

Q2

TECHNICAL SALES DATA

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CALREC



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1.0 Principal Features & Introduction

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PRINCIPAL FEATURES:

- ☐ **Mono, Stereo and Stereo Line modules**
- ☐ **Dual inputs on all channels**
- ☐ **Can be configured for up to 96 channels / 8 groups**
- ☐ **10 Auxiliaries (2 Stereo)**
- ☐ **Optional 24 / 32 Track Routing**
- ☐ **2 independent Mix Minus systems**
- ☐ **Sophisticated Monitor section**
- ☐ **Optional Surround facilities**
- ☐ **10 VCA Group faders**

INTRODUCTION

The Calrec **Q2** is at the top of the analogue range of consoles providing high density mono and Stereo broadcast facilities together with optional multitrack recording and replay circuits.

Channel modules have dual inputs (dual mic and line in mono versions). Facilities are not compromised on stereo modules which also have provision for M/S conversion and width adjustment. All modules have full 4-band equalisation and 2-band filters, provision for Surround sound and VCA grouping.

Features:

- Choice of 3 channel modules:
 - Mono with dual mic/line inputs
 - Stereo with stereo mic/line inputs
 - Stereo line with dual stereo line inputs
- Very low noise performance
- 28dB console headroom
- Channel headroom still extends to 36dB by unique auto-gain ranging circuit
- 36 to 96 channel options
- 8 Stereo free groups - patched or normalled to Stereo channels for control
- 4 Main Stereo outputs with dynamics
- 10 Auxiliary outputs - 2 Stereo with separate pan
- Surround facility on channels with optional surround monitor including surround pan controls
- 10 VCA group faders - plus Master VCA fader
- CMOS analogue switch routing for low noise & reliability
- Optional 24 or 32 track recording and replay facility, using assignable path and routing selection with auto-recall of settings on power up
- 30mm modules & faders
- Unique printed circuit board backplane connectors for reliability and fast installation time
- 4-band parametric equalisation & 2-band parametric filters
- Provision for a range of metering, compressor & similar modules in upstand
- SLS & PA mute system follows faders & main selections
- Stereo AFL
- Sophisticated monitor LS panel with many external stereo inputs
- Optional "LS2" panel for additional inputs and/or second monitor LS system
- Provision for remote operation (Fader ON, Cut & VCA)
- 2 Mix minus systems on channel direct outputs
- Switched M/S to L/R conversion on Stereo channels
- Stereo width & pan controls
- Channel direct outputs have provision for Talkback and listen
- All interfaces balanced standard level, main & auxiliary outputs transformer isolated
- Separate mains power units with elaborate fail monitor
- Elegant stand & finishes

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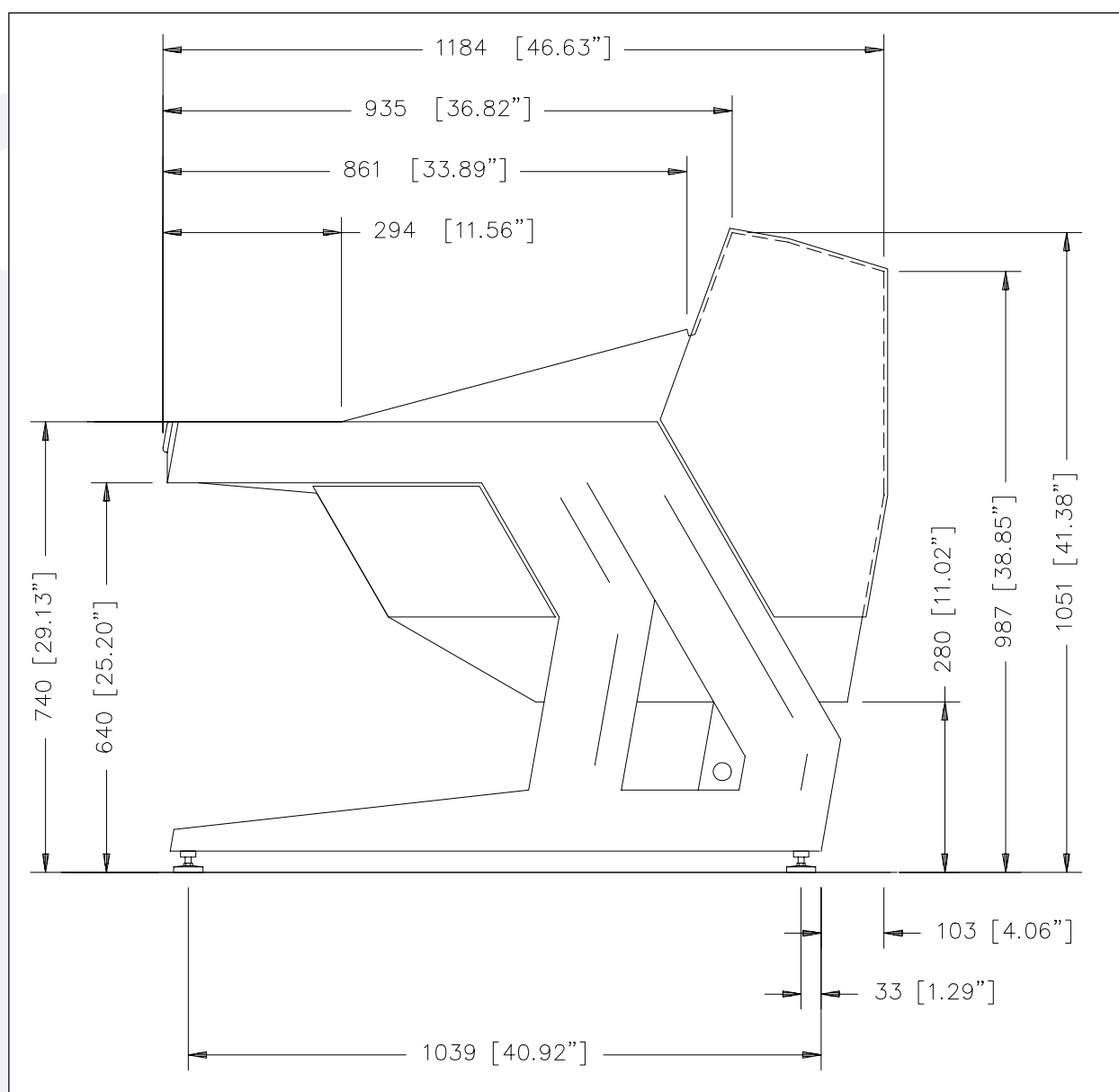


2.0 Console typical layout & profiles

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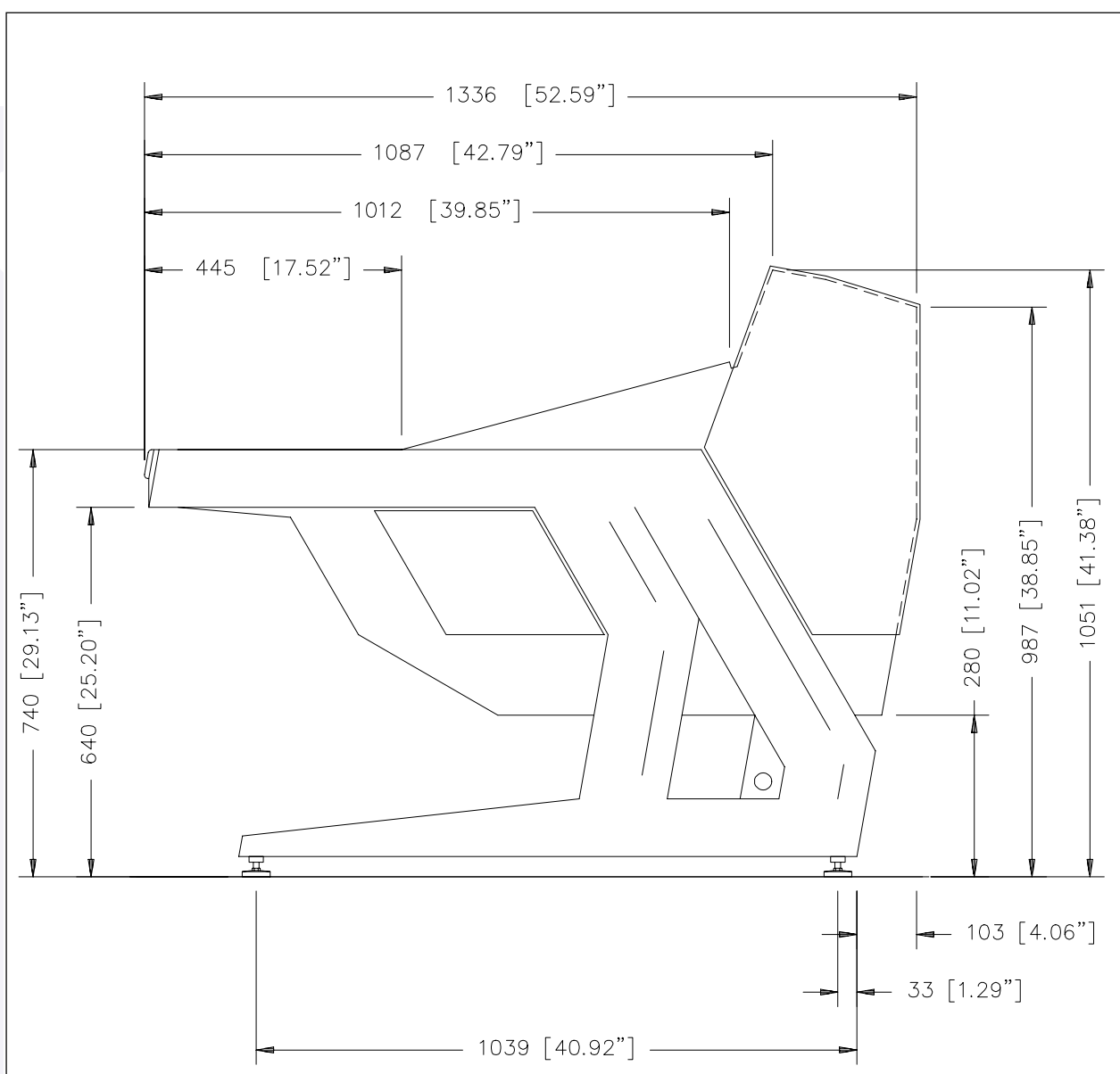
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SINGLE FADER PROFILE

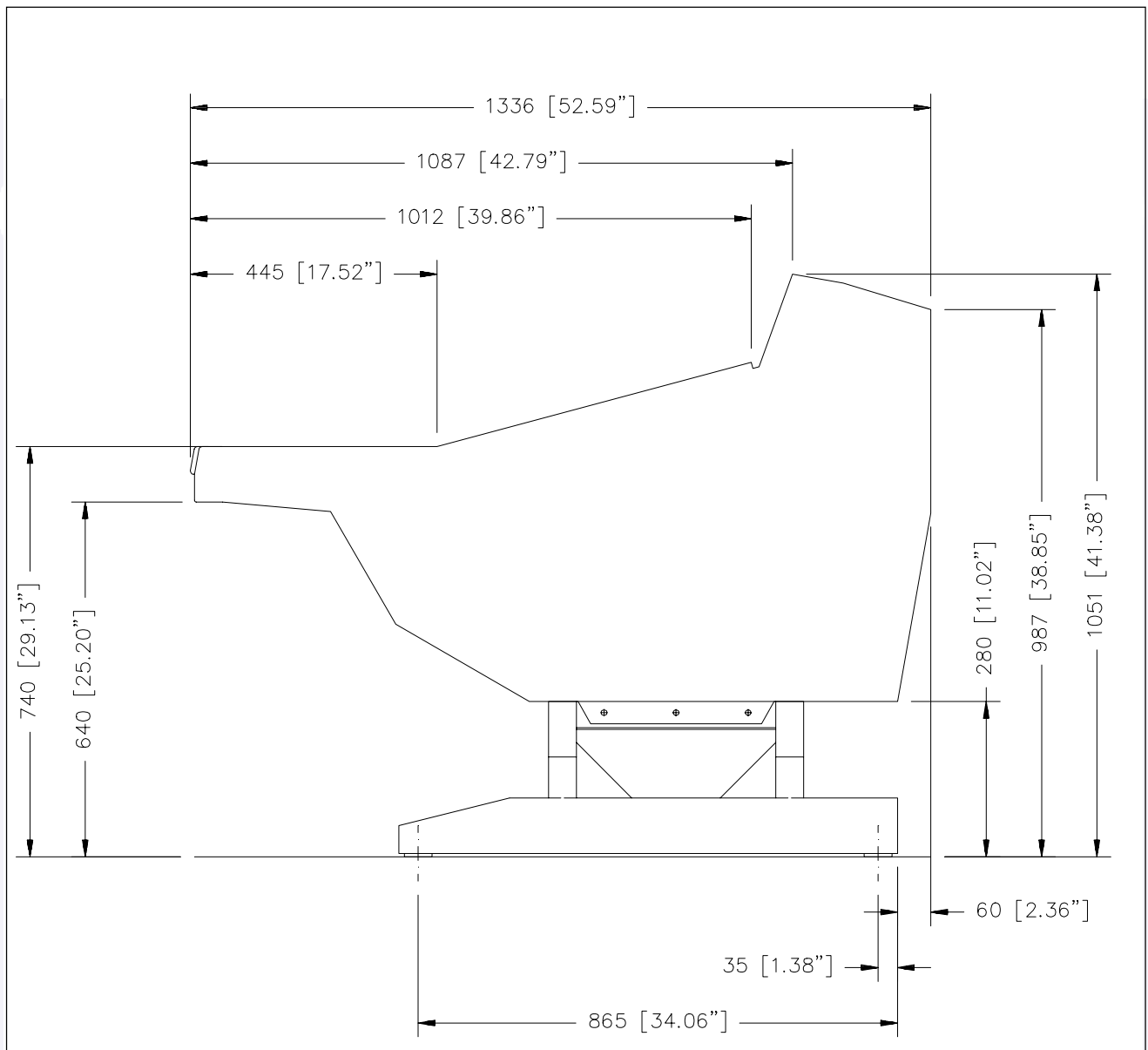


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TWIN FADER PROFILE



**TWIN FADER PROFILE WITH CHASSIS STAND
FOR OUTSIDE BROADCAST VEHICLES**



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3.0 Modules & Panels Description

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PQ4641 MONO CHANNEL

Routing to: 4 Main Stereo outputs, Red LED's. 8 Stereo groups, Yellow LED's.

Groups are patched or normalled to nominated Stereo channels for Group control.

Routing to Multitrack (if fitted). Channel route to any track is selected on Multitrack selection panel MT4320 but is set here pre or post fader (Red/Green LED) or from the Direct output control (Yellow LED). LED's only illuminate fully when route is made.

Signal can be panned odds/evens if PAN is selected, Red LED.

OverDUB button releases channel set globally for REMIX (if internally selected) from multi-track to channel input for over-dubbing. Red LED.

TONE button switches channel inputs after gain controls to adjustment tone. Red LED.

(No TONE when On-Air).

48V Phantom power button. Red LED.

Φ Phase reverse button.

I/P 2 selects second inputs Mic and Line. Yellow LED.

LINE selects Line inputs: Changes Red LED (Mic) to Green (LINE).

REMIX, Yellow LED, set globally via internal selection for multi-track remix into channel. Condition cancelled by DUB and REMIX LED extinguished.

Coarse gain rotary switch, 6dB steps - Restricted Line range.

TRIM: ±6dB Mic & Line.

Mon allows the Auxiliary feeds to be sourced from the monitor path. Yellow LED.

10 Auxiliary outputs. Common gain control and pre/post fader selection on 5/6, 7/8 and 9/10. 9/10 are stereo with separate pan control. PRE changes source from post fader to pre fader. Red LED. Aux ON (numbered) switches have Green LEDs. Aux 1 & 2 can be enabled by P.A. selection system if required (internal switch). Aux 1 is controlled by the fader on and CUT switch if the master bird beater switch is pressed.

DIRECT Output (mono) with pre/post fader selection. Red/Green LED, (Pre EQ internal option) and button for Talkback injection. Momentary listen button allows Direct Output to be heard on PFL loudspeaker(s).

MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Output. O/P 2 overrides O/P 1. Internal pre/post fader selection of bus feed. Yellow LED's. LF and HF parametric filters with separate button. Green LED. LF (high pass) 18dB / Octave. HF (low pass) 12dB / Octave.

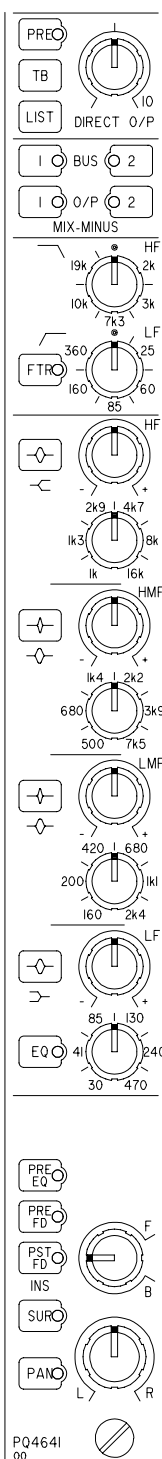
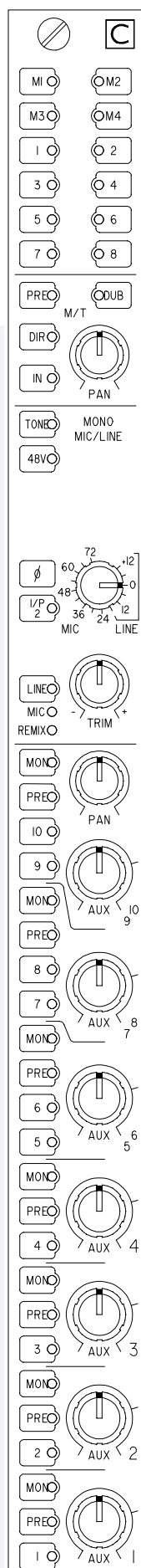
4-band parametric equaliser, +16dB at selected frequencies. Exclusive lift/cut law allows fine control near centre and provides optimum low noise particularly in centre detent positions. LF & HF bands can be shelf or bell (Q 1.0). LMF & HMF bands can be normal Q (1.0) or high Q (3.5) bell. EQ button, Red LED. Filter and/or EQ Circuits can be transferred to monitor fader in twin fader console configuration.

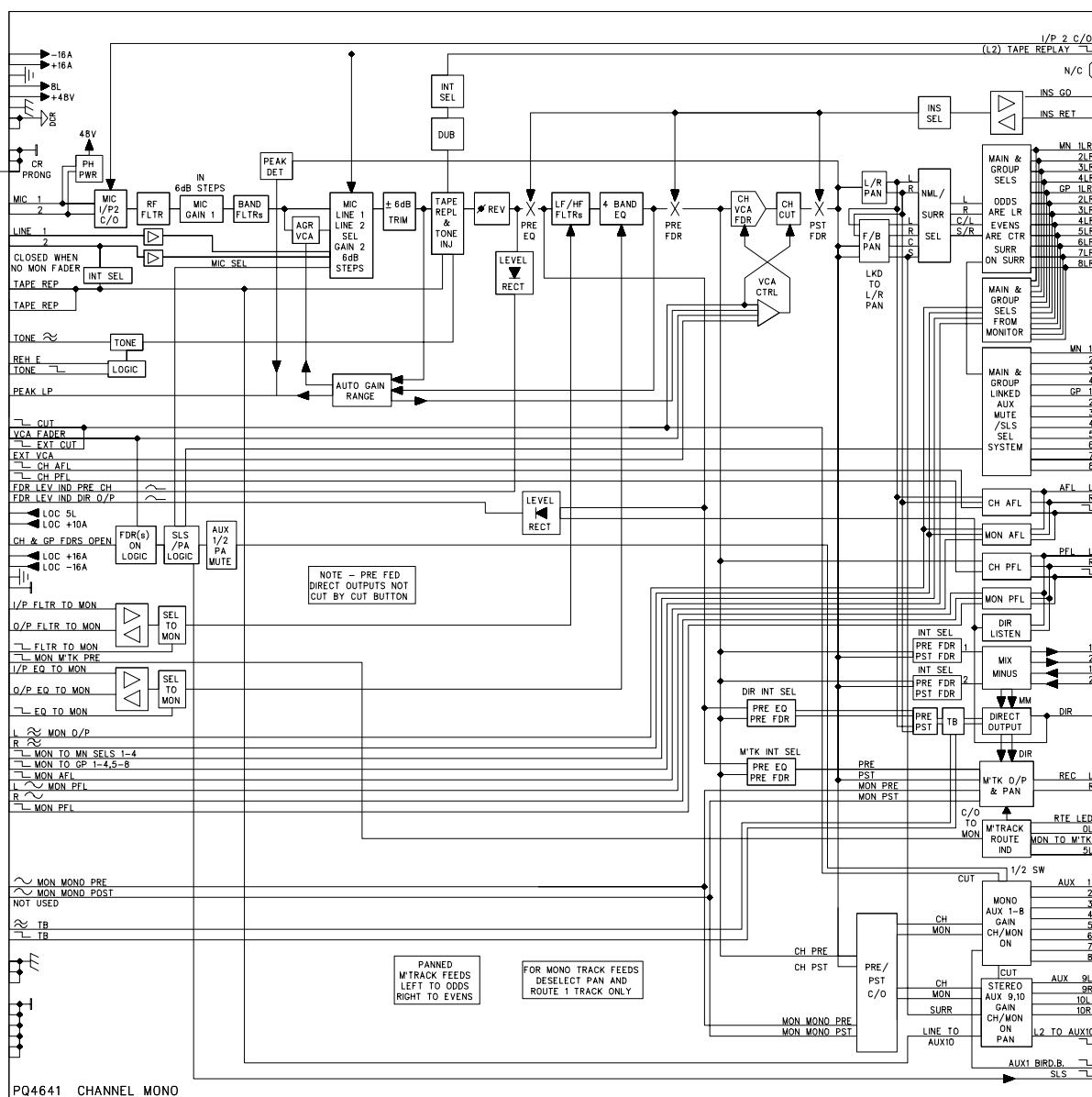
Pre EQ, Pre and Post faders INSERT selection with standard level balanced in & out interface. Yellow LED.

