



## 33609/J Limiter/Compressor

### Technical Handbook

527-149  
Issue 3

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# 1. Limiter/Compressor Unit

Note: This document refers to the /J variant of the limiter compressor unit. For information concerning the other variants refer to the **Uses and Variant Information** sections.

## Introduction

The limiter/compressor unit contains two identical, isolated channels which are suitable for mono, stereo or independent operation; units can be linked for multi-channel use. When limiting and compression is not required, both channels may be by-passed. Both mono, stereo and by-pass functions are switched by logic-controlled relays. Depending on the position of an EXTERNAL – INTERNAL switch, these functions are either operated by front panel switches or externally controlled by a rear panel connector. The above switches are internally illuminated from the Logic to show the operational mode of the unit, and external tallies are available via the rear panel connector. The reset position of the relays is BY-PASS and MONO: when power is disconnected or switched off, the unit is in BY-PASS mode.

The limiter/compressor unit contains the following four identifiable sections:

- Limiter/Compressor board (11475): This is a motherboard which contains the attenuator control element, the 10640 amplifier and the limiting and compression sidechain electronics.
- The external control potentiometers, switches and gain reduction meters (which indicate the overall gain reduction in each channel during limiting and compression) are mounted on the front panel.
- Input and output sockets mounted on the rear panel.
- A D.C power and relay logic board, which provides a regulated +24V supply for the 11475 board, and +5V for logic circuits controlling the relay switching.

## Limiter/Compressor Board (11475)

This board contains the main audio signal processing circuits of the limiter/compressor unit. The operation of the board is described elsewhere.

## Front Panel Switches

The rotary control switches located on the front panel of the unit are multi-contact multi-layer rotary switches. Electrical loading of the switches is provided via resistors connected across the contacts.

## Mains Power Supply

The 24V DC input, derived from the main supply, required by the limiter/compressor board (11475) is supplied by a power supply unit located in the limiter/compressor unit. The power supply unit comprises a toroidal mains input transformer (TF14201), a regulator circuit (part of 11720), and associated components. The arrangement is shown as part of the limiter/compressor block diagram EB20515.

Mains power is applied via an IEC inlet connector to the front panel mounted switch POWER. The switch illuminates when the unit is switched on. Input voltages of 100V, 120V, 220V or 240V AC can be selected using the voltage selector mounted on the rear panel. Primary circuit protection is provided by a 500mA anti-surge fuse for 100V, 120V, 220V or 240V operation, the fuse is located in the body of the voltage selector.

The 24V AC output of the toroidal transformer is connected to the secondary protection fuse, a 500mA anti-surge type, mounted on the rear panel of the unit.

## Specification

Frequency Response	20Hz to 20kHz +/-0.5dB, measured at 0dBu relative to 1kHz.
Noise	-75dBu with input terminated in 600 ohms, by-passed IN, compress and limit OFF; -55dBu with compress IN and gain make-up at maximum.
Limit Level	+4dBu to +15dBu, measured with limit recovery set at 50ms, level at +8dBu using a 1kHz sine-wave at +20dBu and +8 control adjusted to give +8dBu output.
Limit Ratio	with input level at 10dBu, increased to +20dBu the change in output level should be 0.1dB, +/-0.1dB.
Attack Time	slow: 4ms, +/-1ms fast: 2ms, +/-1ms being the time taken for a signal to return to within 1dB of its original value, using an increase in input level of 10dB on an input adjusted to +10dBu at 1kHz.
Limit Recovery	this is the time taken by the control voltage to reach a new value when an input at +20dBu is reduced in value by 10dB. The recovery times can be set to 50ms, 100ms, 200ms, 800ms, AUTO 1 1500ms, AUTO 2 3000ms (all +/-50%).
Gain Make-up	settings 0 to 20dB correspond with output level +/-0.5dB.

Compress Ratio recovery set to 100ms  
 threshold to -20dBu  
 input 1kHz at 0dBu  
 for each setting of the Compress Ratio Switch the input level is increased by 10dB and the change in output level should be:

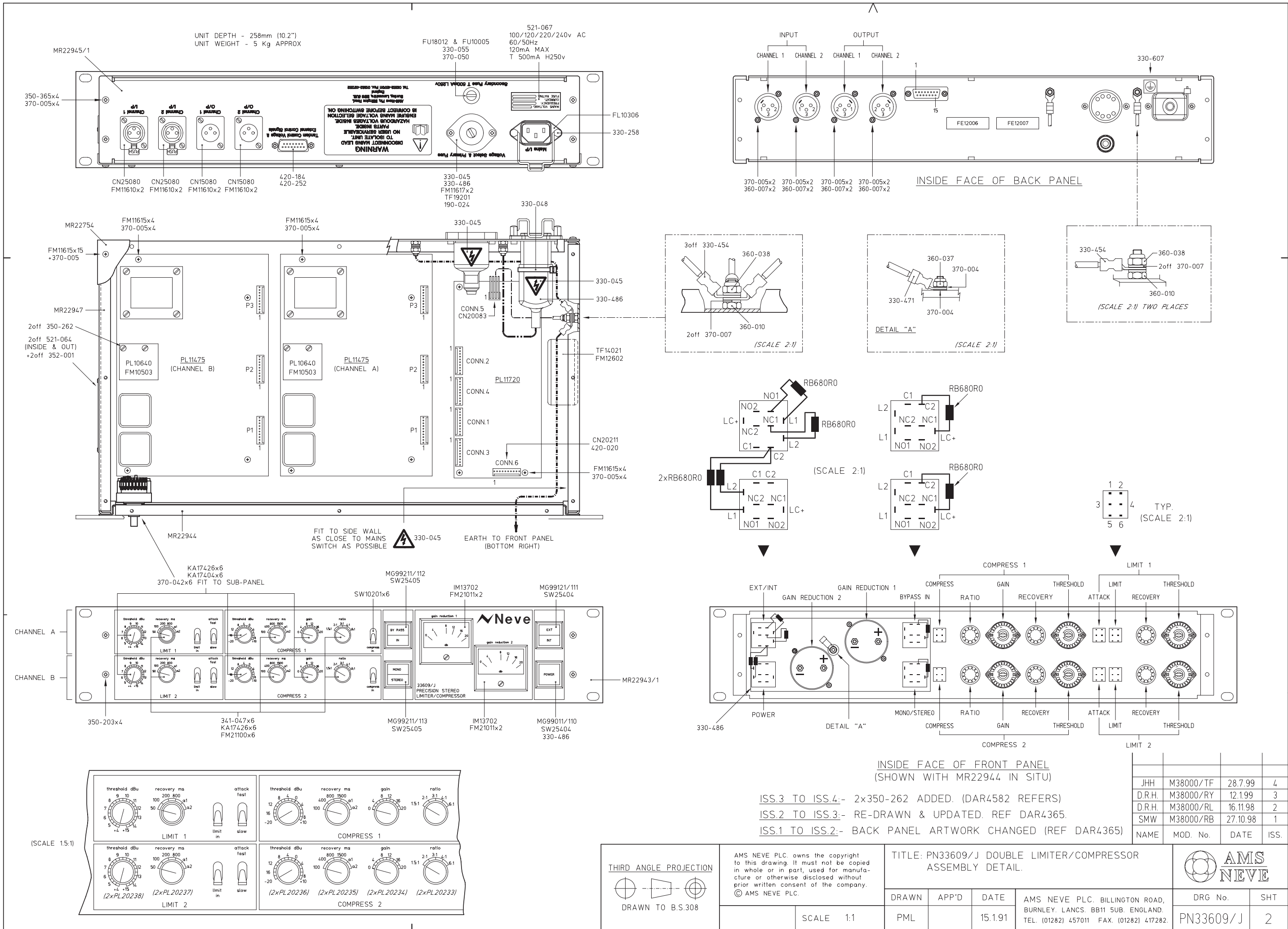
Compress Ratio Switch	O/P Level Change (dBu)	Tolerance (dB)
1.5 : 1	6.5	± 1
2 : 1	5.0	± 1
3 : 1	3.5	± 1
4 : 1	2.5	± 0.5
5 : 1	1.5	± 0.5

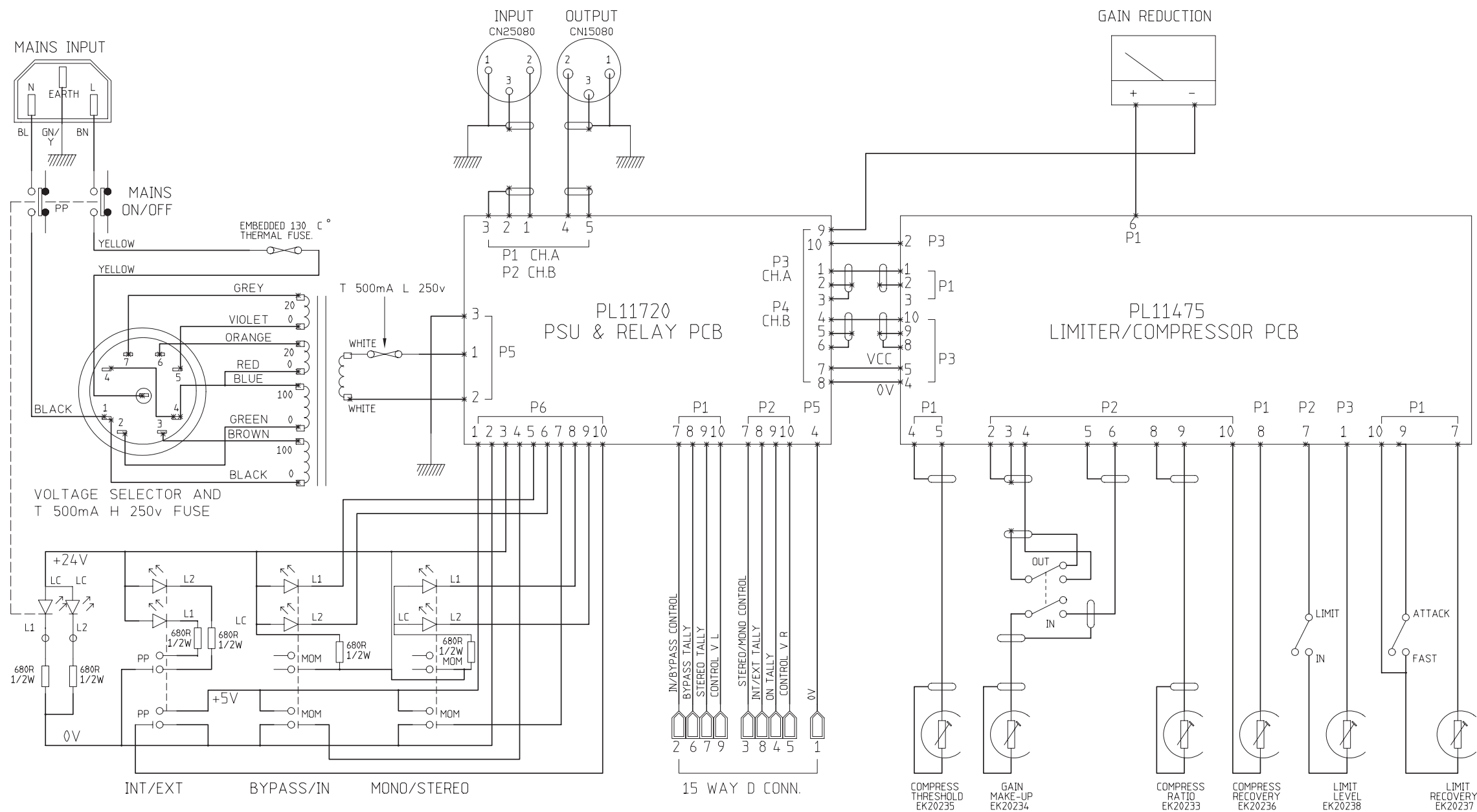
Compress Recovery 100ms, 400ms, 800ms, 1500ms  
 AUTO 1 800ms AUTO 2 1500ms

Distortion 0.075% maximum (bypass IN, Compress and Limit OUT, input level at +9dBu, 1KHz).  
 0.2% maximum (Compress IN ratio 6:1, Gain make-up to MAX, Recovery 800ms, Threshold -18dBu).  
 0.45% maximum (Limit IN, Compress OUT, Recovery 800ms. Input level +22dBu, Threshold -18dBu).

