
D-5.1 & D-5.2

Digital Television Control Surface

TECHNICAL GUIDE



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 user-friendly and flexible. Wheatstone BRIDGE network cages house all I/O ports and engine cards, and may be wired in tandem within a single equipment room or interconnected to separate remote locations by means of fiber-optic or CAT-5 cables to provide single wire studio integration schemes.

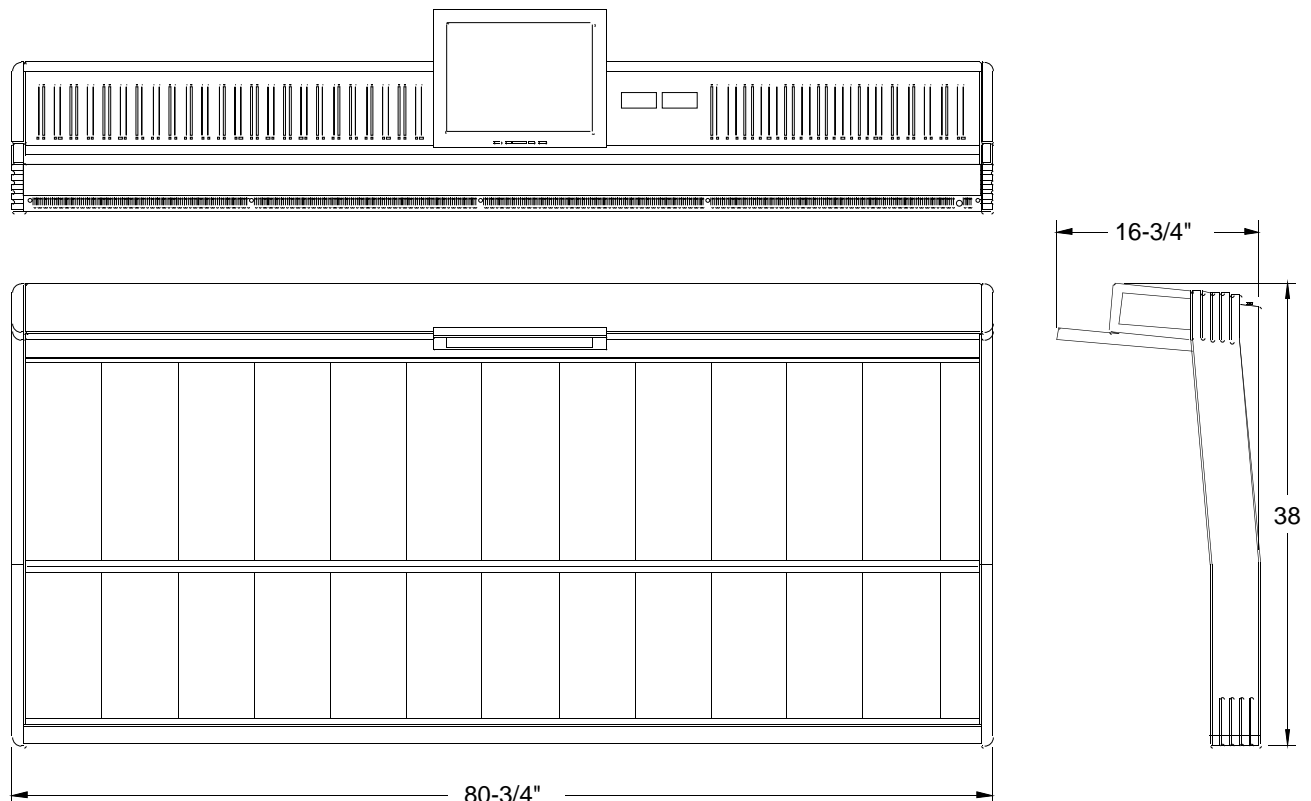
Once configured, the system operates entirely independently of external computers. Configuration itself is intuitive and carried out onsite by means of user-friendly graphic interfaces provided by Wheatstone desktop software. The D-5.1 system also takes full advantage of Wheatstone's exclusive VDip configuration 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.

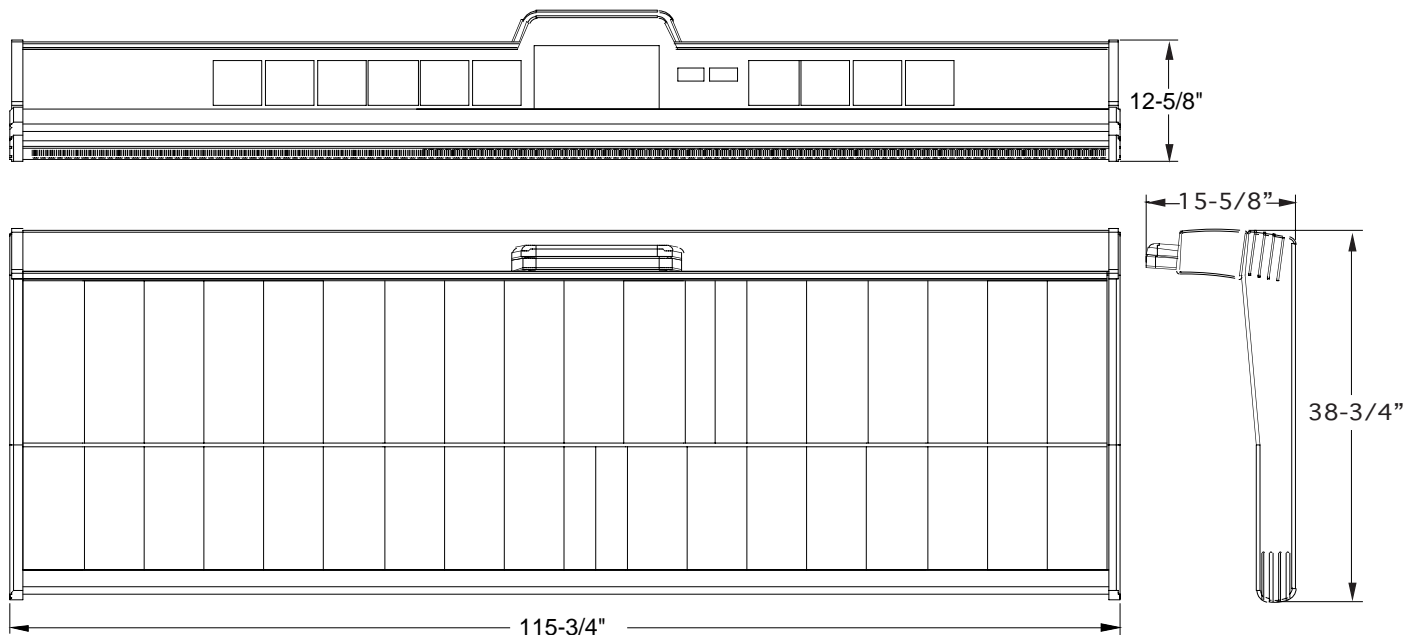


D-5.2 Control Surface



The D-5.2 is an update of the D-5.1 digital audio control surface, with an entirely new look and additional features.

