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# **G-6 Digital Control Surface**

## **TECHNICAL GUIDE**

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 *Wheatstone Corporation*

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600 Industrial Drive, New Bern, North Carolina, USA 28562

**G-6 Digital Control Surface Technical Manual - 1st Edition**

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# General Information

## Chapter Contents

<b>Introduction</b> .....	<b>1-2</b>
<b>Control Surface Placement</b> .....	<b>1-3</b>
<b>Power Supply</b> .....	<b>1-4</b>
Failsafe Dual Redundant Supply .....	1-5
Energizing .....	1-5
<b>I/O Connections</b> .....	<b>1-6</b>
The Insulation Displacement Connector System .....	1-6
Wiring Procedure - Double Connection to One Pin .....	1-8



# General Information

## Introduction

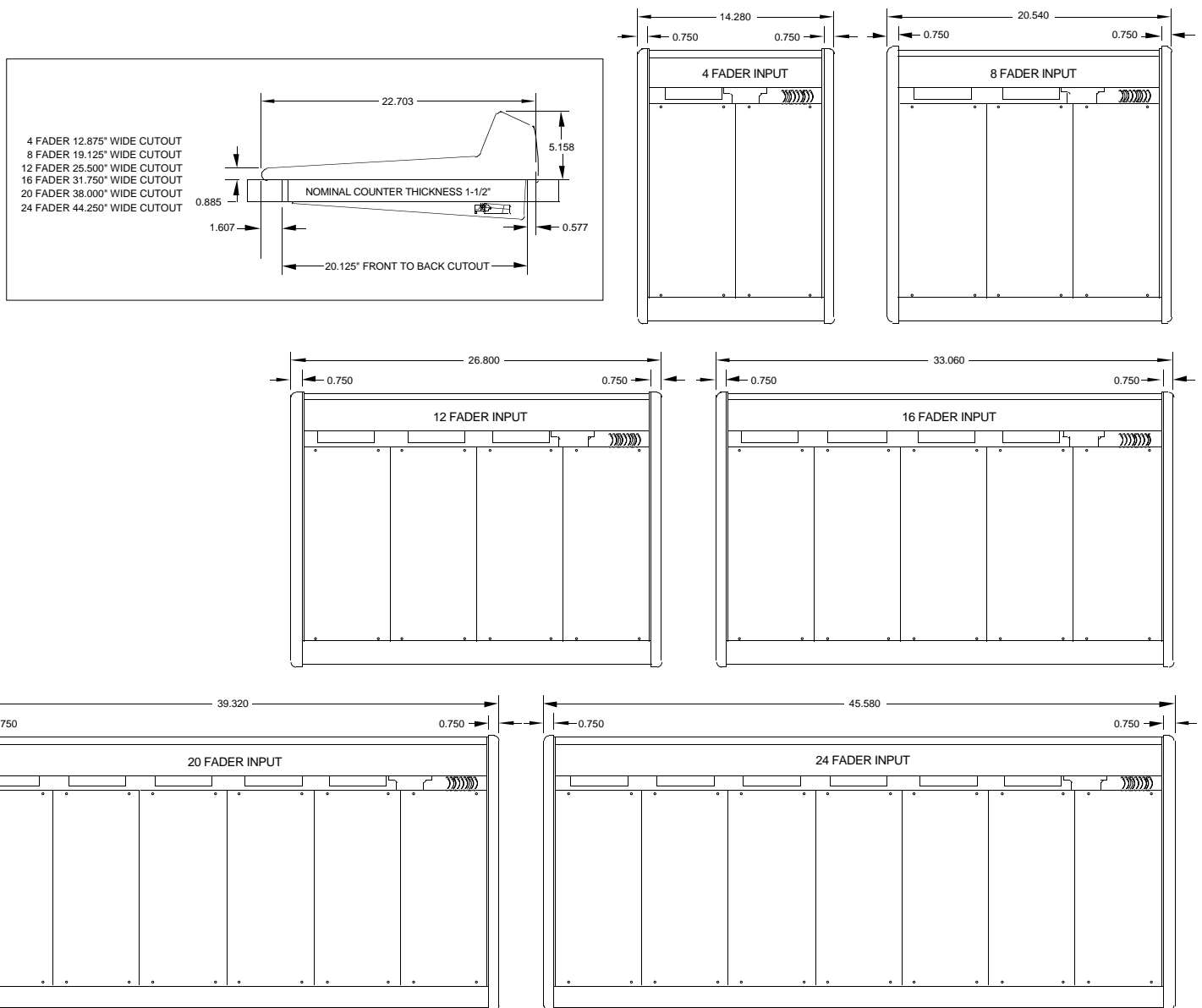
The G-6 Digital Control Surface is a member of the line of Wheatstone's intercompatible G-series control surfaces. Above each fader is an 8-character dot matrix source display, a cue switch, eight mix-minus assignment displays, four stereo bus assigns, two AUX encoders, and a source select encoder. It's got four monitor outputs (each with source displays), automatic telephone support, an event recall system (with security function), and an array of user-programmable switches. Designed to integrate flawlessly with the Wheatstone BRIDGE digital audio network router, the G-6 control surface allows you to easily create large or small platform-based systems that are exceptionally user-friendly and flexible. Wheatstone BRIDGE network cages house all I/O ports and engine cards, and may be wired in tandem within a single equipment room or interconnected to separate remote locations by means of CAT-5 cables to provide single wire studio integration schemes.

Once configured, the system operates entirely independently of external computers. Configuration itself is intuitive and carried out onsite by means of user-friendly graphic interfaces provided by Wheatstone desktop software. The G-6 system also takes full advantage of Wheatstone's exclusive VDip configuration software, so that studio functions (like mutes, fader and timer starts, tallies, etc.) are easily accomplished right at your desktop. Once completed, all settings are retained in non-volatile storage, allowing the entire system to run independently. Ethernet protocol is built in, providing interface with automation, scheduling, and hardware controllers as you require.

## Control Surface Placement

The G-6 digital audio control surface is designed for simple drop-in installation in a countertop. Cutout dimensions (in inches) are shown in the drawings below for the six available frame sizes.

Do not connect the G-6 control surface to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.



# Power Supply



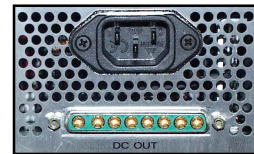
Front view of the SPS-180R rackmount power supply



Front view of the PSR rackmount power supply



Rear view of the SPS-180R rackmount power supply



Rear view of the SPS-180 unit

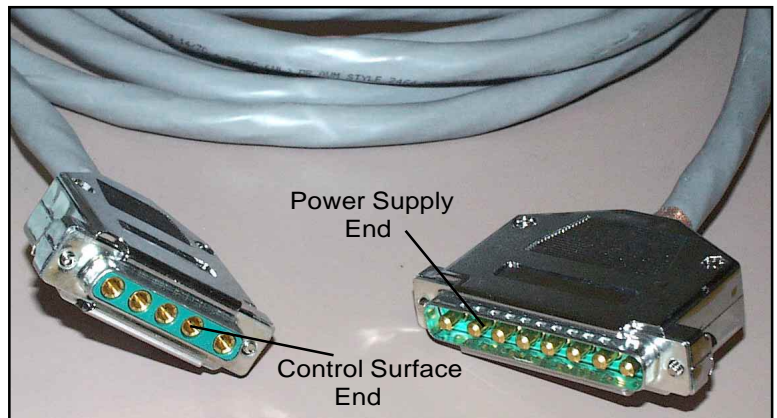
The G-6 control surface is powered by a Wheatstone Model SPS-180R rackmount power supply, or an SPS-180 power supply installed in a Wheatstone Model PSR rackmount unit. Each of the units occupies two 19" wide rack spaces (total height 3-1/2"). The PSR unit houses up to four SPS-180 power supply units.

If failsafe redundant supplies have been ordered, you will be installing two SPS-180R or SPS-180 units.

Note the power supply (supplies) should be mounted in an equipment rack within fifteen feet of the control surface (but no closer than 3 feet). Avoid locating any high gain equipment (such as phono preamps, tape recorders, etc.) too near the rackmount supplies, to avoid magnetic interference into that equipment.

This power supply contains high voltage circuits that are hazardous and potentially harmful. ***Under no circumstances should the metal cover be removed!*** If you have a problem with the power supply, the SPS-180R or SPS-180 unit must be returned to Wheatstone Corporation for repair.