Power Consumption 5.3VA

Dimensions Length: 482mm (19in)  
 Height: 88mm (3.26in)  
 Depth: 255mm (10.03in)





NOTE:-  
 1 CHANNEL "A" WIRING AS SHOWN  
 2 CHANNEL "B" WIRING TO BE SIMILAR  
 3 USING P2 & P4. ON PL11720  
 4 = 3 X LEDs IN SERIES

D.R.H.	M38000/RV	13.1.99	2
SMW	M38000/RB	27.10.98	1
NAME	MOD. No.	DATE	ISS.

ISS.1 TO ISS.2:- FUSING INFORMATION  
 ALTERED. REF. DAR4365.

THIRD ANGLE PROJECTION  
  
 DRAWN TO B.S.308

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TITLE: PN33609/J DOUBLE LIMITER/COMPRESSOR WIRING DIAGRAM.

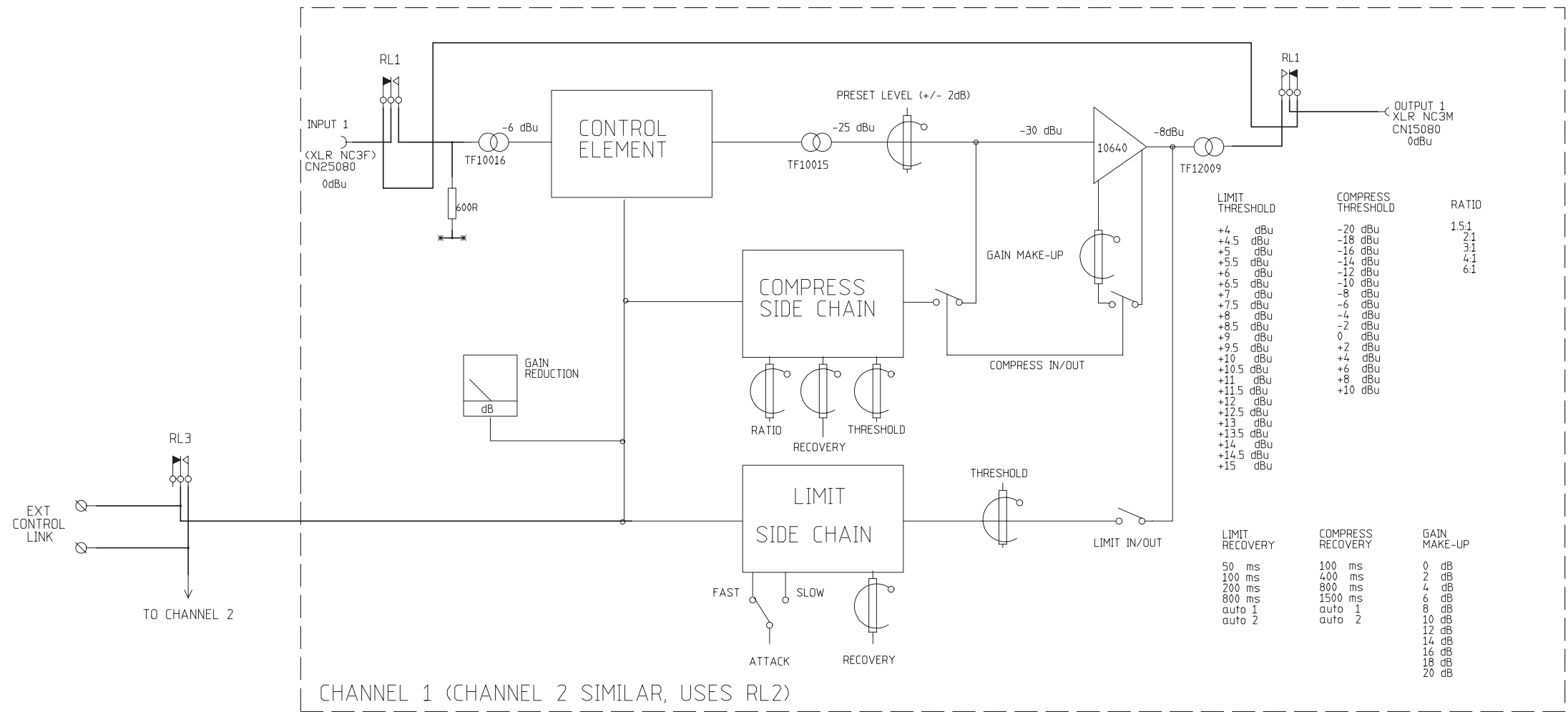
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SMW		27.10.98

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DRG No.	SHT
PN33609/J	3

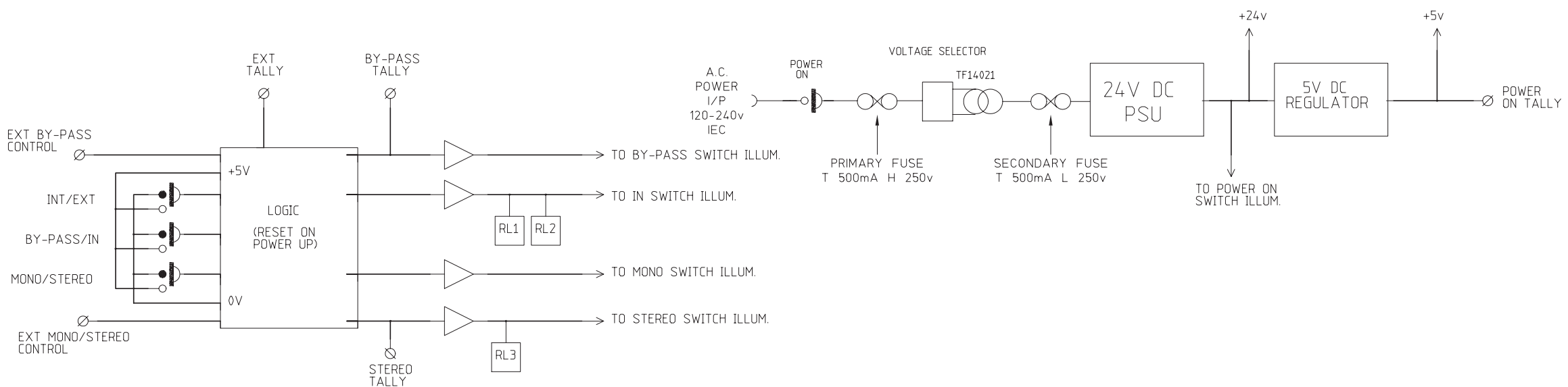
SCALE NTS



LIMIT THRESHOLD	COMPRESS THRESHOLD	RATIO
+4 dBu	-20 dBu	1.5:1
+4.5 dBu	-18 dBu	2:1
+5 dBu	-16 dBu	3:1
+5.5 dBu	-14 dBu	4:1
+6 dBu	-12 dBu	6:1
+6.5 dBu	-10 dBu	
+7 dBu	-8 dBu	
+7.5 dBu	-6 dBu	
+8 dBu	-4 dBu	
+8.5 dBu	-2 dBu	
+9 dBu	0 dBu	
+9.5 dBu	+2 dBu	
+10 dBu	+4 dBu	
+10.5 dBu	+6 dBu	
+11 dBu	+8 dBu	
+11.5 dBu	+10 dBu	
+12 dBu		
+12.5 dBu		
+13 dBu		
+13.5 dBu		
+14 dBu		
+14.5 dBu		
+15 dBu		

LIMIT RECOVERY	COMPRESS RECOVERY	GAIN MAKE-UP
50 ms	100 ms	0 dB
100 ms	400 ms	2 dB
200 ms	800 ms	4 dB
800 ms	1500 ms	6 dB
auto 1	auto 1	8 dB
auto 2	auto 2	10 dB
		12 dB
		14 dB
		16 dB
		18 dB
		20 dB



ISS.1 TO ISS.2- FUSING DETAILS ALTERED.  
REF. DAR4365

NAME	MOD. No.	DATE	ISS.
D.R.H.	M38000/RV	13.1.99	2
SMW	M38000/RB	27.10.98	1

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TITLE: PN33069/J DOUBLE LIMITER/COMPRESSOR  
BLOCK DIAGRAM.