The 5.2 control surface 6-bay frame size is shown below.



D-5.2 Panels

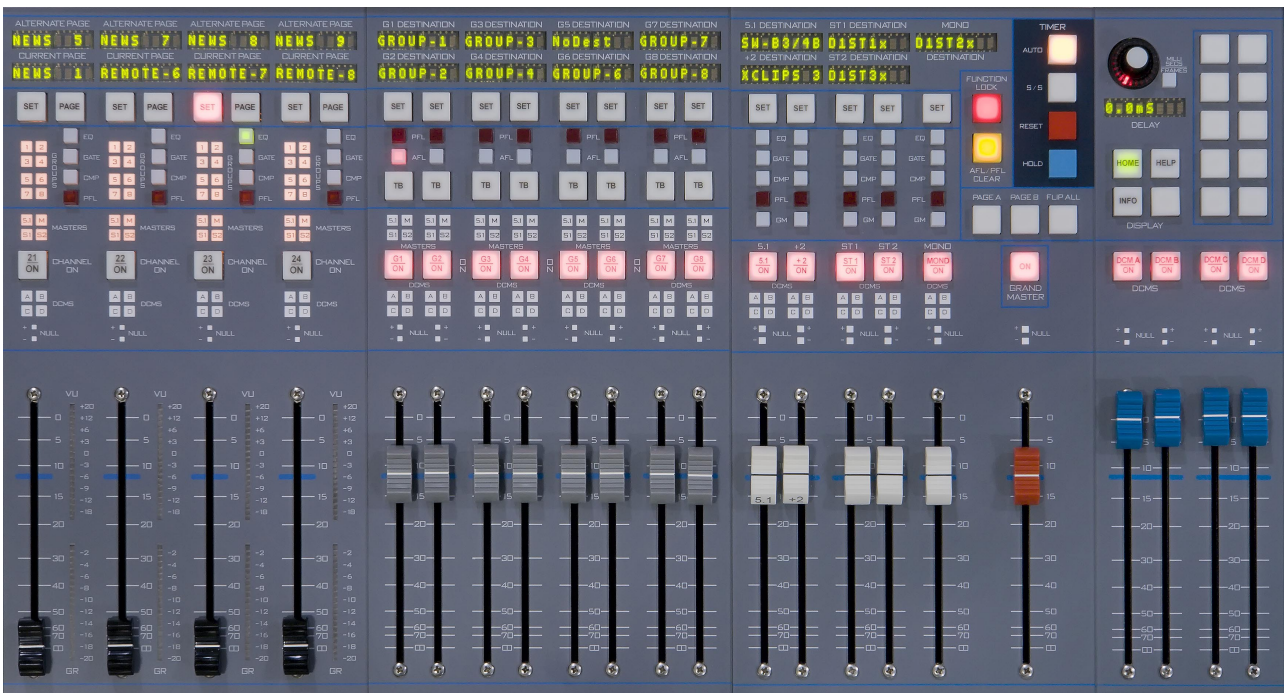


IS-5.2 Panel

EFS-5.2 Panel

MS-5.2 Panel

DS-5.2 Panel



IFSM-5.2 Panel

SFSM-5.2 Panel

MFSM-5.2 Panel

DSMM-5.2 Panel

end of the cable to one of the two power supply connectors. Then use the other cable to connect the second power supply connector to the remaining control surface power supply connector. Connect the cable(s) first to the control surface, then to the rear of the rackmount power supply.

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

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

Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two SPS-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.

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.

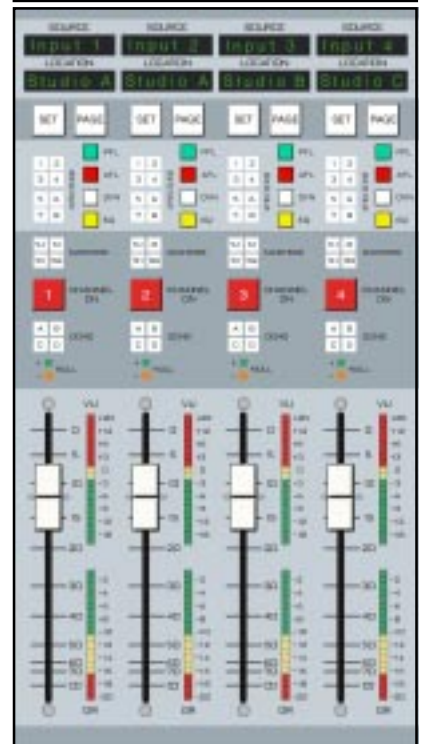
Insert

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



IS-5.1
Panel



IFS-5.1
Panel

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.

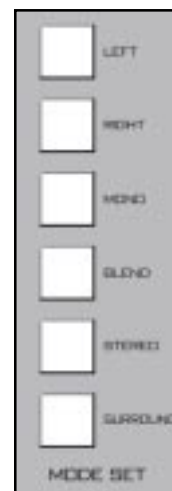
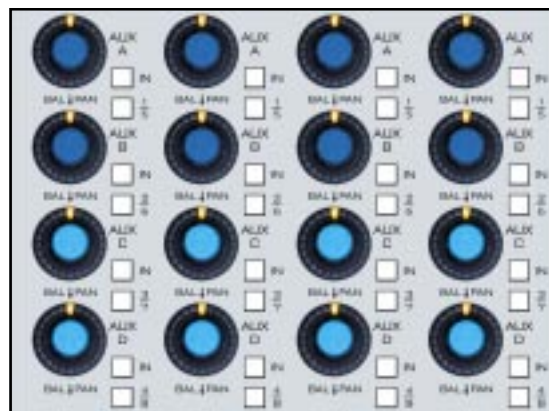
There are actually a total of eight AUX SENDs available, and controlled by the AUX A, AUX B, AUX C, and AUX D sections. For example, the AUX A knob controls the level of that channel to AUX 1 when the “1/5” select switch is in “1” (the switch is not lit), and the level of that channel to AUX 5 when the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



EFS-5.1 Panel



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.



MS-5.1 Panel

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 upper-right corner of the EFS panel or an external mic plugged into the system and triggered externally) allowing communication between the operator and the talent receiving that mix.



EFS-5.1 Panel

Solo

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

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 name 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 than one output. Press the CLEAR button when it is lit and the channel's BUS MINUS will be removed from the displayed output.



MS-5.1 Panel

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.



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 LOCATION 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

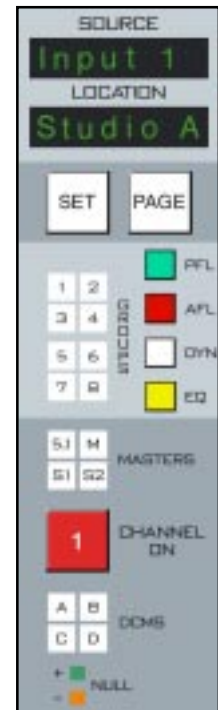
The SET button allows the operator to access various controls on the EFS, DS and MS panels of the control surface and apply them to the selected channel. SET can access GROUP, MIX-MINUS, DYNAMICS, EQ, BUS ASSIGN, and DCM ASSIGN functions. To use, simply hit the SET button and then make your appropriate section settings in other areas of the control surface. Once a SET button has been pressed, the button lights up, and all of the central section controls (EQ, MODE, DYNAMICS, etc.) display the current settings **for that input channel** until a different input SET button is pressed.



