

BA716/717 INFORMATION

GENERAL - (SEE FIGURE 1)

BA716 and 717 are fixed together to form a sandwich assembly mounted near the centre of the channel or rev modules. A single 16 way flying flatcable connector connects BA716 to a header on BA740.

BA716/717 form a four band fully variable (parametric) equaliser which may be switched into the Channel or Mixdown signal paths. The high frequency and low frequency bands may be switched from a peaking to a shelving characteristic. When used in a Rev module the EQ may be switched into the Rev Send path (or Delay Insertion path if "INS" button on BA752 is pressed) or the Rev Return path.

USER CONTROLS

Frequency controls : one per band, marked 30Hz - 300Hz ; 200Hz - 2kHz ; 0.8kHz - 8kHz ; 1.5kHz - 15kHz. Set band centre frequencies.

Boost/Cut controls : one per band, marked LOW, MID 1, MID 2, HIGH. Set band boost or cut over range ± 18 dB.

"D" button : When out, low band response is bell shaped. When in, lowband response is shelving.

"C" button : When out, high band response is bell shaped. When in, high band response is shelving.

"CH" button : When out, EQ is available in the Mixdown path. When in, EQ is available in the channel path.

"IN" button : When out, EQ is bypassed. When in, EQ is inserted in the signal path.

NOTE : As with all parametric equalisers, a certain amount of overlap of frequency ranges is provided. Careless use can thus result in ridiculously high gains at certain frequencies which may cause oscillation.

DETAIL

See ET10209 (circuit diagram), EB20364 (channel module block diagram), and figure 1.

The BA716/717 parametric equaliser may be considered to consist of five separate sections, each of which is physically split between the two printed circuit boards:

- a) In/Out switching and LED indicator switching
- b) Low band EQ section
- c) Mid 1 band EQ section
- d) Mid 2 band EQ section
- e) High band EQ section

All the EQ sections are connected in series.

INPUT/OUTPUT AND LED SWITCHING

Switch S1 ("CH") on BA717 and S2 ("IN") on BA716 enable the equaliser to be switched into either the Channel or the Mixdown signal paths, and to be either in circuit or bypassed. One pole of each switch is used to switch LEDs mounted remotely on BA740. IC1 on BA716 is a non-inverting buffer amplifier.

LOW BAND EQ SECTION

BA717 : IC1 amplifiers a, b, and c, form a Two-Integrator loop filter whose frequency is tuned by RV1 (30Hz - 300Hz). The filter has a fixed "Q" of 1 and its input is provided by IC2a on BA716. Two outputs are taken from the filter to a summing amplifier IC1d, one filter output and IC1d output then going to the shelving switch (S1 on BA716).

BA716 : IC2b is used as an inverting summing amplifier to combine the filter output, selected by S1 with the input signal from IC1 buffer. RV1 devices a voltage which is somewhere between the full input signal (fully clockwise, full boost) and the full inverted and summed output of IC2b (fully anticlockwise, full cut). The output of RV1 is amplified by IC2a and is the input for the filter on BA717. Low band EQ section output is taken from IC2b, and is the input for the Mid 1 EQ section (IC2d etc).

MID 1 BAND EQ SECTION

BA717 : IC2a and d form a modified Two Integrator loop giving only a second order bandpass output from IC2d. The "Q" of this filter is 2 and centre frequency set by RV2 (200Hz - 2kHz). Filter input is received from IC2c on BA716, and bandpass output sent to IC2d on BA716.

BA716 : IC2d is used to invert the Mid 1 EQ sections input signal, (from IC2b the lowpass EQ sections output) and add to it the bandpass filter output received from IC2d on BA717. RV2 derives a voltage which is somewhere between full input signal (fully clockwise, full boost) and full filter output minus input signal (fully anticlockwise, full cut). The output of RV2 is buffered by IC2c and provides the input for the filter on BA717. Mid 1 band EQ section output is taken from IC2d and is the input for the Mid 2 band EQ section (IC3a). The signal at this point has passed through both Low and Mid 1 band EQ sections in series, each of which operate without interacting.

MID 2 BAND EQ SECTION

The operation of this circuit is identical to that of the Mid 1 band section described above. It uses IC2b and c and RV3 (0.8kHz - 8kHz) on BA717, IC3 a and b and RV3 (boost/cut) on BA716. Input is received from IC2c on BA716, the Mid 1 sections output. Output is sent from IC3b on BA716 to the input of the high band EQ section. At this point the signal has been operated on non-interactively by the Low, Mid 1, and Mid 2 band EQ sections.