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SMW		26.10.98

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DRG No.	SHT
PN33609/J	4

## 2. Switch Assembly Information

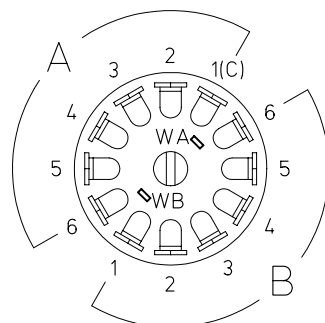
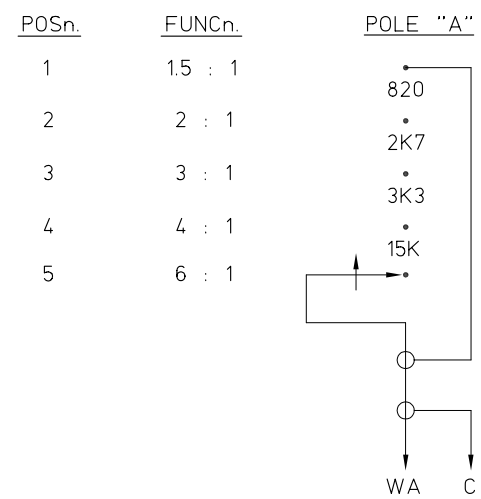
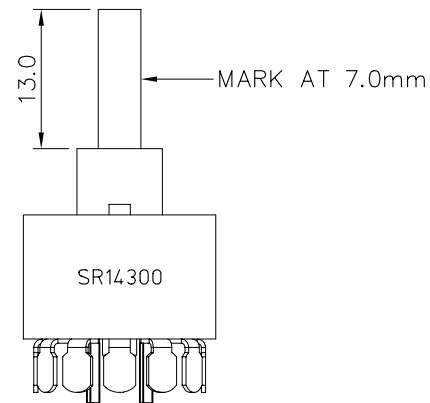
Assembly information for the following switches is included in this section:

### Switch Function

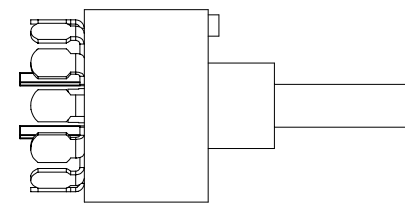
Compress Ratio	PL20233
Gain Make-Up	PL20234
Compress Threshold	PL20235
Compress Recovery	PL20236
Limit Recovery	PL20237
Limit level	PL20238



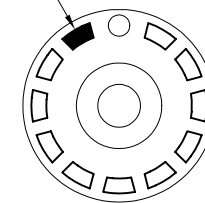
FUNCTION	FROM	TO	PART No.
820 RES	1	2	080-821
2K7 RES	2	3	080-272
3K3 RES	3	4	080-332
15K RES	4	5	080-153



WA= WIPER POLE "A"  
WB= WIPER POLE "B"

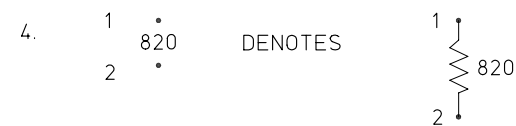


FIT SR90000 ROTATION  
STOP HERE



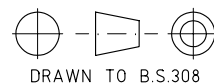
NOTES -

- SR14300 IS AN ELMA 2P 6WAY SWITCH STOPPED DOWN TO 5 POSITIONS.
- POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED FROM OPERATING OR PANEL END OF SWITCH.
- FUNCTION IS LEGEND PRINTED ON PANEL.



KB	M38000/ZR	28.2.02	2
D.R.H.	M38000/Ry	12.1.99	1
NAME	MOD. No.	DATE	ISS.

THIRD ANGLE PROJECTION



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TITLE: COMPRESS RATIO SWITCH

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D.R.H.

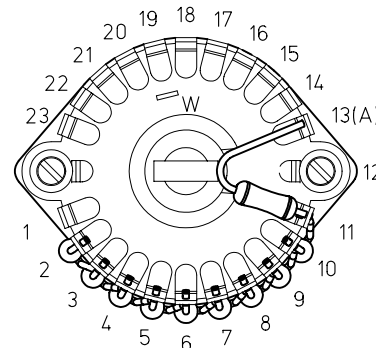
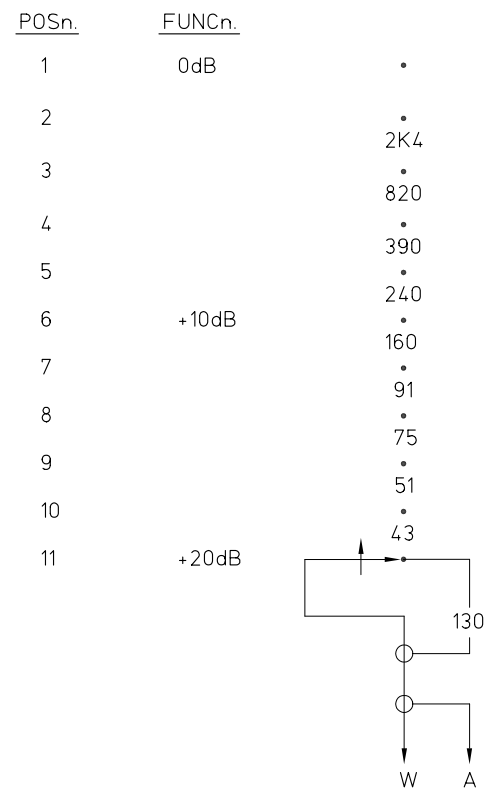
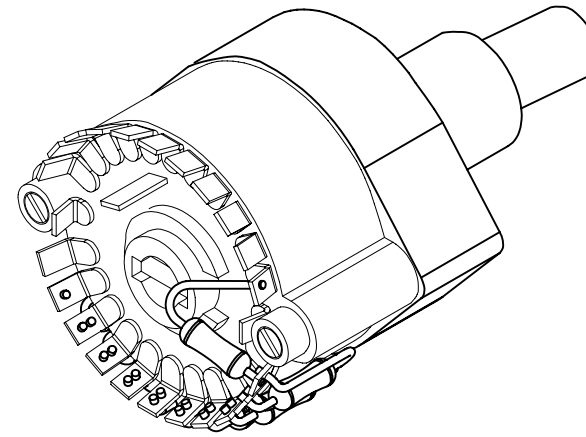
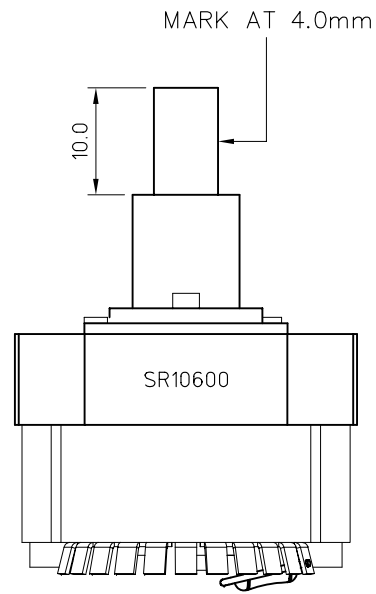
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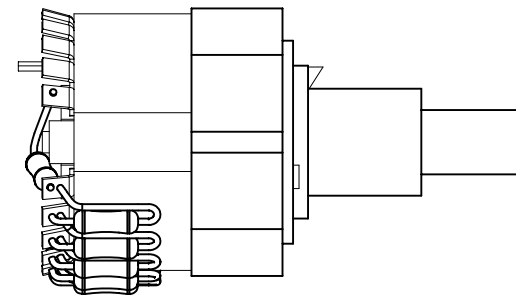
DRG No. SHT  
PL20233 2

SCALE 2:1

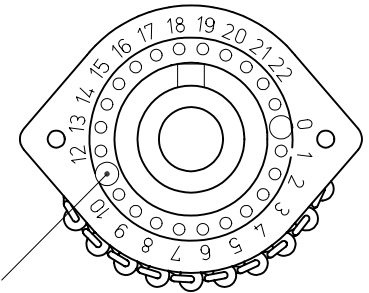
FUNCTION	FROM	TO	PART No.
2K4 RES	2	3	080-242
820 RES	3	4	080-821
390 RES	4	5	080-391
240 RES	5	6	080-241
160 RES	6	7	080-161
91 RES	7	8	080-910
75 RES	8	9	080-750
51 RES	9	10	080-510
43 RES	10	11	080-430
130 RES	11	TO SPARE ANCHOR POINT	080-131



W= WIPER

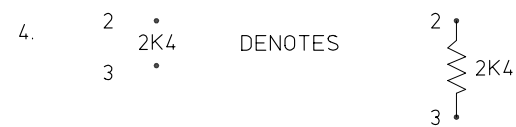


FIT SR90001  
ROTATION STOP  
POS 11 & ZERO



NOTES -

- SR10600 IS AN ELMA 1P 23WAY SWITCH STOPPED DOWN TO 11 POSITIONS. SPARE WAYS MAY BE USED AS ANCHOR POINTS.
- POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED FROM OPERATING OR PANEL END OF SWITCH.
- FUNCTION IS LEGEND PRINTED ON PANEL.



KB	M38000/ZR	28.2.02	3
KB	M38000/ZC	19.11.01	2
D.R.H.	M38000/RV	11.1.99	1
NAME	MOD. No.	DATE	ISS.

THIRD ANGLE PROJECTION

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TITLE: COMPRESS GAIN SWITCH ASSEMBLY

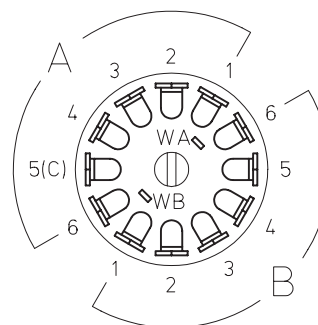
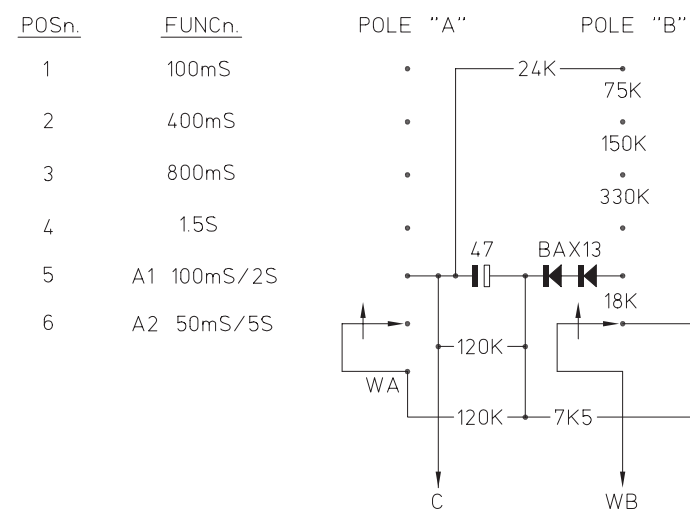
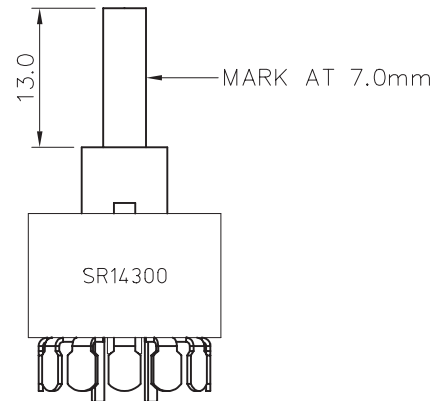
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D.R.H.		11.1.99

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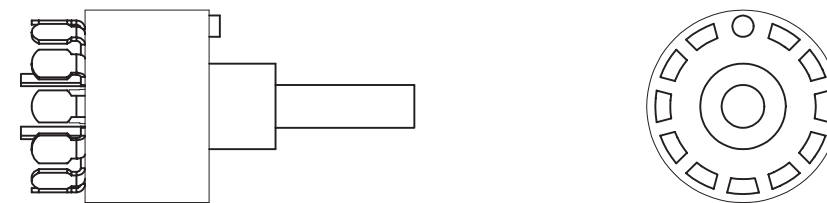


DRG No.	SHT
PL20234	2

24K	1B	A5
75K	B1	B2
150K	B2	B3
330K	B3	B4
CAP47	A5	-FLOATING
120K	A5	-SIDE OF CAP
120K	WIPER	-SIDE OF CAP
BAX <sup>13</sup> ①	CATHODE B5	ANODE FLOATING
BAX <sup>13</sup> ②	1 CATHODE	ANODE SIDE OF CAP
18K	5B	B6
7K5	B6	-SIDE OF DIODE

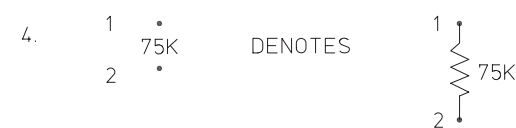


WA= WIPER POLE "A"  
WB= WIPER POLE "B"



NOTES -

- SR14300 IS AN ELMA 2P 6WAY SWITCH.
- POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED. FROM PANEL OR OPERATING END OF SWITCH.
- FUNCTION IS LEGEND PRINTED ON PANEL.



