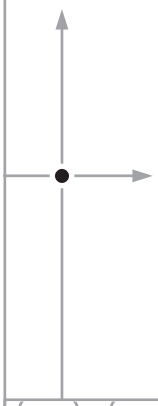
grass valley

Zodiak

DIGITAL PRODUCTION SWITCHER

Installation Planning Guide



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Contacting Grass Valley

Region	Voice	Fax	Address	Web Site
North America	(800) 547-8949 Support: 530-478-4148	Sales: (530) 478-3347 Support: (530) 478-3181	Grass Valley P.O. Box 599000 Nevada City, CA 95959-7900 USA	www.thomsongrassvalley.com
Pacific Operations	+852-2585-6688 Support: 852-2585-6579	+852-2802-2996		
U.K., Asia, Middle East	+44 1753 218 777	+44 1753 218 757		
France	+33 1 45 29 73 00			
Germany, Europe	+49 6150 104 782	+49 6150 104 223		

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Zodiak Digital Production Switcher

The Zodiak Digital Production Switcher features powerful digital video switching, mixing, and keying with E-MEM, plus integrated control of other production devices such as external effects systems, VTRs, and DDRs. The architecture of the system provides a flexible, quickly reconfigurable system able to meet the demanding requirements of live production and post production applications. Refer to the Zodiak *Data Sheet* and Grass Valley Group *Full Line Product Catalog* for information on the hardware and software options available. Online documentation is available on the Grass Valley Group web site. The URL for the Grass Valley Group website is found on the copyright page at the front of this manual.

The standard features for the Zodiak 2.5-M/E and 3-M/E systems are listed in Table 1 and Table 1, respectively, and optional features for both systems are listed in Table 2.

Table 1. Standard Zodiak 2.5-M/E Features

2.5-M/E Standard Features	
M/E 1 & 2	Four full function keyers per M/E
	Two Complex Wipe Generators per M/E
	Four Simple Wipe Generators per M/E (1 per Keyer)
	YUV Color Correction
	One Utility Bus per M/E
	One Program Output per M/E
	One Preview Output per M/E
PGM/PST	Background Cut and Mix
	Three simple (Luminance or Linear) Downstream Keyers (DSKs)
	Program Output (PGM A)
	Programmable Clean Feed (PGM B)
	Preview Outputs for PGM A & PGM B
64 Inputs	
9 Aux Outputs (4 with Effects Send)	
Switched Preview	
2 Floating Chroma Keyers (Use on Any Full Function Keyer)	
2 In/4 Out Still Store	
Redundant Video Processor Frame Power Supply	
Redundant Main Panel Power Supply	

Table 1. Standard Zodiak 3-M/E Features

3-M/E Standard Features	
M/E 1 & 2	Four full function keyers per M/E
	Two Complex Wipe Generators per M/E
	Four Simple Wipe Generators per M/E (1 per Keyer)
	YUV Color Correction
	One Utility Bus per M/E
	One Program Output per M/E
	One Preview Output per M/E
M/E 3 (PGM/PST)	All the functionality of M/E 1 & 2 plus:
	Program and Preview Output of M/E 3
	Three simple (Luminance or Linear) Downstream Keyers (DSKs)
	Four Full Function Keyers
	Program Output (PGM A)
	Programmable Clean Feed (PGM B)
	Preview Outputs for PGM A & PGM B
64 Inputs	
13 Aux Outputs (8 with Effects Send)	
Switched Preview	
2 Floating Chroma Keyers (Use on Any Full Function Keyer)	
2 In/4 Out Still Store	
Redundant Video Processor Frame Power Supply	
Redundant Main Panel Power Supply	

Table 2. Zodiak Optional Features

2.5-M/E & 3-M/E Optional Features	
2.5-M/E & 3-M/E	Additional Floating Chroma Keyers (Use on Any Full Function Keyer)
	M/E 1 & 2: Four Video/Key Transform Engines (DVE) per M/E (1 per Keyer)
	RGB Color Correction
	Net Central II Agent
	Menu Panel Flush Mount and Adjustable Console Mounting Kits
	Additional Menu Panels
	24- and 32-Crosspoint Remote Aux Panels
	E-MEM Shot Box
2.5-M/E Only	Upgrade Kit Converts 2.5-M/E into a 3-M/E[a]
3-M/E Only	Transform Engine for M/E 3

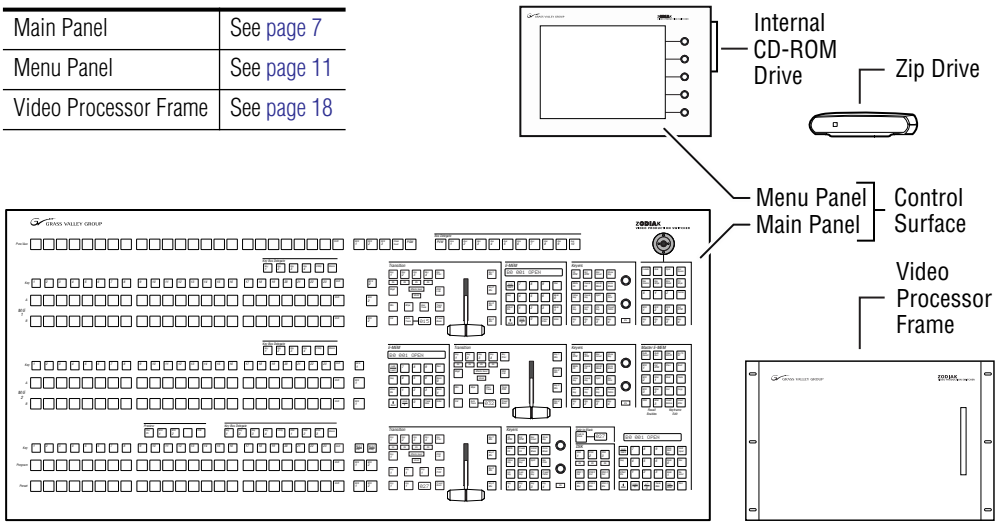
[a] Upgrading consists of the addition of an M/E module and power supply to the Video Processor frame and changing keycaps on the Main panel. No retrofitting or recabling required.

Standard System Components

Standard Zodiak system components include a Main panel, Menu panel with touch screen display, and Video Processor frame (Figure 1).

Figure 1. System Components

Main Panel	See page 7
Menu Panel	See page 11
Video Processor Frame	See page 18



Control Surface

The modular design of Zodiak control panels provides flexibility for mounting component panels in various environments, and allows the addition of specialized accessory control panels. A group of panels available to a single operator is called a Control Surface. A Control Surface consists of at least two components, a Main panel and a Menu panel.

Main Panel

The Main panel provides the operator with real time control of the system. Panel ventilation is accomplished by two fans located on the back of the power supplies which draw air into the panel, around the buttons, and expel it out the back. Blocking the front slots of the panel in a flush mount installation does not constrict ventilation.

Menu Panel

The Menu panel provides access to additional system configurations and controls that generally do not require adjustment during live production. Additional Menu panels may be added as options.

Note Only one Menu panel can be programmed to respond to button presses (DPOPs) from the Main panel.

Removable Media Drives

Four removable media drives are standard components of a Zodiak system:

- A CD-ROM in the Menu panel (see Figure 8),
- An external 250 MB Zip drive connected through and powered by the USB port on the Menu panel (see Figure 9), and
- Two standard 1.4 MB 3.5 in. floppy disk drives, one in the Main Panel tub (see Figure 2) and one in the Video Processor frame (see Figure 18).

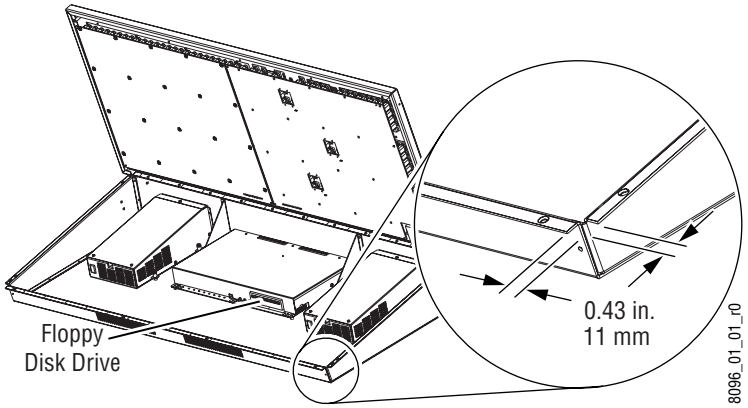
Note The floppy disk drives are used exclusively for emergency boot procedures.

Installation

Main Panel

Main panel installation requires careful attention to the console support structure and the console cutout dimensions necessary to accommodate the mounting flanges located on the front and sides of the tub (Figure 2).

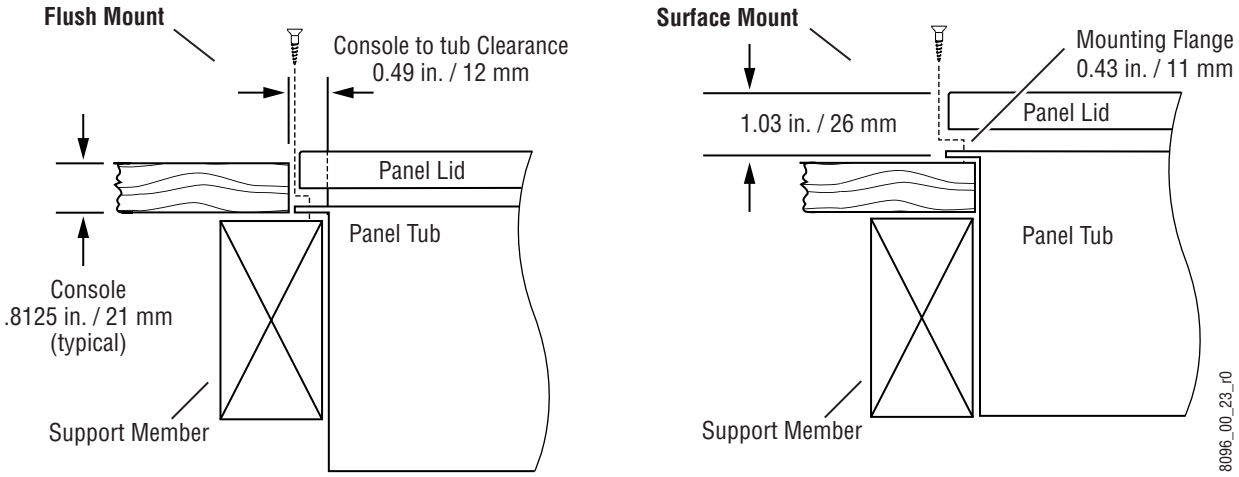
Figure 2. Floppy Drive and Mounting Flanges



CAUTION The Main panel weighs approximately 36 kg (79 lb). Prior to installation, ensure that your console is structurally capable of supporting the Main panel.

The Main panel was designed to be flush mounted in a console, but it may also be surface mounted. Figure 3 provides installation details for both flush mount and surface mount installations. Figure 4 through Figure 6 provide panel dimensions and connector layout.

Figure 3. Main Panel Mounting Options (Front Left View)



Mounting Option	Cutout Dimensions		
	A[a]	B	C[b]
Flush Mount	19.00 in. (483 mm)	42.19 in. (1072 mm)	41.16 in. (1045 mm)
Surface Mount	18.38 in. (467 mm)	41.16 in. (1045 mm)	n/a

[a] Console surface cutout.

[b] Distance between flush mount support members.

WARNING **The Main panel lid is held in the open position by two gas spring assemblies. The ability of these devices to properly support the lid and keep it closed is compromised if the installed panel tilts toward the user at an angle greater than 15 degrees.**

