Concept
400 Series

OWNER'S MANUAL

Hill Audio

Concept
400 Series

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CONTENTS

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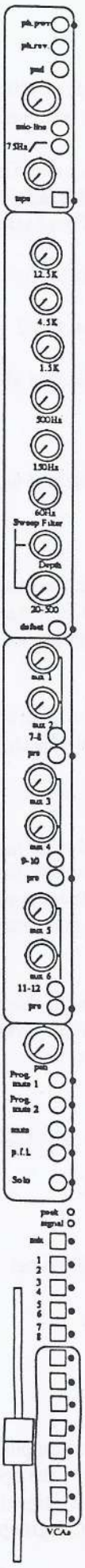


CONCEPT INPUT SECTION

ph. pwr (phantom power switch)
This switch connects the 48volt phantom power to the XLR input socket.

ph. rev (phase reverse switch)
This switch reverses the phase of the microphone input signal.

pad (20dB - microphone input only)
If the microphone signal coming into the channel is too strong for the gain control to adjust effectively (gain set below 9 o'clock and peak LED still on), then depressing the pad switch will reduce the input signal strength and allow the gain control to work at a more desirable level.

mic/line gain
This controls the input level of the microphone and line inputs depending on whether a microphone or line input is selected. The continually variable control has a range of: +20dB to +60dB (pad out) 0dB to +40dB (pad in). The input channels feature a transformerless balanced microphone input with an impedance of 1.2k ohms which will allow any normal low impedance microphone to be used without matching problems. An optional transformer input stage is available with improved noise specifications.

high pass filter
This inserts a 75Hz high pass filter in the signal path from the mic or line inputs which is useful for removing mains 'hum' or low frequencies from the signal

line
This switches between the balanced microphone input (XLR) and the dual balanced/unbalanced line input (1/4"). If a stereo(TRS) 1/4" jack is used, the input is balanced, otherwise it is unbalanced.

tape gain
This controls the input level of the tape input. The variable control has a range of +20dB to -20dB. The gain control also affects the gain of the tape return to the subgroup section.

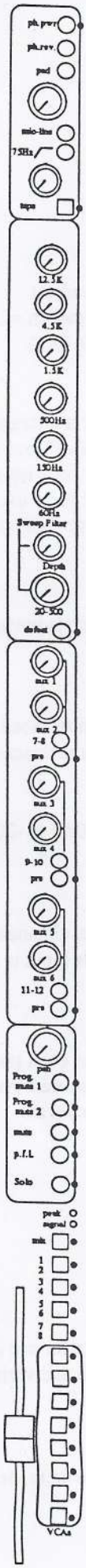
tape
This switches from the input as selected above, to the tape return and allows the input channels to be used for remixing. If a stereo (TRS) 1/4" jack is used the tape return is balanced. This input is also used as the return input for the subgroup monitor section.

equalisation
The equalisation section is a 6 band, fixed bandwidth, low Q type. Particular care has been taken to eliminate phase distortion, with the result that full boost or cut of any band will cause minimal phase cancellation in any other. The response is of the 'bell' type with centre frequencies at:

12.5kHz	+/- 12dB
4.5kHz	+/- 12dB
1.5kHz	+/- 12dB
500Hz	+/- 12dB
150Hz	+/- 12dB
60Hz	+/- 12dB

sweep filter
This section contains a fixed Q sweepable notch filter with variable cut and frequency for use in removing unwanted peaks in a signal. It is variable in depth between +6dB and -24dB and variable in frequency between 50Hz to 5kHz.

defeat
This switch defeats the current setting of equalisation, thus allowing a comparison to be made.



auxiliary
These controls allow some of the input signal to be "tapped" off the signal path (without affecting the signal strength) at different positions, and sent to an auxiliary device (such as an echo unit) or to a separate amplifier for monitor (foldback) purposes.
aux #1/2. aux #1 and 2 may be switched PRE or POST insert, eq. and fader and may therefore be used as either a cue (foldback) send (PRE) or effects send (POST) When switched PRE fade, they may be linked PRE or POST equalisation dependent on the position of an internal link. These sends may be further directed to either aux #1/2 or aux#7/8.
aux #3/4. as auxiliary #1/2. In addition they may be sent to either Aux 3/4 or to Aux 9/10 busses.
aux #5/6. as auxiliary #1/2. In addition they may be sent to either Aux 5/6 or to Aux 11/12 busses.
All the auxiliary sends may optionally be factory fitted with dual concentric controls, thus allowing simultaneous control of all 12 auxiliary sends.

pan
This control adjusts the position of the signal within a stereo image at the outputs selected with the routing switches below.

prog. mute 1/2 (programmable mute, sometimes called auto-mute)
These switches are used to assign this channel to the programmable mute bus. When the master Programmable mute button is pressed, any channel with these switches pressed will be instantly muted. Two master buttons are provided to allow 2 different mute settings to be programmed.

mute
This switch prevents signal from leaving the channel. In effect it turns the channel off, yet allows all PRE fader busses (monitors) to operate, and the signal can still be monitored in the headphones, on the channel led displays and on the pfl VU meter.

pfl
This switch sends the PRE fader signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl led display. If the auto-pfl switch is depressed on the functions module, depressing the pfl switch causes the signal to be connected to the monitor speaker output. Note: the pfl system is additive, in that any number of pfl buttons can be depressed at the same time.

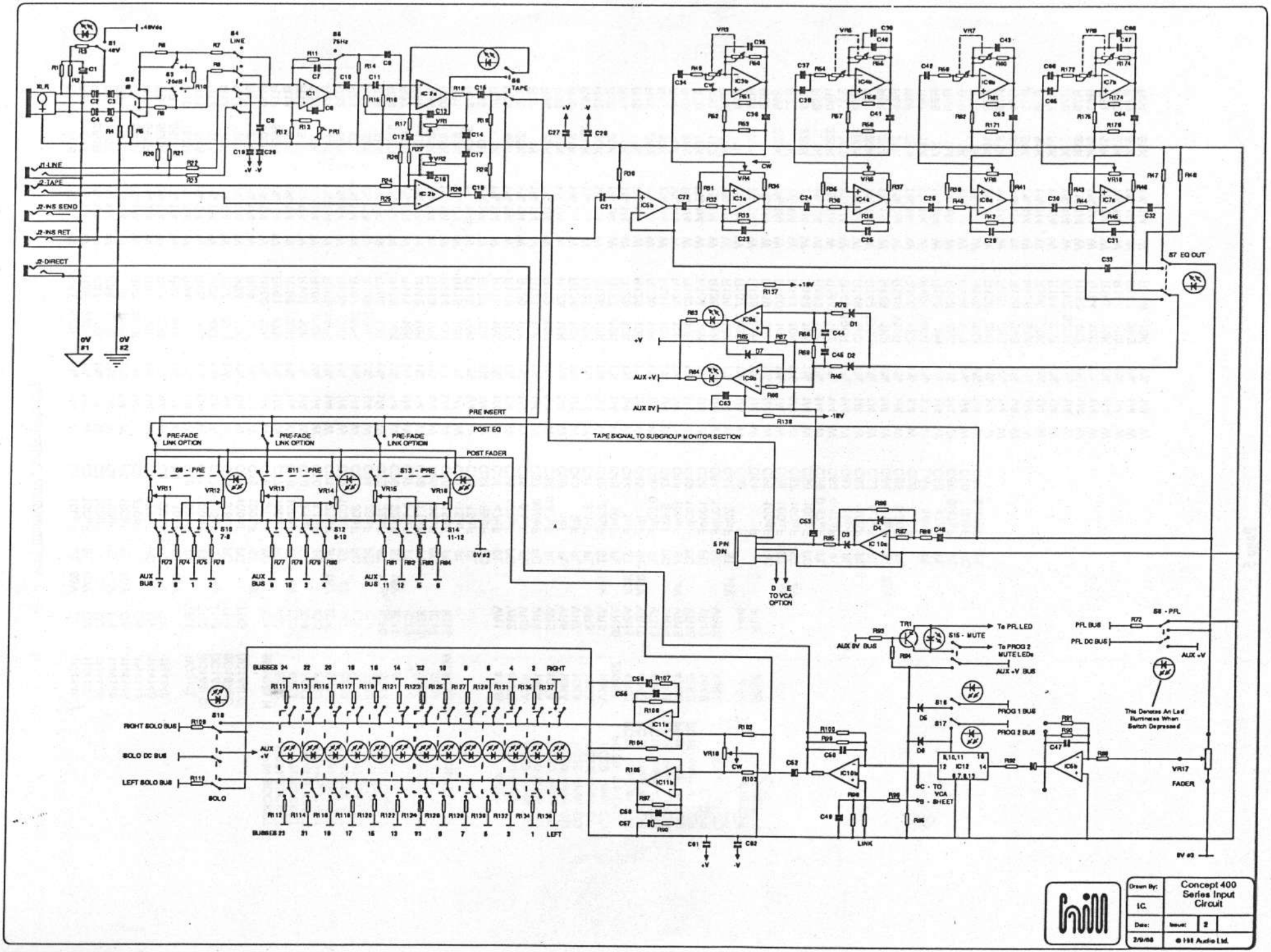
solo
This switch sends the post fader / post pan signal directly to the monitor speakers and is therefore an 'in-place solo' switch. It may be used to check signals in the mix without changing their level and position. More than one channel may be 'soloed' to check several signals at the same time.

