Sound Techniques ZR Center Sections

(See Last Page for Images)

The ZR console has 4 types of Center / Master sections. Each has its own specific characteristics and facilities and the family of Center Sections has been designed to cover all sizes of ZR console from the smallest stand-alone 8-channel bucket, right up to the 48-channel (or more) Large Format Master Audio consoles.

As an overview, the Center Sections are:

ZR-7.1 Master.

This is a fully-modular center section that is a little over 28 inches wide with 3 rows of modules across the width. It has its own special bucket. Although there is a standard Sound Techniques layout for the module positions, the flexibility of the design allows modules to be freely placed wherever the user wants them to be. There is a core set of modules that is required to be fitted so as to provide the console's essential facilities. These modules are augmented by a range of optional modules that can be fitted at the time of ordering the console or retro-fitted at future dates as required. It is envisaged that this center section will be fitted only to the large-format consoles that require maximum flexibility. The master bucket can be located anywhere along the length of the console. The complexity of the Flagship facilities makes it impossible to summarize in a few lines; please go to the full description of the Flagship center section for further details.

ZR-5.1 Compact Master.

This is a one-piece module that takes up the equivalent of 6 channel widths (i.e. 6 units wide; each unit is 60mm). The center section module is fitted into a 9-unit wide bucket and can be placed to the left or right of the bucket. The 3 units of spare space can be fitted with blanking panels, or Sound Techniques optional modules. The width of the spare space is more than enough for, as an example, a Lexicon LARC, or other small equipment, to sit on the console surface and not hinder access to surrounding console controls. Blank panels can be customized (by Sound Techniques or the user) to house user-specified controls. Sound Techniques offer a range of optional modules that can be fitted in the 3 units of spare space. Where possible, their controls are located in the lower-half so as to leave free space in the upper half for the aforementioned LARC to be able to sit on the console. Currently the optional modules are a stereo compressor (similar specification to the Sound Techniques bus compressor) and a stereo equalizer (same specification as the channel equalizer).

This center section can be fitted to all sizes of ZR console and can be located anywhere along the length of the console.

Facilities are summarized thus:

Echo & foldback master level controls with master Pre/Post fader switching, LED metering and output ON switches.

4 stereo effects returns with tone-tilt EQ, stereo width, balance, foldback send level, route-to-mix switch & level, PFL switch.

4 stereo direct input to mix sections, each with level, balance, AFL switch, route-to-mix switch and peak LED.

4 sets of group-to-mix controls for the outputs of the stereo groups, each with echo & FB sends, balance, level, AFL switch, route-to-mix switch & peak LED. Group insert switches. The rotary level controls can be fader-swapped with the group faders.

Source selection and level control for studio speakers, and similarly, source selection and level control for studio headphones.

Switches for console status, console mode, solo mode, meter control, and, master mutes.

Comprehensive monitor facilities, including 5.1 surround sound monitor controls.

Oscillator, talkback, parallel compression controls, mix insert switching.

A threshold control sets the level at which the channel signal LEDs illuminate.

Bus compressor (fitted as standard) and the space to fit a second “patchable” compressor.

Masterflex.

This master module that is only one unit wide and is of the same physical size and mechanical specification as a channel module. A 9-unit wide bucket can hold 8 channel modules plus the Masterflex module. The module can be placed to the left or right of the 8 channels. Although envisaged for ZR “sidecar” units and small format consoles of 8 to 24 channels, there is no technical or practical reason to limit the number of channels that a Masterflex module can handle. In addition to the Masterflex module, there are two associated modules:

Mix fader module that also has the master A & B mute bus switches and mix insert switches.

Meter module. Due to the small space (60mm width) that is available, the master meters are LED bar graphs There are 3 meters, Left signal, Right signal and phase correlation. The meters always follow the monitor output, which is Mix (by default), External 1, External 2, PFL or AFL. There is a PFL/AFL indicating LED to warn when the monitor system is switched over to PFL or AFL. There is also a console power LED which glows when all supply voltages are healthy.

The Masterflex module has master level & master Pre/Post switching for the echos & foldbacks.

There are Group master level controls and route-to-mix switches.

The Sound Techniques bus compressor is in the middle area of the module and can be switched pre or post the Mix fader. Controls for parallel compression are provided.

Console mode, Solo mode and Channel meter source switches are above the monitor level control and its associated switches.

The Masterflex does not have an oscillator and does not have any talkback facilities.

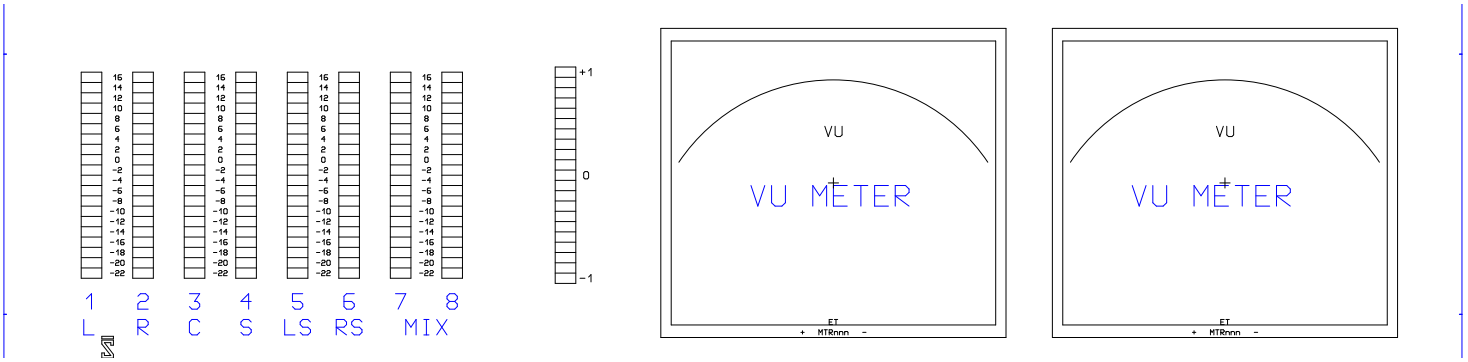
Z-Pod.

This is the most basic of the master units and is used with an 8-channel bucket, the pair forming a ZR demonstration system, the purpose being to show the core facilities of the ZR console, in particular, the central mode switching, solo safe system and echo & foldback global pre/post fader switching. Although the facilities are limited, the Z-Pod / bucket combination is a viable product in its own right. Of necessity, it is an external unit and it connects to the bucket with a pair of multicore cables that are 5 metres long. The Z-Pod itself is an aluminium enclosure that can be sat on the bucket’s control surface, on an adjacent table, or similarly convenient place near to the bucket. Its connecting cables are light weight and do not impinge on their surroundings. As well as the aforementioned master switching, the Z-Pod also has a monitor level control, master Mix fader, headphones amplifier, PFL/AFL indicating LED and a switch to select an external stereo monitor source. The feed to the monitor speaker outputs can be switched on/off. All console bus outputs (groups, echos, foldbacks) are available as balanced line-level signals on DB25 connectors at the back of the bucket, but they do not have any level control or monitoring facilities.

ZR Compact Master Section & Facilities

The Compact Center Section comprises of 3 modules:
Meter bridge,
Master Module,
Fader module.

Meter bridge:



Metering consists of:

- 8 LED bar graphs for level metering, 20-segment each.
- A 21-segment LED phase correlation meter.
- Two mechanical movement VU meters.

Operationally, the signal being presented to the LED level bar graphs is determined by the Master Meter Control switches: it is either Group Outputs or 5.1 Surround Monitor. In Surround mode, the first 6 meters look at the 5.1 signal whilst meters 7&8 look at the main Mix L&R signals (parallel with the VU meters).

The VU meters follow the monitor selection.
The phase correlation meter is fed from the VU meters.

For monitoring of “hot” signals the inputs to the meters can be dimmed by 10dB via the “-10 DIM” switch in the Master Meter Control area.

Master Module

The module has a fixed set of facilities in regard to the controls that are provided as well as their locations.

Mechanically, the module comprises of a single-piece sub-panel that provides the strength to hold the electronic assemblies plus a set of 4 dress panels that provide the aesthetic finish to the module. The dress panels serve a number of purposes:

1. To cover the many screws that are required to fix the electronic assemblies to the sub-panel.
2. To minimize the number of pot knobs that need to be removed when changing an electronic assembly.
3. To provide the option of a small degree of customization, for example, the module is capable of having 2 compressors but some customers may only want one compressor to be installed.
4. Aesthetically the dress panels give the appearance of a modular assembly.

The horizontal split points for the dress plates divide the module into:

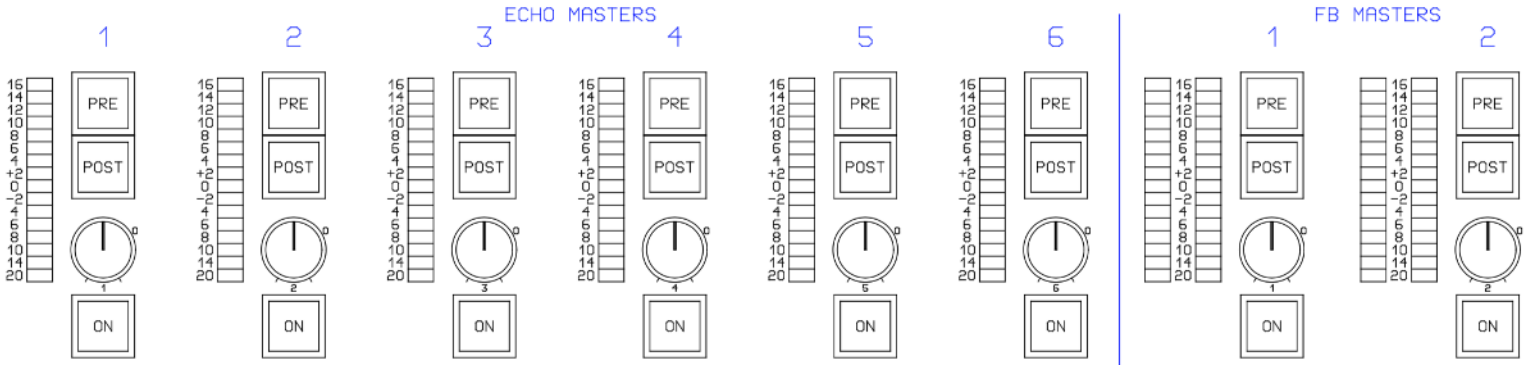
1. Echo & Foldback masters,

2. Effects returns & misc functions,
3. Group controls, Status & Compressors
4. Monitor & Talkback.

Facility Descriptions:

Starting at the top of the module, working downwards, the facilities are:

Echo Master/Foldback Master



The console has 6 mono echo sends and 2 stereo foldbacks.

