SubSonic 5i

Service Documentation

Rev 1.1 June 18, 2003

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SubSonic 5I Amplifier Circuit Description

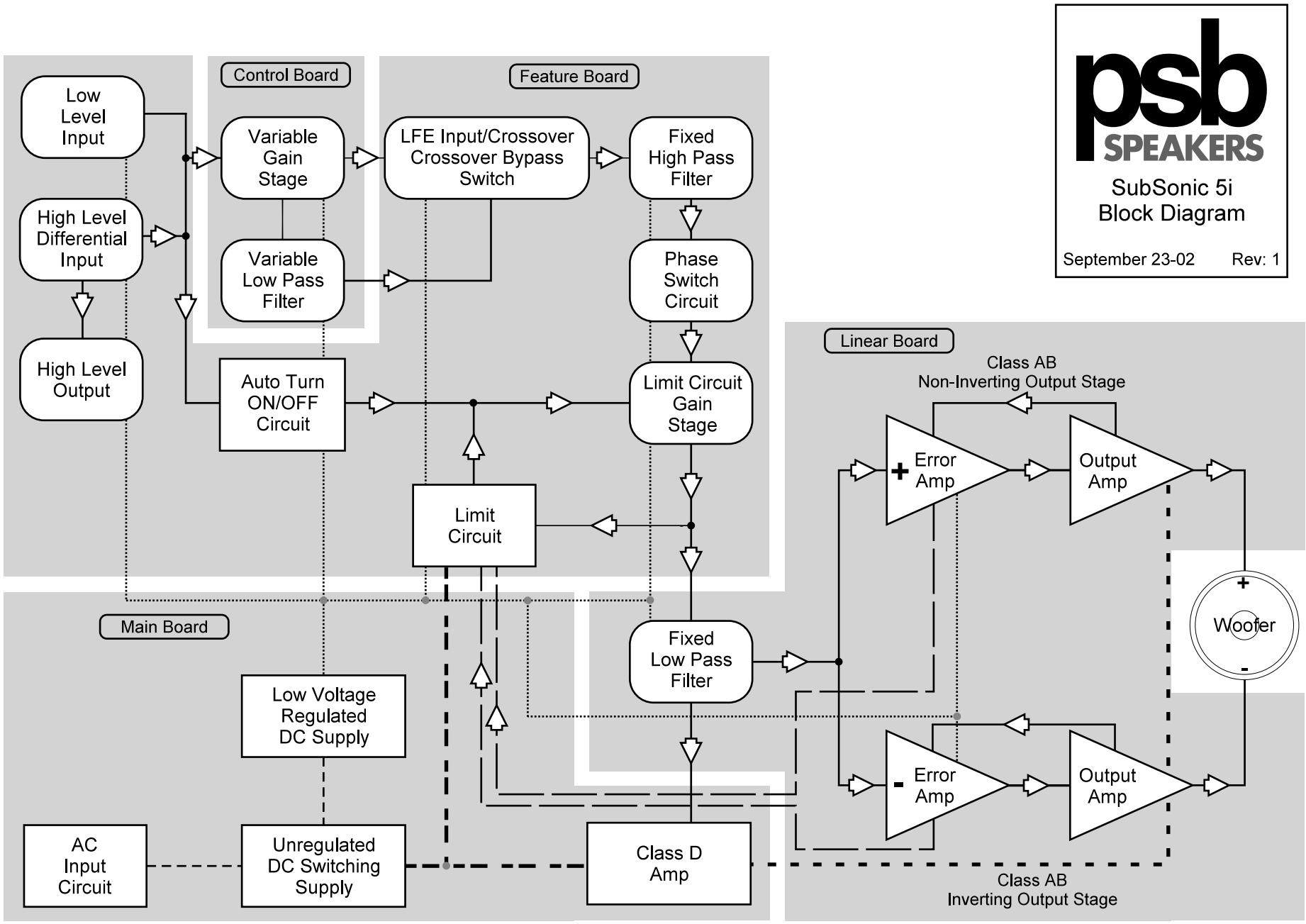
The SubSonic 5I amplifier is capable of delivering 150W of continuous RMS power into a 4 ohm load with less than 1% THD + Noise.

The main unregulated switch mode DC power supply has been designed with dynamic capability in mind. Switching at 50KHz substantially increases the efficiency of the power supply while reducing its size. The power supply can be switched to operate from either a 120 or 230Vac primary voltage by changing the position of two jumpers. The regulated low voltage (+/- 15v) DC supply is comprised of a pair of three terminal series voltage regulators.

An audio signal can be connected to either the low or high level inputs. The high level input uses a differential input to minimize noise. The high level outputs are fed directly from the high level inputs. The low level and high level input signals are summed together at the input buffer. The signal then proceeds to the control board, which contains the variable gain stage and variable low pass filter. The LFE Input/ Crossover Bypass switch selects between the output of the variable gain stage and the output of the variable low pass filter stage. The signal then passes through a high pass filter, a selectable phase stage, a transconductance amplifier (U5) and a current to voltage conversion stage. This last stage also contains an Auto-Off circuit that uses a JFET to MUTE the output when no signal is detected at the input of the variable gain stage for a period in excess of 10 to 15 minutes. When the output is muted, the Auto Off circuit will immediately un-mute the amplifier whenever a signal is detected.

A diode signal limiter provides dynamic overdrive protection through a series resistor at the output of the current to voltage conversion stage. The signal level at which this protection occurs varies with the main power supply voltage fed through the net labelled BULK_MONITOR. The transconductance amp gain is reduced when output clipping is detected or the diode signal limiter is frequently engaged. The signal finally passes through a 2nd order low pass filter before proceeding to the Class AB output stage section.

The balanced output stage is comprised of dual error amps and discrete bipolar transistor Class A voltage gain stages coupled to discrete MOSFET Class AB current gain stages. The Class AB MOSFET bias circuitry is factory calibrated and temperature compensated. The power supply for the Class AB output stage is a single ended current mode controlled Class D amplifier. The output of the Class D amplifier is modulated by the audio signal to maintain a constant small voltage between the source and drain of the Class AB output devices drastically increasing efficiency and reducing heat dissipation. This composite Class AB and Class D amplifier design combines the fidelity of a pure Class AB amplifier with an efficiency approaching that of a pure Class D amplifier.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SubSonic 5i
Block Diagram
September 23-02
Rev: 1
Control Board
Feature Board
Linear Board
Main Board
Low Level Input
High Level Differential Input
High Level Output
Variable Gain Stage
Variable Low Pass Filter
LFE Input/Crossover Crossover Bypass Switch
Fixed High Pass Filter
Phase Switch Circuit
Limit Circuit Gain Stage
Auto Turn ON/OFF Circuit
Limit Circuit
Fixed Low Pass Filter
Class AB Non-Inverting Output Stage
Error Amp
Output Amp
Woofer
Error Amp
Output Amp
Class AB Inverting Output Stage
Low Voltage Regulated DC Supply
Unregulated DC Switching Supply
AC Input Circuit
Class D Amp

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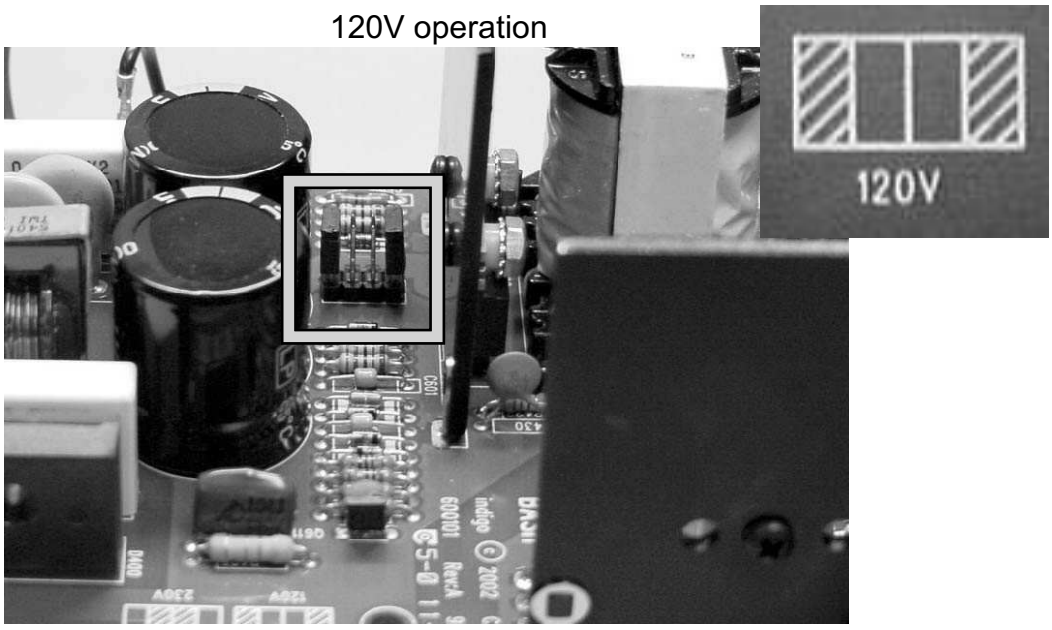
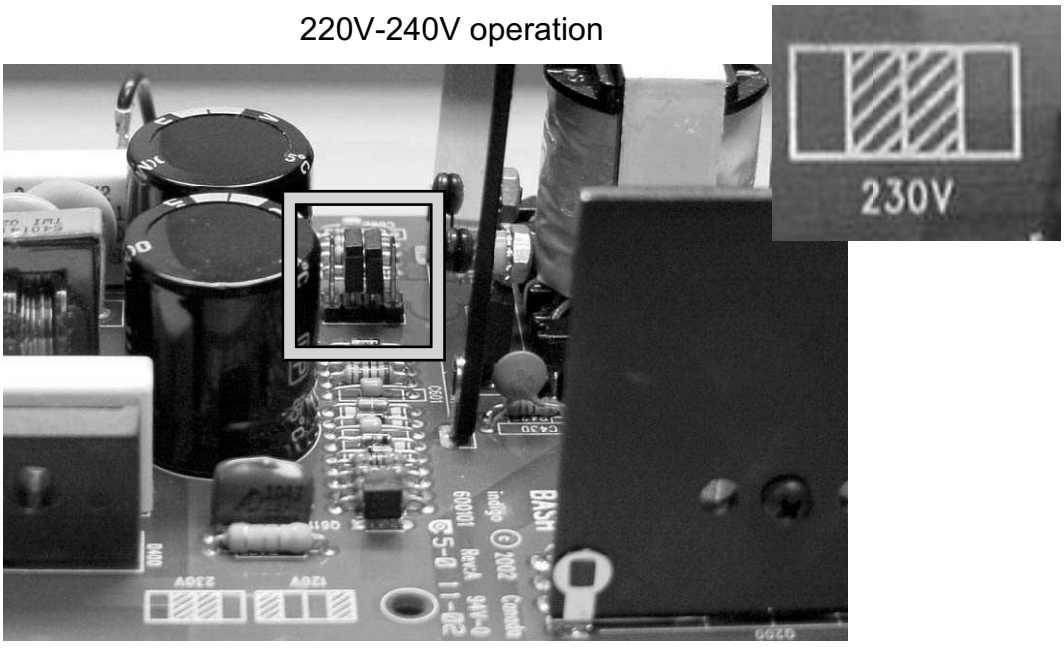
120V operation



By installing the two jumpers on the outside pins of the voltage selection block, the amplifier can be set to operate on 120VAC.

220V-240V operation



By installing the two jumpers on the inside pins of the voltage selection block, the amplifier can be set to operate on 220-240VAC.

