

Soundcraft

TS24

USER MANUAL

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SOUNDCRAFT TS24 MIXING CONSOLE

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*Note

CPS 450 or 650 Power Supplies have seperate
USER MANUAL.

2.00 GENERAL DESCRIPTION

The Soundcraft TS24 is the first of a new breed of in-line mixing console. The TS24 offers the quality, sophistication and flexibility that's demanded of a top class installation.

Like all the best ideas the TS24 concept is simple. Although each channel still contains two signal paths, unlike other more conventional in-line consoles, the two signal paths always do the same job. The path designated CHANNEL always goes to the routing matrix, whilst the MIX signal path normally goes to the Mix bus. Thus, your monitor mix in record becomes a rough mix for mix-down.

The entire design philosophy behind the TS24 is keyed to this simple concept. Pressing a single master button determines the console configuration for each stage of the recording process, with no loss of flexibility.

Visual clarity is obtained by using two separate scribble strips for the signal in the channel path and the signal in the mix path. Various LEDs used throughout the console allow the operator to follow a signal path quickly and easily.

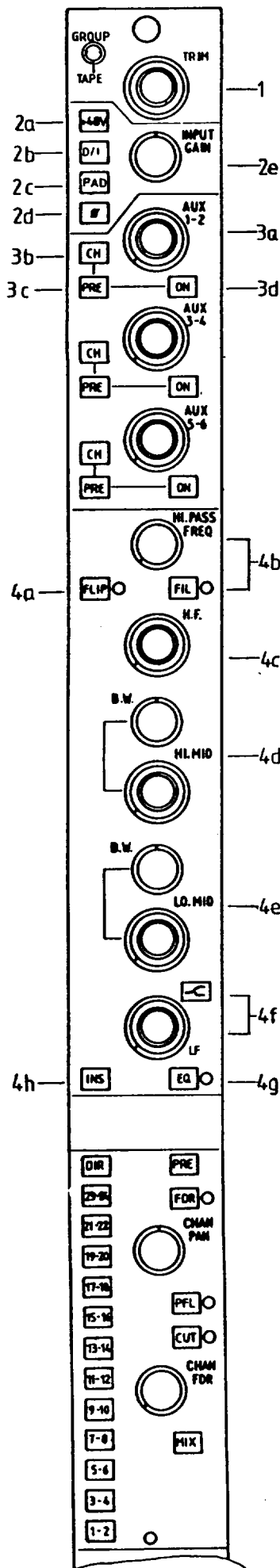
All inputs and outputs are electronically balanced, with the exception of the insert send which is ground compensated. Electronic balancing reduces the signal degradation introduced by more conventional transformer coupled designs, and ensures superior transient response, minimal phase shift, and excellent common mode rejection even at high frequencies.

The four band parametric equaliser, which may be used in either the channel or the mix path, provides exceptional musical enhancement and, when used in conjunction with the High Pass filter, almost total control over the audio spectrum.

Metering is provided in the form of 30 segment, high resolution, Bar-graph meters, which are switchable between Peak or VU characteristics, to meter Group Outputs and Auxiliary sends. Wide scale VU meters are provided for the main stereo mix.

A patchbay provides standardised connection points to many sections of the console circuitry and to numerous pieces of external equipment. This allows rapid insertion of peripheral equipment into the system by means of patch-cords.

The TS24 is modular in construction allowing easy removal of modules for any necessary maintenance. The TS24 comes in a variety of frame sizes to accomodate 24, 32, 40, 48 or 56 modules. Blank modules are available in 1, 2 and 4 module widths. The Command Module is centrally located and the rest of the console laid out to suit the operators requirements.



2.01 INPUT/OUTPUT MODULE

1. Line/Bus Trim

The skirt of this dual concentric pot is the Group output corresponding to the module number. The top is the Line Trim control and is provided to cope with higher level input signals.

2. Input to channel

The Channel can be operated in either Microphone or Direct Injection mode.

The Channel Input is an electronically balanced design, configured for optimum low noise performance. The Microphone Input impedance is greater than 2kOhms, which provides an optimum load for most studio microphones.

The high level Direct Injection/Line Input impedance is 47kOhms and is suitable for the direct injection of an instrument, thus eliminating the need for a D/I box. However, the input is still capable of accepting a normal Line Input if required.

a) +48

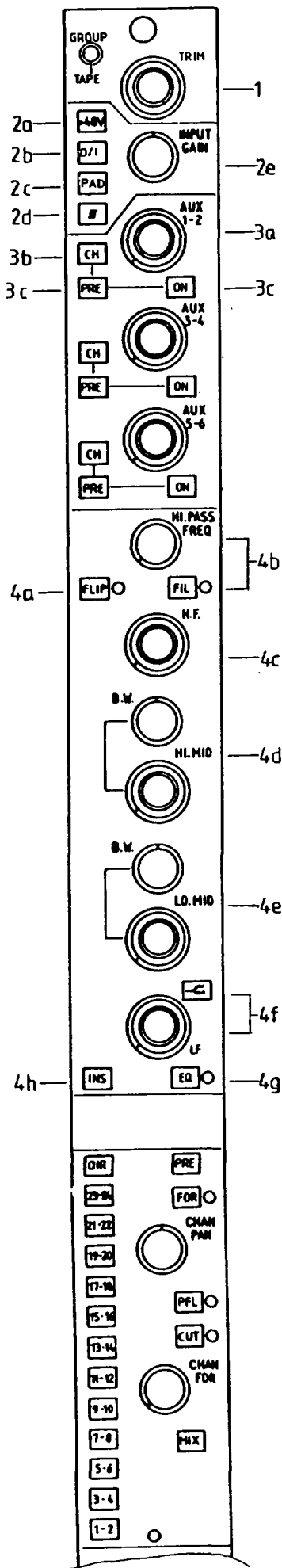
Capacitor microphones can be powered by the internal +48V phantom power supply by pressing the +48 button.

b) D/I

The D/I button switches the input to receive a line level signal into a high impedance (47kOhm) suitable for the direct injection of an instrument or accepting a normal line input if required.

c) PAD

Pressing the PAD button inserts a 15dB attenuator into the input of the microphone amplifier, and a 30dB attenuator in DI mode this allows extremely high level input signals to be catered for, without overloading the input stage. Such high level signals can easily occur from high output capacitor microphones used in close proximity to musical instruments.



d) PHASE

The phase of the input signal can be reversed by pressing the phase button to correct for mis-wired microphones or to correct for out of phase microphones in multimic set ups.

e) I/P GAIN

The Input Gain can be varied between 20 and 60dB of Gain, using the Input Gain control. Used in conjunction with the 15dB Pad a 55dB control range is available.

3. Auxiliary Section

There are 6 Auxiliary sends available in pairs for use as echo, foldback or other auxiliary effects units.

AUX 1-2

a) LEVEL CONTROL

The level control is a dual concentric potentiometer. The top controls Aux 1 and the skirt Aux 2.

b) CH

Normally the Aux send is fed from the Mix path, by pressing the CH button the Aux send may be taken from the Channel path to allow the headphone mix to be derived from individual inputs or the recorded signal, which may include external effects.

c) PRE

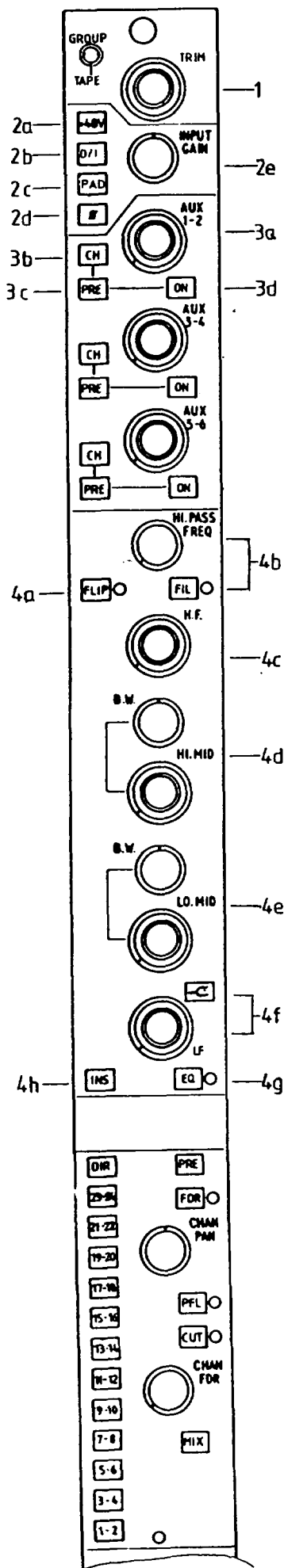
When selecting PRE the feed for the pair of auxiliaries is taken from before the respective fader, (Channel or Mix).

d) ON

Enables the pair of auxiliaries.

AUX 3-4 & AUX 5-6

Both Aux 3-4 and Aux 5-6 have the same layout and function as above.



4. Equaliser Section

A 4 band parametric equaliser is available with bandwidth control on the middle frequencies. On all frequency bands the top of the dual concentric pot is the boost/cut control and the skirt the frequency select.

a) FLIP

Normally the Equaliser, high pass filter and insert patch point are positioned in the Channel path in Record mode and in the Mix path in Mix mode. This may be changed locally by pressing the FLIP button. The Master Status buttons reconfigure the whole console including any FLIP buttons. The amber LED illuminates when the equaliser section is positioned in the Channel path.

b) HIGH PASS FILTER

The High Pass Filter has a continuously variable turnover frequency between 50Hz and 800Hz, below which the signal is attenuated at a rate of 12dB/Octave and may be switched in or out independent of the equaliser using the FIL button.

