of the GPI inputs will be configured using the other menu items in the *GPI SETUP* menu branch.

Upon entering the first menu branch, the selected GPI input will be shown. To change to configuring another GPI input press the **SELECT** button. The display will show `GPI=A` indicating that the GPI input can be changed. Use the ↑ or ↓ pushbuttons to select the GPI input you wish to configure and press the **SELECT** button. You can configure the preset to load, transition to make and logo to display when the selected GPI input is closed and opened using the other menu items in the *GPI SETUP* menu branch.

3.9.5.2.   Configuring the GPI Actions

There are 2 menu items that configure what happens when the selected GPI closes (*CLoadPrest,and CTransition)*. There are also 2 menu items that configures the actions when the selected GPI opens (*OLoadPrest, and OTransition)*. For the sake of simplicity in the manual, only the *On Close* event menu items will be shown. The applicable GPI is shown on the left of the front panel display. Each GPI can be independently configured by first selecting the GPI using the *GPI* menu item.

```
┌─────────────────────────┐
│ PRESET                  │
│ ┌───────────────────────┤
│ │ GPI Setup             │
│ │   ┌───────────────────┤
│ │   │ A CLoadPrest:1    │
│ │   │   ┌───────────────┤
│ │   │   │ NON           │
│ │   │   │ 1 to 10       │
└─┴───┴───┴───────────────┘
```

This menu item is used to select the preset that will be loaded when the GPI input is closed to ground.

Select *NON* to **not** load a user preset when the GPI is closed. The existing downstream keyer settings will be used.

Select *1* to *10* to load a specific user preset when the GPI is closed.

Note that the preset is loaded on the Preview bus. If the user wants the preset to go to the Program bus, set C Transition to *Yes.*

PRESET
GPI Setup
A CTransition
A CTransition: No
A CTransition: Ye

This menu item is used to select whether a transition will occur when the GPI is closed to ground.

Select *No* to **not** perform a transition when the GPI is closed.

Select *Ye* (yes) to perform a transition when the GPI is closed.

3.9.6. Configuring the GPO Outputs

The HD9626DSK Downstream Keyer is fitted with 4 contact closure general purpose outputs (GPOs) that can be used as tallies for various functions. Use the ↑ or ↓ pushbuttons to scroll through the list of available GPO's (1 through 4). The function of each GPO is displayed in brackets. To change the function of a GPO press the **SELECT** pushbutton. The GPO's are active low and require a pull-up resistor to make them high when not active. See section 2.7 for information on connecting the GPO's. All the GPO's have the same functions available. These functions are described below.

PRESET
GPO Setup
GPO 1 - 4
None
Bypass
Transition
Video C Invalid
Video C Valid
Video B Invalid
Video B Valid
Video A Invalid
Video A Valid
Fan OK
Power OK
PSUs Okay
PSU1 Okay
PSU2 Okay
DSK Statu
Program A
Program B
Program Black

Select *None* to disable the GPO

Select *Bypass* to make the GPO low when **BYPASS** is selected on the panel.

Select *Transition* to make the GPO low when **TRANSITION** is selected on the panel.

Select *Video (A, B, or C) Invalid* to make the GPO low when there is invalid video on inputs A, B or C is invalid.

Select *Video (A, B, or C) Valid* to make the GPO low when there is invalid video on inputs A, B or C is valid.\

Select *Fan OK* to make the GPO low when the fans are functioning.

Select *Power OK* to make the GPO low when either PSU1 or PSU2 are functioning.

Select *PSUs Okay* to make the GPO low when both PSU1 and PSU2 are functioning.

Select *PSU1 Okay* to make the GPO low when PSU1 is functioning.

Select *PSU2 Okay* to make the GPO low when PSU2 is functioning.

Select *DSK Statu (status)* to make the GPO low when the Downstream Keyer function is active on the Program bus.

Select *Program A or B* to make the GPO low when the specified source is being output on the Program bus.

Select *Program Black* to make the GPO low when black is being output on the Program bus.

CHAPTER 4
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4. HOW TO OPERATE THE KEYER USING THE DESKTOP CONTROL PANEL

