S2

OPERATORS MANUAL

Calrec Audio Ltd
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Email: enquiries@calrec.com
Website: www.calrec.com

Please observe the following:-

After Sales Modifications.

Modifications to this equipment by any party other than Calrec Audio Limited may invalidate EMC and safety features designed into this equipment. Calrec Audio Limited can not be liable for any legal proceedings or problems that may arise relating to such modifications.

If in doubt, please contact Calrec Audio Limited for guidance prior to commencing any such work.

ESD (Static) Handling Procedures.

In its completed form, this equipment has been designed to have a high level of immunity to static discharges. However, when handling individual boards and modules, many highly static sensitive parts are exposed, therefore in order to protect these devices from damage and to protect your warranty, please observe static handling procedures (e.g. use an appropriately grounded anti-static wrist band).

All modules and cards should be returned to Calrec Audio Limited in anti-static wrapping. Calrec Audio Limited can supply these items upon request, should you require assistance.

This applies particularly to digital products due to the types of devices and very small geometries used in their fabrication, analogue parts can, however, still be affected.

Important Health and Safety Information

* **This equipment must be EARTHED.**

*** Only suitably trained personnel should service this equipment.**

*** Please read and take note of all warning and informative labels.**

*** Before starting any servicing operation, this equipment must be isolated from the AC supply (mains) by removing the incoming IEC mains connector.**

*** Fuses should only be replaced with ones of the same type and rating as that indicated.**

*** Operate only in a clean, dry and pollutant-free environment.**

*** Do not operate in an explosive atmosphere.**

*** Do not allow any liquid or solid objects to enter the equipment. Should this accidentally occur then immediately switch off the unit and contact your service agent.**

*** Do not allow ventilation slots to be blocked.**

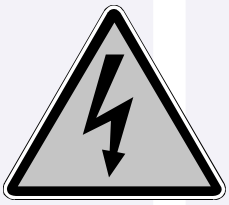
*** Do not leave the equipment powered up with the dust cover fitted (where provided).**

Please refer to the installation section of the manual for further details.

Cleaning

For cleaning the front panels of the equipment we recommend anti-static screen cleaner sprayed onto a soft cloth to dampen it only.

Explanation of Warning Symbols



The lightning flash with arrow head symbol within an equilateral triangle is intended to alert the user to the presence of dangerous voltages and energy levels within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock or injury.

The exclamation mark within an equilateral triangle is intended to prompt the user to refer to important operating or maintenance (servicing) instructions in the documentation supplied with the product.

TECHNICAL CUSTOMER SUPPORT

Should you require any technical assistance with your Calrec product then please contact your local distributor, if outside the U.K. and Ireland. For a list of Worldwide distributors please see the Calrec Web site at www.calrec.com or contact Calrec UK.
If you do not have a local distributor, then please contact Calrec UK.

For Technical assistance within the UK and Ireland, please contact a member of the Calrec Customer Support Team at :-

Customer Support
Calrec Audio Ltd
Nutclough Mill
Hebden Bridge
HX7 8EZ
UK

Tel. +44 (0) 1422 842159
Fax +44 (0) 1422 845244
Email support@calrec.com
Website: www.calrec.com

We can deal with all technical after sales issues, such as :-

- Arrange repairs
- Supply of replacement or loan units while repairs are being carried out.
- Service / commissioning site visits
- Operational training courses
- Maintenance training courses
- Supply of replacement components
- Supply of documentation
- Technical advice by telephone

If you have any other issues regarding your Calrec purchase, then please contact us and we will do our best to help. Calrec welcomes all Customer feedback.

Stephen Brant
Senior Customer Support Engineer

INTRODUCTION

This publication is for International usage.

UPDATED INFORMATION

Whilst the Company take the utmost care in ensuring that all details in the publication are correct at the time of publication, we are constantly striving for improvement & therefore reserve the right to alter specifications & equipment without notice.
Please also refer to the User Registration page.

PRODUCT WARRANTY

A full list of our conditions & warranties relating to Goods & Services is contained in the Company's standard 'Terms & Conditions'. A copy of this is available on request.

CUSTOMER SUPPORT

If you have a problem which cannot be solved without the reference to this user manual or the full technical handbook, then please contact either the distributor from whom you bought this console or the Customer Support team at the factory. A full list of all the Calrec distributors is available on the Company website at www.calrec.com

Factory based customer support engineers can be contacted by telephone during normal office hours, or outside hours, a message can be left on the answering machine.
All messages are dealt with promptly on the next working day. Alternatively a message can be sent to them by email at: support@calrec.com

REPAIRS

If you need to return goods to Calrec, for whatever reason, please contact the Company beforehand in order that you can receive advice on the best method of returning the goods & that a repair order reference number can be issued.

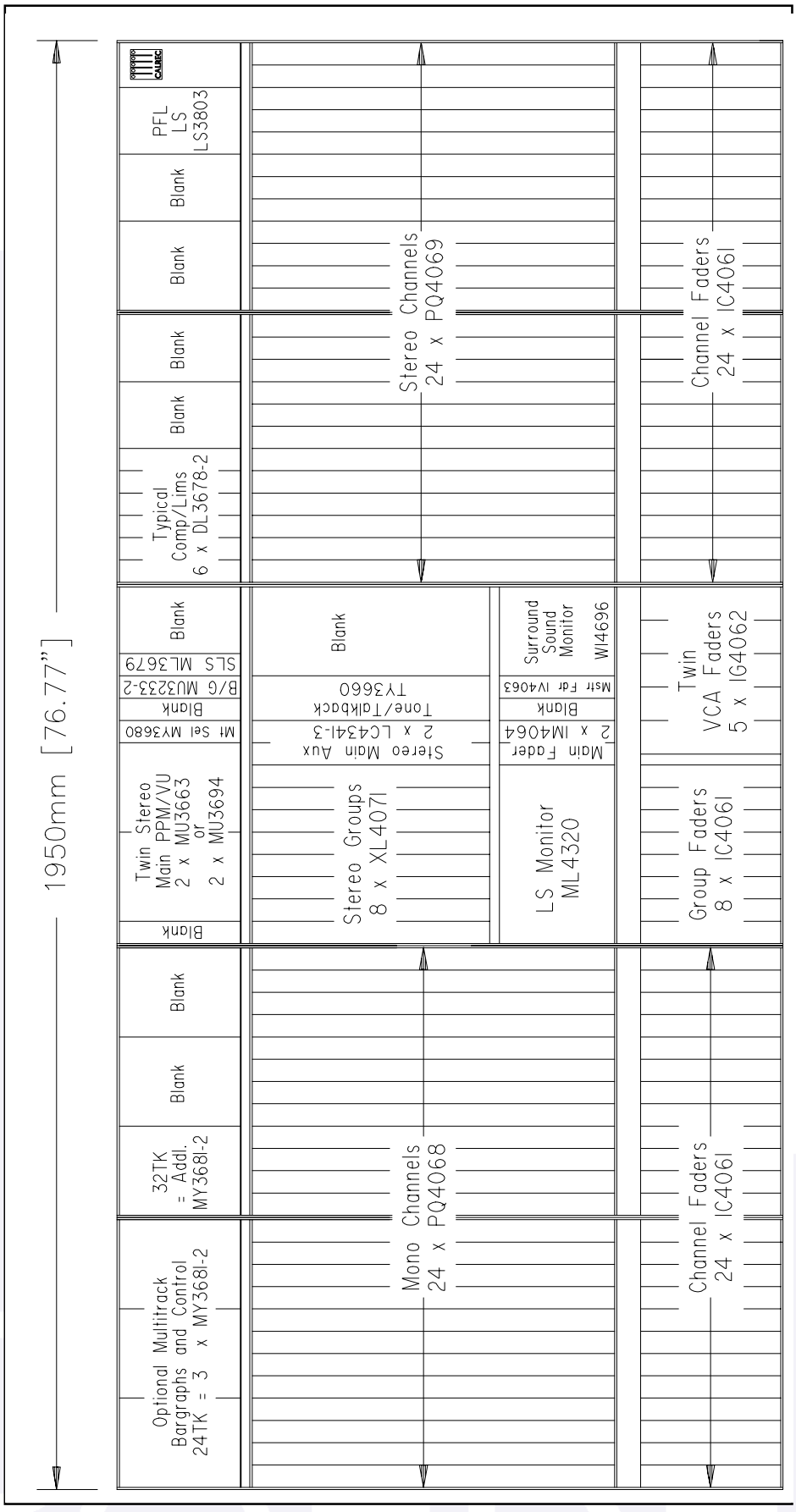
STANDARD OF SERVICE

Ensuring high standards is a priority & if you have any comments on the level of service, product quality or documentation offered to you by Calrec, then the Customer Support team would be pleased to receive your comments through any of the normal contact numbers, the email address listed earlier or on the customer registration form.

CONTENTS

1.0 Typical Console Layout

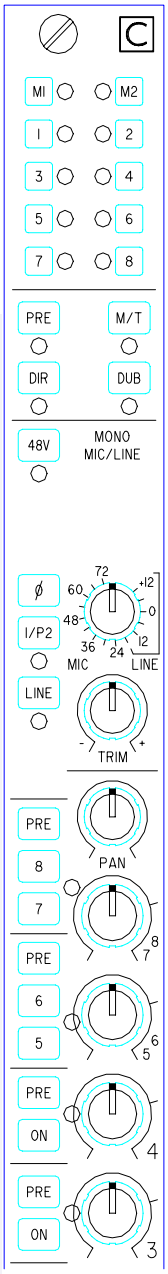
1.0 TYPICAL LAYOUT



2.0 Panels & Modules Description

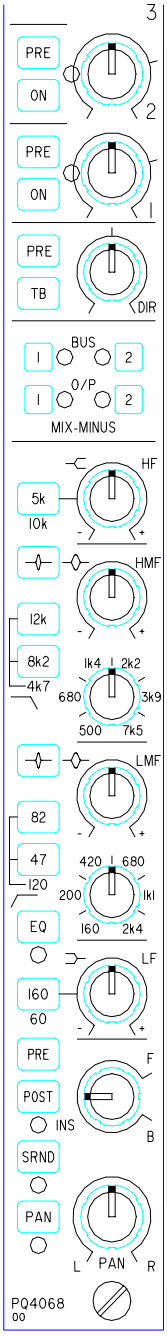
MODULES LIST

2.1 PQ4068 MONO CHANNEL



Routing to: 2 Main Stereo outputs, Red LED's
8 Stereo groups, Yellow LED's

Optional assignable routing to 24 or 32 Multitrack recording outputs normally from Post channel Pan but switchable to Pre Fader (or Pre Eq internally) or Direct Output (post Direct Output level control).
Pre/post fader: Red/green LED's. Direct: Yellow LED. M/T Assign: Green LED when channel/group selected. Enables routing from channel/group and performs forward routing interrogation via Multitrack Bargraph displays.
OverDUB button releases channel set globally for Multitrack replay to previous setting for over-dubbing. Yellow LED.



48V phantom power button. Red LED.

Φ Phase reverse button.
I/P2 selects second inputs Mic & Line. Green LED.
LINE selects Line inputs: Changes Red LED (Mic) to Green.
Coarse gain rotary switch: 6dB steps - Restricted Line range.
TRIM: ±6dB Mic & Line.
DIRect Output (mono) with pre/post fader selection (pre eq internal option) and provision for talkback injection.

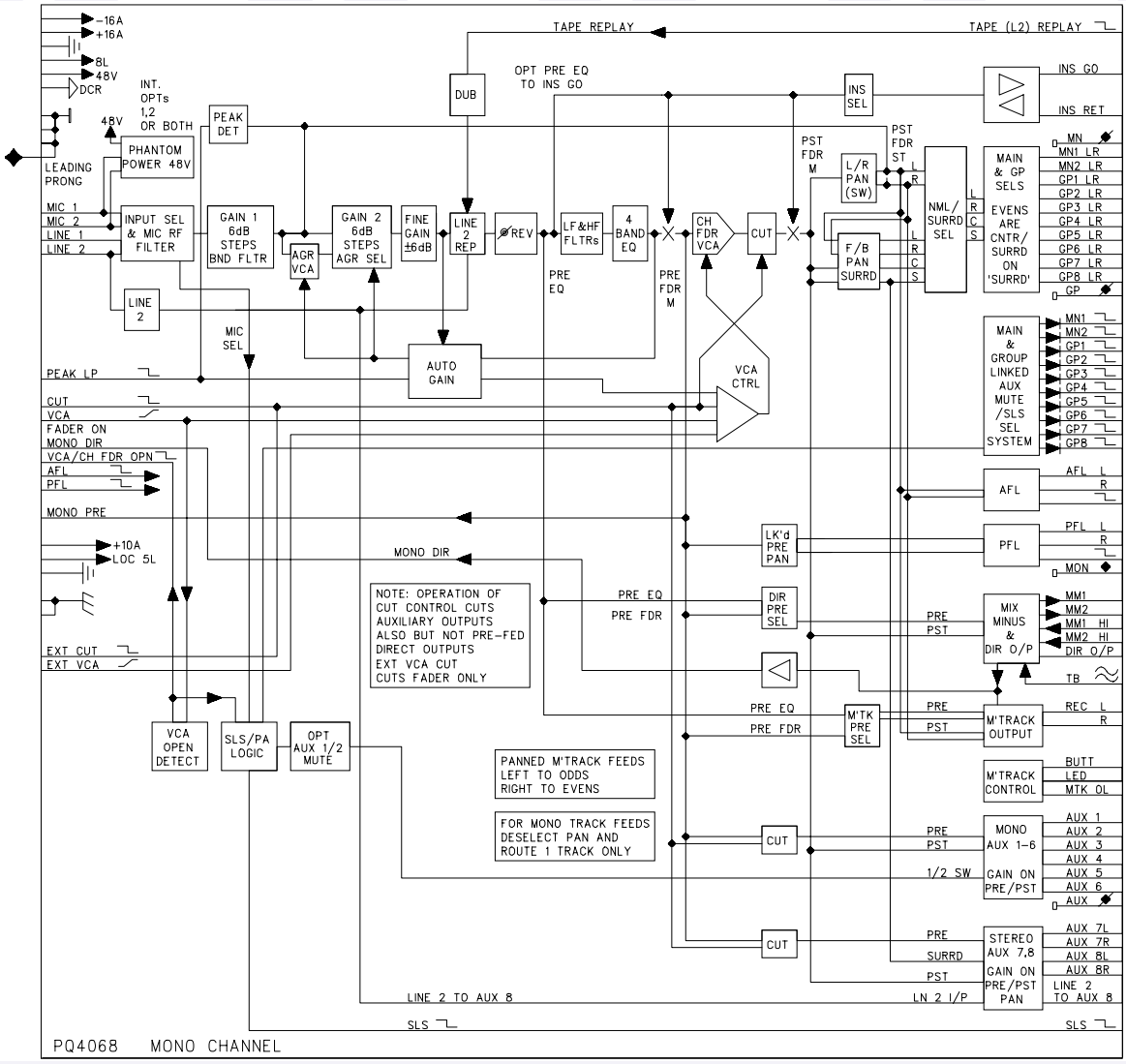
8 Auxiliary Outputs: Common gain control and common pre/post fader selection on 5/6 and 7/8. 7 & 8 are stereo with Pan control. Red/green LED indication of pre/post fader selection when output is selected. Aux 1 & 2 can be muted by P.A. selection system if required (internal switch).

MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Output. Bus 2 overides Bus 1. Internal pre/post fader selection of bus feed Yellow LED's. A Mix Minus bus can have several feeds & several outputs - not necessarily the same number. Each output is a mix of the other bus feeds except its own feed unless the bus is not selected.

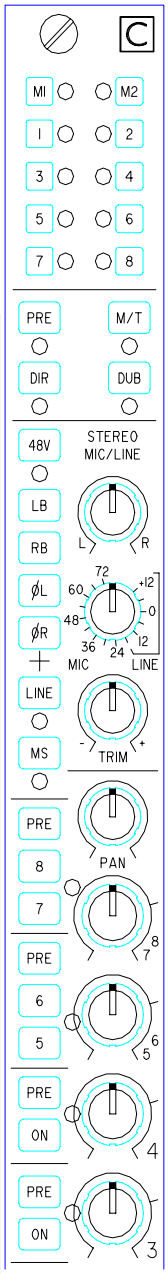
4-band Equaliser with 2 parametric mid bands and double shelf selection on LF & HF bands. LF & HF filters 3-position selection. EQ in/out with Red LED.
Pre & Post fader insert selection with standard level balanced in & out interface. Yellow LED.

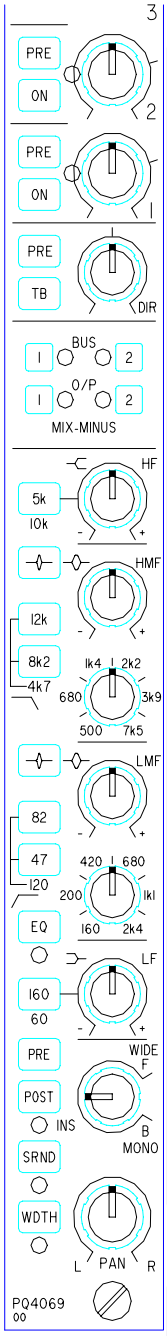
Surround selects odd numbered outputs & groups to be L-R and even numbered outputs & groups to be CENTRE-SURROUND. Aux 8 becomes STEREO SURROUND with PAN control.

FRONT/BACK pan between L-C-R and surround.
L-R PAN control with In/Out selection & Red LED.


-16A
+16A
8L
48V
DCR
INT. OPTs 1,2 OR BOTH
48V
PHANTOM POWER 48V
LEADING PRONG
MIC 1
MIC 2
LINE 1
LINE 2
INPUT SEL & MIC RF FILTER
LINE 2
PEAK DET
GAIN 1 6dB STEPS BND FLTR
AGR VCA
GAIN 2 6dB STEPS AGR SEL
FINE GAIN ±6dB
LINE 2 REP
REV
LF&HF FLTRs
4 BAND EQ
CH FDR VCA
CUT
DUB
OPT PRE EQ TO INS GO
INS SEL
TAPE REPLAY
TAPE (L2) REPLAY
INS GO
INS RET
PST FDR M
L/R PAN (SW)
PST FDR ST
F/B PAN SURRD
NML/ SURRD SEL
MAIN & GP SELS
EVENS ARE CNTR/ SURRD ON 'SURRD'
MN
MN1 LR
MN2 LR
GP1 LR
GP2 LR
GP3 LR
GP4 LR
GP5 LR
GP6 LR
GP7 LR
GP8 LR
GP
MIC SEL
AUTO GAIN
PRE EQ
PRE FDR M
VCA CTRL
MAIN & GROUP LINKED AUX MUTE /SLS SEL SYSTEM
MN1
MN2
GP1
GP2
GP3
GP4
GP5
GP6
GP7
GP8
PEAK LP
CUT
VCA
FADER ON
MONO DIR
VCA/CH FDR OPN
AFL
PFL
AFL
AFL L
R
MONO PRE
+10A
LOC 5L
MONO DIR
LK'd PRE PAN
PFL
PFL L
R
MON
NOTE: OPERATION OF CUT CONTROL CUTS AUXILIARY OUTPUTS ALSO BUT NOT PRE-FED DIRECT OUTPUTS EXT VCA CUT CUTS FADER ONLY
PRE EQ
PRE FDR
DIR PRE SEL
MIX MINUS & DIR O/P
MM1
MM2
MM1 HI
MM2 HI
DIR O/P
TB
EXT CUT
EXT VCA
PRE
PST
M'TK PRE SEL
M'TRACK OUTPUT
REC L
R
PRE EQ
PRE FDR
VCA OPEN DETECT
SLS/PA LOGIC
OPT AUX 1/2 MUTE
PANNED M'TRACK FEEDS LEFT TO ODDS RIGHT TO EVENS
M'TRACK CONTROL
BUTT LED
MTK OL
FOR MONO TRACK FEEDS DESELECT PAN AND ROUTE 1 TRACK ONLY
CUT
MONO AUX 1-6
GAIN ON PRE/PST
1/2 SW
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX
CUT
PRE
SURRD
PST
STEREO AUX 7,8
GAIN ON PRE/PST PAN
LN 2 I/P
AUX 7L
AUX 7R
AUX 8L
AUX 8R
LINE 2 TO AUX 8
LINE 2 TO AUX 8
SLS
SLS
PQ4068 MONO CHANNEL

2.2 PQ4069 STEREO CHANNEL





Routing to: 2 Main Stereo outputs, Red LEDs
8 Stereo Groups, Yellow LEDs

Optional assignable routing to 24 or 32 Multitrack recording outputs normally from Post channel Pan but switchable to Pre Fader (or Pre Eq internally) or Direct Output (post Direct Output level control). Pre/post fader: Red/green LEDs. Direct: Yellow LED. M/T Assign: Green LED when channel/group selected. Enables routing from channel/group and performs forward routing interrogation via Multitrack Bargraph displays.
OverDUB button releases Channel set globally for Multitrack replay to previous setting for over-dubbing. Yellow LED.

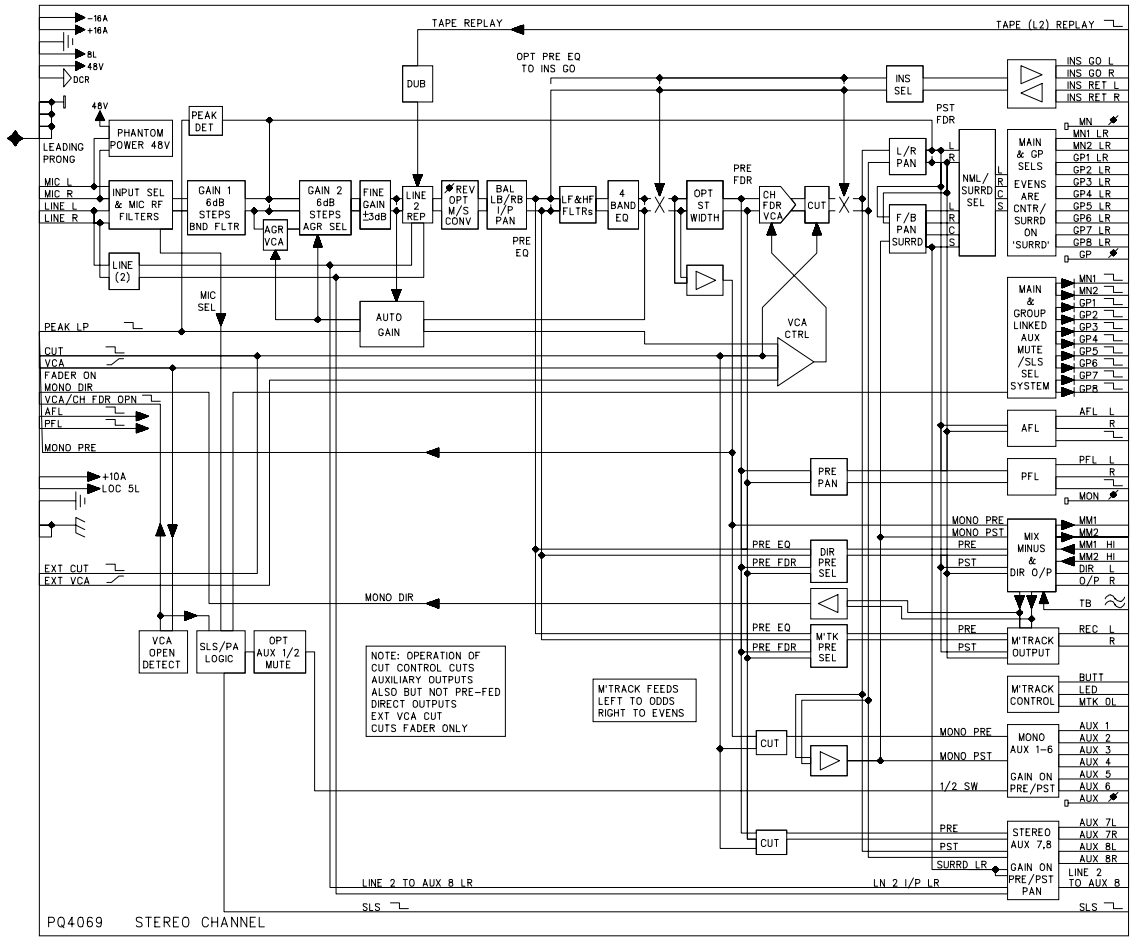
48V phantom power button. Red LED.

Balance ±3dB control on stereo is inoperative on LB or RB (left to both, right to both outputs) and becomes an input pan control on LB+RB between left & right inputs to both left & right outputs.
ΦL, ΦR Phase reverse left & right.
LINE selects Line input: Changes Red LED (Mic) to Green.
MS inserts MS/LR convertor: Red LED.
Coarse gain rotary switch: 6dB steps - Restricted Line range.
TRIM: ±6dB Mic & Line.
DIRect Output (stereo) with pre/post fader selection (pre eq internal option) and provision for talkback injection.

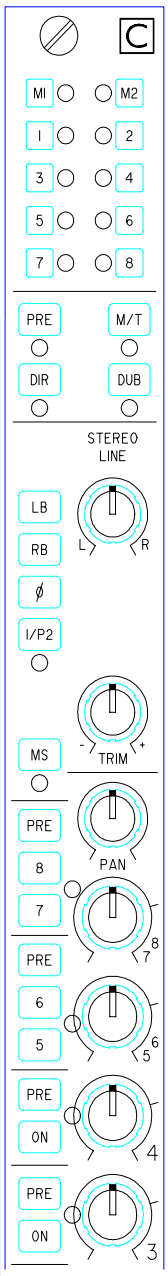
8 Auxiliary Outputs: Common gain control and common pre/post fader selection on 5/6 and 7/8. 7 & 8 are stereo.
Red/green LED indication of pre/post fader selection when output is selected. Aux 1 & 2 can be muted by PA selection system if required (internal switch).

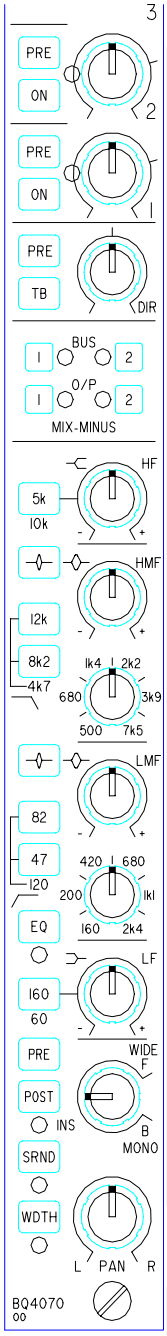
MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Output. Internal pre/post fader selection of bus feed. Yellow LEDs. A Mix Minus bus can have several feeds & several outputs - not necessarily the same number. Each output is a mix of the other bus feeds except its own feed unless the bus is not selected. 4-band Equaliser with 2 parametric mid bands and double shelf selection on LF & HF bands. LF & HF filters 3-position selection. EQ in/out with Red LED.
Pre & Post fader insert selection with standard level balanced in & out interface. Yellow LED.

Stereo width control with In/Out selection & Red LED.
Surround selects odd numbered outputs & groups to be L-R and even numbered outputs & groups to be CENTRE-SURROUND. Aux 8 becomes STEREO SURROUND with PAN control. WIDTH control becomes FRONT-BACK pan between L-C-R & SURROUND or SURROUND when width is not selected.
Stereo L/R PAN control.