Figure 4. Main Panel Dimensions

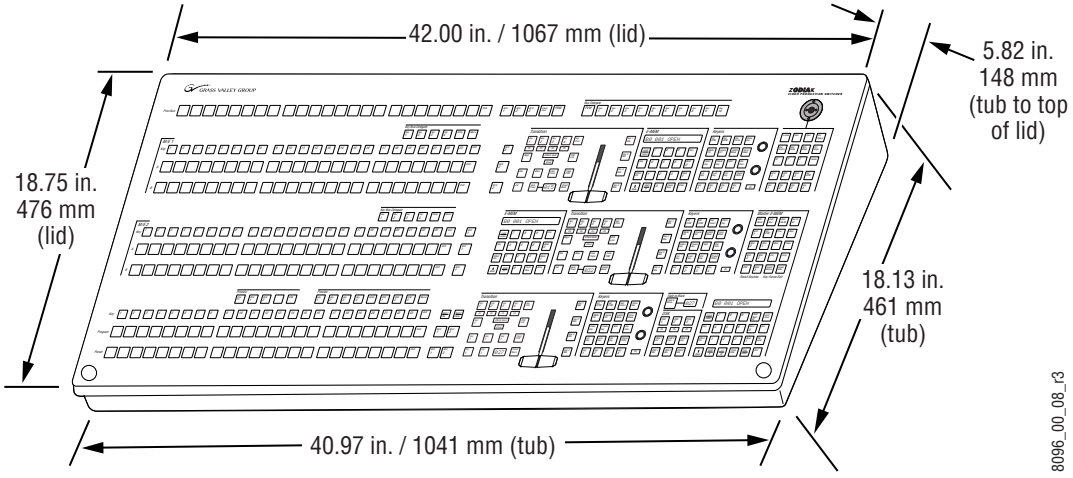


Figure 5. Main Panel Dimensions, Side View

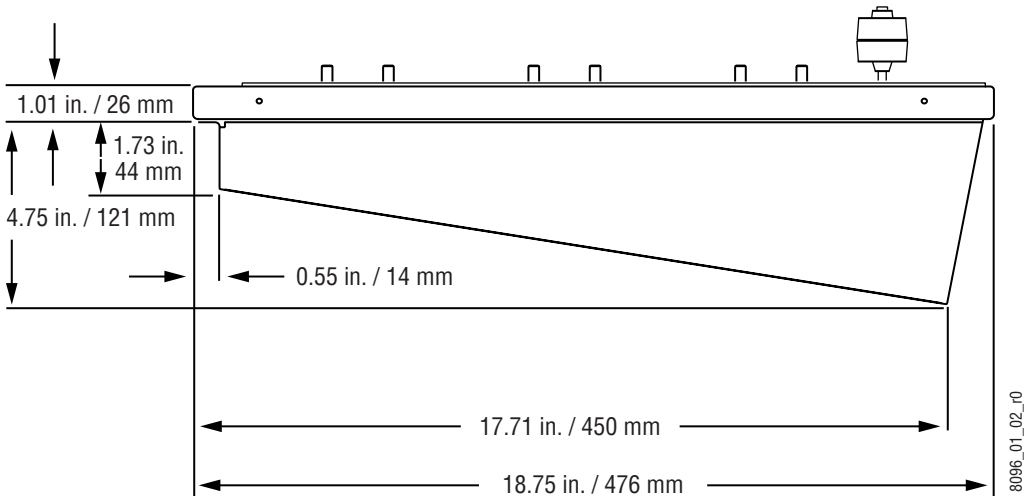


Figure 6. Main Panel Dimensions, Rear View

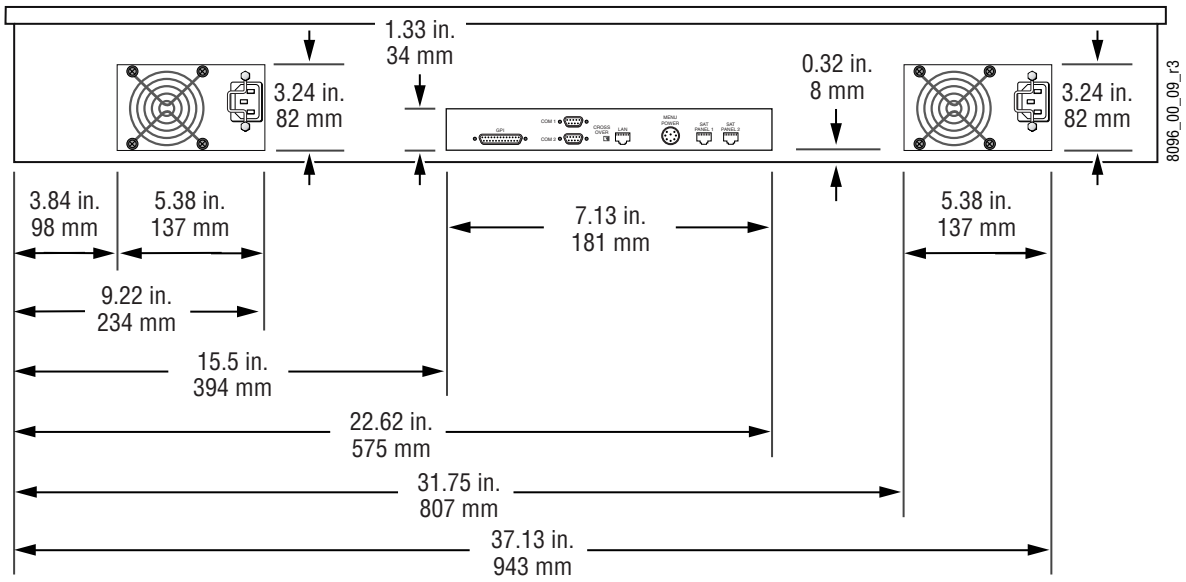
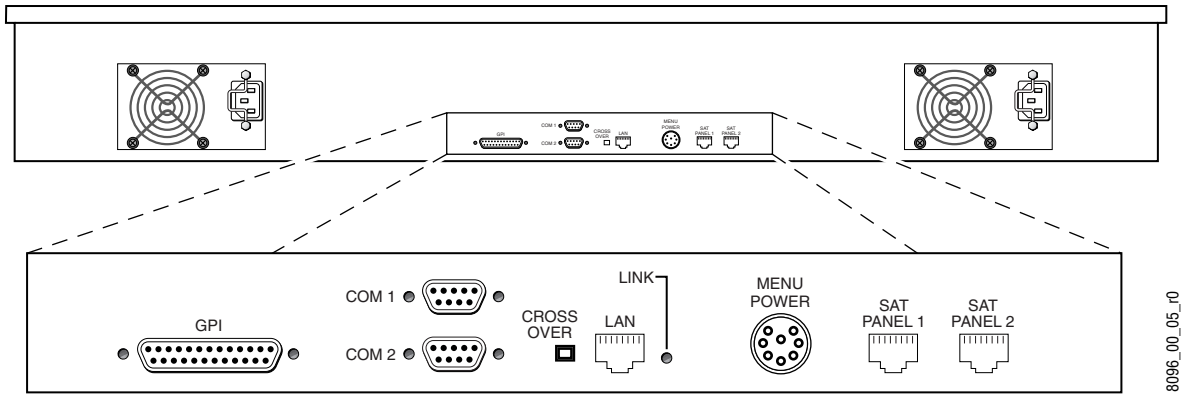


Figure 7. Main Panel Connector Locations

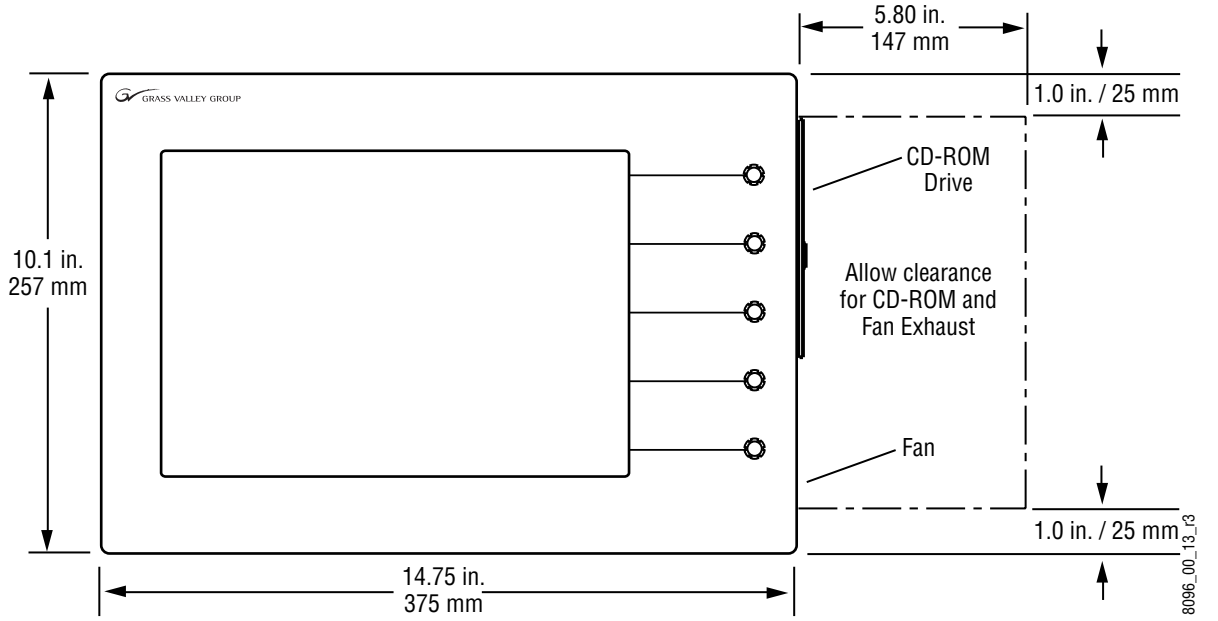


CAUTION Regardless of mounting method or cutout dimensions, for proper cable clearance and air flow, ensure that there is at least 6 in. (152 mm) of clear space at the rear of the Main panel below the mounting surface. Allow an extra 8 in. (203 mm) to 10 in. (254 mm) of mounting surface behind the Main panel for peripheral components.

Menu Panel

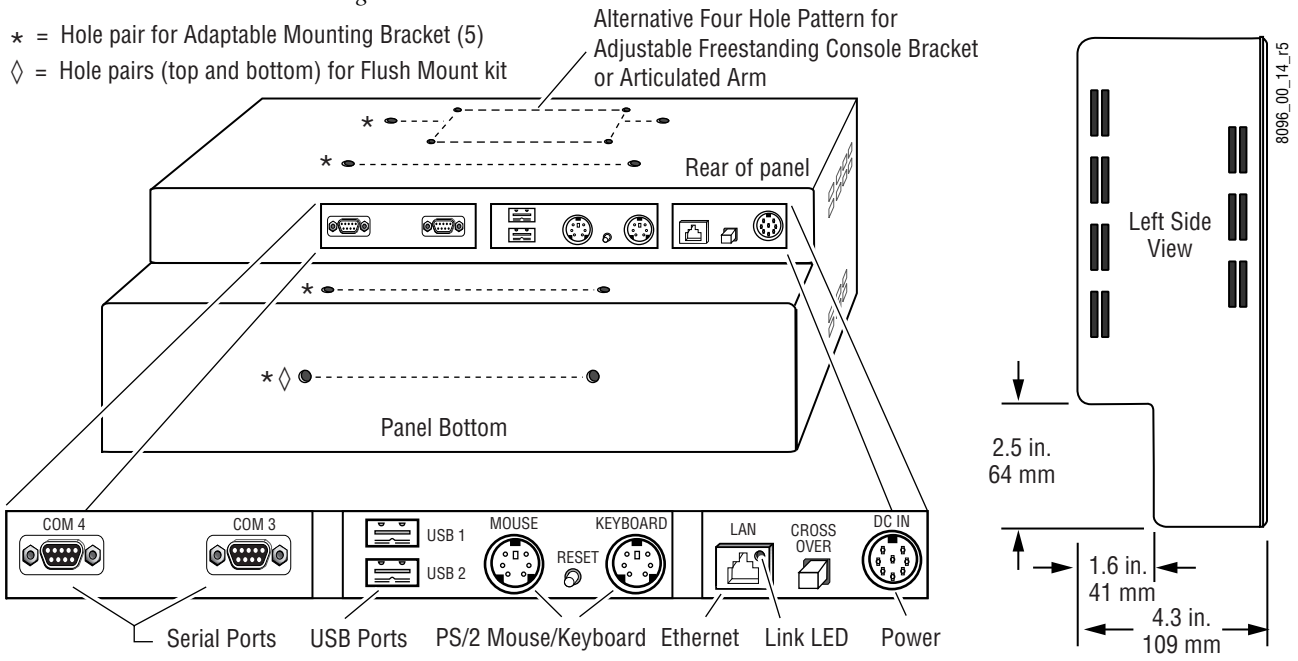
The Menu panel includes a Touch Screen, control processor, five knobs for adjusting parameter values, and a CD-ROM drive (Figure 8).

Figure 8. Menu Panel Dimensions



Ports located on the rear of the Menu panel (Figure 9) provide connections to the Zodiak Main Panel, Video Processor frame, an external Zip drive, and other devices.

Figure 9. Menu Panel Connections



CAUTION All Menu panel mounting holes are tapped 10-32. Do not penetrate the case more than 0.24 in. / 6.10 mm.

Available Mounting Brackets

Three different mounting brackets are available for mounting the Menu panel:

- Adaptable Mounting Bracket (standard),
- Adjustable Console Bracket, or
- Flush Mount Kit.

When considering mounting options, remember that the optimum viewing angle is 90 degrees in both the horizontal and vertical planes. The adaptable mounting bracket allows the Menu panel to be tilted on a horizontal axis for optimum viewing. Clamping pivot screws secure the bracket angle.

The adjustable console bracket has a friction-lock mechanism to allow the user to tilt the Menu panel to the desired horizontal position.

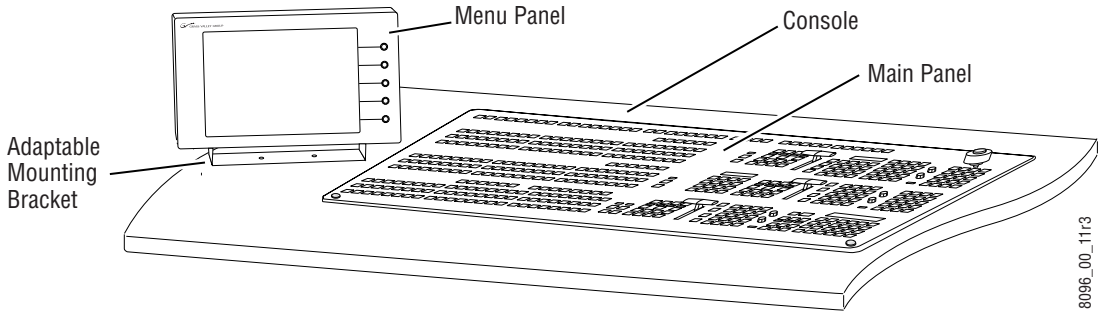
CAUTION When using either console mounting bracket, be sure to open the Main panel lid and check for sufficient clearance between the Menu panel and the Main panel components. Without sufficient clearance, the lever arm or joystick could damage the Touch Screen when the Main panel is opened.

Adaptable Mounting Bracket

An adaptable mounting bracket ships with every panel. This mounting bracket allows mounting the Menu panel from above, from either side, or from the back of the Main panel (Figure 9 on page 12).

The recommended locations are to the left (Figure 10), right or behind the Main panel. These locations provide for the most comfortable reach to the Touch Screen, soft knobs, and CD-ROM, and also clears the area for better viewing of monitors beyond the Main panel.