Left/Right PAN control with IN/OUT selection, Red LED.

SURROUND button, Red LED, introduces FRONT/BACK PAN and sends LEFT/RIGHT signals ONLY to odd Main and Group outputs. Even Mains & Groups receive CENTRE & MONO SURROUND signals (L & R) and Aux 10 becomes a STEREO SURROUND output where the Aux 10 PAN is used to produce SURROUND LEFT & SURROUND RIGHT.

FRONT/BACK pan between LEFT-CENTRE-RIGHT and SURROUND to produce the MONO & STEREO SURROUND OUTPUTS.





PQ4642 STEREO CHANNEL OR GROUP

Routing to: 4 Main Stereo outputs, Red LED's. 8 Stereo groups, Yellow LED's.
Groups are patched or normalled to nominated Stereo channels for Group control.

Routing to Multitrack (if fitted). Channel route to any track is selected on Multitrack selection panel MT4320 but is set here pre or post fader (Red/Green LED) or from the Direct output control (Yellow LED). LED's only illuminate fully when route is made.

Signal can be panned in stereo if PAN is selected between odds/evens tracks (left & right). Red LED. Internal switches change the operation of the PAN control such that, when selected, full left sends left signal to all tracks & full right sends right signal to all tracks. At PAN centre, a mono reduction of left & right is sent to all tracks.

OverDUB button releases channel set globally for REMIX (if internally selected) from multi-track to channel input for over-dubbing. Red LED.

TONE button switches channel inputs after gain controls to adjustment tone. Red LED. (No TONE when On-Air).

48V Phantom power button. Red LED.

LB, RB: Left or right signals to both outputs. (No balance control).

LB+RB: Both outputs (Mono) are panned with **BALANCE** control between L & R inputs.

BALANCE control $\pm 3\text{dB}$ in normal STEREO

$\Phi L \Phi R$ Phase reverse buttons left & right.

MS inserts MS/LR convertor. Red LED.

LINE selects Line inputs: Changes Red LED (Mic) to Green (LINE).

LINE button is marked GRP on modules in Group Position.

REMIX, Yellow LED, set globally via internal selection for multi-track remix into channel. Condition cancelled by DUB and REMIX LED extinguished.

Coarse gain rotary switch, 6dB steps - Restricted Line range.

TRIM: $\pm 6\text{dB}$ Mic & Line.

Mon allows the Auxiliary feeds to be sourced from the monitor path. Yellow LED.

10 Auxiliary outputs. 1-8 are mono reduction of stereo signal. 9 & 10 are stereo with separate pan control. Common gain control and pre/post fader selection on 5/6, 7/8 and 9/10. PRE changes source from post fader to pre fader. Red LED.

Aux ON (numbered) switches have Green LEDs.

Aux 1 & 2 can be enabled by P.A. selection system if required (internal switch).

Aux 1 is controlled by the fader on if the master bird beater switch is pressed.

DIRECT Output (stereo) with pre/post fader selection. Red/Green LED, (Pre EQ internal option) and button for Talkback injection. Momentary listen button allows Direct Output to be heard on PFL loudspeaker(s).

MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Output. O/P 2 overrides O/P 1. Internal pre/post fader selection of bus feed. Yellow LED's.

LF and HF parametric filters with separate button. Green LED. LF (high pass) 18dB / Octave. HF (low pass) 12dB / Octave.

4-band parametric equaliser, $\pm 16\text{dB}$ at selected frequencies. Exclusive lift/cut law allows fine control near centre and provides optimum low noise particularly in centre detent positions. LF & HF bands can be shelf or bell (Q 1.0).

LMF & HMF bands can be normal Q (1.0) or high Q (3.5) bell. EQ button, Red LED.

Filter and/or EQ Circuits can be transferred to monitor fader in twin fader console configuration.

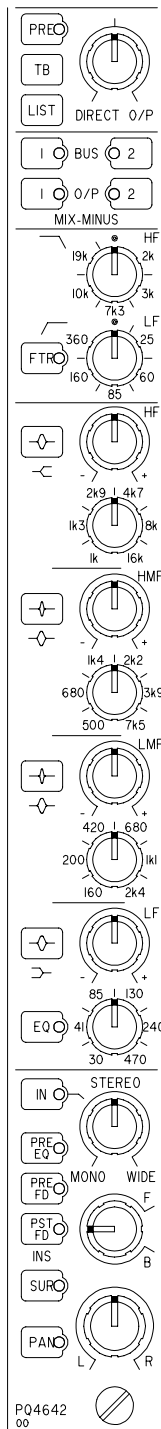
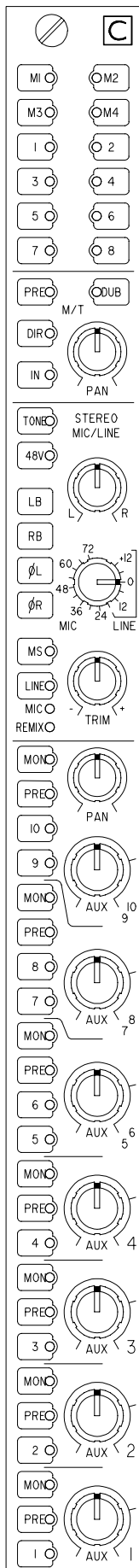
Pre EQ, Pre and Post faders INSERT selection with standard level balanced in & out interface. Yellow LED.

WIDTH control with IN/OUT button. Red LED. Signal can be varied from MONO through normal STEREO to extra WIDE STEREO.

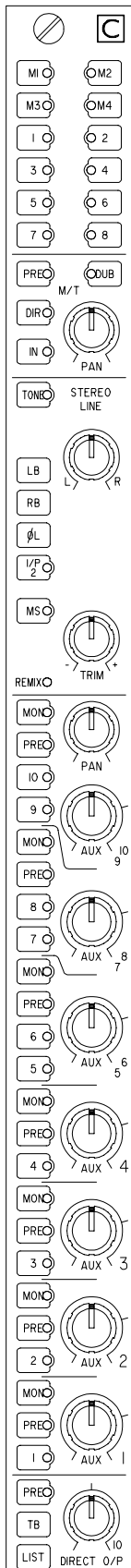
Left/Right PAN control with IN/OUT selection, Red LED.

SURROUND button, Red LED, introduces FRONT/BACK PAN and sends LEFT/RIGHT signals ONLY to odd Main and Group outputs. Even Mains & Groups receive CENTRE & MONO SURROUND signals (L & R) and Aux 10 becomes a STEREO SURROUND output where the Aux 10 PAN is used to produce SURROUND LEFT & SURROUND RIGHT.

FRONT/BACK pan between LEFT-CENTRE-RIGHT and SURROUND to produce the MONO & STEREO SURROUND OUTPUTS.



BQ4643 STEREO LINE CHANNEL OR GROUP



Routing to: 4 Main Stereo outputs, Red LED's. 8 Stereo groups, Yellow LED's.
Groups are patched or normalled to nominated Stereo channels for Group control.

Routing to Multitrack (if fitted). Channel route to any track is selected on Multitrack selection panel MT4320 but is set here pre or post fader (Red/Green LED) or from the Direct output control (Yellow LED). LED's only illuminate fully when route is made.

Signal can be panned in stereo if PAN is selected between odds/evens tracks (left & right). Red LED. Internal switches change the operation of the PAN control such that, when selected, full left sends left signal to all tracks & full right sends right signal to all tracks. At PAN centre, a mono reduction of left & right is sent to all tracks.

OverDUB button releases channel set globally for REMIX (if internally selected) from multi-track to channel input for over-dubbing. Red LED.

TONE button switches channel inputs after gain controls to adjustment tone. Red LED.
(No TONE when On-Air).

LB, RB: Left or right signals to both outputs. (No balance control). LB+RB: Both outputs (Mono) are panned with BALANCE control between L & R inputs. BALANCE control $\pm 3\text{dB}$ in normal STEREO.

Φ Phase reverse button. Left only.

I/P 2 selects second inputs. Yellow LED. (button is marked GRP when in Group position).

MS inserts MS/LR convertor. Red LED.

REMIX, Yellow LED, set globally via internal selection for multi-track remix into channel. Condition cancelled by DUB and REMIX LED extinguished.

TRIM: $\pm 15\text{dB}$ Inputs 1 & 2.

Mon allows the Auxiliary feeds to be sourced from the monitor path. Yellow LED.

10 Auxiliary outputs. 1-8 are mono reduction of stereo signal. 9 & 10 are stereo with separate pan control. Common gain control and pre/post fader selection on 5/6, 7/8 and 9/10. PRE changes source from post fader to pre fader. Red LED.

Aux ON (numbered) switches have Green LEDs.

Aux 1 & 2 can be enabled by P.A. selection system if required (internal switch).

Aux 1 is controlled by the fader on if the master bird beater switch is pressed.

DIRECT Output (stereo) with pre/post fader selection. Red/Green LED, (Pre Eq internal option) and button for talkback injection. Momentary listen button allows Direct Output to be heard on PFL loudspeaker(s).

MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Output. O/P 2 overrides O/P 1. Internal pre/post fader selection of bus feed. Yellow LED's.

LF and HF parametric filters with separate button. Green LED. LF (high pass) 18dB / Octave. HF (low pass) 12dB / Octave.

4-band parametric equaliser, $\pm 16\text{dB}$ at selected frequencies. Exclusive lift/cut law allows fine control near centre and provides optimum low noise particularly in centre detent positions. LF & HF bands can be shelf or bell (Q 1.0).

LMF & HMF bands can be normal Q (1.0) or high Q (3.5) bell. EQ button, Red LED. Filter and/or Eq Circuits can be transferred to monitor fader in twin fader console configuration.

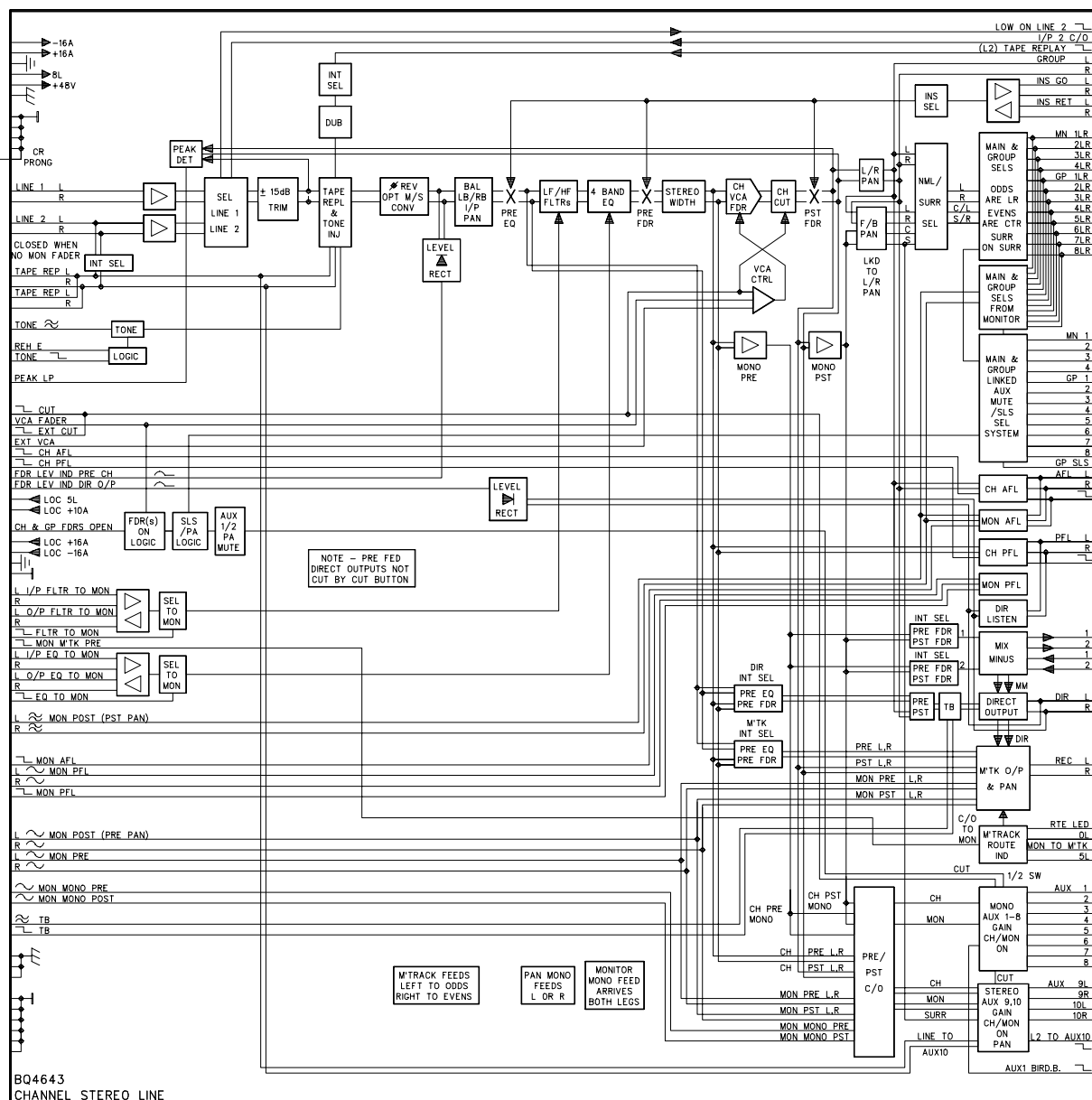
Pre Eq, Pre and Post faders INSERT selection with standard level balanced in & out interface. Yellow LED.

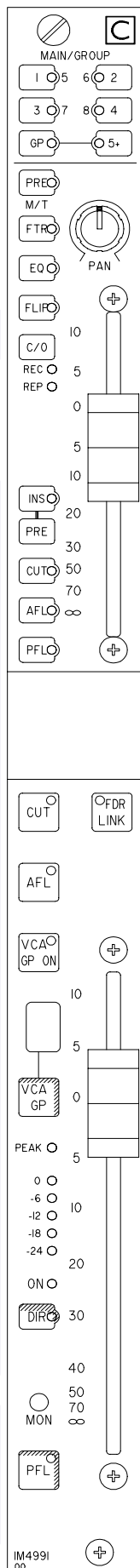
WIDTH control with IN/OUT button. Red LED. Signal can be varied from MONO through normal STEREO to extra WIDE STEREO.

Left/Right PAN control with IN/OUT selection, Red LED.

SURROUND button, Red LED, introduces FRONT/BACK PAN and sends LEFT/RIGHT signals ONLY to odd Main and Group outputs. Even Mains & Groups receive CENTRE & MONO SURROUND signals (L & R) and Aux 10 becomes a STEREO SURROUND output where the Aux 10 PAN is used to produce SURROUND LEFT & SURROUND RIGHT.

FRONT/BACK pan between LEFT-CENTRE-RIGHT and SURROUND to produce the MONO & STEREO SURROUND OUTPUTS.





IM4991 MONO CHANNEL & MONITOR FADERS (WITH FADER LINK SWITCH) IM4644 MONO CHANNEL & MONITOR FADERS

Monitor Fader Routing to:

4 Main Stereo Outputs. Red LED's.

Stereo Groups 1-4. Yellow LED.

Stereo Groups 5-8. Yellow LED.

PRE button - LED only illuminates when 'FROM MON' is selected on the Multitrack Control Panel and the channel is routed to a track. Green = post Monitor Fader, Red = pre Monitor fader.

MONITOR PAN control - in circuit all the time.

MONITOR Fader - with +10dB in hand (Channel if flipped).

FTR button - borrows filters & controls from channel. Green LED.

EQ button - borrows EQ & controls from channel. Red LED.

FLIP - exchanges monitor fader with channel fader. CUT, AFL & PFL controls exchange also. FLIP may be controlled globally & the local control used as an opt-out. Yellow LED when flipped.

RECORD - Red LED & REPLAY - Green LED usually controlled globally but can be changed over with C/O button.

INSERT - puts the insertion in circuit - Yellow LED.

PRE selects the insert from Post to Pre the Monitor fader

CUT - Monitor fader unless flipped - Yellow LED - latching button.

AFL button - Routes monitor signal (channel if flipped) exclusively to monitor loudspeakers (in-place stereo). Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Several AFL's can be operated together. Red LED.

PFL - Monitor fader unless flipped - momentary button routes pre fader monitor signal to PFL loudspeakers.

CUT - Channel fader unless flipped - Yellow LED - latching button.

FADER LINK - Makes the small fader a slave of the large fader - Green LED.

AFL - Routes channel signal (monitor if flipped) exclusively to monitor loudspeakers (in-place stereo). Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Several AFL's can be operated together. Red LED.

VCA GROUP ON - puts channel under control of indicated VCA Group fader. This includes fader level, AFL & CUT. Green LED's unless either this fader OR the VCA Group fader are faded out when LED shows RED.

NUMERIC - indicates which VCA Group is selected.

VCA GROUP - controls VCA Group selection via numeric. Note this selection is retained on power down over 1 week. Selection is locked with VCA GP ON.

CHANNEL FADER - with +10dB in hand (Monitor if flipped).

PEAK - Red LED illuminates when signal anywhere in channel circuit approaches within 3dB of clipping.

BARGRAPH - (5 LED's: 1 Red, 1 Yellow, 3 Green) gives a display of Pre EQ signal level in the channel.

ON - Green LED illuminates when fader is open.

DIR button switches bargraph to show DIRECT OP level. Restricted access button - Yellow LED.

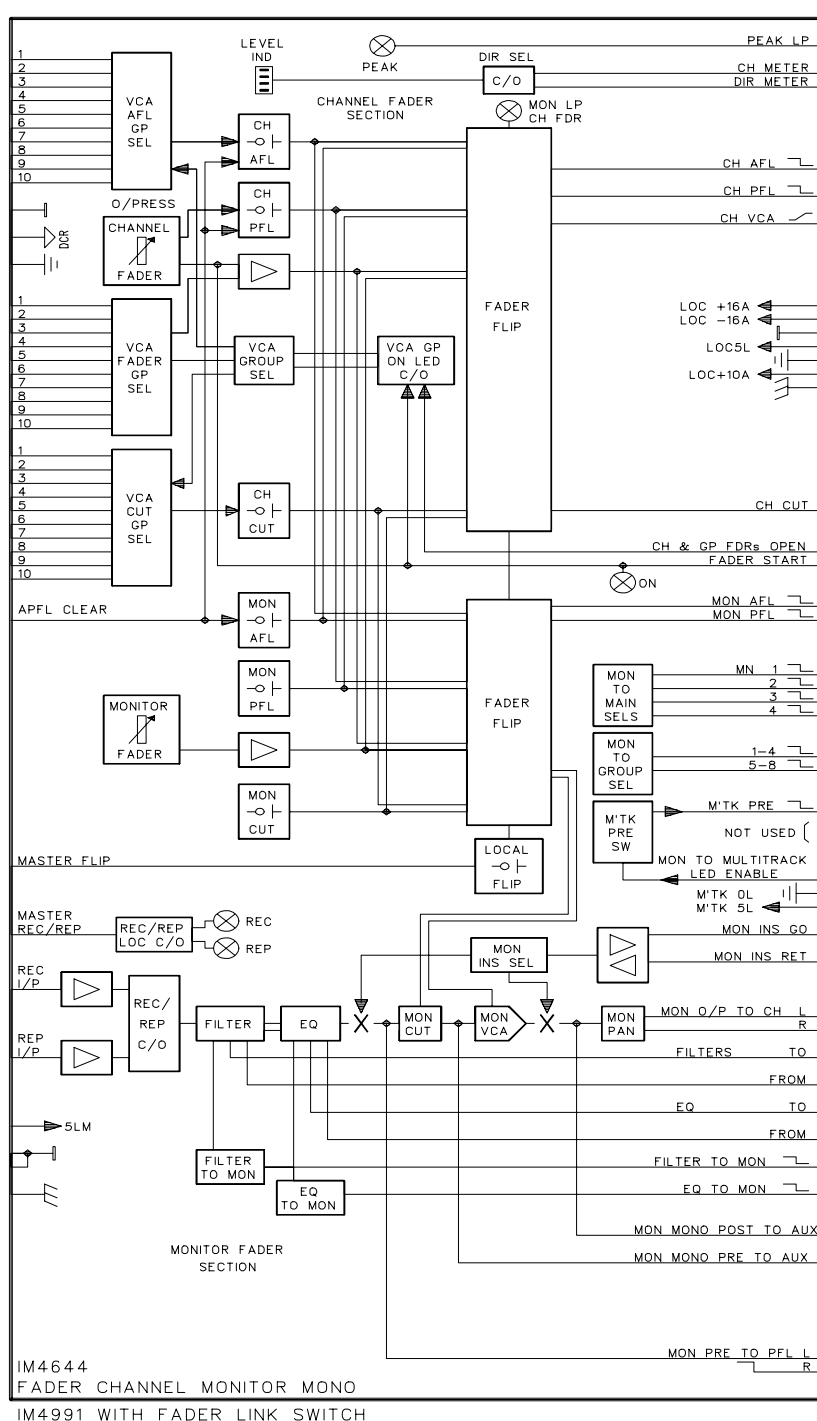
MONITOR - Red LED - illuminates when faders are flipped and this fader is MONITOR.