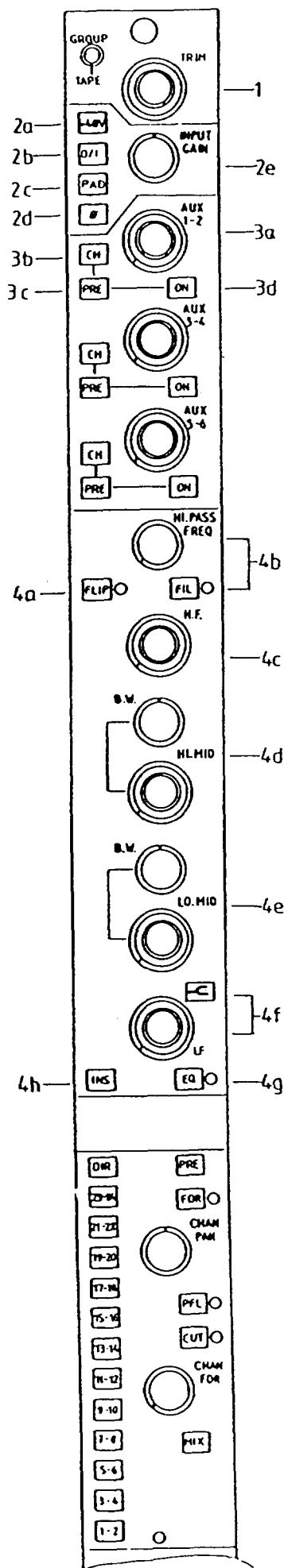
The position of the High Pass Filter in the signal path will be determined by the FLIP button and/or the Master Status.

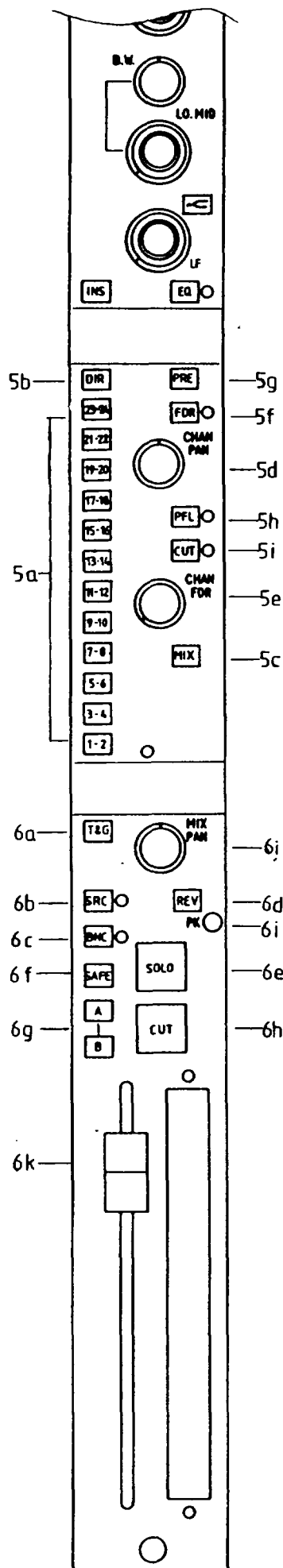
c) HF (High Frequency)

The frequency is continuously variable between 1.2kHz and 20kHz. 15dB of boost or cut is available, with a "shelving" characteristic. ie. The slope of the eq curve does not keep rising with frequency, but having reached the desired amount, flattens out or "shelves" from that frequency on.

d) HI MID

The frequency is continuously variable between 600Hz and 10kHz with 15dB of boost or cut available, with a peak/dip characteristic. The bandwidth (Q) of the filter may also be varied, with a range of "Q" from 0.4 to 2.5.





5. Channel Fader Section

a) ROUTING

The signal may be routed to any or all 24 Groups or the Stereo Mix by pressing the relevant button and panning hard left, for odd groups, or hard right, for even groups.

b) DIR

This button routes the output of that channel directly to the respective Group AND completely OVERRIDES anything else assigned to that particular Group.

c) MIX

Pressing MIX routes the signal in the channel path to the mix bus enabling the channel to be used as an extra input for effects returns etc.

d) CHANNEL PAN

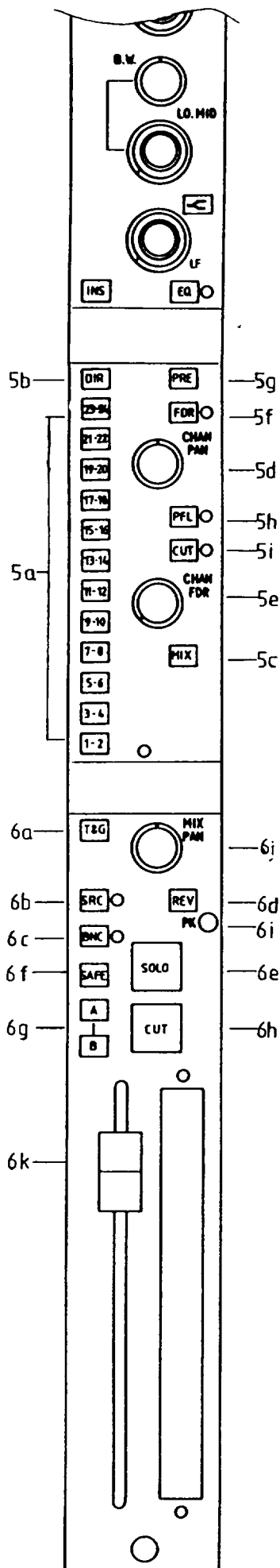
The Pan Pot is a centre detented control, with a loss of 4.5dB at the centre point. This is a compromise between the 3dB loss required for constant power panning, and the 6dB loss required for constant voltage panning.

e) CHANNEL FADER

The Channel fader is a rotary control calibrated in dBs with a mark at 0dB.

f) FDR

The FDR button with its associated amber LED feeds the signal present in the MIX path to the Channel Fader and Pan Pot, OVERRIDING the normal input. This allows the channel fader and Pan Pot to be used as an extra send from the Mix path, thus Aux sends via the routing matrix are possible. However, when FDR is selected Group Outputs to the monitor path are disabled.



g) PRE

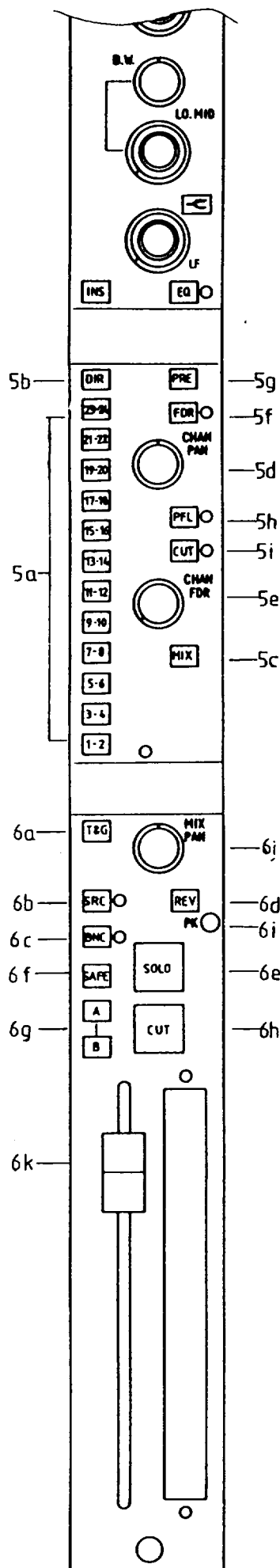
The PRE button allows the signal from the Mix path to be taken from before the Mix fader instead of post fader.

h) PFL

Pre-Fade Listen solos the pre-fader, post insert jack signal, independently of the CUT button. PFL operation is indicated by a red LED on the channel, and a master warning LED on the Command Module.

i) CUT

The CUT button disables the Channel Path



6. Mix Fader Section

The Input to the Mix Path may be either Tape Return or Group Output or Tape and Group together with a compensating drop in level to accomodate the two signals, so that although two signals are being summed there is no audible difference.

a) T & G

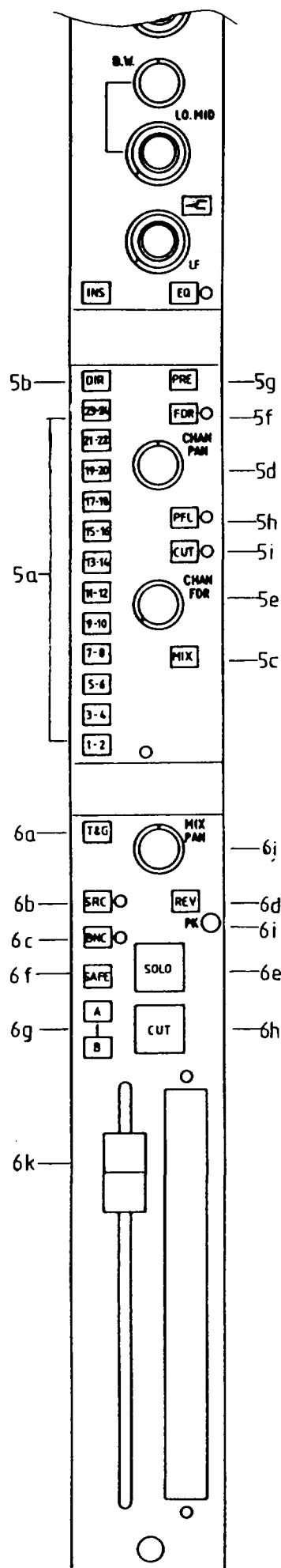
Pressing the T and G button allows both the Tape Return and the Group Output to be fed to the Mix path. Just before dropping-in it is useful to hear not only the existing track, but also the musician warming up so that the drop-in moment may be timed for the best performance. After dropping-in the multitrack machine will return to input and you will be effectively only monitoring Group.