D.R.H.	M38000/RV	13.1.99	1
NAME	MOD. No.	DATE	ISS.

THIRD ANGLE PROJECTION  
  
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TITLE: COMPRESS RECOVERY SWITCH

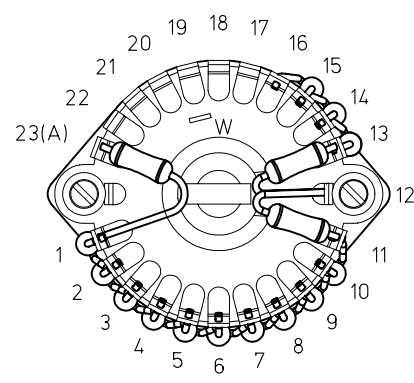
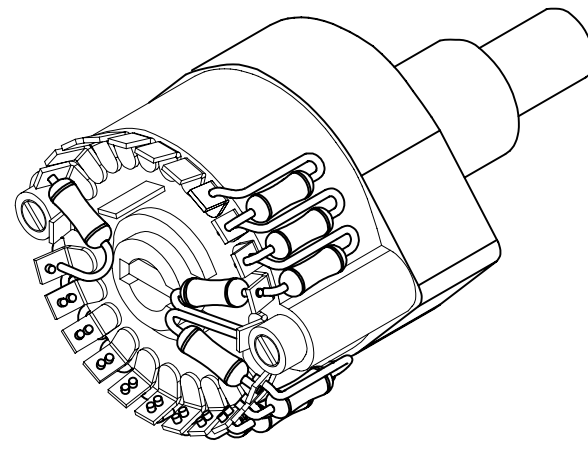
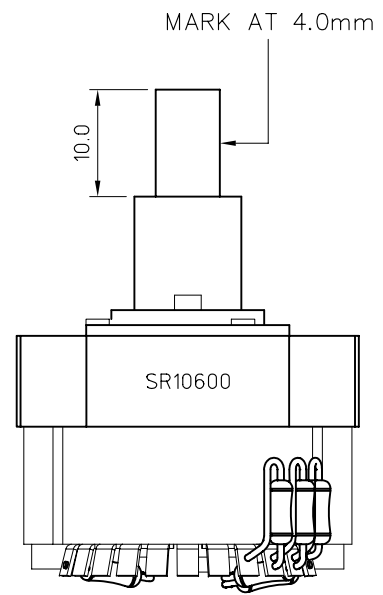
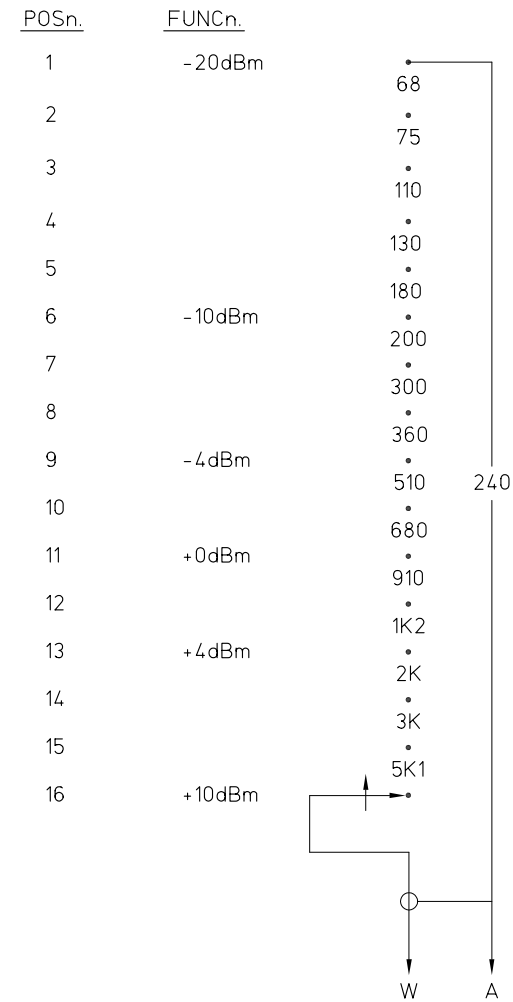
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D.R.H.		13.1.99

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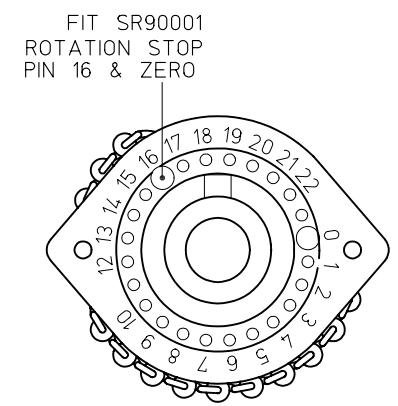
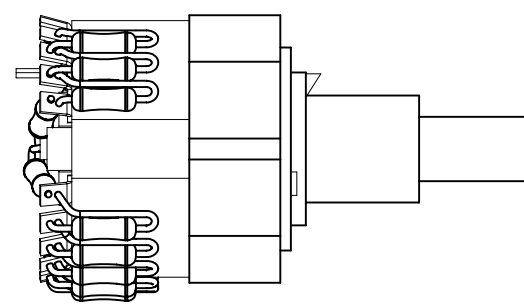


DRG No.	SHT
PL20235	2

FUNCTION	FROM	TO	PART No.
68	1	2	080-680
75	2	3	080-750
110	3	4	080-111
130	4	5	080-131
180	5	6	080-181
200	6	7	080-201
300	7	8	080-301
360	8	9	080-361
510	9	10	080-511
680	10	11	080-681
910	11	12	080-911
1K2	12	13	080-122
2K	13	14	080-202
3K	14	15	080-302
5K1	15	16	080-512
240	23A	1	080-241

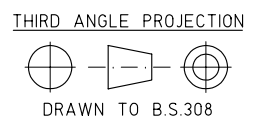


W= WIPER



- NOTES -
- SR10600 IS AN ELMA 1P 23WAY SWITCH, STOPPED DOWN TO 16 POSN'S.
  - POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED FROM OPERATING OR PANEL END OF SWITCH.
  - FUNCTION IS LEGEND PRINTED ON PANEL.
  - |   |   |         |   |
|---|---|---------|---|
| 1 | • | DENOTES | 1 |
| 2 | • |         | 2 |
  - SPARE POSITIONS MAY BE USED AS ANCHOR POINTS.

NAME	MOD. No.	DATE	ISS.
KB	M38000/ZR	28.2.02	3
KB	M38000/ZC	19.11.01	2
D.R.H.	M38000/RV	11.1.99	1



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TITLE: COMPRESS THRESHOLD SWITCH ASSEMBLY

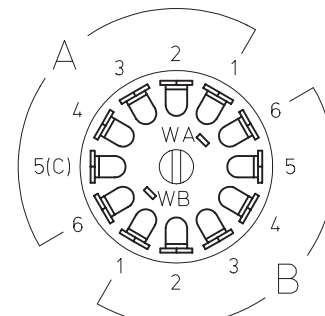
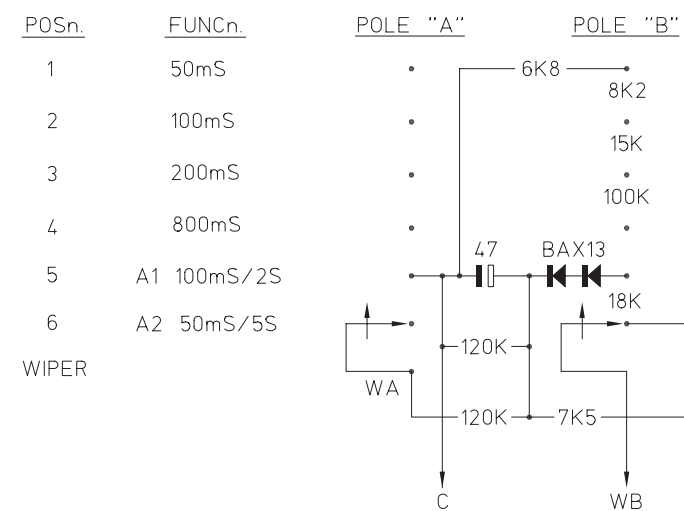
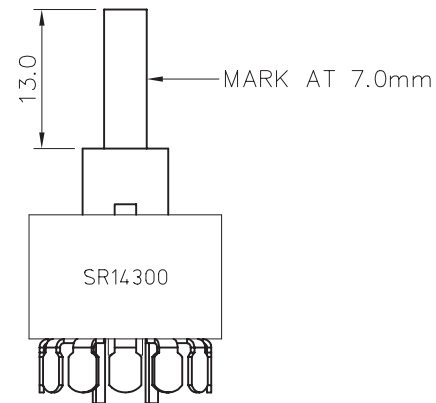
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D.R.H.		11.1.99

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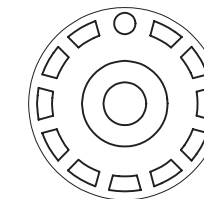
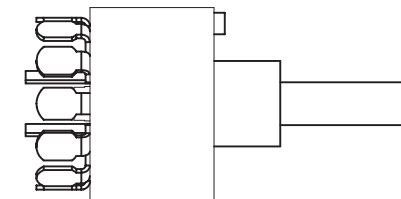


DRG No.	SHT
PL20236	2

FUNCTION	FROM	TO
8K2	1B	2B
15K	2B	3B
100K	3B	4B
6K8	B1	A5
CAP47	A5	FLOATING
120K	A5	- SIDE OF CAP
120K	WIPER	- SIDE OF CAP
BAX13 <sup>1</sup>	B5 CATHODE	ANODE FLOATING
BAX13 <sup>2</sup>	CATHODE ANODE	- ANODE SIDE OF CAP
18K	5B	B6
7K5	6B	* SIDE OF DIODE

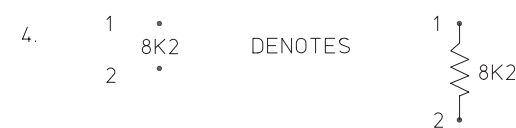


WA= WIPER POLE "A"  
WB= WIPER POLE "B"



NOTES -

- SR14300 IS AN ELMA 2P 6WAY SWITCH.
- POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED. FROM PANEL OR OPERATING END OF SWITCH.
- FUNCTION IS LEGEND PRINTED ON PANEL.