HIGH BAND EQ SECTION

The operation of this circuit is similar to that of the low band EQ section described above except that different outputs from the Two Integrator loop filter on BA717 (IC3 a - d) are used in order to achieve high pass shelving characteristics when selected by S2 on BA717. Amplifiers used on BA716 are IC3c and d. Input is received from IC3b on BA716, the Mid 2 EQ sections output. Output is sent from IC3c on BA716 back to the "IN" switch S2 on BA716. At this point the signal has been operated on by all four EQ sections in series, non- interactively.

LEVELS

The BA716/7 circuits are used at a nominal level of -10dBu.

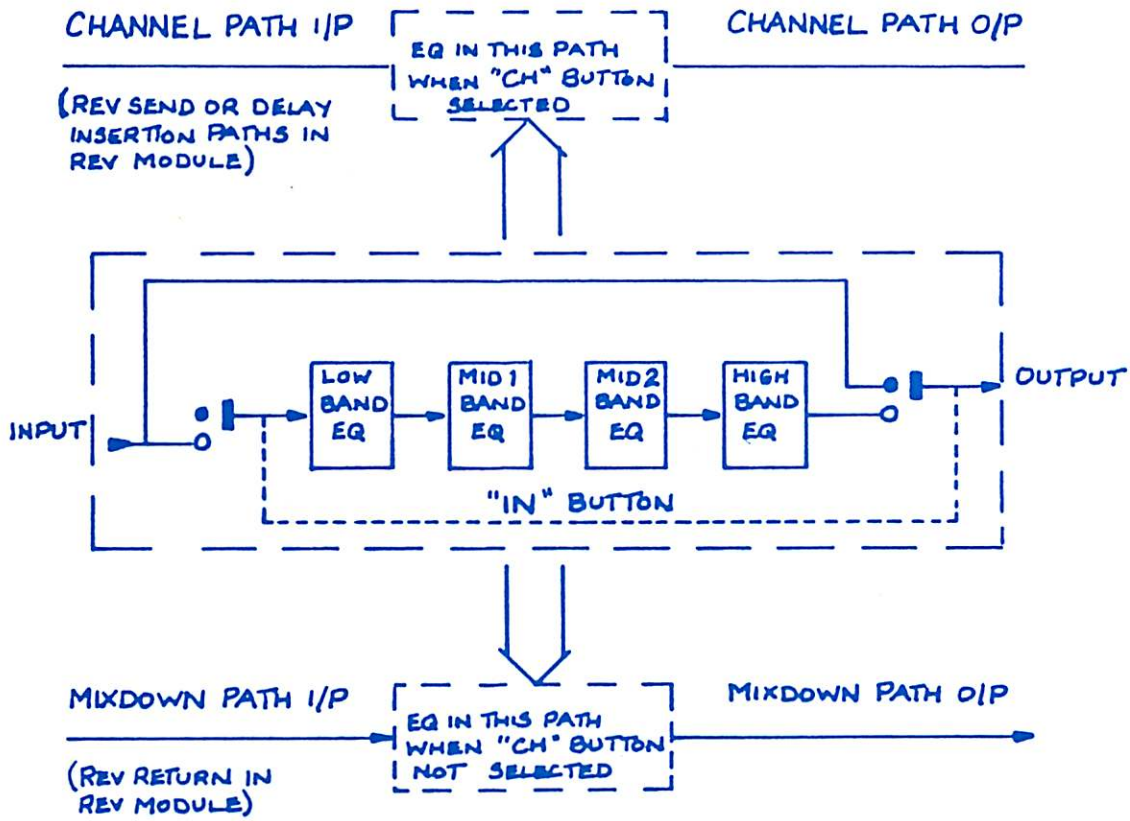
D.C. SUPPLIES

The BA716/717 EQ assembly runs from +18V regulated power which it receives from the BA712/713 or BA752/753 assemblies via BA740.

