



Campion & Alabaster Integrated Amplifiers

Service Manual

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Important Safety Information

Always disconnect the amplifier from the mains supply before removing (or replacing) the case lid.

When testing the amplifier with the lid removed it is strongly recommended that the unit is powered from a Safety Mains Isolating Transformer, this will minimise (but not eliminate!) the risk of electric shock due to accidental contact with the power supply.

The power supply contains a number of safety related components. If these parts are replaced during servicing it is essential that they are replaced with appropriately rated and approved parts to protect the user against electric shock or fire risk.

To provide continued protection against fire, always replace the mains fuse on the power supply with the proper type and rating. Please refer to the specification section in this manual.

This product is a metal cased Class I product to BS EN60065.

This product **MUST BE EARTHED** to avoid risk of electric shock to the user, before replacing the case lid:

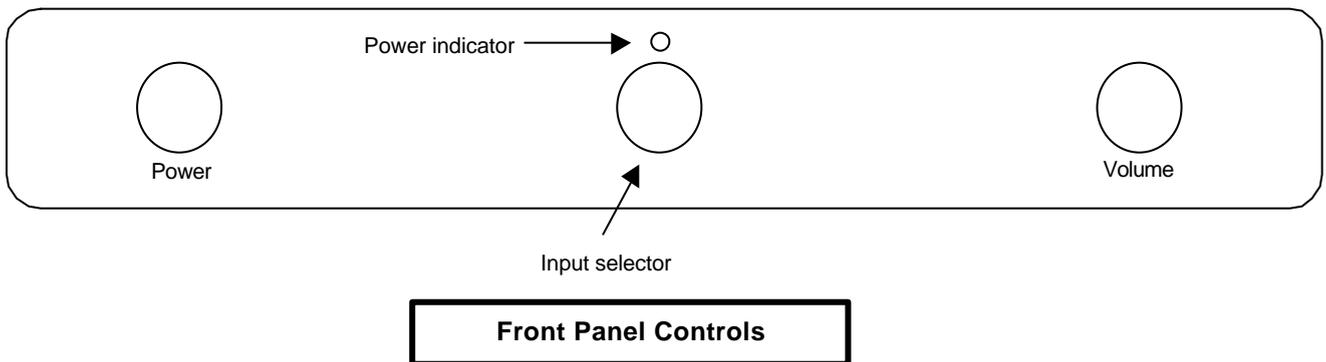
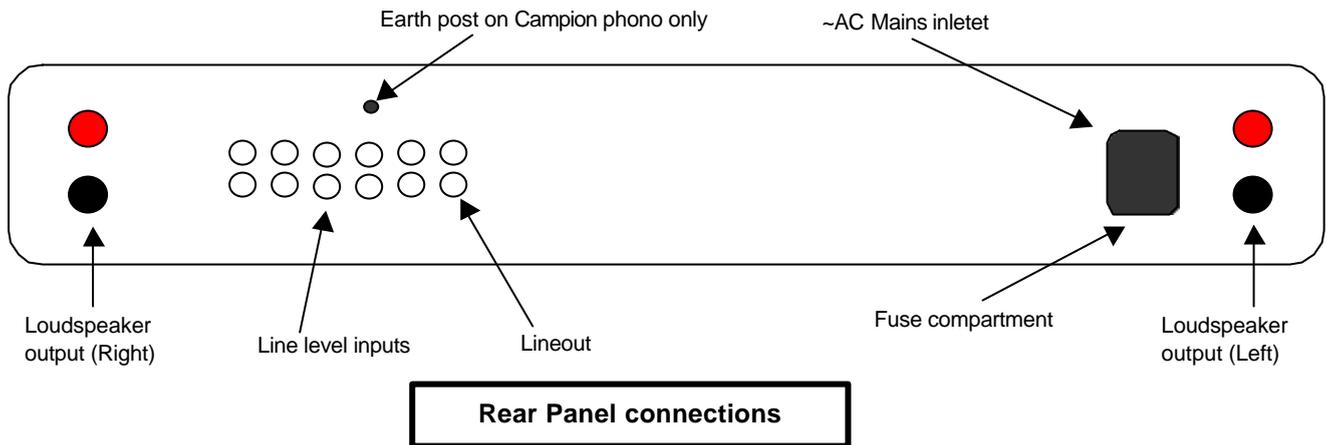
- Ensure that no foreign objects have been left inside the equipment which could cause shorting between the power supply and the case.
- Ensure that all fixing screws within the unit have been tightened securely.

THIS MANUAL COVERS BOTH THE CAMPION AND ALABASTER INTEGRATED AMPLIFIERS. DO TAKE NOTE WHEN CHECKING THE SPECIFICATIONS AND CALIBRATION.

Product description

The Sonneteer Campion and Alabaster are Stereo integrated amplifiers. They both have 5 line level inputs (two passive and three active), one fixed line out, one IEC inlet for mains and two sets of loudspeaker level outputs. There are three knobs on the front panel. Power is for switching the amplifier on, Volume is for control of volume, and the middle knob is for selection of any one of the five inputs.

For specifications see section 1.



