TAPE I/O CONNECTIONS FOR A & B. IN PIN ORDER

EDACs 20 - 27, 29, 30, 32, 33.

FOR LINE INPUT 33 - 48, USE PINS DESIGNATED "TAPE RETURN".

PIN	FUNCTION		TRACK	LINE
A	TAPE RETURN	+	6, 14, 22, 30	38, 46
B	TAPE RETURN	-	6, 14, 22, 30	38, 46
C	GND			
D	TAPE SEND	+	7, 15, 23, 31	
E	TAPE SEND	-	6, 14, 22, 30	
F	GND			
H	GND			
J	GND			
K	TAPE SEND	-	7, 15, 23, 31	
L	TAPE SEND	+	6, 14, 22, 30	
M	GND			
N	TAPE RETURN	-	7, 15, 23, 31	39, 47
P	TAPE RETURN	+	7, 15, 23, 31	39, 47
R	TAPE RETURN	+	5, 13, 21, 29	37, 45
S	TAPE RETURN	-	5, 13, 21, 29	37, 45
T	GND			
U	GND			
V	TAPE SEND	+	8, 16, 24, 32	
W	TAPE SEND	-	5, 13, 21, 29	
X	GND			
Y	GND			
Z	TAPE SEND	-	8, 16, 24, 32	
a	TAPE SEND	+	5, 13, 21, 29	
b	GND			
c	TAPE RETURN	-	8, 16, 24, 32	40, 48
d	TAPE RETURN	+	8, 16, 24, 32	40, 48
e,f,h,j	GND			
k	TAPE RETURN	+	4, 12, 20, 28	36, 44
l	TAPE RETURN	-	4, 12, 20, 28	36, 44
m	GND			
n	TAPE SEND	+	1, 9, 17, 25	
p	TAPE SEND	-	4, 12, 20, 28	
r,s	GND			
t	TAPE SEND	-	1, 9, 17, 25	
u	TAPE SEND	+	4, 12, 20, 28	
v,w	GND			
x	TAPE RETURN	-	1, 9, 17, 25	33, 41
y	TAPE RETURN	+	1, 9, 17, 25	33, 41
z	TAPE RETURN	+	3, 11, 19, 27	35, 43
AA	TAPE RETURN	-	3, 11, 19, 27	35, 43
BB	GND			
CC	TAPE SEND	+	2, 10, 18, 26	
DD	TAPE SEND	-	3, 11, 19, 27	
EE	GND			
FF	GND			
HH	GND			
JJ	TAPE SEND	-	2, 10, 18, 26	
KK	TAPE SEND	+	3, 11, 19, 27	
LL	GND			
MM	TAPE RETURN	-	2, 10, 18, 26	34, 42
NN	TAPE RETURN	+	2, 10, 18, 26	34, 42

TAPE I/O CONNECTIONS FOR A & B. IN TRACK ORDER.

EDACs 20 - 27

FOR LINE INPUT 33 - 48, USE PINS DESIGNATED "TAPE RETURN".

PIN	FUNCTION		TRACK	LINE
n	TAPE SEND	+	1, 9, 17, 25	
t	TAPE SEND	-	1, 9, 17, 25	
x	TAPE RETURN	-	1, 9, 17, 25	33, 41
y	TAPE RETURN	+	1, 9, 17, 25	33, 41
CC	TAPE SEND	+	2, 10, 18, 26	
JJ	TAPE SEND	-	2, 10, 18, 26	
NN	TAPE RETURN	+	2, 10, 18, 26	34, 42
MM	TAPE RETURN	-	2, 10, 18, 26	34, 42
KK	TAPE SEND	+	3, 11, 19, 27	
DD	TAPE SEND	-	3, 11, 19, 27	
z	TAPE RETURN	+	3, 11, 19, 27	35, 43
AA	TAPE RETURN	-	3, 11, 19, 27	35, 43
u	TAPE SEND	+	4, 12, 20, 28	
p	TAPE SEND	-	4, 12, 20, 28	
k	TAPE RETURN	+	4, 12, 20, 28	36, 44
l	TAPE RETURN	-	4, 12, 20, 28	36, 44
a	TAPE SEND	+	5, 13, 21, 29	
W	TAPE SEND	-	5, 13, 21, 29	
R	TAPE RETURN	+	5, 13, 21, 29	37, 45
S	TAPE RETURN	-	5, 13, 21, 29	37, 45
L	TAPE SEND	+	6, 14, 22, 30	
E	TAPE SEND	-	6, 14, 22, 30	
A	TAPE RETURN	+	6, 14, 22, 30	38, 46
B	TAPE RETURN	-	6, 14, 22, 30	38, 46
D	TAPE SEND	+	7, 15, 23, 31	
K	TAPE SEND	-	7, 15, 23, 31	
P	TAPE RETURN	+	7, 15, 23, 31	39, 47
N	TAPE RETURN	-	7, 15, 23, 31	39, 47
V	TAPE SEND	+	8, 16, 24, 32	
Z	TAPE SEND	-	8, 16, 24, 32	
d	TAPE RETURN	+	8, 16, 24, 32	40, 48
c	TAPE RETURN	-	8, 16, 24, 32	40, 48

PIN	FUNCTION	PIN	FUNCTION
C	GND	F	GND
J	GND	M	GND
U	GND	X	GND
Y	GND	b	GND
e,f,h,j	GND	m	GND
r,s	GND	v	GND
BB	GND	EE	GND
HH	GND	LL	GND

MICROPHONE INPUTS.

EDACs 1 - 3

PIN	FUNCTION	MIC INPUT		
F	+	1	17	33
E	-	1	17	33
A	GND	1	17	33
B	+	2	18	34
C	-	2	18	34
H	GND	2	18	34
K	+	3	19	35
J	-	3	19	35
D	GND	3	19	35
V	+	4	20	36
U	-	4	20	36
P	GND	4	20	36
M	+	5	21	37
N	-	5	21	37
T	GND	5	21	37
S	+	6	22	38
R	-	6	22	38
L	GND	6	22	38
b	+	7	23	39
a	-	7	23	39
W	GND	7	23	39
d	+	8	24	40
c	-	8	24	40
Z	GND	8	24	40

PIN	FUNCTION	MIC INPUT		
k	+	9	25	41
l	-	9	25	41
p	GND	9	25	41
m	+	10	26	42
n	-	10	26	42
t	GND	10	26	42
x	+	11	27	43
y	-	11	27	43
CC	GND	11	27	43
BB	+	12	28	44
AA	-	12	28	44
w	GND	12	28	44
u	+	13	29	45
v	-	13	29	45
z	GND	13	29	45
DD	+	14	30	46
EE	-	14	30	46
KK	GND	14	30	46
MM	+	15	31	47
LL	-	15	31	47
FF	GND	15	31	47
HH	+	16	32	48
JJ	-	16	32	48
NN	GND	16	32	48

AUX AND STEREO-A,B OUTPUTS.

