D-5.1 Digital Television Control Surface

TECHNICAL MANUAL



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

D-5.1 Digital Television Control Surface Technical Manual - 1st Edition

 $@2003 \ Wheatstone \ Corporation \\$

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Attention!

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

Caution! Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.

IMPORTANT!

Cleaning the Acrylic Surface

An acrylic surface is a beautiful, lustrous material that is outstanding in durability and break resistance. With proper care, it will retain its attractive appearance for many years to come. This care should include precautions against scratching or contact with objects of high temperature that might mar the surface. A few simple precautions will preserve the beauty of the acrylic.

- FIRST be sure the surface to be cleaned is powered off.
- NEVER spray or pour any liquid directly onto the surface.

• TO AVOID scratching these surfaces, use a soft brush or cloth to gently brush away any larger dirt particles. Alternately the larger particles can be blown from the surface with the use of canned air.

• USE a soft, clean lint free cloth or micro fiber cloth and clean lukewarm water to clean the surface. For stubborn dirt and stains use a mild, nonabrasive soap and water mixture with the gentle cleaning cloth. Use only light pressure when cleaning. Avoid rubbing dirt or grit into the surface. Turn the cloth often and replace with a clean cloth frequently. Dry by blotting gently with a clean, dry cloth.

• AVOID using kleenex, paper towels, sponges or other coarse shop towels, as these materials may contain abrasives that can scratch acrylic surface.

• DO NOT USE ketones, aromatics, esters, halogens, window cleaning sprays, alcohol, kitchen scouring compounds, or solvents (such as acetone, benzene, gasoline, carbon tetrachloride, or thinners).

Caution! Do not use ammonia based cleaning solutions as they can cause the surface to yellow, and became brittle and eventually cause structural damage to the acrylic surface.

Wheatstone will not be liable for damage resulting from improper cleaning and maintenance.



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GENERAL INFORMATION



General Information

Introduction

The Wheatstone D-5.1 Digital Television Control Surface is the next step in the continuing evolution of Wheatstone's proven BRIDGE technology. Designed to integrate flawlessly with the Wheatstone BRIDGE digital audio network router, the D-5.1 control surface allows you to easily create large or small platform-based systems that are exceptionally userfriendly 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 fiber-optic or CAT-5 cables to provide single wire studio integration schemes.

Once configurated, 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 D-5.1 system also takes full advantage of Wheatstone's exclusive VDip configuration software, so that studio functions (like mutes, fader and timer starts, tally, 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 D-5.1 digital audio control surface may be mounted either on a custom constructed table or the optional factory leg support system, using the holes provided in the bottom of the chassis. In either case, the control surface's handrest top would be generally located 29-30 inches from the floor. The D-5.1 control surface 4-bay frame size is shown below.

Do not connect the D-5.1 control surface to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.



GENERAL INFORMATION

Power Supply



Front view of the PSR rackmount power supply



Rear view of the SPS-400 unit

Rear view of the SPS-40 unit

The D-5.1 control surface is powered by an SPS-180, SPS-400 or SPS-40 power supply installed in a Wheatstone Model PSR rackmount unit. Each PSR houses up to four SPS-180 or up to two SPS-400/SPS-40 power supply units. Mount the two-rackunit power supply chassis in a standard 19" equipment rack, keeping in mind that adequate ventilation is necessary to prevent heat build-up within the rack.



Rear view of the SPS-180 unit

If failsafe redundant supplies have been ordered, you will be installing two SPS-180, SPS-400, or SPS-40 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).

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 its end: a 5pin female connector that connects to the control surface's power supply connector, and an 8-pin male connector that plugs into the PSR 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 bottom 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, 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.

Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two SPS-180, SPS-400, or SPS-40 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 D-5.1 control surface mainframe is properly placed, and its PSR power supply (or supplies) correctly rackmounted and connected to the control surface, you may now energize the PSR rackmount power supply by plugging it into the AC mains. The control surface's LCD displays 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.*

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. 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.

I/O Connections

All user wiring to and from the D-5.1 control surface is made via connectors located on the control surface's rear panel. There are two RJ-45 connectors for main and failsafe ethernet connections. The "TB MIC" DB-9 connector is for talkback microphone connection (see the pinout on page 3-3). CAT-5 or multi-mode optical fiber Mixer Link connections are made via RJ-45 or LC type optical connectors. Two 5-pin male connectors are for power supply connections. For all wiring pinout connections refer to Chapter 6. The sketch below shows connector locations.

NOTE: Keyboard,VGA and COM 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 for 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, indexed to the first pin, and the wires are inserted one by one into the



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.

GENERAL INFORMATION

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.

Wiring Procedure - Double Connection to One Pin

ref: DB-25 male multi-pin connector



Most audio equipment machine interfaces (as well as Wheatstone consoles) use subminiature D-type connectors. Sometimes the interfaces require making two connections to a single DB pin. If the wiring has been set up using punchblocks, this is not a problem; however, for situations where direct machine-to-console wiring is used, Wheatstone recommends the following procedure:

- 1) Connect the first wire to the desired pin as you normally would.
- 2) Note connector pins may easily be removed from the DB-25 shell with the wire still attached: Hold the connector with the metal part down and observe its side. You will see a row of "Vees"—simply press the top of the selected vee together with a scribe or other sharp instrument; this will unlock the pin from the shell, allowing it to be removed.
- 3) With the pin removed, strip out a short section of insulation from the connected wire and wrap and solder the second wire to the first as shown above.
- 4) A short piece of heatshrink tubing (pictured here before being slid into place) completes the connection.
- 5) Re-insert the pin into the DB-25 shell, spreading the vee apart to lock it in place.

Input Section (IS-D5.1 & IFS-5.1)

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INPUT SECTION

Input Section (IS-D5.1 & IFS-5.1)

Controls and Functions

Each input section of the D-5.1 digital audio control surface consist of two panels (IS-5.1 and IFS-5.1 with non-motorized faders, or IFSM-5.1 with motorized faders), and has four identical strips representing four input channels.

The D-5.1 control surface also can be built-up with optional IFSM-5.1NP motorized fader panels without PAGE buttons.

Gain Control

The GAIN level control controls mic or line gain for the selected input source. Relative gain is shown in the display below the GAIN knob.



Phantom Power

The PHAN On/Off switch applies phantom voltage to any selected microphone. The phantom power attribute stays ON even when the microphone is not selected on the control surface.

Insert

The INSERT switch applies a preselected insert device to the signal path. The INSERT button will light to indicate that the device has been INSERTed. If the button flashes a few times and then goes out, this indicates that an insert device has not been selected for that channel.

To select an insert device for a channel, press the channel's SET button. The display next to the INSERT SELECT knob in the EFS section (see Chapter 3) will show the name of the currently selected insert device, or will show "------" if no insert device has been selected. Rotate the INSERT SELECT knob until the desired insert device is displayed. If that device has not already been assigned elsewhere, the TAKE button will be lit. Press TAKE to assign the selected insert device to the



page 2-2

channel. If the TAKE button does not light for a given insert device, that device is already assigned to a different channel.

To free up a selected input device, press the channel SET button, rotate the INSERT SELECT knob until the display shows "------", then press TAKE.

NOTE: Insert devices (both inputs and outputs) must be defined in the XPoint GUI (graphic user interface).

AUX

For clarity we will discuss AUX A. The same control descriptions also apply to AUX B, C and D.

Encoder AUX A adjusts the gain for the channel in the AUX SEND, which may be mono or stereo. The default mode follows the source type (mono sources would have a mono send, stereo sources would have a stereo send). When the knob is pushed and turned, it then acts as a PAN or BALance control as appropriate. Additionally, the mode can be altered by means of the MODE SET buttons in the EFS section.

To set MODE for an AUX SEND, hit the appropriate AUX SET button and then the desired MODE SET button (in the EFS panel). NOTE that surround sends are not created. Surround input sources would default to a derived stereo AUX.

There are actually a total of eight AUX SENDs available, and controlled by the AUX A, AUX B, AUX C, and AUX D sections. For example, the AUX A knob controls the level of that channel to AUX 1 when the "1/5" select switch is in "1" (the switch is not lit), and the level of that channel to AUX 5 when the "1/5" select switch is in "5" (the switch is lit). Likewise, the AUX A IN button toggles the channel in and out of AUX 1 when "1/5" is off, and in and out of AUX 5 when "1/5" is on.

PRE/POST PROGRAMMING: The eight AUX sends can be programmed to be PRE or POST fader and PRE or POST channel ON. There are both global settings and individual settings for this.

Generally, the global settings should be made first. The factory default global setting for all AUX sends is post fader, post channel ON. To change a GLOBAL setting, press the AUX SET button for the desired send (on the EFS panel); it will light. Then program the PRE/POST FDR and ON switches respectively the way you want. Note that the signal is PRE when the button is lit and POST when the button is not lit. To reprogram another aux send, press its AUX SET button and proceed as before.

As an example of programming an individual channel AUX send differently then the global setting, let's look specifically at AUX 1. Make sure the "1/5" button is off, then press the AUX A knob once. The button LED segment (6 o'clock position) of the encoder knob will light. The channel's PRE-ON and PRE-FADER buttons, just below the channel's MODE selector display (see next section) will indicate the channel's AUX 1 status (lit means PRE, unlit means POST). Use these switches to set the desired AUX 1 status for that channel.

Remember, changing the global settings for an AUX send will reprogram all channels to follow the global setting for that AUX, overriding any individual programming.





1 2 3 4 ALIX	5 6 7 8 SET
SOLO F	RE/POST

INPUT SECTION

Mode Selector

The MODE button toggles through the channel's available modes. As shown on the display below the button the modes are STEREO, LT-ONLY, RT-ONLY, MONO, and BLEND. Pushing the button again returns to STEREO mode. When in STEREO mode the MODE button lights.

NOTE: these modes apply to those signals that are assigned to the stereo submixers or the stereo masters only. Bus assigns that are applied to 5.1 are routed through a special surround pan section on the MS panel. MODE may also be selected through the central mode section on the EFS panel.

The MODE knob acts as a balance control in STEREO mode and as a panpot in MONO, LT-ONLY, and RT-ONLY modes. The BLEND mode sends both the left and right input signals to both the left and right sides of assigned stereo destinations. In this mode the MODE knob acts as a mix control between the left and right inputs. Blend is useful for correcting NAT sound/voice-over imbalances.





Bus Minus

Each input channel can generate its own independent mix-minus

output, called BUS MINUS; thus each anchor, each announcer, each host, each guest can have a dedicated mix-minus feed.

Start by assigning any desired input channels to the Bus Minus bus. This is accomplished by pressing the BUS MINUS IN switch, which places a summed signal of

those input channels onto a special dedicated mix bus. This bus now becomes available to other input channels for use in their own Bus Minus outputs. A BUS MINUS encoder controls the level for each of the individual IFB channel/direct outputs. That channel's input signal may be added or omitted by means of the +/- button. If the +/- button is lit, the channel is added; if unlit the channel is omitted.

TB (Talkback)

A TB switch lets the control surface operator talk back to that individual bus-minus/direct output (via a microphone plugged into the mic XLR connector located on the lower part of the TB-5.1 panel or an external mic plugged into the system and triggered externally) allowing communication between the operator and the talent receiving that mix.

Solo

A SOLO switch allows the operator to solo monitor the individual channel's IFB feed.





EFS-5.1 Panel



TB-5.1 Panel

INPUT SECTION

Destination Display

The BUS MINUS DESTINATION display indicates which output on the various output cards is receiving this BUS MINUS mix. To select the BUS MINUS destination, press the channel's SET button. The input and output displays in the upper right corner of the MS-5.1 panel will display the channel's number on the INPUT CHANNEL display, the name of the channel's current input in the INPUT NAME display, the location of that input on the INPUT LOCATION display, the output mix number on the OUTPUT MIX display, the output mix number on the OUTPUT MIX display, the output on the OUTPUT NAME display, and the location of that output on the OUTPUT LOCATION display. If no destination has been selected the OUTPUT NAME will show "NoDest". The channel's BUS MINUS DESTINATION display mirrors the MS-5.1 panel's OUTPUT NAME display. As you rotate the DESTINATION

knob below the OUTPUT LOCATION display, the names and locations of the allowed destinations will appear in the matching displays. If that channel's BUS MINUS is not currently routed to the displayed output, the TAKE button will be lit; if it is currently routed to the displayed output, the CLEAR button will be lit. Press the TAKE button when it is lit and the channel's BUS MINUS will be routed to the displayed output. Note that a BUS MINUS mix may be sent to more that one output. Press the CLEAR button when it is lit and the channel's BUS MINUS will be removed from the displayed output.

A BUS MINUS mix can feed multiple destinations, but only one BUS MINUS mix can feed a given destination. When you assign a channel's BUS MINUS to an output which currently has a different channel's BUS MINUS assigned to it, the newest BUS MINUS will be assigned to that output and the old BUS MINUS will be removed.

NOTE: The GUI must provide a means of restricting disallowed destinations for each channel.

Mix-Minus

There are 18 mix-minus buttons that normally will illuminate when the channel has been *removed* from any of the 18 mix-minuses. If the client prefers, GUI set-up allows for alternative illumination of the button when the channel is *added* to the mix. All mix-minuses are mono signals appropriately derived from the channel's mono/stereo/5.1 source. To toggle a channel into or out of a mix-minus, simply press the button.



MS-5.1 Panel



Presets A & B

These displays indicate the signal source that the channel will receive if the PRESET A and B buttons are pushed. The channel's current source is displayed in the SOURCE display, along with an indication of the location of that source in the LOCATION display (that is, the studio, rack or other descriptor). If the preset A button is pressed, then PRESET A as shown in the display will be transferred as the current source in the channel SOURCE display; the appropriate location descriptor appears in the LOCA-TION display. The PRESET B button works in a similar fashion. If no preset source has been assigned to a PRESET button, the



PRESET display will show "NOPRESET". The SOURCE displays "LOCKED" when the channel is ON and a PRESET or SOURCE is taken. Turn OFF the channel before taking a new source.

To program PRESET A, press the channel SET button, then press the PRESET A button. Rotate the INPUTS knob to the desired selection, as shown in the SOURCE display. Press and hold PRESET A until the source name appears in the PRESET A display. If you also want to immediately take this source after setting up the preset, just press the TAKE button. If you have not rotated the INPUTS knob or pressed the TAKE button for a period of about 5 seconds, the TAKE button will go out.

The current input as displayed in the SOURCE display can also be selected by means of the rotary channel input selector. By rotating the INPUTS knob permissible sources are displayed in the channel input SOURCE display. When the desired source has been located the operator can take that source by pressing the TAKE button. The source does not actually change until the take action has been initiated on the downstroke. If the take action hasn't been initiated after the knob has been idle for 5 seconds, the channel will revert to its previous status.

NOTE 1: There is an alternative way of selecting a channel's input source, and that is by pressing the channel SET button. The INPUT CHANNEL display on the MS panel will show the current channel number and the INPUT NAME and INPUT LOCATION displays will indicate a match to the channel's input SOURCE and LOCATION displays. If a different source is desired, rotate the SOURCE knob on the MS-5.1 panel. The INPUT NAME and INPUT LOCATION displays will change accordingly. When the desired source is indicated, execute a take command by the downstroke of the TAKE button. The TAKE button will then extinguish, and the new source will now be shown in the SOURCE and LOCATION displays. Once again, the channel reverts to its previous state if TAKE has not been pressed after the SOURCE knob has been idle for 5 seconds.

NOTE 2: The GUI must provide a means of restricting possible sources for each channel.



MS-5.1 Panel

Set

The SET button allows the operator to access various controls on the EFS, DS and MS panels of the control surface and apply them to the selected channel. SET can access GROUP, MIX-MINUS, DYNAMICS, EQ, BUS AS-SIGN, and DCM ASSIGN functions. To use, simply hit the SET button and then make your

SOURCE	SOUNCE	BOLRCE	SCIFICOE	
Input t	Input 2	Input 3	Input 4	
LOCATION	LOCATION	LOCATION	LOCATION	
Studio A	Studio A	Studio B	Studio C	
BET PAGE	SET PAGE	SET PAGE	SET PAGE	

appropriate section settings in other areas of the control surface. Once a SET button has been pressed, the button lights up, and all of the central section controls (EQ, MODE, DYNAMICS, etc.) display the current settings <u>for that input channel</u> until a different input SET button is pressed. Or, if you don't use any SET-related controls for 20 seconds, the current SET selection will time out and the SET button will go off.

Page

The PAGE function allows each physical channel strip to control two strips worth of audio. This would allow a 16 fader control surface, for example, to control 32 channels of audio. Fader #1 would control audio channel 1 when the PAGE button is off, and would control audio channel 17 when the PAGE button is on. Likewise, faders 2-16 would control audio channels 2-16 when their respective PAGE button were off, and audio channels 18-32 with the PAGE button is on. Each audio channel controlled by a fader is controllable separately via the PAGE button, yet both audio channels are available simultaneously. That is, if you have just set the level for channel 17 using fader 1 with the PAGE button on, turning the PAGE button off switches control to channel 1, but channel 17 continues to sound.

See also "PAGE BUTTONS" (in Chapter 4) which allow groups of input channels to be paged simultaneously. NOTE also that PAGE buttons can be linked into the EVENT STORAGE and RECALL function.

PFL (Cue)

This switch lets the control surface operator monitor the channel's pre-fader signal.

AFL (Solo)

This switch lets the control surface operator monitor the channel's post-fader signal.

DYN (Dynamics)

This switch inserts dynamic functions that have been preset by the operator in the DCM-5.1 panel. When a knob in the dynamic section is rotated the display located next to the DYN IN button automatically shows the proper setting units and parameters for the active knob. The display is updated as the settings are changed by rotating the knob.





DS-5.1 Panel

EQ

This switch inserts EQ functions that have been preset by the operator in the EQ section of the EFS-5.1 panel. When an EQ section knob is rotated, the appropriate display associated with that knob automatically shows the proper setting units and parameters for the active knob. The display is updated as the settings are changed by rotating the knob.



EFS-5.1 Panel

Output Assign Displays

These 12 indicators (GROUPS and MASTERS) show where the channel has been assigned to using control switches in the BUS



ASSIGN section of the EFS-5.1 panel. The output assigns are accessed by means of channel SET button. Press SET, then toggle the channel assigns by toggling the appropriate BUS ASSIGN buttons on the EFS-5.1 panel.

EFS-5.1 Panel

Channel ON Switches

The CHANNEL ON switch turns the channel signal ON and OFF and fires the channel ON (START)/OFF(STOP) logic. The switch LED lights to indicate the channel is ON.



DCM (Digital Control Master) Displays

Each channel can be assigned to any combination of the four DCM masters (DCM-5.1 panel). The assigned setting is displayed in the DCMS ABCD display group. Any channel that is assigned to a DCM will have its level controlled in a subgroup manner, much like a VCA in an analog control surface. For example, all announcer voices could be on DCM A, all remotes could be assigned to DCM B, and commercial source material could be on DCM C. The channels can then be easily adjusted in groups by means of faders on the DCM-5.1 panel. Furthermore, these DCMs may be used as group mutes, to cut out or in an entire bank of faders by simply

toggling the appropriate ON switch on the DCM-5.1 panel.



Channels are assigned to these DCMs in the following manner: press the channel SET button on the input fader section and then press the desired DCM SET assign button, located in the center of the EFS-5.1 panel.



DCM-5.1 Panel

VU

This 20-segment LED display ladder monitors the pre-fader channel signal. If the channel is in a multi-signal (i.e., non-mono) MODE, a summed version of the signal is displayed.

GR (Gain Reduction)

A 20-segment LED display ladder that monitors gain reduction as determined by preset parameters in the Dynamics Section on the DCM-5.1 panel. Ladder may light with no signal with certain GATE settings. This is normal.

FADER

Channel output level set by a long-throw fader. When the control surface has recalled a preset or is under external serial control from an automation system, the fader NULL LEDs light to show that the channel output level is actually different from what the fader indicates. The channel output level will remain at the computer directed value until the fader is moved to a matching level, after which the fader will control the level. The LED indicates which direction to move the fader to regain level control. Once the fader has been moved to the matching level the LED will turn off.

The D-5.1 control surface can be ordered with optional touch sensitive, long-throw motorized faders for automated level control.



Control Section (EFS-5.1 & SFS-5.1)

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Control Section (EFS-5.1 & SFS-5.1)

Controls and Functions

The D-5.1 digital audio control surface is equipped with one CONTROL section which consist of two panels (EFS-5.1 and SFS-5.1 with non-motorized faders, or SFSM-5.1 with motorized faders). This section houses AUX/MXM MASTER OUT-PUTS, GROUP MXM ASSIGN, GAIN SET, TB, BUS AS-SIGN, MODE, INSERT, DCM SET, COPY and EQ controller sections.

Bus Assign Section

All bus assignment is accomplished through a bank of BUS ASSIGN switches on the EFS-5.1 panel, consisting of eight group assign switches and four master assign switches. The



switches illuminate to indicate the assign status of the input channel or group whose SET switch is currently active. Indicator windows on the input or group panels show the assign status for each individual source.

Bus assignment may be made in any combination, and is accomplished by first pressing the SET button on the desired input channel (IFS-5.1 panel) or group (SFS-5.1 panel). The switches in the EFS panel BUS ASSIGN section illuminate to show the source's current bus assignment. Press required switches to create the desired set of bus assigns. The local indicators on the IFS-5.1 or SFS-5.1 panel will change to reflect the new bus assignment.

NOTE: A non-applicable bus assign will flash rapidly to indicate error. Choose another button.



Mode Select Section

The mode selector switchbank includes LEFT, RIGHT, MONO, BLEND, STEREO, and SURROUND buttons. When pressed, the switch will light up to indicate the selected mode.

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. In most cases pressing a disallowed button has no effect. The exception to this is when you press the BLEND button and BLEND is not a valid choice but STEREO is; in that case pressing BLEND will automatically select STEREO.

Talkback Mic

The operator's talkback mic plugs into the panel mounted XLR connector located on the lower part of the TB-5.1 panel. Its gain is set by the TB encoder, located on the upper-right corner of the EFS-5.1 panel. This signal is then available for the various TALKBACK functions of the control surface. The XLR-M connector is wired to the "TB MIC" DB-9 connector located on the control surface's rear panel. This DB-9 connector must be wired out to a destination, such as a Bridge Router mic input, to be usable by the system.

Pin 1 XLR SH – Pin 4 "TB MIC" DB-9 SH Pin 2 XLR HI – Pin 5 "TB MIC" DB-9 HI Pin 3 XLR LO – Pin 9 "TB MIC" DB-9 LO

Other external microphones may also be connected to the engine system and talk to destinations or mixes and be triggered through the system's logic LIO-2001 I/O card (Bridge Router). This function would be mapped through the GUI.

AUX/MXM Master Outputs

This section is used to control master GAIN, SOLO, PRE/POST FDR, PRE/POST ON, TB, MODE selection, and DESTINATION routing for the eight aux send mixes and the eighteen MXM mixes. It is comprised of a shared GAIN SET knob and its attendant 8-character display, the TB button, the SOLO button, and the PRE/POST switches. Additionally, there is a bank of eight master AUX SET buttons and a bank of 18 master MIX-MINUS SET buttons.

To set a GAIN, press any of the 8 AUX SET or 18 MIX-MINUS SET buttons and rotate the GAIN SET knob. Its display will show the level setting.

To set a SOLO, again press any of the 8 AUX SET or 18 MIX-MINUS SET buttons, and then press the SOLO button. To interrupt a signal with the TB signal, press any of the eight AUX SET or eighteen MIX-MINUS SET buttons and then press the TB button.

PRE/POST settings are all accomplished in the same manner.









Insert Section

Inserts are devices that are placed ahead of the selected input source for each input channel. Insert devices (that is, equipment external to the control surface) by definition have both inputs and outputs. These inputs and outputs are plugged into the engine portion of the control surface, and are configured in the GUI setup, so when you have a device (such as an outboard equalizer) it is designated with a single name (say "outboard EQ 3") with its input and output mapped to specific input and output ports of the control surface system. NOTE that these devices will generally be multi-channel (stereo or even 5.1). Each device then has a name that would be displayed in the display. Because an insert is an inline device, each insert can only be used on one input channel at a time. However, multiple insert devices could be used, each being assigned to different input channel.

To assign an insert, begin by pressing the SET button of an input channel (IS-5.1 panel). The display next to the INSERT SELECT knob will show the name of the currently selected insert device, or will show "------" if no insert device has been selected. Rotate the INSERT SELECT knob until the desired insert device is displayed. If that device has not already been assigned elsewhere, the TAKE button will be lit. Press TAKE to assign the selected insert device to the channel. If the TAKE button does not light for a given insert device, that device is already assigned to a different channel. To actually place the selected insert into the signal chain of the channel, press the INSERT button on the input channel (IS-5.1 panel). NOTE that the INSERT button can be pressed again to bypass the device, but the insert device will remain reserved and ready for reinsertion at any time unless reassigned for use elsewhere.