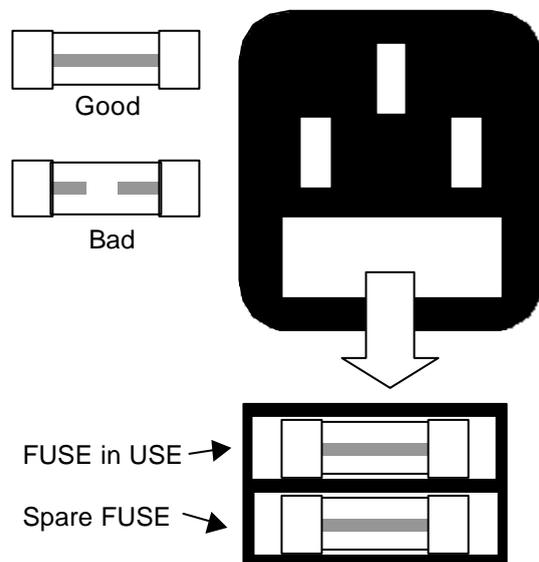
Fuses:

Within the mains input socket there is a FUSE compartment which holds the mains fuse and a spare fuse. Always check the condition of the mains fuse if a fault occurs.

Replace the blown fuse only after you have checked all external connections are OK. It is always best to disconnect all connections to the amplifier (CD, speakers, etc.) when checking the amplifier when a fuse has been replaced. This way if there is a fault with the amplifier you will not risk damaging your source or speakers.

If the replacement fuse blows immediately after replacing then do not replace with any further fuses unless an internal fuse has been located.

Always replace the fuse with one that has the exact specification.

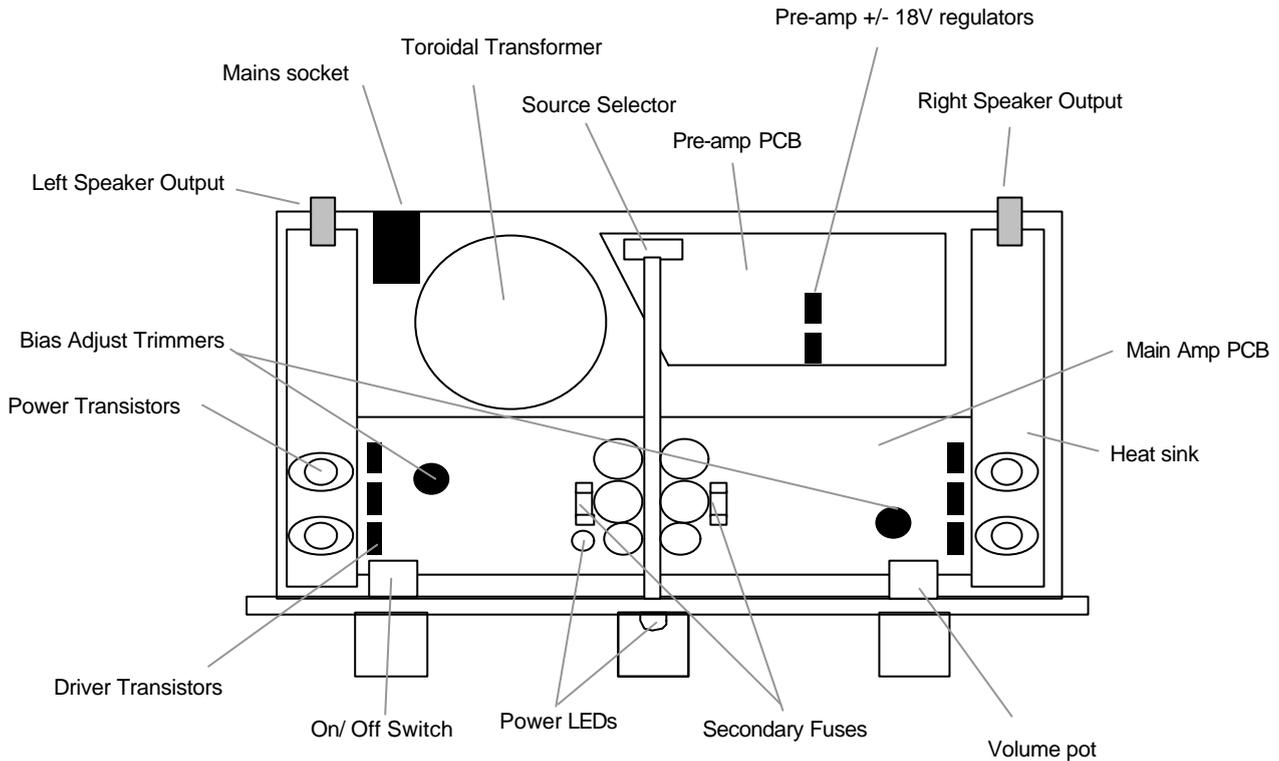


Opening the Amplifier

Always make sure the amplifier is not connected to mains when opening and closing the lid.

Remove the 3 top screws from each side for the amplifier (12 screws in total).
Lift the lid off vertically, do not lift front to rear or vice versa.

With the amplifier front panel facing you familiarise yourselves with the following key areas:



You will notice that on the main amplifier board the left channel is exactly same as the right channel rotated at 180 degrees to achieve true circuit layout balance. With the exception of the power supply, any component on the left channel will be diagonally duplicated on the right hand side (from example the Bias Adjust Trimmers). Once you have familiarise yourselves with this principle you will find locating the L/R part pairs for cross-checking purposes will be much easier.

In further sections you will be referred to areas on this diagram in conjunction with the supplier schematic diagrams.

Basic diagnostics.

