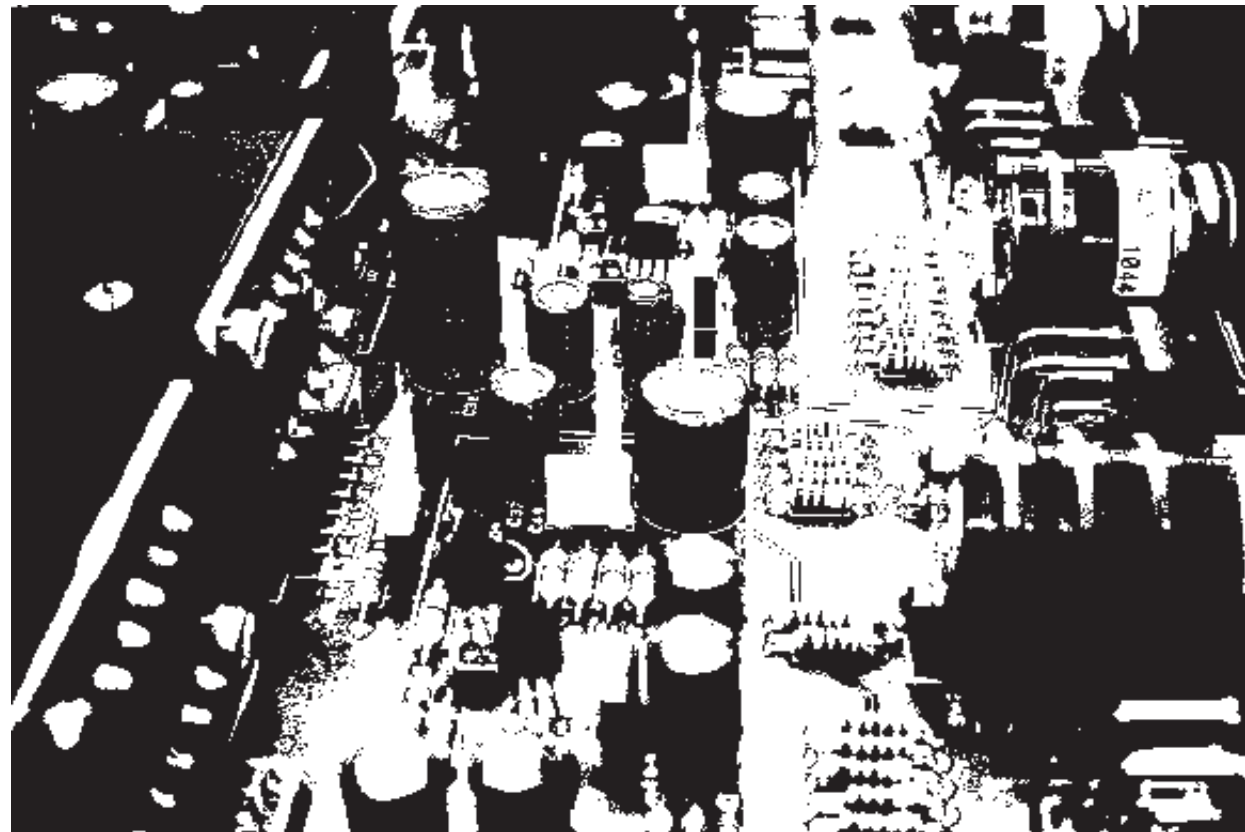


ez1073 Mic/Line EQ - Assembly manual **["Colourbook" Issue 1c]**



ez1073-500 “Colourbook” Contents.

Section 1 - “Colourbook” assembly guide

Section 2 - Schematics diagrams and PCB Overlays

Section 3 - Parts List

Section 4 - Setup and Calibration

ez1073 “Colourbook” revision history

Revisions 1 to 1a;

U1 / U2 colour correction

Output transformer mounting drawing

TO220 heatsink part number / supplier

Revisions 1a to 1b;

Power transformer wiring drawing added

Revisions 1b to 1c;

BC550C transistor option added

Calibration procedure added

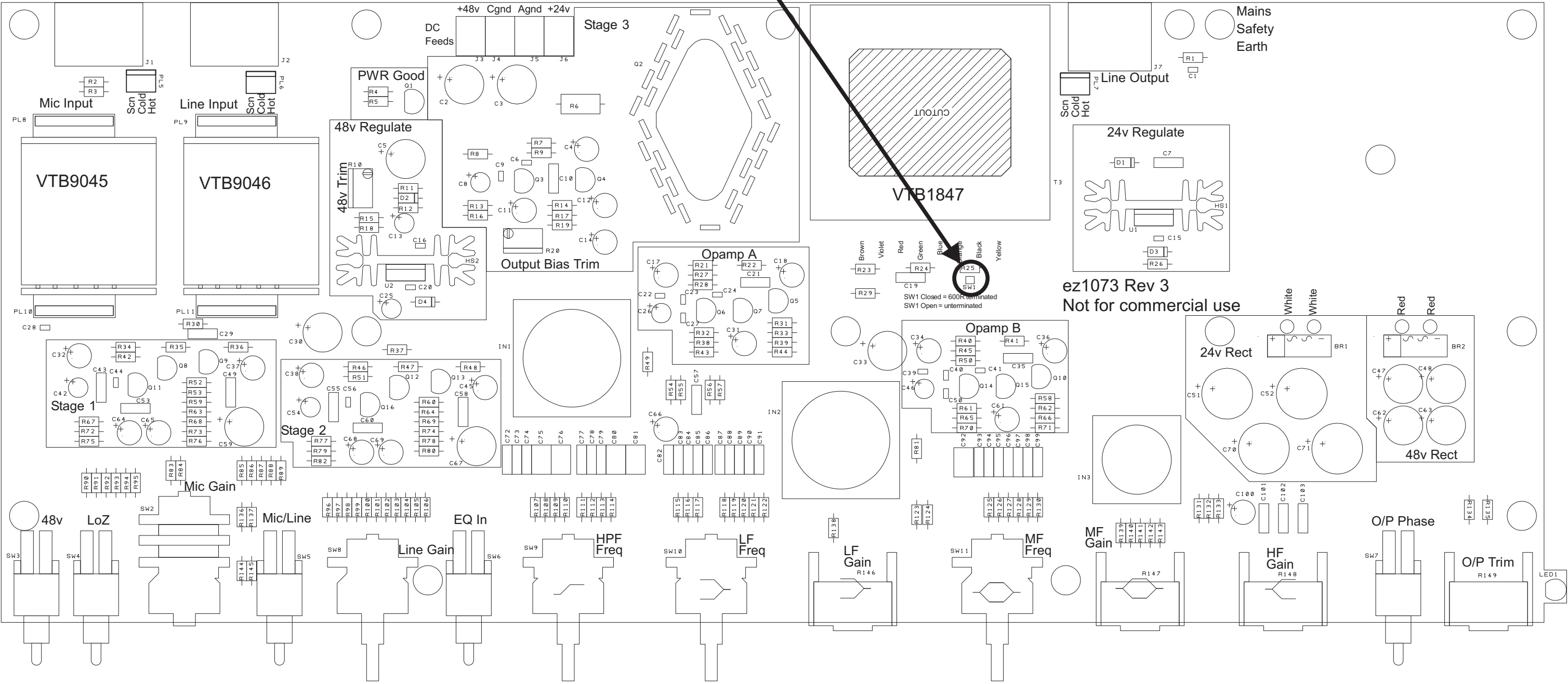
Contents page added

Spade terminals added

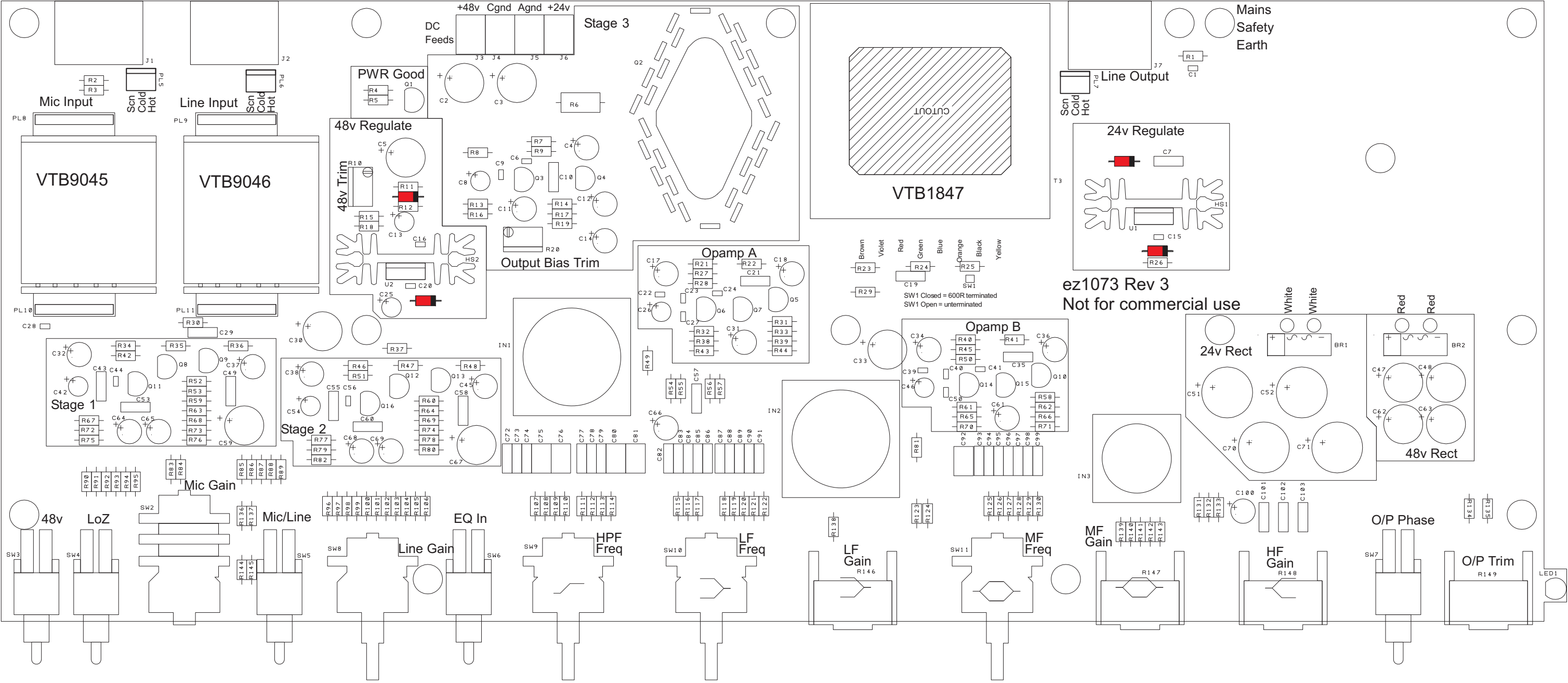
Output Termination



Place a “blob” of solder across the two pads for 600 Ohm termination

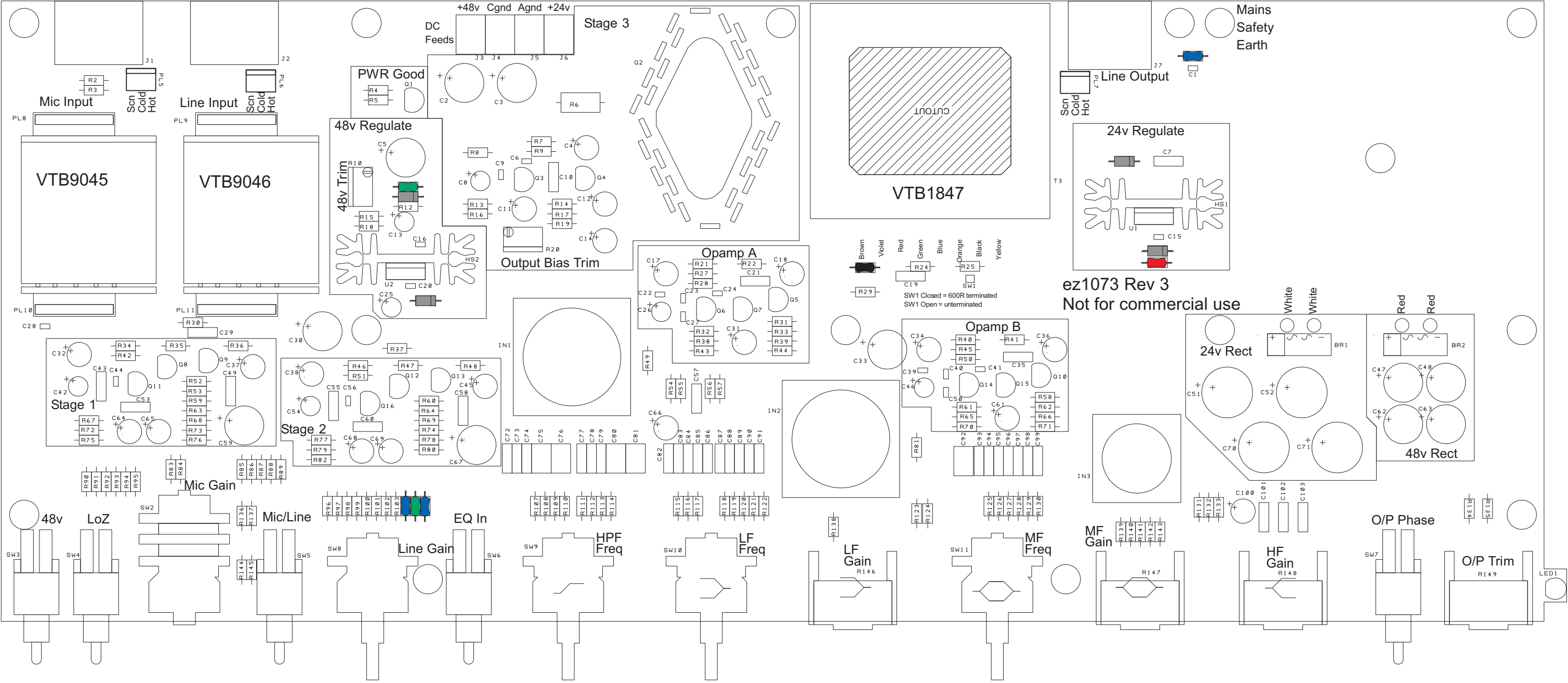


Diodes D1, D2, D3, D4 = 1N4001 or 1N4007 (4)



Resistors

-  R26 = 1R (1)
-  R11, R105 = 5R6 (2)
-  R1, R104, R106 = 10R (3)
-  R23 = 12R (1)



Resistors

R103 = 15R

(1)

R102 = 22R

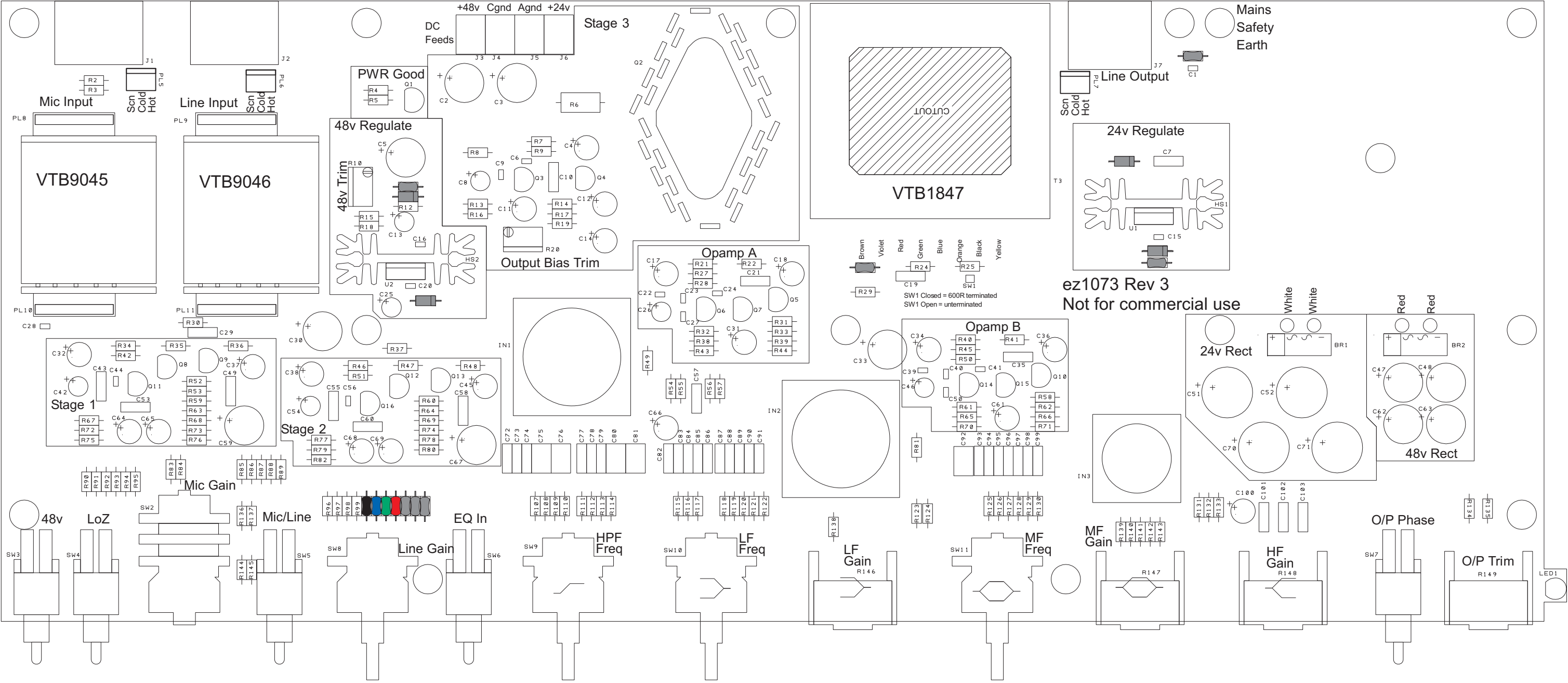
(1)

R101 = 39R

(1)

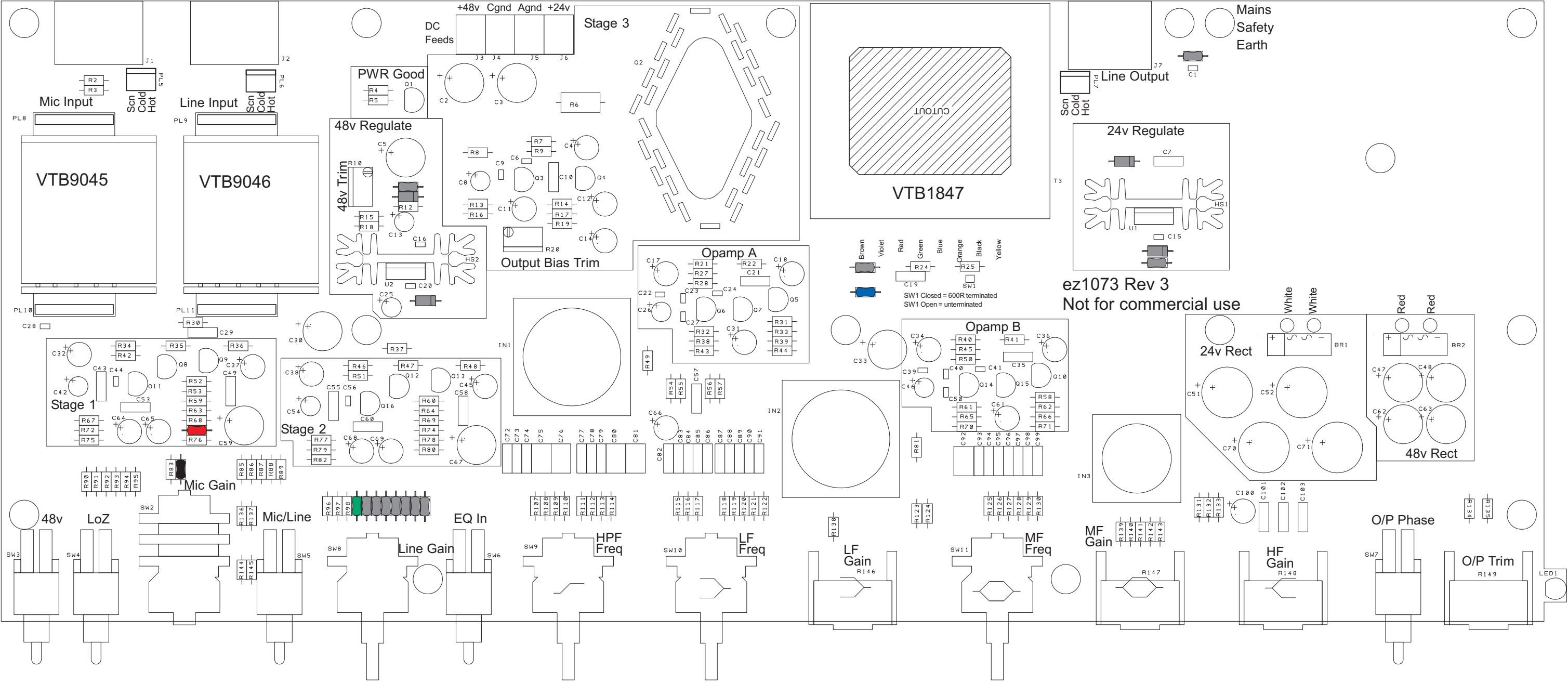
R100 = 56R

(1)



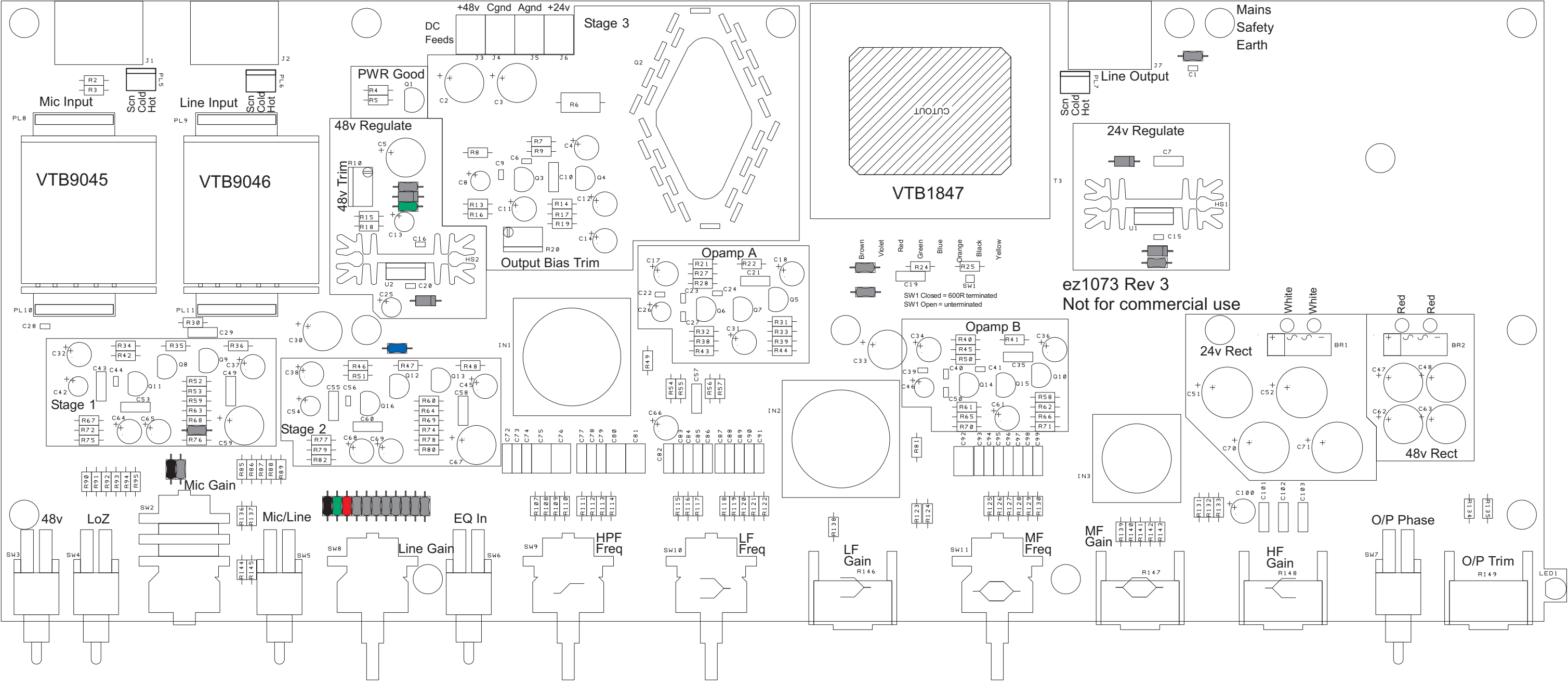
Resistors

-  R73 = 82R (1)
-  R99 = 91R (1)
-  R29 = 120R (1)
-  R84 = 130R (1)