The HD9626DSK Keyer is available as a 1RU chassis with a separate 1RU desktop remote control panel. This chapter describes the operation of the HD9626DSK Keyer using the desktop remote control panel. For information about connecting the desktop remote control panel to the HD9626DSK Keyer electronics see section 2.4.
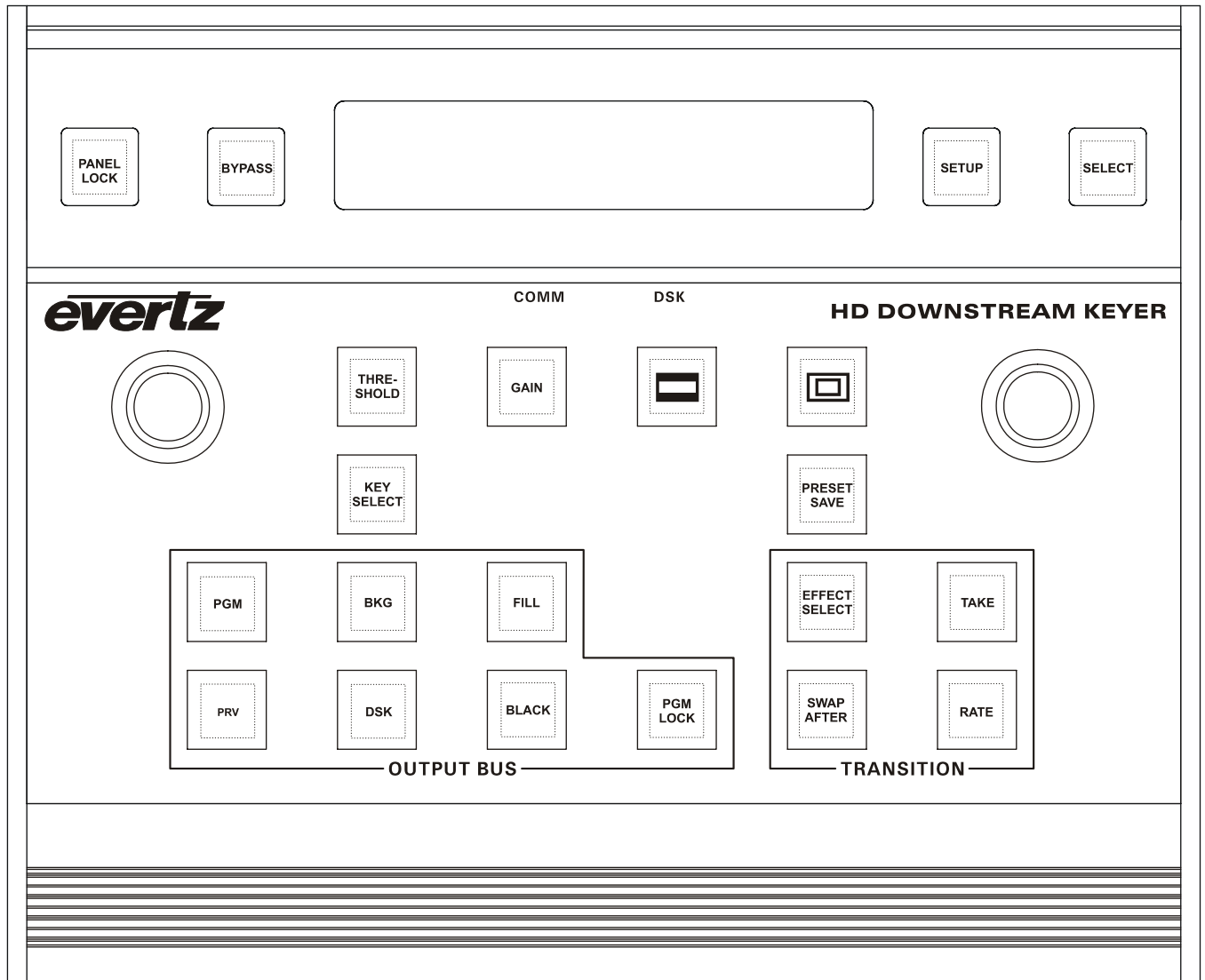

Figure 4-1: HD9626DSK + Desktop Control Panel

4.1.   AN OVERVIEW OF KEY AND DISPLAY FUNCTIONS

The Desktop panel controls consist of a shaft encoder knob, a 16 digit alphanumeric display, and 18 illuminated buttons. The illuminated buttons will light up to indicate that their controlled function is active.

The buttons are used to provide control of the HD9626DSK Downstream Keyer unit, and to navigate the front panel *Setup* menu system. The DCP enables a quick and simple method of configuring the Keyer. See sections 3.5 to 3.9 for information on configuring the unit using the *Setup* menu system.

4.1.1. Shaft Encoder Knobs

SHAFT ENCODER: The Shaft Encoders function as a replacement for the up and down arrow keys. This control knob is used to increment and decrement the values selected in the menu system. The shaft encoders enable the user to adjust the values, or to change the current selection in the setup menus. There are 2 shaft encoders in the DSK configuration and they both have the same function.

4.1.2. The Function Button Group

PANEL LOCK: The **PANEL LOCK** button is used to lock the control panel interface from accidental changes. This is a toggle **ON/OFF** switch and is engaged when the button's internal LED is illuminated.

TAKE: When illuminated, this LED indicates that a transition from the **PREVIEW BUS** to the **PROGRAM BUS** is in progress. Transitions are configured from the on screen menus and buttons described earlier. This button is used to transfer the **PREVIEW BUS** material to the **PROGRAM BUS** using the pre-configured transition type.