When the T and G button is cancelled the source for the mix path will always revert to TAPE, to save having to perform 2 operations to listen back.

In T and G mode the meters read the Group signal at its full level rather than the sum of Tape and Group.

b) SRC

The SRC button allows the status of the Mix section to be flipped locally to either Tape or Group. When Group is selected the amber LED glows, when T and G is selected the LED flashes, when the LED is not illuminated the feed is Tape Return.



c) BNC

The BOUNCE (BNC) button allows simple track bouncing to be performed. When BNC is selected the Mix fader and its associated Pan Pot are disconnected from the main Left and Right buses and sent to the routing matrix, OVERRIDING the Channel Input. Thus a sub-mix may be balanced on the long throw Mix faders and can be transferred at once to any selected pair of tracks without having to try and duplicate this balance on the rotary faders.

d) REV

When REV is pressed the Channel fader and Mix fader are reversed, ONLY the roles of the faders change, the pan pots retain their normal function.

e) SOLO

Solo follows the pattern set up on the command module, (either solo-in-place or AFL or PFL), if Solo-in-place is selected then the soloed signal will appear in its normal stereo position. If PFL/AFL is selected then a mono feed will be heard in the control room rather than the main mix.

f) SFE

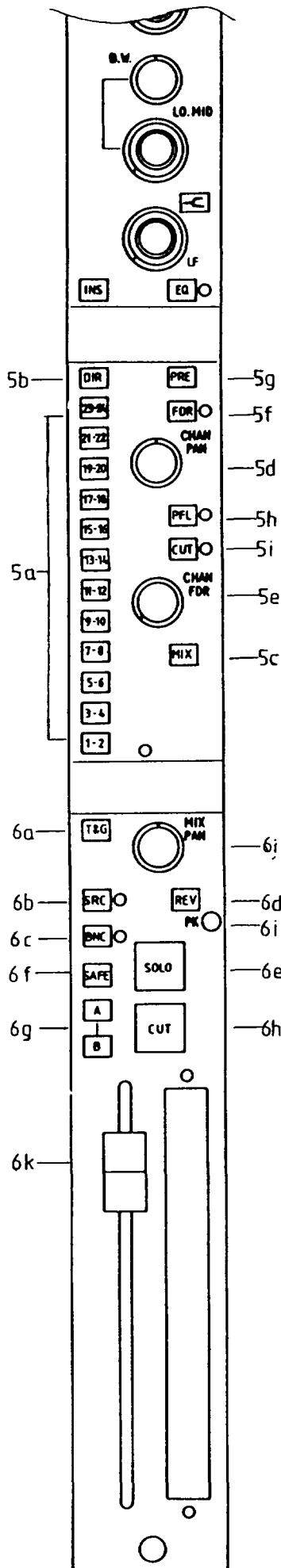
Pressing SAFE prevents the signal in a module from being cut by another SOLO.

g) A and B

The A and B buttons allow a CUT to be primed to be fired from the Master Cut buttons, on the Command Module. ie. If A is pressed on a module, that mix path will be cut when master cut button A is pressed on the Command Module.

h) CUT

The CUT button cuts that particular mix path from the main mix bus.



i) PEAK

The Peak Led inspects BOTH signal paths (Channel and Mix) in the module at the following points:-
Post Channel input amplifier, Post tape/group amplifier and Post equaliser. When any of the points exceeds +15dB (5dB below clipping) the LED will light. Even short duration transients will register since the characteristics are such that reaction time is very fast, but the decay is emphasised.

j) MIX PAN

The Mix Pan Pot is a centre detented device with a loss of 4.5dB at the centre point.

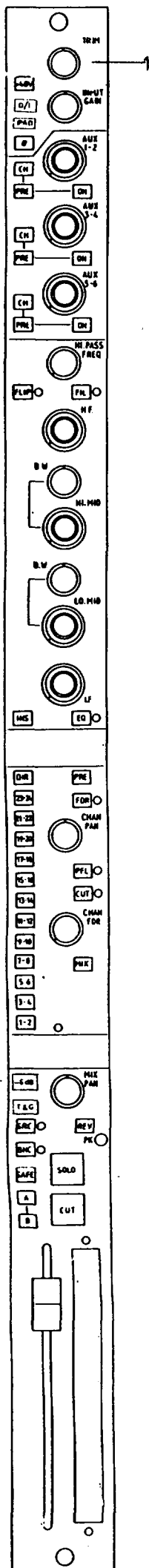
k) MIX FADER

The output of the Mix path is controlled by a high quality long throw conductive plastic unit. The law has been specially tailored to allow fine resolution in the upper working region, infinity cut off is greater than 90dB

l) METERING

Metering for each module is provided by a Bar-graph display in the overbridge. The characteristics may be either PEAK or VU, this being determined by a master switch in the overbridge.

The Meter above each module always relates to the Mix path signal. When the Mix path on the module is switched to Group, then the meter will read the Group Output; when the Mix path is switched to Tape then the meter will monitor the level coming into the console from the tape machine. However, when T and G is pressed the meter will monitor the Group Output, even though both Tape and Group may be heard.



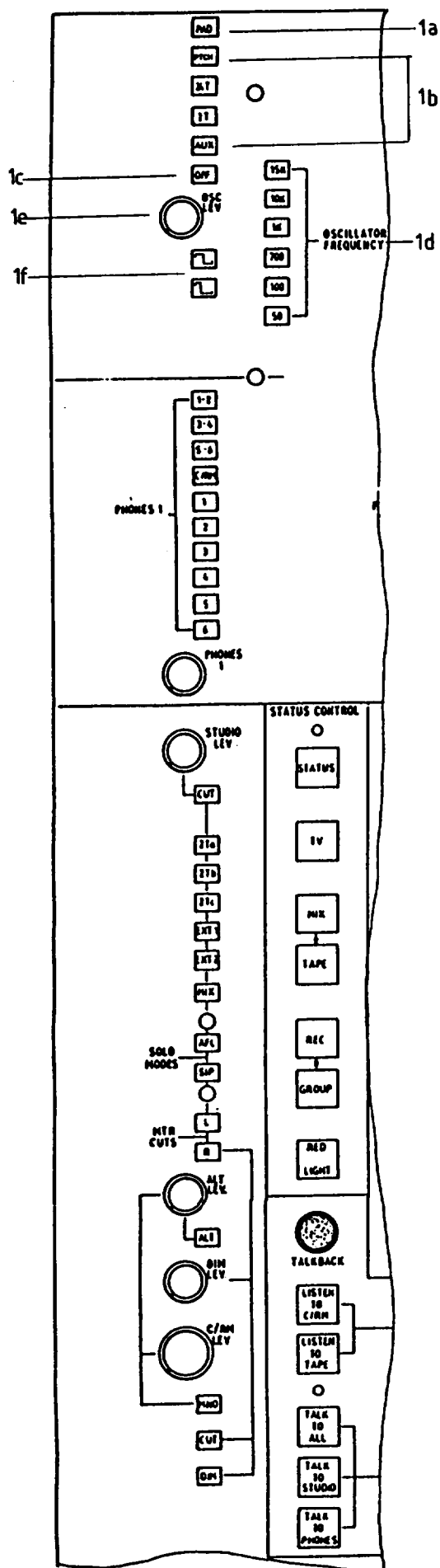
2.02 OLD INPUT/OUTPUT MODULE

1. Bus Trim

On early consoles the only the Group Bus Trim was located at the top of the module. This controls the level of the Group Output corresponding to the module number. A range of -20dB to +6dB is available.

2. -6dB PAD

Instead of a Line Trim control a -6dB PAS is provided to cope with high level input signals.



2.03 TS24 COMMAND MODULE

1. Oscillator

a) PAD

The Oscillator output can be reduced by a 40dB attenuator. This allows the signal at the oscillator patch point to be used for testing Input Channels via the low level mic input.

b) ROUTING

As well as appearing as a single output at the patchbay the Oscillator may be routed directly to:-

- i. [24T] The 24 Group Outputs
- ii. [AUX] The 6 auxiliary sends
- iii. [2T] The main stereo outputs
- iv. [PTCH] The external oscillator output on the patchbay.

c) OFF

Pressing the OFF button disables the oscillator completely to avoid accidental use.

d) FREQUENCY

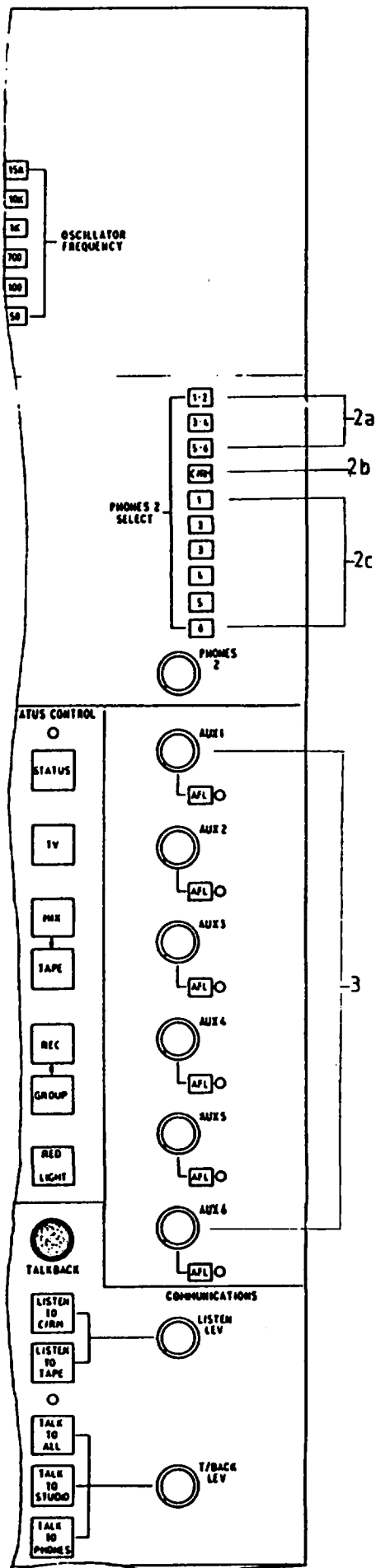
The Oscillator frequency is switchable between 50Hz, 100Hz, 700Hz, 1kHz, 10kHz and 15kHz.

e) LEVEL

Adjusts the level of the oscillator. When used in conjunction with the PAD a wide range of output levels can be obtained.

f) WAVEFORM

The Oscillator may be either Sine Wave, Square Wave or an Assymmetrical pulse train which is designed to be useful in locating phasing errors.