EDAC 14

PAIR	PIN	FUNCTION
1 +	NN	AUX OUT 1
1 -	JJ	
2 +	MM	AUX OUT 2
2 -	HH	
3 +	LL	AUX OUT 3
3 -	FF	
4 +	DD	AUX OUT 4
4 -	KK	
5 +	z	AUX OUT 5
5 -	EE	
6 +	u	AUX OUT 6
6 -	AA	
7 +	p	AUX OUT 7
7 -	v	
8 +	h	AUX OUT 8
8 -	k	
9 +	a	STEREO-A OUT L
9 -	e	
10 +	S	STEREO-A OUT R
10 -	W	
11 +	M	STEREO-B OUT L
11 -	R	
12 +	F	STEREO-B OUT R
12 -	L	
13 +	A	not used
13 -	E	
14 +	H	not used
14 -	B	
15 +	J	not used
15 -	C	
16 +	K	not used
16 -	D	

ALL OTHER PINS ARE GROUND.

STEREO RETURNS (DISC, CASSETTE, EXT 1, EXT 2) & FX RETURNS.

EDAC 15

PAIR	PIN	FUNCTION
1 +	NN	FX RETURN 1 LEFT
1 -	JJ	
2 +	MM	FX RETURN 1 RIGHT
2 -	HH	
3 +	LL	FX RETURN 2 LEFT
3 -	FF	
4 +	DD	FX RETURN 2 RIGHT
4 -	KK	
5 +	z	FX RETURN 3 LEFT
5 -	EE	
6 +	u	FX RETURN 3 RIGHT
6 -	AA	
7 +	p	FX RETURN 4 LEFT
7 -	v	
8 +	h	FX RETURN 4 RIGHT
8 -	k	
9 +	a	EXT 1 INPUT L
9 -	c	
10 +	S	EXT 1 INPUT R
10 -	W	
11 +	M	EXT 2 INPUT L
11 -	R	
12 +	F	EXT 2 INPUT R
12 -	L	
13 +	A	CASSETTE INPUT L
13 -	E	
14 +	H	CASSETTE INPUT R
14 -	B	
15 +	J	COMPACT DISC INPUT L
15 -	C	
16 +	K	COMPACT DISC INPUT R
16 -	D	

ALL OTHER PINS ARE GROUND.

COMMUNICATIONS IN/OUT.

EDAC 16

PAIR	PIN	FUNCTION
1 +	NN	EXT 1 TALKBACK OUTPUT.
1 -	JJ	
2 +	MM	EXT 2 TALKBACK OUTPUT.
2 -	HH	
3 +	LL	BOOTH TALKBACK OUTPUT.
3 -	FF	
4 +	DD	not used
4 -	KK	
5 +	z	not used
5 -	EE	
6 +	u	not used
6 -	AA	
7 +	p	not used
7 -	v	
8 +	h	LISTEN MIC INPUT.
8 -	k	
9 +	a	not used
9 -	e	
10 +	S	not used
10 -	W	
11 +	M	not used
11 -	R	
12 +	F	not used
12 -	L	
13 +	A	not used
13 -	E	
14 +	H	not used
14 -	B	
15 +	J	RED LIGHT A
15 -	C	RED LIGHT B
16 +	K	RED LIGHT C
16 -	D	RED LIGHT D

ALL OTHER PINS ARE GROUND.

PHONES OUTPUTS. MONITOR OUTPUTS.

EDAC 17

PAIR	PIN	FUNCTION
1 +	NN	PHONES OUT 1 L
1 -	JJ	
2 +	MM	PHONES OUT 1 R
2 -	HH	
3 +	LL	PHONES OUT 2 L
3 -	FF	
4 +	DD	PHONES OUT 2 R
4 -	KK	
5 +	z	PHONES OUT 3 L
5 -	EE	
6 +	u	PHONES OUT 3 R
6 -	AA	
7 +	p	PHONES OUT 4 L
7 -	v	
8 +	h	PHONES OUT 4 R
8 -	k	
9 +	a	STUDIO SPEAKERS OUT L
9 -	e	
10 +	S	STUDIO SPEAKERS OUT R
10 -	W	
11 +	M	MAIN MONITOR SPEAKERS OUT L
11 -	R	
12 +	F	MAIN MONITOR SPEAKERS OUT R
12 -	L	
13 +	A	ALTERNATE MONITORS OUT L
13 -	E	
14 +	H	ALTERNATE MONITORS OUT R
14 -	B	
15 +	J	NEAR FIELD SPEAKERS OUT L
15 -	C	
16 +	K	NEAR FIELD SPEAKERS OUT R
16 -	D	

ALL OTHER PINS ARE GROUND.

2 TRACK SENDS & RETURNS, & MIX OUTPUTS.

EDAC 18

PAIR	PIN	FUNCTION
1 +	NN	2-TRACK B L SEND
1 -	JJ	
2 +	MM	2-TRACK A L SEND
2 -	HH	
3 +	LL	2-TRACK C L SEND
3 -	FF	
4 +	DD	2-TRACK B R SEND
4 -	KK	
5 +	z	2-TRACK A R SEND
5 -	EE	
6 +	u	2-TRACK C R SEND
6 -	AA	
7 +	p	2-TRACK C L RETURN
7 -	v	
8 +	h	2-TRACK C R RETURN
8 -	k	
9 +	a	2-TRACK B L RETURN
9 -	e	
10 +	S	2-TRACK B R RETURN
10 -	W	
11 +	M	2-TRACK A L RETURN
11 -	R	
12 +	F	2-TRACK A R RETURN
12 -	L	
13 +	A	not used
13 -	E	not used
14 +	H	MIX OUT LEFT
14 -	B	
15 +	J	MIX OUT RIGHT
15 -	C	
16 +	K	MIX OUT MONO (L+R)
16 -	D	

ALL OTHER PINS ARE GROUND.

TIE LINES.