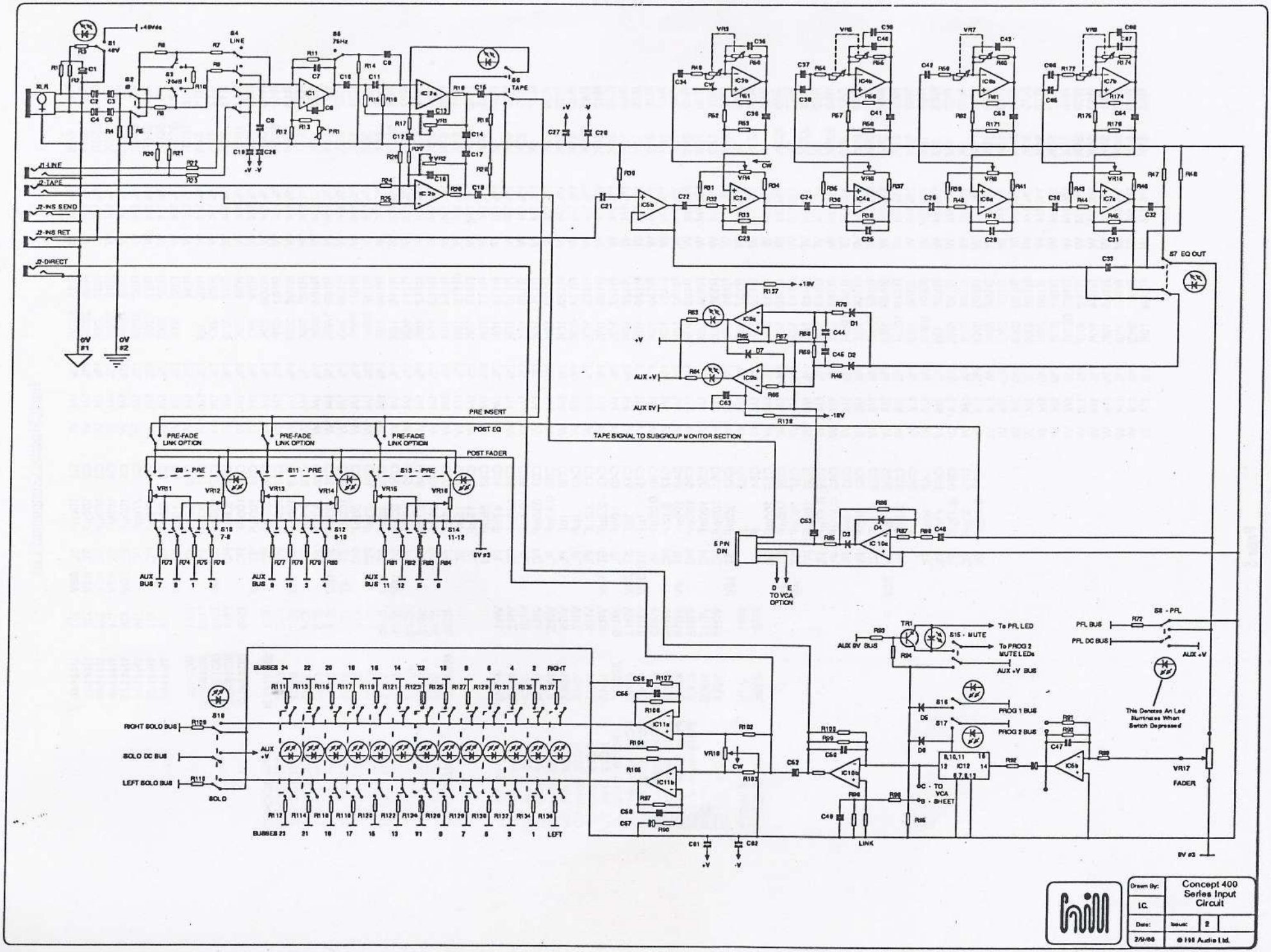
peak
This LED (light emitting diode) indicates when the input signal level is at +10dBu. The LED is POST eq. and PRE fader to allow accurate reading of the signal strength.
This is not a clip indicator - there is 12dB of headroom after this LED illuminates.

signal
This LED indicates that a signal is present at the selected input of the module. It will go out whenever the peak LED comes on.

fader
A 100mm smooth action fader controls the output level of the channel.

routing
The POST fader signal can be sent to any of the 24 subgroups, or to the master stereo outputs, using these switches. Using the pan control in conjunction with the routing switches allows the operator to send to one or both of the outputs selected. Example: select groups 1 - 2. pan left - signal in group 1, pan right - signal in group 2 , pan centre - signal in both. (See details on VCA grouping)


J1-LINE
J2-TAPE
J2-INS SEND
J2-INS RET
J2-DIRECT
0V #1
0V #2
S1 +48V
S4 LINE
S6 75Hz
S6 TAPE
S7 EQ OUT
PRE INSERT
POST EQ
POST FADER
TAPE SIGNAL TO SUBGROUP MONITOR SECTION
PRE-FADE LINK OPTION
S8 - PRE
S11 - PRE
S13 - PRE
AUX BUS 7 8 1 2
AUX BUS 9 10 3 4
AUX BUS 11 12 5 6
0V #3
5 PIN DIN
D E TO VCA OPTION
BUSSES 24 22 20 18 16 14 12 10 8 6 4 2 RIGHT
BUSSES 23 21 19 17 15 13 11 9 7 5 3 1 LEFT
RIGHT SOLO BUS
SOLO DC BUS
LEFT SOLO BUS
SOLO
AUX +V
AUX 0V BUS
TR1
To PFL LED
S15 - MUTE
To PROG 2 MUTE LEDs
AUX +V BUS
S16
PROG 1 BUS
S17
PROG 2 BUS
LINK
C - TO VCA
B - SHEET
S9 - PFL
PFL BUS
PFL DC BUS
AUX +V
This Denotes An Led Illuminess When Switch Depressed
VR17 FADER
Drawn By: I.C.
Date: 2/9/88
Issue: 2
Concept 400 Series Input Circuit
© Hill Audio Ltd.


J1-LINE
J2-TAPE
J2-INS SEND
J2-INS RET
J2-DIRECT
0V #1
0V #2
S1 48V
S4 LINE
S5 75Hz
S6 TAPE
S7 EQ OUT
PRE INSERT
POST EQ
POST FADER
PRE-FADE LINK OPTION
S9 - PRE
S11 - PRE
S13 - PRE
AUX BUS
0V #3
TAPE SIGNAL TO SUBGROUP MONITOR SECTION
5 PIN DIN
D E TO VCA OPTION
RIGHT SOLO BUS
SOLO DC BUS
LEFT SOLO BUS
SOLO
BUSSES 24 22 20 18 16 14 12 10 8 6 4 2 RIGHT
BUSSES 23 21 19 17 15 13 11 9 7 5 3 1 LEFT
S15 - MUTE
To PFL LED
To PROG 2 MUTE LEDs
AUX +V BUS
AUX 0V BUS
S16
PROG 1 BUS
S17
PROG 2 BUS
S8 - PFL
PFL BUS
PFL DC BUS
This Denotes An Led Illuminates When Switch Depressed
C - TO VCA B - SHEET
LINK
VR17 FADER
Drawn By: I.C.
Date: 2/9/88
Concept 400 Series Input Circuit
Issue: 2
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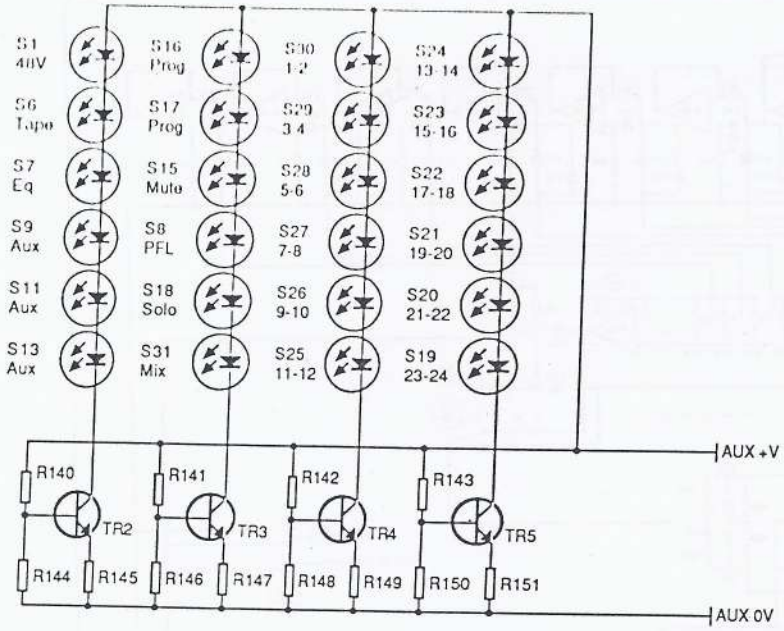
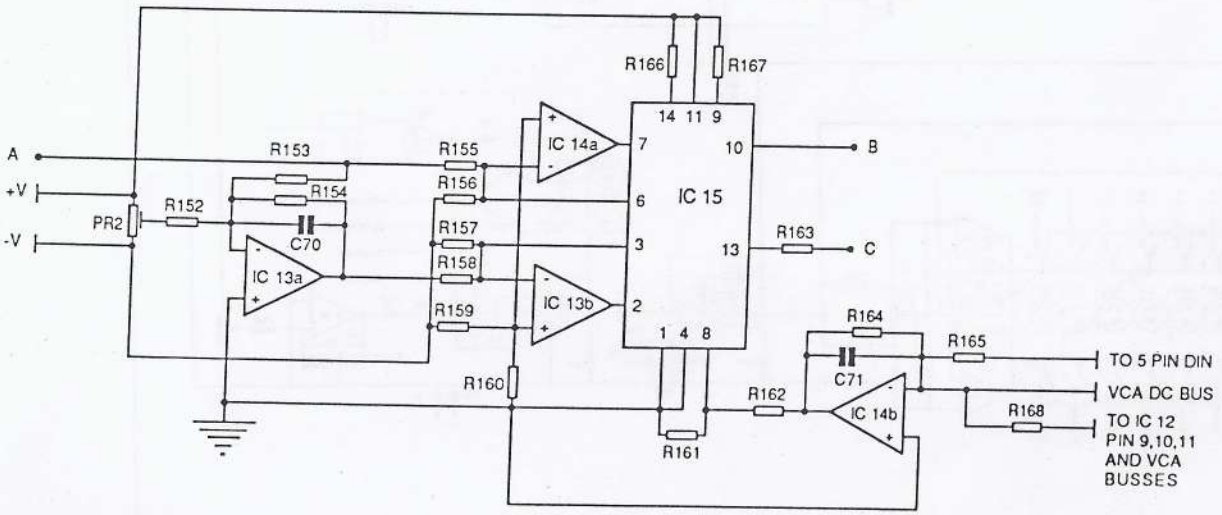
DETAILS OF STATUS LED CONNECTION.



DETAILS OF VCA OPTION.



Drawn By: I.C.	Concept Series Input Card		
Date: 29/3/87	Issue: 1	Sheet 2/2	
© Hill Audio Ltd.			