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.

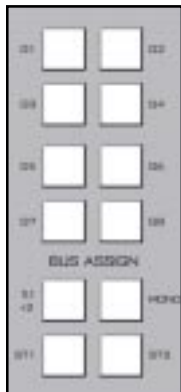


EFS-5.1 Panel



Output Assign Displays

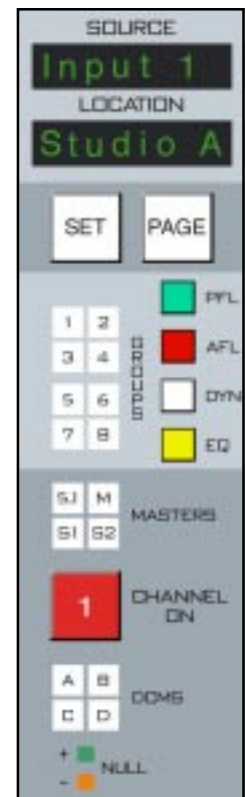
These 12 indicators (GROUPS and MASTERS) show where the channel has been assigned to using control switches in the BUS ASSIGN section of the EFS-5.1 panel. The output assigns are accessed by means of channel SET button. Press SET, then toggle the channel assigns by toggling the appropriate BUS ASSIGN buttons on the EFS-5.1 panel.



EFS-5.1 Panel

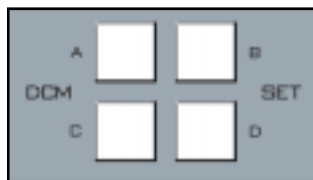
Channel ON Switches

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.



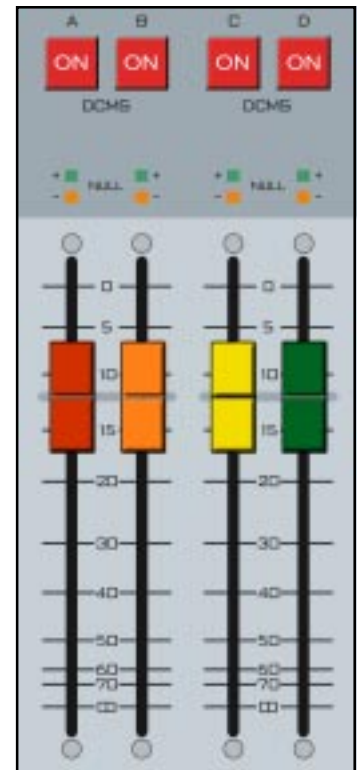
DCM (Digital Control Master) Displays

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.



EFS-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.

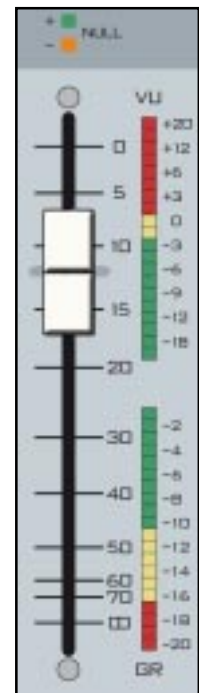
GR (Gain Reduction)

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.



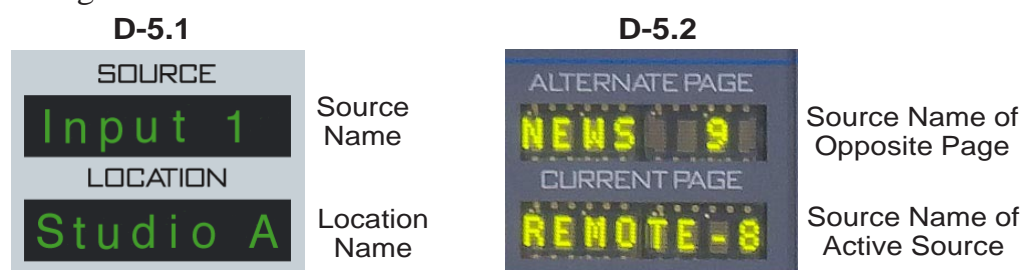
D-5.2 Hardware Changes

As we already mention, D-5.2 is updated version of the D-5.1 control surface. For a description of each panel type's controls and functions, refer to the corresponding chapter. Here we will cover the D-5.2 new controls and functions.

The D-5.2 incorporates minor changes to the Input Fader panel and the Master Fader panel.

IFSM-5.2 INPUT FADER PANEL

The Input Fader panel adds individual GATE and CMP (Compressor) IN switches. The function of the eight character displays at the top of the panel has changed.



The D-5.1 always displayed the active source selected to a fader along with the text entered in the LOCATION field of the signal definition.

On the D-5.2, the upper display always shows the source signal located on the opposite page (i.e. if Page A is selected Alternate Page display shows the source signal on Page B.)

The signal name shown in the CURRENT PAGE display is active on the fader.

Alternate Page

This display indicates the signal source located on the opposite page. This display is not available on NON-PAGING Input fader positions.

Current Page

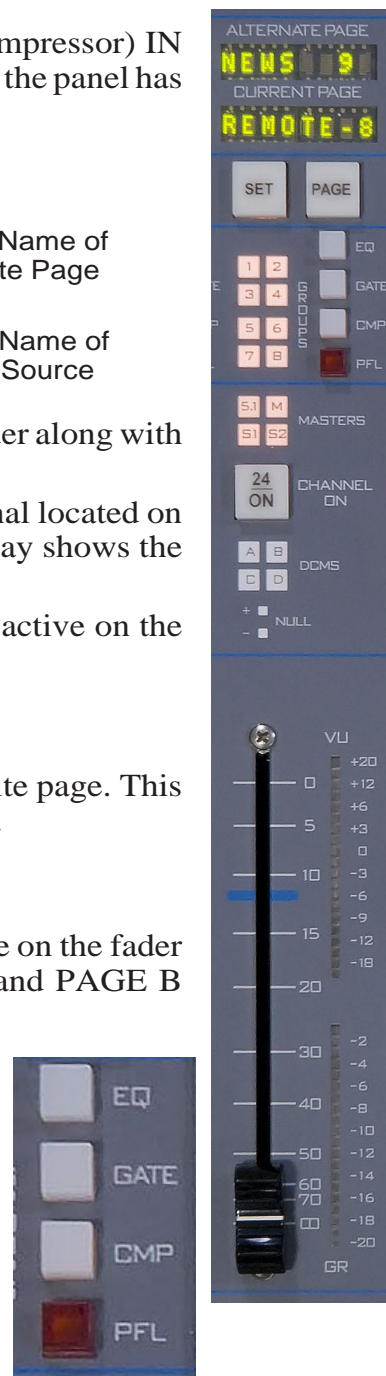
This display indicates the signal source that is currently active on the fader strip. Press the PAGE switch to toggle between the PAGE A and PAGE B sources.