EDACs 4 - 13

PAIR	PIN	TIE LINE NUMBER									
1 +	NN	1	17	33	49	65	81	97	113	129	145
1 -	JJ										
2 +	MM	2	18	34	50	66	82	98	114	130	146
2 -	HH										
3 +	LL	3	19	35	51	67	83	99	115	131	147
3 -	FF										
4 +	DD	4	20	36	52	68	84	100	116	132	148
4 -	KK										
5 +	z	5	21	37	53	69	85	101	117	133	149
5 -	EE										
6 +	u	6	22	38	54	70	86	102	118	134	150
6 -	AA										
7 +	p	7	23	39	55	71	87	103	119	135	151
7 -	v										
8 +	h	8	24	40	56	72	88	104	120	136	152
8 -	k										
9 +	a	9	25	41	57	73	89	105	121	137	153
9 -	e										
10 +	S	10	26	42	58	74	90	106	122	138	154
10 -	W										
11 +	M	11	27	43	59	75	91	107	123	139	155
11 -	R										
12 +	F	12	28	44	60	76	92	108	124	140	156
12 -	L										
13 +	A	13	29	45	61	77	93	109	125	141	157
13 -	E										
14 +	H	14	30	46	62	78	94	110	126	142	158
14 -	B										
15 +	J	15	31	47	63	79	95	111	127	143	159
15 -	C										
16 +	K	16	32	48	64	80	96	112	128	144	160
16 -	D										

ALL OTHER PINS ARE GROUND.

TIE LINE FUNCTIONS: USER NOTES.

1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

17	25
18	26
19	27
20	28
21	29
22	30
23	31
24	32

33	41
34	42
35	43
36	44
37	45
38	46
39	47
40	48

49	57
50	58
51	59
52	60
53	61
54	62
55	63
56	64

65	73
66	74
67	75
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70	78
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72	80

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TIE LINE FUNCTIONS: USER NOTES.

145	153
146	154
147	155
148	156
149	157
150	158
151	159
152	160

4.03 COMMISSIONING.

NOTES: **PROVISIONAL**

1 See also Section 6.04 Power Supply.

2 **ENSURE THIS SECTION IS READ BEFORE APPLYING POWER.**

PSU LOCATION.
The Soundcraft 3200 is exceptionally resistant to interfering magnetic fields by virtue of its balanced group and mix buses. However, to be certain of obtaining the full performance of which this console is capable, the power supplies should not be placed directly below the console, where in any case they are likely to be kicked. The supplies should be placed not less than 1 metre from the nearest point of the console.

PSU CABLE ROUTING.
No special care is needed in the routing of the cables between power supplies and console.

METER OVERBRIDGE INSTALLATION.
The meter overbridge mounts onto the console frame by two interlocking extrusions. Six M5x24mm grubscrews and nuts are employed to prevent movement and accidental disengagement of the overbridge.

To remove overbridge, first remove the two back panels. This permits access to all the components within, including the M5 grubscrews and nuts. Remove the nuts.

All ribbon cables and flying leads need to be disconnected at the in line connectors provided. The overbridge can now be removed by lifting both ends up and away from the console.

Refitting is a reversal of this procedure.

Locking clip devices top and bottom hold module in position, once unlocked they disengage module edge connectors with a simple lever action.

Acheive this by inserting a small flat edge screwdriver in the slot provided then gently pull clip back untill module is no longer locked in position. Do this to both ends before attempting to lift module.

Now with equal force lever back both clips until module disengages.

Slide out module but remember to disconnect fader lead from module PCB.

Replacement is a reversal of this procedure and will cause no problems provided modules are inserted within their card guide rails and care is taken not to trap fader lead.

modules must insert their card guide rails.

The meterbridge is retained by two interlocking extrusions

Six M6x24mm grubscrews and nuts are employed to prevent movement and accidental disengagement.

To remove meterbridge first remove the two back panels this will give you access to all the components within including the m6 grubscrews, remove them.

All ribbon cables and flying leads need to be disconnected at the in line connectors provided.

Meterbridge can now be removed by lifting both ends up and away from the console.

Refitting is a reversal of this procedure.

Locking clip devices top and bottom hold module in position, once unlocked they disengage module edge connectors with a simple lever action.

Acheive this by inserting a small flat edge screwdriver in the slot provided then gently pull clip back untill module is no longer locked in position. Do this to both ends before attempting to lift module.

Now with equal force lever back both clips untill module disengages.

Slide out module but remember to disconnect fader lead from module PCB.

Replacement is a reversal of this procedure and will cause no problems provided modules are inserted within their card guide rails and care is taken not to trap fader lead.

MODULE REMOVAL/REPLACEMENT WITH PSU ON.
Console power supplies may be turned on and off in any order. Any module may be plugged or unplugged into the frame with power applied, without damage occurring, though this is not recommended as a constant practice. It is perfectly safe to switch off the supply to one section of the console only, in order to remove the modules from that section. Leaving modules half-plugged-in for long periods with power applied must be avoided.

MODULE LOADING ORDER.
When a console is being reassembled after delivery, the modules can be loaded into the frame in any order.

TESTING OF CONSOLE ON INSTALLATION.
Note: It is not necessary to carry out a full system test.

MAJOR FUNCTIONS.
A brief check of all the major functions should be made:

1 Check that all meters are illuminated and that the needles lie at minimum deflection. For meter adjustment, lamp changing and calibration, refer to the maintenance section (6).

2 Before any modules are loaded into the console frame, the power supply rails to each mother-board should be checked to ensure that they are receiving the correct DC voltages and that there are no PSU faults.

LOGIC.
1 Check that the global control "MIC/LINE" switches the inputs between mic and line. This is shown by the status illumination of the MIC/LINE button on the inputs.

2 Check that the global control "TAPE/GROUP" switches the monitor source between tape and group. This is indicated by the illuminated TAPE and GROUP switches on the output module.

3 Check that the global control "LINE A/B" switches the monitor tape source between LINE A and LINE B input. This is indicated by the status illumination of line B button on the output module.

4 Select MUTE A on each channel and monitor, and check the action of the mute bus, using the global control. This should also indicate any errors in the programming of the status jumpers. (The switch can be set to illuminate to show either CUT or ON status). Repeat for the remaining three mute busses. Release all switches.

5 Check the action of SIP Bus by selecting SIP on the CSP module, and then SOLO each input and output module in turn. Note that each time a module is SOLO'ed, all the other modules are muted. Repeat this test, but this time with all the "SFE" buttons selected. Check that none of the modules can now be muted by soloing any module. Release all switches.