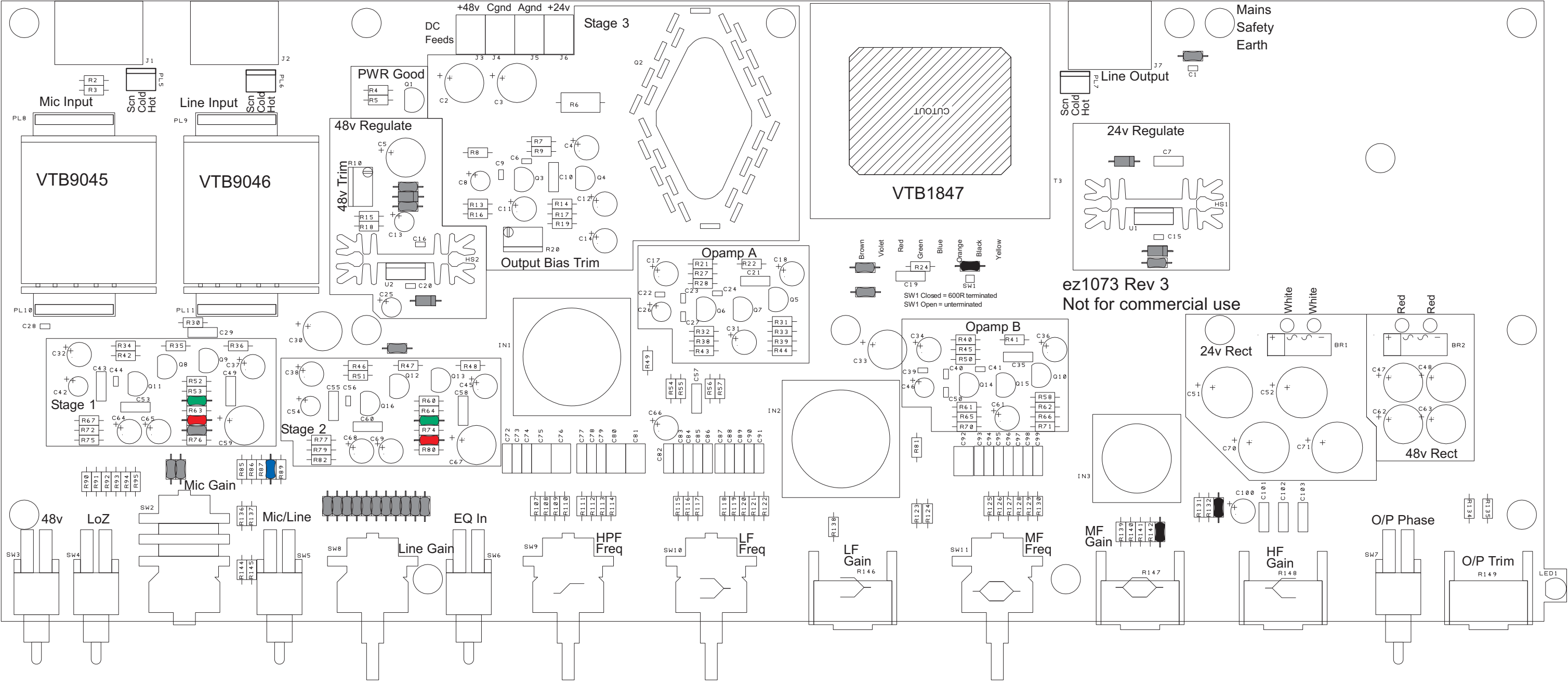
Resistors

-  R98 = 150R (1)
-  R12, R97 = 240R (2)
-  R37 = 270R (1)
-  R83, R96 = 360R (2)



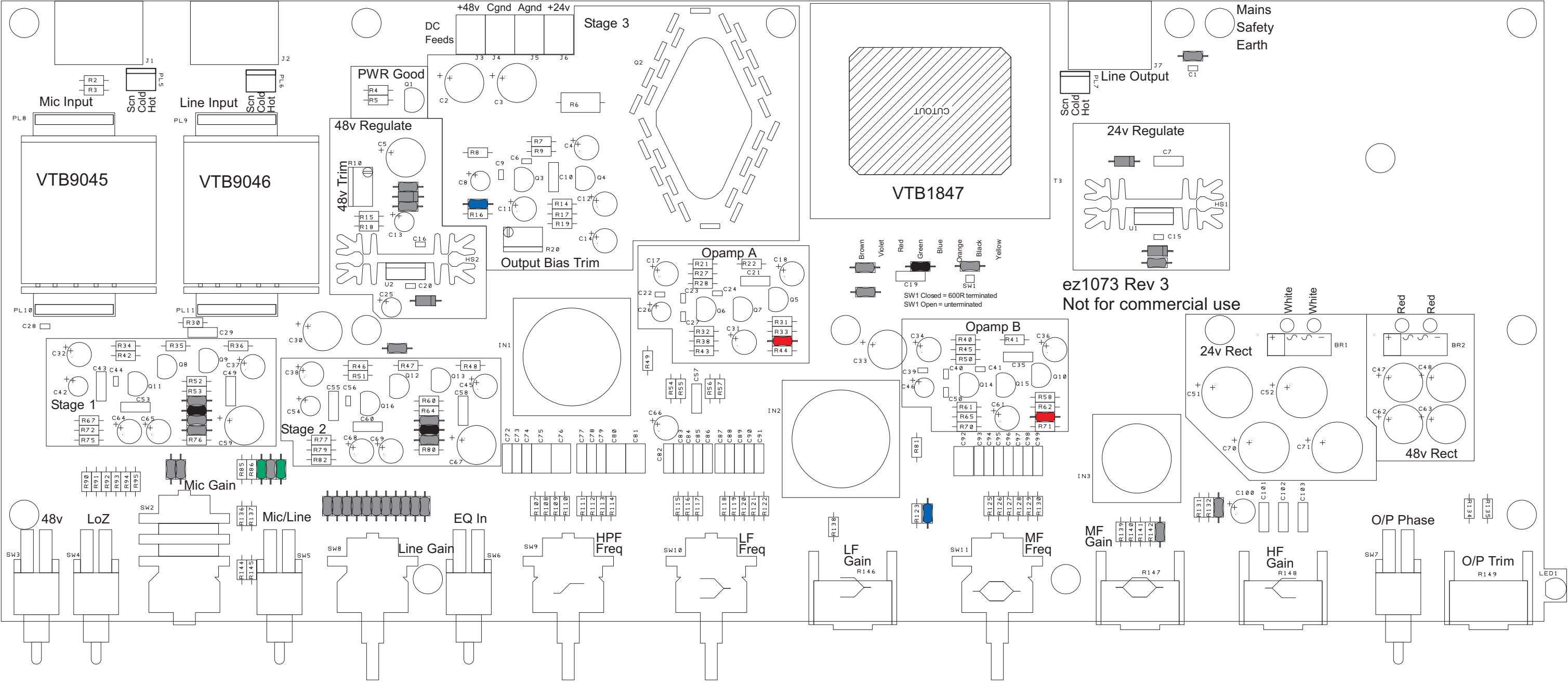
Resistors

-  R68, R78 = 390R (2)
-  R59, R69 = 470R (2)
-  R88 = 510R (1)
-  R25,R133, R143 = 620R (3)



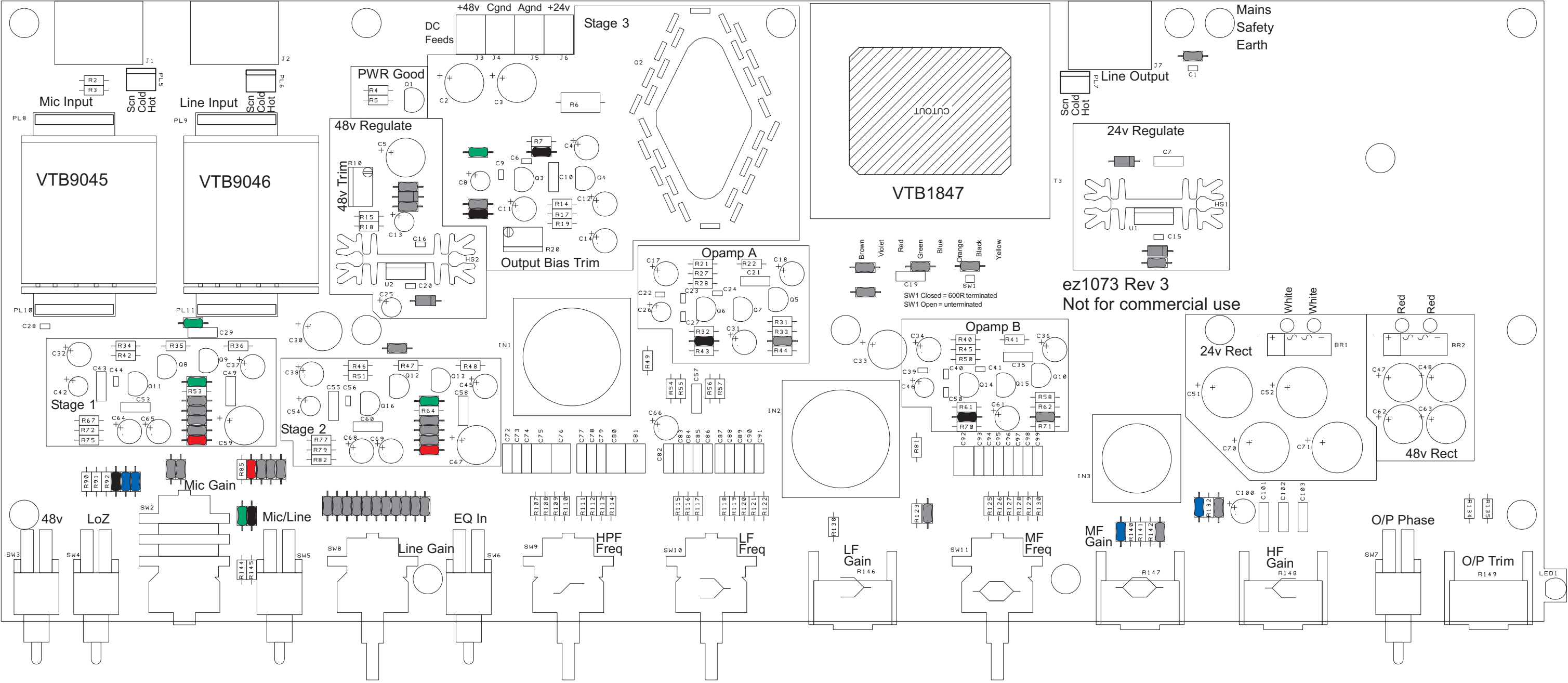
Resistors

-  R39, R66 = 820R (2)
-  R87, R89 = 1k0 (2)
-  R13, R124 = 1k2 (2)
-  R24, R63, R74 = 1k5 (3)



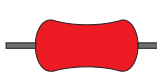
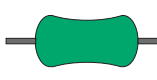
Resistors

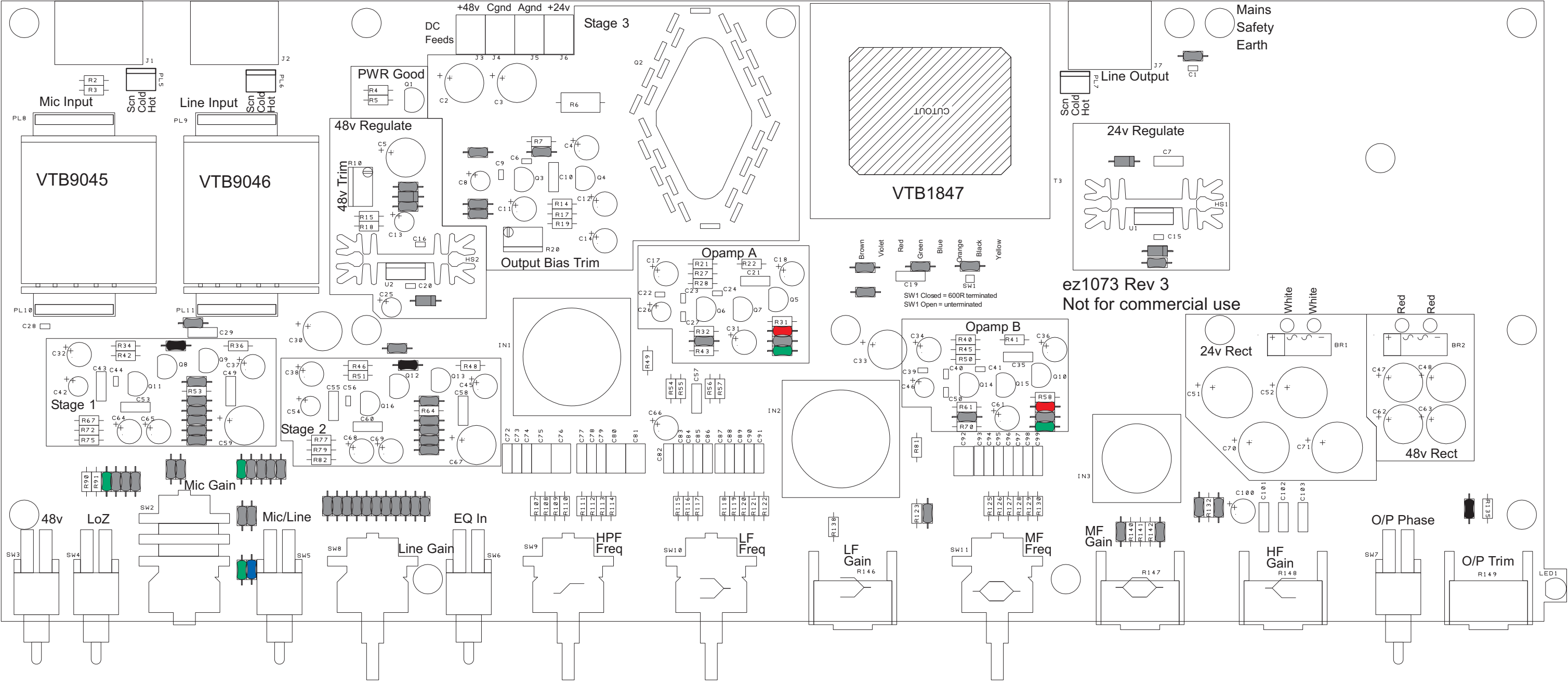
-  R76, R80, R86 = 1k8 (3)
-  R8, R30, R52, R60, R136 = 2k2 (5)
-  R94, R95, R131, R139 = 2k7 (4)
-  R9, R16, R38, R65, R93, R137 = 3k3 (6)



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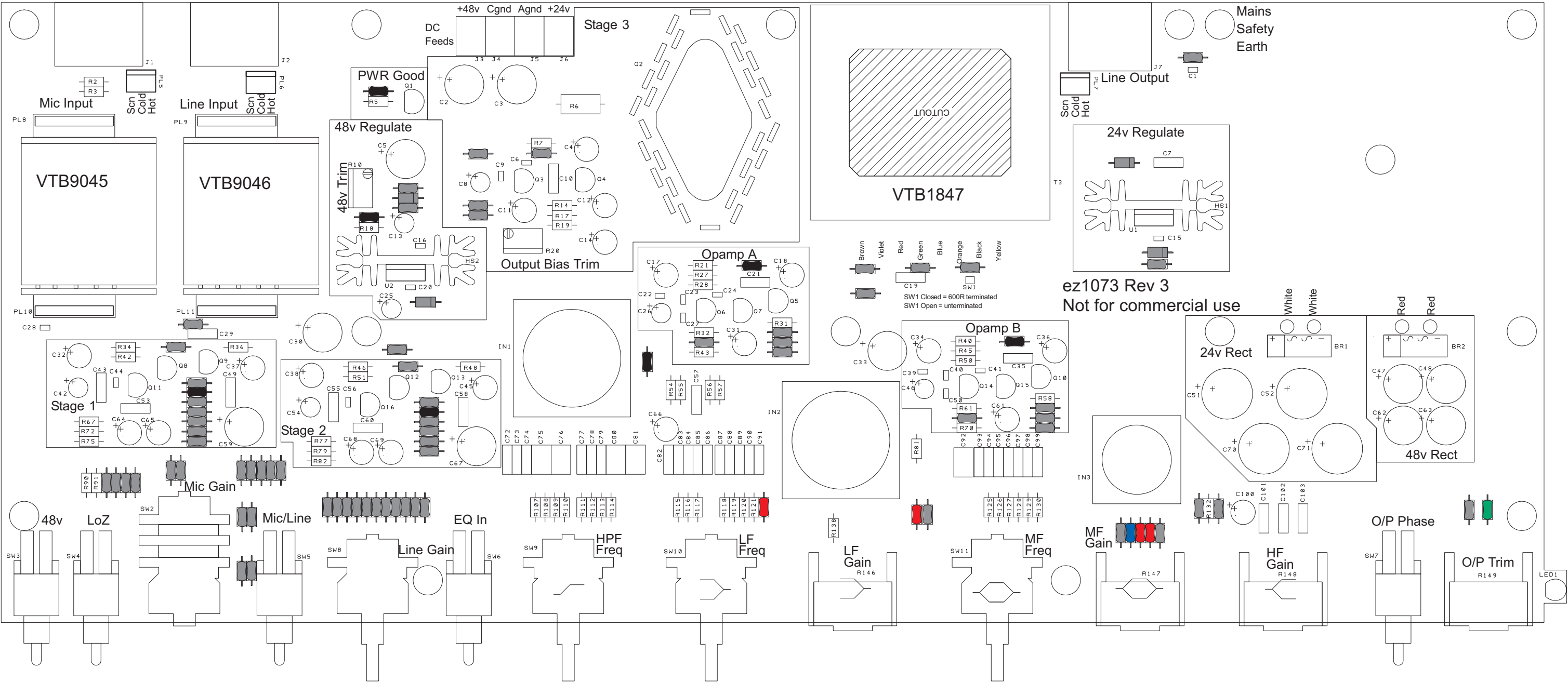
Resistors

-  R33, R62 = 3k6 (2)
-  R44, R71, R85, R92, R144 = 3k9 (5)
-  R145 = 4k3 (1)
-  R35, R47, R134 = 5k1 (3)



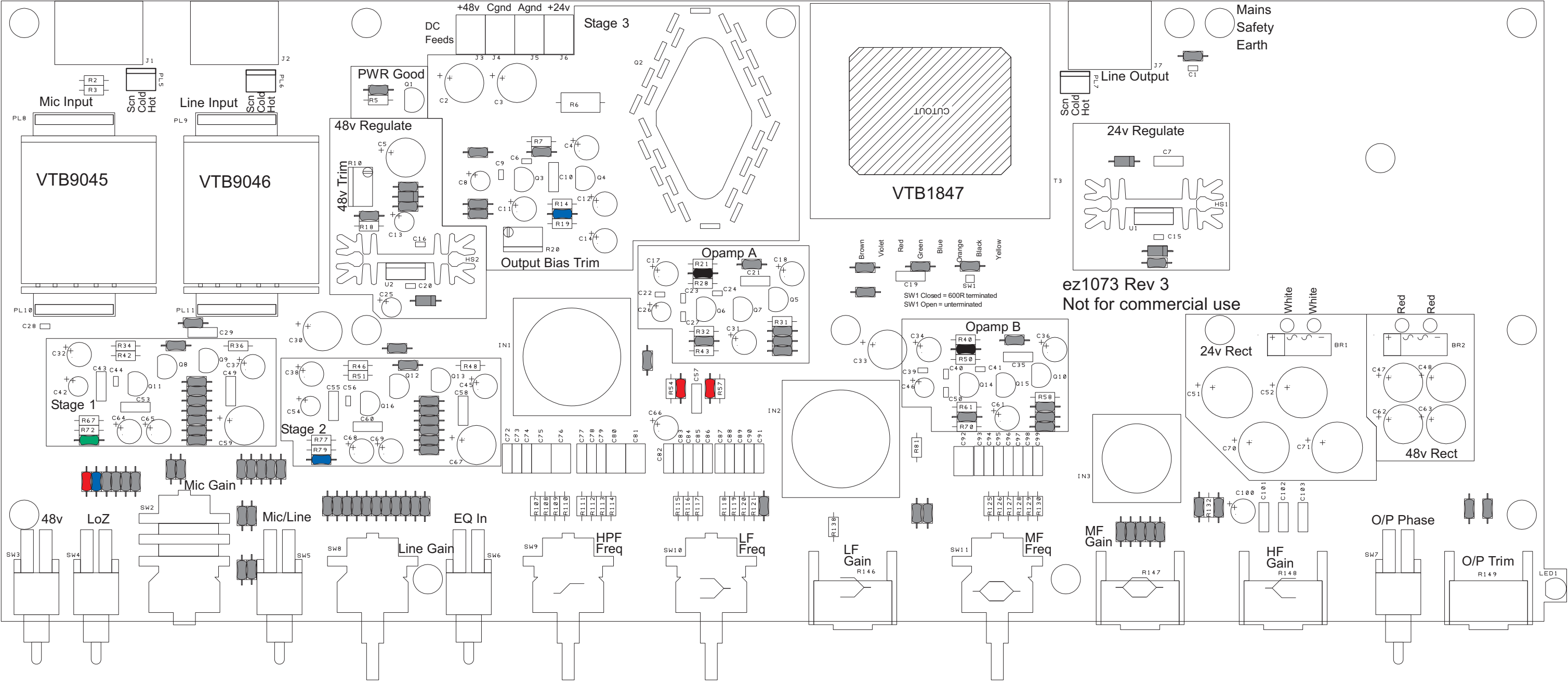
Resistors

-  R122, R123, R141, R142 = 6k8 (4)
-  R135 = 7k5 (1)
-  R140 = 8k2 (1)
-  R4, R15, R22, R41, R49, R53, R64 = 10k (7)



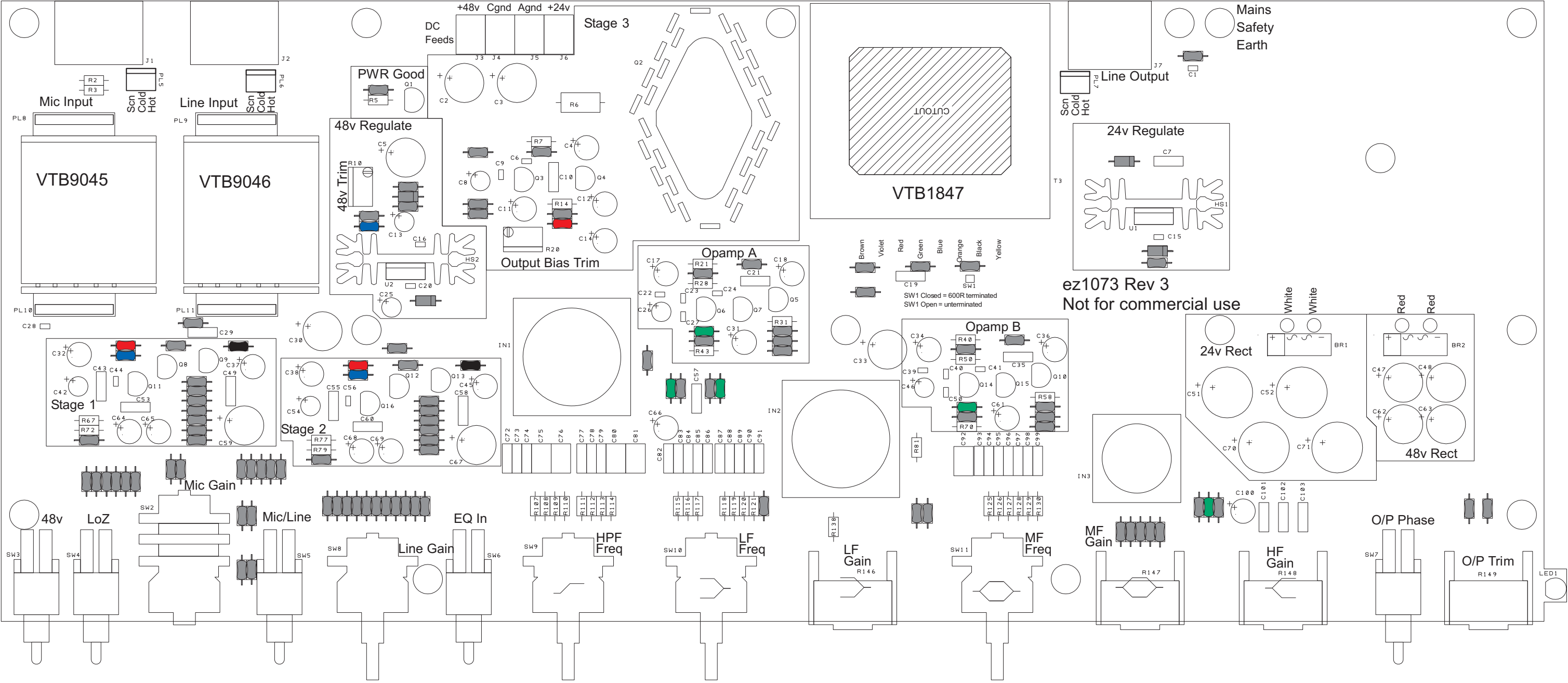
Resistors

-  R55, R56, R90 = 12k (3)
-  R75 = 15k (1)
-  R17, R82, R91 = 18k (3)
-  R27, R45 = 27k (2)