NAME	MOD. No.	DATE	ISS.
D.R.H.	M38000/RV	13.1.99	1

THIRD ANGLE PROJECTION  
DRAWN TO B.S.308

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TITLE: LIMIT RECOVERY SWITCH

DRAWN APP'D DATE  
D.R.H.

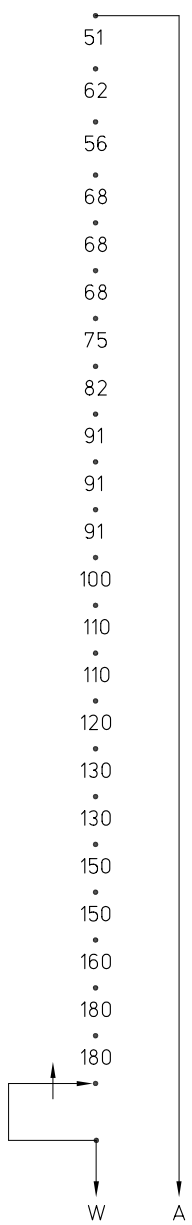
SCALE 2:1

AMS NEVE PLC. BILLINGTON ROAD, BURNLEY. LANCs. BB11 5UB. ENGLAND. TEL. (01282) 457011 FAX. (01282) 417282.



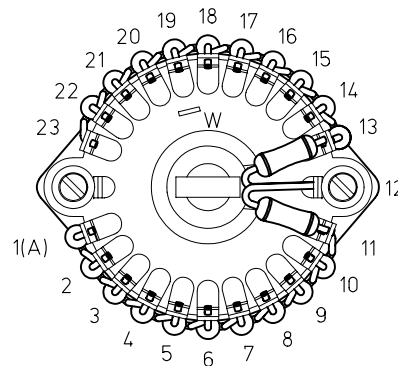
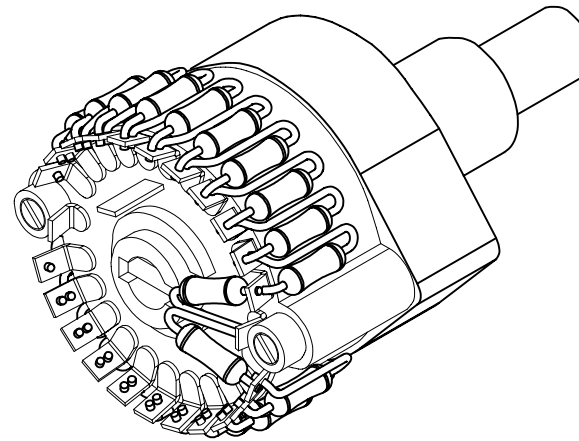
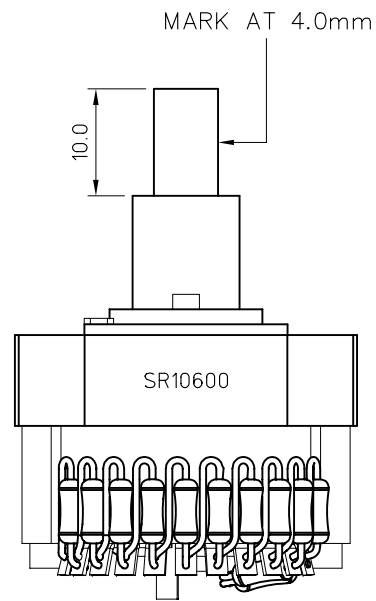
DRG No. SHT  
PL20237 2

POSn.	FUNCn.
1	+4dBm
2	
3	
4	
5	
6	
7	
8	
9	+8dBm
10	
11	
12	
13	
14	
15	
16	
17	+12dBm
18	
19	
20	
21	
22	
23	+15dBm

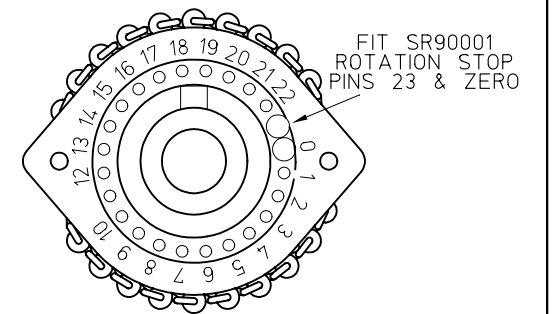
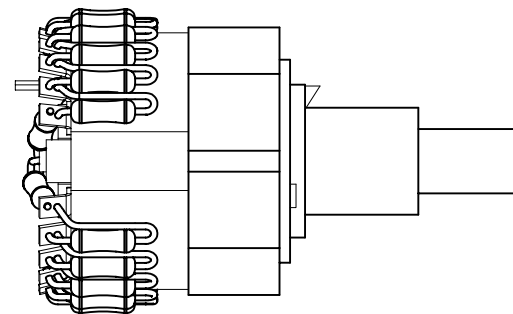


NOTES -

- SR10600 IS AN ELMA 1P 23WAY SWITCH.
- POSITION 1 IS FULLY COUNTER CLOCKWISE VIEWED FROM PANEL OR OPERATING END OF SWITCH.
- FUNCTION IS LEGEND PRINTED ON PANEL.



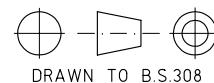
W= WIPER



FUNCTION	FROM	TO	PART No.
51	1	2	080-510
62	2	3	080-620
56	3	4	080-560
68	4	5	080-680
68	5	6	080-680
68	6	7	080-680
75	7	8	080-750
82	8	9	080-820
91	9	10	080-910
91	10	11	080-910
91	11	12	080-910
100	12	13	080-101
110	13	14	080-111
110	14	15	080-111
120	15	16	080-121
130	16	17	080-131
130	17	18	080-131
150	18	19	080-151
150	19	20	080-151
160	20	21	080-161
180	21	22	080-181
180	22	23	080-181

KB	M38000/ZR	28.2.02	3
KB	M38000/ZC	19.11.01	2
D.R.H.	M38000/RV	11.1.99	1
NAME	MOD. No.	DATE	ISS.

THIRD ANGLE PROJECTION



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TITLE: LIMIT THRESHOLD SWITCH ASSEMBLY

DRAWN	APP'D	DATE
D.R.H.		11.1.99

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DRG No.	SHT
PL20238	2

SCALE 2:1

### 3. Limiter/Compressor Board (11475)

The main audio path through each channel is via T2, D14, to D17, TR16 and TR17, TR3 and TR4, T1, T3 and the bypass switch. The remaining components on the board and some external components from the sidechain.

The incoming audio signal is applied to the transformer T2 which feeds a balanced attenuator pad formed by R47 to R49 and R11. The active attenuator of the limiter/compressor is formed by a balanced diode bridge D14 to D17. A DC Control voltage, derived by the limiter or compressor sidechain sections, is used to forward bias the diodes in the bridge and thereby alter the effective value of the attenuator resistance. The attenuator pad reduces the input signal level such that the signal remains in a linear region of the diode characteristic.

A high impedance buffer is formed by transistors TR16, TR3, TR17 and TR4, eliminating loading effects by the transformer T1 on the diode bridge. The signal from T2 is fed to the power amplifier 10640 via the gain preset control RV1. From the power amplifier the signal is supplied to the output transformer T3 and then via connector pins P3 10 and P3 9 to the output bypass/in switch.

Transistors TR2, TR5, TR8 and TR9 form the active components of the compressor sidechain and TR6, TR7 and TR10 to TR13 the active components of the limiter sidechain. The combination of TR9, TR13 and TR1 gives a low output impedance signal equal to the larger of the compressor or limiter sidechain signals. The voltage is attenuated by R36, RV2, R45, R29 and D10 supplied as the control voltage to the diode bridge.

#### Limiting

The output of the power amplifier board (10640) is connected via the limit in (Plug 3, pin 1; P3 1), the threshold dBu control (RV4) (P1 4 and P1 5) and capacitor C11 to a phase dividing amplifier pair TR6 and TR10, the outputs of which are rectified by diodes D7 and D8. Transistors TR11 and TR7 form a threshold detector and DC amplifier to feed TR12 via D9. The threshold reference is derived by D13 and R22. Emitter follower TR12 charges a storage capacitor C14 through R28 which determines the attack time constant of the limiter. R30 is connected in parallel with R28 when the attack switch is in the fast position.

The recovery time is set by the resistance of the recovery ms control (P2 1 and P1 7/8). P1 7/8 is connected to the junction of D11 and R8. D11 provides a temperature compensated reference voltage for use in the recovery time circuits of the limiter/compressor sidechains. Transistors TR13 and TR1 form a high input impedance buffer stage following the time constant circuit. To set the exact limit threshold of the sidechain circuit, the threshold control is set to the +8dBu position and an input level of +20dBu is applied to the module. The preset potentiometer RV4 is adjusted (altering the gain of the amplifier stages TR6 and TR10) to obtain an output level of +8dBu.