R 1	6K8	1 %	1/4 W
R 2	6K8	1 %	1/4 W
R 3	560R	1 %	1/4 W
R 4	100K?	1 %	1/4 W
R 5	100K?	1 %	1/4 W
R 6	560R	1 %	1/4 W
R 7	560R	1 %	1/4 W
R 8	560R	1 %	1/4 W
R 9	560R	1 %	1/4 W
R 10	120R	1 %	1/4 W
R 11	5K6	1 %	1/4 W
R 12	7K5	1 %	1/4 W
R 13	20K	1 %	1/4 W
R 14	100K	1 %	1/4 W
R 15	33K	1 %	1/4 W
R 16	100K	1 %	1/4 W
R 17	560R	1 %	1/4 W
R 18	47R	1 %	1/4 W
R 19	51K	1 %	1/4 W
R 20	10K	1 %	1/4 W
R 21	10K	1 %	1/4 W
R 22	56K	1 %	1/4 W
R 23	56K	1 %	1/4 W
R 24	5K6	1 %	1/4 W
R 25	5K6	1 %	1/4 W
R 26	510R	1 %	1/4 W
R 27	560R	1 %	1/4 W
R 28	47R	1 %	1/4 W
R 29	51K	1 %	1/4 W
R 30	51K	1 %	1/4 W
R 31	51K	1 %	1/4 W
R 32	390K	1 %	1/4 W
R 33	10K	1 %	1/4 W
R 34	1K	1 %	1/4 W
R 35	68K	1 %	1/4 W
R 36	22K	1 %	1/4 W
R 37	1K	1 %	1/4 W
R 38	22K	1 %	1/4 W
R 39	51K	1 %	1/4 W
R 40	51K	1 %	1/4 W
R 41	390K	1 %	1/4 W
R 42	10K	1 %	1/4 W
R 43	20K	1 %	1/4 W
R 44	10K	1 %	1/4 W
R 45	10K	1 %	1/4 W
R 46	2K2	1 %	1/4 W
R 47	10K	1 %	1/4 W
R 48	10K	1 %	1/4 W
R 49	2K2	1 %	1/4 W
R 50	10K	1 %	1/4 W
R 51	1K2	1 %	1/4 W
R 52	220K	1 %	1/4 W
R 53	1K	1 %	1/4 W
R 54	220K	1 %	1/4 W
R 55	1K	1 %	1/4 W
R 56	220K	1 %	1/4 W
R 57	1K	1 %	1/4 W
R 58	220K	1 %	1/4 W
R 59	1K	1 %	1/4 W
R 60	220K	1 %	1/4 W
R 61	1K2	1 %	1/4 W
R 62	220K	1 %	1/4 W
R 63	20K	1 %	1/4 W
R 64	3K9	1 %	1/4 W
R 65	51K	1 %	1/4 W
R 66	1K5	1 %	1/4 W
R 67	10K	1 %	1/4 W
R 68	1M	1 %	1/4 W
R 69	1M	1 %	1/4 W
R 70	1K	1 %	1/4 W
R 71	1K	1 %	1/4 W
R 72	10K	1 %	1/4 W
R 73	51K	1 %	1/4 W
R 74	51K	1 %	1/4 W
R 75	51K	1 %	1/4 W
R 76	51K	1 %	1/4 W
R 77	51K	1 %	1/4 W
R 78	51K	1 %	1/4 W
R 79	51K	1 %	1/4 W
R 80	51K	1 %	1/4 W
R 81	51K	1 %	1/4 W
R 82	51K	1 %	1/4 W
R 83	51K	1 %	1/4 W
R 84	51K	1 %	1/4 W
R 85	560R	1 %	1/4 W
R 86	220K	1 %	1/4 W
R 87	1K5	1 %	1/4 W
R 88	220K	1 %	1/4 W
R 89	100K	1 %	1/4 W
R 90	180K	1 %	1/4 W
R 91	150K	1 %	1/4 W
R 92	3K3	1 %	1/4 W
R 93	51K	1 %	1/4 W
R 94	-----	1 %	1/4 W
R 95	1M	1 %	1/4 W
R 96	4K7	1 %	1/4 W
R 97	3K9	1 %	1/4 W
R 98	10K	1 %	1/4 W
R 99	5K1	1 %	1/4 W
R 100	10K	1 %	1/4 W
R 101	47R	1 %	1/4 W
R 102	33K	1 %	1/4 W
R 103	33K	1 %	1/4 W
R 104	100K	1 %	1/4 W
R 105	100K	1 %	1/4 W
R 106	3K9	1 %	1/4 W
R 107	560R	1 %	1/4 W
R 108	560R	1 %	1/4 W
R 109	10K	1 %	1/4 W
R 110	10K	1 %	1/4 W
R 111	10K	1 %	1/4 W
R 112	10K	1 %	1/4 W
R 113	10K	1 %	1/4 W
R 114	10K	1 %	1/4 W
R 115	10K	1 %	1/4 W
R 116	10K	1 %	1/4 W
R 117	10K	1 %	1/4 W
R 118	10K	1 %	1/4 W
R 119	10K	1 %	1/4 W
R 120	10K	1 %	1/4 W
R 121	10K	1 %	1/4 W
R 122	10K	1 %	1/4 W
R 123	10K	1 %	1/4 W
R 124	10K	1 %	1/4 W
R 125	10K	1 %	1/4 W
R 126	10K	1 %	1/4 W
R 127	10K	1 %	1/4 W
R 128	10K	1 %	1/4 W
R 129	10K	1 %	1/4 W
R 130	10K	1 %	1/4 W
R 131	10K	1 %	1/4 W
R 132	10K	1 %	1/4 W
R 133	10K	1 %	1/4 W
R 134	10K	1 %	1/4 W
R 135	10K	1 %	1/4 W
R 136	10K	1 %	1/4 W
R 137	100R	1 %	1/4 W
R 138	100R	1 %	1/4 W
R 139	22K	1 %	1/4 W
R 140	10K	1 %	1/4 W
R 141	10K	1 %	1/4 W
R 142	10K	1 %	1/4 W
R 143	10K	1 %	1/4 W
R 144	1K2	1 %	1/4 W
R 145	100R	1 %	1/4 W
R 146	1K2	1 %	1/4 W
R 147	100R	1 %	1/4 W
R 148	1K2	1 %	1/4 W
R 149	100R	1 %	1/4 W
R 150	1K2	1 %	1/4 W
R 151	100R	1 %	1/4 W
R 152	1M	1 %	1/4 W
R 153	6K8	1 %	1/4 W
R 154	6K8	1 %	1/4 W
R 155	3K3	1 %	1/4 W
R 156	3K3	1 %	1/4 W
R 157	3K3	1 %	1/4 W
R 158	3K3	1 %	1/4 W
R 159	51K	1 %	1/4 W
R 160	20K	1 %	1/4 W
R 161	27R	1 %	1/4 W
R 162	620R	1 %	1/4 W
R 163	4K7	1 %	1/4 W
R 164	10K	1 %	1/4 W
R 165	10K	1 %	1/4 W
R 166	3K3	1 %	1/4 W
R 167	3K3	1 %	1/4 W
R 168	10K	1 %	1/4 W

C 1	100µ F	EL	63V
C 2	100µ F	EL	63V
C 3	100µ F	EL	63V
C 4	100µ F	EL	63V
C 5	100µ F	EL	63V
C 6	270p F	PC	
C 7	270p F	PC	
C 8	22p F	PC	
C 9	10µ F	ST	10V
C 10	33n F	PL	
C 11	33n F	PL	
C 12	100µ F	ST	4V
C 13	5.6p F	PC	
C 14	100p F	PC	
C 15	100µ F	ST	4V
C 16	5.6p F	PC	
C 17	100p F	PC	
C 18	100µ F	ST	4V
C 19	0.1µ F	PL	
C 20	0.1µ F	PL	
C 21	22µ F	ST	16V
C 22	100µ F	ST	4V
C 23	33p F	PC	
C 24	33p F	PC	
C 25	22µ F	ST	16V
C 26	22µ F	ST	16V
C 27	0.1µ F	PL	
C 28	0.1µ F	PL	
C 29	33p F	PC	
C 30	15n F	PL	
C 31	15n F	PL	
C 32	15n F	PL	
C 33	56p F	PC	
C 34	47n F	PL	
C 35	120p F	PC	
C 36	0.1µ F	PL	
C 37	330p F	PC	
C 38	0.47µ F	PL	
C 39	1n F	PL	
C 40	1µ F	PL	
C 41	3.3n F	PL	
C 42	2.2µ F	ST	16V
C 43	10n F	PL	
C 44	1µ F	ST	35V
C 45	1µ F	ST	35V
C 46	0.22µ F	PL	
C 47	5.6p F	PC	
C 48	100µ F	ST	4V
C 49	100p F	PC	
C 50	100p F	PC	
C 51	100p F	PC	
C 52	22µ F	ST	16V
C 53	F		
C 54	F		
C 55	100p F	PC	
C 56	100µ F	ST	4V
C 57	100µ F	ST	4V
C 58	100p F	PC	
C 59	0.47µ F	PL	
C 60	0.47µ F	PL	
C 61	10n F	PL	
C 62	10n F	PL	
C 63	0.1µ F	PL	
C 64	1µ F	ST	35V
C 65	3.3n F	PL	
C 66	----- F		
C 67	10n F	PL	
C 68	47n F	PL	
C 69	0.47µ F	PL	
C 70	33p F	PC	
C 71	0.47µ F	PL	

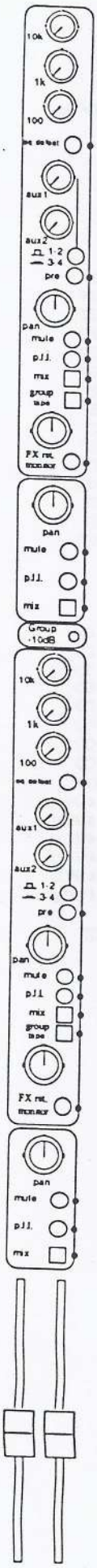
D 1	1N4148	
D 2	1N4148	
D 3	1N4148	
D 4	1N4148	
D 5	1N4148	
D 6	1N4148	
D 7	1N4148	(IN PLACE OF R34)
D 8	1N4148	

TR 1	BC213L	
TR 2	BC184LC	
TR 3	BC184LC	
TR 4	BC184LC	
TR 5	BC184LC	

IC 1	5534 N	8 PIN SOCKET
IC 2	5532	8 PIN SOCKET
IC 3	5532	8 PIN SOCKET
IC 4	5532	8 PIN SOCKET
IC 5	5532	8 PIN SOCKET
IC 6	5532	8 PIN SOCKET
IC 7	5532	8 PIN SOCKET
IC 8	5532	8 PIN SOCKET
IC 9	5532	8 PIN SOCKET
IC 10	5532	8 PIN SOCKET
IC 11	5532	8 PIN SOCKET
IC 12	4053B	16 PIN SOCKET
IC 13	5532	8 PIN SOCKET
IC 14	5532	8 PIN SOCKET
IC 15	MTA1537A	14 PIN SOCKET

VR 1	47KB	PC20 1/4
VR 2	47KB	PC20 4mm CD
VR 3	10KA	PC20 4mm CD
VR 4	10KA	PC20 4mm CD
VR 5	10KA	PC20 4mm CD
VR 6	10KA	PC20 4mm CD
VR 7	10KA	PC20 4mm CD
VR 8	10KA	PC20 4mm CD
VR 9	10KA	PC20 4mm CD
VR 10	220KC	PC 20 1/4 DUAL
VR 11	47KB	PC16 4mm 41POS
VR 12	47KB	PC16 4mm 41POS
VR 13	47KB	PC16 4mm 41POS
VR 14	47KB	PC16 4mm 41POS
VR 15	47KB	PC16 4mm 41POS
VR 16	47KB	PC16 4mm 41POS
VR 17	10KB	FADER
VR 18	10KA	PC20 1/4 CD

PR 1	4.7K	PRESET
PR 2	220K	PRESET



SUBGROUP

Monitor section x 2

Two monitor sections are provided to allow for 16 track monitoring on the 8 bus version and 24 track monitoring on the 12 bus version.

equalisation
The response is of the bell type with a response of:

10kHz +/- 12dB
1kHz +/- 12dB
100Hz +/- 12dB

It operates on the monitor signal as selected by the source / tape and effects switch as described later.

defeat
This switch defeats the current setting of equalisation, thus allowing a comparison to be made.

auxiliary
These controls allow some of the monitor signal to be "tapped" off the signal path (without affecting the signal strength) at different positions, and sent to an auxiliary device (such as an echo unit) or to a separate amplifier for cue (foldback) purposes.
aux #1/2 auxiliary #1/2 take signal from the signal path PRE insert, eq. and fader (i.e. before eq. and fader) and is therefore only dependent on the input gain. PRE eq. and fader signal is ideally suited for cue (foldback). They may be switched to aux #3/4 in which case they are POST the monitor fader and e.q. and ideally suited for effects sends. Dual concentric controls may be optionally fitted to allow simultaneous access to all 4 busses.

pan
This control adjusts the position of the subgroup monitor signal within the stereo image of the monitor or mix outputs.

mute
This switch mutes the signal from this monitor group to the monitor speakers or master outputs. It does not affect the pfl signal or pre-fade aux1 and aux2 sends.