Copy Section

This system provides a convenient means of copying input channel settings and duplicating them to other input channels. To go into COPY MODE, press the COPY button. It will flash. Choose the desired channel to be copied by pressing its SET button (IFS panel). The SET button will then flash in concert with the COPY button. To go into PASTE mode, press the PASTE button. It will flash at a faster rate than the COPY button. Then press the SET button of the target module you wish to copy to. It will begin to flash in concert with the PASTE button. To accomplish the copy, press the TAKE button.

Note, the copy function does not copy source assigns, destinations, presets, or input gain.

The UNDO button is used to undo a TAKE copy. Simply press UNDO to return the modified channel to its pre-TAKE status. There is only one level of UNDO. If you do a copy operation, then do another copy operation, then press UNDO to go back to the status before the last copy, pressing UNDO again will have no effect.





To Copy Groups

It is possible to take a bank of channels and duplicate it to another channel bank of equal number. Press the COPY button, then press the desired SET buttons on the source bank. The COPY button and the source bank SET buttons will flash in concert. Then press the PASTE button, which will begin flashing (at the faster "paste" rate); press the desired target channel SET buttons, which will flash in concert with the PASTE button. To execute, press the TAKE button.

This function can be used to copy the settings from any number of channels to an equal size group of channels. The channels in each group do not have to be consecutive, and channels within a group can be a mixture from each PAGE if desired. There can even be overlap; for example, you can choose to copy from channels 1, 2, and 3 to channels 2, 4, and 5. After this copy, channels 1 and 3 would not have changed, channel 2 would be set as channel 1 had been, channel 4 would be set as channel 2 had been, and channel 5 would be set as channel 3 had been.

When selecting channels for the COPY and PASTE sets, the order in which you press the buttons matters. For example, if you selected, in order, channels 1, 2, 4 and 3 for COPY, and then selected, in order, channels 5, 7, 6, and 8 for PASTE, the end result would be that channel 5 would have channel 1 settings, channel 6 would have channel 4 settings, channel 7 would have channel 2 settings, and channel 8 would have channel 3 settings. Not that this is something you would necessarily want to do, but that's what would happen. To reiterate, order matters when selecting the COPY and PASTE sets.

If the size of the COPY and PASTE groups are different, TAKE will not effect the change, except for the special case of Copy One and Paste Many, described next.

To Copy One and Paste Many

Press the COPY button, and then the desired source channel SET button; both will flash in concert. Then press the PASTE button and the target channel SET buttons, which will flash in concert with the PASTE button at the faster paste rate. To execute, press the TAKE button.

To Copy One To All

Press the COPY button, and then the desired source channel SET button; both will flash in concert. Then press PASTE ALL, which will commence flashing. To execute the global paste, press TAKE.

NOTE: If the TAKE button is not pressed within a timeout period of 10 seconds, the entire copy/paste operation will cancel out.



DCM Set Section

Each input channel, group, or master can be assigned to any combination of the four DCM masters (DCM-5.1 panel). Assignments are made as follows: press the SET button for the desired input channel (IFS-5.1), group (SFS-5.1 panel), or master (MFS-5.1 panel), then press the desired DCM SET buttons. The buttons will light, as will the DCM indicator LEDs on the chosen input, group, or master.



EQ Section

The EQ section consist of a bank of knobs, various associated switches, and a bank of 8-character displays. The EQ system consists of a four-band parametric EQ with low band and high band PEAK/ SHELF switching, plus variable frequency high and low pass filters. There is also a seventh frequency control, a variable band notch filter. As any of the controls are adjusted, a real time graphic display is presented on the flat screen monitor panel showing the resulting frequency response curves. Also, the last knob turned in each bank will display its setting in its associated 8-character display.

To access EQ on an individual input channels, press the appropriate channel's SET button and make the desired adjustments in the EQ Section. To actually place the adjusted EQ in the signal chain, press the channel's EQ button in the IFS-5.1 panel or the master EQ IN button in the MFS-5.1 panel. The input channel's EQ button will light, and its display will show "EQ".



High-Pass Filter

This is a 24dB/octave variable high-pass filter with Butterworth characteristics, tunable between 16.1Hz and 500Hz, and with a separate in/out switch ("HPF" switch). The relatively high order of filter is necessary to allow definite and decisive removal of unwanted low-frequency artifacts (air-conditioning rumble, line hum, traffic or foot-

Note: Butterworth Filters typically yield excellent flatness, no ripple in the pass band and a rounded amplitude response near the cutoff frequency. step impacts) with minimal effect on the required program. The display indicates the filter's frequency, and the filter may be clicked in and out by way of the IN switch.

Notch Filter

This 1/10th octave, variable center frequency notch filter is tunable between 16.1Hz and 20.2KHz. This filter is used to remove specific audio frequencies, such as 60Hz or 120Hz for an AC power line hum or buzz, or perhaps a horizontal scanning interference from a monitor. The display indicates the filter's center frequency, and the filter may be clicked in and out by way of the IN switch.

Low-Pass Filter

This is a 24dB/octave variable low-pass filter with Butterworth characteristics, tunable between 1KHz and 20KHz. This filter is used to remove unwanted high frequency artifacts (noise, squeaks, etc.) with minimal effect on the required program. The display indicates the filter's frequency, and the filter may be clicked in and out by way of the IN switch.

Equalizer

This consists of four bands of parametric control used for modifying the sonic qualities of a signal. Each band has +/-14dB of BOOST/ CUT capabilities (+/- knob; "double click" the knob to return to 0.0dB), sweepable center frequency over the range of 16.1Hz to 20.2kHz, and with a filter "Q" or sharpness [BW(BandWidth) knob] sweepable between 0.2 and 3.0. The LOW and HIGH bands also have a switchable shelving function. The composite effect of any EQ adjustments, as well as text describing the equalizer settings, are shown on the screen.

Phase

A pair of switches, one for left and one for right, are provided to allow for the reversal of absolute phase of the signal path.

Group Mix-Minus Assign

Each of the eight groups can assign to the first eight mix-minus groups. Bus assign is accomplished directly by pressing the appropriate combination of eight buttons for each subgroup.

NOTE: Normal operation would illuminate a mix-minus that has been DE-assigned. However, GUI option allows a reversal of that convention.

09911	DRP 2	ORP 5	(141) 4	DRP 5	GRP-5	CHEF?	DRP II
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
з	3	3	3	3	3	3	3
+	4	4	4	4	4	-	
			0		•	0	
6	6	1	6	6	1	٥	Б
7	3	7	7	3	1	7	7
8			8			8	
GROUP MIX-MNUS ASSIDN							

ТΒ

Pressing the TB button allows the announcer's mic that is plugged into mic XLR connector (or an external mic plugged into the system and triggered externally), to talk directly to the group output.

Output Destinations, Group 1 Example



MS-5.1 Panel

Output destinations are selected by pressing the SET button. The master mix channel OUTPUT MIX display (MS-5.1 panel) will be illuminated and the OUTPUT NAME display will reflect the same name as shown in the channel G1 DESTINATION display, the most *recent* output destination assigned. It should be noted, however, that a mix channel can go to multiple destinations, and for this reason the entire list of destinations that channel is assigned to is displayed in the LCD display when that channel's SET button is active. If the mix is not assigned anywhere the display will show "NoDest"

As you rotate the DESTINATION knob in the MS-5.1 panel the names of allowable destinations will appear in the OUTPUT NAME and G1 DESTINATION displays. If G1 is not currently routed to the displayed output, the TAKE button will be lit; if G1 *is* currently routed to the displayed output, the CLEAR button will be lit. Press the TAKE button when lit to add the currently displayed output as a G1 destination, or press the CLEAR button when lit to delete that output as a G1 destination.

Destinations for the remaining groups are handled in a like manner.

Set

The SET button allows the operator to access BUS ASSIGN and DCM ASSIGN (EFS-5.1 panel) functions. To use, simply hit the SET button and then make your appropriate section settings in other areas of the control surface.

PFL (Cue)

This switch lets the console operator monitor the submix channel's pre-fader signal.

AFL (Solo)

This switch lets the console operator monitor the submix channel's post-fader signal.



Bus Assign Displays

These 4 indicators show where the channel has been assigned to using BUS ASSIGN section control switches (which are called up by means of the SET button).

Mute/ON-OFF Switch

The G1-G8 switches turn the submix channel signal on and off.

DCM Master Displays

These 4 indicators show which DCM masters the submix channel has been assigned to using the DCM SET control switches. Groups are assigned to these DCMs by pressing the group SET button and then pressing the desired DCM SET assign button.

Submix/Group Fader

Generally the eight audio submixes would operate in stereo mode. They may be mixed to two duplicate mono channels by means of the channel SET button and the MONO mode button in the MODE selector section. The left and right outputs of the submixes would be identical summed outputs of the left and right signals assigned to them from the input section.

The fader sets the output level of the submix channel. When the control surface has recalled a preset or is under external serial control from an automation system, the fader NULL LEDs light to show that the submix channel output level is actually different from what the fader indicates. The submix channel output level will remain at the computer directed value until the fader is moved to a matching level, after which the fader will control the level. The LED indicates which direction to move the fader to regain level control. Once the fader has been moved to the matching level the LED will turn off.

The D-5.1 control surface can be ordered with optional touch sensitive, long-throw motorized faders for automated level control.

The audio submixes generate two-channel mixes (i.e., STEREO) from stereo inputs assigned to them, or MONO inputs panned to them, and do not support 5.1 signals through them. However, they can be assigned to the 5.1 Surround master in the MFS-5.1 panel and multi-channel controlled in the MS-5.1 panel.



Master Section (MS-5.1 & MFS-5.1)

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Master Section (MS-5.1 & MFS-5.1)

Controls and Functions

The D-5.1 digital audio control surface is equipped with one MASTER section which consists of two panels (MS-5.1 and MFS-5.1 with non-motorized faders, or MFSM-5.1 with motorized faders). This section houses MONITORS, CUE, XY and EVENT CONTROLLERS, TIMER, SWITCHED METERS, and FUNCTION LOCK sections.

Monitors

There are eight studio/headphone monitor outputs available. Six of them (Studio 1 thru 5 and HEADPHONE) provide for stereo outputs, while the remaining two have provision for mono, stereo or 5.1 surround monitoring environments. Additionally, these last two (PRODUCTION and CR) also have a choice of three preprogrammed speaker system feeds to compare differing listener experiences.

Each monitor has a level control, a SET button, an 8-character monitor display, a monitor DIM button and a TB button (the CR monitor does *not* have a TB button). PRODUC-TION and CR monitors also have mono/stereo/5.1 MODE status display arrays and three SPEAKER selection buttons (A, B, C).

Production and Control Room Sections

For descriptive purposes we will define the CONTROL ROOM monitor section; applicable control descriptions will also apply to the PRODUCTION monitor section, except where noted.

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 or 5.1 signal 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 external cue speaker, or may want to listen via headphones.

CONTROL ROOM SET button - lets the operator select the source to be listened to in the control room speakers. Also provides access to MUTE, DIM, PFL, and SOLO settings.



MS-5.1 Panel

MFS-5.1 Panel CONTROL ROOM MIX display - the eight character display shows the source that is selected for monitoring in the control room.

CONTROL ROOM level control - determines the overall loudness of the signal being monitored as it appears in the control room speakers.

MODE LEDs - this ladder display gives local visual indication of the selected mode for that monitor (stereo, mono, etc.). Mode may be changed in the following way: Press the SET button and select the allowed MODE SET button in the EFS panel. If BLEND is pressed in the MODE section, the selection will automatically switch to STEREO. Note that SURR mode requires that the CR be configured for 6 channel operation in software. Not all systems support this mode. Consult factory for details.

SPEAKERS buttons - there are three speaker feeds each (A, B and C) for PRODUCTION and CR monitors. Each feed may be programmed with a desired MODE. To program a speaker output, press a SPEAKERS A, B, or C button, hit SET and then the desired MODE SET button, located on the EFS panel.

DIM button - lets the operator dim the control room speakers (drop in level). Note the DIM function also affects the talkback interrupt. The amount of dimming (that is, the audio level when in DIM) is set by the DIM control near the top of the panel.

TB (talkback) button (not available on the CR monitor) - takes a predefined signal, usually the mic plugged into the TB-5.1 panel's XLR connector, and feeds it to the monitor output, allowing direct communication between the operator and talent.

PFL/CUE - Adjust CUE speaker level with the PFL/CUE master.

AFL/SOLO - Adjust SOLO to CR speaker level with the AFL/SOLO master.

Studio Section

In addition to the control room and production room, there are five studio rooms in which one or more performers may 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 stereo studio outputs.

As in the production and control rooms, 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

EFS-5.1 Panel



SOLO, DIM and CUE Masters (see following section for details)



configuration software to prevent the occurrence of feedback.

STUDIO SET button - lets the operator select the source to be listened to in the studio.

STUDIO MIX display - the eight character display shows the source that is selected for monitoring in the studio.

STUDIO level control - determines the overall loudness of the signal being monitored as it appears in the studio speakers.

DIM button - lets the operator dim the studio speakers (drop in level). Note the DIM function also affects the talkback interrupt. Note also if the studio is muted, talkback cannot be heard. However, if the studio is dimmed,



talkback audio could presumably make it from the studio monitor speakers to the open studio mic.

TB (talkback) 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 mic plugged into the TB-5.1 panel's XLR connector, 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.

On the top right corner of the EFS control panel is TB GAIN master level control that sets the talkback output and the level of the talkback interrupt signal. The normal studio feed, which is interrupted by the TB signal, will fall to a level set by the DIM control.

Headphone Section

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

HDPN MIX 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.

DIM button - lets the operator dim the headphone output signal (drop in level).

TB (talkback) button - takes the assigned TB signal and feeds it to the headphone output, allowing direct communication between the operator and talent. The normal headphone feed falls to a level set by the DIM control.

Programming Monitor Section

Monitor sources can be selected in several ways:

PRE-PROGRAMMED MONITOR MIXES • switchbank allows direct access to the main mixes most frequently monitored: SURROUND, +2, ST1, ST2 and MONO.

• A bank of four preselects (A, B, C and D) can be preprogrammed.

• Sources can be randomly selected with the selector knob (SELECT) and its at-

tendant MIX display and TAKE button.

To program the four MONITOR PRESELECTS (A, B, C and D), rotate the

SELECT knob until the desired signal is shown in the MIX display, then press and hold the desired PRESELECT button (A, B, C or D) until the name in the MIX display transfers to the matching PRESELECT display (takes about two seconds). If you stop turning the SELECT knob and fail to press a PRESELECT button or the TAKE button, the operation will time out after about five seconds.

SURROUND

+2

ST I

BT 2

To select an individual monitor, push the monitor's SET button and then press the appropriate button in the PRE-PROGRAMMED MONI-TOR MIXES switchbank. The selected source will then be displayed in the output MIX display (below the monitor knob).

Test Section

The test section, located at the top left of the MS-5.1 panel, provides adjustable frequency test signals, a pink noise source, and a stereo ID source (a 400Hz tone on the left channel, and a 1KHz tone on the right channel).

To set up the test generator, press STEREO ID TONES to select the stereo ID tones, or press PINK to select pink noise, or press FREQ and use the knob to dial up a test frequency (20Hz to 20KHz), as shown in the TEST TONES display.

Once the source is set, the level can be adjusted by pressing LEVEL and turning the knob to the desired level (from 0dB down to OFF).

The selected test signal can then be routed to any of the AUX sends, mix-minuses (but not bus minuses), groups, masters, or monitors. Press the SET switch for the desired destination, then press the ASSIGN button. The test signal can be assigned to multiple outputs. Once the desired assignments have been made, press the ON button to turn the test generator on.





Cue (PFL)/Solo (AFL)/Mute/Dim Section

The PFL/CUE master level control, AFL/SOLO master level control, and the DIM master level control, and their associated DEFEAT switches, are located near the top left corner of the MS-5.1 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 display will show the level of the pre-fader signal if it has been so programmed. The PFL/CUE level control determines the overall loudness

of the cue signal (normally wired to the external cue speaker).

Use the PFL/CUE defeat switch to prevent CUE from interrupting the main Control Room speakers.

The SOLO signal is after fader, and is normally used to check a mix. When an output (such as an AUX SEND) is SOLOed, its post-fader signal will appear in the solo output (and usually, the control room speakers). The SOLO meter array in the meterbridge display will show the level of the mix. The solo defeat switch allows for disabling the control room/solo interrupt function.

The DIM level control sets the amount of attenuation applied to a monitor signal (such as control room output) when its DIM switch is engaged, and also sets the level of the normal feed when it is interrupted by the TB signal. The dim defeat switch allows for temporarily overriding the attenuation to bring all DIMmed signals back to their normal level. AFL/SOLO DEFEAT

MAINS													
ST 1 ST 2 MOND SOLD													
-	OVER	•		OVER			040	-	_	0.0	-		
20	a	+20	+20	a	+20	+20	•	+20	+20	a	421		
		+177			=17			+17					
-13	-1 -4			-1.			-1			7			
	-10	+10		-10	+10		-10	+10		-10			
•=	12	- P	+#	-12	- P	+8	-12		+8	-12			
+6	14	-6	+6	14	-6	+6	1	1+6	+6				
•••	-16		+4	-16		++#		-++	+-4	1	1.		
- 2	-18	+2	+2	-10	-2	42	-2	+2	+2	-10	-2		
	vu	10	0	vu	10	D	VU	0	0	VU	80		
- 2	1 1 1 1	- 2	-2	-21	- 2	- 9	-21	- 2	- 2	41 49	- 3		
-4	-24			-34			-24			-24	1-4		
-6	-26		-6	-26		-6	-26			-26			
-	-28		-8	-28		- 8	-28		- 8	-28			
10	-00	10	-10	-30	10	- 10	-00	-10	- 10	-00			
12	-32		-12	-32			-32	- 12		-32			
16	-30	-16 -16	-16	-36			-30	-16		-36	1-1		
20 =	-48		-20 =	-40		-20	-411	=-30	-30 -	-411	=-2		
	STI			5T 2			MON	1 6		BOLD	3		

Monitor outputs are normally subject to the control surface's muting and solo/cue interrupt circuits; however, these may be defeated by using the DEFEAT buttons as described above. To defeat these functions, activate the monitor's SET button and press the AFL/SOLO DEFEAT, MUTE/DIM DEFEAT or the PFL/CUE DEFEAT button as desired.

MASTER SECTION

Surround/PAN System

NOTE: The 5.1 Surround panning system is used only for those signal paths assigned to a 5.1 destination.

To program a channel for surround sound, select the channel you wish to program by pressing its SET button. Assign it to the 5.1 destination by means of the BUS ASSIGN switchbank (EFS-5.1 panel). The 5.1 SURROUND section will indicate the current settings of the encoder LT/RT, FRONT/REAR, SURR/CENTER, WIDTH and LFE knobs. The relative LT/RT and FRONT/REAR information is also shown on dot matrix displays. The meterbridge display also shows a multi-color graphic representation of this system. The system can generate 5.1 signals from MONO or STEREO sources, and can modify the 5.1 signal of existing 5.1 input sources.







Switched Meters Section

The D-5.1 control surface has provision for two switched meter arrays: Array A and Array B. Each array includes six meter columns, so they may display 5.1 Surround program. When a twochannel program is selected, of course only two of the six columns will illuminate with the program content (and so on).

To select a program to Array A rotate its SELECT encoder. Allowed content will be displayed in the ARRAY A display. When the desired program is displayed, press the TAKE button. Meter array A will then display the program as designated in the display. If, however, after a timeout period of 5 seconds, the TAKE button is not pressed, Array A will revert back to its previous selected program.

Array B is selected in the same way, only by means of a separate ARRAY B SELECT encoder, alpha display, and TAKE button.

NOTE: program content allowed for selection by these encoders is predetermined in the system setup GUI.





XY Controller Section

This section provides a means of selecting sources for input channels and destinations for output mixes.

Selecting Input Channel Sources

To select a new source for an input channel, press the channel's SET button. The INPUT CHANNEL display shows the selected channel number and the INPUT NAME and INPUT LOCATION displays will match the channel's input SOURCE and LOCATION displays. Rotate the SOURCE knob, and the INPUT NAME and INPUT LOCATION displays will change. When the desired source is indicated, press TAKE. The new source now shows in the channel's SOURCE and LOCATION displays. If the SOURCE knob has been idle for 5 seconds and the TAKE button has not been pressed, the operation cancels and the channel reverts to its



previous state. You can also remove the input source from the channel by hitting the channel's SET button and then hitting the CLEAR button next to the MS-5.1 SOURCE knob; the channel's display will then show "NoSource".

Selecting Output Mix Destinations

Press the output's SET button. The OUTPUT MIX display shows the selected output number and the OUTPUT NAME and OUTPUT LOCATION displays will show the current location (the output may be routed to multiple sources but only one will show in the displays), which will match the output's DESTINATION display. As you rotate the DESTINATION knob, the CLEAR button will light if the output currently does not feed that destination, or the TAKE button will light if the output does currently feed that destination. Press the TAKE button while it is lit and the selected destination will be added to the list of destinations the output feeds. Press the CLEAR button while it is lit and the selected destination will be removed from the list. If all destinations have been removed from the list the DESTINATION display will show "NoDest". You may also "dobby" the DESTINA-TION knob to step through all of the currently routed destinations.

EXAMPLE: An example might be a MXM feed routed to several listeners participating in the program, or an OUTPUT MIX bus routed to multiple recording devices.

Tip: DOBBY (pronounce dah-bee) - means to quickly press and release an encoder knob.

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 (SAVE lights, NEW flashes, and a new name is generated in the PROGRAM/PREVIEW display), and



then hit SAVE button. If SAVE is not pressed within about 10 seconds of pressing NEW, the operation will time out. To overwrite an existing event with <u>the current settings</u>, 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 ARM, TAKE, UNDO, and PREVIEW buttons will flash to indicate that the panel is ready to act on a take. Then press the TAKE button to execute the EVENT. If TAKE is not pressed within about 10 seconds of pressing ARM, the operation will time out.

Undoing an Event

To recover from a premature or erroneous EVENT take, press the ARM button (ARM, TAKE, UNDO, and PREVIEW buttons all flash), then press the UNDO button. 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 button 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 (SAVE and DEFAULT light and MODIFY flashes), 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. If SAVE is not pressed within about 10 seconds of pressing MODIFY, the operation will time out.

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 16-character PROGRAM/ PREVIEW display. When the desired event is shown in the display, press the ARM button (ARM, TAKE, UNDO, and



PREVIEW buttons all flash), then press the PREVIEW button. This will cause the entire control surface to display all settings associated with that event, without disturbing the current event. The preview status will be indicated by flashing of the PREVIEW button and 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.* After pressing ARM, if PREVIEW is not pressed for about 10 seconds the operation will time out.

Event Default Button

This control allows rapid access to a default or home control surface setting. Push it, and the DEFAULT, TAKE, and PREVIEW buttons in the Preview section will flash. Hit the TAKE button and the default setting will be executed. Pressing the DEFAULT button again cancels the operation. If TAKE or DEFAULT is not pressed within about 10 seconds of the first DEFAULT press, the operation will time out.

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 (SAVE and DEFAULT light and MODIFY flashes), and then the DEFAULT button. The default setting is stored. If DEFAULT is not pressed within about 10 seconds of pressing MODIFY, the operation will time out.

Naming an Event

When events are saved, they receive a default event designation number. In 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 in the PROGRAM/PREVIEW display. 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 several seconds.

Mute Groups

This bank of four buttons duplicates the function of the DCM ON buttons, as described in Chapter 5. Note, however, that a MUTE button is lit when the associated DCM is off, whereas the DCM ON button itself would not be lit in this case.



Confidence Feed

The CONFIDENCE ALL and REM TRIG switches are duplicate function of the CONF ALL and REM TRIG switches in the MIX-MINUS CONFI-DENCE FEED section on the DS-5.1 panel (see Chapter 5, page 5-6).

Mix Destination 5.1 Surround

NOTE: There are five different mix destinations: 5.1 Surround, +2, Stereo 1 (ST 1), Stereo 2 (ST 2) and MONO. For descriptive purposes we will be discussing the controls for one section only, 5.1 Surround, with occasional references to other sections. Control descriptions for one section also apply to identical controls at the other four destinations on the MFS-5.1 panel.



EFS-5.1 Panel

MS-5.1 Panel

Input channels are assigned to the 5.1 Surround master by means of BUS ASSIGN button "5.1" (BUS ASSIGN section on the EFS-5.1 panel). Mono input sources would pan anywhere in the 5.1 sound field. Stereo inputs would typically route to left front/right front or be balanced to the surrounds.