TAPE REPLAY
TAPE (L2) REPLAY
OPT PRE EQ TO INS GO
DUB
INS SEL
INS GO L
INS GO R
INS RET L
INS RET R
PST FDR
-16A
+16A
RL
48V
DCR
48V
PEAK DET
PHANTOM POWER 48V
LEADING PRONG
MIC L
MIC R
LINE L
LINE R
INPUT SEL & MIC RF FILTERS
GAIN 1 6dB STEPS BND FLTR
GAIN 2 6dB STEPS AGR SEL
FINE GAIN ±3dB
LINE 2 REP
REV OPT M/S CONV
BAL LB/RB I/P PAN
LF&HF FLTRs
4 BAND EQ
OPT ST WIDTH
PRE FDR
CH FDR VCA
CUT
L/R PAN
F/B PAN SURRD
NML/ SURRD SEL
MAIN & GP SELS EVENS ARE CNTR/ SURRD ON 'SURRD'
MN
MN1 LR
MN2 LR
GP1 LR
GP2 LR
GP3 LR
GP4 LR
GP5 LR
GP6 LR
GP7 LR
GP8 LR
GP
AGR VCA
LINE (2)
MIC SEL
PRE EQ
AUTO GAIN
VCA CTRL
MAIN & GROUP LINKED AUX MUTE /SLS SEL SYSTEM
MN1
MN2
GP1
GP2
GP3
GP4
GP5
GP6
GP7
GP8
PEAK LP
CUT
VCA
FADER ON
MONO DIR
VCA/CH FDR OPN
AFL
PFL
MONO PRE
AFL
AFL L
R
PFL
PFL L
R
MON
+10A
LOC 5L
PRE PAN
MONO PRE
MONO PST
PRE
PST
MIX MINUS & DIR O/P
MM1
MM2
MM1 HI
MM2 HI
DIR L
O/P R
TB
PRE EQ
PRE FDR
DIR PRE SEL
EXT CUT
EXT VCA
MONO DIR
PRE EQ
PRE FDR
M'TK PRE SEL
PRE
PST
M'TRACK OUTPUT
REC L
R
M'TRACK CONTROL
BUTT
LED
MTK OL
VCA OPEN DETECT
SLS/PA LOGIC
OPT AUX 1/2 MUTE
NOTE: OPERATION OF CUT CONTROL CUTS AUXILIARY OUTPUTS ALSO BUT NOT PRE-FED DIRECT OUTPUTS EXT VCA CUT CUTS FADER ONLY
M'TRACK FEEDS LEFT TO ODDS RIGHT TO EVENS
CUT
MONO PRE
MONO PST
1/2 SW
MONO AUX 1-6
GAIN ON PRE/PST
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX
CUT
PRE
PST
SURRD LR
STEREO AUX 7,8
GAIN ON PRE/PST PAN
AUX 7L
AUX 7R
AUX 8L
AUX 8R
LINE 2 TO AUX 8
LINE 2 TO AUX 8 LR
LN 2 I/P LR
SLS
SLS
PQ4069 STEREO CHANNEL

2.3 BQ4070 STEREO LINE CHANNEL





Routing to: 2 Main Stereo outputs, Red LEDs
8 Stereo Groups, Yellow LEDs

Optional assignable routing to 24 or 32 Multitrack recording outputs normally from Post channel Pan but switchable to Pre Fader (or Pre Eq internally) or Direct Output (post Direct Output level control).

Pre/post fader: Red/green LEDs. Direct: Yellow LED. M/T Assign: Green LED when channel/group selected. Enables routing from channel/group and performs forward routing interrogation via Multitrack Bargraph displays.
OverDUB button releases channel set globally for Multitrack replay to previous setting for over-dubbing. Yellow LED.

Balance ±3dB control on stereo is inoperative on LB or RB (left to both, right to both outputs) and becomes an input pan control on LB+RB between left & right inputs to both left & right outputs.

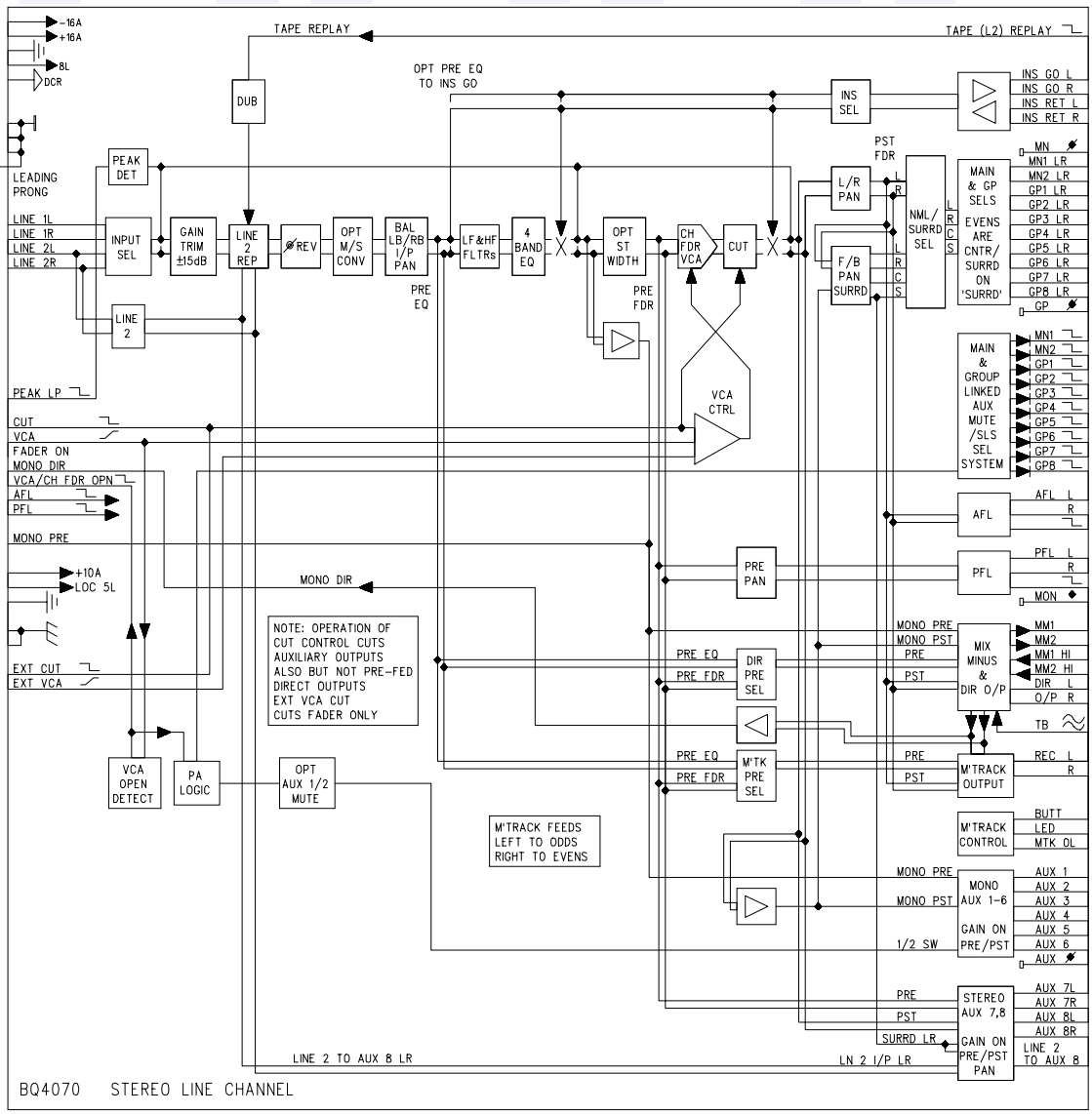
Φ - Phase reverse button. (L & R)
I/P2 - Selects second Stereo Line input. Green LED.
MS inserts MS/LR convertor: Red LED.
TRIM: ±15dB on both Stereo Line inputs.
DIRect Output (stereo) with pre/post fader selection (pre eq internal option) and provision for talkback injection.

8 Auxiliary Outputs: Common gain control and common pre/post fader selection on 5/6 and 7/8. 7 & 8 are stereo. Red/green LED indication of pre/post fader selection when output is selected. Aux 1 & 2 can be muted by PA selection system if required (internal switch).

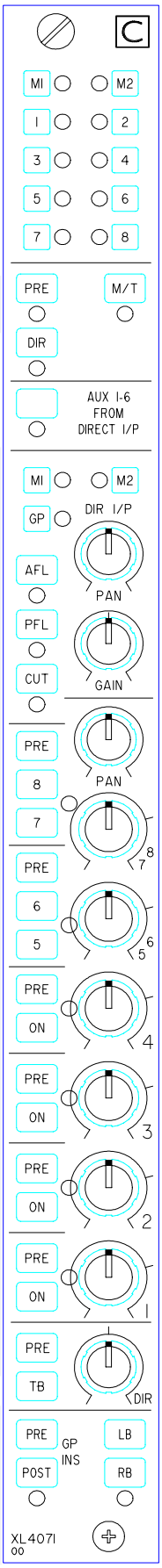
MIX MINUS: 2 independent systems with BUS & O/P selection to Direct Outputs. Internal pre/post fader selection of bus feed Yellow LEDs. A Mix Minus bus can have several feeds & several outputs - not necessarily the same number. Each output is a mix of the other bus feeds except its own feed unless the bus is not selected.

4-band Equaliser with 2 parametric mid bands and double shelf selection on LF & HF bands. LF & HF filters 3-position selection. EQ in/out with Red LED.
Pre & Post fader insert selection with standard level balanced in & out interface. Yellow LED.

Stereo width control with In/Out selection & Red LED.
Surround selects odd numbered outputs & groups to be L-R and even numbered outputs & groups to be CENTRE-SURROUND. Aux 8 becomes STEREO SURROUND with PAN control. WIDTH control becomes FRONT-BACK pan between L-C-R & SURROUND or SURROUND when width is not selected.
Stereo L/R PAN control.


-16A
+16A
8L
DCR
LEADING PRONG
TAPE REPLAY
TAPE (L2) REPLAY
OPT PRE EQ TO INS GO
DUB
INS SEL
INS GO L
INS GO R
INS RET L
INS RET R
PEAK DET
PST FDR
LINE 1L
LINE 1R
LINE 2L
LINE 2R
INPUT SEL
GAIN TRIM ±15dB
LINE 2 REP
Ø REV
OPT M/S CONV
BAL LB/RB I/P PAN
PRE EQ
LF&HF FLTRs
4 BAND EQ
OPT ST WIDTH
PRE FDR
CH FDR VCA
CUT
L/R PAN
F/B PAN SURRD
NML/ SURRD SEL
MAIN & GP SELS
EVENS ARE CNTR/ SURRD ON 'SURRD'
MN
MN1 LR
MN2 LR
GP1 LR
GP2 LR
GP3 LR
GP4 LR
GP5 LR
GP6 LR
GP7 LR
GP8 LR
GP
LINE 2
PEAK LP
VCA CTRL
MAIN & GROUP LINKED AUX MUTE /SLS SEL SYSTEM
MN1
MN2
GP1
GP2
GP3
GP4
GP5
GP6
GP7
GP8
CUT
VCA
FADER ON
MOND DIR
VCA/CH FDR OPN
AFL
PFL
AFL
AFL L
R
MONO PRE
PRE PAN
PFL
PFL L
R
MON
+10A
LOC 5L
MONO DIR
NOTE: OPERATION OF CUT CONTROL CUTS AUXILIARY OUTPUTS ALSO BUT NOT PRE-FED DIRECT OUTPUTS EXT VCA CUT CUTS FADER ONLY
MONO PRE
MONO PST
PRE
PST
MIX MINUS & DIR O/P
MM1
MM2
MM1 HI
MM2 HI
DIR O/P L
R
TB
EXT CUT
EXT VCA
PRE EQ
PRE FDR
DIR PRE SEL
VCA OPEN DETECT
PA LOGIC
OPT AUX 1/2 MUTE
PRE EQ
PRE FDR
M'TK PRE SEL
PRE
PST
M'TRACK OUTPUT
REC L
R
M'TRACK FEEDS LEFT TO ODDS RIGHT TO EVENS
M'TRACK CONTROL
BUTT LED
MTK OL
MONO PRE
MONO PST
MONO AUX 1-6
GAIN ON PRE/PST
1/2 SW
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
AUX
PRE
PST
SURRD LR
STEREO AUX 7,8
GAIN ON PRE/PST PAN
AUX 7L
AUX 7R
AUX 8L
AUX 8R
LINE 2 TO AUX 8
LINE 2 TO AUX 8 LR
LN 2 I/P LR
BQ4070 STEREO LINE CHANNEL

2.4 XL4071 STEREO GROUP



Routing to: 2 Main Stereo outputs, Red LEDs
Other 7 Stereo Groups, Yellow LEDs

Optional assignable routing to 24 or 32 Multitrack recording outputs normally from Post channel Pan but switchable to Pre Fader (or Pre Eq internally) or Direct Output (post Direct Output level control).

Pre/post fader: Red/green LEDs. Direct: Yellow LED. M/T Assign: Green LED when channel/group selected. Enables routing from channel/group and performs forward routing interrogation via Multitrack Bargraph displays.

Aux 1-6 from Direct I/P: switches pre & post feeds to Direct I/P circuit. Yellow Led.

Direct I/P Routing to: 2 Main Stereo outputs. Red LEDs.
Direct I/P Routing to: Group Mixer. Yellow LED.

DIRECT I/P:

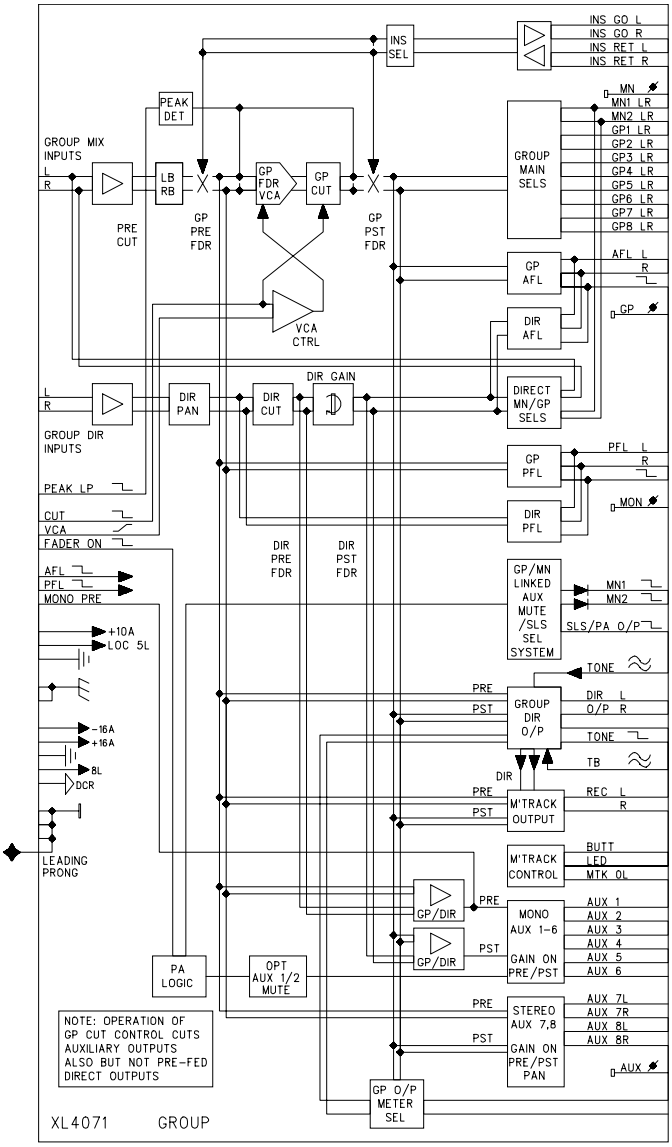
AFL	:	Red LED (Stereo)
PFL	:	Green LED (Stereo)
CUT	:	Yellow LED

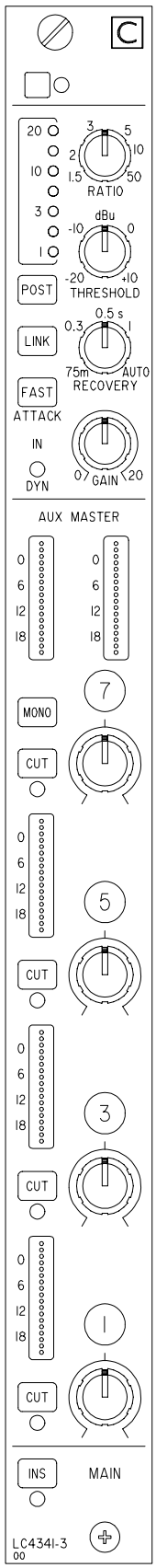
Direct I/P Stereo PAN control.

Direct I/P GAIN control with 10dB in hand at 12 o'clock line-up.

8 Auxiliary Outputs: Common gain control and common pre/post fader selection on 5/6 and 7/8, 7 & 8 are stereo. Red/green LED indication of pre/post selection when output is selected. Aux 1 & 2 can be muted by PA selection system if required (internal switch).

DIRect Output (stereo) with pre/post fader selection (pre eq internal option) and provision for talkback injection.
Pre & Post fader insert selection with standard level balanced in & out interface. Yellow LED.
LB: Left input to Both outputs.
RB: Right input to Both outputs.
LB + RB: A mono mix of both inputs to both outputs.


INS GO L
INS GO R
INS RET L
INS RET R
INS SEL
PEAK DET
GROUP MIX INPUTS
L
R
LB
RB
GP FDR VCA
GP CUT
PRE CUT
GP PRE FDR
GP PST FDR
GROUP MAIN SELS
MN
MN1 LR
MN2 LR
GP1 LR
GP2 LR
GP3 LR
GP4 LR
GP5 LR
GP6 LR
GP7 LR
GP8 LR
GP AFL
AFL L
R
GP
DIR AFL
VCA CTRL
DIR GAIN
DIR PAN
DIR CUT
DIRECT MN/GP SELS
GROUP DIR INPUTS
PEAK LP
CUT
VCA
FADER ON
AFL
PFL
MONO PRE
GP PFL
PFL L
R
MON
DIR PFL
DIR PRE FDR
DIR PST FDR
GP/MN LINKED AUX MUTE /SLS SEL SYSTEM
MN1
MN2
SLS/PA O/P
TONE
+10A
LOC 5L
-16A
+16A
8L
DCR
LEADING PRONG
PRE
PST
GROUP DIR O/P
DIR L
O/P R
TONE
TB
DIR
M'TRACK OUTPUT
REC L
R
M'TRACK CONTROL
BUTT LED
MTK OL
GP/DIR
MONO AUX 1-6
GAIN ON PRE/PST
AUX 1
AUX 2
AUX 3
AUX 4
AUX 5
AUX 6
PA LOGIC
OPT AUX 1/2 MUTE
STEREO AUX 7,8
AUX 7L
AUX 7R
AUX 8L
AUX 8R
AUX
NOTE: OPERATION OF GP CUT CONTROL CUTS AUXILIARY OUTPUTS ALSO BUT NOT PRE-FED DIRECT OUTPUTS
GP O/P METER SEL
XL4071 GROUP



2.5 LC4341-3 MAIN OUTPUT

Routing from Output 2 to Output 1 only. Red LED.

Main output compressor, may be used as a limiter (50/1 ratio).

20dB gain reduction Yellow bargraph.

Normally pre fader - can be set post fader.

Can be linked between outputs.

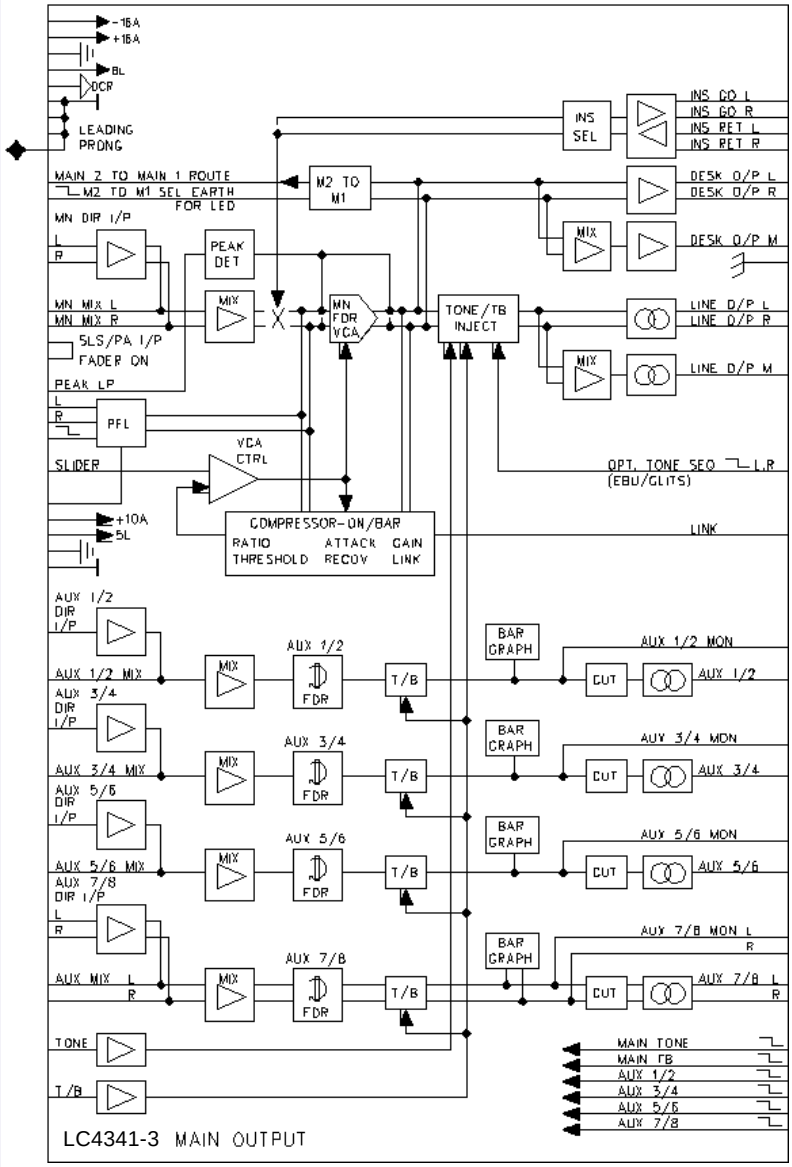
Separate In/Out switch: Red LED - Dims Gain reduction bargraph when out.
Make-up gain control - 20dB max.

Auxiliary Output Master Controls.
Output 1 controls Auxiliaries 1, 3, 5 and 7.
Output 2 controls Auxiliaries 2, 4, 6 and 8.

Each output can be cut if required, then the Green/Red bargraphs are dimmed.

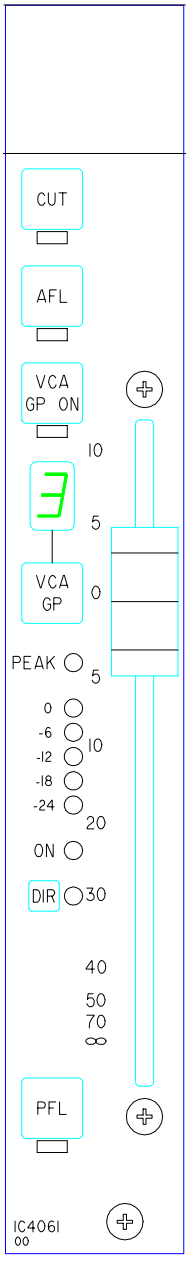
Stereo auxiliary outputs 7 & 8 may be set for MONO operation.

Pre Fader Insert selection. Yellow LED.



LC4341-3 MAIN OUTPUT

2.6 IC4061 CHANNEL/GROUP FADER



Scribble strip.

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

AFL button routes channel or group signal exclusively to monitor loudspeaker, (in place stereo) via AFL bus over-ride. Momentary button can be internally set for push-push electronic latching.

VCA GROUP ON
Latching switch: switches VCA channel or group assignment on/off.
Normally, red LED when depressed. When VCA assigned to channel or group and active, LED illuminates green.

VCA GROUP
Push to select channel or group to VCA assignment number 1-10.

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

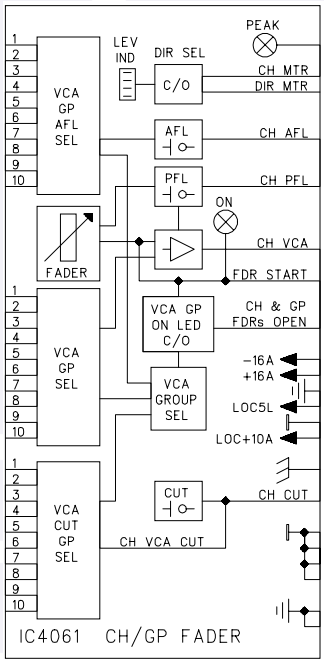
PEAK - Red LED (top) illuminates when signal anywhere in circuit approaches within 3dB of clipping. Yellow LED illuminates when auto gain ranging circuit is operative in a channel selected to mic (see below).

SIGNAL LEVEL LEDS
Post channel eq/pre fader, signal level detection.

ON - Green LED illuminates when fader is open.

DIR
Latching switch: changes signal level LEDS to read channel/group direct output signal feed.

PFL button routes channel or group signal to PFL loudspeaker{s} (in-place stereo). Momentary button can be internally set for push-push electronic latching.



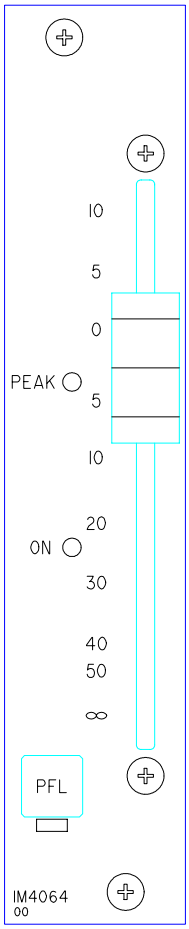
Calrec Auto Gain Ranging

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. and 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.

This principle ensures a very good noise figure in the channel especially in the equaliser whilst coping with extreme levels experienced often in outside broadcast work.

2.7 IM4064 MAIN OUTPUT FADER



Scribble strip.

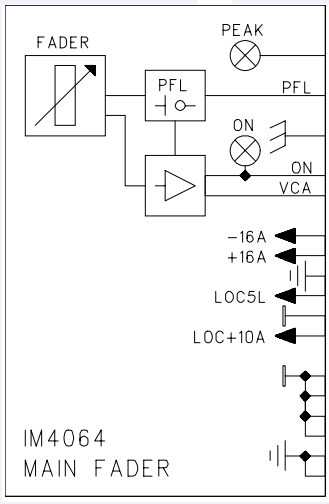
FADER - with +10dB in hand - can be reverse scale to order.

PEAK - Red LED illuminates when pre or post fader signal approaches within 3dB of clipping.

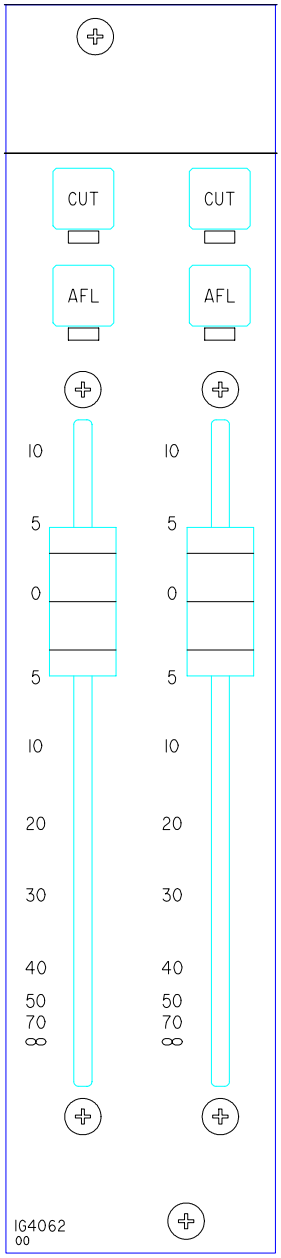
ON - Green LED illuminates when fader is open.

PFL button routes main signal to PFL loudspeaker{s} (in-place stereo).

Momentary button can be internally set for push-push electronic latching.



2.8 IG4062 VCA GROUP TWIN FADER

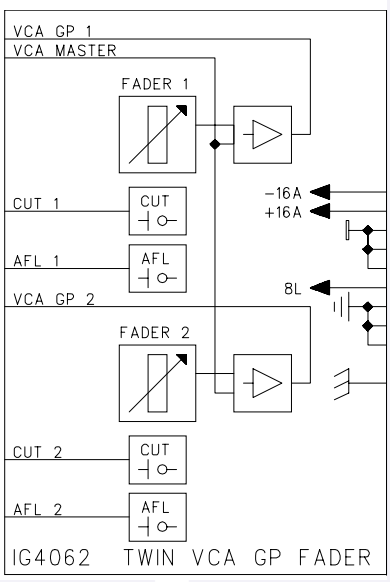


Scribble strip.

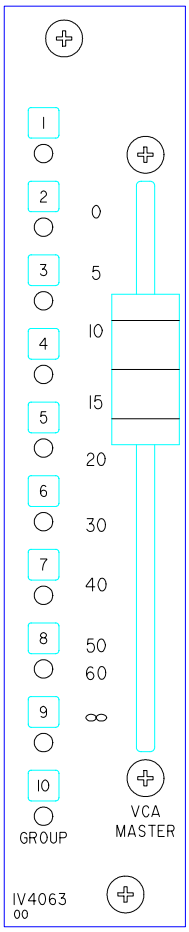
FADER - with +10dB in hand - can be reverse scale to order.