## Compression

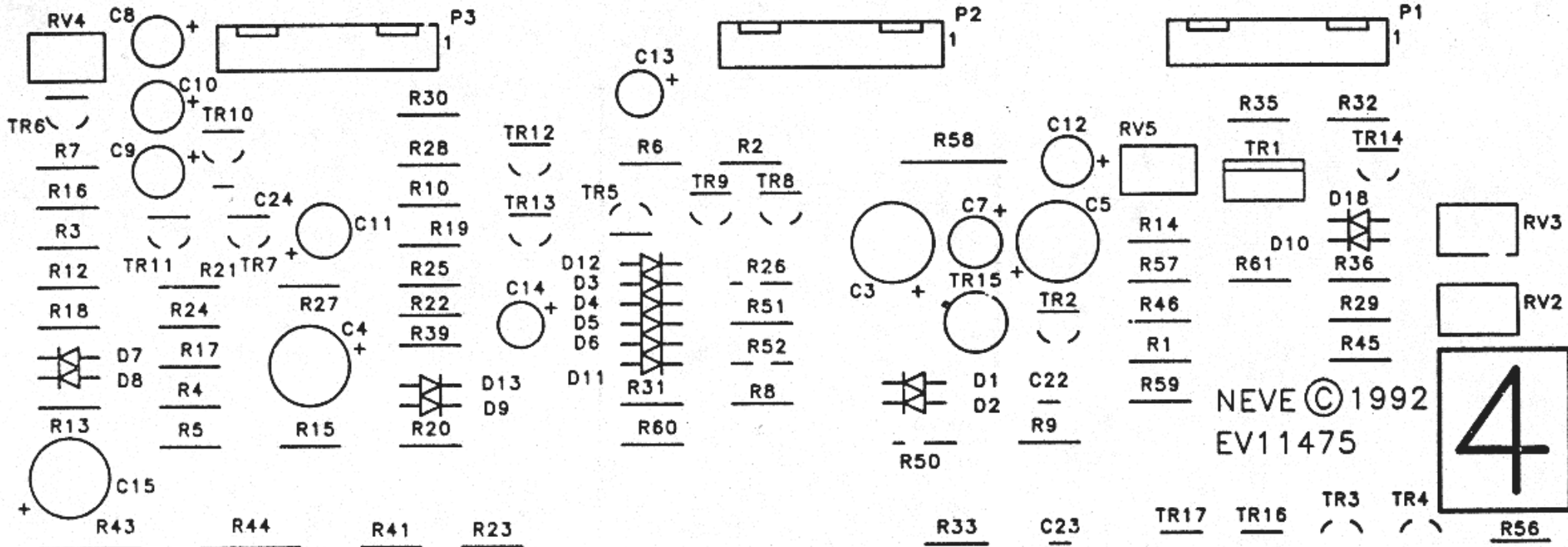
The input signal to the compressor sidechain is taken from the wiper of RV1 and is connected via the **compress in** switch and C12 to the base of TR2. The gain of the amplifier formed by TR2 and TR15 is changed by the value of resistance selected on the **threshold dBu** control. TR5 is used as the threshold detector, taking its reference from D2 and R50, and provides current drive to the series network of D12, D3 to D6 and R26 and the **compress ratio** control. These components give a voltage of the correct characteristic necessary for the selected compression ratio. This voltage turns on TR8 which charges C13 via R31. The time constant determined by the combination of R31 and C13 sets the fixed attack time constant of the compressor. The resistance selected by the **compress recovery (ms)** control and the value of C13 determines the recovery time constant of the circuit. The voltage on C13 is fed to the high impedance buffer formed by TR9 and Tr1. The emitter load of TR9 is formed by R36, RV2, R45, R29 and D10 and produces a law correction characteristic necessary to properly drive the gain control diode bridge.

The voltage on the emitters of TR9 and TR13 is connected to the meter preset RV3 and to the gain reduction meter itself via D18 and R35. The wiper of RV3 is buffered by emitter follower TR14 and the output signal fed to the gain reduction meter via R32. Rv3 is adjust to calibrate the meter at known levels of gain reduction., D18 and R35 feed a small amount of the control voltage directly to the meter to improve the accuracy at small amounts of gain reduction.

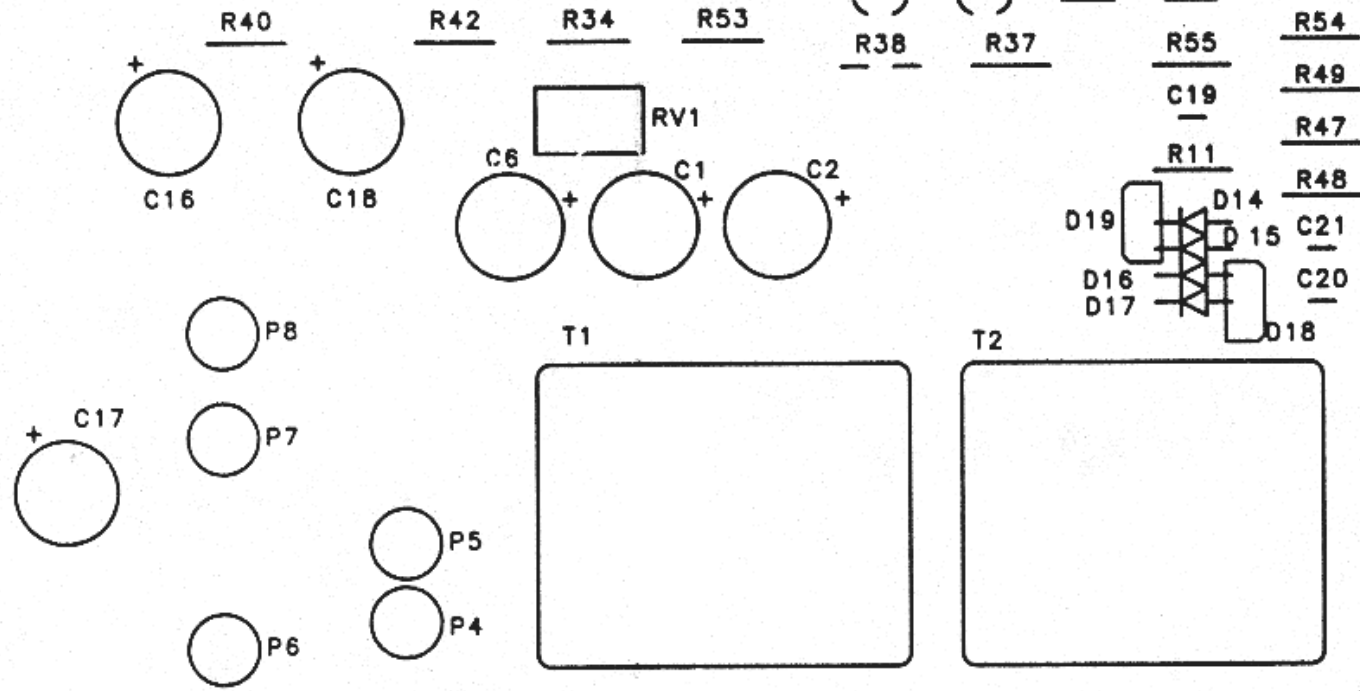
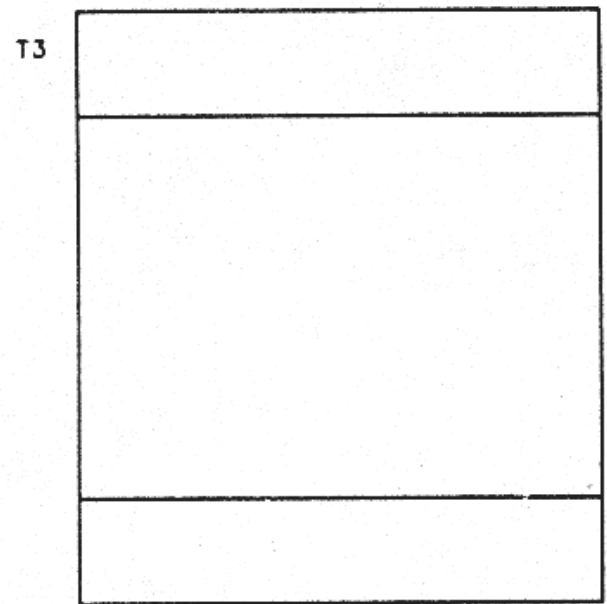
## Gain Make-Up

If a compressor threshold point below line level is selected, it may be necessary to add gain after compression to restore mean programme level. The function is obtained by use of the gain make-up control which alters the feedback in amplifier 10640 when the **compress in** switch is closed.

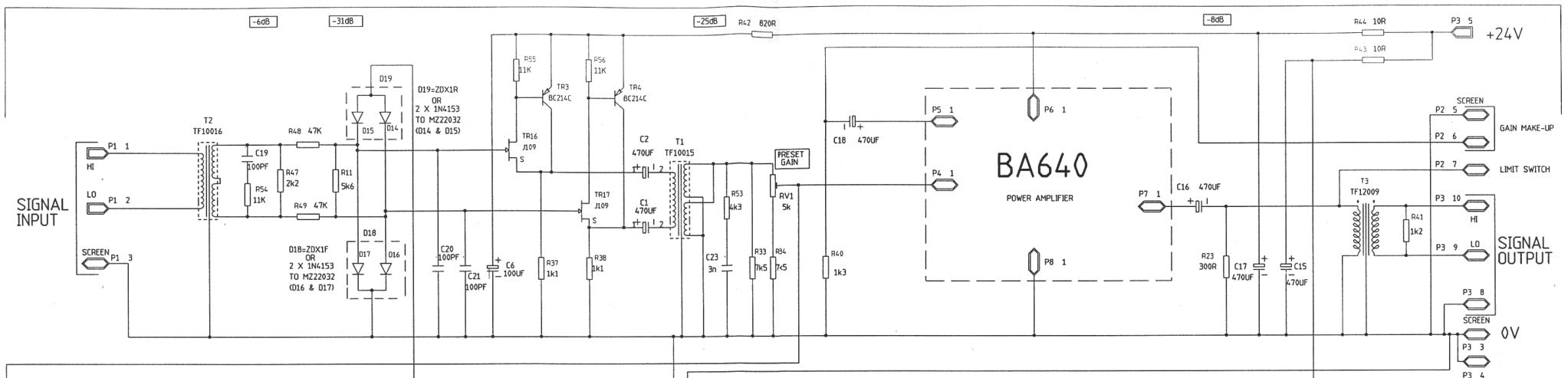




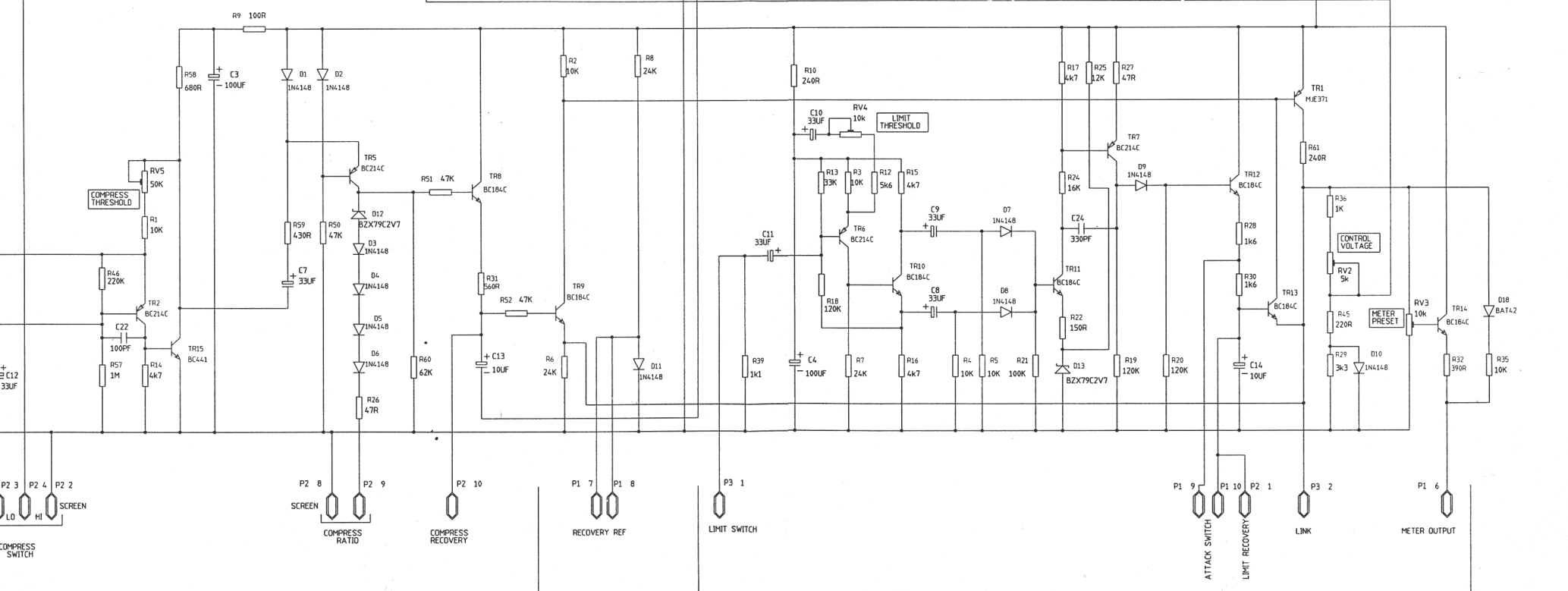
RV3  
 RV2  
**4**



# SIGNAL PATH



CONTROL VOLTAGE



# COMPRESSOR SIDECHAIN

# LIMITER SIDECHAIN

3	2	1	C	Issue	Drn.	CRH	TITLE COMPRESSOR	USED ON	PN33609
21-6-99	15-10-92	19-4-91	13-2-91	Date	Traced		LIMITER PCB		EX11475
M38000/TB	31739	31623	31576 31590	C.N. No.	Checked		CIRCUIT DIAGRAM	SH.T.	1 of 1
JT/KB reconstructed	RFC			Checked		Neve Electronics International Ltd		19 88 ©	A1