With the exception of stereo meters for the foldback masters, the facilities for each master are identical, and comprise:

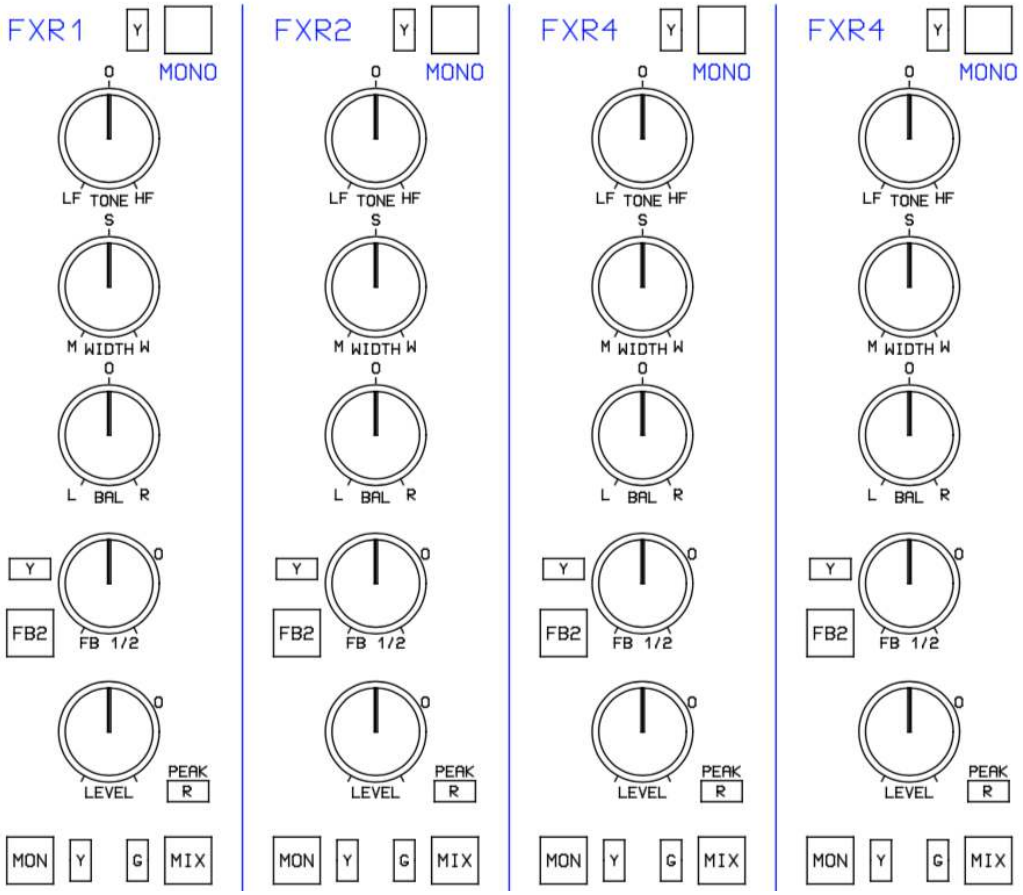
- Master level control with a nominal 6dB gain in hand.
- 16-segment LED meter, covering the range -20dBu to +16dBu.
- Output ON switch to turn the output on/off.
- Master pre-fader and post-fader selector switches. These drive all channels to globally set the echo (or FB) send pre or post fader. The master selection can be individually swapped on the console's channels as required.

Effects Returns

There are 4 stereo effects (reverb) returns, each with:

- MONO switch for those effects devices that only provide a mono output. The switch takes the signal on the left leg and splits it equally left & right.
- TONE pot. This is a single-pot “tilt equalizer” The center position is flat, turning left increases bass whilst reducing treble and turning right increases treble whilst decreasing bass.
- Stereo width pot. The center position is stereo. Turning left steadily reduces the stereo image to mono; turning right steadily increases the stereo image width by phase manipulation to give a sense of a widening image.
- Balance pot to shift the left-right balance of a stereo image.
- Foldback send pot. Switchable between FB1 and FB2 sends, a yellow LED illuminates when FB2 is selected. The foldback source is fixed as being post-level pot.

- Level pot. Used to set the level that is being contributed to the console's stereo MIX bus.
- MIX switch. Turns on the feed to the MIX bus. A green LED illuminates when MIX is selected.
- MON switch. Sends stereo PFL & AFL signals to the monitor system. A yellow LED illuminates when active. The monitor system determines whether PFL or AFL is presented to the speakers.
- Peak LED. This lights when either the left or right leg rises above +20dBu in level.



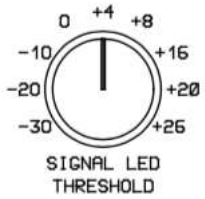
Meter Illumination Brightness

A pot sets the brightness of the illumination of the console's VU meters.

Signal LED Threshold

A rotary switch sets the signal level at which the channel SIGNAL LEDs light. The pre-determined levels are:

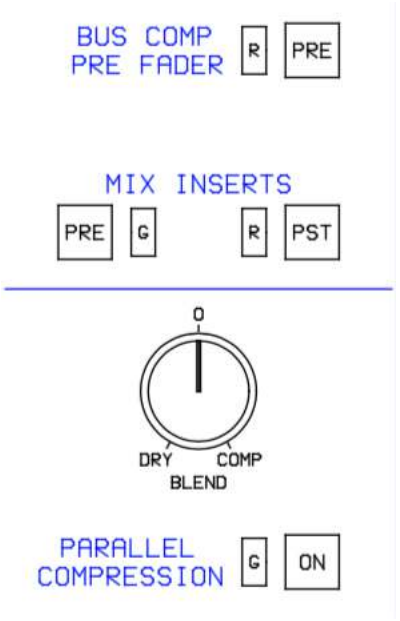
-30dBu, -20dBu, -10dBu, 0dBu, +4dBu, +8dBu, +16dBu, +20dBu, +26dBu.



Stereo Mix Output

The Mix path consists of a fader, signal routing switches and the bus compressor. The controls are:

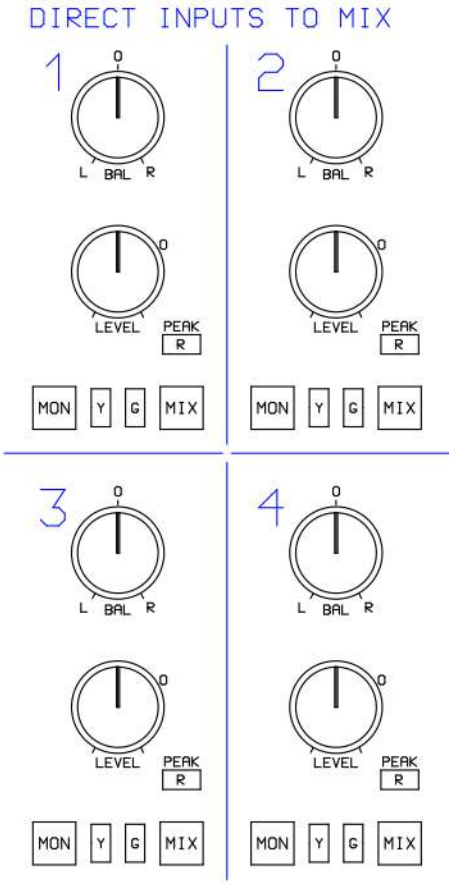
- Bus Comp Pre-fader switch. By default the bus comp is post-fader; this switch moves it pre-fader. There is an associated red LED to show pre-fade.
- Pre-fader mix insert on/off switch & LED.
- Post-fader mix insert on/off switch & LED.
- Parallel compression ON switch & LED.
- Parallel compression “blend” pot. The blend pot takes the compressed (wet) signal and the compressor input (dry) signal and sweeps between them, enabling a blended mix output that ranges between uncompressed to compressed.



Mix Direct Inputs

4 stereo inputs to the console can be fed directly into the main stereo mix. These are typically pre-mixed stereo stems or feeds from external sub-mixers. There are a minimum of controls and circuitry in these inputs. The facilities for each input are:

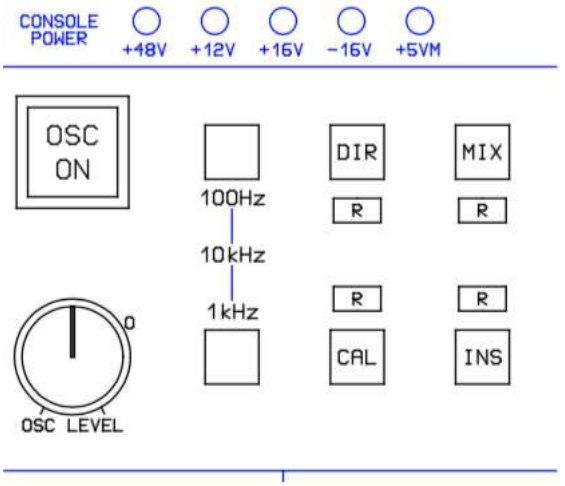
- Balance pot to shift the left-right balance of a stereo image
- Level pot. Used to set the level that is being contributed to the console's stereo MIX bus.
- MIX switch. Turns on the feed to the MIX bus. A green LED illuminates when MIX is selected.
- MON switch. Sends stereo PFL & AFL signals to the monitor system. A yellow LED illuminates when active. The monitor system determines whether PFL or AFL is presented to the speakers.
- Peak LED. This lights when either the left or right leg rises above +20dBu in level.



Console Power

A set of LEDs provide visual indication that the various power supply voltages to the console are present. The LED drive circuit illuminates each LED within a pre-determined voltage window; each voltage must not only be present, but must also be within an acceptable voltage range before the LEDs will light.

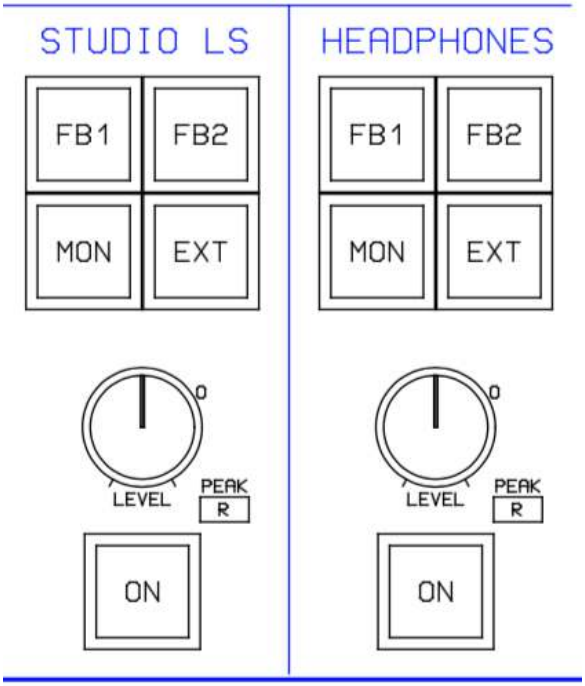
Oscillator:



- OSC ON turns the oscillator on. This is cancelled by the Status section's RED LIGHT switch being activated or by pressing any talkback switch.
- LEVEL sets the output level of the oscillator.
- CAL sets the output to a calibrated level and in doing so defeats the level pot. A red LED warns that CAL is active.
- One of three frequencies is set by two switches.
- DIR routes the oscillator to a dedicated oscillator output.
- MIX routes the oscillator to the main MIX output.
- The oscillator has its own insert point on the patchbay. Pressing the INS switch activates the oscillator's insert return. By plugging an external oscillator (e.g. from a test set) and operating the INS switch, the external oscillator can be used instead of the console's own oscillator. This can be useful when doing console performance testing or fault-finding.