EFFECT SELECT: This button is quick access into the internal menu system of the DSK unit. This button allows the user to access the Transition Type level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the **SHAFT ENCODERS** to select the transition option from the DSK sub-menu. Select the desired type of transition that is applied when the **TRANSITION** button is pressed. Options are Cut, Fade, Wipe 315, Wipe 270, Wipe 225, Wipe 180, Wipe 135, Wipe 90, Wipe 45 or Wipe 0. (item orders may vary). Transition effects only appear on the program output. Transitions on the Preview Output are always Cut type performed at the end of the transition to program. The numbers following the Wipe reference the angle of the wipe. This also indicates the direction of the wipe. For example a wipe of 45 will start a 45 degree wipe that will progress from the top left of the screen to the bottom right of the screen. See the diagram below for an example. Arrows indicate direction of wipe.

90°   90°

45°

180° ———————— 0°   180° ———————— 0°

225°

270°   270°
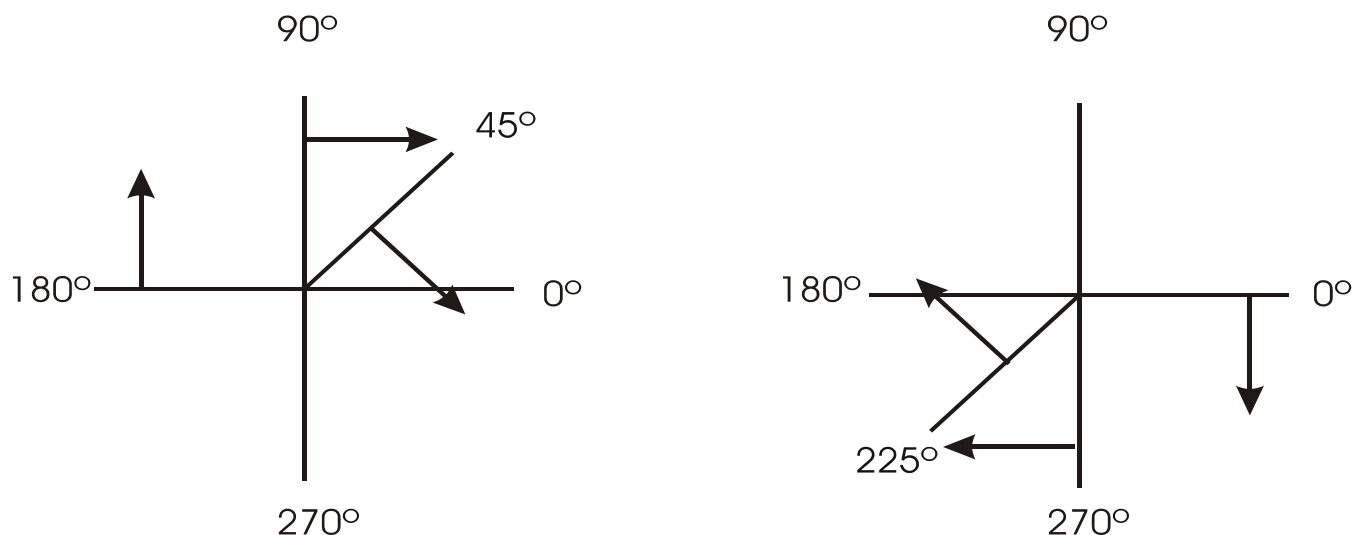
Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

4.1.3. Setup Key Group

SETUP: Press the **SETUP** button to enter the setup menu. Options will be displayed on the display panel. Use the shaft encoder to cycle through the available setup options. Press the **SELECT** button to choose the currently displayed setup option; the current value for that setup option will be displayed. Use the shaft encoders to change the value. Press the **SELECT** button to save the change or the **SETUP** button to cancel the change or exit that setup option. Press the **SETUP** button again to exit the setup menu completely. All buttons on the DCP panel are disabled when the user enters the "On Screen Menu" system, with the exception of the **SELECT, SETUP** and **PANEL LOCK** buttons.

SELECT: The **SELECT** button is similar to the "enter" key on a standard PC keyboard. The button is used to confirm operations, save settings, confirm choices etc.

KEY SELECT: This is a quick access into the internal menu system of the DSK unit. This button enables the user to access the Key Type level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the shaft encoders to select the Key type option from the DSK sub-menu. After pressing the **KEY SELECT**, the user may adjust the value for either input or self. Select Input to use the Input Key from the Key video input Source or select "Self" to use the settings provided in the Threshold, Sharpness, and Filter settings that follow. In the "Self" mode, the video on the fill input is used as a source for keying based on the other related parameters mentioned above. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

4.1.4. Control Panel Status Indicators

BYPASS: Pressing the **BYPASS** button will force the relay on the input of the I/O module to disengage. This will route the incoming video directly out through the relay bypass output connector. The LED inside the **BYPASS** button illuminates to indicate that the unit is in manual Bypass. Pressing the button once again energizes the relay allowing the input video to pass through the unit. The **BYPASS** relay will disengage if the frame loses power preserving the video output stream. Note: Only the bypass output connector is bypass relay protected, all other outputs will not function on a power loss. The bypass option must be purchased for HD units and may not be installed in your unit. SD units have a bypass as a standard feature.