TEST POINTS

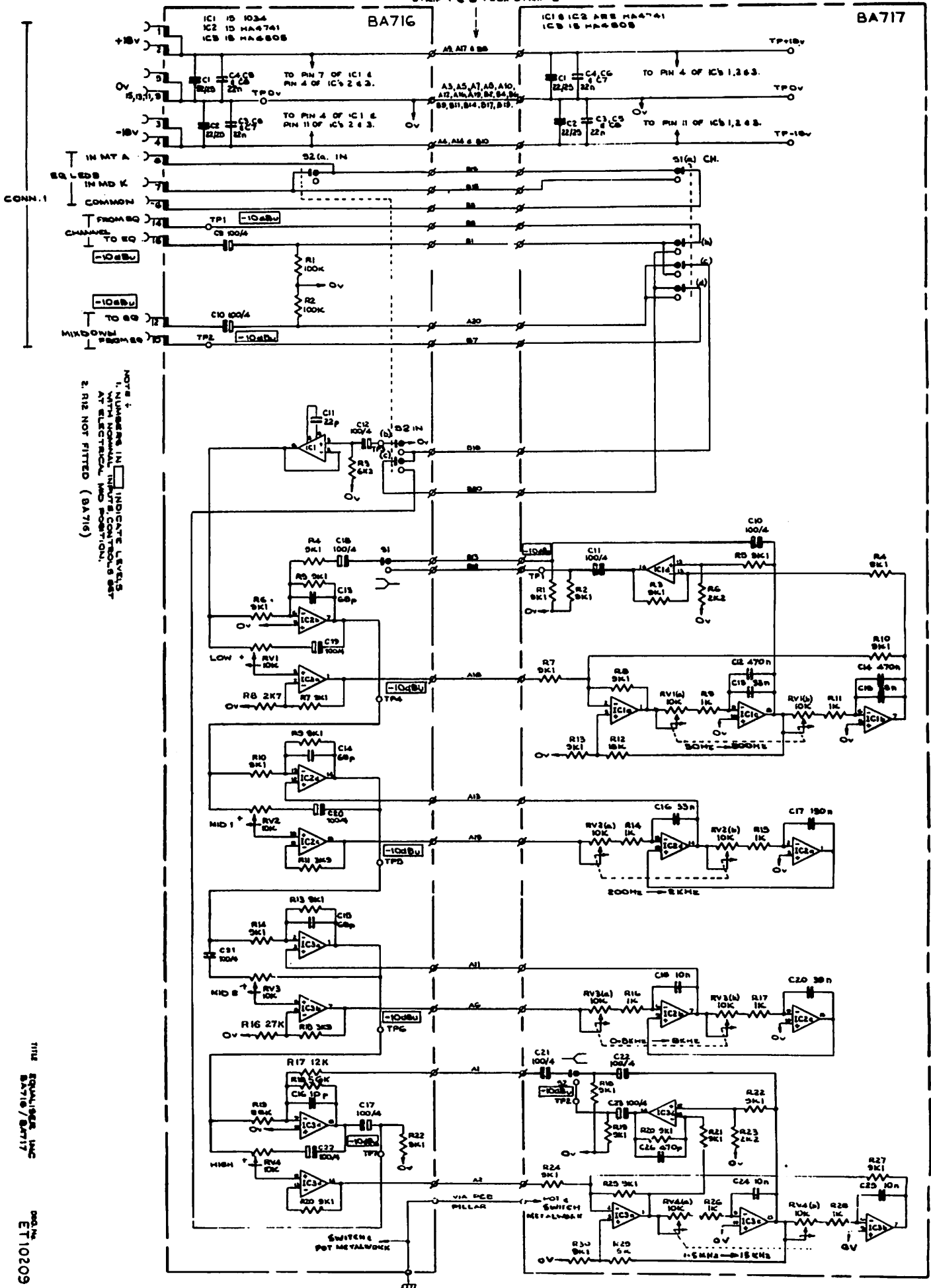
Test points are provided as follows on BA716.