Figure 10. Menu Panel Mounting With Adaptable Console Bracket



Adjustable Console Bracket Option or Articulated Arm

A four-hole pattern on the back of the panel (Figure 9 on page 12) allows connection to a Kalypso-style adjustable console bracket option (Figure 11) or, for more flexibility, a user-supplied articulated arm.

Figure 11. Menu Panel Mounting With Adjustable Console Bracket

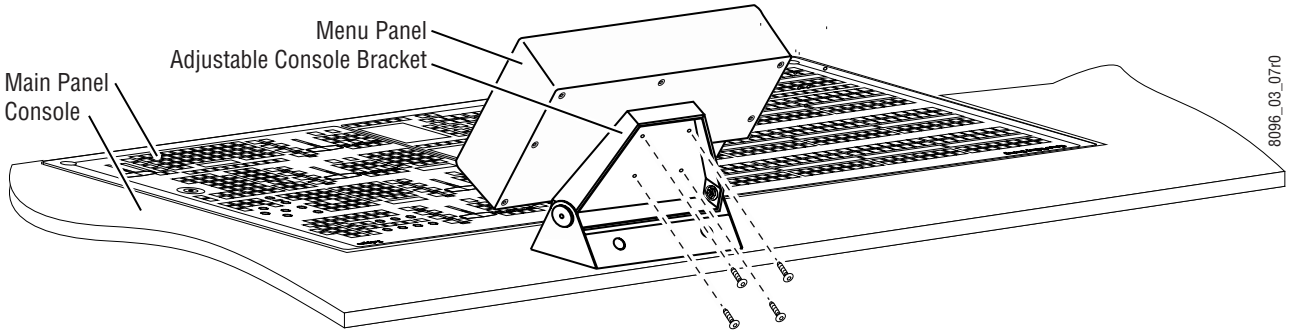
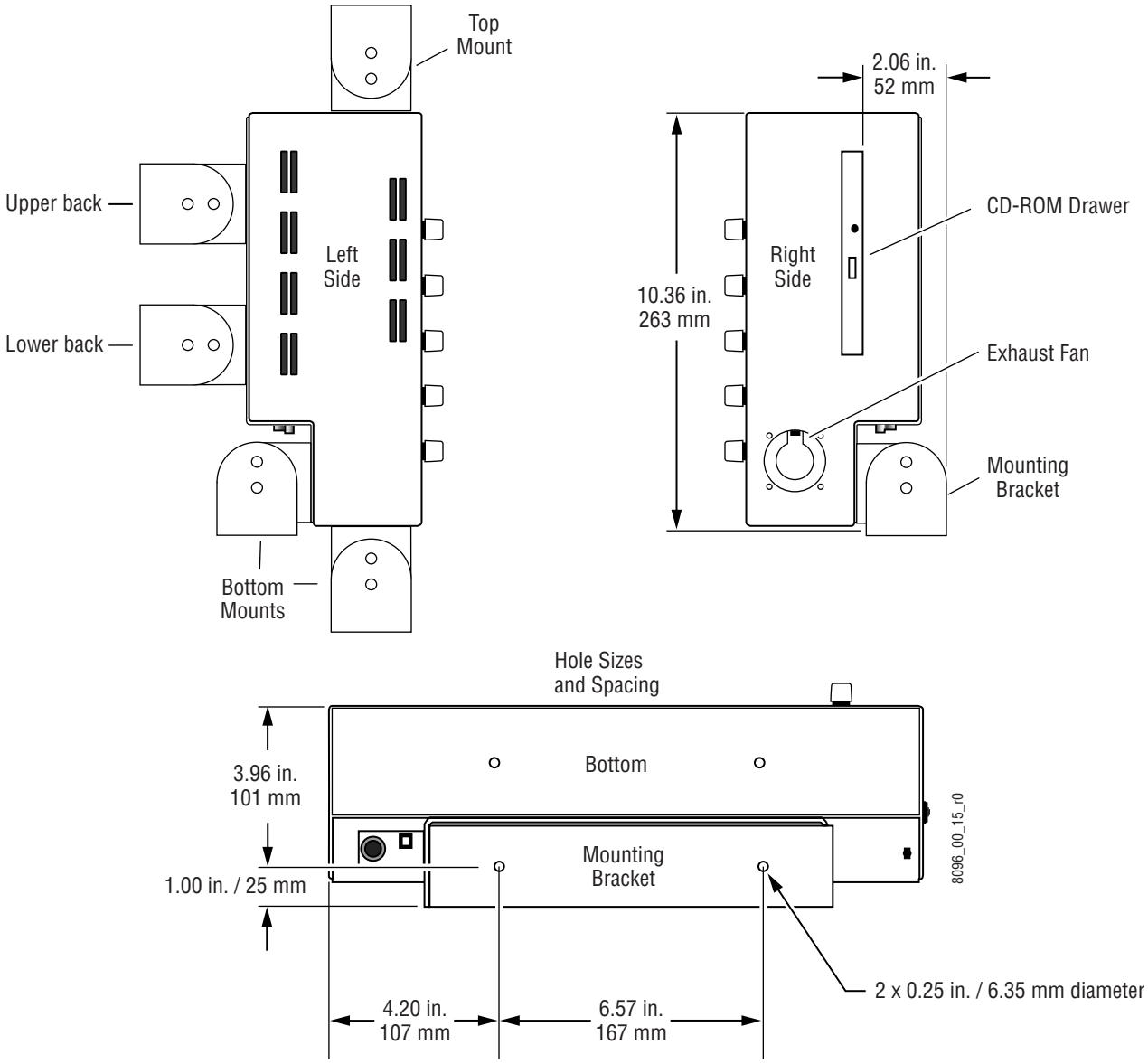


Figure 12. Optional Placement of Menu Panel Adaptable Mounting Brackets



Flush Mount Kit Option

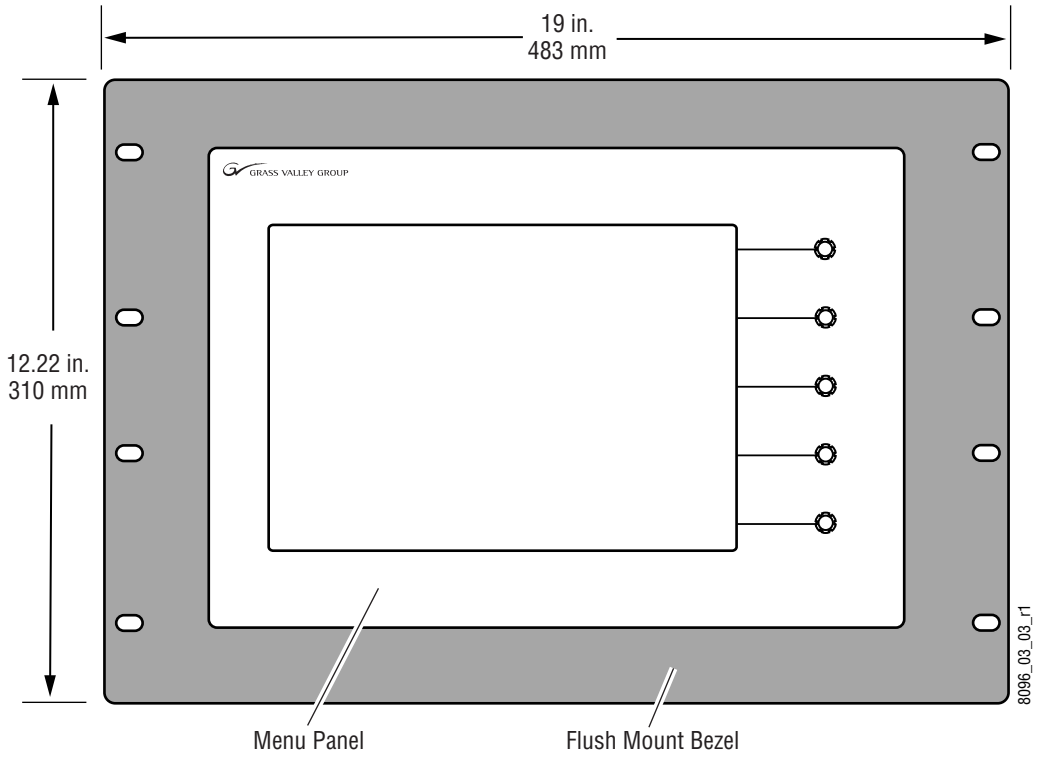
The Flush Mount kit option allows the Menu panel to be installed in a standard 19 in. (483 mm) rack occupying 7 rack units (Figure 13). Alternatively, the Menu panel can be set into a console cutout (Figure 15 on page 17).

Access to the CD-ROM drive on the right side of the Menu panel is blocked with this mounting option, so an external CD-ROM drive with an adapter and USB cable is provided. The external CD-ROM drive connects to one of the two USB ports on the Menu panel and receives its power through this cable.

The Menu panel normally receives its DC power from the Main panel via a 10 ft (3 m) power cable. If a longer distance between the Main panel and Menu panel is required, the Menu panel can be powered by a separate power supply option.

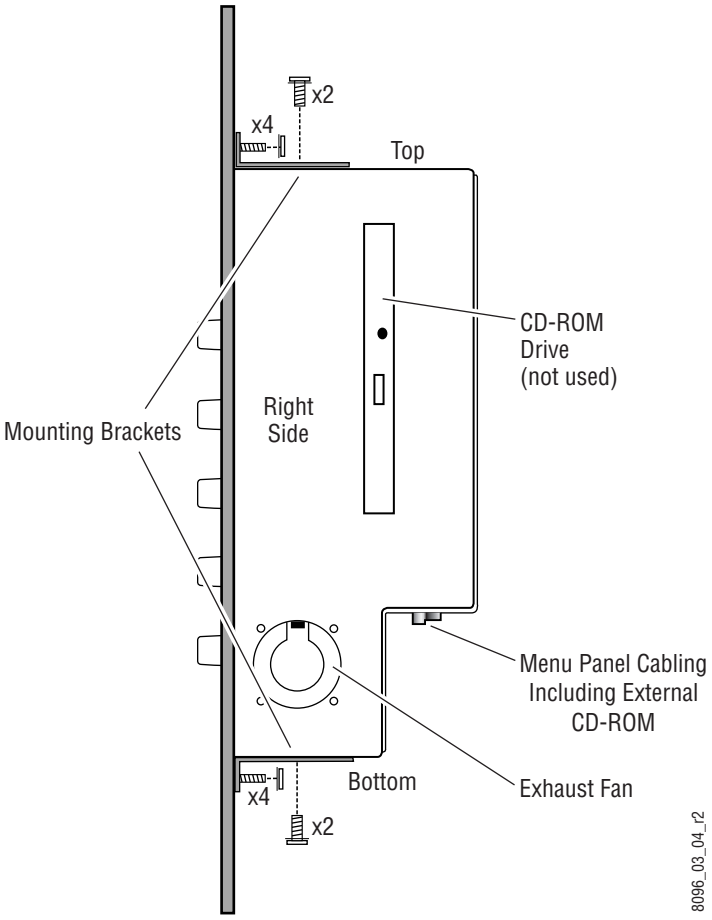
Clearance for the exhaust fan on the right side of the panel and the interconnect cables to the external CD-ROM drive, Main panel and Video Processor frame on the bottom of the panel must also be taken into consideration when mounting the panel in this manner.

Figure 13. Optional Flush Mount Kit



The Flush Mount bezel is attached to the top and bottom of the Menu panel with two mounting brackets as shown in Figure 14. Four #10 screws and eight nuts are included for attaching the Flush Mount assembly to the Menu panel.

Figure 14. Attaching Flush Mount Bezel to Menu Panel



For installing the Menu panel into a console cutout, the mounting brackets without the Flush Mount bezel can be used to support the top and bottom of the Menu panel in the console cutout (Figure 15). Slots in each mounting bracket allow adjusting for variable height adjustment to match console thickness. Eight wood screws (not provided) are required for securing the mounting brackets to the console. Dimensions for the console cutout (without the Flush Mount bezel) are given in Figure 16.

CAUTION Console thickness should not be less than 0.5 in./13 mm for proper support of the Menu panel.