CUT button cuts channels & groups selected to VCA fader illuminating their LEDs. Yellow LED.

AFL button puts channels & groups selected to VCA fader to the AFL monitor illuminating their LEDs. Red LED.



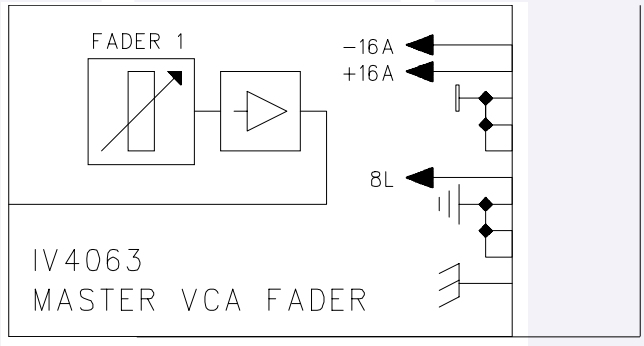
2.9 IV4063 VCA MASTER FADER



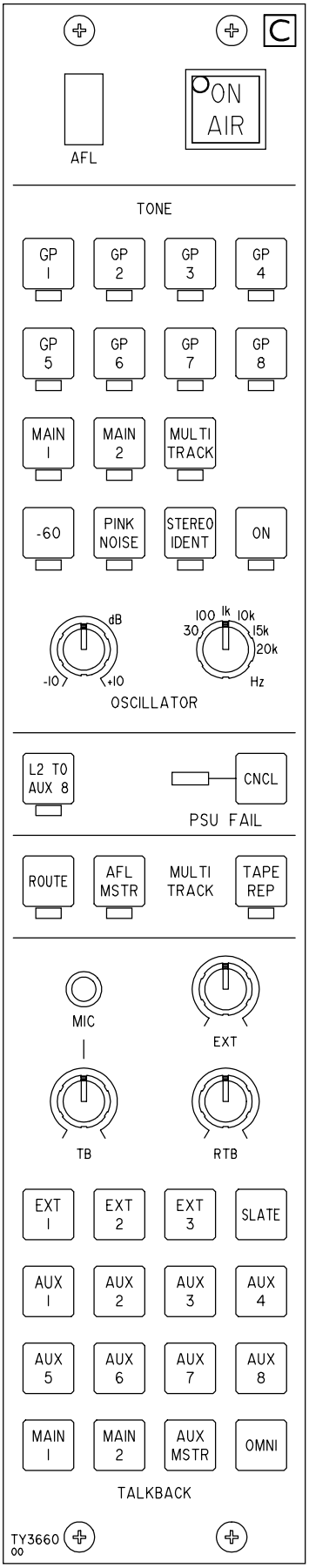
Scribble strip.

FADER - normally operated at top of travel - can be reverse scale to order.

BUTTONS 1 to 10 to select which VCA Group faders the Master is acting upon. Green LEDs.



2.10 TY3660 TONE/TALKBACK



Master AFL indicator illuminates red when any AFL button is selected or a multitrack AFL is switched in. Also illuminates AFL LED on ML3661 Monitor Loudspeaker panel.

ON AIR button disables all tone and main talkback functions with remote indication. Red LED.

Tone oscillator - Red LED, -60dB button - Green LED and PINK noise option - Yellow LED. Routing to all Groups, Main Outputs and Multitrack - Yellow LEDs.

L2 TO AUX 8: Routes all Line 2 (Line on Stereo channel) to Auxiliary 8 output. Stereo from stereo channels. Global function on all channels. Yellow LED.
Independent of other input selections - used for Multitrack replay monitor system.

STEREO IDENT: Switches on an internal sequencer which controls switches tone on the main outputs. EBU sequence or Glits (option).

PSU FAIL - LED & cancel button. Lamp flashes when a PSU or part thereof fails. Cancel button stops flashing & leaves LED steady red. Second failure or switching on console resumes flashing.

The Multitrack buttons ROUTE and AFL are used to assign routing from channels or groups to tracks and perform track AFL. Normally both LEDs are off, but when either button is pressed the LEDs illuminate appropriately. ROUTE is GREEN, and AFL is RED.

When the ROUTE LED is GREEN, the console is in assignable routing mode. When the AFL LED is RED, the console is in Track AFL mode. When neither LED is lit, the console is i NORMAL mode and both forward and reverse interrogation is available.

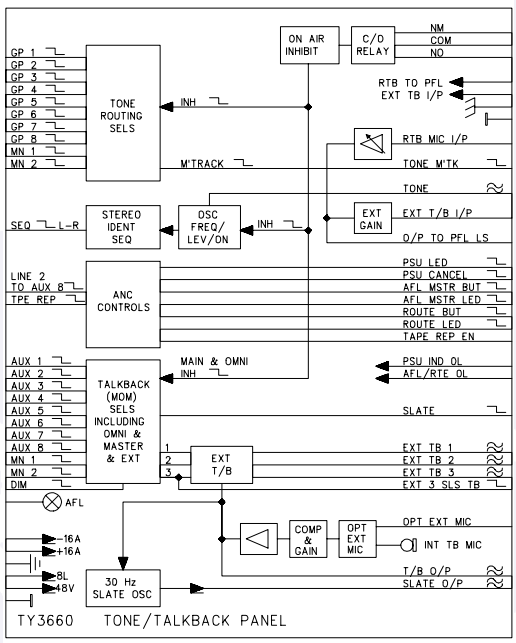
If the console is in ROUTE or AFL mode, and no multitrack activity is performed within 20 seconds, the console time out to NORMAL mode, preserving all current settings.

TAPE REP - Globally switches all channels to Tape Replay via Line 2 inputs (LINE on Stereo) over-riding other sections.
Can be over-ridden by OVERDUB button on channels. Green LED.

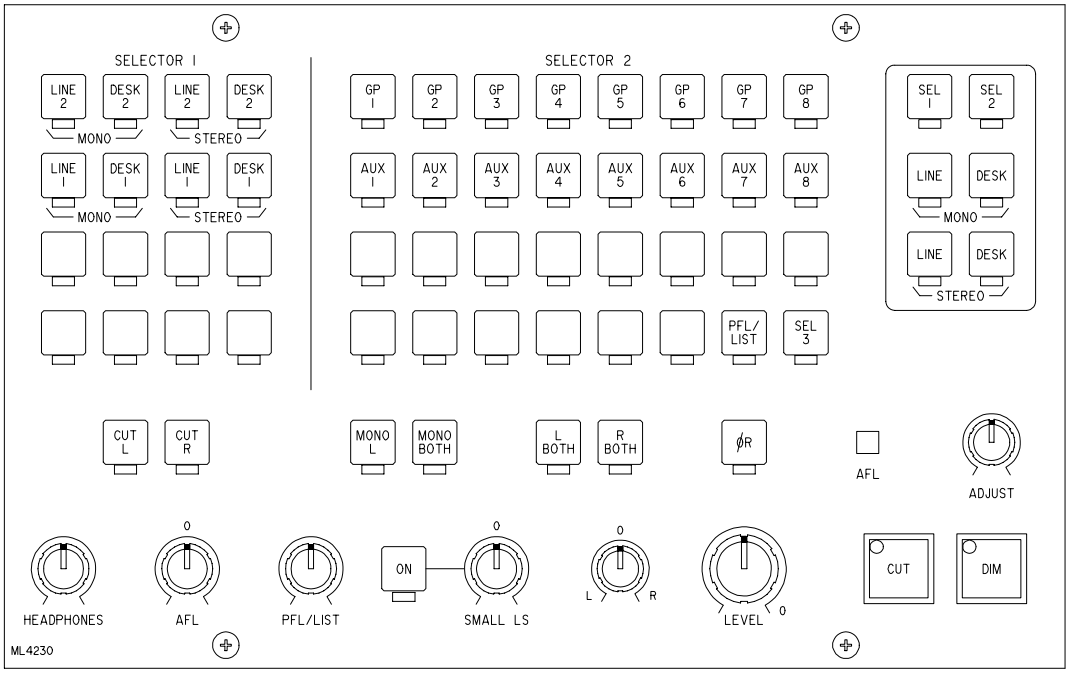
TALKBACK MIC and Gain control.

EXT & RTB. (Reverse talkback) Line and mic level inputs to PFL loudspeaker.

TALKBACK momentary routing as shown.



2.11 ML4230 MONITOR L.S.



SELECTOR 1: 16 selections as show. 8 external stereo. Green LEDs.

SELECTOR 2: 32 selections as shown. 14 external stereo.
Facility for bringing in selections from a LS2 panel via SEL 3. Green LEDs.

MAIN selector: 6 selections: SEL 1 & 2 & Main 1 outputs. Red LEDs.

LS Mode Selections: 7 buttons with Red LEDs and AFL over-ride red LED.

HEADPHONES: Level control to separate output. +10/-oo

AFL: Trim ±10dB.

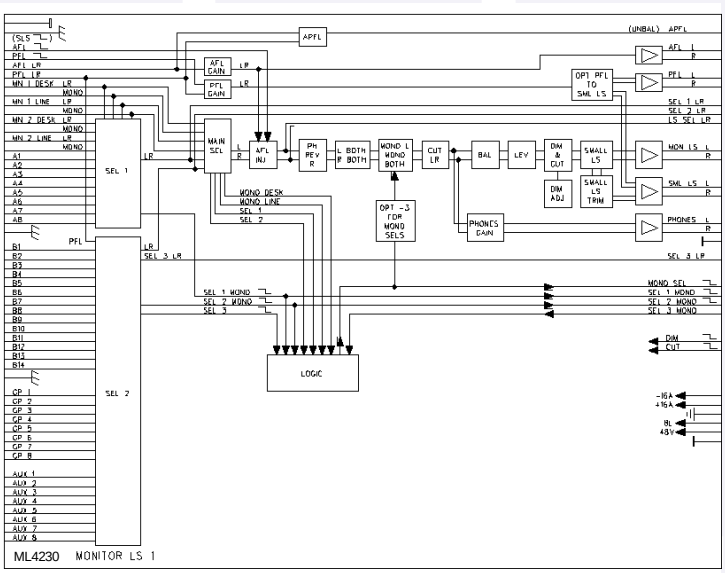
PFL: Level control. +10/-oo

SMALL LS: Button option with Trim to near-field LS ±10dB.

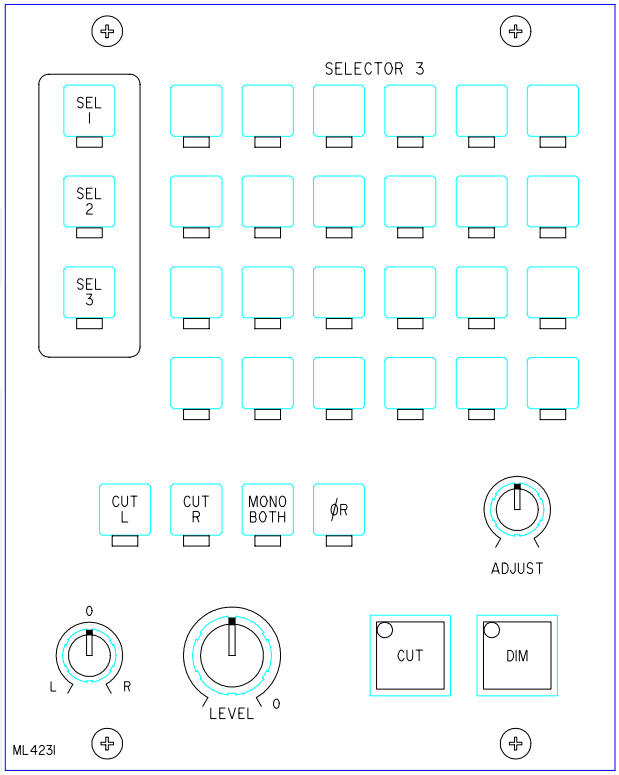
BALANCE Control: ±3dB.

GAIN Control: 0/-oo

CUT & DIM buttons with Dim level adjust. -6/-30dB.
Red LEDs.



2.12 ML4231 LOUDSPEAKER 2



SELECTOR 3: 24 stereo external inputs. Green LEDs.

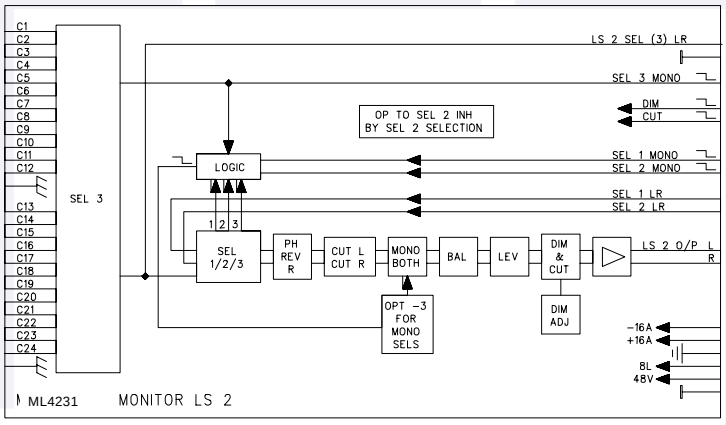
MAIN Selector: Facility for selecting SEL 1 & SEL 2 outputs from Monitor LS module as well as local SEL 3 output.

LS Mode Selector: 4 buttons with Red LEDs.

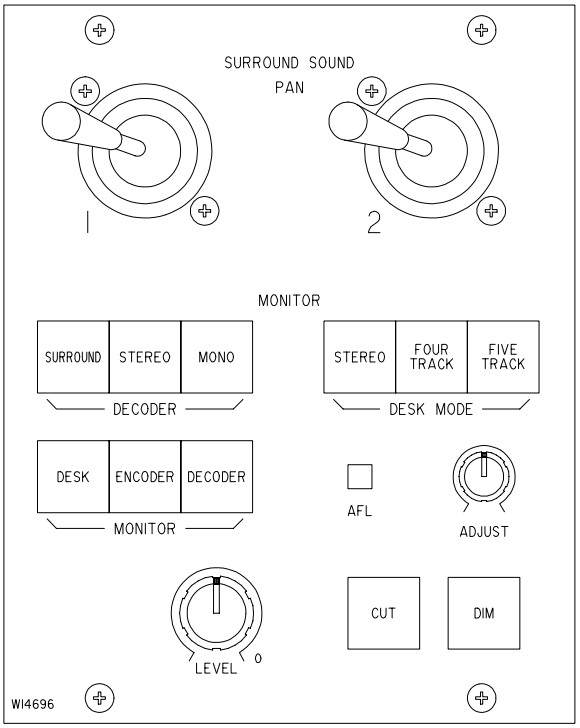
BALANCE control ±3dB.

GAIN control 0/-oodB.

CUT & DIM buttons with dim level adjust, -6/-30dB. Red LEDs.



2.13 WI4696 SURROUND MONITOR



DESK MODE SELECTOR:

Stereo: Desk normal & monitor controlled by MONITOR LOUDSPEAKER panel.

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

Five Track: As 4-track except that L & R surround from Aux 8 LR also.

MONITOR SELECTOR:

Desk:Surround monitor as set above from Desk outputs.

Encoder:Stereo compatibility check from external Encoder outputs LR.
Decoder:Surround monitor of Encoder & Decoder outputs. (external units)

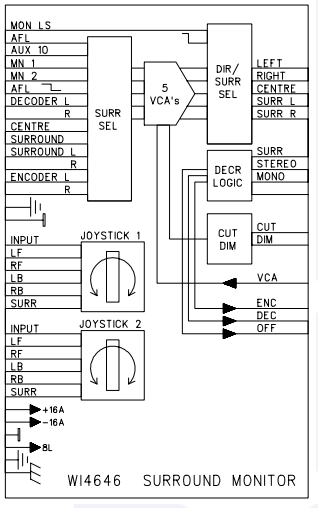
DECODER SELECTOR: Mono, Stereo, Surround — Optional remote controls of decoder for comparison purposes.

Level: Loudspeaker volume control 0/Off.

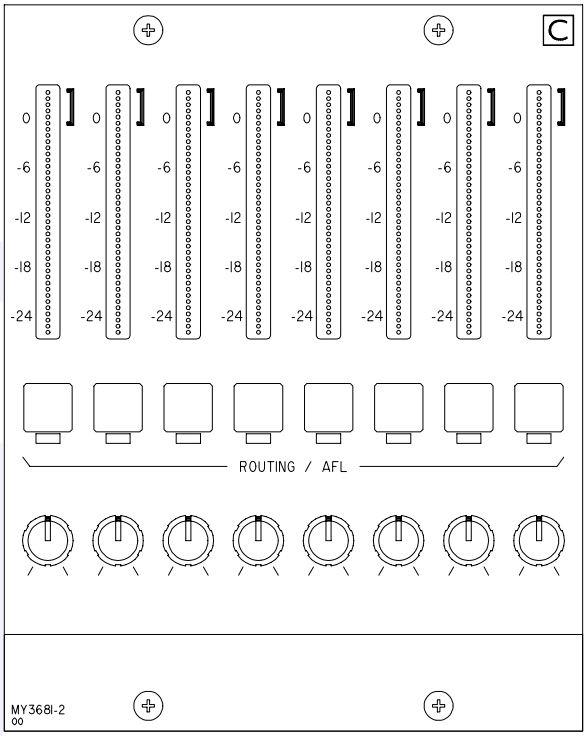
Cut & Dim buttons with Dim Level adjust -6/-30dB. Red LEDs.

AFL - Red LED drawing attention to an AFL selection.

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



2.14 MY3681 MULTI-TRACK BARGRAPH/CONTROL

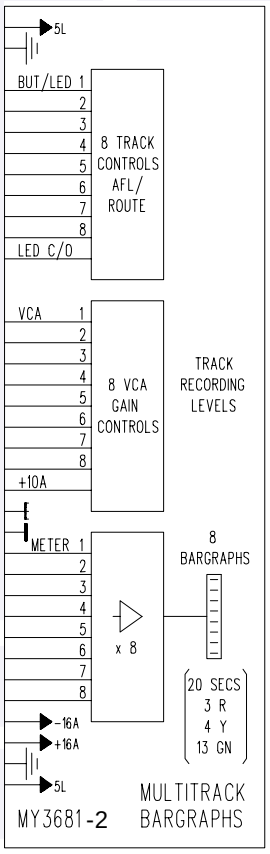


Each Bargraph Control panel provides control over 8 tracks. The Bargraph Meters are GREEN from -oo to -6, YELLOW from -6 to 0, and RED from 0 to +6. There are usually 3 panels for 24 tracks and 4 for 32 track systems.

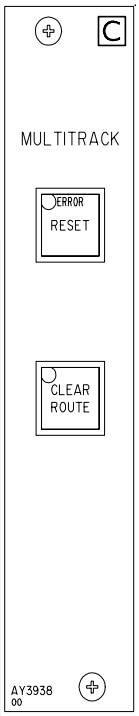
ROUTING/AFL Buttons:
These normally display the current ROUTING assignment for the current selected channel or group (forward interrogation), in GREEN.

The 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.

The eight/8 Track Record Send level controls provide +10/ oodB control. The displays can be factory set for 0 = +/- 6dB.



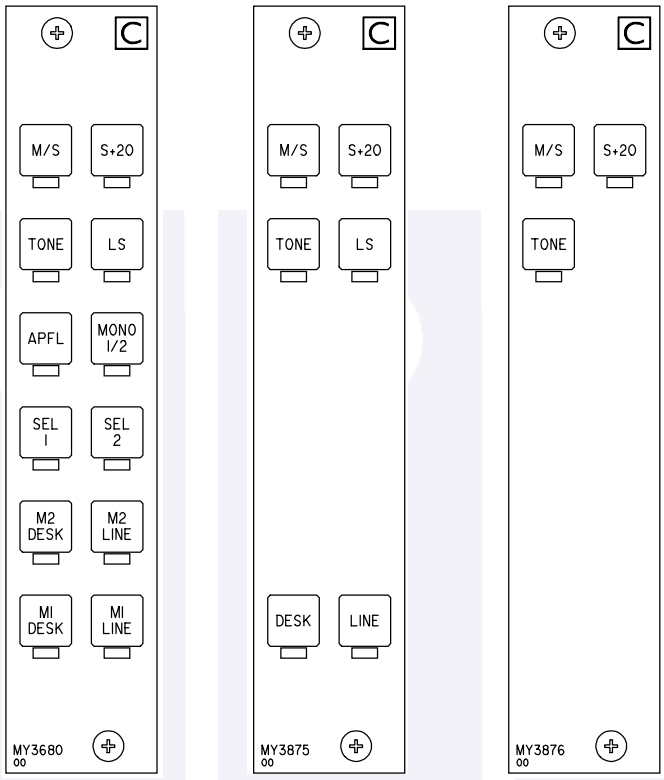
2.15 AY3938 MULTITRACK ERROR / RESET



This module provides ancilliary control buttons for Multitrack Operation. Provisionally, the two buttons are RESET and CLEAR ROUTE. The RESET button controls the Computer Sub System, and forces an automatic restart, recalling the last known (saved) ROUTE and AFL settings. The internal LED is RED, and will illuminate if there is a Computer Sub System unrecoverable error, or on power down to indicate the safe CLEAR ROUTE button enables a channel or group routeing to be cleared. A double press is required in order to confirm the operation.

(An optional third button, GLOBAL CLEAR ROUTE will clear ALL settings for all channels and groups).

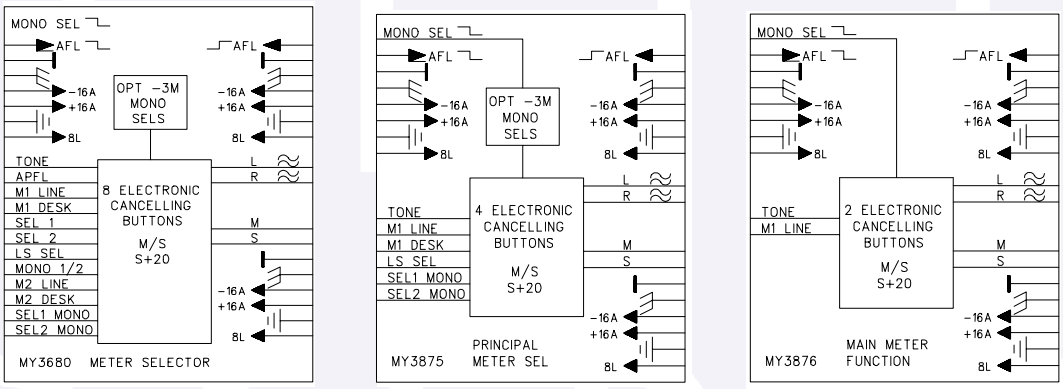
2.16 MY3680 METER SELECTOR (General)
2.17 MY3875 METER SELECTOR (Principal selections)
2.18 MY3876 METER SELECTOR (Main function)



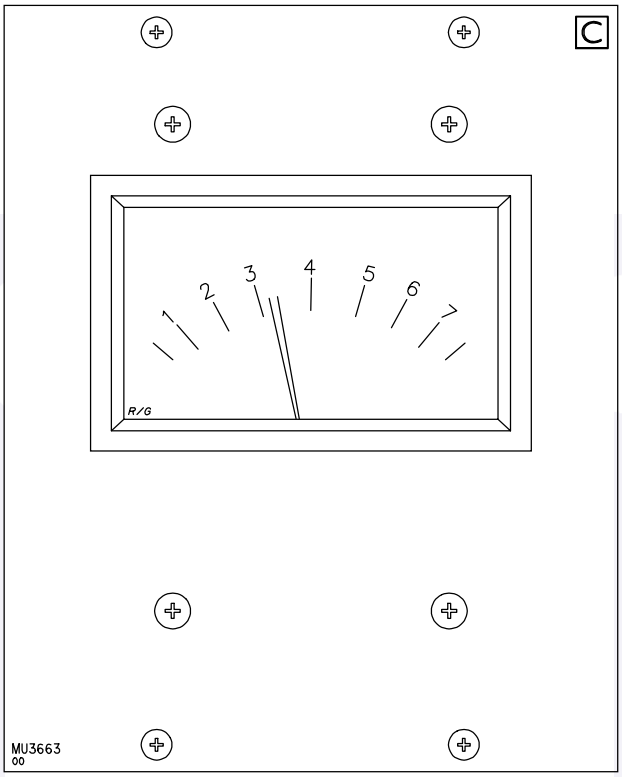
Selections from labelled sources.

Yellow LEDs - Electronic cancelling set (latching on MY3876).

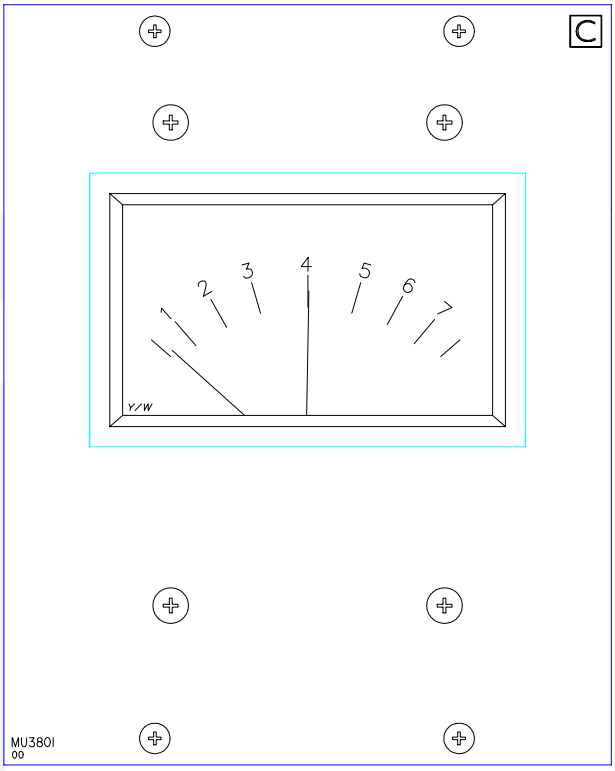
M/S latching & S+20. Red LEDs.



2.19 MU3663 STEREO PPM L/R

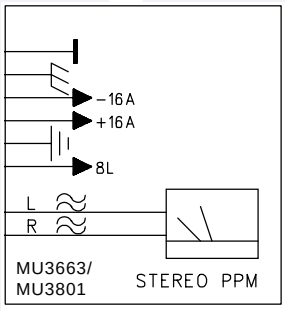


2.20 MU3801 STEREO PPM M/S

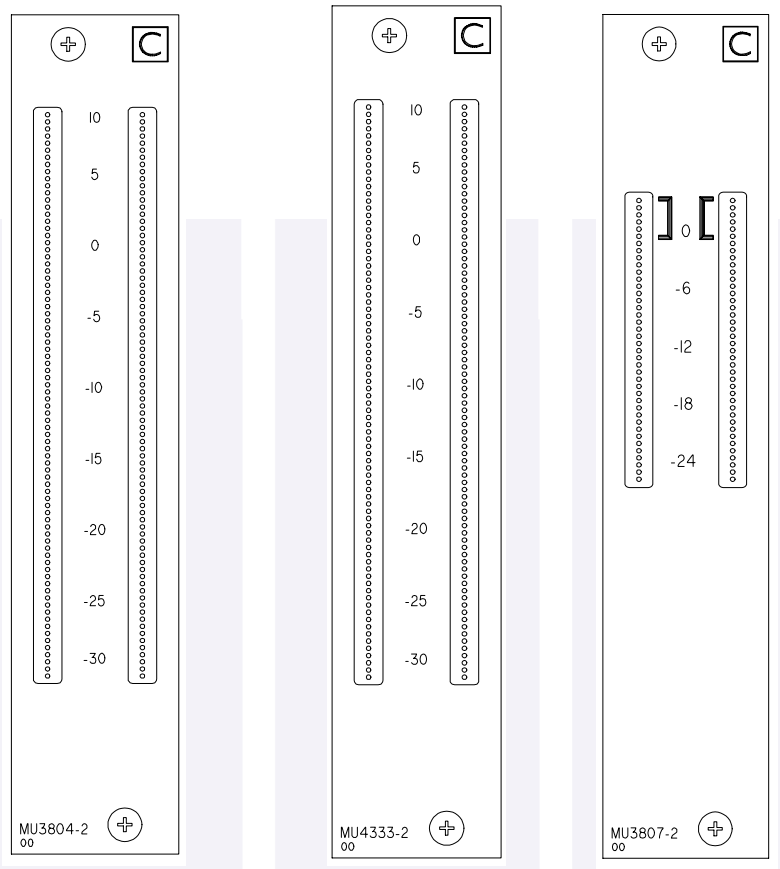


MU3663 Stereo PPM with Red/Green needles and illumination.
MU3801 Stereo PPM with White/Orange needles and illumination.