Mono and stereo inputs may be processed into 5.1 Surround signals by means of the 5.1 SURROUND section on the MS-5.1 panel. 5.1 input sources would preferably route to the SURROUND output unmodified. Groups in the SFS-5.1 panel may also be routed to the masters in the MFS-5.1 panel (including the 5.1).

DESTINATION +2 NOTE: The +2 output is a compatible composite output that's derived (see following paragraph) from the surround output. In a typical application the 5.1 surround output would go to the DTV signal chain, and the +2 signal would go to the SDTV chain, such that the audience experiences the same program content.

There are two possible ways to handle +2 compatibility. The choice is established in GUI and hardware configuration within the engine system. In the most desirable case the 5.1 signal that has been routed through the control surface and to the master output fader is then remixed by an internal algorithm within the control surface system that generates a second compatible stereo mix automatically; this mix will appear on the +2 fader.

The second case, which involves dedicating more engine hardware, provides for a broadcast network pre-established +2 system, whereby the network transmits the 5.1 signal and the +2 signal pre-derived; in this case, when a 5.1 signal is selected for an input channel, the control surface is in fact also selecting and routing the two channel +2 signal. This signal would then be routed to the +2 mix engine and appear on the +2 fader.

Output Destinations, 5.1 Master Example

Output destinations are selected by pressing the SET button. The master mix channel OUTPUT MIX display (MS-5.1panel) will be illuminated and the OUTPUT NAME display will reflect the same name as shown in the 5.1 DESTINATION display, which will be the most *recent* output destination assigned. It should be noted, however, that a mix channel can go to multiple destinations, and for this reason the entire list of destinations that channel is assigned to is displayed in the LCD display when that channel's SET button is active. If the mix is not assigned anywhere the display will show "NoDest".

As you rotate the DESTINATION knob in the MS-5.1 panel the names of allowable destinations will appear in the OUTPUT NAME and 5.1 DESTINATION displays. If 5.1 is not currently routed to the displayed output, the TAKE button will be lit; if 5.1 *is* currently routed to the displayed output, the CLEAR button will be lit. Press the TAKE button when lit to add the currently displayed output as a 5.1 destination, or press the CLEAR button when lit to delete that output as a 5.1 destination.

Destinations for the remaining master outputs are handled in a like manner.



Set

The SET button allows the operator to access various controls in other sections of the control surface and apply them to the master channel in question. SET can access DYNAMICS section (DS-5.1 panel), EQ section (EFS-5.1 panel), and GRAND MASTER ASSIGN (MFS-5.1 panel). To use, simply hit the SET button and then make desired section settings in other areas of the control surface.

PFL (Cue)

This switch lets the control surface operator monitor the channel's prefader signal.

AFL (Solo)

This switch lets the control surface operator monitor the channel's post-fader signal.

DYN (Dynamics)

This switch inserts dynamic functions that have been preset by the operator in the DCM-5.1 panel. When a knob in the dynamic section is rotated the display located next to the DYN IN button automatically shows the proper setting units and parameters for the active knob. The display is updated as the settings are changed by rotating the knob.

EQ

This switch inserts EQ functions that have been preset by the operator in the EQ section of the EFS-5.1 panel. When an EQ section knob is rotated, the appropriate display associated with that knob automatically shows the proper setting units and parameters for the active knob. The display is updated as the settings are changed by rotating the knob.

5.1 DESTINATION
ABCDEFGH
+2 DESTINATION
ABCDEFGH
SET SET
PFL
AFL
GM



DS-5.1 Panel



EFS-5.1 Panel

DCM (Digital Control Master) Displays

These 4 indicators show which DCM masters the output has been assigned to using the DCM SET control switches. Outputs are assigned to these DCMs by pressing the output SET button and then pressing the desired DCM SET assign button.



Channel Master ON/OFF

The MASTER ON switch turns the output signal ON and OFF. The switch LED lights to indicate the channel is ON.

5.1 Master Faders

These controls set the levels of the master channels. When the control surface has recalled a preset or is under external serial control from an automation system, the fader NULL LEDs light to show that the master output level is actually different from what the fader indicates. The master output level will remain at the computer directed value until the fader is moved to a matching level, after which the fader to regain level control. Once the fader has been moved to the matching level the LED will turn off.

The D-5.1 control surface can be ordered with optional touch sensitive, long-throw motorized faders for automated level control.



GM (Grand Master) Assign

The grand master assign acts like a VCA type grand master control for the surround, +2, stereo 1, stereo 2 and mono master outputs. All output masters that are assigned to the grand master fader will have their levels adjusted simultaneously in a gang-like manner. Assignment is made by simply pressing the GM button on the appropriate master output.

Grand Master ON/OFF

This switch acts as a master mute for any master mix that has been linked to the grand master.

Function Lock

It is a necessity under some circumstances that non-technical personnel be prevented from adjusting a control surface's signal processing; even with qualified personnel at the helm, locking out the controls can prevent an inadvertent mid-show disaster.

This is achieved by the FUNCTION LOCK switch on the MFS-5.1 panel. The control surface operator can lock out functions that may be undesirable to accidentally activate. To lock out a function, first press the FUNCTION LOCK button. This causes the FUNCTION LOCK button



to flash. Then press the control you wish to lock out. If you fail to press a target control within about five seconds, the operation will be canceled.

When you press a locked control, the FUNCTION LOCK button flashes to let you know you have tried to access a locked control. To unlock the control, press the FUNCTION LOCK button once. The locked control is released. If you fail to press the FUNCTION LOCK button within about five seconds of pressing the locked control, the operation will time out and the control will remain locked.

Clear PFL/AFL

When any PFL (Cue) or AFL (Solo) on the control surface is pressed, its light will be illuminated and should flash slowly. The AFL/PFL CLEAR button will also flash synchronously with any inputs or mixes that have been soloed or cued. Any channel can be released from cue/solo by pressing its individual PFL/AFL buttons a second time. All PFL/AFL activated buttons can be cleared at once by pressing the AFL/PFL CLEAR button.

Page Buttons

These three buttons are used to simultaneously toggle groups of individual input channel PAGE buttons at once. The PAGE A button places all input channels in Page A mode, the PAGE B button places all input channels in B Mode, and the FLIP ALL button toggles each individual input channel page button to its opposite state (i.e., A becomes B, B becomes A). This is useful for instant LIVE to BREAK setups.





Timer Section

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. This is enabled by pressing the AUTO button, which lights when the timer is in auto-restart mode.

The S/S 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. The S/S button is lit while the timer is running.

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.



Dynamics Processing Control Section (DS-5.1 & DCM-5.1)

Chapter Contents Audio Delay 5-6

Dynamics Processing Control Section (DS-5.1 & DCM-5.1)

Controls and Functions

The D-5.1 digital audio control surface is equipped with one DYNAMICS PROCESSING CONTROL section which consist of two panels (DS-5.1 and DCM-5.1 with non-motorized faders, or DCMM-5.1 with motorized faders). This section houses DY-NAMICS, TALKBACK PRESELECTS, MXM CONFIDENCE FEED, AUDIO DELAY, DCM, DISPLAY and PROGRAM-MABLE BUTTONS sections.

Dynamics Section

This section provides compression, limiting, expansion and gating functions for individual input channels. The section can be accessed by means of the SET buttons on the desired input channels. As you turn the knobs in this section, the LED display next to the DYN IN button displays the current settings of that knob for the channel currently in SET mode. The last knob adjusted will show its actual adjusted setting in the display. The knobs may also be pressed to obtain a display reading without actually turning them. Any current settings of the active channel will also be graphically shown in real time on the flat panel display.

COMPRESSOR/LIMITER

The compressor algorithm used in the D-5.1 control surface is designed to:

- allow smooth, inaudible, and unobtrusive level control on uneven sources;

- be able to act as a peak limiter for inadvertent overload control;

- enable deep effects if required.

The DCM-9 panel compressor section is a compound of many diverse dynamics elements.

The level detector is a pseudo-RMS averaging type with its own symmetrical-in-time attack-and-release characteristic ad-



DYNAMICS PROCESSING CONTROL SECTION

justable between 0.1mS and 330mS ("Attack" control). At the slower end of its range, by itself it achieves a nouveau-classic "dbx" style syllabic-rate level control. As the time-constant is shortened, it becomes progressively shorter in relation to the lower audio frequencies themselves; the effect is to turn the detector into more of a peak-level detector, necessary for limiting or wilder effects. A secondary effect at intermediate to fast attack-times is that low frequencies are peak sensed while high frequencies are average sensed resulting in an effective high-frequency bias (up to as much as 6dB differential) which helps to mitigate the detrimental limiting effect of the resulting audio seeming "bottom heavy" normal to most compressors.

While the overall gain-reduction scheme is "feed-forward", the heart of the detector stage itself is a feedback limiter; this allows for this carefully-contrived loosely-damped servo-loop to permit far more interesting dynamic effects.

The compressor is "soft-knee", meaning the compression ratio increases slowly with increasing applied level, greatly easing the sonic transition into full compression; it helps avoid the "snatching" and "pumping" at threshold that many "hardknee" dynamics units exhibit.

A full range of controls is available over the compressor's behavior:

DYN IN

A DYN IN button toggles the settings in and out of the signal path. Each input channel also has its own "DYN" button to allow engaging these functions directly from the input panel. Whenever dynamic functions are engaged, the flat screen display will show a gain reduction bargraph meter, indicating both that the dynamics functions are active, and the amount of gain reduction being generated.

THRESHOLD

The THRES knob sets the level at which the compressor is fully into compression of whatever ratio is set. This can be set anywhere in the range of -30dB to +10dB, unless the lower range is limited by the GATE THRES setting (see below).

ATTACK

This control determines how quickly (between nominally 0.1mS and 330mS) the compressor reacts to signals. Faster attack times result in "tighter" and more obvious control; longer attack times lend themselves well to gentler automatic volume control.





RATIO

This control determines how much the compressor's gain is reduced in relation to the applied signal. For instance, if the ratio is set at 3:1 and the input level above threshold changes by 12dB, the output level will changed by 4dB. Normal usage is between approximately 2:1 and 4:1; anything greater than, say, 7:1 may be considered "limiting". The ratio can be set anywhere from 1.0:1 to 20.0:1.

RELEASE

This knob determines the nominal time the compressor takes to recover after excitation (between 50.0mS and 3.0 Seconds). Short release times make for more intense, denser, obvious processing; longer release times are better suited to automatic gain control.

MAKEUP GAIN

When fairly deep compression is invoked (large gain reduction) it can be necessary to increase the compressor's output level back up to nominal system signal level; up to 20dB of output gain is available to allow this.

GATE

The Dynamics section also contains a noise gate, useful for reducing sounds below a certain threshold.

The GATE THRES control determines the signal level at which the gate operates. This level be anywhere between -60.0dB and +10.0dB. This setting will determine the minimum available setting of the LIMITER THRES knob; the LIMITER THRES cannot be set lower then the GATE THRES.

The OPEN knob determines how quickly the gate opens to allow signal passage once the threshold is reached. It can be set anywhere in the range of 0.1mS to 100.0mS.

The DEPTH knob sets the amount of attenuation given to signals below the GATE THRES setting, and can be adjusted to be between 0dB and 30.0dB.

The CLOSE IHOLD knob serves a dual purpose. Turning the knob without pressing it down determines how quickly the gate closes once the incoming signal falls below the GATE THRES level. Turning the knob while pressing it determines how long the gate will stay open after the signal falls below the GATE THRES level before it begins to close.

Talkback Preselects

These eight switches allow for a dedicated Bridge Router output to be designated as a destination for the talkback signal. Once a specific output has been programmed into the preselector, the talkback signal can be sent to that output at any time by pressing the corresponding switch.

Each of the eight TB buttons can be individually programmed, and then the entire programmed bank of eight can be stored and recalled in the EVENTS section (see Chapter 4, pages 4-10 to 4-12). Each individual TB button is programmed as follows: press the PGM/TAKE button (this button will light), then press the TB button you want to program (the TB button and its associated display will flash). Then rotate the MIX SELECT knob (programmable section on the MS-5.1 panel) and available destinations will be shown in the MIX display. When the desired channel is shown, press the TAKE button located next to SELECT knob (MS-5.1 panel), and the appropriate TB PRESELECTS display will then match what is shown in the MIX display on the MS-5.1 panel. Repeat this procedure for each of the eight TB buttons. The procedure will time out after about 5 seconds if you fail to complete one of the steps.

When EVENTS are stored, the eight TB preselects as displayed at the time of the EVENT SAVE action will be also stored and can be recalled with that EVENT.

> MIX AUX

PROGRAMMABLE

PRESELECT B

PRESELECT C

MXM 3

NXYZ PRESELECT D

AUX 1 PRESELECT A

ΔΙΙΧ



DS-5.1 Panel

MXM Confidence Feed

This system provides a means of sending an external signal to any or all of the 18 MXM outputs. This is typically used during show setup or airtime operations so talent can remain confident that their MXM feeds are active and working. (A typical confidence feed signal might be master control audio.)

A bank of 18 buttons allows individual activation of confidence feeds to any of the MXM outputs. Each feed can be unique.



Additionally, all 18 outputs can be put into confidence mode by means of a CONFIDENCE ALL switch (on the DS-5.1 or MS-5.1 panel). Also, the CONFIDENCE ALL feed function can

be triggered from an external contact closure and armed for such action by means of the REM TRIG button (on the DS-5.1 or MS-5.1 panel). All Confidence Feed programming is included in the EVENT storage.

1	2	3
4	5	6
7	8	9
MIX-	MINUS	SET
10	11	12
13	14	15
16	17	18

EFS-5.1 Panel

To set and store a confidence feed signal, go to the MIX-MINUS SET section of the EFS-5.1 panel and hit the corresponding button to establish a programming mode. Select the desired source in the XY Controller section of the MS-5.1 panel by rotating the SOURCE knob until the desired signal is shown in the INPUT NAME display, at which time the TAKE button will flash. Pressing that TAKE button will now program the corresponding MXM to receive the selected source. Repeat the procedure for each of the 18 MXM outputs

in the MIX-MINUS SET section on the EFS-5.1 panel.

To DEselect a source, select that source by means of the SOURCE knob, and press the CLEAR button.

After a timeout period of 5 seconds the INPUT NAME display will revert to the current channel that's in the SET mode elsewhere on the console.

Audio Delay

Audio delay is shown in the DELAY display. Delay is accomplished for inputs, submixes, master mixes, aux sends and mixminuses by means of activating their corresponding SET button and simply dialing in the audio delay. Delay may be set in milliseconds (0.0 to 667.5) or frames (0.0 to 20.0 in 0.5 frame steps) by means of the MICRO SECS/FRAMES button.

Delay settings are vitally important, permitting audio time delay adjustments to allow for video processor delays or satellite-to-terrestrial link audio/ video timing discrepancies.



DS-5.1 Panel



MS-5.1 Panel



DCM Section

To assign a DCM to an input, submix or master, place the input, submix or master channel in the SET MODE and press any combina-





EFS-5.1 panel. The appropriate DCM display cluster (on the IFS-5.1, SFS-5.1 or MFS-5.1 panel) on the inputs, submixes, or masters respectively, will be illuminated, as well as the assign buttons.

DCM ON

The ON switch provides a rapid way to mute a group of signals. Any signals that are assigned to a DCM will be muted when the DCM ON switch is turned off. Note that there are also four matching MUTE buttons at the bottom of the MS-5.1 panel; these MUTE buttons are lit (to indicate a group is MUTEd) when the matching DCM ON button is off, and vice versa. Either set of buttons may be used to control the DCMs at any time.



FADER

DCM level is set by a long-throw fader. When the control surface has recalled a preset or is under external serial control from an automation system, the fader NULL LEDs light to show that the DCM level is actually different from what the fader indicates. The DCM level will remain at the computer directed value until the fader is moved to a matching level, after which the

fader will control the level. The LED indicates which direction to move the fader to regain level control. Once the fader has been moved to the matching level the LED will turn off.

The D-5.1 control surface can be ordered with optional touch sensitive, long-throw motorized faders for automated level control.

Programmable Buttons

These 10 momentary switches and indicating LEDs are designed for user accessible external functions (GPIs). They can be mapped with the configuration software to any available logic I/O ports within the Bridge Router system, and used to control external devices.





Display Buttons

There are four display buttons on the DCMS fader panel. These buttons access various VGA display modes. To revert to normal panel display, press the upper left HOME DISPLAY button.

HOME - Default; Press this switch to have VGA monitor follow SET buttons.

HELP - Press this switch to activate the built in user Help system. The HELP system uses the DELAY knob and MILLISEC/FRAMES switch to navigate various topics.

INFO - Beneath the Surround graphic panel on the VGA display is a panel that normally shows information about the selected input or mix. By pressing the lower left INFO Display button, the VGA monitor panel will change to INFO and show information about the CPU, installed surface and DSP software revisions, and memory use.

BLANK - not used at this time.





HARDWARE

Host CPU (HC-5.1)

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All devices in the system must be set to the same sample rate!

Host Controller (HC-5.1)

Overview

The host controller card used in the D-5.1 incorporates a PC/104 computer mounted on the HC-5.1 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 D-5.1 control surface. The HC-5.1 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-5.1 card and is restored at power up or reset. This configuration information provides details to the host application running on the HC-5.1, such as the specific audio hardware available and serial port allocation. The HC-5.1 host controller card can be fitted with an optional 2nd PC/104 computer for redundancy.

HC-5.1 BIOS Settings/Format

BIOS Setup and formatting of the Host CPU is completed prior to the testing of your D-5.1 control surface at the Wheatstone factory. There are no user adjustable settings.

Ethernet IP Addressing

The Wheatstone D-5.1 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 via a straight (pin to pin) CAT-5 cable. Typical CAT-5 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 (or optical) 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 CAT-5 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 dipswitches.

Switch Settings

DIPSW1 - SW4 - Not Used

The four positions of dipswitches SW1-SW4 and SW9 are reserved for future use.

SW5 - SW8 - CAT5 vs. Fiber & Transceiver Select

These slide switches can be used to select the CAT5 or fiber optic mixer link connection.

To set MIXER LINK 1 for CAT 5 connection slide switches SW6 - TX and SW8 - RX to the up position (toward the surface's rear). Sliding these switches down selects fiber optic connection for transceiver 1.

To set MIXER LINK 2 for CAT 5 connection slide switches SW5 - TX and SW7 - RX to the up position (toward the surface's rear). Sliding these switches down selects fiber optic connection for transceiver 2.

Note that the setting of these switches and SW11 pos 4 (see below) must be made to the same selection. The Mixer Link is either CAT5 or FIBER.

SW9 - Master Reset

This switch can be used to force takeover by the backup CPU if the main CPU has failed and automatic failover has not been accomplished.

SW10 - CPU Reset

This switch can be used to reset the host controller's main CPU without powering down the system. If the system is running from the backup CPU this switch will NOT cause the main CPU to take over again. To do that you must recycle the surface power.

SW11 Position 1 - Sample Rate

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

SW11 Position 2 - Not Used

This dipswitch position is reserved for future use.



SW11 Position 3 - Redundant CPU

To enable automatic failover from the main CPU to the backup CPU this switch position must be on.

SW11 Position 4 - CAT5 vs. Fiber

The mixer link can be connected via CAT5 cable or fiber optic cable. Set position 4 of SW11 on if you are using CAT5 or off if you are using fiber. Note that switches SW5 - SW8 must also be set to agree with the SW11 position 4 setting.

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 Ethernet connectors. CAT5 or multi-mode optical fiber Mixer Link connections are made via RJ-45 or LC type optical connectors. The pinout drawing on page 6-7 shows all wiring connections at a glance.

"ETH A" RJ-45—MAIN ETHERNET CONNECTOR

 $\begin{array}{l} \text{Pin } 1 - \text{TXD} + \\ \text{Pin } 2 - \text{TXD} - \\ \text{Pin } 3 - \text{RXD} + \\ \text{Pin } 4 - \text{N/C} \\ \text{Pin } 5 - \text{N/C} \\ \text{Pin } 6 - \text{RXD} - \\ \text{Pin } 7 - \text{LN LED} \\ \text{Pin } 8 - \text{LK LED} \end{array}$

"ETH B" RJ-45—Optional Redundant Computer Ethernet Connector

 $\begin{array}{l} Pin \ 1 - TXD + \\ Pin \ 2 - TXD - \\ Pin \ 3 - RXD + \\ Pin \ 4 - N/C \\ Pin \ 5 - N/C \\ Pin \ 6 - RXD - \\ Pin \ 7 - LN \ LED \\ Pin \ 8 - LK \ LED \end{array}$

"CAT5" RJ-45- MIXER LINK CONNECTOR

 $\begin{array}{l} \operatorname{Pin} 1 - \operatorname{TXD} + \\ \operatorname{Pin} 2 - \operatorname{TXD} - \\ \operatorname{Pin} 3 - \operatorname{RXD} + \\ \operatorname{Pin} 4 - \operatorname{N/C} \\ \operatorname{Pin} 5 - \operatorname{N/C} \\ \operatorname{Pin} 6 - \operatorname{RXD} - \\ \operatorname{Pin} 7 - \operatorname{N/C} \\ \operatorname{Pin} 8 - \operatorname{N/C} \end{array}$

HARDWARE

TYPICAL ETHERNET CABLE



Used for connecting the host controller to your network hub.

TYPICAL CROSSOVER CABLE



USED FOR MIXER LINK CONNECTOR.

Optical Fiber Interface

The D-5.1 control surface supports an optional fiber connection to the Bridge Router. The D-5.1 surface uses an SFP module interface with integral LC connectors. Note that the QOT-2001 rear panel on the Bridge router uses SC connectors, so a patch cable fitted with LC connectors on one end and SC connectors on the other end is required.

Optical Transceiver

Optical Transceivers convert physical signals from electrical to optical (and vice-versa) in a network and couple the optical signals into (and out of) optical fiber. Small form factor pluggable (SFP) transceivers, used in the D-5.1 surface, are designed to be hot-swappable in industry standard cages and connectors (for easy field repair), and offer high speed and physical compactness.

Connectors Type

The high-density *LC Duplex* connector has a tabbed locking mechanism similar to what you would find on a phone jack. This enables secure connectivity and easy removal.

The SC (subscription channel) Duplex connector is a low insertion loss connector using a push/ pull locking mechanism.

Optical Fiber Cable

The SC-LC optical fiber cable required in this application is a multimode duplex fiber optic patch cable with a core/cladding size 62.5/125 micron suitable for low-to-moderate-speed data links (100Mbps). The following Fiber Instrument Sales, Inc. part number X2YLM3FISC may be used to reference the physical characteristics of the required cable assembly. The full-duplex nature of the audio network interface requires one fiber for transmit, and one for receive; hence dual zip cables are recommended.