Studio Loudspeakers Controls (SLS)

One of 4 sources can be fed to the studio loudspeakers:



- Foldback 1,
- Foldback 2,
- The output from the monitor system (MON),
- An external input from the patchbay (EXT)

Other controls are:

- A level pot with 6dB gain in hand sets the output level.
- A peak LED that illuminates at +20dBu
- An ON switch to activate the feed to the studio loudspeakers amplifier.

The studio loudspeakers are switched off by either the Status section's RED LIGHT or MIC/REC switches being activated.

Talkback to SLS replaces the selected source.

Talkback to FB1 or FB2 replaces the signal on the selected foldback output.

Headphones Controls

One of 4 sources can be fed to the headphones:

- Foldback 1,
- Foldback 2,
- The output from the monitor system (MON),
- An external input from the patchbay (EXT)

Other controls are:

- A level pot with 6dB gain in hand sets the output level.
- A peak LED that illuminates at +20dBu
- An ON switch to activate the feed to the headphones amplifier.

The headphones are not affected by the Status section's RED LIGHT or MIC/REC switches being activated.

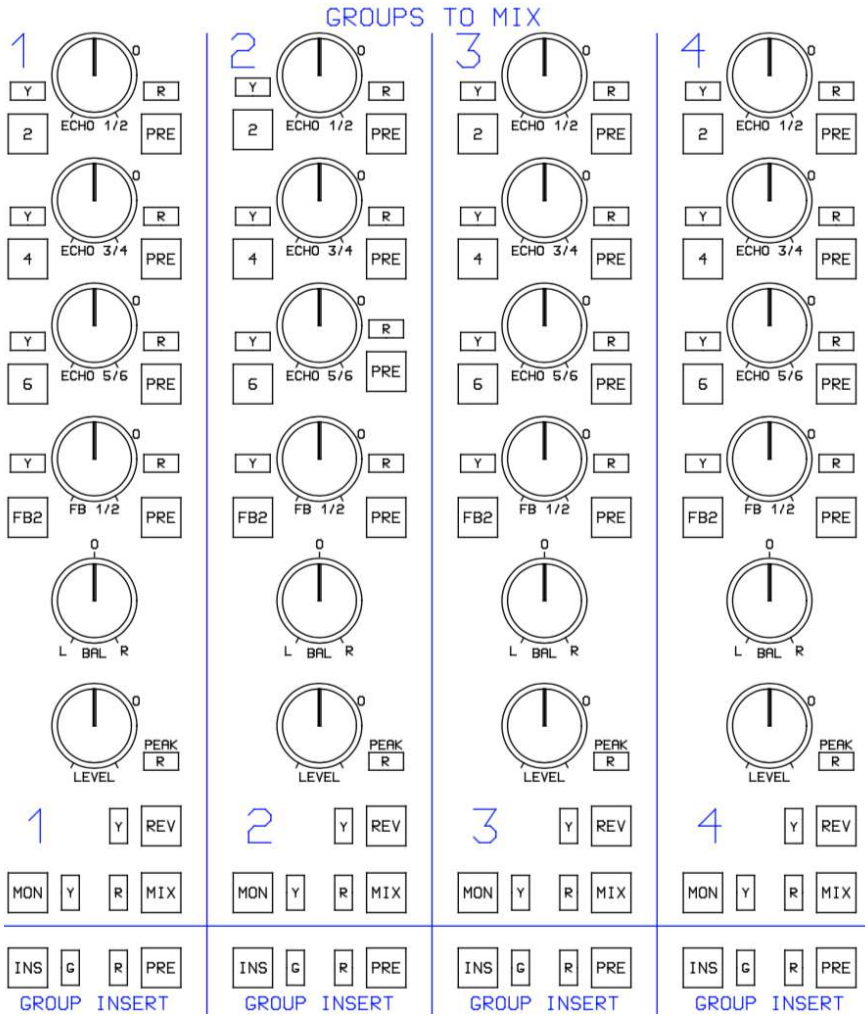
Talkback to SLS also feeds the headphones and replaces the selected source.

Talkback to FB1 or FB2 replaces the signal on the selected foldback output.

Groups to Mix and Group Insert Controls

The console's 8 group paths (4 stereo groups) can be sub-mixed into the echo, foldback and main Mix buses. The signal source for the group-to-mix signal is the post-fader group output. There are 4 sets of controls, one each per stereo group, with this functionality:

- At the bottom of the column of controls there is a level pot that sets the level that the group contributes to the Mix bus when the MIX switch is pressed.
- REV is a fader/level pot reverse switch. The default signal flow is for the group output level to be controlled by the fader in the console's fader bed and for the group-to-mix level to be controlled by the pot. REV swaps these functions so that the pot sets the group output level and the fader sets the group-to-mix level.
- The MIX switch routes the group to the MIX bus. It has an associated green LED that is lit when group-to-mix is selected.



- The PEAK LED illuminates when the post-fade group-to-mix signal exceeds +20dBu.
- MON routes the group-to-mix PFL and AFL signals to the monitor system. A yellow LED illuminates when active. The monitor system determines whether PFL or AFL is presented to the speakers.
- Moving to the top of the column of controls, there are the Echo and Foldback controls. Describing Echo Sends 1 / 2, the level pot has an associated switch that selects which bus (1 as default, 2 with the switch pressed) is driven by the pot. A yellow LED is illuminated when Echo 2 bus is selected.
- PRE selects the echo source as pre or post the level pot (or fader if REV is selected).
- Echo 3 / 4, Echo 5 / 6 and Foldback 1 / 2 pots and switches operate in the same manner.
- BAL allows the left-right stereo balance of the group-to-mix signal to be shifted.
- The output group's insert point is activated by the INS switch. The insert is post-fader by default, but can be switched pre-fader. LEDs illuminate to show the active switches.

Console Status

A bank of switches determines the operating modes of the console and its facilities. The switch blocks within this bank are:

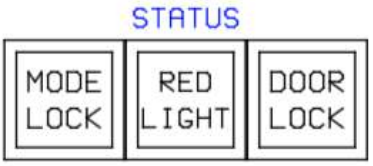
Status

- Mode Lock. Various of the console center-section selectable functions that affect the whole console or the console's operation can be locked when this switch is operated. This is to stop accidental changes to be made during console operation. “Console Mode” is always driven by Status Lock. “Solo Mode”, “Master Meter Control”, “Channel Meter Source”, “Echo Pre/Post”, “Foldback Pre/Post” are optionally lockable by internal jumper links. These are factory-set, but can be altered by a technically competent person.
- Red light drives a relay that can be used to activate a red light outside the studio, usually used to warn people that the studio is in use.
- Door lock drives a relay that can be used to activate a door locking device so as to over-ride the actions of people who are intent on ignoring the red light.
- The Red Light and Door Lock switches can be used for any contact-closure functions; Sound Techniques chooses to call them Red Light and Door Lock, however, users can request that the switch buttons be printed with their own preferences.

Console Mode

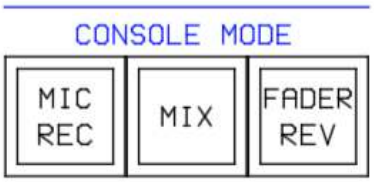
- Mic/Record sets all input channels so that the selected input source is the Microphone, with its signal passing through the channel EQ and the short fader. Locally, per channel, the input can be flipped between Mic and Line. The console's monitor inputs route through the long fader. Locally, per channel, the faders can be reversed.

- Mix sets all input channels so that the Monitor input routes through the channel EQ and the long fader, with the Mic/Line input routing through the short fader. Locally, per channel, the faders can be reversed.
- Fader Reverse will globally swap the roles of the long and short faders, over-riding any channel fader reverse settings.



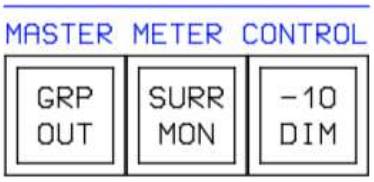
Solo Mode

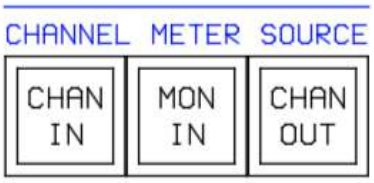
- Chan Safe. Channel solo is destructive by default – operating a channel solo will mute all other channels. Chan Safe turns the solo function into a PFL/AFL function so that when a channel solo is operated, the mix remains intact and the monitor speakers swap over to the PFL or AFL signal being sent from the channel.
- Mon Safe performs in the same way, but on the monitor path.
- PFL/AFL cancels all destructive solo, making both Chan safe and Mon safe active.
- Chan Safe & Mon safe do not affect the Group Fader Solo switches.
- PFL/AFL cancels Group Fader destructive solo, so that Group Fader Solo becomes a PFL/AFL.

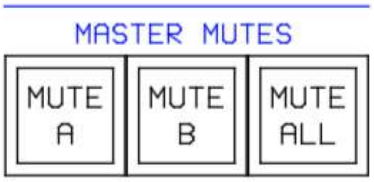


Master Meter Control

- Group Out is the default source for the 8 bar-graphs in the meter bridge.
- Surr Mon swaps the bar graph source from groups to the monitor control panel where the selected 5.1 external source will be shown on the meters. Meters 7&8 follow the L&R VU meters.
- -10 Dim is used to attenuate the feeds to the meters by 10dB. This is used when monitoring high-level or “hot” signals that would normally “pin” the VU meter needles at maximum or fully light the bar graphs; the -10dB pad brings the levels into a range that can be metered.







Channel Meter Source

- Chan In selects the output of the mic/line input stage as the feed to the channel meters.
- Mon In selects the monitor input as the feed to the channel meters.
- Chan Out selects the post-fader channel direct output as the feed to the channel meters.

There are no local channel switches to alter these sources.