SubSonic 5i Power Supply Board Operating Voltage Configuration

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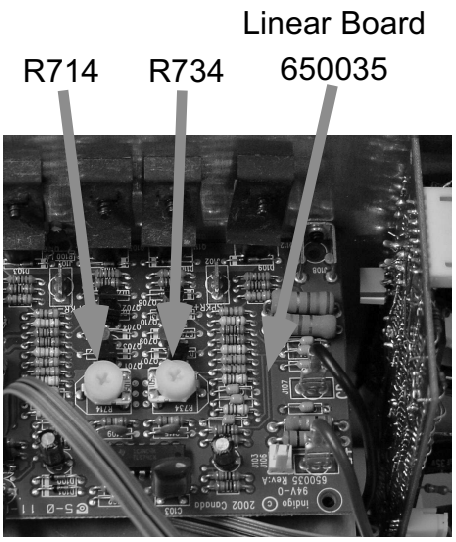
Setting Bias Current

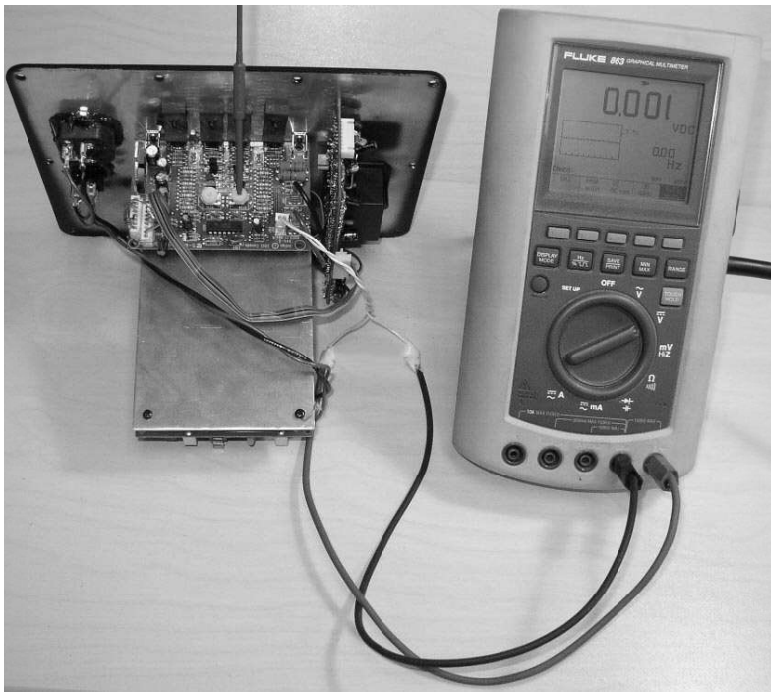
Setup

- Disconnect any signal connections from the High Level and Low Level inputs on the amplifier panel.
- Disconnect the power cord from the amplifier
- Remove the amplifier from the cabinet, disconnecting the control board cable from J6 and the driver wires from J102 (SPKR +) and J101 (SPKR -).
- Adjust potentiometers R714 and R734 on the Linear PCB (650035/650038) fully counter-clockwise.
- Connect a DC Voltmeter to bias header (J103) on the Linear PCB.
- Connect the power cord to the amplifier and turn the power switch on.
- Check the initial meter reading, it should be less than 1.3mV.
- Make note of initial meter reading

Bias Adjustment

- Adjust R714 until the meter reads the initial value +0.3mV
- Adjust R734 until the meter reads the initial value +0.6mV
- Turn the amplifier off and disconnect the power cord.
- Disconnect the meter.
- Return the amplifier to the cabinet, connecting the black driver wire to J101 (SPKR -), the red driver wire to J102 (SPKR +) and the control board cable to J6.





Test Setup

SubSonic 5i Bill of Materials

Main Board (600101)

Component ID	Qty	Description	Comment
	1	PCB, MAIN HC BASH SS5I	
C200	1	CAP, CA 470PF 100V 5%	
C202,C204	2	CAP, CA 1000PF 100V 10%	
C203	1	CAP, F 3.3UF 100V 5% 22MMLS	
C205,C206,C407,C413,C421,C422,C424	7	CAP, CA .1UF 50V 20%	
C400,C432	2	CAP, FX .22UF 250V 10% 22MMLS	
C403,C415,C416,C429	4	CAP, F .1UF 250V 10% 5MMLS	
C412	1	CAP, E 1000UF 100V 18X40	
C417	1	CAP, CY1 4700PF 250V 20% .4LS	
C418,C419	2	CAP, E 47UF 50V 20% 5MMLS	
C426	1	CAP, E 22UF 50V 20% 5X11 5MMLS	
C427,C428	2	CAP, E 220UF 200V 20% 22X25	
C501	1	CAP, CA 6800PF 50V 10%	
C503	1	CAP, F 2200PF 100V 5% 5MMLS	
C506	1	CAP, CA 47PF 50V 10%	
C601,C602	2	CAP, F 4700PF 100V 5% 5MMLS	
C611	1	CAP, CA 4700PF 100V 10%	
D200,D407,D409	3	RECT, 4A 200V ULTRA MUR420	
D400	1	RECT, 6A 400V BRIDGE PRETRIM	
D405,D406,D408	3	RECT, 1A 100V FAST REC 1N4934	
D501,D502,D503,D504,D612	5	RECT, 100mA 75V SIGNAL 1N4148T	
D611	1	RECT, 1A2 60V DIAC	
D613,D614	2	RECT, 100MA 200V SIGNAL 1N3070	
J201	1	TERM, FASTON MALE PCMT 250X032	
J202,J400,J401	3	TERM, FASTON MALE PCMT 187X032	
J210	1	CNCTR, HEADER 8PIN LOCKING .1C	
J402	2	CNCTR, HEADER 2PIN DOUBLE .1CT	
L200	1	IND, U16/20 15UH 16APK	
L402	1	IND, CM CHOKE U16/20 8mH 2.0A	
Q200 IR ONLY	1	MOSFET, IRF540 TO220AB	
Q401,Q402	2	MOSFET, IRF730 TO220	
Q403,Q405,Q502,Q504	4	TRANS, NPN 40V .6A TO92 2N4401	
Q404	1	TRANS, NPN 150V 0.6A 2N5551TR	
Q501,Q503,Q611	3	TRANS, PNP 150V 0.6A 2N5401TR	
Q611	1	TRANS, PNP TO92 MPSA92TR	
R209	1	RES, CF 33R 1/4W 5%	
R400	1	SURGISTOR, 10R 2A CL-110	
R401,R414	2	RES, MF 100K 1/4W 1%	
R412,R415	2	RES, MF 4K75 1/4W 1%	
R426	1	RES, CF 160K 1/4W 5%	
R501	1	RES, MF 6K81 1/4W 1%	
R502,R503,R612	3	RES, MF 1K00 1/4W 1%	
R505	1	RES, MF 1K50 1/4W 1%	
R506,R509	2	RES, MF 10K0 1/4W 1%	
R510,R511	2	RES, MF 475R 1/4W 1%	
R601,R604	2	RES, MF 392R 1/4W 1%	
R602,R603,R605,R606	4	RES, MF 1K10 1/4W 1%	
T1	1	XFMR, POWER EER35L 100V	
Z400	1	VARISTOR, 275V 100J .6W	
Z405	1	ZENER, 500mW 12V 5% 1N5242B	
Z601,Z602	2	ZENER, 500MW 15V 5% 1N5245B	

SubSonic 5i Bill of Materials

Main Board (600101) (Continued)

Component ID	Qty	Description	Comment
R200	1	RES, MF 16K5 1/4W 1%	
R201	1	RES, MF 2K67 1/4W 1%	
R202	1	RES, MF 6K34 1/4W 1%	
R203,R204,R210	3	RES, MO 0R1 2W 5% 1W BODY	
R206,R211	2	RES, MF 22R 0.6W 1% FLAMEPROOF	
R413,R421	2	RES, MF 10R 0.6W 1% FLAMEPROOF	
R416	1	RES, MF 169K 1/4W 1%	
R425	1	RES, MO 47K 1W 5%	
R504	1	RES, MF 3K65 1/4W 1%	
R512	1	RES, MF 2K32 1/4W 1%	
R611,R613,R614	3	RES, MF 200K 1/4W 1%	
U501	1	PWM, 8PIN DIL UC3842N	

Control Board (610055)

Component ID	Qty	Description	Comment
	1	PCB, CONTROL BD SS5i	
C1	1	CAP, F .022UF 100V 5% 5MMLS	
C2	1	CAP, F .082UF 63VDC 5% 5MMLS	
C4	1	CAP, E 4.7UF 35V BIPOLAR 5X11	
D1	1	CNCTR, HEADER 2PIN .100CTR	
J1	1	CNCTR, HEADER 8PIN LOCKING .1C	
R10	1	RES, CF 470K 1/4W 5%	
R2	1	RES, ZERO OHM 1/4W	
R3,R4	2	RES, MF 27K4 1/4W 1%	
R5	1	RES, MF 5K11 1/4W 1%	
R7	1	POT, B50K DUAL / BRACKET	
R8	1	POT, A100K SINGLE/ BRACKET 10%	
U1	1	OPAMP, DUAL 8PIN DIL LM358N	
	2	NUT, HEX 7MM	
	4	WASHER, FLAT 7MM	

Miscellaneous Hardware

Component ID	Qty	Description	Comment
Power Cord	1	WIRE, PWR CORD SPT2/IEC 8FT	

SubSonic 5i Bill of Materials

Linear Board (650035)

Component ID	Qty	Description	Comment
REVISION	1	PCB, LINEAR BD HC BASH SS5I	
C100,C104,C110	3	CAP, E 4.7UF 35V BIPOLAR 5X11	
C101	1	CAP, E 22UF 50V 20% 5X11 5MMLS	
C102,C105,C111	3	CAP, CA 2200P 100V 10%	
C103	1	CAP, F .1UF 63DC 5% 5MMLS	
C109,C115	2	CAP, C 10P 50V 5%	
C116,C117,C122,C123,C701,C702	6	CAP, CA .1UF 50V 20%	
C118,C119	2	CAP, E 47UF 50V 20% 5MMLS	
C120,C121	2	CAP, E 100UF 35V 85DEG 5MMLS	
C706,C707,C712,C713	4	CAP, CA 470PF 100V 5%	
D100,D101,D103,D104,D109,D110,D702,D705	14	RECT, 100mA 75V SIGNAL 1N4148T	
D706,D707,D708,D711,D712,D713			
J101	1	TERM, FASTON MALE PCMT 205X020	
J102,J106	2	TERM, FASTON MALE PCMT 250X032	
J103	1	CNCTR, HEADER 2PIN .100CTR	
J104,J105	2	CNCTR, HEADER 8PIN LOCKING .1C	
J107	1	TERM, FASTON MALE PCMT 187X032	
J108,J109	2	MISC, PC MT SCREW TERM 6-32	
Q100	1	JFET, N-CH J113 TO92 TR	
Q105,Q111	2	MOSFET, IRF9540 TO220AB	
Q106,Q112	2	MOSFET, IRF530 TO220 (IR ONLY)	
Q701,Q707	2	TRANS, NPN 40V .6A TO92 2N4401	
Q702,Q708	2	TRANS, PNP 40V .6A TO92 2N4403	
Q703,Q709	2	TRANS, PNP 150V 0.6A 2N5401TR	
Q704,Q710	2	TRANS, NPN 150V 0.6A 2N5551TR	
R100	1	THERM, PTH9L04BD222TS2F510	
R101,R102	2	RES, MF 2K49 1/4W 1%	
R103,R104,R105,R106,R107,R108,R127,R128	8	RES, MF 10K0 1/4W 1%	
R109,R110	2	RES, MO 0R1 2W 5% 1W BODY	
R111,R112	2	RES, MO 150R 3W 5% 2W BODY	
R120,R121,R140,R141	4	RES, MF 1K00 1/4W 1%	
R122,R123,R142,R143	4	RES, MF 22R 0.6W 1% FLAMEPROOF	
R126,R146	2	RES, MF 64K9 1/4W 1%	
R709,R710,R711,R712,R729,R730,R731,R732	8	RES, CF 510R 1/4W 5%	
R713,R717,R733,R737	4	RES, MF 2K00 1/4W 1%	
R714,R734	2	POT, 500R 8MM HOR TOP ADJ/COVR	
R715,R716,R735,R736	4	RES, MF 3K92 1/4W 1%	
R718,R719,R738,R739	4	RES, CF 330R 1/4W 5%	
U100	1	OPAMP, QUAD 14P DIL TL074/084	
U102	1	VREG, +15V 500MA LM7815CT	
U103	1	VREG, -15V 500MA LM7915CT	