6 Press SOLO on on each module and check that the red PFL indicator on the CSP module lights.

7 Selecting RED LIGHT on the FX/COMMS module should lock any global switching.

AUDIO TESTS.

1 Select monitor section to monitor groups, then set all group faders to 0dB. Switch on oscillator at 1KHz, and route to multitrack (ie. groups). Increase oscillator gain and check that all monitor meters start to rise. Leave oscillator set so that all monitor meters read 0dB (+4dBu at group output).

2 If a multitrack is already connected to the console, switch the multitrack to "line" mode. Look at meters on the multitrack to check that the signal is present. By adjusting each group fader in turn, it is possible to see that each output is being fed to the right track of the tape machine. The tape machine may need to be re-adjusted, so that the meters show 0dB when the input level is +4dBu. (See section 4.03).

3 Switch monitor section source to TAPE. Monitor meters should still show the same level. (Unless the output of the of tape machine is not set to 0dB at +4dBu).

4 Check that the control room source is selected to "MIX". Move mix fader to 0dB (fully up) and monitor fader 1 to 0dB. The mix meters should now show a signal. Pan the monitor left and right, checking that 0dB is reached on the relevant meter when panned hard to left or right. Reset fader. Repeat this for the remaining monitor modules.

5 Tape normalisation and channel line input can now be checked at the same time. Make sure all monitor faders are down, switch all input channels to LINE (select line A on the inputs if the tape returns are connected to A returns, or line B if tape returns B are used). Route all the inputs to MIX and SOLO each channel in turn. Signal should be present on the master meters. Adjust line gain on each SOLO'ed channel, for 0dB on the master meters. Select AFL on the CSP module, and again SOLO each channel, but this time signal should be post fader. Now move a channel fader to 0dB; 0dB should be shown on the master meters. Check the action of the ON/MUTE button then reset the fader and repeat for the remaining input channels.

6 Route the oscillator to AUX. Select AFL on each aux master, setting its gain to show 0dB on the master meters, also checking that 0dB is shown on the relevant aux meter. NOTE: when stereo aux A and stereo aux B are AFL'ed, the AFL signal sent to the master meters is a sum of the left and right signal. So when the gain has been adjusted to give a AFL level of 0dB, the level shown on the ST A and ST B meters will be approx -3dB.

7 When setting up the control-room monitors, route the oscillator to "2TRK". Slowly turn up the MAIN monitor gain on the CSP module and listen for a clean tone. The main monitor power amps are best set to give the maximum desired monitoring level when the MAIN monitor level on the console is set to approximately 8 on its scale. Check that the CUT button does cut the MAIN output.

8 If ALT, NFS and STUDIO monitors are used, carry out the same test as above. Note: STUDIO has its own cut button. Also check that pressing any talkback button dims the control room monitors.

9 Turn off the oscillator. Switch the monitor section to GROUP; switch inputs to MIC. Route all inputs to all groups and turn on the 48V on each channel. Connect a condenser mic to input 1, via the microphone connection box. Bring up channel fader 1, and check that the signal reaches all the groups. It may be necessary to adjust the gain of the input to give a large enough signal. Repeat for the rest of the inputs.

10 If a talkback mic has been fitted, check that it is possible to send the signal to all destinations, adjusting the gain where necessary. Due to the location of the talkback mic, and its possible sensitivity, it may be necessary to have the gain set quite high. Reset the faders and switch off 48V when finished.

11 If a listen mic has been fitted, check that it can be routed to the control room, and to all the groups. Note that when RED LIGHT is activated, listen to control room will function, but listen to groups will not.

12 The control room and studio sources can be checked by feeding a signal into one of the designated inputs, and selecting the appropriate button on the CSP module. Note that the CASS input, is the only one set up to expect -10dBV (-7.8dBu) nominal level (TASCAM level).

13 The 2TA, 2TB and 2TC outputs are parallelled off the mix output. Any signal fed to mix will always appear on these outputs.

14 A quick check of the headphones output can be made by selecting a signal on the STUDIO output, turning the studio feed on the headphone section to full. (Note: this signal is pre the main studio volume control), and turning up the main headphone volume to the desired level. It is best to use a stereo music signal for this. Repeat this for the remaining headphone outputs to be used.

TEST EQUIPMENT.

It is advatageous to have access to test equipment, ideally:

- Signal generator,
- Millivolt meter capable of measuring dB,
- Associated leads and test probes,
- Bantam patchbay leads.

There will be a set of extender cards accompanying the console.

4.04 OPERATING LEVELS AND INTERFACING

All line inputs and outputs operate at a nominal level of +4dBu, with the following exceptions:

Input module inserts -2dBu
Input module line outputs -2dBu
Group inserts -2dBu
Mix inserts -8dBu
Control-room monitor cassette inputs -8dBu.

NB. Line inputs on both input and output modules have sufficent reserve gain to allow convenient operation at -8dBu (-10dBv) semi-professional levels.

4.05 CONSOLE CONFIGURATION & USER-PROGRAMMABLE OPTIONS

The Soundcraft 3200 has a number of options in its configuration and operation that allow the user to set it up to meet individual requirements, and while these are described in other parts of this manual, they are also gathered together in this section for ease of reference. The options are set by means of push-on links on the module printed-circuit boards. Changing them requires module removal, and you should be confident about your ability to locate components on a complex PCB.

INDIVIDUAL INPUT MODULE OPTIONS.

All on RH PCB.

1) Channel on/off button may be set to be ON or CUT.
FIT LK3 ONLY FOR ON-SWITCH ACTION. (labelled **ON**)
FIT LK4 ONLY FOR CUT-SWITCH ACTION. (labelled **CUT**)

2) Channel may power-up to either on or off, independent of the ON/CUT mode setting above.
FIT LK1 ONLY FOR POWER-UP TO ON. (labelled **UNMT**)
FIT LK2 ONLY FOR POWER-UP TO OFF. (labelled **MT**)

3) Prefade sends are normally muted when the main channel path is muted. Stereo-A, however, may be set to remain on.
FIT LK5 ONLY FOR STEREO-A MUTING. (labelled **MUTE**)
FIT LK6 ONLY FOR STEREO-A TO NOT MUTE. (labelled **ON**)

INDIVIDUAL OUTPUT MODULE OPTIONS.