THRESHOLD: This is a quick access into the internal menu system of the DSK unit. This button enables the user to access the Threshold level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the shaft encoders to select the Threshold option from the DSK sub-menu. After pressing the threshold button you may use the shaft encoders to cycle through the range from 4 Black to 1020 White. The **SELF** KEY is a hard key. All values from the key that fall above the Key Threshold will be keyed from Fill. All values from the key that fall below the Key Threshold will be keyed from Background. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

GAIN: This is a quick access into the internal menu system of the DSK unit. This button enables the user to access the Gain level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the shaft encoders to select the Gain option from the DSK sub-menu. After pressing the gain, the user may adjust the range of values from 500 to 2000 (per thousand). This setting increases or decreases the entire range of colour with respect to the key input. This will render the fill as more or less pronounced respectively. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

MATTE: This is a **MATTE** On/Off button. A lit LED indicates that the Matte is enabled. Matte settings can be changed from the Matte menu option. Press the **SETUP** button and scroll to the Matte menu item to make changes to the aspect ratio and other aspects of the Matte.

GRATICULE: A lit LED indicates that the graticules are ON. Graticules are only visible on the preview output. Graticules are a SD feature only and not available on the HD version of the DSK.

PRESET SAVE: This is a quick access into the internal menu system of the DSK unit. This button enables the user to access the **PRESET SAVE** level of the menu system. This is similar to pressing the Setup button to access the menu system and then using the shaft encoders to select the Save Preset option from the Preset sub-menu. After pressing the **PRESET SAVE** button the user may adjust the value from 1 to 10 to store the preview bus state into a storage file that can be recalled at a later time. This stored preset can be triggered from automation, or recalled from the preset recall option of the preset sub-menu. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

PGM: The **PGM** and **PRV** buttons control which bus the button presses of the **BKG, DSK, FILL** and **BLACK** affect. If the PGM output bus is active (as indicated by a lit PGM button), then pressing the above mentioned buttons will switch the output video of the program bus.

PRV: The **PRV** and **PGM** buttons control which bus the button presses of the **BKG, DSK, FILL** and **BLACK** affect. If the PRV output bus is active (as indicated by a lit PRV button), then pressing the above mentioned buttons will switch the output video of the preview bus.

BKG: This button sets the output bus to display the video from the BGND/A input. If the button is flashing, the preview output is set to BKG, if the button is on solid the program output is set to BKG. If the preview and program are both set to display the BKG, then the button will be on solid.

FILL: This button sets the output bus to display the video from the Fill/B input. Button LED states as per the BKG button description.

DSK: This button sets the output bus to display the video from the **BKND/A** input, mixed with the video from the **FILL/B** input, based on the settings from the Key Setup menu. Button LED states as per the BKG button description.

BLACK: This button sets the output bus to display the black video. Button LED states as per the BKG button description.

PGM LOCK: This button locks manual changes to the output video on the program bus. Transition changes from the take button and GPI triggers are still active and can change program output.

SWAP AFTER: This is a quick access into the internal menu system of the DSK unit. This button enables the user to access the Transition level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the shaft encoders to select the transition option from the menu. Toggle **YES/NO** setting for whether the program and preview channels are swapped after a transition or take command is issued. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

RATE: This is a quick access into the internal menu system of the Downstream Keyer unit. This button enables the user to access the Rate level of the menu system. This is similar to pressing the **SETUP** button to access the menu system and then using the shaft encoders to select the transition option from the menu. Set the time for the transition to take affect. The setting is referenced in frames. Quick access is provided from the front panel **RATE** button. Press **SELECT** to accept the changes or **SETUP** to escape without making any changes.

COMM LED: When illuminated, this LED indicates that the communications circuitry is active. The communications circuitry is active when one or more external applications are sending or receiving data from the DB9 connectors on the rear of the unit. Examples of external applications could be Automation systems or Monitoring devices.

DSK LED: When illuminated, this LED indicates that the unit is actively using the **FILL** Key and Background video inputs. Flashing indicates the DSK is only on the preview output

4.2.   AN OVERVIEW OF THE SETUP MENU SYSTEM

The *SETUP* menu system uses the 16 digit alphanumeric display and provides a quick, intuitive method of configuring the HD9626DSK Keyer. These items are often only required to be set up at installation time, and do not pertain to the day-to-day operation of the unit. Figure 3-2 provides an overview of the *Setup* menu system.

4.2.1. Navigating the Setup Menu

To enter the *Setup* menu, press the **SETUP** button. This will bring up the main *Setup* menu where the user can use the **SHAFT ENCODER** to move up and down the list of available sub-menus. Top level menu items are shown in UPPERCASE. Once you have chosen the desired sub-menu, press the **SELECT** button to select the next menu level.