SubSonic 5i Bill of Materials

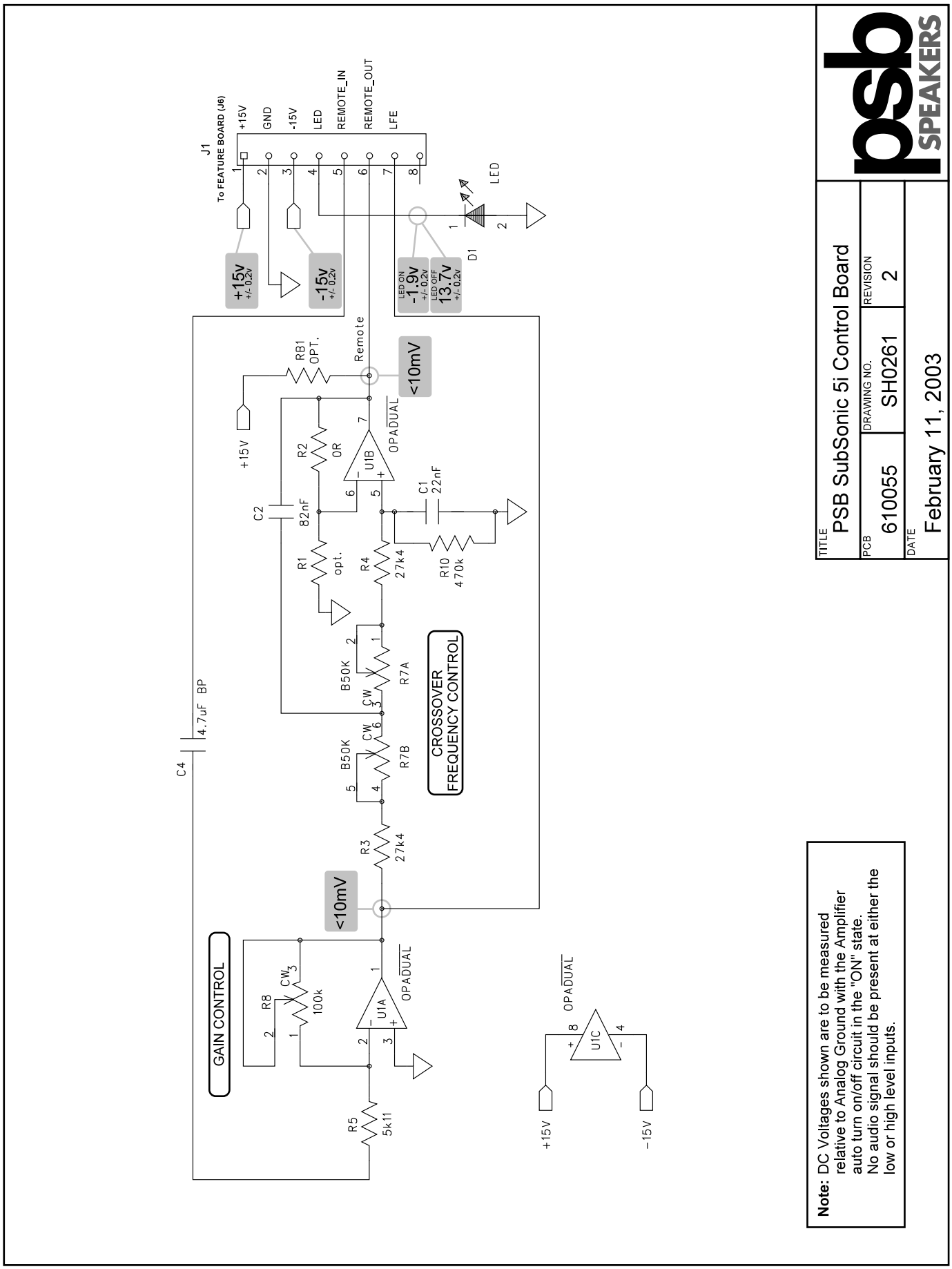
Feature Board (630117)

Component ID	Qty	Description	Comment
	1	PCB, FEATURE BD HC BASH SUB5I	
C1	1	CAP, E 2.2UF 50V BIPOLAR 20% 105C	
C10	1	CAP, F .056UF 100V 5% 5MMLS	
C11,C12	2	CAP, CA .01UF 100V 20%	
C13,C14,C17	3	CAP, CA 100PF 100V NPO 10%	
C15,C19	2	CAP, E 47UF 50V 20% 5MMLS	
C18,C26,C27	3	CAP, CA .1UF 50V 20%	
C2	1	CAP, F 100PF 63V 10% 5MMLS	
C20	1	CAP, CA 1000PF 100V 10%	
C3,C4	2	CAP, F .22UF 63V 5% 5MMLS	
C5	1	CAP, E 22UF 35V BP 8X11 5MMLS	
C6	1	CAP, CA 330PF 50V 10%	
C7	1	CAP, E 2.2UF 50V 20% 105C	
C8	1	CAP, E 4.7UF 35V BIPOLAR 5X11	
C9	1	CAP, F .22UF 63V 10% 5MMLS	
D1,D2,D3,D4,D5,D6,D7,D8,D9,D10,D11,	14	RECT, 100mA 75V SIGNAL 1N4148T	
D12,D13,D14			
J1,J6	2	CNCTR, HEADER 8PIN LOCKING .1C	
J4	1	MISC, PC MT SCREW TERM 6-32	
Q1	1	JFET, N-CH J113 TO92 TR	
R1,R2,R19	3	RES, MF 47K5 1/4W 1%	
R12	1	RES, MF 39K2 1/4W 1%	
R17	1	RES, MF 27K4 1/4W 1%	
R18	1	RES, MF 392R 1/4W 1%	
R20,R21,R28,R29,R30,R31,R52,R55,R56,R59	10	RES, MF 10K0 1/4W 1%	
R24,R25	2	RES, MO 330R 1W 5%	
R26,R27	2	RES, MO 1K 1W 5%	
R3	1	RES, MF 1K00 1/4W 1%	
R32,R33,R51	3	RES, MF 475R 1/4W 1%	
R34	1	RES, MF 68K1 1/4W 1%	
R35,R36,R37	3	RES, MF 200K 1/4W 1%	
R38,R40,R48,R49	4	RES, MF 100K 1/4W 1%	
R39,R42,R46,R54	4	RES, MF 2K21 1/4W 1%	
R4,R15	2	RES, MF 61K9 1/4W 1%	
R41,R50	2	RES, MF 499R 1/4W 1%	
R43,R47	2	RES, MF 475K 1/4W 1%	
R44,R45	2	RES, MF 4K99 1/4W 1%	
R5	1	RES, MF 4K22 1/4W 1%	
R53	1	RES, CF 9M1 1/4W 5%	
R58	1	RES, MF 15K0 1/4W 1%	
R6	1	RES, MF 95K3 1/4W 1%	
R67	1	RES, MF 22K1 1/4W 1%	
R7,R22	2	RES, ZERO OHM 1/4W	
R9,R10,R11,R13,R57	5	RES, MF 4K75 1/4W 1%	
RCA1	1	CNCTR, DUAL JACK RCA	
SW1,SW2	2	SWITCH, SPDT TOGGLE C/W CAP PC	
U1,U2	2	OPAMP, QUAD 14P DIL TL074/084	
U3,U4	2	OPAMP, QUAD 14PIN DIL LM324N	
U5	1	TRANSAMP, DUAL 16P DIL LM13700	
Z1	1	ZENER, 500MW 14V 5% 1N5244B	
Z2	1	ZENER, 500mW 12V 5% 1N5242B	