It is advisable to ask your customer to describe the fault when they have contacted you with regards to returning the product for repair. Their fault description can be one of the following, it is recommended to check in the following manner:

The amplifier just didn't come on after turning the power switch.

This could be surge and most of the time replacing the rear fuse can solve the problem.

The amplifier was running then there was a loud "hum " from the speakers.

If the fuse at the back is intact then please inspect the internal secondary fuse as shown in the diagram. Sometimes only one side may be blown.

A loud "hum" has developed and heard from both speakers after the amplifier has been on for a while. Switching the amplifier off for a while and back on again will repeat the problem.

Check the voltage regulators on the pre-amplifier board are not overheating causing the +/-18V to collapse. With the Alabaster model please check the clip-on heat sinks are there and not dislodged in transit.

The amplifier was running then there was a loud "hum " from one speaker.

This seems to be a channel breakdown. If the amplifier still operates with this hum then replace Q3 and Q6 for the right hand channel and Q15 and Q18 for the left hand channel. It is most likely that the hum is due to the partial failure of one of these devices. If the problem persists then it is likely that one other diode or small signal transistor has partially failed. If the amplifier is no longer operational, please refer to Output Device Failure section.

There was a loud hum and then I saw signs of smoke.

If there are any smell of smoke when inspecting the amplifier, do not attempt to rectify the problem by changing fuses, please refer to the next section. This is probably the most severe fault the amplifiers can have and from our experience there can usually be the following causes:

1. Component (drivers/power transistors) break-down (caused by a large mains spike).
2. User has short-circuited the amplifier's output while the amplifier is ON.
3. The amplifier has suffered an induced oscillation.

When opening and closing the amplifier and changing fuses, please make sure that you have disconnected the amplifier from the mains supply and preferably disconnect all other connections to the amplifier (Interconnects, speaker cables etc.).

Trouble shooting at component level.

SAFETY FIRST!!!

- Please make sure you have taken all possible safety precaution.
- Make sure you are using an isolating transformer when powering the unit.
- Make sure that your supply is earthed.
- Make sure that you have observed all anti-static precautions.
- Only use a low voltage soldering iron (35-45W is sufficient). DO NOT use a soldering iron which is powered by the mains supply.
- Wear safety glasses.
- Use only insulated and electrical tools when working on the product.

Output device failure:

As previously mentioned, the output devices may fail for the following reasons:

1. Component failure (from manufacturing tolerance or from mains spikes).
2. User has short-circuited the amplifier's output while the amplifier is ON.
3. The amplifier has suffered an induced oscillation.

For the above symptoms please check the following:

Check the rear mains fuse, Internal secondary fuse FS1 and FS2, replace where necessary.

Check R6, R8 R28, R30 (depending on which channel is suspect). These are all 100Ohm resistors and if any of them are charred or burnt (even if they measure 100Ohm still), then it normally indicates that one or both the output devices are blown.

To repair the fault we recommend that R6, R8, Q1, Q2, Q3, Q4, and Q5 should be replaced. Remove the remaining 6 side screws to allow access to the main amplifier board.

After replacing Q1 and Q2, please make sure that the body of Q1 and Q2 is isolated from the heat-sink electrically. If there is an electrical connection between Q1 or Q2 to heat-sink then you must rectify the problem or the devices will blow again.

Between the body of Q1 and Q2 should now measure about 1 Ohm.

Check also on both side of the circuit board that there are no copper tracks that are burnt or severed. If so then please make appropriate repairs of the copper track with wires and solder to bridge the burnt section. Insulate afterwards.

After carefully checking all repairs and the circuit board cleaned, you can reassemble the heatsinks back onto the case.

With the amplifier power switch in the OFF position:

- Turn the selector to DIR and the Volume control to minimum.
- Connect the amplifier to an isolating transformer power supply.
- Do not connect any other audio equipment to the amplifier i.e. No speakers and no sources.
- Connect a volt meter to the speaker output of the repaired channel. Set the meter to read in volts (50V FSD D.C.).
- Now put on your safety glasses.

First test:

1. Quickly turn the power switch ON and OFF immediately then check the following:
2. Did the fuses blow immediately? If yes then there is still a problem or the problem not repaired correctly.
3. Did the power LED on the amplifier board or the front panel switch ON and went OFF as soon as you switch the power OFF? If yes then there is still a problem or the problem not repaired correctly.

Check for Oscillation!

This is a difficult problem to solve and can be very destructive to the amplifier and speakers. This could be due to the failure of one of a number of components and is the least common of all the faults mentioned. Please refer to the manufacturer before proceeding further with servicing the product.

If the answer is NO to 2 (Fuses are OK) and 3 the LEDs when out with a delay of at least a few seconds) then proceed with the following:

1. Switch On the power again for about 3-5 seconds and take note of the Volt meter readings:
2. If it reads +25 or -25Volt then there is still a problem, usually a short circuit somewhere and you must check for solder splashes or bridges that can cause the short circuit. Check also that BOTH power supply rails are reading their correct voltage (Campion +/-25V and Alabaster +/-37V +/-5%, if one rail is dead then check the fuses again).
3. If it reads 0V then please check your calibration of your meter, turn the scale down a little to increase the volt meter's sensitivity. Try around 1V FSD. If it still reads 0V then check for short or open circuit to the components you have replaced, make sure you have not missed soldering a component pin.
4. If the meter reads between 10mV and 60mV then the chances are the amplifier has been repaired. We recommend that you switch on the amplifier for about 5 minutes and keep an eye on the unit during that time.