Optical fiber cables are manufactured with a variety of jacket materials, which directly affect cable cost, including Thermoplastic Elastomer (TPE), Kynar® and Teflon® FEP. Physical properties of the jacket material determine a cable's resistance to abrasions, flame retardancy, etc. *Check local codes to be sure the cable you plan on using is compliant in your application.*

Optical Transceiver

Optical Fiber Cable







HC-5.1 Host Controller I/O Connections

Ethernet Connections











Schematic and Load Sheet Drawings

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IFS-5.1 4 Inputs Fader Panel Switch Card
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EFS-5.1 Control Panel Switch Card
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н	Г <u>с LED. D. (1)</u>	SW_Y.1	<u>N. Y. J.</u>	E-Y-WS	<u>SW-Y-2</u>	Sw. Y. 5	E-Y-WS	SW-Y-7	M.Y.4	6-7-WS	Sw.Y.S	Sw_Y_B	= SENSE =	SW Y B SW Y A SW Y A	₩ . X.mS	SW-Y.B SW-Y.C SW-Y.C W-Y.C	SWYLE SWYLE SWYLE	7-1-MS
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_			4148 D39 5W30 2		+1		1				,		4148 D31 SW31 2 500 3 500 4	3 X 4 4(48)079 2 5 4 3 X 4 5 4 5 4 4 4		3 2 4 446 032 5 8/32 2 6 6 3 <u>6</u> 4 4	3 2 4 4146 033 5893 2 569 3 2 6 6 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
F	C		448.082 		448 574 2 557 3 7 4	2 5 1 3 7 4 148 075	4145 076 SW44 2 00 3 44	2	4448 078 SW46 2	2	4148 079 SW48 2 5 4			4148 080 3 3 3 4 4148 074 4148 074 5 3 806 4 4148 074 5 3 806 4 4148 074 5 8 906 5 8 906 4 148 074 5 8 906 5 8 906 5 8 907 5 90				4148 B68 5854 2
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₩ITCH L	B	4148 0135 5W79 2 to 1 3 x 4 B	4448 8138 2	2	4448 6138 	4148 0139 	4148 D140 SW83 2 0 0 0 1 3 0 4	4148 0141 5N84 2	3 KA		3 2	4168 01.05 SW88 2 + 1 3		4448 0147 5 WB7 2 + 4 4448 0147 5 WB7 4448 0147 5 WB7 4448 0157 4448 0157 4458 0157 4458 0157 4458 01578 01578	446 BM6 5800 2			446 0131 5893 2 0 0 0 11 3 0 0 0 0 0 0 4140 0153 4140 0153 5803 4140 0153 5803 4140 0153 5803 4140 0153 5803 4140 0153 5803 4140 0153 5803 4140 0153 5803 4140 0153 5803 58
D				D5427		D5428		05427		B5430				3 × 4 444 0447 × 144 047 × 146 047 ×	054.37 	3 × 4 4148 D60 ×148 D60 2 × 6 ±	3 0 4 4400 DISS 5 WII3 2 0 0 4 3 0 4 4 0 0 10 5 WII3 3 0 4 5 WII3 5 WII3 5 WII3 5 WII3 5 WII3 5 WII3 5 WII3 5 WII3 5 WII3 7 WI	3 6 4140 Bb62 5W114 2 6 9 3 <u>6</u> 4 1
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В					R66 R6 15 15						R46 R15		Switch LED	DRIVE LOW				
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IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 1 of 8





IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 2 of 8

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CONTRACT NO.						IS-5	5.1				4		
APPROVALS	DATE		Wheatstone Corporation										
CHECKED SA	2-11-03 SA			6 N	00 Ie) Industr w Bern, N	ial D IC 28	rive 562					
ISSUED	SA	size D	SIZE FSCM NO. DWG. NO. 84S0084							REV A			
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2 1													



1		2		1		1	
DSPL_C							
DSPL_C DSPL_I DSPL_C							
				U1			
		74		PWRDWN	26		
•	GND +3.3V	24	- M0 - M1	INIT,1/0 HDC,1/0 CDC,1/0	36 28 30	INIT DSPL_CLK DSPL_4_DOUT	
	+3.3V +3.3V	4 6 5	TDI,1/0 TMS,1/0 TCK,1/0	GCK6,DOUT,I/O DONE	73	DINOUT_12	\bigcirc
	SS1_CK	<u>27</u> 54 <u>21</u> 48	GCK3,1/0 GCK5,1/0 GCK2,1/0 GCK4,1/0	TDO,O CS1,I/O	76 80		

DIN.I/O

11 I/O

04.I/O

)5,I/O

04.I/O

)7,I/O

PAD2,I/O PAD11.I/O

PAD14,I/O

PAD17.1/0

AD20,I/O

PAD26,I/0

PAD29,I/O

PAD23,1/0

R85 1.00K 70

R86 1.00K 61

68 02.I/O 13 I/O

<u>86</u> 87

GND

GND

6CK71/I GCK8,I/C

GCK1,I/I

PAD98.I/

PAD104,I/C

PAD107,I/0

PAD110.I/

PAD113,1/1 PAD116.1/

PAD132,I/

PAD138.1/

PAD141,I/

PAD144,I

PAD147,1/

PAD150.L

PAD156,I/

PAD159,I/

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			P		0		D						
		LED_E12_B		LED_E12_C		LED_E12_D							
DS739													
DS791										7U 26 NWURWE			
D5790									3V 24 MO	INIT.1/0 36 INIT	\supset		
DS789			DS594 LED_E1161					+3	3V 22 M1				
DS788								+ <u>1</u>	3V 4 TDL1/0 TMS,1/0	GCK6,DOUT,I/0 73	_		
G DS787									27 GCK3.J/0	TD0.0 76			
DS786								\bigcirc ss	Z_CK 54 21 GCK5,1/0 48 GCK2,1/0	CS1,1/0 80			
DS785									10UT_127200_DIN.1/0	GCK7,I/0 79 GCK8,I/0 99			
DS769									D R315 1.00K 70 D1,1/O 0 68 D2,1/O	GCK1,I/O 2	_		
DS738									D R303 1.00K 61 D4,1/O 2_D 57 D51/O	PAD98,1/0 PAD104,1/0 PAD104,1/0 16 LED_E12_C PAD1071/0 17 LED_E12_B	Ř		
D\$737									2_SY 55 D6,1/0 2_SP 53 D7,1/0	PAD110,1/0 PAD110,1/0 PAD113,1/0 PAD113,1/0 PAD113,1/0 PAD113,1/0 PAD113,1/0 PAD113,1/0 PAD110,1/0 PAD10,1/0 PAD110,1/0 P			
05716									D_E1[1] R212 33 78 PAD2,1/0 D_E1[2] R191 33 81 DA0111 1/0	PAD116,1/0 PAD132,1/0 PAD132,1/0 PAD132,1/0 BAD138,1/0 B1 33,8247 LED_E2[2]	\neq		
F 05700									D_E1131 R190 33 82 PAD14,1/0 D_E114J R183 33 83 D_E1151 P182 33 c PAD14,1/0	PAD141,1/0 32 33 R248 LED_E2[3] PAD144,1/0 33 33 R254 LED_E2[4] PAD144,1/0 24 33 R255 TED E2[4]	Ĭ		
									D_E1161 R179 33 85 PAD20,I/O D_E1171 R178 33 86 PAD23,I/O D_E1171 R178 33 86 PAD24,I/O	PAD147,1/0 3* 25 R260 LED_E2(5) PAD150,1/0 35 33 R260 LED_E2(6) PAD1550,1/0 39 33 R269 LED_E2(7)	<u></u> ₹		
									D_E1181 P171 33 87 PAU26,1/0 D_E1191 P170 33 90 PAD29,1/0 D_E1191 P170 33 90 PAD32,1/0	PA0159,1/0 40 33 R279 LED_EZI81 PA0159,1/0 41 33 R280 LED_EZI91 PA0162,1/0 41 33 R280 LED_EZI91	Ž		
DS645		-							D_E1(10) R164 33 91 PAD35,1/O D_E1(11) R163 33 92 PAD38,1/O D_E1(12) R160 33 93 PAD38,1/O	PAD165,1/0 42 33 R261 LED_E2(10) PAD168,1/0 43 33 R262 LED_E2(11) PAD168,1/0 44 33 R270 LED_E2(12)			
		-							D_E1113J R159 33 94 PAD41,1/0 D_E1114J R157 33 95 PAD44,1/0 D_E1114J R157 33 95 PAD47,1/0	PADI 71,1/0 45 33 R271 LED_EZ[13] PADI 74,1/0 46 33 R281 LED_EZ[14] PADI 77,1/0 46 33 R281 LED_EZ[14]	Ž		-
		-	DS437						D_E1[15] R169 33 96 PAD50,I/O D_E1[16] R176 33 97 PAD53,I/O D_E1[17] R177 33 98 PAD53,I/O	PA0180,I/0 47 33 R282 LED_E2(15) PA0195,I/0 56 33 R287 LED_E2(16) S8 33 R288 LED_E2(17)			
		-							D_E1[18] R188 33 3 PAD56,1/0 D_E1[19] R189 33 7 PAD55,1/0 PAD5,1/0	PAU201,//U 59 33 R295 LED_E2(18) PAD204,1/0 60 33 R296 LED_E2(19) PAD207,1/0 60 33 R296 LED_E2(19)			
F DS685			DS476		DS251				D_E1[20] R211 33 8 PAD83,I/O D_E1[21] R215 33 9 PAD83,I/O D_E1[22] R220 33 10 PAD86,I/O	PAD213,I/0 62 33 R304 LED_E2(20) PAD219,I/0 66 33 R310 LED_E2(21) 67 33 R311 LED_E2(21)			
									D_E1[23] R221 33 13 D_E1[24] R225 33 14 D_E1[24] R225 33 14	PAD222,1/0 69 33 R314 LED_EZIZ31 PAD231,1/0 71 33 R318 LED_EZIZ41	Ž		
									XC	S05XL			
→													٥
A DS743			B 05526		C DS316		D DS106						
D DS772									+33V +33V +33V +33V R240 R238 R237 R232				
DS798									D_E1Z_D \$10.0K \$10.0K \$10.0K \$10.0K	+33V	\supset		
DS797		-							· · ·		\supset		
DS796		-								+33V ~~~~	\supset		
		-	DS598						· · ·	LED_E12_C	\supset		-
DS794		-								+33V	\supset		
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C D5792		-	DS564							+33V	\supset		
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		-									APPROVALS DRAWN	Wheat	tstone Corporation
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	1						Δ				W# 700700	SCALE IS	S-5.1A PCB SHEET 3 OF 8

IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 3 of 8

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H A DS747	 B	C DS318		150 534 0	D D5108						
DS774		DS343									
		DS376						U3 PWRDWN 26			
DS804		DS375					+3.3V 24 M0	INIT.1/0 36 NIT			
DS803		DS405		_	DS195		+3.3V <u>4</u> TDLI/0	СDС.1/0 - 30 GCK6,DOUT.1/0 - 73			
		DS404		-			+3.3V 6 5 TCK,1/0				
G DS001				-		\subset	SS2_CK 54 GCK3,1/0 GCK5,1/0 GCK5,1/0	TD0,0 76			
		D5373		-			- DINOLIT 12 72	GCK7,L/O 79 99			
DS773		D\$342		-		BRO	GND R154 100K 70 D1,1/0 ESDN 2				
		D5341				BR1	GND R144 1.00K 61 SS2_D 57 D5_I/0	PAD98,I/0 15 CED_E34_D PAD104,I/0 16 LED_E34_C PAD107,I/0 17 LED_E34_B			-
DS745		DS317					SS2_SY 55 SS2_SP 53 D6,1/0 D7,1/0	PAD110,L/0 18 LED_E34_A PAD113,L/0 19 GND PAD113,L/0 20 +33V]5			
		DS300					LED_E3(I) R48 33 78 LED_E3(Z) R49 33 81 LED_E3(Z) R49 33 81 PAD11,1/0 LED_E3(3) R52 33 82	PAD132,I/O PAD132,I/O PAD132,I/O 31 39 R108 LED_E4[1] PAD138,I/O 32 39 R111 LED_E4[3]			
F				-			LED_E3141 R53 33 83 PAU14,1/0 LED_E3151 R57 33 84 PAU17,1/0 LED_E3151 R58 33 sc PAU24,1/0	PA0144,1/0 PA0144,1/0 PA0144,1/0 34 33 R112 LED_E414J 34 33 R117 LED_E415J 35 33 R118 LFT F474J			
D5688		DS256	LED_E3(16)				LED_E3(7) LED_E3(7) R64_33 86 PAD23,I/O PAD23,I/O PAD26,I/O PAD26,I/O PAD29,I/O	PA0150.I/0 39 33 R129 LED_E4(10) PA0156.I/0 40 33 R130 LED_E4(17) PA0159.I/0 40 33 R130 LED_E4(18)			
				+			LEULE3(9) H/0 33 90 PAD32//0 LEULE3(10) R/1 33 91 PAD35//0 LEULE3(11) R/6 33 92 PAD35//0	PA0162,1/0 41 33 /4134 LED_E4(19) PA0165,1/0 42 33 /4139 LED_E4(10) PA0165,1/0 43 33 /4122 LED_E4(11)			
			LED_E3(18)	-			LED_E3(12) R77 33 93 LED_E3(13) R83 33 94 LED_E3(13) R83 33 94 PAD41,1/0 PAD44,1/0 PAD44,1/0	PAD171,1/0 44 33 R123 LED_E4[12] PAD171,1/0 45 33 R131 LED_E4[13] PAD174,1/0 46 39 R132 LED_E4[14]			-
D5457				-			LED_E3(15) R88 33 % LED_E3(16) R82 33 % LED_E3(16) R82 33 % PAD50,1/0 PAD50,1/0 PAD53,1/0	PA0171,D/0 47 33 R135 LED_E4(15) PA0180,L/0 56 33 R136 LED_E4(16) PA0195,L/0 58 33 R139 FED_E4(16)			
DS658		DS258		-			LED_E31181 R69 33 B LED_E31181 R69 33 PAD56,I/O PAD65,I/O PAD65,I/O PAD77,I/O	PAD201,1/0 59 33 R140 LED_E41181 PAD204,1/0 60 33 R143 LED_E41181 PAD207,1/0 60 33 R143 LED_E41191			
E D5689		DS259		-			LED_E3/201 H01 33 8 PAD83.1/0 LED_E3/211 R82 33 9 PAD86.1/0 LED_E3/221 R90 33 10 PAD86.1/0	PAD213,L/O PAD219,L/O PAD219,L/O 66 33 R149 LED_E4[2] PAD222,L/O 67 33 R151 LED_E4[2]			
DS705		DS285					LED_E3(Z3) R91 33 13 LED_E3(Z4) R94 33 14 PAD92,I/O PAD95,I/O	PAD231,1/0 69 33 R152 LED_E4[23] PAD237,1/0 71 33 R155 LED_E4[24]			
DST72		D5301					XCS	505XL			
											4
A	В	c			D						
D D5776		D5348		-	DS138		+33V +33V +33V +33V				
		DS380		-		\subset		+3.3V			
DS811		DS379		-				LED_E34_D			
		DS408				\subset		07 FDNG4AP			
		DS407						+33V			
		DS406						FDN340P			
		DS378		-		_	~ LED_E34_A	VEE+			
				-		<u> </u>		FDN340P			
				-				R30 1.00K 1.00K 1.00K 1.00K 1.00K			
DS750				+				ดรั้อ ดรั้อ ดรั้อ			
				-							F
DS706		DS286									
D5690											
	DS451 LED_E4(19)	DS234									
				+							-
				-					CONTRACT NO.		
	LED_E4[22]								- Sergey Averin -	1.C-CI	
A D5724				-					DRAWN SA 2-11-03	WVVheatstone Corpor 600 Industrial Drive	pration ze
									CHECKED SA ISSUED SA SIZE	New Bern, NC 28562	2 REV
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IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 4 of 8

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Н	A DS756		1 FD F56 B												ł
	DS755														
	DS778		1												
	DS819		•								U6 26				
										PROGRAM 52 PROGR					_
										+3.3V 24 +3.3V 22 M0 M1	HDC,1/0 28 LTDC,1/0 30				
										+3.3V 4 TOLL/O	0 GCK6,DOUT,1/0 73				
			-							5 TCK.I/C	0 DONE 50.				
G			-							SS2_CK 27 GCK3,I/ GCK3,I/ GCK3,I/	/0 TD0,0 76 /0				
			-							48 GCK2,I/ 48 GCK4,I/	/0 CS1,1/0 80 /0				
										BR0 DINOUT_12 72 D0,DIN,3 GND R302 1,00K 70 D1 1/0	1/0 GCK8,1/0 99 GCK11/0 2				
	DS777									FSIN_2 68 D2,1/0 FSIN_2 65 D2,1/0 D3,1/0	PAD98,1/0 15 LED_	56_0			
	DS754									BR1 SS2_D 57 D5,1/0 SS2_SY 55 D5,1/0	PAD104,I/O 16 LED PAD107,I/O 17 LED 18 LED	156_B			
	DS753									SS2_SP 53 07,1/0	PAD110,1/0 19 PAD113,1/0 20	+3.3V GND			
	DS725									LED_ESIZI R200 33 78 LED_ESIZI R200 33 81 PAD2,L PAD11,	/0 PAD132,1/0 29 33 R245 LED 1/0 PAD132,1/0 31 33 R246 LED 1/0 PAD138,1/0 31 33 R246 LED				
F	D5708									LED_ESI31 H18/ 33 82 LED_ESI41 R186 33 83 LED_ESI41 R186 33 83 PAD14, PAD14,	,1/0 PAD141,1/0 32 33 R252 LED ,1/0 PAD144,1/0 33 33 R253 LED ,1/0 PAD144,1/0 34 33 R259 LED				F
	D5692									LED_E5(6) R180 33 85 LED_E5(7) R175 33 86 PAD23, DAD24	L/O PAD147,1/O 35 39 R266 LED L/O PAD150,1/O 39 33 R275 LED	E6161			
			t							LED_E5(8) R174 33 87 LED_E5(9) R166 33 90 PA029, PA037	L/O PAD159,L/O 40 33 R276 LED L/O PAD162,L/O 41 33 R291 LED				
				DS455						LED_ESIIII R162 33 91 LED_ESIIII R162 33 92 LED_ESIIII R163 33 83	L/O PAD165,1/O 43 33 R299 LED_ L/O PAD168,1/O 43 33 R299 LED_				
										LED_E5(13) R158 33 94 LED_E5(13) R158 33 94 LED_E5(14) R165 33 95	,1/0 PAD171,1/0 44 539 R307 LED ,1/0 PAD174,1/0 46 33 R308 LED				_
										LED_E5(15) R166 33 % LED_E5(16) R172 33 97 PAD50, LED_E5(16) R172 33 97 PAD53,	L/O PAD177,0 47 39 R317 LED. L/O PAD180,1/O 56 33 R267 LED.				
			-							LED_ES(17) H173 33 98 LED_ES(18) R184 33 3 LED_ES(19) R185 33 7 PAD55,	1/0 PAD201,1/0 58 33 R268 LED_ 1/0 PAD204,1/0 59 33 R277 LED_ 1/0 PAD204,1/0 40 33 R278 LED				
			-							LED_ESIZ01 R208 33 8 LED_ESIZ01 R214 33 9 DAD84	L/O PAD207,1/O 60 239 R286 LED L/O PAD213,1/O 66 33 R293 LED				
E			-							LED_E5IZZI RZ19 33 10 LED_E5IZ3I R219 33 13 PAD80, PAD800, PAD800, PAD80, PAD80	1/0 PA0213/0 67 33 R294 LED_ 1/0 PA0222,1/0 69 39 R301 LED_	61221			E
										LED_ESIZ41 HZZ4 33 14 PAD95	1/0 PAD237,1/0 71 33 R309 LED.	-61241			
	DS726														
->															-
	٨			B		C		D							
	LED_E56_A	LED_EGII	LED_E56_B		LED_E56_C		LED_E56_D								
	DS760									+3,3V +3,3V +3,3V +3,3V	v				
D	DS780									R239 R236 R235 F	R231	+33V			I
	DS826										10.0K 10.0K FDNB40P				
	DS825		t the second sec								LED_				
					·							+339			
											LED_	<u>E56_C</u>			
										LED_E56_B		-33V VEE+			
			ł									<u>=56_B</u>			
			ł									VEE+			
			ł								I P FDN340P LED_I	56_A			
			+								R42 1.00K 1.00K 1.00K 1.00K 1.00K				
											evo evo evo				
	DS757														
	DS727														
	DS710														
	DS694		Ĩ												
в	DS669		t												E
			ł												
	D5472					DS241									
-			ł												
													CONTRACT NO.	т ~	
			ł										- Sergey Averin -	15-	-9.1
			+										APPROVALS DATE) Wheatstor	ne Corporation
A	DS728												SA 2-11-03 CHECKED SA	600 Indus New Bern.	trial Drive , NC 28562
													ISSUED SA	SIZE FSCM NO. DWG. NO.	8450087 REV
													W# 700700	SCALE IS-5.1A PC	CB SHEET 5 OF 8
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IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 5 of 8

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A			в		с		D						
		LED_E78_B		LED_E78_C		LED_E78_D							
DS764				_									
DS782													
DS833											26		
									+3.3V		T,1/0 36 INIT		
DS831									+3.3V	22 M1 LDC			
DS830									+3.3V +3.3V	4 TDI,1/0 GCK6,DOU1			
G D5829		t the second sec								27 FCK,1/0 E			
D5828		+							SS2_CK	54 GCK5,1/0 21 GCK2,1/0 CS1	1,I/0 80		
DS827		t							DINOUT_12	48 GCK4,1/0 GCK7	7,I/0 79		
		•							BRO GND FSOUT_2	R313 1.00K 70 D1,1/0 GCK1 68 D2,1/0	1,1/0 2		
		+							BR1	65 D3,I/O PAD96 R297 1.00K 61 D4,I/O PAD104	8,1/0 15 LED_E78_D 4,1/0 16 LED_E78_C		
		•							SS2_SY SS2_SP	57 D5,1/0 PAD107 55 D6,1/0 PAD107 53 D7,1/0 PAD110	7,1/0 17 LCD_C78_B 0,1/0 18 LED_E78_A 19 +3.3V		
		+								R207 33 78 PAD2.I/O PAD13	6.1/0 20 +3.3V 29 33 R241 LEU_E8(1)	Ħ	
		+								R205 33 81 PAD11,1/0 PAD136 R205 33 82 PAD14,1/0 PAD145 R204 33 83	8,1/0 31 33,8243 LED_E8(2) 1,1/0 32 33,8244 LED_E8(3) 1,1/0 33 33,8249 LED_E8(3)		
		-								R203 33 84 PAD20,I/O PAD144 R202 33 85 PAD20,I/O PAD147	4,1/0 34 33 A250 LED_E8(5) 7,1/0 35 33 A256 LED_E8(6)		
	LED_E7(16]	ł								R201 33 86 PAD26,I/O PAD150 R200 33 87 PAD26,I/O PAD156	6.L/0 39 33 R272 LED_E8(7) 9.L/0 40 33 R272 LED_E8(8) 9.L/0 41 33 R251 LED_E8(8)		
D5674		ł								70 PAD32,I/O PAD162 R198 33 91 PAD35,I/O PAD162 R197 33 92 PAD35,I/O PAD163	2,1/0 41 33 R257 LED_E8131		
	LED_E7(18)	ł	DS465 LED_E7(18)							R196 33 93 PAD36,I/U PAD160 PAD41,I/O PAD171 R195 33 94 PAD41,I/O PAD171 PAD44,I/O PAD171	44 33 R264 LED_E8[12]		
DS676	LED_E7(19)	-								R194 33 95 R193 33 96 R193 33 96 PAD47,1/0 PAD177 PAD177 PAD177 PAD177	7,1/0 46 33 R273 LED_E8(14) 47 33 R274 LED_E8(15) 0,1/0 56 33 R283 LED_E8(15)		
DS677		-								R213 33 98 PAD53,I/O PAD195 R216 33 3 PAD56,I/O PAD201 R216 33 3 PAD65,I/O PAD201	5,1/0 58 33 A284 LED_E8(17) 1,1/0 59 33 A289 LED_E8(18)		
DS678	LED_E7(21)		DS468							R217 33 7 R222 33 8 PAD77,I/O PAD207 PAD83,I/O PAD213	7,1/0 60 39 A290 LED_E8(19) 7,1/0 62 39 A298 LED_E8(20) 3,1/0 62 39 A298 LED_E8(20)		
DS697										R226 33 10 PAD86,I/O PAD219 R227 33 13 PAD89,I/O PAD222	9,1/0 67 33 R306 LED_E8(22) 2,1/0 67 33 R306 LED_E8(22) 69 39 R312 LED_E8(23)		
05713										R226 33 14 PAD95,I/O PAD23	7,1/0 71 33 A316 LED_E8(24)		
DS731										XCS05XL			
			N		И		И						
1			D		a		P						
LED_E78_A	LED_E8111	LED_E78_B		LED_E78_C		LED_E78_D							
DS768									+33V	+3,3V +3,3V +3,3V			
D DS784		-							RZ3	34 {RZ33 {RZ30 {RZ29	+3.3V		
DS840		-								0K 10.0K 10.0K 10.0K			
DS839											+33V		
DS838		•								012 FDN340P			
05837													
DS836		t the second sec								420 FDN340P			
DS835		t the second sec											
C D5834		t the second sec								026 FDN340P			
DS783		•	DS587							· · · · · · · · · · · · · · · · · · ·	R43 2R36 2R27 2R14		
DS766		•) E	1.00K \$1.00K \$1.00K		
DS765		ł								UNI UNI	D GNU GNU GNU		
		ł											
DS714		ł	DS502							F/2 001/F 01/8 SS1/			
		-							FSOUT_2				
		+									¥10.0К		
		•								Š. Š.	ส้อ		
		+											
		ł							FSIN_2				
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D5699		ł										- Sergey Averin -	15-5.1
	E0_E8(23)	ł										APPROVALS DATE	Wheatstone Corporation
	E8(24)											CHECKED SA	600 Industrial Drive New Bern, NC 28562
												ISSUED SA SIZE I	ESCM NO. DWG. NO. 84S0088
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IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 6 of 8

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IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 7 of 8



IS-5.1 4 Inputs Panel Switch Card Schematic - Sheet 8 of 8

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CONTRACT NO		-									1
CONTRACT NO.		IS-51									
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APPROVALS	DATE		<u>)</u>	\/h	0	st ctope	C_{OI}	norol	ion	Ň	
DRAWN SA	2-11-03		600 Industrial Drive New Bern, NC 28562								
CHECKED	SA										
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IFS-5.1 4 Inputs Fader Panel Switch Card Schematic - Sheet 1 of 4