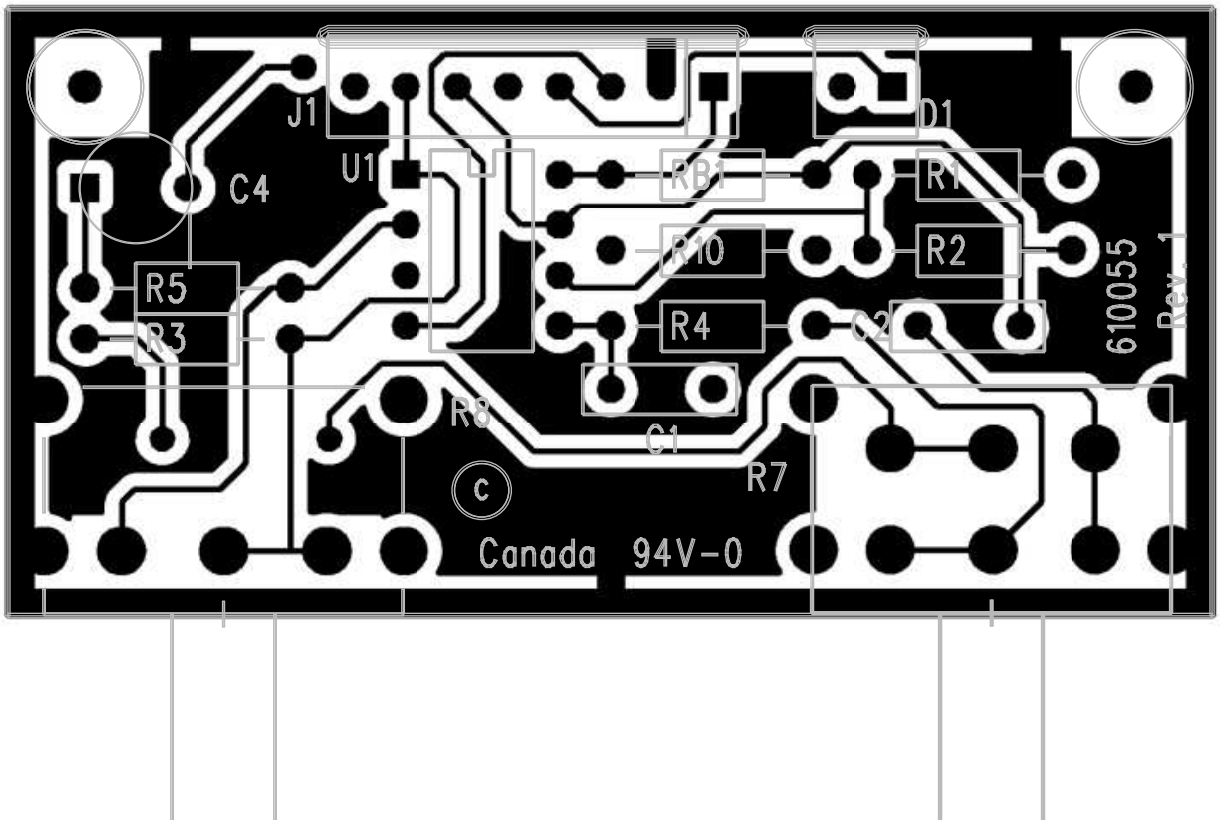
SubSonic 5i Bill of Materials

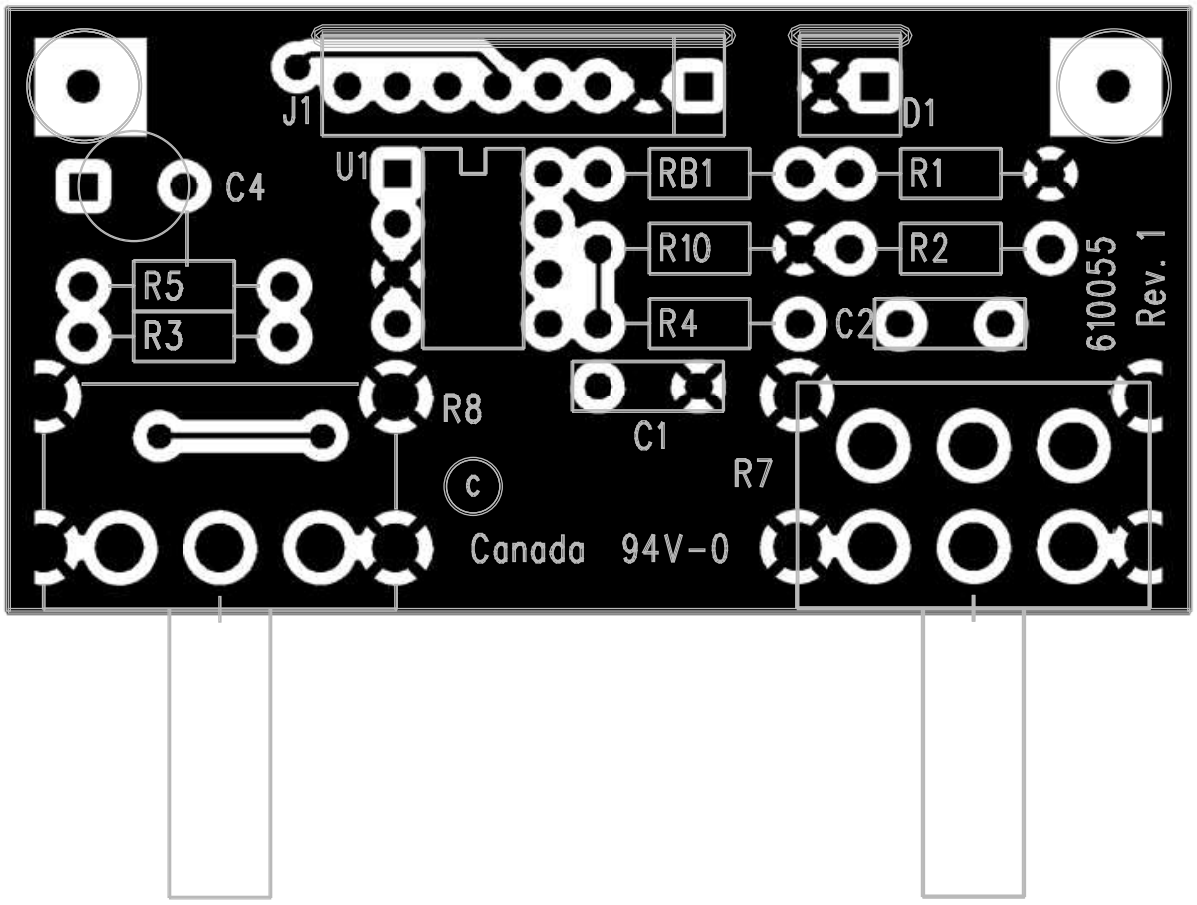
Backpanel Hardware			
Component ID	**Qty**	**Description**	**Comment**
IEC SOCKET TO AC SWITCH	1	SUB, #16B 3" 187X032/1/4" STRP	
IEC SOCKET TO AC SWITCH	1	SUB, #16R 3" 187X032/1/4" STRP	
2 PC B P RIGHT BLACK TO FEATURE BD R-	4	SUB, #18B 7" 1/4" STRIP BOTH	
2 PC B P LEFT BLACK TO FEATURE BD L-			
2 PC B P RIGHT RED TO FEATURE BOARD R+	4	SUB, #18R 7.5" 1/4" STRIP BOTH	
2 PC B P LEFT RED TO FEATURE BOARD L+			
SPKR+ TO DRIVER	1	SUB, #16R 24" 250X020/250X020	
SPKR- TO DRIVER	1	SUB, #16B 24" 205X020/205X020	
AC SWITCH TO J401 OF MAIN BD	1	SUB, #16B 12" 187X032/187X032	
AC SWITCH TO J400 OF MAIN BD	1	SUB, #16R 12" 187X032/187X032	
CD- MAIN BOARD TO CD- LINEAR BOARD	1	SUB, #16B 9" 187X032/187X032	
CD+ MAIN BOARD TO CD+ LINEAR BOARD	1	SUB, #16R 9" 250X032/250X032	
USED ON THE LINEAR BOARD	4	HTSNK, FET CLIP .9X.5X.2	
1PC USED ON Q200 ON MAIN BOARD	2	HTSNK, FET 1-2 SAM 2X2	
1PC USED ON Q401,Q402 ON MAIN BOARD			
	1	BRACKET, SUB5 I	
RCA PLASTIC BOX	1	MISC, QUAD PHONO BOX	
FUSE	2	FUSE, 2A 5MMX20MM SLOW EXPORT	
2PC USED ON Q401,Q402 ON MAIN BOARD	4	NUT, HEX KEP #4-40 ZNP	
2PC USED ON IEC CONNECTOR			
1PC USED ON Q200 ON MAIN BOARD	3	NUT, HEX KEP #6-32 ZNP	
2PC USED ON BRACKET			
USED WITH MM0025	3	SCREW, #6-32X1/4 PAN PHIL ZNP	
USED WITH NYLON STANDOFF	3	SCREW, #4-3/8 TYPE AB PP BLK	
2PC USED ON Q401,Q402 ON MAIN BOARD	4	SCREW, #4-40X3/8 PAN PHIL BLK	
2PC USED ON IEC CONNECTOR			
6PC USED ON RCA BOX 1PC USED ON RCA	7	SCREW, #4-1/2 TYPE AB PP BLK	
USED ON Q200 ON MAIN BOARD	1	SCREW, #6-32X3/8 PAN PHIL BLK	
USED ON THE FET CLIPS	4	SCREW, #6-1/2 TYPE B PP BLK	
2PC USED WITH METAL STANDOFFS	2	SCREW, #6-32X1/4 PAN PHIL BLK	
2PC USED FOR BRACKET	2	SCREW, #6-32X1/2 PAN PHIL BLK	
USED ON Q200,Q401,Q402 ON MAIN BOARD	3	WASHER, SHOULDER #4	
1 FROM FEATURE BD TO LINEAR BD	2	CNCTR, FEM-FEM HARNESS 8P 9"	
1 FROM LINEAR BD TO POWER SUPPLY			
USED ON J402 ON MAIN BOARD	2	CNCTR, 2PIN MINI JUMPER(SHUNT)	
ON THE PANEL	4	CNCTR, SINGLE BINDING POST RED	
ON THE PANEL	4	CNCTR, SINGLE BINDING POST BLK	
LED HARNESS INSTALL ON 610055	1	CNCTR, FEM-LED GRN 5.5" 2P 5MM	
IN FINISHING	1	CNCTR, IEC/FUSE COMBO SOCKET	
INSTALL ON 610055 CONTROL BOARD ASSY	1	CNCTR, FEM-FEM HARNESS 8P 24"	
GASKET FOR TOGGLE SWITCHES	2	MISC, FOAM .5X.5X.25 HOLE	
AROUND THE PERIMETER OF THE PANEL	2	MISC, PANEL GASKET PA-SS5/SS0	
2PC USED ON Q401,Q402 ON MAIN BOARD	6	SILPAD, .009" .3C/W TO3P	
4PC USED ON LINEAR BOARD			
USED ON Q200 ON MAIN BOARD	1	MISC, CERAMIC PLATE TO-220	
USED ON MAIN BOARD	1	STANDOFF, #6-32 3/8 ROUND AL	
USED ON MAIN BOARD	3	STANDOFF, 3/8" NYLON LOCKING	
	1	PANEL, PA-SS5I/N	
	1	SWITCH, ROCKER TV5 C/W TERM	