1) Monitor on/off button may be set to be ON or CUT.
FIT LK3 ONLY FOR ON-SWITCH ACTION.
FIT LK4 ONLY FOR CUT-SWITCH ACTION.

2) Monitor may power-up to on or off.
FIT LK1 ONLY FOR POWER-UP TO ON.
FIT LK2 ONLY FOR POWER-UP TO OFF.

3) Stereo-A may mute or not when the monitor is path muted. (NB LH PCB)
FIT LK5 ONLY FOR STEREO-A MUTING.
FIT LK6 ONLY FOR STEREO-A TO NOT MUTE.

CONTROL-ROOM/STUDIO/PHONES (CSP) MODULE OPTIONS.

PFL/AFL states may be set to override solo-in-place (ie all SIP mutes are suppressed) by installing J1 on the LH PCB.

MASTER-CONTROL MODULE OPTIONS.

The master-status at power-up may be selected on this module. The relevant link positions are marked on the PCB.
J1 selects Line-A or Line-B input for monitor sections.
J2 selects Group A or Tape B input for monitor sections.
J3 selects Mic or Line input for input modules.
Mute masters always power-up to unmuted.

5.00 CONSOLE OPERATION.

5.01 GETTING THE BEST FROM THE SOUNDCRAFT 3200.

The Soundcraft 3200 provides superlative audio performance under all conditions, but certain operational considerations should be observed when the very highest technical standards are required.

As with any mixing console, there are two situations to be avoided; firstly, input faders well up and level pulled back with group/mix fader; this can cause headroom problems in the summing amplifier, which is before the second fader. Secondly, input faders well down and level pulled back up with group/mix fader; this does not make the best use of the console noise performance. Note that the first problem does not apply to the aux sends on the Soundcraft 3200, which uses innovative circuit techniques in the aux summing amplifiers to enhance headroom.

Line inputs on the Soundcraft 3200 are via EDAC connectors, and are therefore not automatically terminated when not in use, as jack socket inputs would be. It is therefore essential to mute or pull down the fader on any unused input or monitor sections.

When an input is no longer needed for routing to group buses, the routing buttons should be released to maximise signal isolation and to alloww the "intelligent routing" system to close down those parts of the module circuitry that are no longer required.

Using the panpot for routing is not recommended, and with the individual routing buttons provided is not necessary. While the panpot isolation on the console is exceptionally good at -90dB, the routing isolation is even better at -120dB.

The best noise and crosstalk results are obtained when an aux send is turned off via its ON button, rather than by turning down the send control. All aux ON buttons should be off except when the module concerned is actually in use for sending to that aux bus.

6.00 MAINTENANCE

6.01 MODULE REMOVAL

MODULE REMOVAL/REPLACEMENT WITH PSU ON
Console power supplies may be turned on and off in any order. Any module may be plugged or unplugged into the frame with power applied, without damage occurring, though this is not recommended as a constant practice. It is perfectly safe to switch off the supply to one section of the console only, in order to remove the modules from that section. Leaving modules half-plugged-in for long periods with power applied must be avoided.

6.02 METER ALIGNMENT

Console metering in the Soundcraft 3200 is provided by 46 moving coil VU meters, and an LED bar graph phase correlation meter mounted in the overbridge. The drive electronics for the meters are located on drive cards mounted on the rear of the meters. The mix meters and phase correlation meter have individual drive cards, while the group and auxiliary meters have one drive card per four meters.

Meter Calibration

The meters on the Soundcraft 3200 are factory calibrated for 0VU = +4dBU, at 1kHz. They should not need re-calibration unless either the meter itself, or a component in the drive card is replaced.

(Note:0dBu= 0.775V RMS, +4dBu=1.228V RMS.)

To re-calibrate any of the meters, it will be necessary to remove the section of the overbridge rear cover behind that meter. Each section is held in position by six screws along the top edge, and fits into a slot in the overbridge body on the lower edge.

MIX METERS

Select MIX on the control-room monitor source select switch-bank, and ensure that no PFL/AFL or SOLO switches are selected anywhere on the console (the solo warning LED should be OFF.)

Set the MIX faders to the top of their travel, turn the oscillator on, set the frequency to 1kHz and press the 2-TRK button to route the signal to the mix busses.

Plug an AC voltmeter into MIX LEFT OUT on the patchbay, and adjust the oscillator level to give a reading of exactly +4dBu, or 1.228V RMS, on the voltmeter. Using a small flat-blade screw driver, adjust the preset on the rear of the MIX LEFT VU meter drive card so that the meter reads exactly 0VU.

The MIX RIGHT meter is calibrated in a similar fashion.

GROUP METERS

Ensure that the monitor source on the relevant group module is set to GROUP, and that MONITOR-TO-GROUP, EQ , FIL and GATE are deselected.

Turn on the console oscillator, set the frequency to 1kHz and press MTRK to route the signal to the group busses.

Plug an AC voltmeter into the GROUP output socket on the patchbay, and adjust the oscillator level to give a reading of exactly +4dBu, or 1.228V RMS, on the voltmeter.

Using a small flat-blade screw driver, adjust the preset on the rear of the group VU meter drive card so that the meter reads exactly 0VU.

AUX METERS
Press the relevant aux master ON button, and turn the level control fully clockwise.

Turn on the console oscillator, set the frequency to 1kHz and press AUX to route the signal to the aux busses.

Plug an AC voltmeter into the relevant AUX output socket on the patchbay, and adjust the oscillator level to give a reading of exactly +4dBu, or 1.228V RMS, on the voltmeter.

Using a small flat-blade screw driver, adjust the preset on the rear of the aux VU meter drive card so that the meter reads exactly 0VU.

HIGH GROUPS (SMALL FRAME CONSOLES)
The high group meters are adjusted in a similar way to the AUX meters described above. However, signal is routed to the high groups by selecting MTRK on the oscillator, rather than AUX.

PHASE CORRELATION METER
Turn the oscillator on, and set the frequency to 1kHz and the level control to about '7.

Using three patch cords, patch the oscillator signal from the OSCILLATOR OUT socket on the patchbay to two input channel line inputs.

Select LINE IN on the inputs, press PAN on both channels, and pan one channel to mix left, and the other to mix right. Route both inputs to MIX to give approximately 0VU on the main meters.

The correlation meter should be at the right hand (in phase) end of the scale.

Press the PHASE REVERSE button on one input - the correlation meter should move to the left hand (out of phase) end of the scale.