Internal PPM drivers.



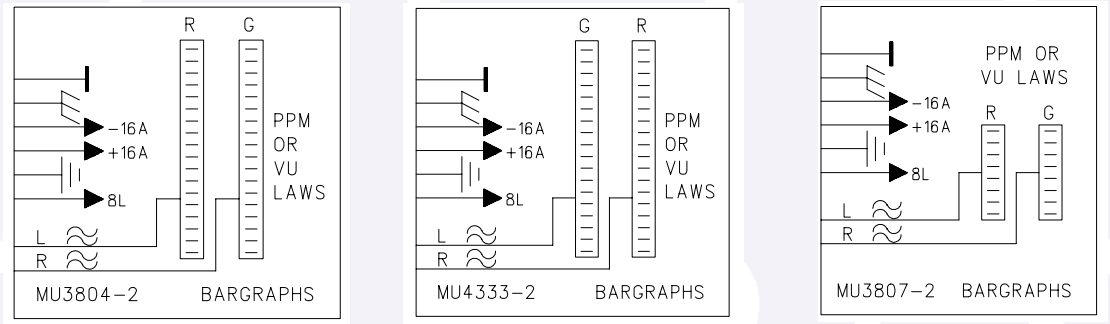
2.21 MU3804 LARGE STEREO BARGRAPH
2.22 MU4333 LARGE STEREO BARGRAPH - (Revsd. cols)
2.23 MU380 SMALL STEREO BARGRAPH



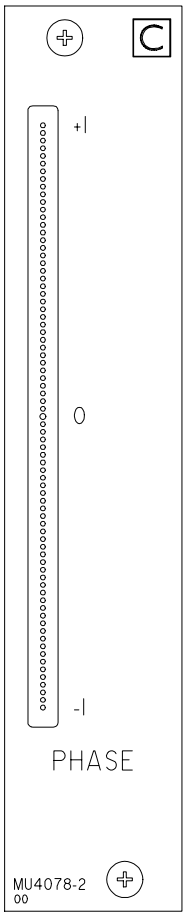
Twin LED bargraphs - 40 LED's each for good resolution.

Left hand bar is RED.
Right hand bar is GREEN. (reversed colours on MU4333)

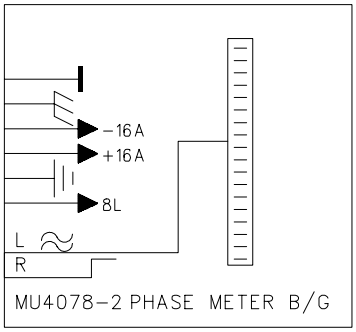
Bars brighten at 0dB representing +6 or +8 dBu for PPM or +4dBu (SCALE 0) for VU (set internally).



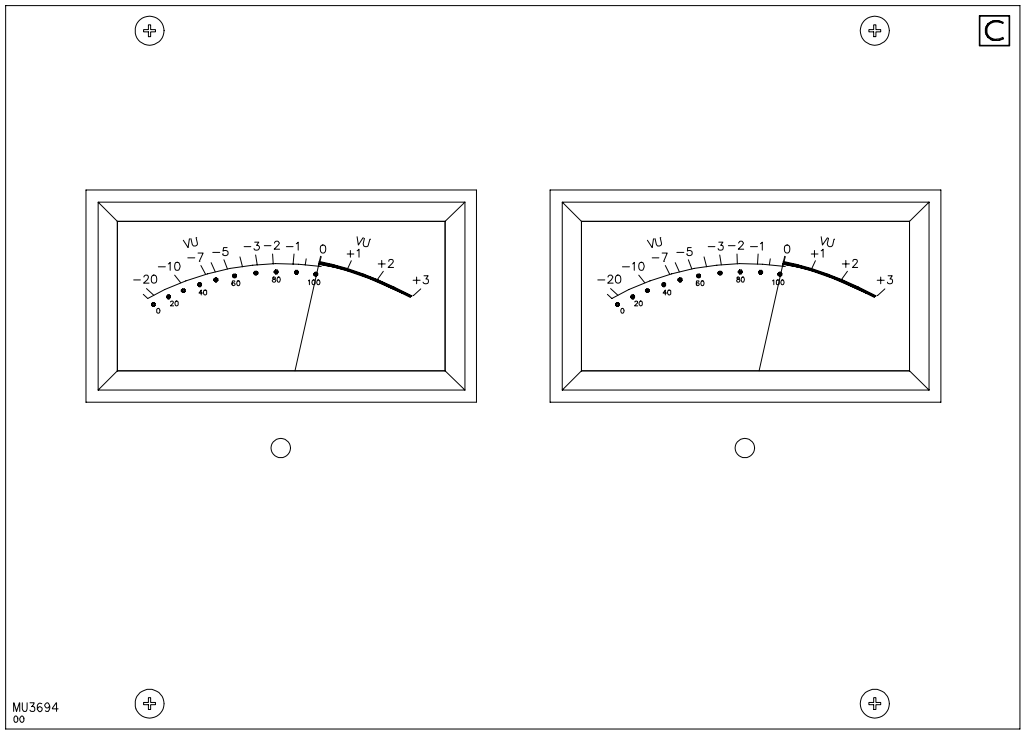
2.24 MU4078 PHASE BARGRAPH



LED Bargraph.
Upper section representing good phase coherence is GREEN.
Lower section representing poor phase coherence is RED.
Spot moves dynamically.

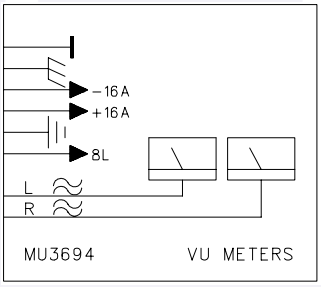


2.25 MU3694 2 VU METERS

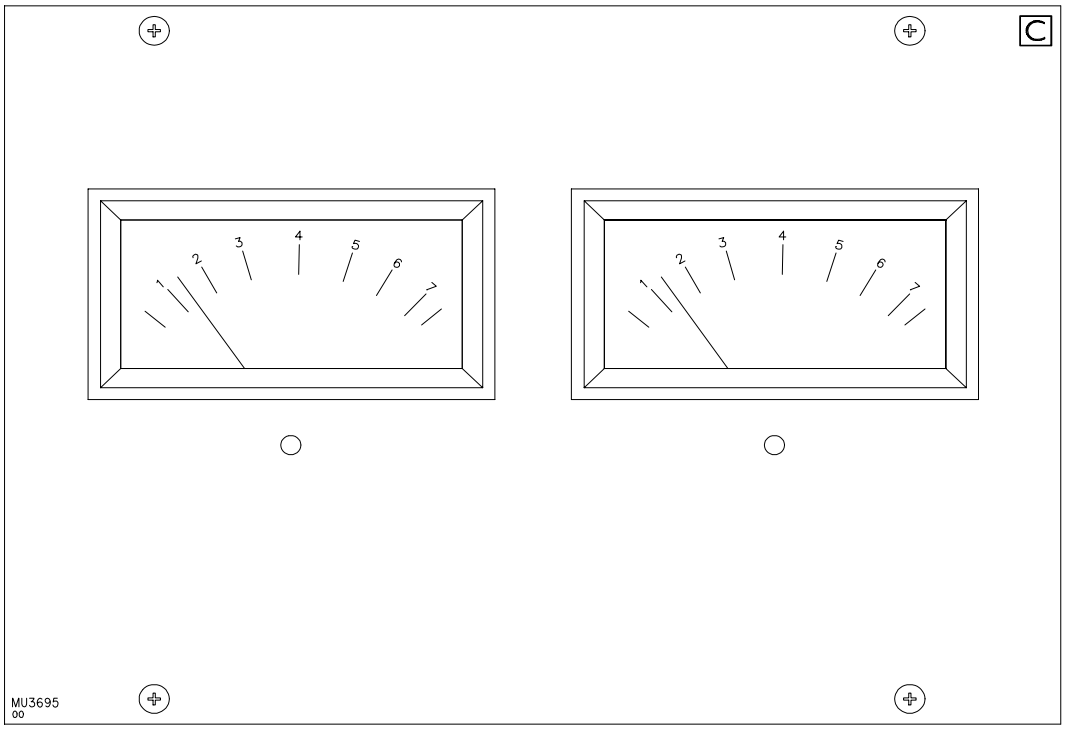


VU meters with illumination.

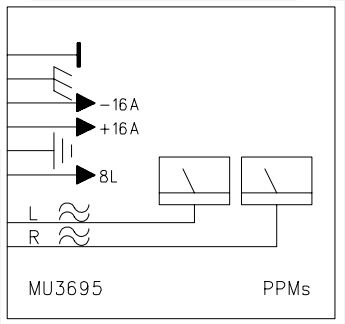
Internal buffer amplifiers.



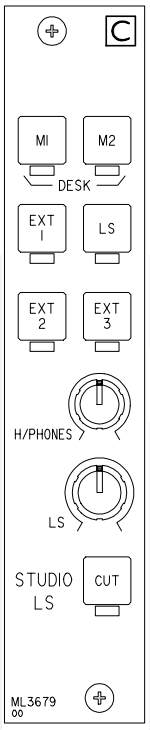
2.26 MU3695 2 MONO PEAK PROGRAMME METERS



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



2.27 ML3679 STUDIO LS CONTROL

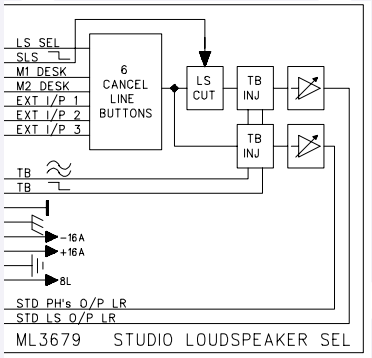


6 Electronic cancelling inputs - Yellow LEDs including 3 external inputs.

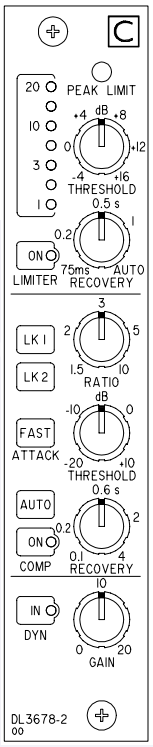
Gain controls 0dB to OFF.

CUT 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.

Separate studio headphones outputs. Level control 0/-ooodB



2.28 DL3678-2 STEREO COMPRESSOR/LIMITER



Stereo Limiter:

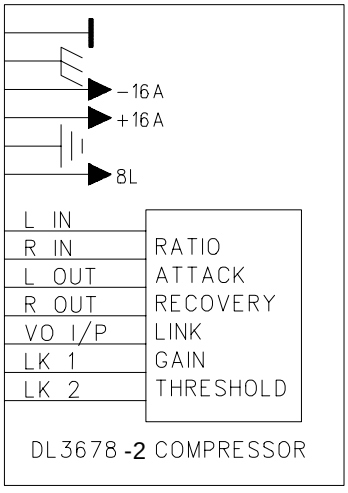
Ratio	:	fixed 100/1
Threshold	:	-4/+16dBu variable
Attack	:	fixed 100 u-secs
Recovery	:	0.075 to 4 secs variable with AUTO facility: 0.1 to 1.5 secs (programme dependent)
Peak Limit	:	Yellow LED indicator
Limiter	:	On button with Yellow LED indication

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:

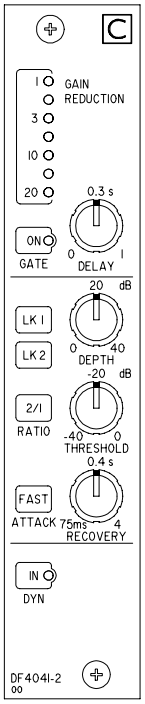
Bargraph	:	Up to 24dB gain reduction with enhanced resolution at lower reduction levels.
Links	:	Button 1 & 2 to external buss or pairs etc - links side chains together.
DYN-IN	:	Button with Red LED indication - when OUT gives total bypass condition except that bargraph operates as a preview at reduced intensity.



Balanced line input & outputs, 0dBu.
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.

2.29 DF4041-2 EXPANDER/GATE



Stereo Expander:

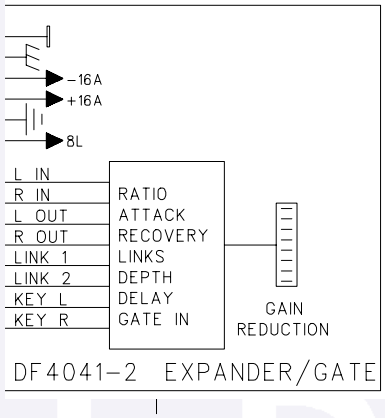
Ratio	:	Normal, varies with level 1.5/1 to 5/1. Fixed 2/1 (button)
Threshold	:	0/-40dBu variable
Attack	:	Normal 4 m-sec. FAST (button) 50 u-sec
Recovery	:	75ms to 4 sec variable
Depth	:	0/40dB variable (extent of expansion below threshold)
Bargraph	:	Up to 20dB gain reduction
Links	:	1 & 2 to external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

Stereo Noise Gate:

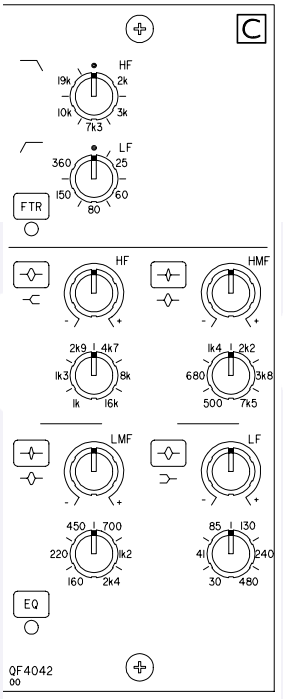
Gate	:	Button with LED indication. All expander controls apply except Ratio becomes infinite.
Gate Delay	:	0/1 sec variable - in addition to normal 6dB gate hysteresis

Expander & Noise Gate:

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



2.30 QF4042 PARAMETRIC EQ & FILTERS



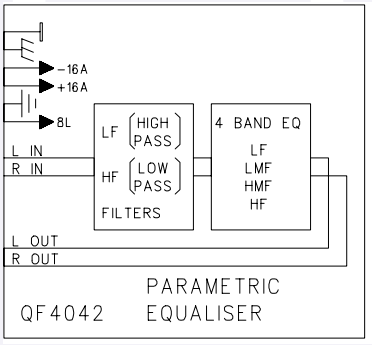
Stereo Filters / Equaliser:

2 band parametric filters:	HF (low pass) 12dB/octave LF (high pass) 18dB/octave
4 band parametric equaliser:	± 16dB max at selected frequencies

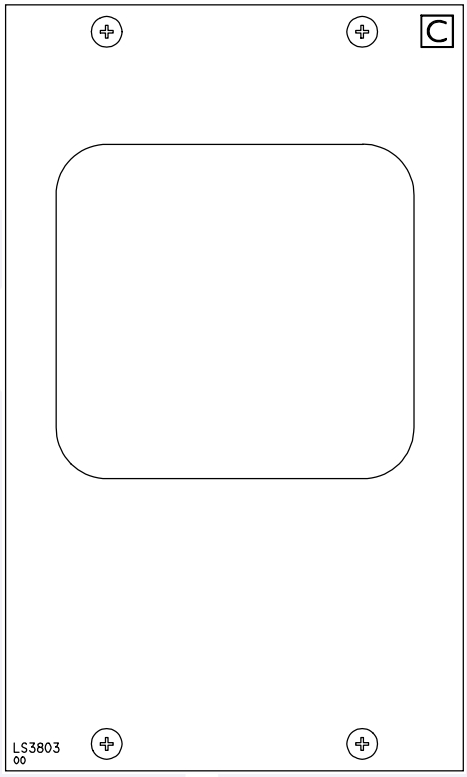
Exclusive lift/cut law allows fine control near centre and low noise in detent.

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.

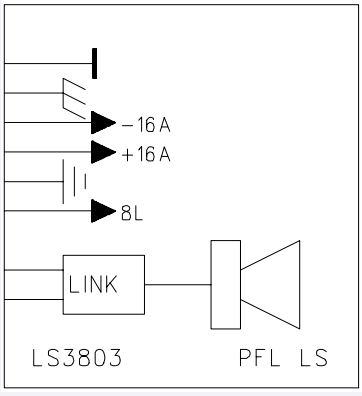
Separate Filters & EQ in buttons.



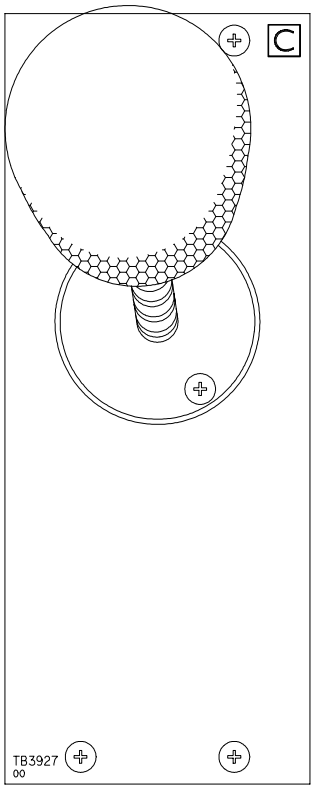
2.31 LS3803 PFL LOUDSPEAKER



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

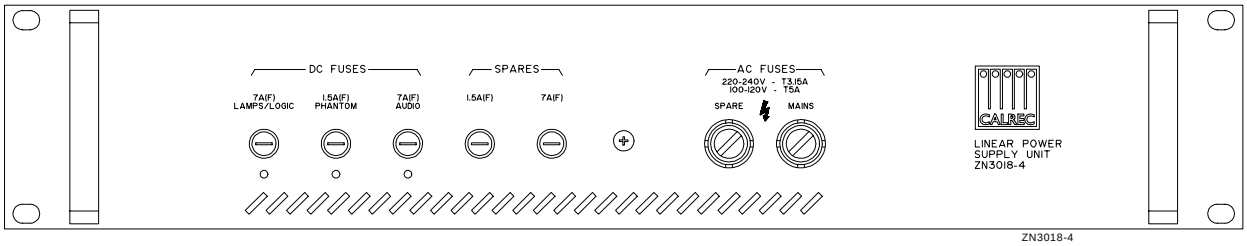


2.32 TB3927 EXTERNAL TALKBACK MICROPHONE



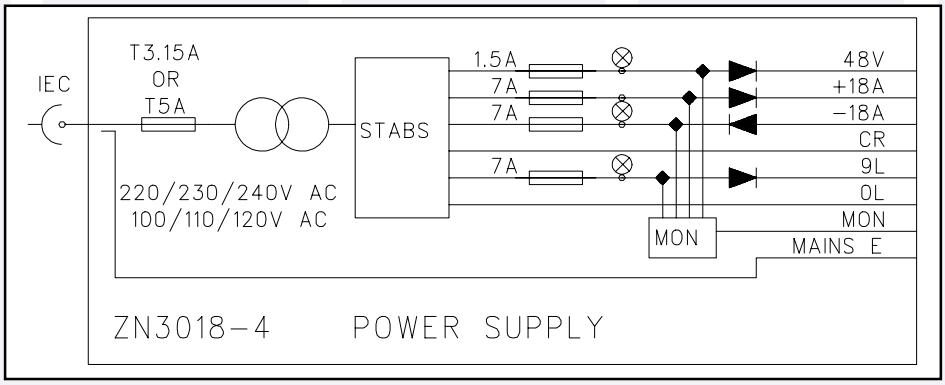
For those customers requiring a microphone projecting from the console on a stalk.

2.33 ZN3018-4 MAINS POWER UNIT



A Calrec designed special unit to provide ±16 volts audio power, 8 volts logic power (stabilised in modules at 5 volts where required) and 48 volts phantom power suitable for approximately 16 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 10% below that set.

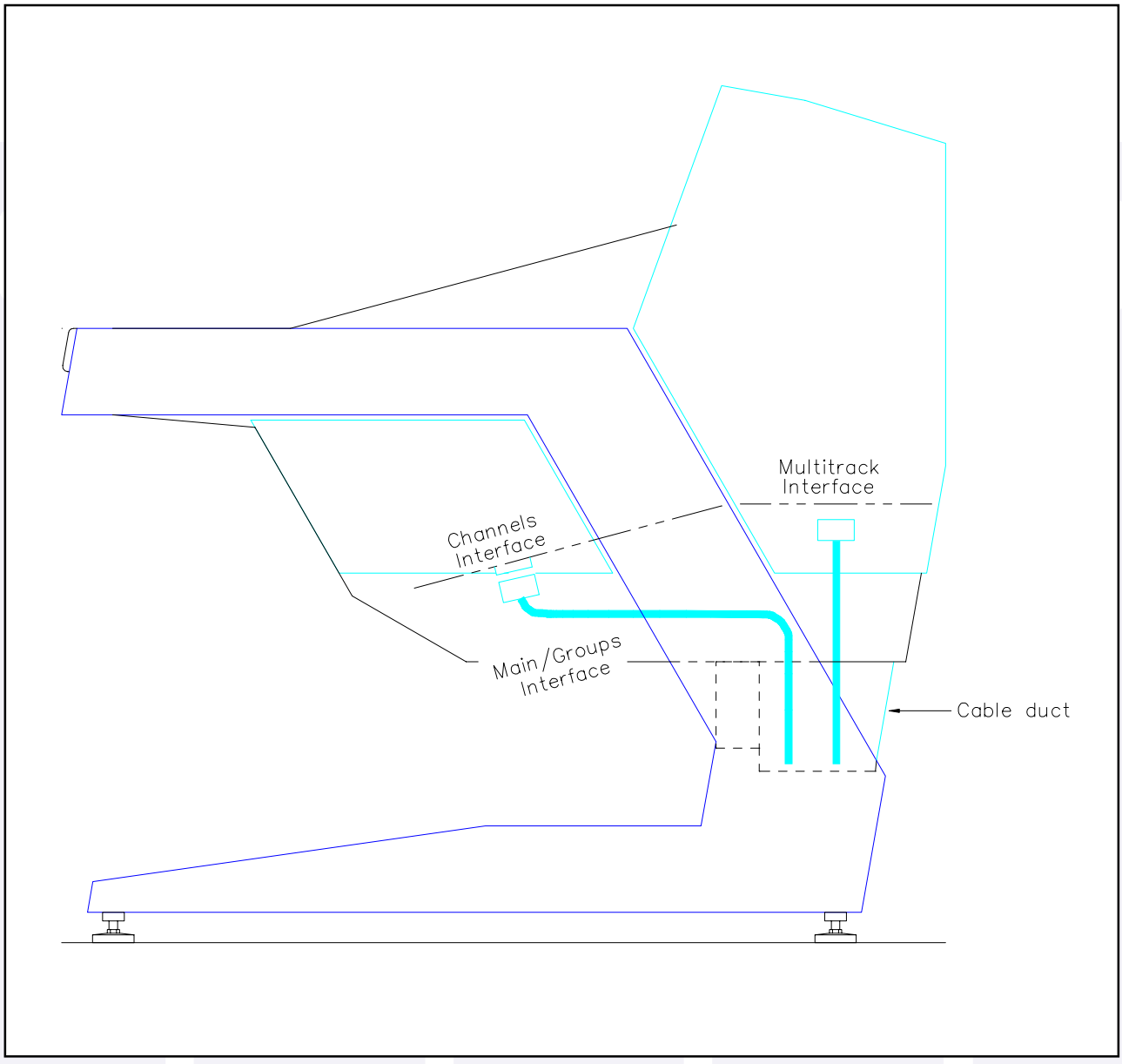


2.34 INTERNAL/REAR CARDS, PANELS & POWER SYSTEM

XN4342	Internal PFL/AFL/Mix minus card
RX3651	Multitrack matrix card (option)
RL4343	Multitrack outputs card (option)
RY3696	Multitrack functions card (option)
UN3551	Multitrack processor card (option)
ZN3564	Multitrack 5V stabiliser card (option)
ZN3693	Power Distribution Unit
HN3919	Dynamics connections card
HN4232	12 channels back-plane
HN4233	Main back-plane
HN3914	Multitrack back-plane 1 (option)
HN3915	Multitrack back-plane 2 (option)
HN3916	Multitrack back-plane 3 (option)
HN3939	Processor Card Services Panel (Multitrack option)
IC4089	Fader back-plane channel
IG4090	Fader back-plane group/main
HN4092	Fader back-plane link
MY4099	Surround monitor back-plane

3.0
Installation & Commissioning

3.0 LAYOUT OF CONNECTORS



3.3 CONNECTORS TYPES

The connectors fitted to the console are VARICON 38 WAY & 56 WAY FIXED PLUGS (MALE).
The mating free socket details are listed below:-

Component	Calrec Ref.	Edac Ref.
Varicon 38 way free socket	400-040	516-038-000-401
Varicon 38 way metal hood	400-037	516-230-538
Varicon 56 way free socket	400-008	516-056-00-401
Varicon 56 way metal hood	400-038	516-230-556
Solder type varicon pins	400-025	516-290-520
Varicon pin extraction tool		516-280-200
Crimp type varicon pins	400-024	516-290-541
(XLR) Neutrik NC-3-FC	410-007	

3.4 CABLE TYPES

For microphones a DOUBLE HELICAL SCREENED STRANDED CONDUCTOR INDIVIDUALLY JACKETED MULTIPAIR CABLE is recommended.
e.g. CANFORD AUDIO HSJ type.

Size	Black	Blue
HSJ 4-pair	31-454	31-404
HSJ 8-pair	31-458	31-408
HSJ 12-pair	31-462	31-412
HSJ 16-pair	31-466	31-416
HSJ 20-pair	31-470	31-420
HSJ 24-pair	31-474	31-424

3.4 CABLE TYPES (cont.)

For lines at standard level a FOIL SCREENED SOLID CONDUCTOR MULTICORE CABLE (BBC TYPE) is recommended.
e.g. CANFORD AUDIO KSM type.

Size	Ref.	BBC ref.
KSM 5-pair	31-305	BBC PSN 10/3
KSM 10-pair	31-310	BBC PSN 20/4
KSM 16-pair	31-316	BBC PSN 32/1
KSM 20-pair	31-320	BBC PSN 40/2
KSM 25-pair	31-325	BBC PSN 50/3
KSM 50-pair	31-350	BBC PSN 100/2

3.5 CONNECTIONS

All connections are Varicon 56-way and 38-way, except L.S. Mon is duplicated on XLR 3M connectors. Audio connections are all balanced.

Interface	Level	Impedance	Recommended Min Load
Microphone I/Ps VP38 - 1 per 4chs	-78/+18dBu	1.2 KΩ	-
Line I/Ps VP56 - 1 per 12chs (plus VP38s St Lne)	-24/+18dBu	10 KΩ	-
Insert Go VP56 - 1 per 12 chs (VP56)	0dBu	<40Ω	600Ω
Insert Return VP56 - 1 per 12chs (VP56)	0dBu	20 KΩ	-
Direct Outputs VP56/16 - 1 per 12chs (VP56)	0dBu (+10)	<40Ω	600Ω
External Cuts/VCA ctrl/ Fader on - VP56 1 per 12chs (8 Grps)	5V/0V operate	-	-
Group Directs I/Ps VP56	0dBu	20 KΩ	-
Auxiliary Outputs VP56	0dBu	<40Ω	600Ω
Main Outputs/Mn Dir I/Ps/ Monitor VP 56 & XLR 3M	0dBu	20/20 KΩ	600Ω
Monitor LS I/Ps VP56	0dBu	20 KΩ	-
Optional additional Monitor I/Ps VP56	0dBu	20 KΩ	-
Main D.C Interface (Cuts/ dims/tone/tb etc) VP56	5V/0V operate	-	-
Optional multitrack outputs VP38	0dBu	<40Ω	600Ω
Optional Compressor/ Limiter conns VP56	0dBu	20/20 KΩ	600Ω

*Note - Recommended minimum loads of 600Ω can be 300Ω with reduced output levels (see specification).