## 4. Power Amplifier (10640)

### Introduction

This board is a line amplifier with a low impedance output, suitable for use as a distribution amplifier. It is designated as a plug-in unit to be incorporated in a larger motherboard. The gain of the circuit is determined by the value of an external gain boost resistor.

### Circuit Description

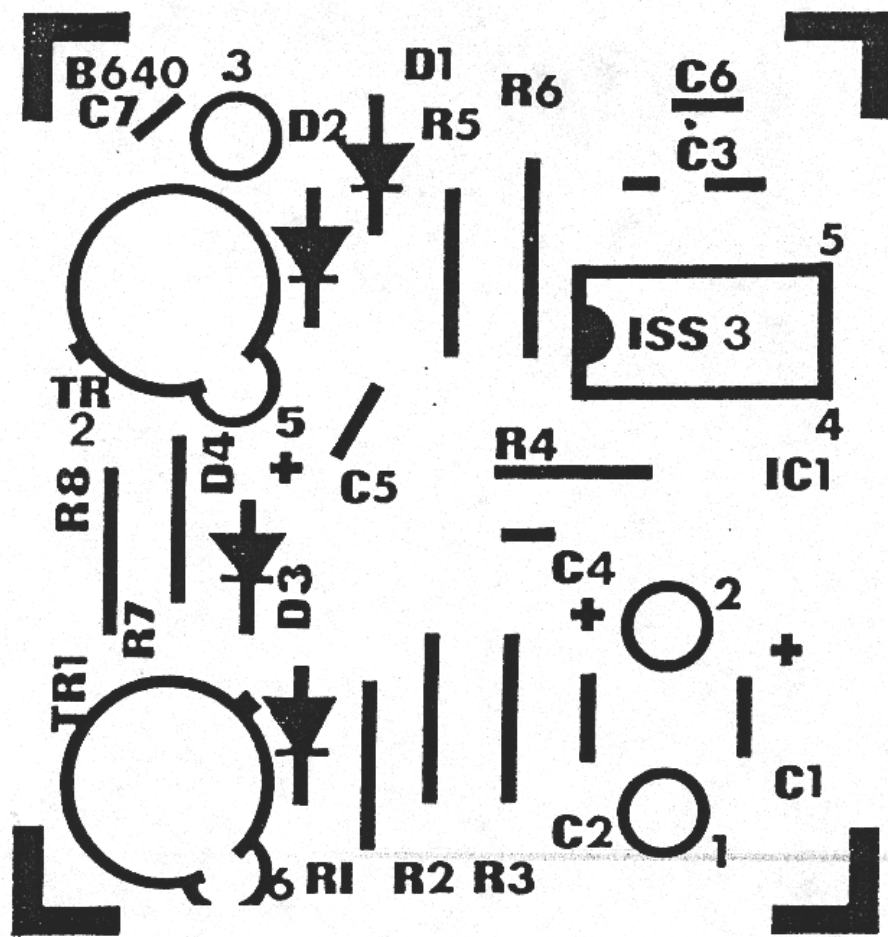
The circuit is driven by a nominal +24V supply; decoupling and smoothing components will normally be mounted on the motherboard.

Inverting and non-inverting inputs are both accessible on IC1 via board input pins 1 and 2; a gain boost resistor can be fitted between the PCB inverting input (pin 2) and 0V.

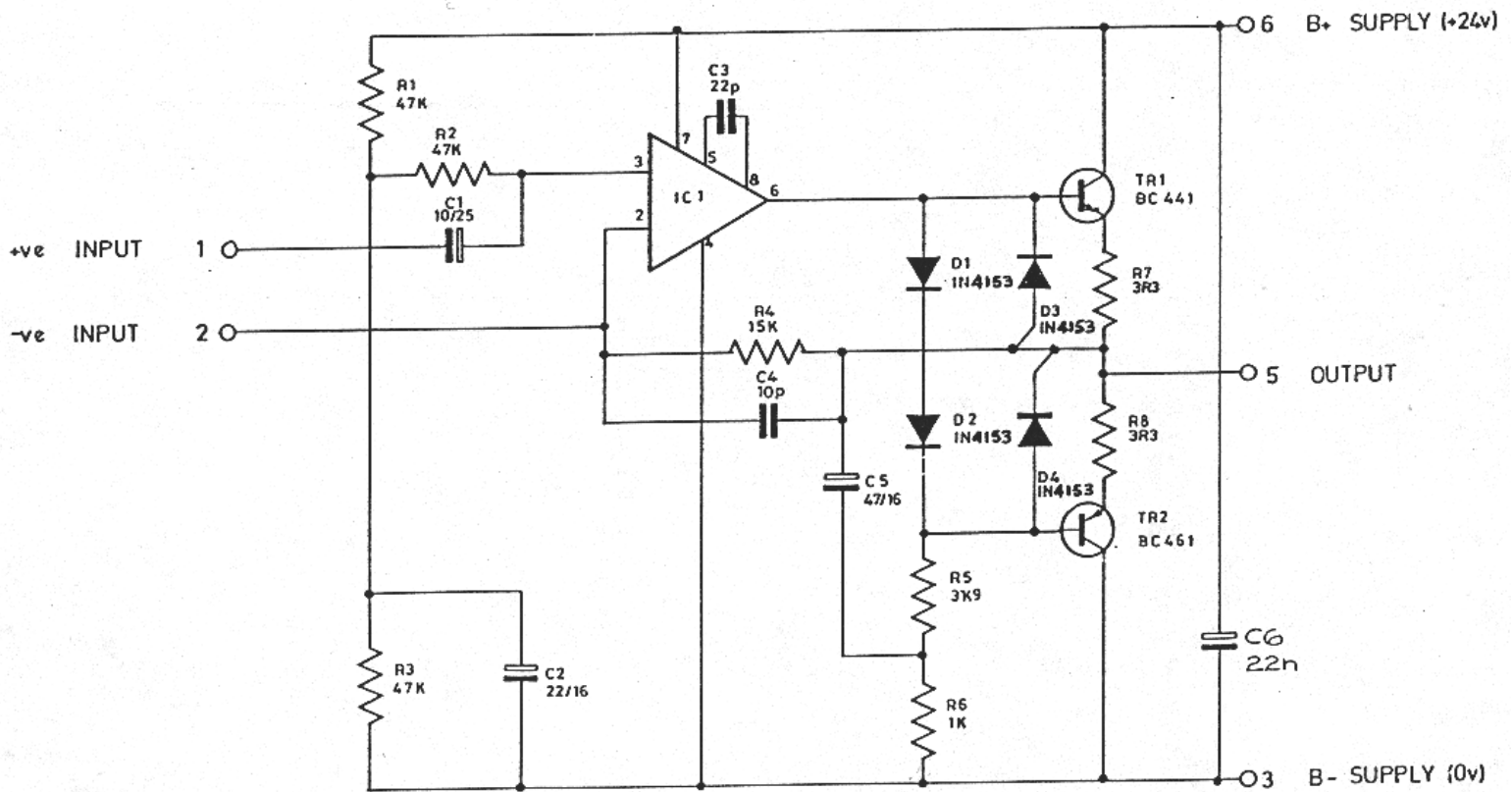
IC1 is followed by a low impedance output stage (TR1, TR2) which also incorporates overload protection.

### Specification

Quiescent Conditions:	With a gain boost resistor of 1k6 ohm (equivalent to +20dB gain) and the output terminated in 620 ohm, the static current should be between 20mA and 30mA; the standing output voltage (pin 6) should be +12V $\pm$ 1V.						
Gain:	With 1kHz sine wave input at -10dBu, the output level should be +10dBu $\pm$ 0.5dB.						
Maximum Output:	With an output load of 50 ohm and the 1kHz input level increased until the output signal is just clipping, the output level should be greater than +18dBu.						
Distortion:	At 1kHz input adjusted to give 17dB output into 50ohm, the distortion should be as follows: <table><tr><td>100Hz</td><td>less than 0.008%</td></tr><tr><td>1kHz</td><td>less than 0.004%</td></tr><tr><td>10kHz</td><td>less than 0.02%</td></tr></table>	100Hz	less than 0.008%	1kHz	less than 0.004%	10kHz	less than 0.02%
100Hz	less than 0.008%						
1kHz	less than 0.004%						
10kHz	less than 0.02%						
Noise	With the input short-circuited, the output noise level must be less than -96dBu over the bandwidth 20Hz to 20kHz.						



10640 Power Amplifier Component Layout



- NOTE:-
1. ALL RESISTORS  $\frac{1}{4}$ W 5% M.O.
  2. C1 IS A LOW LEAKAGE TANTALUM CAPACITOR.
  3. TR1 & TR2 ARE MOUNTED TO HEATSINK

10640 Power Amplifier Circuit Diagram

## 5. Limiter/Compressor DC Power & Relay Logic Board (11720)

The PL11720 board contains power supply and audio switching circuitry for the PL33609/J limiter/compressor.

The power supply is based around regulator IC6. The AC supply from the mains transformer is applied via CONN 5 Pins 1 and 2, rectified and smoothed by D7 and C6 respectively. IC6 regulates the smoothed DC voltage down to +24V factory preset by RV1.

Audio In/Out switching is accomplished by four pole relays RL 1 and 2. (Left and Right channels respectively)

Stereo Linking of Left and Right control voltages is accomplished by RL3.

Control of the three relays is achieved by IC1, 2 and 3. The logic controlling In/Out and Stereo Linking is similar, and this description will only describe In/Out switching.