After that you can switch off the amplifier and proceed to the next section for calibration.

Calibration:

Taking all safety precautions as described previously, you can start calibrating the amplifier.

With nothing connected to the amplifier switch on the amplifier, measure the 4 D.C power supply rails:

Amplifier board power supply:

Campion should read +/-25V DC

Alabaster should read +/-37V DC

Pre-amplifier board supply should read +/-18V for both models.

If these values are all correct then now measure the D.C offset on each speaker channel, their reading should be:

Campion should read -38mV DC +/-10mV

Alabaster should read +/-25mV DC +/-10mV

If any of the voltage are little above and below don't be too alarmed at this stage. If the offset are 0V or over 60mV then you should switch off and check the amplifier for any shorts or open circuits, or other damaged components.

Now calibrate the bias for each model in the following way:

Campion:

With the amplifier cold, switch on the power and adjust the Bias trimmer resistor so that you can read 1.475V d.c. between TP1 and TP2 with a volt meter.

Repeat the same for the other channel.

Alabaster:

With the amplifier switched on for about 10 minutes (warm), adjust the Bias trimmer so that you can read 126mV d.c. across resistors R23 and R44 with a volt meter.

Temperature concerns:

Please note that the normal idle temperature of the Alabaster is around 42 (+/- 10%) degrees centigrade. Some customers may be concerned because it feels rather hot and may contact you regarding this. Please be assured that this is normal for the Alabaster.

Alabaster User Manual:

Alabaster should be placed in an open space away from moisture and with adequate ventilation.

The device is connected to the mains via an IEC mains lead which is provided with your Alabaster amplifier.

The IEC socket on the rear of the device has a replaceable fuse; see the specifications at the end of this manual or rear of machine for correct values.

Be sure that all appliances are turned off before disconnecting or connecting anything.

Alabaster has five inputs; Tp, CD, DIR, L1, L2 and one output; LnOut.

We recommend using DIR and CD for best sonic performance. Tp, L1 and L2 should be used for line level signals e.g. Tape source.

Beware, do not have the Tape Source selected when LnOut is connected to it whilst recording as this will result in a very nasty experience.

For best loudspeaker connection use bare wire through the threaded holes in the binding posts or spade connectors and be sure never to short positive and negative wires as this could have a detrimental effect on your speakers and your amplifier.

The controls on the front panel are, from left to right; Power, Source select and Volume.

When cleaning your Alabaster never use solvents. A clean dry cloth would be adequate.

Please note that there are no user serviceable parts inside the device and you should refer any problems to your dealer. Tampering with the device may void your warranty.

Caution: This amplifier runs hot. Be sure to keep it well ventilated.

Technical specification:

Power	52Wrms 95Wrms	@8 Ohms @4 Ohms
Input impedance	11k Ohms	
Gain	33dB	
Input sensitivity:		
DIR	470 mVrms	
CD	470 mVrms	
L1,L2,Tp	250 mVrms	
Bandwidth	8Hz to 80kHz	
THD	0.004% 0.005%	@1kHz @Full Power @10kHz @Full Power
Size (mm)	434 x 74 x 280	
Fuse Values:		
UK/Europe/Australasia	230V/240V, T 2.5 Amp	
USA/Canada	110V/120V, T 5.0 Amp	

Sonneteer reserves the right to change specifications without prior notice.

If a fault occurs, please refer to your dealer. Do not attempt to repair the unit yourself.

Campion with Phono option User Manual:

Campion should be placed in an open space away from moisture and with adequate ventilation.

The device is connected to the mains via an IEC mains lead which is provided with your Campion amplifier.

The IEC socket on the rear of the device has a replaceable fuse; see the specifications at the end of this manual for correct values.

Be sure that all appliances are turned off before disconnecting or connecting anything.

Campion has five inputs; Tp, CD, DIR, L1, L2 (Phono) and one output; LnOut.

We recommend using DIR for best sonic performance. Tp, L1 should be used for line level signals e.g. Tape source. CD input is provided for high output level CD players. L2 is the phono input together with the earth stud, do not use this input for any other source.

Beware, do not have the Tape Source selected when LnOut is connected to it whilst recording as this will result in a very nasty experience.

For best loudspeaker connection use 4 mm banana plugs or spade connectors and be sure never to short positive and negative wires as this could have a detrimental effect on your speakers and your amplifier.

The controls on the front panel are, from left to right; Power, Source select and Volume.

When cleaning your Campion never use solvents. A clean dry cloth would be adequate.

Please note that there are no user serviceable parts inside the device and you should refer any problems to your dealer. Tampering with the device may void your warranty.

Technical specification

Power 33Wrms @8 Ohms
 44Wrms @6 Ohms

Input impedance 11k Ohms

Gain 27dB

Input sensitivity:

DIR 650 mVrms
CD 2 Vrms
L1, Tp 400 mVrms
L2 (Phono) Gain = x1000 (47K @ 47pF)

Bandwidth 8Hz to 80kHz

THD 0.02% @1kHz @Full Power
 0.035% @10kHz @Full Power

Size (mm) 434 x 74 x 280

Fuse Values:

UK/Europe/Australasia: 230V/240V, T 2.5 Amp

USA/Canada 110V/120V, T 4.0 Amp

Sonneteer reserves the right to change specifications without prior notice.

If a fault occurs, please refer to your dealer. Do not attempt to repair the unit yourself.