Once in a sub-menu, there may be another menu layer (shown in Title Case), or there may be a list of parameters to adjust (shown in lower case). If there is another set of menu options, use the **SHAFT ENCODER** to select the desired menu item and press the **SELECT** button. Continue this process until you get to the bottom of the menu tree where the list of parameters to be adjusted is shown.

To adjust any parameter, use the **SHAFT ENCODER** to move up or down the parameter list to the desired parameter. To view the possible values for that item, press the **SELECT** button. The current value for that parameter will be shown with an asterisk (*). Turning one of the **SHAFT ENCODERS** allows the user to show the possible values for the selected parameter. The various parameter values that are not currently selected will NOT have an asterisk (*). Once the desired selection is found, press the **SELECT** button to save the selection. The value will be shown with an asterisk (*) indicating that it is now the current value. To move up one level in the menu, press the **SETUP** button.

The user can select other parameters from that sub-menu by using the **SHAFT ENCODER**, followed by the **SELECT** button. Alternately the user can move up one menu item by pressing the **SETUP** button.

Once all the desired changes have been made, press the **SETUP** button one or more times until it returns to the top of the Menu tree and exits the *Setup* menu.

Each of the menu items, with function explanations, is described in sections 3.5 to 3.9.

CHAPTER 5
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5. TECHNICAL DESCRIPTION

5.1. SPECIFICATIONS

5.1.1. Video Specifications

5.1.1.1. HD Serial Digital Video Input

Standard: 1.485 Gb/sec HD Serial component digital SMPTE 292M
standards supported shown in Table 2-6 - software selectable
SMTPE 292M 1.485Gb/s, 1080i/60, 1080i/59.94, 1080/50, 1080p/24(sF),
1080p/23.98 (sF), 720p/60, 720p/59.94
Number of Inputs: 4 (A, B, Key and Fill)
Connector: BNC per IEC 61169-8 Annex A.
Equalization: Automatic 100m @ 1.5Gb/s with Belden 1694 or equivalent cable
Impedance: 75 ohm
Return Loss: > 15 dB up to 1.5Gb/s Mb/s

5.1.1.2. HD Serial Digital Video Outputs

Standard: SMPTE 292M, same as input
Number of Outputs: 1 Program, 1 preview
Connectors: BNC per IEC 61169-8 Annex A.
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal
Overshoot: <10% of amplitude
Wide Band Jitter: < 0.2 UI
Impedance: 75 ohm

5.1.1.3. Serial Remote Control

Serial Control: RS-232/422, 8 bits, no parity, 9600, 19200, 38400, 57600 baud, computer control of all functions

Upgrade Port: 9 pin female "D", RS-232 57600 baud, 8 bits, no parity for firmware upgrade

COM D Port: 9 pin female "D", RS-232/422 8 bits, no parity, baud rate depends on protocol.

Selectable protocols: Automation, EAS Interface, temperature probe interface.

Remote Panel Port: 9 pin female "D", RS-422 9600 baud, 8 bits, no parity
Rack mount control panel interface

5.1.2. Control

Logo Transfers: RJ-45 100Base T Ethernet, TCP/IP

5.1.3. Video Reference

Type: Depends on video format
                                   NTSC or PAL Colour Black 1 V p-p
Connectors: BNC per IEC 61169-8 Annex A.
Termination: High impedance loop through on router unit
                                   75 ohm terminated on keyer unit

5.1.4. General Purpose Inputs and Outputs

Number of Inputs: 8, programmable functions
Number of Outputs: 4
Type: Opto isolated, active low
Connector: Female High-density DB-15
Signal Level: +5V nominal. Pulled up to Vext supplied voltage. 3.3V DC provided.

5.1.5. Electrical

Power: Auto-ranging 115/230 VAC 50/60 Hz, 30 VA.
Safety: ETL listed. Complies with EU safety directive
EMI/RFI: Complies with FCC Part 15 Class A, EU EMC Directive

5.1.6. Physical

Dimensions: 19" W x 1.75" H x 18.75" D.
                          (483mm W x 45mm H x 477mm D)

Weight (total):   8 lbs. (3.5kg)

5.2.   UPGRADING THE FIRMWARE - RS232 SERIAL PORT

5.2.1.   Overview

The firmware in the downstream keyer units is contained on a FLASH EPROM. Occasionally, firmware updates will be provided to add additional features to the units.   The router unit and the keyer unit each have their own firmware and each must be updated separately if required. The keyer unit update can be initiated using either the front panel or the terminal program method. As the router unit has no front panel it can only be initiated using the terminal program method.

The following equipment is required in order to update the Firmware:
- PC with available communications port. The communication speed is 57600 baud, therefore a 486 PC or better with a 16550 UART based communications port is recommended.
- "Straight-thru" serial extension cable (DB9 female to DB9 male).
- Terminal program that is capable of Xmodem file transfer protocol. (such as HyperTerminal)
- New firmware supplied by Evertz.