Figure 15. Menu Panel Console Installation

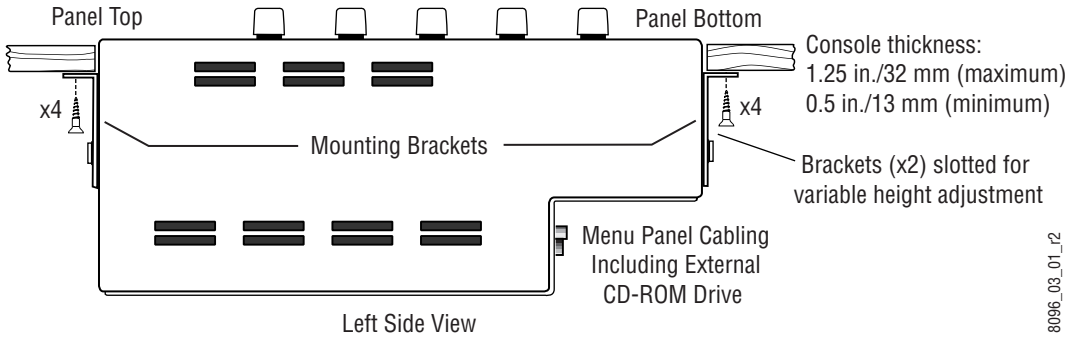
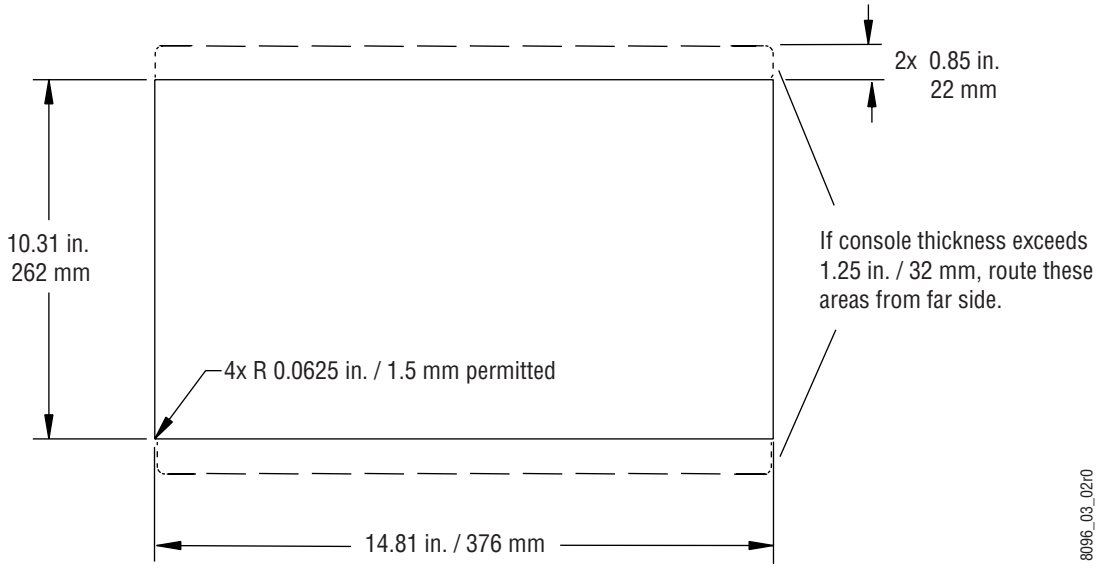


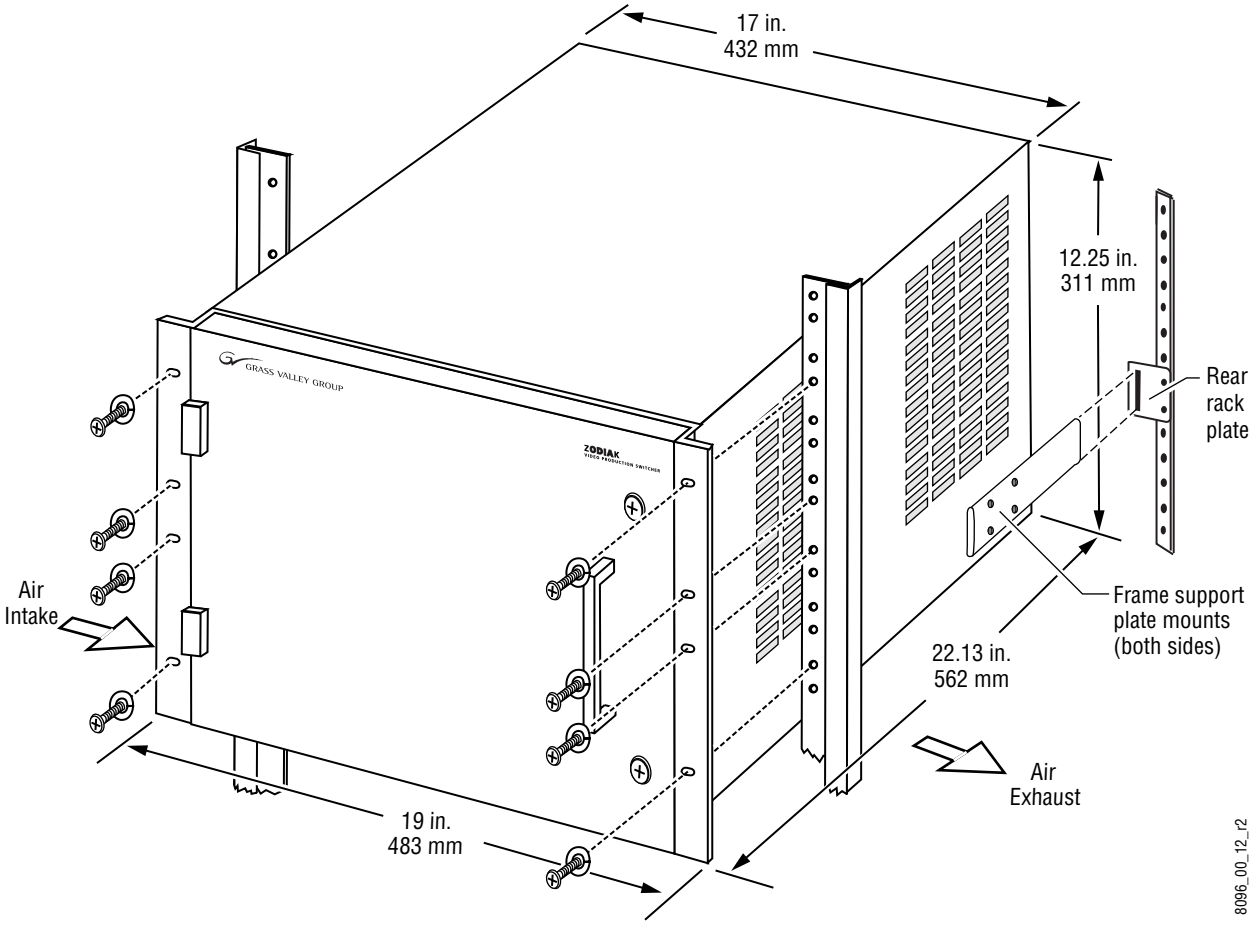
Figure 16. Menu Panel Console Cutout Dimensions



Video Processor Frame

The Zodiak Video Processor frame is a 7 rack unit chassis which mounts in a standard 19 in. (483 mm) rack (Figure 17). It has a built-in cooling system consisting of a fan/plenum mounted in the right section of the frame, and an air filter in the left section. Cooling air is drawn in at the left side of the frame, through the filter and modules, then expelled at the right of the fan/plenum unit.

Figure 17. Video Processor Frame Rack Installation



The Zodiak Video Processor frame houses components as shown in Figure 18. Table 3 lists the standard modules and options for 2.5-M/E and 3-M/E Zodiak configurations. The frame is shown below with the front door removed. The front door must remain in place and closed during normal system operation to maintain maximum cooling efficiency.

Figure 18. Video Processor Frame, Front View

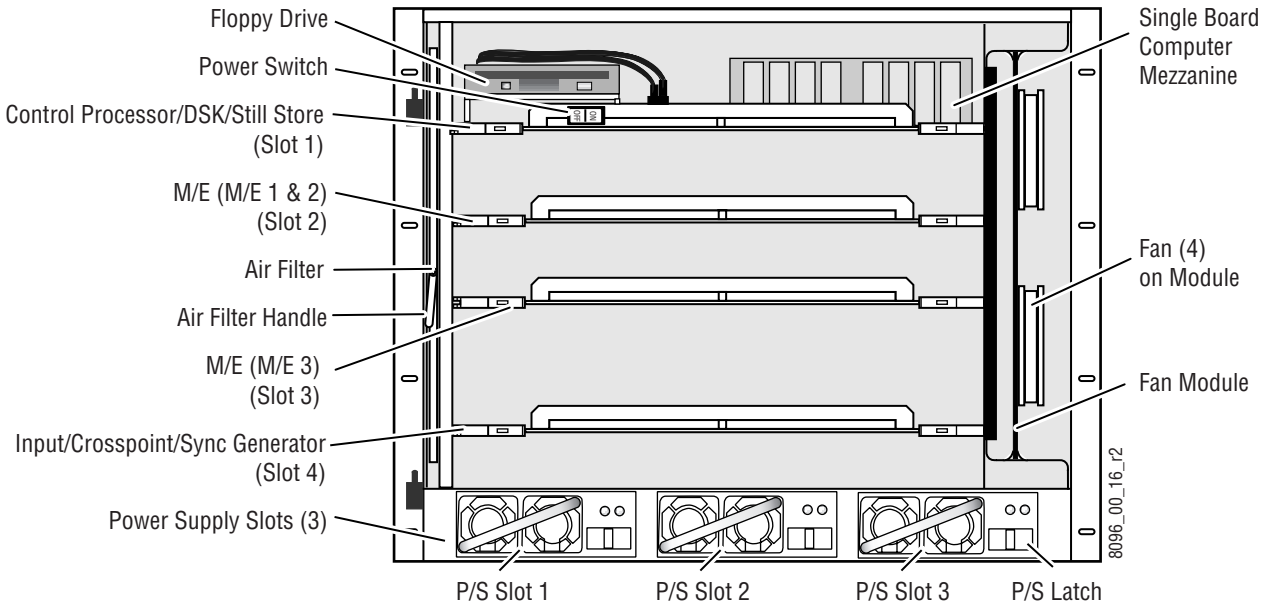


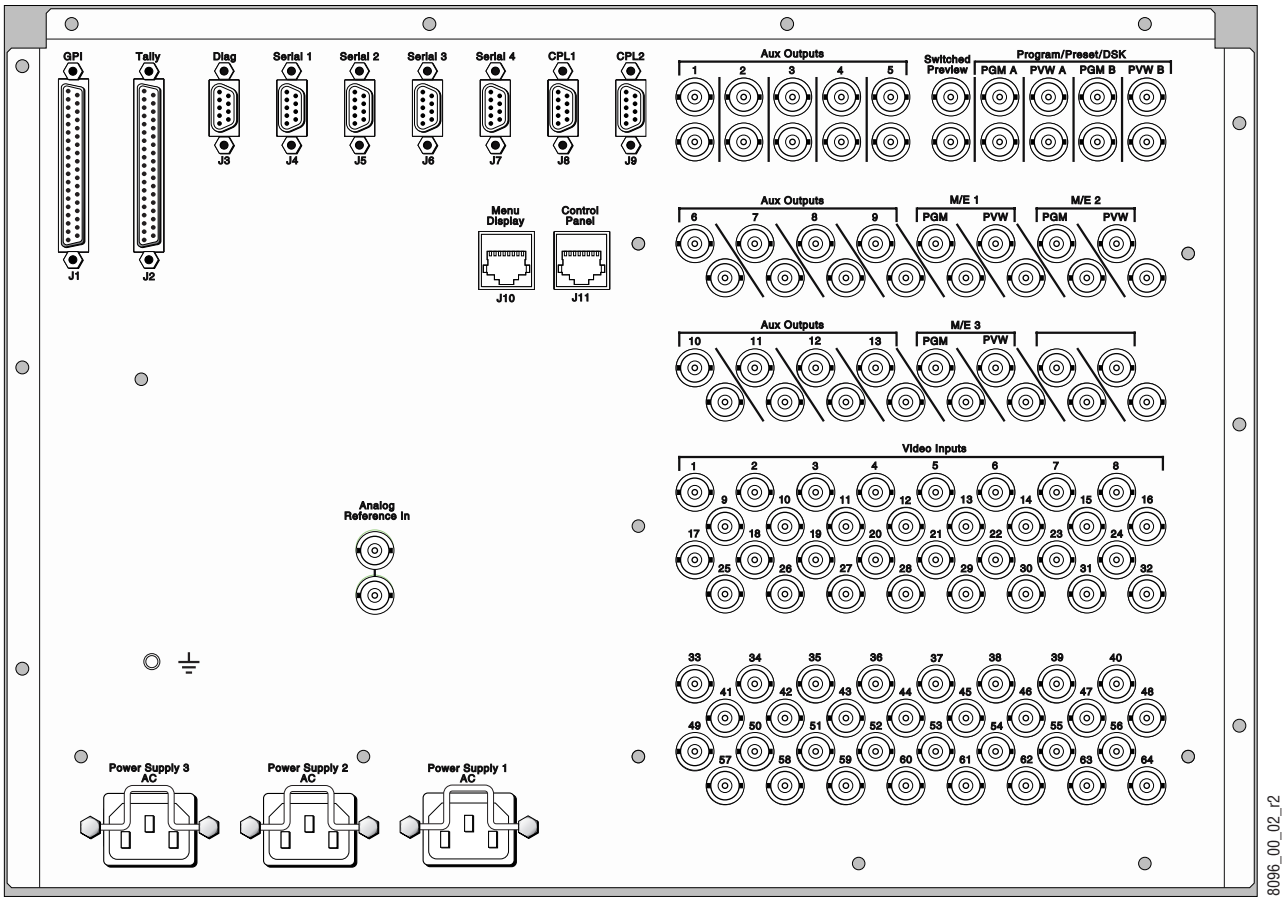
Table 3. Standard Modules and Options for 2.5-M/E and 3-M/E Configurations

Standard Modules	2.5-M/E System	3-M/E System
Control Processor/DSK/Still Store	Yes	Yes
Mix Effects (M/E 1 and M/E 2)	Yes	Yes
Mix Effects (M/E 3)	N/A	Yes
Input/Crosspoint/Sync Generator	Yes	Yes
Fan Module	Yes	Yes
Air Filter	Yes	Yes
Power Supply Modules	2	3

Module Options	2.5-M/E System	3-M/E System
Single Spare Power Supply Module	Yes	Yes
2.5-M/E to 3-M/E Upgrade Kit	Yes	N/A

Power, control, and video connections are made at the rear of the Video Processor frame. Figure 19 shows the rear frame connectors.

Figure 19. Video Processor Frame, Rear View



Video Processor Power Supply

The Zodiak Video Processor frame houses up to three slide-in modules rated at 400 watts each. (See Figure 18 on page 19).

Two hot-swappable power supply modules (primary and redundant) are standard with the 2.5-M/E system, and three power supply modules are standard with the 3-M/E system.

The power supplies load share such that a supply can fail and the Video Processor frame will continue to operate.

It is recommended that each module's AC input be connected to a separate AC supply circuit. Any module(s) for which a separate supply circuit is not available can be connected to an uninterruptible power supply (UPS).