Gate

This switch lets the control surface operator independently insert the GATE portion of the dynamics control processing.

CMP

This switch lets the control surface operator independently insert just the Compressor/Limiter dynamics processing.

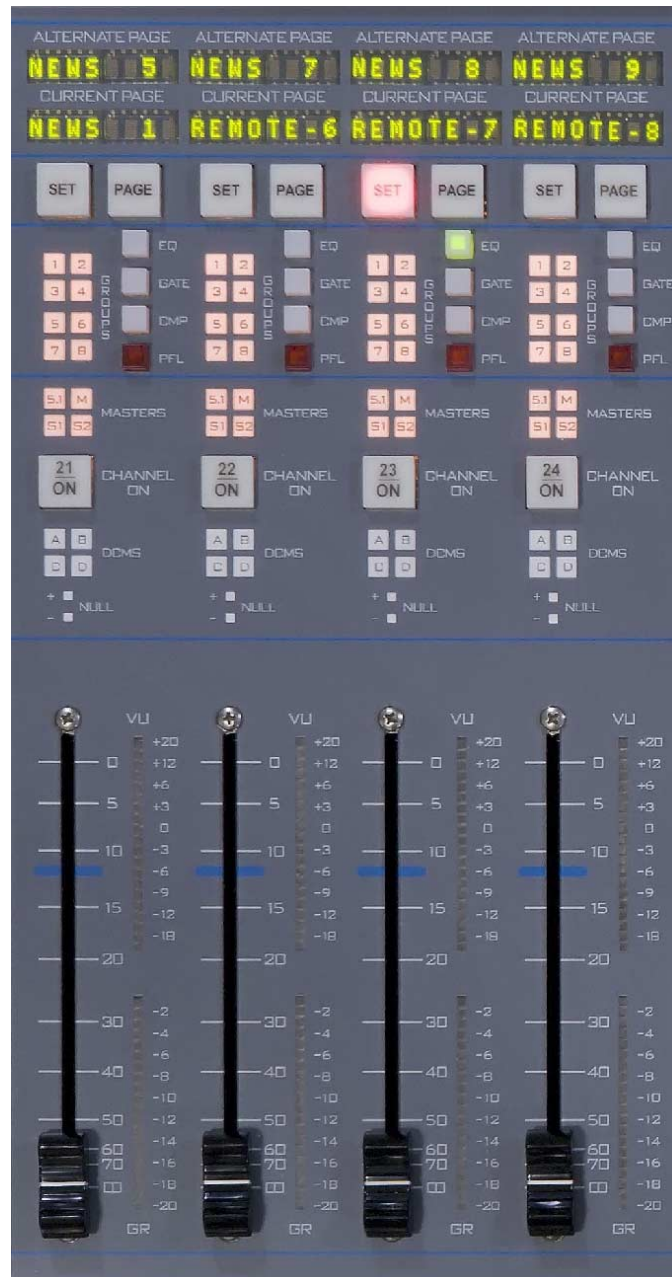


D-5.2 UPDATE



IS-5.2

D-5.2 UPDATE



IFSM-5.2

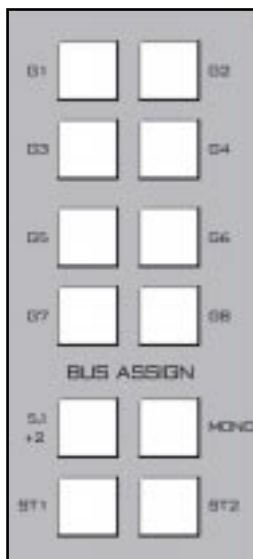
Control Section (EFS-D5.1 & SFS-5.1)

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/MXMM MASTER OUTPUTS, GROUP MXM ASSIGN, GAIN SET, TB, BUS ASSIGN, 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.



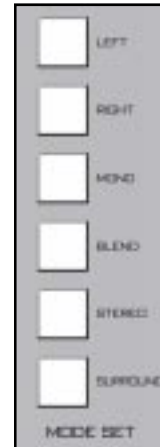
EFS-5.1
Panel

SFS-5.1
Panel

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 upper-right corner of the panel. It's gain is set by the TB encoder. This signal is then available for the various TALKBACK functions of the control surface.

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 2001 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.

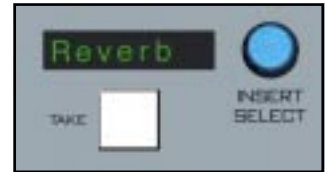
To set a SOLO, again press any of the 8 AUX SET or 18 MIX-MINUS SET buttons, and then press the SOLO button. To interrupt a signal with the TB signal, press any of the eight AUX SET or eighteen MIX-MINUS SET buttons and then press the TB button.

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.

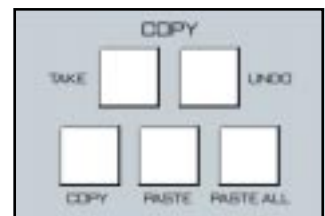


Copy Section

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.

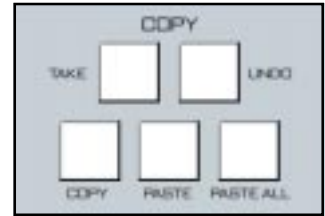
Note, the copy function does not copy source assigns, destinations, presets, or input gain.

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.

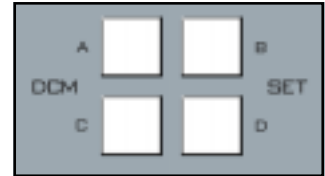
To Copy One To All

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 affect 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.



TB

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.

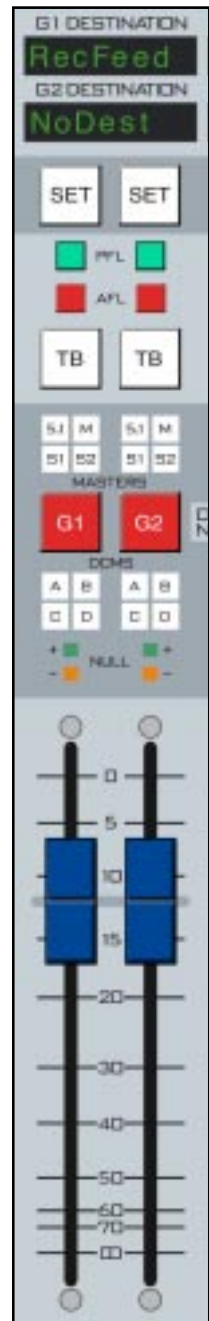
Submix/Group Fader

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.