Control Board Schematic

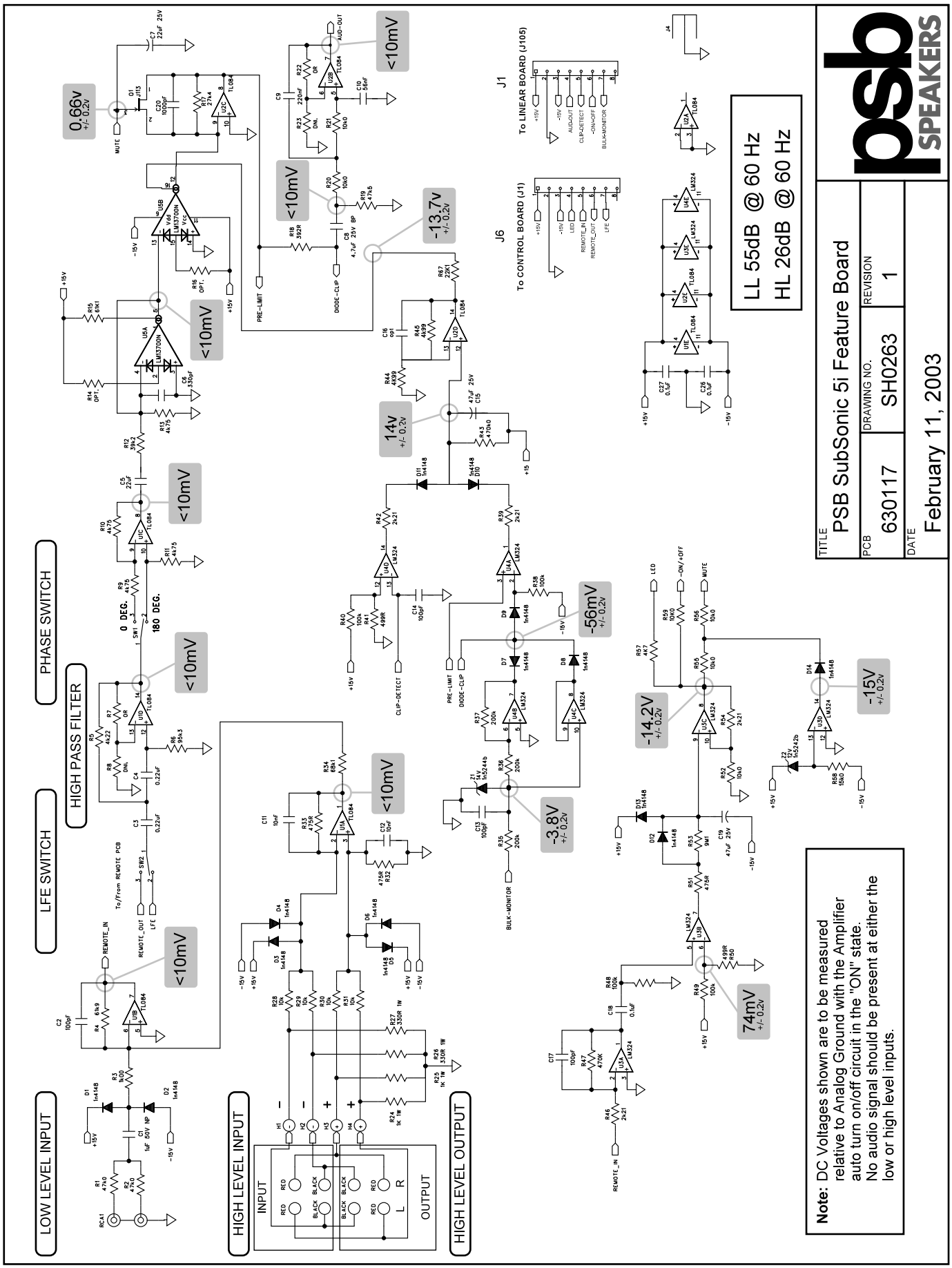


Control Board Artwork

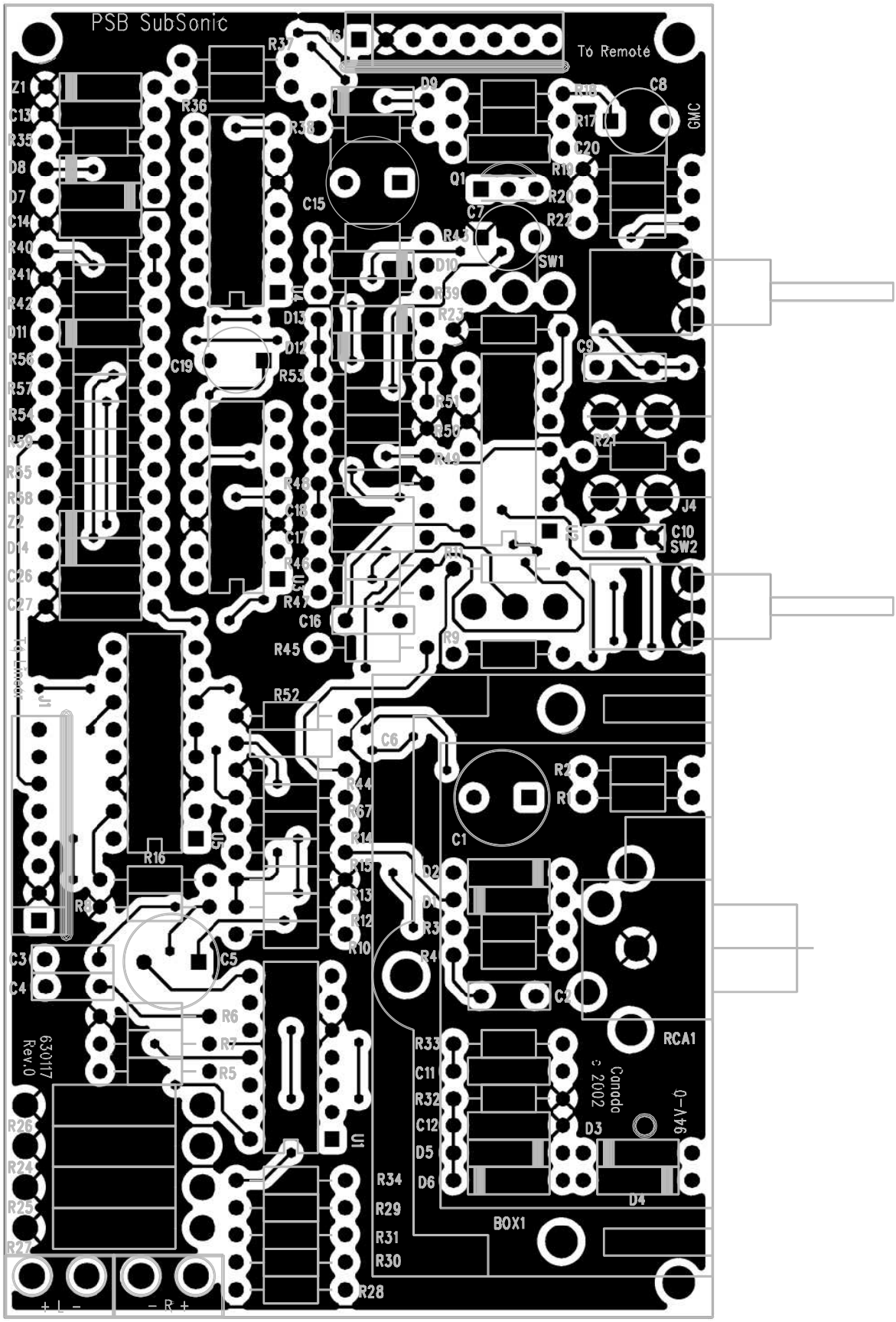




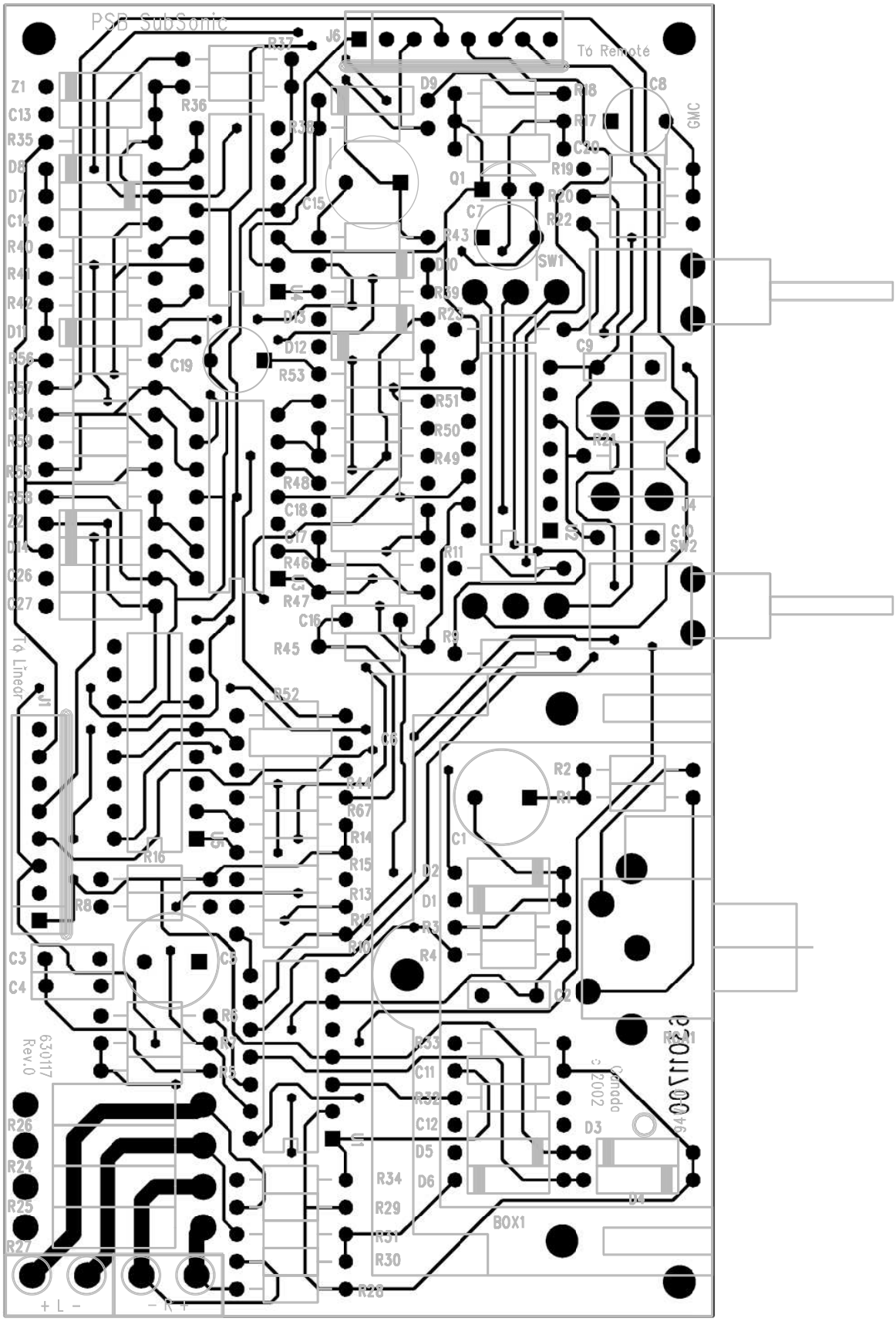
Feature Board Schematic



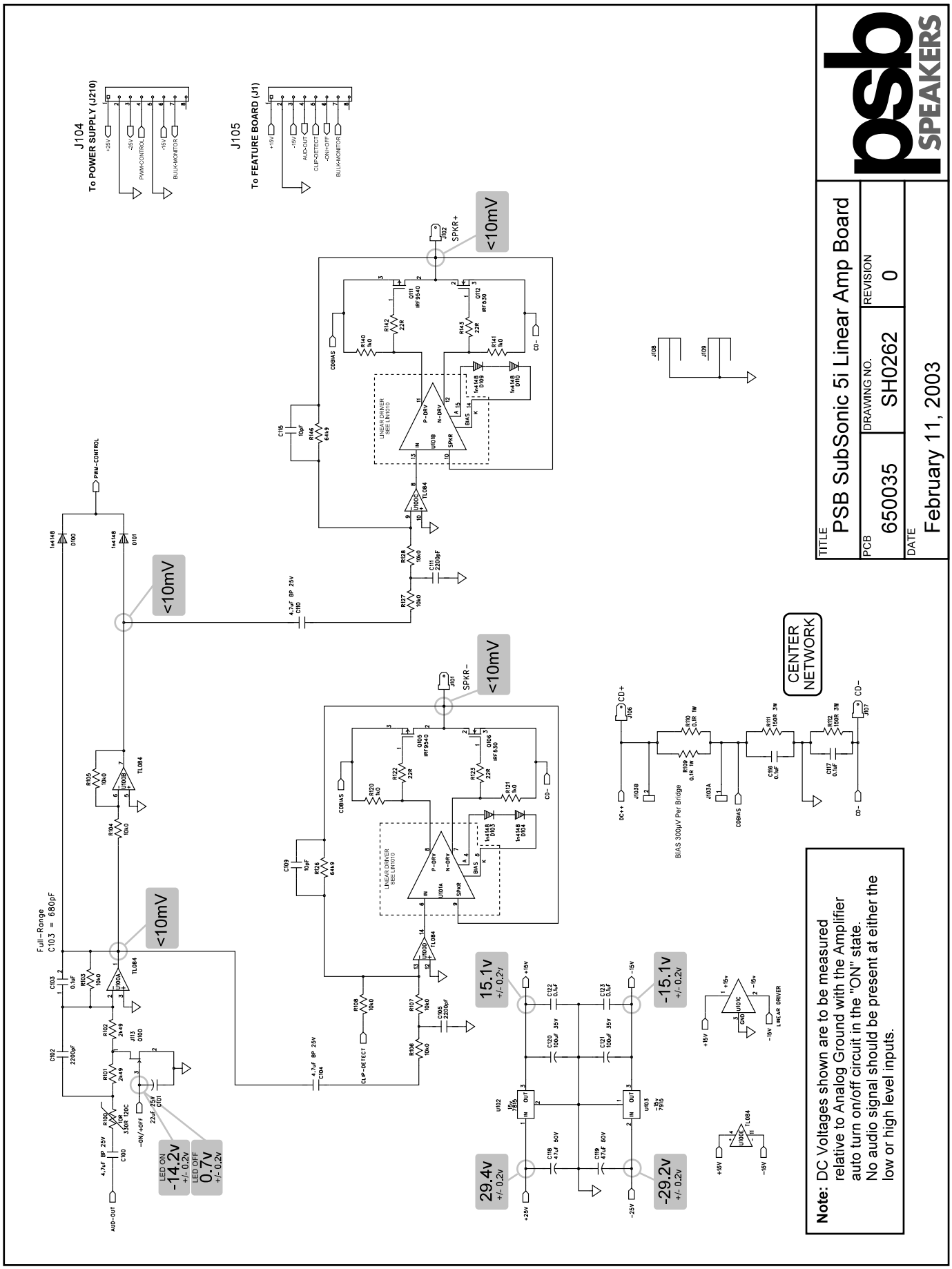
Feature Board Artwork

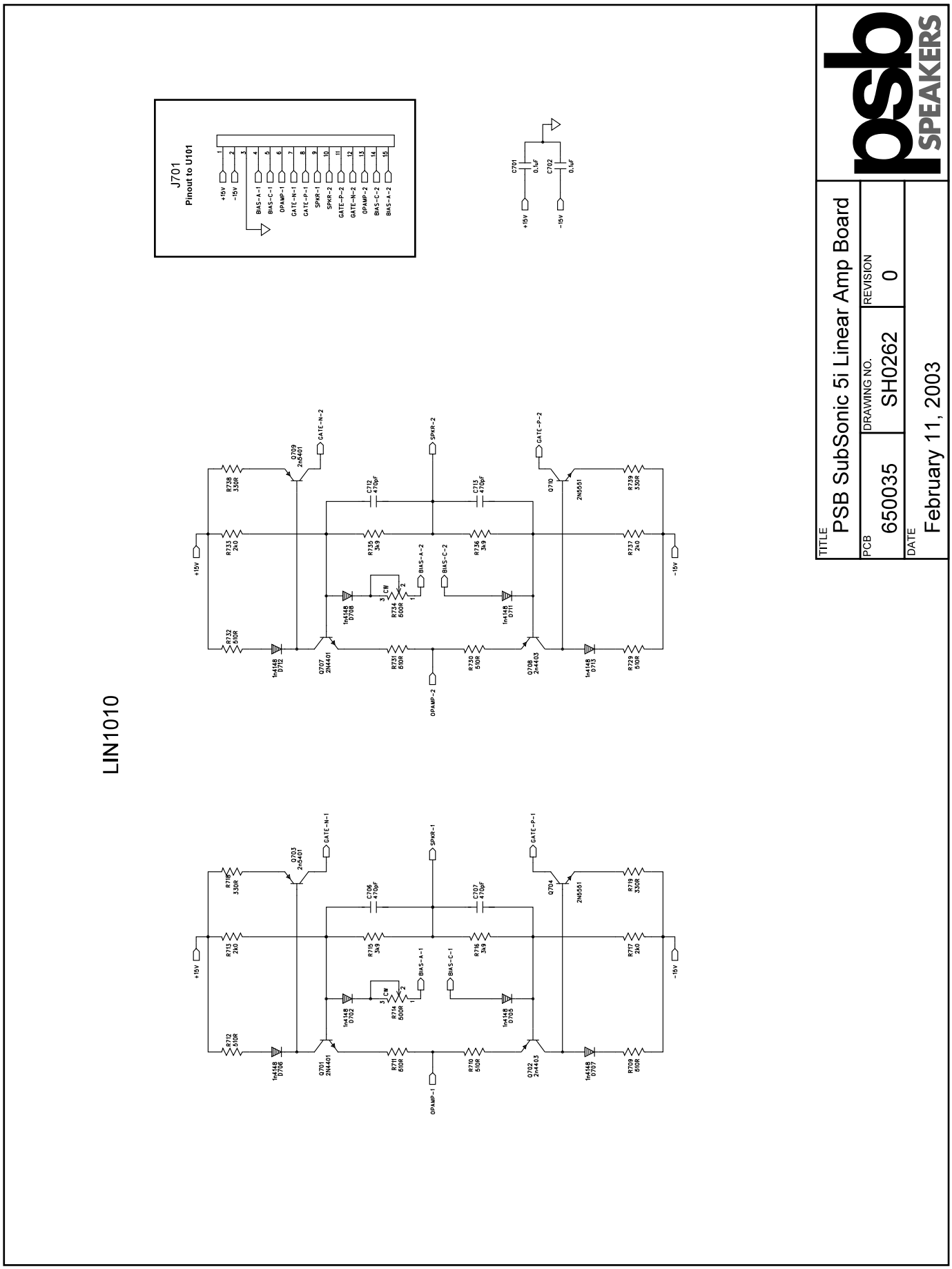


Feature Board Artwork

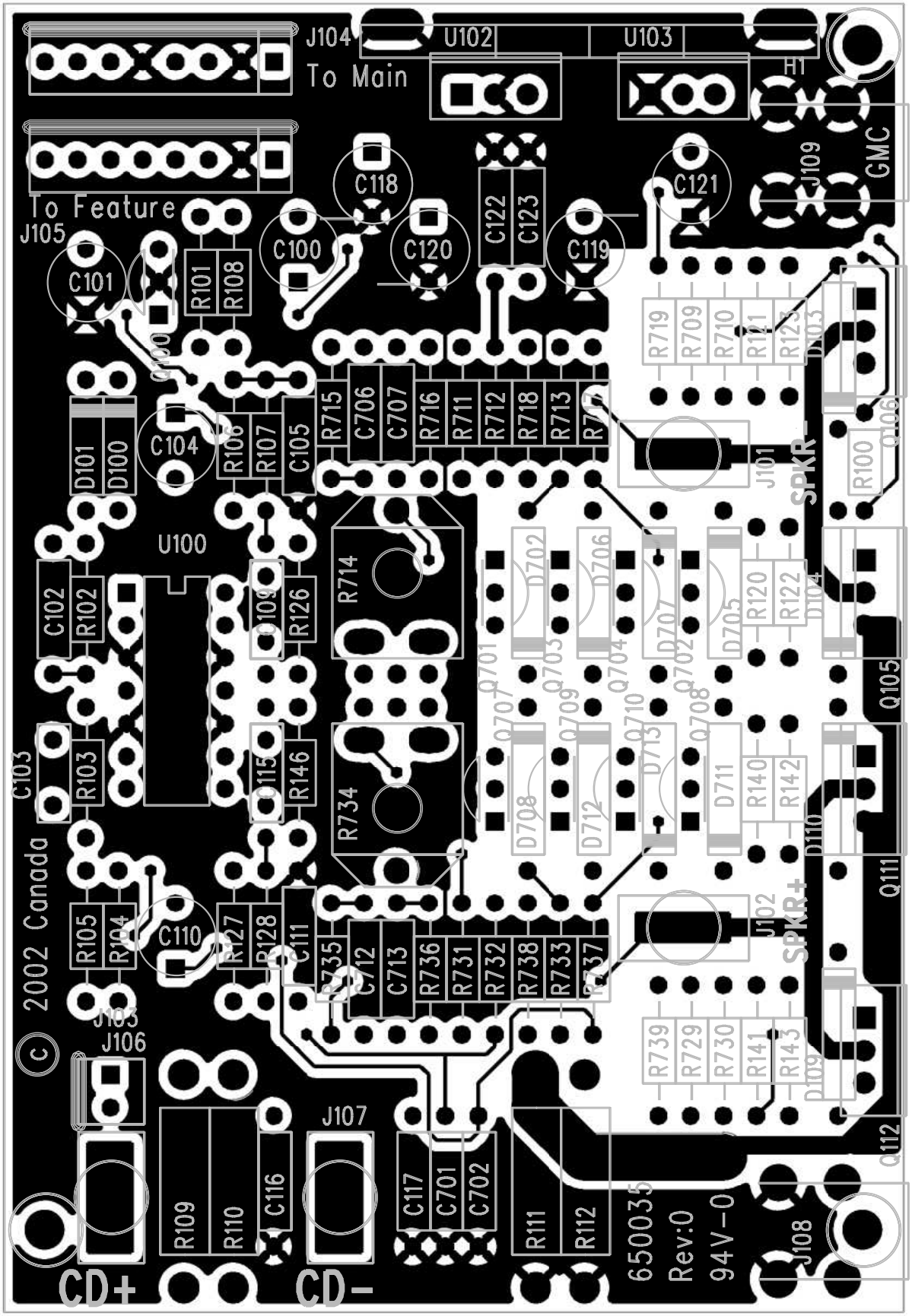