3.6 EARTHING

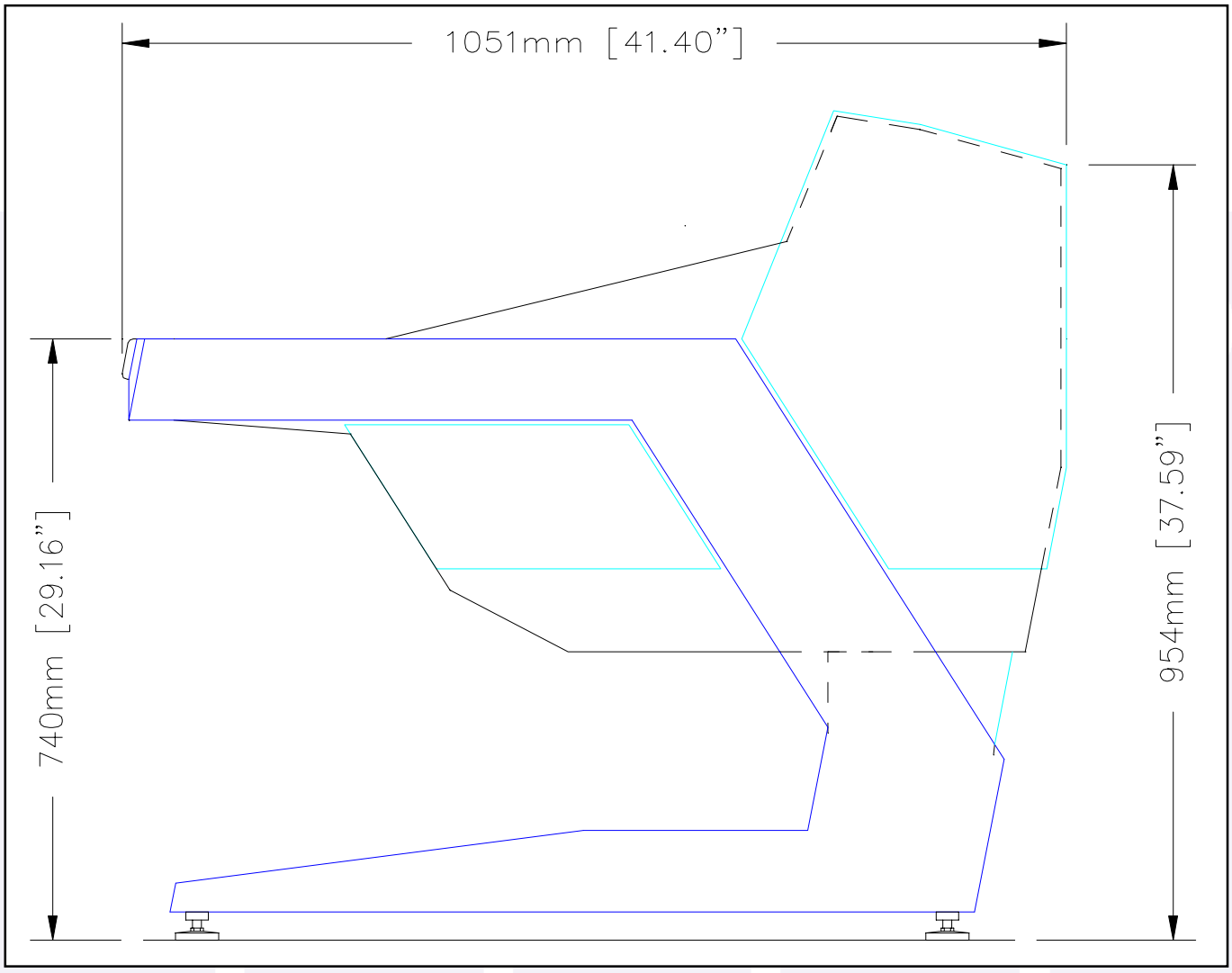
The earthing system within the console is the subject of great care and design. The analogue centre rail, the dump CR and the logic 0 volts (0L) are kept separate from the chassis throughout and are only brought together at the power supply interface next to the TECHNICAL EARTH bolt.

This should be connected to a good, clean earth preferably not associated with mains power supply by a substantial piece of cable.

Power supply chassis are connected to mains earth (usually) and although this connection is brought into the console at each power unit interface, it is only used for the grounding of filters used to remove mains borne interference. The DC power supplies are totally isolated from earth until they reach the technical earth.

Multi-pin audio and other interfaces all carry pins labelled CR (audio supply centre rail) and CH (Chassis). Generally multicore cable sheaths should be connected to CHASSIS to maintain full screening at the interface. Logic interfaces will generally have a 0L (logic ground) provided, and external logic switching circuits etc. should use this connection.

3.7 DIMENSIONS



Overall console dimensions including stand.

24 channel	=	1320 mm
36 channel	=	1686 mm
48 channel	=	2052 mm
60 channel	=	2418 mm
72 channel	=	2784 mm

Approximate console weights:

24 channel	=	145Kg
36 channel	=	175Kg
48 channel	=	205Kg
60 channel	=	235Kg
72 channel	=	265Kg

3.9 POWER SYSTEM

The console is designed to operate with the following power supplies:

-16A/CR/+16A	analogue power
8L/0L	logic power
48V/CR	microphone phantom power

The +16A is used internally in the modules to derive +10V and -10V stabilised reference voltages and also +5A (and sometimes -1A or -2A) for CMOS analogue switches.
The 8L is internally stabilised to 5L for logic circuits.
Power supply units each provide all 3 supplies simultaneously in the correct proportions i.e.

-16A/CR/+16A	at 5 amps.
8L/0L	at 5 amps.
48V/CR	at 0.3 amp.

These supplies are isolated and diode protected so that they can be parallelled and CR, 0L grounded at the console. Each power supply is connected to the console DC interface by a multicore cable and heavy duty 19-pin plugs and sockets.

Each supply in each power unit is separately monitored and provided all 3 are intact in a given unit a monitor line to the console in the DC connecting cable is energised.

All power supply monitor lines are brought together at the power supply interface unit such that if any section of any power supply unit fails, a PSU FAIL lamp flashes. This may be cancelled to avoid irritation but will resume flashing if another section fails or when the desk is switched off and on again.

The power supply units will operate correctly at 10% below normal mains voltage.

3.10 POWER CONSUMPTION

It is usual to provide spare capacity when the choice of the number of power supply units is made to allow for a failure without affecting performance. This is known as a "hot spare". It also helps to share the load and keep the power supply units running at a reasonable temperature. Generally the number of power supply units provided and the power consumption is approximately as follows:

Console	No. of PSU's	Audio Amps	Logic Amps	Mains loading
24ch	3	7.5	3	750W
36ch	4	12	5	900W
36ch with m'trk	5	14	7	1100W
48ch	5	16.5	8	1200W
48ch with m'trk	6	18	10	1400W
60ch	6	21	11	1500W
60ch with m'trk	7	25	15	1700W
72ch	7	27	16	1800W
72ch with m'trk	8	31	20	2000W

3.11 PRE POWER CHECKS

Before connecting mains power to the power units ensure that the voltage tapping on each unit is set for the mains voltage in use.

This is done at the factory prior to shipping for the given customer. Confirmation is given by a label on the back of each power supply unit.

Ensure that all fuses are intact and that they are the correct rating as marked.

Each power supply unit may be energised individually, disconnected from the console if desired to ensure correct LED indication and charge and reform the capacitors (if the console has been a long time in transit).

Power supplies should then be connected to the console by the connections leads provided, and to the mains supply (switched off) which should then be switched on energising all the power supply units simultaneously.

The units are fitted with a time delay mechanism to reduce the inrush of current in this condition.

Ensure that all the LED's are illuminated on the PSU's and that the PSU FAIL indicator is not lit. (If it lights initially then cancel it and ensure it remains off.)

Check some desk selections and observe correct led indication.

4.0 Operation

4.1 GAIN & INPUT SETTINGS

Connect a source to a channel input & select as follows:-

Mono	Mono Mic 1	- ensure LINE & IP2 are not pressed (red LED)
	Mono Line 1	- select LINE (green LED) and ensure IP2 is not pressed
	(Mic or Line 2	- select MIC or LINE & press IP2 - yell LED)
Stereo	Stereo Mic	- ensure LINE is not pressed (red LED)
	Stereo Line	- select LINE (green LED)
Stereo Line	Stereo Line 1	- ensure IP2 is not pressed
	(Stereo Line 2	- select IP2 - yell LED)

If the source is a microphone, turn up the switched GAIN control and adjust the TRIM (if necessary) until the bargraph in the fader shows a level which should just occasionally illuminate the yellow LED. (The balance control can be adjusted later).
The microphone can be phantom powered by pressing the button marked 48V (red LED) and if necessary, phase reversed.
A line source would probably not need a switched gain away from the 0dB position although a restricted range is available. Adjust the TRIM if necessary for the level described above.
An M/S microphone in a stereo input can be converted back to Left-Right by pressing M/S (red LED).
Mono inputs to a stereo channel can be sent down both stereo legs by use of LB (Left to Both), RB (Right to Both) when the balance control is inoperative or LB+RB when the balance control pans across both inputs (for two mono feeds) and feeds both outputs with the same panned signal.

Press the channel PFL button and the source should be heard in the PFL loudspeaker, in stereo if so connected.

4.2 ROUTING

Select one of the eight stereo Groups or one of the two Main stereo outputs on the channel output selectors. If a group is selected, then select that Group to a Main Output.

4.3 FADER

Fade up the channel, the group (if selected) and the selected Main to about 0dB on the faders. It should now be possible to hear the source on the main loudspeakers by pressing the channel, (& Group if selected), AFL button. The input balance control can be adjusted if necessary on a stereo source in this condition.

4.4 MONITOR

Select STEREO LINE on the LS1 MONITOR panel & ensure no other buttons are pressed. The source should now be heard in the loudspeakers.
The monitor panel allows selection via 2 selector banks of Group Outputs, Auxiliary outputs as well as principal console outputs, Desk or Line (before and after tone insertion) together with a range of external inputs chosen by the customer.
A number of buttons associated with stereo monitoring allow either stereo leg to be cut, a mono reduction to be heard on the left or both loudspeakers and left or right to be heard on both loudspeakers. Right phase reverse is also provided.
There is a bright red LED AFL indicator to warn the operator when the AFL is selected from a channel or group.
The monitor output is provided with Gain & Balance controls and Cut & Dim buttons, the latter having a trim for the amount of 'dim'.
Provision is also made for alternative small loudspeakers and adjustment of AFL & PFL levels. A separate headphones level control sets a headphones output.
There is a separate (optional) LS2 MONITOR panel providing a further 24 external input selections which can be heard on LS1 by selecting SEL 3 or heard on a second pair of stereo loudspeakers controlled by additional Gain, Balance, Cut & Dim (with adjust) controls.
There are separate left & right cut buttons on LS2 together with a button for hearing a mono reduction in both loudspeakers also one for right phase reverse.

4.5 METERING

With the source still operative and faded up the signal can be seen on the main meter when selected to M1 Line or M1 Desk (assuming Main 1 is in use).
The principal metering may be restricted to Line, Desk & Tone together with provision for switching to M/S (with S +20dB) but if so, another meter is usually provided which allows the following selections:-

Main 1 Line
Main 1 Desk
Main 2 Line
Main 2 Desk
Monitor Sel 1
Monitor Sel 2
Monitor Sel 3
APFL
LS Sel (follow loudspeaker 1 selection)
Tone
M/S & S +20

It should be noted that mono sources are fed to both legs of the stereo selectors on the Monitor LS panels. This means that when metering a mono source, both needles (bars) move correctly together.
However if M/S is also selected the 'M' needle (bar) will read 3dB high & this may be misleading.
There are optional internal switches on the metering system to correct this situation when mono sources & M/S are selected together. (See detail in section 2.9 for MONITOR LS1:ML3661).

4.6 EQUALISATION & FILTERS

Now the source can be metered as well as heard it is possible to experiment with equalisation & filters. Select EQ (red LED) and try the effect of the filters first.
The low frequency (high pass) filter can be set 47Hz or 82Hz on 2 separate buttons & 120Hz when both buttons are selected together. The high frequency (low pass) filter can be set to 12KHz or 8.2KHz on 2 separate buttons and 4.7KHz when both buttons are selected together.

The equalisation is in 4 bands. The HF band is shelving at 10KHz unless the button marked 5KHz is pressed. It may be set up or down to a maximum of 15dB. The LF band is shelving at 60Hz unless the button marked 160Hz is pressed. It may also be set up or down to a maximum of 15dB.

The two mid bands can also be set up or down to a maximum of 15dB around a frequency set by a second knob in each band.
The bands cover HMF (High Mid Frequency) and LMF (Low Mid Frequency) ranges.
The Q of each band is about 1.0 unless the H1 Q button is pressed (a narrower mid-band symbol) when it becomes approx 2.5.

4.7 AUXILIARIES

These may be set on the channel or group in use by simply pressing the ON button on the Auxiliary to be used. In the case of Aux 5&6 or 7&8 which have common gain controls, the buttons are marked 5, 6, 7&8.

The selection is normally POST fader and the led will usually light up green but it may be set PRE fader by pressing the PRE button when the LED goes red.
The gain of the Auxiliary feed may be adjusted if required. Line-up is marked close to 3 o'clock. There is 5dB in hand above this.
Auxiliaries gain knobs are coloured as follows:-

1	Green
2	Blue
3	Orange
4	Red
5-6	Grey
7-8	Yellow

These colours are repeated on the Auxiliary Master controls on the Main module panels. Here are provided Master Gain controls with 10dB in hand above line-up (at 12 o'clock) & bargraph level meters. Each output has a CUT button and the stereo outputs can be set to MONO.
It is possible to monitor and meter (on the main meter) an Auxiliary by selecting it on the LS1 MONITOR panel & following it on the meter by selecting LS SEL.
The CUT button does not cut the monitor & meter feeds.

4.8 MULTITRACK

Channels & Groups settings
The signal input to the multitrack system from a Channel of Group is normally post fader but can be set to pre fader or post The Direct Output control if a control is required.
The input Assign button from the Channel or Group is red and marked M/T. Channel 1 is illuminated Green at boot-up unless previously set on another Channel or Group. Set it to the Channel or Group to be routed or interrogated.

Routing to Tracks
Select ROUTE on the Tone/Talkback panel - green LED. Select the Track or Tracks to be routed from the selected Channel or Group on the Multitrack control panel - green LEDs. De-selection follows a similar procedure. ROUTE times out if not de-selected after 20 secs.

Track AFL
Select AFL on the Tone/Talkback panel - red LED. Select the Track or Tracks to send to AFL on the multitrack control panel - red LEDs. De-selection follows a similar procedure. Selection of any Track to AFL illuminates the AFL warning light on the Tone/Talkback panel. AFL times out if not selected & PROVIDED THERE ARE NO AFL SELECTIONS after 20 secs.

Interrogation
Forward interrogation is carried out in the ROUTE mode. That is which track or tracks are fed from this channel or group? - by simply selecting M/T or that channel or group & observing the green track select LEDs.
Reverse interrogation - that is which channels &/or groups are fed to this track? - is carried out in the NORMAL mode - that is when ROUTE & AFL are NOT selected. The track button is held momentarily and the M/T button green LEDs on the channels and/or groups selected to that track, are momentarily illuminated.

Clear Routing
Select ROUTE on the Tone/Talkback panel. Press the CLEAR ROUTE times out to ROUTE after 10 secs.

Reset
If there is an error the LED associated with RESET illuminates. Press RESET & the system should restore to normal. For faults see the Manual referred to below.

Power Failure
The system will write the current settings into flash memory during the power decline and on restoration will set the console accordingly. It may be necessary to press RESET.
Note that there is a separate comprehensive User Operational Manual for S Series Multitrack Routing V1.1.

4.9 DIRECT OUTPUTS & MIX MINUS

Each channel & group has a Direct Output - at balanced line level with a gain control, pre/post fader select and Talkback (momentary) select buttons. There is 10dB in hand on the gain control. The pre button position may be internally selected to be pre eq or pre fader.
Associated with the channel Direct Outputs are 2 mix minus systems. These are mono and consist of 2 select buttons to 2 Buss (1 & 2) (internally selectable pre/post fader) and 2 select buttons to the Direct Output (1 & 2, 2 having priority over 1).
When a number of channels are connected to Bus 1 (for example) and one channel is selected by button 1 to the O/P (Direct Output) then those channels so selected including that selected to be the output mix together to that output.
If the channel selected to be an output is also making a contribution to the bus, then its input is cancelled on the channel direct output.
This allows a whole matirx of channels to be set up in a MIX MINUS system where the contribution from each channel is not heard on the channel Direct Output but all the other channels are heard. The Direct Output would in this case be fed to a Studio Loudspeaker with no contribution from the local microphone (due to the Mix Minus).
A group of studios are typically linked in this way where each studio hears contributions from all other studios via the loudspeaker and his own contribution live without any howl round paths.
It is possible using Busses 1 & 2 to set up 2 such matrices simultaneously. The mix minus system may be internally selected to be pre or post fader.

4.10 TONE

A Tone oscillator is fitted to the console which can be set to a number of switched frequencies:-

30Hz	100Hz	1KHz
10KHz	15KHz	20KHz

The output from the oscillator is 0dBu (balanced) at very low impedance (to avoid loading effects) but this can be trimmed ±10dB.
There is a button to reduce the output level -60dB and another one to substitute PINK NOISE.
The tone may be selected to all group Direct Outputs and to each Main Output and to Multitrack outputs. On Main outputs the tone is injected after the DESK outputs and thus appears only at the LINE outputs.
This allows rehearsal to continue by monitoring the Desk Outputs whilst sending an alignment tone to Line.
Another button indicates a stereo identification system with sequences of short interruptions which can be observed on the meters to confirm left and right. Further detail of this is given in Section 5.6.
The Tone oscillator is immobilised when the ON-AIR button is selected even when switched on.

4.11 TALKBACK

The console is fitted with a talkback microphone and amplifier with automatic gain control. The gain can be set for a given operator on a separate gain control and should then remain reasonably constant despite his movements.
The talkback can be selected to several destinations.

Main 1 & 2
Aux 1 then 8 or Aux Master (all 8 simultaneously)
Slate (all Multitrack outputs)
External outputs 1 to 3
(Ext 3 can be Studio LS)
Ommi - all selections simultaneously

The talkback to Main Outputs & Ommi is inhibited when ON AIR is selected.
The Slate output to Multitrack is accompanied by a 30Hz low level tone (Slate oscillator) for tape search when spooling.
There is a reverse talkback system comprising an input intended to be from the studio with a gain control (RTB) and a second external input with a gain control (EXT).
The reverse talkback is fed into the PFL mixer left input.

4.12 STUDIO LOUDSPEAKER

Provision is made at the top of the console for feeding signals to loudspeakers and headphones in the studio.
Selections can be made as follows:-

Main 1 (Desk)
Main 2 (Desk)
External inputs 1 to 3
LS (Follow Monitor LS Selection)

There are separate gain controls for the loudspeaker and phones outputs which are in Stereo. There is a CUT button & cut is automatic in certain conditions to avoid howl round - see section 5.10.

4.13 COMPRESSOR/LIMITERS

The DL3678 module, several of which may be fitted in the upper part of the console, is an outboard unit requiring to be connected to the channel, group or main insert.
It operates at standard line level (0dBu) and is balanced in & out.
The unit comprises separate limiter & compressor circuits with a common gain reduction bargraph up to 24dB. Limiting is shown separately also on a Peak Limit LED. The limiter & compressor may be switched in independently & the complete module can be bypassed - when the DYN button is not pressed.
In all off conditions the effect of the limiter & compressor may be observed dimly on the gain reduction bargraph.

The compressor has the following controls:-

Ratio:	1.5/10 variable
Threshold:	-20/+10dB variable
Attack:	Normal 4 m sec at 5:1 Fast 0.2 m sec at 5:1
Recovery:	0.1 to 4 secs variable with AUTO facility which is 0.1 to 1.5 secs dependent on programme
Make-up gain:	0 to 20dB variable
Voice-over:	Line level balanced input (may be used when compressor is OFF)
Compressor:	ON button with yellow LED
Links 1 & 2:	Buttons to connect to 2 link busbars

The limiter has the following control/features:-

Ratio:	Fixed 100/1
Threshold:	-4/+16dBu variable
Attack:	Fixed 100u secs
Recovery:	0.1 to 4 secs variable with AUTO facility which is 0.1 to 1.5 secs dependant on programme
Peak Limit:	Yellow LED
Limiter:	ON button with yellow LED

A unit may be used in MONO by ignoring right channel.
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 which an operator may otherwise do to guard against the possibility of a higher than desired mono level.

Each main module has an in-built compressor which may be set as a limiter.
For this reason the ratio is extended to 1.5/50. Otherwise the controls provided are identical to their counterparts on DL3678.
There is provision only for linking the main compressor side chains together.
The compressor may be inserted pre or Post the Main fader.

5.0 General Information

5.1 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 Normal operating level = 0dBu (peak +8dBu or +6dBu)

Inputs

Microphones:	Sensitivity	=	+18dBu to -78dBu
Lines:		=	+18dBu to -24dBu
Normally fed from source impedance:	Mic	=	200 Ω
	Line	=	40 Ω
Maximum input levels:	Mic & Line	=	+24dBu
Input impedance:	Mic	=	1.2K Ω -24 to -75dBu (Hi gain)
(Electronic balance)		=	10K Ω +15 to -18dBu (Lo gain)
	Line	=	10K Ω
Common mode rejection (CMR)			
Mics - hi gain - 200 Ω source		=	>75dB at 1KHz
			>60dB at 15KHz
Mics - lo gain - 200 Ω source		=	>70dB at 1KHz
& Lines			>50dB at 15KHz
Other inputs (Insert Returns, Dir I/Ps) -40 Ω source		=	>40dB at 1KHz

Outputs

Maximum output levels	Principal outputs (transformer)	=	+24dBu into 10K Ω
	incl. Main Outputs 1&2 (Stereo & Mono)	=	+24dBu into 600 Ω at 1KHz
			+22dBu into 300 Ω at 1KHz
	All auxiliaries	=	+23dBu into 600 Ω at 1KHz
			+22dBu into 300 Ω
	Other outputs (electronic)	=	+24dBu into 10K Ω
		=	+23.5dBu into 600 Ω
		=	+20.5dBu into 300 Ω
Output impedances:	Transformer	=	25 Ω Main/50 Ω Aux
	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.

Inputs Headroom

Above any input gain setting up to a max. input of +24dBu:	Mics	=	36dB with 8dBu auto gain ranging
	Other	=	28dB

Fader Tolerances

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

Frequency Response

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

	Mics & Lines	=	±0.25dB 40Hz to 15KHz
Microphone & Line 1 inputs have fixed LF/HF filters.			
(measured to main O/P)	12dB/octave		≤ 4dB at 10Hz
			≤ 20dB at 100KHz
Phase Difference	Left to Right		≤ 5° (no EQ)
			≤ 7° (with EQ)

Harmonic Distortion

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

-24 to +6dBu, 40Hz to 5KHz ≤ 0.04% (-68dB)
-24 to +20dBu, 40Hz to 5KHz ≤ 0.1% (-60dB)

Noise

1 Channel from line input (terminated) at line up 0dB

	via group to main output	=	-86dBu (22-22KHz)
		=	-76dBq
48 Channels routed to group but faded down to Main output at 0dB		=	-78dBu (22-22KHz)
		=	-68dBq
	Microphone input noise: Hi gain	=	-127dB equivalent input
			-116 CCIR dBq
			(RMS, 22-22KHz)
	Lo gain	=	-86dBu
		=	-78dBq

Crosstalk

Mic & Line inputs from 200 & 40Ω respectively to outputs in 600Ω signals at 0dBu.
Signal to mono channel via group to main output.

Measured at output of similar chain		≤ -90dB at 1KHz
		≤ -80dB at 15KHz
Mono channel panned left or right - measure right or left		≤ -75dB at 1KHz
Left/Right on stereo channel		≤ -60dB at 1KHz
		≤ -50dB at 10KHz
Fader cut off:	Principal	≤ -90dB at 1KHz
		≤ -80dB at 15KHz
	Auxiliary	≤ -80dB
	Routing	≤ -80dB
	Mutes	≤ -90dB at 1KHz
		≤ -80dB at 15KHz

Multitrack

Control System Noise:	< -80dBu
Audio Noise Floor	< -72dBu
Max. Output Levels:	+24dBu into 10KΩ

5.2 REWIRING & EXCHANGING MODULES

Modules and circuit cards may be removed and plugged in with the console switched on. It is advisable however to switch off before exchanging the 5 volt stabiliser and the processor cards in the multitrack section (if fitted).

5.3 STEREO WIDTH

The stereo width circuit may be seen in the CIRCUITS DESCRIPTION section - No. 14 Stereo Processor. It is well known that the width of a stereo image is a function of the difference component of signal between left & right - usually given the symbol S

$$\text{and} \quad S = \frac{L - R}{\sqrt{2}}$$

The Mono component of a stereo image is M

$$\text{and} \quad M = \frac{L + R}{\sqrt{2}}$$

The stereo width control therefore passes left and right unchanged in the central detent, produces $\frac{L + R}{2}$ at each output in the MONO position (Same level as L or R alone) and produces 2L - R at the left output and 2R - L at the right output in the "WIDE" position with corresponding variable states in-between.
2L - R & 2R - L represent a considerable increase in the " S " component (width) ie.

$$S = \frac{(2L - R) - (2R - L)}{\sqrt{2}}$$

$$= \frac{3L - 3R}{\sqrt{2}}$$

$$= \frac{3}{\sqrt{2}}(L - R) \text{ (ie. X 2.12)}$$

5.4 M/S WORKING

From the above it can be seen that it is possible to carry Left & Right information in the form M and S (Sum & Difference).
This technique has been exploited in many areas of the audio industry over the years such as stereo microphone design using one ommi (M) receiver and one gradient (S) receiver and then matrixing the M & S signals to produce left & right as follows:-

$$\text{Left} = \frac{M + S}{\sqrt{2}}$$

$$\text{Right} = \frac{M - S}{\sqrt{2}}$$

(These formulae are compatible in reverse as follows:-

$$M = \frac{L + R}{\sqrt{2}}$$

$$S = \frac{L - R}{\sqrt{2}}$$

The advantage of course is that the M signal represents a mono reduction of L & R at an appropriate level which is always a requirement.
The S series console channel inputs all have provision for M/S inputs and conversion back to L & R via the M/S button to the formulae above.

5.5 DESK & LINE OUTPUTS

All Calrec consoles have Desk & Line Main Outputs both Stereo & Mono. This is essentially a BBC technique where the alignment tone is injected after the desk outputs and before the line outputs (which follow the desk outputs).

This is so that rehearsal can proceed whilst monitoring the desk outputs & simultaneously sending a tone to line.
The Line output is the principal console output but Desk outputs besides being used as above can be distributed to the Studio Loudspeaker and to other studios as required for cue purposes.

5.6 STEREO IDENTIFICATION SYSTEM

The stereo identification system circuit can be seen in the CIRCUITS DESCRIPTION section - No. 20, 2 sequences are available:-

1 EBU which interrupts the left signal only once every 3 seconds and does not affect the right signal.

2 BBC "GLITS" system which interrupts the left signal once every 4 seconds and interrupts the right signal twice in the intervening period. The period of the interruptions is such that it can easily be seen on a PPM or VU meter or bargraph. The button to initiate these sequences is found on the TONE (oscillator) section. The sequences affect only the Main Output.

5.7 AUDIO GAIN RANGING

The S series consoles have a basic headroom of 28dB above standard line-up level 0dBu (peaking at +8dBu). This approach produces an excellent noise performance throughout a channel particularly in the equaliser section which can produce the bulk of channel noise. The BBC and others in the past have required an input headroom of 32dB or even 36dB up to the channel fader particularly in Outside Broadcast situations where an unexpected input overload can occur and pulling back the fader does not remove the distortion.

For these rare situations a new techniques in design has been evolved at Calrec which allows the superb noise figure to be uncompromised for the majority of the time (more than 99.9%).

Rather than have the headroom available the whole time (with a compromised noise figure) it is only made available for the brief period of high signal input, by exchanging input gain for fader gain.
This is in no way a compressor but simply allows the operator to control the gain on his channel fader up to 36dB input headroom for the duration of the high signal. Pre-fed signals are in fact limited but they would be drastically overloaded anyway with a signal close to a normal headroom figure of 36dB.
The circuit/schematic of the technique used for this may be seen in STANDARD CIRCUITS NO. 19.