IFS-5.1 4 Inputs Fader Panel Switch Card Schematic - Sheet 2 of 4

				U2		_								D
CCLK PROGRAM		74	CCLK	F	WRDWN	26								
TROUNALI			PROGRAM			36				INIT				
+3.3V		24	MO		HDC,I/O	28								
+3.3V		22	M1		LDC,I/O	30								
+3.3V		4	TDLI/O	GCK6,D	IOUT,I/O	73			DINOU	T_3IQ				
+3.3V FS FATI		6	TMS,I/O			50				NONE				
			TCK,1/0		DONE	- 30				DONL	\sim			
000 54		27	GCK3,1/0		TDO,O	76								
SSZ_LK		 21	GCK5,I/O			80								
		48	GCK2,1/0		LS1,I/0									
DINOUT 12		77		G	iCK7,I/O	79								
GND	R51_1.00K	70	D0,DIN,I/O	6	5CK8,1/0	2								
		68	D2,I/O		JCI(1,17 U		22.04	-						
GND	R52 1.00K	<u>65</u> 61	D3,I/O	PA	D98,I/O	15	33 R6	6	LED_V	70(25) 70(26)	$\overline{\frown}$			
SS2_D		57	D4,1/0 D5,1/0	PAL)104,1/0)107,I/O	17	33 R6	7	LED_V	70[27]	\approx			
SSZ_SY		55	D6,I/O	PA	0110,I/O	18	33 R6	9		/U[28]	$\overline{\frown}$			
002101			D7,I/O	PAI PAI	0113,I/O 0116 I/O	20	33 R7	0	LED_V	70[30]	\leq			
	R39 33	78	PAD2,I/O	PA	0132,I/O	29	33 R7.	1		70[31]	\prec			
	R41 33	81 82	PAD11,I/O	PAE	0138,I/O	31 32		3	LED_V	70(32) 70(33)	$\overline{\frown}$			~
LED_VU[4]	R42 33	83	PAD14,1/0 PAD17.1/0	I PAL PAD)141,I/U)144.I/O	33	33 R7	4	LED_V	/U[34]	\Rightarrow			C
	R43 33 R44 33	84	PAD20,I/O	PAE	0147,I/O	34	33 R7	6		/U[35] /II[36]				
LED_VU[7]	R45 33	86	PAD23,I/0 PAD26 I/0	PA[ΡΔΓ	J150,I/O J156 I/O	39	33 R7	7	LED_V	70(37)	\rightleftharpoons			
	R46 33	87	PAD29,1/0	PA	0159,I/O	40	33 R7	8	LED_V	70[38]	\prec			
LED_VU[10]	R48 33	90 91	PAD32,I/O	PAE	0162,1/0	41 42	33 RB	, 0	LED_V	70[40]	\rightarrow			
LED_VU[11]	R49 33	92	PAD35,1/0 PAD38,1/0	PAL PAL)168,I/O	43			LED.		\succ			
LED_VU(12)	R50 33	93 94	PAD41,1/0	PA[0171,I/O	44			LED.		$\overline{\Box}$			
LED_VU[14]	R54 33	95	PA044,1/C	J PAL I PAL	J174,I/U J177,I/O	46			LED.	VU_A	\rightleftharpoons			
	R55 33	96	PAD50,I/O	PA	0180,I/O	47								
LED_VU(17)	R57 33	98	PAD53,1/0 PAD56 1/0	I PAL PAL	J195,I/O J201 I/O	58								4
	R58 33	3	PAD65,1/0	PAD)204,I/O	59								-
LED_VU(20)	R60 33	8	PAD77,I/0	I PAE)207,I/O	62								
	R61 33	9	PAD86,1/0	I PAL)219,1/0	66								
LED_VU(22) LED_VU(23)	R63 33	10	PAD89,1/0	PAE)222,I/O	67								
LED_VU[24]	R64 33	14	PAU92,1/0 PAD95.1/0	I PAL I PAL	JZ31,I/U)237.I/O	71								
LED_VU_D	+3.3V +3.3V R30 R16 10.0K 10.0K	+3.3V	+Э.ЭV ↑ 0 .0К 10.0₩	` ப						+3.3V				B
			•		0P									
									LED.	_VU_D	\leftarrow			
										+3.3V				
LED_VU_C		-												
					10P		•		LED.	_VU_C				
										+7.7V				
LED_VU_B				 107							$\prec $			
				FDN34	0P				LED	VII B	_			
LED_VU_A										VE.E+	\sim			
				FDN34	R31	R11	7 0К =	R11 1.00K	LED. R3 1.00K	.VU_A	\rightarrow			
1155					GND	GND	GÑE) GŘ	U					
viii ↑														
C4														
0.1uF	CONTRAC	:/ NC).					T 1	FC	_5	1			А
GND		Serge	y Averin -					11	L' N	J	• 1			
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	→ LED_VU_A						LED_VU_D	
	A		B DS134		C DS70			
			DS135		DS71			
			DS136		DS72			
			DS137		DS73			
			DS138		DS74			
			DS139		DS75			
			DS140		DS76			
			DS141		DS77			
-			DS142		DS78			
			DS143		DS79			
			DS144		DS80			
			DS145					
			DS146					
			DS147					
			DS148					
			DS149					
					DS89			
			DS155		DS91			
			DS156		DS92			
			DS157					
			DS158					
	-		DS159					
			DS160		DS96			
	-		DS161		DS97			
	-							
	-		DS163		DS99			
	-		DS164		DS100			
	-		DS165		DS101			
	-		DS166					
	-							
			DS168		DS104			
	+		DS169					
	+		DS170		DS106			
	+		DS171		DS107			
			DS172		DS108			
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IFS-5.1 4 Inputs Fader Panel Switch Card Schematic - Sheet 3 of 4

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IFS-5.1 4 Inputs Fader Panel Switch Card Schematic - Sheet 4 of 4

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		DSPL_DIN	
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н	Г <u>ЦЕО.0.(1)</u>		T L λ MS	E-Y-WS	SM-Y-2	SM.Y.5	E-Y-WS	∠-x-ws	SW_Y-4	SW-Y-9	S ^m , Y, B	SW_Y_B	$\xrightarrow{g_{\lambda_{1}}}$ SENSE $\xrightarrow{g_{\lambda_{1}}}$		C-Y-D-Y-NS	Sw. 7.B Sw. 7.D Sw. 7.C Sw. 7.E	M. Y. 2 W. Y. 1 W. Y. 2 W. 2 W. 2 W. 2 W. 2 W. 2 W. 2 W. 2 W	E-Y-W2
		4148 0150 SW101 2 1 3	4148 0154 SW105 2	2 - 1 3 - 4			4148 076 SW45 2 0 0 1 3 0 4						4148 D14 SW14 2					4148 024
G			4148 0152 SW03 2 0 0 1 3 0 4														ZN1 2 448 020 5W2 2 448 020 5W2 2 3 5W2 1 3 5W2 1 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	SW24 2 3 4448 023 5W23 2 5W23 2 5W23 2 5W23
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switch LE			4148 D153 5W104 2 0 1 3 4			4148 084 58469 2 0 0 1 3 0 4	4148 D74 5W43 2 0 0 1 3 0 4			4148 D51 5W29 2 0 0 1 3 4		4148 DI66 SM123 2				446 0121 589% 2 589% 2 589% 446 0121 589% 446 0121 589%	4448 0124 SW97 2	4148 0126
D			4148 DIS1 54102 2 0 0 0 1 3 0 4										4148 D90 5W67 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				2	2 3 4149 UI25 SW98 2 3 3
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_			4148 0170 SW119 2 1 3										4148 D89 5866 2				2	2 3 4148 gtg80 5W131 2 3 3
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EFS-5.1 Control Panel Switch Card Schematic - Sheet 1 of 7





EFS-5.1 Control Panel Switch Card Schematic - Sheet 2 of 7

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DSPL_RS	\sim							
DSPL_DIN	\bigcirc							
		74		U1 PWRDWN	26			D
		52	PROGRAM	INIT,I/O	36	INIT	\frown	
	+3.3V	24	M0 M1	HDC,I/O CDC,I/O	28 30			
	+3.3V	4	TDI,1/O	GCK6,DOUT,I/O	73	DINOUT_12	\bigcirc	
		5	TMS,I/O TCK,I/O	DONE	50	DONE	\bigcirc	
	SS1 (K	27	GCK3,1/0	TDO,O	76			
		<u>21</u> 48	GCK5,1/0 GCK2,1/0	CS1,I/0	80			
	DINOUT_01	72		GCK7,I/O	79 99			
BRO		7 1.00K 70 68	D1,I/O	GCK1,I/O	2			
BR1	GND R11	Z 1.00K 61	D3,I/O	PAD98,I/0 PAD10/, I/0	15 16			
DRI	SS1_D SS1_SY	57	D5,I/0	PAD107,I/O PAD107,I/O	17 18			
	SS1_SP	53	D7,I/O	PAD113,I/O	19 20			
		<u>78</u> 81	PAD2,I/O	PAD132,I/O	29 31			
		82	PAD11,I/U PAD14,I/O	PAD136,1/0 PAD141,1/0	32			С
		84	PAD17,1/0 PAD20,1/0	PAD144,I/U PAD147,I/O	34			
		<u>86</u>	PAD23,1/0 PAD26,1/0	PAD150,I/O PAD156,I/O	39			
		90	PAD29,I/O PAD32,I/O	PAD159,I/O PAD162,I/O	40	SW_Y_0	\bigcirc	
		91	PAD35,1/0 PAD38,1/0	PAD165,I/O PAD168,I/O	42	SW_Y_2	8	
	<u>SW_4_X</u>	93	PAD41,I/0 PAD44,I/0	PAD171,I/O PAD174,I/O	44	SW_1_3 SW_Y_4	$ \ge $	
	<u>SW_5_X</u> <u>SW_6_X</u>	95	PAD47,I/0 PAD50.I/0	PAD177,I/O PAD180,I/O	46	SW_Y_5 SW_Y_6	\boxtimes	
	<u>SW_7_X</u> <u>SW_8_X</u>	97 98	PAD53,I/0	PAD195,I/O PAD201 I/O	56 58	SW_Y_7 SW_Y_8	\square	—
	SW_9_X SW_A_X	3	PAD65,I/O	PAD204,I/O	59 60	<u>SW_Y_9</u> SW_Y_A	\ge	
	SW_B_X SW_C_X	8	PAD77,1/0 PAD83,1/0	PAD207,1/0 PAD213,1/0	62 66	SW_Y_B SW_Y_C	\ge	
	SW_D_X SW_E_X	10	PAD86,1/0 PAD89,1/0	PAD219,1/0 PAD222,1/0	67	SW_Y_D SW_Y_E	\ge	
	SW_F_X	14	PAD92,1/0 PAD95,1/0	PAD231,I/O PAD237,I/O	71	SW_Y_F	\bowtie	
			XCS	\$05XL	1			
								R
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				GÑD	GND	GÑD	GÑD	
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			vcc ↑	vcc ↑	vcc ↑		vcc ↑	
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_	05377 CED_EII[2] 05387 CED_EII[3] 05399 CED_EII[5] 0539 CED_EII[5] 053					CCLK 74 CCLK PWF PROGRAM 52 PROGRAM NII +33V 24 M0 H0I +33V 22 M1 UD +33V 4 H0I/FO GCK6.00U +33V 4 H0I/FO GCK6.00U	DWN 28. 1/0 99. NIT 1/0 29 1/0 39 1/0 72 1/0 72	
G						5 TCK1/0 1 SS2_CK 21/5 GCK31/0 1 31 GCK2/70 CS CS 12 GCK2/70 CS CS 13 GCK2/70 CS CS 14 GCK2/70 CS CS 15 GCK4/70 GCK GCK 16 GCX T2 DODN1/70 GCK 17 GCX T2 DODN1/70 GCK 17 GCX T12 T2 DODN1/70 GCK	59 DONE 59 DONE 1,1/0	G
_	053% US37% US37% US37% UEU_EUI31 US375 UEU_EUI31				<u>D_E1131</u> BI	FSIN.2 88 021/0 6N0 R119 1006 600 PAD9 SS2.0 57 05/0 PAD10 SS2.5 55 05/0 PAD10 SS2.5 55 06/0 PAD10 CULUE 77 05/0 PAD10 SS2.5 53 07/0 PAD10 CULUE 77 06/0 PAD10	IJU0 IS IEU.EIZ.I 1/0 IA IA 1/0 IA IA 1/0 IA IA 1/0 IB IEU.EIZ.X 1/10 IEU.EIZ.X IEU.EIZ.X 1/10 IEU.EIZ.X IEU.EIZ.X 1/10	
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н	LED_E56_A	B DS287 LED_E56_B LED_E56_B LED_E51II	LED_E56_C		LED_E56_D							F
	DS404											
									U4 CLK PWRDWN 26 PPHRDXN			
								+3.3V 24 +3.3V 22	100 H0C,1/0 36 INIT			
								+3.3V 4 T +3.3V 6 T				
G								SS2_CK 54 37 G	5CK3,1/0 TD0,0 76 5CK3,1/0 TD0,0 76 5CK5,1/0 80			G
									EKC2//0 CS1//0 0 EKC4.1/0 0 00.DIN1/0 GCK7.1/0 99 99			
							BF	R0 UNU H06/100K 70 D FSIN_2 65 D GND R176 100K 61 D	11.1/0 GCK1.1/0 2 12.1/0 15 LED_E56_D 13.1/0 PAD96_1/0 16 LED_E56_C			_
							10	SS2_SY 55 SS2_SP 53 D	Intro FADIO1/LO 17 LED_E56_IB ISL/O PADI01/LO 18 LED_E55_A ISL/O PADI01/LO 19 +33V I7L/O PADI01/LO 19 -130V			
								LED_E5(1) H22, 33 R12, 33 R13, 33 R12, 33 R13, 33 R	PADI16//0 29 33 RU75 LEU_EGIT AD211//0 PADI32.1/0 31 39 Kis2 LED_EGIZI AD11.1/0 PAD138.1/0 32 39 Auss LED_EGIZI AD14.1/0 PAD141.1/0 32 39 Auss LED_EGIZI			
F	D5379							LED_E51(4) R126 33 83 LED_E51(5) R126 33 84 LED_E51(6) R131 33 85 LED_E51(7) R127 33 86 LED_E51(7) R127 33 86	PAD17,1/0 PAD144,1/0 33 39 R190 LED_E641 PAD20,1/0 PAD147,1/0 34 37.691 LED_E6151 PAD23,1/0 PAD150,1/0 35 37.697 LED_E6151 PAD24,1/0 PAD147,1/0 35 37.697 LED_E6151 PAD24,1/0 PAD147,1/0 35 37.697 LED_E6151 PAD24,1/0 39 37.6201 LED_E6171 LED_E6171			F
								LED_E5(8) LED_E5(9) LED_E5(9) LED_E5(10	AD26,1/0 PAD159,1/0 40 39 8202 LED_E6181 2A029,1/0 PAD159,1/0 41 39 8205 LED_E6191 2A032,1/0 PAD162,1/0 42 39 8206 LED_E6101 2A035,1/0 PAD165,1/0 42 39 8206 LED_E6101			
	DS352							LED_E5(13) R143 33 93 LED_E5(13) R144 33 94 LED_E5(13) R144 33 94 LED_E5(14) R145 33 95	AD38L/0 PAD168L/0 44 33 4210 LED_E61121 PAD41.1/0 PAD171.1/0 45 3 4212 LED_E61131 PAD44.1/0 PAD174.1/0 45 3 4212 LED_E61131 PAD171.0 PAD174.1/0 46 33 4213 LED_E61141			-
								LED_ES(13) R140 33 56 LED_ES(13) R147 33 77 LED_ES(13) R146 33 58 LED_ES(13) R140 33 59	PAD50,I/O PAD180,I/O 4/7 35,7425 LEU_L60151 PAD51,I/O PAD195,I/O 56 33,892 LEU_L60151 PAD56,I/O PAD195,I/O 58 33,8125 LEU_L60171 PAD56,I/O PAD204,I/O 59 33,8126 LEU_L60171 SAD55,I/O PAD204,I/O 59 34,8144 LEU_L60171			
F	DS355							LED_E5(2) P15(3) 7 LED_E5(2) P15(3) 8 LED_E5(2) P15(3) 8 LED_E5(2) P15(3) 9 LED_E5(2) P15(3) 9 LED_E5	Audor,I/O PAD2091,I/O 60 3) Au77 LED_E6[19] VA007,I/O PAD2091,I/O 62 3) Au77 LED_E6[20] VA083,I/O PAD213,I/O 62 3) Au71 LED_E6[21] VA084,I/O PAD213,I/O 66 3) Au71 LED_E6[21] VA086,I/O PAD213,I/O 64 3) Au71 LED_E6[21]			F
								LED_E5IZ3J P155 33 13 LED_E5IZ4J P155 33 14 P	AD89,1/0 PAD221,1/0 PAD21,1/0 PAD231,1/0 PAD251,1/0 PAD231,1/0 71 39 4160 LED_E61231 71 39 4160 LED_E61241			
	D5390								XCS05XL			
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EFS-5.1 Control Panel Switch Card Schematic - Sheet 4 of 7

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– F	5546 5546 5546 5546 5546 5546 5546 5546	LED_E7130 LED_E7131 LED_E7131 LED_E7131 LED_E7131 LED_E7135 LED_E7155	IDE70101 IDS704 IDE70101 IDS704 IDE70101		Image: Constraint of the		>* LED_ETILIST 0507 EED_ETILIST 0556 EED_ETILIST 0566 EED_ETILIST 0567 EED_ETILIST 0566 EED_ETILIST 0567 EED_ETILIST 0566 EED_ETILIST 0567 EED_ETILIST 0568 EED_ETILIST 0569 EED_ETILIST		BR0 GKU BB6 1 600 * 19 (2000) DODM//O GKKL/D 2 JU/O GKKL/D 2 1000 <th>F</th>	F
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⊸ D			B LED_E78_B LED_E78_B BS379 LED_E8011 SS30 LED_E8021 SS30 SS30 LED_E8021 SS30 SS30 LED_E8021 SS30	LED_E78_C	C 153199 15703 15703 15707	LED_E78_D	D D5% C5103 LED_E8[1] C5103 LED_E8[2] C5107			- ⊐ D
 C			0533 ED_E863 0534 ED_E863 0532 ED_E863 0539 ED_E803		16225 16226 16225 16226 16223 16226 16223 16226 16223 160.16871 16223 160.16871 16324 160.16871 16324 160.16871 16324 160.16871 16324 160.16871 16324 160.16811 16320 160.168111 16320 160.168121 16329 160.168121 16329 160.168121		B12* COLLON B512* EULERGI B513* EULERGI B510* EULERGI B510* EULERGI B510* EULERGI B510* EULERGI B510* EULERGI B510* EULERGI		LED_E78_C	c
B			IED_EBIGI 05275 IED_EBIGI 05275 IED_EBIGI 05275 IED_EBIGI 05275 IED_EBIGI 05275 IED_EBIGI 05275 IED_EBIGI 05255 IED_EBIGI 05255 IED_EBIGI 05259 IED_EBIGI 05259 IED_EBIGI 05259 IED_EBIGI 05259 IED_EBIGI		LEU LEGI 31 CEU LEGI 31 CEU LEGI 31 DS176 CEU LEGI 51 DS176 CEU LEGI 51 DS14 CEU LEGI 51 DS159 CEU LEGI 71		10 10<		FSOUT_2 FSO	В
A	8		SSMA LED_EB(ZI) SSTR LED_EB(ZI) US278 LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR LED_EB(ZI) SSTR	6	05145 05144 05177 05177 05177 05177 05177 05177 05177 05173 05183 05183 05183 05182 05182 0516 0517 051	5	D554, EED_EBIZII 0555, 100 0570, EED_EBIZII 0580, 100 0580, EED_EBIZII	4	3	CONTRACT NO. EFS-5.1 - Sergey Avertar- APPROVALS DATE DRAWN SA 3-13-02 CHECKED SA 600 Industrial Drive ISSUED SA SIZE VW PO0709 SCALE EFS-51 PCB SCALE EFS-51 PCB SHEET 2 1

EFS-5.1 Control Panel Switch Card Schematic - Sheet 5 of 7

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page 7 - 21



EFS-5.1 Control Panel Switch Card Schematic - Sheet 6 of 7



EFS-5.1 Control Panel Switch Card Schematic - Sheet 7 of 7

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CONTRACT NO.				- - - - - - - - - - - - - - - - - - -	5	1		
- Sergey Averin -				EF D	J.,	L		
APPROVALS	DATE	<u>)</u>	∧/ha	ot clone	C_{\circ}	rnorol	tion	`
DRAWN SA	3-13-02	31	60 60	0 Industr	ial D	rive		1
CHECKED	SA		Ňe	ew Bern, N	IC 28	562		
ISSUED	SA	SIZE FSCI D	1 NO.	DWG.NO.	845	0114		REV
W# 700709		SCALE		EFS-5.1 PCB		SHEET	7 0	 F 7
	>					1		





S <u>W2</u>	_°°∎			SW3	SW4	SW5	SW6	SW7	SW8	6MS	SW10
βz			DS16			a م		∎ ¤°		a م	
8 55 5											
			5	D17 回	D18 回	D19	D20	D21	D22 回	D23	D24
	DS103		D	∎ ⊼ °	∎ ⊼ °	∎ ⊼		∎ ¤ °	∎ ⊼ °		
	°21		C13	SW17	SW18	SW19	SW20	SW21	SW22	SW23	SW24
D4 ⊠ SV	1 V32		50	SW33	SW34	SW35	SW36	SW37	SW 38	SW39	SW40
∎ ¤			DS133								
	511 DS183			D54 D65	D55 D66	D56 D67	D57 D68	D58 D69	D59 D70	D60 D71	D61 D72
	DS199		19191								
	^{\$202}			SW51	SW52	SW53	SW54	SW55	SW56	SW57	C24
ð ⊠ SV	8 V72 — [SW73	•••• ••••	SW75	SW76		•••• •••• SW78	SW79	
			15235	Δ							
			C28								
	5270 DS285		ა ე	D110 D119	D111 D120	D112 D121	D113 D122	D114 D123	D115 D124	D116 D125	D117 D126
	DS29		DS2								
	³ 377 70		C41	Sw9	2 SW93	SW94	SW95	SW96	SW97	SW98	SW99
N142				Sw10	7 5W108	SW109	SW110	SW111	SWI12	SW113	SW114
	С 4	C4	⊧5 ■								
166	M115	Δ									
	167 S		•	D157 D174	D158 D175	D159 D176	D160 D177	D161 D178	D162 D179	D163 D180	D164
	124 D.	∆°	•								
	S S S	D19		SW125	SW126	SW127	SW128	SW129	SW130		SW132
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SFS-5.1 4 Outputs Fader Panel Switch Card Schematic - Sheet 1 of 3



SFS-5.1 4 Outputs Fader Panel Switch Card Schematic - Sheet 2 of 3

CONTRACT NO.				апа	F 1		
- Sergey Averin -				SFS-	1.C		
APPROVALS	DATE		Vha	ot ctope	Corporo	tion	
DRAWN SA	3-4-02	30	60	0 Industr	ial Drive		
CHECKED	SA		Ne	w Bern, N	C 28562		
ISSUED	SA	SIZE FSCM	NO.	DWG.NO.	84S0101		REV
W# 700710		SCALE		SFS-5.1 PCB	SHEET	2 OF	- ' 3

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SFS-5.1 4 Outputs Fader Panel Switch Card Schematic - Sheet 3 of 3

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CONTRACT NO. - Sergey Averin -		SFS-5.1						А		
APPROVALS	DATE		MA/heat stone Corporation							
DRAWN SA	3-5-02	, sav	Sevene Corporation							
CHECKED	SA		Ne	w Bern, 1	VC 28	562				
ISSUED	SA	size fscm D	NO.	DWG.NO.	84S	0102		REV		
W# 700710		SCALE		SFS-5.1 PCB		SHEET	3 OF	3		
2	-					1				

VCC	+33V	
		D
3		
5		
	SS1_CK	
	SS1_D	
	SS1_SY	
	-	
	SS1_SP	
	SSZ_D	С
	SS2_SY	
	SS2_SP	
24		
25	SS3_CK	
26	000 0	
27		
	Y2 522	
	SS3_SP	
	SS4_CK	
	SS4_D	
36	-	
37		В
38		
	PROGRAM	
45		
		_
	DONE	
GŇ)	
Q	$PS_{-5,1}$	A
S.	L'N N.T	
Nhentr	tone Corporation	
600 In	dustrial Drive	
New Be	ern, NC 28562	