Campion Line version User Manual:

Campion should be placed in an open space away from moisture and with adequate ventilation.

The device is connected to the mains via an IEC mains lead which is provided with your Campion amplifier.

The IEC socket on the rear of the device has a replaceable fuse; see the specifications at the end of this manual for correct values.

Be sure that all appliances are turned off before disconnecting or connecting anything.

Campion has five inputs; Tp, CD, DIR, L1, L2 and one output; LnOut.

We recommend using DIR for best sonic performance. Tp, L1 and L2 should be used for line level signals e.g. Tape source. CD input is provided for high output level CD players.

Beware, do not have the Tape Source selected when LnOut is connected to it whilst recording as this will result in a very nasty experience.

For best loudspeaker connection use 4 mm banana plugs or spade connectors and be sure never to short positive and negative wires as this could have a detrimental effect on your speakers and your amplifier.

The controls on the front panel are, from left to right; Power, Source select and Volume.

When cleaning your Campion never use solvents. A clean dry cloth would be adequate.

Please note that there are no user serviceable parts inside the device and you should refer any problems to your dealer. Tampering with the device may void your warranty.

Technical specification:

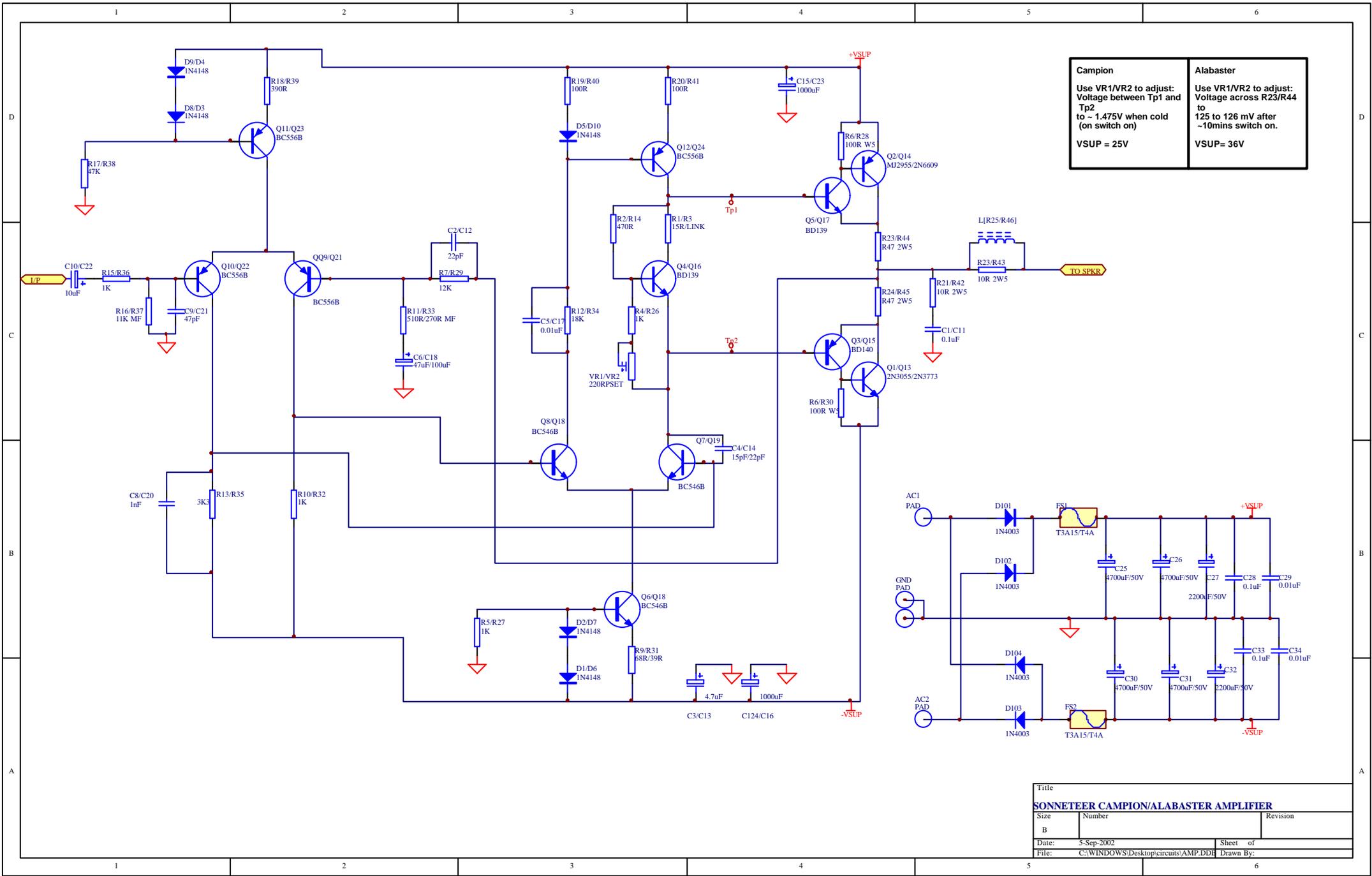
Power	33Wrms 44Wrms	@8 Ohms @6 Ohms
Input impedance	11k Ohms	
Gain	27dB	
Input sensitivity:		
DIR	650 mVrms	
CD	2 Vrms	
L1,L2,Tp	400 mVrms	
Bandwidth	8Hz to 80kHz	
THD	0.02% 0.035%	@1kHz @Full Power @10kHz @Full Power
Size (mm)	434 x 74 x 280	