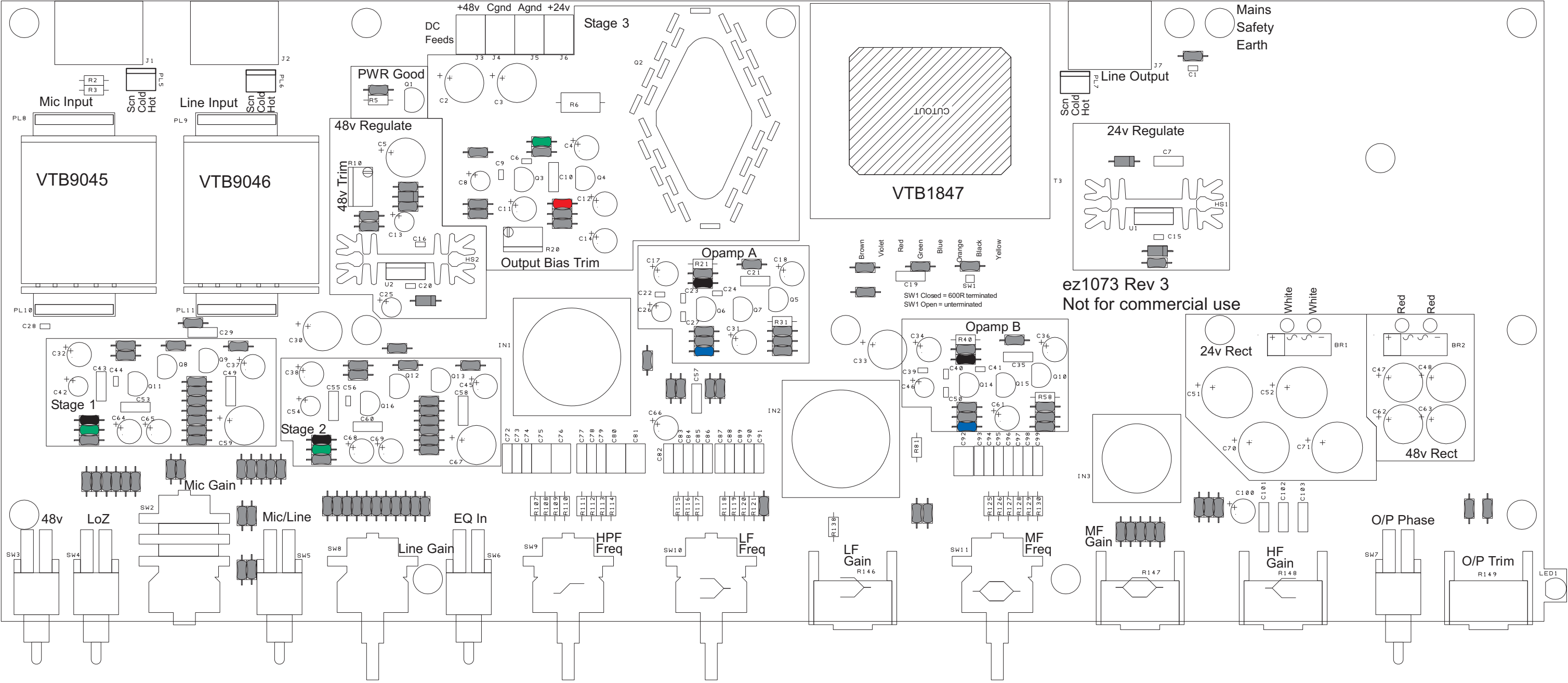
Resistors

-  R19, R34, R46 = 33k (3)
-  R32, R54, R57, R61, R132 = 39k (5)
-  R18, R42, R51 = 47k (3)
-  R36, R48 = 51k (2)



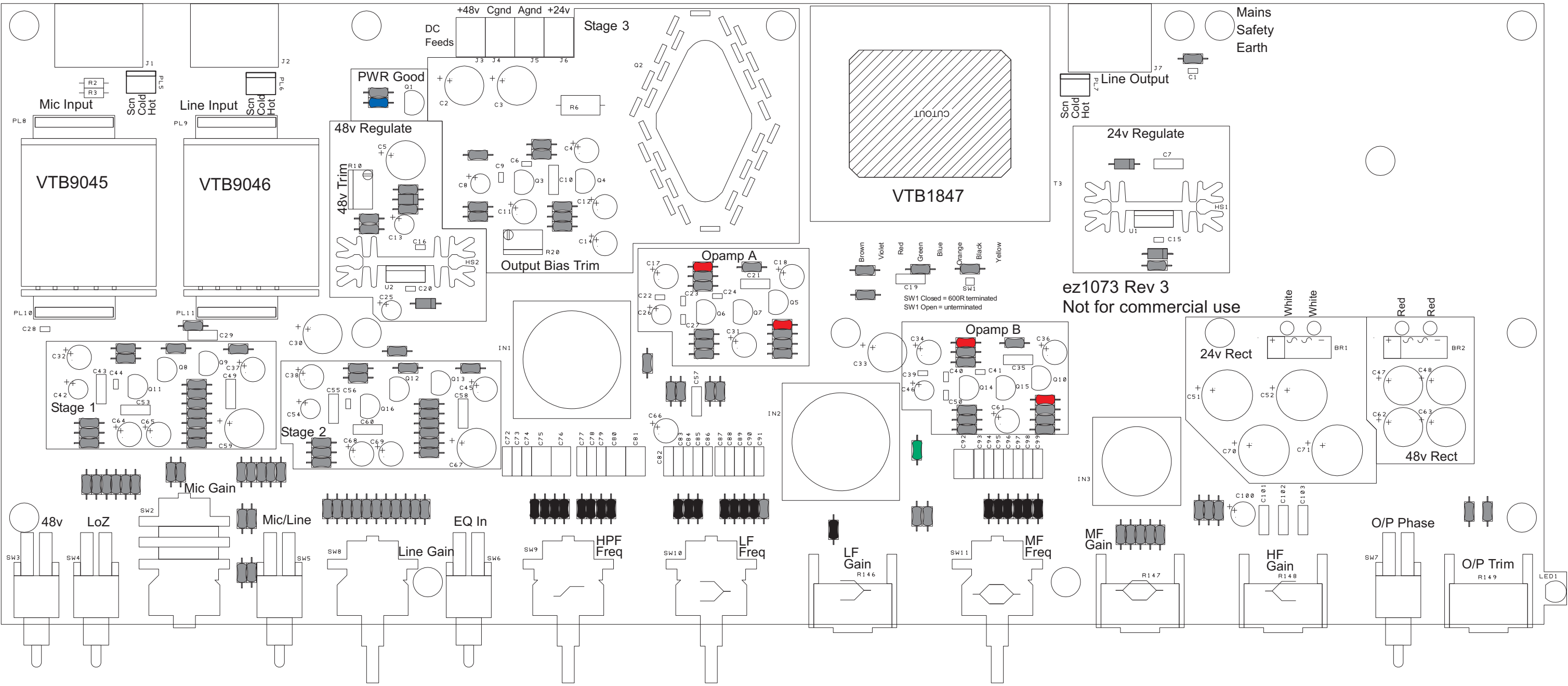
Resistors

-  R14 = 56k (1)
-  R7, R72, R79 = 68k (3)
-  R43, R70 = 100k (2)
-  R28, R50, R67, R77 = 120k (4)



Resistors

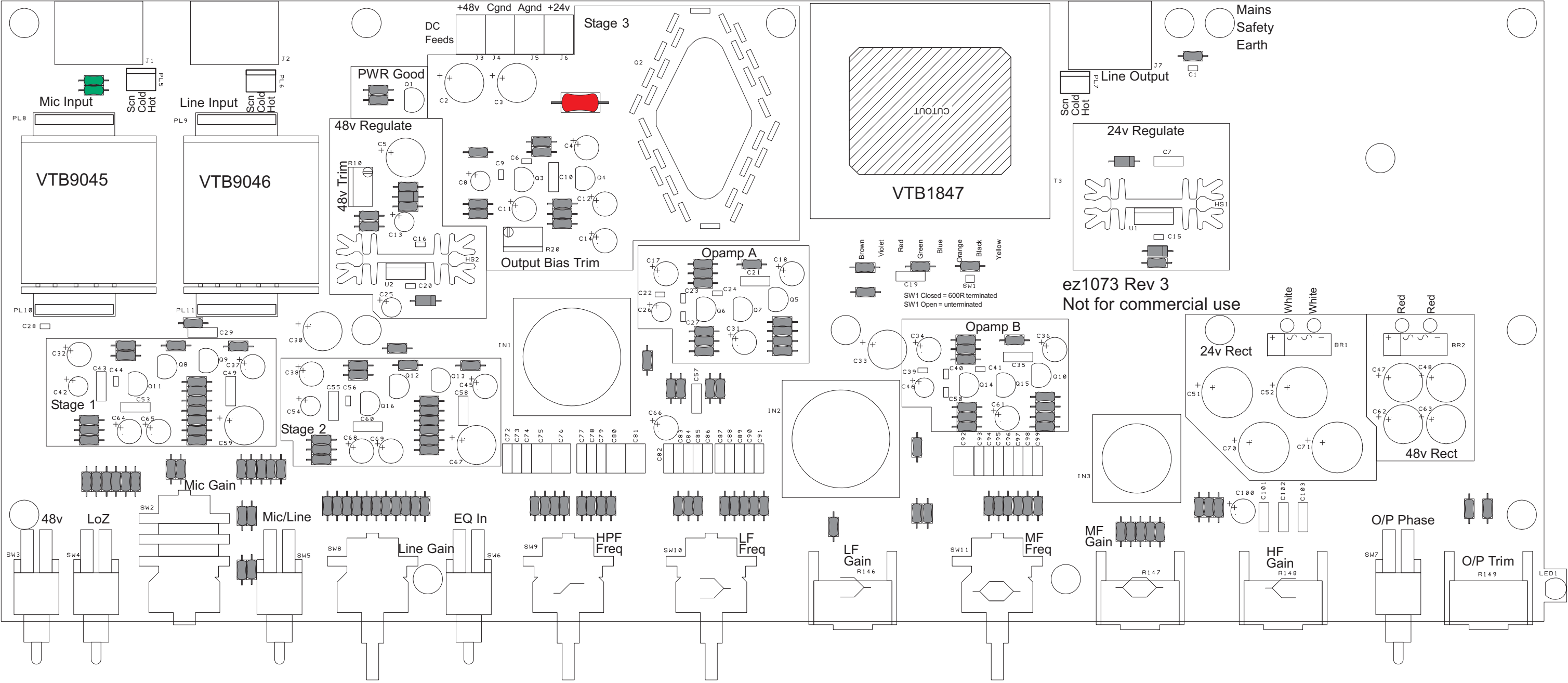
-  R21, R31, R40, R58 = 180k (4)
-  R81 = 220k (1)
-  R5 = 1M0 (1)
-  R107-R121, R125-R130, R138 = 4M7 (22)



Resistors

-  R6 = 47R / 3Watt (1)
-  R2, R3 = 6k81 - 0.1% (2)

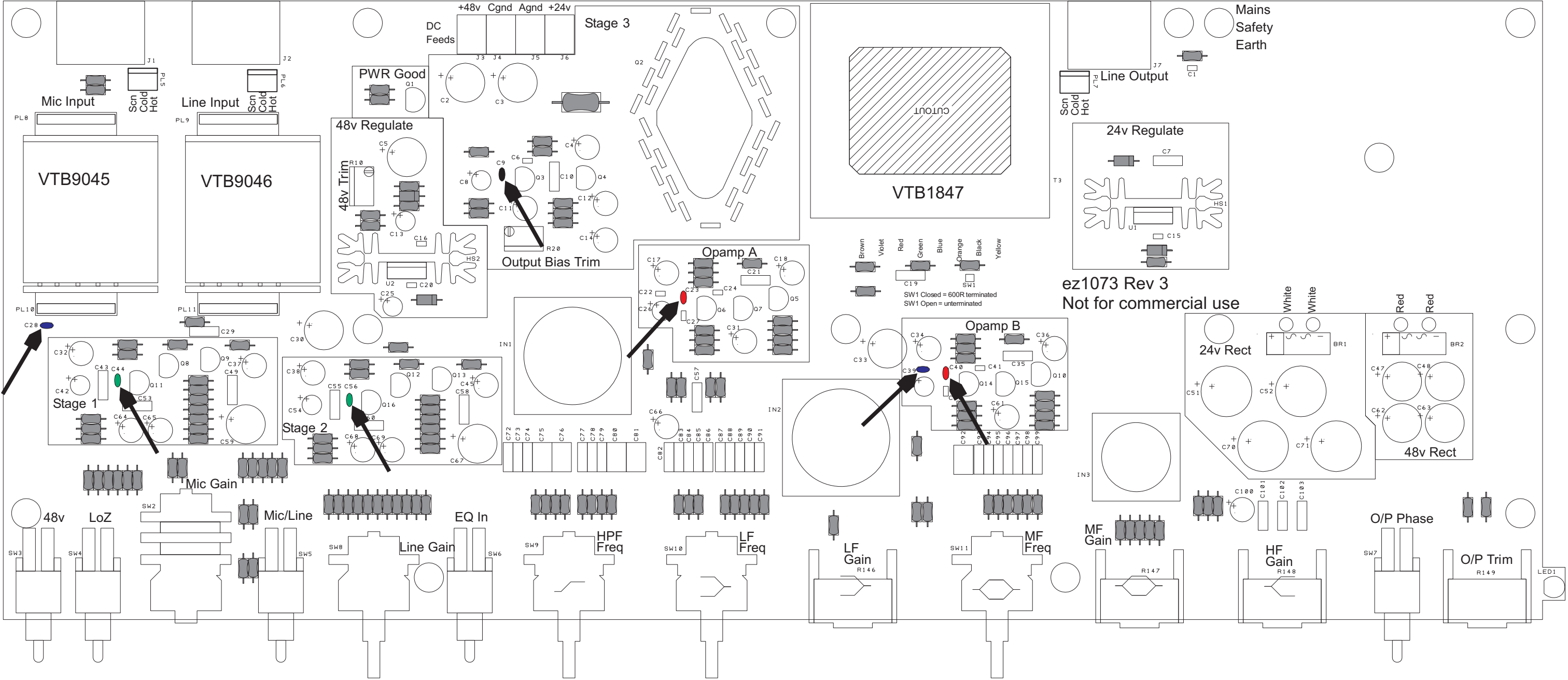
The actual value of R109 and R110 is less important than their closeness of matching.
2 accurately matched 1% resistors are better than 2 inaccurately matched 0.1% resistors



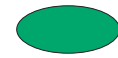
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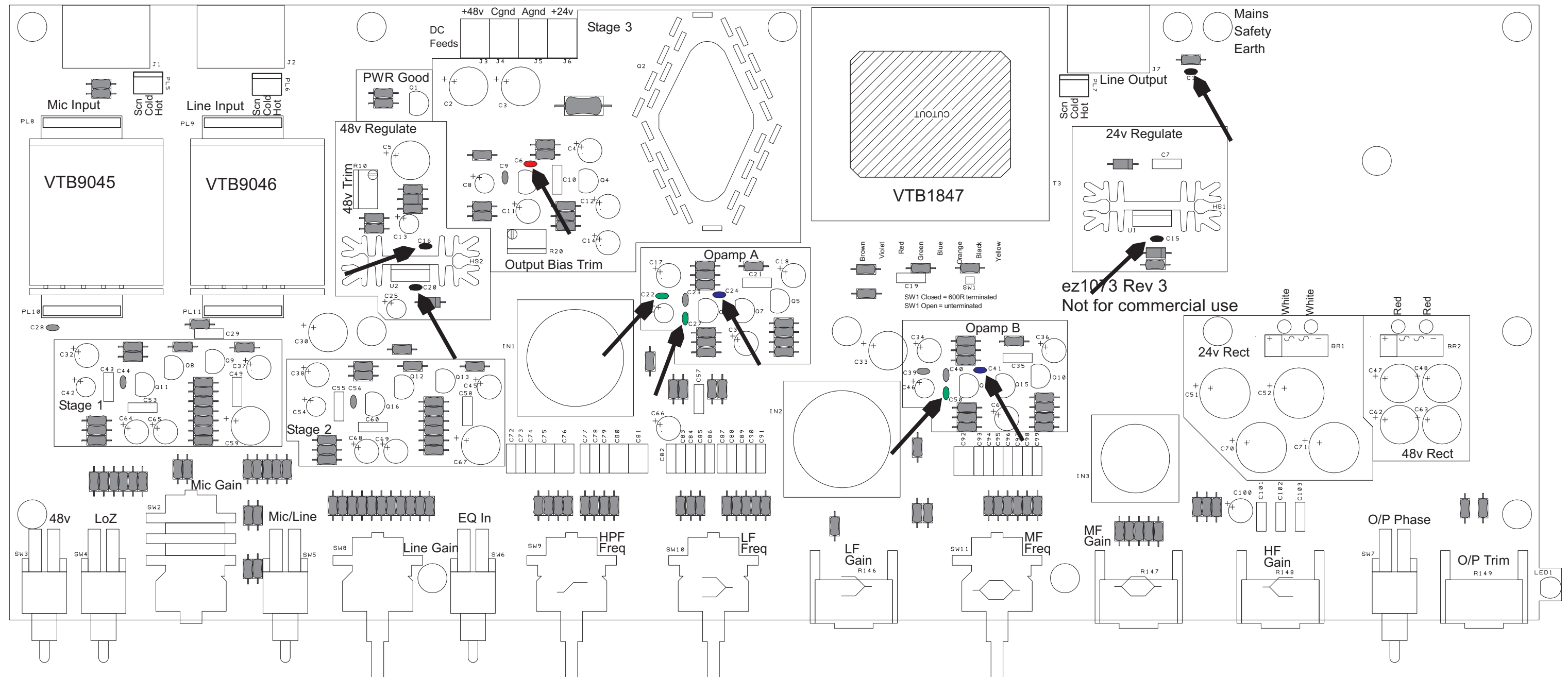
Ceramic Capacitors

- C23, C40 = 47pF (2)
- C44, C56 = 100pF (2)
- C28, C39 = 180pF (2)
- C9 = 220pF (1)



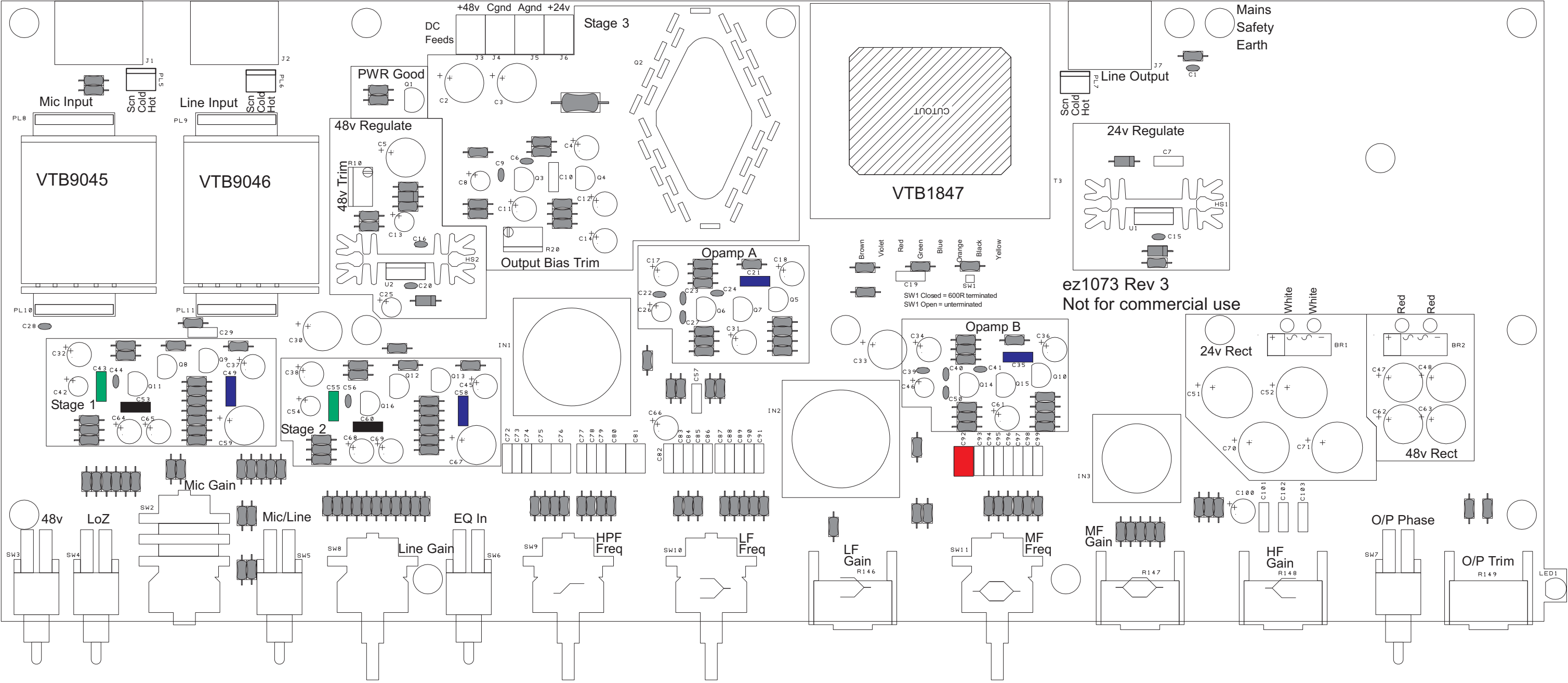
Ceramic Capacitors

-  C6 = 330pF (1)
-  C22, C27, C50 = 470pF (3)
-  C24, C41 = 680pF (2)
-  C1, C15, C16, C20, = 100nF (4)



Film Capacitors

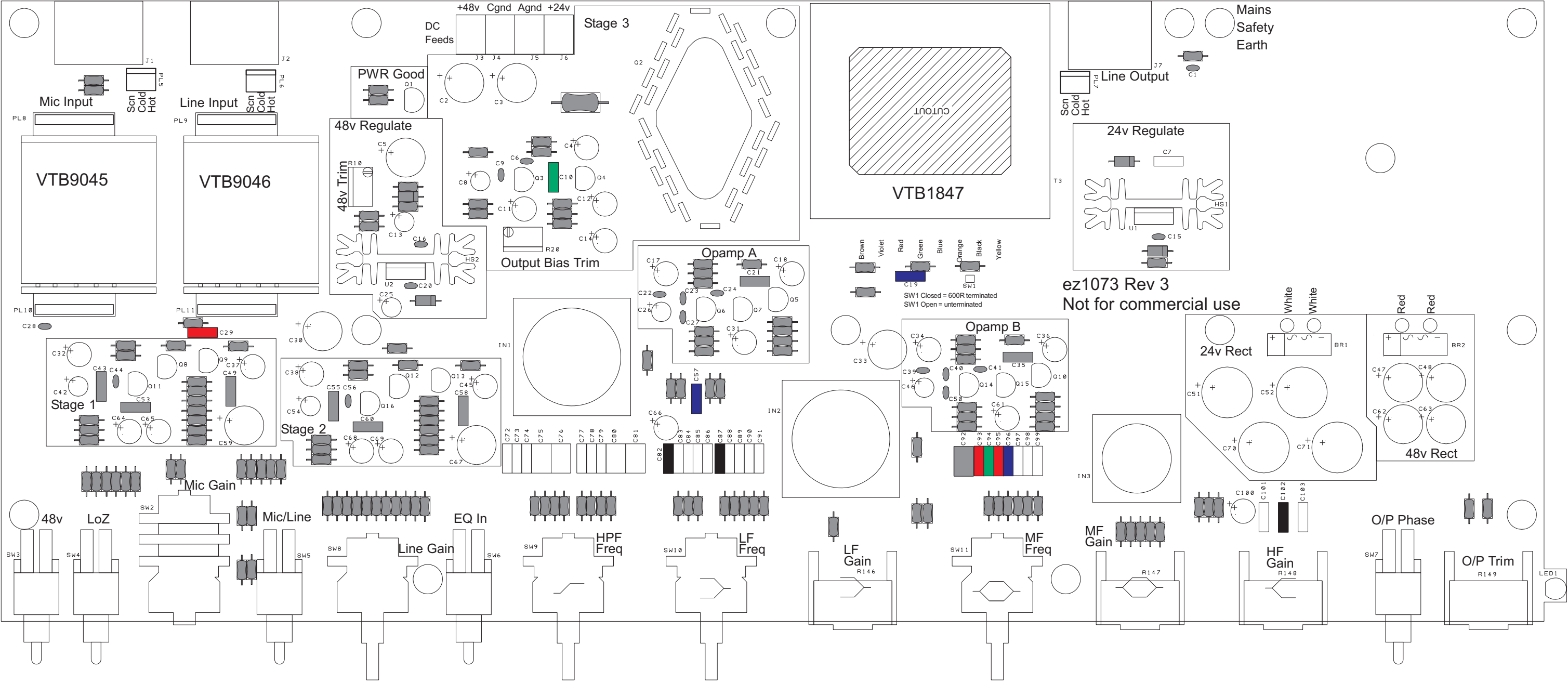
- C92 = 220pF (1)
- C43, C55 = 680pF (2)
- C21, C35, C49, C58 = 1nF (4)
- C53, C60 = 1n5F (2)