MS-5.1 Master Panel Switch Card Schematic - Sheet 1 of 6

	8	7	6	5	↓ 4	3
D	$\begin{array}{c} \overset{+3.3V}{7} & \overset{VCC}{5} & \overset{VCC}{4} & \overset{-1.6}{16} \\ & \overset{-1.6}{9^{1}} & \overset{-1.6}{7} & \overset{-1.6}{2} \\ & \overset{-1.6}{11} & \overset{-1.6}{13} & \overset{-1.6}{11} \\ & \overset{-1.6}{11} & \overset{-1.6}{11} \\ & \overset{-1.6}{11} & \overset{-1.6}{11} & \overset{-1.6}{11} \\ & \overset{-1.6}{11} \\ & \overset{-1.6}{11} & \overset{-1.6}{11} \\ & \overset{-1.6}{11} $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & & $	$\begin{array}{c} +3.3^{V} \\ 7 \\ 7 \\ 5 \\ 6 \\ 3^{J} \\ 7 \\ 2^{J} \\ 7 \\ 2^{J} \\ 7 \\ 2^{J} \\ 10^{J} \\ 8 \\ 10^{J} \\ 8 \\ 10^{J} \\ 10^{J} \\ 8 \\ 11^{J} \\ 10^{J} \\ 10^{J} \\ 8 \\ 11^{J} \\ 10^{J} \\ 10^{J} \\ 8 \\ 10^{J} \\ 10^{$	$\begin{array}{c} +3.3V \\ \hline 7 \\ \hline 6 \\ \hline 9 \\ \hline 17 \\ \hline 10 \\ \hline 8 \\ \hline 12 \\ \hline 111 \\ \hline 00 \\ \hline 12 \\ \hline 12 \\ \hline 111 \\ \hline 00 \\ \hline 12 \\ \hline 12 \\ \hline 111 \\ \hline 00 \\ \hline 111 \\ \hline 10 \\ \hline 12 \\ \hline 12 \\ \hline 111 \\ \hline 10 \\ \hline 12 \\ \hline 111 \\ \hline 10 \\ \hline 12 \\ \hline 111 \\ \hline 10 \\ \hline 11 \\ \hline 111 \\ \hline 10 \\ \hline 11 \\ \hline 111 \\ \hline 10 \\ \hline 11 \\ \hline 111 \\ \hline 111 \\ \hline 10 \\ \hline 10 \\ \hline 10 \\ \hline 10 \\ \hline 11 \\ \hline 111 \\ 1$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
C	$\begin{array}{c} 1337 \\ 7 \\ 7 \\ 8 \\ 9 \\ 16 \\ 9 \\ 17 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10$	$\begin{array}{c} & \text{A}_{3,0}^{+3,3V} & \text{CC} \\ & \text{A}_{1,0}^{-1,6} & \text{A}_{1,0}^{-1,6} \\ & \text{A}_{1,0}^{+1,6} & \text{A}_{1,0}^{-1,6} \\ & \text{A}_{1,0}^{+1,1} & \text{A}_{1,0}^{-1,1} \\ & \text{A}_{1,0}^{-1,1} & \text{A}_{1,0}^{$	$\begin{array}{c} +3.3V \\ +3.3V \\ 7 \\ -5 \\ -6 \\ -9 \\ -7 \\ -5 \\ -7 \\ -5 \\ -7 \\ -5 \\ -7 \\ -7$	$\begin{array}{c} +3.3V \\ \hline \\ 7 \\ \hline \\ 6 \\ 9 \\ 9 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$	$\begin{array}{c} +33' & \\ & $	$\begin{array}{c} +3.3^{V} \\ 7^{-} & 5 \\ 8^{+} & 6 \\ 9^{+} & 7 \\ 9^{+} & 7 \\ 10^{-} & 2^{-} \\ 11^{-} & 10^{-} \\ 10^{-} & 3^{-} \\ 11^{-} $
B	$\begin{array}{c} \begin{array}{c} +3.3^{V} & VC\\ 7^{+} & 5\\ 8^{+} & 6\\ 9^{+} & 7\\ 9^{+} & 7\\ 9^{+} & 7\\ 10^{-} & 2\\ 14\\ 10^{-} & 2\\ 11\\ 10^{-} & 2\\ 12\\ 11\\ 10^{-} & 2\\ 12\\ 11\\ 10^{-} & 2\\ 12\\ 11\\ 10^{-} & 2\\ 12\\ 11\\ 10^{-} & 2\\ 12\\ 11\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10\\ 10^{-} & 2\\ 12\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10$	$\begin{array}{c} +3.3V \\ \hline 7 \\ \hline 6 \\ \hline 9 \\ \hline 10 \\ \hline 11 \\ \hline 11$	$\begin{array}{c} *3.3V & VCC \\ \hline 7 & -5 & 4 & -6 \\ \hline 9 & -7 & 5 & 4 & -6 \\ \hline 9 & -7 & -5 & -16 \\ \hline 9 & -7 & 2 & -14 \\ \hline 101 & 8 & -7 & -7 & -3 & -2 \\ \hline 111 & -7 & -7 & -3 & -2 \\ \hline 121 & 101 & 8 & -1 & -7 & -3 & -2 \\ \hline 121 & 101 & 8 & -1 & -7 & -3 & -2 \\ \hline 121 & 101 & 8 & -1 & -7 & -3 & -2 \\ \hline 7 & -1 & -7 & -3 & -2 & -7 & -7 \\ \hline 121 & 101 & 8 & -1 & -7 & -7 & -7 \\ \hline 9 & -7 & -7 & -7 & -7 & -7 & -7 \\ \hline 101 & 101 & 105 & -7 & -7 & -7 & -7 \\ \hline 9 & -7 & -7 & -7 & -7 & -7 & -7 \\ \hline 111 & 17 & 2 & -12 & -7 & -7 & -7 \\ \hline 121 & 101 & 105 & -7 & -7 & -7 & -7 \\ \hline 121 & 101 & 105 & -7 & -7 & -7 & -7 \\ \hline 9 & -7 & -7 & -7 &$	$\begin{array}{c} +3.3V \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \\ & 9 \\ & 10 \\ & 9 \\ & 10 $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
- A	$\begin{array}{c} +3.3V & VC \\ \hline 7' & 5 & 4 \\ 9^{1} & 7 & 2 \\ 14 \\ 10^{1} & 8 \\ 11^{1} & 6 \\ 11^{1} & 9 \\ 12^{1} & 11^{1} & 0 \\ 11^{1} & 8 \\ 11^{1} & 10^{1} & 9 \\ 12^{1} & 11^{1} & 10^{1} \\ 12^{1} & 11^{1} & 8 \\ 11^{1} & 10^{1} & 6 \\ 12^{1} & 11^{1} & 10^{1} \\ 12^{1} & 10^{1} \\ 12^{1} & 10^{1$	$\begin{array}{c} & \overset{+33V}{} & \overset{DS78}{} & \overset{-16}{} & \overset{0}{} & \overset{-16}{} \\ & \overset{+1}{3} & \overset{-1}{6} & \overset{-16}{} \\ & \overset{+1}{3} & \overset{-1}{6} & \overset{-1}{3} \\ & \overset{+1}{3} & \overset{-1}{3} & \overset{-1}{3} \\ & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} \\ & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} \\ & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} & \overset{-1}{3} \\ & \overset{-1}{3} & \overset$	$\begin{array}{c} +33V & VC \\ \hline 7 & -5 & 4 & -6 \\ \hline 9 & -7 & 5 & 4 & -6 \\ \hline 9 & -7 & -5 & -1 & -6 \\ \hline 9 & -7 & -5 & -7 & -16 \\ \hline 9 & -7 & -7 & -7 & -7 \\ \hline 101 & 8 & -7 & -7 & -7 \\ \hline 111 & -7 & -7 & -7 & -7 \\ \hline 121 & 101 & -7 & -7 & -7 \\ \hline 121 & -7 & -7 & -7 \\ \hline 121 &$	$\begin{array}{c} +3.3V \\ 7 \\ \hline \\ 7 \\ \hline \\ 7 \\ \hline \\ \\ 7 \\ \hline \\ \\ 9 \\ 1 \\ \hline \\ 1 \\ 1 \\ \hline \\ 1 \\ 1 \\ \hline \\ 1 \\ 1$	$\begin{array}{c} +3.3V & VCC \\ \hline 7 & -5 & -16 \\ \hline 9 & -7 & 5 \\ \hline 9 & -7 & -7 & -16 \\ \hline 9 & -7 & 2 & -16 \\ \hline 9 & -7 & 2 & -1 \\ \hline 10 & -7 & 2 & -1 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -1 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 11 & -7 & -7 & -7 & -7 \\ \hline 12 & -7 & -7 & -7$	$\begin{array}{c} +3.3V & VCC \\ \hline 7^{-} 5 & 4^{-} 16 \\ \hline 8^{+} 6 & 3^{-} 15 \\ \hline 9^{+} 7 & 2^{-} 14 \\ \hline 10^{+} 7 & 2^{+} 14 \\ \hline 10^{+} 12 \\ \hline 10^{+} 12 \\ \hline 10^{+} 12 \\ \hline 10^{+} 12 \\ \hline 10^{+} 16 \\ \hline 10^{+} 10^{+} 16 \\ \hline 10^{+} 10$
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	8 1	7	6	5	т 4	3

MS-5.1 Master Panel Switch Card Schematic - Sheet 2 of 6

	8	7	6	5	Ŷ	4	3		2	1	1
Н	A LED_E12_A										Н
							U5 CCLK PWRDWN 26				
						+33V +33V	24 M0 HDC, VO 28 22 M1 LDC, VO 30	INIT (
	DS455 DS454					+3.3V +3.3V	4 TDI,VO GCK6,DOUT,VO 73 6 TMS,VO 5 50 50	DONE			
G						SS2_CK					G
	DS452					DINOUT_1	2 72 DO DIN V/O CC1, V/O 99				
						BR0 GND FSIN 2 GND	R171_100K_70_D1/I/O_GCK1/I/O_2 68 D2/I/O_GCK1/I/O_2 R166_100K_61				_
	DS419 DS396					BRI SS2_D SS2_SY SS2_SP	D4,I/O PAD104,I/O 57 D5,I/O PAD107,I/O 55 D6,I/O PAD101,I/O 53 D7,I/O PAD113,I/O				
							R91 33 78 PAD2,I/O PAD132,I/O 29 33 R1 R83 33 81 PAD11,I/O PAD132,I/O 31 33 R1 R83 63 82 PAD11,I/O PAD134,I/O 32 33 R1				
F	DS362		DS155 LED_E11151	DS189 DS171			Ref 7 33 83 PAD17, I/O PAD144, I/O 33 33 R10 R100, 33 84 PAD20, I/O PAD147, I/O PAD144, I/O 34 33 81 R101, 33 85 PAD23, I/O PAD150, I/O 35 35 81 R104, 33 86 PAD23, I/O PAD150, I/O 39 33 81	LED_EZI41 LED_EZI51 EED_EZI61 LED_EZI61			F
							R105 33 87 PAD28,I/O PAD156,I/O 40 33,115 R108 33 90 PAD29,I/O PAD159,I/O 41 33, R15 R109 33 91 PAD32,I/O PAD165,I/O 42 33, R15 R109 33 91 PAD32,I/O PAD165,I/O 42 33, R15				
							R110,33 92 PAD38,I/O PAD168,I/O 43 SUC I R111,33 93 PAD41/I/O PAD171,I/O 44 33 R1 I R112,33 94 PAD41/I/O PAD171,I/O 45 33 R1 R112,33 94 PAD44,I/O PAD174,I/O 45 33 R1 R113,33 95 PAD42,I/O PAD174,I/O 46 33 R1				_
							R114 33 96 PAD50,//O PAD50,//O PAD190,//O 47 33 R16 R115 33 97 PAD53,//O PAD195,//O PAD195,//O 56 33 R16 R116 33 98 PAD56,//O PAD201,//O 58 33 R16 R119 33 3 PAD56,//O PAD201,//O 59 33 R16	LED_EZ(15) 2 LED_EZ(16) 3 LED_EZ(17) 4 LED_EZ(17)			
F							R120_33 7 PAD65_I/O PAD204_I/O 60 33 R16 R120_33 7 PAD77_I/O PAD207_I/O 60 33 R16 R120_33 7 PAD83_I/O PAD213_I/O 62 32 R16 R126_33 9 PAD83_I/O PAD213_I/O 66 33 R16 R126_33 9 PAD86_I/O PAD213_I/O 66 33 R16	LED_EZIZIO IED_EZIZI LED_EZIZI			F
							R12(X) 10 PAD89,I/O PAD222,I/O 67 33 R13 I R130 33 13 PAD92,I/O PAD231,I/O 69 33 R13 I R131 31 4 PAD92,I/O PAD231,I/O 71 33 R13 I R131 31 4 PAD95,I/O PAD237,I/O 71 33 R13	J LED_E2/221 D LED_E2/1231 2 LED_E2/1241			
	DS377						XCS05				
⊸	۵	В	C	D							4–
D							+3.3V +3.3V +3.3V +3.3V R139 R138 R135 R134	+3.3V			D
	DS400							+3.3V			
						LED_E12_P		+3.3V			
	DS421						FDN340P	LED_E12_B			
C							Q12 FDN340P				C
	DS379							15 R21			
											_
	DS352										
В	DS310 DS311 DS311			DS164							В
			DS322 LED_EZII91								
	DS313 DS314	DS318 LED_EZIZOT	DS323 DS324								-
									CONTRACT NO. - SA UR US - Sergey Averin -	MS-5	5.1
A	DS332 DS353		DS336 DS357 DS357						APPROVALS DATE DRAWN SA 4-20-07	Wheatstone 600 Industria	Corporation A
									CHECKED SA ISSUED SA	New Bern, NC SIZE FSCM NO. DWG. NO.	84S0124
	8	7	6	5	f	4	3		W# 700711	SCALE MS-5.1B PCB	SHEET 3 OF 6

MS-5.1 Master Panel Switch Card Schematic - Sheet 3 of 6

	8	7	6		5 L	4	3	2	1
	А	В	С		D				
Η									Н
						<u>ZI</u>			
							U3		
							CCLK 74 CCLK PWRDWN 26 PRUGRAM 52 PROGRAM 36	INIT	_
			DS129			51	+3.3V 24 M0 HDC,VO 30		
							+3.3V 4 +3.3V 6 TMS.IO	DINOUT_23	
G						$\xrightarrow{\pi}$	5 TCK,VO DONE 50		G
							SS2_CK		
							48 GCK4,I/O DINOUT_12 72 DD DIN VO GCK8,I/O 99		
					DS55	В	RO <u>GND R143 1.00K 70</u> D1/0 GCK1.00 2 FSOUT_2 66 D2,VO GCK1.00 15		
						тороди и ви 21 стороди и ви	RI CIND R136 1.00K 61 SS2_D 57 D5,VO PAD104,VO 17 D5,VO PAD104,VO 17	LED_E34_C LED_E34_B	
	DS411 LED_E3[13]		LE3[13]		DS48 LED_E		SS2_SP 53 D6,I/O PAD110,I/O 18 PAD110,I/O PAD110,I/O 19 19 19 PAD116,I/O 20 20 20 20	GND +3.3V	
							LED_E3III R31,33 76 PAD2,I/O PAD132,I/O 29 33,782 LED_E3IZI R33,33 81 PAD11,I/O PAD138,I/O 31 33,784 LED_E3IZI R33,33 82 PAD11,I/O PAD14,I/O PAD18,I/O 32 33,784		
F						<u>51</u> —	LED_E3I41 R3433 B3 LED_E3I51 R3533 B4 PAD144,00 PAD144,00 33 33 R89 PAD144,00 PAD144,00 33 33 R89 PAD142,00 PAD144,00 PAD144,00 34 33 R89 PAD140,00 PAD144,00 PAD144,0		F
						51	LED_E3(6) CSULD PAD23,IO PAD150,IO 36 33 37 LED_E3(8) Re6,33 87 PAD29,IO PAD156,IO 40 33 166		
			LE3(17)				LED_E3I37 R46_33 90 PAD32,I/O PAD162,I/O 41 33,R107 LED_E3I101 R5133 91 PAD33,I/O PAD162,I/O 41 33,R107 LED_E3I101 R5133 91 PAD35,I/O PAD162,I/O 42 33,R177 LED_E3I01 R5133 92 PAD35,I/O PAD165,I/O 43 33,R177		
				LED_E 3(18)			LED_E3127 R5V33 93 LED_E3137 R5V33 93 PAD4171,1/0 PAD171,1/0 PAD44,1/0 PAD174,1/0 PAD44,1/0 PAD174,1/0 PAD45,0/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD174,1/0 PAD45,0/0 PAD4		_
						<u>, 11</u>	LED_E31241 084/04 96 LED_E31251 R64/33 96 PAD53/00 PAD180/00 47 33 R12 LED_E31251 R64/33 97 PAD53/00 PAD180/00 56 33 R128		
			E31201				LED_E31277 R69.33 98 LED_E31287 R73.33 3 LED_E31287 R73.33 7 PAD65,I/O PAD201,I/O 59 33 R122 PAD65,I/O PAD204,I/O 59 33 R122 PAD65,I/O PAD204,I/O 69 33 R132 PAD65,I/O PAD204,I/O 69 33 R132		
E							LED_E3IZ01 R7033 8 PAD83/O PAD213/O 62 33 R137 LED_E3IZ01 R8033 9 PAD86/O PAD213/O 66 33 R140		F
			E31221				LED_E3I221 R84.33 13 LED_E3I2741 R84.33 14 LED_E3I2741 R84.33 14 PAD92.I/O PAD92.I/O PAD221.I/O R83.3144 PAD95.I/O PAD231.I/O R84.33 144 PAD95.I/O PAD231.I/O R84.34 144 PAD95.I/O PAD231.I/O R8		
			E31231 DS107.				XCS05		
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							+33V +33V +33V		
D			DS125				F0 F34 D 10.0K 10.0K 10.0K 10.0K	+3.3V	D
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						<u>51</u>		+3.3V	
								LED_E34_C	_
						\overline{n}		+3.3V	
							FDN340P	LED_E34_B	
C								+3.3V	С
								LED_E34_A	
							$\begin{array}{c} 1.00k \\ \pm \\ \pm \\ 6ND \\ 6$	< ↓1.00K GND	
	DS415 LED_E4[13]								
						51	FSOUT_2 C35 0.01uF D53 \$S14		
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						<u>n</u>	FSIN_2		
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	DS375.							- SA UF	US-Sergey Averin - IVID-J. I ROVALS DATE SIMULA // L.L. C.L.
A			E4/23/					DRAWN	SA 4-20-07 SA 4-20-07 600 Industrial Drive
						***		CHECK	ED SA New Bern, NC 28562 SA SIZE FSCM NO. DWG. NO. 0450105 REV
								W# 1	E 8450125 A 700711 SCALE MS-5.1B PCB SHEET _ 4 OF 6
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MS-5.1 Master Panel Switch Card Schematic - Sheet 4 of 6

MS-5.1 Master Panel Switch Card Schematic - Sheet 5 of 6

MS-5.1 Master Panel Switch Card Schematic - Sheet 6 of 6

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D	$\begin{bmatrix} BWG, NO, \\ A \end{bmatrix} = \begin{bmatrix} 84S0127 \\ A \end{bmatrix}$	
SCALE	MS-5.1B PCB SHEET 6 OF 6	
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MFS-5.1 4 Master Fader Panel Switch Card Schematic - Sheet 1 of 3

MFS-5.1 4 Master Fader Panel Switch Card Schematic - Sheet 2 of 3

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CONTRACT NO. - Sergey Averin -		MFS-5.1							
APPROVALS	DATE		Wheat stone Corporation						
DRAWN SA	1-26-04	Sev.	600 Industrial Drive						
CHECKED	SA		Ñ	ew Bern, NG	28	562			
ISSUED	SA	size fscm D	SIZE FSCM NO. DWG. NO. 84S0104				R	EV A	
W# 700712		SCALE MFS-5.1A PCB SHEET 2 OF					2 OF 3		
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MFS-5.1 4 Master Fader Panel Switch Card Schematic - Sheet 3 of 3

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21+	SSZ_SY	
22 <u> </u>		
23	SS2_SP >	
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(25)++	SS3_CK	
		4
	SS3_SY	
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Whent	stone Corporation	
	ndustrial Drive	
New	Bern, NC 28562	
CM NO. IDW	G. NO.	
	84S0105 A	
MFS	S-5.1A PCB SHEET 3 OF 3	

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DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 1 of 6

T 150uF T 150uF GND GND	1500 GND	F	T 150u GND	F	G	150uF ND					
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APPROVALS	DATE		M/heat stone Corporation								
DRAWN SA	3-17-02		600 Industrial Drive								
CHECKED	SA			Ν	le	w Bern,	NC 28	562			
ISSUED	SA	size D	FSCM	NO.		DWG.NO.	845	0116		REV	
W# 700713		SCAL	E			DS-5.1 PCB		SHEET	1 01	° 6	
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DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 2 of 6

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DSPL_RS	\bigcirc							
DSPL_DIN	\bigcirc							
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	GND GND	GND	GND	GND	GND	GND		
		vcc	vcc ↑	vcc 个		VCC 个		
C42		. C9	C33		C39			
V.10F								
		uno	UND	unu	UND	UND		
		vcc 1	vcc 1	vcc 1				
C37 150uF	+ C17+ 	C34	150uF	C31 150uF				
		⊥ GŇD		⊥ GND				
	CONTRACT NO.			Т)S-5	1		А
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	DRAWN	SA 3-17-00	≝V	Vheat	rtone (orpora	tion	
	CHECKED	SA		600 In New E	idustria Bern, NC	1 Drive 28562		
	ISSUED	SA	SIZE FSCM	vo. DWG	. NO.	3450117	REV	
	W# 700713		D SCALE	DS-	-5.1 PCB	SHEET	2 OF 6	
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	65212 65711 55710 55700 57	LED_EZIS LED_EZIS	0529 EED_E2/05 0528 EED_E2/05 05217 EED_E2/05 0525 EED_E2/07 0526 D* 0527 EED_E2/07 0528 EED_E2/07 0529 EED_E2/07 0520 D* 05215 EED_E2/07 05206 D* 05207 EED_E2/07 05206 EED_E2/07 05207 EED_E2/07	05226 LED_EZIST 05225 CED_EZIST 05226 CED_EZIST 05223 CED_EZIST 05224 CED_EZIST 05223 CED_EZIST 05224 CED_EZIST 05225 CED_EZIST 05226 CED_EZIST 05227 CED_EZIST 05238 CED_EZIST 05239 CED_EZIST 05239 CED_EZIST 05239 CED_EZIST 05239 CED_EZIST 05139 CED_EZIST 05139 CED_EZIST	05233 EED_E2(5) 0523 EED_E2(6) 0523 EED_E2(7) 0523 EED_E2(7) 0523 EED_E2(7) 05230 EED_E2(7) 05230 EED_E2(7) 05230 EED_E2(7) 05230 EED_E2(7) 05230 EED_E2(7) 05230 EED_E2(12) 05230 EED_E2(12) 05305 EED_E2(12) 05305 EED_E2(12) 05305 EED_E2(12)	IEU_EIZ.Z +33V IEU_EIZ.A IEU_EIZ.A		
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DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 3 of 6