Optional Components

Remote Aux Panels

Remote Aux panels control Zodiak aux buses from remote locations. Three 24-Crosspoint and two 32-Crosspoint Remote Aux panel configurations are available for Zodiak systems. Refer to Table 4 and the following sections for panel-specific information.

Table 4. Remote Aux Panel Summary

	24-Crosspoint Aux Panel	32-Crosspoint Aux Panel
Connection	Serial Port Daisy Chain	Ethernet
Maximum Panels[a]	32	40
External Sources Controlled	48 (24 unshifted, 24 shifted)	64 (32 unshifted, 32 shifted)
Available Configurations	KAL-24AUX1 (1 RU, single bus)	KAL-32AUX1 (1 RU, single bus)
	KAL-24AUX2 (2 RU, single bus)	KAL-32AUX2 (2 RU, 16 bus delegate buttons)
	KAL-24AUX3 (3 RU, 18 bus delegate buttons)	--

[a] A maximum of 40 Remote Aux panels can be connected to a 2.5-M/E or 3-M/E.

Remote aux panels may be purchased with the Zodiak system or added at a later time. For more information on Zodiak options, refer to the Zodiak *Data Sheet* or Grass Valley Group *Full Line Product Catalog*. Online documentation is available at www.grassvalleygroup.com.

Note Remote Aux panels used with Model 2200, 3000, and 4000 systems can be upgraded for use in a Zodiak environment. See the Kalypso *Model 4000 Remote Aux Panel Upgrade Instruction Manual* for details.

24-Crosspoint Remote Aux Panels

These panels are designed to select 48 external sources (24 unshifted and 24 shifted). Thirty-two 24-Crosspoint Remote Aux panels can be daisy-chained on a single serial control port on the Zodiak Video Processor frame. Three panel configurations are available, identified by the number of rack units (RUs) each occupies in a standard 19 in. (483 mm) equipment rack (see Figure 20 through Figure 22). The 1 and 2 RU panels (KAL-24AUX1 and KAL-24AUX2) are dedicated to a single bus. The 3 RU panel (KAL-24AUX3) panel has 18 bus delegate buttons. All three panels have the same connectors and DIP switches as that depicted for the KAL-24AUX1 in Figure 23 on page 22.

Figure 20. KAL-24AUX1 (1 RU)

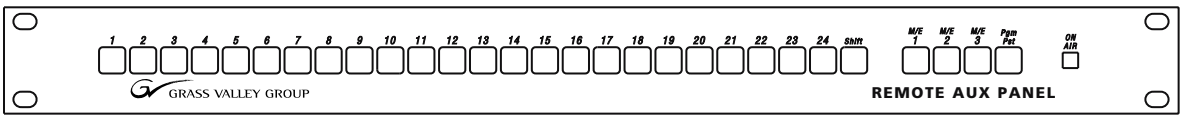


Figure 21. KAL-24AUX2 (2 RU)

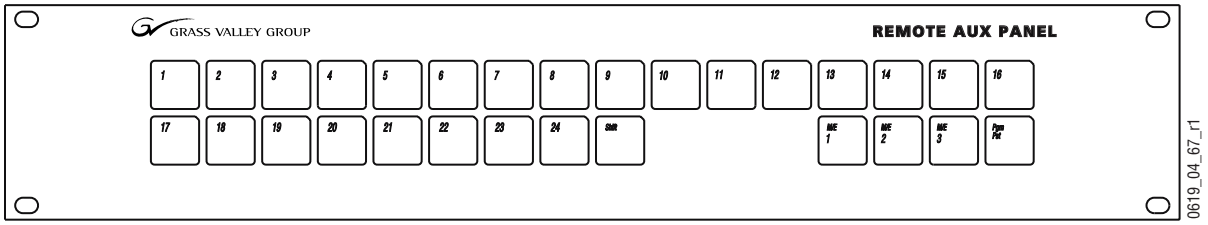
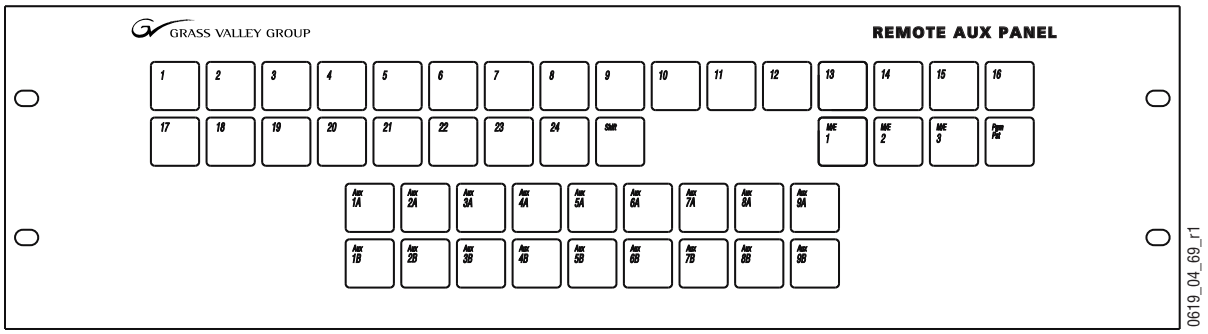


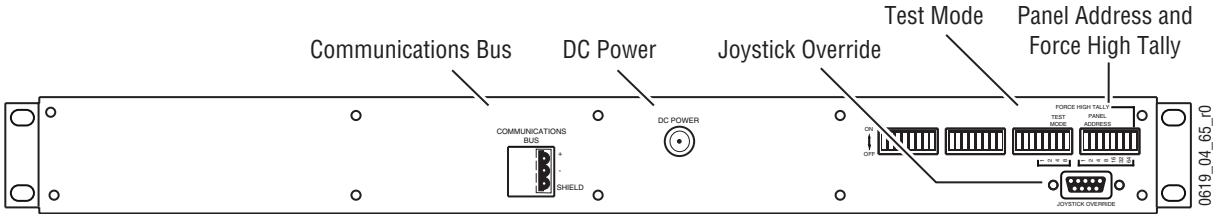
Figure 22. KAL-24AUX3 (3 RU)



24-Crosspoint Remote Aux Connections

The 24-Crosspoint Remote Aux rear panels have connectors for Communications Bus, DC power, and Joystick Override (Figure 23).

Figure 23. KAL-24AUX1 (1 RU), Rear View

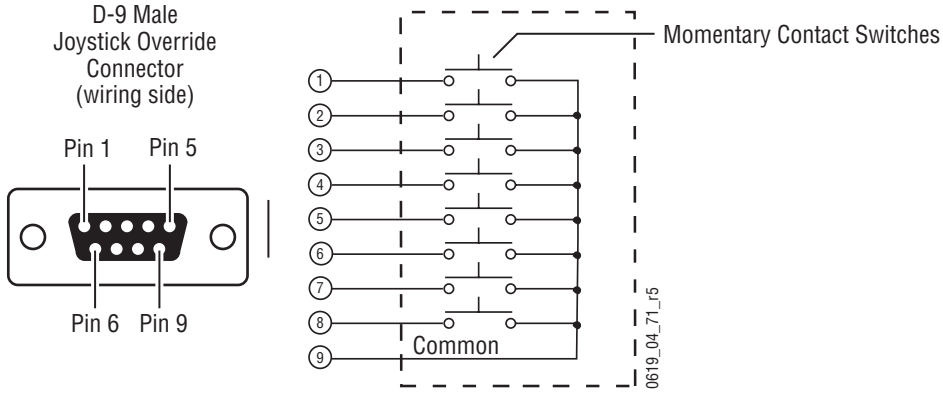


Note All KAL-24AUX rear panels have similar layouts and have the same connectors.

Joystick Override

A user fabricated cable, external switch, and a 9-pin D connector are required to implement camera joystick override. Use shielded cable and connect the shield to the metal connector shell when fabricating the joystick override cable. Refer to Figure 24 for connector wiring.

Figure 24. KAL-24AUX Joystick Override Connector Cable Wiring



Communications Bus

The communications bus cable connector shipped with each panel must be attached to the supplied cable or a user fabricated cable (refer to Figure 25). The supplied cable is 164 ft (50 m) long and has a pre-wired 9-pin D connector on one end. If fabricating a cable, use a shielded twisted pair cable such as Belden 8451 and refer to Table 5 for wiring connections.

Thirty-two 24-Crosspoint Remote Aux panels can be daisy-chained on a single serial control port on the Zodiak Video Processor frame, but the total length of cable in the panel daisy-chain cannot exceed 1000 ft (320 m). Allow enough cable to reach each control panel connector, plus approximately 3 ft (1 m) extra.

Figure 25. KAL-24 AUX Communications Bus Connector Cable Wiring

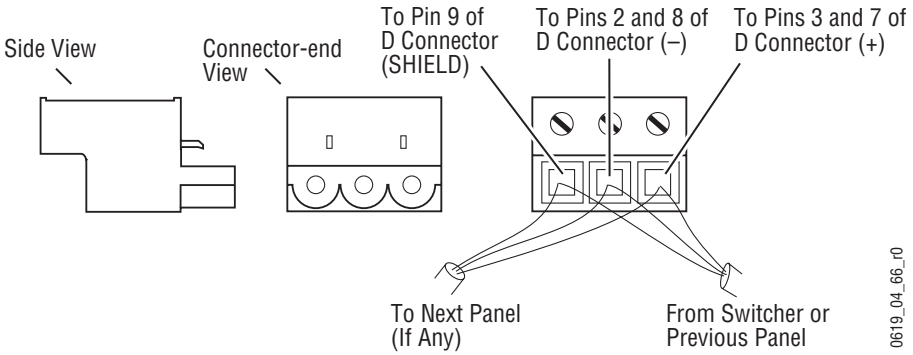


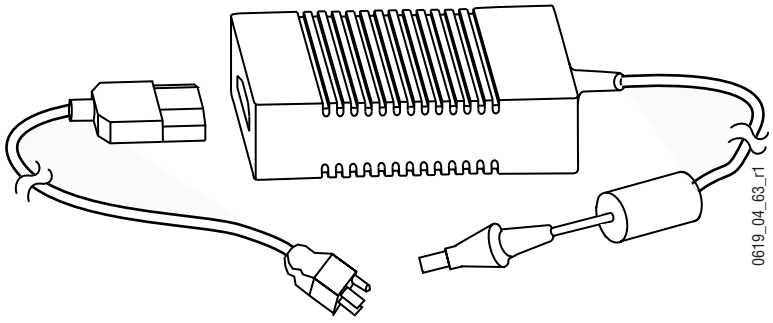
Table 5. Cable Polarity

Panel Connector	D-Connector Pins	Factory Supplied Cable
+ (Plus)	3 and 7	Red
- (Minus)	2 and 8	Black
Shield	9	Shield

Power Supply

The 24-Crosspoint Remote Aux panel power supply (Figure 26) should be securely fastened to a horizontal surface or attached to a support inside the equipment rack. Verify that the power supply cord reaches the 24-Crosspoint Remote Aux Control panel and the AC source.

Figure 26. KAL-24AUX Power Supply



32-Crosspoint Remote Aux Panels

These panels are designed to select 64 external sources (32 unshifted and 32 shifted). The number of 32-Crosspoint Remote Aux panels that can be network connected to the Zodiak Video Processor frame is 40. Two panel configurations are available, identified by the number of rack units (RUs) each occupies in the standard 19 in. (483 mm) equipment rack (see Figure 27 and Figure 28). Both panels have the same connector layout as that depicted for the KAL-32AUX1 in Figure 29.

The 1 RU panel (KAL-32AUX1) is dedicated to a single bus. The 2 RU panel (KAL-32AUX2) panel has 16 bus delegate buttons.

Figure 27. KAL-32AUX1 (1 RU)

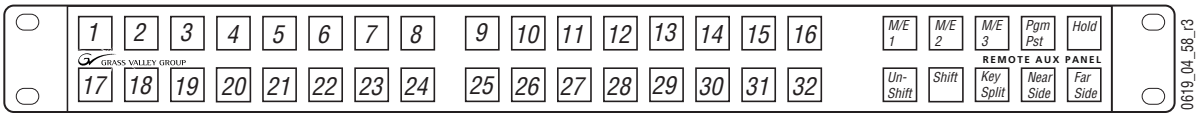
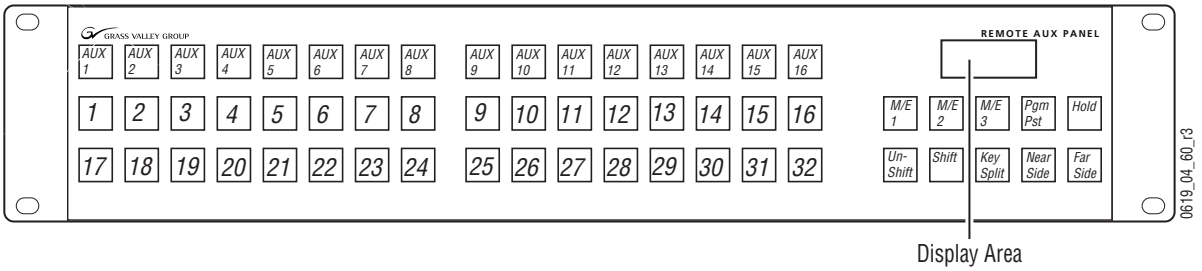


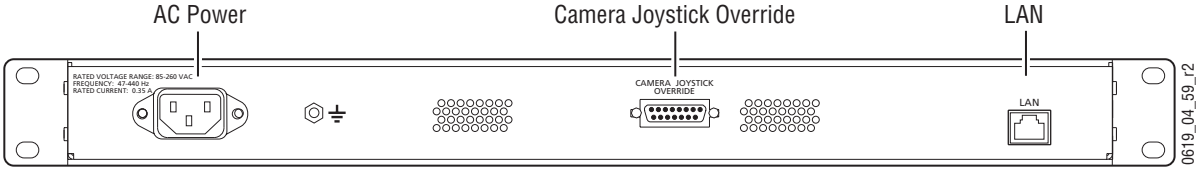
Figure 28. KAL-32AUX2 (2 RU)



32-Crosspoint Remote Aux Connections

The 32-Crosspoint Remote Aux rear panels have connectors for AC power, Camera Joystick Override and LAN (Figure 29).