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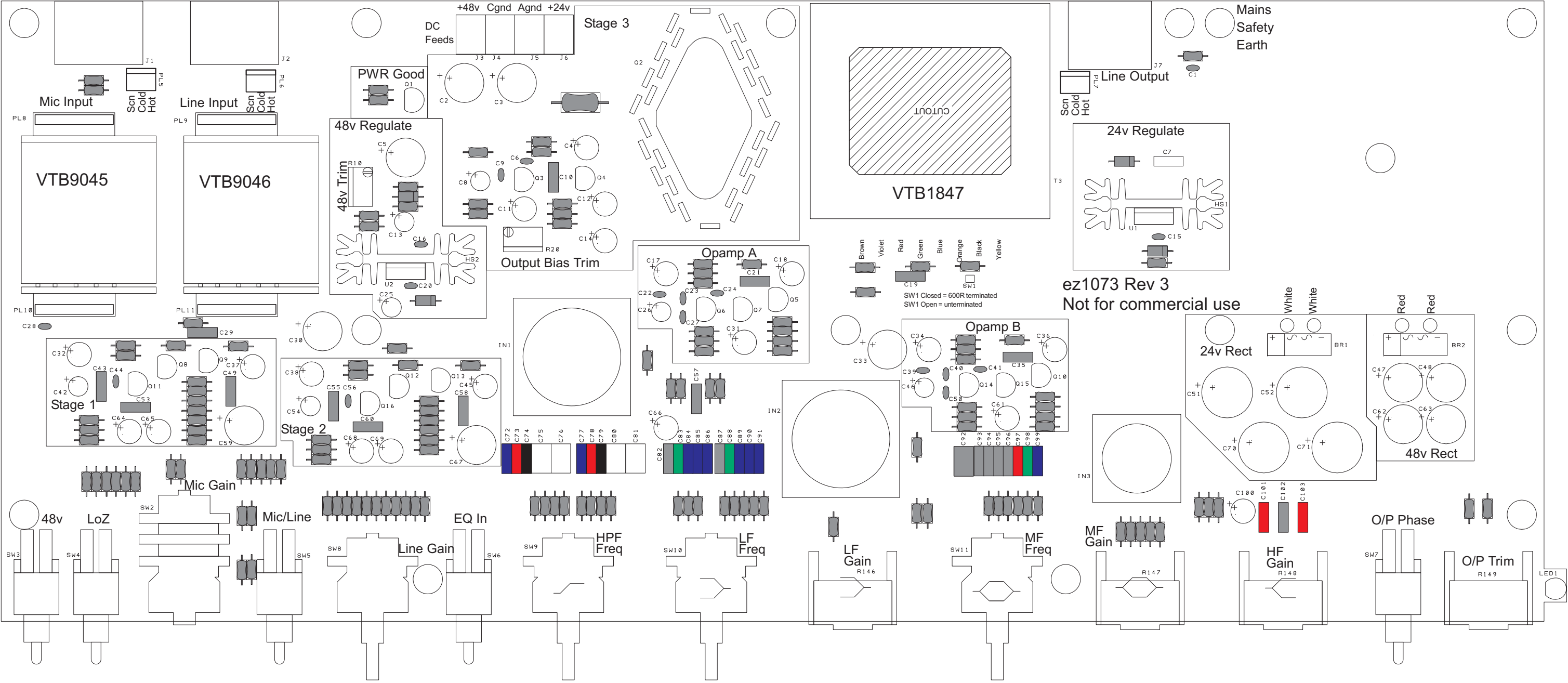
Film Capacitors

- C29, C93, C95 = 2n2F (3)
- C10, C94 = 4n7F (2)
- C19, C57, C96 = 10nF (3)
- C82, C87, C102 = 15nF (3)



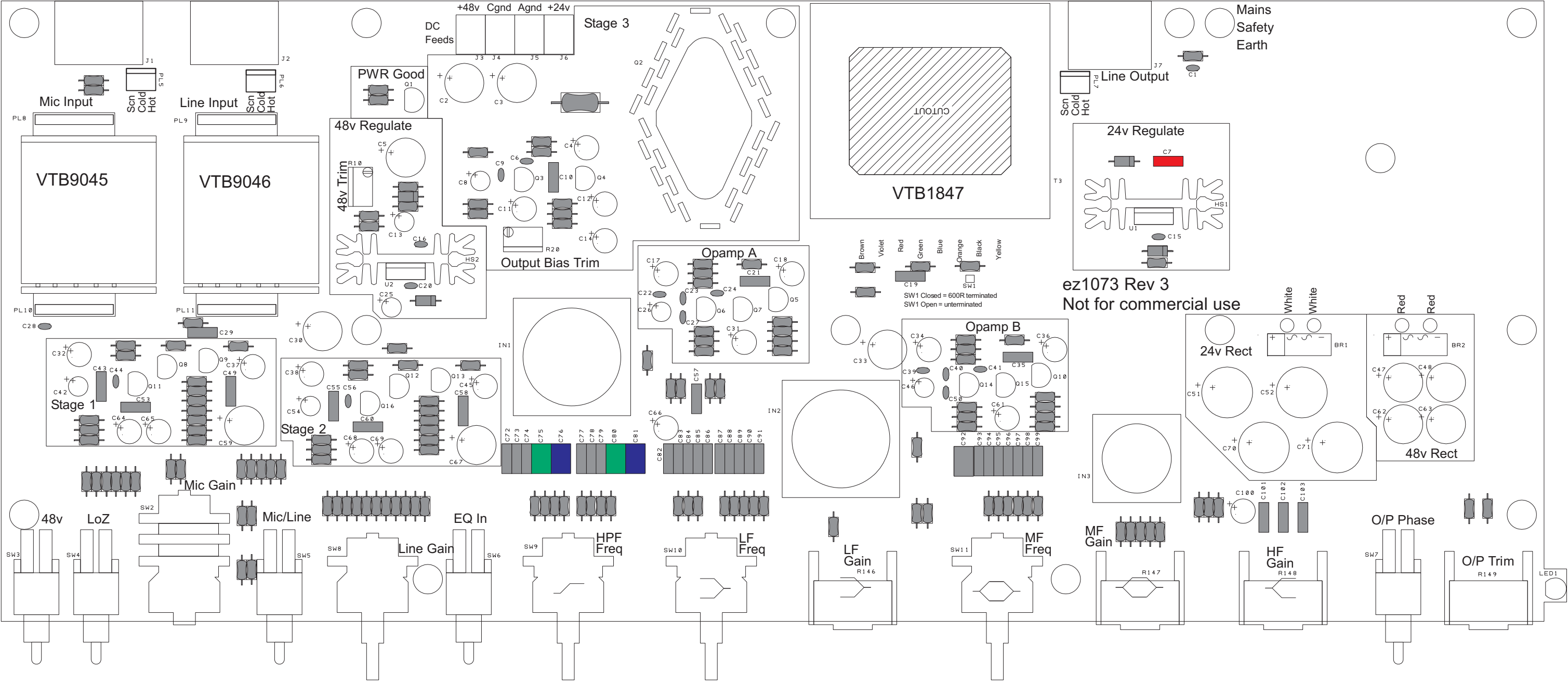
Film Capacitors

- C73, C78, C97, C101, C103 = 22nF (5)
- C83, C88, C98 = 47nF (3)
- C72, C77, C84, C85, C86, C89, C90, C91, C99 = 100nF (9)
- C74, C79 = 220nF (2)



Film Capacitors

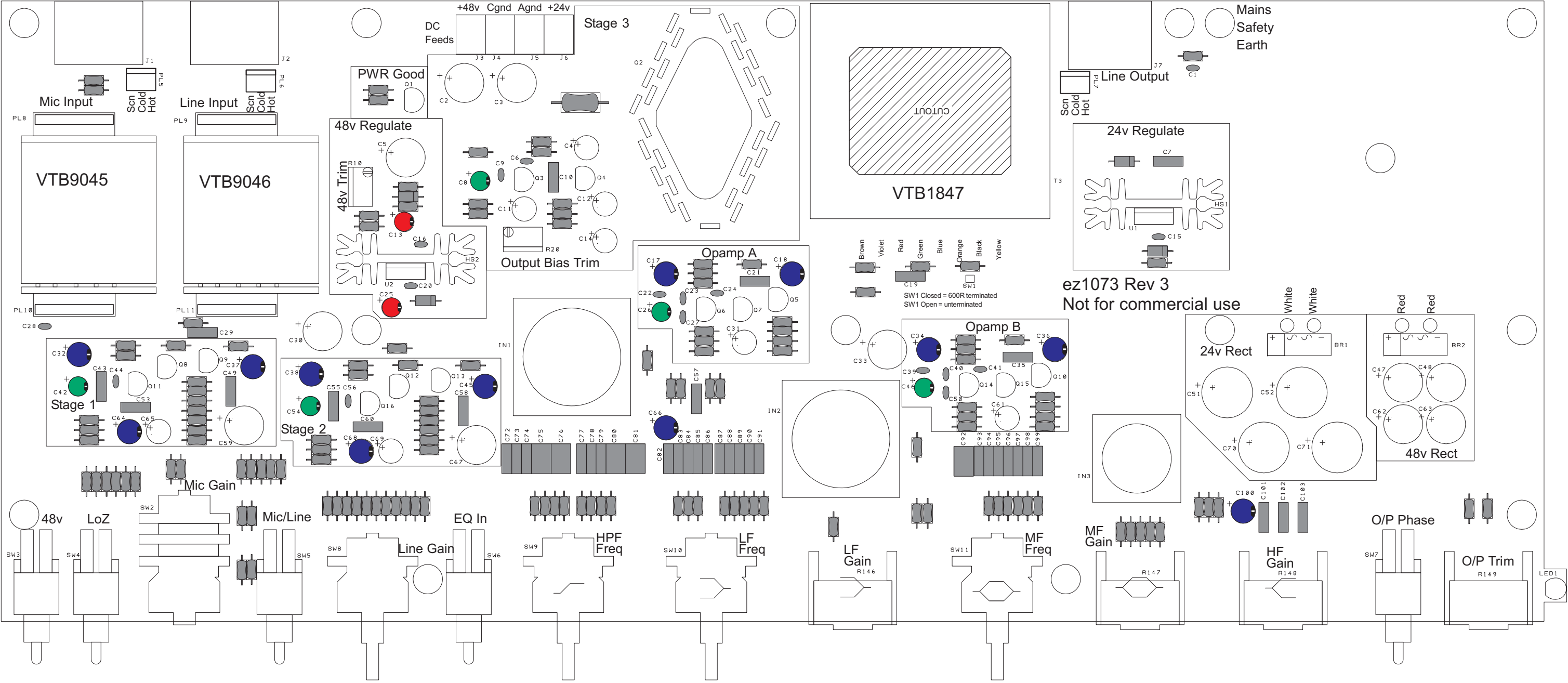
- C7 = 330nF (1)
- C75, C80 = 470nF (2)
- C76, C81, = 1uF (2)



Electrolytic Capacitors

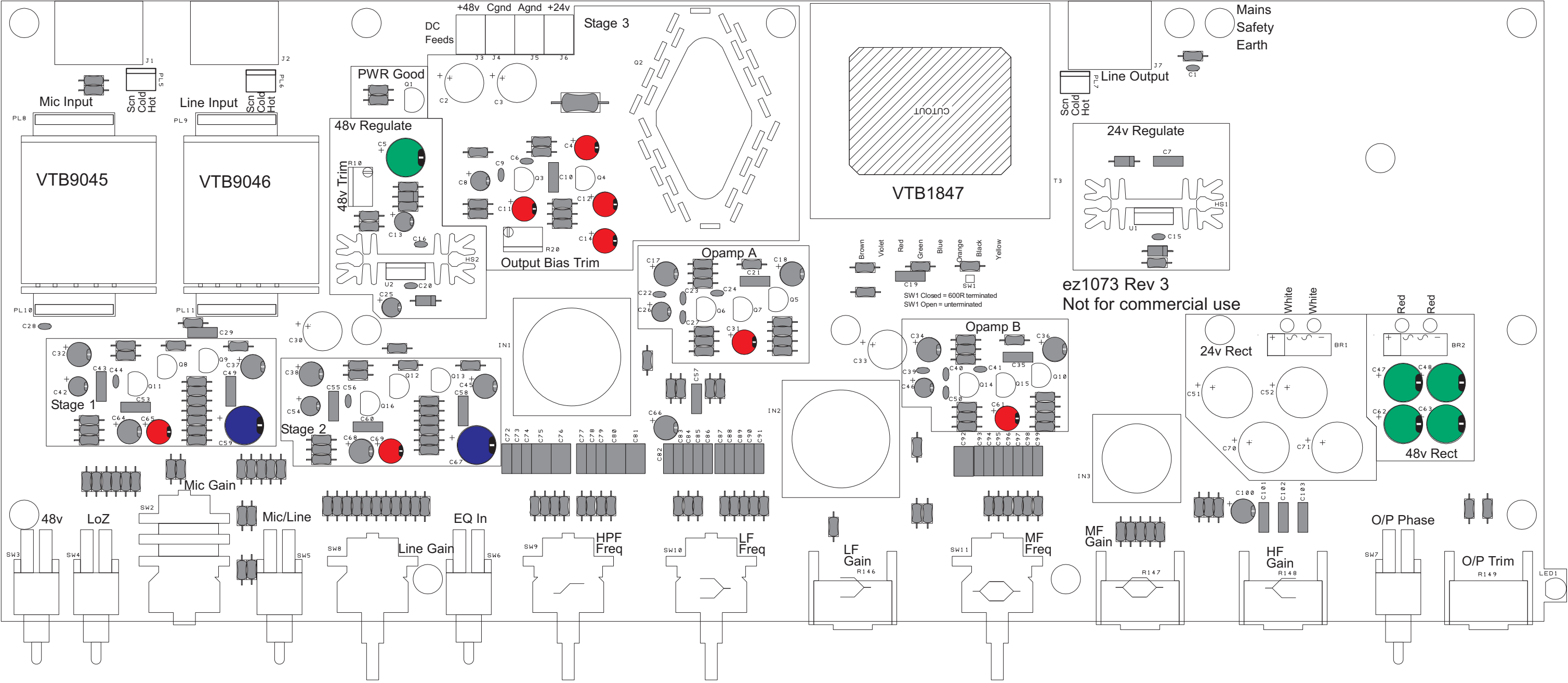
- C13, C25 = 2u2F / 63v (2)
- C8, C26, C42, C46, C54 = 10uF / 50v (5)
- C17, C18, C32, C34, C36, C37, C38, C45, C64, C66, C68, C100 = 22uF / 63v (12)

All positive terminals towards left



Electrolytic Capacitors

- C4, C11, C12, C14, C31, C61, C65, C69 = 100uF / 25v (8)
- C5, C47, C48, C62, C63 = 220uF / 63v (5)
- C59, C67 = 470uF / 16v (2)

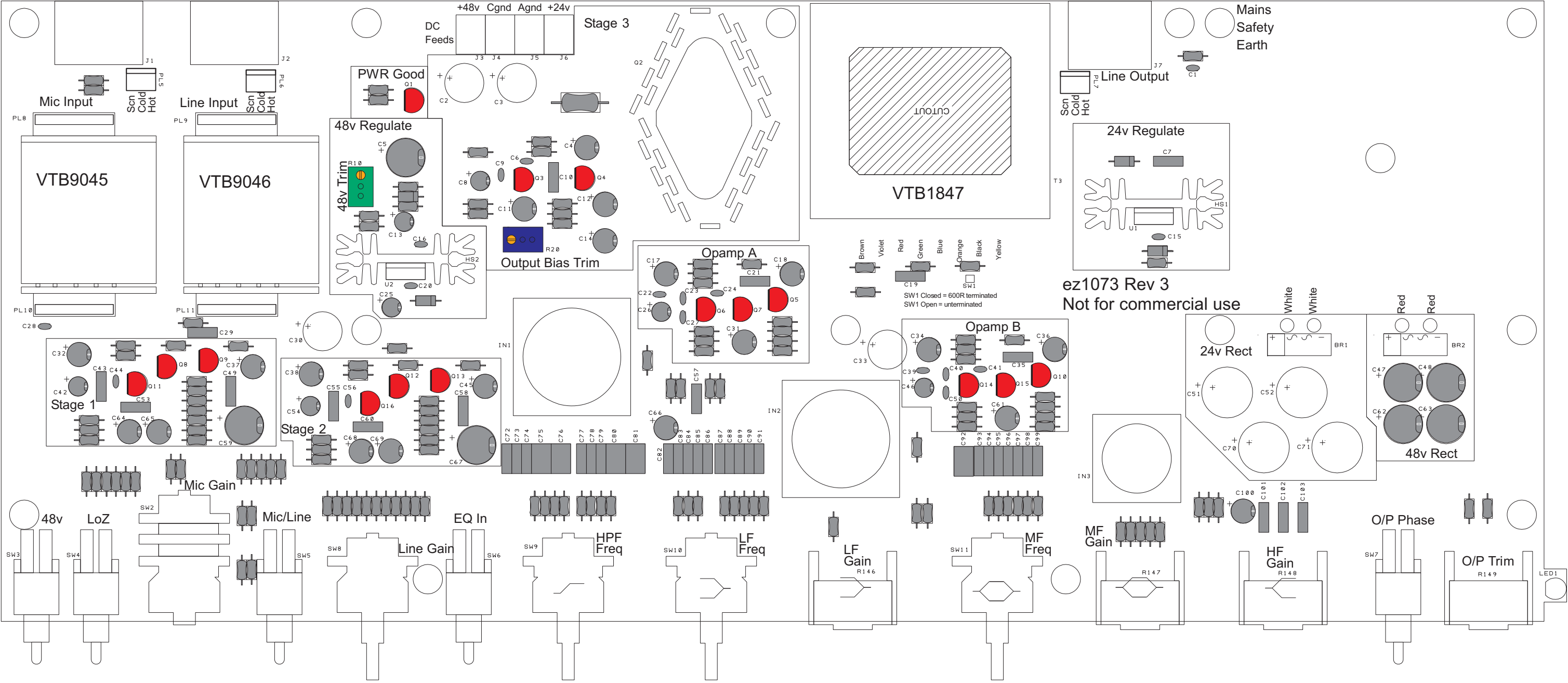


Small Signal Transistors
(All “flat side
to the left”)

Q1, Q3-Q16 = BC184C or BC550C (15)

R10 = 47k (or 50k) (1) - Top adjust style

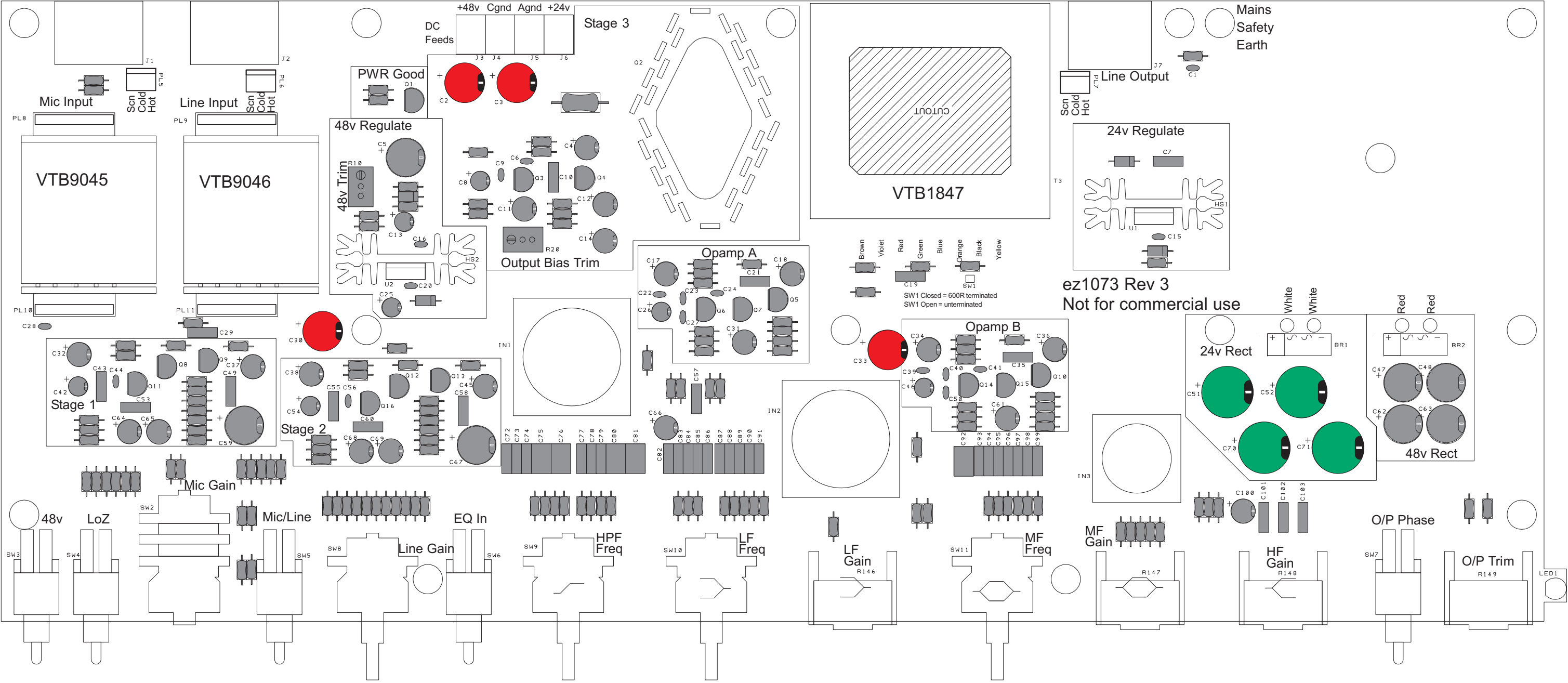
R20 = 4K7 (or 5k) (1) - Top adjust style



Electrolytic Capacitors

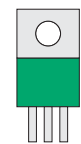
- C2, C3, C30, C33 = 470uF / 35v (4)
- C51, C52, C70, C71 = 1000uF / 35v (4)