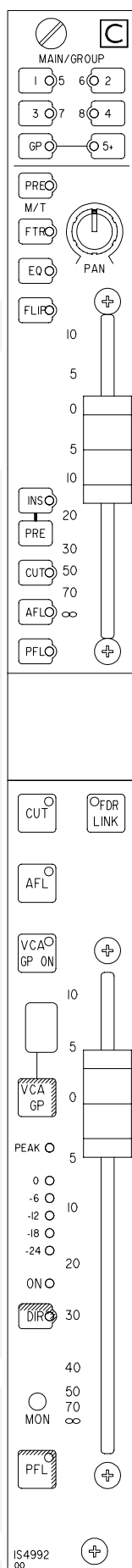
PFL button routes channel signal (Monitor if flipped) exclusively to PFL loudspeaker(s). Momentary button can be internally set for latching, or momentary on sustained press AND latching on short press. PFL can be cancelled when fader opens (internal switch). Green LED.

Calrec Auto Gain Ranging

This unique principle allows the channel to operate with a normal headroom of 28dB above chosen setting.

On severe overloads the headroom is automatically extended to 36dB up to the fader. The pre-fader signals to Echo, Foldback etc. are limited in this condition to avoid severe overload but the channel signal is exclusively under the control of the operator and he/she will naturally pull back the channel fader.





IS4992 STEREO CHANNEL & MONITOR FADERS (WITH FADER LINK SWITCH) IS4645 STEREO CHANNEL & MONITOR FADERS

Monitor Fader Routing to:

4 Main Stereo Outputs. Red LED's.

Stereo Groups 1-4. Yellow LED.

Stereo Groups 5-8. Yellow LED.

PRE button - LED only illuminates when 'FROM MON' is selected on the Multitrack Control Panel and the channel is routed to a track. Green = post Monitor Fader, Red = pre Monitor fader.

MONITOR PAN control - in circuit all the time.

MONITOR Fader - with +10dB in hand (Channel if flipped).

FTR button - borrows filters & controls from channel. Green LED.

EQ button - borrows EQ & controls from channel. Red LED.

FLIP - exchanges monitor fader with channel fader. CUT, AFL & PFL controls exchange also. FLIP may be controlled globally & the local control used as an opt-out. Yellow LED when flipped.

INSERT - puts the insertion in circuit - Yellow LED.

PRE selects the feed to Multitrack from Post to Pre the monitor fader.

CUT - Monitor fader unless flipped - Yellow LED - latching button.

AFL button - Routes monitor signal (channel if flipped) exclusively to monitor loudspeakers (in-place stereo). Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Several AFL's can be operated together. Red LED.

PFL - Monitor fader unless flipped - momentary button routes pre fader monitor signal to PFL loudspeakers.

CUT - Channel fader unless flipped - Yellow LED - latching button.

FADER LINK - Makes the small fader a slave of the large fader - Green LED

AFL - Routes channel signal (monitor if flipped) exclusively to monitor loudspeakers (in-place stereo). Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Several AFL's can be operated together. Red LED.

VCA GROUP ON - puts channel under control of indicated VCA Group fader. This includes fader level, AFL & CUT. Green LED's unless either this fader OR the VCA Group fader are faded out when LED shows RED.

NUMERIC - indicates which VCA Group is selected.

VCA GROUP - controls VCA Group selection via numeric. Note this selection is retained on power down over 1 week. Selection is locked with VCA GP ON.

CHANNEL FADER - with +10dB in hand (Monitor if flipped).

PEAK - Red LED illuminates when signal anywhere in channel circuit approaches within 3dB of clipping.

BAR GRAPH - (5 LED's: 1 Red, 1 Yellow, 3 Green) gives a display of Pre EQ signal level in the channel.

ON - Green LED illuminates when fader is open.

DIR button switches bargraph to show DIRECT OP level. Restricted access button - Yellow LED.

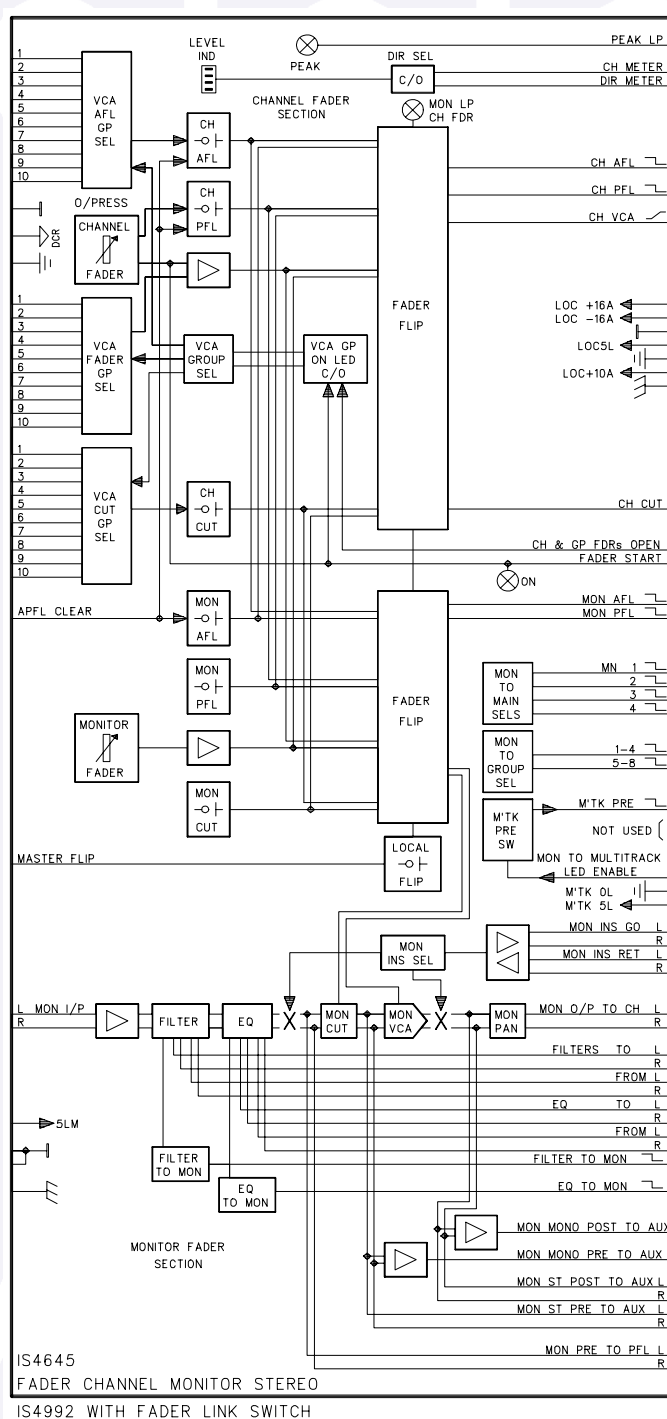
MONITOR - Red LED - illuminates when faders are flipped and this fader is MONITOR.

PFL button routes channel signal (Monitor if flipped) exclusively to PFL loudspeaker(s) in-place stereo if 2 loudspeakers are used. Momentary button can be internally set for latching, or momentary on sustained press AND latching on short press. PFL can be cancelled when fader opens (internal switch). Green LED.

Calrec Auto Gain Ranging

This unique principle allows the channel to operate with a normal headroom of 28dB above chosen setting.

On severe overloads the headroom is automatically extended to 36dB up to the fader. The pre-fader signals to Echo, Foldback etc. are limited in this condition to avoid severe overload but the channel signal is exclusively under the control of the operator and he/she will naturally pull back the channel fader.



IC4061 CHANNEL/GROUP FADER

Single fader version of console. Used for Mono/Stereo channels.

Scribble strip.

CUT button - cuts all channel/group outputs. Yellow LED.
- mechanically latching function - retained through power down.

AFL button routes channel signal exclusively to monitor loudspeakers (in place stereo). Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Several AFL's can be selected together.

VCA GROUP ON - puts channel under control of indicated VCA Group fader. This includes fader level, AFL & CUT. Green LED's unless either this fader OR the VCA Group fader are faded out when LED shows RED.

NUMERIC - indicates which VCA Group is selected.

VCA GROUP - controls VCA Group selection via numeric. Note this selection is retained on power down up to 1 week.

FADER - with +10dB in hand - can be reverse scale to order.

PEAK - Red LED illuminates when signal anywhere in channel circuit approaches within 3dB of clipping.

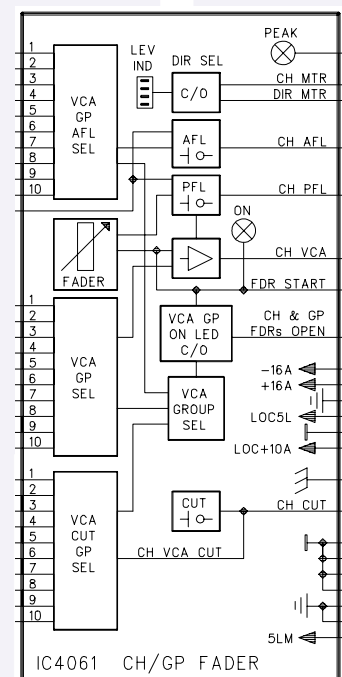
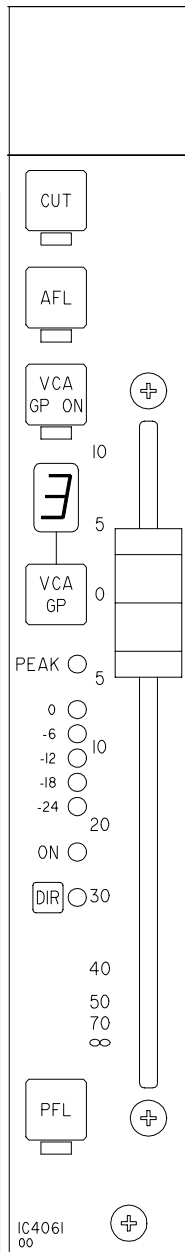
BARGRAPH - (5 LED's: 1 Red, 1 Yellow, 3 Green) gives a display of Pre EQ signal level in the channel.

ON - Green LED illuminates when fader is open.

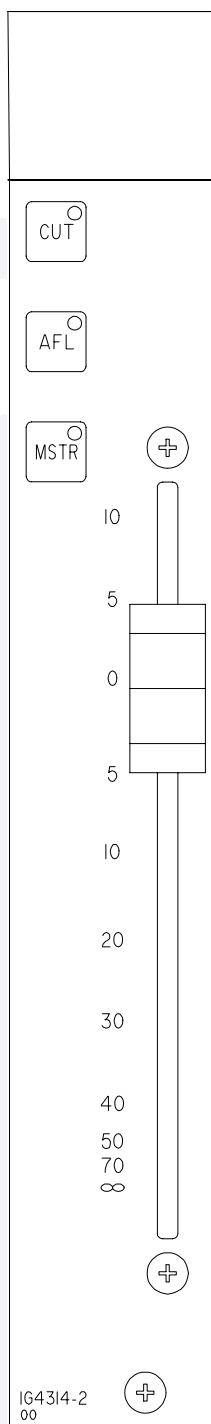
DIR button switches bargraph to show DIRECT OP level.

Restricted access button - Yellow LED.

PFL button routes channel pre fader signal to PFL loudspeaker(s) in-place stereo if 2 are used. Momentary button can be internally set for latching OR. Momentary on sustained press AND latching on short press. PFL can be cancelled when fader opens (internal switch). Green LED.



IG4314-2 VCA GROUP FADER

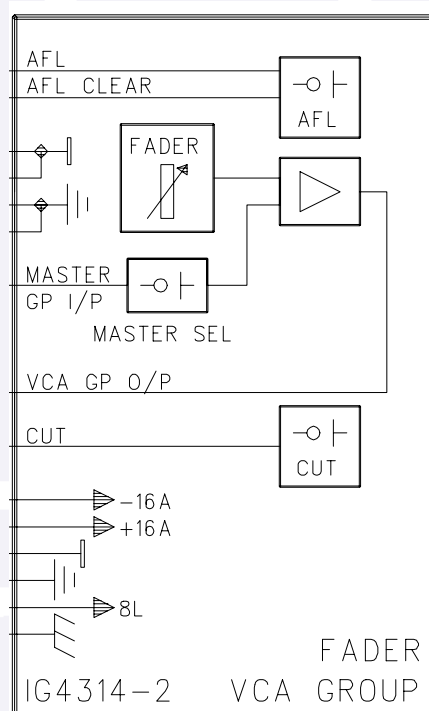


CUT - cuts all faders routed to this VCA Group fader - latching button. Yellow LED.

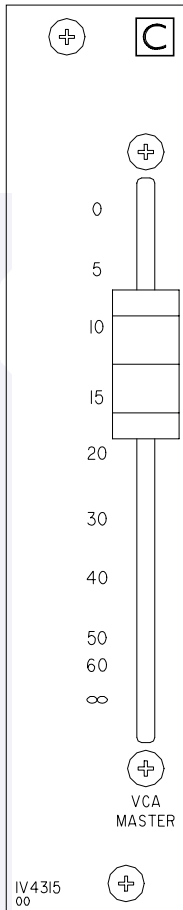
AFL - sets all faders routed to this VCA Group fader to AFL. Momentary button can be internally set for latching OR momentary on sustained press AND latching on short press. Red LED.

MASTER - sets fader under additional control of Master VCA fader. Green LED.

VCA GROUP FADER - with +10dB in hand.

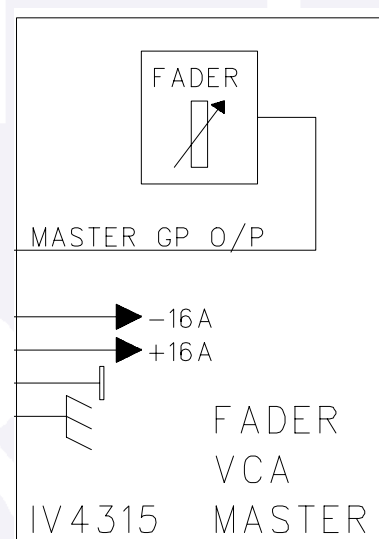


IV4315 VCA MASTER FADER

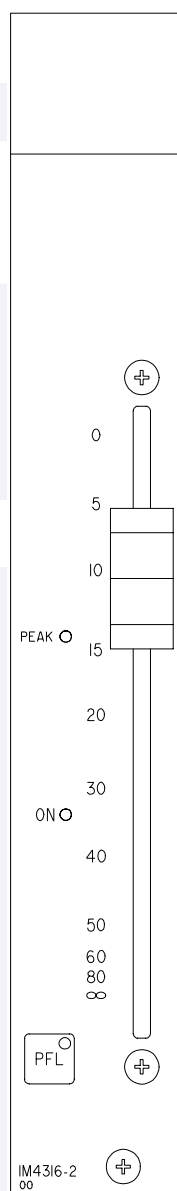


Fader controls selected VCA group faders and channels selected to those VCA groups.

Fader is fade-out only - nothing in hand.



IM4316-2 MAIN FADER



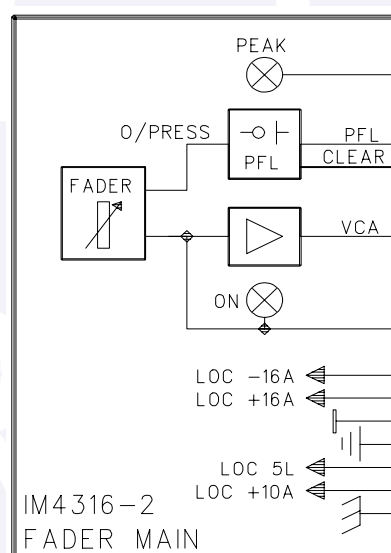
FADER

PEAK - Red LED illuminates when signal in the Main circuits approaches within 3dB of clipping.

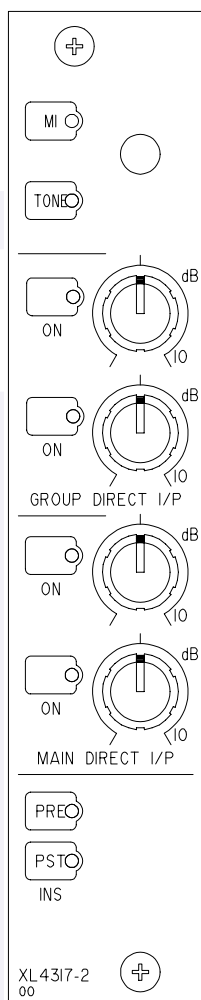
ON - Green LED illuminates when fader is open.

PFL button routes main signal to PFL loudspeakers (optional in-place stereo).

Momentary button - Green Led - can be internally set for latching OR momentary on a sustained press AND latching on a short press.



XL4317-2 MAIN OUTPUT



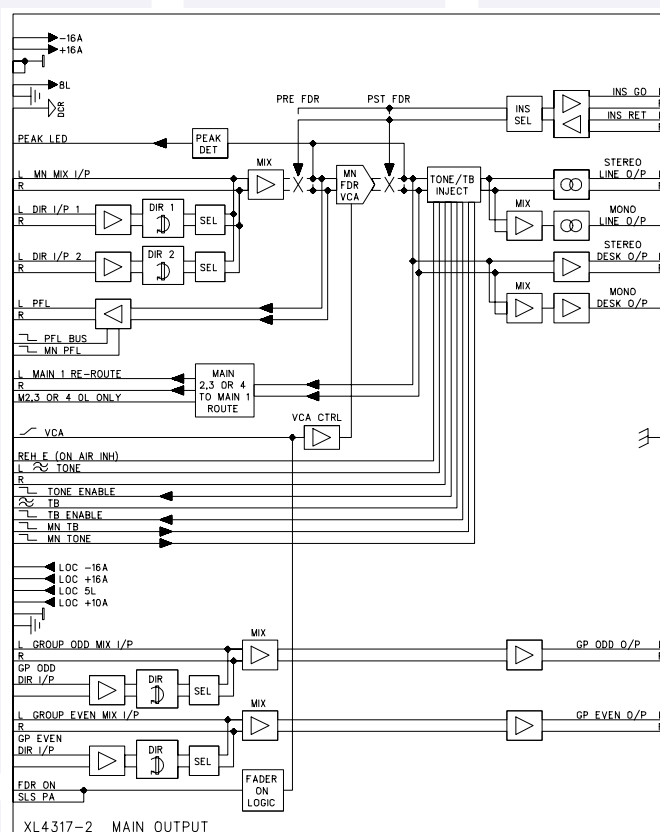
M1 Routing button for Mains 2, 3 and 4 back to M1. Red LED.

TONE button puts alignment tone on Main Output. Red LED.

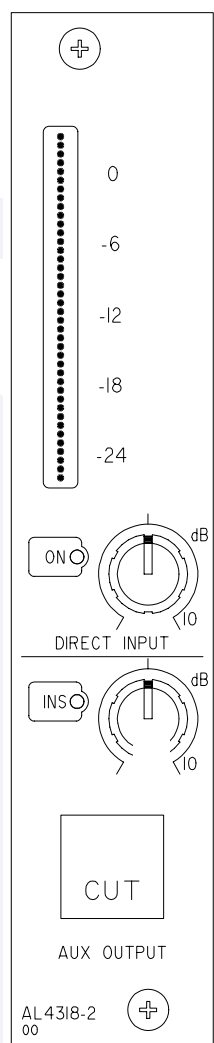
FOUR Main output modules carry 8 Group Direct inputs (two each). Each control has 10dB in hand and a separate ON button with Yellow LED.