> **After upgrading the HD9626DSK with new firmware, all presets should be recalled using the *Recall Preset* menu item, the values for new features must be set, and the preset must be saved again using the *Store Preset* menu item.**
>
> **IF THIS IS NOT DONE, OLD PRESETS COULD BE RECALLED WITH UNDESIRABLE SETTINGS.**

5.2.2. Terminal Program Setup

1. If updating the keyer unit firmware, connect the serial cable to the **UPGRADE RS232** DB9 connector on the keyer unit rear panel. If you are updating the router unit firmware, connect the serial cable to the **REMOTE CTL** DB9 connector on the router unit rear panel.

2. Connect the 9 pin connector on the end of the serial update cable to the PCs' RS-232 communications port

3. Start the terminal program.

4. Configure the port settings of the terminal program as follows:

Baud	57600
Parity	No
Data bits	8
Stop bits	2
Flow Control	None
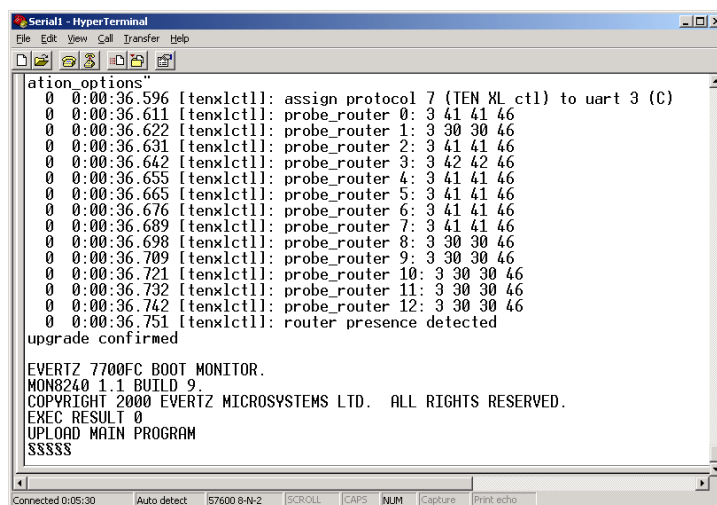
5. Power up the unit.

5.2.3. Initiating Firmware Upgrade Mode Via the Front Panel (Keyer units only)

This is the recommended method of updating the software in the keyer units. It is activated through the *GENERAL* Setup menu branch. If unable to invoke the upload mode via the front panel as outlined in step 6 then follow the steps in section 5.2.4.

6. You can invoke the Firmware upgrade mode using the front panel Setup Menu. (See section 3 for information on how to operate the front panel menus.) Press the **SETUP** button to enter the top level of the Setup menu. Use the ⬆ or ⬇ pushbuttons to find the *GENERAL* menu item and then press the **SELECT** button. Use the ⬆ or ⬇ pushbuttons to find the Update Code menu item and then press the **SELECT** button. Use the ⬆ or ⬇ pushbuttons to find the *yes-upgrade now* menu item and then press the SELECT button.

    Once the **SELECT** button is pressed the keyer unit will be placed in programming mode and its serial port is opened to communicate with the terminal software program. The following message will appear on the terminal screen

    Proceed to section 5.2.5 for instructions on uploading the firmware using the terminal program.

5.2.4. Initiating Firmware Upgrade Mode from the Terminal Program

7. Power up the unit. After the unit powers up, a banner with the boot code version information should appear in the terminal window. A series of characters are slowly displayed after the upload main program line. (The symbol displayed may vary from that shown in the figure). The symbol used depends on the font selected for use with HyperTerminal.