Once the supply is rackmounted, it should be connected to the control surface using the factory supplied cable. The cable has two different types of connectors on it: a 5-pin female connector that connects to the control surface's power supply connector, and an 8-pin male connector that plugs into the power supply. The control surface's two power supply connectors are located at the rear of the control surface, in the middle of the meterbridge bot-



*PS Cable Pinout*

		PIN		PIN	
		RED 1	← +V in	8	RED, YEL
		YEL 2	← -V in	7	BLU, BLK
Console End		BLU 3		6	N/C
5-pin Connector		BLK 4		5	N/C
Female		N/C 5		4	N/C
				3	N/C
				2	N/C
				1	N/C

Power Supply End  
8-pin Connector  
Male

tom pan. If you are using one supply, connect it to one of the control surface connectors (it doesn't matter which one). If you are using the failsafe option (two SPS-180R or SPS-180 supplies), connect one end of a power supply cable to either control surface power connector and connect the other end of the cable to one of the two power supply connectors. Then use the other cable to connect the second power supply connector to the remaining control surface power supply connector. Connect the cable(s) first to the control surface, then to the rear of the rackmount power supply.

Note each power supply is fitted with a 3-wire grounded AC cord that should be plugged into a "clean" AC power source, that is, an AC source that feeds only the control room audio gear. This source should be a separate feed from those powering lighting, air-conditioning, or any other non-audio machinery. The third pin ground wire of the AC source should be tied to the central system ground point.

The power feed recommended in the text is often installed and referred to in studios as an "isolated AC ground" outlet. It is usually orange in color.

### Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two SPS-180R or SPS-180 power supplies for each piece of powered equipment. Though either is capable of running a full load on its own, in failsafe operation both units run in tandem: if one fails, the other takes over, assuring uninterrupted operation.

In order for failsafe systems to perform as designed, always have BOTH rackmount supplies powered up and connected to their associated equipment.

### Energizing

Assuming the G-6 control surface mainframe is properly placed, and its SPS-180 or SPS-180R power supply (or supplies) correctly rackmounted and connected to the control surface, you may now energize the rackmount power supply by plugging it into the AC mains. The control surface's LED meters will illuminate and individual module switches will assume factory default settings.

Note: To de-energize the control surface, unplug the rackmount power supply's AC cord from the AC mains. *Never de-energize the control surface by disconnecting the cable that connects the control surface and power supply together.*

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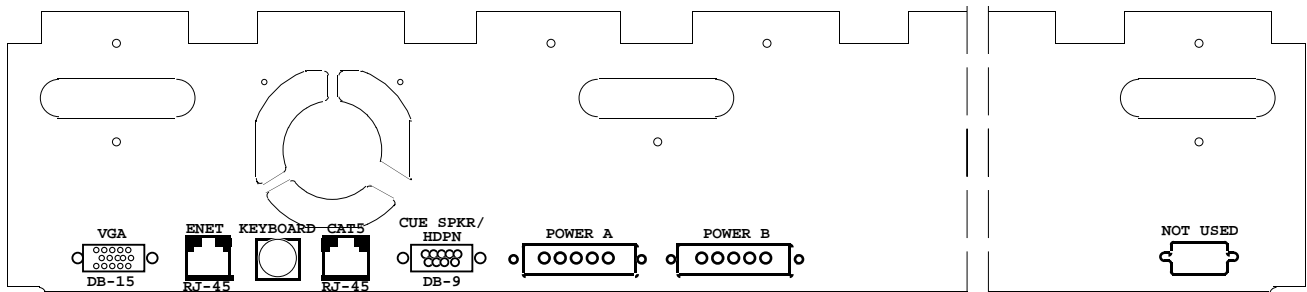
**Once you have verified proper power-up, unplug the rackmount power supplies to de-energize the control surface. You may now proceed to wire up audio and control connections.**

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## I/O Connections

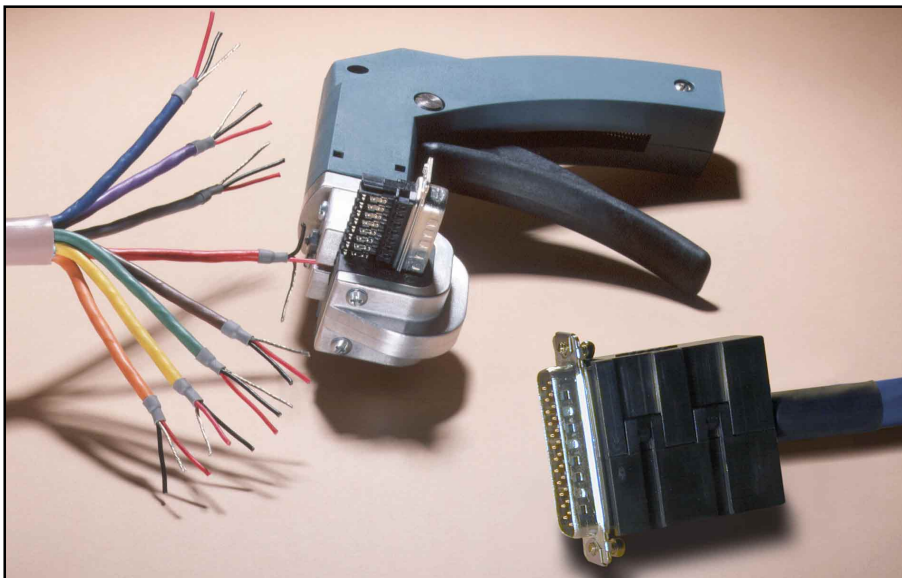
All user wiring to and from the G-6 control surface is made via connectors located on the control surface's rear panel. Two 5-pin male connectors at the left end of the control surface's rear are for power supply connections. Line level cue and headphone signals plug into the female DB-9 connector, located next to power supply connectors. These signals are routed to internal amplifiers that feed the internal cue speaker and headphone jack. There are two RJ-45 connectors for Ethernet connection and for CAT-5 connection. For all wiring pinout connections refer to Chapter 4. The sketch below shows connector locations.

NOTE: Keyboard and VGA connectors for factory use only.



### The Insulation Displacement Connector System

The I/O wiring interface system is based on insulation displacement technology. A special AMP wiring tool is included with each control surface; it is auto-indexing, and allows individual wire connections to be positively made with a single squeeze of the tool's trigger. The trigger action is ratchet controlled, and will not release until a full connection is made. Once released, the multipin connector held in the tool's jaw automatically indexes to the next connector pin. The technology is such that no stripping, soldering or tinning of wire ends is required; all that is needed is that the wires destined for the connector be snub cut and laid out in order (although tubing should be used on bare drain wires). An empty DB-9 connector is inserted into the tool,



The AMP tool insulation displacement connector system. Note the right angle hood with self-locking tabs. The tool, multipin connectors (with gold plated pins) and latching hoods are supplied with each control surface.

indexed to the first pin, and the wires are inserted one by one into the jaw and the trigger squeezed. In this way a single multipin connector can be completely wired up in a minute or two. These connectors will accept wire gauge 22 - 26 AWG.

In the event of a wiring error, connector pins may easily be removed from the shell with the wire still attached, and inserted into the correct position. Observe the side of the connector, with the metal part down. You will see a row of "Vees"—simply press the top of the vee together with a scribe or other sharp instrument; this will unlock the pin from the shell, and it can be removed and inserted into the correct position. Spread the vee apart to lock the pin in the new position. It should never be necessary to discard a connector due to a wiring error.

Note that mating hoods for each connector are also supplied with the system. These have locking screws that hold the connectors securely to their mates.

# Input Panel (IS-G6)

## Chapter Contents

<b>Controls and Functions .....</b>	<b>2-2</b>
Input Sources .....	2-2
SET Button .....	2-2
AUX .....	2-2
Mode Selector Indicator .....	2-3
Pan/Balance Knob .....	2-3
Main Bus Assign .....	2-3
MXM Displays .....	2-3
CUE Switch .....	2-3
Fader .....	2-3
ON/OFF Switches .....	2-4

# Input Panel (IS-G6)

## Controls and Functions

Each input panel of the G-6 digital audio control surface has four identical strips representing four input channels.