Adjust the preset on the meter so that the rate of movement from in-phase to out-of-phase reading is the same as that for out-of-phase to in-phase reading.

6.03 LAMP REPLACEMENT

GROUP AND AUX METERS

Remove the overbridge rear cover section behind the meter.

Unplug the 26-way ribbon cable and two power looms from the drive card.

Unscrew the sixteen nuts holding the four-way VU driver card to the meters, and remove the drive card, taking care not to loose the washers.

The meters are held in place by spring clips on either side of the meter. When the spring clips are removed, the meter may be pulled out from the back of the overbridge.

The bulbs are accessed by removing the clip-on front plastic cover. The bulbs are push-fit into the sockets.

Note: Replacing the bulbs does not necessitate re-calibrating the meter.

MIX METERS

Remove the overbridge rear cover section behind the mix meters.

Each mix meter is held in by two screw clips. These may be unscrewed without removing the drive card from the meter. The meter may then be slid downwards out of the bezel and removed.

Bulb replacement is as for the group meters.

6.04 POWER SUPPLY

IMPORTANT: PLEASE READ THIS SECTION OF THE MANUAL CAREFULLY BEFORE CONNECTING THE SOUNDCRAFT 3200 CONSOLE POWER SUPPLY UNITS TO THE MAINS FOR THE FIRST TIME.

The CPS550 is a linear power supply which, like other linear supplies, produces dc voltages by rectifying, smoothing and regulating ac voltages from the secondary windings of the mains transformer. The 3200 employs a number of dc voltage supply levels in their operation and these are all provided at the output of each supply unit. In regulating these voltages there is some heat generated, the dissipation of which is achieved through a substantial heat sink on each side of the unit.

The CPS550 is designed for installation in 19" rack units and is provided with the necessary fixing holes for this, but can be free standing. Refer to the section "RECOMMENDATIONS FOR INSTALLATION" later in this section.

LED indication is provided on the front panel to show correct operation of all regulating circuits.

MAINS VOLTAGE SELECTION.

SPECIAL ATTENTION SHOULD BE PAID TO THE FOLLOWING INFORMATION:

This unit is capable of operating over a wide range of mains voltages by means of a comprehensive set of user-selectable voltage settings. It is important to ensure that the correct voltage setting has been selected for the level of local mains voltage supply for safe, uninterrupted operation of the unit.

There are three MAINS VOLTAGE SELECTION switches inside the top of the unit, which are accessed by removing the blanking plugs that cover them. DO NOT DISCARD THE BLANKING PLUGS. Voltage selection is achieved by moving the switches using a screwdriver blade, into the correct positions, as shown by the symbols to the side of the access holes. In this way the unit is set up for operation at one of the following ranges of mains supply:

NOMINAL VOLTAGE	OPERATING VOLTAGE RANGE
Vrms AC	Vrms AC
240	221-264
220	202-242
120(115)	109-132
100 NORM.	92-110
90 LOW	83-99

"NORMAL-LOW" SWITCH: when the unit is set for operation AT 100V AC it is possible to lower its working input voltage range further using the NORMAL-LOW switch set to LOW. This enables the unit to function down to only 81Vrms on the mains supply. This facility is incorporated to overcome the problems that some power supplies have with internal regulation when operating from a poorly regulated mains supply.

In any situation where the nominal mains level is 100V AC but poor mains regulation is suspected, measure the r.m.s. level using an AC voltmeter. If the observed voltage is at 90V or below, then the LOW position should be selected before connecting the unit to the mains supply.

DO NOT CHANGE THE VOLTAGE SETTING WITHOUT FIRST UNPLUGGING THE MAINS LEAD and REPLACE ALL THREE BLANKING PLUGS after correct voltage selection has been made.

REPLACING MAINS FUSE.

In the event of incorrect switching of the mains voltage selectors, a mains power surge or underrated fuse value, the mains fuse in the front panel will blow and the CPS550 will not function. Switch the ON/OFF switch to the OFF position. Check the fuse and replace if necessary; also check that the voltage selection is correct for the mains supply level before switching the unit ON again.

**TO AVOID RISK OF FIRE
REPLACE ONLY WITH THE
CORRECT VALUE FUSE,AS
INDICATED ON THE UNIT**

In the event of repeated failure of the mains fuse consult the Soundcraft dealer from where the unit was purchased.

**THIS UNIT CONTAINS NO USER SERVICEABLE PARTS.
REFER ALL SERVICING TO A QUALIFIED SERVICE ENGINEER,
THROUGH THE APPROPRIATE SOUNDCRAFT DEALER.**

RECOMMENDATIONS FOR INSTALLATION OF CPS550.

The CPS550 power supply is provided with front panel fixing holes for 19" rack-mounting and will occupy 2U of rack space when the four feet are removed from the base of the unit. These unscrew and can be press-fitted and screwed back onto the unit. It is not necessary to get inside the PSU to perform this operation. The feet have an expanding clamp system to hold them into the base of the PSU: unscrewing contracts the clampm and enables removal, screwing expands the clamp.

As with any power supply that contains a large mains-voltage transformer, it is preferable to provide a degree of physical isolation of the unit from other electronic equipment, particularly that which carries low level audio signals, to avoid any possible hum pick-up. For this reason the unit is provided with a long (6.5 metres) output cable to enable it to be positioned away from the mixing console.

For the same reason, when rack-mounting it is preferable to avoid locating the unit adjacent to signal processing equipment.

It should be noted that if a complete rack containing a CPS550 unit is to be operated from a different mains supply level, then the unit should be withdrawn from the rack in order to reselect the mains voltage setting, at the same time as resetting any other equipment.

The other important consideration when rack-mounting the unit is the need for natural convection of air over the heatsink cooling fins.

Good ventilation BELOW the unit, in the floor or back of the rack, and similarly ABOVE the unit, at the top of the rack, will ensure a path for continuous air flow.

Other equipment in the rack which is known NOT to produce a significant amount of heat should be mounted BELOW the unit. Equipment that also relies on good air flow within the rack (ie. most power amplifiers and other power supplies) should be given due consideration and some space should be provided between such units and between these and the CPS550 unit(s). Forced convection, by means of a fan-tray, may be desirable in this situation.

The CPS550 will operate as a free-standing unit without requiring any special cooling arrangement, but should not be allowed to be accidentally or deliberately covered over in any way.