2. Headphones Section

There are 2 stereo headphone outputs provided on the TS24 console, each with a master level control. The source to each may be any combination of Aux master signals, plus the Control Room stereo signal.

a) AUX 1-2

A stereo cue mix may be sent via AUX 1 and 2. Likewise, AUX 3-4 and AUX 5-6 may be used as stereo cue mixes.

b) CRM

Selecting CRM sends the Control Room Monitor signal to the Headphones, Pre any solo signal which may be selected.

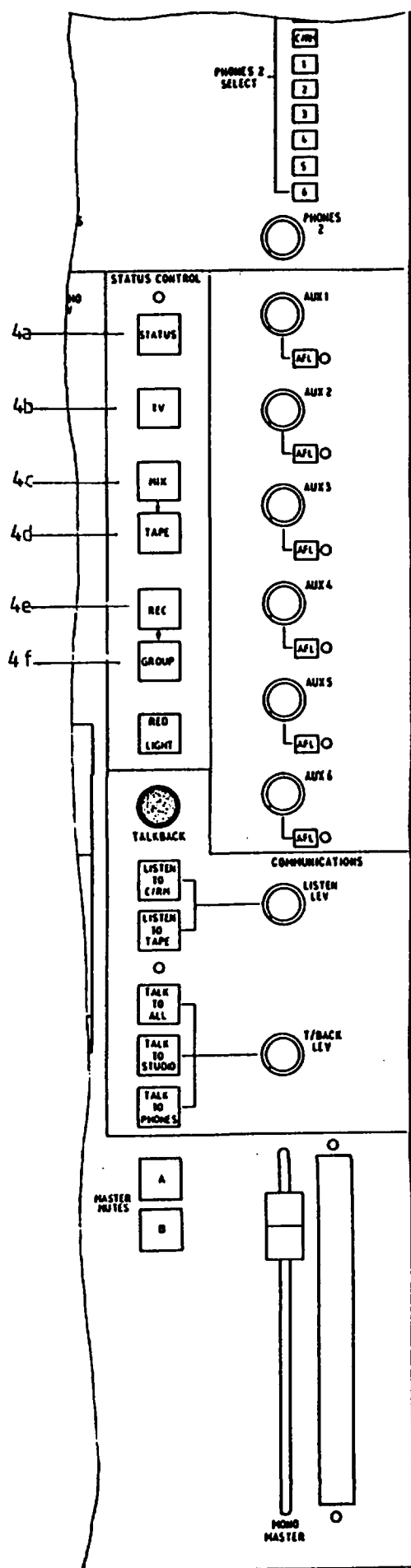
c) AUX 1-6

Selecting any of the six individual Auxiliaries feeds both Left and Right.

3. Auxiliary Masters

There are 6 auxiliary send master level controls. Each master has its own AFL, after-fade listen, facility. The LED illuminates when AFL is pressed.

When AFL is selected the current signal in the control room monitors is replaced by the AFL signal.



4. Status Control

a) STATUS

When pressed, the STATUS button allows a period of 8 seconds in which to alter the Master Status of the console. After this time the Status of the console is locked and cannot be changed until the STATUS button is pressed again. TAPE/GROUP master buttons are not affected.

b) TV

Pressing the TV button changes the routing in the I/O module to be appropriate for TV operation.

c) MIX

Selecting MIX automatically places the Equaliser, High Pass Filter and insert patch point, if required, of every I/O module into the Mix path, regardless of where they were before. All cut operations will cut both Pre and Post sends without exception.

d) TAPE

Selecting Tape allows the Returns from the Multitrack machine to be monitored during recording or remix, using the Mix path.

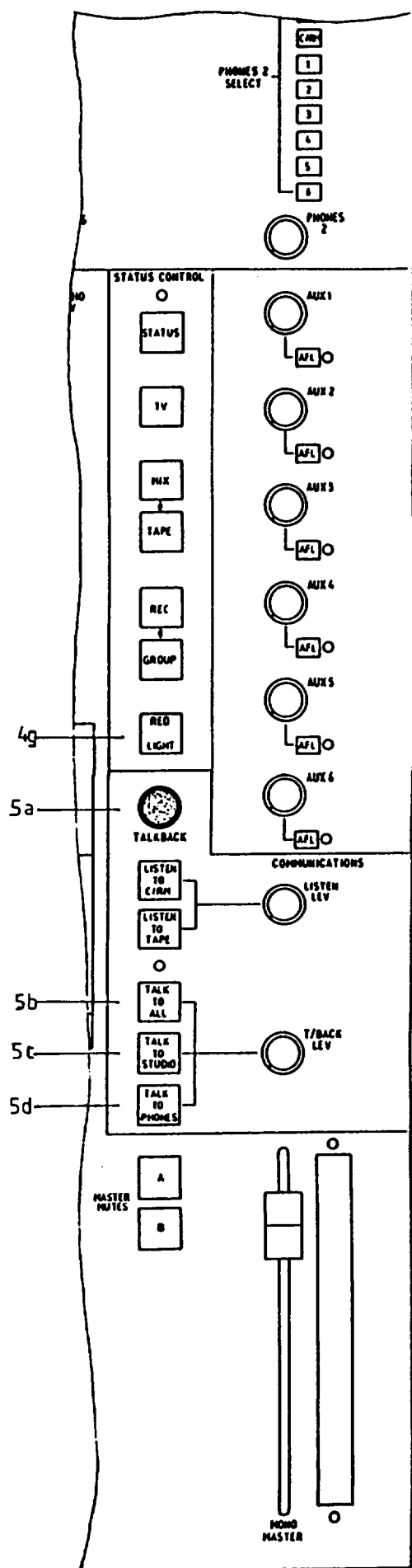
e) REC

RECORD automatically places the Equaliser, High Pass Filter and insert patch point, if required, of every I/O module into the channel path and CUT operates on to post sends only.

f) GROUP

Selecting Group allows the Group Outputs to be monitored, using the Mix path.

The Monitor source may be changed locally with the SRC button. (See section 4.02).



g) RED LIGHT

This activates an opto-isolated output which may be used to energise an external mains relay to illuminate the Studio Red Light. This also acts as a safety button by disabling the Oscillator, preventing Listen Mic to Tape, and Talkback to anywhere other than in the headphones. It also locks all current console status, including Master Tape or Master Group. The switch is electronically latching.

5. Communications

a) TALKBACK

The Talkback Mic is an electret microphone and has a variable gain controlled by the Talkback Level Pot.

b) TALK TO ALL

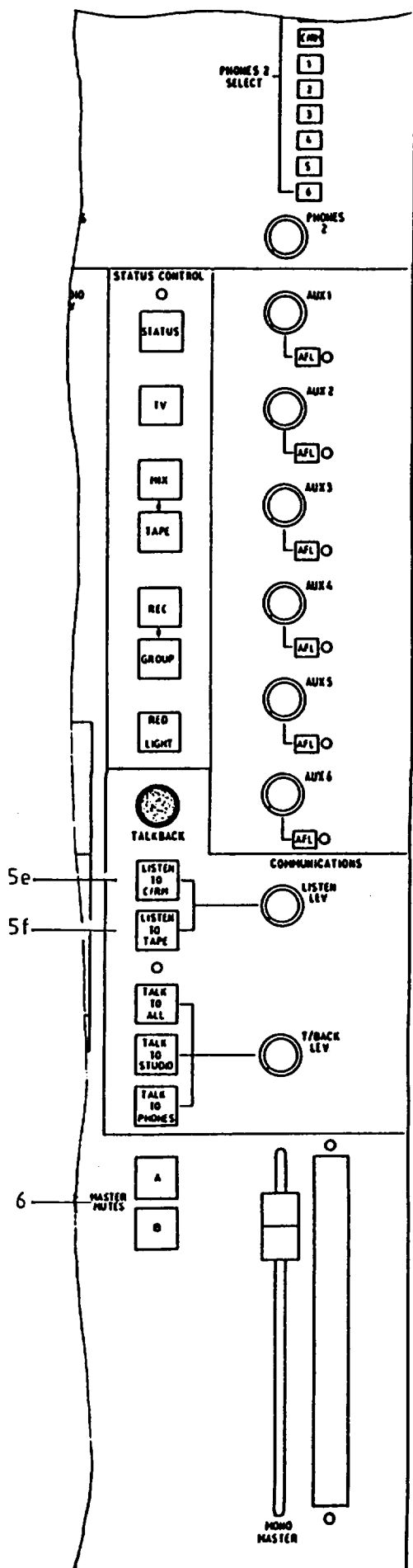
This allows the Talkback microphone to be fed to the Group Outputs, the Auxiliaries and the Main Outputs. The control room monitor is dimmed and a 30Hz slate is also added to the talkback signal. The switch has a momentary action.