### Input Sources

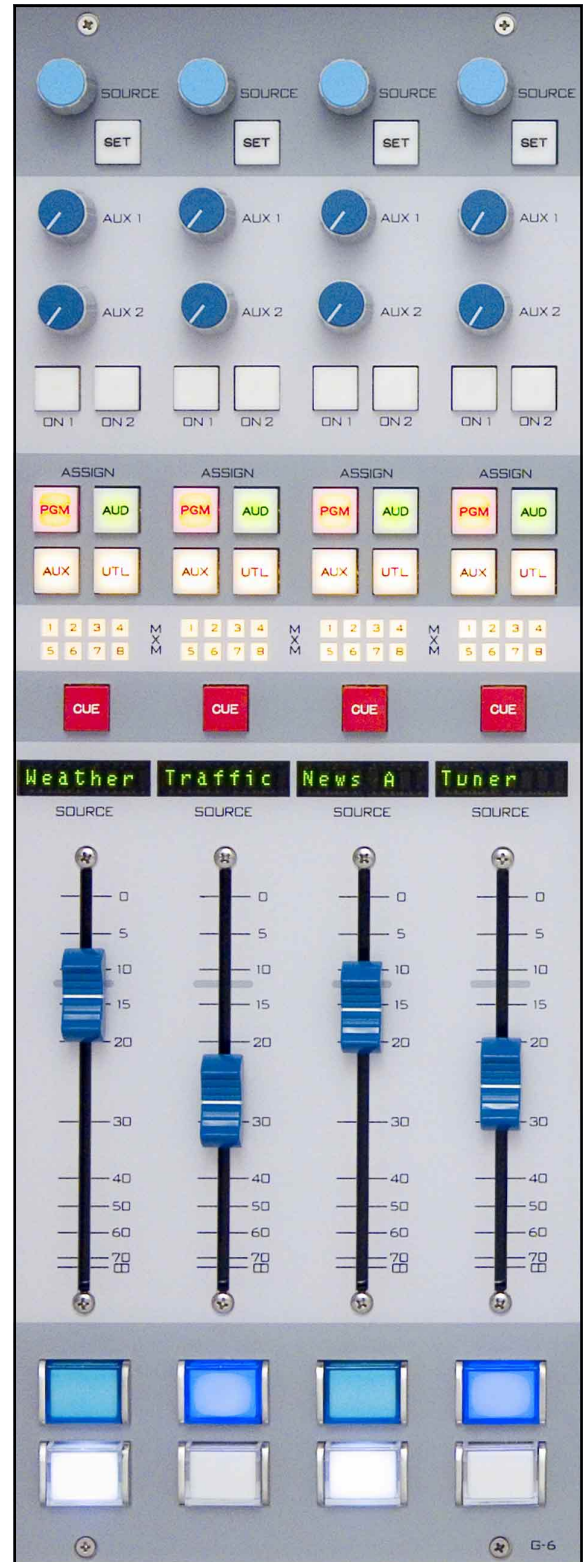
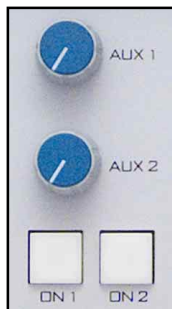
Each input panel controls four stereo sources. By turning the source selector (SOURCE knob) at the top of the panel, the available inputs are displayed in the 8-character SOURCE display. When the desired input source is scrolled into the SOURCE window, the SET button will act like a TAKE button, and pressing it will cause that source to be switched to the input of the channel. If you fail to press SET, the display will revert to its original setting after a timeout of approximately 4 seconds, and the original source remains in effect.

### SET Button

This allows the operator to access various controls and displays in the EFS CONTROL panel and apply them to the selected channel. To use, press the SET button and then make your appropriate section settings in other areas of the control surface. Once a SET button has been pressed, the button lights up, and all setting changes will apply to **that input channel** until a different input SET button is pressed, or until a timeout of about 20 seconds has occurred.

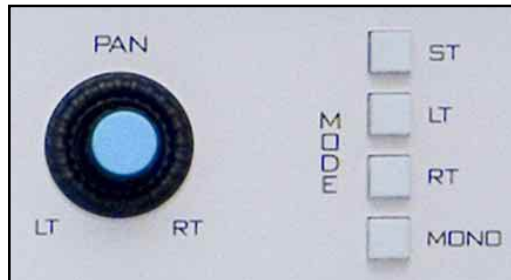
### AUX

Each channel of the input panel IS-G6 has two AUX encoders (AUX1 and AUX2) to set the level of the channel's audio in the AUX SENDS. Two switches (ON1 and ON2), determine whether the channel feeds AUX1 (ON1) and/or AUX2 (ON2).



## Mode Selector Indicator

MODE selection switches in the EFS panel (see Chapter 3) enable input channels to operate in Stereo, Mono, Left only, or Right only. The switch lights up to indicate the selected mode. This feature is activated for a given channel by pressing the channel's SET button (see page 2-2).



EFS-G6 Panel

## PAN/BALANCE Knob

The PAN knob (in the EFS panel) acts as a panpot in MONO, LEFT only and RIGHT only modes, and as a balance control in STEREO mode. Once again, this feature is activated for a given channel by pressing the channel's SET button. To easily set the PAN to center, you can press the control twice in rapid succession, like double-clicking a mouse button.

## Main Bus Assign

ASSIGN buttons assign the input channel signal to the four main busses: PGM (program), AUD (audition), AUX (auxiliary), and UTL (utility), respectively. Note that the UTL bus can be set up during configuration to be pre/post fader or ON switch.

## MXM Displays

Each channel can be assigned to any combination of the eight MIX-MINUS buses (EFS panel). The assigned setting is displayed in the MXM 1-8 display group. Channels are assigned to these MXMs in the following manner: press the channel SET button on the input fader section and then press the desired MIX-MINUS ASSIGN button, located on the EFS panel. Note that you are assigning the channel, and not the source, to the MXM bus.



EFS-G6 Panel

## CUE Switch

The CUE switch lets the operator monitor the channel's pre-fader signal.

## Fader

Channel output level is set by a long-throw fader.



## ON/OFF Switches

Channel ON (blue) and OFF (white) switches are at the bottom of the input section. The ON switch turns the channel signal ON and fires the channel ON/START logic; the switch LED lights to indicate the channel is ON. The OFF switch turns the channel signal OFF and fires the channel OFF/STOP logic; the switch LED lights to indicate the channel is OFF.



# Control Panel (EFS-G6)

## Chapter Contents

<b>Controls and Functions .....</b>	<b>3-2</b>
Monitors .....	3-2
Control Room Section .....	3-2
Studio Section .....	3-3
Headphone Section .....	3-4
Talkback .....	3-4
CUE Section .....	3-4
Switched Meters Section .....	3-4
AUX Master Outputs .....	3-5
Mode Select Section .....	3-5
MXM Assign .....	3-5
MXM Talkback .....	3-5
Timer Section .....	3-6
Event Controller Section .....	3-6
Storing an Event .....	3-6
Taking an Event .....	3-7
Undoing an Event .....	3-7
Modifying the Currently Selected Event .....	3-7
Deleting an Event .....	3-7
Previewing an Event .....	3-7
Event Default Button .....	3-8
Establishing the Default Setting .....	3-8
Naming an Event .....	3-8
Control Modes .....	3-9
Programmable Buttons .....	3-10

# Control Panel (EFS-G6)

## Controls and Functions

The G-6 digital audio control surface is equipped with one CONTROL panel. This panel contains MONITORS, CUE, TALKBACK, MODE, MXM ASSIGN, EVENT PRESET, TIMER, METER, AUX and PROGRAMMABLE controller sections.

## Monitors

There are four monitor outputs available: CONTROL ROOM, STUDIO 1, STUDIO 2, and HEADPHONE.

Each monitor has a LEVEL control, a SET button, and a SOURCE display, located at the bottom section of the EFS panel. There are also TB buttons in the two STUDIO sections.

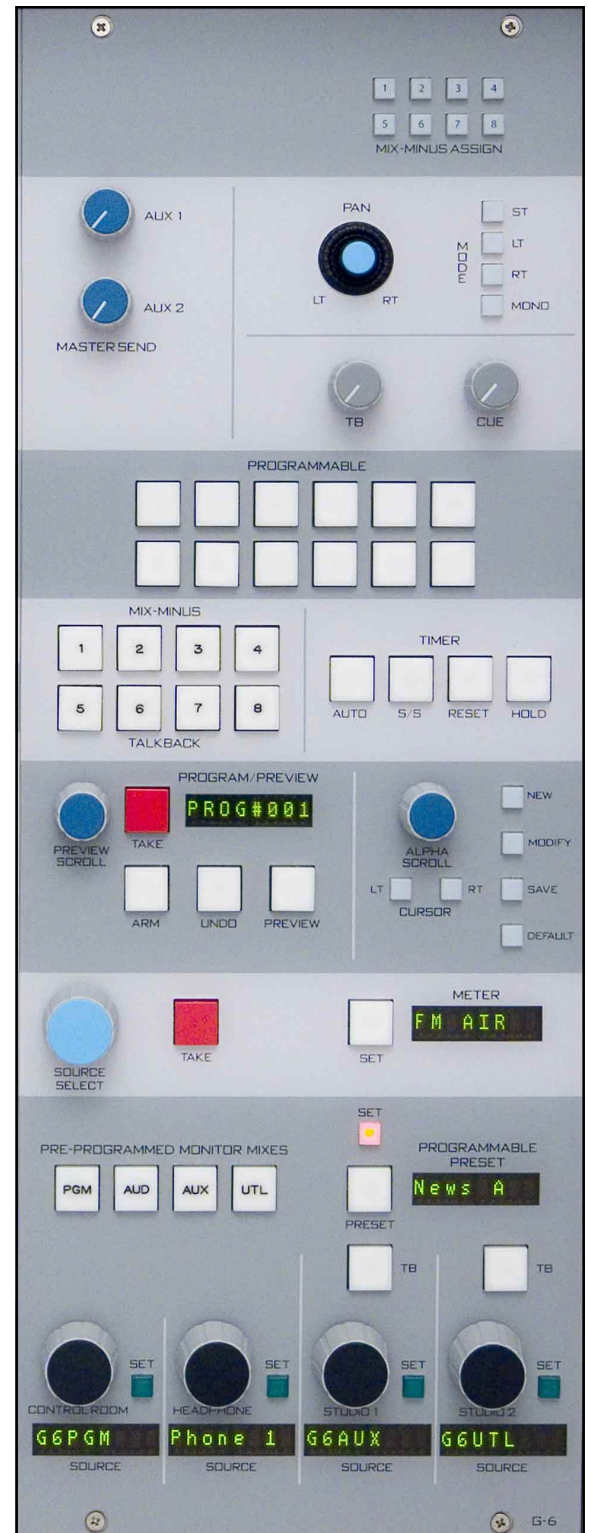
Monitor sources can be selected several ways:

- Four PRE-PROGRAMMED MONITOR MIXES switches (PGM, AUD, AUX, and UTL) allow direct access to the main mixes most frequently monitored.
- Sources can be randomly selected with the SOURCE SELECT knob and the TAKE button.
- A source can be loaded as a monitor preset by first selecting it with the SOURCE SELECT knob, and then holding the PRESET button down until the source shows in the PROGRAMMABLE PRESET display. That source can then be monitored by pressing the PRESET button.

To select a source for a monitor by one of the above methods, first press the SET button next to the knob for the desired monitor. The knob will control the level of the monitor signal.

## Control Room Section

In a typical radio application the control surface is located in the audio control room. Speakers in the control room allow the control surface operator to listen to the various control surface bus outputs to be assured that the control surface is performing as



desired. These speakers are fed by a stereo signal routed from the control surface's control room output. In addition to the control room output, the operator may also desire to listen to specific isolated faders via the cue system and the control surface's internal or external cue speaker, or may want to listen via headphones.

In some instances the control surface operator may also be performing talent whose voice will be heard over the radio. The operator's microphone may thus provide a part of the signal that is going out over the air. If that signal is the one being monitored with the control room speakers, there is the potential for feedback. The amplified signal from the control room speakers is picked up by the microphone and reamplified to a new, higher, level, which then is once again picked up by the microphone. The signal quickly rises to an ear-splitting screech. To prevent this, the operator's microphone is normally set in the configuration software to MUTE the control room output to prevent the occurrence of feedback.

**CR SET BUTTON** - lets the operator select the source to be listened to in the control room speakers.

**CR DISPLAY** - the eight character display shows the source that is selected for monitoring in the control room.

**CR LEVEL CONTROL** - determines the overall loudness of the signal being monitored as it appears in the control room speakers.



## Studio Section

In addition to the control room, there may be one or two studios in which one or more performers will be assembled, usually with microphones so that their voices can become part of the mix. Speakers may be provided in the studio to allow the talent to listen to the various control surface bus outputs at times that they are not actually on air. These speakers are fed from one of the control surface's two stereo studio outputs.

As in the control room, the potential for feedback also exists in the studio. The talent microphones will usually provide a part of the signal that is going out over the air. If that signal is the one being monitored with the studio speakers, feedback will occur. To prevent this, the studio mic faders are usually set to MUTE the studio output in the configuration software to prevent the occurrence of feedback.

**ST SET BUTTON** - lets the operator select the source to be listened to in the studio.

**ST DISPLAY** - the eight character display shows the source that is selected for monitoring in the studio.

**ST LEVEL CONTROL** - determines the overall loudness of the signal being monitored as it appears in the studio speakers.

## Headphone Section

**HDPN SET BUTTON** - lets the operator select the source to be listened to in the headphones.

**HDPN DISPLAY** - the eight character display shows the source that is selected for monitoring in the headphones.

**HEADPHONE LEVEL CONTROL** - determines the overall loudness of the headphone output signal.



## Talkback

**TALKBACK (TB) BUTTON** - there may be times when the control surface operator wants to talk to one of the talent in the studio. When the TB button in the studio monitor section is pressed, a predefined signal, usually the operator's mic, will "interrupt" the speaker feed that is normally heard in the studio.

If there is a live mic in the studio which has activated the mute feature, talkback will also be muted in the speakers.

In the center of the EFS control panel is the TB master level control that sets the talkback output and the level of the talkback interrupt signal.



## CUE Section

The CUE master level control is located in the center section of the EFS panel. The CUE signal is pre-fader, and is normally used to check signals. When a channel is CUEd, its pre-fader signal will appear in the cue speaker, and the switched meter array in the meterbridge will show the level of the pre-fader signal.

The CUE level control determines the overall loudness of the cue signal (normally wired to the cue speaker in the meterbridge).

Similar to the control room speakers, the cue speaker also has the potential for feedback and should be muted (using the configuration software—VDIP menu) whenever the control room speakers are.

## Switched Meters Section

The control surface has provision for a switched meter.

To select a signal to meter, first press the SET button, then rotate the encoder SOURCE SELECT. Available sources will be displayed in the eight character METER display. When the desired signal is displayed, press the TAKE button.



The switched meter array will then display the signal level. If, however, after a timeout period of 20 seconds, the TAKE button is not pressed, the array will revert back to its previous selected program.

## AUX Master Outputs

MASTER SEND controls AUX1 and AUX2 are provided at the top of the EFS panel to set the output levels of AUX sends 1 and 2, respectively.

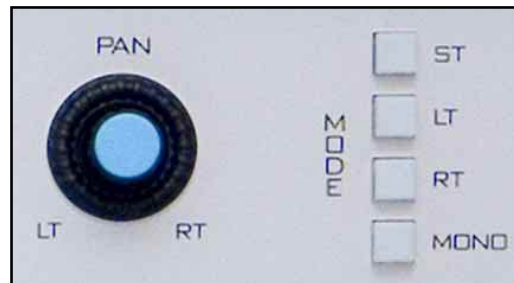


## Mode Select Section

The mode selector switchbank (ST, LT, RT, MONO buttons) and mode knob (PAN) are located at the top of the EFS panel. There are four available channel modes: STEREO, LEFT ONLY, RIGHT ONLY and MONO. When pressed, the switch will light up to indicate the selected mode.

The PAN knob acts as a panpot in MONO, LEFT ONLY and RIGHT ONLY modes, and as a balance control in STEREO mode. The PAN knob is only used with input channels, and has no effect when setting the mode of the monitor signals.

To select a MODE, press the SET button of the desired channel or mix; the SET button will illuminate, and the current mode setting for that channel will be displayed on the MODE switches. MODE can be reconfigured by pressing any allowable button.



## MXM Assign

These buttons are used to control the makeup of the eight MIX-MINUS buses. Press the SET button on any channel. If that channel is assigned to feed an MXM bus, the corresponding MIX-MINUS ASSIGN switch will be lit. Pressing a MIX-MINUS ASSIGN switch will toggle that channel's signal into or out of the corresponding MXM bus. Note that you are assigning the channel, and not the source, to the MXM bus.



## MXM Talkback

To interrupt an MXM output with the TB signal, press any of the eight MIX-MINUS/TALKBACK momentary switches.



## Timer Section

The digital timer display is mounted in the righthand end of the control surface's meterbridge, and its control buttons are in the center of the EFS panel.

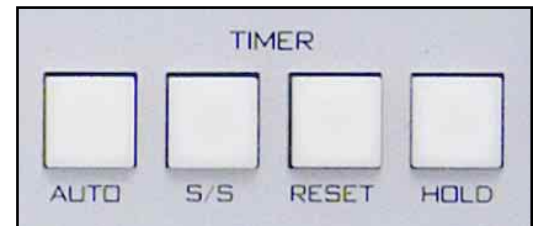
The control surface timer is provided with an AUTO-RESTART function so programmed (via GUI) input modules can automatically reset the timer display to zero and start a new count (if the timer is currently running), allowing the announcer to easily track his own pace.

The START/STOP button halts the timer, holds the last count, and then restarts and accumulates the count when depressed again—perfect for compiling tapes of desired duration.

RESET has a dual-mode capability:

- if you depress it while the timer is counting, the display will instantly reset to zero and start a fresh count;
- if the timer is already stopped, depressing this button will reset the timer to zero, where it will hold until start is pressed.

The HOLD button allows you to hold the display for a longer viewing duration, while still allowing the counter to continue in the background. Releasing the button will then display the current count.



## Event Controller Section

This section provides a means for storage and retrieval of control surface settings, and naming those settings as “events”. In this manner complete configuration and setting information that is used repeatedly (for example, morning show) can be saved and recalled. Up to 100 different events can be stored.