TPOV	OV reference
TP1	Channel path output from EQ
TP2	Mixdown path output from EQ
TP3	EQ input, after path selection and in/out
TP4	Signal after low-band EQ section
TP5	Signal after Mid 1 band EQ section
TP6	Signal after Mid 2 band EQ section
TP7	Signal after High band EQ section



BOARD INTERCONNECTIONS
 PROVIDED A COMPRESS FLEX
 STRIP 1 & 2 FLEX STRIP 2

BA717

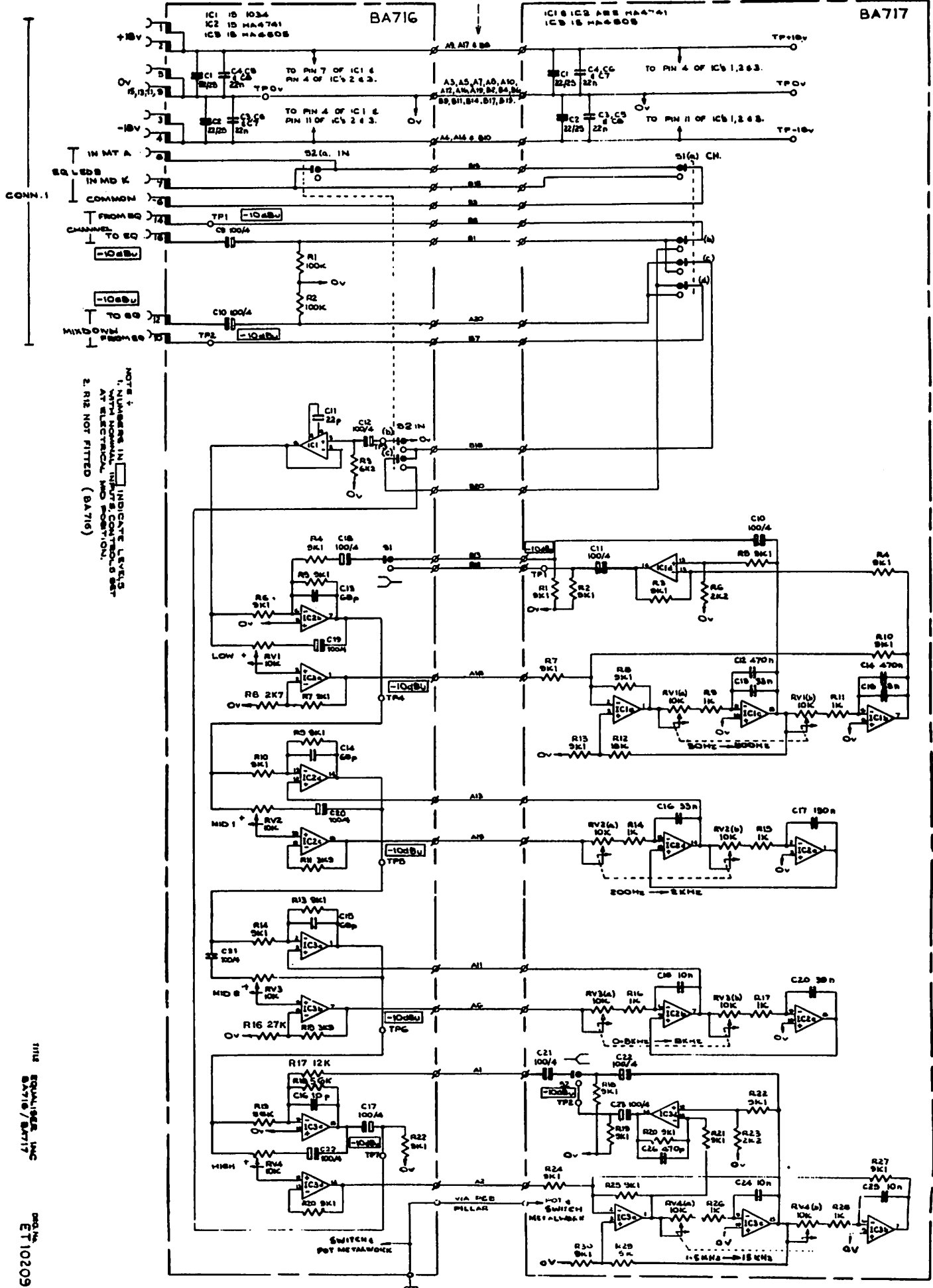


NOTE 1
 1. NUMBERS IN INDICATE LEVELS
 WITH NORMAL INPUTS CONTROLLED BY
 AT ELECTRICAL MID POSITION.
 2. R12 NOT FITTED (BA716)