MAIN DIRECT INPUTS - Two off per Main output, each with a control and 10dB in hand and two separate ON buttons with Red LED's.

INSERT buttons - PRE fader and POST fader. Yellow LED.



AL4318-2 MONO AUXILIARY OUTPUT



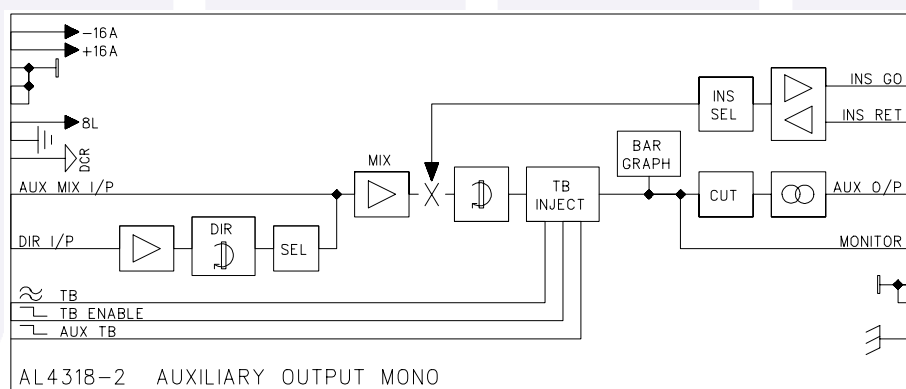
BARGRAPH shows Auxiliary output level. Level shows dimly even when CUT. (3 Red bars above PEAK level, 4 Yellow and 13 Green).

AUXILIARY DIRECT input control with 10dB in hand and ON button - Green LED.

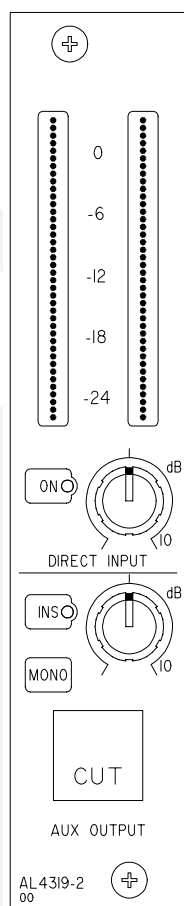
AUXILIARY OUTPUT level control with 10dB in hand.

INSERT button - pre fader insert - Yellow LED.

CUT button - latching - Yellow LED - does not cut monitor or bargraph signals.



AL4319-2 STEREO AUXILIARY OUTPUT



BARGRAPHS show Auxiliary output level. Level shows dimly even when CUT. (3 Red bars above PEAK level, 4 Yellow and 13 Green).

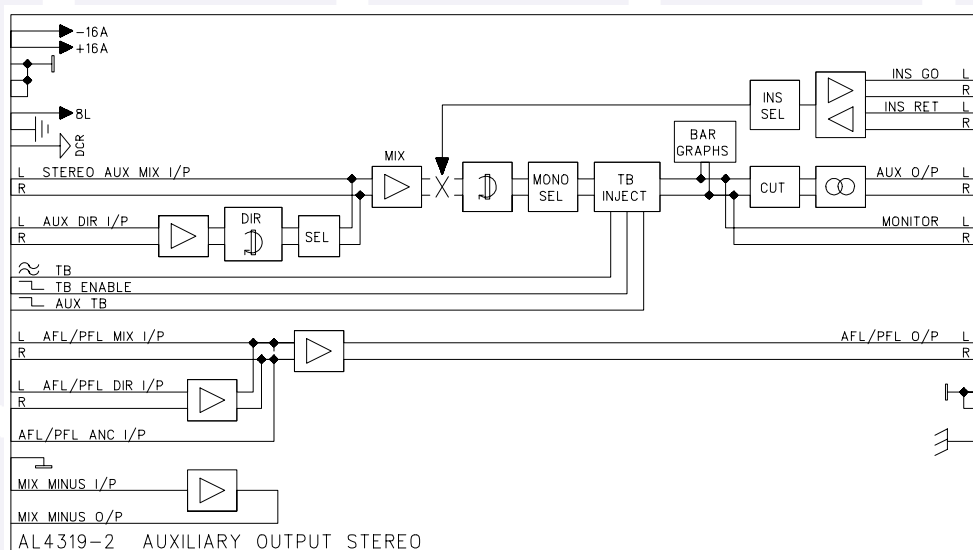
AUXILIARY DIRECT input control with 10dB in hand and ON button - Green LED.

AUXILIARY OUTPUT level control with 10dB in hand.

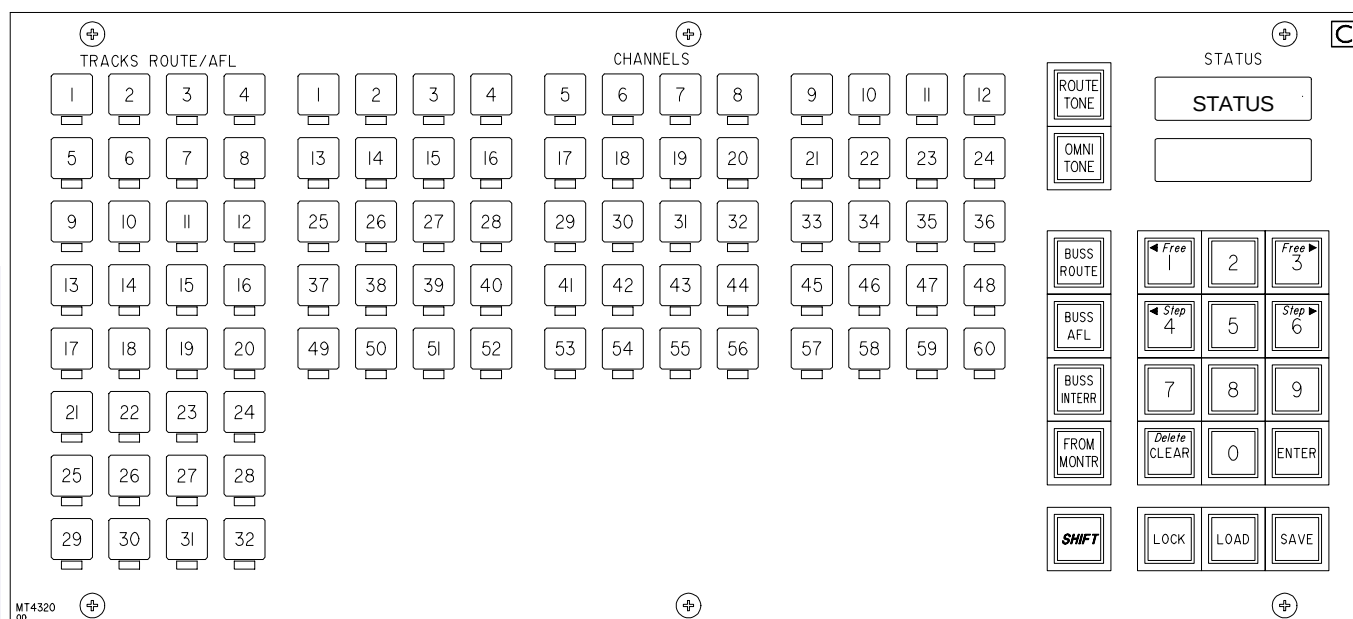
INSERT button - pre fader insert - Yellow LED.

MONO button - reduces stereo output to mono on both legs.

CUT button - latching - Yellow LED - does not cut monitor or bargraph signals.



MT4320 MULTI-TRACK SELECTOR



TRACKS ROUTE/AFL: 32 buttons with Red, Green or Yellow LED's.

CHANNELS: 96 buttons (60 shown). Green LED's.

ROUTE TONE / OMNI TONE: To send alignment tone to selected or all tracks using TRACK buttons. Red LED's.

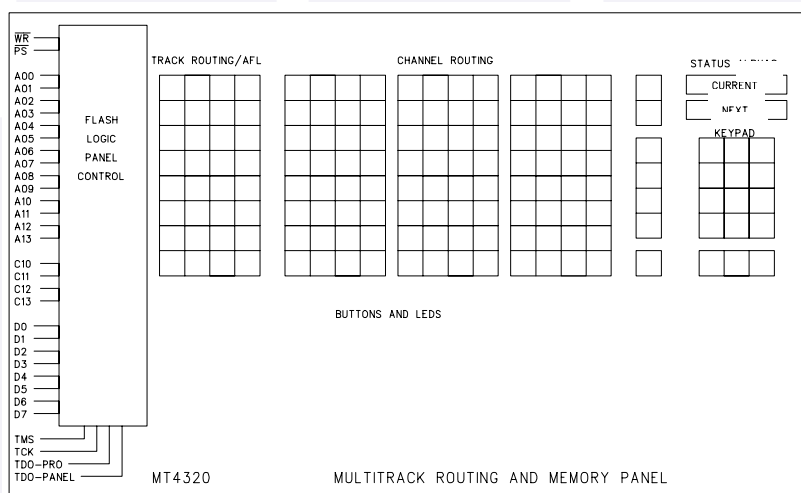
BUSS ROUTE: To route TRACKS from CHANNELS using these buttons. Green LED.

BUSS AFL (After fade listen): For Sending track signal(s) exclusively to Monitor loudspeakers using TRACK buttons. Red LED.

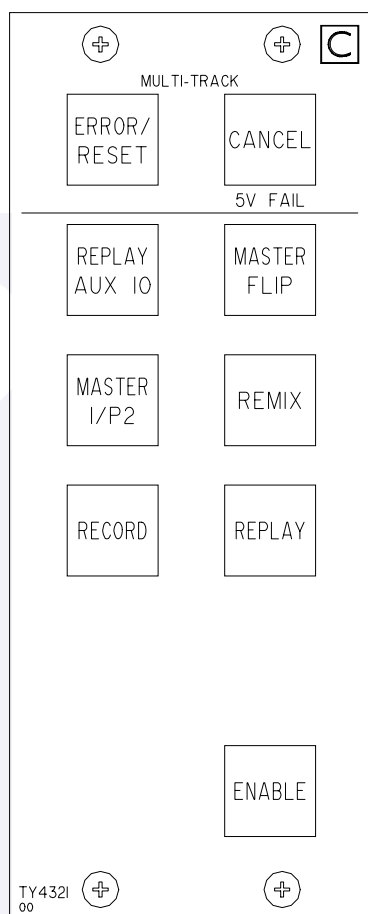
BUSS INTERROGATE: To observe selected routes FROM channels using Track buttons. Yellow LED.

FROM MONITOR: Allows routing to tracks to be set from the Channel MONITOR path. Red LED.

MEMORY: Buttons and alpha-numeric displays for up to 99 memory settings.



TY4321 MASTER CONTROL



ERROR / RESET - Red LED shows an error in the processors. The button resets the processors.

5V FAIL - Red LED flashes if one of the two 5 volt regulators supplying the processor and multitrack control system should fail. Pressing cancel under this condition makes the LED stay on steady.

REPLAY AUX 10 - Routes the Line 2 channel inputs to the Stereo Auxiliary 10 output for those consoles not having a Monitor fader. This is used for Multitrack replay and monitor mix (with PAN controls). Yellow LED.

MASTER FLIP - Exchanges ALL CHANNEL FADERS with MONITOR FADERS together with allied CUT, AFL and PFL controls. Faders can be changed locally or opted out of the Master FLIP. Red LED.

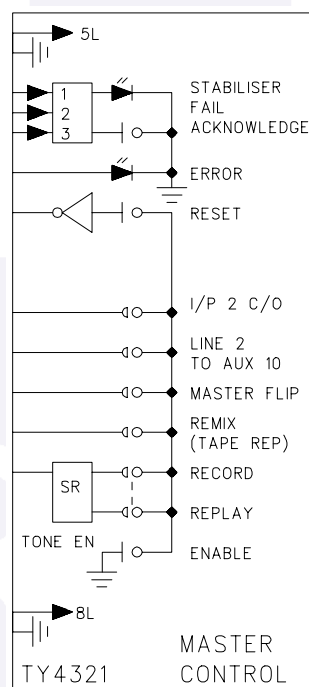
MASTER I/P2 - Changes ALL CHANNELS to INPUT 2 - does not apply to STEREO channels - but includes STEREO LINE channels. Channels can be changed locally but cannot opt-out. Yellow LED.

REMIX - Sets all channels selected internally to Multitrack replay bypassing the input gain controls. Yellow LED. This condition is TAPE REPLAY on consoles without monitor faders.

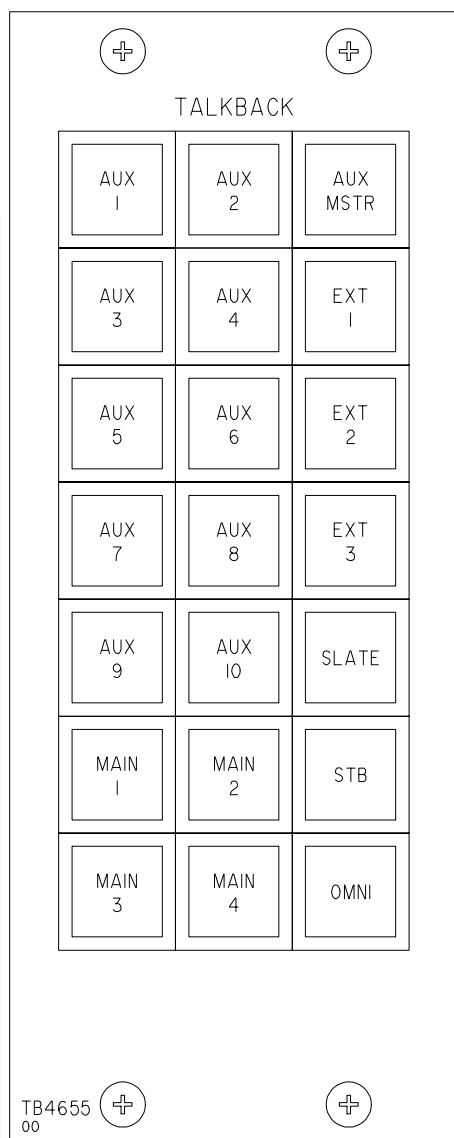
RECORD - Sets MONO MONITOR FADER inputs to the Multitrack record signals. Red LED. Cancels REPLAY.

REPLAY - Sets all MONO MONITOR FADERS to hear the Multitrack replay signals. Green LED. Cancels RECORD.

ENABLE - must be used simultaneously with above selections to prevent accidental operation.



TB4655 TALKBACK CONTROL

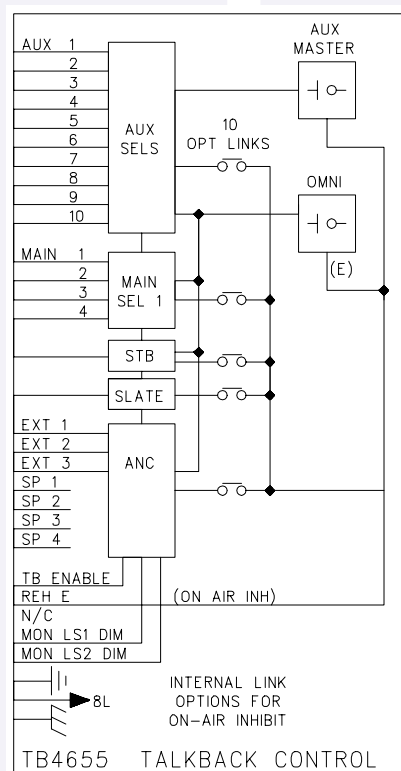


21 Momentary buttons route talkback to listed destinations.

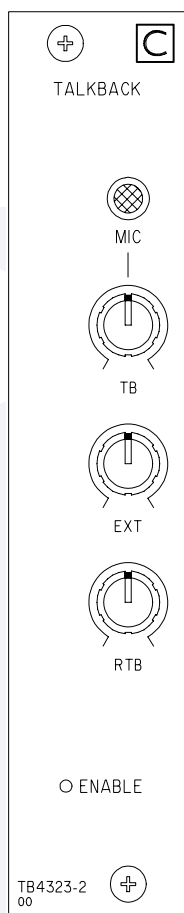
* Note - OMNI sends Talkback to all destinations except SLATE. SLATE sends Talkback to all track outputs.

AUX MSTR and OMNI buttons are inhibited when console is ON-AIR.

Each AUX, the 4 MAIN, STB, SLATE and the 3 EXT buttons can be inhibited ON-AIR or permanently enabled with optional pluggable links.



TB4323-2 TALKBACK



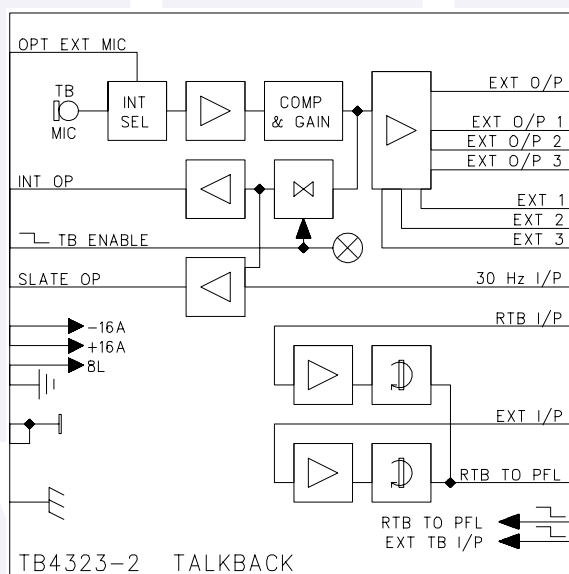
TALKBACK microphone.

TALKBACK microphone level control.

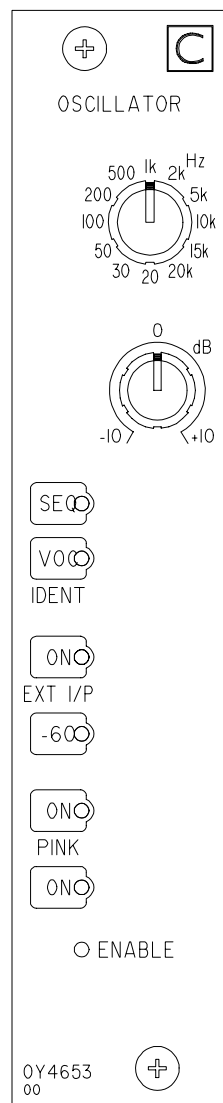
EXTERNAL input to PFL loudspeakers.

RTB (Reverse Talkback) input to PFL loudspeakers.

ENABLE - Red LED illuminates when internal buss is enabled.



OY4653 OSCILLATOR



FREQUENCY select switch - 12 frequencies.

OSCILLATOR OUTPUT LEVEL control - 0dB in CENTRE DETENT, can vary -10 to +10dB. 0dB can be set to = 0dBu or +4dBu (0VU)

STEREO IDENT (SEQ) - Option of BBC GLITS (L&R) or EBU (left only) identification by interruption of left and right signals - internal switch.

VOC - Vocal Ident. The Tone is periodically interrupted by a MALE voice speaking the word 'LEFT' in the left loudspeaker and a FEMALE voice speaking the word 'RIGHT' in the right loudspeaker. Yellow LED.

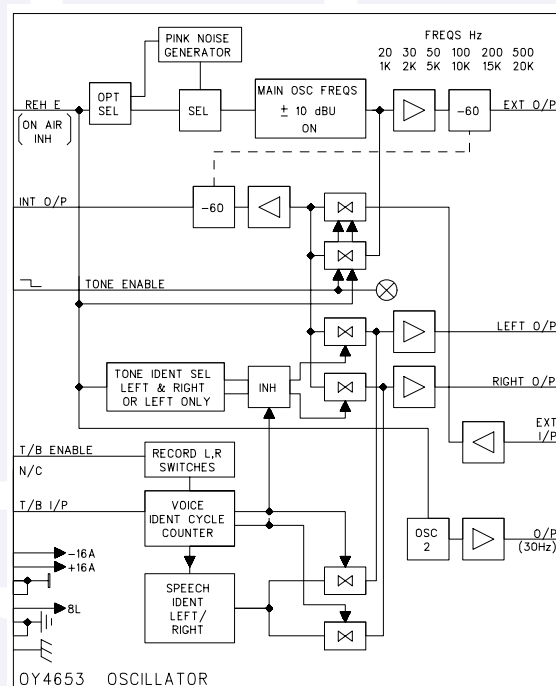
EXT I/P (ON) for feeding in station tone or test tone. Red LED.

-60: Attenuates the output level -60dB. Green LED.