c) TALK TO STUDIO

This allows the Talkback microphone to be fed to the Studio Loudspeaker. The control room monitor is dimmed, the switch has a momentary action.

d) TALK TO PHONES

This allows the Talkback microphone to be fed to the 2 Headphone circuits. The control room monitor is dimmed and the switch has a momentary action. (Links are provided so that this function may access the auxiliaries instead. See CN10 on ED2157 sheet 2.)



e) LISTEN

The LISTEN microphone is external, normally a Microphone placed in the Studio, and feeds a standard balanced input stage. The gain of the listen amplifier is variable.

f) LISTEN TO C/RM

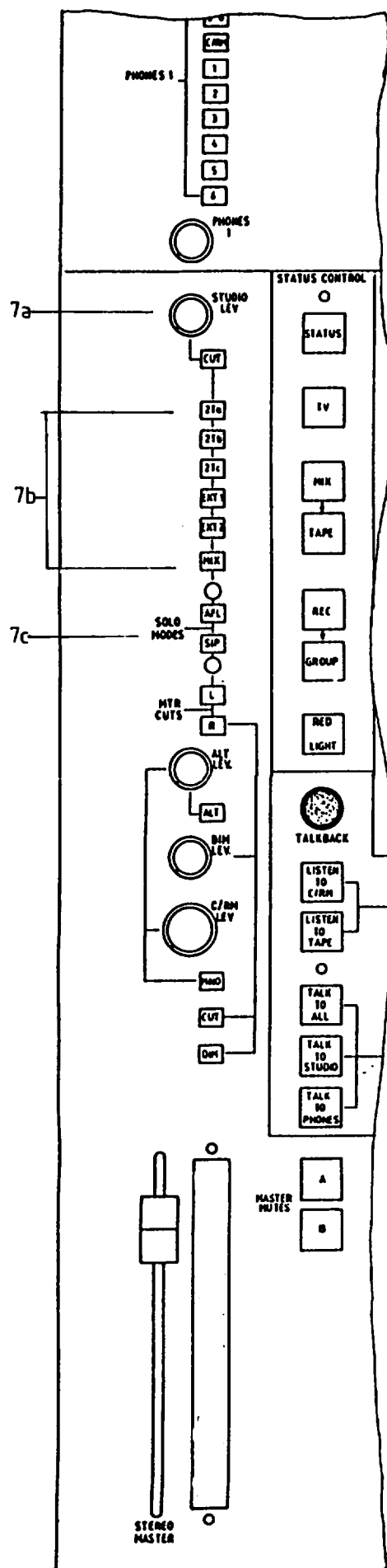
This brings the Listen mic up onto the control room monitor, dimming the main feed. The switch is latching and the 3 talkback buttons may be accessed while this function is on, allowing easy 2-way conversation.

g) LISTEN TO TAPE

This allows the feed from the Listen mic to be sent to the Group Outputs, thus allowing floor counts etc. to go directly to tape.

6. Master Mutes

The Master Mutes may be found at the bottom of the Command Module. On pressing master mute A or B the button illuminates. Mutes are pre-programmed on the I/O module mix paths.



7. Main Master Controls

a) STUDIO LEVEL

The signal present on the Control Room Monitor can be sent to a Studio loudspeaker via the STUDIO level control and the on/off switch.

b) MONITOR SOURCE

The source for the Control Room Monitor can be either Main Mix left and right, the separate mono output, or one of 5 external sources: replay from tape machines a,b,c, Ext 1 or Ext 2.

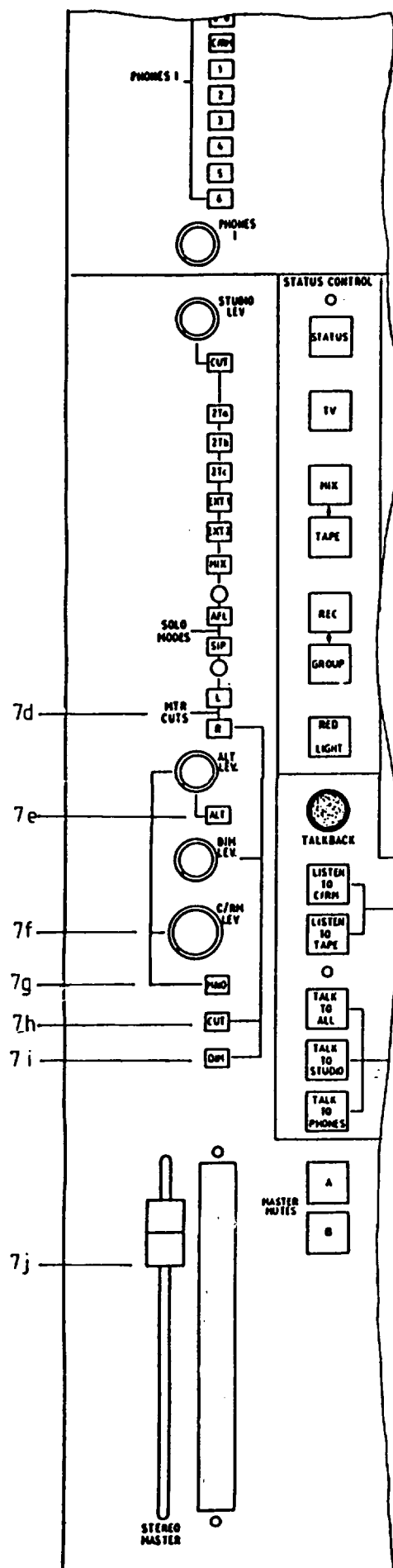
c) SOLO STATUS

i. PFL/AFL

The PFL/AFL LED flashes when a PFL/AFL button is pressed, (or SOLO is not in SIP enabled mode), on any of the mix paths and a mono feed is heard in the control room rather than the main mix, main outputs, however, are not cut. PFL is obtained with the master button UP and AFL with the button DOWN.

ii. SOLO IN PLACE

When SOLO IN PLACE is selected a solo button (Mix paths only) will cut all other Mix paths, unless they have their "safe" button down, and leave the soloed signal/s in its normal stereo position. Any SIP signal will be heard with any EQ that has been added and any effects that are routed via the Auxiliaries. The red LED will illuminate whenever the SIP is enabled as this could be potentially dangerous during a Mix or Broadcast. The LED will flash when a solo is actually activated and the solo button or buttons will also light.



iii If a PFL or AFL button is pressed, such as on a channel path, when SIP is in operation, the main monitors will be cut and the solo bus will be heard instead. PFL or AFL selection OVERRIDES SIP conditions.

d) MONITOR CUTS

The Monitor Cuts L and R cut the signal feeding the main control room monitors either left or right or both.

e) ALT

An alternative set of loudspeakers may be fed from the TS24, these are controlled by a separate level control and are switched in by pressing ALT.

f) CONTROL ROOM LEVEL

This is the master level control for the control room monitor.

g) MONO

This sums the left and right signals and provides a mono compatibility check on the control room monitor.

h) CUT

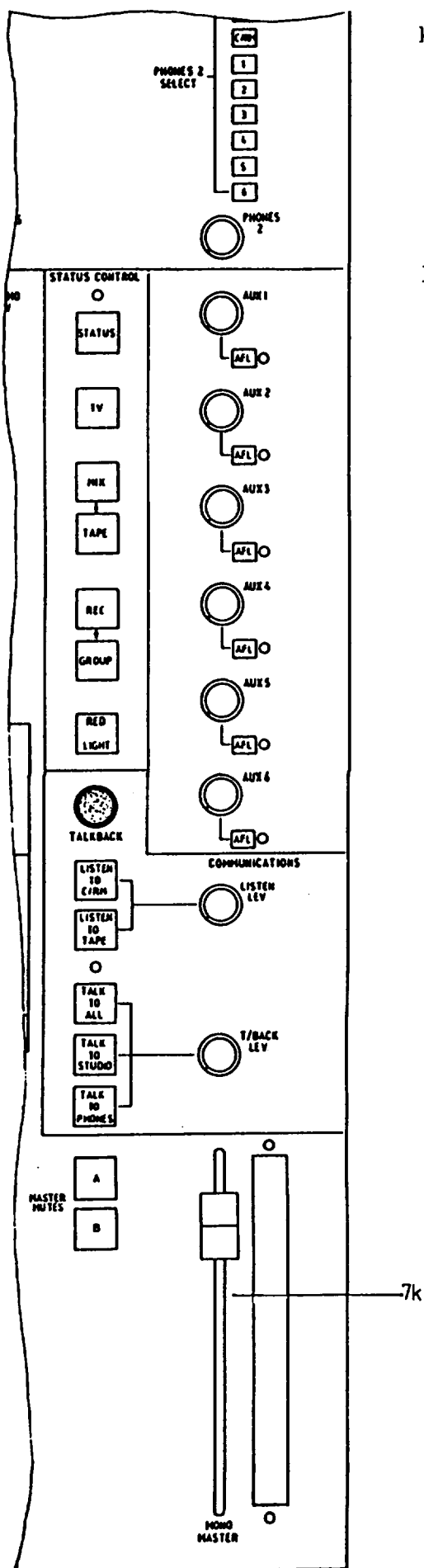
This cuts the signal to the control room monitor.

i) DIM

This attenuates the signal to the monitor by the amount set by the Dim level control above.

j) STEREO FADER

The Main stereo fader is a Penny and Giles long throw fader which has 0dB at the top of its travel.



k) MONO FADER

A separate mono output is also provided via another Penny and Giles long throw fader, which also has 0dB at the top of its travel. The mono signal is derived from a sum of the L and R signals.