5.8 LINE 2 TO AUX 8

This button found on the TONE/TALKBACK panel automatically switches Mono Line 2 inputs and stereo line inputs directly to Aux 8 in lieu of the normal pre/post feeds Aux 7 is immobilised. The Aux 8 Leds confirm the connection.
This allows Aux 8 which is a stereo buss to be used as a multitrack monitor system in stereo with pan controls from each track.

5.9 TAPE REPLAY

This button found on the TONE/TALKBACK panel switches all channels to Mono Line 2 input and stereo line inputs.
This is to allow multitrack tape replay through the console. The Line inputs are at standard 0dBu level in this condition with no input gain control.
A track may be disconnected from this mode and reconnected to (say) a mic input by pressing the button marked DUB on the channel.

5.10 SLS/PA INHIBITS

CIRCUIT DESCRIPTION No. 15 refers to this principle.
Basically the Studio Loudspeaker is muted when (& only when) all the following conditions are met on any channel.

The channel is selected to MIC
The channel is routed to a GROUP or MAIN
The channel fader is off the backstop
The GROUP (if selected) is routed to MAIN
The group fader is off the backstop (if selected)
The main fader is off the backstop

The PA (Public Address System), which is deemed to be Aux 1 or 2, is only energised when the above conditions are met except for the mic selection.
The PA inhibit is an internal option in the faders.
The system allows PA only to be heard when the console is 'On-Air'.

5.11 SURROUND SOUND

A button on the channel modules marked SURROUND directs left and right signals to odd Groups and Main only and directs centre and surround signals to even Groups and Main. A Front/Back pan allows the channel signal to be panned between front (L, R and centre) outputs and Surround output in addition to the normal left/right pan. The Front/Back pan control is shared with the width control on Stereo Modules where it is assumed that only one facility is required at any one time.

The Surround Sound monitor panel allows the DESK MODE to be set for normal STEREO, 4 TRACK and 5 TRACK. In the 4 TRACK mode, the outputs from the console are Main 1: Left and Right, Main 2: Centre and Mono Surround and the loudspeaker monitor outputs are provided at these positions. There are two outputs for Surround connected together.

In the 5 TRACK Mode Left and Right Surround are taken and monitored separately from Auxiliary 8 Output thus featuring the new Aux 7/8 pan control to move the Surround left-right across the rear sector.

The Surround monitor panel enables comparisons to be made between the two Surround conditions (as well as normal DESK STEREO), the ENCODER left-right signal (for compatibility) and the DECODER Surround presentation. This involves the connection of an external encoder and monitor decoder. Provision is made for the latter to be switched between STEREO, MONO and SURROUND when this facility is available on the decoder.

Finally two joysticks are provided for surround panning on a channel by feeding from a channel insert go input (just left on a stereo) and returning the four outputs as follows:-

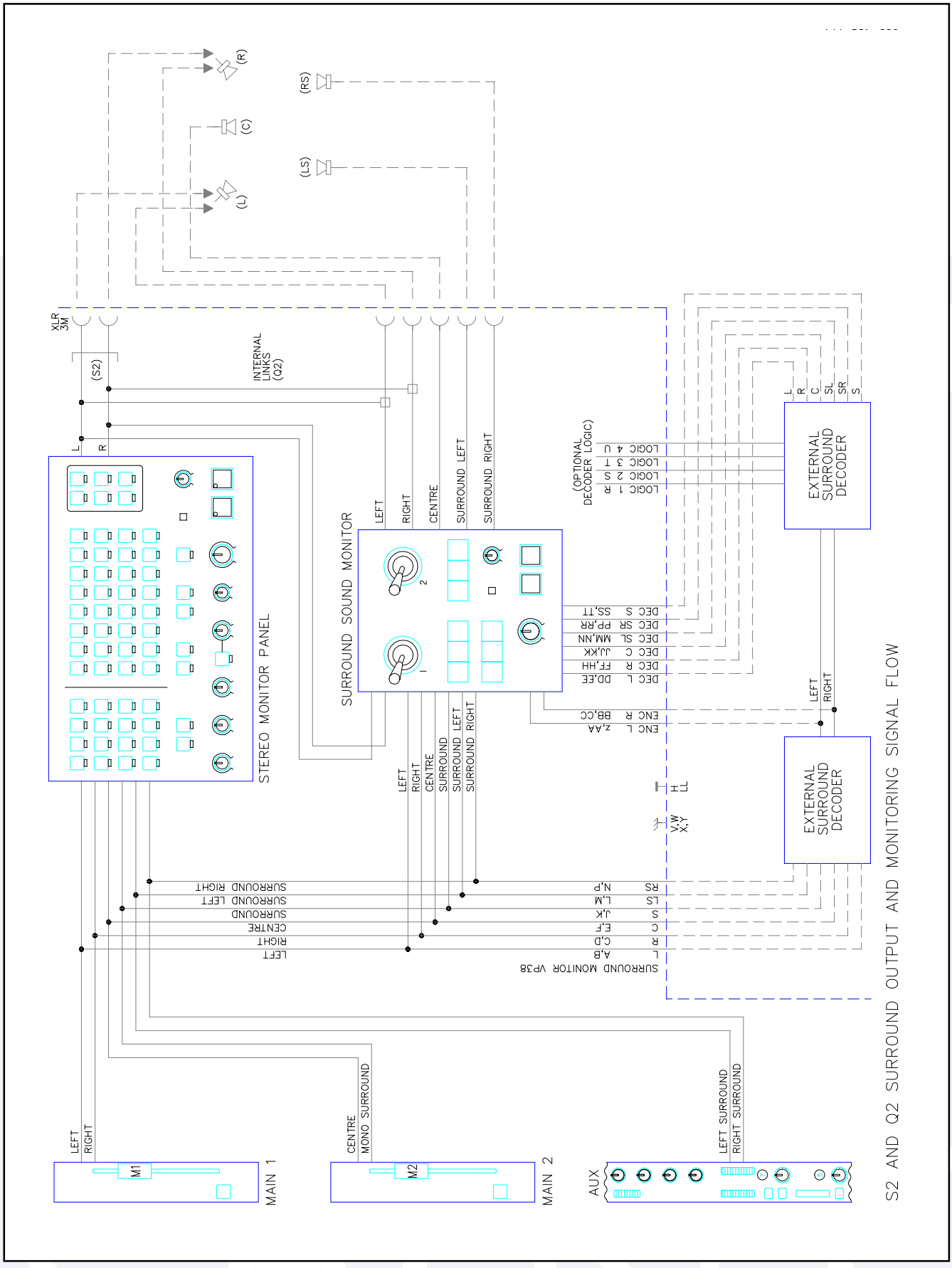
LEFT AND RIGHT FRONT RETURNS:-

1. To the insert return on the same stereo channel routed to an odd group or inputs.
2. To the insert return on another stereo channel routed as above.
3. To the direct input on a spare odd numbered group routed to the Main output.

LEFT AND RIGHT BACK RETURNS:-

1. To the insert returns on a spare stereo channel with only the Auxiliary 8 active.
2. To the direct input on any spare group with only the Auxiliary 8 active.

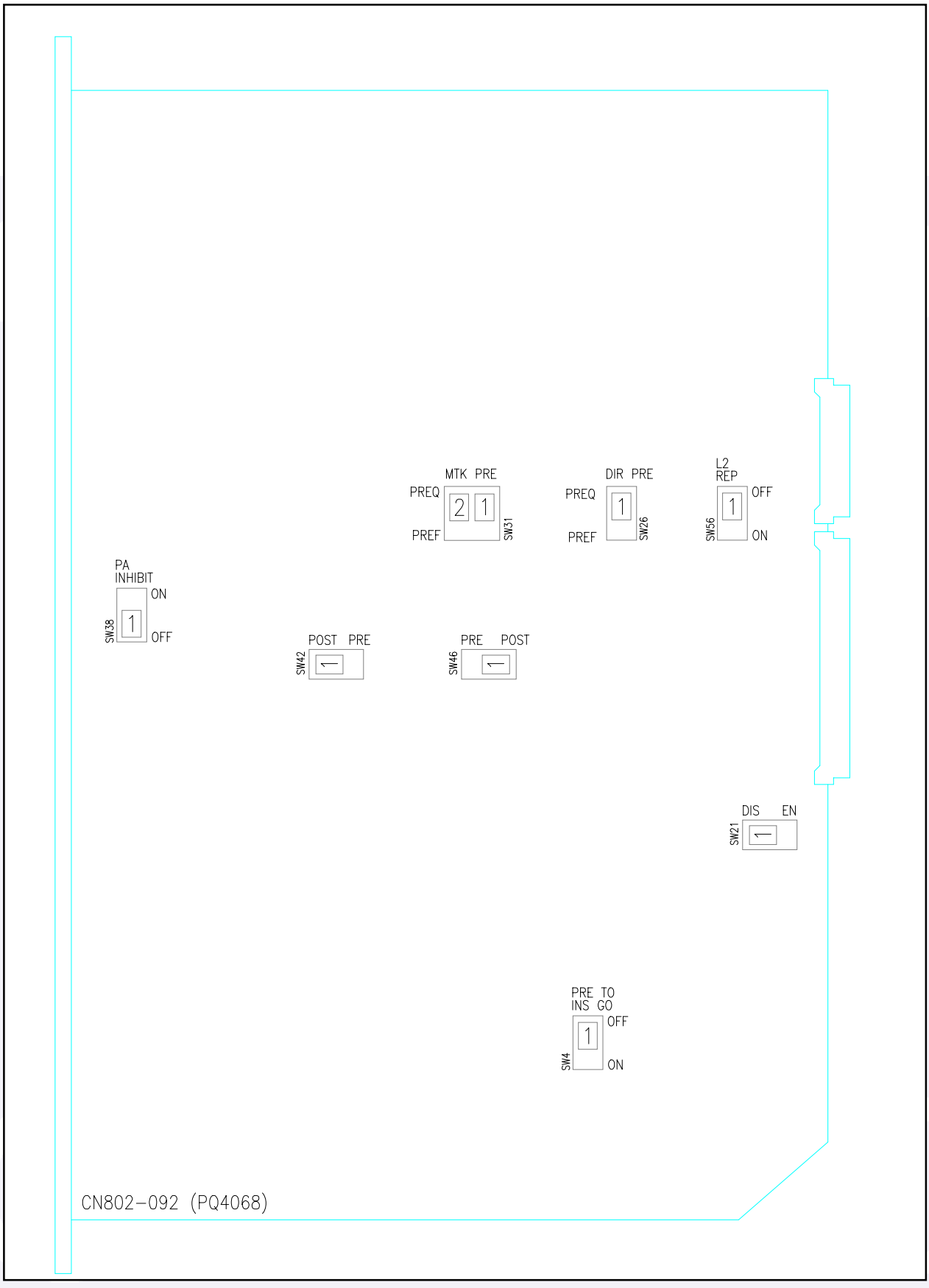
See illustrations on the following 2 pages.


S2 AND Q2 SURROUND OUTPUT AND MONITORING SIGNAL FLOW
STEREO MONITOR PANEL
SURROUND SOUND MONITOR
EXTERNAL SURROUND DECODER
EXTERNAL SURROUND DECODER
(OPTIONAL DECODER LOGIC)
INTERNAL LINKS (Q2)
XLR 3M
(S2)
(L)
(C)
(R)
(LS)
(RS)
LEFT
RIGHT
CENTRE
SURROUND LEFT
SURROUND RIGHT
SURROUND
MAIN 1
MAIN 2
AUX
M1
M2
CENTRE
MONO SURROUND
LEFT SURROUND
RIGHT SURROUND


SURROUND SOUND SELECTIONS ON S2
STEREO SURROUND
LEFT/RIGHT
CENTRE/MONO SURROUND
AUX MASTER
MAIN 2 FADER
MAIN 1 FADER
VCA GROUP FADER
VCA GROUP FADER
VCA CHANNEL FADER
GROUPS 2,4,6&8 AND MAIN 2
GROUPS 1,3,5&7 AND MAIN 1
CHANNEL
MONO SURROUND
LEFT/RIGHT
LEFT/RIGHT CENTRE/SURROUND
STEREO SURROUND

6.0 DIL Switch Settings

PQ4068 MONO MIC/LINE CHANNEL



PQ4068 MONO MIC/LINE CHANNEL DIL SWITCHES

SW4 PRE EQUALISER FEED to INSERT GO OUTPUT:-

DOWN = ON = PRE EQUALISER FEED to INSERT GO when no insert selected.
UP = OFF = No feed to INSERT GO when no insert selected.

SW21 LINE 2 to AUXILIARY 8 OUTPUT:-

LEFT = DISABLE
RIGHT = ENABLE = changed by global switching (for MULTITRACK MONITOR).

SW26 DIRECT OUTPUT PRE FADER FEEDS:-

1 = MONO FEED } UP = PRE EQUALISER
2 = Not used } DOWN = PRE FADER (POST EQ).

SW31 PRE FADER FEED to MULTITRACK:-

1 = Panned LEFT FEED } UP = PRE EQUALISER.
2 = Panned RIGHT FEED } DOWN = PRE FADER (POST EQ).

N.B. Mono channels are usually fed only to one track with pan to left for odd and pan to right for even track numbers.

SW38 P.A. INHIBIT (AUX MUTE):-

UP = ON = AUXILIARY OUTPUTS 1 and 2 switched off as fader is closed.
DOWN = OFF = AUXILIARY OUTPUTS not switched off.

SW42 MIX MINUS BUS 1 OUTPUT FEED:-

LEFT = POST FADER
RIGHT = PRE FADER

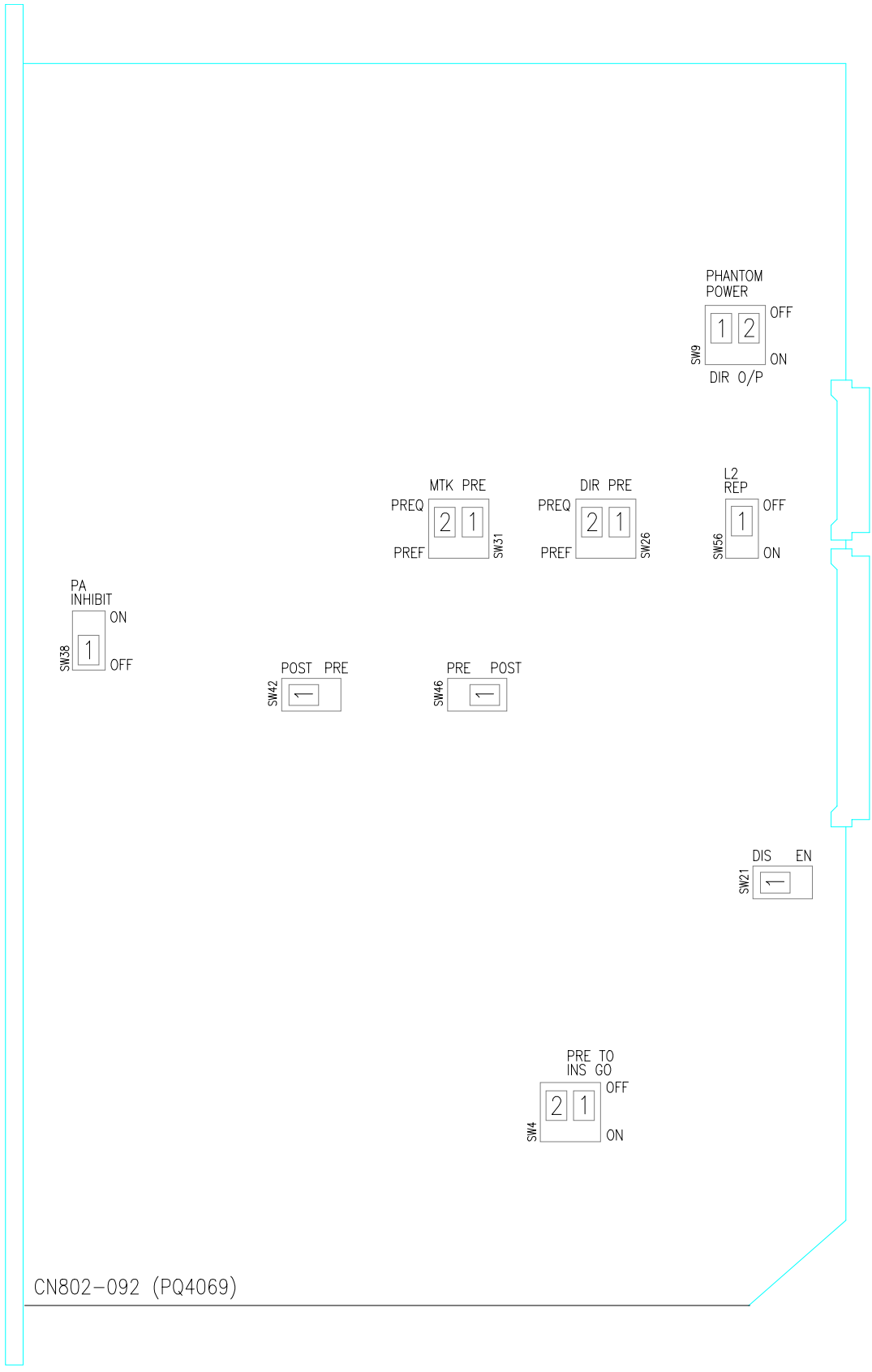
SW46 MIX MINUS BUS 2 OUTPUT FEED:-

LEFT = PRE FADER
RIGHT = POST FADER

SW56 LINE 2 REPLAY:-

UP = OFF = Channel input not changed by global switching.
DOWN = ON = Channel input changed to LINE 2 INPUT by global switching.

PQ4069 STEREO MIC/LINE CHANNEL



PQ4069 STEREO MIC/LINE CHANNEL DIL SWITCHES

SW4 PRE EQUALISER FEED to INSERT GO OUTPUT:-

1 = LEFT FEED } UP = ON = PRE EQUALISER FEED to INSERT GO when no insert selected.
2 = RIGHT FEED } DOWN = OFF = No feed to INSERT GO when no insert selected.

SW9 PHANTOM POWER:-

1 = MIC INPUT L } UP = OFF
2 = MIC INPUT R } DOWN = ON

SW21 LINE 2 to AUXILIARY 8 OUTPUT:-

LEFT = DISABLE
RIGHT = ENABLE = changed by global switching (for MULTITRACK MONITOR).

SW26 DIRECT OUTPUT PRE FADER FEEDS:-

1 = LEFT FEED } UP = PRE EQUALISER
2 = RIGHT FEED } DOWN = PRE FADER (POST EQ).

SW31 PRE FADER FEED to MULTITRACK:-

1 = LEFT FEED } UP = PRE EQUALISER.
2 = RIGHT FEED } DOWN = PRE FADER (POST EQ).

SW38 P.A. INHIBIT (AUX MUTE):-

UP = ON = AUXILIARY OUTPUTS 1 and 2 switched off as fader is closed.
DOWN = OFF = AUXILIARY OUTPUTS not switched off.

SW42 MIX MINUS BUS 1 OUTPUT FEED:-

LEFT = POST FADER
RIGHT = PRE FADER (MONO FEED).

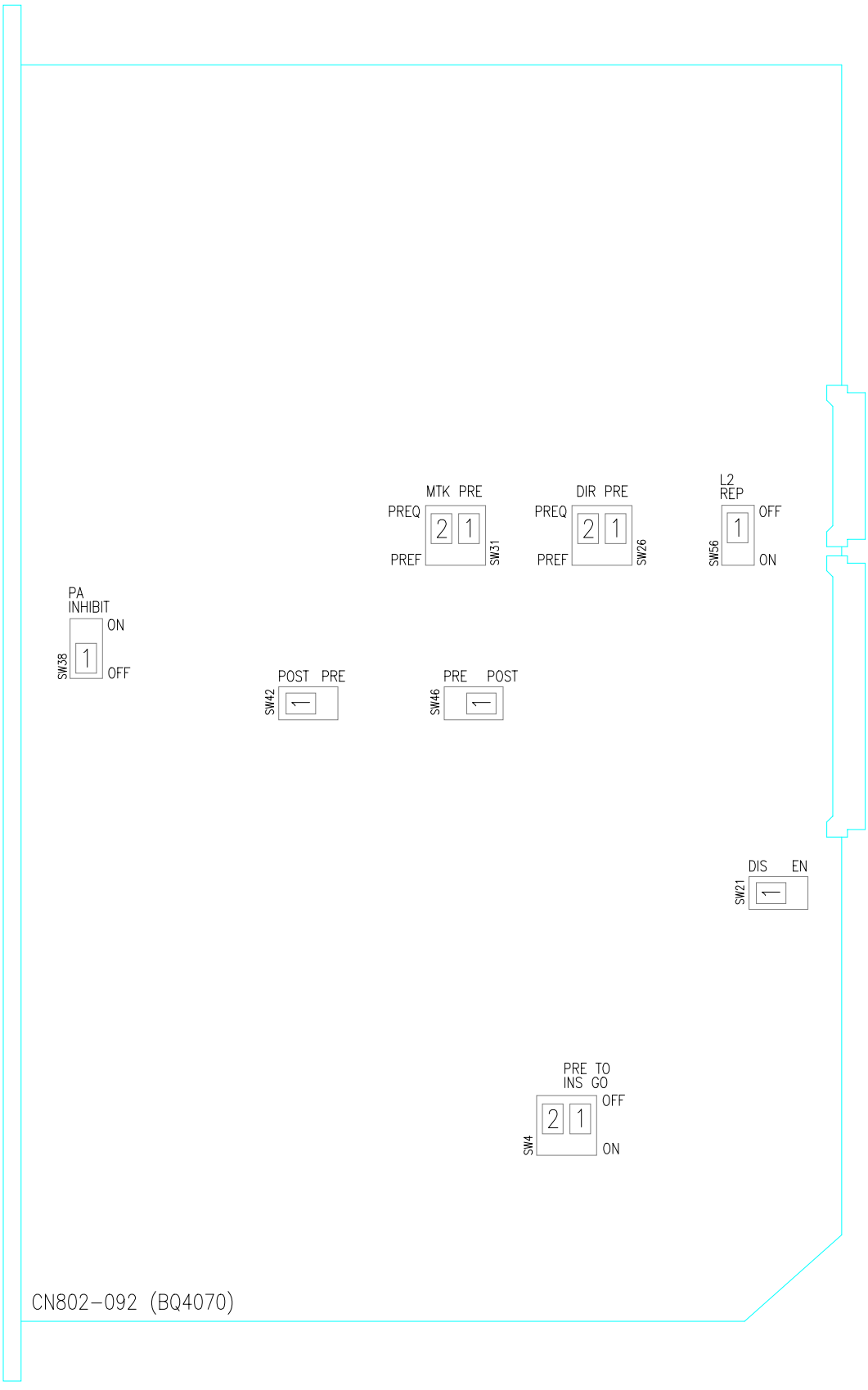
SW46 MIX MINUS BUS 2 OUTPUT FEED:-

LEFT = PRE FADER
RIGHT = POST FADER (MONO FEED).

SW56 LINE 2 REPLAY:-

UP = OFF = Channel input not changed by global switching.
DOWN = ON = Channel input changed to LINE 2 INPUT by global switching.

BQ4070 STEREO LINE CHANNEL



BQ4070 STEREO LINE CHANNEL DIL SWITCHES

SW4 PRE EQUALISER FEED to INSERT GO OUTPUT:-

1 = LEFT FEED } UP = ON = PRE EQUALISER FEED to INSERT GO when no insert selected.
2 = RIGHT FEED } DOWN = OFF = No feed to INSERT GO when no insert selected.

SW21 LINE 2 to AUXILIARY 8 OUTPUT:-

LEFT = DISABLE
RIGHT = ENABLE = changed by global switching (for MULTITRACK MONITOR).

SW26 DIRECT OUTPUT PRE FADER FEEDS:-

1 = LEFT FEED } UP = PRE EQUALISER
2 = RIGHT FEED } DOWN = PRE FADER (POST EQ).

SW31 PRE FADER FEED to MULTITRACK:-

1 = LEFT FEED } UP = PRE EQUALISER.
2 = RIGHT FEED } DOWN = PRE FADER (POST EQ).

SW38 P.A. INHIBIT (AUX MUTE):-

UP = ON = AUXILIARY OUTPUTS 1 and 2 switched off as fader is closed.
DOWN = OFF = AUXILIARY OUTPUTS not switched off.

SW42 MIX MINUS BUS 1 OUTPUT FEED:-

LEFT = POST FADER
RIGHT = PRE FADER (MONO FEED).

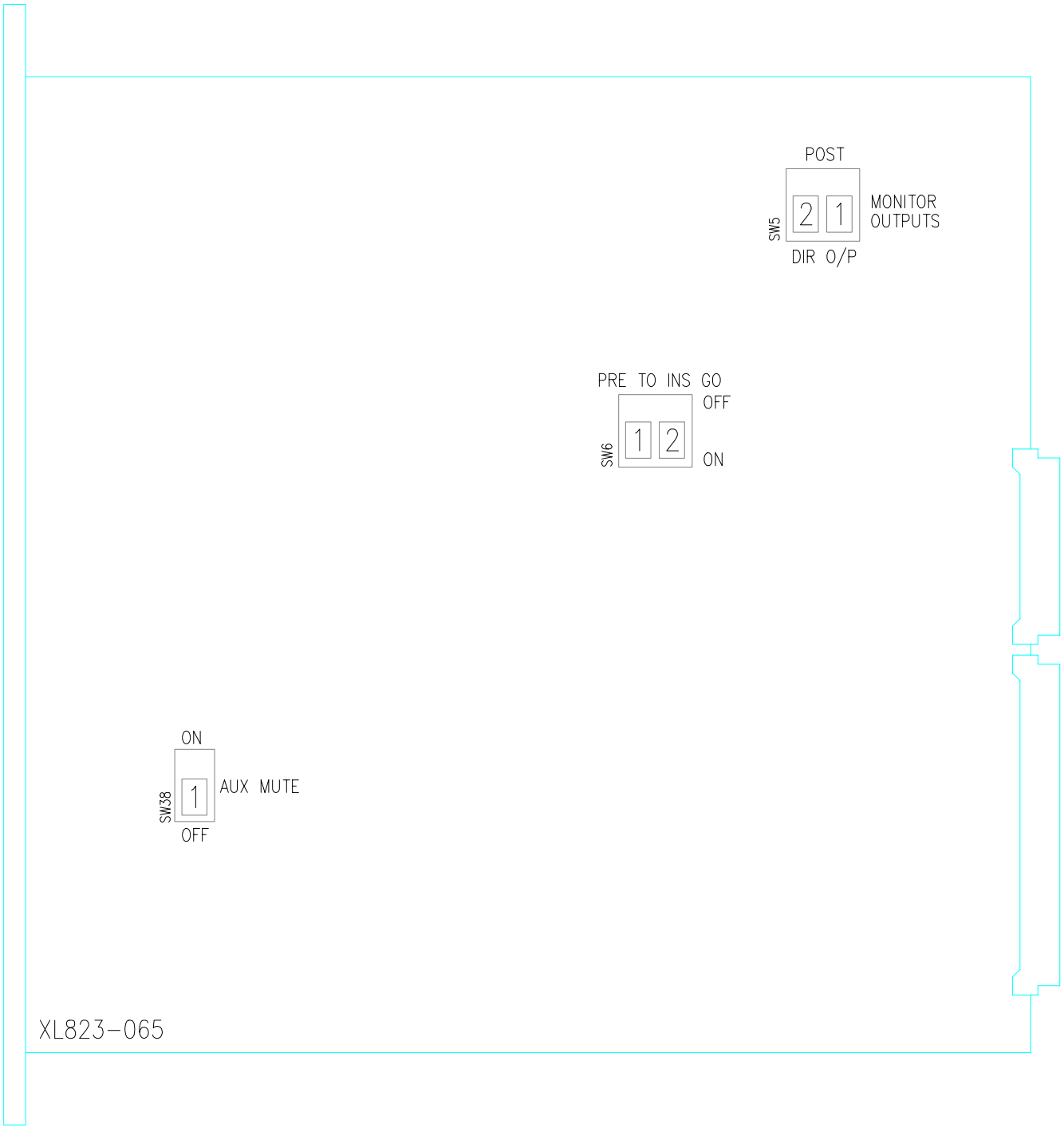
SW46 MIX MINUS BUS 2 OUTPUT FEED:-

LEFT = PRE FADER
RIGHT = POST FADER (MONO FEED).