Finally, some consideration should be given to the earthing arrangement of the system at the centre of which are the console and the CPS550. The console chassis is earthed, through the mains earth, via the power supply. When rack-mounting the CPS550 care should be taken to avoid any possible 'ground loops' in the system which would introduce audible hum to otherwise clean audio signals. Ground loops may occur where signal processing equipment, patched to the console, has its signal earth commoned to the equipment chassis. The ground loop is formed if this chassis and the CPS550 chassis are in electrical contact through the fixing rails they share in the rack. To avoid this situation, standard isolating washers may be employed when fixing the power supply or any other unit into the rack.

GENERAL.

As with all electrical/electronic equipment some care should be taken when handling this unit. Avoid general mishandling and do not drop. Avoid storage and operation in dusty locations and do not expose to corrosive atmospheres.

TO AVOID RISK OF FIRE DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

Retain all packaging for transportation in the event of the unit requiring servicing.

CPS550 TECHNICAL SPECIFICATION.

MAINS INPUT VOLTAGE RANGE:

250 TO 216V AC AT 240V SETTING; 220/120/100/90 V AC +10%/-8% @ 50/60Hz

RATED INPUT POWER (MAX): 600 WATTS

MAINS FUSE RATING: USE T6.3A/250V

OUTPUTS

DC. VOLTAGE RAIL	MAX. OUTPUT CURRENT	MAX. NOISE
+17V	3.0 AMPS	-68dBu
-17V	3.0 AMPS	-68dBu
+17V	3.0 AMPS	-68dBu
-17V	3.0 AMPS	-68dBu

OPERATING TEMPERATURE RANGE (AMBIENT):

-10 TO +50 DEG C.

OVERALL DIMENSIONS.

HEIGHT: 89MM (2U)

WIDTH: CHASSIS 424MM

FRONT PANEL 483MM

DEPTH: 350mm WEIGHT (EXCL. PACKING): 13KG

(PACKED, INCL. LEAD): 18KG

7.00 TECHNICAL DESCRIPTION

The technical details that follow are provided to assist with fault-finding, and to give a general appreciation of the philosophy behind a console that provides a significantly improved level of audio performance. We believe that this will be of help in obtaining the best possible results from the equipment. We also hope that even if you have no intention of servicing the console yourself you will find parts of it worth reading, though in a concise description of this sort it is not possible to describe all of the many design decisions that have been made.

INTERNAL LEVEL.
The internal operating level of the console is a nominal -2dBu.

All major modules have two PCBs, and there are therefore frequent references below to LH (left-hand) and RH PCBs. These refer to the module viewed normally from the front.

Note that the LEDs associated with the illuminated switches are referenced as part of the switch, eg a LED might be called S4-E.

The table below gives a quick guide to PCB numbers and their associated circuit diagrams:

DESCRIPTION	PCB No.	CIRCUIT
Input LH PCB	SC2792	ED2792
Input RH PCB	SC2793	ED2793
Output LH PCB	SC2795	ED2795
Output RH PCB	SC2796	ED2796
Aux master LH PCB	SC2799	ED2799
Aux master RH PCB	SC2800	ED2800
FX/Comms LH	SC2801	ED2801
FX/Comms RH	SC2802	ED2802
CSP LH PCB	SC2803	ED2803
CSP RH PCB	SC2804	ED2804
High-Groups RH PCB	SC2806	ED2806
High-Groups LH PCB	SC2807	ED2807
8 I/P Mbrd, Upper	SC2823	ED2823
8 I/P Mbrd, Lower	SC2824	ED2824
Output Mbrd, Upper	SC2825	ED2825
Output Mbrd, Lower	SC2826	ED2826
Master Mbrd, Upper	SC2827	ED2827
Master Mbrd, Lower	SC2828	ED2828
Global Status	SC2837	ED2837

DESCRIPTION	PCB No.	CIRCUIT
1-24 Patch	SC2842	ED2842
Patchbay Mbrd, Upper	SC2843	ED2843
25-32 Patch	SC2845	ED2845
39 Patch	SC2846	ED2846
40/41 Patch	SC2847	ED2847
42/43 Patch	SC2848	ED2848
44 Patch	SC2849	ED2849
46/47 Patch	SC2850	ED2850
48 Patch	SC2851	ED2851
33-35 Patch	SC2852	ED2852
36/37 Patch	SC2853	ED2853
38 Patch	SC2854	ED2854
Patchbay Mbrd, Lower	SC2855	ED2855
45 Patch	SC2856	ED2856
Stereo Tape EDAC	SC2857	ED2857
High Group Patch	SC2858	ED2858
Tie Lines Patch	SC2859	ED2859
Tie Lines EDAC	SC2860	ED2860
4 Way VU Driver	SC2877	ED2877
4 I/P.Mbrd, Upper	SC2878	ED2878
4 I/P Mbrd, Lower	SC2879	ED2879
PSU Distribution	SC2880	ED2880
CPS550 PSU	SC2881	ED2882
2 Track EDAC	SC2882	ED2882
Phones EDAC	SC2883	ED2883
Line EDAC	SC2884	ED2884
Master EDAC	SC2885	ED2885

7.01 INPUT MODULE CIRCUIT DESCRIPTION. (SC2792,SC2793).

PHANTOM POWER. (RH PCB)
S1 switches the +48V phantom power to the mic input via 6K8 resistors R1,R2.

MIC INPUT AMPLIFIER. (LH PCB)
Effective stage gain is variable between 0 and +70 dB, given by two variable-gain stages, the first yielding 0-50dB (set by VR1-A), and the second 0-20dB. (set by VR1-B)

The input stage is built around TR1,TR2 and IC1,IC2, combining the benefits of discrete low-noise devices with the open-loop gain and current-drive of IC op-amps. IC1-A performs the differential to single-ended conversion (phase summing) while IC1-B is an inverter generating the balanced feedback required for linearity.

R1 defines the load impedance on the mic. C1,C2 provide DC blocking and C3,C4,C5 protect against RF breakthrough. D1-D6 give protection against transients, especially those from switching the phantom-power. C8 & C41 stabilise the circuit at HF. The maximum gain of the stage is set by R8, relative to feedback resistors R11,R12. There are two anti-phase outputs from this stage and one is selected by the phase switch (S2 RH PCB)

The transistors used in this stage are of a special low-noise type and should be replaced only with the same type or a Soundcraft-approved alternative. However, in an emergency, standard PNP types such as BC212 will work, though the noise performance will suffer. The second stage is a simple shunt-feedback amplifier; R16 sets the maximum gain to 20dB.