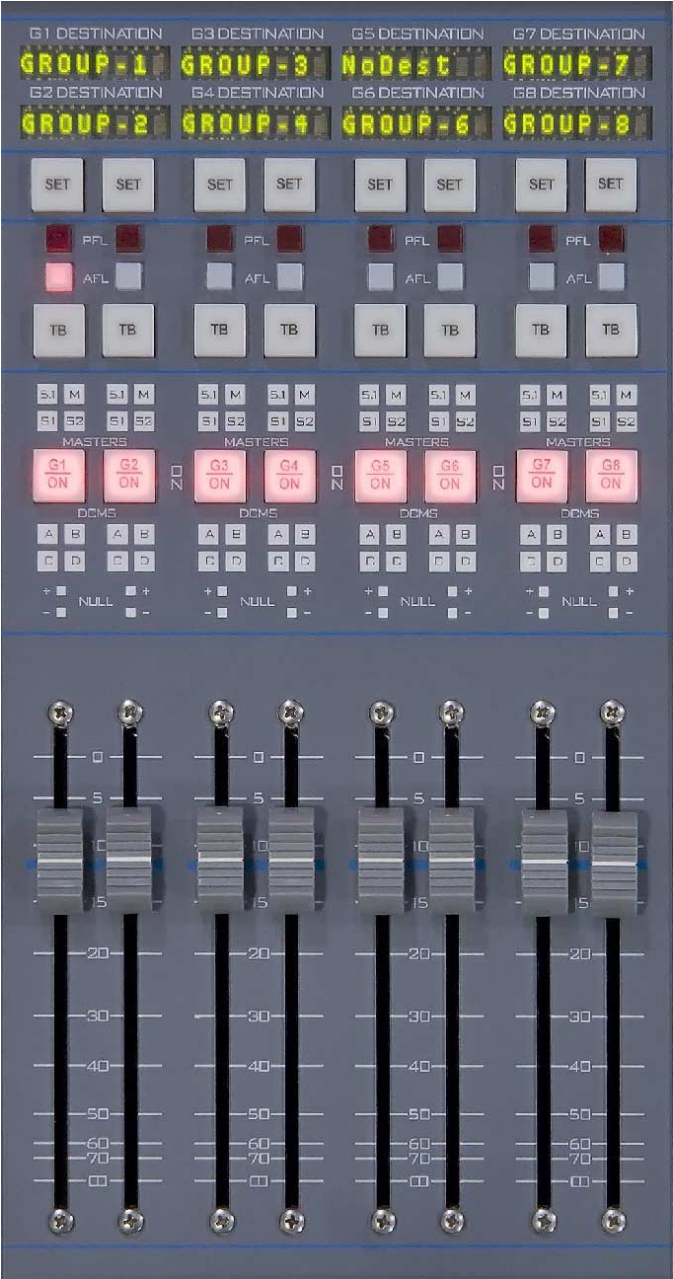


D-5.2 UPDATE



EFS-5.2

D-5.2 UPDATE



SFSM-5.2

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.

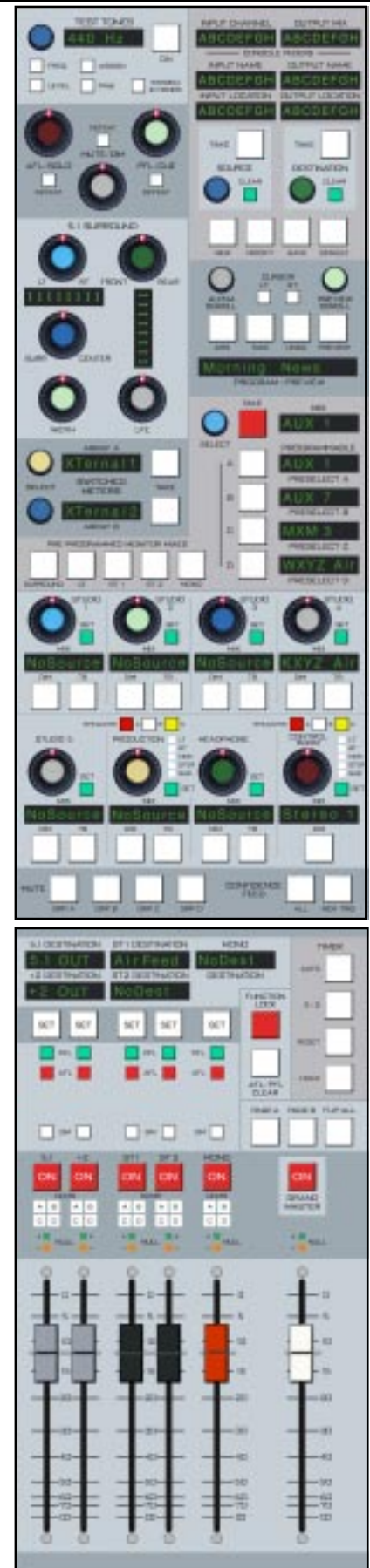
Each monitor has a level control, a SET button, an 8-character monitor display, a monitor DIM button and a TB button (the CR monitor does *not* have a TB button). PRODUCTION and CR monitors also have mono/stereo/5.1 MODE status display arrays and three SPEAKER selection buttons (A, B, C).

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 access to MUTE, DIM, PFL, 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.



EFS-5.1 Panel

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 mic plugged into the EFS-5.1 panel's XLR connector, and feeds it to the monitor output, allowing direct communication between the operator and talent.



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

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

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.

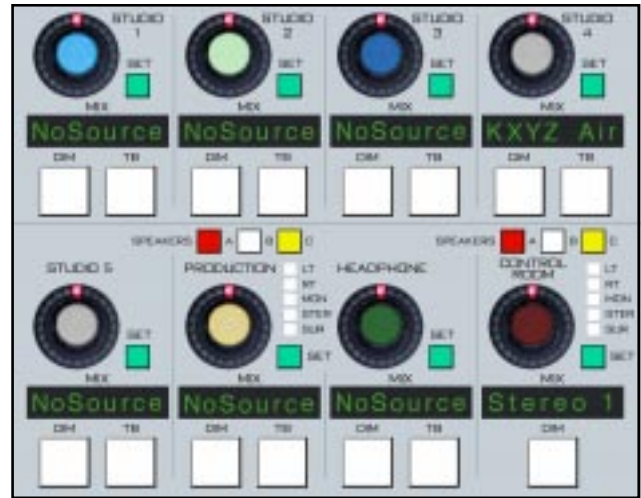
STUDIO level control - determines the overall loudness of the signal being monitored as it appears in the studio speakers.

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 EFS-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.