For example:

```
Serial1 - HyperTerminal
File  Edit  View  Call  Transfer  Help

ation_options"
    0  0:00:36.596 [tenxlctl]: assign protocol 7 (TEN XL ctl) to uart 3 (C)
    0  0:00:36.611 [tenxlctl]: probe_router 0: 3 41 41 46
    0  0:00:36.622 [tenxlctl]: probe_router 1: 3 30 30 46
    0  0:00:36.631 [tenxlctl]: probe_router 2: 3 41 41 46
    0  0:00:36.642 [tenxlctl]: probe_router 3: 3 42 42 46
    0  0:00:36.655 [tenxlctl]: probe_router 4: 3 41 41 46
    0  0:00:36.665 [tenxlctl]: probe_router 5: 3 41 41 46
    0  0:00:36.676 [tenxlctl]: probe_router 6: 3 41 41 46
    0  0:00:36.689 [tenxlctl]: probe_router 7: 3 41 41 46
    0  0:00:36.698 [tenxlctl]: probe_router 8: 3 30 30 46
    0  0:00:36.709 [tenxlctl]: probe_router 9: 3 30 30 46
    0  0:00:36.721 [tenxlctl]: probe_router 10: 3 30 30 46
    0  0:00:36.732 [tenxlctl]: probe_router 11: 3 30 30 46
    0  0:00:36.742 [tenxlctl]: probe_router 12: 3 30 30 46
    0  0:00:36.751 [tenxlctl]: router presence detected
upgrade confirmed

EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 9.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
EXEC RESULT 0
UPLOAD MAIN PROGRAM
$$$$$

Connected 0:05:30    Auto detect    57600 8-N-2    SCROLL    CAPS    NUM    Capture    Print echo
```
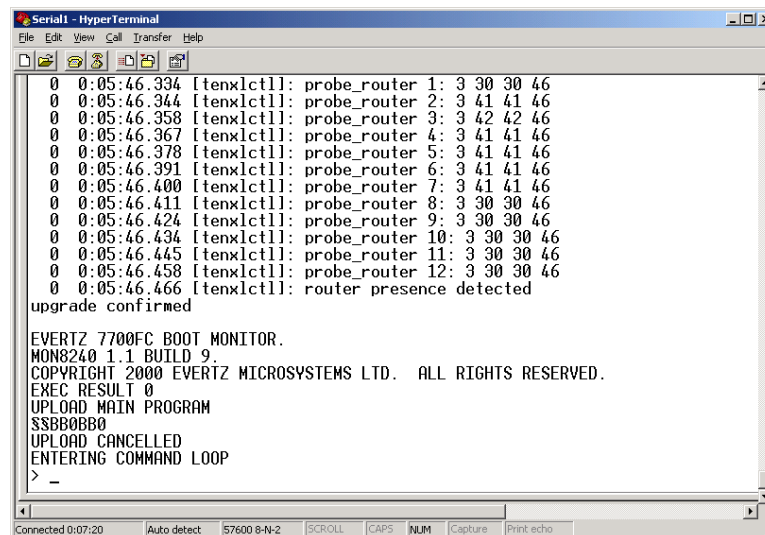
8. The following is a list of possible reasons for failed communications:

   - Defective Serial Upgrade cable.
   - Wrong communications port selected in the terminal program.
   - Improper port settings in the terminal program. (Refer to step 4 for settings). Note that HyperTerminal will not change port settings while connected. Click on HyperTerminal's "Disconnect" Button then click the "Reconnect" button to activate changes to the port settings.

9. While the special character is repeated on the screen press the <CTRL> and <X> keys, this will stop the special character output. The character is repeated for about 5 seconds. You must press <CTRL-X> during this 5 second delay. If the unit continues to boot-up, simply cycle the power and repeat this step.

```
Serial1 - HyperTerminal
File  Edit  View  Call  Transfer  Help

    0  0:05:46.334 [tenxlctl]: probe_router 1: 3 30 30 46
    0  0:05:46.344 [tenxlctl]: probe_router 2: 3 41 41 46
    0  0:05:46.358 [tenxlctl]: probe_router 3: 3 42 42 46
    0  0:05:46.367 [tenxlctl]: probe_router 4: 3 41 41 46
    0  0:05:46.378 [tenxlctl]: probe_router 5: 3 41 41 46
    0  0:05:46.391 [tenxlctl]: probe_router 6: 3 41 41 46
    0  0:05:46.400 [tenxlctl]: probe_router 7: 3 41 41 46
    0  0:05:46.411 [tenxlctl]: probe_router 8: 3 30 30 46
    0  0:05:46.424 [tenxlctl]: probe_router 9: 3 30 30 46
    0  0:05:46.434 [tenxlctl]: probe_router 10: 3 30 30 46
    0  0:05:46.445 [tenxlctl]: probe_router 11: 3 30 30 46
    0  0:05:46.458 [tenxlctl]: probe_router 12: 3 30 30 46
    0  0:05:46.466 [tenxlctl]: router presence detected
upgrade confirmed

EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 9.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
EXEC RESULT 0
UPLOAD MAIN PROGRAM
$$BB0BB0
UPLOAD CANCELLED
ENTERING COMMAND LOOP
> _

Connected 0:07:20    Auto detect    57600 8-N-2    SCROLL    CAPS    NUM    Capture    Print echo
```

10. Hit the <ENTER> key on your computer once.

11. Type the word "upgrade", without quotes, and hit the <ENTER> key once.

5.2.5. Uploading the New Firmware

12. The unit is now waiting for you to start the file transfer.

13. Upload the "*.bin" file supplied using the X-Modem transfer protocol of your terminal program. If you do not start the upload within 5 minutes the unit's Boot code will time out. The upgrade process can be restarted by typing the word "upgrade", without quotes and pressing the `<enter>` key once.

The application firmware is contained in a "bin" file will have a name consisting of the version number and the product name.

For the HD9626DSK keyer unit, the name will be similar to: HD9626DSK_2v01_284.bin

To upload the code, select the **TRANSFER** from the HyperTerminal drop down menus and select the **SEND FILE** option.

Select the **BROWSE** button to open a standard file picker window and locate your .bin firmware file.

Ensure that the protocol selection is set for Xmodem and click the **SEND** button to start the transfer.