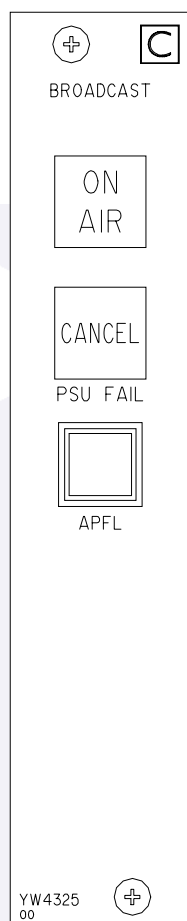
PINK (ON) - substitutes Pink Noise for the signal. Yellow LED.

ON - switches on the oscillator - Red LED. An internal switch selects whether or not the oscillator is switched off 'ON AIR'. In any event the TONE signal cannot be enabled within the console when ON AIR.

ENABLE - Red LED - only switches the Tone on within the console when required to do so by a TONE selection. Optional mute ON-AIR.



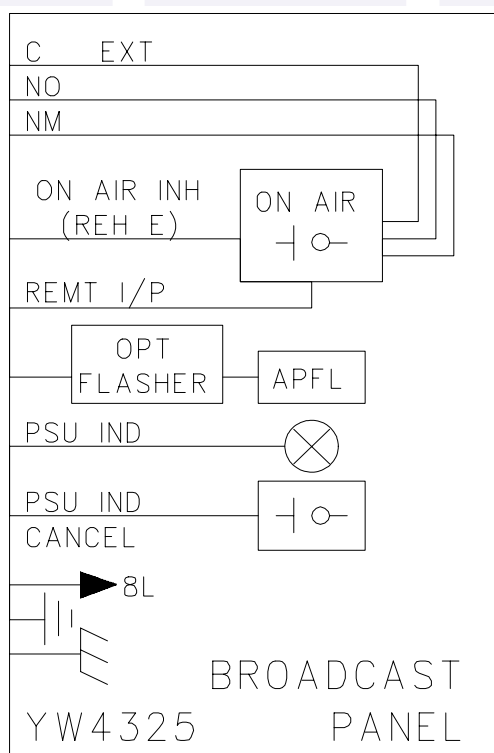
YW4325 BROADCAST

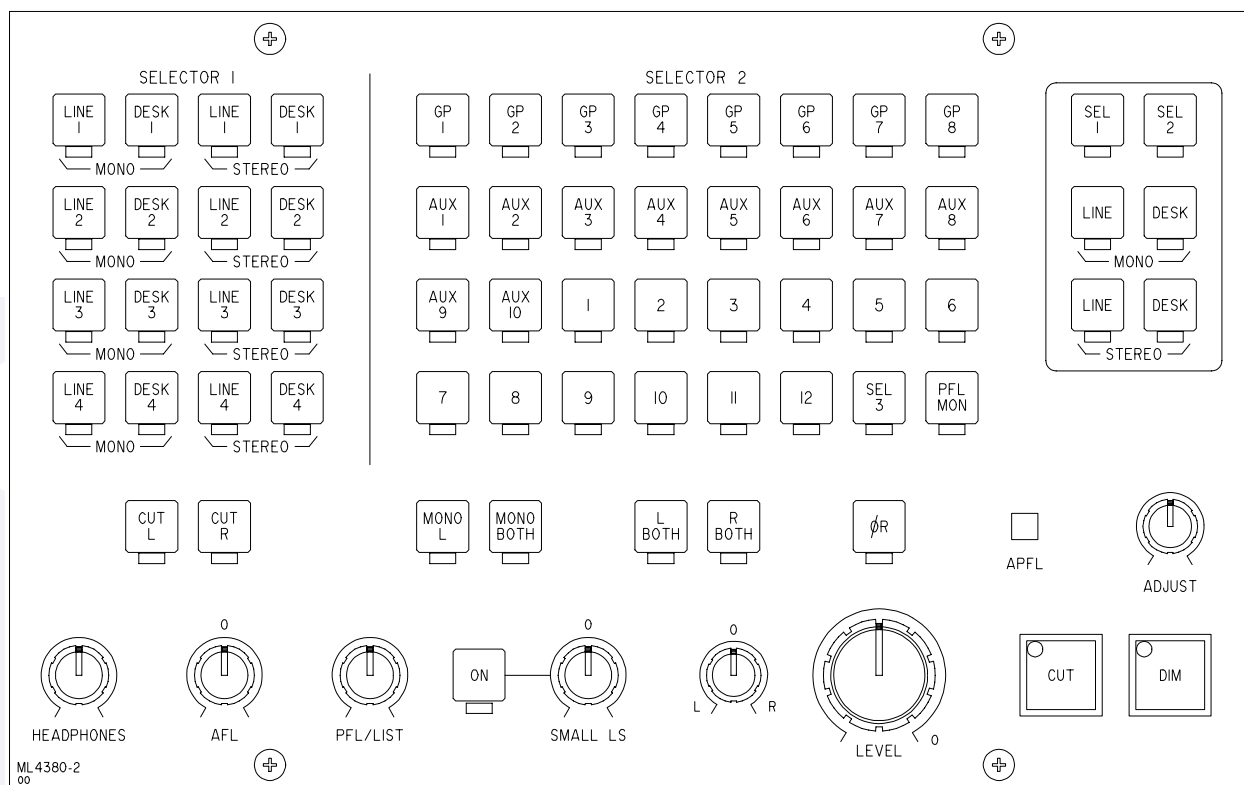


ON AIR - Large button with RED LED - Inhibits Tone and Talkback within the console and operates relay contacts to other areas.

PSU FAIL / CANCEL - Red LED flashes when a PSU or part of a PSU has failed. Flashing may be cancelled by button but will resume with a further failure or if the console is switched off and on again.

APFL - Large RED LED - illuminated when ANY AFL selection is made - to warn the operator that the monitor loudspeakers have changed. Also operates for PFL if PFL MON is selected, on the ML4380-2 panel. (See next page). The LED can be set to flash with an optional internal link.



ML4380-2 MONITOR LOUDSPEAKER (-3 VERSION HAS HEADPHONES FED FROM SELECTOR 3)


SELECTOR 1: 16 selections for 4 Main Outputs as shown. Green LEDs.

SELECTOR 2: 32 selections as shown. Green LEDs except PFL MON which is RED and when selected, sets PFL to Monitor Loudspeakers automatically when a PFL button is pressed. 12 External inputs are STEREO.

MAIN SELECTOR: 6 selections: SEL 1 & 2 AND MAIN 1 OUTPUTS - Desk and Line (before and after TONE injection) Mono and Stereo. Yellow LEDs.

LS MODE SELECTIONS: 7 buttons with Red LEDs as shown. ØR is phase reverse right.

APFL : RED LED: Illuminates for an AFL selection or PFL with PFL MON, selected.

HEADPHONES: Level control to separate output. +10dB/Off.

AFL: Trim ± 10 dB.

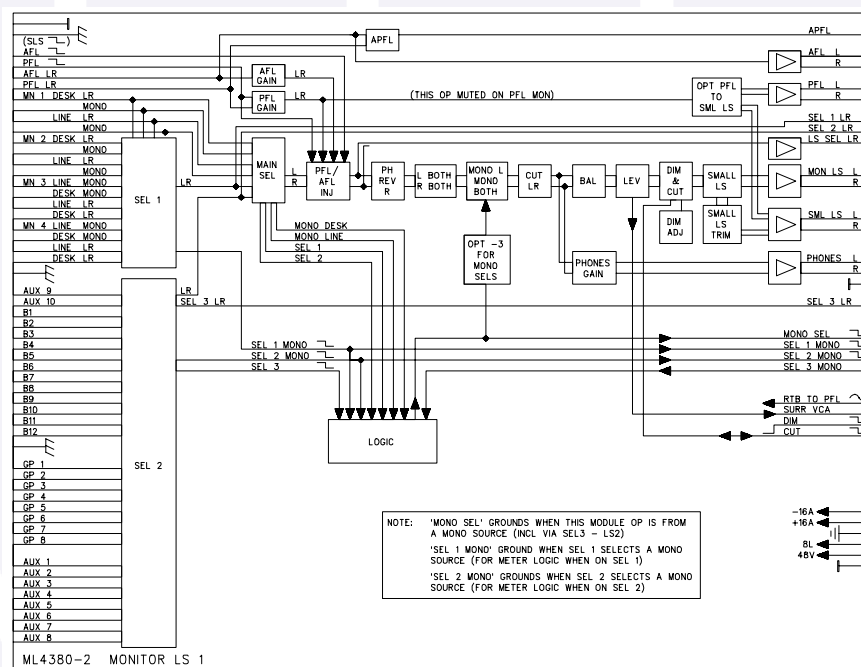
PFL: Level control. +10dB/Off. Trims PFL to Monitor L.S. on PFL MON.

SMALL LS: Button with Trim control to near field LS ± 10 dB. Red LED.

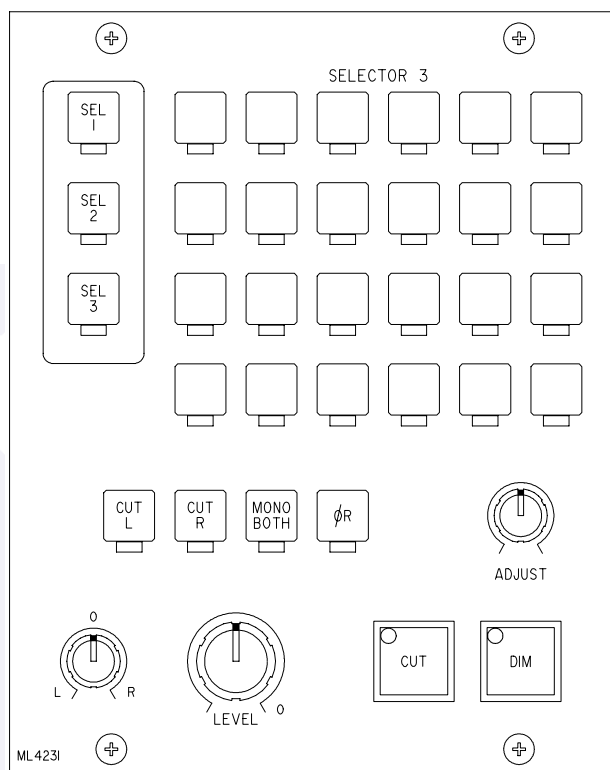
BALANCE Control: ± 3 dB.

GAIN Control: 0dB/Off. For main and small LS outputs.

CUT & DIM: Buttons with Dim level adjust. -6/-30dB. Red LED's.



ML4231 LOUDSPEAKER 2



Panel can be used for extra external inputs and/or a second set of monitor loudspeakers.

SELECTOR 3: 24 STEREO external inputs. Green LED's.

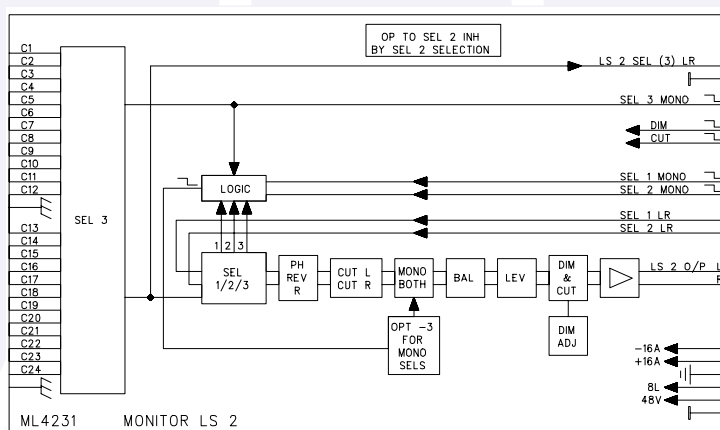
MAIN SELECTOR: Facility for selecting SEL 1 and SEL 2 outputs from Monitor L.S. as well as local SEL 3 output.

LS MODE SELECTOR: 4 buttons with Red LED's ϕR is phase reverse right.

Balance: Control $\pm 3dB$.

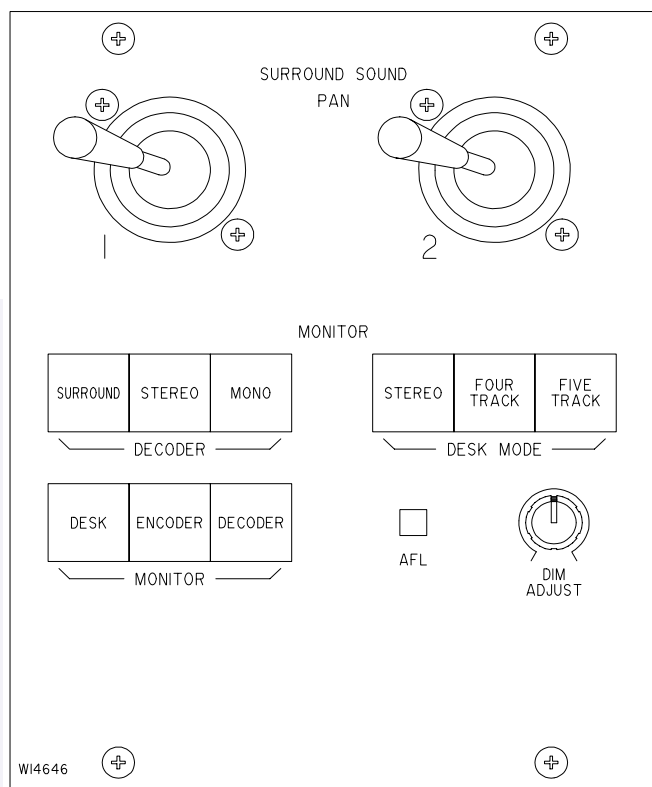
GAIN: Control 0dB/Off.

CUT & DIM: Buttons with DIM level ADJUST -6/-30dB. Red LED's.



Q2

WI4646 SURROUND MONITOR WI4993 SURROUND MONITOR WITHOUT JOYSTICK PANS



DESK MODE SELECTOR:
3 buttons - Yellow LED's.

Monitor Sels: Desk stereo & monitor controlled by MONITOR LOUDSPEAKER panel.

Four Track: Desk outputs M1: L - R, M2: CENTRE, MONO SURROUND MONITOR controlled by this panel. Mono surround feeds to L & R Surround LS.

Five Track: As 4-track except that L & R surround from Aux 10 L & R.

MONITOR SELECTOR: (SURROUND LS SOURCE)

Desk out: Surround monitor as set above from Desk outputs.

Encoder out: Stereo compatibility check from external Encoder outputs LR.

Decoder out: Surround monitor of Decoder outputs. (external units)

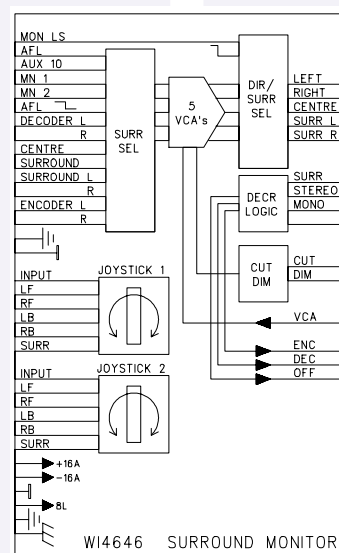
DECODER SELECTOR: Mono Stereo Surround } Optional remote controls of decoder for comparison purposes.

Level: Loudspeaker volume control 0/Off.

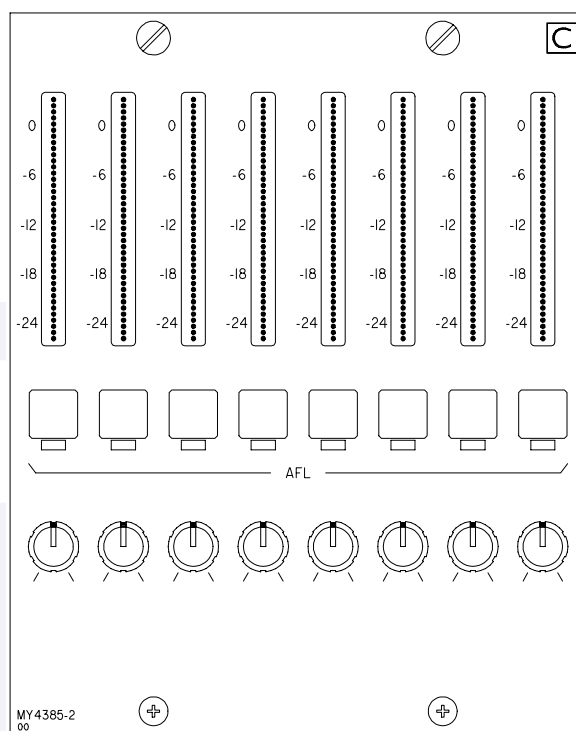
Dim Level adjust -6/-30dB.

APFL - Red LED drawing attention to an AFL selection or PFL when PFL MON is selected.

SURROUND PAN CONTROLS - TWO - A channel signal can be panned to any part of the surround presentation. Units have to be patched.



MY4385-2 MULTI-TRACK BARGRAPH/CONTROL

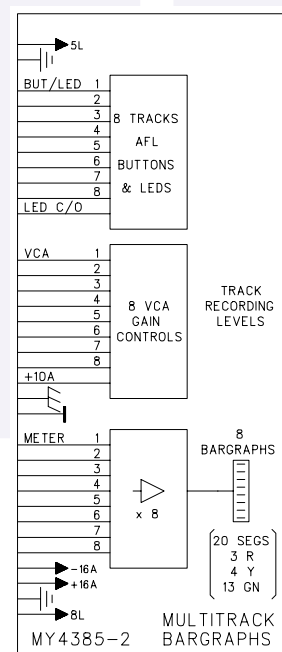


Each Bargraph Control panel provides control over 8 tracks. The Bargraph Meters are GREEN from 00 to -6, YELLOW from -6 to 0, and RED from 0 to +6. The bargraphs can be set to PPM or VU characteristic.

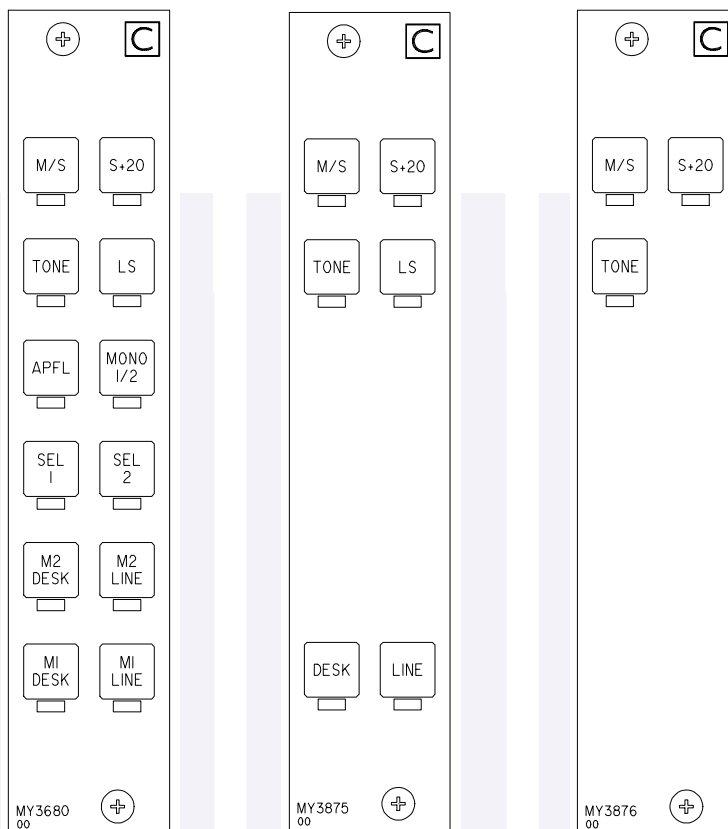
AFL buttons are mechanically momentary and are electronically latched. Tracks are selected and deselected on each push/release cycle. AFL track selections are displayed in RED. Tracks AFL may also be selected on the MT4320 multitrack control panel local to the operator.

The eight/8 Track Record Send level controls provide +10dB/Off control.

There are 3 panels for 24 tracks and 4 for 32 track systems.