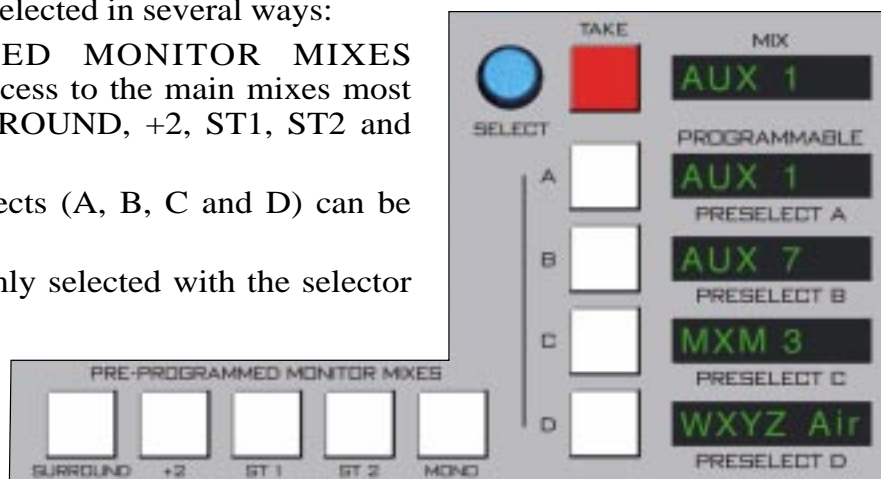
- A bank of four preselects (A, B, C and D) can be preprogrammed.

- Sources can be randomly selected with the selector knob (SELECT) and its attendant 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.

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



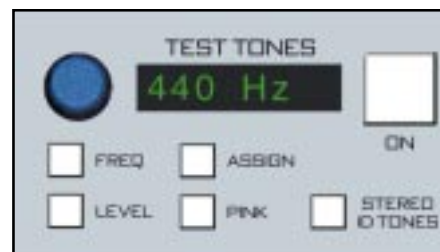
Test Section

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.

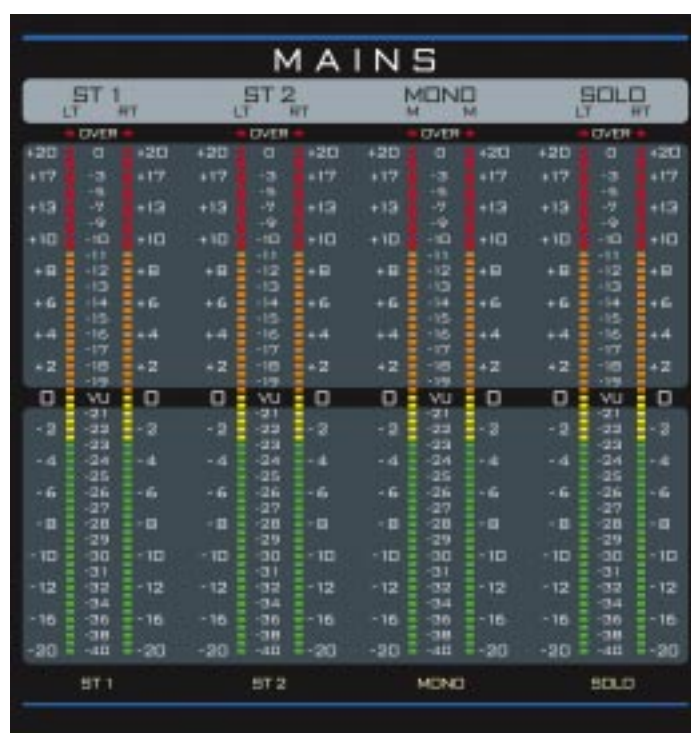
The CUE signal is pre-fader, and is normally used to check signals. When a channel is CUEd, its pre-fader signal will appear in the cue speaker, and the switched meter array in the meterbridge display will show the level of the pre-fader signal if it has been so programmed. The PFL/CUE level control 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.

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.



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.



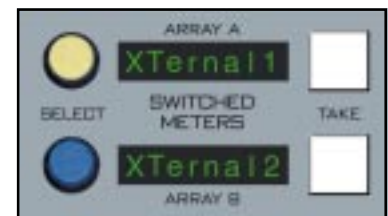
Switched Meters Section

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 two-channel 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.

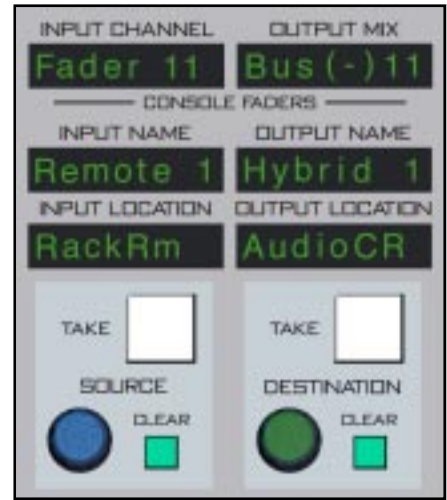


XY Controller Section

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 DESTINATION 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.

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.



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, the undo function will do nothing.

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.



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 the current settings, turn the PREVIEW SCROLL knob until the desired event is displayed in the PROGRAM/PREVIEW window, then quickly press MODIFY, then SAVE.

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.

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.

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.

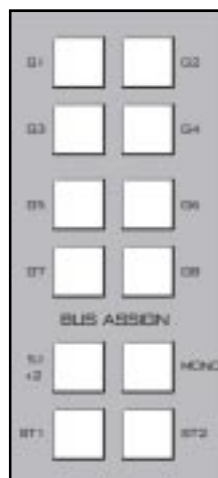


Confidence Feed

The CONFIDENCE ALL and REM TRIG switches are duplicate function of the CONF ALL and REM TRIG switches in the MIX-MINUS CONFIDENCE 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-5.1 panel) 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 pre-fader signal.

AFL (Solo)

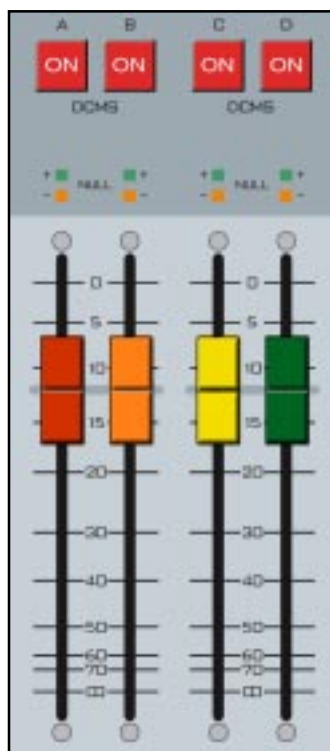
This switch lets the control surface operator monitor the channel's post-fader signal.

DCM (Digital Control Master) Displays

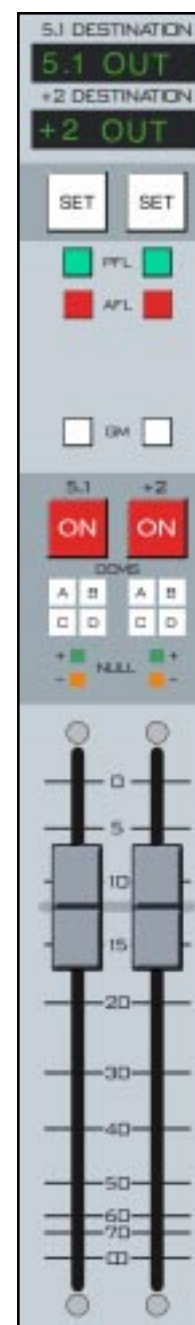
These 4 indicators show which DCM masters the output has been assigned to using the DCM SET control switches. Outputs are assigned to these DCMs by pressing the output SET button and then pressing the desired DCM SET assign button.