Analogue switch (output pin 14) IC2, selects between control from the front panel switches or from an external control via the 15 Way "D" connector. A logic level from the front panel INT/EXT switch determines which input of IC2 is selected:

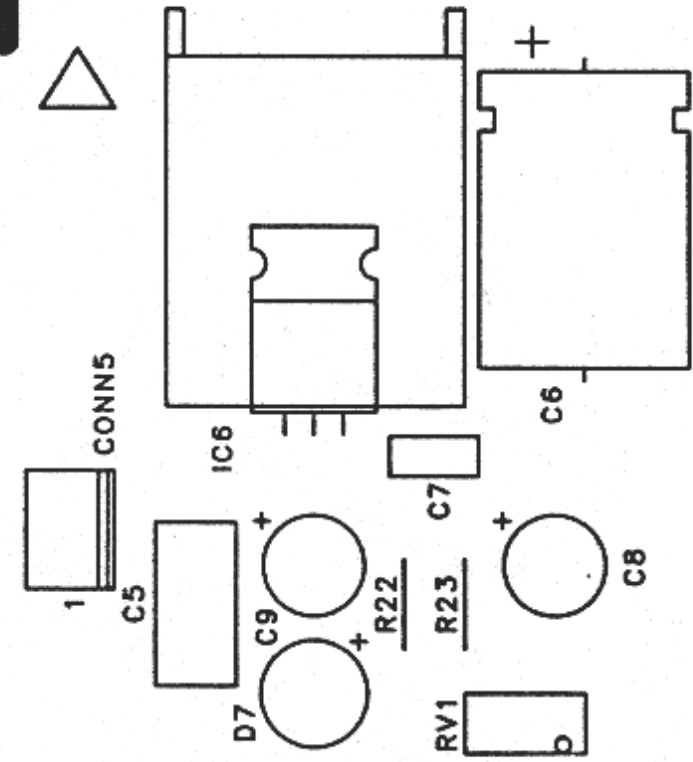
Logic 0 (0V) pin 12 - Internal  
Logic 1 (5V) pin 13 – External

The external input I s clamped by D2 and buffered by IC1 (output pin 3) before being applied to IC2. The output of IC2 is de-bounced by IC1 (output pin 8) and R6, D3 and C3 and then applied to the clock input of "D" type latch IC3 (outputs pins 5 and 6). The output of IC3 is fed to TR1 which drives the coil of RL1 and 2. TR2 similarly drives the By-pass illumination of the front panel switch.

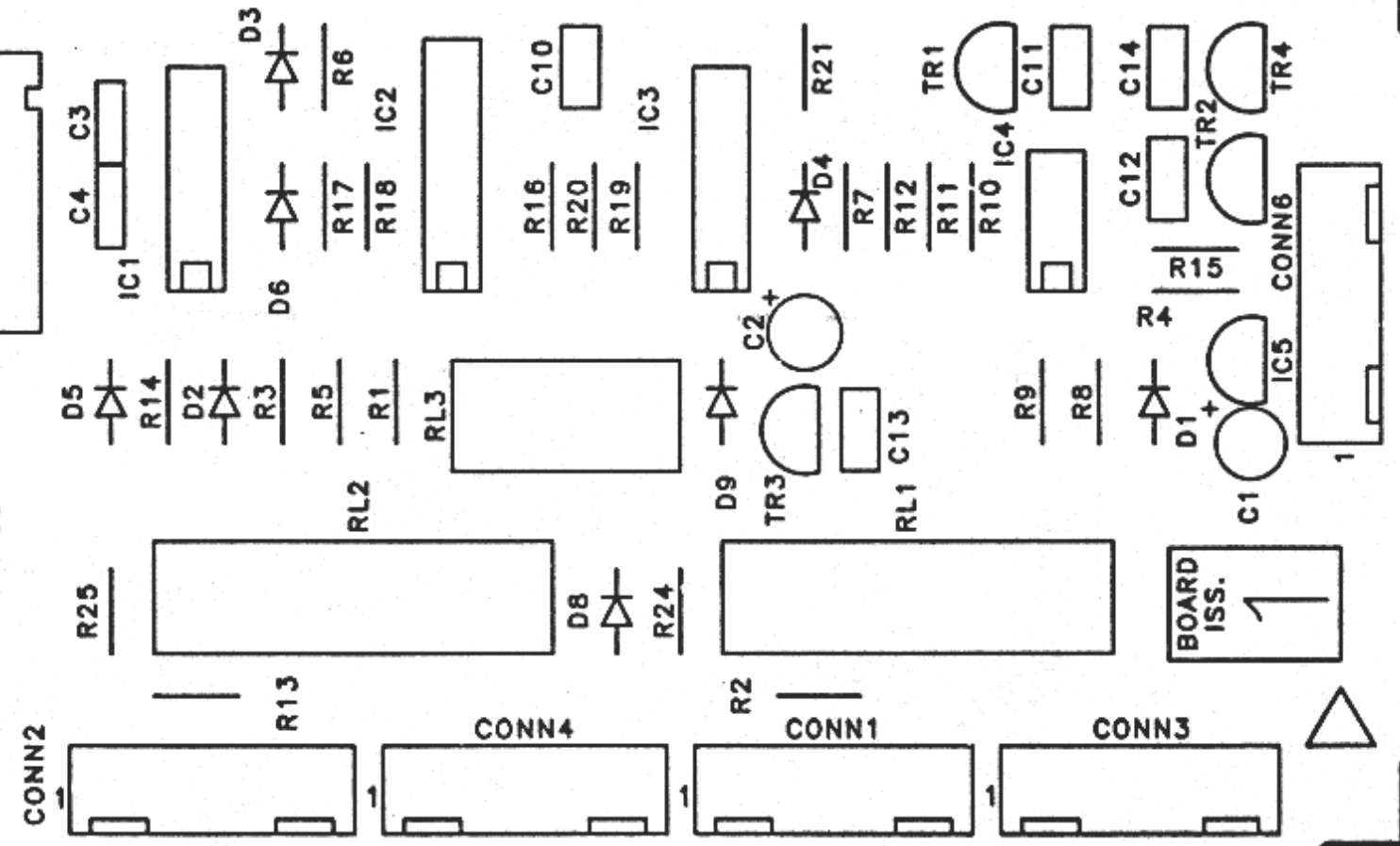
IC4 (output pin 1) is a comparator which monitors the pre-regulator DC voltage. In the event of this voltage falling below a preset level the output switches low "stealing" the base current of TR1 and thus de-energising the relays hence switching the unit into "By-pass" mode. This ensures continuity in the event of a power failure.

R7, D4 and C2 clear the latches on power-up.

Regulator IC5 regulates the 24V supply to +5V for the logic IC's.

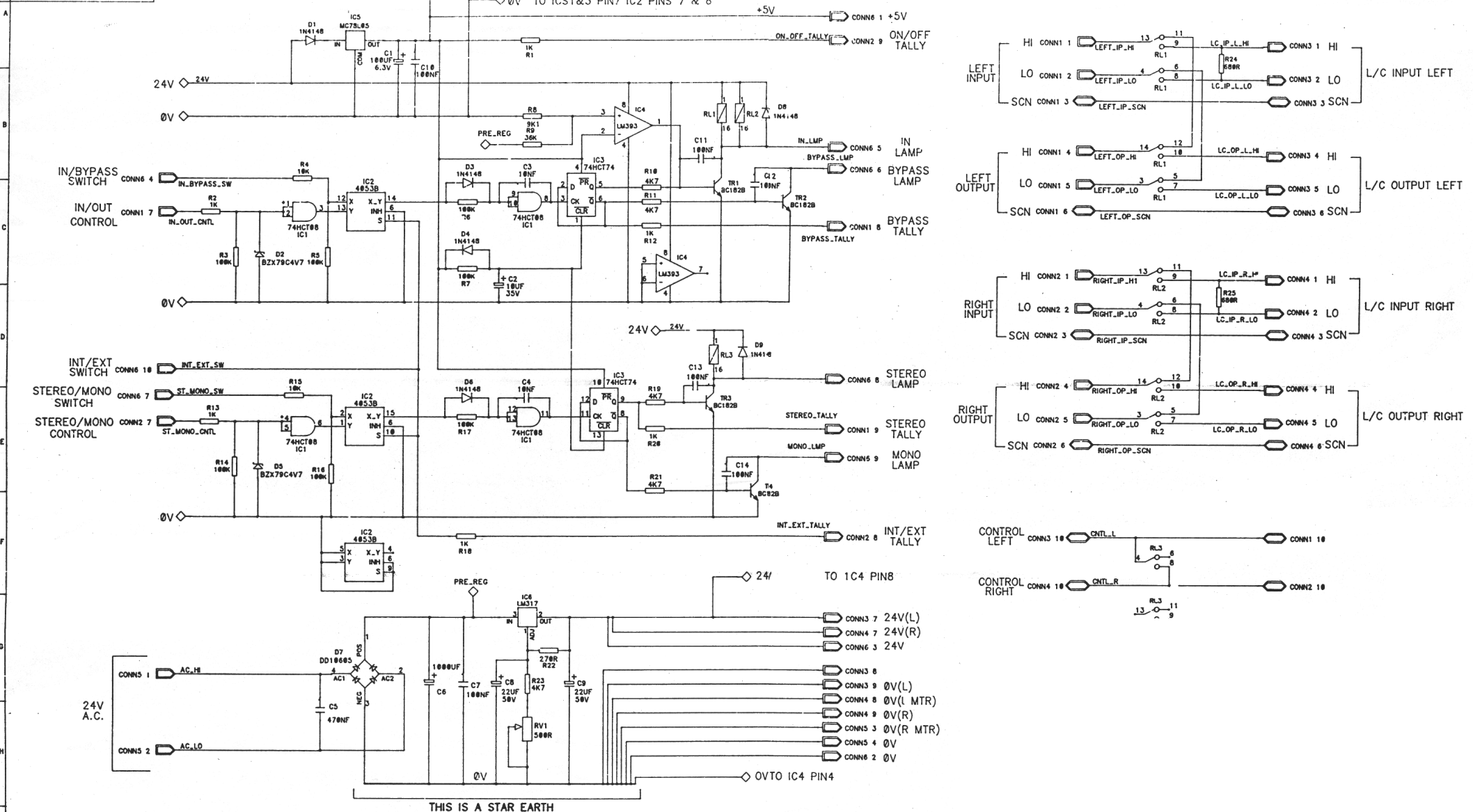


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EV11720



BOARD  
ISS.  
1

DRAWING No. SHF 1 of 1  
EX11720



THIS IS A STAR EARTH

1	B	A	Issue	Drn.	C.R.H.	TITLE	USED ON
15-5-91	2-4-91	25-3-91	Date	Traced	P.S.	33609/J	Drp. No. EX11720
			C.N. No.	Checked		PSU & RELAY CARD	SHF. 1 of 1
CP Hds.			Checked	Neve Electronics International Ltd 1991 © A1			

# Recall Sheet