Linear Board Schematic

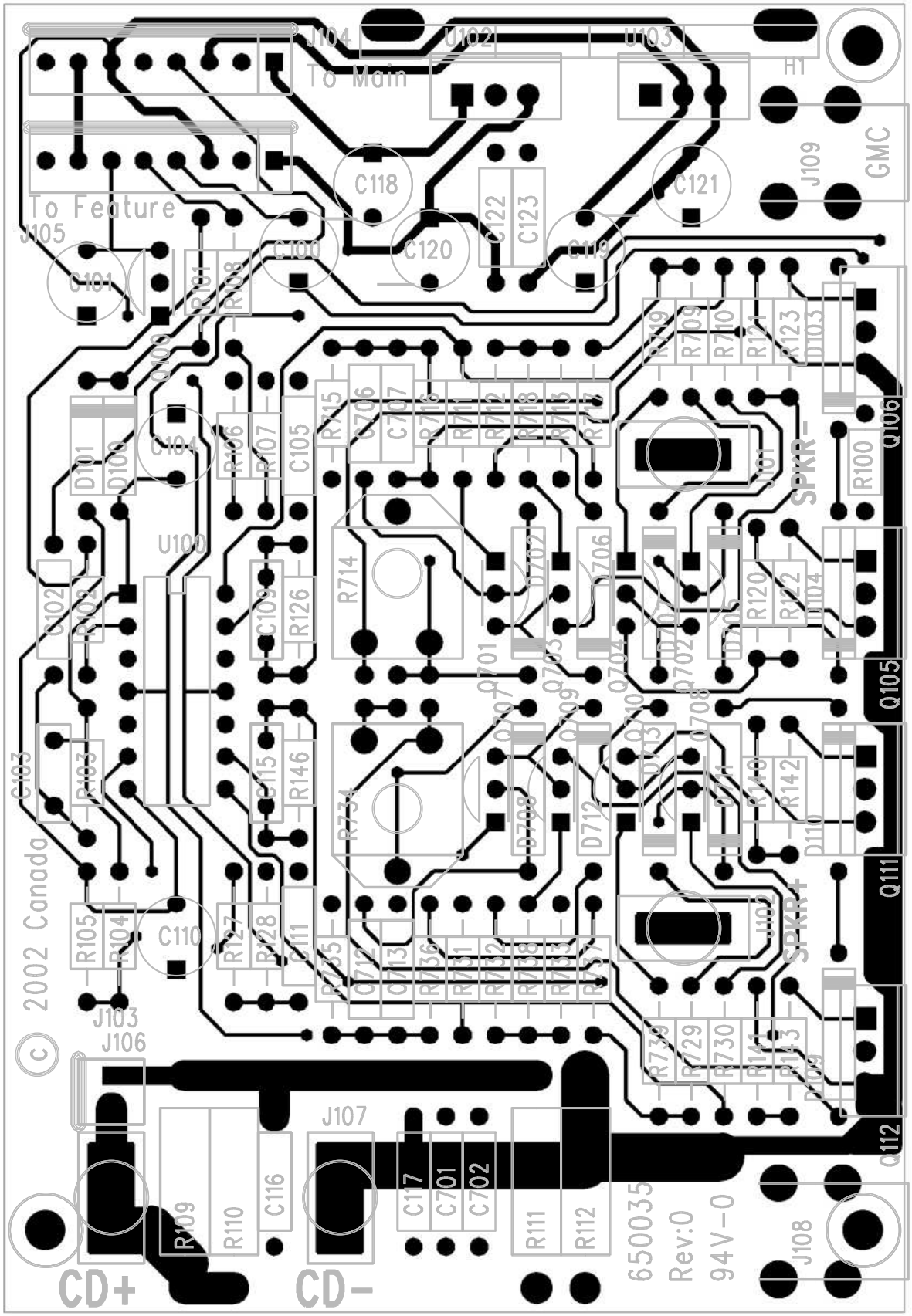


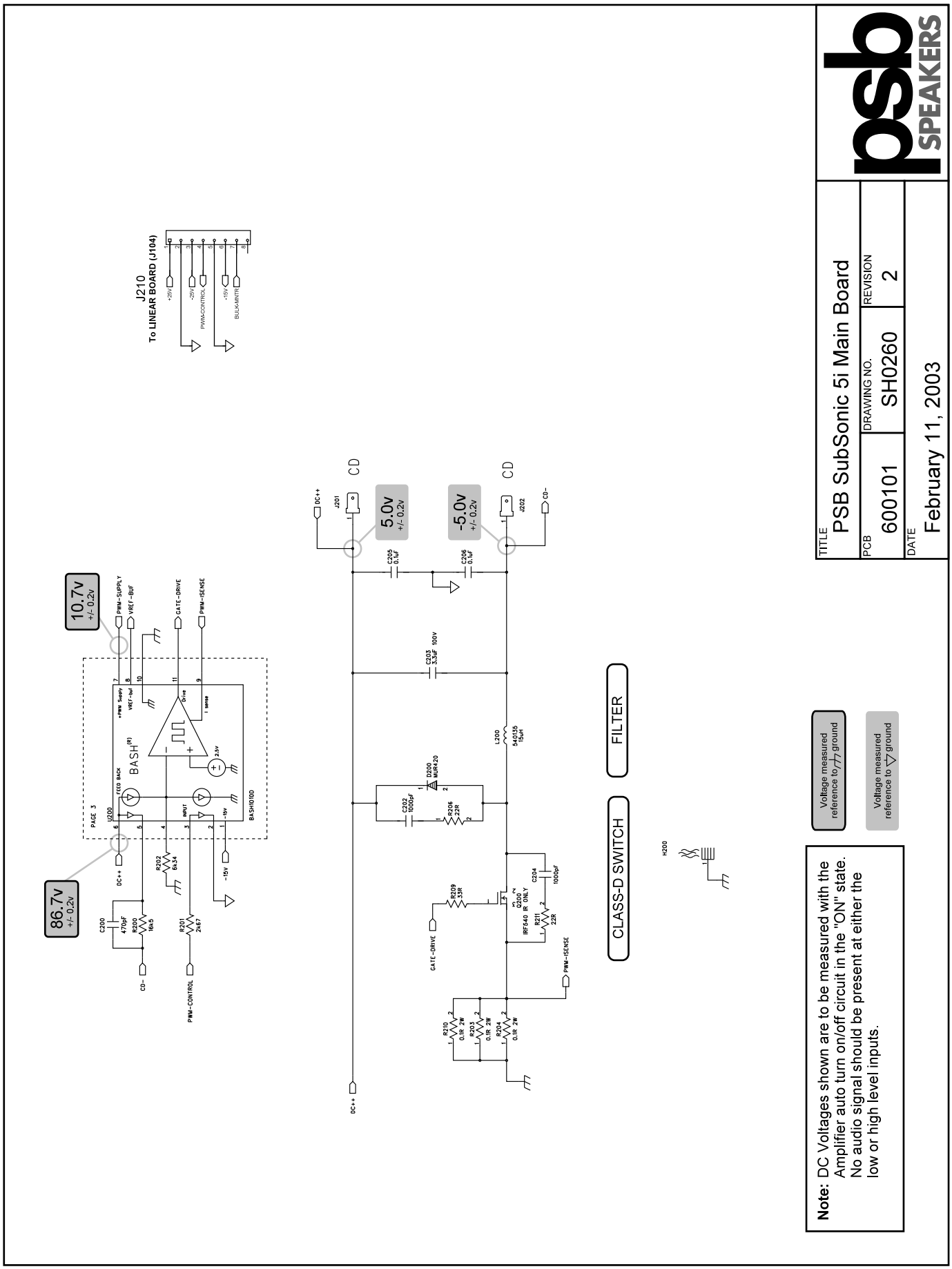

J701
Pinout to U101
+15V
-15V
BIAS-A-1
BIAS-C-1
OPAMP-1
GATE-N-1
GATE-P-1
SPKR-1
SPKR-2
GATE-P-2
GATE-N-2
OPAMP-2
BIAS-C-2
BIAS-A-2
C701
0.1uF
C702
0.1uF
LIN1010
TITLE
PSB SubSonic 5i Linear Amp Board
PCB
650035
DRAWING NO.
SH0262
REVISION
0
DATE
February 11, 2003
psb SPEAKERS