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н		A DS128									
	LED_E34_A										
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	-						+3.3V +3.3V	24 M0 HDC,I/O 36 40 HDC,I/O 28 M1 UDC,I/O 30			
	-						+3.3V +3.3V	4 TDI,I/O GCK6,DOUT,I/O 73			
G							SS2.CK	27 GCK3,1/0 DONE 76			
	_							21 GCK2,1/0 48 GCK4,1/0			
	-	DS131 DS130				В	BR0	72 00,01№,1/0 01,1/0 68 02,1/0 02,1/0 02,1/0 02,1/0 02,1/0 02,1/0 02,1/0 04,1/0 0 99 2 0,01			
						I	BR1	65 D3,1/0 PAD98,1/0 15 61 D4,1/0 PAD104,1/0 16 57 D5,1/0 PAD104,1/0 17			
							SSZ_SP	55 D6,I/O PAD110,I/O 18 53 D7,I/O PAD113,I/O 19 78 PAD116,I/O 20			
	-							81 PAD112//0 PAD132//0 27 37 81 37 8 37 3	100 LED_E4[2] 29 LED_E4[3] 25 LED_E4[4]		
Г	-							PAD1/,// PAD14,//	24 LED_E4I51 22 LED_E4I61 21 LED_E4I71		
								87 PA029,1/0 PA0159,1/0 40 37 90 PA032,1/0 PA0162,1/0 41 39 91 PA035,1/0 PA0165,1/0 42 39	90 LED_E4(8) 89 LED_E4(9) 88 LED_E4(10)		
_	_							92 PAD38,I/O PAD168,I/O 43 33 R 93 PAD44,1/O PAD171,I/O 44 33 R 94 PAD44,1/O PAD171,I/O 44 33 R 94 PAD44,1/O PAD174,I/O 45 33 R	87 LED_E4(11) 86 LED_E4(12) 85 LED_E4(13) 89 LED_E4(13)		
		DS109 LED_E4[19]						95 PADI 7,1/0 PADI 77,1/0 46 37 96 PAD50,1/0 PAD180,1/0 56 33 R 97 PAD53,1/0 PAD195,1/0 56 33 R	22 LED_E4[14] 82 LED_E4[15] 78 LED_E4[16] 17 IFIL F4[17]		
								3 PAD56,1/O PAD201,1/O 59 33 R 7 PAD65,1/O PAD204,1/O 59 33 R 7 PAD77,1/O PAD207,1/O 60 33 R 8 PAD72,1/O PAD202,1/O 62 33 R	11 LED_E41181 10 LED_E41191 65 LED_E41201		
E								PAU83//U PAU213//U PAU213//U 63 PA 9 PA086,I/O PA0219,I/O 66 39 PA 10 PA089,I/O PA0222,I/O 67 39 PA 13 PA0921/O PA0221,I/O 69 39 PA	64 <u>LED_E4(21)</u> 63 <u>LED_E4(22)</u> 62 <u>LED_E4(23)</u>		
								14 PAD95,1/0 PAD237,1/0 71 33 R XCS05XL	59 LED_E4(24)		
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DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 4 of 6





DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 5 of 6

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				SW_9_X SW_8_X	
				<u>SW-5-X</u>	С
				SW-1_X SW-0_X	ł
					В
				SW_Y_6 SW_Y_6 SW_Y_5 SW_Y_3 SW_Y_2 SW_Y_2 SW_Y_1 SW_Y_0	
	CONTRACT NO. - Sergey Averin - APPROVALS DAT		DS-	5.1	A
	DRAWN SA 3-17- CHECKED SA ISSUED SA W# 700713 2	02 60 SIZE FSCM NO. D SCALE	O Industrial Dr W Bern, NC 285 DWG. NO. BS-5.1 PCB	IVICUUN ive 62 1120 SHEET 5 OF 6	



DS-5.1 Dynamic Panel Switch Card Schematic - Sheet 6 of 6

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CONTRACT NO.			DS-5 1								
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DRAWN SA	3-17-02		⊴a v	6	00) Industr	ial D	rive		I	
CHECKED	SA		New Bern, NC 28562								
ISSUED	SA	size D	FSCM	N0.		DWG.NO.	8 4S	0121		REV	l
W# 700713		SCAL	E			DS-5.1 PCB		SHEET	6 01	76	
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DCM-5.1 Dynamics Fader Panel Switch Card Schematic - Sheet 1 of 3

CONTRACT NO. - Sergey Averin -		DCM-5.1						А			
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DRAWN SA	3-8-02		Seven and the corporation						1		
CHECKED	SA	1	New Bern, NC 28562								
ISSUED	SA	size D	FSCM	N0.		DWG.NO.	8 4S	0106		REV	
W# 700714		SCAL	E			DCM-5.1 PCB		SHEET	1 01	F 3	
2	2							1			



DCM-5.1 Dynamics Fader Panel Switch Card Schematic - Sheet 2 of 3

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atstone Corporation						
600 Industrial Drive						
New Bern, NC 28562						
DWG. NO. 84S0107						
DCM-5.1 PCB SHEET 2 OF 3						

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DCM-5.1 Dynamics Fader Panel Switch Card Schematic - Sheet 3 of 3

FDR_25REF									
CONTRACT NO.			DCM-5.1						
- Sergey Averin -		DCM J.I							
APPROVALS	DATE	\∧	/he	ot ctope Co	rporol	ion			
DRAWN SA	3-8-02	30	600) Industrial I)rive				
CHECKED	SA		Ne	w Bern, NC 28	3562				
ISSUED	SA	SIZE FSCM N D	10.	DWG. NO. 845	S0108	REV			
W# 700714		SCALE		DCM-5.1 PCB	SHEET	3 OF 3			
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DCM-5.1 Dynamics Fader Panel Switch Card Load Sheet



HC-5.1 Host Controller Module Schematic - Sheet 1 of 6



HC-5.1 Host Controller Card Schematic - Sheet 2 of 6



HC-5.1 Host Controller Module Schematic - Sheet 3 of 6



HC-5.1 Host Controller Card Schematic - Sheet 4 of 6



HC-5.1 Host Controller Card Schematic - Sheet 5 of 6



HC-5.1 Host Controller Card Schematic - Sheet 6 of 6

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PROGRAM CCLK DONE VGA_TDI VGA_TDI VGA_TDO VGA_TCK		POWERGOOD 1140 WBAT	Image: state	D
T_FSYNC NTRLB[0] NTRLB[1] NTRLB[3] NTRLB[3] NTRLB[1] A2A71[3] _A2A71[3] _A2A71[3] _A2A71[0]		G_FDD_DCHNG G_FDD_SIDE G_FDD_RD G_FDD_RD G_FDD_WP G_FDD_WQ G_FDD_WQ G_FDD_WQ G_FDD_WQ G_FDD_WQ G_FDD_DR G_FDD_DR G_FDD_DR G_FDD_DR (12 G_FDD_DR (12 G_FDD_DR (12 G_FDD_DR (12 G_FDD_DR (12 G_FDD_DR) (12 G_FDD_DR (12 G_FDD_DR) (1	CT24 GND 33 GND 31 GND 29 GND 29 GND 21 GND 22 GND 23 GND 23 GND 23 GND 23 GND 13 GND 13 GND 9 GND 11 GND 9 GND 1 GND 3 GND 1 GND 5 GND 6 GND 7 GND 6 GND 7 GND 6 GND 7 GND 7 GND 6 GND 7 GND	C 🕈
		G_FDD_SIDE 26 G_FDD_RD 24 G_FDD_RD 24 G_FDD_RD 22 G_FDD_RD 20 G_FDD_WG 18 G_FDD_WD 16 G_FDD_IR 12 G_FDD_IR 12 G_FD	CT21 GND 25 GND 23 GND 23 GND 19 GND 19 GND 11 GND_PIN_13 13 G.FDD_PIN_13 11 G.FDD_PIN_17 5 VCC 3 VCC 1 VCC 5 VCC 6 VCC 7 VCC 6 VCC 7 VCC	в
+3.3V 	VGA (G) PC- CONTRACT NO. - SA UR US - Sergey Averin -	<u>VCC</u> GND GND FDD_VGA+12V 104	C-5.1	A
+2.5V C180 0.01uF GND	APPROVALSDATEDRAWNSA8-14-07CHECKEDSAISSUEDSAW# 7007182	Wheat sta 600 Inc New Be SIZE FSCM NO. DWG. I D SCALE HC-5.10	one Corporation dustrial Drive rn, NC 28562 NO. 84S0138 REV C PCB SHEET 6 OF 6	





MG-5.1 4 Main Gate (IQ) Card Schematic - Sheet 1 of 2

page 7	-	58
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CONTRACT NO. - Sergey Averin -				MG-5	5.1			
APPROVALS	DATE	M/heat stone Corporation						
DRAWN SA	7-20-04	600 Industrial Drive						
CHECKED	SA		Ν	ew Bern, NO	C 285	562		
ISSUED	SA	size D	FSCM NO.	DWG.NO.	84S(0091	R	EV C
W# 700717		SCAL	E	MG-5.1C PCB		SHEET	1 OF 2	<u> </u>
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MG-5.1 4 Main Gate (IQ) Card Schematic - Sheet 2 of 2

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CONTRACT NO.					M	G-?	5.1				A
- Sergey Averin - APPROVALS	DATE	3	<u>)/@</u>	Vhe	ot d	<u></u>	Corr	oro	tior		
DRAWN SA	7-20-04			60	0 Ind	ustri	al Dr	ive		'	
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MG-5.1 Main Gate Card Load Sheet



BP-5.1 Back Plane Card Schematic - Sheet 1 of 1

		5	AGND	
BPR-5.1	I PCB			
CII0 1 2 3 0_FSYNCI2 3 0_FSYNCI3 3 0_FSYNCI0 3 0_FSYNCI3			LCLK	F
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			LB0.1077	(
	CONTRACT NO. - Sergey Averin - APPROVALS DATE	BP-	5.1	

 CONTRACT NO.
 BP-5.1

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BPR-5.1 Back Plane Repeater Card Schematic - Sheet 1 of 1

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- Sergey Averin APPROVALS

W# 700716

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BPR-5.1 Back Plane Repeater Card Load Sheet



LVU-5.1 LED VU Card Schematic - Sheet 1 of 9

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CONTRACT NO.		LVU-5.1								А	
APPROVALS	DATE		M/heat stope Corporation								
DRAWN SA	9-16-03		600 Industrial Drive								
CHECKED	SA			Ν	le	w Bern, 1	NC 28	562			
ISSUED	SA	size D	FSCM	NO.		DWG.NO.	845	0130		REV	
W# 700719		SCAL	E			LVU-5.1 PCB		SHEET	1 01	r 9	
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		U5		
CCLK 74	CCL K		26	
PROGRAM 52		FWRDWIN		
	FROUMAIN		36	INIT
GND 24	MO		28	33 R279 LED_07(39)
+3.3V 22			30	33 R281 LED_07[41]
	7""	LDC,17 0		
SSZ_SY 4	TDU/O		73	DINOUT_12
SSZ_SP 6		00001,170		
LED_07[25] R265 33 5		DONE	50	DONE
		DUNE		
SS2_D 27	661/21/0	TROO	76	
SSZ_CK 54		100,0		
LED_07[38] R278 33 21	GLK5,1/U		80	
LED_07[56] R296 33 48	GLK2,1/U	LS1,1/U		
	- GLK4,1/U		79	33 R245 LED_07(5)
DINOUT 01 72		GLK7,1/0	99	33 R262 [F[] 07[22]
LED 07[2] R242 33 70	00,DIN,1/0	GCK8,1/0	2	33 R263 [ED 07[23]
	101,1/0	GCK1,1/0		
ESIN 65	D2,1/0		15	33 R272 FD 07(32)
FD 07/641 8304 33 61	- D3,1/0	PAD98,I/0	16	33 R273 [FD 07[33]
LED 07(601 B300 33 57	D4,I/0	PAD104,I/O	17	33 BZ74 LED 07/341
LED 07(58) B298 33 55	D5,I/O	PAD107,I/O	18	33 BZ75 LED 07(35)
LED_07(50) (200 33 53	D6,I/O	PAD110,I/O	10	33 8276 LED 07/361
	D7,1/0	PAD113,I/O	20	33 8277 LED 07(37)
ED_07(/1		PAD116,I/O	20	33 8280 LED 07/201
	PAD2,I/O	PAD132,I/O	27	33 8787 LED_07/(40)
	PAD11,1/0	PAD138,I/O	22	33 8283 LED_07/(42)
	PAD14,I/O	PAD141,I/O	22	33 8284 LED_07//41
	PAD17,I/0	PAD144,I/O	33	33 P285 LED_07/751
	PAD20,1/0	PAD147,I/O	34	33 P286 LED_07/743
	PAD23,1/0	PAD150,I/O	20	33 B287 LED_07/(48)
	PAD26,1/0	PAD156,I/O	39	33 0788 150 07/291
	PAD29,1/0	PAD159,I/O	40	
	PAD32,1/0	PAD162,I/O	41	
	PAD35,1/0	PAD165,I/O	42	33 8291 LED 07(51)
	PAD38,1/0	PAD168,I/O	43	33 8292 LED 07(52)
	PAD41,I/0	PAD171,I/O	44	33 B293 LED 07(53)
	PAD44,I/O	PAD174,I/O	43	
	PAD47,I/0	PAD177,I/0	46	
	PAD50,I/O	PAD180,I/O	4/	
	PAD53,I/0	PAD195,I/O	56	33 HZ77 LEU_07(59)
	PAD56,I/O	PAD201,I/O	58	33 P342 LEU_0/(61)
	PAD65,I/0	PAD204,I/O	59	33 P303 LED_V/I621
	PAD77,I/0	PAD207,I/O	60	
	PAD83,1/0	PAD213,I/0	62	23 P238 ED A7(4)
	PAD86,1/0	PAD219,I/O	66	
	PAD89,1/0	PAD222,I/0	67	100K P2/1 GND BR0
LED_07(30) R270 33 13	PAD92,1/0	PAD231,I/O	69	BR1
LEU_0/[31] H2/1 33 14	PAD95,1/0	PAD237,I/0	71	
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		t			LED_03	1		LED_07(33)		+		
				45 LED_07(34)		DS286					DS388	
				<u> <u> <u> </u> /u></u>							DS389	
D		DS214 LED_07(3		LED_07(36)		DS288					DS390	
		DS215 LED_07[2				DS289				DS358 LED_07[4]	DS391	
											DS392	
						DS291 LED_07(6)		LED_07(39)			DS393	LED_07(39)
							DS325	LED_07(40)			DS394	LED_07[40]
		DS219 LED_07(6		52 LED_07[41]		DS293	DS326	LED_07[41]			DS395	LED_07[41]
		DS220				DS294					DS396	
		DS221									DS397	
											DS 398	
											DS399	
		DS224		57							DS400	
С		DS225		LED_07[46]		LED_07(13)						
		D2220 - LED_07(15						LED_07(48)				
				⁵² LED_07(51)								
->						DS304 EED_07(19)					DS406	
		DS231 LED_07(20						LED_07(53)				LED_07(53)
		DS232 LED_07(21						LED_07(54)				
				LED_07(55)							DS409	LED_07(55)
		DS234		57		DS308 LED_07(23)		LED_07(56)			DS410	
		DS235				DS309 LED_07(24)					DS411	
В				59 <u>LED_07(58)</u>				LED_07(58)			DS412	LED_07(58)
		DS237		TO LED_07(59)		DS311 LED_07(26)				DS380	DS413	LED_07(59)
		DS238		LED_07(60)				LED_07[60]			DS414	LED_07[60]
		DS239 LED_07[28		⁷² <u>EED_07(61)</u>		DS313 LED_07(28)				DS382	DS415	
		DS240				DS314 LED_07(29)		LED_07(62)		DS383	DS416	LED_07(62)
_		DS241				DS315					DS417	
		DS242 LED_07(3)				DS316 LED_07(31)				DS385	DS418	
		DS243				DS317 LED_07(32)		LED_07(65)			DS419	LED_07(65)
		Ч				-Ч с	_//				Ч	
	+3.3V	•	DSZ	1.00K R20	+3.3V		DS285	1.00K R28	+3.3V		DS354	1.00K R33
		DS281 1.00K R24	DSZ	78 1.00K R21			DS351	1.00K R30			DS420	1.00K R34
А		DS282 1.00K R25		79 1.00K R22			DS352	1.00K R31			DS421	1.00K R35
		DS283 1.00K B76		30 1.00K B23			DS353	1.00K R32			DS422	1.00K B36
		DS284 100K B27									<u> </u>	
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			TO									
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LVU-5.1 LED VU Card Schematic - Sheet 2 of 9





LVU-5.1 LED VU Card Schematic - Sheet 3 of 9

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CONTRACT NO. - Sergey Averin -		LVU-5.1									
APPROVALS	DATE	Wheat stone Corporation									
DRAWN SA	9-16-03	600 Industrial Drive									
CHECKED	SA	New Bern, NC 28562									
ISSUED	SA	SIZE FSCM NO. DWG. NO. 84S0132									
W# 700719		SCALE LVU-5.1 PCB SHEET 3 OF 9									
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LVU-5.1 LED VU Card Schematic - Sheet 4 of 9

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	page 7 - 68	

CONTRACT N - Serg		LVU-5.1							А			
APPRO	OVALS	DATE		Wheat stone Corporation								
DRAWN	SA	9-16-03		600 Industrial Drive New Bern, NC 28562								
CHECKED		SA										
ISSUED		SA	size D	FSCM	N0.		DWG.NO.	845	50133		REV	
W# 70	0719		SCALE LVU-5.1 PCB SHEET 4 OF S					F 9				
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	LED_10	•	DS6		LED_11	•	DS951		LED_11	•	DS1020	
		DS846 LED_8F[1				DS919 LED_8F(1)	DS952				DS1021	
											DS1022	
D				381 J ~ LED_8F(36)								LED_8F(36)
		DS849 LED_8F[4		382 LED_8F(37)			DS955			DS991 LED_8F[4]	DS1024	LED_8F(37)
							DS956				DS1025	LED_8F(38)
				1 184 1/2 LED_8F(39)						DS993 LED_8F(6)	DS1026	LED_8F(39)
		DS852 DS852 LED_8F(7)					DS958			DS994	DS1027	
		DS853									DS1028	
				387							DS1029	
											DS1030	
											DS1031	
		DS857		390							DS1032	
		DS858		291				LED_8F(45)				8F[45]
С		DS859		197				LED_8F[46]				
								LED_8F[48]				
				¹⁹⁴ ≁ <u>LED_8F[49]</u> ←				LED_8F[49]				
				₩ <u>LED_8F(50)</u>								
				³⁹⁶ <u>LED_8F(51)</u> ←								
⊸⊳				*** LED_8F(52)								
		DS865 LED_8F(20		³⁹⁸ → LED_8F(53)		DS938 LED_8F[20]		LED_8F(53)				
				399 							DS1041	
		DS867 LED_8F(22		₩ LED_8F(55)								LED_8F(55)
				201 EED_8F(56)				LED_8F1561				
				202 							DS1044	
В				203							DS1045	
		DS871		₩4 LED_8F(59)							DS1046	LED_8F(59)
		DS872 LED_8F(27		LED_8F[60]				LED_8F[60]			DS1047	LED_8F(60)
											DS1048	
		DS874 LED_8F(29				DS947 LED_8F[29]					DS1049	
_		DS875				DS948 LED_8F(30)					DS1050	
		DS876				DS949 LED_8F(31)					DS1051	
		DS877 LED_8F(32				DS950 LED_8F(32)	DS983	LED_8F(65)		DS1019 LED_8F(32)	DS1052	
				1		й с	_ 4			И		
	<u>+3.3</u> V	•	DS8	1.00K R73	+3.3V		DS918	1.00K R82	+3.3V		DS987	1.00K R87
		DS914 1.00K R78	DSS	911 1.00K R75			DS984	1.00K R84			DS1053	1.00K R88
A		DS915 1.00K R79		212 1.00K R76			DS985	1.00K R85			DS1054	1.00K R89
		DS916 1.00K R80		213 1.00K R77			DS986	1.00K R86			DS1055	1.00K R90
		DS917 1.00K R81					N -					
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LVU-5.1 LED VU Card Schematic - Sheet 5 of 9

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page	7 -	69

CONTRACT NO. - Sergey Averin -		LVU-5.1								
APPROVALS	DATE	M/heat dane Corporation								
DRAWN SA	9-16-03	600 Industrial Drive								
CHECKED	SA	New Bern, NC 28562								
ISSUED	SA	SIZE FSCM NO. DWG. NO. 84S0134								
W# 700719		SCALE LVU-5.1 PCB SHEET 5 OF 9								
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\rightarrow	CCLK		74	ссік	PWRNWN	26	<u> </u>
\equiv	PROGRAM		52	PROGRAM			
					INIT.I/O	36	INIT
\rightarrow	+3.3V		Z4	MO	HDC 1/0	28	33 R194 LED_8F(39)
\equiv	+3.3V		22	M1		30	33 A196 LED_8F[41]
					EDC,I/ O		
	SS2_SY		4	TOULO		73	DINOUT_23
\prec	SS2_SP		6	TMSI/0	dci(0,0001,1/0		
\prec	LED_8F[25]	R180 33	5	TCK 1/0	DONE	50	DONE
				101,170	DONE		
	SS2_D		27	CCK3T/0	TDO 0	76	
=	SS2_CK		54		100,0		
=	LED_8F(38)	R193_33	21	GCK31/0	CC1 1/0	80	
=	LED_8F(56)	R211 33	48		LS1,1/U		_
				GCK4,1/U	CCKALIO	79	33 R160 LED_8F(5)
	DINOUT_12		72	DA DIVILIO	GEK 7,170	99	33 R177 LED_8F[22]
$ \rightarrow$	LED_8F[2]	R157 33	70	U0,UIN,I/U	GLK8,1/U	2	33 R178 LED_8F[23]
$ \rightarrow$	+3.3V		68	U1,I/U	GCK1,1/U	-	
$ \rightarrow$	FSIN		65	02,1/0		15	33 R187 ED_8F[32]
$ \rightarrow$	LED BEIGAT	R219 33	61	03,170	PAD98,1/0	16	33 R188 [FD 8F[33]
$ \rightarrow$	LED BEIGOT	R215 33	57	D4,I/O	PAD104,I/O	17	33 R189 FED 8FF341
$ \rightarrow$	LED 851581	R213 33	55	D5,I/O	PAD107,I/O	18	33 R190 LED 8F1351
$ \ge$	LED 8E[57]	R212 33	53	D6,I/O	PAD110,I/O	19	33 R191 LED 8F1361
	LEDIONUM			D7,I/O	PAD113,I/0	20	33 B192 LED 8F1371
	ED SEL	R159 33	79		PAD116,I/O	20	33 B195 LED BEIZOI
$ \ge$		R161 33	91	PAD2,I/O	PAD132,I/0	2/	33 8197 LED 8E1/21
		R167 33	01	PAD11,I/O	PAD138,I/O	22	33 8198 LED 8EI/ 31
		R163 33	02	PAD14,I/O	PAD141,I/O	32	33 8199 LED 8E1//1
		R164 33	0.0	PAD17,I/O	PAD144,I/O	33	33 8200 LED 8FI/51
		P165 33	04	PAD20,I/O	PAD147,I/O	34	33 8201 LED 8FI7.21
\supset		R166 33	00	PAD23,I/O	PAD150,I/O	20	33 8202 LED 8EI/71
\supset	LED_0(111)	R167 33	05	PAD26,I/O	PAD156,I/O	39	
		P148 33	0/	PAD29,I/0	PAD159,I/O	40	33 P204 LED 9EI/ 01
		D149 33	90	PAD32,I/O	PAD162,I/O	41	
>		D170 33	91	PAD35,I/0	PAD165,I/O	42	
>		D171 33	92	PAD38,I/0	PAD168,I/O	43	
\supset	LED_OF[16]		93	PAD41,I/0	PAD171,I/0	44	
\supset	LED_OFII/J	D172 33	94	PAD44,I/O	PAD174,I/O	45	
>			95	PAD47,I/O	PAD177,I/0	46	
$ \rightarrow $	LED_8F(19)	R1/4 33	96	PAD50,I/O	PAD180,I/O	47	33 R210 LED_8F(55)
$ \rightarrow $	LED_8F120J	R1/5 33	97	PAD53,I/O	PAD195,I/O	56	33 HZ14 LEU_8F(59)
	LED_8F(ZI)	R1/6 33	98	PAD56,I/O	PAD201,I/O	58	33 HZ16 LEU_8F(61)
$ \rightarrow $	LED_8F124J	R1/9 33	3	PAD65,I/0	PAD204,I/0	59	33 HZ1/ LEU_8F[62]
\equiv	LED_8F[26]	H181 33	7	PAD77,I/0	PAD207,I/0	60	33 HZ18 LED_8F[63]
\equiv	LED_8F[27]	R182 33	8	PAD83,1/0	PAD213,I/0	62	33 HZZ0 LED_8F[65]
\dashv	LED_8F(28)	н183 33	9	PAD86.1/0	PAD219.I/0	66	
\dashv	LED_8F[29]	R184 33	10	PAD89.1/0	PAD222.1/0	67	1.00K R155 GND BR0
\dashv	LED_8F[30]	R185 33	13	PAD92.1/0	PAD231.1/0	69	1.00K R156 GND BR1
\prec	LED_8F(31)	R186 33	14	PA095.1/0	PAD237.1/0	71	33 R158 LED_8F(3)
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	I FD 12			ED 13					
					DS1130				
		DS1057							
D									
			DS1096						
		DS1065	> LED_8F[42]		DS1139				
C									
0									
			> LED_8F(48)						
			>		DS1145 LED_8F(16)				
		LED_8F(18)							
_₽		DS1074 LED_8F[19]	> DS1107 LED_8F(52)						DS1251
		DS1075 LED_8F(20)			DS1149 LED_8F(20)				
		DS1076 LED_8F[21]			DS1150 LED_8F(21)				
		DS1077			DS1151 LED_8F(22)				
		DS1078 LED_8F(23)			DS1152 LED_8F[23]	DS1185			
		DS1079 LED_8F[24]			DS1153 LED_8F[24]				
В		DS1080							
		DS1082 LED_8F(27)	DS1115 LED_8F(60)						
		DS1083			DS1157 LED_8F[28]				
		DS1084 LED_8F(29)	DS1117 LED_8F(62)		DS1158 LED_8F[29]				
		DS1085			DS1159 LED_8F(30)				DS1262 LED_8F1631
		DS1086			DS1160 LED_8F(31)	DS1193 LED_8F(64)			DS1263 LED_8F[64]
		DS1087 LED_8F(32)							
					И	_ и		И	
	+3.3V		DS1121 1.00K R92			DS1129 1.00K R100	+3.3V		DS1198 1.00K R105
		DS1125 1.00K R96	DS1122 1.00K R93			DS1195 1.00K R102			DS1199 1.00K F106
А		DS1126 1.00K R97	DS1123 1.00K R94			DS1196 1.00K F103			DS1265 1.00K P107
		DS1127 1.00K R98	DS1124 1.00K R95			DS1197 1.00K R104			DS1266 1.00K P108
		DS1128 DS1128 DS1128 DS1128 DS1128							
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LVU-5.1 LED VU Card Schematic - Sheet 6 of 9