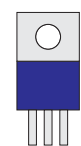
All positive terminals towards left

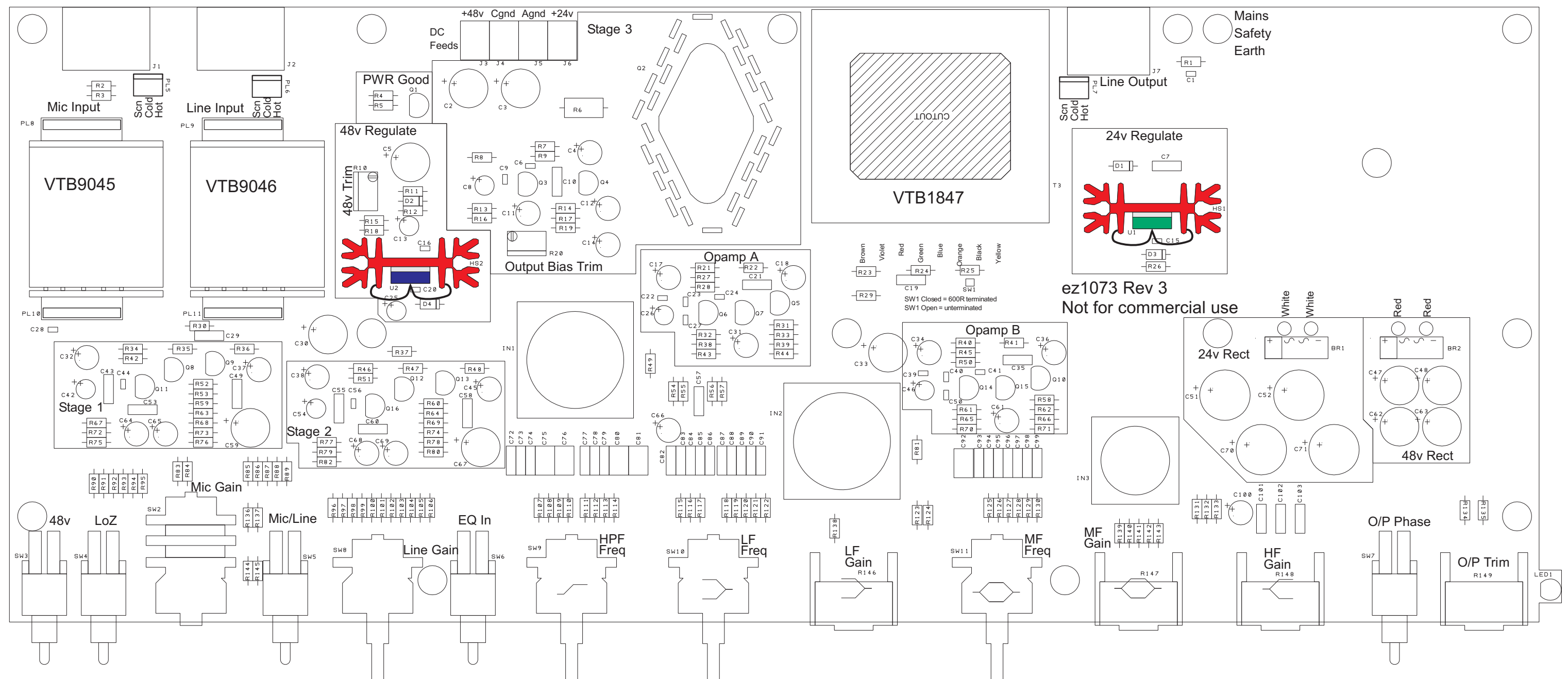


Voltage Regulator

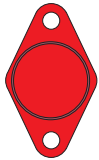
 HS1, HS2 = Heatsink + Clip (2)

 U1 = 7824 voltage regulator (1)

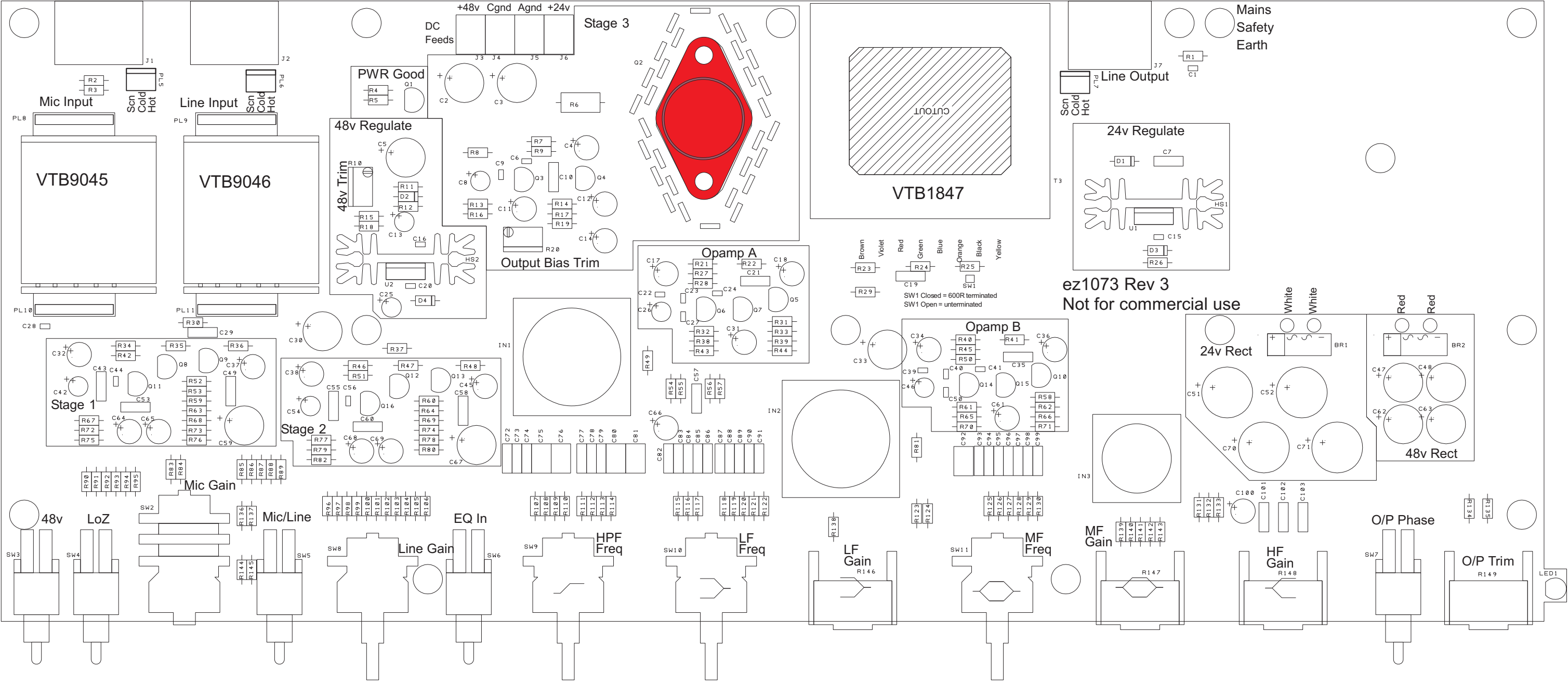
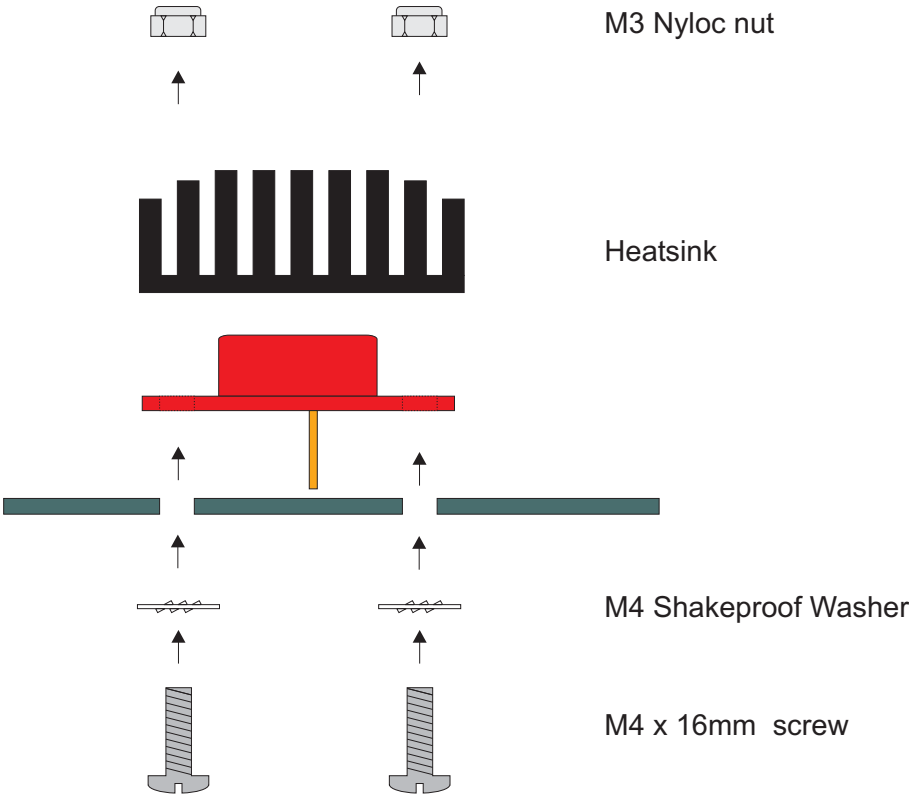
 U2 = TL783 voltage regulator (1)



Output Transistor
2N3055

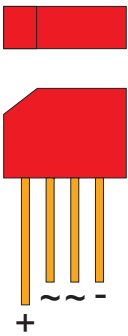


Q2 = 2N3055 + Heatsink (1)

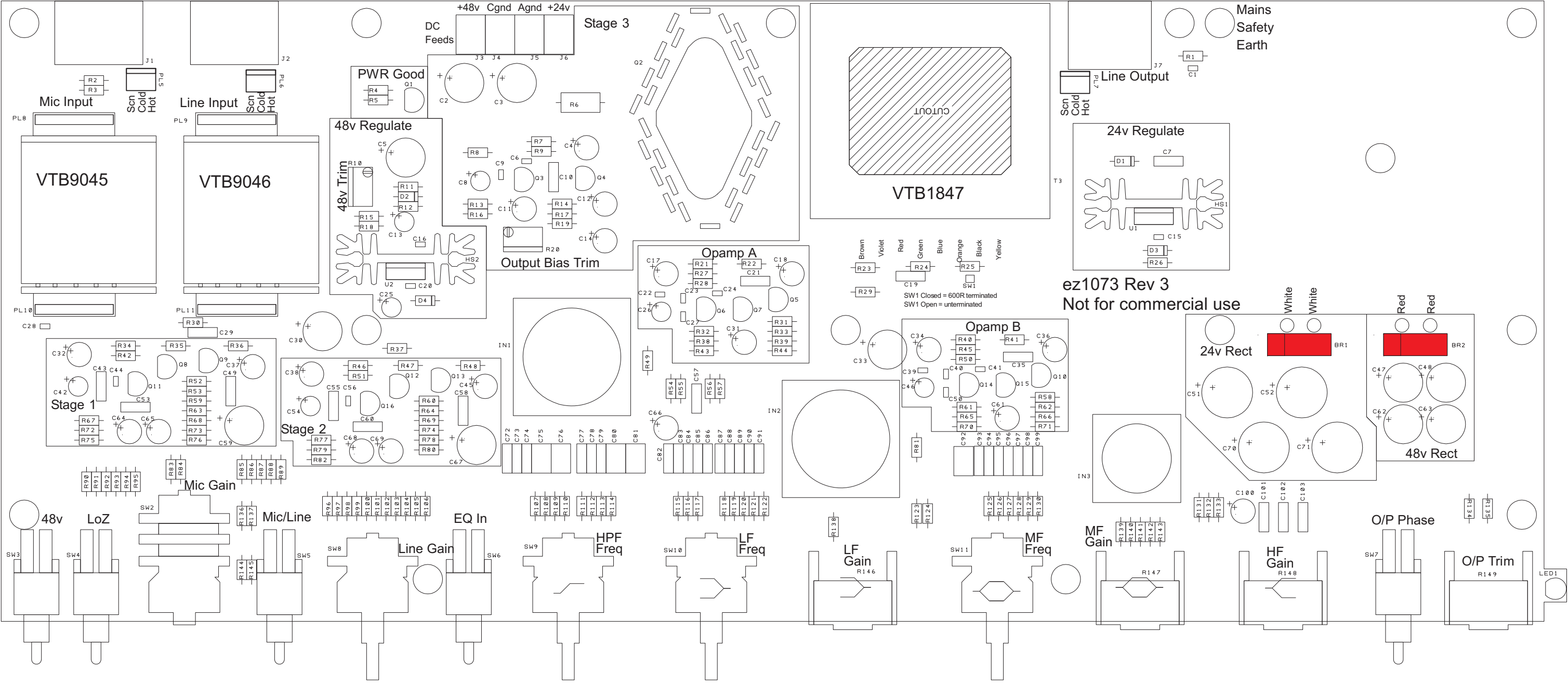


Bridge Rectifiers

KPB02



BR1, BR2 = KPB02 (2)



Inductors



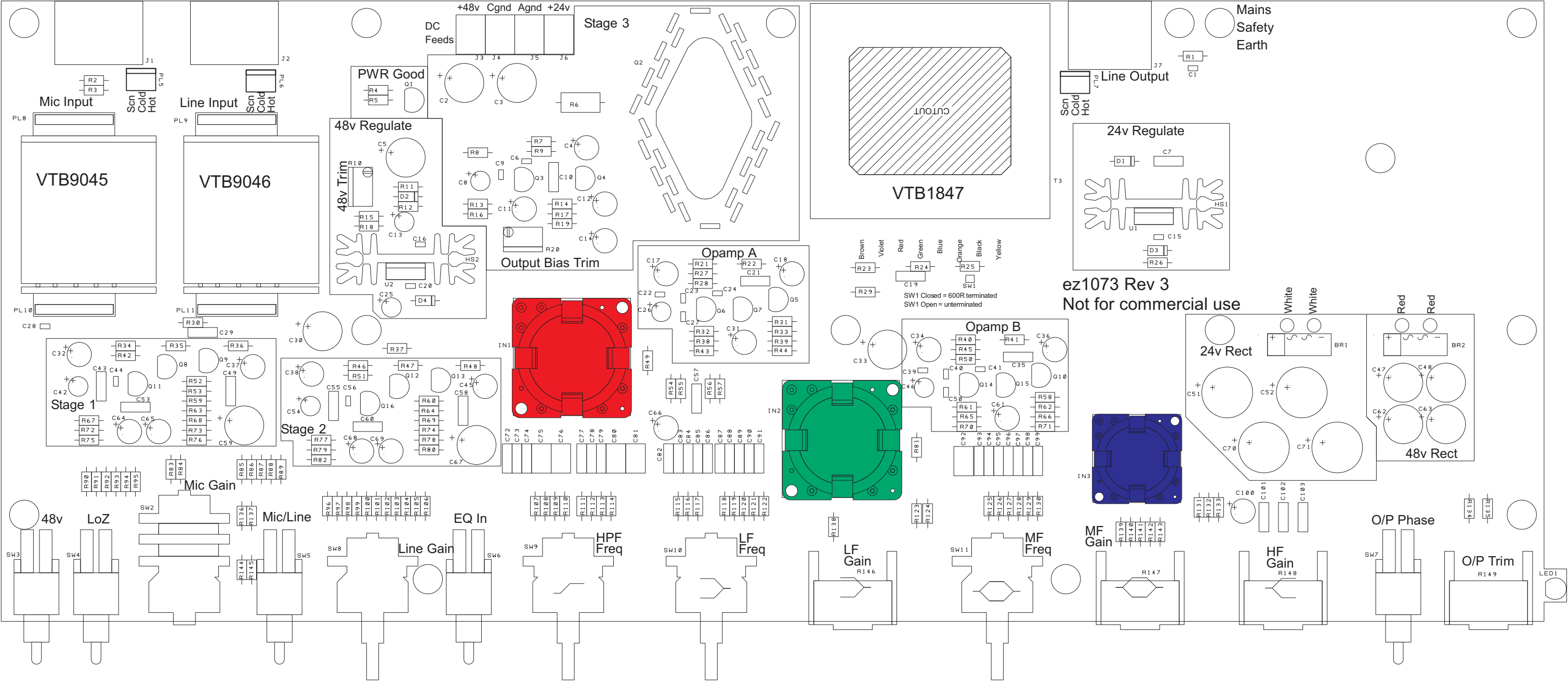
IN1 = VTB9043



IN2 = VTB9050



IN3= VTB9044



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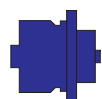
Rotary Switches



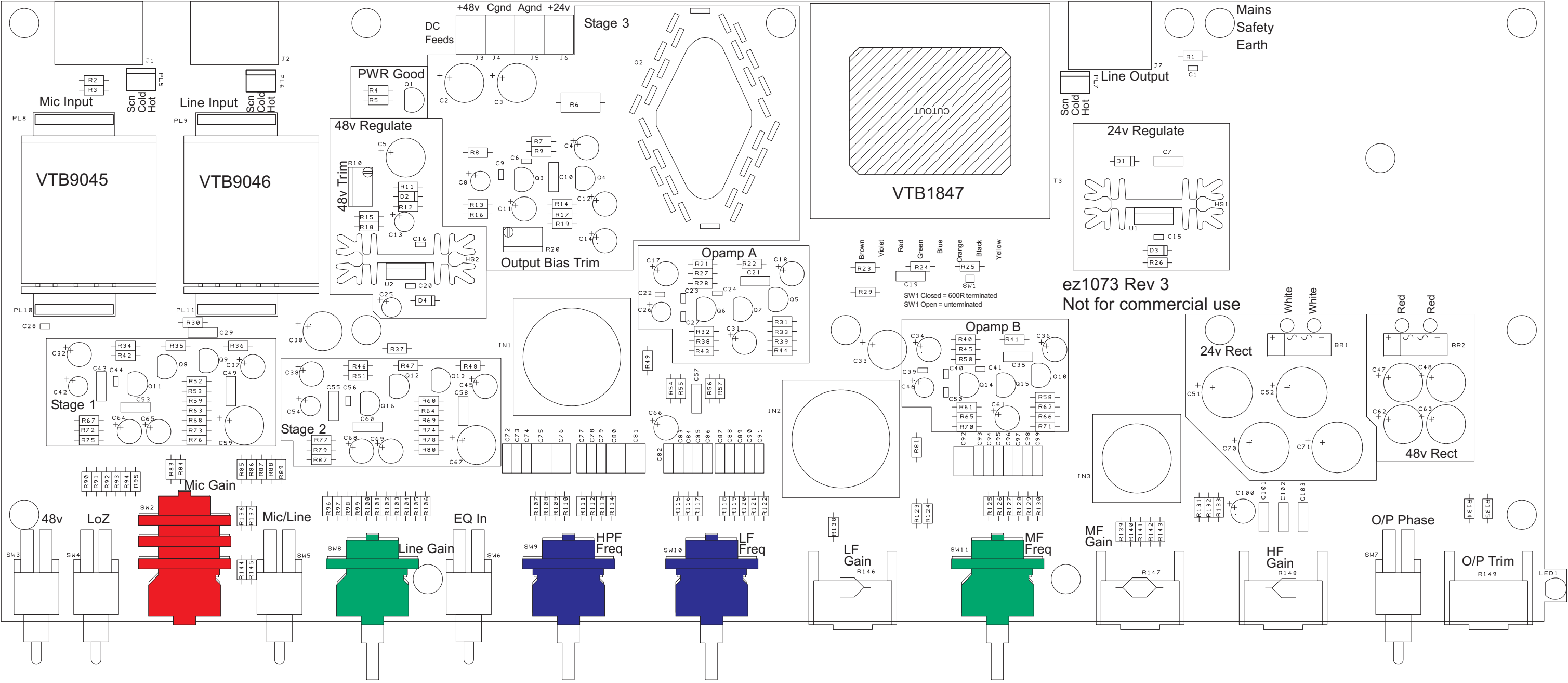
SW2 = GR-03-001 (1) - 12 position, 1 pole, 3 gang



SW8, SW11 = GR-03-002 (2) - 12 position, 1 pole, 1 gang

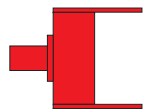


SW9, SW10 = GR-03-003 (2) - 6 position, 2 pole, 1 gang

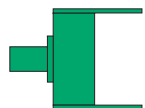


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Not for commercial use

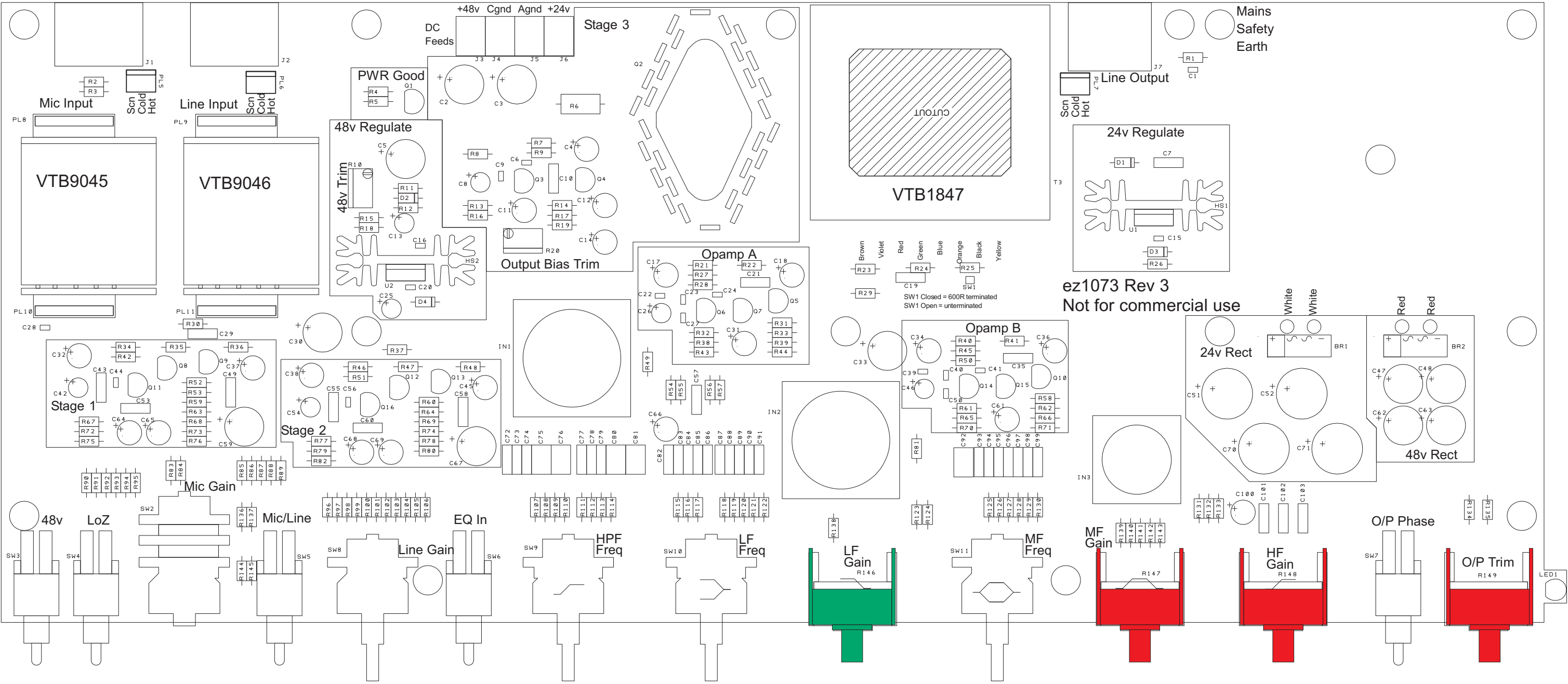
Potentiometers



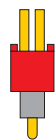
R147, R148, R149 = OM-01-xxx (3) - 10k Linear 20mm + bracket