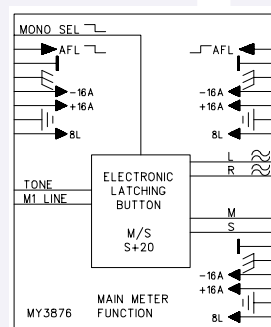
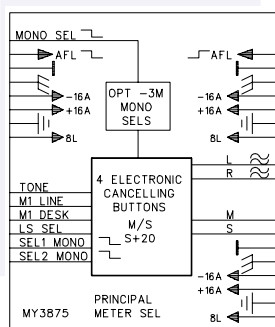
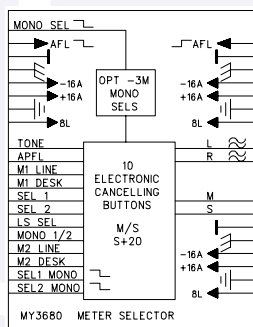
MY3680 METER SELECTOR (General)
MY3875 METER SELECTOR (Principal selections)
MY3876 METER SELECTOR (Main function)

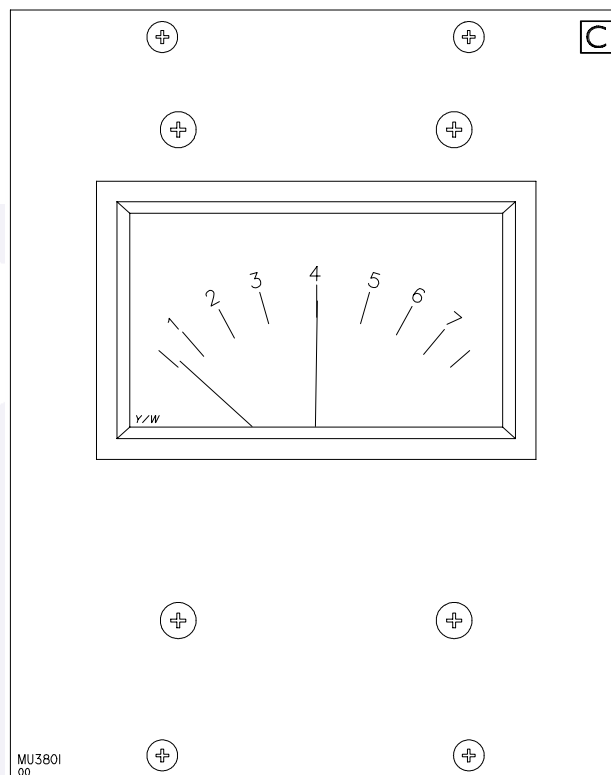
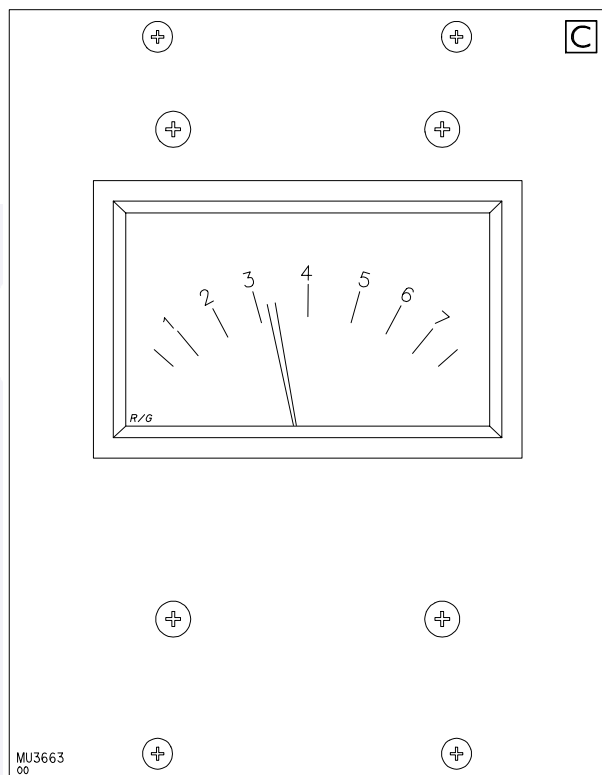


Selections from labelled sources.

Yellow LEDs - Electronic cancelling set.

M/S latching & S+20. Red LEDs.

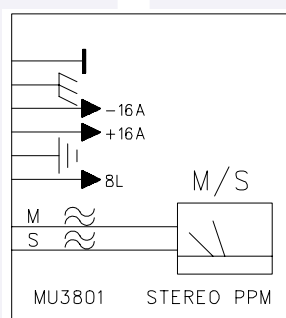
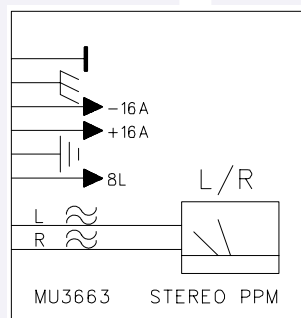


MU3663 STEREO PPM L/R**MU3801 STEREO PPM M/S**

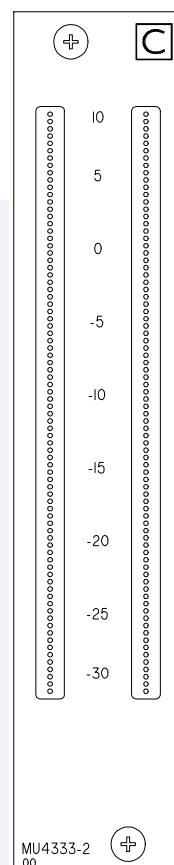
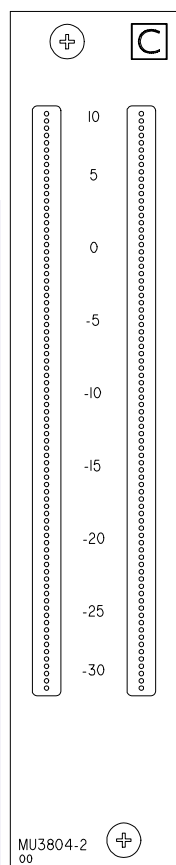
MU3663 Stereo PPM with Red/Green needles and illumination.
 MU3801 Stereo PPM with White/Orange needles and illumination.

Internal PPM drivers.

'4' = 0dBu.



MU3804-2 LARGE STEREO BARGRAPH
MU4333-2 LARGE STEREO BARGRAPH (Reversed colours)

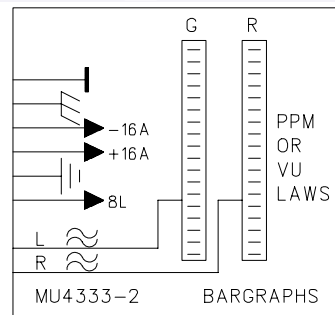
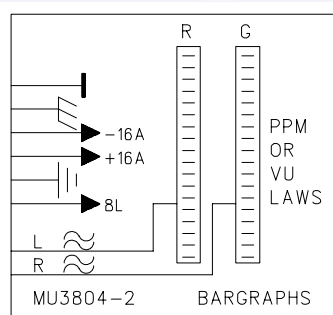


Twin LED bargraphs - 40 LED's each for good resolution.

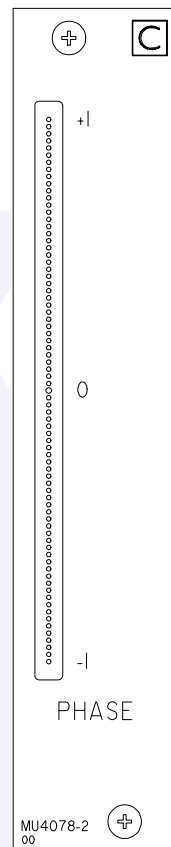
Left hand bar is RED.

Right hand bar is GREEN. (reversed colours on MU4333-2)

Bars brighten at 0dB (Scale 0) representing +6 or +8 dBu for PPM or +4dBu for VU (set internally).



MU4078-2 PHASE BARGRAPH

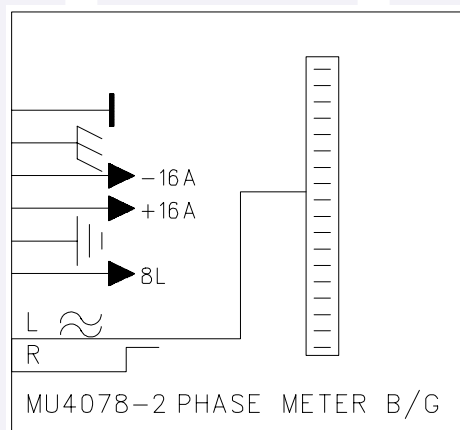


LED Bargraph.

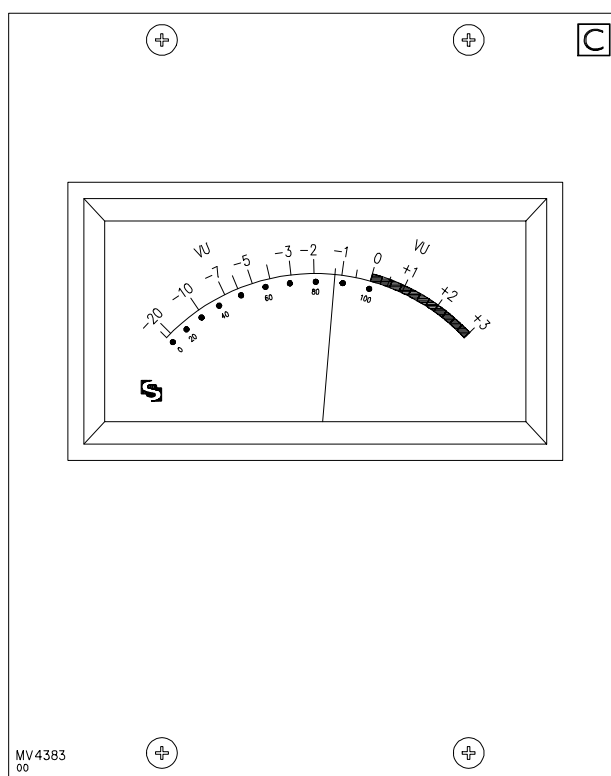
Upper section representing good phase coherence is GREEN.

Lower section representing poor phase coherence is RED.

Spot moves dynamically.



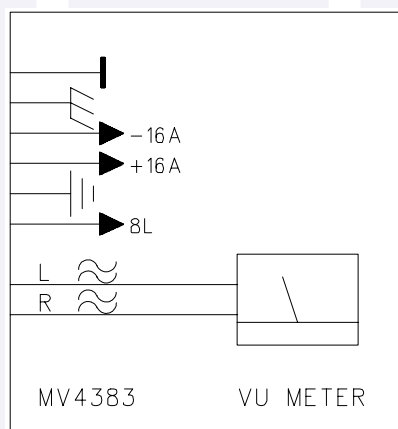
MV4383 VU METER



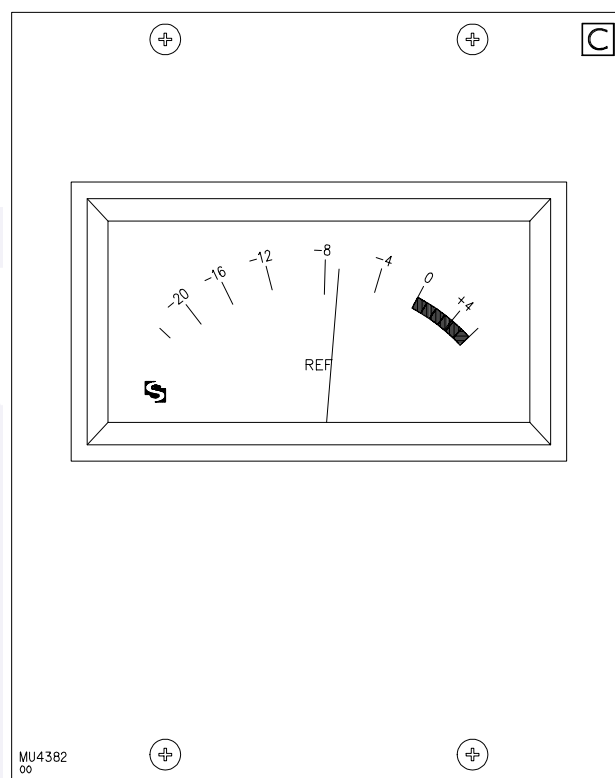
Large V.U. meter with illumination.

0VU represents +4dBu.

Internal buffer amplifier.



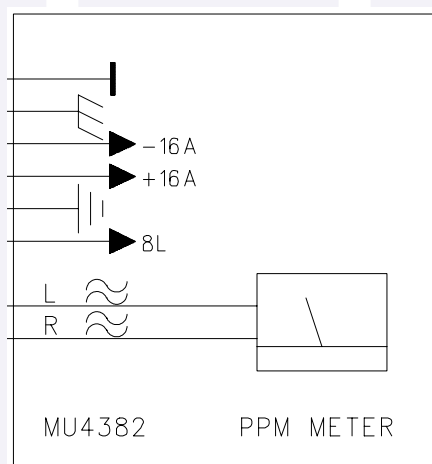
MU4382 PEAK PROGRAMME METER (McCurdy West Coast Scale)



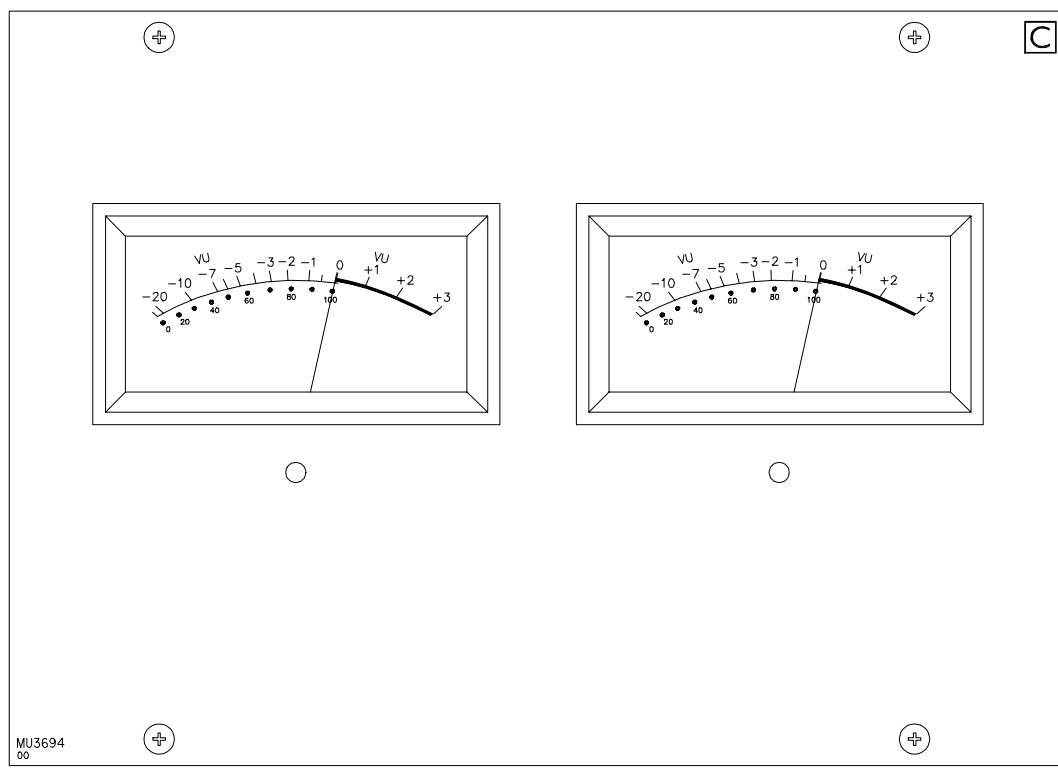
Large Peak programme meter with decibel scale and illumination.

0 represents +4dBu but can be internally set for +8dBu..

Internal PPM drivers.



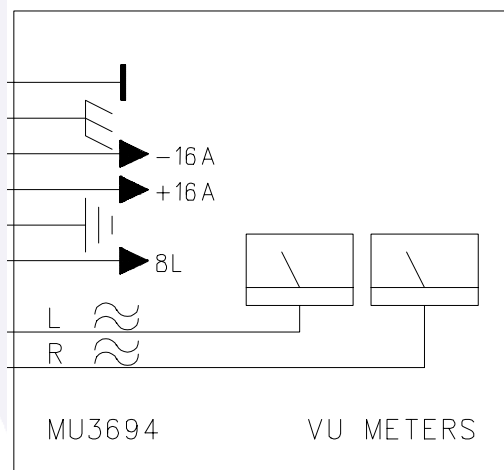
MU3694 2 VU METERS (210mm PANEL)
MV4656 2 VU METERS (180mm PANEL)



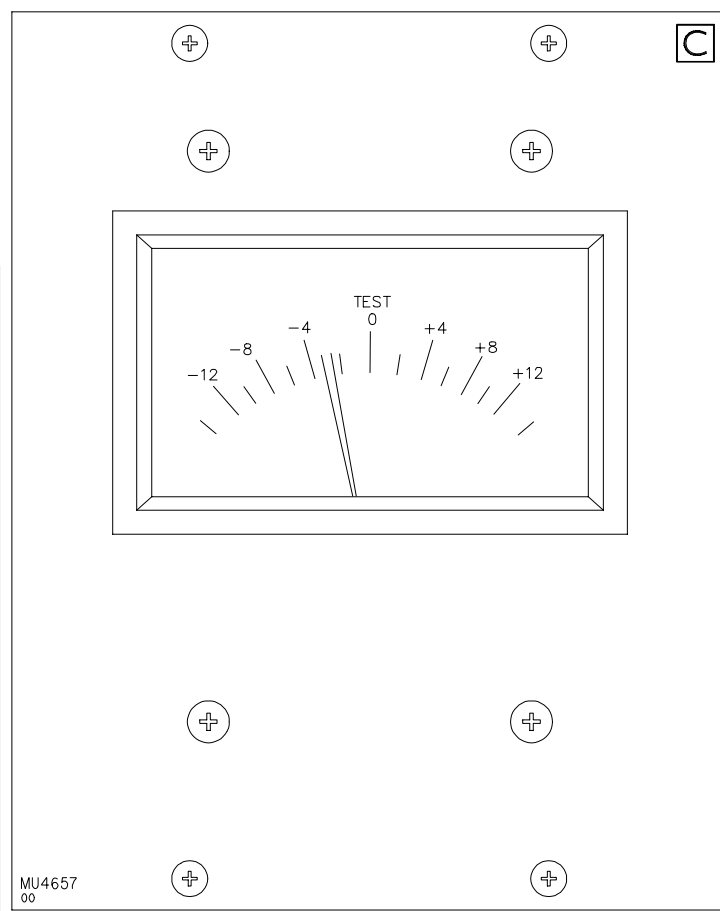
VU meters with illumination.

Internal buffer amplifiers.

0VU = +4 dBu.



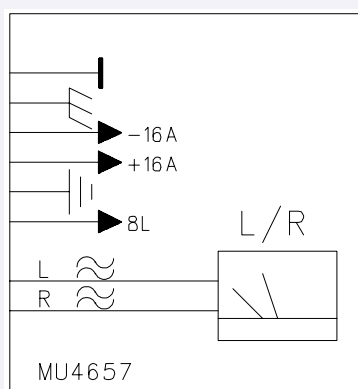
MU4657 STEREO PPM (WITH WARD-BECK SCALE)



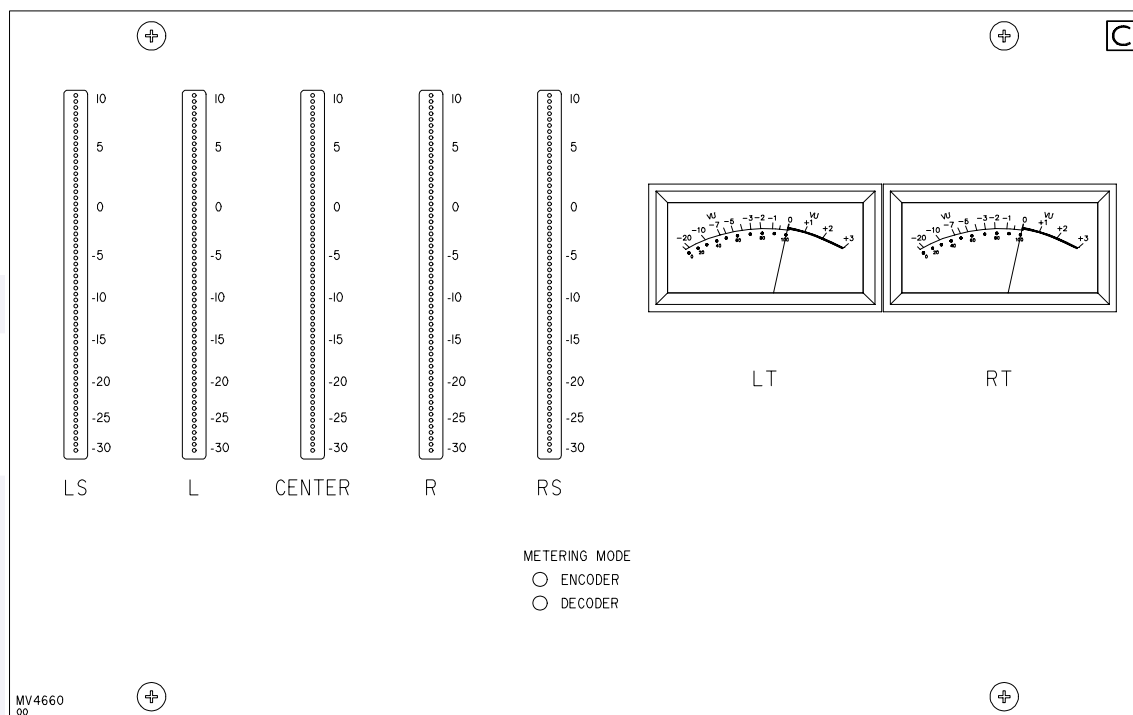
Stereo PPM with Green/Red needles and illumination.