1) METERING

The main Mix outputs are provided with wide scale VU meters and a Phase correlation meter. On later models LED bargraph meters are also provided.

The input to the Phase correlation meter is derived from the left and right master meters which follows the control room monitor selection.

2.04 OPTIONAL STEREO SUB-GROUP

1. Input to Channel

The Module can be operated using either balanced line Inputs A or B or both, when SUB is selected a feed from the Group bus can also be routed to the MIX PATH.

a) INPUT GAIN A

A $\pm 12\text{dB}$ range of gain is available on balanced Line Input A using a centre detented potentiometer.

b) INPUT GAIN B

A $\pm 12\text{dB}$ range of gain is available on balanced Line Input B using a centre detented potentiometer.

c) SUB

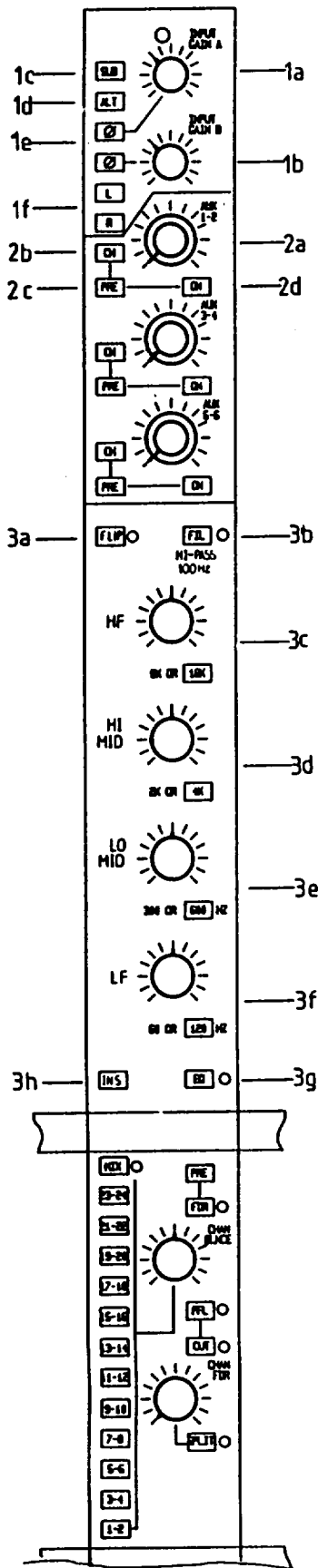
Selecting SUB allows a signal from the Group buses to be sent in stereo, as a pair ie. 1-2, 3-4, 5-6 etc. to the Mix bus and to the routing matrix. If SUB is used in conjunction with SPLIT then this allows Input A to be sent to the routing matrix, AND routes the signal from the Group to the Mix bus. (The SUB LED illuminates on the Mix section).

d) ALT

Selecting ALT swops Inputs A and B and sends Input B to the Mix bus and the routing matrix. If used in conjunction with SPLIT then Input A is sent to the routing matrix and Input B to the Mix bus. When ALT is selected the INPUT B LED illuminates on the Mix path.

e) PHASE

Pressing the top phase button will invert the phase on Input A and correct for any mis-match in relation to other channels. Pressing the bottom Phase button will invert the phase on Input B. NB: Both channels of each input are phase inverted.



f) L and R

These switches allow the module to work in one of three modes.

- i. With both switches out the module works in stereo mode.
- ii. With either L or R in, both paths of the module are fed by either the Left input or the Right input.
- iii. With both switches pressed, both paths of the module are fed by a mono sum of the left and right input.

2. Auxiliary Section

There are 6 mono (L and R sum) Auxiliary sends available in pairs for use as echo, foldback or other auxiliary effects units.

AUX 1-2

a) LEVEL CONTROL

The level control is a dual concentric potentiometer. The top controls Aux 1 and the skirt Aux 2.

b) CH

Normally the Aux send is fed from the Mix path, by pressing the CH button the Aux send may be taken from the Channel path to allow the headphone mix to be derived from individual inputs or the recorded signal, which may include external effects.

c) PRE

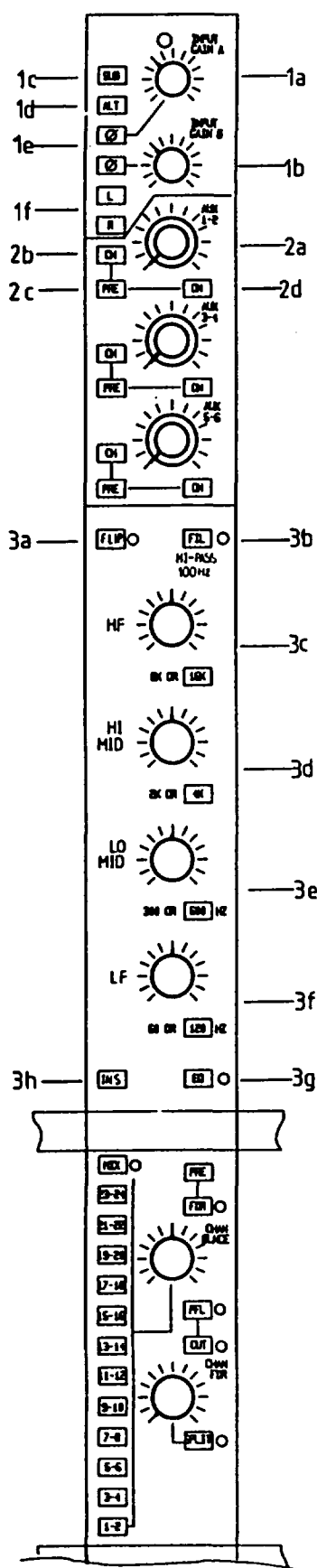
Selecting PRE the feed for the pair of auxiliaries may be taken before the respective fader, (Channel or Mix).

d) ON

Enables the pair of auxiliaries.

AUX 3-4 & AUX 5-6

Both Aux 3-4 and Aux 5-6 have the same layout and function as above.



3. Equaliser section

The equaliser is a versatile unit allowing 5 areas of control over the audio spectrum.

a) FLIP

Normally the Equaliser, high pass filter and insert patch point are positioned in the Channel path in Record mode and in the Mix path in Mix mode. This may be changed locally by pressing the FLIP button. Any change in Master Status reconfigures the whole console including any FLIP buttons. The amber LED illuminates when the equaliser section is positioned in the Channel path.

b)- HIGH PASS FILTER

The High Pass Filter operates at 100Hz with an ultimate slope of 12dB/Octave. This will effectively remove low frequency stage rumble, and other extraneous signals. The High Pass Filter may be switched independant of the Equaliser by pressing the FIL button.

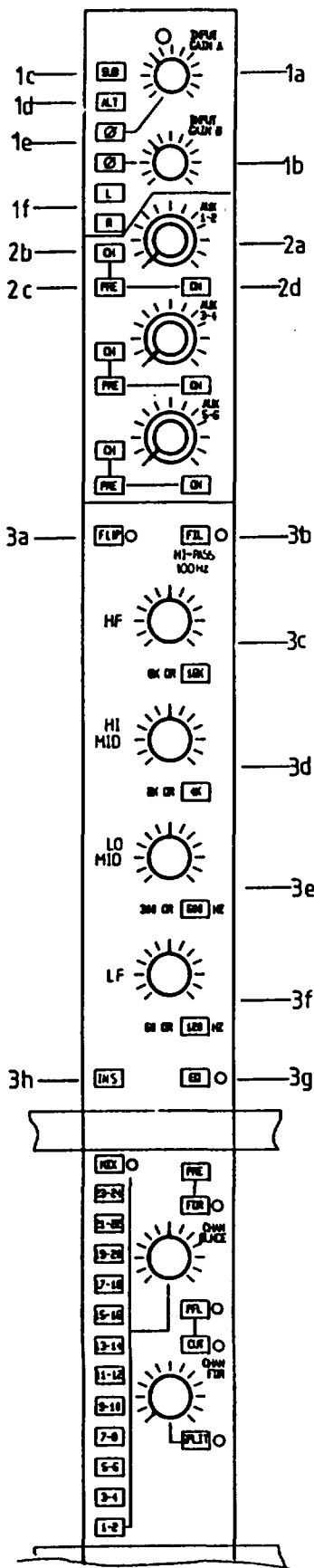
c) HF (High Frequency)

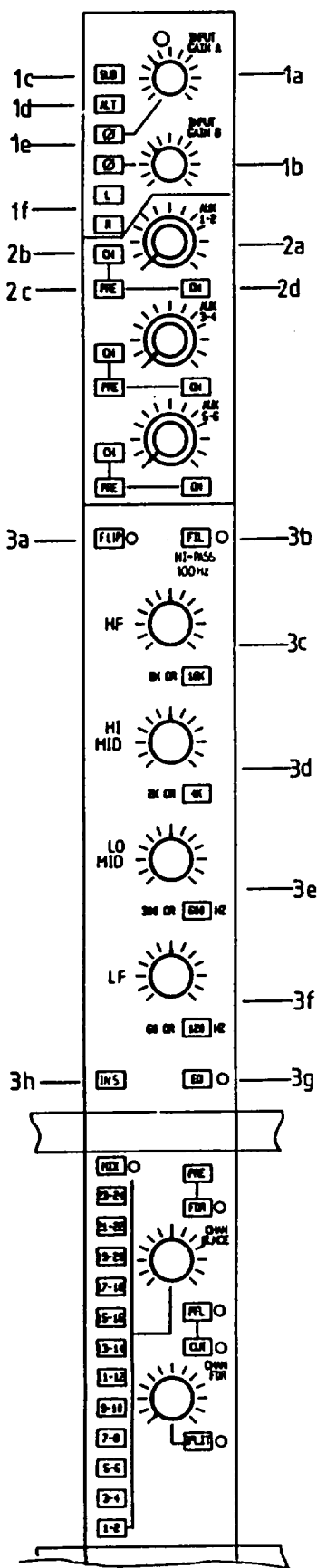
The frequency is switchable between 8kHz or 16kHz with 15dB of boost or cut available with a "shelving" characteristic.