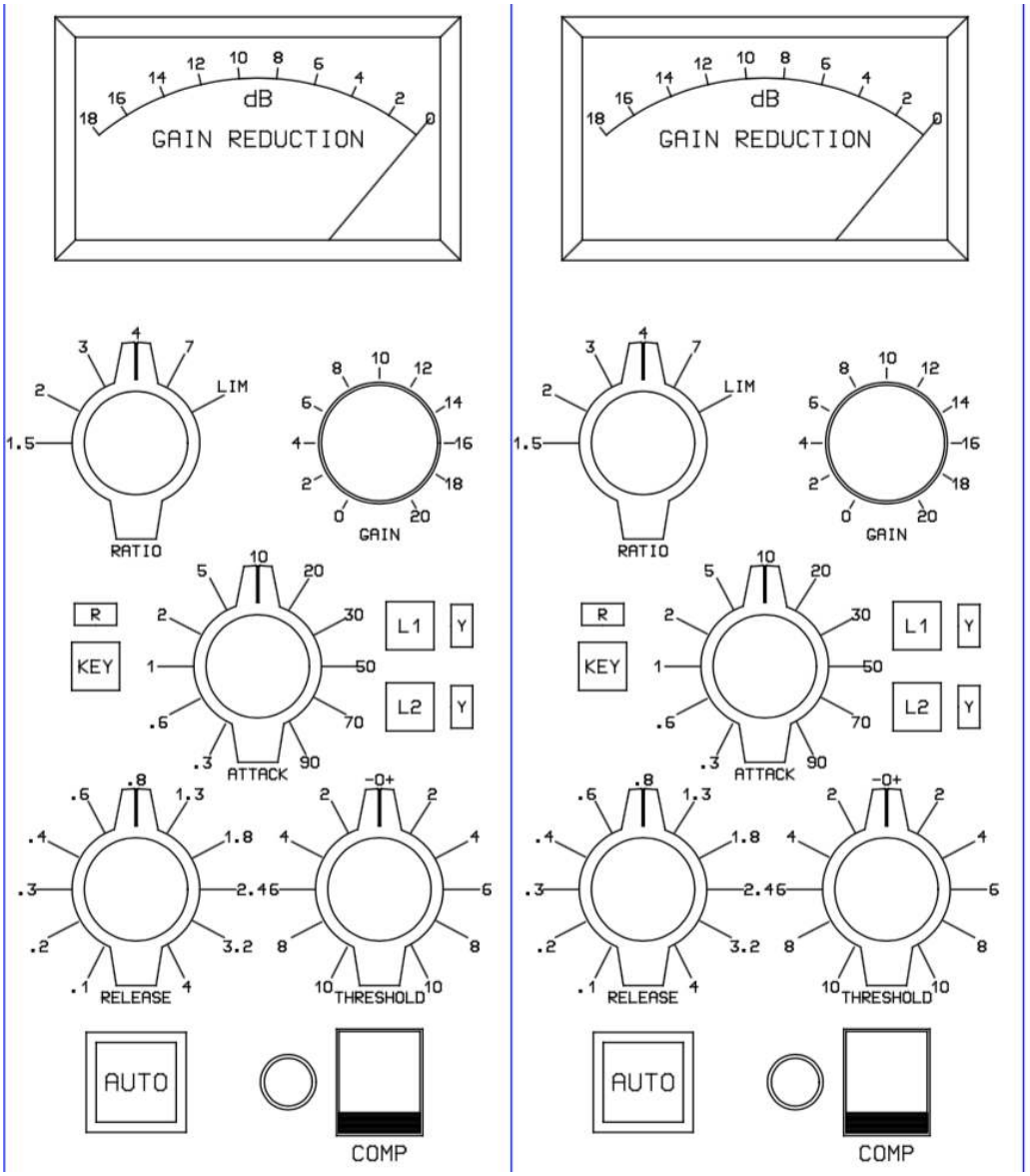
Master Mutes

The drive for the console's Mute A and Mute B buses is controlled from here.

- Mute A. Any channel or group that is assigned to Mute A bus will be muted when this switch is operated.
- Mute B. Any channel or group that is assigned to Mute B bus will be muted when this switch is operated.
- Mute All. Any channel or group that is assigned to Mute A bus or Mute B bus will be muted when this switch is operated.

Stereo Bus Compressor

The stereo bus compressor is a solid-state VCA-based compressor that can operate as a stand-alone stereo unit, or be part of a multi-channel compressor system by linking several units together via the link buses. The compression ratio ranges from a gentle 1.5:1 through to limiting. The soft-knee turnover characteristic gives the unit a smooth unobtrusive compression performance, well suited to mix bus and vocal compression. Rotary switches allow the set up of accurate and repeatable control configurations. Normally, the input signal is used to drive the VCA. Under certain circumstances an alternative “KEY” input can be used to drive the VCA.



The variable controls that shape the signal dynamics are a conventional set of five comprising: threshold, attack, release, gain and ratio. A further set of five switches provide for additional functions: key input, link buses 1&2, auto release, compressor in/out. The meter indicates gain reduction in dB.

Key. The input source for the side-chain is usually the same signal as the compressor input. In certain circumstances it is useful for the compressor to be controlled (or “Keyed”) by a different signal. Operating the KEY switch allows the separate key signal input to be used to feed the compressor side-chain. When active, the associated LED glows red.

Threshold sets the point at which

the soft-knee compression starts to take effect.

Attack. The attack time determines the speed at which a compressor will react to an over-threshold level. It is typically variable over the range 300µS to 90mS.

Release sets the time taken to for the compressor to fully recover from an act of compression or limiting.

Auto switches in an automatic twin-time release circuit that reacts to the dynamic range of the input signal. The higher the level above threshold and the longer it stays above threshold, the longer the release time will be. A signal that briefly exceeds the threshold will release quickly. When AUTO is in operation (switch glows green), the rotary release control is inactive.

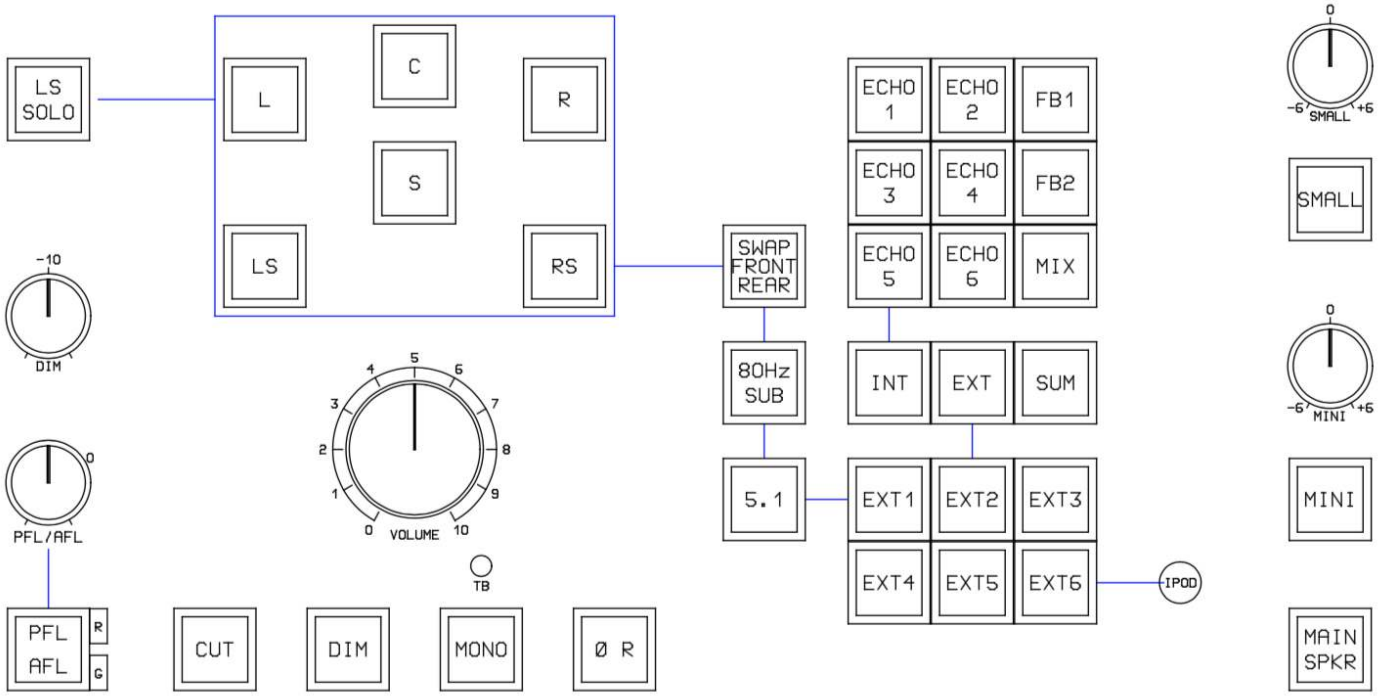
Gain. The reduction in level and peaks caused by compression can be compensated for by adding make-up gain back to the compressed signal by use of the gain control.

Ratio sets the amount of compression that is applied to an input signal. At low ratios, there is still a significant rise in output level for a given rise in input level and much of the dynamic range of the signal is preserved. As the ratio is increased the dynamic range of the output decreases and the effect of compression becomes more noticeable. At its maximum position, the ratio control is at around 100:1, which is limiting.

The COMP switch places the compressor into the Mix signal path.

Link 1 & Link 2 allow the bus comp to be linked to the optional patchable compressor as well as any other Sound Techniques compressors that are fitted to the console.

Monitor Control

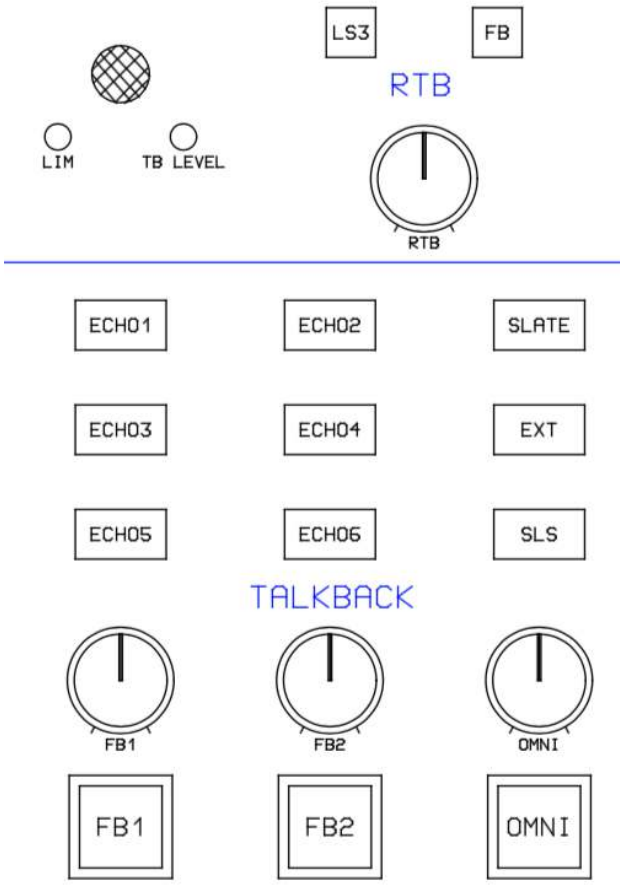


- One of 9 signal sources internal to the console can be pre-selected for monitoring, these sources being Echos 1-6 (mono), FB1, FB2, Mix (stereo). The mono Echo signals are sent equally to the left & right speakers.