## Storing an Event

When an event is stored, all of the control surface's current settings are saved and will be recalled when that event is executed through the TAKE command. To create a new event from current control surface settings, hit the NEW button, and then hit the SAVE button. To overwrite an existing event with the current settings, turn the PREVIEW SCROLL knob until the desired event is displayed in the PROGRAM/PREVIEW window, then quickly press MODIFY, then SAVE.

## Taking an Event

Rotate the PREVIEW SCROLL encoder until the desired event is shown in the PROGRAM/PREVIEW display. To prevent accidental takes, the ARM button must be pressed to arm the function. The TAKE button will now flash indicating that the panel is ready to act on a take. Then press the TAKE button to execute the EVENT.



## Undoing an Event

To recover from a premature or erroneous EVENT take, press the ARM and UNDO buttons. This will return the system to its status prior to the last take, with the last program event being once again the current program event, and the last preview event (the one just taken) becoming the preview event once again. There is only one level of undo. If undo has been done and a subsequent take has not been done, pressing the undo function again will do nothing.

## Modifying the Currently Selected Event

It is presumed an event has already been executed on the control surface. Modifications to that event can be accomplished by simply adjusting the controls and switches as desired and then pressing the MODIFY button, then the SAVE button. In this way the modified event will overwrite the old event setting and be saved, with the same name, in its place.

## Deleting an Event

Rotate the PREVIEW SCROLL encoder until the Event to be deleted is shown in the PROGRAM/PREVIEW display. Press the Modify button, then press the PREVIEW SCROLL knob; the display will ask "DELETE?". Press the TAKE button to delete the previously displayed Event. Do nothing and Delete mode will time out after approximately 7 seconds. *Deleted Events may NOT be restored.*

## Previewing an Event

Rotate the PREVIEW SCROLL encoder (push knob in while rotating for faster scrolling) and available EVENT names will be shown in the 8-character PROGRAM/PREVIEW display. When the desired event is shown in the display, press the ARM button, then press the PREVIEW button. This will cause the entire control surface to display all settings associated with that event, without disturbing the current operative event. The preview status will be indicated by illumination of the PREVIEW button and flashing of all source and

destination displays, to remind the operator that these would be the intended settings when the change is made. Pressing the PREVIEW button a second time will cancel the preview. *It should be noted that no audio signals are changed in any way by the preview feature.*

### Event Default Button

This control allows rapid access to a default or home control surface setting. Push it, and the TAKE button in the Preview section will flash. Hit the TAKE button and the default setting will be executed.



### Establishing the Default Setting

This setting would normally be set only once. For example, it may be desirable to have all controls set to zero, or everything programmed to typical nominal settings. To establish the default setting, adjust all the control surface controls to their desired settings, press the MODIFY button and then the DEFAULT button. The default setting is stored.

### Naming an Event

When events are saved, they receive a default event designation number. This way events can be saved quickly without having to name them. However, an event may be custom named when saved, or at a later time. To rename the displayed event, press the ALPHA SCROLL knob. The CURSOR LT and CURSOR RT buttons will light and the cursor, indicated by a flashing character, will be at the beginning of the name. Also, the SAVE button will begin to flash. At any time you can use CURSOR LT and CURSOR RT to move to a character you want to change. Once the cursor is at the desired character, rotate the ALPHA SCROLL encoder until the desired new character is displayed. Once all desired characters have been changed, simply press SAVE to save your changes. The event is stored with the desired name. At any time you can cancel the name edit by pressing the ALPHA SCROLL knob. Also, if you stop making name changes but fail to press the SAVE button, the name edit process will automatically cancel after a delay of about 10 seconds.

## Control Modes

The G-6 control surface is operated in one of three modes. In Administrator mode access is allowed to all surface functions. In User mode a limited set of user functions is allowed. The set of functions allowed in User mode is

set independently for each console using the Bridge XPoint software (see the Bridge Router manual for details). The third mode, Guest, blocks out MXM level, MXM assign, Event takes, and visibility changes from being controlled by the surface.



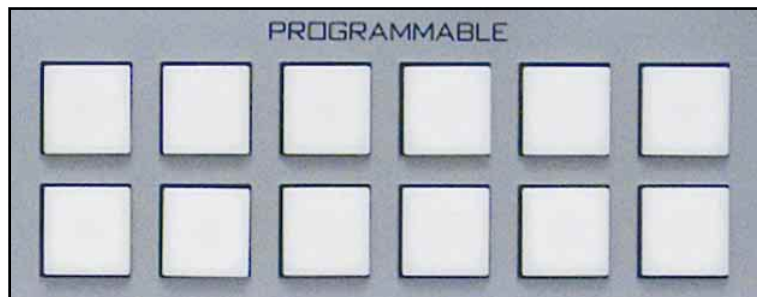
To change the control mode, begin by pressing and holding the SOURCE SELECT knob until the display reads “Admin” and the TAKE button lights (if the surface is currently in Admin mode the SET button will also light). Turn SOURCE SELECT until the desired new mode (Admin, User, or Guest) is showing in the display and press TAKE. Turn SOURCE SELECT again to select the first digit of the password. Default passwords, which may be changed in XPoint, are “1234” for Admin, “2222” for User, and “0000” for Guest. After dialing up the first character of the password, press TAKE. Then dial up the second digit. Continue this procedure until the four characters have been entered. Upon pressing TAKE after entering the fourth character, the display will read “Okay...” if you were successful and “Sorry...” if you were not. When finished, turn SOURCE SELECT until the display reads “<<Exit” and press TAKE to finish the mode select operation.

The SET button lights as you select the mode that the surface is currently in. If you press TAKE when displaying the current mode, the display will switch to “Okay...” and you will not need to enter the password. If you stop partway through the procedure, the mode selection process will time out after about 15 seconds.

Once a given control mode is selected for a surface, that setting will persist through a power cycle or surface reset.

## Programmable Buttons

These twelve (12) momentary switches and indicating LEDs are designed for user accessible external functions (GPIs). With these switches the user can fire Salvos or make a temporary crosspoint without having to wire any physical logic ports. These switches may also be mapped to control physical Logic card output ports, and the LEDs on the Spare buttons may also be lit by a remote device connected to a Logic card input port. See the Bridge Router manual for details.



# Host CPU (HC-3)

## Chapter Contents

<b>Overview .....</b>	<b>4-2</b>
<b>HC-3 BIOS Settings/Format .....</b>	<b>4-2</b>
<b>Ethernet IP Addressing .....</b>	<b>4-2</b>
<b>Ethernet Interface Wiring .....</b>	<b>4-2</b>
<b>Mixer Link Wiring .....</b>	<b>4-3</b>
<b>Internal Programming Options .....</b>	<b>4-3</b>
<b>Switch Settings .....</b>	<b>4-3</b>
SW1 Position 1 - Sample Rate .....	4-3
SW1 Position 4 - CAT5 Enable .....	4-3
SW2 - CPU Reset .....	4-3
<b>Hook-Ups</b>	
“ETH” RJ-45 - Main Ethernet Connector .....	4-4
“CAT5” RJ-45 - Mixer Link Connector .....	4-4
“CUE SPKR/HDPN” - Cue Speaker/Headphone Connector .....	4-4
<b>Typical Ethernet Cable .....</b>	<b>4-5</b>
<b>Typical Crossover Cable .....</b>	<b>4-5</b>
<b>HC-3 Pinouts Drawing .....</b>	<b>4-6</b>

# Host Controller (HC-3)

## Overview

The host controller card used in the G-6 incorporates a PC/104 computer mounted on the HC-3 PCB. The host computer utilizes RAM, a flash disk (which emulates a standard IDE hard drive) and an Ethernet port. There is no hard disk drive. Keyboard, floppy controller and video ports are for factory use only.

The purpose of the host controller is to provide control of the G-6 control surface. The HC-3 communicates to the XPoint Configuration PC via TCP/IP over Ethernet through a standard ethernet hub or switch. It also communicates to the Bridge Router system via a special mixer link connection.

Hardware and software configuration, as well as real time crosspoint information, is saved in non-volatile storage on the HC-3 card and is restored at power up or reset. This configuration information provides details to the host application running on the HC-3, such as the specific audio hardware available.

## HC-3 BIOS Settings/Format

BIOS Setup and formatting of the Host CPU is completed prior to the testing of your G-6 control surface at the Wheatstone factory. There are no user adjustable settings. Please contact customer support with questions regarding the PC/104 SBC BIOS settings or flash disk formatting.

## Ethernet IP Addressing

The Wheatstone G-6 control surface ships with the host controller IP address set. Stand-alone systems (not interfaced to a station's existing network) require no IP address changes.

## Ethernet Interface Wiring

Networked systems are connected to the network hub or switch via a straight (pin to pin) CAT5 cable. Typical CAT5 cable pinouts are included in the "Hook-Ups" section near the end of this chapter. THESE CONNECTIONS ARE FOR COMMUNICATING WITH THE CONFIGURATION COMPUTER; A SEPARATE ETHERNET CONNECTION SHOULD BE PROVIDED FOR EACH CONTROL SURFACE.