i.e. The slope of the eq curve does not keep rising with frequency, but having reached the desired amount, flattens out or "shelves" from that frequency on.

d) HI MID

The frequency is switchable between 2kHz or 4kHz. 15dB of boost or cut is available with a peak/dip characteristic. i.e. Having reached a maximum (or minimum in the case of cut) at the selected frequency, the response returns to zero on either side of that frequency. The shape of the curve when plotted gives the characteristic "bell" shape.





e) LO MID

The LO MID section is identical to the HI MID section, with the exception that it is switchable between 300Hz or 600Hz.

f) LF (Low frequency)

The frequency is switchable between 60Hz or 120Hz. 15dB of boost or cut is available with a "shelving" characteristic.

g) EQ

The Equaliser can be switched in and out of the signal path, independently of the High Pass Filter, by pressing the EQ button. The associated LED will light when the Equaliser is in circuit.

h) INS

The patch point, which has a balanced return, may be switched into the circuit by pressing the INS button. This point is post EQ and filter, its position will follow that of the equaliser block as determined by the FLIP button or the Master Status.

4. Channel Fader Section

a) ROUTING

The stereo signal may be routed to any or all 24 Groups or the Stereo Mix by pressing the relevant button. Should a mono send be required then this is achieved by selecting the relevant Group button and turning the balance control hard left for odd numbered groups and hard right for even numbered groups.

b) CHANNEL BALANCE

The Balance control is a centre detented potentiometer and corrects or deliberately creates any errors in stereo imaging.

c) CHANNEL FADER

The Channel fader is a stereo rotary fader calibrated in dBs, with 10dB in hand.

d) FDR

The FDR button with its associated amber LED feeds the signal present in the MIX path to the Channel Fader and Pan Pot, OVERRIDING the normal input. This allows the channel fader and Pan Pot to be used as an extra send from the Mix path, thus effects sends via the routing matrix are possible.

e) PRE

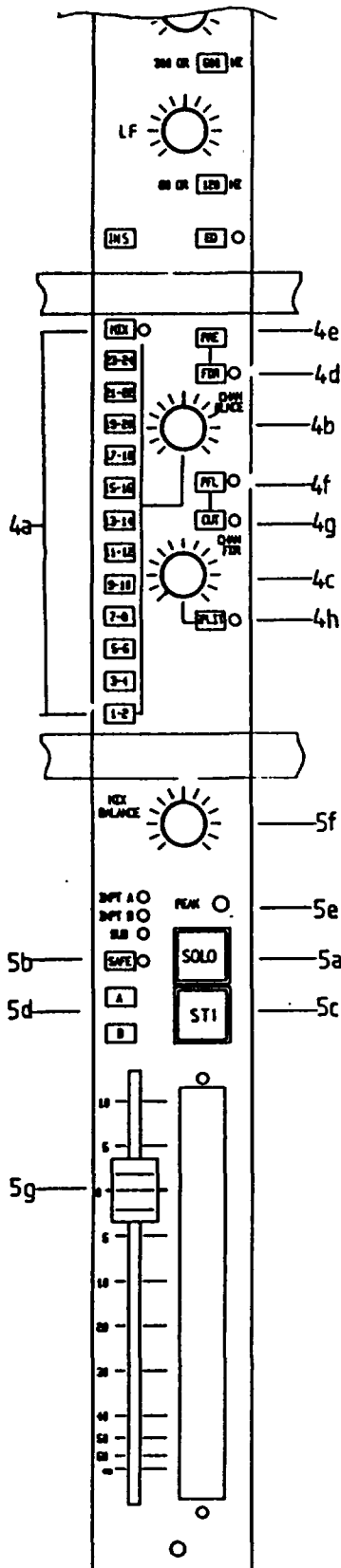
The PRE button, when used in conjunction with FDR, allows the signal from the Mix path to be taken from before the Mix fader instead of post fader.

f) PFL

Pre-fade Listen solos the pre-fader, post insert jack signal, independent of the ON switch. PFL operation sends a mono feed to the control room monitor (L and R sum) and is indicated by a red LED on the channel, and a master warning LED on the Command Module.

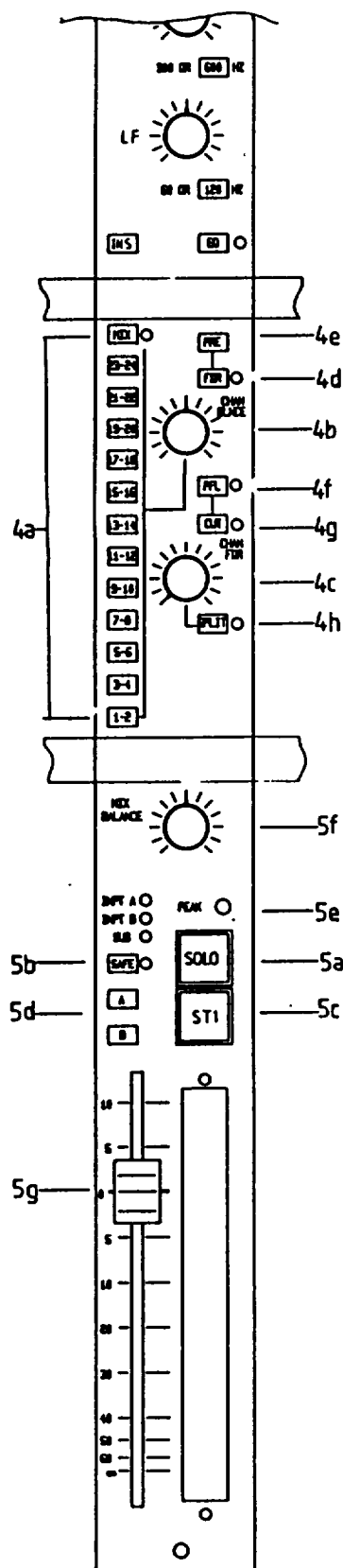
g) CUT

The CUT button disables the Channel Path



h) SPLIT

When SPLIT is selected Input A is sent, in stereo, to the mix bus and Input B is sent, in stereo, to the routing matrix. If used in conjunction with the ALT button then this is reversed (A goes to the routing matrix and B goes to the Mix bus). If used in conjunction with the SUB button then Input A is sent to the routing matrix and a signal from the Group bus is sent to the Mix bus.



5. Mix Fader Section

The Input to the Mix path can be either from Input A (or Input B by selecting ALT) or from the Group bus (when SUB is selected).

a) SOLO

Solo follows the pattern set up on the Command Module, (either solo-in-place or AFL or PFL), if Solo-in-place is selected then the soloed signal will appear in its normal stereo position. If PFL/AFL is selected then a mono feed will be heard in the control room rather than the main mix.

b) SFE

Pressing SAFE prevents the signal in a module from being cut by another SOLO.

c) ST1

This CUTS that particular Mix path from the main stereo bus only. The number corresponds to the relevant group number.

d) A and B

The A and B buttons prime a cut to be fired from the Master Cut buttons, on the Command Module. ie. If A is pressed on a module, that mix path will be cut when master cut button A is pressed on the Command Module.

e) PEAK

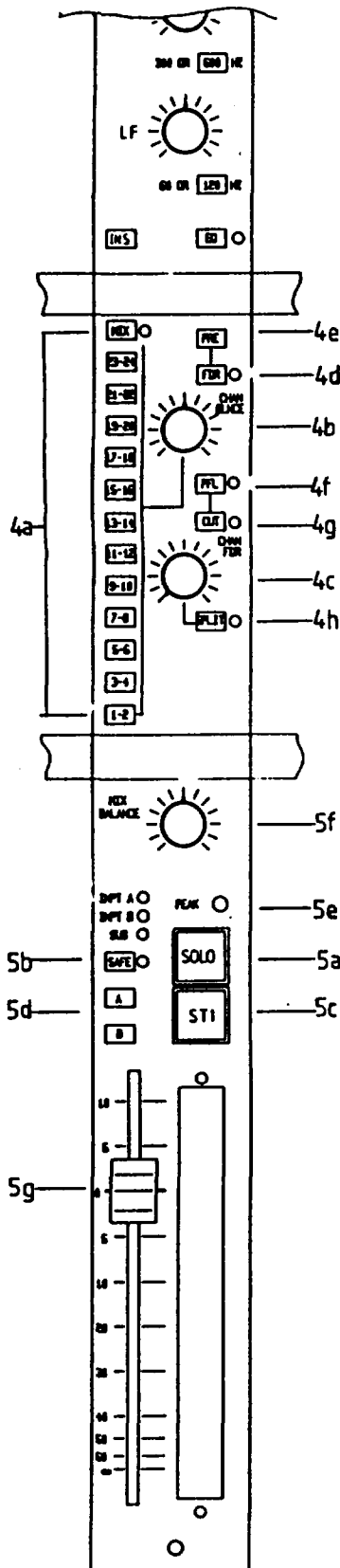
The Peak Led inspects BOTH signal paths (Left and Right) in the module at the following points:-
Post Input amplifier A, post Input amplifier B and Post equaliser. When any of the points exceeds +15dB (5dB below clipping) the LED will light. Even short duration transients will register since the characteristics are such that reaction time is very fast, but the decay is emphasised. Both positive and negative peaks are detected.