HyperTerminal will now start to process the file transfer request and a file transfer progress screen will be displayed.
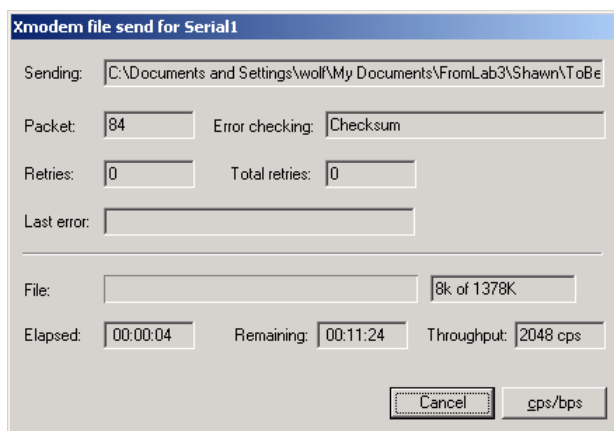
14. The boot code will indicate whether the operation was successful upon completion of the upload.

    For Example:
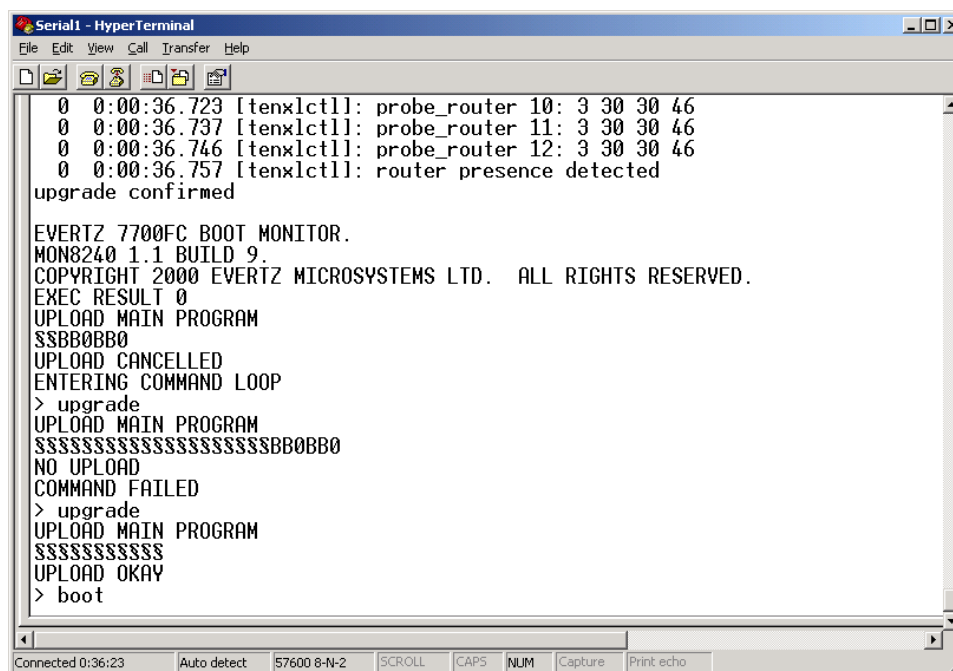
If the unit does not automatically restart, then type the word "boot", without quotes, and press the <enter> key once.

15. The following is a list of possible reasons for a failed upload:
    - If you get the message "transfer cancelled by remote" you must restart the terminal program and load the bin file.
    - The supplied "*.bin" file is corrupt.
    - Wrong file specified to be uploaded.
    - Wrong file transfer protocol used – make sure to specify Xmodem, not Xmodem 1K.
    - The PCs' RS-232 communications port cannot handle a port speed of 57600.
    - Noise induced into the Serial Upgrade cable.

5.2.6. Completing the Upgrade

16. You can now close the terminal program and disconnect the RS-232 serial cable from the PC.

5.3. UPGRADING THE FIRMWARE – FILE TRANSFER PROTOCOL OVER ETHERNET

The Overture™ software can be used to update the firmware in Evertz HD9626DSK Keyer unit using File Transfer Protocol (FTP). Overture™ allows the user to upload the same firmware to multiple units at the same time with the same 'drag and drop' ease that you use to upload media files to the keyer units. For more information see the Overture™ User manual.

5.4. SERVICING INSTRUCTIONS

> **CAUTION – These servicing instructions are for use by qualified service personnel only. To reduce risk of electric shock, do not perform any servicing instructions in this section of the manual unless you are qualified to do so.**

5.4.1. Changing the Fuses

> **Check that the line fuse is rated for the correct value marked on the rear panel. Never replace with a fuse of greater value.**

The fuse holder is located inside the power entry module. To change the fuses, disconnect the line cord from the power entry module and pull out the fuse holder from the power entry module using a small screwdriver. The fuse holder contains two fuses, one for the line and one for the neutral side of the mains connection. Pull out the blown fuse and place a fuse of the correct value in its place. Use slo blo (time delay) 5 x 20 mm fuses rated for 250 Volts with a current rating of 1, shown in Table 5-1. Carefully reinsert the fuse holder into the power entry module.

Model	Fuse Rating
HD9626DSK	1 amp

Table 5-1: Fuse Ratings

6. INDEX

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