## Mixer Link Wiring

This RJ-45 connection provides the control link between the control surface and the Bridge Router system. All settings and commands generated on the control surface pass through this link. A special CAT5 cable wired in “crossover” fashion is used for this link. This special cable connects the RJ-45 jack on the control surface to the matching RJ-45 jack on the Bridge Router system. Please note that, in a typical system, there will be many RJ-45 jacks in the Bridge Router, and for proper operation, the control surface must be connected to the specific RJ-45 jack defined for it in the system configuration.

## Internal Programming Options

All internal programming options are made via PCB mounted switches.

### Switch Settings

#### SW1 Position 1 - Sample Rate

This dipswitch position must be set to agree with the sample rate of the system. The switch is off for a sample rate of 44.1kHz and on for a sample rate of 48kHz.

#### SW1 Positions 2 and 3 - Not Used

These dipswitch positions are reserved for future use.

#### SW1 Position 4 - CAT5 Enable

Position 4 of SW1 must be in the on position in order to activate the CAT5 mixer link connections.

#### SW2 - CPU Reset

This momentary pushbutton switch allows the host controller to be reset without powering down the system.

## Hook-Ups

All user wiring to and from the host controller is made via I/O connectors located on the control surface rear. There are two RJ-45 connectors: one is for Ethernet connection, and another is for CAT5 Mixer Link connection. There is also the female DB-9 connector for feeding line level signals to the internal amplifiers that feed the cue speaker and headphone jack. The pinout drawing on page 4-6 shows all wiring connections at a glance.

### “ETH” RJ-45—MAIN ETHERNET CONNECTOR

PIN 1 – TXD +  
 PIN 2 – TXD -  
 PIN 3 – RXD +  
 PIN 4 – N/C  
 PIN 5 – N/C  
 PIN 6 – RXD -  
 PIN 7 – LN LED  
 PIN 8 – LK LED

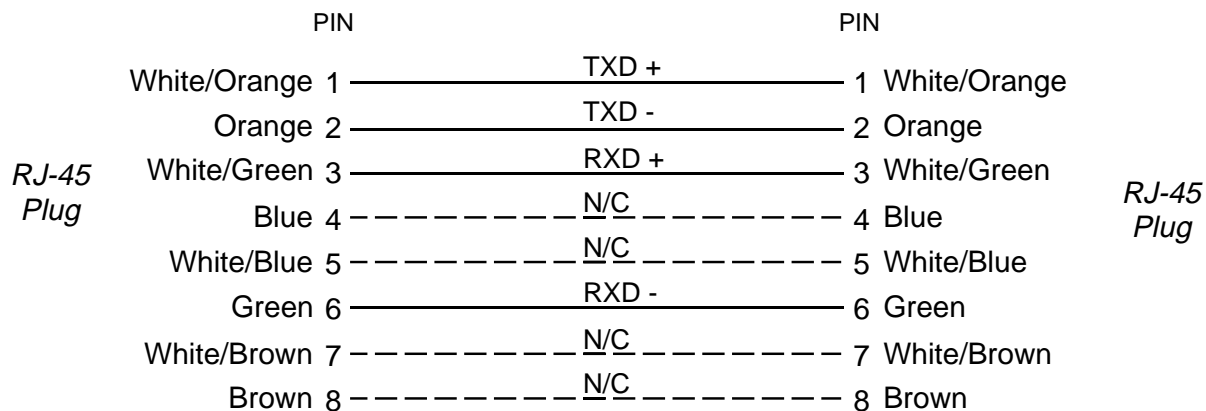
### “CAT5” RJ-45—MIXER LINK CONNECTOR

Pin 1 – TXD +  
 Pin 2 – TXD -  
 Pin 3 – RXD +  
 Pin 4 – N/C  
 Pin 5 – N/C  
 Pin 6 – RXD -  
 Pin 7 – N/C  
 Pin 8 – N/C

### “CUE SPKR/HDPH” DB-9—CUE SPEAKER/HEADPHONE CONNECTOR

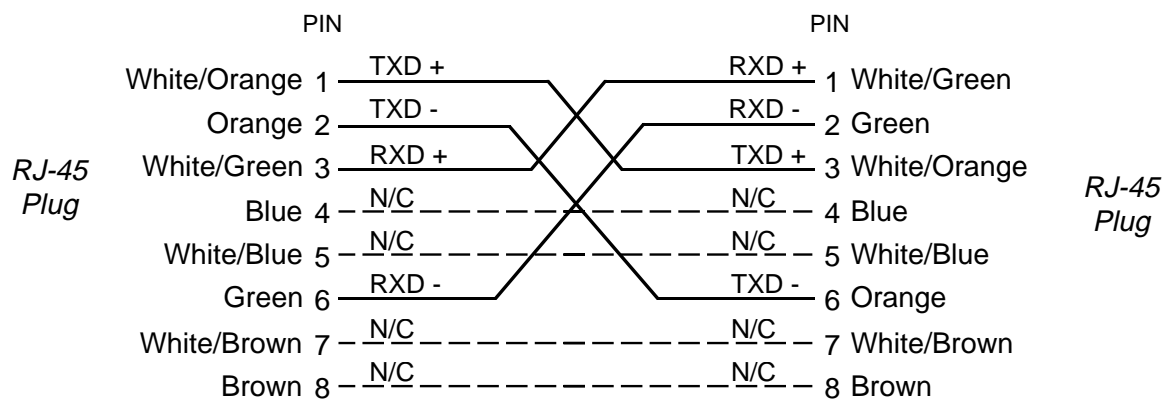
Pin 4 – HDPN LT HI  
 Pin 5 – HDPN LT SH  
 Pin 9 – HDPN LT LO  
 Pin 7 – HDPN RT HI  
 Pin 8 – HDPN RT SH  
 Pin 3 – HDPN RT LO  
 Pin 1 – CUE HI  
 Pin 2 – CUE SH  
 Pin 6 – CUE LO

## TYPICAL ETHERNET CABLE



USED FOR CONNECTING THE HOST CONTROLLER TO YOUR NETWORK HUB.

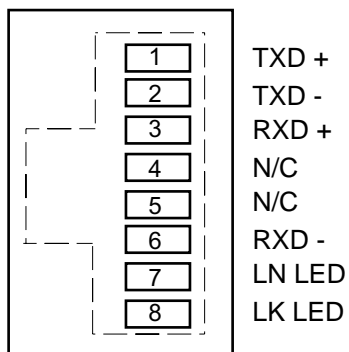
## TYPICAL CROSSOVER CABLE



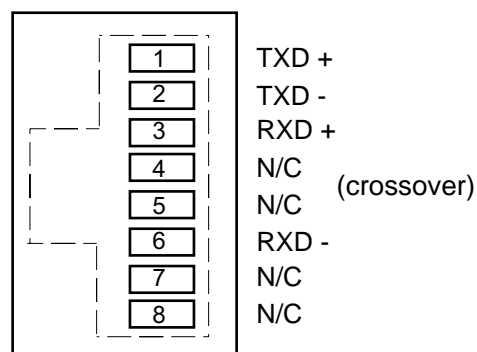
USED FOR MIXER LINK CONNECTOR.

## HC-3 Host Controller I/O Connections

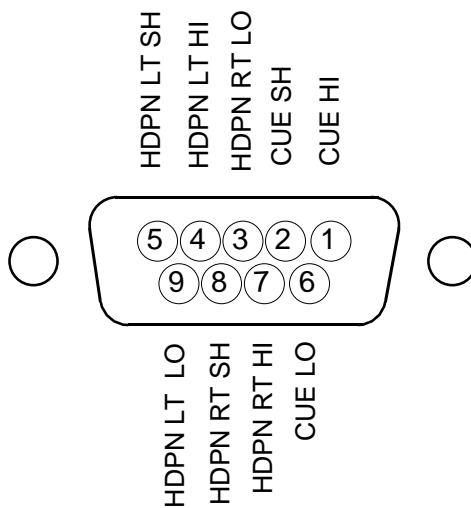
*Ethernet Connector  
(RJ-45)*



*Mixer Link CAT5  
Connector (RJ-45)*



*"CUE SPKR/HDPN"  
Female DB-9*



These are line level inputs to the internal amplifiers that feed the surface's cue speaker and headphone jack.

# Meterbridge and Clock

## Chapter Contents

<b>Overview .....</b>	<b>5-2</b>
<b>Control Surface Clock .....</b>	<b>5-3</b>
Setting the Time .....	5-3
Update Options .....	5-3
Synchronize .....	5-3
Battery Backup .....	5-4
<b>Surface Software Version .....</b>	<b>5-4</b>

# Meterbridge and Clock



## Overview

According to the frame size the control surface meterbridge can accommodate up to four pairs of left-right VU meters (Program, Audition, Auxiliary, and Switched).