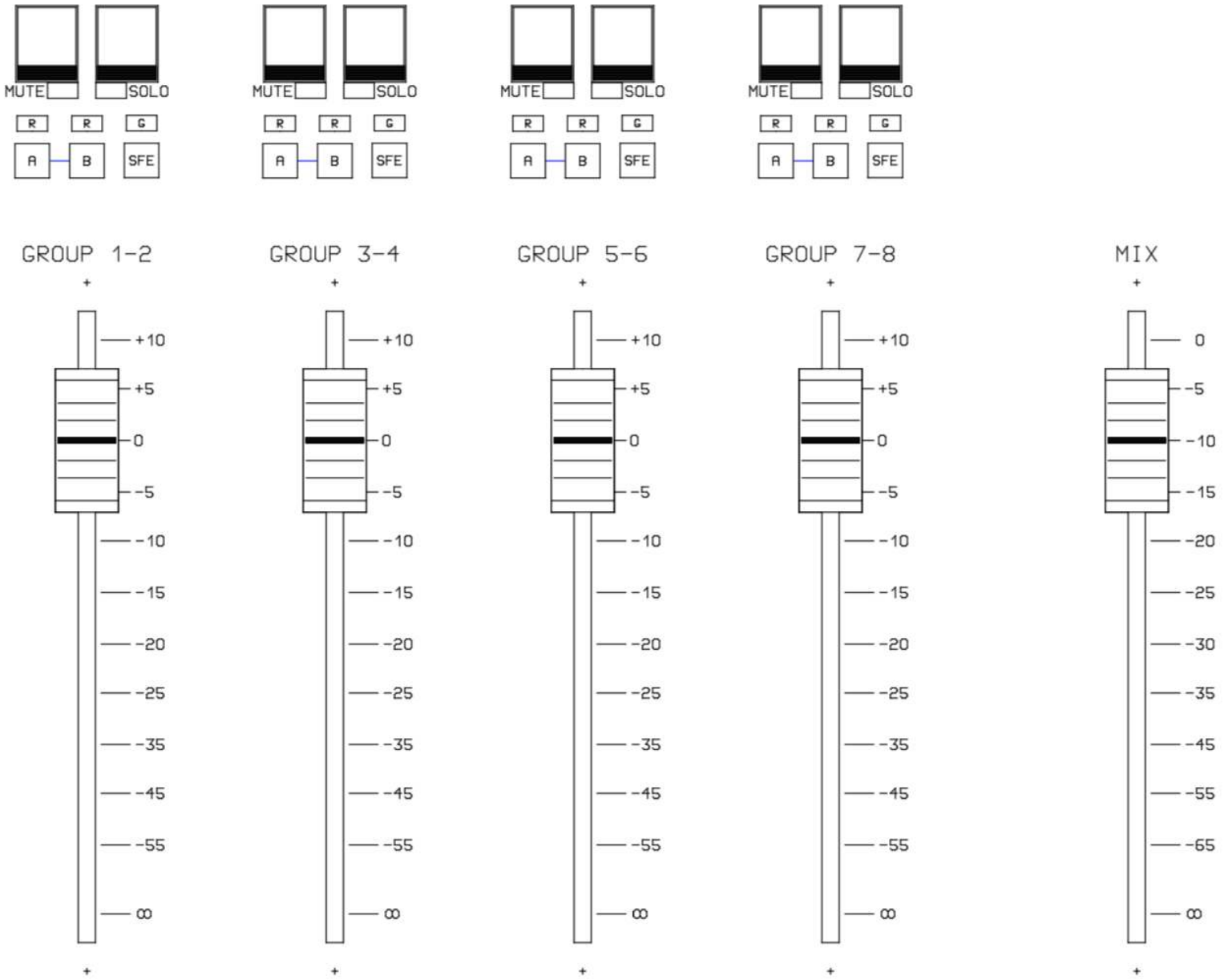
- One of 6 external sources can be pre-selected for monitoring (EXT 1-6). Of these, Ext 1-3 are stereo/ 5.1 surround sources and 4-6 are stereo sources. The default monitor mode for the console is stereo, however, when the 5.1 switch is active, the external sources become 5.1 surround sources.
- The External sources – pre-mixed stems – can be summed. This is a basic way to create a 5.1 mix of the selected stems. This function is activated by the SUM switch. Switches within the EXT switch bank no longer interlock.
- External 6 has a 3.5mm mini-jack IPOD socket on the front panel.
- When 5.1 mode is selected, an 80Hz SUB filter can be applied to the monitored source.
- The front & rear speaker L&R feeds are swapped by the SWAP FRONT REAR switch.
- The 5.1 surround signal, by default, can have its paths individually muted by the switches that are arranged in a surround array. Alternatively, the LS SOLO switch changes the function of the LS array switches to a solo mode, so that operating an array switch (or switches) will mute the other signals.
- PFL/AFL. Where both PFL and AFL signals are available (e.g. from channels), this switch selects which signal is presented to the monitors, the choice being indicated via the adjacent LEDs. The switch itself is lit only when a PFL or an AFL is active. Where only a PFL (or an AFL) is available, the PFL (or AFL) itself will drive the appropriate indicating LED to show the type of signal being presented to the monitors. This ensures that a signal is always presented to the monitors, no matter what the switch is selected to and that the operator is always advised of the signal type. The switch-over from the selected monitor source to PFL/AFL is automatic.
- The level of the PFL/AFL signal can be trimmed by the PFL/AFL pot.
- CUT, DIM, MONO & Phase Reverse Right act on the monitor output. Depth of dim is adjustable by the DIM pot. Mono sums all signals together. Phase Right reverses the phase of the right signal for confirmation of mono-compatibility.
- Monitoring is usually through the MAIN SPKR. Two additional sets of speakers, SMALL and MINI, with their own trim controls are available. The main volume pot sets the speaker levels for all speakers, the Small & Mini pots allow these speakers to be trimmed such that when swapping between speakers there is no change in level.
- TB dim trim (located above the DIM switch. This is a preset pot that is trimmed to suit the amount of dim that is applied to the monitors when Talkback is active.

Talkback

- There are 8 pre-selectable talkback destinations (Echo 1-6, Ext, SLS) that are available under the command of the OMNI switch and level pot. A 30Hz slate signal is applied to the selected destinations when SLATE is pressed.
- Talk to foldback is the most frequently used talkback facility. FB1 & FB2 have their own dedicated TB switches and level pots.
- The built-in TB mic has a pre-set level trimmer that is used to set the level for the console installation. There is also a built-in limiter , the threshold of which is available to set for the console installation.
- A return talkback path is provided for communication from the live-room to the console. The gain of the RTB mic is set by the RTB pot. The RTB signal can be routed to the SMALL speakers (LS3) if required. RTB can also be routed to the foldbacks so that musicians in the live room can clearly hear any comms without having to remove their headphones. This facility does have a risk of acoustic feedback; responsibility for managing this lies with the user.



Master Fader Bank Module



The Master Fader module has 5 faders (4 stereo Groups & the Mix Master). It also has the group fader switches.

The group fader facilities are the same for all 4 faders:

- 100mm fader driving VCAs in the group path. The fader has 10dB of gain in hand.
- Group fader and Group-to-mix rotary pot functions are reversed by the REV switch in the group-to-mix section of the master module.
- Group Mute.
- Group Solo. This is a mini-solo system that is independent of the channel and monitor solo systems and operates only on the Groups. It is destructive and will mute the other groups unless their group

SFE switches are operated, or, unless the console's Solo Mode switch is set to PFL/AFL (which forces all solos into a safe PFL/AFL mode).

- Mute A & Mute B buses will cause any groups selected to mute when the Master A or B switches are operated.

Mix Fader

The 100mm Mix master fader drives VCAs in the Mix path. It does not have gain in hand; the top of the fader travel is 0dB.

Stereo Equalizer Module

The 5-band equalizer is a combination of traditional Sound Techniques passive RCL (resistor, capacitor, inductor) circuitry for the HF cut & boost bands, coupled with modern inductor-based mid bands and a modern active LF section. The unique aspects of this design have evolved from both the electronics R&D lab and the recording studio. The intense research, listening and development has been over a significant period of time and with intense real-life studio tests and aural analysis.

The high-frequency section is split into independent BOOST and CUT bands.

The HF boost band comprises of a 9-position switch, where the first 7 positions are bell/shelf frequency selection from 2kHz through to 12kHz and the last two positions are shelf characteristic at 7.5kHz and 15kHz.

An associated 3-position Bandwidth switch (with Narrow, Medium, Wide settings) is also included to set the Q of the band. Boost is in 2dB steps from 0dB (flat) to +18dB.

The HF Cut band is shelving characteristic. There are two switches; an 8-position frequency selector covering 2kHz through to 15kHz, and a 10-position cut switch covering the cut from 0dB (flat) to -14dB.

Hi and Lo Mid frequency processing is similar in that each band has a 7-position switch to select the frequency, and a rotary pot that gives +/-15db of cut or boost. An additional switch, Hi Q, increases the Q from …. to …..

The low frequency section (Bass) has 2 rotary switches. One selects the amount of cut or boost; around +/-15dB with a center-zero position. The second rotary switch selects the frequency.

Two filter switches located at the bottom of the EQ module provide filtering at either 40Hz, 80Hz or, when both are engaged, filtering at 120Hz.

Finally, the entire equalizer section is switched in or out of circuit by the key lever switch. An associated amber LED illuminates to provide visual indication of the EQ being IN.

Sound Techniques is able to offer two types of equalizer card. The HF and mid-bands are identical, but there is a difference in facilities for the LF band.

The Series 1 EQ has a shelving response at 30Hz, 50Hz, 80Hz, 120Hz, 180Hz and 270Hz. Cut and boost is around the +/-15dB mark.

The Series 2 EQ has a shelf response at 80Hz, then a bell response at 30Hz, 50Hz, 90Hz, 160Hz, and 270Hz. Cut and boost is around the +/-15dB mark.

Card types are inter-changeable. A card selection jumper needs to be set to the appropriate position.

ZR Masterflex Master Section

The Masterflex master module is a very compact master, taking up only one unit of width and is of the same physical size and mechanical specification as a channel module. A 9-unit wide bucket can hold 8 channel modules plus the Masterflex module, which can be placed to the left or right of the 8 channels. Although envisaged for ZR “sidecar” units and small format consoles of 8 to 24 channels, there is no technical or practical reason to limit the number of channels that a Masterflex module can handle. The Masterflex module is complimented by two other modules:

Mix fader module. This also has the master A & B mute bus switches and mix insert switches.

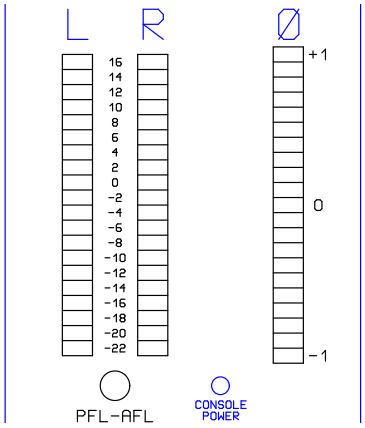
Meter module.

The Masterflex module has master level & master Pre/Post switching for the echos & foldbacks. There are Group master level controls and route-to-mix switches. The Sound Techniques bus compressor is in the middle area of the module and can be switched pre or post the Mix fader. Controls for parallel compression are provided. Console mode, Solo mode and Channel meter source switches are above the monitor level control and its associated switches.

The Masterflex does not have an oscillator and does not have any talkback facilities.

Meter Module

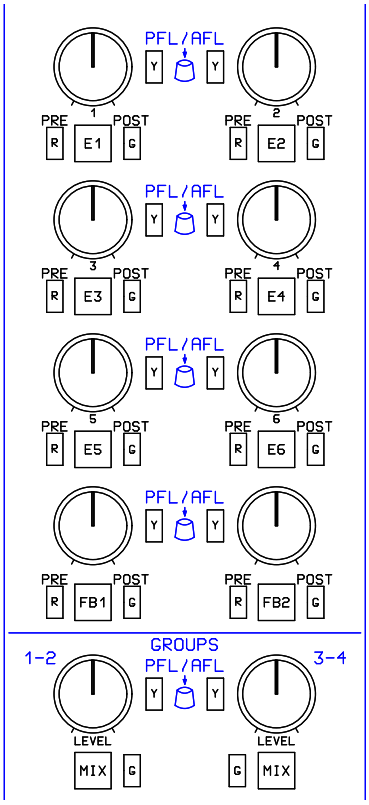
Due to the small space that is available (60mm width), the master meters are LED bar graphs There are 3 meters, Left signal, Right signal (20-segment each) and phase correlation (21 segment). The meters always follow the monitor output, which is Mix (by default), External 1, External 2, PFL or AFL. There is a PFL/AFL indicating LED to warn when the monitor system is switched over to PFL or AFL. There is also a console power LED which glows when all supply voltages are healthy.