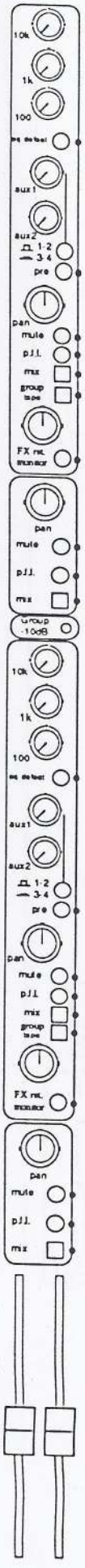
pfl (pre fader listen)
This switch sends the PRE fader signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl led display. It will also send the signal to the monitor output if pfl auto has been depressed.

mix
The POST fader signal is normally sent to the stereo monitor outputs. Pressing the MIX switch assigns the monitor sends to the MIX outputs. Using the pan control in conjunction with the MIX switch allows the operator to send to one or both of the outputs selected.

fx
This switch selects the effects input to the monitor section, overriding the group/tape switch below. This input is suited to use as an effects return input during remixing when all input channels are used for tape returns. The LED metering does not monitor this input which may be viewed on the pfl VU.

tape
This controls the input to this monitor section which may be either the subgroup output or the tape return signal. An LED indicates when tape is selected. The metering follows the group / tape switches.

monitor level
A rotary fader which controls the level of the signal to the stereo monitor output. The output from here is routed via the PAN control and the MASTER switch.



SUBGROUP

Subgroup output section

12 segment LED display (On Meter Bridge)
0dB on the 12 segment LED display indicates that the input level is at +4dBm. The LED's are peak read, with an attack time of 1.7ms similar to PPM standards. The decay time is 1.15ms, which is slightly faster than the PPM standard of 1.5 secs. The LEDs are PRE monitor fader (i.e. they are looking at what is coming into the monitor section from the tape/source switch). They can be used to check the level returned from the tape machine (off-tape level check) or to check the level being sent to the subgroup output. The subgroup feed to the monitors is taken after the subgroup fader, which will thus affect the monitor mix. The FX input cannot be monitored with these LEDs so that tape/source monitoring can continue when these inputs are used as effects returns.

group -10dBv
The subgroup direct outputs are normally set to +4dBm output level - the recording industry standard. This internal switch reduces the output level by 14dB allowing the CONCEPT series to interface with -10dBv equipment. Depress the switch to change to -10dBv outputs.

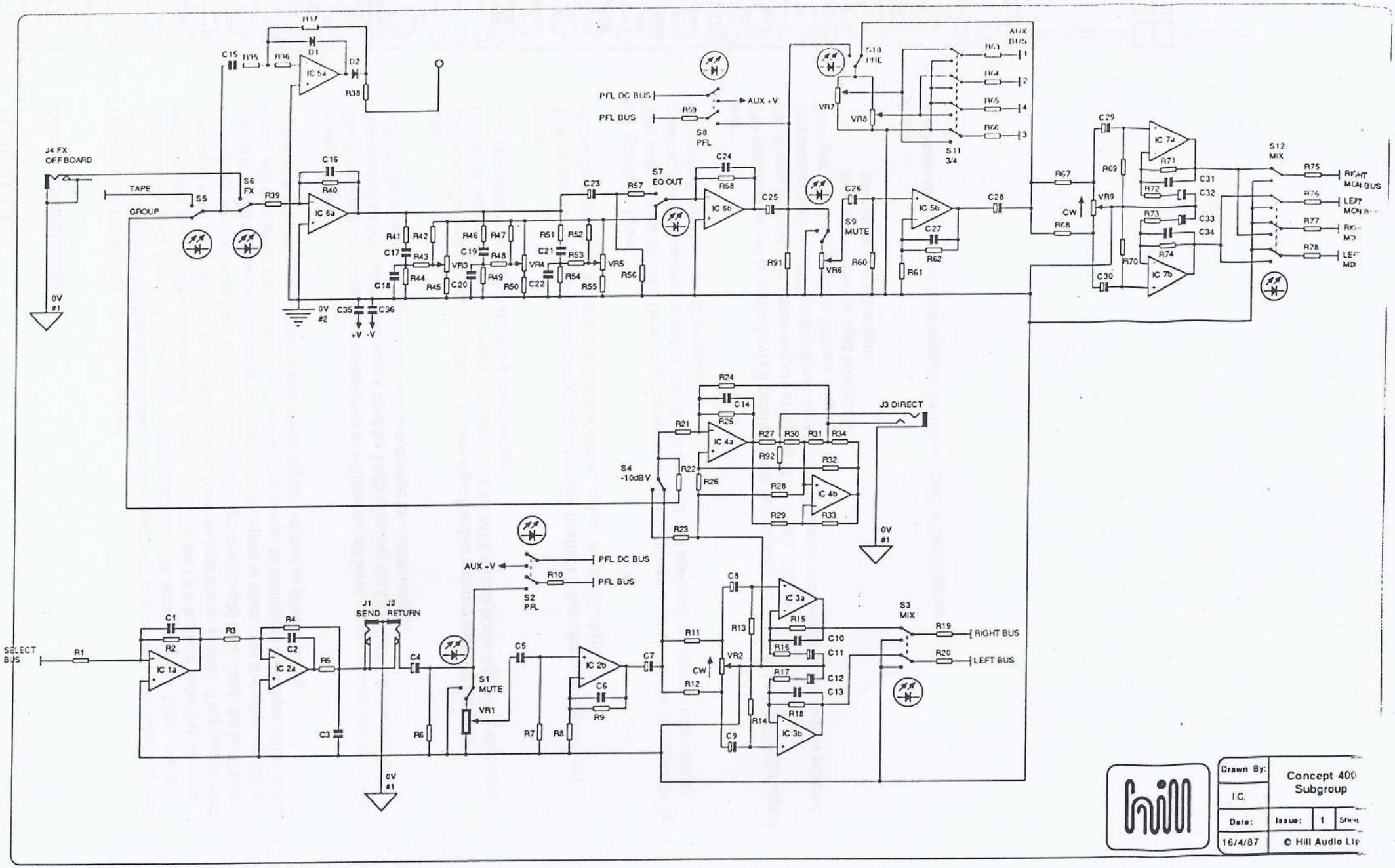
pan
This control adjusts the position of the subgroup signal within a stereo image of the MIX Left/Right outputs if the MIX switch is depressed. If the MIX switch is not depressed, the signal is only accessible using the subgroup direct output.

mute
This switch prevents signal from leaving the subgroup. In effect it turns the subgroup off, yet allows the signal to be monitored in the headphones and on the pfl VU display

pfl (pre fader listen)
This switch sends the PRE fader subgroup signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl VU meter. It will also send the signal to the monitor output if **pfl auto** has been depressed.

mix
The subgroup output is available via 2 parallel direct output jacks. In addition the POST fader signal can be sent to the master stereo outputs using the MIX switch. Using the pan control in conjunction with the MIX switch allows the operator to send to one or both of the outputs selected.
Example: pan left - signal in left mix output
pan right - signal in right mix output
pan centre - signal in both

fader
A 100mm smooth action fader controls the output level of the subgroup.