FRAME SIZE	VU METER (pair)
4 FADER INPUT	1 (PGM)
8 FADER INPUT	2 (PGM, SWT)
12 FADER INPUT	2 (PGM, SWT)
16 FADER INPUT	4 (PGM, AUD, AUX, SWT)
20 FADER INPUT	4 (PGM, AUD, AUX, SWT)
24 FADER INPUT	4 (PGM, AUD, AUX, SWT)

The meterbridge also houses the four-digit LED timer display (control buttons are located on the EFS panel - see Chapter 3, page 3-6), the control surface clock, and the cue speaker.

The G-6 control surface's LED metering system provides readout of both VU and full scale digital peak.

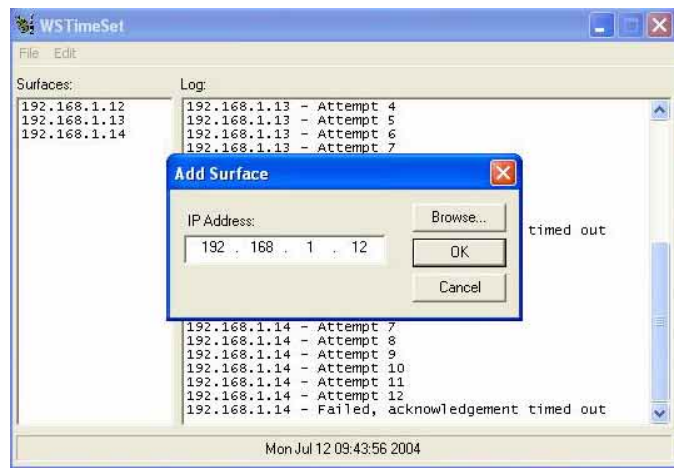
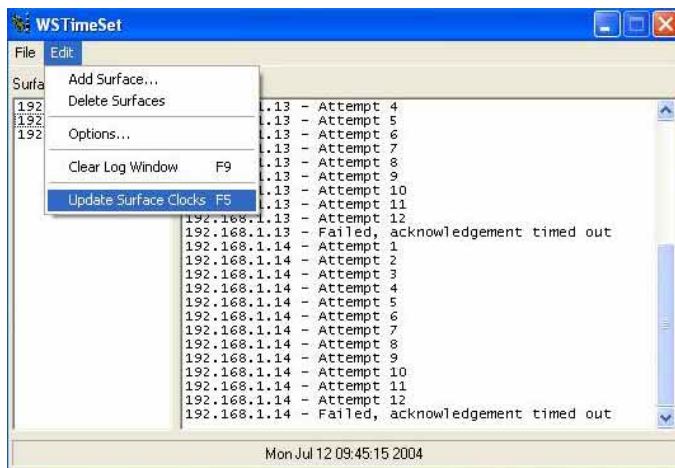
## Control Surface Clock

The Wheatstone digital clock is a six-digit time-of-day clock with LED display.

### Setting the Time

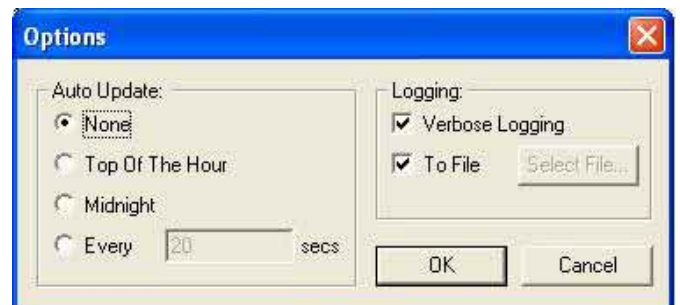
Setting the time of the control surface's clock is made via the Wheatstone Surface Time Manager software:

1. Select *Edit / Add Surface...* from the Main Menu, which will display the following form.
2. Enter an IP address of the control surface.
3. Select *Edit / Update Surface Clocks* or press *F5* key to update all surface clocks.



### Update Options

Select *Edit / Options...* from the Main Menu. The Options form gives you different auto update options. Select the appropriate option for your application.

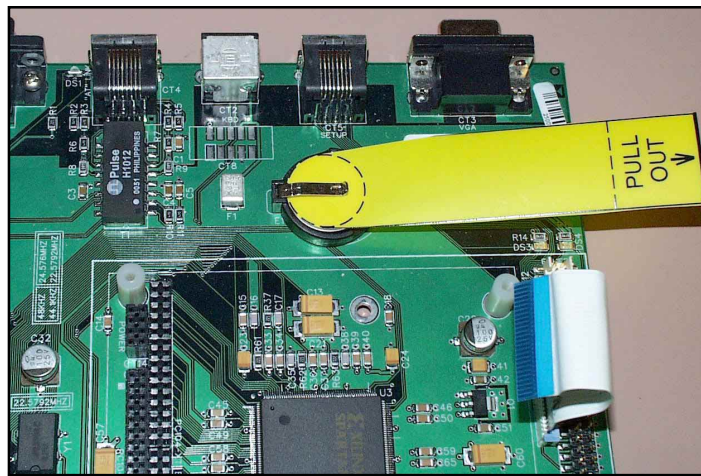


### Synchronize

For the best accuracy synchronize the PC's clock to a master clock system. Refer to your master clock documentation for more information.

## Battery Backup

At the upper-right of the Host Controller HC-3 PCB there is a nickel-sized round Duracell DL2032/3V long-life lithium battery (it goes into the socket negative side in). Note that the battery does NOT light up the clock display; it powers the clock to keep it from losing count (it will do this for 3 to 4 weeks). To activate battery backup of the control surface's clock simply pull out the yellow strip from the HC-3 board, as shown on the picture below.



## Surface Software Version

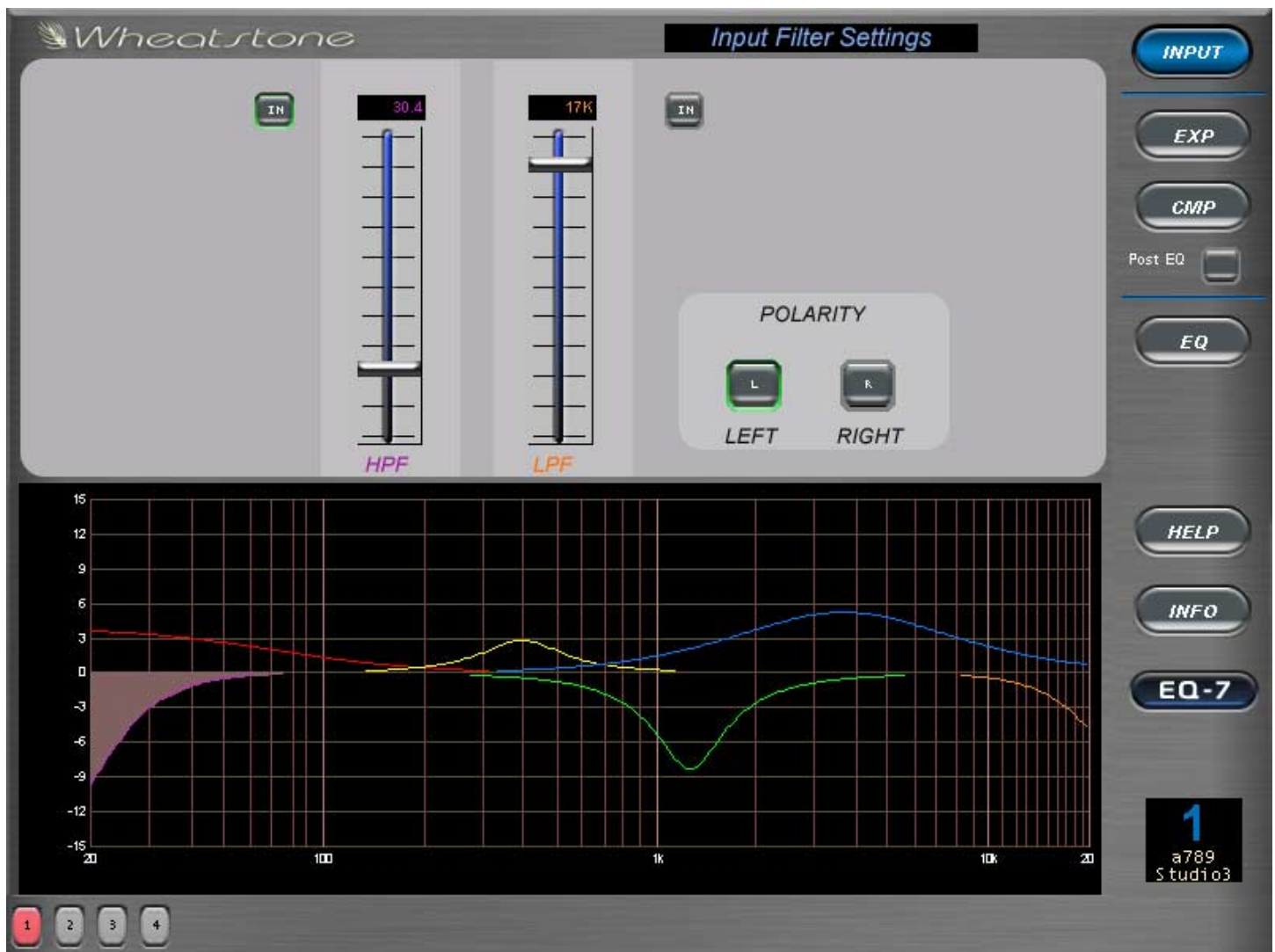
In the event that need to consult the factory about the G-6 control surface, you may need to have the surface software version number available. This information shows up in the clock display during the surface power up sequence.