THIS EQUIPMENT HAS
 BEEN DESIGNED BY
 ET10209

BOARD INTERCONNECTIONS
 PREPARED A COMPASS FLEX
 STRIP 1 & 2 BLACK STRIP 2

BA717



NOTE 1: NUMBERS IN INDICATE LEVELS
 WITH NORMAL INPUTS, CONTROLS SET
 AT ELECTRICAL MD POSITION.
 2. R12 NOT FITTED (BA716)

1118 EQAL/988 144C
 BA716/BA717
 DOC 44
 ET 10209

TITLE:

BA 716 & BA 717 EQUALISER SECTION

PART LIST No. PL 80008
SHT. 1 OF 6



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FIRST USED ON: N 78

ITEM No.	N.E.L. PART NO.	DESCRIPTION	No. OFF									
1		<u>MANUFACTURING INFORMATION</u>										
2	ET 10209	CIRCUIT DIAGRAM		ISSUE 4								
3	EZ 10716	TEST SPECIFICATION		— " — 1								
4												
5												
6		<u>MANUFACTURING INFORMATION FOR BA 716</u>										
7	EU 10716	MASTER LINE DIAGRAM										
8	EV 10716	MANUFACTURING DETAILS										
9	EW 10716	COMPONENT LAYOUT										
10												
11												
12		<u>MANUFACTURING INFORMATION FOR BA 717</u>										
13	EU 10717	MASTER LINE DIAGRAM										
14	EV 10717	MANUFACTURING DETAILS										
15	EW 10717	COMPONENT LAYOUT										
16												
17												
18				12	11	10	9	8				
19				17.12.80	13.11.80	17.7.80	28.6.80	31.5.80				
20				61063	61056	60924	60900	60360	60751			
DRAWN: <i>RA</i>		ISSUE	A	1	2	3	4	5	6	7	PART LIST No: PL 80008	
CHECKED: <i>[Signature]</i>		DATE	27/3/79	20/5/79	3-8-79	8-8-79	20-8-79	12.10.79	28.11.79	10.3.80	SHT. 1 OF 6	
		C/N No.			60510	60512	20214	30211	30260	60793		

ITEM No.	N.E.L. PART No.	DESCRIPTION	No. OFF	
21	<u>BA716 COMPONENTS</u>			
22	EV 10716	PRINTED CIRCUIT BOARD	1	ISSUE 10
(10) 23	RA006K2	RESISTOR TR4 2% 6K2 OHMS	1 F	R3
24	CA 10221	CAPACITOR MULLARD 22pF 100v	1	C11
(6) (5) 25	CA 10681	————— " ————— 68pF 100v	3	C13-15
26	CA 20223	————— " ————— 22nF 63v	6	C3-8
27	CA 60220	————— " ————— 22μF 25v	2	C1,2
(10) 28	CA 61000	————— " ————— 100μF 4v	9	C9,10,12,17,18,19-22
(5) 29	CA 10101	————— " ————— 10pF	1	C16
30	CN 20162	D.I.L. SOCKET 8 WAY	1	FOR ITEM 33
(5) 31	CN 20282	————— " ————— 14 WAY	2	FOR ITEMS 32 & 34
(5) 32	IC 20014	INTEGRATED CCT. HA-4605-5	1	IC3
33	IC 20007	INTEGRATED CCT. TDA 1034B	1	IC1
(5) 34	IC 20010	————— " ————— HA 47415	1	IC2
(4) 35	FG 10502	POP RIVET 3/32" x 0.2" LG.	1 F	FOR ITEM 42
36	PT 15031	POT. 10K SFER.	4	RV1-4
(11) (5) 37	RA 002K7	RESISTOR TR4 2% 2K7 OHMS	1 F	R8
38	RA 003K9	————— " ————— 3K9 ———	2 F	R11,15
(11) (5) 39	RA 009K1	————— " ————— 9K1 ———	10 F	R4-7, 9, 10, 13, 14, , 20, 22.
(10) 40	RA 100K0	————— " ————— 100K ———	2 F	R1-2
(5) 41	RA 056K0	————— " ————— 56K ———	2 F	R18,19
(5) 42	SW 20522	DIALISTAT SWITCH 2B 2P#4P	1	S1#2
(4) 43	WA 17207	SOLDER TAG 8BA	1 F	FOR ITEM 42
(5) (3) 44	WA 17005	TEST POINT	8 F	TPI-7, TP OV
DRAWN: <i>JA</i>				PART LIST No. PL 80008
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① NEW PAGE ADDED.