J4 FX OFF BOARD
TAPE
GROUP
S5
S6 FX
S7 EQ OUT
S8 PFL
S9 MUTE
S10 PRE
S11 3/4
S12 MIX
PFL DC BUS
PFL BUS
AUX +V
AUX BUS
IC 5a
IC 6a
IC 6b
IC 5b
IC 7a
IC 7b
0V #1
0V #2
+V -V
J3 DIRECT
S4 -10dBV
IC 4a
IC 4b
J1 SEND
J2 RETURN
S2 PFL
S1 MUTE
VR1
IC 1a
IC 2a
IC 2b
IC 3a
IC 3b
S3 MIX
SELECT BUS
RIGHT BUS
LEFT BUS
RIGHT MON BUS
LEFT MON BUS
CW
Drawn By: I.C.
Concept 400 Subgroup
Date: 16/4/87
Issue: 1
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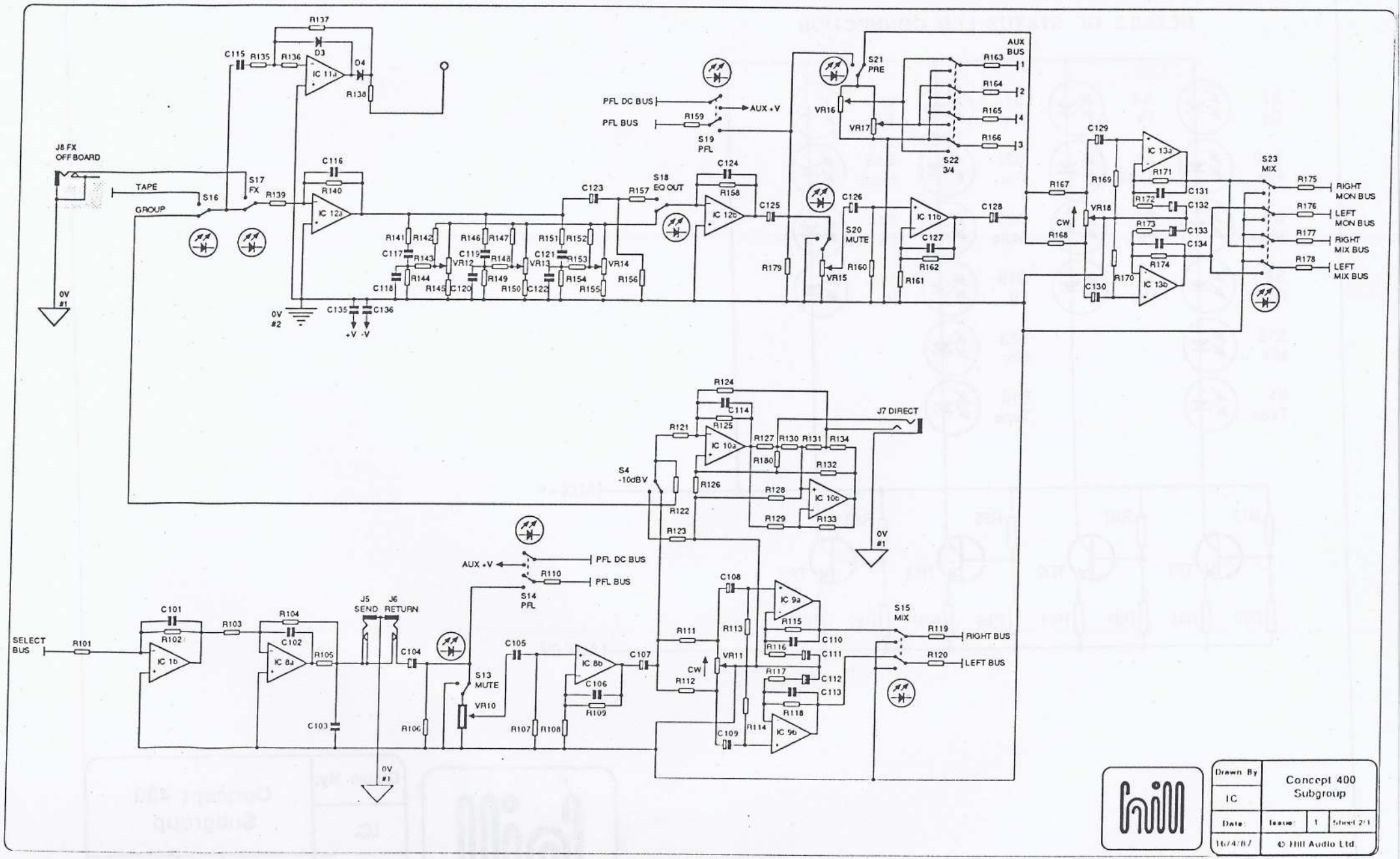
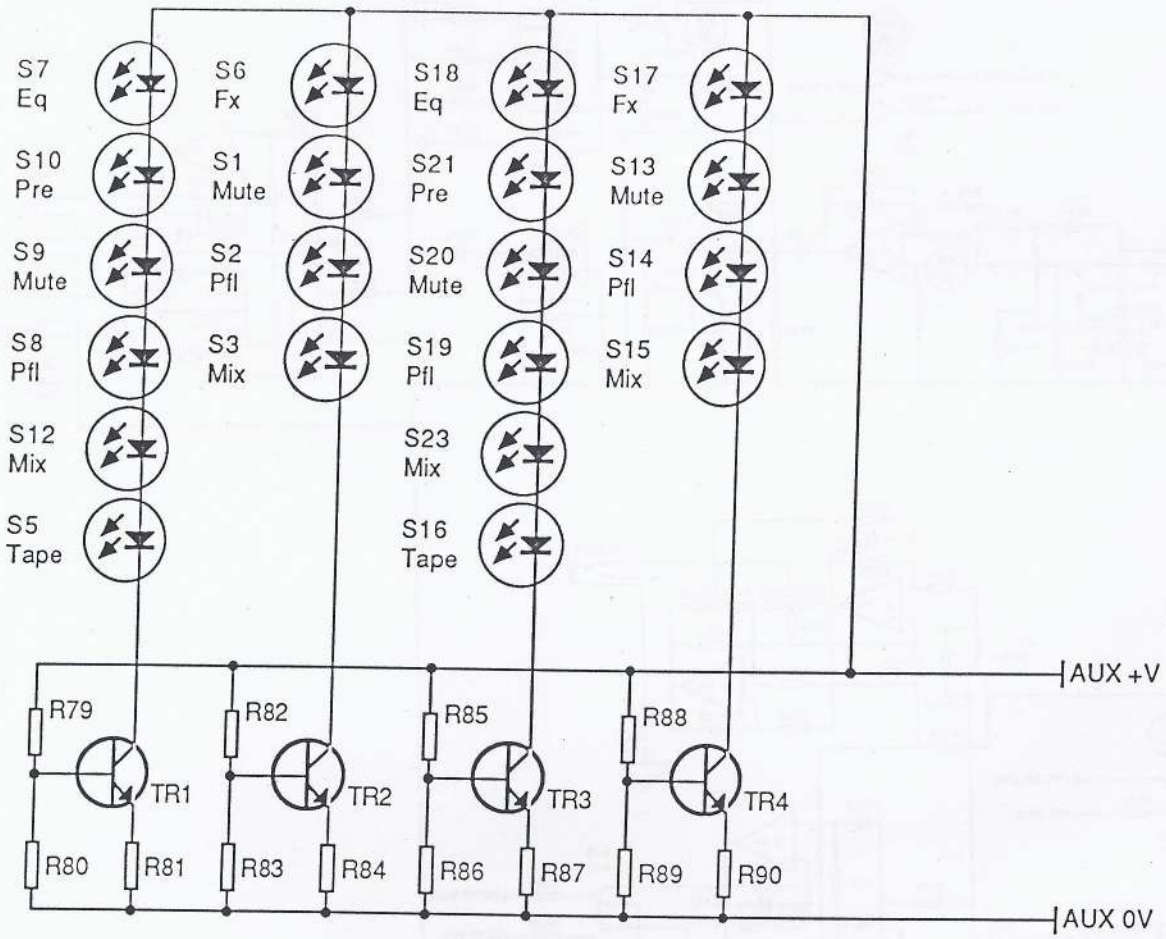


Drawn By	Concept 400 Subgroup	
IC		
Date	Issue: 1	Sheet 2/3
16/4/87	© Hill Audio Ltd.	

DETAILS OF STATUS LED CONNECTION.



Drawn By: I.C.	Concept 400 Subgroup		
Date: 16/4/87	Issue: 1		Sheet 3/3
	© Hill Audio Ltd.		