SW56 LINE 2 REPLAY:-

UP = OFF = Channel input not changed by global switching.
DOWN = ON = Channel input changed to LINE 2 INPUT by global switching.

XL4071 STEREO GROUP



XL4071 STEREO GROUP DIL SWITCHES

SW5 MONITOR OUTPUTS:-

Outputs used usually for group metering.

1 = LEFT } UP = FEED from POST FADER.
2 = RIGHT } DOWN = FEED from DIRECT OUTPUT.

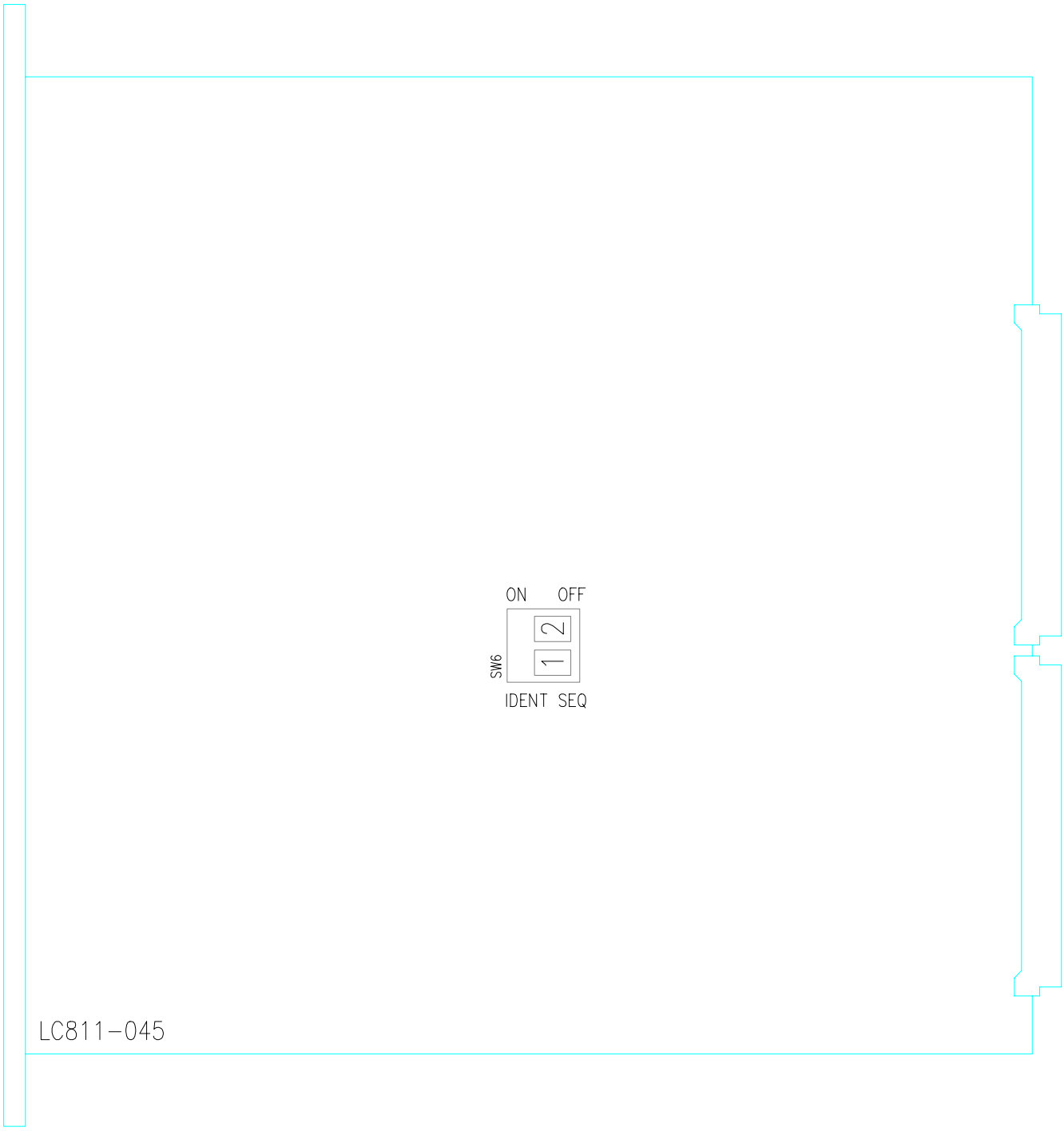
SW6 PRE FADER FEED to INSERT GO OUTPUT:-

1 = LEFT } UP = OFF } PRE FADER STANDING FEED to INSERT GO OUTPUT when
2 = RIGHT } DOWN = ON } no insert is selected.

SW38 P.A. INHIBIT (AUX MUTE):-

UP = ON = AUXILIARY OUTPUTS 1 and 2 switched off as fader is closed.
DOWN = OFF = AUXILIARY OUTPUTS not switched off.

LC4341 STEREO MAIN OUTPUT



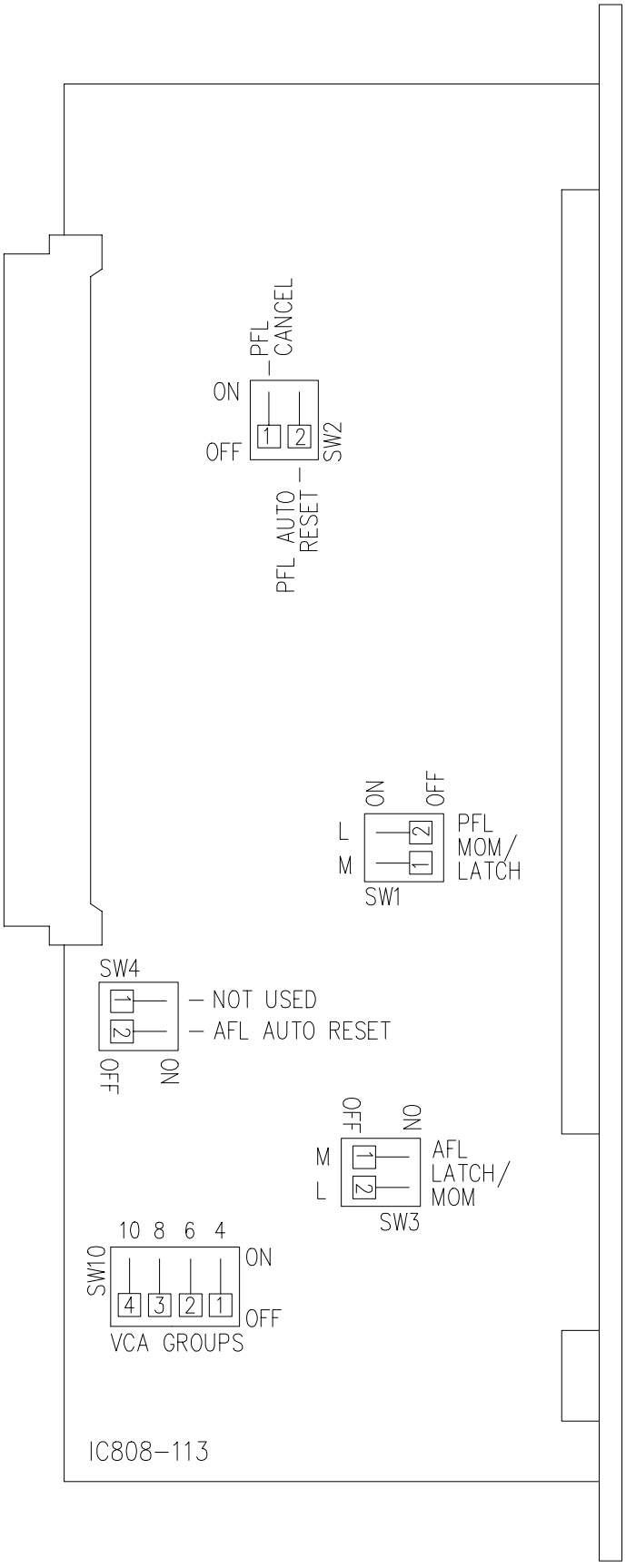
LC4341 STEREO MAIN OUTPUT DIL SWITCHES

SW6 IDENT SEQUENCE:-

1 = LEFT } RIGHT = OFF
2 = RIGHT } LEFT = ON

When sequence is on TONE to MAIN OUTPUT.

IC4905 (REV) CHANNEL/GROUP FADER



IC4905 (REV) CHANNEL/GROUP FADER DIL SWITCHES

SW1 PFL button MOMENTARY or LATCHING.

RIGHT = PFL MOM = PFL button MOMENTARY.
LEFT = PFL LATCH = PFL button LATCHING.

SW2/1 PFL CANCEL when fader opens.

DOWN = OFF.
UP = ON = Opening fader cancels PFL selection if latched.

SW2/2 PFL timed AUTO RESET.

DOWN = OFF = No effect.
UP = ON = PFL button long press acts as momentary, PFL short press latches when SW1 is in latch position.

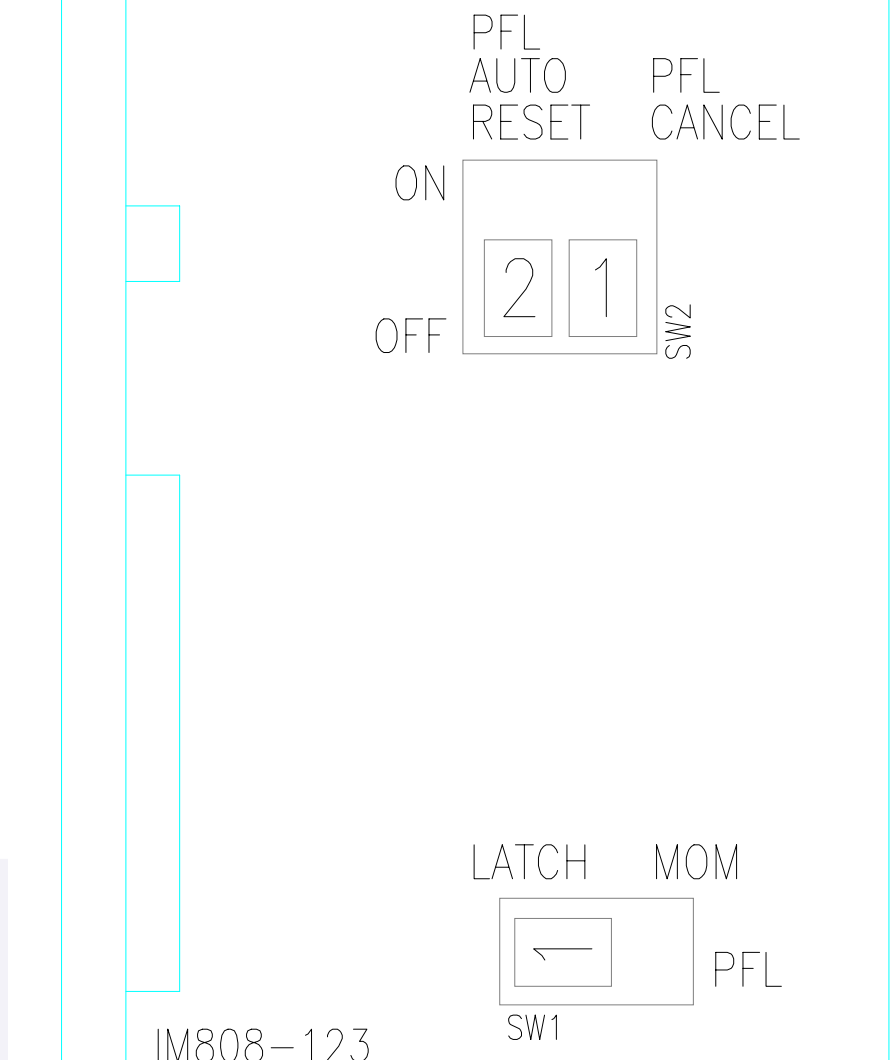
SW3 AFL button MOMENTARY or LATCHING.

RIGHT = AFL MOM = AFL button MOMENTARY.
LEFT = AFL LATCH = AFL button LATCHING.

SW4 AFL timed AUTO RESET.

LEFT = OFF = No effect.
RIGHT = ON = AFL button long press acts as momentary, AFL short press latches when SW6 is in latch position.

IM4064 MAIN FADER



IM4064 MAIN FADER DIL SWITCHES

SW1 PFL button MOMENTARY or LATCHING.

RIGHT = PFL MOM = PFL button MOMENTARY.
LEFT = PFL LATCH = PFL button LATCHING.

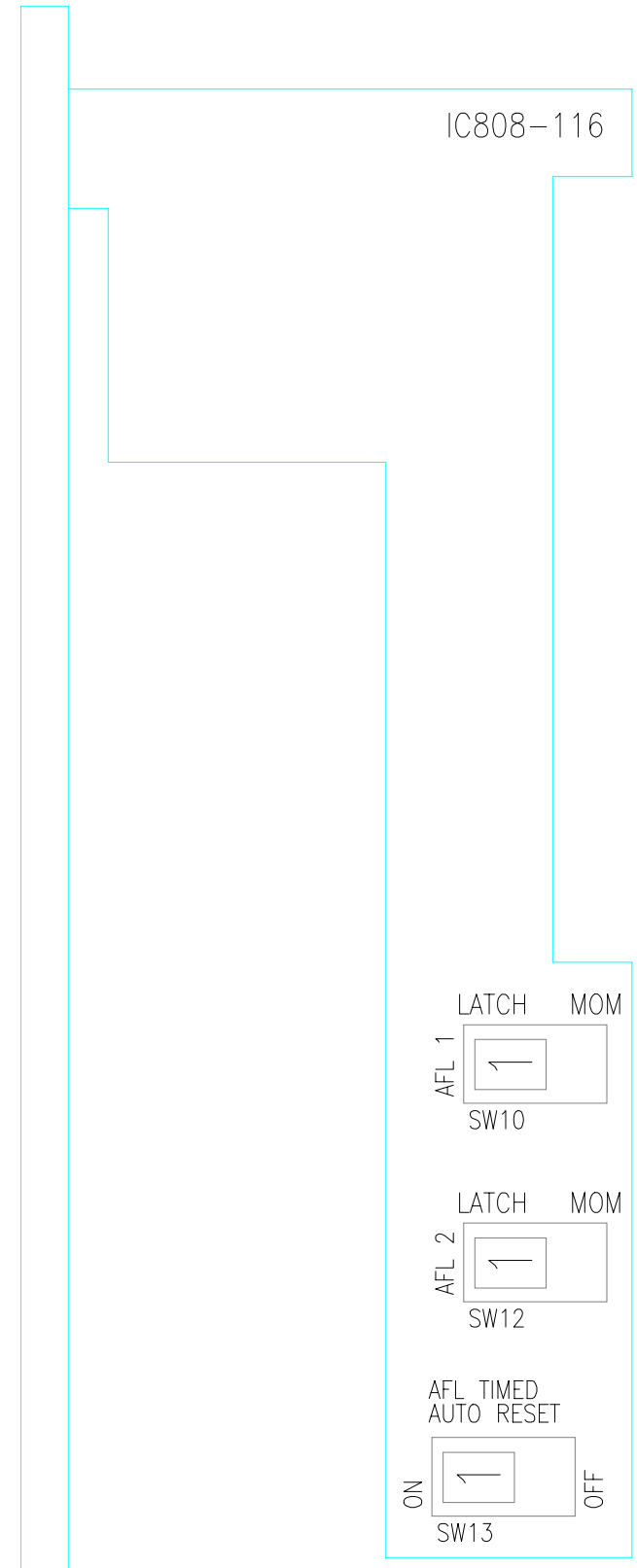
SW2/1 PFL CANCEL when fader opens.

DOWN = OFF.
UP = ON = Opening fader cancels PFL selection if latched.

SW2/2 PFL timed AUTO RESET.

DOWN = OFF = No effect.
UP = ON = PFL button long press acts as momentary, PFL short press latches when SW4 is in latch position.

IG4062 VCA GROUP TWIN FADER



IG4062 VCA GROUP TWIN FADER DIL SWITCHES

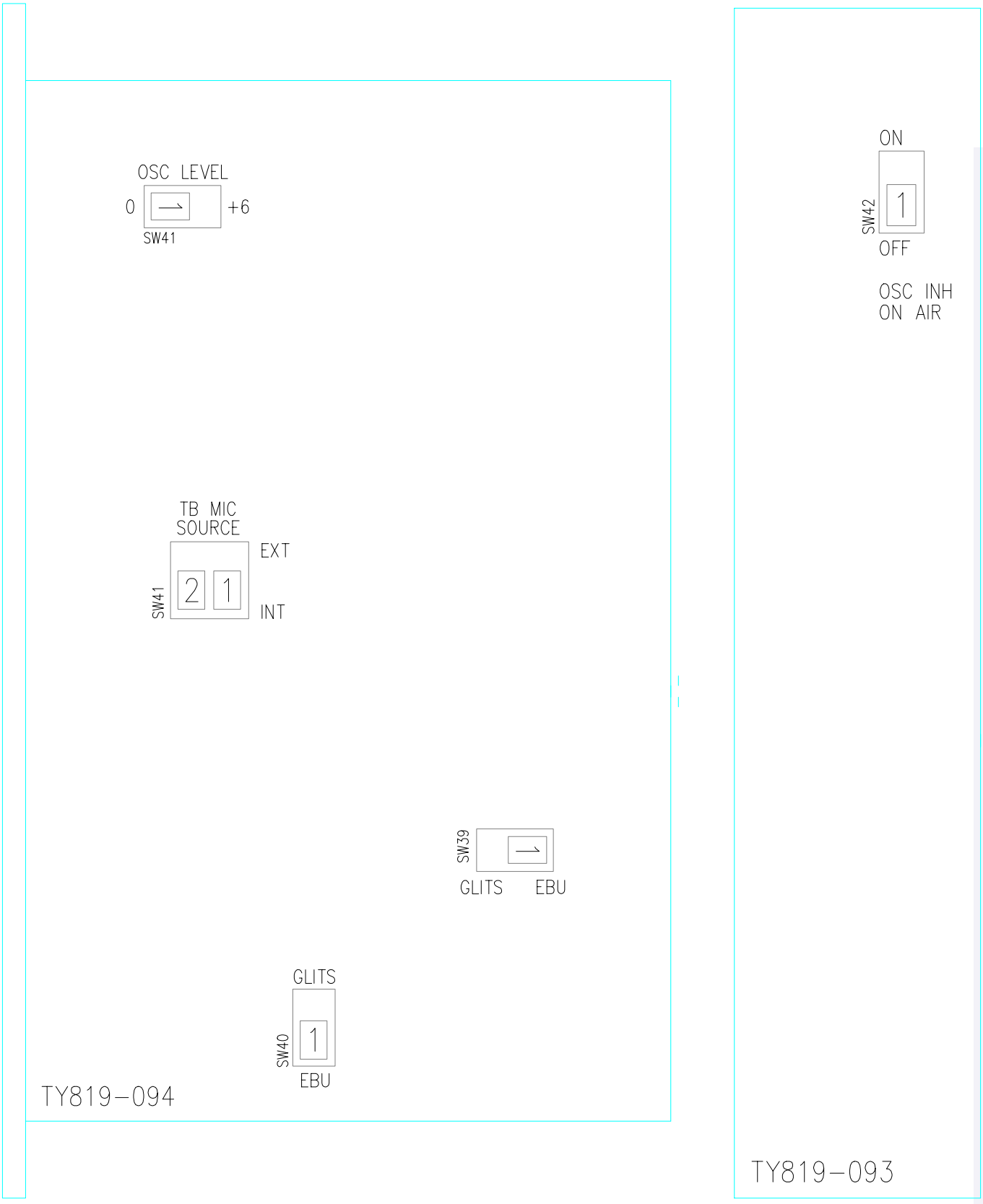
SW10 AFL 1 button MOMENTARY or LATCHING.
SW12 AFL 2 button MOMENTARY or LATCHING.

LEFT = AFL LATCH = AFL button LATCHING.
RIGHT = AFL MOM = AFL button MOMENTARY.

SW13 AFL timed AUTO RESET.

RIGHT = OFF = No effect.
LEFT = ON = AFL button long press acts as momentary, AFL short press latches button.

TY3660 TONE/TALKBACK



TY3660 TONE/TALKBACK DIL SWITCHES

SW41 OSCILLATOR LEVEL:-

LEFT = 0dBu with TRIM CONTROL ident at 12 o'clock.
RIGHT = +6dBu with TRIM CONTROL ident at 12 o'clock.

SW39 GLITS/E.B.U. :-

LEFT = GLITS - BBC stereo ident sequence.
RIGHT = E.B.U. - Stereo ident sequence.

SW40 GLITS/E.B.U. :-

UP = GLITS - BBC stereo ident sequence.
DOWN = E.B.U.- Stereo ident sequence.

N.B. SW39 and SW40 must both be in the same position.

SW41 TALKBACK MIC SOURCE (2 switches 1 and 2) :-

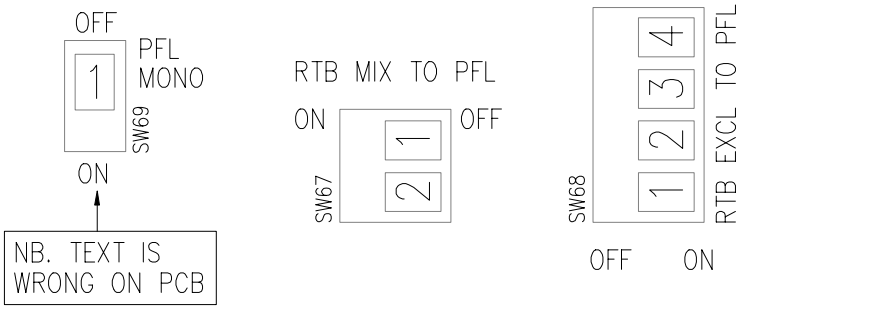
DOWN = INTERNAL MIC.
UP = EXTERNAL MIC.

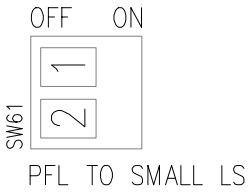
PCB TY819-093

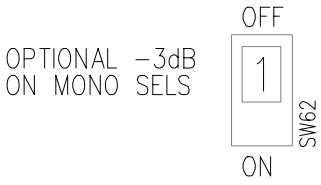
SW42 OSCILLATOR INHIBIT ON-AIR :-

UP	= ON	=	Oscillator is switched off when the ON AIR button is selected.
DOWN	= OFF	=	Oscillator unaffected by the ON AIR button.

ML4230 MONITOR LS







ML812-312

ML4230 MONITOR LS DIL SWITCHES

SW61 PFL to small loudspeakers:-

1 = PFL LEFT } LEFT = OFF.
2 = PFL RIGHT } RIGHT = ON = PFL mixed in to MONITOR FEED to small loudspeakers.

SW62 Optional -3dB on MONO SELS :-

UP = OFF.
DOWN = ON which reduces meter levels -3dB when a mono source & M/S are selected (to correct the M level).

SW67 RTB MIX TO PFL :-

1 = PFL LEFT } LEFT = ON = RTB to PFL.
2 = PFL RIGHT } RIGHT = OFF = No RTB to PFL.

SW68 RTB exclusively to PFL LS OUTPUT.

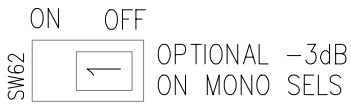
All switches 1 to 4 to be in the same position.

LEFT = OFF.
RIGHT = ON = RTB only to PFL LS OUTPUTS.

SW69 PRE FADE LISTEN MONO :-

DOWN = ON = STEREO PRE FADE LISTEN reduced to MONO for single loudspeaker.
UP = OFF = STEREO PRE FADE LISTEN needing 2 PFL Loudspeakers.

ML4231 LS2 MONITOR



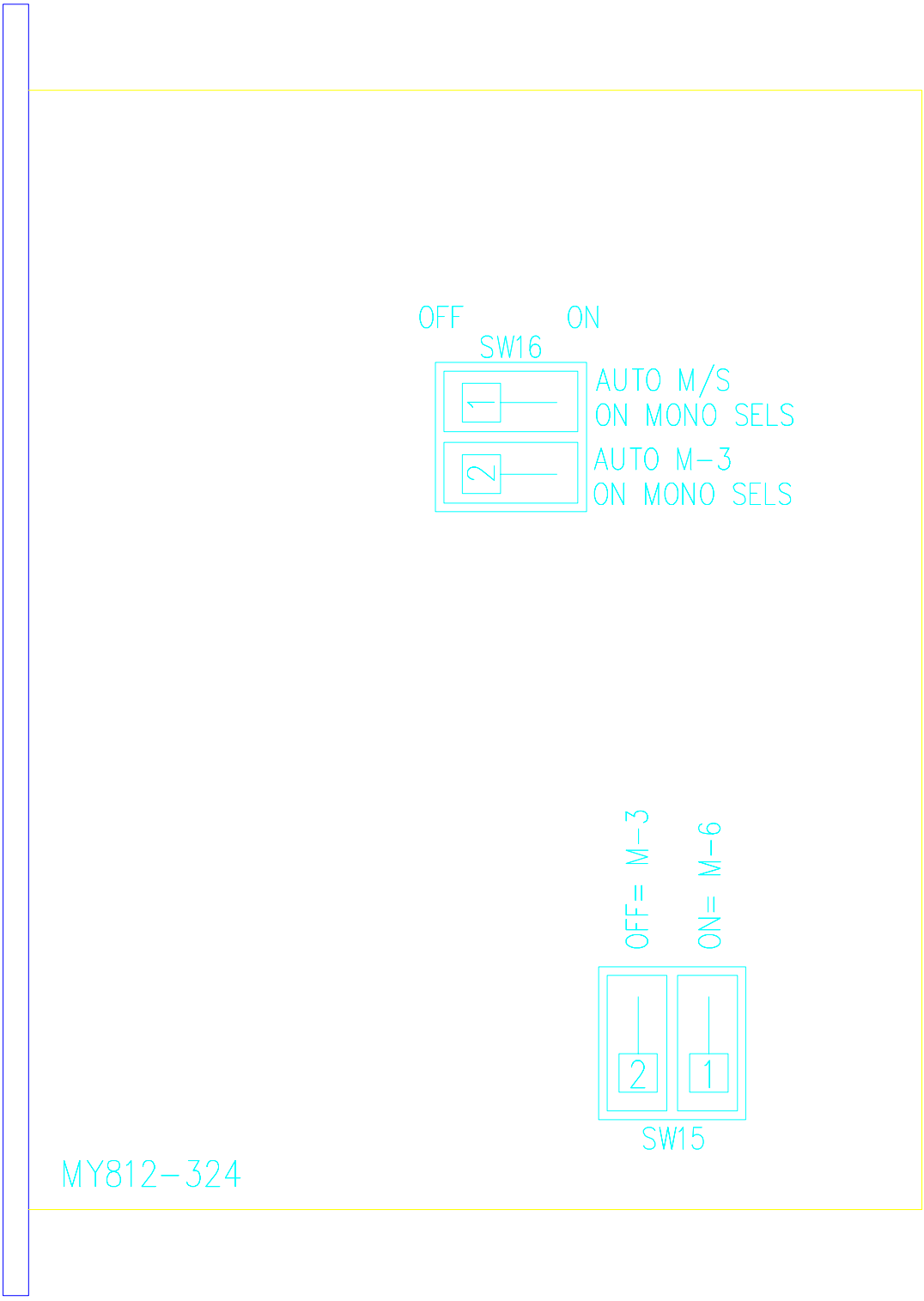
ML812-315

ML4231 LS2 MONITOR DIL SWITCHES

SW62 Optional -3dB on MONO SELS :-

UP = OFF.
DOWN = ON which reduces meter levels -3dB when a mono source & M/S are selected (to correct the M level).