EFS-5.1 Panel



DCM-5.1 Panel



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 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.

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.

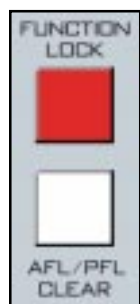
Grand Master ON/OFF

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

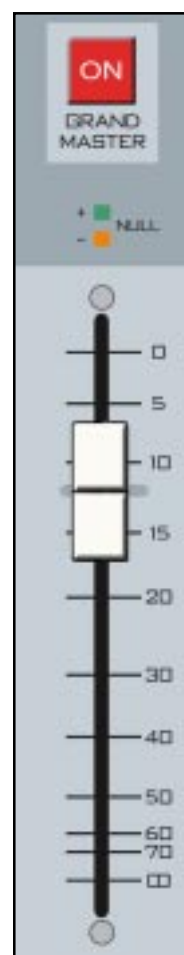
Function Lock

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.

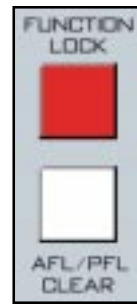


When you press a locked control, the FUNCTION LOCK button flashes to let you know you have tried to access a locked control. To unlock the control, press the FUNCTION LOCK button once. The locked control is released. If you fail to press the FUNCTION LOCK button within about five seconds of pressing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

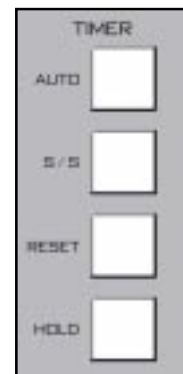
The control surface timer is provided with an auto-restart function so programmed (via GUI) input modules can automatically reset the timer display to zero and start a new count (if the timer is currently running), allowing the announcer to easily track his own pace. This is enabled by pressing the AUTO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



MFSM-5.2 MASTER FADER PANEL

The D-5.2 Master Fader panel has added independent ON/OFF switches for the GATE and COMPRESSOR dynamics processing functions.

Gate

This switch lets the control surface operator independently insert the GATE portion of the dynamics control processing.

CMP

This switch lets the control surface operator independently insert just the Compressor/Limiter dynamics processing.

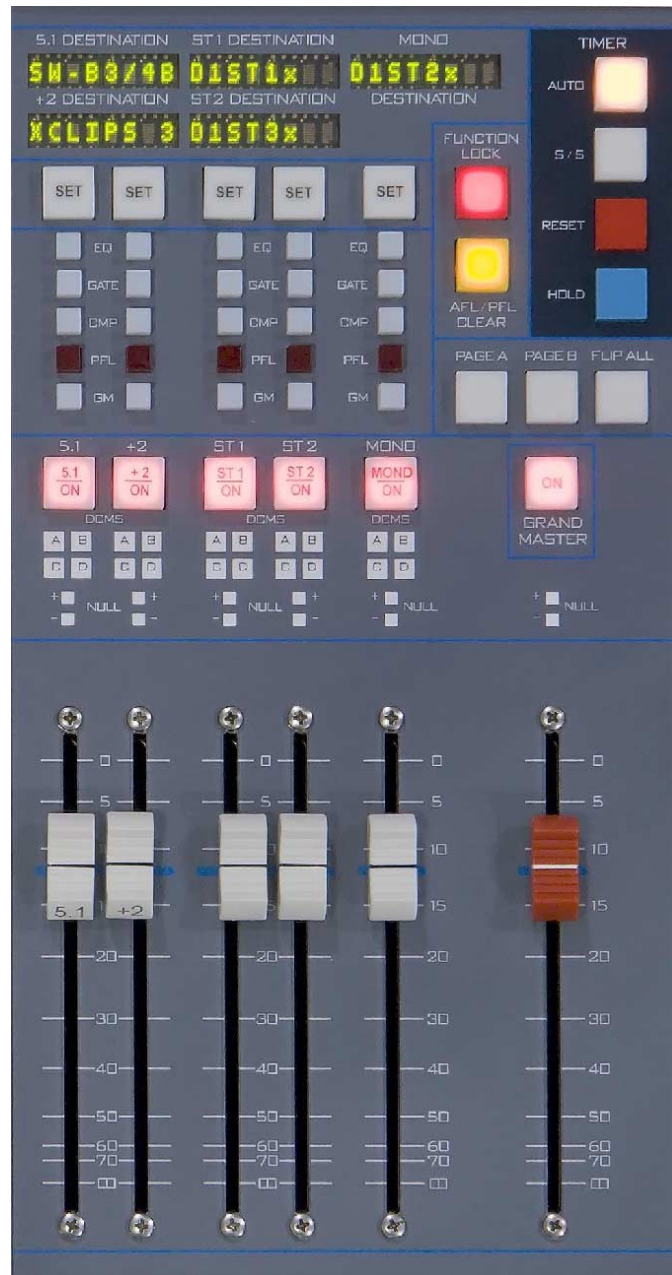


D-5.2 UPDATE



MS-5.2

D-5.2 UPDATE



SFSM-5.2

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 DYNAMICS, TALKBACK PRESELECTS, MXM CONFIDENCE FEED, AUDIO DELAY, DCM, DISPLAY and PROGRAMMABLE BUTTONS sections.

Dynamics Section

This section provides for compression, limiting, expansion and gating for individual input channels. The section can be accessed by means of 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 relative 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.

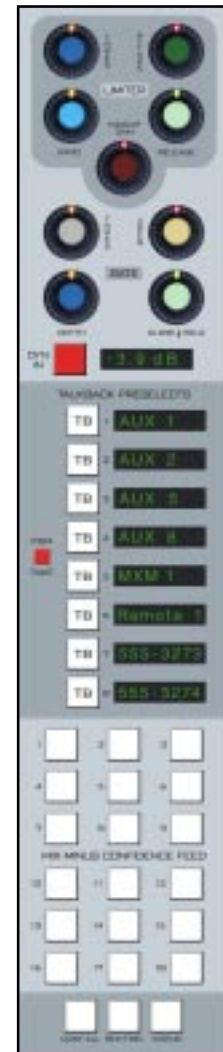
COMPRESSOR/LIMITER

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

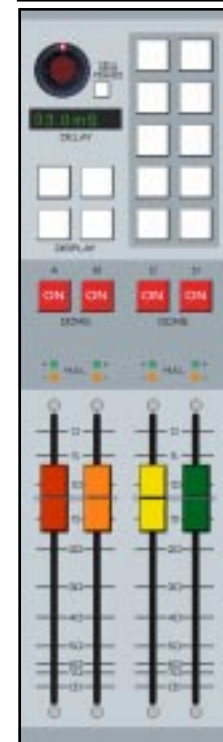
- allow smooth, inaudible and unobtrusive level control on uneven sources;
- be able to act as a peak limiter for inadvertent overload control;
- enable deep effects if required.