Fuse Values:

UK/Europe/Australasia 230V/240V, T 2.5 Amp
USA/Canada 110V/120V, T 4.0 Amp

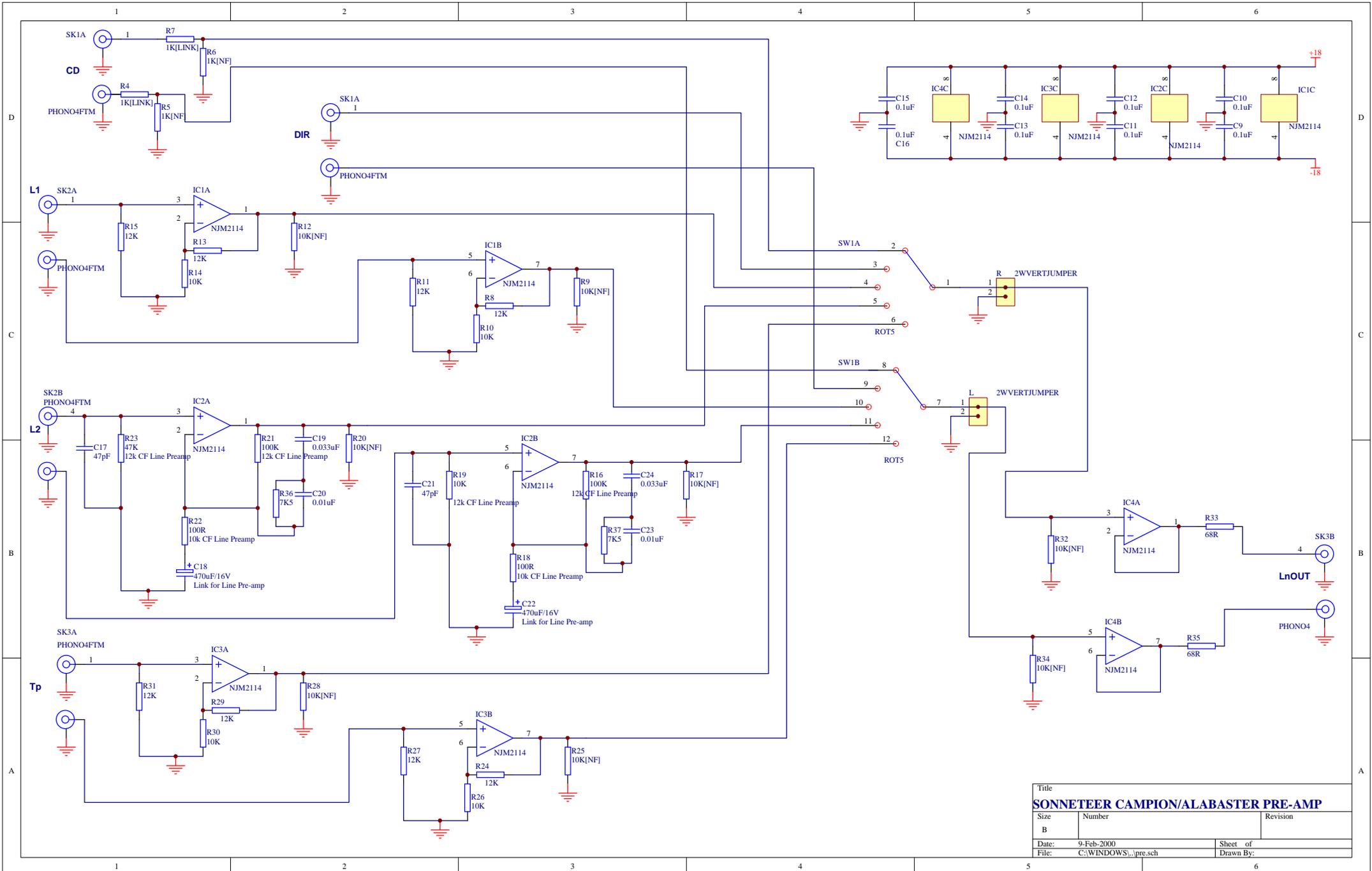
Sonneteer reserves the right to change specifications without prior notice.

If a fault occurs, please refer to your dealer. Do not attempt to repair the unit yourself.