R146 = OM-01-xxx (1) - 47k Linear 20mm + bracket



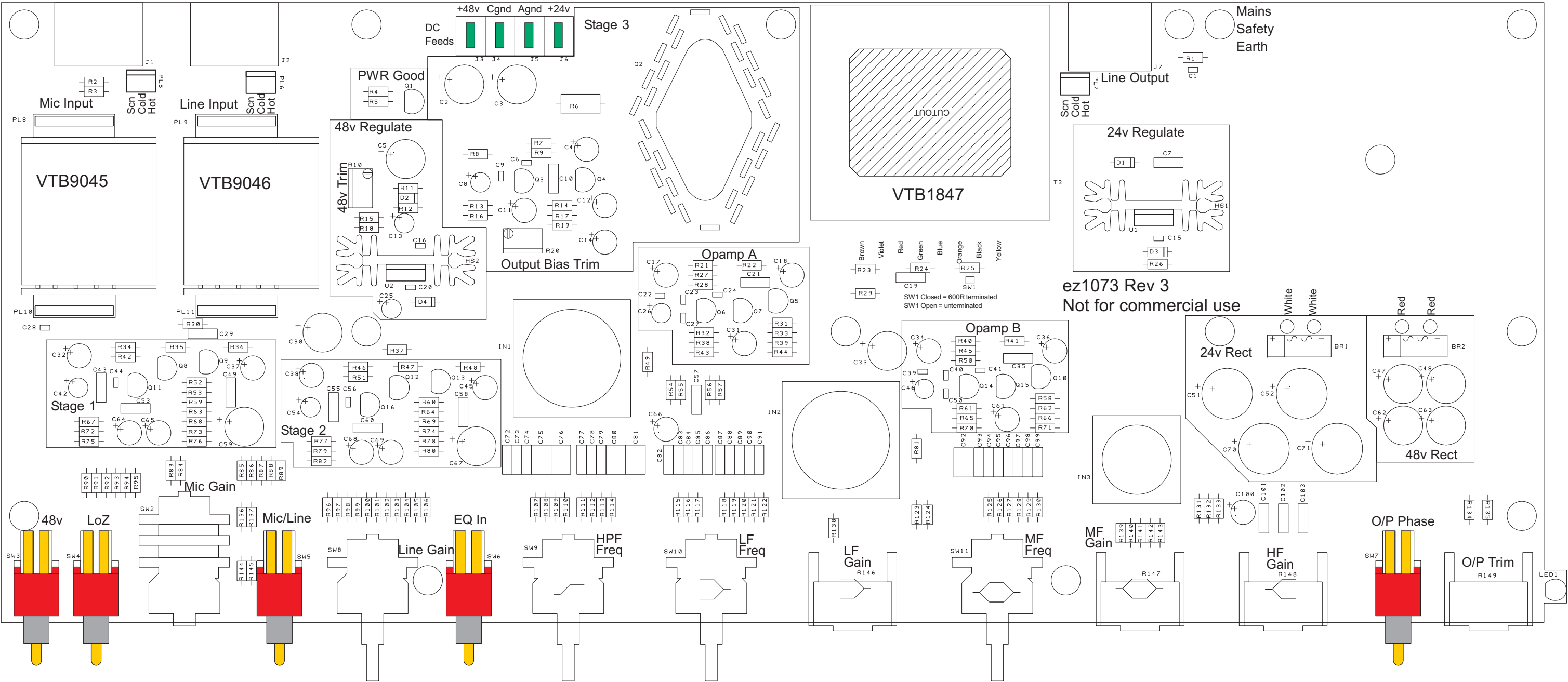
Toggle Switches and Spade Terminals



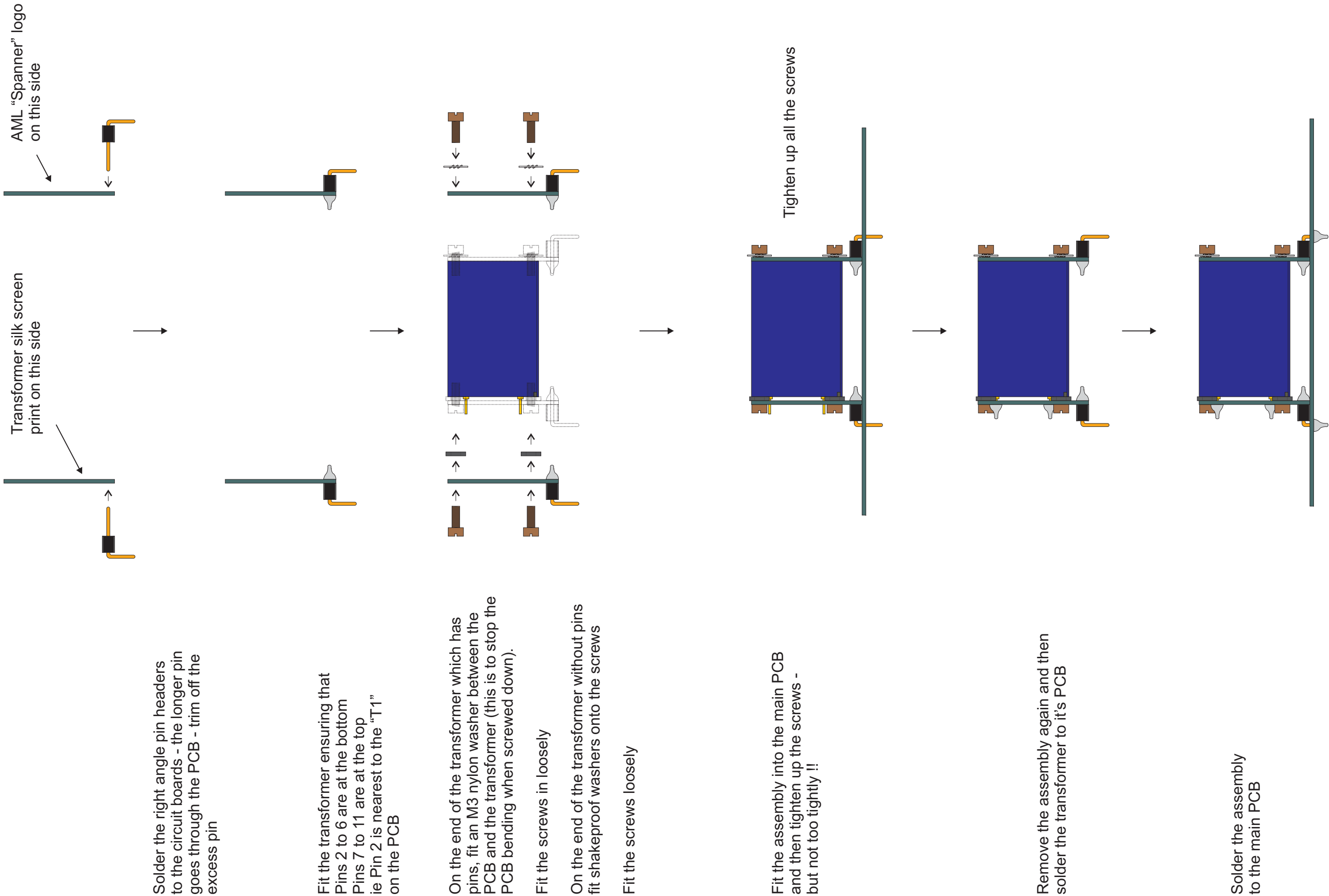
SW3, SW4, SW5, SW6, SW7 = 2 Position DPDT (on-on) (5)



J3, J4, J5, J6 = 1/4 inch Spade terminal (4)



Input Transformer Assembly and Fitting



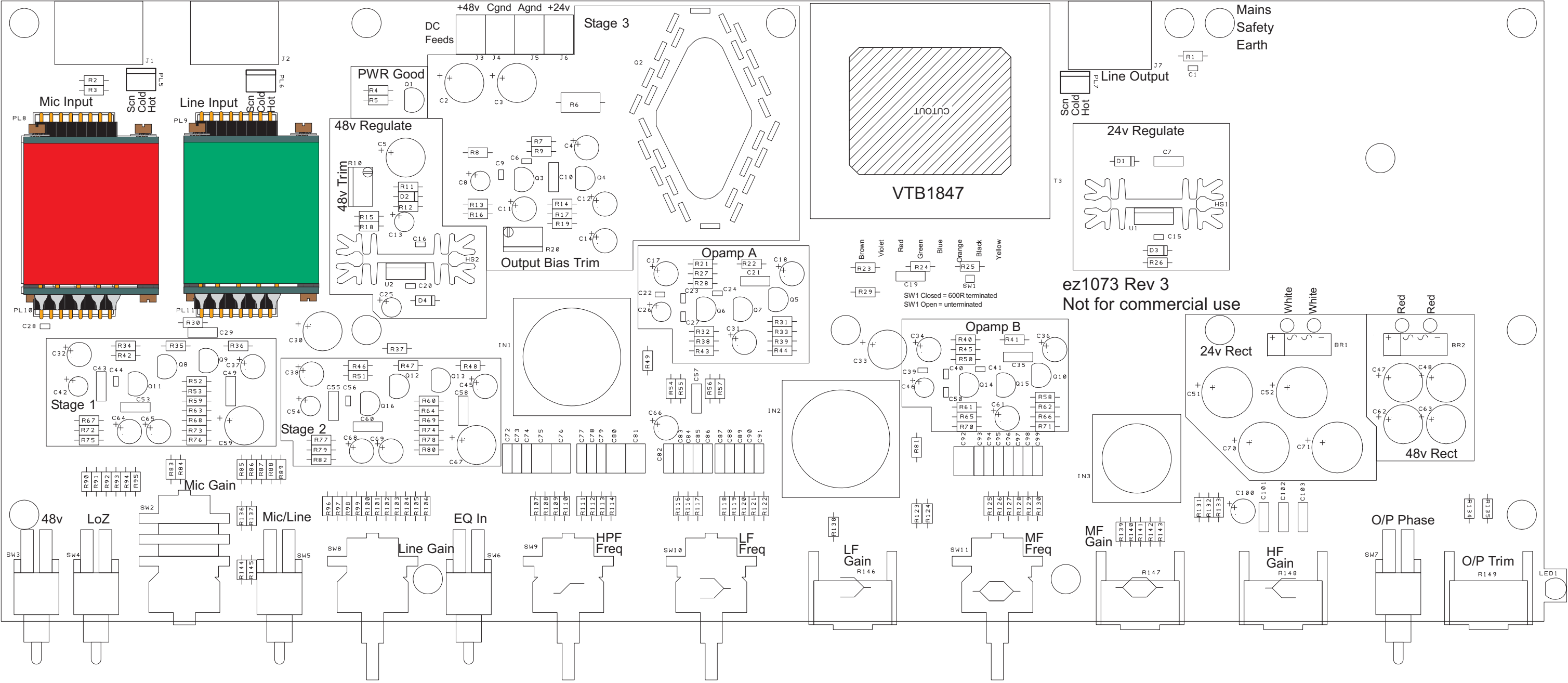
Input Transformer Assembly and Fitting



T1 = VTB9045 (1)

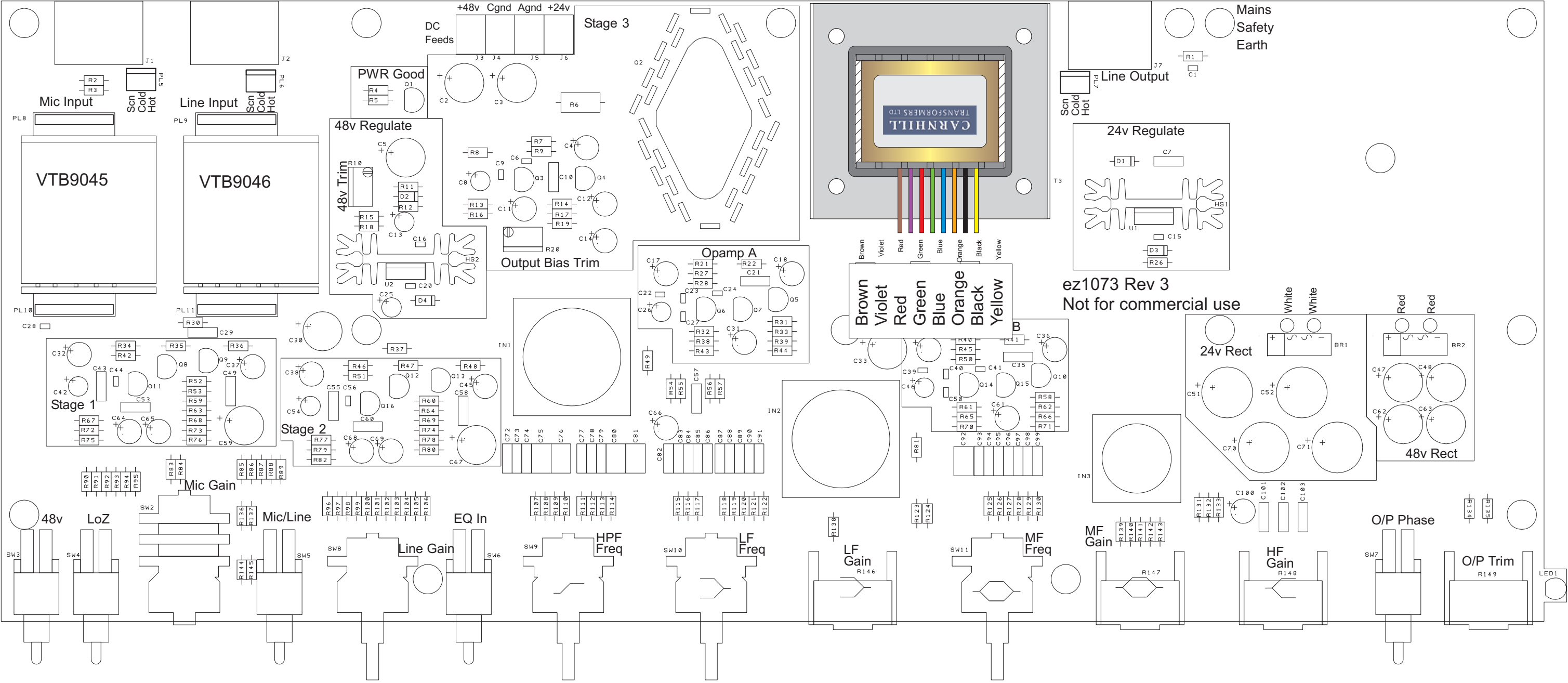
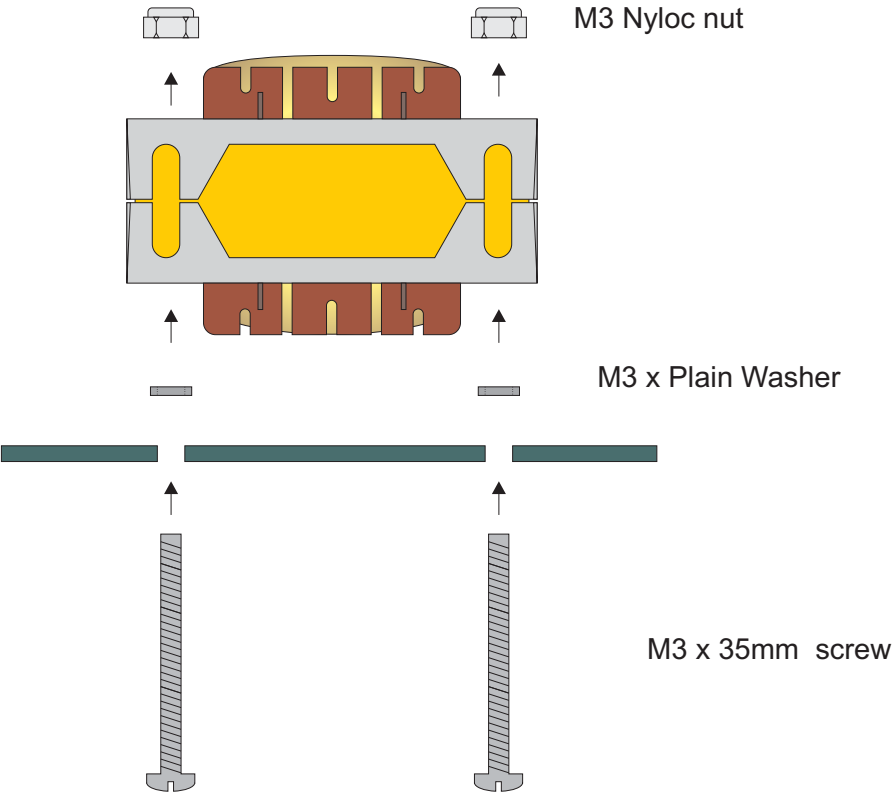
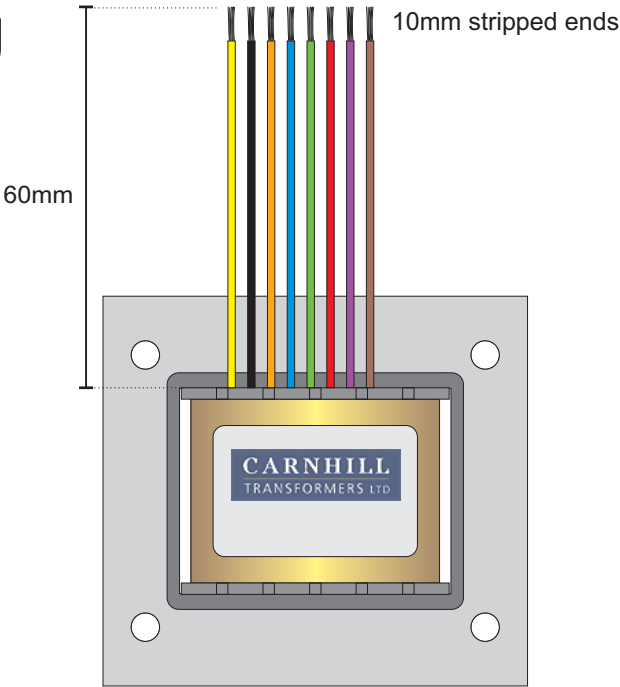


T2 = VTB9046 (1)



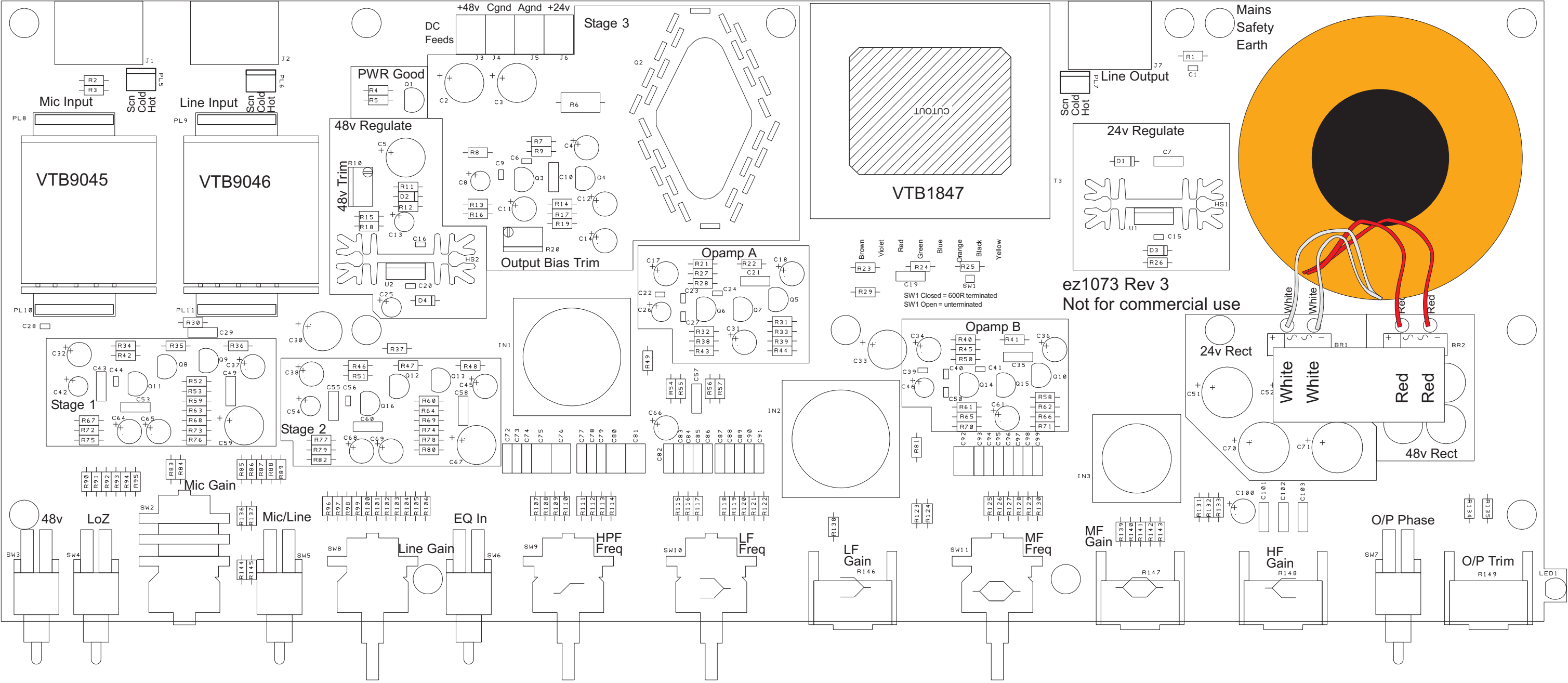
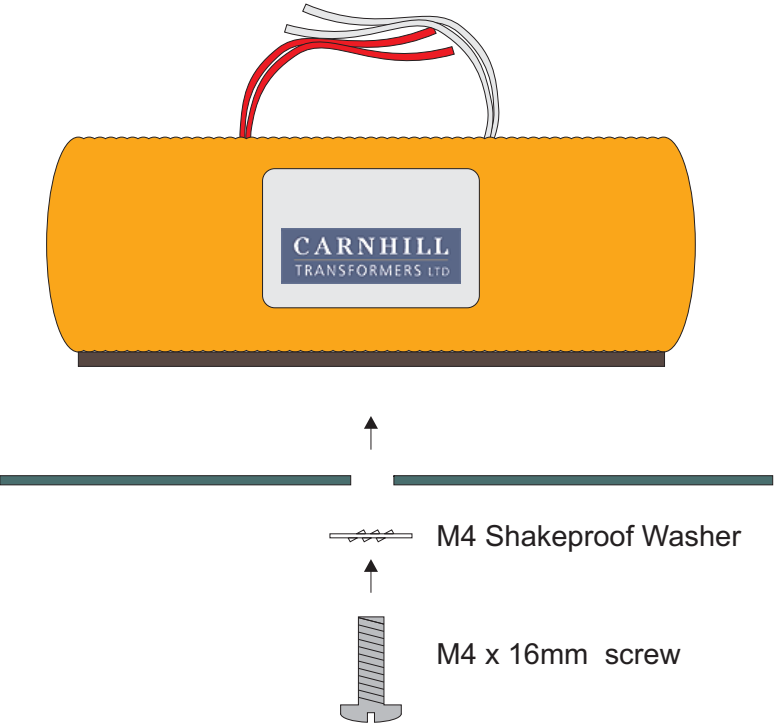
Output Transformer Assembly and Fitting

T3 = VTB1847 (1)



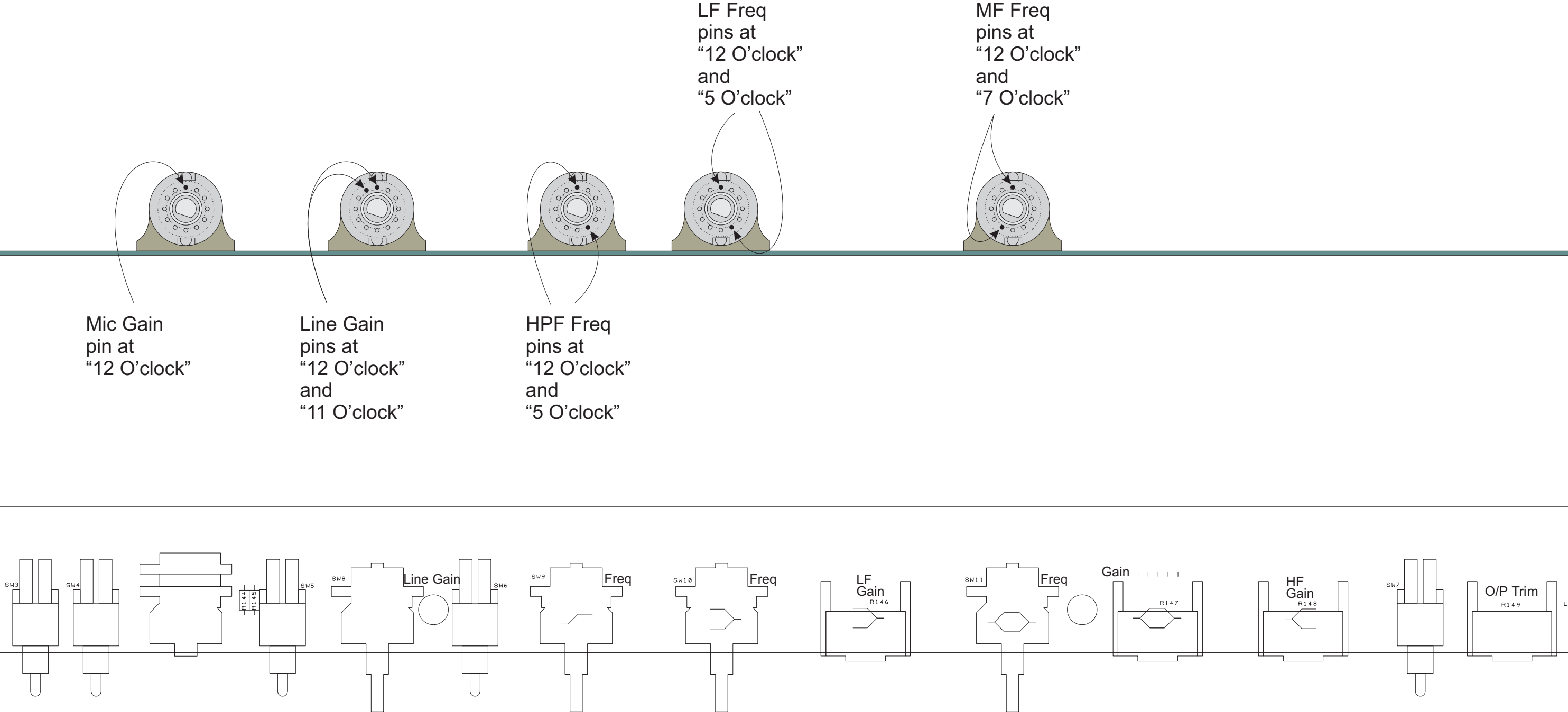
Power Transformer Assembly and Fitting

T4 = VTT2326 (1)