Masterflex Master Module

Echo & Foldback Masters.
The 6 echo & 2 foldback masters are at the top of the module. The facilities for each are identical.
A pot is provided for output level control.
Pressing the pot knob activates PFL/AFL and an associated tally LED.
A switch below the pot globally selects the bus to be pre-fader or post-fader. There are tally LEDs to show the selection; red is pre-fader, green is post-fader.

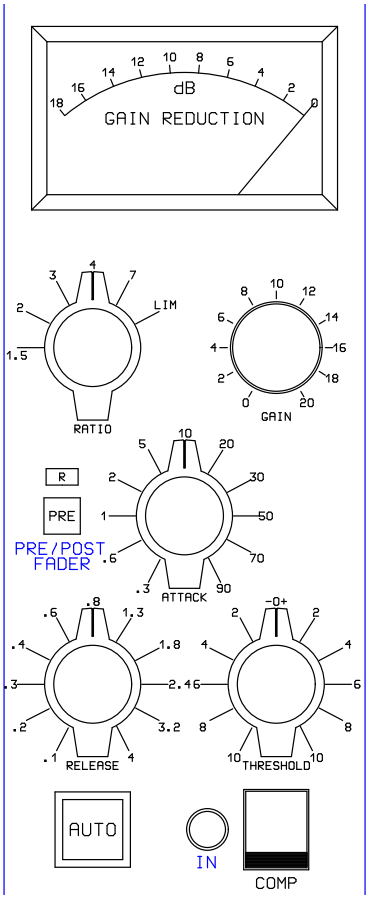
Group Masters.
The 4 stereo output groups are each provided with an output level control. Pressing the pot knob activates PFL/AFL and an associated tally LED.
A switch below the pot selects group-to-mix and there is a tally LED.



Stereo Bus Compressor

The stereo bus compressor is a solid-state VCA-based compressor. The compression ratio ranges from a gentle 1.5:1 through to limiting. The soft-knee turnover characteristic gives the unit a smooth unobtrusive compression performance, well suited to mix bus and vocal compression. Rotary switches allow the setting of accurate and repeatable control configurations.

The variable controls that shape the signal dynamics are a conventional set of five comprising: threshold, attack, release, make-up gain and ratio.



The meter indicates gain reduction in dB.

Threshold sets the point at which the soft-knee compression starts to take effect.

Attack. The attack time determines the speed at which a compressor will react to an over-threshold level. It is typically variable over the range 300µS to 90mS.

Release sets the time taken to for the compressor to fully recover from an act of compression or limiting.

Auto switches in an automatic twin-time release circuit that reacts to the dynamic range of the input signal. The higher the level above threshold and the longer it stays above threshold, the longer the release time will be. A signal that briefly exceeds the threshold will release quickly. When AUTO is in operation (switch glows green), the rotary release control is inactive.

Gain. The reduction in level and peaks caused by compression can be compensated for by adding make-up gain back to the compressed signal by use of the gain control.

Ratio sets the amount of compression that is applied to an input signal. At low ratios, there is still a significant rise in output level for a given rise in input level and much of the dynamic range of the signal is preserved. As the ratio is increased the dynamic range of the output decreases and the effect of compression becomes more noticeable. At its maximum position, the ratio control is at around 100:1, which is limiting.

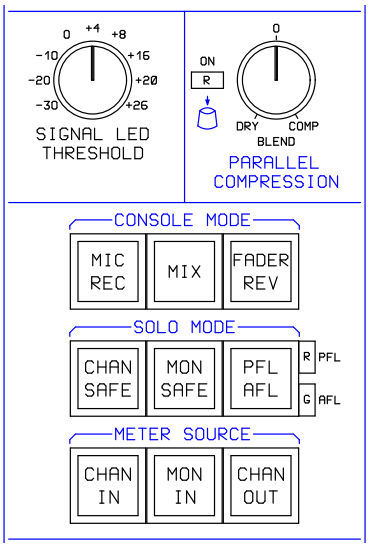
The COMP switch places the compressor into the Mix signal path.

The compressor is post-fader by default, but can be switched to be pre-fade.

Parallel compression “blend”. The blend pot takes the compressed (wet) signal and the compressor input (dry) signal and sweeps between them, enabling a blended mix output that ranges between uncompressed to compressed. Parallel compression is switched into circuit by pressing the knob of the Blend pot.

Signal LED Threshold
A rotary switch sets the signal level at which the channel SIGNAL LEDs light. The pre-determined levels are:

-30dBu, -20dBu, -10dBu, 0dBu, +4dBu, +8dBu, +16dBu, +20dBu, +26dBu.



Console Mode

- Mic/Record sets all input channels so that the selected input source is the Microphone, with its signal passing through the channel EQ and the short fader. Locally, per channel, the input can be flipped between Mic and Line. The console's monitor inputs route through the long fader. Locally, per channel, the faders can be reversed.
- Mix sets all input channels so that the Monitor input routes through the channel EQ and the long fader, with the Mic/Line input routing through the short fader. Locally, per channel, the faders can be reversed.
- Fader Reverse will globally swap the roles of the long and short faders, over-riding any channel fader reverse settings.

Solo Mode

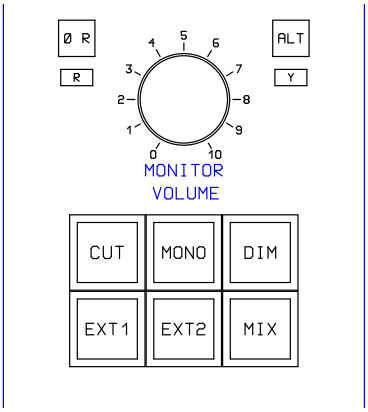
- Chan Safe. Channel solo is destructive by default – operating a channel solo will mute all other channels. Chan Safe turns the solo function into a PFL/AFL function so that when a channel solo is operated, the mix remains intact and the monitor speakers swap over to the PFL or AFL signal being sent from the channel.
- Mon Safe behaves in the same way, but on the monitor path.
- PFL/AFL cancels all destructive solo, making both Chan safe and Mon safe active. It also cancels Group destructive solo, so that Group Solo becomes a PFL/AFL. For non-solo signals, the switch also selects whether PFL or AFL is presented to the monitor speakers.
- Chan Safe & Mon safe do not affect the Group Solo switches.

Channel Meter Source

- Chan In selects the output of the mic/line input stage as the feed to the channel meters.
- Mon In selects the monitor input as the feed to the channel meters.
- Chan Out selects the post-fader channel direct output as the feed to the channel meters.

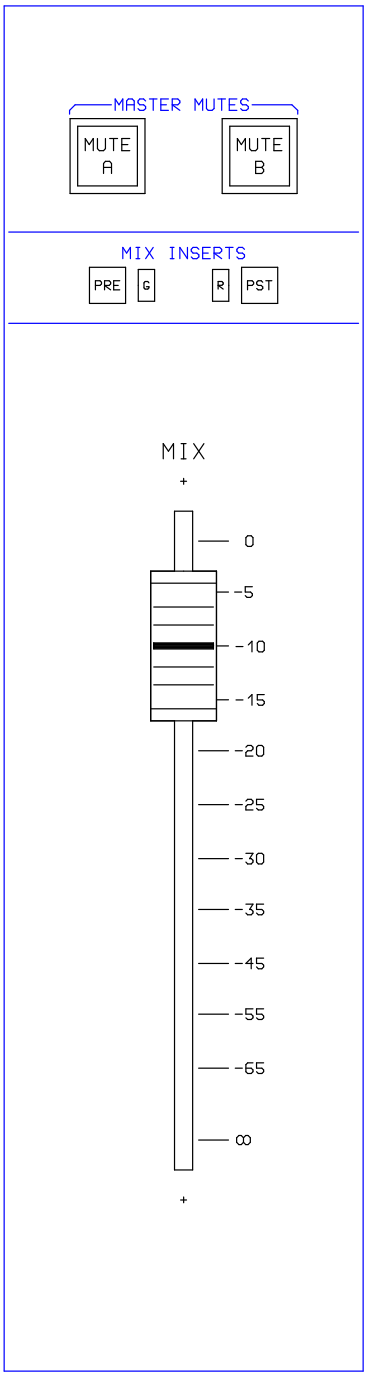
There are no local channel switches to alter these sources.

Monitor Control



- There are 3 monitor sources: External 1, External 2 and Mix (default).
- CUT, DIM, MONO & Phase Reverse Right act on the monitor output. Depth of dim is internally adjustable by a preset pot. Mono sums the L&R signals together. Phase Right reverses the phase of the right signal for confirmation of mono-compatibility.
- Monitoring is usually through the main speakers. An alternate set of speakers can be fed from the monitor system.

Masterflex Fader Module



Mix Fader

The 100mm Mix master fader drives VCAs in the Mix path. It does not have gain in hand; the top of the fader travel is 0dB.

Master Mutes

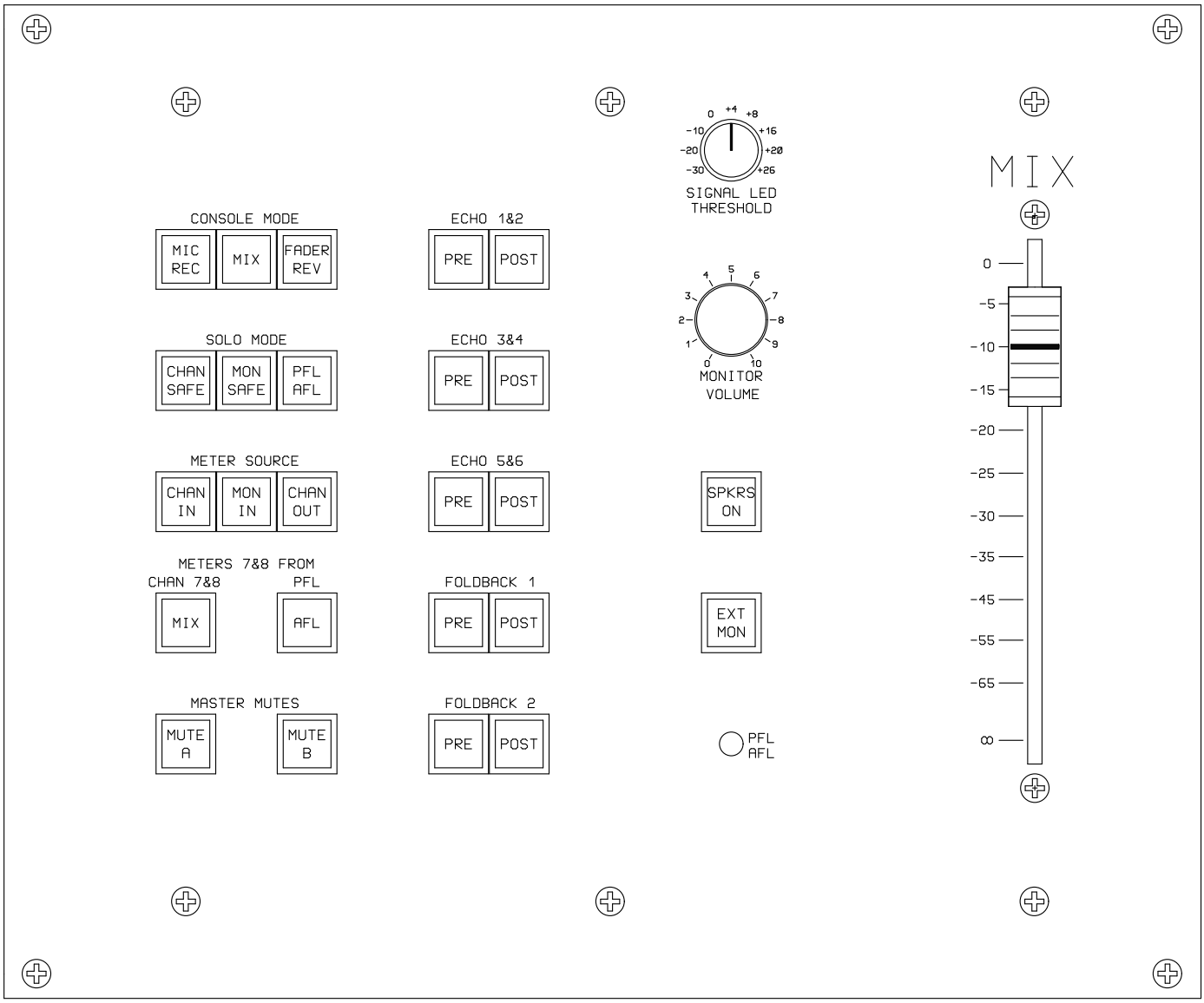
- Mute A. Any channel that is assigned to Mute A bus will be muted when this switch is operated.
- Mute B. Any channel that is assigned to Mute B bus will be muted when this switch is operated.