Internal PPM drivers.

'0' = +4dBu.



MV4660 SURROUND METERS



5 LED bargraphs and 2 VU meters with illumination.

The 5 bargraphs are for surround level indication and the 2 VU meters are for the encoded stereo signal (LT & RT).

The bargraphs can be set to PPM or VU characteristic.

PPM '0' can be set to = 0, +4, +6 or +8dBu. VU '0' = +4dBu.

The bargraphs and meters may be fed from the console monitoring, or from external signals via a 'D' type connector.

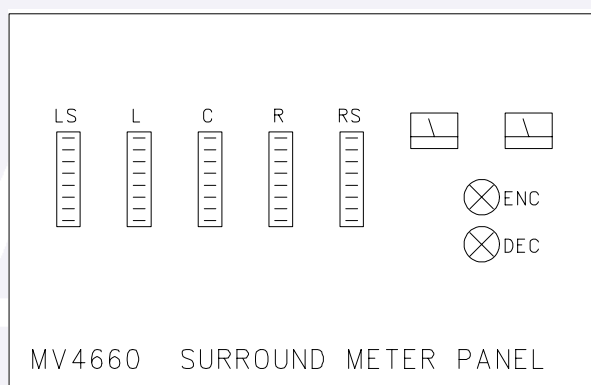
When fed from the console surround monitor (WI4646 or WI4993), this panel responds to the monitor selections as follows:

'DESK' - The bargraphs follow the console surround outputs when in "FOUR TRACK" or "FIVE TRACK" mode.

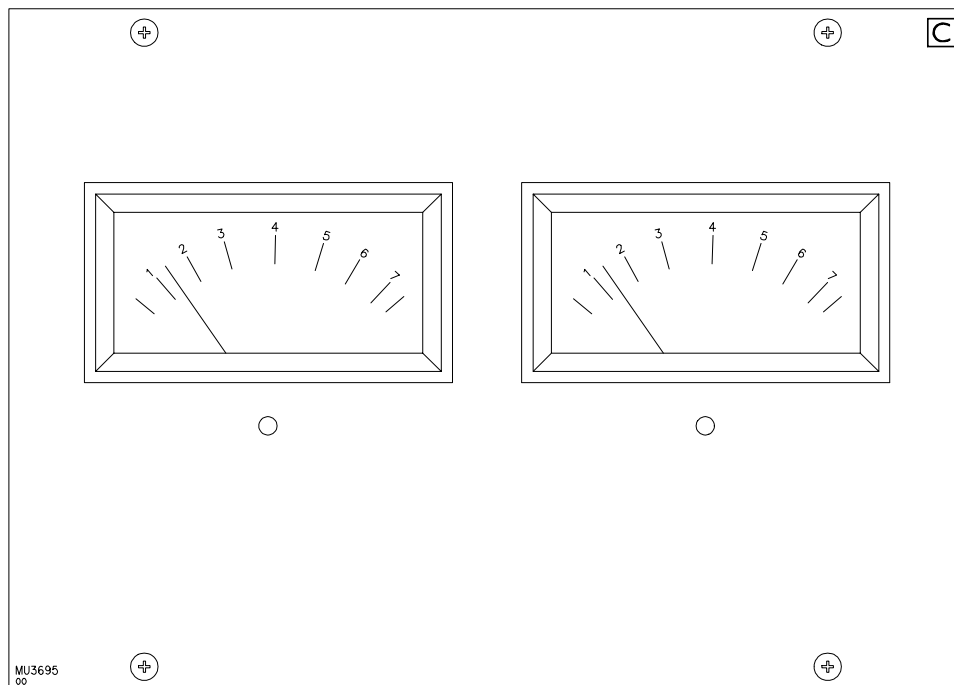
'ENCODER' - Red LED on panel - The bargraphs show the encoder input signals & the LT/RT meters show the encoder outputs.

'DECODER' - Green LED on panel - The LT/RT meters show the decoder input signals and the bargraphs show the decoder output signals.

In 'FOUR TRACK' mode (mono surround) the LS & RS bargraphs display the same signal.

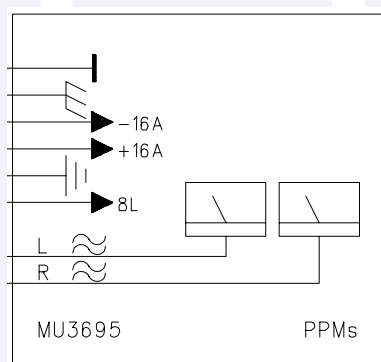


MU3695 2 MONO PEAK PROGRAMME METERS

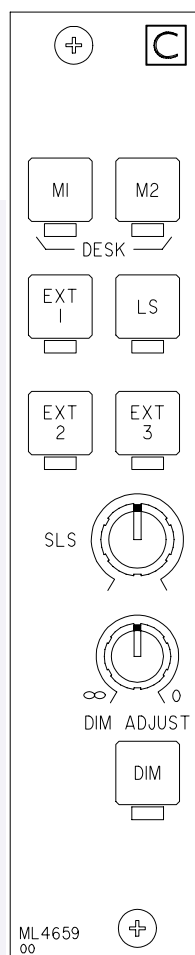


Mono PPMs with white needles and illumination.
Internal PPM drivers.

'4' = 0dBu.



ML4659 STUDIO LS CONTROL

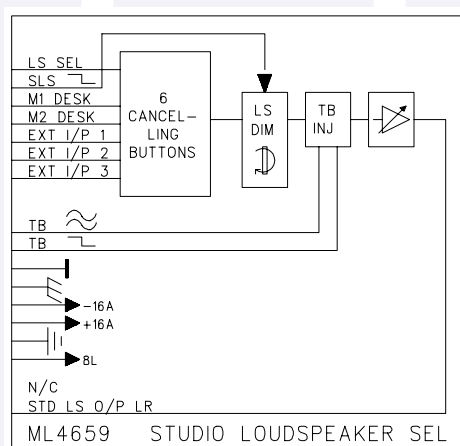


6 Electronic cancelling inputs - Yellow LEDs including 3 external inputs.

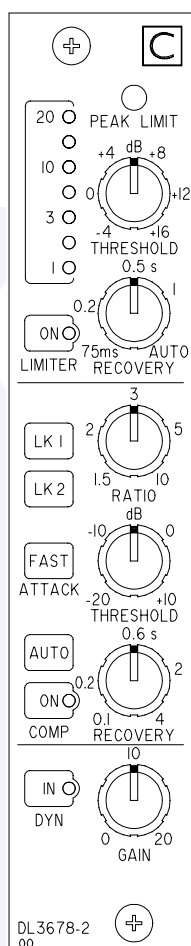
SLS gain controls.

Dim adjust control 0dB to off.

DIM button with Yellow LED - cuts LS automatically when any channel selected to Mic and routed to the Main output either directly or via a group, is opened.



DL3678-2 STEREO COMPRESSOR/LIMITER



Stereo Limiter:

Ratio	: fixed 100:1
Threshold	: -4/+16dB variable
Attack	: fixed 100 u-secs
Recovery	: 0.075 to 4 secs variable with AUTO facility: 0.1 to 1.5 secs (programme dependent)
Peak Limit	: Yellow LED indicator
Limiter	: On button with Yellow LED indication

Stereo Compressor:

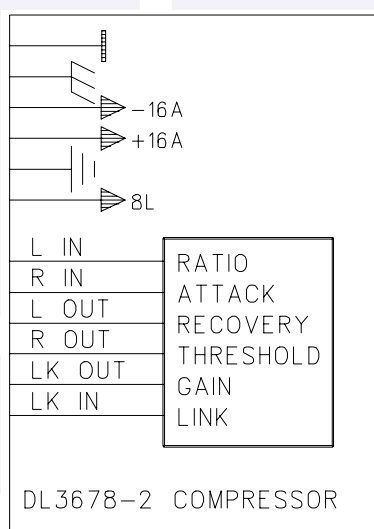
Ratio	: 1.5/10 variable
Threshold	: -20/+10dB variable
Attack	: Normal 4 msec @ 5:1 or FAST 0.2mS @ 5:1
Recovery	: 0.1 to 4 secs variable with AUTO facility: 0.1 to 1.5 secs (programme dependent)
Make-up Gain	: 0/20dB variable
Voice-over	: Line level balanced input (may be used when compressor is Off)
Compressor	: ON button with Yellow LED indicator

Compressor & Limiter:

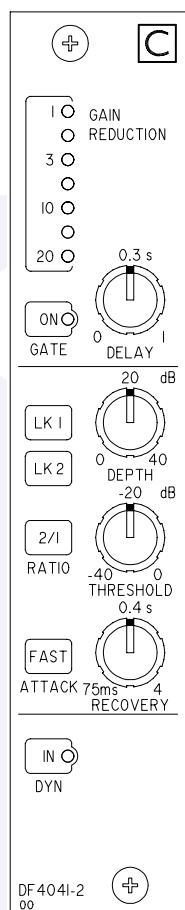
Bargraph	: Up to 20dB gain reduction with enhanced resolution at lower reduction levels.
Links	: Button 1 & 2 to external busses - links side chains together.
DYN-IN	: Button with Red LED indication - when OUT gives total bypass condition except that bargraph operates as a preview at reduced intensity.

Balanced line input & outputs, 0dB.
Ignore right channel for mono use.

The compressor and limiter normally respond to the higher of the left and right signals. An internal option allows the mono reduction of left and right (-3dB) to take control if the stereo coherence is such that this exceeds left or right. This renders it unnecessary to "under-drive" the stereo outputs to guard against the possibility of a higher than desired mono level.



DF4041-2 EXPANDER/GATE



Stereo Expander:

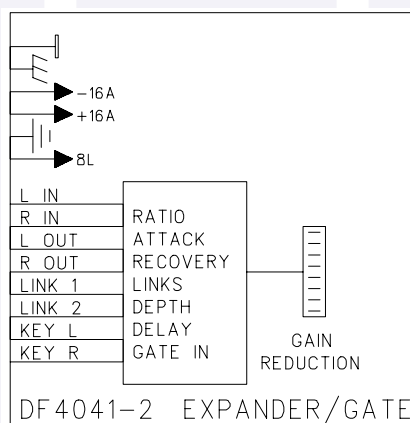
- Ratio : Normal, varies with level 1.5:1 to 5:1.
Fixed 2:1 (button)
- Threshold : 0/-40dB variable
- Attack : Normal 4 m-sec. FAST (button) 50 u-sec
- Recovery : 75ms to 4 sec variable
- Depth : 0/40dB variable (extent of expansion below threshold)
- Bargraph : Up to 20dB gain reduction
- Links : 1 & 2 to external busses (Links side chains together).

Stereo Noise Gate:

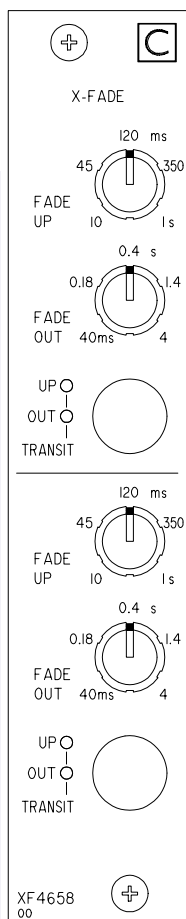
- Gate : 'ON' Button with Yellow LED indication.
All expander controls apply except Ratio becomes infinite.
- Gate Delay : 0/1 sec variable - in addition to normal 6dB gate hysteresis

Expander & Noise Gate:

- DYN-IN : Button with Red LED indication - when OFF gives total bypass condition except that bargraph operates as a preview at reduced intensity.



XF4658 TWIN STEREO CROSS FADER



FADE UP: Variable control from 10ms to 1 second.

FADE OUT: Variable control from 40ms to 4 seconds.

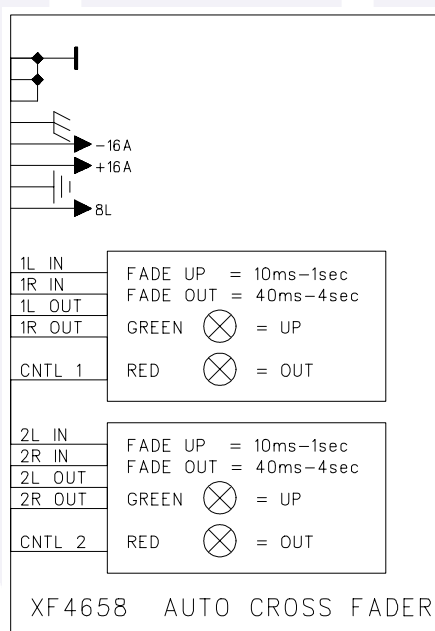
UP LED: Green LED indicates the path is faded up.

OUT LED: Red LED indicates the path is faded out.

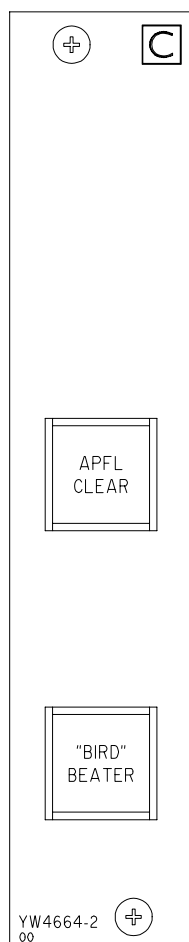
Both LEDs illuminated indicates fading up or fading down.

Numbered disc identifies circuit. Next module 3 & 4 etc.

Circuit 2 as above.

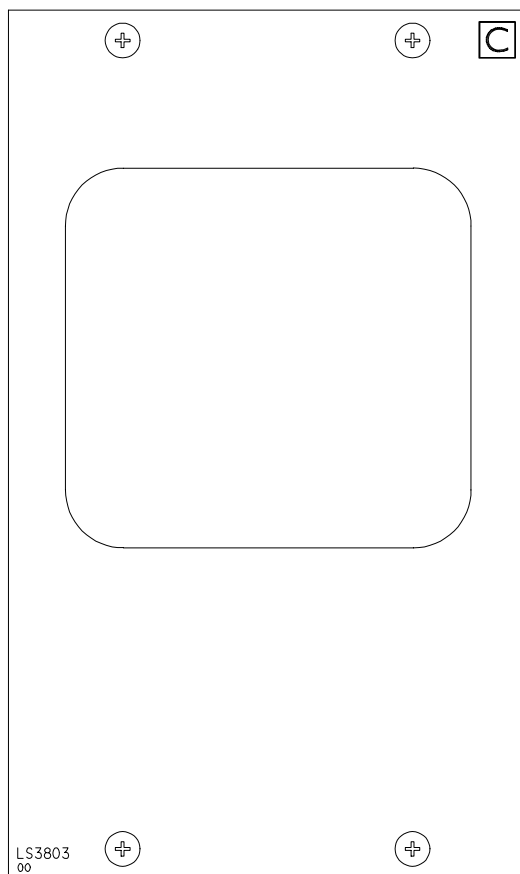


YW4664-2 "BIRD" BEATER PANEL WITH APFL CLEAR

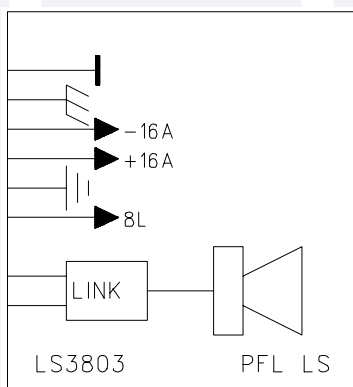


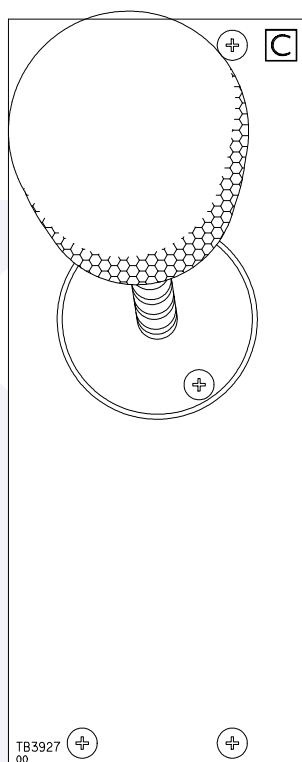
APFL CLEAR: Red momentary switch. This will clear any AFL or PFL selection(s) except for multi-track AFL(s).

"BIRD" BEATER: White latching switch with LED illumination. This mode makes the Auxiliary 1 pre-fader sends work in a special way. Bird is a colloquial term for the transmission satellite. To use this mode the channel(s) or group(s) Aux.1 send(s) must be switched on and selected to pre-fader. Under this condition the Aux.1 send from a channel or group will be muted when its fader is open, conversely, closing that fader (or using the CUT switch) enables the Aux.1 send. One use of this feature is to give the producer a feed to the "cue speaker" when the announcer / commentator mics are closed during a commercial or other break in a live broadcast.

LS3803 PFL LOUDSPEAKER

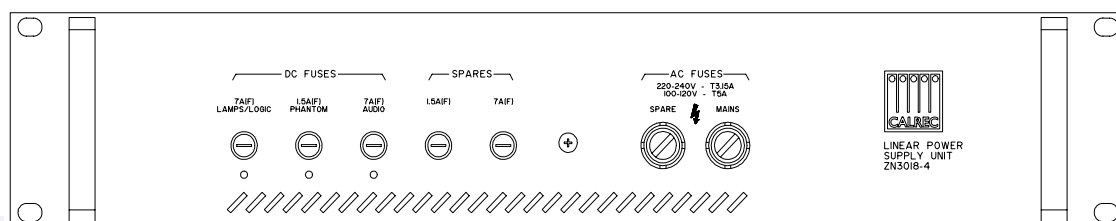
Module can be set for Left, Right or Mono use.
Module can receive Reverse Talkback plus an extra
intercom signal if required.



TB3927 EXTERNAL TALKBACK MICROPHONE

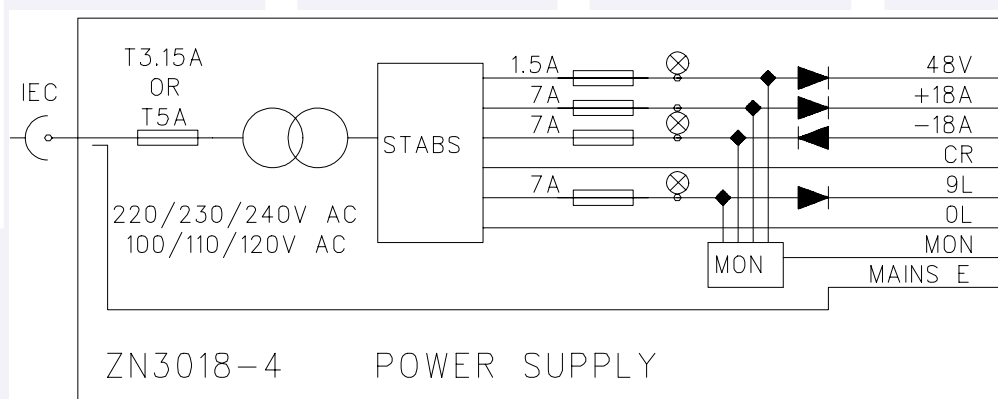
For those customers
requiring a microphone
projecting from the console
on a stalk.

ZN3018-4 MAINS POWER UNIT



A Calrec designed special unit to provide ± 18 volts audio power, 9 volts logic power (regulated in modules at 5 volts where required) and 48 volts phantom power suitable for approximately 8 channels each in a typical console. It is recommended that there be one "Hot" spare in the system which in addition will share the load.

The 2U units include a monitor of the 4 outputs and send a fault signal to the console in the event of failure. The units operate in parallel via internal diodes. The units are designed to operate at mains voltages down to 10% below that set.



INTERNAL/REAR CARDS, PANELS & POWER SYSTEM

HN4389	Multitrack back-plane 1 (PROCESSORS)	MULTITRACK OPTIONAL
HN4390	Multitrack back-plane 2 (AUDIO X 2)	
HN4554	Processor Card Services Panel	
RX4409	Multitrack Matrix card	
RL4392	Multitrack Outputs card	
RY4393	Multitrack Functions card	
RY4394	Multitrack Functions card	
RY4513	Multitrack Functions card	
UN3551	Multitrack processor card	
ZN3564	Multitrack 5V regulator card	
ZN4173	Power Distribution Unit	
HN4334	12 channels back-plane	
HN4673	Main back-plane	
HN4399	Backplane mix bus link card.	
IC4089	Single Fader back-plane	
HN4092	Single Fader back-plane link card.	
IN4361	Twin Fader back-plane	
IN4362	VCA Group Fader back-plane	
SN4489	Group Meters changeover back-plane	
GY4672	Group Meters changeover back-plane	
HX4671	Auto Cross Fader back-plane	
HN3919	Dynamics and Ancillary connections card (OPTION).	