Linear Board Artwork

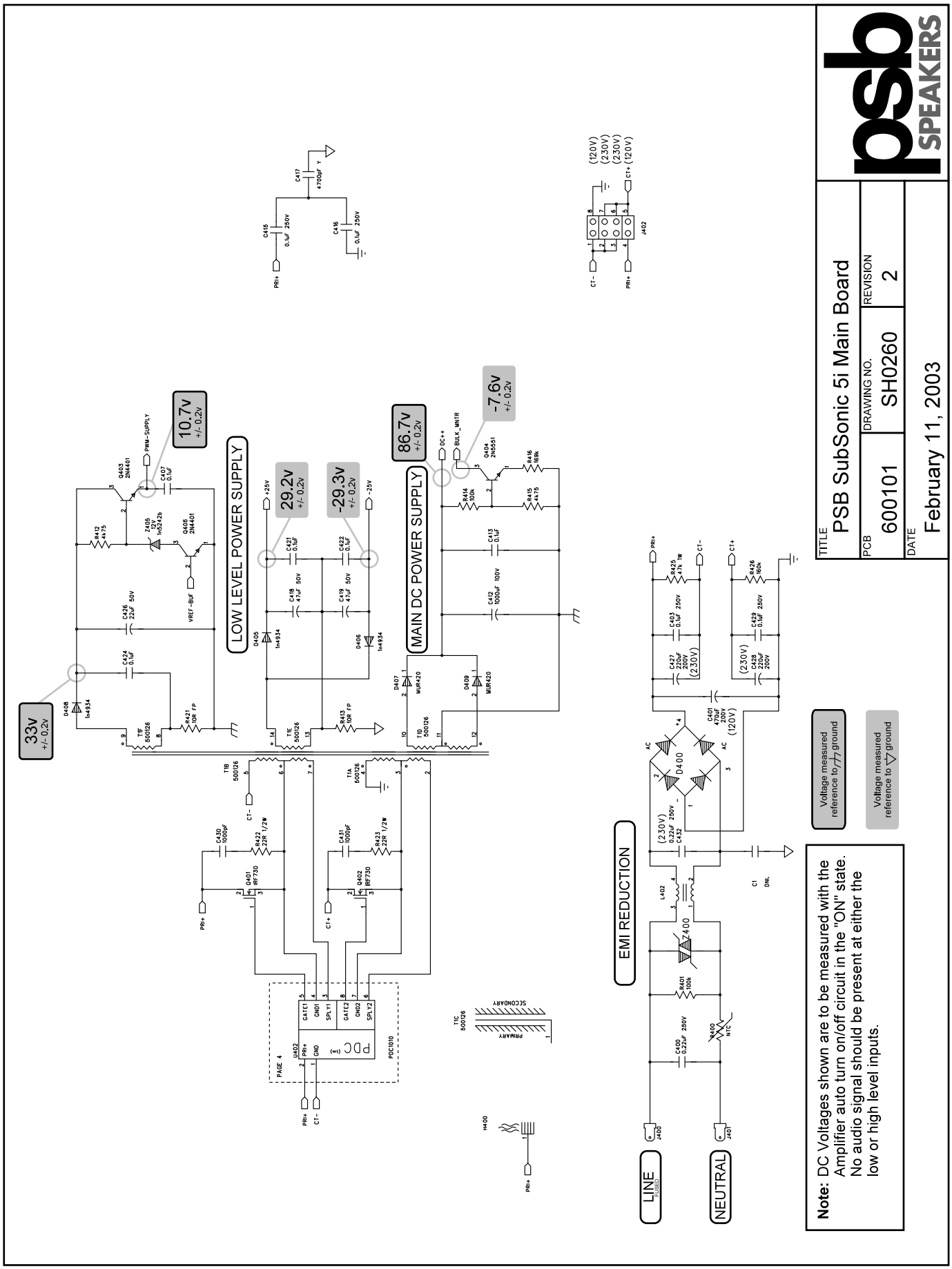


Linear Board Artwork

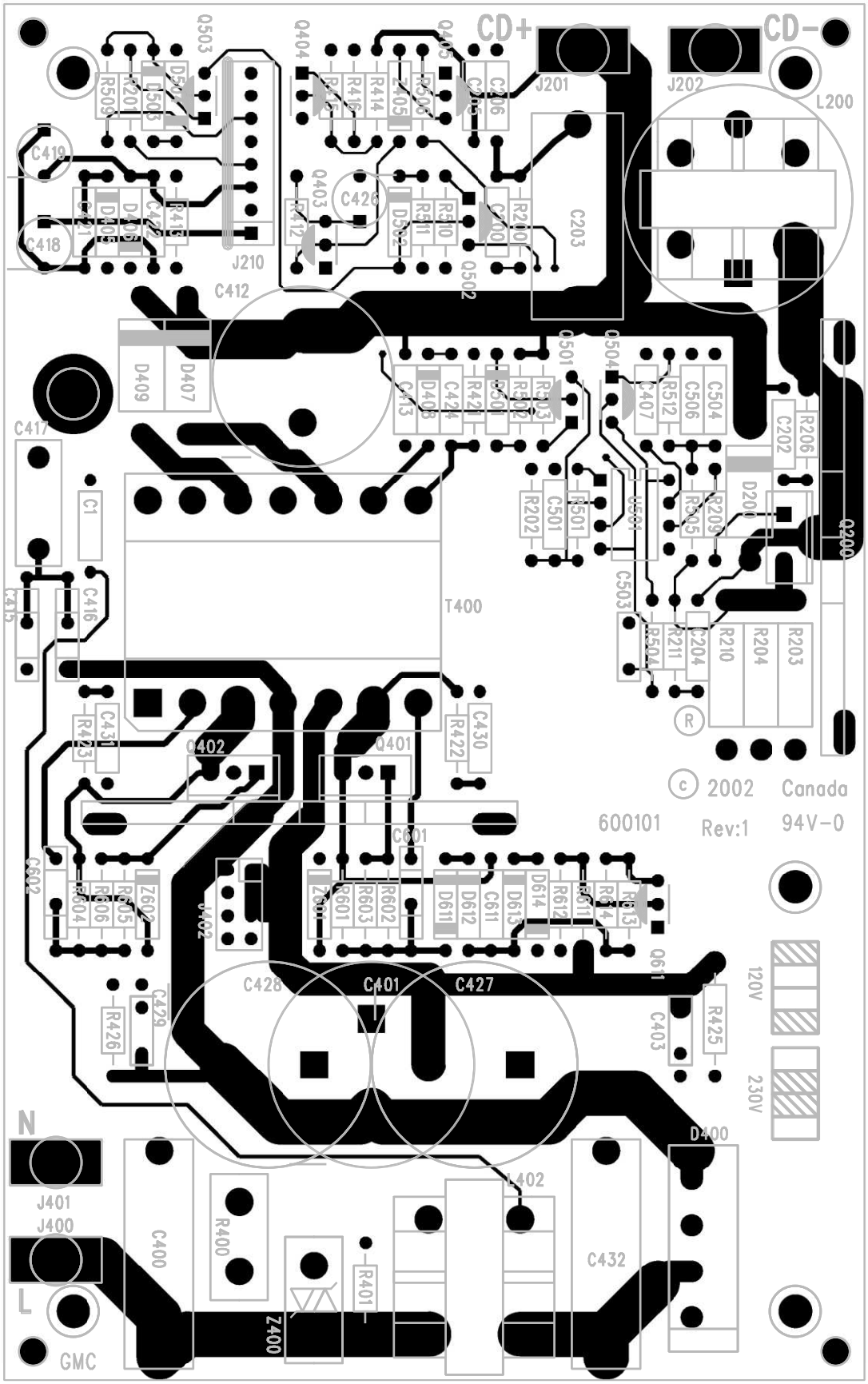



J210
To LINEAR BOARD (J104)
+25V
-25V
PWM-CONTROL
-15V
BULK-MAINTR
10.7v
+/- 0.2v
86.7v
+/- 0.2v
5.0v
+/- 0.2v
-5.0v
+/- 0.2v
CD
CD
DC++
CD-
PWM-SUPPLY
VREF-BUF
GATE-DRIVE
PWM-ISENSE
PAGE 3
U200
BASH
BASH100D
C200
470pF
R200
16k5
R201
2k67
R202
6k34
C202
1000pF
D200
MURA120
L200
540135
15uH
C203
3.3uF 100V
C205
0.1uF
C206
0.1uF
R206
22R
R209
33R
R210
0.1R 2W
R203
0.1R 2W
R204
0.1R 2W
R211
22R
C204
1000pF
IRF540 IR ONLY
CLASS-D SWITCH
FILTER
H200
Voltage measured reference to ground
Voltage measured reference to ground
TITLE
PSB SubSonic 5i Main Board
PCB
600101
DRAWING NO.
SH0260
REVISION
2
DATE
February 11, 2003
psb SPEAKERS
Note: DC Voltages shown are to be measured with the Amplifier auto turn on/off circuit in the "ON" state. No audio signal should be present at either the low or high level inputs.