## EQ-7 Software Plug-in for Wheatstone Generation 6 Control Surfaces

The EQ-7 Software Plug-in for the Wheatstone Generation 6 control surface provides a comprehensive suite of processing functions. These functions include 4-band fully parametric EQ, High and Low-Pass filters, Compressor / Limiter, and Downward Expander. When installed, the EQ-7 plug-in is controlled through a mouse and LCD monitor connected to dedicated ports on the control surface. No PC is required.

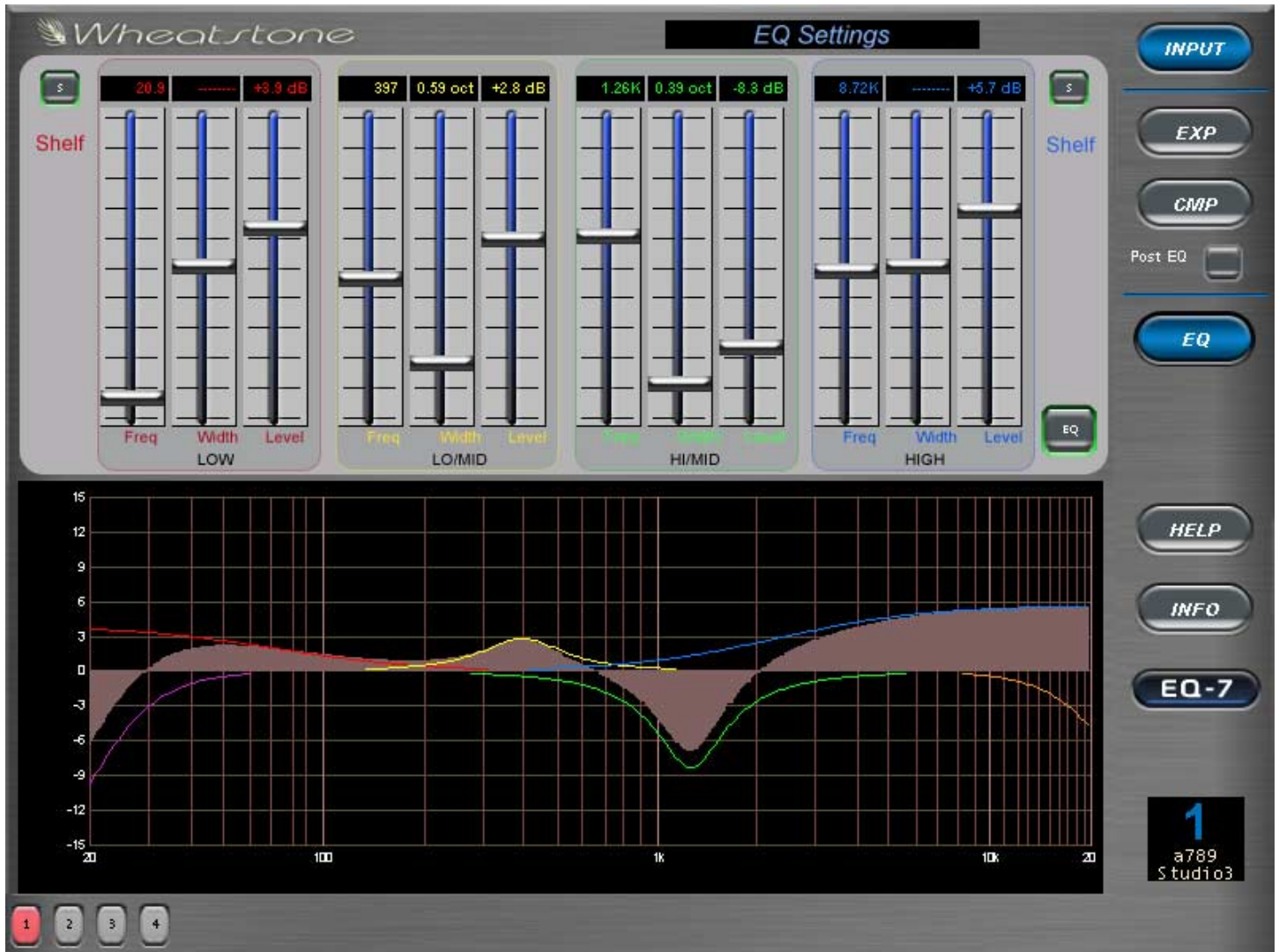
Following are screen shots of the control functions:



High & Low-Pass Filters

# Wheatstone

## EQ-7 Software Plug-in for Wheatstone Generation 6 Control Surfaces



Four-Band, Fully Parametric EQ

# Wheatstone

## EQ-7 Software Plug-in for Wheatstone Generation 6 Control Surfaces

The screenshot displays the 'Compressor Settings' window of the EQ-7 software. The interface is organized into several sections:

- Compressor Settings:** Five vertical sliders control the following parameters:
  - Threshold:** -28.1 dB
  - Ratio:** 1 : 2.59
  - Attack:** 0.10 mS
  - Release:** 50.0 mS
  - Makeup:** +0.2 dB
- Buttons:** A vertical column of buttons on the right includes 'INPUT', 'EXP', 'CMP', 'EQ', 'HELP', 'INFO', and 'EQ-7'. There are also 'AGC' and 'OIP' buttons near the sliders.
- Post EQ:** A checkbox labeled 'Post EQ' is currently unchecked.
- Summary:** A text area on the left lists the current settings for both the Compressor and Expander.
- VU and GR Meters:** Two vertical meters are shown. The VU meter (left) has a scale from -36 to +20. The GR meter (right) has a scale from -30 to 0.
- Dynamics Graph:** A graph showing the relationship between INPUT and OUTPUT. The x-axis (INPUT) and y-axis (OUTPUT) both range from -60 to 20. A red curve shows a gain reduction starting at approximately -30 dB input.
- Channel Selectors:** Four buttons labeled 1, 2, 3, and 4 are located at the bottom left.
- Channel Info:** A small box at the bottom right shows '1 a101 tim2'.

Compressor / Limiter

# Wheatstone

## EQ-7 Software Plug-in for Wheatstone Generation 6 Control Surfaces

The screenshot displays the 'Expander Settings' window of the Wheatstone EQ-7 software. The interface is organized into several sections:

- Top Section:** Features the 'Wheatstone' logo on the left and the title 'Expander Settings' in the center. On the right, there are control buttons for 'INPUT', 'EXP', 'CMP', 'EQ', and 'HELP', along with a 'Post EQ' checkbox and an 'EQ-7' button.
- Parameter Sliders:** Six vertical sliders are arranged horizontally, each with a numerical value displayed above it: Threshold (-21.1 dB), Ratio (1 : 5.0), Depth (+12.8 dB), Open (0.10 mS), Hang (2.20 mS), and Close (50.0 mS). A green 'EXP' button is located to the right of these sliders.
- Compressor Settings:** A list of parameters for the compressor, including Threshold (-28.1 dB), Ratio (1 : 2.59), Attack (0.10 mS), Release (50.0 mS), and Makeup (+0.2 dB).
- Expander Settings:** A list of parameters for the expander, including Threshold (-21.1 dB), Ratio (1 : 5.0), Depth (+12.8 dB), Open (0.10 mS), Hang (2.20 mS), and Close (50.0 mS).
- VU and GR Meters:** Two vertical meters are shown. The 'VU' meter has a scale from -36 to +20, with 'OVR' (Over) indicated at the top. The 'GR' meter has a scale from 0 to -30.
- Dynamics Graph:** A graph titled 'Dynamics' showing the relationship between 'INPUT' and 'OUTPUT' levels. The x-axis (INPUT) and y-axis (OUTPUT) both range from -60 to 20. A diagonal line represents a 1:1 relationship, and a red curve shows the expander's gain reduction characteristics.
- Bottom Section:** Includes a row of four numbered buttons (1, 2, 3, 4) and a small display showing the number '1' and the text 'a101 tim2'.

Expander