Figure 29. KAL-32AUX1 (1 RU), Rear View



Note The rear panel layout is the same for both KAL-32AUX panels.

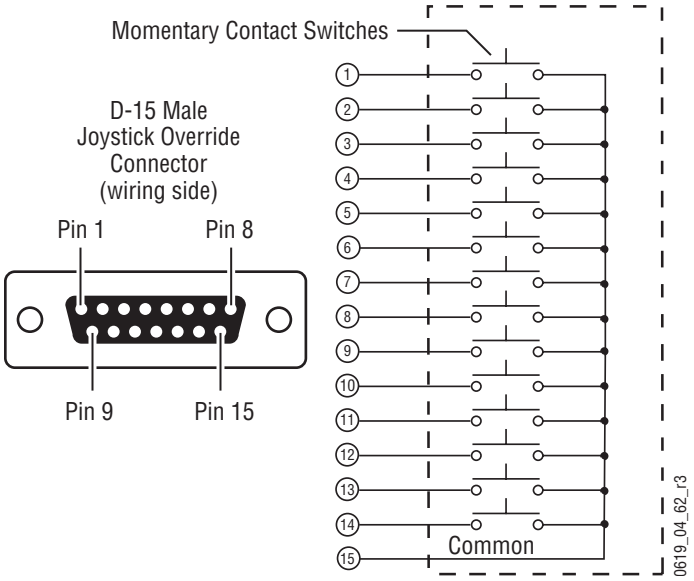
AC Power

The 32-Crosspoint Remote Aux panels have internal power supplies which connect directly to facility AC power by supplied line cords.

Camera Joystick Override

A user fabricated cable, external switch, and a 15-pin D connector are required to implement camera joystick override. Use shielded cable and connect the shield to the metal connector shell when fabricating the joystick override cable. Refer to Figure 30 for connector wiring.

Figure 30. KAL-32AUX Joystick Override Connector Cable Wiring



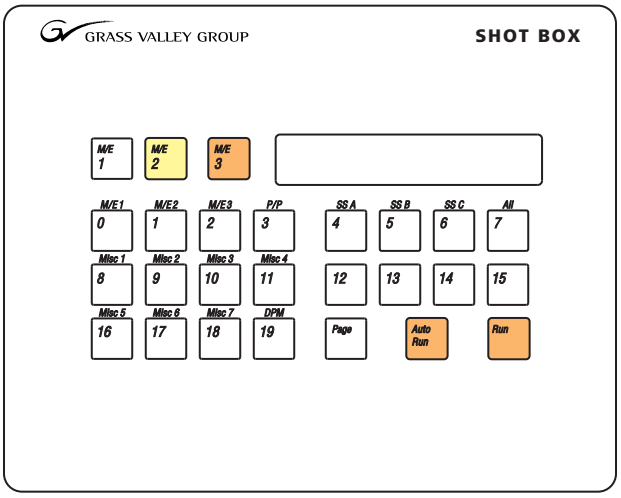
LAN

The 32-Crosspoint Remote Aux panels communicate through the Zodiak Menu (Facility) LAN. Refer to *Ethernet Switches and Hubs* on page 34 for information on system topography.

Shot Box

The E-MEM Shot Box (Figure 31) is a separate panel that is designed for rapidly recalling previously built effects. Features include single button delegation for M/E 1, 2, 3 (3-M/E systems only), or PGM/PST, five pages of 20 registers allowing access to all 100 registers, register and page readout display, and Pvw, Run and Auto Run controls.

Figure 31. Kalypso Shot Box



Installation

The dimensions in Figure 32 allow clearance for sheet metal and fasteners, and provide top plate overlap of approximately 0.6 in. (15 mm) on all sides. If the mounting surface is 0.75 in (19 mm) or less in thickness, the mounting nuts will not need to be countersunk (Figure 32). Refer to Figure 33 for exact screw placement and sheet metal dimensions.

Figure 32. Shot Box Cutout

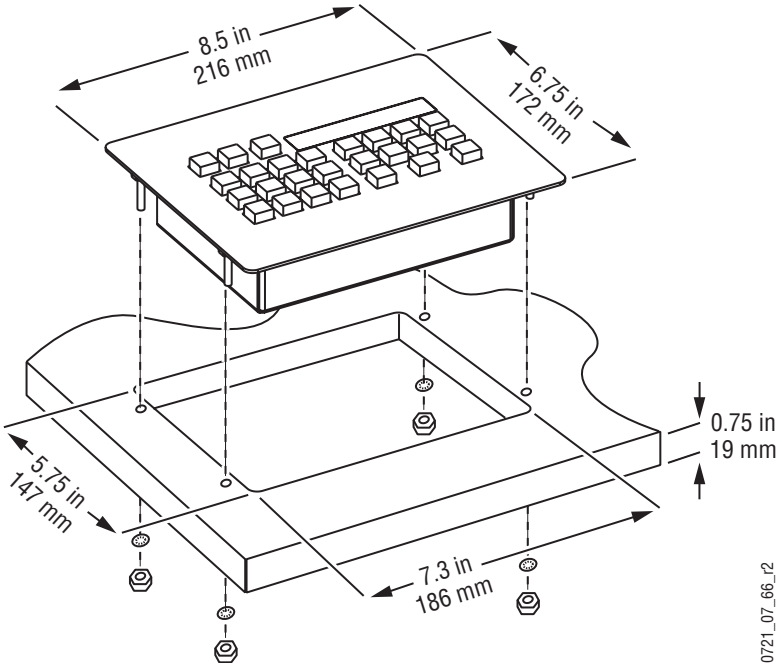
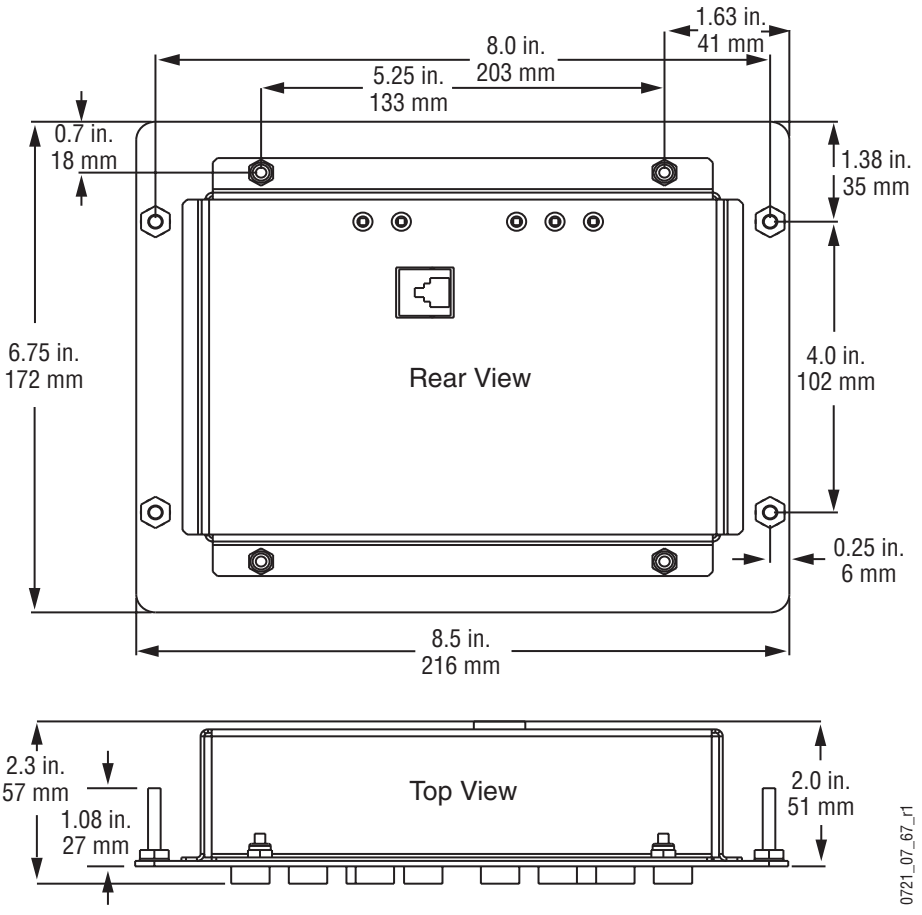


Figure 33. Shot Box Dimensions

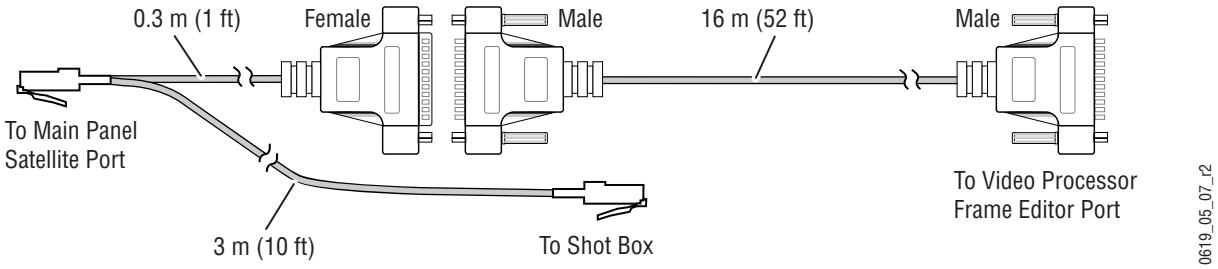


Cabling

The cables provided connect the Main panel, Shot Box, and Video Processor frame as shown in Figure 34. Power passes from the Main panel to the Shot Box over this cable.

Note When the fully functioning version of the Shot Box becomes available, the RJ-45 port on the rear of the Shot Box will connect (via a 10 ft [3 m] cable with RJ-45 connectors at both ends) to one of the Main panel Satellite ports.

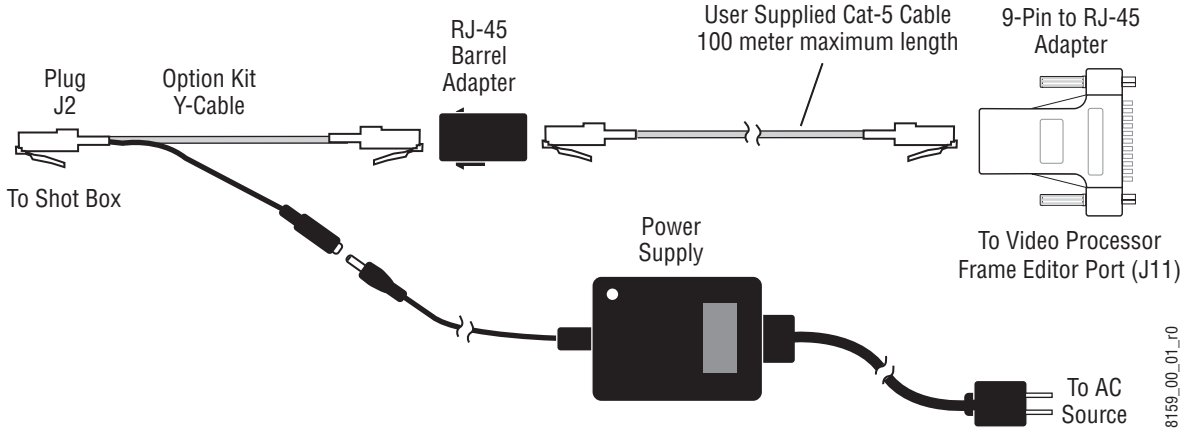
Figure 34. Provided Shot Box Cables and Connections



Optional Satellite Panel Extension

If the Shot Box is to be placed more than 10 ft (3 m) from the Main panel, use an optional Satellite Panel extension kit, permitting installation up to 100 meters away. The kit consists of a Y-cable (to separate the communication path from the power path), a separate power supply, and two adapters. A Cat-5 extension cable of the desired length is to be provided by the end user. The Satellite Panel extension kit cabling replaces any existing Shot Box cabling (Figure 35).