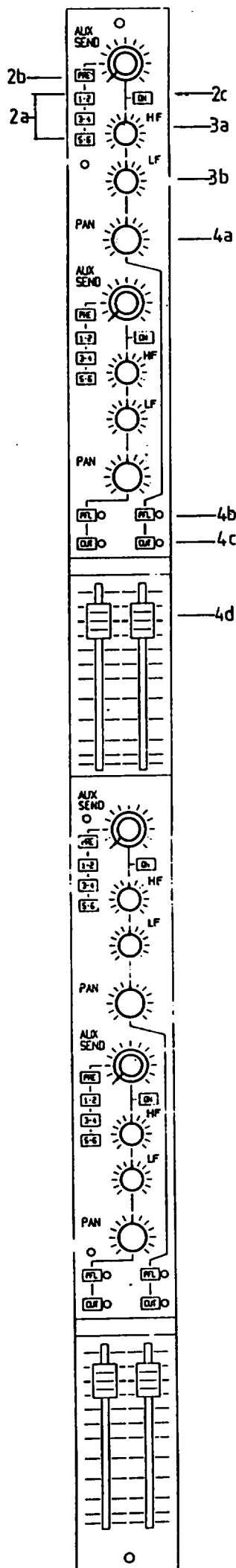
f) MIX BALANCE

The Mix Balance control is a centre detented device and allows the operator to adjust the stereo balance.

g) MIX FADER

The output of the Mix path is controlled by a high quality long throw conductive plastic unit. The law has been specially tailored to allow fine resolution in the upper working region, infinity cut off is greater than 90dB.





2.05 OPTIONAL EFFECTS RETURN MODULE

The optional Effects Return module contains 4 individual Effects Returns with Auxiliary sends and EQ. FX returns 3 and 4 are located at the top of the module and FX returns 1 and 2 are located at the bottom. All four FX returns are identical in function and circuitry. The Effects Return signals are always fed to the main mix bus.

1. Input to channel

The optional Effects Return module has an electronically balanced input. There is no gain control on the input.

2. Aux Send

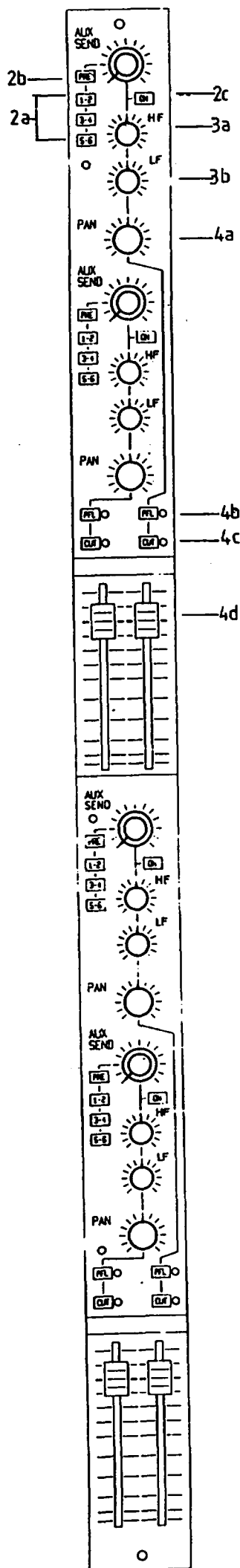
The dual concentric pot is the level control for the Auxiliary sends, the level of odd numbered sends is controlled by the top of the pot and the skirt controls the level of even numbered sends.

- a) **ROUTING BUTTONS.**
The two auxiliary sends may be routed to any pair of auxes as selected on the routing buttons.
- b) **PRE**
Selecting PRE takes the auxiliary sends from before the fader.
- c) **ON**
ON enables the auxiliary sends for the individual FX returns.

3. Equaliser section

The equaliser is positioned in the channel path before the Auxiliary sends.

- a) **HF (High Frequency)**
15dB of boost or cut is available at 10kHz. The filter has a shelving characteristic, ie. the slope of the EQ curve does not keep rising with frequency, but, having reached the desired amount, flattens out, or "shelves" from that frequency on.
- b) **LF (Low Frequency)**
15dB of boost or cut is available at 100Hz, with a shelving characteristic.



4. Pan Pot and Channel status

- a) **PAN**
The Pan Pot is a centre detented control, with a loss of 4.5dB at its centre point. This is a compromise between the 3dB loss required for constant power panning and the 6dB loss required for constant voltage panning.
- b) **PFL**
Pressing PFL solos the pre-fade signal, independent of the CUT switch. When pressed the associated LED illuminates, the signal is routed to the Control Room monitors and to the master meters.
- c) **CUT**
An individual FX return is CUT when the CUT button is pressed. This cuts both the send to the Mix bus and the Auxiliary sends.
- d) **FADER**
The individual fader is a linear short throw device, infinity cut off is greater than 90dB.

NB: The four FX returns are always routed to the main mix bus and can be routed to any pair of auxiliaries.

2.06 PATCH BAY

The Patchbay system installed in the TS24 greatly enhances the console's versatility and ease of use by providing convenient, standardised connection points, to many sections of the console and to numerous pieces of external equipment. This allows rapid insertion of peripheral equipment into the system by means of patch-cords.

The jacks used are of the small Bantam type, and are used in the normal balanced manner.

Tip: HOT (In phase signal)
Ring: COLD (Out of phase signal)
Sleeve: GROUND

All patch points are connected in this manner.

The channel insert send points and mix insert send points are Ground compensated to minimise hum or interference in differing environments, where earthing rules etc. may not always have been adhered to. When connecting a ground compensated output to an unbalanced destination the cold lead should be connected to earth at the destination end. The consideration for wiring the screen at only one end is not of such importance with a ground compensated output. (See MI2426).

The Patchbay has clearly divided sections, thereby making it simple to locate the required connection point in the console.

1. I/O Modules.

Each I/O Module patch section is provided with 8 jack sockets, arranged in 4 pairs as follows:-

- a) FROM STUDIO. This can be used as an output point for the signal feed from the studio etc. Inserting a jack breaks the signal path to the next jack down. Normally mic lines will be connected to these jacks via a molex connector.

NORMALLED TO:-

- b) CHANNEL INPUT. This is an input to the I/O module. Inserting a jack to use it breaks the signal flow FROM STUDIO.

- c) INSERT SEND. An output from the I/O module insert point. This has no break function, so that an output can be taken without disturbing the signal flow in the I/O module. Note that the insert "Flips" from the Channel to Mix path with the EQ. The insert send is Ground compensated to enable the operator to interface with a variety of balanced and unbalanced equipment.

NORMALLED TO:-

- d) INSERT RETURN. An input to the I/O module allowing a processed signal to be returned after the insert send point. Inserting a jack breaks the signal flow from the above send point.

- e) GROUP OUTPUT. An output from the I/O module group. Inserting a jack normally breaks the signal flow to the next socket down, but by adding two links on the patch PCB this can be converted to a non-break point.

NORMALLED TO:-

- f) TAPE SEND. Can be used as an alternative input to the tape machine. Inserting a jack breaks the signal path from the Group Output socket above.
NOTE: When the I/O module is metering the group, the signal level is actually measured at the tape send point, after both of the above patch points. Thus if, say, a compressor is plugged into this point the metering will read the signal level AFTER compression.

- g) TAPE RETURN. An output for the signal coming back from the tape-machine. Jack insertion normally breaks the signal path to the next socket down but this can be altered to non-break by adding two links on the PCB, as for the group output. The multitrack returns would normally be connected to these jacks via molex connectors.

NORMALLED TO:-

- h) MIX INPUT. An alternative input to the Mix path of the I/O module, allowing another signal to replace the normal tape return. Inserting a jack breaks the signal flow from the socket above.

2. Command Patch Points.

There are two different lay outs for the Command Patch Points. Early models have fewer parallels available, see a) below, whilst later models have more inserts available. (See b).

a) Command Patch Points for early TS24 models.

OSCILLATOR	Used as an output point for the feed from the internal oscillator, and may be used for tape alignment.
TALKBACK	This is an output from the Talkback mic and may be used to route the Talkback signal to other sections of the console not covered by the Communications section of the Command Module. The talkback signal is routed to the patchbay via pin 4 on the 40-way connector from the Command Module to the patchbay. This line is live at all times.
PHONES	An output from Phones 1 and 2, Left and Right is available to route the Headphone signal to other sections of the console not covered by the Phones section of the console.
AUX	Insert points, send and return, are provided for the six Auxiliaries. The send is normalled to the return and inserting a jack into the send socket does not break the signal flow. Inserting a jack into the return socket breaks the signal path from the Aux insert send.
MIX INS	Mix Insert sends and returns are available. Inserting a jack into the send socket does not break the signal flow. Inserting a jack into the return socket breaks the signal flow from the Insert send. The Insert send and return jacks, access the stereo mix immediately before the stereo fader. The Insert send is Ground Compensated to allow the operator to interface to a variety of balanced and unbalanced equipment.
MIX O/P	An alternative output from the main Mix is available to route the signal from the main Mix to peripheral equipment if required. The Mix O/P is normalled to 2-track A send.
2-TRACK SENDS	The tape sends allow access to the inputs of the 2-track tape machines. (eg. A jack inserted into the send socket sends the signal to the input of the tape-machine.