ASPECTS OF THIS MICROPHONE PREAMPLIFIER ARE COVERED BY SOUNDCRAFT PROVISIONAL PATENT No. 8719014.

LINE INPUT AMP. (LH PCB)
IC3 is the balanced line input amp, using a special gain-control configuration to maintain CMRR. Line gain setting, like that of mic mode, is done by active gain control rather than a combination of attenuation and amplification. This keeps noise to the minimum while preserving maximum headroom. The noise performance is distinctly superior to the conventional approach of attenuating the line input and applying it to the mic amp.

MIC/LINE SWITCHER. (RH PCB)
This is built around IC2-A and two pairs of series-shunt FET switches. In mic mode, mic input comes in via R16 and is connected to the virtual-earth point of IC2-A via TR3, TR2 being off. At the same time TR5 is off, preventing line signal via R17 reaching the op-amp. TR4 is on, and shorts R17 to ground to prevent crosstalk through the internal capacitances of TR5. The control signals are ramped to provide a fast transient-free crossfade between the two inputs. In line mode all FET states are reversed. C3 is required for HF stabilisation.

FET control signals are dealt with in the Logic Section below.

HIGHPASS FILTER. (LH PCB)
This operates at a nominal level 6dB below the rest of the signal path, to prevent anomalous clipping in IC4-A. R25,R22 attenuate by 6dB, and then feedback network R26,R27 sets the filter gain to +6dB. This is reflected in the unconventional values of C43,C44. A dual rev-log pot sets the turnover frequency. The characteristic is Butterworth maximally-flat with a slope of 12dB/octave.

LOWPASS FILTER. (LH PCB)
This is conventional, with a Butterworth maximally-flat characteristic, and -3 dB frequency set by dual rev-log pot VR2. C12 gives DC blocking.

NOISE GATE. (LH PCB)
This falls into two halves, the forward path with voltage-controlled gain, and the sidechain that generates the control signals.

The forward path includes IC5, TR3,TR4, and FETS TR5,6. Signals from the in/out switching on the RH PCB are buffered by IC5-A, and then attenuated by 30dB by R33,34. The gate therefore operates at a low-level to minimise distortion on fading up or down. IC5-B and TR3 form the heart of a non-inverting ultra-low-noise stage that restores the signal level to a nominal -2dBu, and ensures that operating at low level does not compromise the overall noise performance. The result of this is that FETs TR5,6, at the bottom of feedback network R41,R40 only ever see relatively small signals.

The amplifier stage only undoes the effect of R33,34 when the FETs are on; when they are off the stage reverts to unity gain, giving a -30dB attenuation overall. This is the OFF gate condition, but greater attenuation is needed. This is provided by feeding a little of the input signal into what is effectively an inverting input at TR3 emitter, via R36. PR1 may be adjusted for a null of -90dB or better at 1kHz.

Bias for TR3 is set by R37,38, C15,16 giving HF stability. TR4 is a current-source that isolates TR3 from supply-rail noise; note that its collector is decoupled by C20, so the actual collector load for TR3 is R39 only. IC6-A is a servo-integrator that maintains the output of IC5-B at exactly 0V, by providing whatever offset is needed at its non-inverting input. C18,19 give DC blocking in the feedback loop, and R50 drains away capacitor leakage.

The control voltage is applied to the FETs via R48,49, which allow unity-gain buffer IC6-B to apply half the drain-source signal to the gate; this is a well-known method of enhancing FET linearity. PR2 applies a preset DC bias to the gates, allowing compensation for FET Vgs tolerances, so that all gates behave similarily.

VR3-A sets the depth of attenuation, by cross-fading between the gate ouput itself, and the original input.

The sidechain input signal also comes from the RH PCB, where S7 is the EXT switch. When this is pressed signal comes from IC1-A (RH), which is a subsiduary Line B amp. This ensures that the line B signal is always available for keying applications, no matter which main input is selected.

The sidechain signal is adjusted in level by threshold control VR3-B,VR3-C, with law-shaping resistor R53; this system gives 70dB of control range spread evenly around the pot rotation. IC7-A gives unity-gain buffering against the low i/p impedance of full-wave precision rectifier IC7-B. The two halves of the waveform appear at D9 and D10, and are summed in anti-phase by differential amplifier IC8-A. These two stages provide all the sidechain gain; C24 gives HF stability.

IC8-B is a comparator that implements the actual threshold, switching, its output going low (-15V) when pin 6 falls below the reference voltage set on pin 5 by R60,61. Hysteresis is provided by positive feedback through R62, ensuring clean switching. IC9-A is the hold timer; this ensures that once the gate is opened it remains open for at least 10 mSec, to prevent erratic on/off switching at low frequencies. When the output of IC8-B goes low, C25 is rapidly discharged through D13 and the output of IC9-A goes low at once. When IC8-B output goes high again, C25 charges more slowly via R63, implementing the hold delay before IC9-A o/p goes high again.

The attack/decay switching uses TR7-TR10 to steer current in and out of the main timing capacitor C27. For short attack times in particular, large currents must flow into this component. When the gate is shut, IC9-A o/p is held high, and TR9,10 are firmly off, their bases protected against reverse-voltage by R65,D11. Common-base TR7 is biased on via R64, and in turn holds on TR8. C27 is therefore fully discharged via R68,VR4-B, with about -10V at LK1.

Zener DZ1 prevents this voltage falling to the -16V rail, as the FETs TR5,6 will already be fully off, so it would mean that more time would be required to charge C27 at the next attack phase.

When an attack phase begins, IC9-A o/p goes low, turning off TR7, which is reverse-voltage protected by D12; TR8 also turns off. TR9,10 are then turned on and C27 is rapidly charged to 0V via R66, Vr4-A setting the attack time. Note that the finite slew-rate of IC9-A provides a vital delay of a few microseconds that ensures that TR8 is fully off before TR9,10 turn on. Without this destructive currents could flow through these devices between the 0V and -17V rails.

When an attack ends, IC9-A o/p goes high again, and C27 discharges via decay rate control VR4-B. R69,C26 isolate the current pulses from the -17V rail.

IC9-B buffers the control voltage from C27, so that R48,49 may be driven. Any voltage measurements should be taken here rather than directly on C27. LK1,2 are used in alignment. LK1 is the normal link, but when LK2 is made instead the control voltage is fixed at -6.0V by R70,R71. PR2 is then set for -10dB of attenuation.