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		t			<u>LED_15</u>	1		DS1372		LED_15				
						DS1340		DS1373					DS1443	
Ľ		DS1269 LED_8FI		12 LED_8F(35)		DS1341		DS1374				8F[2]	DS1444	
D		DS1270 LED_8F(DS1342		DS1375	LED_8F(36)			8F(3)	DS1445	
						DS1343		DS1376				BFII ·	DS1446	
		DS1272 LED_8FI				DS1344	LED_8FI51	DS1377				8F[5] ·	DS1447	
									LED_8F(39)			8F[6] ·		
												8F[7]		
						DS1347						8F[8]	DS1450	
									LED_8F[42]			8F[9] · ·	051457	
						DS1 350							DS1453	
		DS1279		LED_8F[44]		DS1351		DS1384					DS1454	
		DS1280				DS1352		DS1385			DS1422		DS1455	
С						DS1353		DS1386			DS1423		DS1456	
		DS1282				DS1354		DS1387			DS1424		DS1457	
				16 LED_8F[49]		DS1355		DS1368					DS1458	
						DS1356		DS1389					DS1459	
				18 18 19 19 19		DS1357		DS1390					DS1460	
-7						DS1358		DS1391					DS1461	
		DS1287 LED_8F(2				DS1359		DS1392					DS1462	
						DS1360		DS1393					DS1463	
		DS1289 LED_8F(2		22 LED_8F(55)		DS1361		DS1394					DS1464	
		DS1290 LED_8FIZ				DS1362		DS1395	LED_8F(56)				DS1465	
		DS1291 LED_8F12				DS1363		DS1396	LED_8F(57)				DS1466	
В		DS1292 LED_8F[2				DS1364		DS1397	LED_8F(58)			F1251	DS1467	
		DS1293 LED_8F(Z				DS1365	LED_8F(26)	DS1398	LED_8F(59)			F126] ·	DS1468	LED_8F(59)
		DS1294 LED_8F(Z				DS1366		DS1399	LED_8F(60)			FI271	DS1469	
		DS1295 LED_8F(2				DS1367		DS1400				F1281	DS1470	
		DS1296 LED_8F(2					LED_8F(29)					F[29] ·		
_		DS1297 LED_8F(3					LED_8F(30)					F1301		
									LED_8F[64]			FI311 ~ ·	DS1475	
							LED_8F(32)		LED_8F(65)			F[32]	——————————————————————————————————————	
			DS176	67				DS1405					DS1409	
	+3.3V	DS1336		1.00K R109	+3.3V			DS1406	.00K R119	+3.3V			D\$1475	1.00K R123
А		DS1337		1.00K R111				DS1407	00K P121				D\$1476	1.00K P125
		DS1338 1.00K P116		35 1.00K R113				DS1408	00K R122			·	DS1477	1.00K B125
		DS1339 DS1339 DIG 1.00K R117											K	
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LVU-5.1 LED VU Card Schematic - Sheet 7 of 9

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APPROVALS	DATE	M/heat clone Corporation								
DRAWN SA	9-16-03	600 Industrial Drive								
CHECKED	SA	New Bern, NC 28562								
ISSUED	SA	SIZE FSCM NO. DWG. NO. 84S0136								
W# 700719		SCALE LVU-5.1 PCB SHEET 7 OF 9								
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	CD_16				DS1584 LED_8F[33]	C LED_17	1	
				S1553				
					CS1589			
				S1557	DS1590			
	DS1486		D					
_	DS1487		•					
	DS1488 LED_8F[10]		D					
	DS1489 DS1489 DI7 LED_8F[11]		ים					DS1664 LED_8F[44]
	DS1490 LED_8F[12]		D:				DS1632 LED_8F[12]	DS1665 LED_8F[45]
			D					
С	DS1492 LED_8F(14)		D					
	DS1493 LED_8F(15)		D					
	DS1494 LED_8F[16]		D	S1567 EED_8F[16]				
	DS1495 LED_8F[17]		D:					
	DS1496 LED_8F[18]			51569 CED_8F[18]				
⊸	DS1497 LED_8F[19]			S1570 LED_8F(19)				
	DS1498 LED_8F(20)			S1571 EED_8F(20)				
	DS1499 LED_8F(21)							
	DS1501 LED_8F(23)							
в	DS154 LED_8F[24]							DS1678
	DS1504_							DS1679
	D\$1505		20					
	DS1506		D					
	DS1507 DS1507 DIA LED_8F[29]		D:	S1580				
	DS1508 LED_8F(30)		D:				DS1650 LED_8F[30]	
	DS1509 LED_8F[31]		D					
	DS1510 LED_8F(32)		D				DS1652 LED_8F(32)	DS1685
				×1				
	+3.3V	DS1478 1.00K R127	-+3.3V		DS1551 1.00K R136			DS1620 1.00K R141
	DS1547 1.00K R132	DS1544 1.00K R129			DS1617 1.00K R138			DS1686, 1.00K R142
A	DS1548 1.00K R133	DS1545 1.00K R130			DS1618 1.00K R139			DS1687 1.00K R143
	DS1549 1.00K R134	DS1546 1.00K RI31			DS1619 1.00K R140			DS1688 1.00K R144
	DS1550 1.00K R135	 			GND			, GND
		GŇD						
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DRAWN SA	9-16-03	600 Industrial Drive						•			
CHECKED	SA		New Bern, NC 28562								
ISSUED	SA	size . D	FSCM	NO.		DWG.NO.	845	0137		REV	
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LVU-5.1 LED VU Card Schematic - Sheet 9 of 9

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APPROVALS	DATE		M/heat dans Corporation						
DRAWN SA	600 Industrial Drive								
CHECKED	SA	New Bern, NC 28562							
ISSUED	SA	SIZE FSCM D	NO.	DWG.NO.	84S0132		REV		
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PWI-5.1 Power Interface Card Schematic - Sheet 1 of 1



CONTRACT NO. - Sergey Averin -		PWI-5.1							А	
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APPENDIX

Appendices

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Options Text File

Introduction

There are a number of operational features on the D-5.1 surface that are controlled by the contents of the Options Text File (DTV_OPTS.TXT) that resides on the surface's flash drive. In order to configure these features it is necessary to modify this file.

Modifying The Options Text File

There are several steps involved in modifying the file:

1. Establish an FTP (File Transfer Protocol) session with the surface. This is best done using an FTP program with a graphical interface, such as FTP Surfer by Whisper Technology. You will set up an anonymous session using the following information:

Name: something useful, assuming you will save the setup Address: use the IP address of the surface User name: knockknock Password: whosthere

- 2. When the FTP session connects you will see a list of files and folders that are on the surface. One of those files is the Options Text file, named as specified above. Drag this file over to your PC's desktop so you can save a copy.
- 3. Make any required changes to the copy of the file on your desktop, according to the information in the following sections, then save the file and drag its icon back to the FTP window to send the modified file back to the surface.
- 4. Once the modified file is on the surface, wait a minute to be sure that the file has actually been written to the surface's flash memory. Then close the FTP session.
- 5. Reboot the surface for the changes to take effect.
- 6. If the surface has a backup CPU you should also save the same modified file to the backup CPU, which needs to be accessed by a separate FTP session using its IP address. You can wait to reboot the surface until you have sent the modified file to both surfaces; in this way you need only reboot the surface once.

A Simple Example From The File

As a simple example let's look at the MUTE_METHOD option. Scroll through the Options Text File (or look at the sample file listing at the end of this Appendix) until you see the following three lines of code:

```
// Syntax: MUTE_METHOD:?
// ? 0 (default) = ON button, 1 = ON AIR.
MUTE_METHOD:0
```

The first line describes the syntax for this option. It starts with two slashes, which are interpreted as the start of a comment line. Comment lines are made for **us** to read, and the surface CPU ignores them. This line shows that the syntax for the option is the keyword MUTE_METHOD followed by a colon (:) followed by some character, as represented by the '?' character.

The next line indicates that the '?' can be replaced by a '0' (a zero, not the letter O) if a muting channel being ON will trigger the mute, or a '1' if the muting channel must be both ON and assigned to a main bus (thus making it ON AIR) before it will trigger the mute. This specific example shows that the default setting is '0' for this option. Please note that this may or may not be the case for your particular surface, as the default option is subject to change. The **idea** of how to use the file remains true.

The third line is not a comment; this is the line the surface CPU actually reads from the file. This line, as shown, sets the muting method to ON (channel must be ON to activate a mute, but need not be ON AIR). If this is not the desired operation, this line must be edited. Change the '0' to a '1' and the muting method will change so that a channel is required to be ON AIR before it will activate a mute. As indicated in the instructions above for modifying the file, the actual change to operation will not happen until the surface has been rebooted and has read the modified file.

The edited line must follow the established syntax precisely or the surface may not behave as expected.

A Second Example

As a second example, lets look at something a little more involved. Once again, scroll through the Options Text File to find the following code (please note that some surfaces may have a different number of code lines in this section; the following is just for the purposes of example):

```
// Syntax: SPARE#:?
// # is the spare button number (1 - 12)
// ? is the mode (default = 2)...
11
    0 = None, Button presses are ignored, LED controlled by DIO
    1 = Toggle, Button state toggles on each press, LED controlled by Surface
11
11
    2 = Momentary, Button is active when held down, LED controlled by Surface
    3 = Momentary, Button is active when held down, LED controlled by DIO
11
11
    4 = Automation, Button & LED are controlled by automation interface
11
     5 = Preset Select, Button selects pre-configured preset, LED controlled by Surface
SPARE1:2
SPARE2:2
SPARE3:2
SPARE4:2
SPARE5:2
SPARE6:2
SPARE7:2
SPARE8:2
SPARE9:2
SPARE10:2
SPARE11:2
SPARE12:2
```

Once again, our first line is a comment line that shows the syntax used for this particular option. In this case there are several code lines, each one referring to a different spare (or programmable) button. Thus the '#' in the example syntax is replaced with a number on the actual code line to indicate which of the spare buttons that particular code line refers to. This fact is described on the second comment line.

The third comment line explains that a number indicating button mode will be used in place of the '?' on each actual code line.

The next few comment lines explain the possible modes that the spare buttons can operate in. You may have fewer or greater modes available depending on the surface model and vintage. In any event you can select the same or a different mode from the available modes for each programmable button on the surface.

An Example File - Complete

The following listing shows a typical Options Text File for the surface type covered by this manual. Your actual Options Text File may be somewhat different, depending on vintage, but the general ideas involved in editing the file will apply.

```
// -----
// SPARE OPTIONS
// -----
// Syntax: SPARE#:?
// # is the spare button number (1 - 12)
//? is the mode (default = 2)...
// Ø = None, Button presses are ignored
    1 = Toggle, Button state toggles on each press
11
    2 = Momentary, Button is active when held down
//
// 3 = Preset Select, Button selects pre-configured preset, LED controlled by Surface
SPARE1:2
SPARE2:2
SPARE3:2
SPARE4:2
SPARE5:2
SPARE6:2
SPARE7:2
SPARE8:2
SPARE9:2
SPARE10:2
// ------
// MISC OPTIONS
// -----
// Syntax: ALPHA SORT:?
// ? 1 (default) enables XY controller alpha sorting, \emptyset = no sort.
ALPHA SORT:1
// Syntax: USE HELP:?
// ? 1 (default) enables help system, \emptyset = no help.
USE HELP:1
// Syntax: XYC_CHECKSUM:?
// ? 1 (default) = use checksum in XYC messages, Ø no checksum.
XYC CHECKSUM:1
// Syntax: HDW LOGGER:?
// ? 1 = use hardware logger, Ø (default) no hardware logger.
HDW LOGGER:Ø
// Syntax: XCHAN_VIS_DISABLE:?
// ? Ø = do not allow X visibility disable, 1 (default) allow X visibility disable.
XCHAN VIS DISABLE:1
// -----
// STUDIO OPTIONS
// -----
// Syntax: MUTE METHOD:?
// ? \emptyset = ON button, 1 (default) = ON AIR.
MUTE METHOD:1
```

```
// Syntax: MUTE MASTER#:?
// Is the specified master used in mute linking logic
// # = 1 M5.1 - ? Ø (default) = no, 1 = yes.
// # = 2 M+2 - ? Ø (default) = no, 1 = yes.
// \# = 3 \text{ MST1} - ? \emptyset = \text{no}, 1 = (default) \text{ yes}.
// # = 4 MST2 - ? Ø (default) = no, 1 = yes.
// \# = 5 \text{ MMONO} - ? \emptyset (default) = no, 1 = yes.
MUTE MASTER1:Ø
MUTE MASTER2:Ø
MUTE MASTER3:1
MUTE_MASTER4:Ø
MUTE_MASTER5:Ø
// Syntax: DCM MUTE LEVEL:?
// ? INF or -80 to -6 = (-60) default) dB level considered
// muted for DCM assign LED indication.
DCM MUTE LEVEL:-6Ø
// Syntax: ACI_DISABLE_MSS:?
// ? Ø (default) = send machine start/stop DIOs whenever input channels go on/off.
// 1 = supress machine start/stop DIOs when input channels on/off via ACI.
// 2 = supress machine start/stop DIOs when input channels on/off via remote on/off DIO
     3 = supress machine start/stop DIOs when input channels on/off via ACI and/or DIO.
11
ACI_DISABLE_MSS:Ø
// Syntax: ENABLE IFB CONF:?
// ? Ø (default) = do not enable IFB (Bus-Minus) conference mode,
11
               1 = enable IFB (Bus-Minus) conference mode.
ENABLE_IFB_CONF:Ø
```

Appendix 2

Contents	
	• •
Replacement Parts List	A-9

For the most part there are no user-replaceable parts in the D-5.1 control surface. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, switches, etc.). A complete list of available components is shown on the next page. Contact Wheatstone technical support for further information.

Wheatstone Corporation (600 Industrial Drive, New Bern, North Carolina, USA 28562) may be reached by phone at 252-638-7000, fax 252-637-1285, electronic mail "techsupport@wheatstone.com".

Contente

REPLACEMENT PARTS — D-5.1 CONTROL SURFACE

COMPONENT	DESCRIPTION	WS P/N
IS-5.1 PANEL	COMPLETE INPUT PANEL	"005000"
IFS-5.1 PANEL	COMPLETE INPUT FADER PANEL	"005001"
IFSM-5.1 PANEL	COMPLETE INPUT FADER PANEL WITH MOTORIZED FADER	"005011"
IFSM-5.1NP PANEL	COMPLETE INPUT FADER PANEL WITH MOTORIZED FADER MINUS PAGE	"005018"
EFS-5.1 PANEL	COMPLETE CONTROL PANEL	"005002"
SFS-5.1 PANEL	COMPLETE CONTROL FADER PANEL	"005003"
SFSM-5.1 PANEL	COMPLETE CONTROL FADER PANEL WITH MOTORIZED FADER	"005013"
MS-5.1 PANEL	COMPLETE MASTER PANEL	"005004"
MFS-5.1 PANEL	COMPLETE MASTER FADER PANEL	"005005"
MFSM-5.1 PANEL	COMPLETE MASTER FADER PANEL WITH MOTORIZED FADER	"005015"
DS-5.1 PANEL	COMPLETE DYNAMIC CONTROL PANEL	"005006"
DCM-5.1 PANEL	COMPLETE DYNAMIC CONTROL FADER PANEL	"005007"
DCMM-5.1 PANEL	COMPLETE DYNAMIC CONTROL FADER PANEL WITH MOTORIZED FADER	"005017"
TB-5.1 PANEL	COMPLETE TALKBACK PANEL	"005004"
BKM3-5.1 BLANK PANEL	MAIN BLANK FACEPLATE ASSEMBLY 3" WIDE	"005109"
BKF3-5.1 BLANK PANEL	FADER BLANK FACEPLATE ASSEMBLY 3" WIDE	"005110"
BKM3.25-5.1 BLANK PANEL	MAIN BLANK FACEPLATE ASSEMBLY 3.25" WIDE	"005111"
BKF3.25-5.1 BLANK PANEL	FADER BLANK FACEPLATE ASSEMBLY 3.25" WIDE	"005112"
BKM6.25-5.1 BLANK PANEL	MAIN BLANK FACEPLATE ASSEMBLY 6.25" WIDE	"005113"
BKF6.25-5.1 BLANK PANEL	FADER BLANK FACEPLATE ASSEMBLY 6.25" WIDE	"005114"
COPY TRAY	D5.1 COPY TRAY ASSEMBLY	"005194"
IS-5.1 LOADED CARD	INPUT PANEL LOADED CARD ASSEMBLY	"005050"
IFS-5.1 LOADED CARD	INPUT FADER PANEL LOADED CARD ASSEMBLY	"005051"
EFS-5.1 LOADED CARD	CONTROL PANEL LOADED CARD ASSEMBLY	"005052"
SFS-5.1 LOADED CARD	CONTROL FADER PANEL LOADED CARD ASSEMBLY	"005053"
MS-5.1 LOADED CARD	MASTER PANEL LOADED CARD ASSEMBLY	"005054"
MFS-5.1 LOADED CARD	MASTER FADER PANEL LOADED CARD ASSEMBLY	"005055"
DS-5.1 LOADED CARD	DYNAMICS CONTROL PANEL LOADED CARD ASSEMBLY	"005056""
DCM-5.1 LOADED CARD	DYNAMICS CONTROL FADER PANEL LOADED CARD ASSEMBLY	"005057""
MG-5.1 LOADED CARD	MAIN GATE LOADED CARD ASSEMBLY	"005060"
MG-5.1M LOADED CARD	MAIN GATE (MOTORIZED) LOADED CARD ASSEMBLY	"005065"
EI-5.1 LOADED CARD	ENCODER LOADED CARD	"005030"
HC-5.1 LOADED CARD	LOADED CARD ASSEMBLY WITH COMPUTER	"005064"
HC-5.1NC LOADED CARD	LOADED CARD ASSEMBLY W/O COMPUTER	"005092"
BP-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005058"
BPR-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005069"
VU8-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005061"
VUM-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005062"
VUS-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005063"
PWI-5.1 LOADED CARD	LOADED CARD ASSEMBLY	"005059"
LED-1 LOADED CARD	LOADED CARD ASSEMBLY	"007101"

REPLACEMENT PARTS — D-5.1 CONTROL SURFACE

COMPONENT	DESCRIPTION	WS P/N
PSR POWER SUPPLY RACK UNIT	RACK CAGE FOR SPS POWER SUPPLIES	"007232"
SPS-400	POWER SUPPLY UNIT FOR USE IN PSR RACK	"007233"
SPS/PWI POWER CABLE	SPS DB TO CONTROL SURFACE PWI POWER CABLE	"007261"
FLAT RIBBON CABLE	50 CONDUCTOR FLAT RIBBON CABLE	"150007"
FADER ASSEMBLY	NON-MOTORIZED FADER ASSEMBLY	"005296"
FADER ASSEMBLY	MOTORIZED FADER ASSEMBLY	"005297"
SWITCH	SINGLE POLE MOMENTARY SWITCH W/RED LED	"510106"
SWITCH	SINGLE POLE MOMENTARY SWITCH W/HOLES FOR LED, NO LED INSTALLED	"510293"
NKK SWITCH	JB15 SWITCH W/BRIGHTER GREEN LED AND SILICON GASKET	"510289"
NKK SWITCH	JB15 SWITCH W/BRIGHTER RED LED AND SILICON GASKET	"510290"
NKK SWITCH	JB15 SWITCH W/BRIGHTER YELLOW LED AND SILICON GASKET	"510291"
SWITCH CAP	RED SWITCH CAP	"530003"
SWITCH CAP	WHITE SWITCH CAP	"530004"
ENCODER	11MM ROTARY ENCODER, 20MM SHAFT LENGTH, ORDER W#005030	
ENCODER KNOB	11MM BLACK PUSH-ON KNOB	"520105"
ENCODER LIGHT PIPE	24 SEGMENT LIGHT PIPE FOR DTVM ENCODER	"520104"
ENCODER CAP	PLAIN BLUE CAP FOR 11MM COLLET KNOB	"530291"
ENCODER CAP	PLAIN GREEN CAP FOR 11MM COLLET KNOB	"530292"
ENCODER CAP	PLAIN GRAY CAP FOR 11MM COLLET KNOB	"530293"
ENCODER CAP	PLAIN PASTEL GREEN CAP FOR 11MM COLLET KNOB	"530294"
ENCODER CAP	PLAIN CREAM CAP FOR 11MM COLLET KNOB	"530295"
ENCODER CAP	PLAIN PALE BLUE CAP FOR 11MM COLLET KNOB	"530296"
ENCODER CAP	PLAIN BURGUNDY CAP FOR 11MM COLLET KNOB	"530315"
LUMA BUTTON	WHITE LUMA BUTTON	"530274"
LUMA BUTTON	RED LUMA BUTTON	"530275"
LUMA BUTTON	YELLOW LUMA BUTTON	"530276"
LUMA BUTTON	GREEN LUMA BUTTON	"530277"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "1"	"530297"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "2"	"530298"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "3"	"530299"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "4"	"530300"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "5"	"530301"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "6"	"530302"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "7"	"530303"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "8"	"530304"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "9"	"530305"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "10"	"530306"

REPLACEMENT PARTS — D-5.1 CONTROL SURFACE

COMPONENT	DESCRIPTION	WS P/N
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "11"	"530307"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "12"	"530308"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "13"	"530309"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "14"	"530310"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "15"	"530311"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "16"	"530312"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "17"	"530313"
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "18"	"530314"
PLUG	5 PIN PLUG FOR #26 AWG	"230030"
PLUG	6 PIN PLUG FOR #26 AWG	"230031"
PLUG	9 PIN PLUG FOR #26 AWG	"230032"
PLUG	50 PIN PLUG	"250049"
PLUG RIBBON	26 PIN RIBBON PLUG	"250043"
PLUG RIBBON	40 PIN RIBBON PLUG	"250053"
PLUG RIBBON	26 PIN RIBBON PLUG	"250043"
HEADER	40 PIN BOXED HEADER, STRAIGHT	"250056"
HEADER	5 PIN JST HEADER	"250064"
HEADER	6 PIN JST HEADER	"250065"
HEADER	9 PIN JST HEADER	"250066"
RECEPTACLE HOUSING	5 POSITION RECEPTACLE HOUSING	"200113"
POWER SOCKET	40 AMP SOLDER CUP POWER SOCKET	"200118"
PHONE JACK	RTS JACK	"260005"
XLR CONNECTOR	BLACK FEMALE XLR CONNECTOR	"260002"
MOLEX CONNECTOR	MOLEX CONNECTOR	"270037A"
MOLEX CONNECTOR	FEMALE MOLEX CONNECTOR	"270038A"
CONNECTOR PIN	FEMALE PIN FOR MOLEX CONNECTOR	"270031A"
CONNECTOR PIN	MALE PIN FOR MOLEX CONNECTOR	"270032A"
DISPLAY	4 SEGMENT GREEN ALPHA NUMERIC DISPLAY	"610016"
LED SUPERBRIGHT GREEN	GREEN LED WITH UNCUT LEADS	"610075"
LED SUPERBRIGHT YELLOW	YELLOW LED WITH UNCUT LEADS	"610076"
METER	VU METER	"630004"
METER LIGHT BOX	LIGHT BOX FOR VU METER WITHOUT LAMP	"630008"
FAN	FAN 12V DC	"840014"
FILTER	FAN FILTER	"840012"
REPLACEMENT CUE SPEAKER	REPLACEMENT CUE SPEAKER	"960000"
MANUAL	OWNER'S MANUAL	"005099"