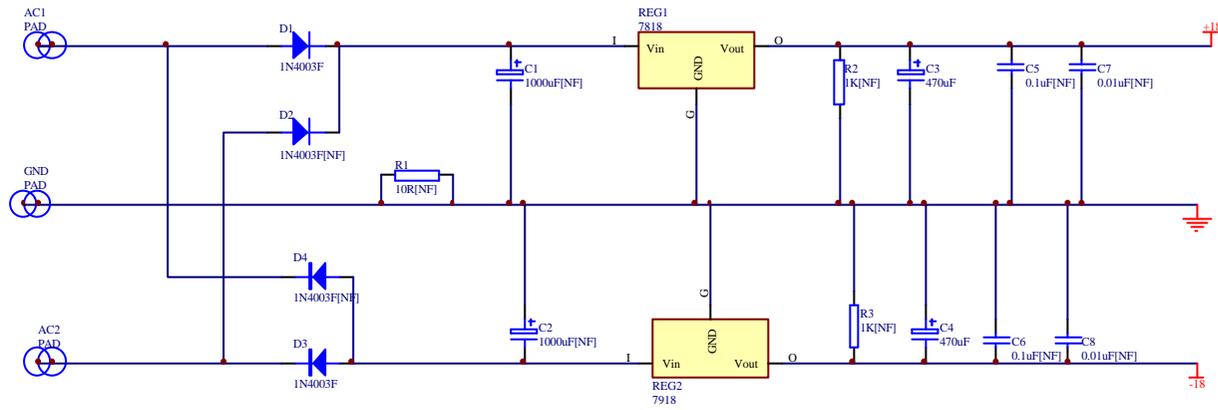


Campion	Alabaster
Use VR1/VR2 to adjust: Voltage between Tp1 and Tp2 to ~ 1.475V when cold (on switch on)	Use VR1/VR2 to adjust: Voltage across R23/R44 to 125 to 126 mV after ~10mins switch on.
VSUP = 25V	VSUP = 36V

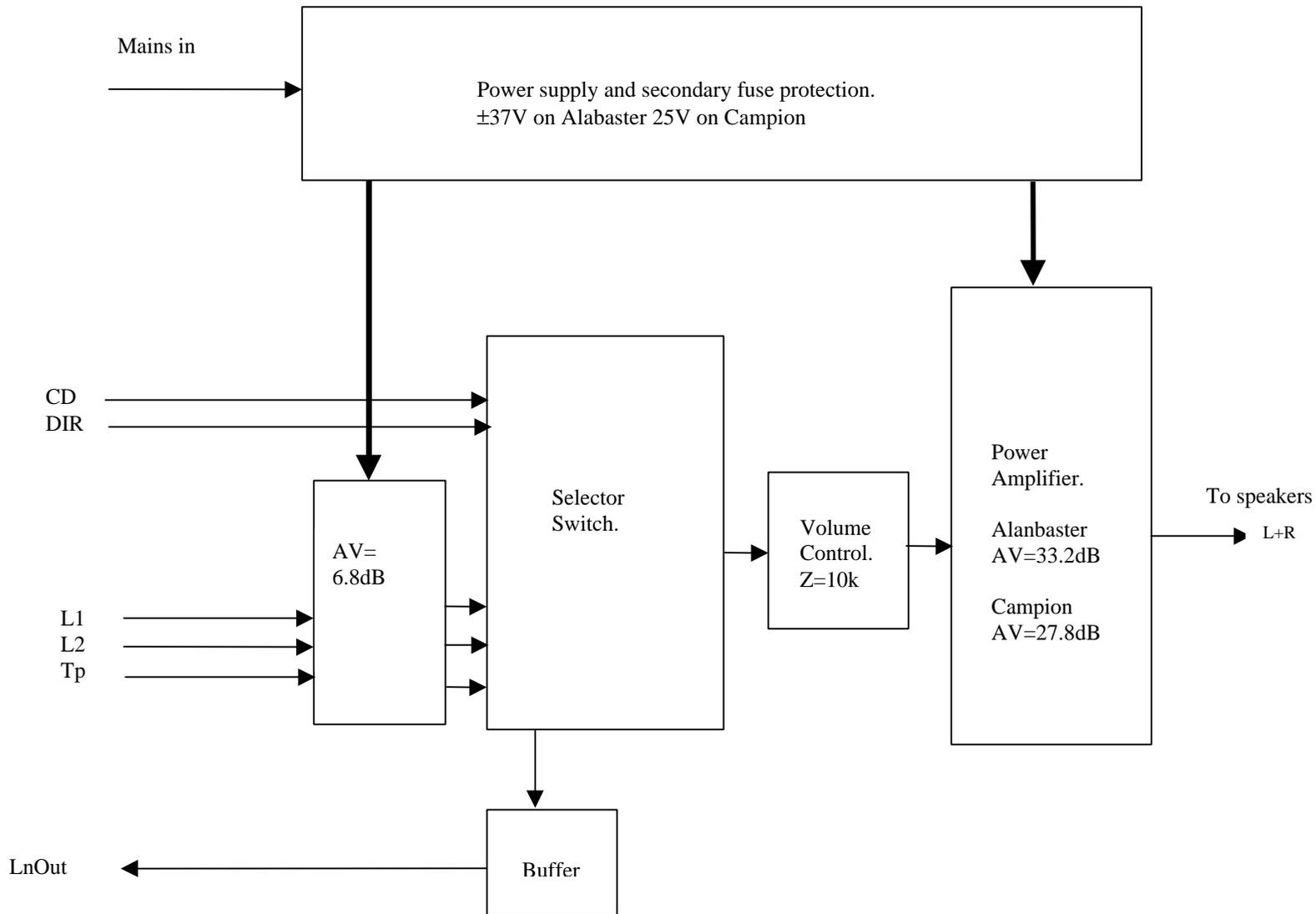
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Title		
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Title		
Pre-amp power supply		
Size	Number	Revision
B		
Date:	5-Sep-2002	Sheet of
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Alabaster and Campion amplifier block diagram.