Figure 35. Shot Box Panel Extension Cabling, Editor Port Connection

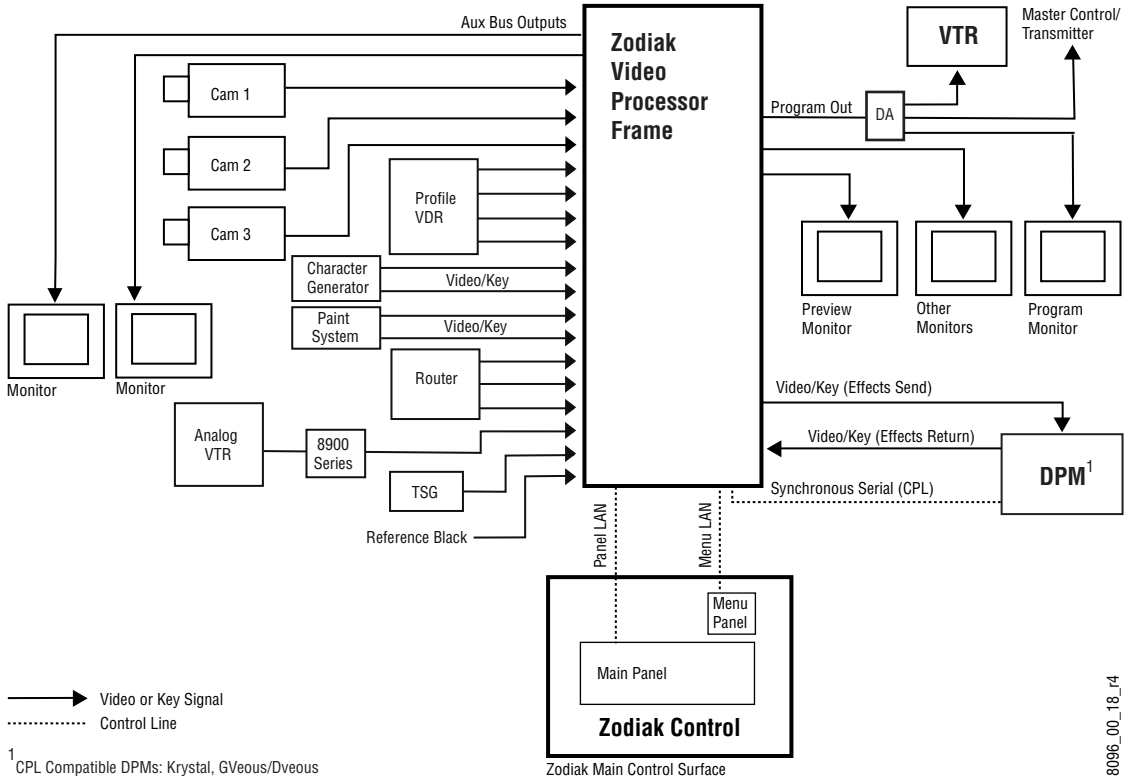


Note When the fully functioning version of the Shot Box becomes available, the RJ-45 port on the rear of the Shot Box will connect to one of the Main panel Satellite ports, and the 9-pin to RJ-45 adapter will not be used.

Typical Zodiak System Video Cabling

Typical Zodiak system connections are shown in Figure 36. Different video and control wiring configurations may be used to meet individual facility requirements. All Zodiak system video inputs are configurable. Each input can be mapped to any Zodiak panel source select button. Zodiak system video outputs are fixed and cannot be mapped.

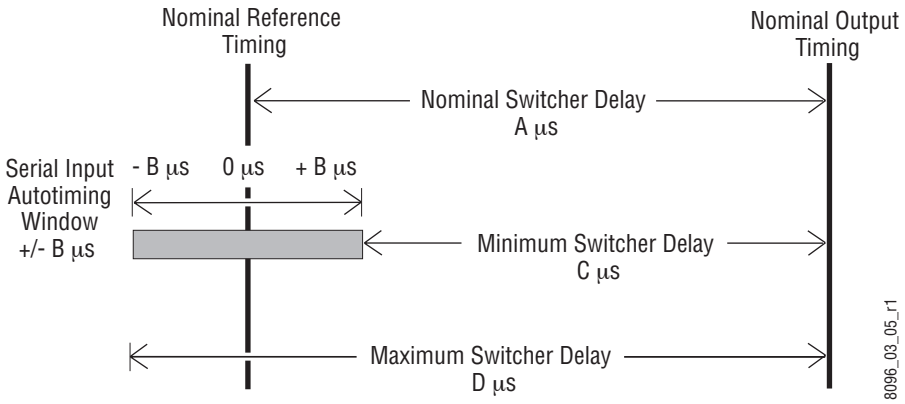
Figure 36. Typical Zodiak System



Zodiak Video Timing and Delay

The total delay of a video input to the switcher output can vary according to the relationship of the input to the switcher reference. The switcher will automatically autotime inputs by a specified amount (± B µs). Inputs must be within this timing range to be properly timed at the output. A timing diagram for illustrating the input autotiming window and various switcher delay values is provided in Figure 37.

Figure 37. Switcher Timing Diagram



Note For both 525 and 625 switcher operation, the approximate maximum switcher delay is one line of video.

- For inputs entering the switcher in zero time with the reference, the total delay through the switcher is expressed as the Nominal Switcher Delay (A µs).
- Inputs that reach the switcher at the latest point in the autotiming window (+ B µs) will have a total delay that equals the length of switcher processing. This value is expressed as the Minimum Switcher Delay (C µs).
- Inputs that reach the switcher at the earliest point in the autotiming window will have a total delay equal to the Nominal Switcher Delay (A µs) plus the autotiming value (– B µs). This value is expressed by the Maximum Switcher Delay value (D µs).

Delay values for a Zodiak system are given in Table 6.

Table 6. Zodiak System Video Delay Values

Nominal Switcher Delay	A	49 µs
Serial Input Autotiming Delay	B	± 14 µs
Minimum Switcher Delay	C	35 µs
Maximum Switcher Delay	D	63 µs

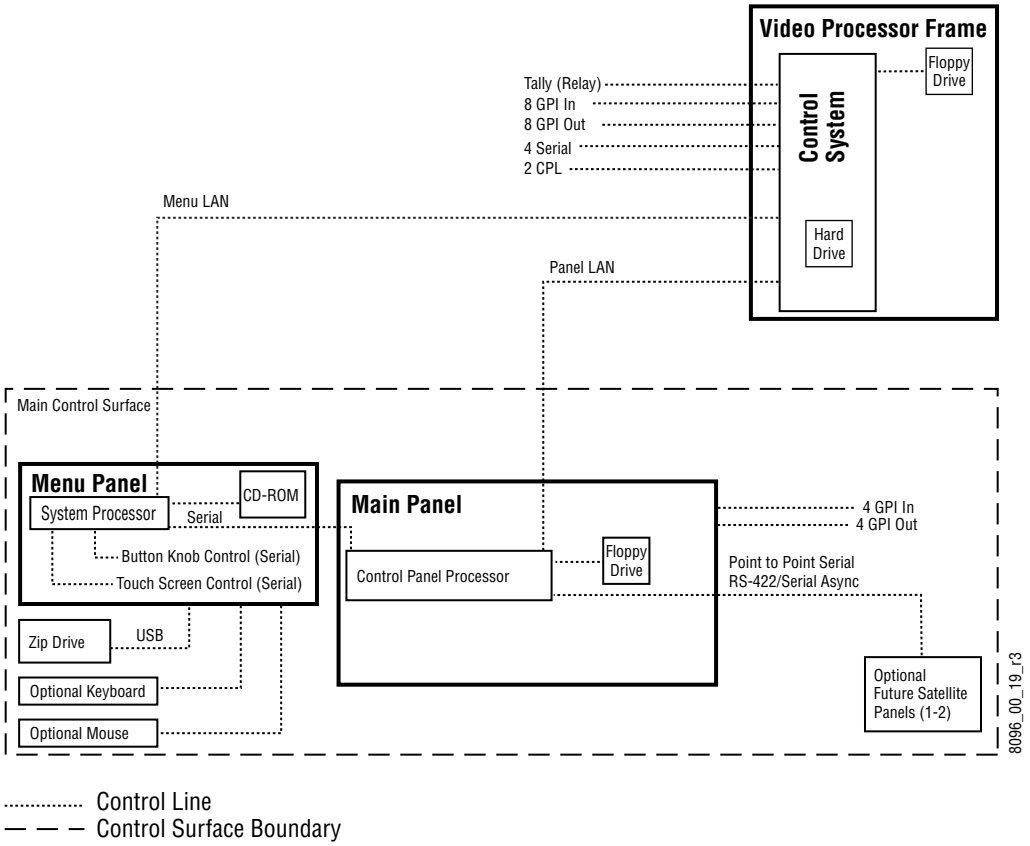
Zodiak System Control Cabling

A simple Zodiak system consisting of a Main panel, Menu panel, and Video Processor frame uses point-to-point connections and does not require an external Ethernet Local Area Network (LAN) (see Figure 39).

The Zodiak system uses Ethernet, serial, parallel, and USB connections. Tally and GPI control are available (see Figure 38).

Refer to Table 7 for a list of supplied cables.

Figure 38. Simple Zodiak System Control



NOTE: Main Panel, Menu LAN, Panel LAN 10Base-T or 100Base-T Ethernnet

Table 7. Supplied Cables (No Options)

Cable	Description	Quantity
AC Power Supply Cable — Main Panel	AC line cord kit	2
AC Power Supply Cable — 3-M/E Frame	AC line cord kit	3[a]
Main Panel to Menu Panel DC Power	8-pin DIN, male-to-male, 10 ft (3 m)	1
Menu Panel to ZIP 250 USB	USB AB cable, 6 ft (1.83 m)	1
Menu Panel to Main Panel	9-pin D, male-to-female serial, 10 ft (3 m)	1
Panel LAN, Menu LAN	Category 5, 100 Base-T, 100 ft (30 m)	2

[a] Two supplied cables for a 2.5-M/E frame.

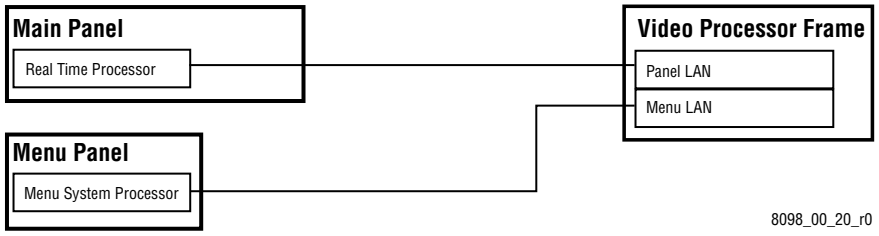
Cable Polarity and Cross Over Buttons

The point-to-point connections between the Main and Menu panel(s) and the Video Processor frame require that the Transmit (TX) and Receive (RX) pairs in the Ethernet cables be swapped. This is normally achieved with a special peer-to-peer (crossover) LAN cable or an Uplink port on the switch or hub. In Zodiak systems, **Cross Over** buttons are provided on both the Menu panel and Main panel to allow swapping cable polarity thus eliminating the need for crossover cables. The LAN cables supplied with the Zodiak system are 100 ft (30 m) straight-through cables. The LAN Link LEDs at each LAN cable connector will illuminate after power up to indicate the connection is correct. If no communication can be established (either LAN Link LED is off), polarity can be reversed by pressing the **Cross Over** button on the Main and Menu panels.

LAN Requirements

A simple Zodiak system uses point-to-point connections and does not require connection to an external Ethernet Local Area Network (LAN) or the use of an Ethernet switch (Figure 39).

Figure 39. Example Topography Not Requiring an Ethernet Switch



When components in addition to the Main panel, Menu panel, and Video Processor frame are connected, or when external network access to the Still Store file system is desired, connection to an external LAN and an appropriately sized Ethernet switch will be required (see Figure 40 on page 35).

CAUTION An Ethernet switch is required for the main Zodiak interconnect to additional components instead of a hub. A hub should be used to exceed maximum cable runs.

Refer to Table 8 for Ethernet specifications.

Note All Ethernet components must be supplied by the customer.

Table 8. Ethernet Specifications

Cables[a]	**Type**	10Base-T and 100Base-T compatible. Category 5 cable, 8 conductor twisted pair.
	Connectors	RJ-45 male connector at each end of cable.
	Length[b]	10Base-T: 984 ft (300 m) maximum. 100Base-T: 328 ft (100 m) maximum.
Switch[c]	**Speed**	Dual: 10 and 100 Mb
	Ports	RJ-45 auto-negotiating 10/100 Mb; number of ports required is dependent upon system size.
	Unmanaged	Recommended. Configuration not required, but does provide remote monitoring capability.
	Managed	May be used. Require configuration, but offer remote monitoring capability.

[a] The system will work at 10Base-T with reduced performance. 100Base-T components are highly recommended.

[b] Use a hub when necessary to exceed maximum cable runs.

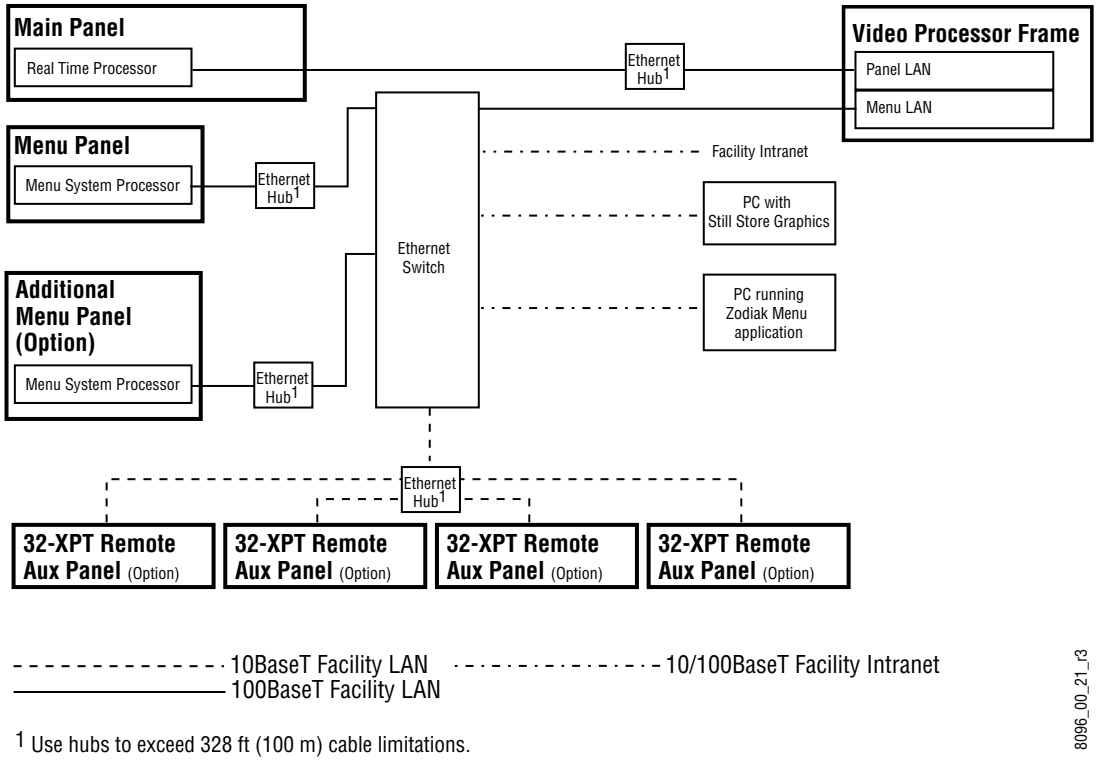
[c] Optional

Ethernet Switches and Hubs

Zodiak optional components rely primarily on Ethernet switches for LAN interconnects (see Figure 40). 32-Crosspoint Remote Aux panels may be connected directly to the Zodiak switch, or through an Ethernet hub. A hub is required only if there is a need to exceed 328 ft (100 m) between a panel and Video Processor frame. If a hub is used, connect the hub to the switch via the Uplink port, or through a peer-to-peer crossover cable. Reserve a port on Zodiak's Ethernet switch if you will be utilizing a hub or switch.