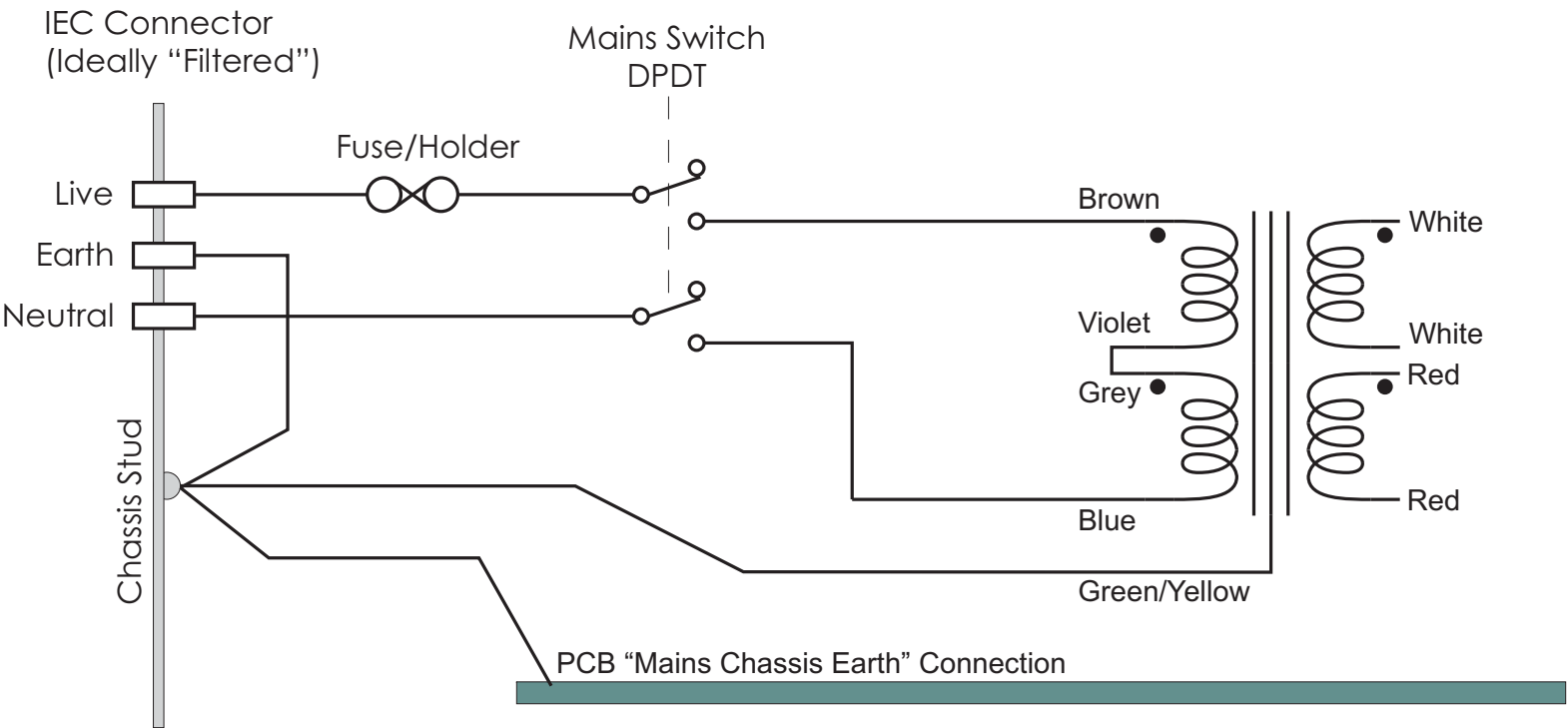


Rotary Switch Adjustment Pins

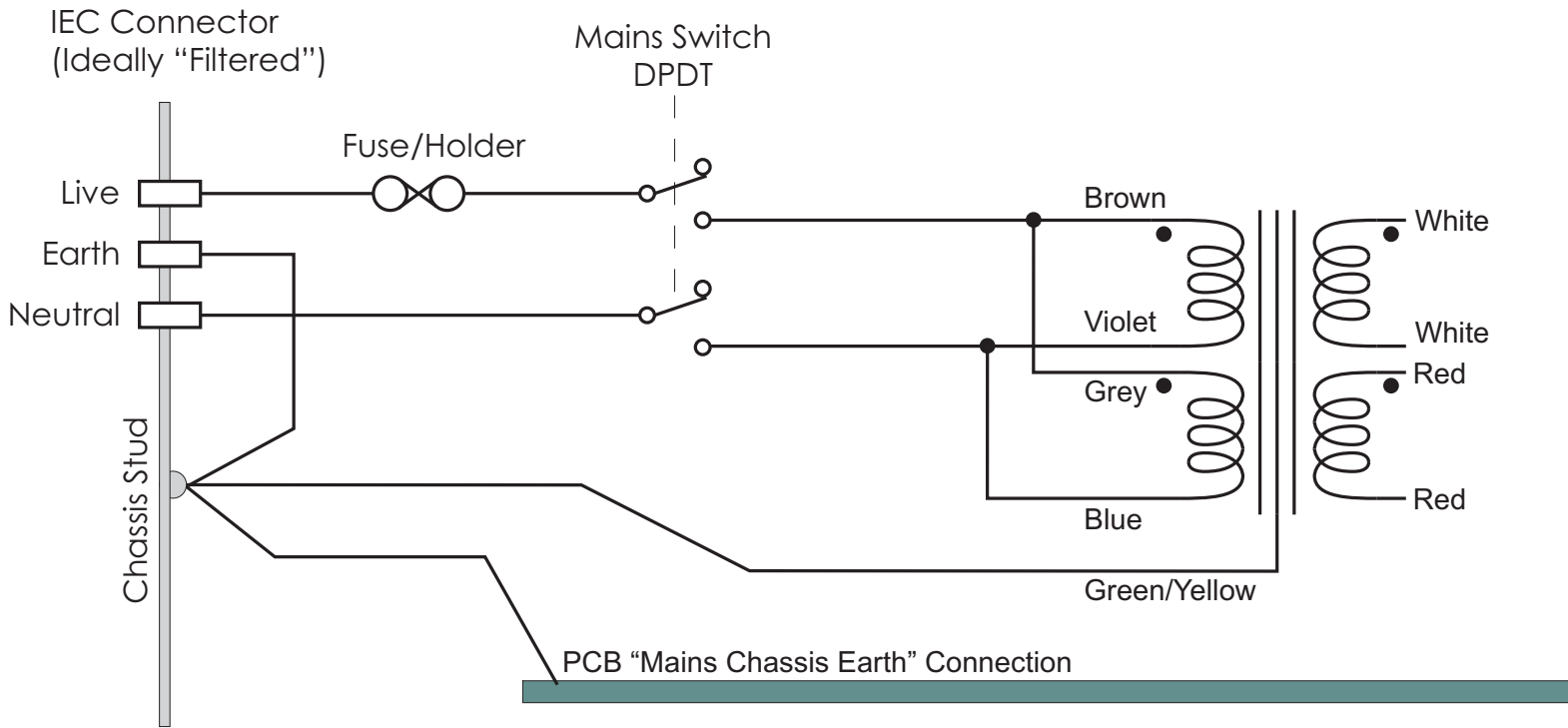
Fit pins in positions shown then apply the self adhesive silver washers over the pin holes to stop the pins coming out.

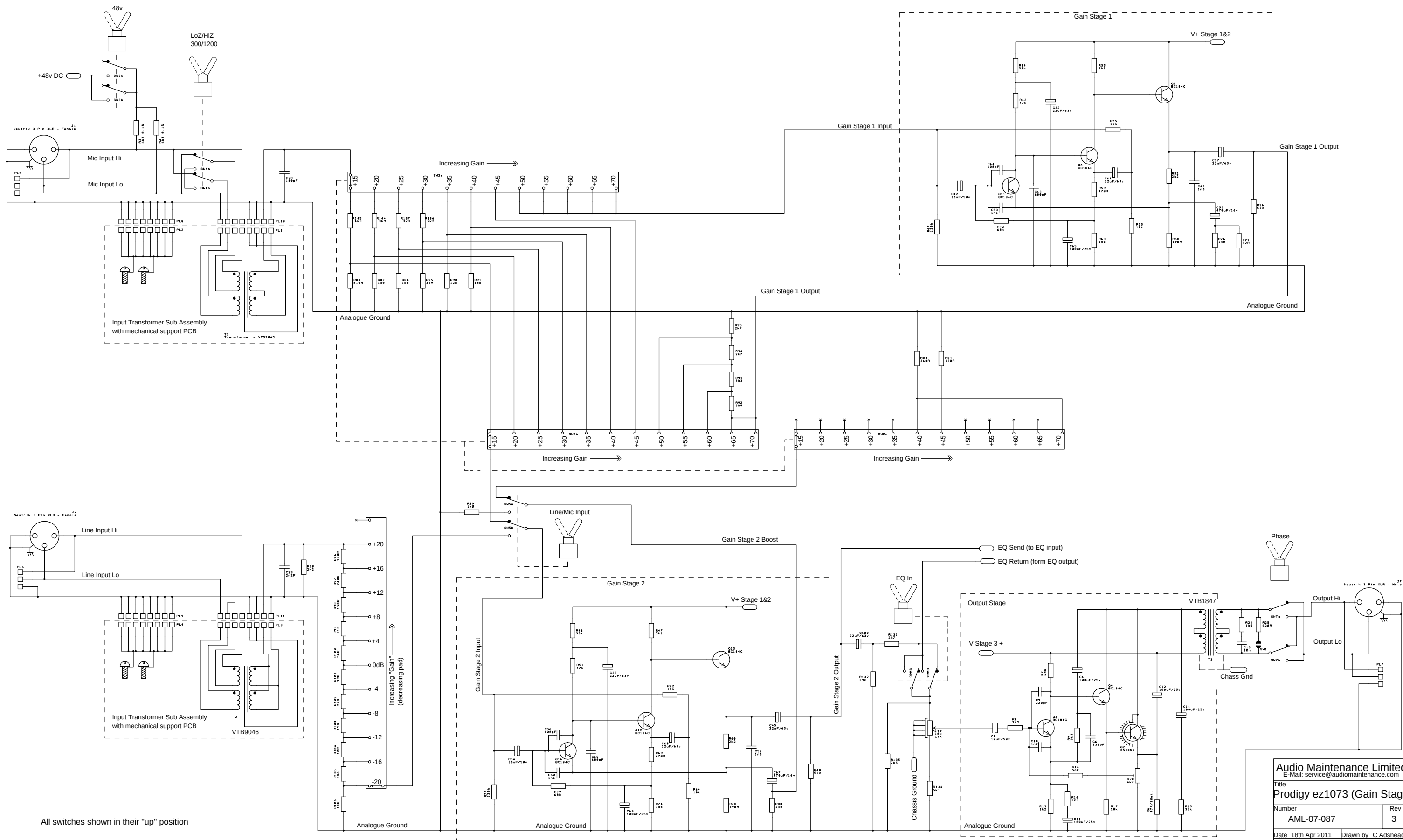


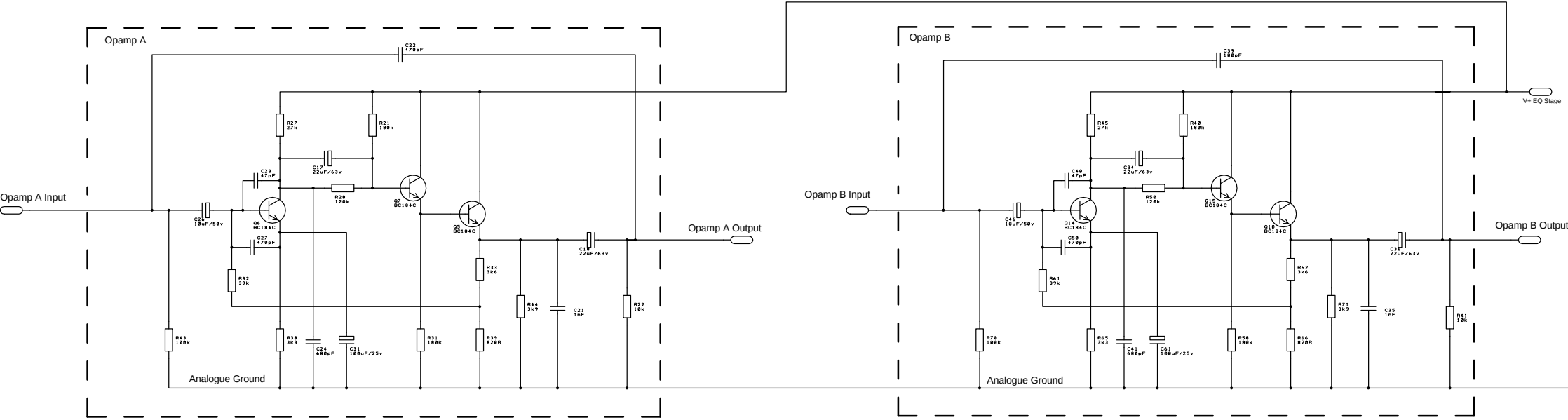
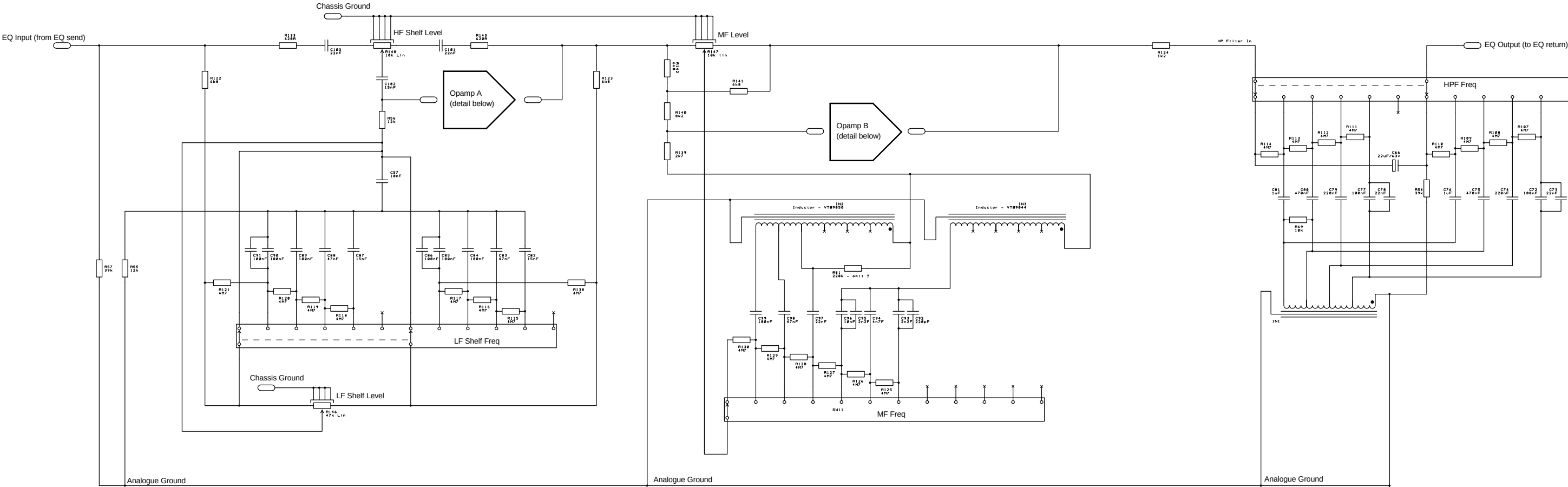
220-240v Transformer Wiring