R 1	27R	1 % 1/4 W	R 88	10K	1 % 1/4 W	C 1	22p F	PC				D 1	1N4148		
R 2	10K	1 % 1/4 W	R 89	1K2	1 % 1/4 W	C 2	47p F	PC				D 2	1N4148		
R 3	10K	1 % 1/4 W	R 90	100R	1 % 1/4 W	C 3	100p F	PC				D 3	1N4148		
R 4	10K	1 % 1/4 W	R 91	51K	1 % 1/4 W	C 4	22µ F	ST	16V			D 4	1N4148		
R 5	47R	1 % 1/4 W	R 92	39K	1 % 1/4 W	C 5	0.33µ F	PL							
R 6	51K	1 % 1/4 W				C 6	100p F	PC				TR 1	BC184LC		
R 7	100K	1 % 1/4 W	R 101	27R	1 % 1/4 W	C 7	100µ F	ST	4V			TR 2	BC184LC		
R 8	27K	1 % 1/4 W	R 102	10K	1 % 1/4 W	C 8	1µ F	ST	35V			TR 3	BC184LC		
R 9	22K	1 % 1/4 W	R 103	10K	1 % 1/4 W	C 9	1µ F	ST	35V			TR 4	BC184LC		
R 10	10K	1 % 1/4 W	R 104	10K	1 % 1/4 W	C 10	47p F	PC							
R 11	33K	1 % 1/4 W	R 105	47R	1 % 1/4 W	C 11	10µ F	ST	10V			IC 1	5532		
R 12	33K	1 % 1/4 W	R 106	51K	1 % 1/4 W	C 12	10µ F	ST	10V			IC 2	5532		
R 13	39K	1 % 1/4 W	R 107	100K	1 % 1/4 W	C 13	47p F	PC				IC 3	5532		
R 14	39K	1 % 1/4 W	R 108	27K	1 % 1/4 W	C 14	22p F	PC				IC 4	5532		
R 15	39K	1 % 1/4 W	R 109	22K	1 % 1/4 W	C 15	0.22µ F	PL				IC 5	5532		
R 16	5K6	1 % 1/4 W	R 110	10K	1 % 1/4 W	C 16	100p F	PC				IC 6	5532		
R 17	5K6	1 % 1/4 W	R 111	33K	1 % 1/4 W	C 17	4.7n F	PL				IC 7	5532		
R 18	39K	1 % 1/4 W	R 112	33K	1 % 1/4 W	C 18	1n F	PL				IC 8	5532		
R 19	10K	1 % 1/4 W	R 113	39K	1 % 1/4 W	C 19	68n F	PL				IC 9	5532		
R 20	10K	1 % 1/4 W	R 114	39K	1 % 1/4 W	C 20	22n F	PL				IC 10	5532		
R 21	39K	1 % 1/4 W	R 115	39K	1 % 1/4 W	C 21	22µ F	ST	16V			IC 11	5532		
R 22	3K3	1 % 1/4 W	R 116	5K6	1 % 1/4 W	C 22	0.33µ F	PL				IC 12	5532		
R 23	1K2	1 % 1/4 W	R 117	5K6	1 % 1/4 W	C 23	22µ F	ST	16V			IC 13	5532		
R 24	39K	1 % 1/4 W	R 118	39K	1 % 1/4 W	C 24	10p F	PC							
R 25	20K	1 % 1/4 W	R 119	10K	1 % 1/4 W	C 25	22µ F	ST	16V						
R 26	39K	1 % 1/4 W	R 120	10K	1 % 1/4 W	C 26	1µ F	ST	35V						
R 27	27R	1 % 1/4 W	R 121	39K	1 % 1/4 W	C 27	100p F	PC							
R 28	4M7	1 % 1/4 W	R 122	3K3	1 % 1/4 W	C 28	22µ F	ST	16V						
R 29	100K	1 % 1/4 W	R 123	1K2	1 % 1/4 W	C 29	1µ F	ST	35V			VR 1	10KB	FADER	
R 30	100K	1 % 1/4 W	R 124	39K	1 % 1/4 W	C 30	1µ F	ST	35V			VR 2	10KA	PC20 1/4 CD	
R 31	100K	1 % 1/4 W	R 125	20K	1 % 1/4 W	C 31	47p F	PC				VR 3	47KB	PC20 4mm CD	
R 32	20K	1 % 1/4 W	R 126	39K	1 % 1/4 W	C 32	10µ F	ST	10V			VR 4	47KB	PC20 4mm CD	
R 33	100K	1 % 1/4 W	R 127	27R	1 % 1/4 W	C 33	10µ F	ST	10V			VR 5	47KB	PC20 4mm CD	
R 34	27R	1 % 1/4 W	R 128	4M7	1 % 1/4 W	C 34	47p F	PC				VR 6	10KB	PC16 4mm	
R 35	220K	1 % 1/4 W	R 129	100K	1 % 1/4 W	C 35	0.1µ F	PL				VR 7	47KB	PC16 4mm 41POS	
R 36	1K5	1 % 1/4 W	R 130	100K	1 % 1/4 W	C 36	0.1µ F	PL				VR 8	47KB	PC16 4mm 41POS	
R 37	220K	1 % 1/4 W	R 131	100K	1 % 1/4 W							VR 9	10KA	PC16 4mm CD	
R 38	560R	1 % 1/4 W	R 132	20K	1 % 1/4 W	C 101	22p F	PC				VR 10	10KB	FADER	
R 39	10K	1 % 1/4 W	R 133	100K	1 % 1/4 W	C 102	47p F	PC				VR 11	10KA	PC20 1/4 CD	
R 40	10K	1 % 1/4 W	R 134	27R	1 % 1/4 W	C 103	100p F	PC				VR 12	47KB	PC20 4mm CD	
R 41	5K6	1 % 1/4 W	R 135	220K	1 % 1/4 W	C 104	22µ F	ST	16V			VR 13	47KB	PC20 4mm CD	
R 42	15K	1 % 1/4 W	R 136	1K5	1 % 1/4 W	C 105	0.33µ F	PL				VR 14	47KB	PC20 4mm CD	
R 43	5K6	1 % 1/4 W	R 137	220K	1 % 1/4 W	C 106	100p F	PC				VR 15	10KB	PC16 4mm	
R 44	5K6	1 % 1/4 W	R 138	560R	1 % 1/4 W	C 107	100µ F	ST	4V			VR 16	47KB	PC16 4mm 41POS	
R 45	560R	1 % 1/4 W	R 139	10K	1 % 1/4 W	C 108	1µ F	ST	35V			VR 17	47KB	PC16 4mm 41POS	
R 46	5K6	1 % 1/4 W	R 140	10K	1 % 1/4 W	C 109	1µ F	ST	35V			VR 18	10KA	PC16 4mm CD	
R 47	15K	1 % 1/4 W	R 141	5K6	1 % 1/4 W	C 110	47p F	PC							
R 48	5K6	1 % 1/4 W	R 142	15K	1 % 1/4 W	C 111	10µ F	ST	10V						
R 49	5K6	1 % 1/4 W	R 143	5K6	1 % 1/4 W	C 112	10µ F	ST	10V						
R 50	560R	1 % 1/4 W	R 144	5K6	1 % 1/4 W	C 113	47p F	PC							
R 51	5K6	1 % 1/4 W	R 145	560R	1 % 1/4 W	C 114	22p F	PC							
R 52	15K	1 % 1/4 W	R 146	5K6	1 % 1/4 W	C 115	0.22µ F	PL							
R 53	5K6	1 % 1/4 W	R 147	15K	1 % 1/4 W	C 116	100p F	PC							
R 54	5K6	1 % 1/4 W	R 148	5K6	1 % 1/4 W	C 117	4.7n F	PL							
R 55	560R	1 % 1/4 W	R 149	5K6	1 % 1/4 W	C 118	1n F	PL							
R 56	51K	1 % 1/4 W	R 150	560R	1 % 1/4 W	C 119	68n F	PL							
R 57	75K	1 % 1/4 W	R 151	5K6	1 % 1/4 W	C 120	22n F	PL							
R 58	75K	1 % 1/4 W	R 152	15K	1 % 1/4 W	C 121	22µ F	ST	16V						
R 59	10K	1 % 1/4 W	R 153	5K6	1 % 1/4 W	C 122	0.33µ F	PL							
R 60	100K	1 % 1/4 W	R 154	5K6	1 % 1/4 W	C 123	22µ F	ST	16V						
R 61	27K	1 % 1/4 W	R 155	560R	1 % 1/4 W	C 124	10p F	PC							
R 62	22K	1 % 1/4 W	R 156	51K	1 % 1/4 W	C 125	22µ F	ST	16V						
R 63	51K	1 % 1/4 W	R 157	75K	1 % 1/4 W	C 126	1µ F	ST	35V						
R 64	51K	1 % 1/4 W	R 158	75K	1 % 1/4 W	C 127	100p F	PC							
R 65	51K	1 % 1/4 W	R 159	10K	1 % 1/4 W	C 128	22µ F	ST	16V						
R 66	51K	1 % 1/4 W	R 160	100K	1 % 1/4 W	C 129	1µ F	ST	35V						
R 67	33K	1 % 1/4 W	R 161	27K	1 % 1/4 W	C 130	1µ F	ST	35V						
R 68	33K	1 % 1/4 W	R 162	22K	1 % 1/4 W	C 131	47p F	PC							
R 69	39K	1 % 1/4 W	R 163	51K	1 % 1/4 W	C 132	10µ F	ST	10V						
R 70	39K	1 % 1/4 W	R 164	51K	1 % 1/4 W	C 133	10µ F	ST	10V						
R 71	39K	1 % 1/4 W	R 165	51K	1 % 1/4 W	C 134	47p F	PC							
R 72	5K6	1 % 1/4 W	R 166	51K	1 % 1/4 W	C 135	0.1µ F	PL							
R 73	5K6	1 % 1/4 W	R 167	33K	1 % 1/4 W	C 136	0.1µ F	PL							
R 74	39K	1 % 1/4 W	R 168	33K	1 % 1/4 W										
R 75	10K	1 % 1/4 W	R 169	39K	1 % 1/4 W										
R 76	10K	1 % 1/4 W	R 170	39K	1 % 1/4 W										
R 77	10K	1 % 1/4 W	R 171	39K	1 % 1/4 W										
R 78	10K	1 % 1/4 W	R 172	5K6	1 % 1/4 W										
R 79	10K	1 % 1/4 W	R 173	5K6	1 % 1/4 W										
R 80	1K2	1 % 1/4 W	R 174	39K	1 % 1/4 W										
R 81	100R	1 % 1/4 W	R 175	10K	1 % 1/4 W										
R 82	10K	1 % 1/4 W	R 176	10K	1 % 1/4 W										
R 83	1K2	1 % 1/4 W	R 177	10K	1 % 1/4 W										
R 84	100R	1 % 1/4 W	R 178	10K	1 % 1/4 W										
R 85	10K	1 % 1/4 W	R 179	51K	1 % 1/4 W										
R 86	1K2	1 % 1/4 W	R 180	39K	1 % 1/4 W										
R 87	100R	1 % 1/4 W													

MATRIX SUBGROUP SECTION

Matrix Send Level controls

8 Matrix level controls are provided to allow the user to generate a special mix of the subgroups, for instance for a dressing-room mix or different areas of the concert hall. The signal source for these controls is internally linkable to either PRE or POST the main subgroup fader.

Matrix Master section

Mute

This switch prevents signal from leaving the matrix group. In effect it turns off the matrix output, yet allows the signal to be monitored in the headphones and on the pfl VU meter.

pfl (pre fader listen)

This switch sends the PRE fader matrix signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl VU meter. It will also send the signal to the monitor output if pfl auto has been depressed.

Level

A rotary master level control is provided to adjust the overall level for a matrix group.

Effects return input

An effects return is provided to allow extra inputs to be added to the mix without using input modules. It is similar to the input module with reduced facilities.

equalisation

The response is of the bell type with a response of:

10kHz +/- 12dB
1kHz +/- 12dB
100Hz +/- 12dB

defeat

This switch defeats the current setting of equalisation, thus allowing a comparison to be made.

auxiliary

These controls allow some of the effects signal to be "tapped" off the signal path (without affecting the signal strength) at different positions, and sent to an auxiliary device (such as an echo unit) or to a separate amplifier for cue (foldback) purposes.

aux #1/2 auxiliary #1/2 take signal from the signal path PRE insert, eq. and fader (i.e. before eq. and fader) and is therefore only dependent on the input gain. PRE eq. and fader signal is ideally suited for cue (foldback). They may be switched to aux #3/4 in which case they are POST the effects fader and e.q. and ideally suited for additional effects sends. Dual concentric controls may be optionally fitted to allow simultaneous access to all 4 busses.

pan

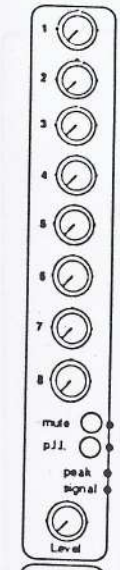
This control adjusts the position of the subgroup monitor signal within the stereo image of the monitor or mix outputs.

mute

This switch mutes the signal from this monitor group to the monitor speakers or master outputs. It does not affect the pfl signal or pre-fade aux1 and aux2 sends.

pfl (pre fader listen)

This switch sends the PRE fader signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl led display. It will also send the signal to the monitor output if pfl auto has been depressed.



Effects return input contd.

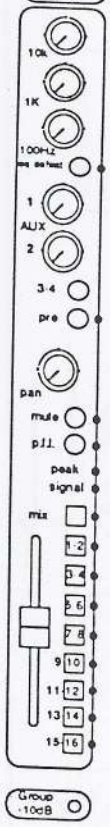
peak
This LED (light emitting diode) indicates when the input signal level is at +10dBu. The LED is POST eq. and PRE fader to allow accurate reading of the signal strength.
This is not a clip indicator - there is 12dB of headroom after this LED illuminates.

signal
This LED indicates that a signal is present at the input of the module. It will go out whenever the peak LED comes on.

fader
A 60mm smooth action fader controls the output level of the channel.

routing
The POST fader signal can be sent to any of the 16 subgroups, or to the master stereo outputs, using these switches. Using the pan control in conjunction with the routing switches allows the operator to send to one or both of the outputs selected. Example: select groups 1 - 2. pan left - signal in group 1, pan right - signal in group 2 , pan centre - signal in both.

SUBGROUP



Subgroup output section

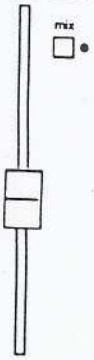
12 segment LED display (On Meter Bridge)
0dB on the 12 segment LED display indicates that the input level is at +4dBm. The LED's are peak read, with an attack time of 1.7ms similar to PPM standards. The decay time is 1.15ms, which is slightly faster than the PPM standard of 1.5 secs. The LEDs are POST the subgroup fader.

group -10dBv
The subgroup direct outputs are normally set to +4dBm output level - the recording industry standard. This internal switch reduces the output level by 14dB allowing the CONCEPT series to interface with -10dBv equipment. Depress the switch to change to -10dBv outputs.

pan
This control adjusts the position of the subgroup signal within a stereo image of the MIX Left/Right outputs if the MIX switch is depressed. If the MIX switch is not depressed, the signal is only accessible using the subgroup direct output.