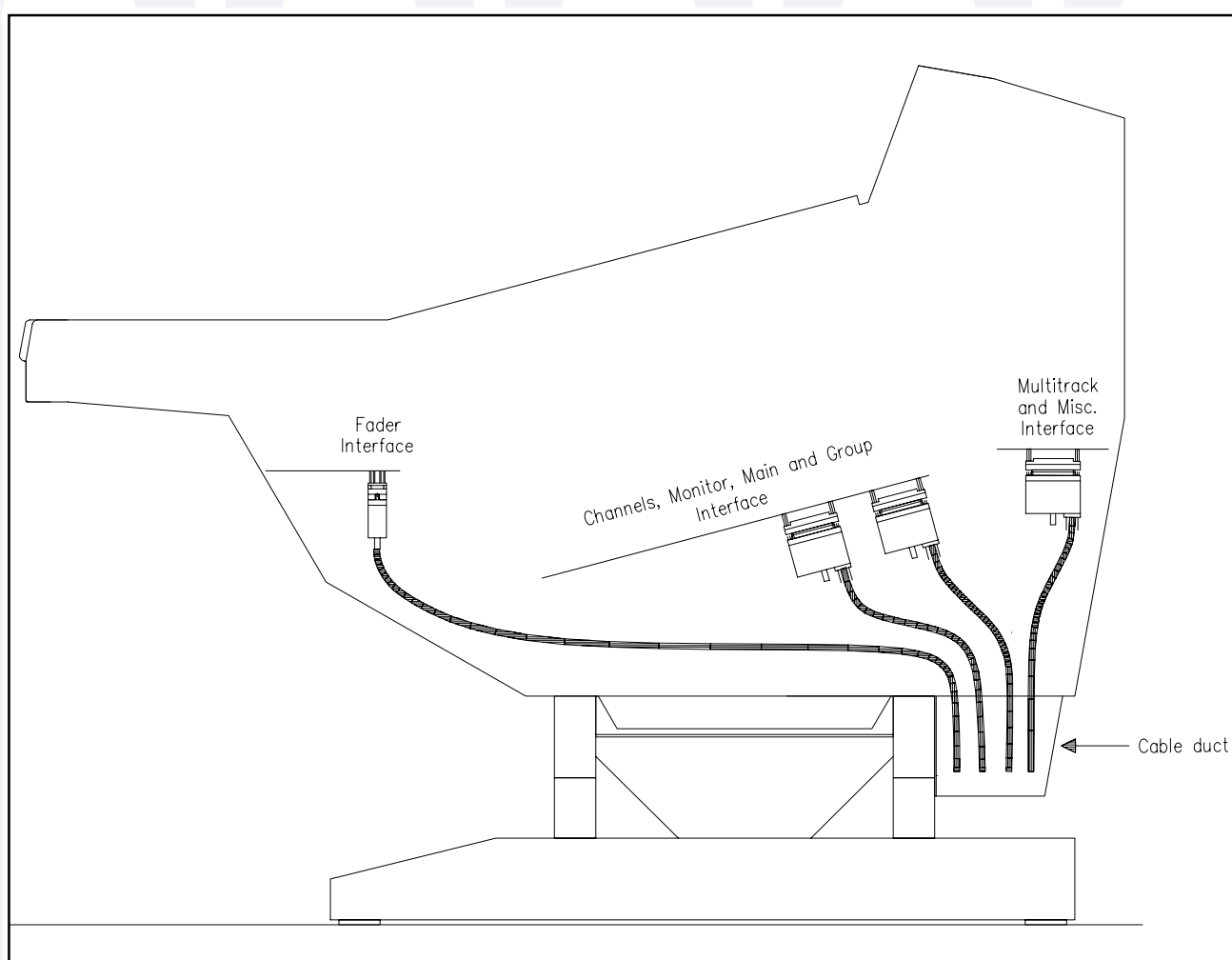
See Console Interface Schedule for External connection detail.
See Console Handbooks for Schematics, Circuits and Internal wiring information.



4.0 General Information

CALREC

LAYOUT OF CONNECTORS



Note: Single fader frame does not have Fader Interface

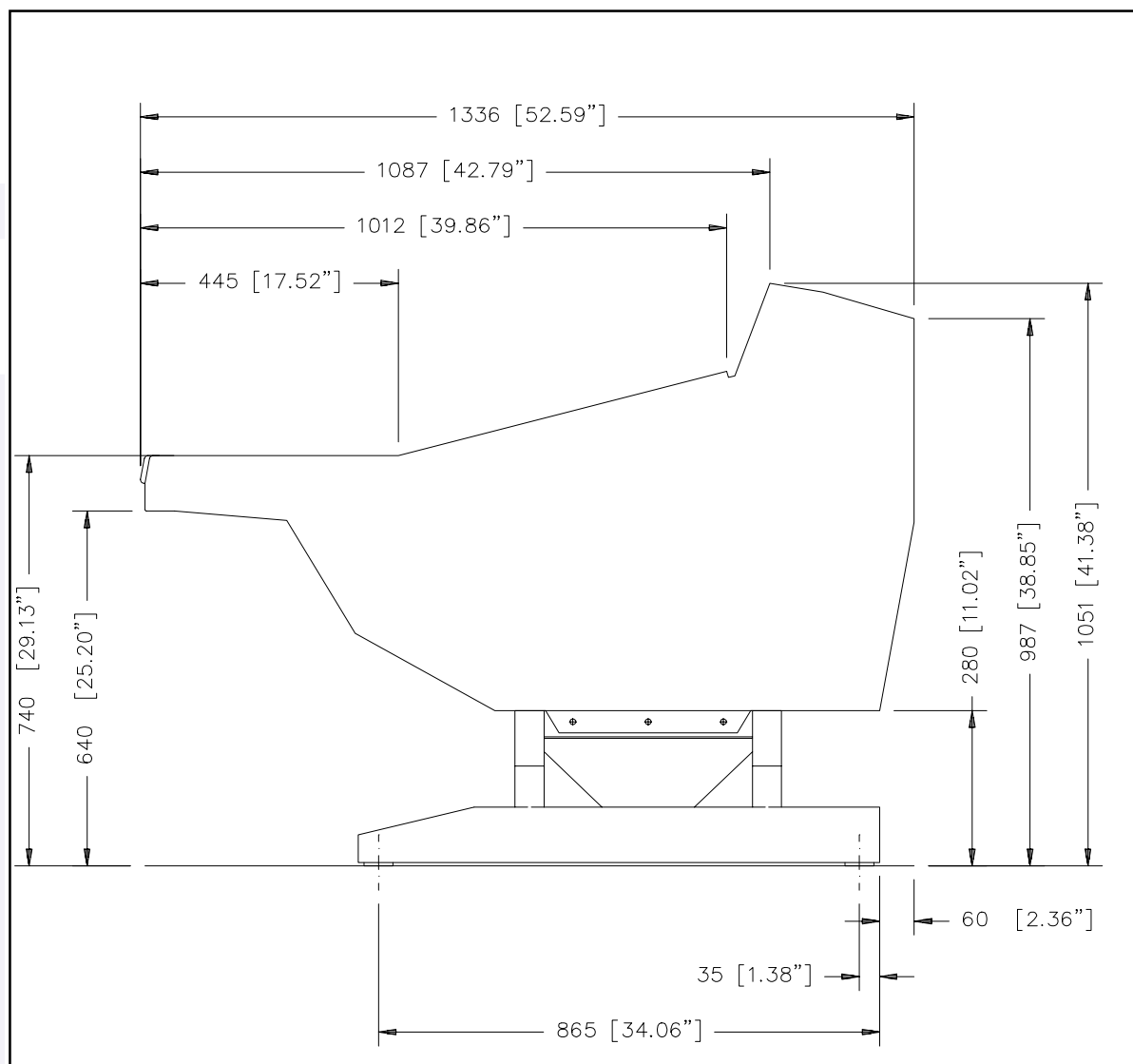
CONNECTIONS

All connections are Varicon 56-way and 38-way, except the surround L.S. outputs are on XLR 3M connectors. Audio connections are all balanced.

<u>Interface</u>	<u>Level</u>	<u>Impedance</u>	<u>Recommend max load</u>
Microphone I/Ps VP38 - 1 per 4chs	-78/+18dBu	1.2K/7K5	-
Line I/Ps VP56 - 1 per 12chs (plus VP38s St Lne)	-24/+18dBu	10K Ω	-
Insert Go VP56 - 1 per 12chs (VP56)	0dBu	$\leq 40\Omega$	600 Ω
Insert Return VP56 - 1 per 12chs (VP56)	0dBu	20K Ω	-
Direct Outputs VP56/16 - 1 per 12chs (VP56)	0dBu (+10)	$\leq 40\Omega$	600 Ω
External Cuts/VCA ctrl/ Fader on - VP56 1 per 12chs (8 Grps)	5V/0V operate	-	-
DirecTs I/Ps VP56	0dBu	20K Ω	-
Auxiliary Outputs VP56	0dBu	$\leq 40\Omega$	600 Ω
Main Outputs VP56	0dBu	$\leq 25\Omega$	600 Ω
LS O/P XLR 3M	0dBu	$\leq 40\Omega$	600 Ω
Monitor LS I/Ps VP56	0dBu	20K Ω	-
Optional additional Monitor I/Ps VP56	0dBu	20K Ω	-
Main D.C Interface (Cuts/ Dims/Tone/TB etc) VP56	5V/0V operate	-	-
Optional multitrack outputs VP38	0dBu	$\leq 40\Omega$	600 Ω
Optional Compressor/ Limiter conns			
Inputs VP56	0dBu	20K Ω	-
Outputs VP56	0dBu	$\leq 40\Omega$	600 Ω

* Note - Levels may be 4 or 6dB higher dependant on reference level.

DIMENSIONS & WEIGHTS



Overall console length including stand.

Studio Console:

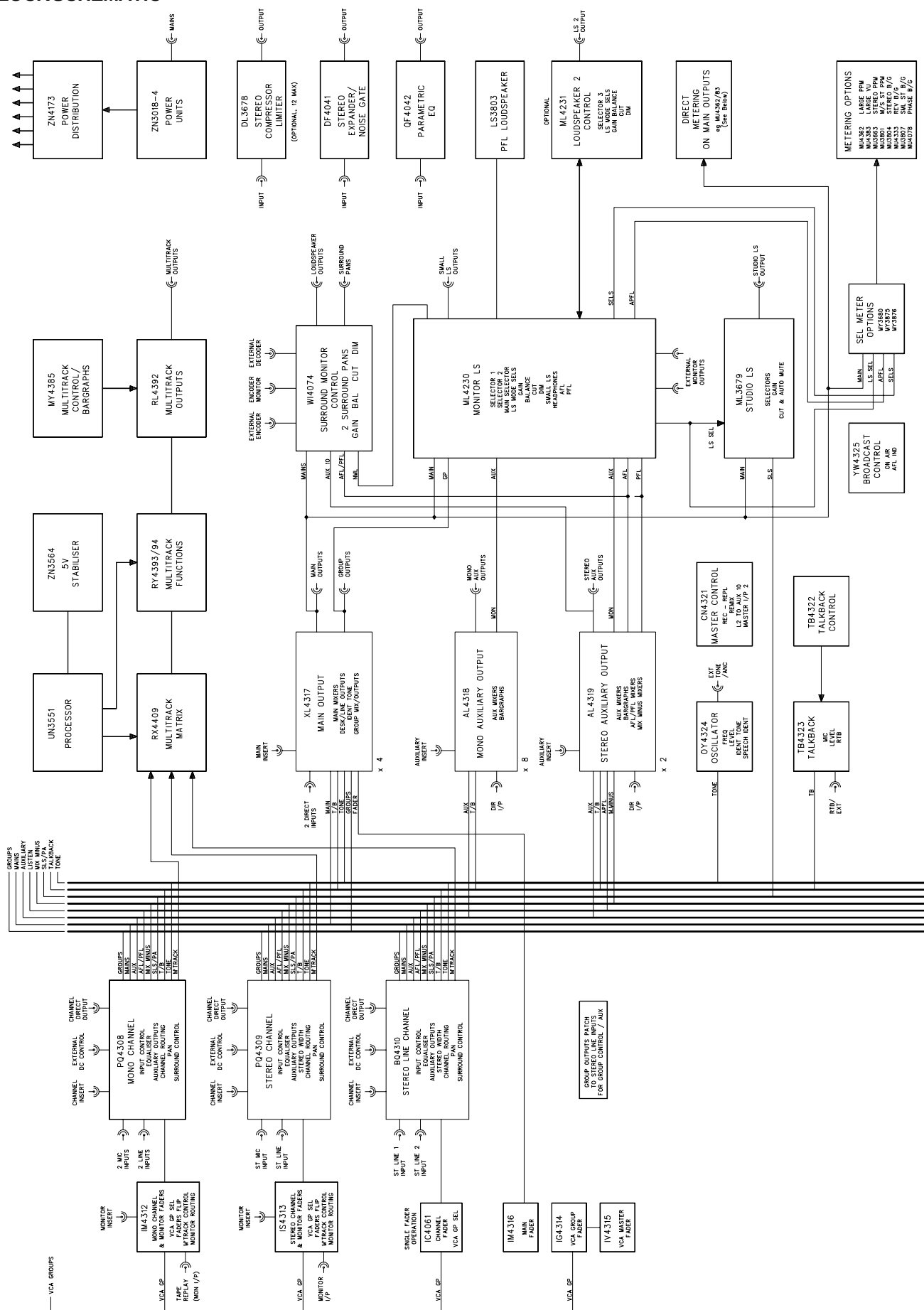
24 channel	=	1260 mm	[49.6"]
36 channel	=	1626 mm	[64.0"]
48 channel	=	1992 mm	[78.4"]
60 channel	=	2358 mm	[92.8"]
72 channel	=	2724 mm	[107.2"]

Approximate console weights:

24 channel	=	145Kg	[319lbs]
36 channel	=	175Kg	[385lbs]
48 channel	=	205Kg	[451lbs]
60 channel	=	235Kg	[517lbs]
72 channel	=	265Kg	[583lbs]

Outside Broadcast Console:

24 channel	=	1158 mm	[45.6"]
36 channel	=	1525 mm	[60.0"]
48 channel	=	1890 mm	[74.4"]
60 channel	=	2256 mm	[88.8"]
72 channel	=	2622 mm	[103.2"]



SPECIFICATION

Measurements are with 22-22KHz filters unless otherwise stated.

All specifications are in the frequency range 40-15KHz unless otherwise stated.

Measurements specified are with equaliser and dynamics out of circuit.

0dBu = 0.775 volts RMS dBq = CCIR QUASI-PEAK

Inputs

All inputs are normally electronically balanced. Mic inputs have transformer option.

Sensitivity: (in 6dB steps)

Mic 1 & 2	=	+12dBu to -72dBu Electronic I/P -12dBu to -72dBu Transformer I/P
Line 1 & 2	=	+12dBu to -18dBu

Trim range:

Mic & Line I/P's = ± 6 dB

Maximum input levels:

Microphone I/P's = +24dBu

Line level I/P's = +28dBu

Line 1 & 2 circuits will operate normally with up to +50V at the input.

Input impedance:

Mic Electronic = $\begin{cases} \geq 1.2K\Omega -24 \text{ to } -72\text{dBu (Hi gain)} \\ \geq 7.5K\Omega +12 \text{ to } -18\text{dBu (Lo gain)} \end{cases}$

Mic Transformer = $\geq 1.2K\Omega$ (Full range)

Line level I/P's = $\geq 10K\Omega$

Common mode rejection (CMR)

Mic Electronic - hi gain - 200 Ω source

= $\begin{cases} >75\text{dB at } 1\text{KHz} \\ >60\text{dB at } 15\text{KHz} \end{cases}$

Mic Transformer - Full range - 200 Ω source

= $\begin{cases} >80\text{dB at } 1\text{KHz} \\ >65\text{dB at } 15\text{KHz} \end{cases}$

Line 1 & 2 - 40 Ω source

= $\begin{cases} >60\text{dB at } 1\text{KHz} \\ >40\text{dB at } 15\text{KHz} \end{cases}$

Other inputs (Insert Returns, Dir & Tape I/Ps) -40 Ω source

= >40dB at 1KHz

Outputs

Maximum output levels:

Principal outputs (transformer)	=	+28dBu into 10K Ω
incl. Main Line Outputs 1-4 (Stereo&Mono)	=	+25.5dBu into 600 Ω at 1KHz
and all auxiliaries.		
Other outputs (electronic)	=	+28dBu into 10K Ω
	=	+25.5dBu into 600 Ω

Output impedances:

Transformer = 25 Ω
Electronic = 40 Ω

Output balance:

Transformer = -40dB at 1KHz
Electronic = -40dB at 1KHz

Output common mode rejection:

Transformer = -70dB
Electronic = -50dB

Outputs can withstand an input of +12dBu from a source impedance of 10 Ω .

All main, auxiliary & direct outputs can withstand phantom power backfeed.

Headroom

Microphone inputs:

= 36dB with 8dB of auto gain ranging

All other inputs to outputs at 0dB gain

= 28dBu

Fader Tolerances

Working range ± 10 dB	=	± 0.5 dB
-10 to -30dB	=	1dB
Below -30dB	=	± 5 dB

Frequency Response

Into 600Ω or 10KΩ in parallel with 22nF all settings.

Microphone inputs have fixed LF/HF filters.
(measured to main O/P)

Mics & Lines	=	$\pm 0.25\text{dB}$ 40Hz to 15KHz
12dB/octave	=	$\begin{cases} \leq -6\text{dB at } 10\text{Hz} \\ \leq -18\text{dB at } 100\text{KHz (continuously falling)} \end{cases}$
Phase Difference	=	$\begin{cases} \leq 5^\circ \text{ (no EQ)} \\ \leq 15^\circ \text{ (with EQ)} \end{cases}$

Harmonic Distortion

Mic & Line inputs from 200Ω & 40Ω respectively to outputs in 600Ω

+6dBu, 40Hz to 5KHz	=	$\leq 0.04\%$ (-68dB)
+20dBu, 40Hz to 5KHz	=	$\leq 0.1\%$ (-60dB)

Noise

1 Channel from line input (terminated with 40Ω) at line up 0dB via channel set as Group to Main output

=	$\begin{cases} -85\text{dBu RMS} \\ -74\text{dBq} \end{cases}$
---	--

48 Channels routed but faded down via channel set as group to Main output at 0dB

=	$\begin{cases} -82\text{dBu RMS} \\ -71\text{dBq} \end{cases}$
---	--

1 channel to track output at 0dB

=	$\begin{cases} -86\text{dBu RMS} \\ -75\text{dBq} \end{cases}$
---	--

Microphone equivalent input noise (200Ω termination):

Hi gain	=	$\begin{cases} -127\text{dB RMS} \\ -116\text{dBq (CCIR)} \\ -126.5\text{dB RMS with transformer input} \end{cases}$
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Crosstalk

Mic & Line inputs from 200Ω & 40Ω respectively to outputs in 600Ω signals at 0dBu.

Signal to mono channel via channel set as group to main output.

Measured at output of similar chain

=	$\begin{cases} \leq -85\text{dB at } 1\text{KHz} \\ \leq -75\text{dB at } 15\text{KHz} \end{cases}$
---	---

Adjacent track outputs

=	$\begin{cases} \leq -80\text{dB at } 1\text{KHz} \\ \leq -70\text{dBu at } 10\text{KHz} \end{cases}$
---	--

Mono channel panned left or right - measure right or left

=	$\leq -72\text{dB at } 1\text{KHz}$
---	-------------------------------------

Left/Right on stereo channel

=	$\begin{cases} \leq -70\text{dB at } 1\text{KHz} \\ \leq -55\text{dB at } 10\text{KHz} \end{cases}$
---	---

Cut off:

Fader	=	$\begin{cases} \leq -90\text{dB at } 1\text{KHz} \\ \leq -80\text{dB at } 15\text{KHz} \end{cases}$
-------	---	---

Level pot	=	$\leq -66\text{dB}$
-----------	---	---------------------

Routing switch	=	$\leq -80\text{dB}$
----------------	---	---------------------

Cuts	=	$\begin{cases} \leq -90\text{dB at } 1\text{KHz} \\ \leq -80\text{dB at } 15\text{KHz} \end{cases}$
------	---	---

Metering

A range of PPM and VU meters available. Stereo bargraphs with PPM or VU characteristics.

0dB Ref level can be set to 0dBu, +4dBu, +6dBu or +8dBu.