	A	B	C	D	E	G	H	I	J	K
1	Campion and Alabaster main boards.				13.03.01					
2	All resistors are 0.25W carbon film unless marked otherwise.									
3	All electrolytic capacitors are Panasonic M Series 85 deg general purpose unless otherwise stated.									
4										
5				CAMPION		ALABASTER		QTY	NOTES	
6	R1,R3			15R		0 LINK		2		
7	R2 R14			470R		470R		2		
8	R4 R26			220R		220R		2		
9	R5 R27			27K		27K		2		
10	R6 R8 R28 R30			100R W5		100R W5		4		
11	R7 R29			12K		12K		2		
12	R9 R31			68R		39R		2		
13	R10 R13 R32 R35			3K3		3K3		4		
14	R11 R33			510R MF		270R MF		2	Metal film only	
15	R12 R34			18K		18K		2		
16	R15 R36			1K		1K		2		
17	R16 R37			11K MF		11K MF		2		
18	R17 R38			47K		47K		2		
19	R18 R39			390R		390R		2		
20	R19 R20 R40 R41			100R		100R		4		
21	R21 R32 R42 R43			10R 2W5		10R 2W5		4		
22	R23 R24 R44 R45			R47 2W5		R47 2W5		4		
23	R47			2K2		3K3		1		
24	R48			2K2		1K8		1		
25	VR1 VR2			220R PRESET		220R PRESET		2	HORIZONTAL CARBON	
26	C1 C11 C28 C33			100n 250V MYLAR		100n 250V MYLAR		4		
27	C2 C12			22pF Polystyrene		22pF Polystyrene		2		
28	C3 C13			4u7 35V		NF		2	PANASONIC 85DEG	
29	C4 C14			15pF Polystyrene		22pF Polystyrene		2		
30	C5 C17			10n 2.5% polystyrene		10n 2.5% polystyrene		2		
31	C6 C18			47u 35V		100u 35V		2	PANASONIC 85DEG	
32	C7 C19			NF		NF		NA		
33	C8 C20			1n Polystyrene		1n Polystyrene		2		
34	C9 C21			47pF Polystyrene		47pF Polystyrene		2		
35	C10 C22			10u 35V		10u 35V		2		
36	C15 C16 C23 C24			1000u 35V		1000u 50V		4	PANASONIC 85DEG	
37	C25 C26 C30 C31			4700u TSU 50V		4700u TSU 50V		4	PANASONIC TSU 85DEG	
38	C27 C32			2200u TSU 50V		2200u TSU 50V		2	PANASONIC TSU 85DEG	
39	C29 C34			1n MYLAR		1n MYLAR		2		
40	Q9 Q10 Q11 Q12 Q21 Q22 Q23 Q24			BC212		BC556		8		
41	Q6 Q7 Q8 Q18 Q19 Q20			BC182		BC546		6		
42	Q3 Q15			BD140		BD140		2		
43	Q4 Q5 Q16 Q17			BD139		BD139		4		
44	*Q1 Q13			2N3055		2N3773		2	TO3 Fit on Heatsink	
45	*Q2 Q14			MJ2955		2N6609		2	TO3 Fit on heatsink	
46	D1 TO D10			1N4148		1N4148		10		
47	D11 D12 D13 D14			1N5401/2/3		UF5401/2		4		
48	FS1 FS2			FUSE HOLDER		FUSE HOLDER		2		
49	L1 L2			COIL		COIL		2	Custom component	
50	NF=Not Fitted									
51	*Fitted in house with heatsink. Use Mica and heat transfer paste.									

Bill of Material for Campion/Alabaster preamplifier pcb.			Line and Phono versions	
Used Part	Type	Designator	Description	Notes
2	0.01uF	C20 C23	BC components Polyester	NF ON LINE VERSION
2	0.01uF[NF]	C7 C8		
2	0.033u dipped polyest	C19 C24	Panasonic	NF ON LINE VERSION
8	0.1uF Mylar	C10 C11 C12 C13 C14 C15 C16 C9		
2	0.1uF[NF]	C5 C6		
2	1000uF[NF]	C1 C2		
2	100K MF	R16 R21		12kCF Line Preamp
2	100R MF	R18 R22		10k CF Line Preamp
4	10K	R10 R14 R26 R30		
6	10K[NF]	R12 R20 R25 R28 R32 R34		
2	10R[NF]	R1 R9		
8	12K	R11 R13 R15 R24 R27 R29 R31 R8		
2	[LINK]	R4 R7		LINK WIRE
4	1K[NF]	R2 R3 R5 R6		
2	1N4002	D1 D3	RECTIFIER 1N4002	
2	1N4003F[NF]	D2 D4	RECTIFIER 1N4002	
2	470uF	C3 C4		
2	470uF/16V	C18 C22		Link for Line Pre-amp
2		R23 R19		12k CF Line Preamp
2	47pF	C17 C21		NF ON LINE VERSION
2	68R MF	R33 R35		Metal film 0.33W
1	7818	REG1	IC VREG POS 7818	Heat sink on Alabaster
1	7918	REG2	IC VREG NEG 7918	Heat sink on Alabaster
2	7K5 MF	R36 R37		NF ON LINE VERSION
4	NJM2114	IC1 IC2 IC3 IC4	IC OPAMP DUAL NJM2114D	IC2 NJM5532 FOR PHONO VERSION
3	PAD	AC1 AC2 GND	Power connection to VSUP on main b	
4	PHONO4FTM	SK1 SK1 SK2 SK3	PHONO SKT 4-WAY	
1	ROT5	SW1	Lorlin Rotary switch	
All resistors are 0.25W carbon film unless otherwise specified.				
[NF]= Not Fitted.				
CF=CARBON FILM, MF=METAL FILM				