MY3680 METER SELECTOR - FULL FUNCTION



MY3680 METER SELECTOR - FULL FUNCTION DIL SWITCHES

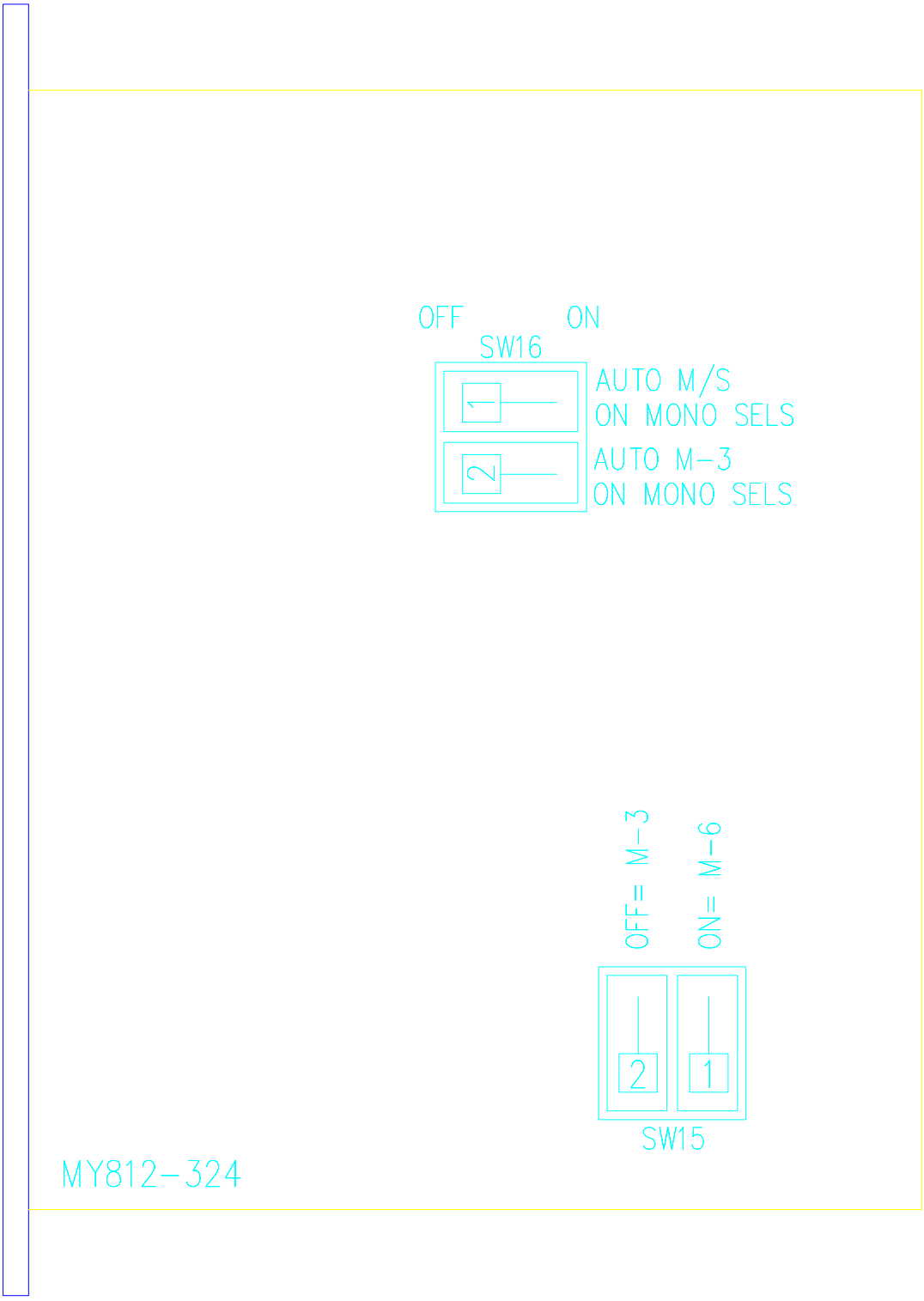
SW13 AUTO SWITCH to M/S for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	Metering is automatically changed over to read M and S when a mono source is selected (M/S button illuminates).

SW14 AUTO M -3dB for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	M Metering is reduced -3dB to read correctly when a mono source is selected.

MY3875 METER SELECTOR - PRINCIPAL FUNCTION



MY3875 METER SELECTOR - PRINCIPAL FUNCTION DIL SWITCHES

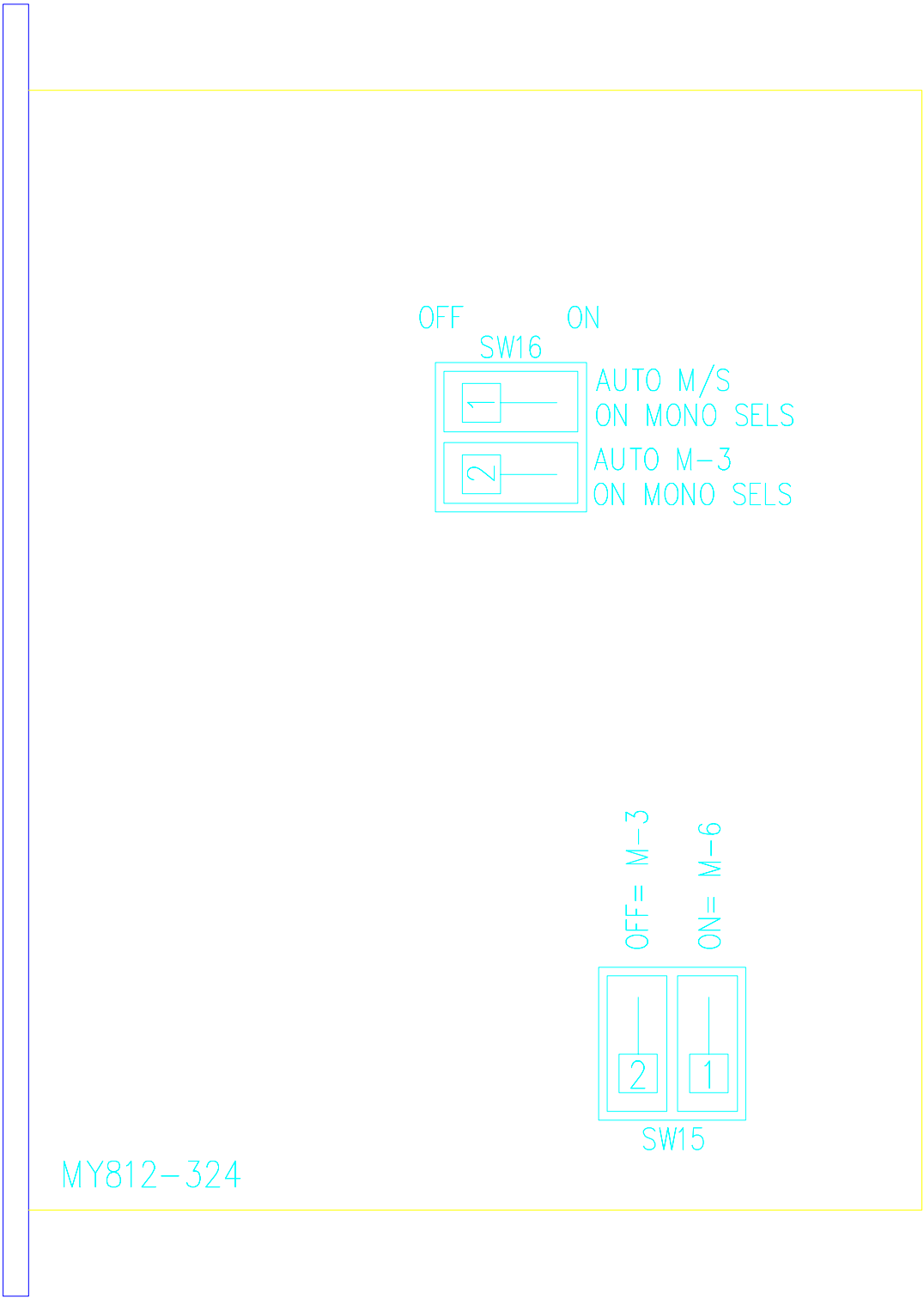
SW13 AUTO SWITCH to M/S for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	Metering is automatically changed over to read M and S when a mono source is selected (M/S button illuminates).

SW14 AUTO M -3dB for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	M Metering is reduced -3dB to read correctly when a mono source is selected.

MY3876 METER SELECTOR - MAIN FUNCTION



MY3876 METER SELECTOR - MAIN FUNCTION DIL SWITCHES

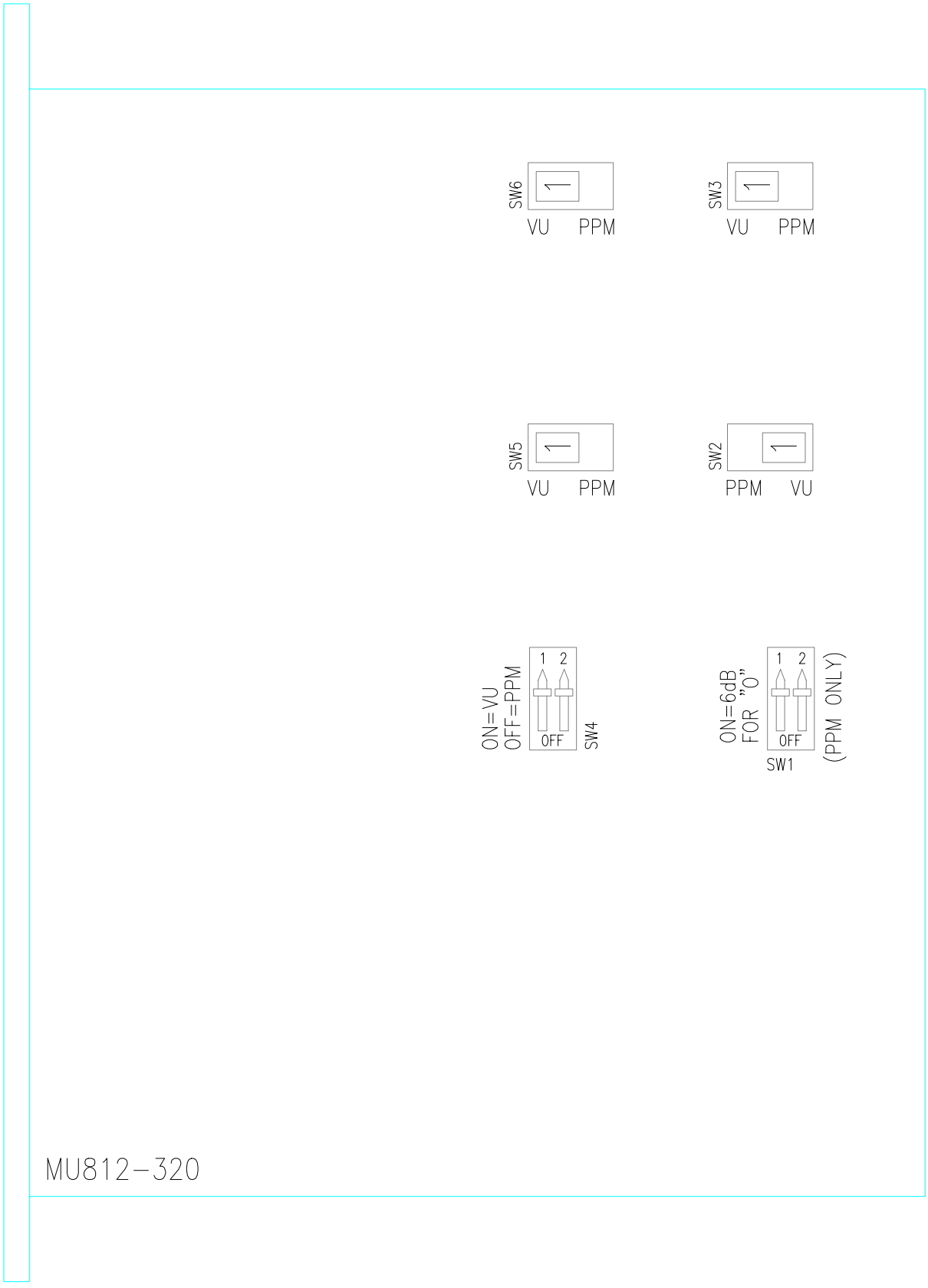
SW13 AUTO SWITCH to M/S for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	Metering is automatically changed over to read M and S when a mono source is selected (M/S button illuminates).

SW14 AUTO M -3dB for MONO SELS :-

LEFT	=	OFF	=	No effect.
RIGHT	=	ON	=	M Metering is reduced -3dB to read correctly when a mono source is selected.

MU3804 RED/GREEN STEREO BARGRAPH



MU3804 RED/GREEN STEREO BARGRAPH DIL SWITCHES

SW1 +6dBu at the scale "0" position (PPM only):-

1 = LEFT BAR } UP = ON = +6dBu at scale "0".
2 = RIGHT BAR } DOWN = OFF = +8dBu at scale "0".

SW2 PPM/VU characteristics, LEFT BAR :-

LEFT = PPM.
RIGHT = VU.

SW3 PPM/VU characteristics, LEFT BAR :-

LEFT = VU.
RIGHT = PPM.

SW4 PPM/VU characteristics :-

1 = LEFT BAR } UP = ON = VU.
2 = RIGHT BAR } DOWN = OFF = PPM.

SW5 PPM/VU characteristics, RIGHT BAR :-

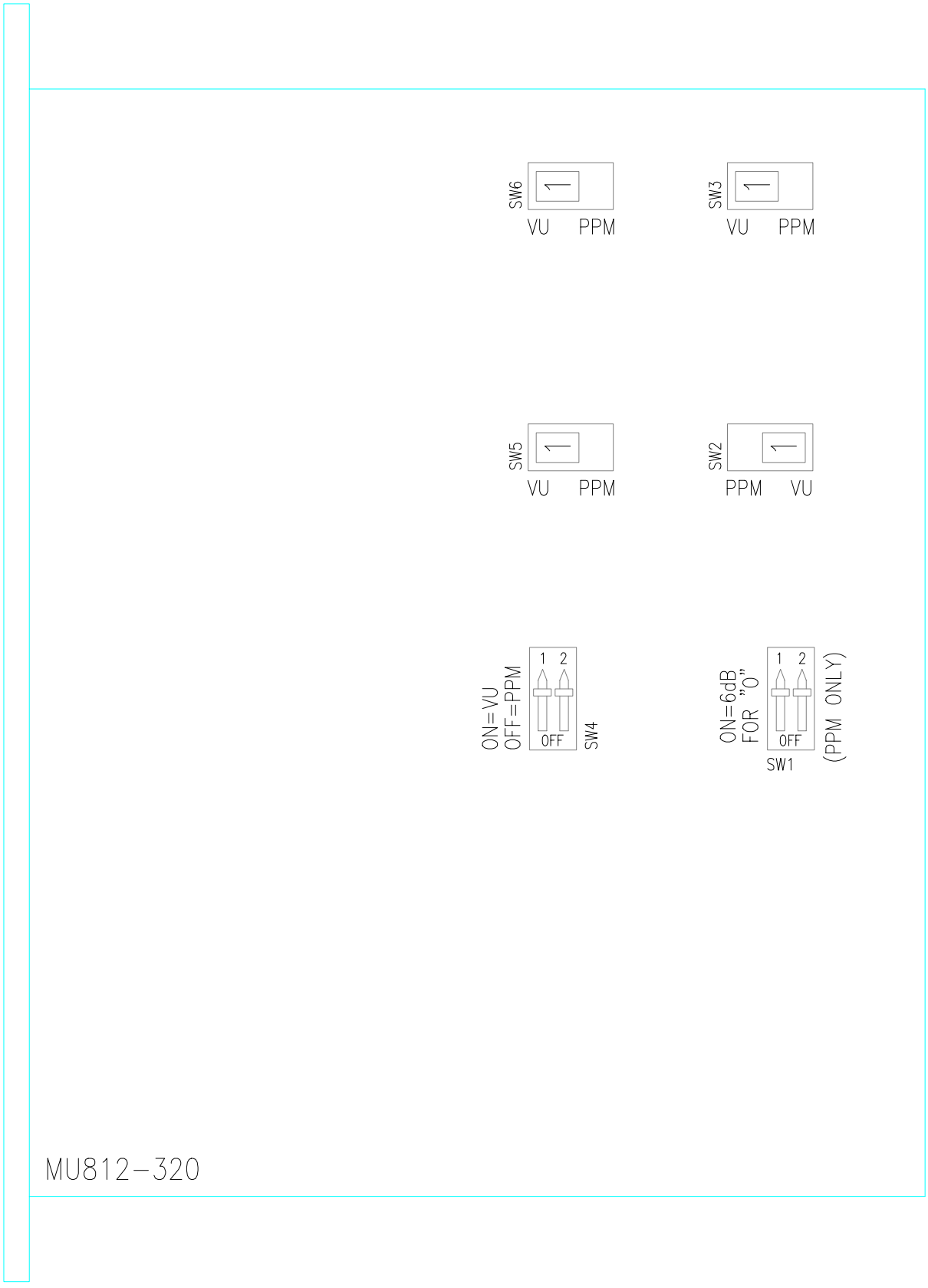
LEFT = VU.
RIGHT = PPM.

SW6 PPM/VU characteristics, RIGHT BAR :-

LEFT = VU.
RIGHT = PPM.

N.B. All the above switches should be in the same position (i.e. VU or PPM) to achieve proper performance (It is remotely possible to have different characteristics on LEFT and RIGHT BARS when used for other than stereo metering.)

MU4333 LARGE STEREO BARGRAPH (REV. COL.)



MU4333 LARGE STEREO BARGRAPH (REV. COL.) DIL SWITCHES

SW1 +6dBu at the scale "0" position (PPM only):-

1 = LEFT BAR } UP = ON = +6dBu at scale "0".
2 = RIGHT BAR } DOWN = OFF = +8dBu at scale "0".

SW2 PPM/VU characteristics, LEFT BAR :-

LEFT = PPM.
RIGHT = VU.

SW3 PPM/VU characteristics, LEFT BAR :-

LEFT = VU.
RIGHT = PPM.

SW4 PPM/VU characteristics :-

1 = LEFT BAR } UP = ON = VU.
2 = RIGHT BAR } DOWN = OFF = PPM.

SW5 PPM/VU characteristics, RIGHT BAR :-

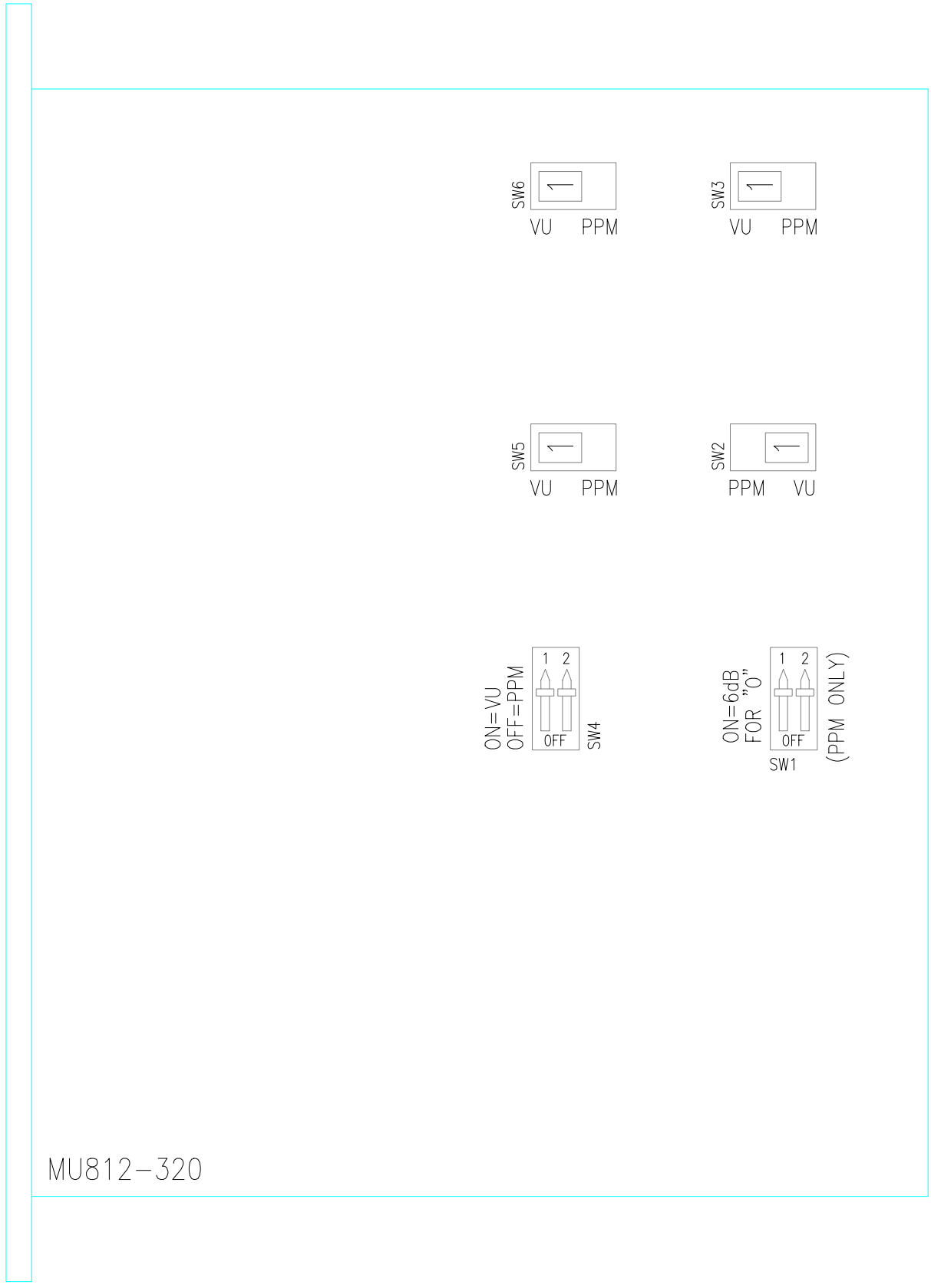
LEFT = VU.
RIGHT = PPM.

SW6 PPM/VU characteristics, RIGHT BAR :-

LEFT = VU.
RIGHT = PPM.

N.B. All the above switches should be in the same position (i.e. VU or PPM) to achieve proper performance (It is remotely possible to have different characteristics on LEFT and RIGHT BARS when used for other than stereo metering.)

MU3807 STEREO PFL BARGRAPH



MU3807 STEREO PFL BARGRAPH DIL SWITCHES

SW1 +6dBu at the scale "0" position (PPM only):-

1 = LEFT BAR } UP = ON = +6dBu at scale "0".
2 = RIGHT BAR } DOWN = OFF = +8dBu at scale "0".

SW2 PPM/VU characteristics, LEFT BAR :-

LEFT = PPM.
RIGHT = VU.

SW3 PPM/VU characteristics, LEFT BAR :-

LEFT = VU.
RIGHT = PPM.

SW4 PPM/VU characteristics :-

1 = LEFT BAR } UP = ON = VU.
2 = RIGHT BAR } DOWN = OFF = PPM.

SW5 PPM/VU characteristics, RIGHT BAR :-

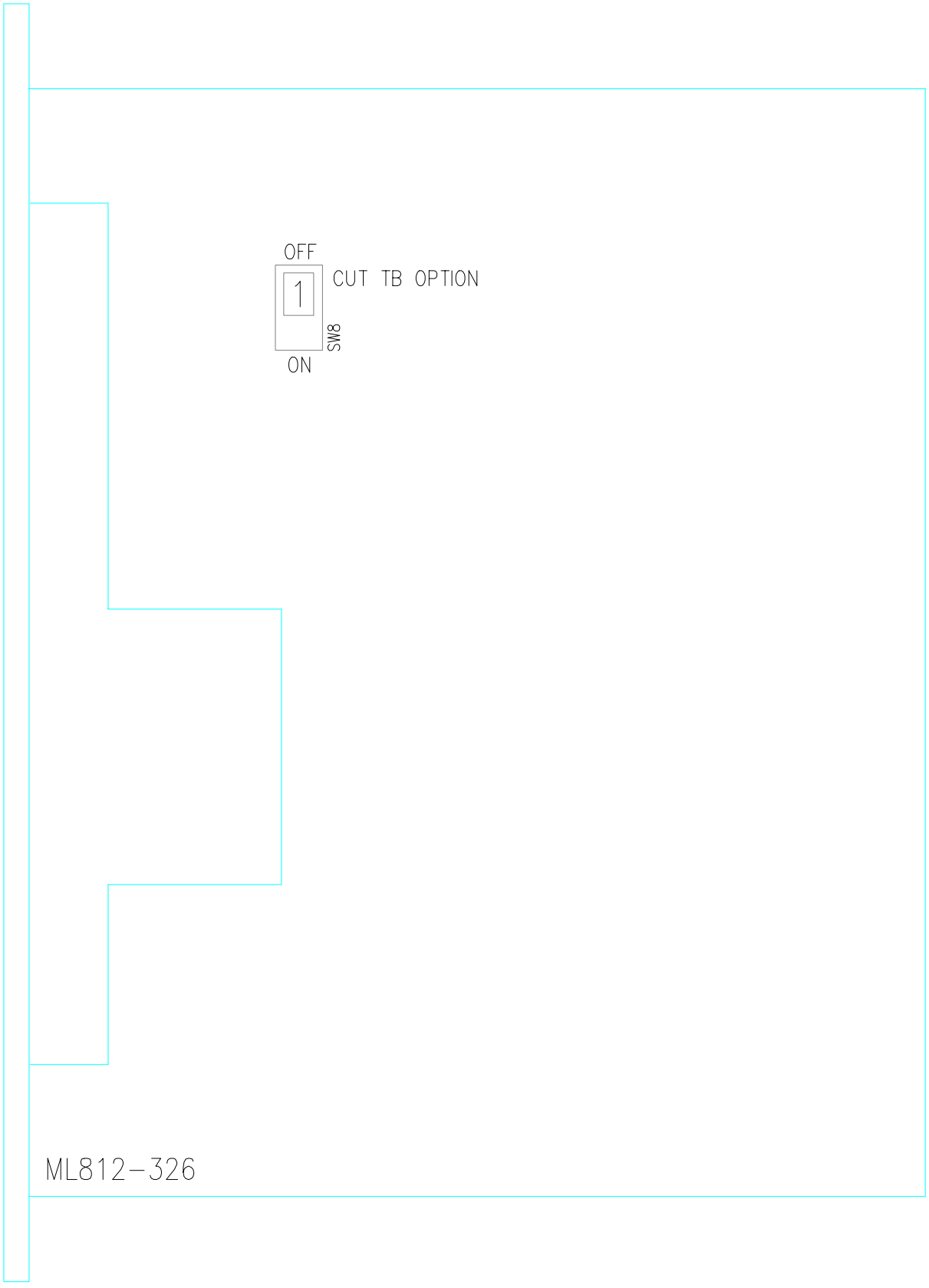
LEFT = VU.
RIGHT = PPM.

SW6 PPM/VU characteristics, RIGHT BAR :-

LEFT = VU.
RIGHT = PPM.

N.B. All the above switches should be in the same position (i.e. VU or PPM) to achieve proper performance (It is remotely possible to have different characteristics on LEFT and RIGHT BARS when used for other than stereo metering.)

ML3679 STUDIO LS SELECTOR

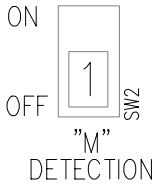


ML3679 STUDIO LS SELECTOR DIL SWITCHES

SW8 CUT TALKBACK option:-

UP	=	OFF	=	No effect = TALKBACK heard.
DOWN	=	ON	=	TALKBACK as well as loudspeaker signals cut by cut button and REMOTE CUT.

DL3678 COMPRESSOR/LIMITER



DL803-053

DL3678 COMPRESSOR/LIMITER DIL SWITCHES

SW4 "M" detection:-

DOWN = OFF.
UP = ON = Detection of reduced mono signal into side chain (see note).

N.B. The compressor and limiter normally respond to the higher of the left and right signals. SW2 allows the mono reduction of left and right (-3dB) to take control it 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.

Notes:

USER REGISTRATION

Please complete this end user registration form as soon as you receive this manual. This will allow us to not only provide you with any manual update sheets &/or modification information, but also with information on new product developments which may be of interest to you.
Completion of this registration form will ensure that we send all technical correspondence directly to you at the address you have indicated.

The form, once completed should be returned to Calrec at the following address.

User Registrations
Calrec Audio Ltd
Nutclough Mill
Hebden Bridge
West Yorkshire
HX7 8EZ
England
UK

or alternatively it can be faxed back to us on +44 (0) 1422 845244

Console Type: S2

Serial Number (located on the base panel):.....
Date Received: .....
Name: .....
Department: .....
Company: .....
Address: .....
.....
.....
.....
Post/Zipcode: .....
Tel No: .....
Fax No: .....
Email: .....

Customer comments:.....
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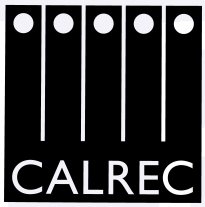
Notes:



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