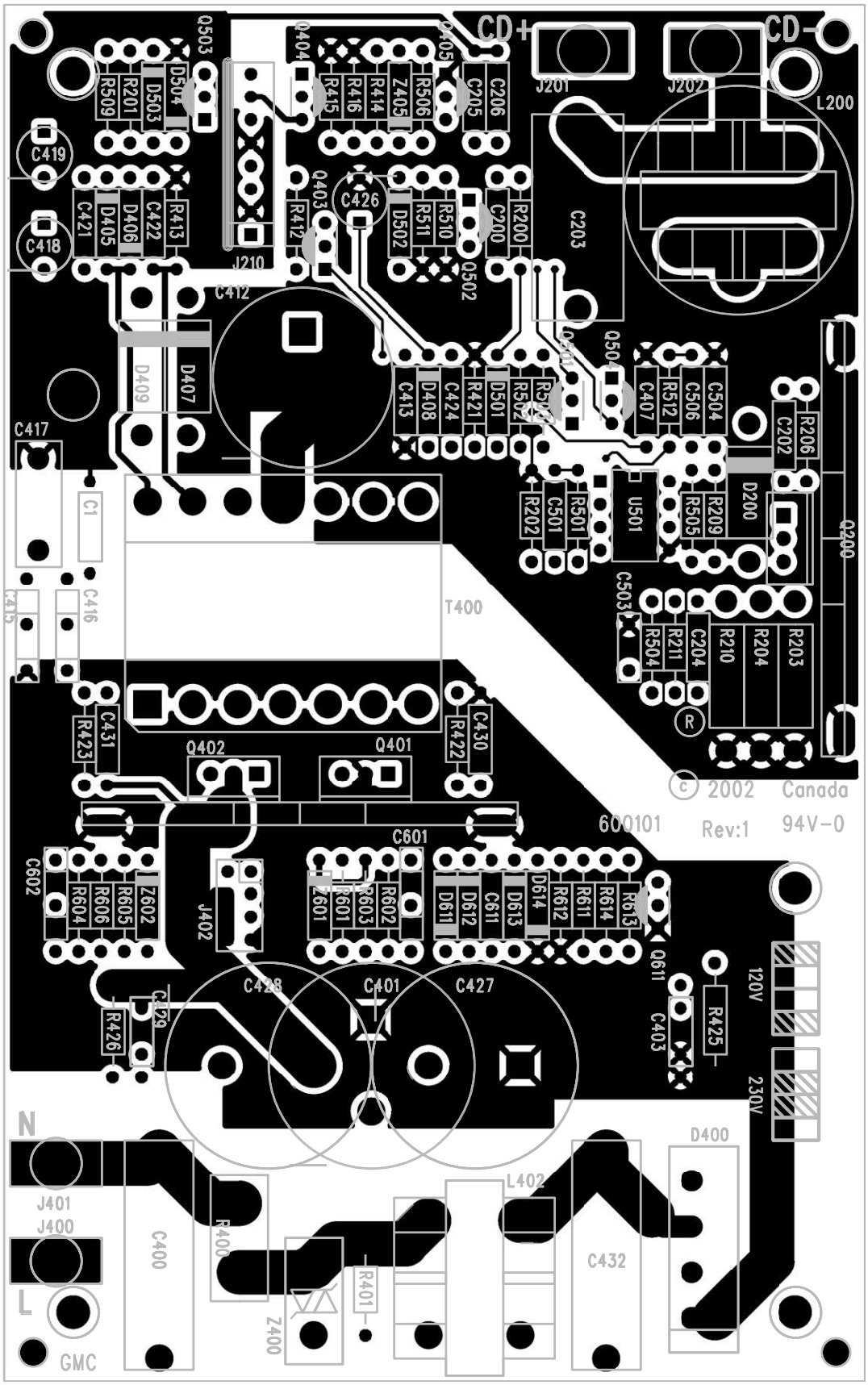
Main Board Schematic

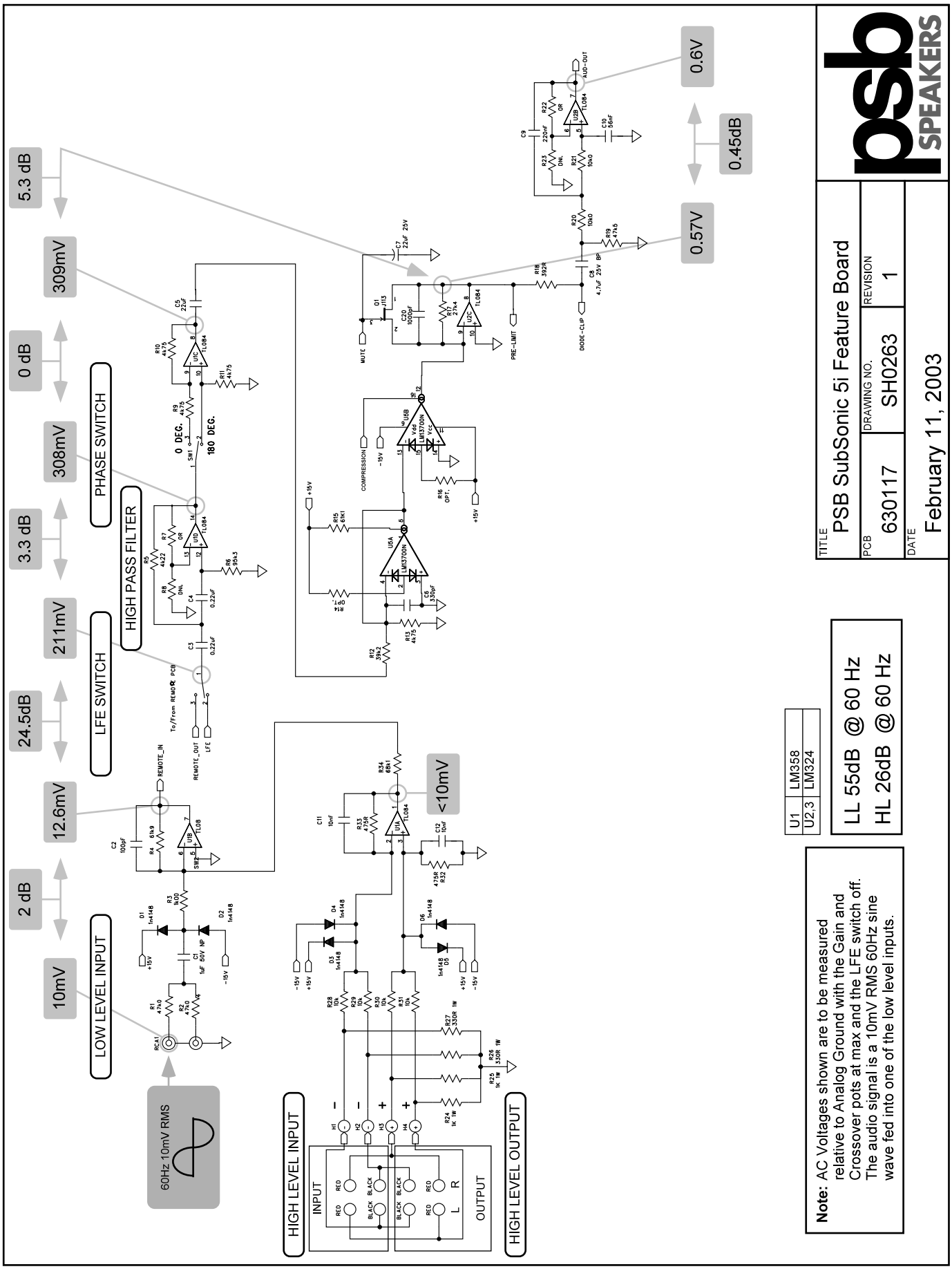


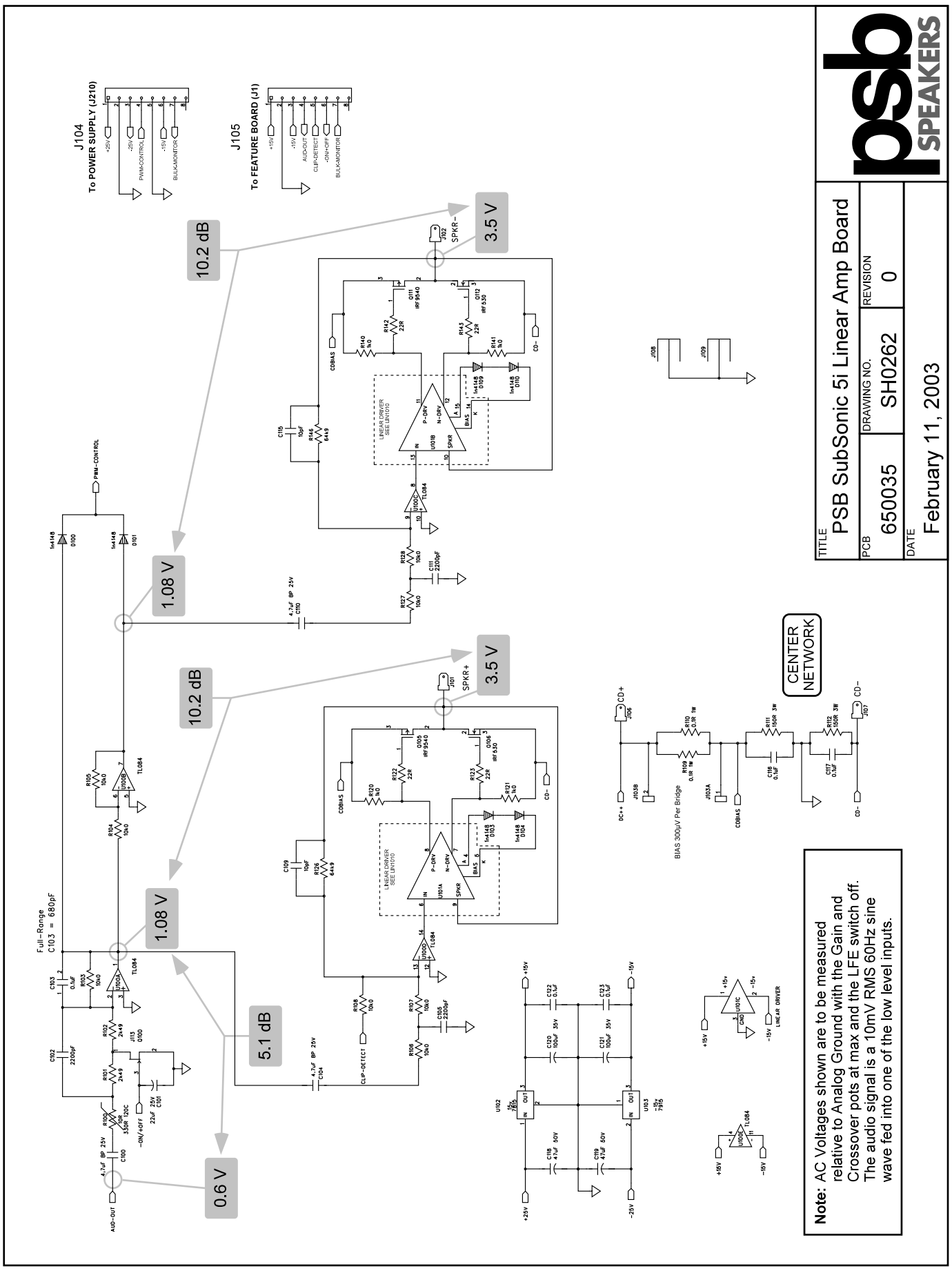
Main Board Artwork



Main Board Artwork




LOW LEVEL INPUT
10mV
2 dB
12.6mV
24.5dB
LFE SWITCH
211mV
HIGH PASS FILTER
3.3 dB
308mV
PHASE SWITCH
0 dB
309mV
5.3 dB
60Hz 10mV RMS
HIGH LEVEL INPUT
HIGH LEVEL OUTPUT
INPUT
OUTPUT
<10mV
0.57V
0.45dB
0.6V
U1 LM358
U2,3 LM324
LL 55dB @ 60 Hz
HL 26dB @ 60 Hz
Note: AC Voltages shown are to be measured relative to Analog Ground with the Gain and Crossover pots at max and the LFE switch off. The audio signal is a 10mV RMS 60Hz sine wave fed into one of the low level inputs.
TITLE
PSB SubSonic 5i Feature Board
PCB
630117
DRAWING NO.
SH0263
REVISION
1
DATE
February 11, 2003
psb SPEAKERS


J104
To POWER SUPPLY (J210)
+25V
-25V
PWM-CONTROL
-15V
BULK-MONITOR
J105
To FEATURE BOARD (J1)
+15V
-15V
AUD-OUT
CLIP-DETECT
-ON/+OFF
BULK-MONITOR
10.2 dB
3.5 V
SPKR-
1.08 V
10.2 dB
3.5 V
SPKR+
1.08 V
5.1 dB
0.6 V
Full-Range
C103 = 680pF
AUD-OUT
-ON/+OFF
PWM-CONTROL
CLIP-DETECT
CENTER NETWORK
CD+
CD-
BIAS 300µV Per Bridge
LINEAR DRIVER
LINEAR DRIVER SEE LIN1010
TL084
IRF9540
IRF530
1n4148
+25V
-25V
+15V
-15V
TITLE
PSB SubSonic 5i Linear Amp Board
PCB
650035
DRAWING NO.
SH0262
REVISION
0
DATE
February 11, 2003
psb SPEAKERS
Note: AC Voltages shown are to be measured relative to Analog Ground with the Gain and Crossover pots at max and the LFE switch off. The audio signal is a 10mV RMS 60Hz sine wave fed into one of the low level inputs.

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1341520 **Master Contract:** 158206 (LR 106476)

Project: 1341520 **Date Issued:** October 15, 2002

Issued to: **Indigo Manufacturing Inc.**
165 Steelcase Rd. E
Markham, ON
L3R 1G1
CANADA
Attention: Mr. Qudus Khalifa

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'

C US

Issued by: David Briere, B. Eng.

Authorized by: Ray Fadavi, P.Eng., MBA
Operations Manager

PRODUCTS

CLASS 2224 51 - AUDIO AND VIDEO EQUIPMENT - Audio Equipment
CLASS 2224 81 - AUDIO AND VIDEO EQUIPMENT - Audio Equipment - CERTIFIED TO U.S. STANDARDS

Powered subwoofer, Model Alpha SubSonic 5i, rated 120Vac, 60Hz, 2.0A.

APPLICABLE REQUIREMENTS

CAN/CSA	E60065-00	-	Audio, Video and Similar Electronic Apparatus--Safety Requirements
ANSI/UL Std No.	6500-99	-	Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognised to perform certification to U.S. Standards.

DQD 507WD 2001/07/20

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
COMMISSION ELECTROTECHNIQUE INTERNATIONALE (CEI)

Ref. Certif. No.
CA 4005

IEC SYSTEM FOR CONFORMITY TESTING AND CERTIFICATION OF ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTÈME CEI D'ESSAIS DE CONFORMITÉ ET DE CERTIFICATION DES ÉQUIPEMENTS ÉLECTRIQUES (IECEE) MÉTHODE OC

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product *Produit*	**Powered Subwoofer**
Name and address of the applicant *Nom et adresse du demandeur*	Indigo Manufacturing Inc. 165 Steelcase Rd., Markham, ON Canada L3R 1G1
Name and address of the manufacturer *Nom et adresse du fabricant*	Same as applicant.
Name and address of the factory *Nom et adresse de l'usine*	Everbright (Lung Kong) Hsin Ho Chun, Fu Yung Chen Baoan Hsien, Shen Zhen, China
Rating and principal characteristics *Valeurs nominales et caractéristiques principales*	120V~, 60Hz, 2.0A; 220-240V~, 50/60Hz, 1.0A
Trade mark (if any) *Marque de fabrique (si elle existe)*	PSB
Model/type Ref. *Ref. de type*	Alpha SubSonic 5i
Additional information (if necessary) *Information complémentaire (si nécessaire)*	-
A sample of the product was tested and found to be in conformity with *Un échantillon de ce produit a été essayé et a été considéré conforme à la*	IEC **PUBLICATION** 60065 **EDITION** 6 (1998) Including National Differences AR, AU, CA, DE, DK, GB, IE, IT, KR, NO, SE, SG, US and Group Differences for Europe per CB Bulletin 101A
as shown in the Test Report Ref. No. which form part of this certificate *comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce certificat*	CB 158206-1341521

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

CSA INTERNATIONAL

CSA International
178 Rexdale Boulevard
Toronto, ON M9W 1R3

Date October 15, 2002

Signature T. Venalainen, P. Eng.

Issue 1998-09

VERIFICATION

February 20, 2003

Indigo Manufacturing Inc.
165 Steelcase Road East
Markham, Ontario
Canada, L3R 1G1

Our File No.: BAS017-EN13

NOT TRANSFERABLE

This Verification Certificate is hereby issued to the named GRANTEE and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below:

GRANTEE'S NAME:	**Indigo Manufacturing Inc.**
MODEL NO.:	**SubSonic 5i**
APPLICABLE STANDARD:	**EN 55013/A13/A14:1995, Part 1 - Electromagnetic Compatibility Requirements for Sound and Television Broadcast Receivers and Associated Equipment**
EQUIPMENT TYPE:	**Sound and Television Broadcast Receivers**

Note(s): *See attached report, UltraTech's File No.: BAS017-EN13, dated* February 20, 2003 *for details and conditions of Verification Compliance.*

- Assessed by ITI (UK) Competent Body, NVLAP (USA) Accreditation Body & ACA/AUSTEL (Australia), VCCI (Japan)
- Accredited by Industry Canada (Canada) under ACC-LAB (Europe/Canada MRA and APEC/Canada MRA)
- Recognized/Listed by FCC (USA)
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Approved by: Tri M. Luu, P.Eng.
V.P. – Engineering

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4

Telephone (905) 829-1750
Facsimile (905) 829-8050

Website: www.ultratech-labs.com
Email: vhk.ultratech@sympatico.ca

VERIFICATION CERTIFICATE

NOT TRANSFERABLE

This Verification Certificate is hereby issued to the named GRANTEE and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below:

GRANTEE:	Indigo Manufacturing Inc.
Address:	165 Steelcase Road East Markham, Ontario Canada, L3R 1G1
Contact Person:	Mr. Qudus Khalifa Phone #: (905) 513-9850 (ext.: 239) Fax #: (905) 513-9849 Email Address: qkhalifa@bashaudio.com
Equipment Type:	Computing Devices for Home and Office Use
Model No.:	SubSonic 5i
Year of manufacture:	2003
The above product was tested by UltraTech Engineering Labs Inc. and found to comply with:	FCC Part 15, Subpart B - Class B Unintentional Radiators for Uses in Home, Commercial and Industrial Areas.

Note(s):

(1) Test methods employed conform to the following General Test Procedures:
- *UltraTech's Standard Operating Procedures.*
- *CISPR 22:1997/EN 55022:1998*
- *ANSI C63.4-1992*

(2) *See attached report, UltraTech's File No.:* BAS017-FCC15B, *dated* February 20, 2003 *for details and conditions of Verification Compliance.*

Approved by: Tri M. Luu, P.Eng.
V.P. – Engineering

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050
Website: www.ultratech-labs.com Email: vic@ultratech-labs.com, Email: tri.luu@sympatico.ca

FC	VCCI	Canada	NVLAP	IT	UL	entela
31040/SIT	C-1376	46390-2049	200093-0	00-034		