ITEM No.	N.E.L. PART No.	DESCRIPTION	No. OFF	
117	BA 716 COMPONENTS CONT:-			
118				
119	RA 027KO	RESISTOR TR4 2% 27K OHMS	1 F	R16
120	RA 012KO	RESISTOR TR4 2% 12K OHMS	1 F	R17
121				
122				NOTE:- R12 NOT FITTED.
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CHECKED:				

ITEM No.	N.E.L. PART No.	DESCRIPTION	No. OFF	
45	BA 717	COMPONENTS		
46	EV 10717	PRINTED CIRCUIT BOARD	1.	ISSUE 10
47				
⑤ 48	CA 20332	CAPACITOR SIEMANS 33nF	3.	C13, C15, C16
49	CA 24703	" " 470nF	2.	C12, C14.
⑤ 50				
⑤ 51				
⑤ 52	CA 20102	CAPACITOR SIEMANS 10nF	3.	C18, C24, C25.
53	CA 20223	" CERAMIC 22nF	6.	C3, C4, C5, C6, C7, C8.
⑤ 54				
⑤ 55	CA 20390	CAPACITOR SIEMANS 39nF	1 F	C20.
⑤ 56	CA 21502	" " 150nF	1.	C17.
57	CA 60220	" ELECTROLYTIC 22μF 25V	2.	C1, C2.
58	CA 61000	" " 100μF 4V	5.	C10, C11, C21, C22, C23.
② 59	CA 14700	" SUFLEY 470PF 63V	1.	C26
60				
⑤ 61	CN 20282	IC SOCKET 14 WAY	3.	FOR ITEMS NOS 65, & 66
62				
63				
64				
⑤ 65	IC 20010	INTEGRATED C.C.T. HA 4741-5	2	IC1, IC2
⑤ 66	IC 20014	" " " HA 4605-5	1	IC3
67	PT 45015	POT 10K+10K OHMS	4.	Rv 1, Rv 2, Rv 3, Rv 4.
68				
DRAWN:				PART LIST No. PL 80008
CHECKED:				SHT. 4 OF 6

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ITEM No.	N.E.L. PART No.	DESCRIPTION	No. OFF	
⑤ 69	RA001K0	RESISTOR TR4 1K OHMS	8 ^F	R9, R11, R14-17, 26, 28
⑤ 70	RA002K2	———— " ——— 2K2 — " ———	2 ^F	R6, R23
71	RA009K1	———— " ——— 9K1 — " ———	18 ^F	R1, R2, R3, R4, R5, R7, R8, R10, R13, R18,
72				R19, R20, R21, R22, R24, R25, R27, R30
73	RA018K0	———— " ——— 18K — " ———	2 ^F	R12, R29.
74				
75				
76				
⑤ 77	SW20502	1B.2P DIALISTAT SWITCH	1.	S2
⑤ 78	SW20501	1B.4P ————— " —————	1.	S1. replaced
79				
80				
81				
⑤ 82	WA17005	TEST POINT	5 ^F	TP1, TP2, 0V, +18V, -18V
83				
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DRAWN:				PART LIST No. PL 80008
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ITEM No.	N.E.L. PART No.	DESCRIPTION	No. OFF	
93		<u>INTERFACE COMPONENTS</u>		
94				
⑤ 95	CN 20323	16W ANSLEY WRAP POST SKT	1.	FOR ITEM 107.
96				
97				
98	MG22250	P.C.B. BRIDGE	3.	
99				
100	MG22251	BRIDGE CAPTIVE SCREW	3.	FOR ITEM N° 98.
101				
102	MG 22248	P.C.B. PILLAR	1	
103	FM 11620	SCREW M3 X 5mm PAN. POZI. HD.	2 F	FOR ITEM 102
⑦ ⑤ 104	FA 12703	SELF TAPPING SCREW	12 F	FOR ITEM 98
105		PAN POZI HD N°4 x 3/8" LG		
106				
⑤ 107	WA 17601	SOLDER TRANSITION 16WAY	1.	ST1
⑤ 108	WR 74381	FLEXI STRIP 20WAY	2.	FSP1,2
109				
110				
⑤ 111	WR 71007	FLAT CABLE 16 WAY		80mm LENGTH. FOR ITEM 107.
112				
113				
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