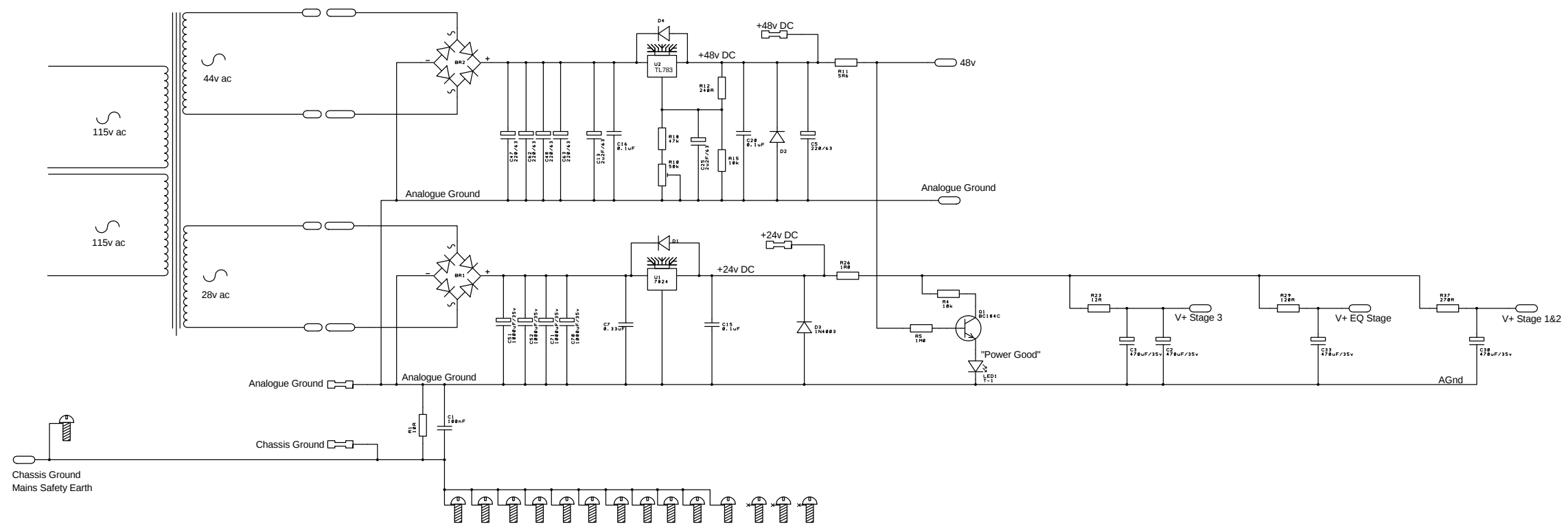


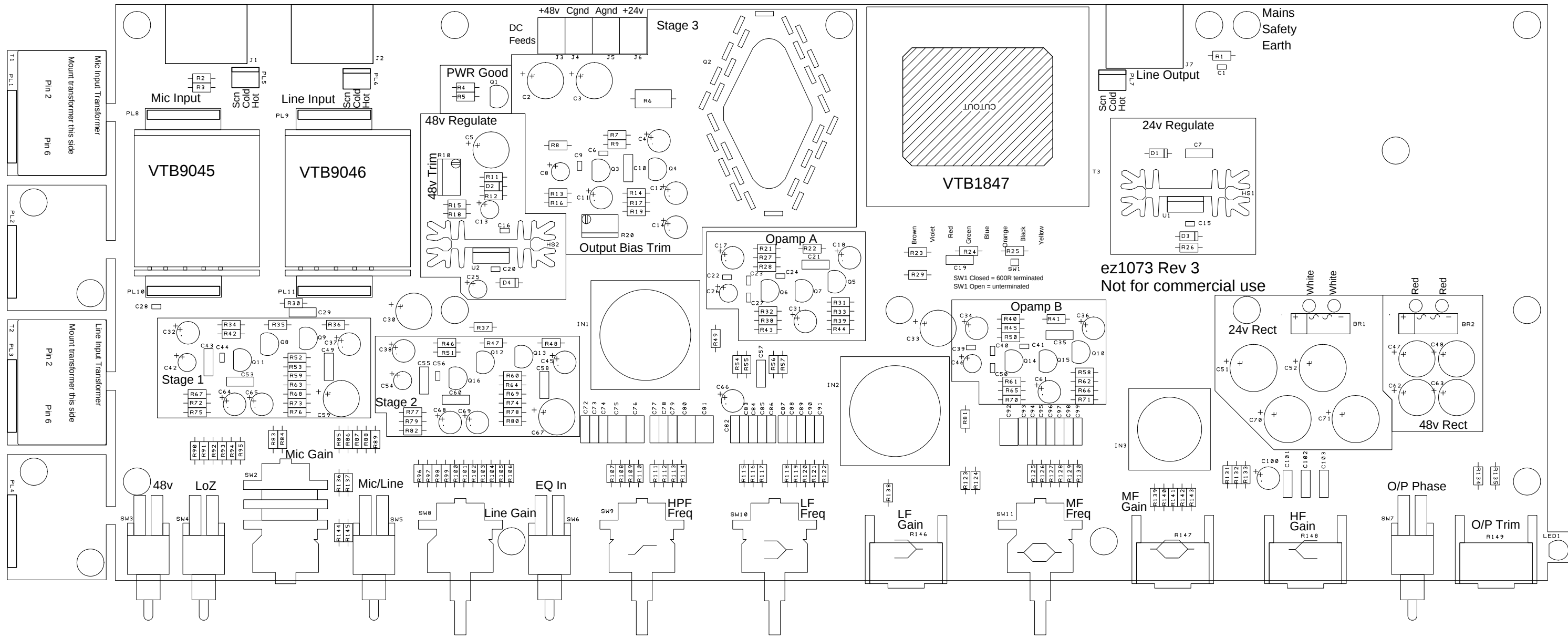
100-120v Transformer Wiring

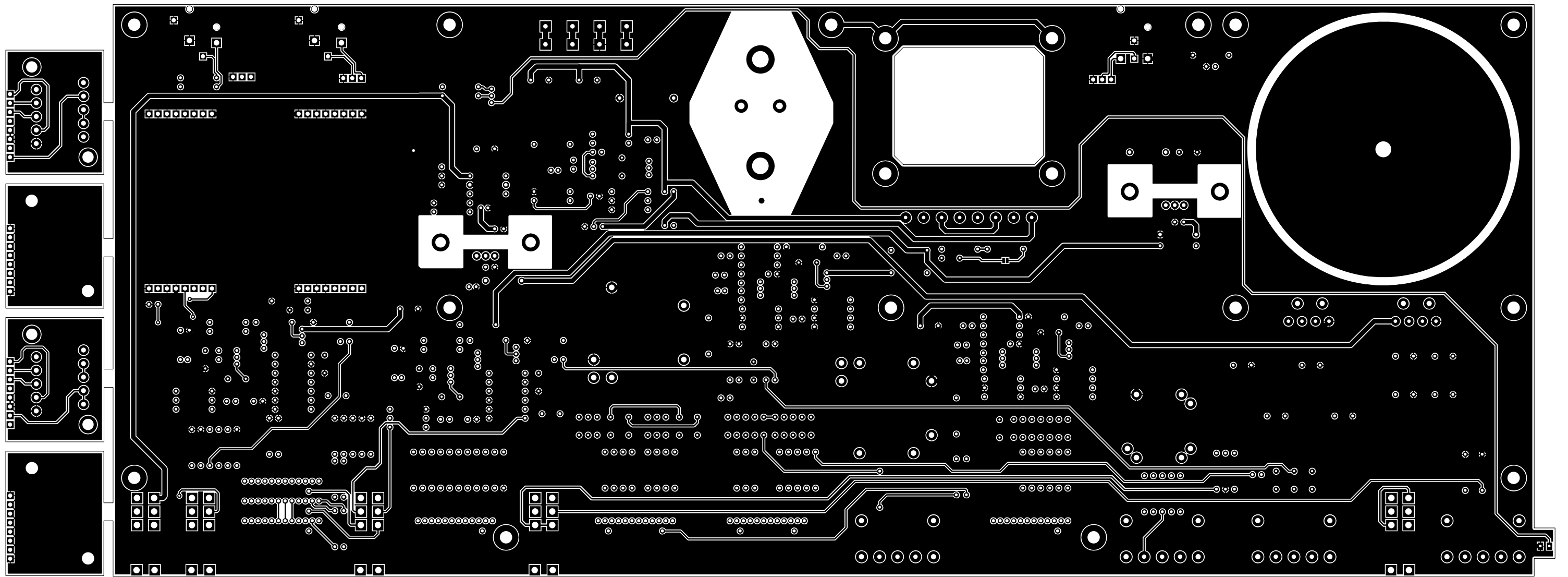


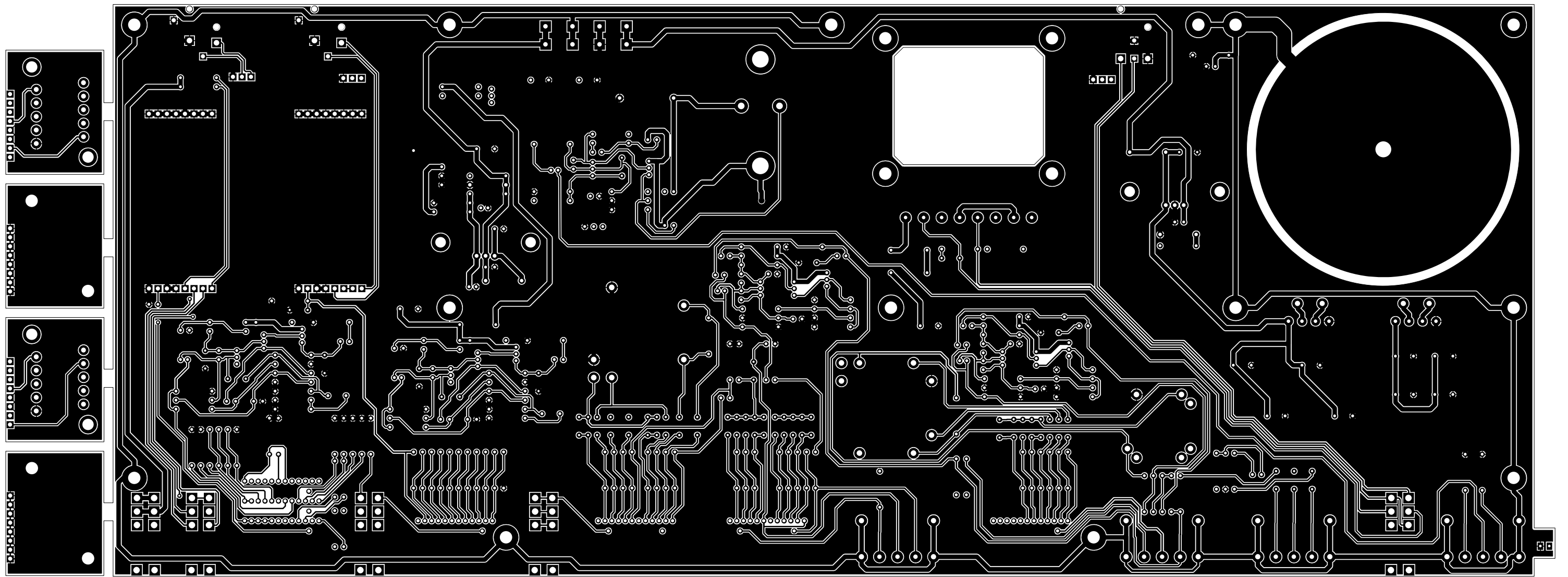




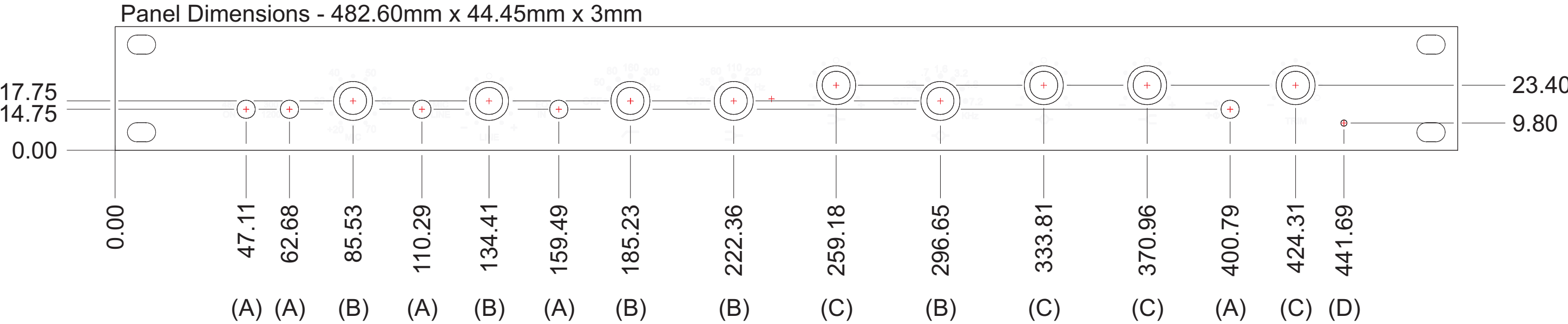








ez1073 (1U) AML-07-087 Faceplate Holes

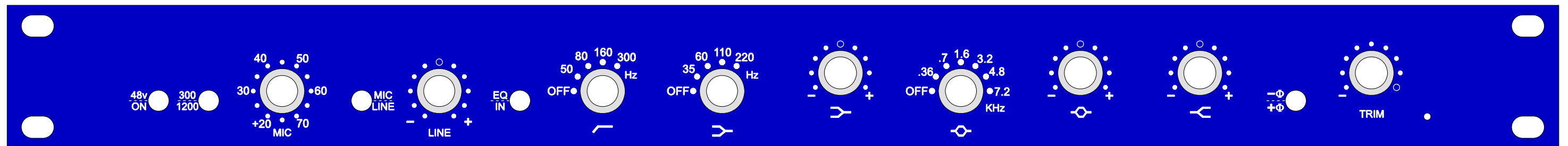


- (A) = 6.5mm
- (B) = 9.7mm with 14mm counterbore 1.75mm deep
- (C) = 10.0mm with 14mm counterbore 1.75mm deep
- (D) = 2.2mm

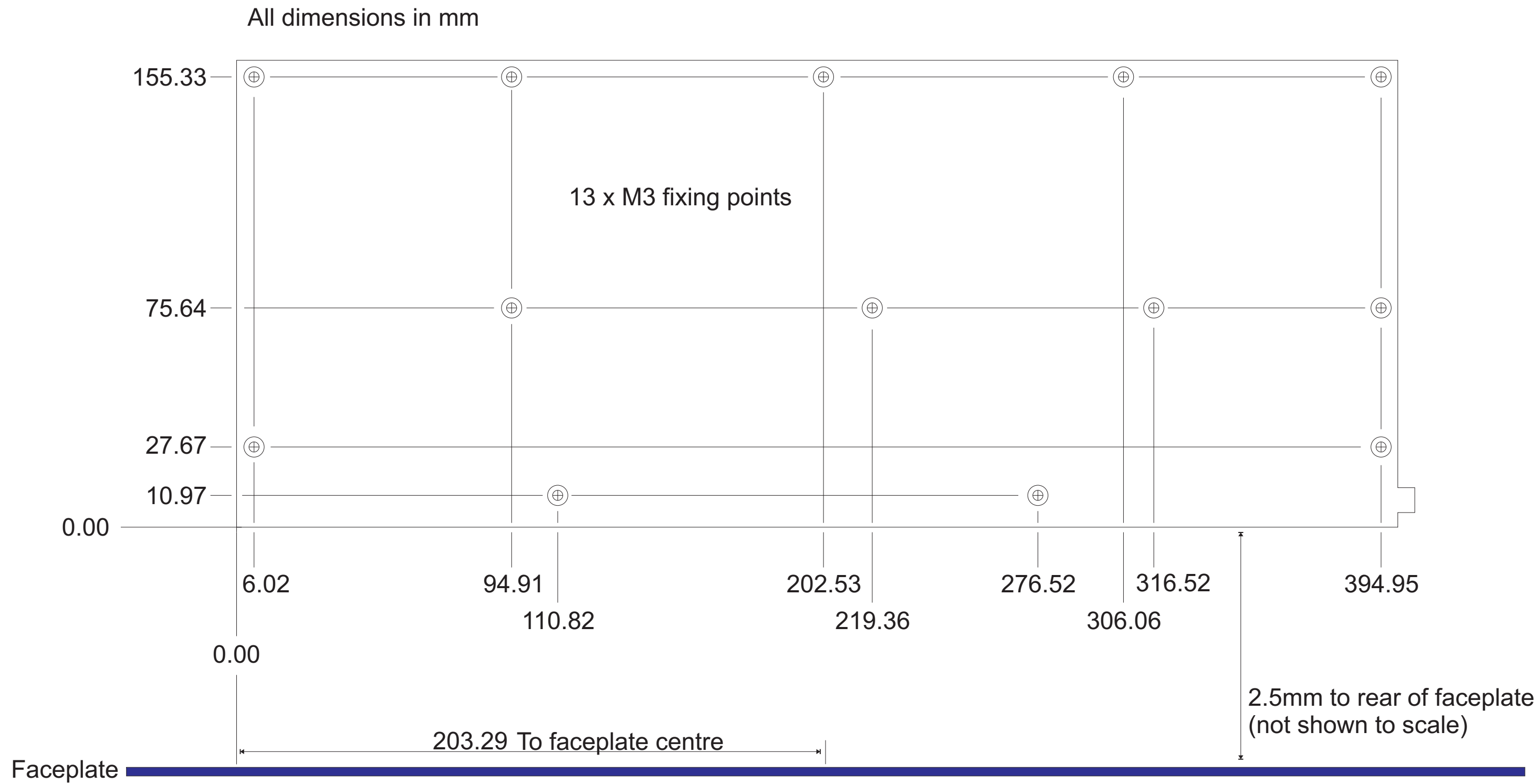
All dimensions in mm

Shaeffer/Front Panel Express file:

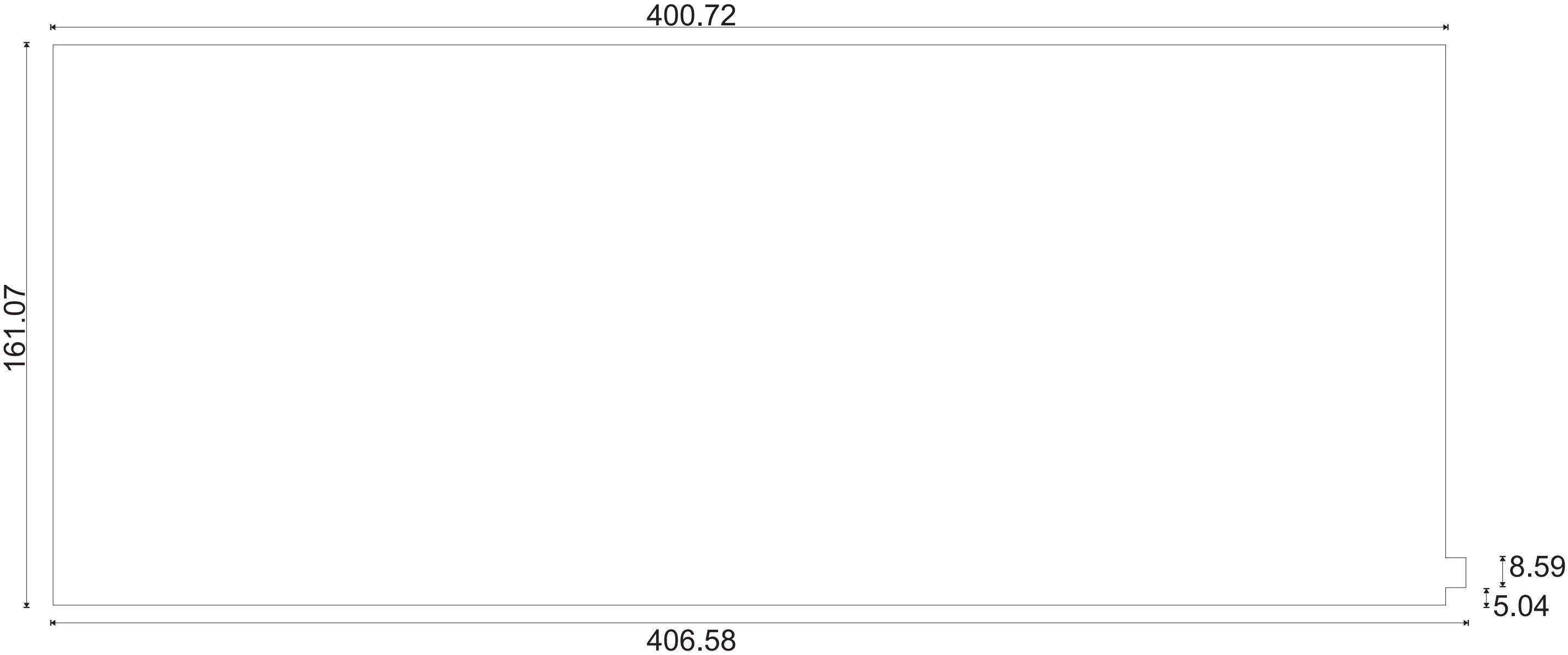
www.audiomaintenance.com/downloads/ez1073_1u_front_panel.fpd



ez1073 (1U) AML-07-087 PCB mounting holes



ez1073 (1U) AML-07-087 PCB dimensions



Ref Des	Value	Description	Part Number
U1	7824	Voltage Regulator 24 volt	Farnell: 975-6213
D1	1N4001/3/7	Diode	Farnell: 146-7514
D2	1N4001/3/7	Diode	Farnell: 146-7514
D3	1N4001/3/7	Diode	Farnell: 146-7514
D4	1N4001/3/7	Diode	Farnell: 146-7514
Q1	BC184C	NPN Bipolar	Farnell: 101-7657
Q3	BC184C	NPN Bipolar	Farnell: 101-7657
Q4	BC184C	NPN Bipolar	Farnell: 101-7657
Q5	BC184C	NPN Bipolar	Farnell: 101-7657
Q6	BC184C	NPN Bipolar	Farnell: 101-7657
Q7	BC184C	NPN Bipolar	Farnell: 101-7657
Q8	BC184C	NPN Bipolar	Farnell: 101-7657
Q9	BC184C	NPN Bipolar	Farnell: 101-7657
Q10	BC184C	NPN Bipolar	Farnell: 101-7657
Q11	BC184C	NPN Bipolar	Farnell: 101-7657
Q12	BC184C	NPN Bipolar	Farnell: 101-7657
Q13	BC184C	NPN Bipolar	Farnell: 101-7657
Q14	BC184C	NPN Bipolar	Farnell: 101-7657
Q15	BC184C	NPN Bipolar	Farnell: 101-7657
Q16	BC184C	NPN Bipolar	Farnell: 101-7657
BR1	KBP02	Bridge Rectifier - SIL KBP02	Farnell: 938-0957
BR2	KBP02	Bridge Rectifier - SIL KBP02	Farnell: 938-0957
Q2	2N3055	Power Transistor	Farnell: 980-1308
H1	AKK 191	Heatsink - T03	Farnell: 462-1372
HS1	Heatsink - TO220	NPN Bipolar	Farnell: 171-0605 + 171-0642 (clip)
HS2	Heatsink - TO220	NPN Bipolar	Farnell: 171-0605 + 171-0642 (clip)
IN1	VTB9043	Inductor - VTB9043	AML: CA-18-VTB9043
IN3	VTB9044	Inductor - VTB9044	AML: CA-18-VTB9044
IN2	VTB9050	Inductor - VTB9050	AML: CA-18-VTB9050
PL1	THS-08-R-RAF	8 pin right angle header	Toby Electronics: THS-08-R-RAF
PL2	THS-08-R-RAF	8 pin right angle header	Toby Electronics: THS-08-R-RAF
PL3	THS-08-R-RAF	8 pin right angle header	Toby Electronics: THS-08-R-RAF
PL4	THS-08-R-RAF	8 pin right angle header	Toby Electronics: THS-08-R-RAF
LED1	L-13HD	Kingbright L-13HD	Farnell: 114-2484
PL5	Molex Connector - 3 way	3 way Pin Header	
PL6	Molex Connector - 3 way	3 way Pin Header	
PL7	Molex Connector - 3 way	3 way Pin Header	
J1	NC3FBH1	Neutrik 3 Pin XLR - Female	Canford Audio: 40-211
J2	NC3FBH1	Neutrik 3 Pin XLR - Female	Canford Audio: 40-211
J7	NC3MBH	Neutrik 3 Pin XLR - Male	Canford Audio: 40-260
R146	47k Lin	POT Omeg P20 Single + Bracket	AML: OM-01-081
R147	10k Lin	POT Omeg P20 Single + Bracket	AML: OM-01-074
R148	10k Lin	POT Omeg P20 Single + Bracket	AML: OM-01-074
R149	10k Lin	POT Omeg P20 Single + Bracket	AML: OM-01-074
SW3	Switch - C&K toggle DPDT on-on		Farnell: 947-3319
SW4	Switch - C&K toggle DPDT on-on		Farnell: 947-3319
SW5	Switch - C&K toggle DPDT on-on		Farnell: 947-3319
SW6	Switch - C&K toggle DPDT on-on		Farnell: 947-3319
SW7	Switch - C&K toggle DPDT on-on		Farnell: 947-3319
SW8	12 Way 1 Pole 1 Gang	Switch - Grayhill 71 12W1P1G	AML: GR-03-002
SW11	12 Way 1 Pole 1 Gang	Switch - Grayhill 71 12W1P1G	AML: GR-03-002
SW2	12 Way 1 Pole 3 Gang	Switch - Grayhill 71 12W1P3G	AML: GR-03-001
SW9	6 Way 2 Pole 1 Gang	Switch - Grayhill 71- 6W2P1G	AML: GR-03-003
SW10	6 Way 2 Pole 1 Gang	Switch - Grayhill 71- 6W2P1G	AML: GR-03-003
U2	TL783	Voltage Regulator	Farnell: 170-3396
T1	VTB9045	Mic InputTransformer - VTB9045	AML: CA-18-VTB9045
T2	VTB9046	Line Input Transformer - VTB9046	AML: CA-18-VTB9046
T3	VTB1847	Line Output Transformer - VTB1847	AML: CA-18-VTB1847
T4	VTT2326	Power Transformer - VTT2326	AML: CA-18-VTT2326
R10	50k	Preset Potentiometer	Farnell: 114-1407
R20	4k7	Preset Potentiometer	Farnell: 114-1403

1R0	R26	1k0	R87	10k	R4	100k	R43
5R6	R11	1k0	R89	10k	R15	100k	R70
5R6	R105	1k2	R13	10k	R22	120k	R28
10R	R1	1k2	R124	10k	R41	120k	R50
10R	R104	1k5	R24	10k	R49	120k	R67
10R	R106	1k5	R63	10k	R53	120k	R77
12R	R23	1k5	R74	10k	R64	180k	R21
15R	R103	1k8	R76	12k	R55	180k	R31
22R	R102	1k8	R80	12k	R56	180k	R40
39R	R101	1k8	R86	12k	R90	180k	R58
47R/3Watt	R6	2k2	R8	15k	R75	220k	R81
56R	R100	2k2	R30	18k	R17	1M0	R5
82R	R73	2k2	R52	18k	R82	4M7	R107
91R	R99	2k2	R60	18k	R91	4M7	R108
120R	R29	2k2	R136			4M7	R109
130R	R84	2k7	R94			4M7	R110
150R	R98	2k7	R95	27k	R27	4M7	R111
240R	R12	2k7	R131	27k	R45	4M7	R112
240R	R97	2k7	R139	33k	R19	4M7	R113
270R	R37	3k3	R9	33k	R34	4M7	R114
360R	R83	3k3	R16	33k	R46	4M7	R115
360R	R96	3k3	R38	39k	R32	4M7	R116
390R	R68	3k3	R65	39k	R54	4M7	R117
390R	R78	3k3	R93	39k	R57	4M7	R118
470R	R59	3k3	R137	39k	R61	4M7	R119
470R	R69	3k6	R33	39k	R132	4M7	R120
510R	R88	3k6	R62	47k	R18	4M7	R121
620R	R25	3k9	R44	47k	R42	4M7	R125
620R	R133	3k9	R71	47k	R51	4M7	R126
620R	R143	3k9	R85			4M7	R127
820R	R39	3k9	R92	51k	R36	4M7	R128
820R	R66	3k9	R144	51k	R48	4M7	R129
		4k3	R145	56k	R14	4M7	R130
		5k1	R35	68k	R7	4M7	R138
		5k1	R47	68k	R72		
		5k1	R134	68k	R79		
		6k8	R122				
		6k8	R123				
		6k8	R141				
		6k8	R142				
		6k8 0.1%	R2				
		6k8 0.1%	R3				
		7k5	R135				
		8k2	R140				

Ref Des	Value	Description									
C23	47pF	Ceramic 2.54mm pitch	C92	220pF	Wima FPK2	C72	100nF	Wima MKS2	C13	2u2F/63	Electrolytic 0.08 pitch 5mm diameter
C40	47pF	Ceramic 2.54mm pitch				C77	100nF	Wima MKS2	C25	2u2F/63	Electrolytic 0.08 pitch 5mm diameter
			C43	680pF	Wima FPK2	C84	100nF	Wima MKS2			
C44	100pF	Ceramic 2.54mm pitch	C55	680pF	Wima FPK2	C85	100nF	Wima MKS2	C8	10uF/50v	Electrolytic 0.08 pitch 5mm diameter
C56	100pF	Ceramic 2.54mm pitch				C86	100nF	Wima MKS2	C26	10uF/50v	Electrolytic 0.08 pitch 5mm diameter
C28	180pF	Ceramic 2.54mm pitch	C21	1nF	Wima MKS2	C89	100nF	Wima MKS2	C42	10uF/50v	Electrolytic 0.08 pitch 5mm diameter
C39	180pF	Ceramic 2.54mm pitch	C35	1nF	Wima MKS2	C90	100nF	Wima MKS2	C46	10uF/50v	Electrolytic 0.08 pitch 5mm diameter
C9	220pF	Ceramic 2.54mm pitch	C49	1nF	Wima MKS2	C91	100nF	Wima MKS2	C54	10uF/50v	Electrolytic 0.08 pitch 5mm diameter
C6	330pF	Ceramic 2.54mm pitch	C58	1nF	Wima MKS2	C99	100nF	Wima MKS2			
C22	470pF	Ceramic 2.54mm pitch							C17	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C27	470pF	Ceramic 2.54mm pitch	C53	1n5F	Wima MKS2	C74	220nF	Wima MKS2	C18	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C50	470pF	Ceramic 2.54mm pitch	C60	1n5F	Wima MKS2	C79	220nF	Wima MKS2	C32	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
						C7	330nF	Wima MKS2	C34	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C24	680pF	Ceramic 2.54mm pitch	C29	2n2F	Wima MKS2	C75	470nF	Wima MKS2	C36	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C41	680pF	Ceramic 2.54mm pitch	C93	2n2F	Wima MKS2	C80	470nF	Wima MKS2	C37	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
			C95	2n2F	Wima MKS2				C38	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C15	100nF	Ceramic 2.54mm pitch				C76	1uF	Wima MKS2	C45	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C16	100nF	Ceramic 2.54mm pitch	C10	4n7F	Wima MKS2	C81	1uF	Wima MKS2	C64	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C20	100nF	Ceramic 2.54mm pitch	C94	4n7F	Wima MKS2				C66	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
C1	100nF	Ceramic 2.54mm pitch							C68	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
			C19	10nF	Wima MKS2				C100	22uF/63v	Electrolytic 0.1 pitch 6.3mm diameter
			C57	10nF	Wima MKS2						
			C96	10nF	Wima MKS2				C4	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C82	15nF	Wima MKS2				C11	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C87	15nF	Wima MKS2				C12	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C102	15nF	Wima MKS2				C14	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
									C31	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C73	22nF	Wima MKS2				C61	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C78	22nF	Wima MKS2				C65	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C97	22nF	Wima MKS2				C69	100uF/25v	Electrolytic 0.1 pitch 6.3mm diameter
			C101	22nF	Wima MKS2						
			C103	22nF	Wima MKS2				C5	220uF/63v	Electrolytic 0.2 pitch 10mm diameter
									C47	220uF/63v	Electrolytic 0.2 pitch 10mm diameter
			C83	47nF	Wima MKS2				C48	220uF/63v	Electrolytic 0.2 pitch 10mm diameter
			C88	47nF	Wima MKS2				C62	220uF/63v	Electrolytic 0.2 pitch 10mm diameter
			C98	47nF	Wima MKS2				C63	220uF/63v	Electrolytic 0.2 pitch 10mm diameter
									C59	470uF/16v	Electrolytic 0.2 pitch 10mm diameter
									C67	470uF/16v	Electrolytic 0.2 pitch 10mm diameter
									C2	470uF/35v	Electrolytic 0.2 pitch 10mm diameter
									C3	470uF/35v	Electrolytic 0.2 pitch 10mm diameter
									C30	470uF/35v	Electrolytic 0.2 pitch 10mm diameter
									C33	470uF/35v	Electrolytic 0.2 pitch 10mm diameter
									C51	1000uF/35v	Electrolytic 0.2 pitch 12.5mm diameter
									C52	1000uF/35v	Electrolytic 0.2 pitch 12.5mm diameter
									C70	1000uF/35v	Electrolytic 0.2 pitch 12.5mm diameter
									C71	1000uF/35v	Electrolytic 0.2 pitch 12.5mm diameter

ez1073 Calibration / Setup

Power Up;

Measure the voltage between J6 and J5 (the “DC Feeds” spade terminals)

You should read +24 volts

Phantom Voltage Setting;

Measure the voltage between J3 and J5 (the “DC Feeds” spade terminals)

Adjust R10 until you read +48 volts

Output Bias Setting*;

Measure the voltage across R26

You should initially get a reading of about 70-80mV DC

Adjust R20 until you read 130mV

* If you have the equipment available, the “correct” way to do this is by measuring the output distortion and adjusting R20 for minimum. However, you will probably end up with a current of about 130mA anyway so the above method works fine.