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-



DS-5.1
Panel



DCM-5.1
Panel

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.

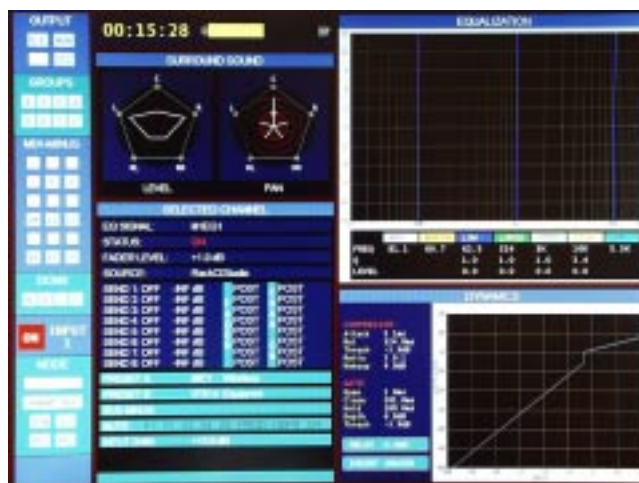
The compressor is “soft-knee”, meaning the compression ratio increases slowly with increasing applied level, greatly easing the sonic transition into full compression; it helps avoid the “snatching” and “pumping” at threshold that many “hard-knee” dynamics units exhibit.

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 be 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 can 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 than 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.

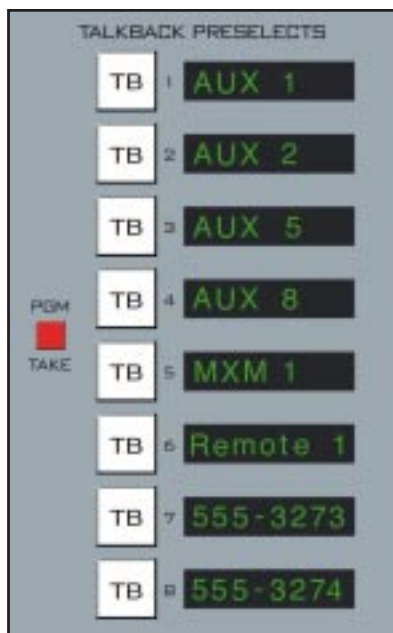
The CLOSE/HOLD knob serves a dual purpose. Turning the knob without pressing it down determines how quickly the gate closes once the incoming signal falls below the GATE THRES level. Turning the knob while pressing it determines how long the gate will stay open after the signal falls below the GATE THRES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

Talkback Preselects

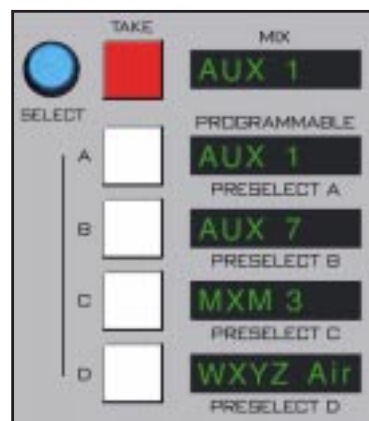
These eight switches allow for a dedicated Bridge 2001 Router output to be designated as a destination for the talkback signal. Once a specific output has been programmed into the preselector, the talkback signal can be sent to that output at any time by pressing the corresponding switch.

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.



DS-5.1 Panel



MS-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.



MS-5.1 Panel

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.



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.

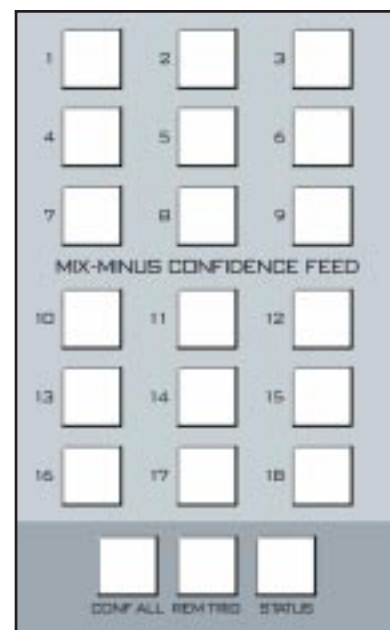
To DEselect a source, select that source by means of the SOURCE knob, and press the CLEAR button.

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 mix-minuses 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

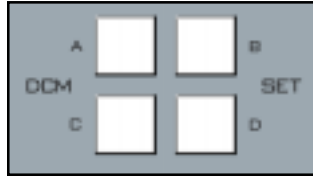


MS-5.1 Panel



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 combination of the DCM ASSIGN BUTTONS on the 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.



EFS-5.1 Panel

DCM ON

The ON switch provides a rapid way to mute a group of signals. Any signal 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.

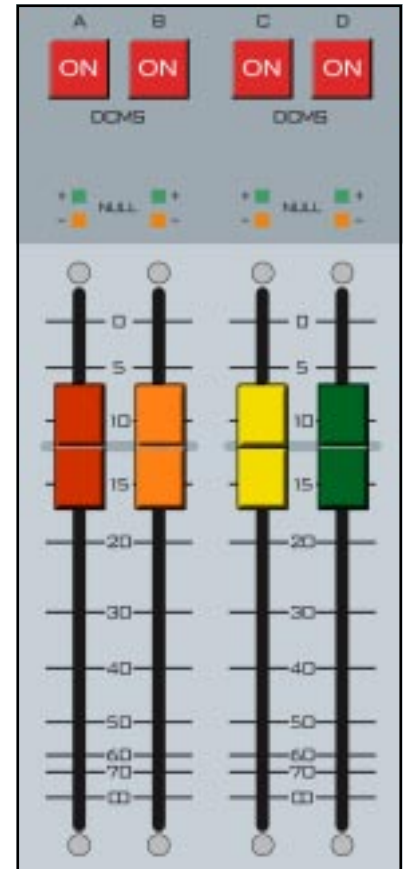


MS-5.1 Panel

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

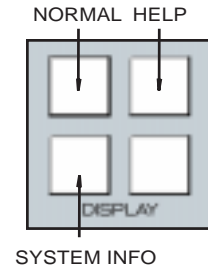
These 10 momentary switches and indicating LEDs are designed for user accessible external functions (GPIs). They can be mapped with the configuration software to any available logic I/O ports within the Bridge 2001 Router system, and used to control external devices.



Display Buttons

Beneath the Surround graphic panel on the display is a panel that normally shows information about the selected input or mix. By pressing the lower left SYSTEM INFO DISPLAY button, this panel will change to show information about the CPU, current firmware rev, etc. To revert to normal panel display, press the upper left NORMAL DISPLAY button.

A future revision of the firmware will provide access to a series of help screens by pressing the upper right HELP DISPLAY button.



D-5.2 UPDATE



DS-5.2

D-5.2 UPDATE



DCM-5.2