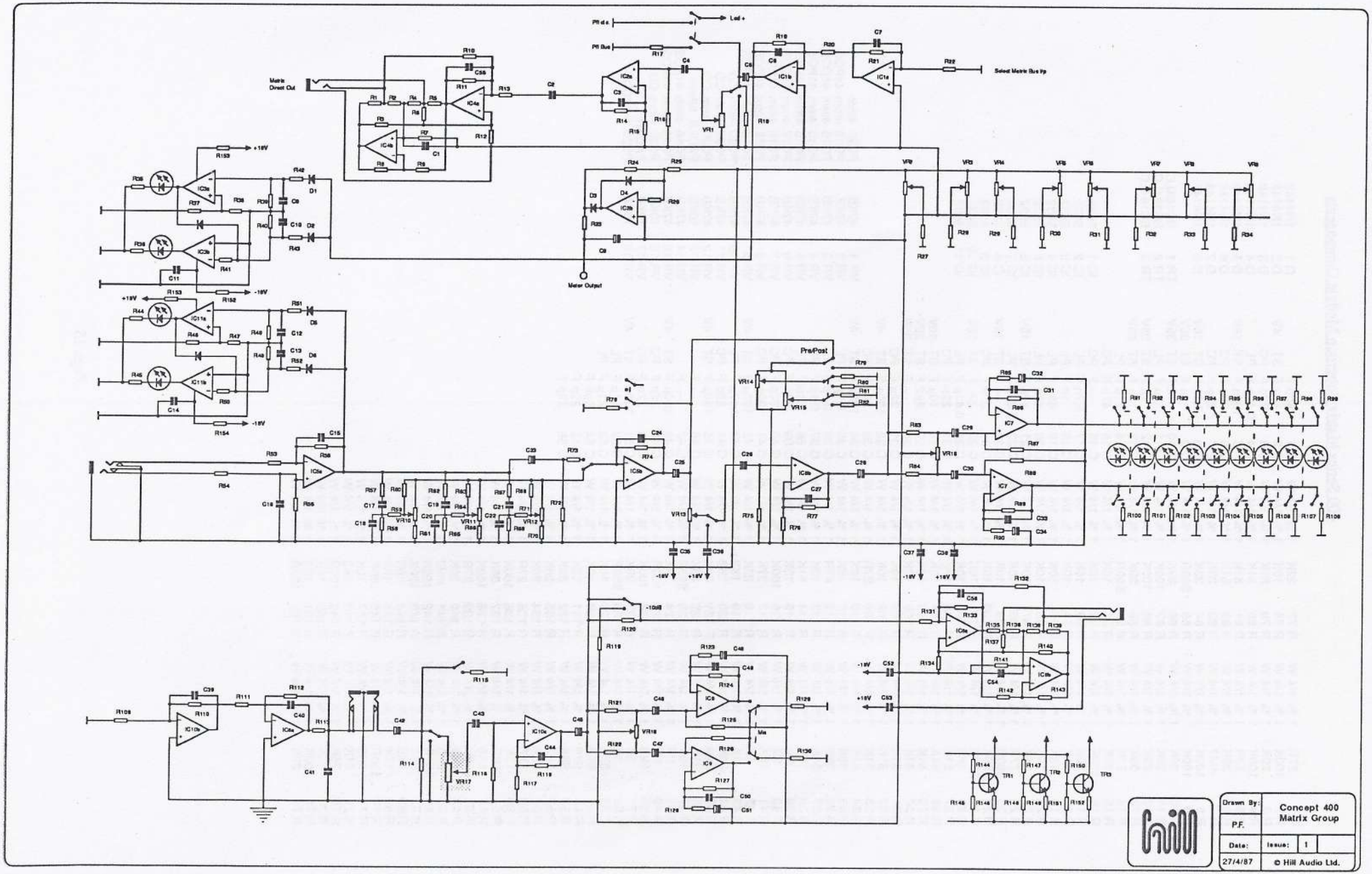
mute
This switch prevents signal from leaving the subgroup. In effect it turns the subgroup off, yet allows the signal to be monitored in the headphones and on the pfl VU display

pfl (pre fader listen)
This switch sends the PRE fader subgroup signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl VU meter. It will also send the signal to the monitor output if **pfl auto** has been depressed.



mix
The subgroup output is available via a direct output jack on the rear panel. In addition the POST fader signal can be sent to the master stereo outputs using the MIX switch. Using the pan control in conjunction with the MIX switch allows the operator to send to one or both of the outputs selected.
Example: pan left - signal in left mix output
pan right - signal in right mix output
pan centre - signal in both

fader
A 100mm smooth action fader controls the output level of the subgroup.


Matrix Direct Out
Pfl d.c.
Pfl Bus
Led +
Select Matrix Bus Op
Meter Output
Pre/Post
-10dB
Drawn By: P.F.
Concept 400 Matrix Group
Date: 27/4/87
Issue: 1
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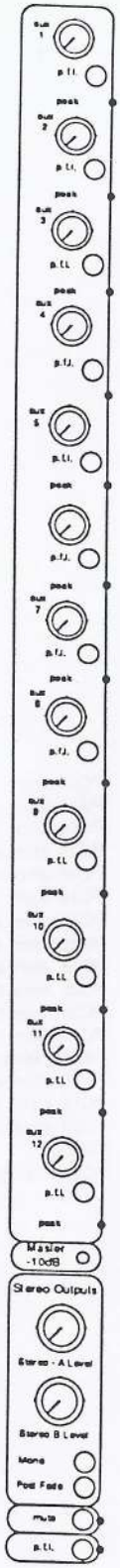
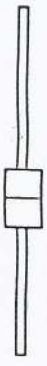
400 Series Matrix Subgroup Module Components

R 1	27R	1 % 1/4 W	R 77	22K	1 % 1/4 W	C 1	5p6 F			D 1	1N4148				
R 2	100K	1 % 1/4 W	R 78	10K	1 % 1/4 W	C 2	10µ F	ST	4V	D 2	1N4148				
R 3	20K	1 % 1/4 W	R 79	51K	1 % 1/4 W	C 3	22p F	PC		D 3	1N4148				
R 4	100K	1 % 1/4 W	R 80	51K	1 % 1/4 W	C 4	0.47µ F	PL		D 4	1N4148				
R 5	27R	1 % 1/4 W	R 81	51K	1 % 1/4 W	C 5	100µ F	ST	16V	D 5	1N4148				
R 6	39K	1 % 1/4 W	R 82	51K	1 % 1/4 W	C 6	22p F	PC		D 6	1N4148				
R 7	4M7	1 % 1/4 W	R 83	33K	1 % 1/4 W	C 7	22p F	PC		D 7	1N4148				
R 8	100K	1 % 1/4 W	R 84	33K	1 % 1/4 W	C 8	2.2µ F	ST	16V	D 8	1N4148				
R 9	100K	1 % 1/4 W	R 85	560R	1 % 1/4 W	C 9	1µ F	ST	35V						
R 10	39K	1 % 1/4 W	R 86	39K	1 % 1/4 W	C 10	1µ F	ST	35V	TR 1	BC184LC				
R 11	20K	1 % 1/4 W	R 87	100K	1 % 1/4 W	C 11	0.1µ F	PL		TR 2	BC184LC				
R 12	39K	1 % 1/4 W	R 88	100K	1 % 1/4 W	C 12	1µ F	ST	35V	TR 3	BC184LC				
R 13	39K	1 % 1/4 W	R 89	39K	1 % 1/4 W	C 13	1µ F	ST	35V						
R 14	22K	1 % 1/4 W	R 90	560R	1 % 1/4 W	C 14	0.1µ F	PL							
R 15	27K	1 % 1/4 W	R 91	10K	1 % 1/4 W	C 15	47p F	PC							
R 16	100K	1 % 1/4 W	R 92	10K	1 % 1/4 W	C 16	--- F	PC		IC 1	5532				
R 17	10K	1 % 1/4 W	R 93	10K	1 % 1/4 W	C 17	4.7n F	PL		IC 2	5532				
R 18	51K	1 % 1/4 W	R 94	10K	1 % 1/4 W	C 18	1n F	PL		IC 3	5532				
R 19	10K	1 % 1/4 W	R 95	10K	1 % 1/4 W	C 19	68n F	PL		IC 4	5532				
R 20	10K	1 % 1/4 W	R 96	10K	1 % 1/4 W	C 20	22n F	PL		IC 5	5532				
R 21	51K	1 % 1/4 W	R 97	10K	1 % 1/4 W	C 21	10µ F	ST	10V	IC 6	5532				
R 22	27R	1 % 1/4 W	R 98	10K	1 % 1/4 W	C 22	0.33µ F	PL		IC 7	5532				
R 23	560R	1 % 1/4 W	R 99	10K	1 % 1/4 W	C 23	--- F	ST	16V	IC 8	5532				
R 24	220K	1 % 1/4 W	R 100	10K	1 % 1/4 W	C 24	22p F	PC		IC 9	5532				
R 25	220K	1 % 1/4 W	R 101	10K	1 % 1/4 W	C 25	22µ F	ST	16V	IC 10	5532				
R 26	1K5	1 % 1/4 W	R 102	10K	1 % 1/4 W	C 26	0.47µ F	PL		IC 11	5532				
R 27	51K	1 % 1/4 W	R 103	10K	1 % 1/4 W	C 27	22p F	PC							
R 28	51K	1 % 1/4 W	R 104	10K	1 % 1/4 W	C 28	10µ F	ST	10V						
R 29	51K	1 % 1/4 W	R 105	10K	1 % 1/4 W	C 29	2µ2 F	ST	20V						
R 30	51K	1 % 1/4 W	R 106	10K	1 % 1/4 W	C 30	--- F	ST	35V						
R 31	51K	1 % 1/4 W	R 107	10K	1 % 1/4 W	C 31	22p F	PC							
R 32	51K	1 % 1/4 W	R 108	10K	1 % 1/4 W	C 32	100µ F	ST	4V						
R 33	51K	1 % 1/4 W	R 109	27R	1 % 1/4 W	C 33	22p F	PC							
R 34	51K	1 % 1/4 W	R 110	10K	1 % 1/4 W	C 34	100µ F	ST	4V	VR 1	47KB	PC20 4mm			
R 35	20K	1 % 1/4 W	R 111	10K	1 % 1/4 W	C 35	0.1µ F	PL		VR 2	47KB	PC16 4mm 41POS			
R 36	3K9	1 % 1/4 W	R 112	47R	1 % 1/4 W	C 36	0.1µ F	PL		VR 3	47KB	PC16 4mm 41POS			
R 37	51K	1 % 1/4 W	R 113	10K	1 % 1/4 W	C 37	0.1µ F	PL		VR 4	47KB	PC16 4mm 41POS			
R 38	10K	1 % 1/4 W	R 114	51K	1 % 1/4 W	C 38	0.1µ F	PL		VR 5	47KB	PC16 4mm 41POS			
R 39	1M	1 % 1/4 W	R 115	10K	1 % 1/4 W	C 39	22p F	PC		VR 6	47KB	PC16 4mm 41POS			
R 40	1M	1 % 1/4 W	R 116	100K	1 % 1/4 W	C 40	22p F	PC		VR 7	47KB	PC16 4mm 41POS			
R 41	1K5	1 % 1/4 W	R 117	27K	1 % 1/4 W	C 41	100p F	PC		VR 8	47KB	PC16 4mm 41POS			
R 42	1K	1 % 1/4 W	R 118	22K	1 % 1/4 W	C 42	100µ F	ST	4V	VR 9	47KB	PC16 4mm 41POS			
R 43	1K	1 % 1/4 W	R 119	1K2	1 % 1/4 W	C 43	0.47µ F	PL		VR 10	47KB	PC20 4mm CD			
R 44	20K	1 % 1/4 W	R 120	3K3	1 % 1/4 W	C 44	22p F	PC		VR 11	47KB	PC20 4mm CD			
R 45	3K9	1 % 1/4 W	R 121	33K	1 % 1/4 W	C 45	100µ F	ST	4V	VR 12	47KB	PC20 4mm CD			
R 46	51K	1 % 1/4 W	R 122	33K	1 % 1/4 W	C 46	--- F			VR 13	10KB	FADER 60mm			
R 47	10K	1 % 1/4 W	R 123	560R	1 % 1/4 W	C 47	--- F			VR 14	47KB	PC16 4mm 41POS			
R 48	1M	1 % 1/4 W	R 124	39K	1 % 1/4 W	C 48	100µ F	ST	4V	VR 15	47KB	PC16 4mm 41POS			
R 49	1M	1 % 1/4 W	R 125	100R	1 % 1/4 W	C 49	22p F	PC		VR 16	10KA	PC20 4mm CD			
R 50	1K5	1 % 1/4 W	R 126	100K	1 % 1/4 W	C 50	22p F	PC		VR 17	10KB	FADER			
R 51	1K	1 % 1/4 W	R 127	39K	1 % 1/4 W	C 51	100µ F	ST	4V	VR 18	10KA	PC20 1/4 CD			
R 52	1K	1 % 1/4 W	R 128	560R	1 % 1/4 W	C 52	0.1µ F	PL							
R 53	5K6	1 % 1/4 W	R 129	10K	1 % 1/4 W	C 53	0.1µ F	PL							
R 54	5K6	1 % 1/4 W	R 130	10K	1 % 1/4 W	C 54	5p6 F								
R 55	5K6	1 % 1/4 W	R 131	39K	1 % 1/4 W	C 55	22p F								
R 56	5K6	1 % 1/4 W	R 132	39K	1 % 1/4 W	C 56	22p F								
R 57	5K6	1 % 1/4 W	R 133	20K	1 % 1/4 W										
R 58	5K6	1 % 1/4 W	R 134	39K	1 % 1/4 W										
R 59	5K6	1 % 1/4 W	R 135	27R	1 % 1/4 W										
R 60	15K	1 % 1/4 W	R 136	100K	1 % 1/4 W										
R 61	560R	1 % 1/4 W	R 137	39K	1 % 1/4 W										
R 62	5K6	1 % 1/4 W	R 138	100K	1 % 1/4 W										
R 63	15K	1 % 1/4 W	R 139	27R	1 % 1/4 W										
R 64	5K6	1 % 1/4 W	R 140	20K	1 % 1/4 W										
R 65	5K6	1 % 1/4 W	R 141	4M7	1 % 1/4 W										
R 66	560R	1 % 1/4 W	R 142	100K	1 % 1/4 W										
R 67	5K6	1 % 1/4 W	R 143	100K	1 % 1/4 W										
R 68	5K6	1 % 1/4 W	R 144	10K	1 % 1/4 W										
R 69	15K	1 % 1/4 W	R 145	1K2	1 % 1/4 W										
R 70	560R	1 % 1/4 W	R 146	100R	1 % 1/4 W										
R 71	5K6	1 % 1/4 W	R 147	10K	1 % 1/4 W										
R 72	51K	1 % 1/4 W	R 148	1K2	1 % 1/4 W										
R 73	75K	1 % 1/4 W	R 149	100R	1 % 1/4 W										
R 74	75K	1 % 1/4 W	R 150	10K	1 % 1/4 W										
R 75	100K	1 % 1/4 W	R 151	1K2	1 % 1/4 W										
R 76	27K	1 % 1/4 W	R 152	100R	1 % 1/4 W										