Mix Inserts

- Pre-fader mix insert on/off switch & LED.
- Post-fader mix insert on/off switch & LED.

ZR Demonstration System – Bucket & Z-Pod

This is the most basic of the master units and is used with an 8-channel bucket, the pair forming a ZR demonstration system, the purpose being to show the core facilities of the ZR console, in particular, the central mode switching, solo safe system and echo & foldback global pre/post fader switching. Although the facilities are limited, the Z-Pod / bucket combination is a viable product in its own right. Of necessity, it is an external unit and it connects to the bucket with a pair of multicore cables that are 5 metres long. The Z-Pod itself is an aluminium enclosure that can be sat on the bucket's control surface, on an adjacent table, or similarly convenient place near to the bucket. Its connecting cables are light weight and do not impinge on their surroundings. As well as the aforementioned master switching, the Z-Pod also has a monitor level control, master Mix fader, headphones amplifier, PFL/AFL indicating LED and a switch to select an external stereo monitor source. The feed to the monitor speaker outputs can be switched on/off. All console bus outputs (groups, echos, foldbacks) are available as balanced line-level signals on DB25 connectors at the back of the bucket, but they do not have any level control or monitoring facilities.

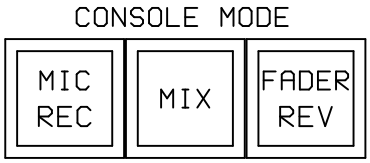


Console Status

A bank of switches determines the operating modes of the console and its facilities. The switch blocks within this bank are:

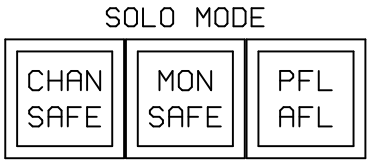
Console Mode

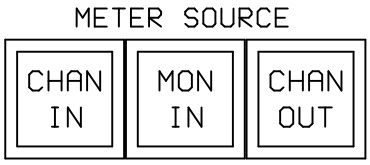
- Mic/Record sets all input channels so that the selected input source is the Microphone, with its signal passing through the channel EQ and the short fader. Locally, per channel, the input can be flipped between Mic and Line. The console's monitor inputs route through the long fader. Locally, per channel, the faders can be reversed.
- Mix sets all input channels so that the Monitor input routes through the channel EQ and the long fader, with the Mic/Line input routing through the short fader. Locally, per channel, the faders can be reversed.
- Fader Reverse will globally swap the roles of the long and short faders, over-riding any channel fader reverse settings.



Solo Mode

- Chan Safe. Channel solo is destructive by default – operating a channel solo will mute all other channels. Chan Safe turns the solo function into a PFL/AFL function so that when a channel solo is operated, the mix remains intact and the monitor speakers swap over to the PFL or AFL signal being sent from the channel.
- Mon Safe works in the same way, but on the monitor path.
- PFL/AFL cancels all destructive solo, activating both Chan safe and Mon safe.





Meter Source

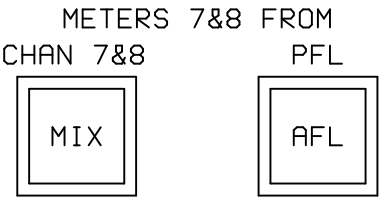
- Chan In selects the output of the mic/line input stage as the feed to the channel meters.
- Mon In selects the monitor input as the feed to the channel meters.
- Chan Out selects the post-fader channel direct output as the feed to the channel meters.

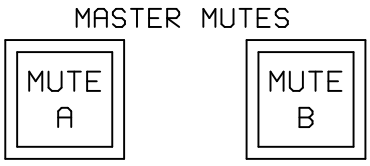
There are no local channel switches to alter these sources.

Meters 7&8

The channel bucket only has 8 meters. The Z-Pod facilities require additional metering, so channel meters 7 & 8 are, under certain circumstances, “borrowed” by the Z-Pod.

- The MIX switch places meters 7 & 8 under the control of the Z-Pod, normally to show the signal present on the Mix Left & Right outputs.
- When a channel or monitor PFL or AFL is activated, and meters 7&8 to Mix is selected, the meters will switch over to PFL, or AFL if the AFL switch is active. (The monitor speakers / headphones also switch to follow this signal selection).

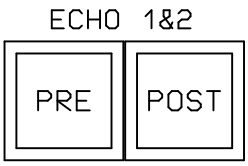




Master Mutes

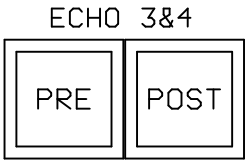
The drive for the console's Mute A and Mute B buses is controlled by:

- Mute A. Any channel that is assigned to Mute A bus will be muted when this switch is operated.
- Mute B. Any channel that is assigned to Mute B bus will be muted when this switch is operated.

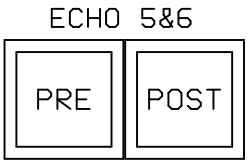


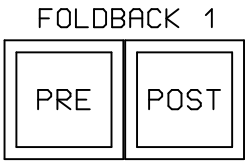
Echo & Foldback Pre/Post

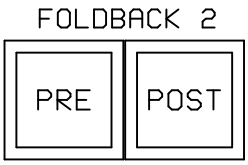
The console has 6 mono echo sends and 2 stereo foldbacks.



- For simplicity and space, the echo send buses are controlled in pairs.
- Master pre-fader and post-fader selector switches. These drive all channels to globally set the echo (or FB) send pre or post fader. The selection can be swapped on the console's channels as required.







Monitor Facilities

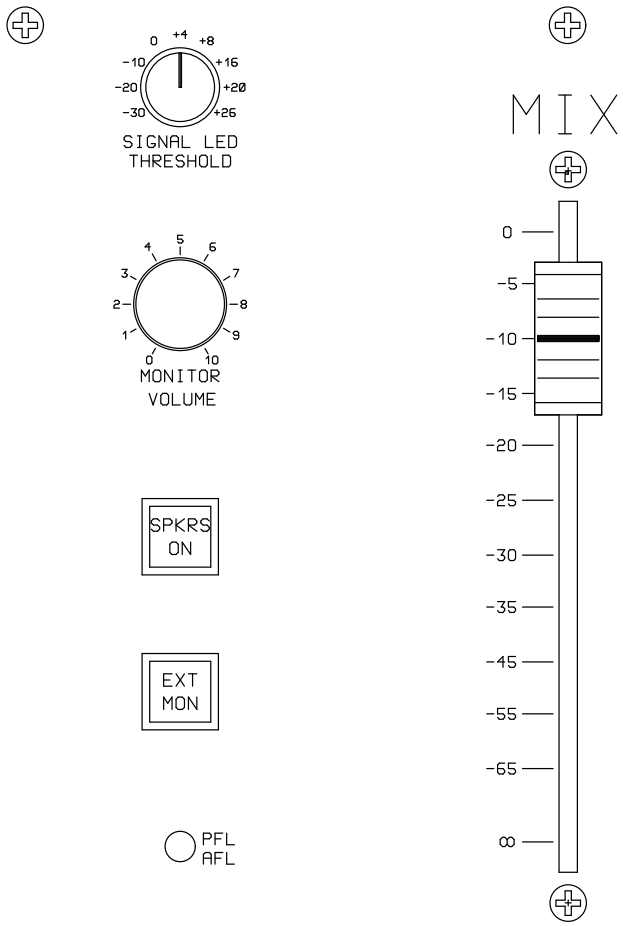
A Signal LED Threshold rotary switch sets the signal level at which the channel SIGNAL LEDs light. The pre-determined levels are:-30dBu, -20dBu, -10dBu, 0dBu, +4dBu, +8dBu, +16dBu, +20dBu, +26dBu.

The Pod has balanced line outputs to feed a pair of monitor speakers. It also has a stereo headphones output. The headphones and speaker outputs are controlled by the Monitor Volume pot. The headphones are always active. The speakers are turned on/off by the SPKRS ON switch.

An external stereo source can be selected for monitoring by pressing the EXT MON switch.

The PFL/AFL LED illuminates whenever a channel or monitor-path PFL or AFL is activated

The Mix fader is a 100mm unit and has unity gain.



Audio Interface

All console bus outputs (8 groups, 6 echos, 2 stereo foldbacks, stereo Mix, stereo PFL, stereo AFL) are available as balanced line-level signals on DB25 connectors at the back of the bucket. These bucket outputs do not have any level control or monitoring facilities.

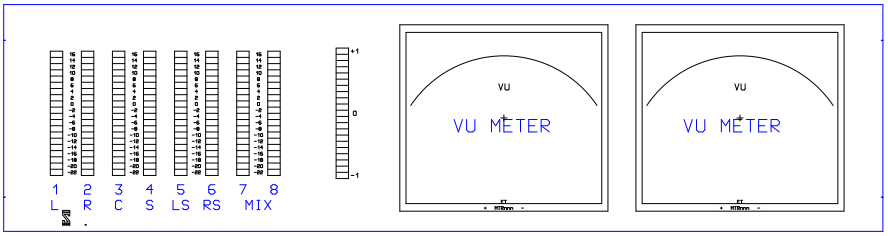
The stereo MIX output is additionally available as a variable-level output from the Z-Pod. It is balanced.