Note The number and type of components in your Zodiak system determines the size of the switch (number of ports) required. Refer to the following examples of system topography and the accompanying worksheet to determine the number of ports required for your system.

Figure 40. Example Topography Requiring an Ethernet Switch



Standard System Components	Ports Required		Number of Components		
Frame[a]	NA	x	--	=	--
Menu Panel	1	x	1	=	1
Zodiak Options					
32-Crosspoint Remote Aux Panel Hub	1[b]	x	(# of Hubs)	=	
Additional Zodiak Menu Panel	1				
Other Ethernet Devices					
Facility Intranet	1	x		=	
PC with Still Store Graphics	1	x		=	
PC running Zodiak Menu application	1	x		=	
				Total Number of Ports Required:	

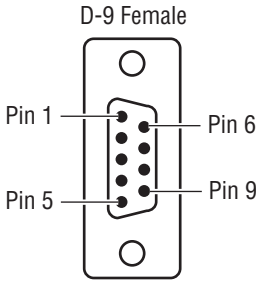
[a] The connection from the Main panel to the Video Processor frame is always a direct connection and does not require a port.

[b] No port required if option not installed.

Pinouts

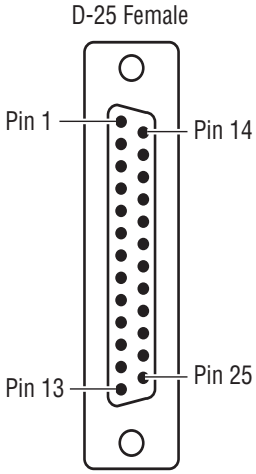
Main Panel

Table 9. Main Panel COM1 and COM2 Ports

Serial Ports RS-232	Pin	Main Panel Proc. Com 1	Main Panel Proc. Com 2
	1	DSD	DSD
	2	TXD	TXD
	3	RXD	RXD
	4	DSR	DSR
	5	Chassis GND	Chassis GND
	6	DTR	DTR
	7	CTS	CTS
	8	RTS	RTS
	9	Menu Reset[a]	Reserved

[a] Reset is active low.

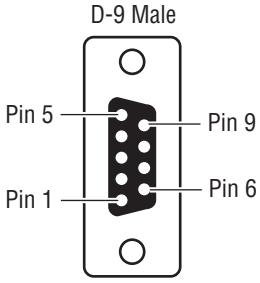
Table 10. Main Panel GPI Inputs and Outputs

GPI	Pin	Function	Pin	Function
	1	Chassis GND	14	IN 1B
	2	IN 1A	15	Chassis GND
	3	IN 2A	16	IN 2B
	4	Chassis GND	17	IN 3B
	5	IN 3A	18	Chassis GND
	6	IN 4A	19	IN 4B
	7	Chassis GND	20	OUT 1B
	8	OUT 1A	21	Chassis GND
	9	OUT 2A	22	OUT 2B
	10	Chassis GND	23	OUT 3B
	11	OUT 3A	24	Chassis GND
	12	OUT 4A	25	OUT 4B
	13	Chassis GND		

Notes:
Inputs are opto-isolated.
A and B are polarity independent.
Apply from 5 to 24 volts between A and B Inputs to turn on.
Outputs are normally open relay closures between A and B.

Menu Panel

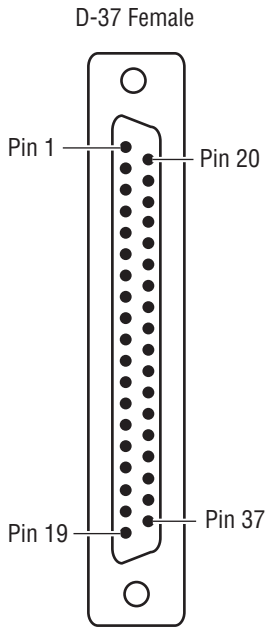
Table 11. Menu Panel Serial Ports

Serial Ports RS-232	Pin	Menu Proc. Com 3	Menu Proc. Com 4
	1	DSD	DSD
	2	RXD	RXD
	3	TXD	TXD
	4	DTR	DTR
	5	Chassis GND	Chassis GND
	6	DSR	DSR
	7	RTS	RTS
	8	CTS	CTS
	9	Menu Reset[a]	RI (Ring Indicator)

[a] Reset is active low.

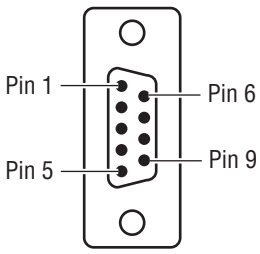
Video Processor Frame

Table 12. Video Processor Frame GPI Inputs and Outputs

GPI	Pin	Function	Pin	Function
	1	Chassis GND	20	IN 1B
	2	IN 1A	21	IN 2B
	3	IN 2A	22	IN 3B
	4	IN 3A	23	IN 4B
	5	IN 4A	24	Chassis GND
	6	IN 5B	25	IN 5A
	7	IN 6B	26	IN 6A
	8	IN 7B	27	IN 7A
	9	IN 8B	28	IN 8A
	10	Chassis GND	29	OUT 1B
	11	OUT 1A	30	OUT 2B
	12	OUT 2A	31	OUT 3B
	13	OUT 3A	32	OUT 4B
	14	OUT 4A	33	Chassis GND
	15	OUT 5B	34	OUT 5A
	16	OUT 6B	35	OUT 6A
	17	OUT 7B	36	OUT 7A
	18	OUT 8B	37	OUT 8A
	19	Chassis GND		

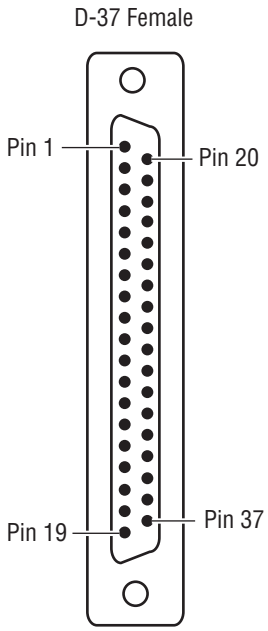
Notes:
Inputs are opto-isolated.
A and B are polarity independent.
Apply from 5 to 24 volts between A and B Inputs to turn on.
Outputs are normally open relay closures between A and B.

Table 13. Video Processor Frame Serial Ports

RS-422 Ports	Pin	Serial/CPL Ports J4 -J9
	1	Chassis GND
	2	TX-
	3	RX+
	4	Chassis GND
	5	Reserved
	6	Chassis GND
	7	TX+
	8	RX-
	9	Chassis GND

Notes:
Ports J4 – J9: The data directions specified on pins 2&3 and 7&8 as RX and TX may be reversed in software configuration.

Table 14. Video Processor Frame Tally Port

Tally Port	Pin	Function	Pin	Function
	1	Tally 1	20	Tally 20
	2	Tally 2	21	Tally 21
	3	Tally 3	22	Tally 22
	4	Tally 4	23	Tally 23
	5	Tally 5	24	Tally 24
	6	Tally 6	25	Tally 25
	7	Tally 7	26	Tally 26
	8	Tally 8	27	Tally 27
	9	Tally 9	28	Tally 28
	10	Tally 10	29	Tally 29
	11	Tally 11	30	Tally 30
	12	Tally 12	31	Tally 31
	13	Tally 13	32	Tally 32
	14	Tally 14	33	Reserved
	15	Tally 15	34	Reserved
	16	Tally 16	35	Reserved
	17	Tally 17	36	Tally Common[a]
	18	Tally 18	37	Chassis GND
	19	Tally 19		

[a] Outputs are relay closures between the respective tally pin and Tally Common (pin 36).

Specifications

Table 15. Zodiak System Specifications

Power		
Video Processor Frame	Power Supply	100-125 VAC or 200-250 VAC autorange, 50-60 Hz power factor corrected
	Power Consumption	2.5-M/E: 300 W (typical) 3-M/E: 400 W (typical)
Main Panel	Power Supply	100-125 VAC or 200-250 VAC autorange, 50-60 Hz power factor corrected
	Power Consumption	150 W (typical)
Environmental		
Temperature Range	Frame, Menu Panel	Specification: 20º to 30º C (68º to 86º F) Operational: 0º to 40º C (32º to 104º F)
	Main Panel	Specification: 20º to 30º C (68º to 86º F) Operational: 0º to 35º C (32º to 95º F)
Relative Humidity	Up to 95% (non-condensing)	
Mechanical Stress	ASTM D 4728, Fig. X1.1, Table X1.1, Truck Profile	
Serial Digital Video Inputs		
Number	64 non-looping	
Type of Connectors	75 ohm BNC, (SMPTE 259M)	
Nominal Amplitude	800 mV peak-to-peak terminated	
Return Loss	> 15 dB, 5 MHz to 270 MHz	
Channel Coding	Conforms to SMPTE RP-259M	
Ancillary Data	Included on each M/E and DSK Program output	
Input Impedance	75 ohm, self terminating	
Autotiming Range (Serial Inputs)	± 14 microseconds[a]	
Maximum Cable Length Equalized (Belden 8281 type cable)	738 ft (225 m)	
Number of Bits	10	
Serial Digital Video Outputs		
Number	26 outputs (3-M/E), 2 BNCs per output (52 BNCs)	
Type of Connectors	75 ohm BNC, self terminating (SMPTE 259M)	
Amplitude	800 mV peak-to-peak across 75 ohm ± 10% (SMPTE 259M)	
Return Loss	> 15 dB, 5 MHz to 270 MHz	
Rise and Fall Times (between 20% and 80% amplitude points)	Between 400 picosecond and 1.5 nanosecond across 75 ohm termination	
Timing Jitter	0.2 UI (SMPTE RP184-1996 method)	
Channel Coding	Conforms to SMPTE RP-259M	
Output Impedance	75 ohm	
Ancillary Data	Passed from A background to program outputs	
DC Offset on Output	< 50 mV across 75 ohm termination	
Number of Bits	10	
Number of Outputs	2 BNC connectors per channel	

Table 15. Zodiak System Specifications - (continued)

Analog Reference Input	
Signal Type	Composite Color Black (NTSC or PAL), 525 (60 Hz) or 625 (50 Hz)
Connectors	Two 75 ohm BNC
Return Loss	> 40 dB to 5 MHz
Impedance	75 ohm loop through
System Timing	
Switcher Output Delay (nominal)	49 microseconds

[a] Approximate value

Table 16. Zodiak Mechanical Specifications

Component	Depth	Width	Height	Weight [a]	Rack Units
Standard					
Video Processor Frame	22.13 in. / 562 mm [b]	19.0 in. /483 mm [c]	12.25 in. / 311 mm	79lb/36 kg	7
Main Panel	18.75 in. / 476 mm [d, e]	40.97 in. / 1041 mm	5.82 in. / 148 mm [f]	86 lb/39 kg	N/A
Menu Panel[g]	4.30 in. / 109 mm	14.75 in. / 375 mm [h]	10.1 in. / 257 mm	17 lb/7.7 kg	N/A
Options					
KAL-24AUX1 Remote Aux Panel	2.0 in. / 51 mm	19.0 in. / 483 mm	1.75 in. / 45 mm	2.25 lb/1.02 kg	1
KAL-24AUX2 Remote Aux Panel	2.5 in. / 64 mm	19.0 in. / 483 mm	3.5 in. / 89 mm	4.5 lb /2.04 kg	2
KAL-24AUX3 Remote Aux Panel	2.5 in. / 64 mm	19.0 in. / 483 mm	5.25 in. / 133 mm	6.75 lb/3.06 kg	3
KAL-32AUX1 Remote Aux Panel	5.25 in. /133 mm	19.0 in. / 483 mm	1.75 in. / 44 mm	2.06 lb/0.93 kg	1
KAL-32AUX2 Remote Aux Panel	4.25 in. / 108 mm	19.0 in. / 483 mm	3.5 in. / 89 mm	2.25 lb/1.02 kg	2

[a] All weights approximate.

[b] Allow an extra 4.0 in. (102 mm) for cable.

[c] Allow an extra 4.0 in. (102 mm) on the left and right of the frame for air flow.

[d] Allow a minimum of 6.0 in. (152 mm) of clear space at the rear of the Main panel below the mounting surface for proper cable clearance and air flow. Allow an extra 8.0 in. (203 mm) to 10.0 in (254 mm) of mounting surface behind the Main panel for peripheral components.

[e] Indicated measurement is for the lid. Refer to installation detail for tub measurements.

[f] Add 0,25 in. (6 mm) for rubber feet on bottom of tub if required. Indicated measurement is from bottom surface of tub to top surface of lid.

[g] Not including mounting bracket.

[h] Allow an extra 5.8 in. (147 mm) clearance for the CD-ROM and fan exhaust.