AUXILIARY SEND SECTION

Auxiliary Master Level controls
These are the overall output level controls for the auxiliary busses.
If, after setting the individual aux sends on each channel to your desired level, you find the overall level is too high or low, it can be adjusted using this control, without having to adjust all the individual aux sends.

Pfl (pre fader listen)
These switches sends the PRE fader signal to the headphone output, allowing the signal to be monitored in the headphones and on the pfl led display. It will also send the signal to the monitor output if **pfl auto** has been depressed. An LED indicates depression of the switch.

Peak
These LEDs (light emitting diode) indicates when the post aux signal level is at +10dBm. These are not clip indicators - there is 12dB of headroom after these LEDs illuminates.

MASTER SECTION

12 segment LED display (on meter bridge)
The POST fader signal of each MIX output is indicated on a 12 segment LED display.
0dB on the LED's indicates that the output level is at +4dBm. (see -10dBv switch above). The LED's are peak read, with an attack time of 1.7ms similar to PPM standards. The decay time is 1.15ms, which is slightly faster than the PPM standard of 1.5 secs.

-10dBv
This switch reduces the output from stereo output A by 14dB, making it suitable for -10dBv equipment. Stereo output B is unaffected by this switch.

stereo outputs
2 rotary stereo level controls are provided to allow 2 alternative tape machines to be used on the MIX output. They may be used for sending a signal to a cassette machine in addition to the main stereo recorder.

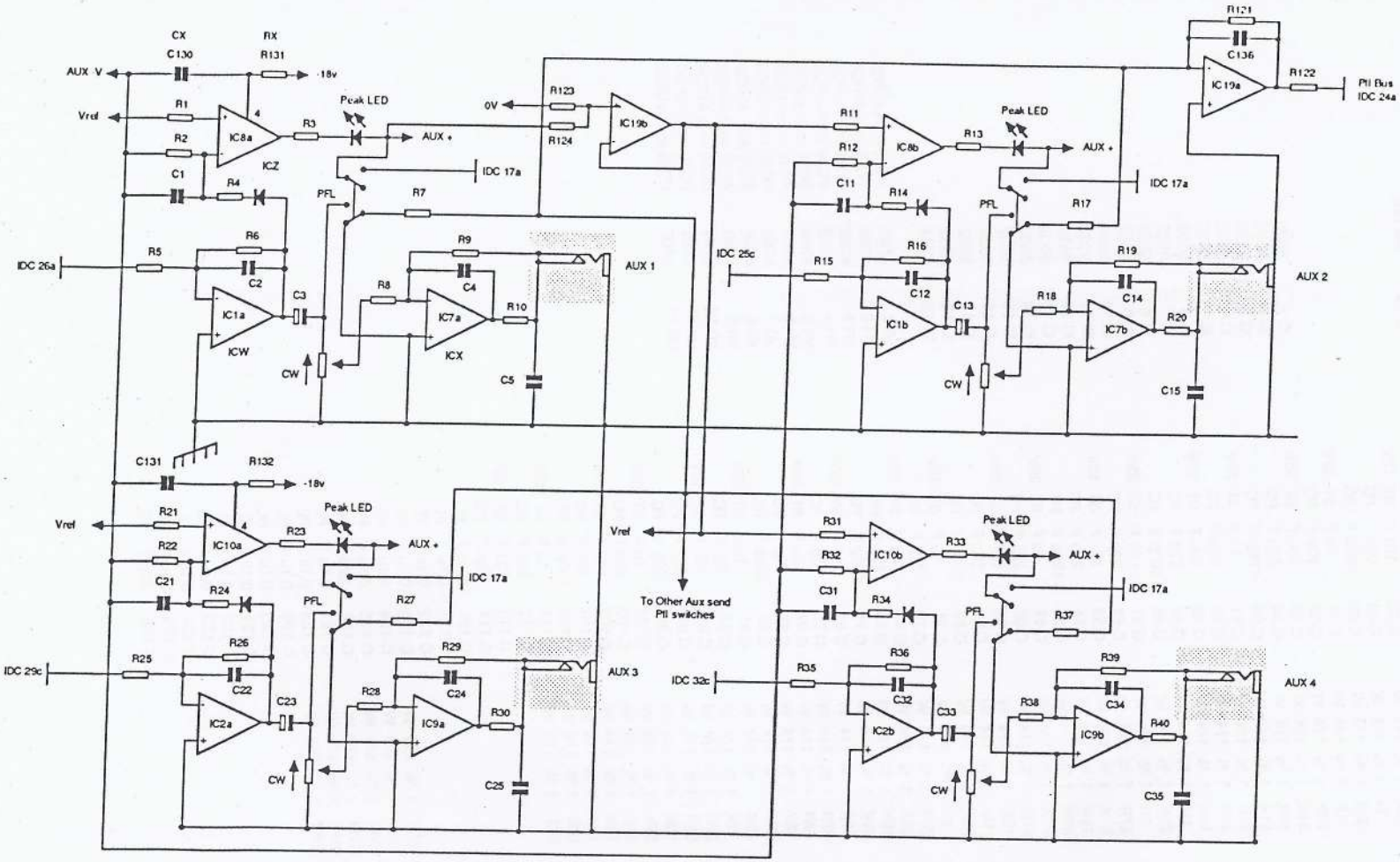
mono
This switch when depressed causes the alternative stereo outputs to be used as mono outputs. It does not affect the main stereo MIX outputs.

pre/post
This switch switches the above stereo outputs from PRE the MIX fader to POST the MIX fader. This allows these outputs to be used independant of the MIX faders.

mute
This switch prevents signal from leaving the main MIX output. In effect it turns the MIX output off, yet allows the signal to be monitored in the headphones and on the pfl led display.

pfl (pre fader listen)
This switch sends the PRE fader signal to the headphone output, allowing the signal to be monitored on the headphones and on the pfl VDU display. It will also send the signal to the monitor output if **pfl auto** has been depressed. It is only a mono signal, the stereo outputs may be monitored in stereo by using the MIX monitor switch on the functions module.

faders
2 100mm smooth action faders control the output level of the master stereo MIX outputs. Optionally a single stereo fader may be specified.



AUX	Resistors	Capacitors	RX	CX	ICW -	ICX -	ICZ -	IDC pin
5	R41 50	C43 45	R133	C132	IC3a	IC11a	IC12a	25a
6	R51 60	C51 55			IC3b	IC11b	IC12b	28c
7	R61 70	C61 65	R134	C133	IC4a	IC13a	IC14a	27a
8	R71 80	C71 75			IC4b	IC13b	IC14b	24c
9	R81 90	C81 85	R135	C134	IC5a	IC15a	IC16a	30c
10	R91 100	C91 95			IC5b	IC15b	IC16b	31c
11	R101 110	C101 105	R136	C136	IC6a	IC17a	IC18a	26c
12	R111 120	C111 115			IC6b	IC17b	IC18b	27c

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