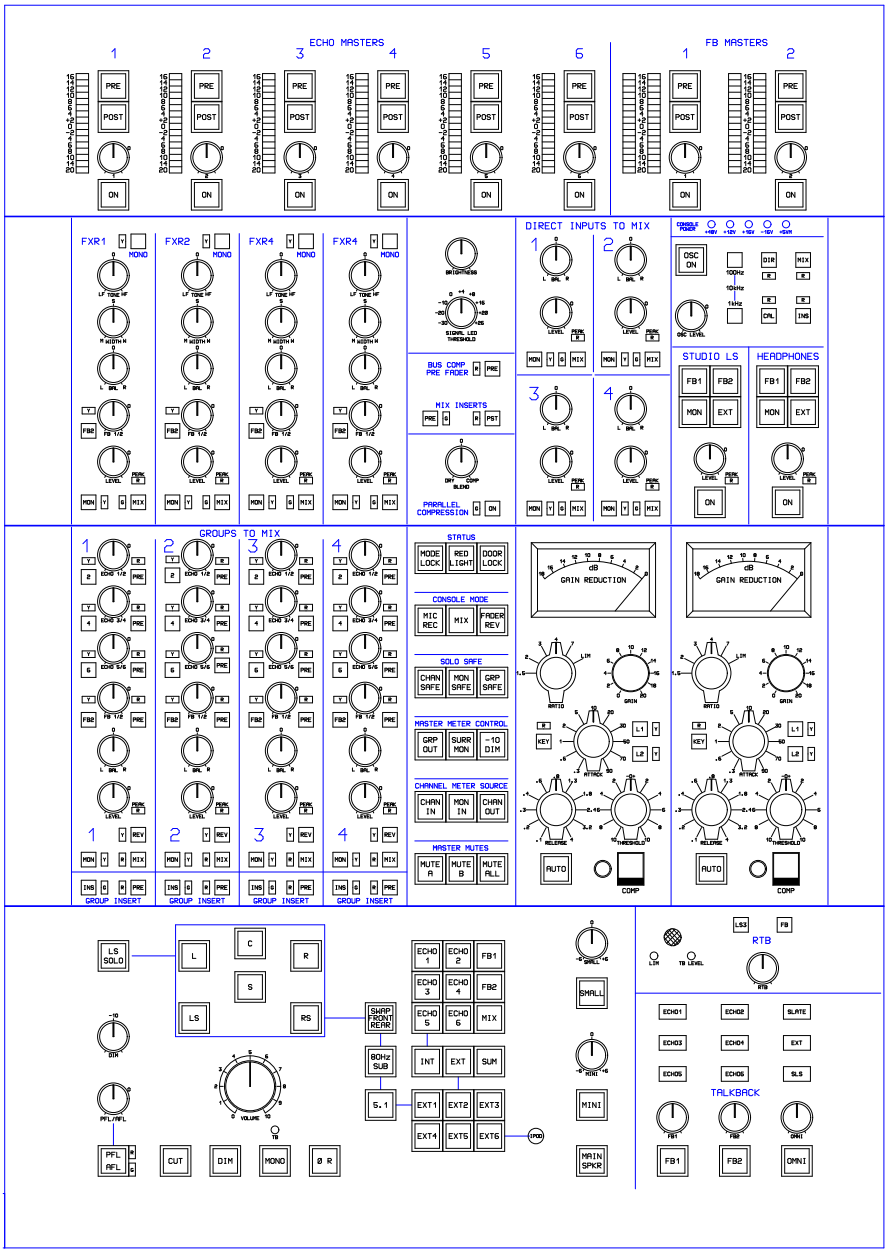
The monitor speaker feed is available as a variable-level output from the Z-Pod. It is balanced. It has relays to back-short the speaker amplifier inputs so as to eliminate crosstalk or noise pickup on open lines.

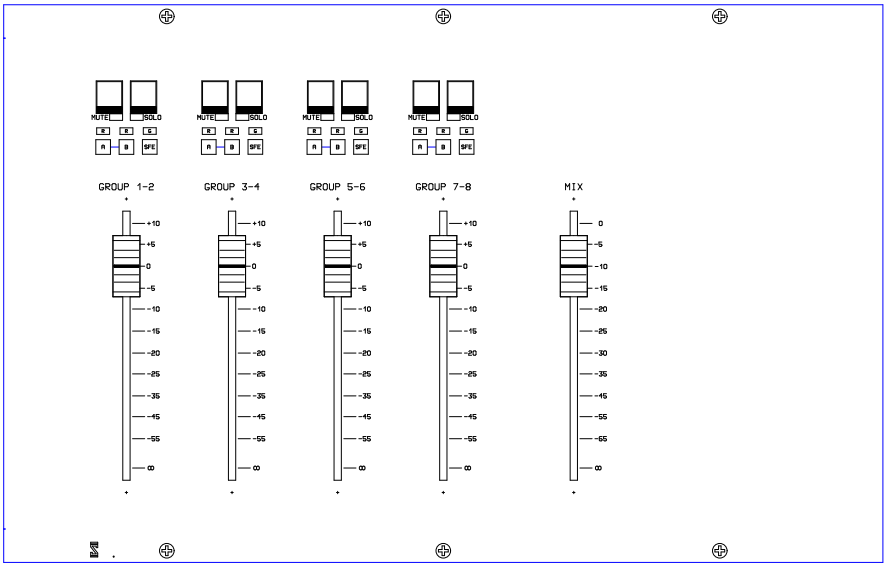
The Mix and Monitor outputs are on a DB25 connector at the back of the bucket.

The external monitor input is via a DB25 connector at the back of the bucket.

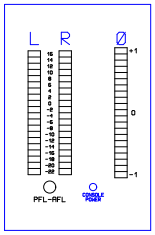
COMPACT MASTER SECTION

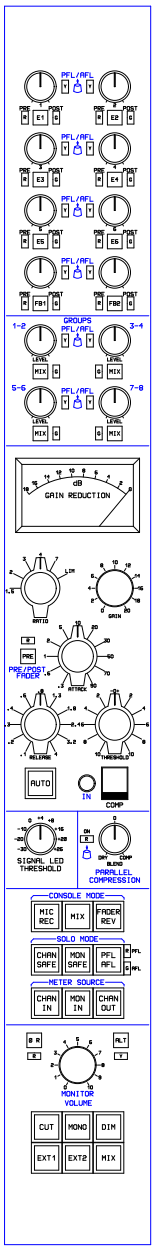


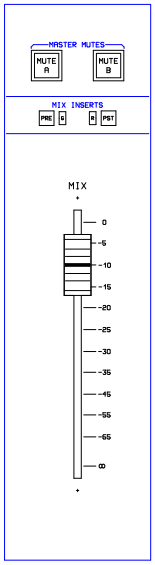




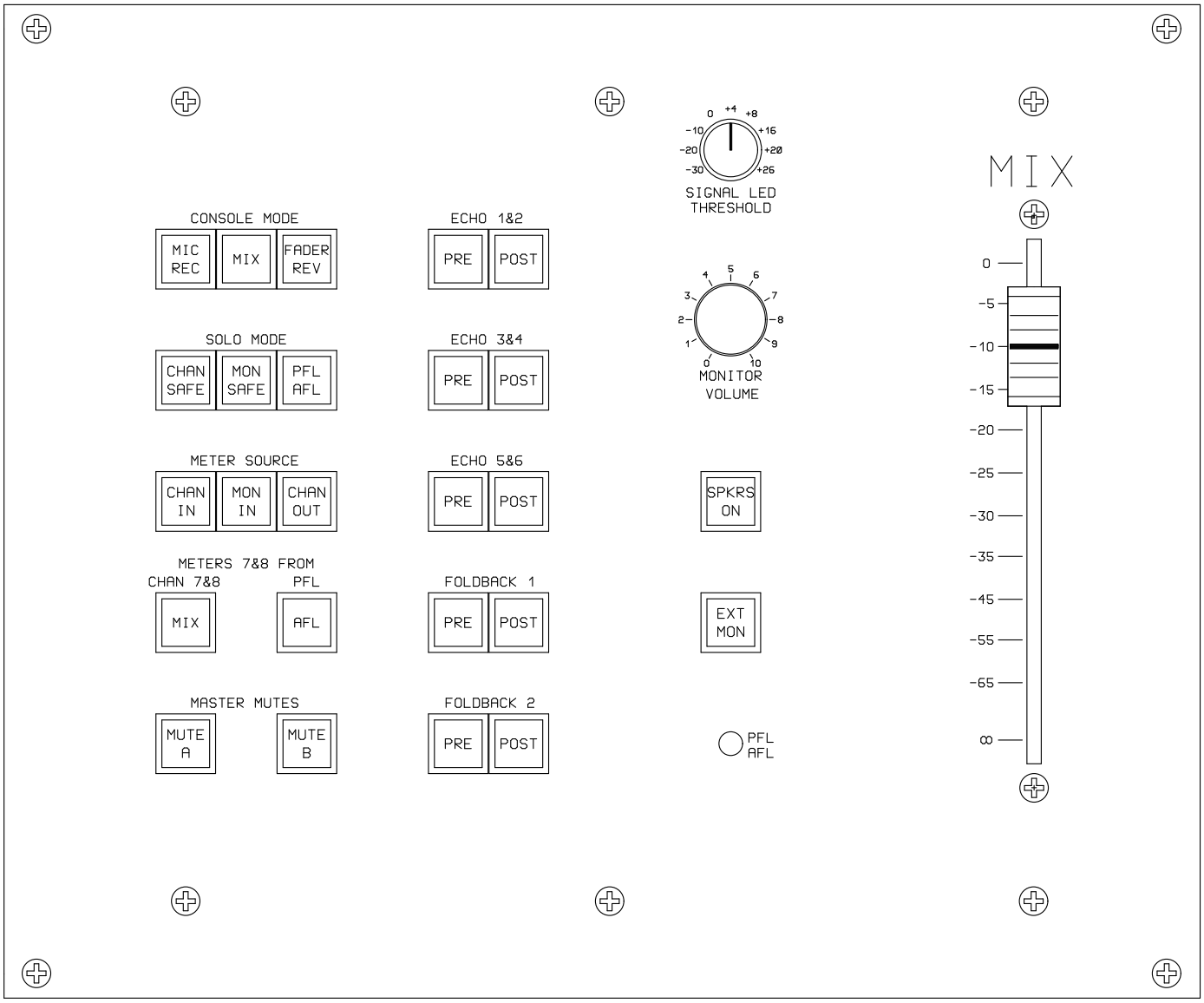
MASTERFLEX MASTER SECTION







Z-POD


0
+4
+8
-10
+16
-20
+20
-30
+26
SIGNAL LED
THRESHOLD
MIX
CONSOLE MODE
MIC REC
MIX
FADER REV
ECHO 1&2
PRE
POST
SOLO MODE
CHAN SAFE
MON SAFE
PFL AFL
ECHO 3&4
PRE
POST
1
2
3
4
5
6
7
8
9
10
MONITOR
VOLUME
METER SOURCE
CHAN IN
MON IN
CHAN OUT
ECHO 5&6
PRE
POST
SPKRS ON
METERS 7&8 FROM
CHAN 7&8
PFL
MIX
AFL
FOLDBACK 1
PRE
POST
EXT MON
MASTER MUTES
MUTE A
MUTE B
FOLDBACK 2
PRE
POST
PFL
AFL
0
-5
-10
-15
-20
-25
-30
-35
-45
-55
-65
∞