

**JBL**

Project Array™  
**1500 Array**  
Subwoofer

**Service Manual**



JBL Consumer Products  
250 Crossways Park Dr.  
Woodbury, New York 11797

Rev0 4/2006

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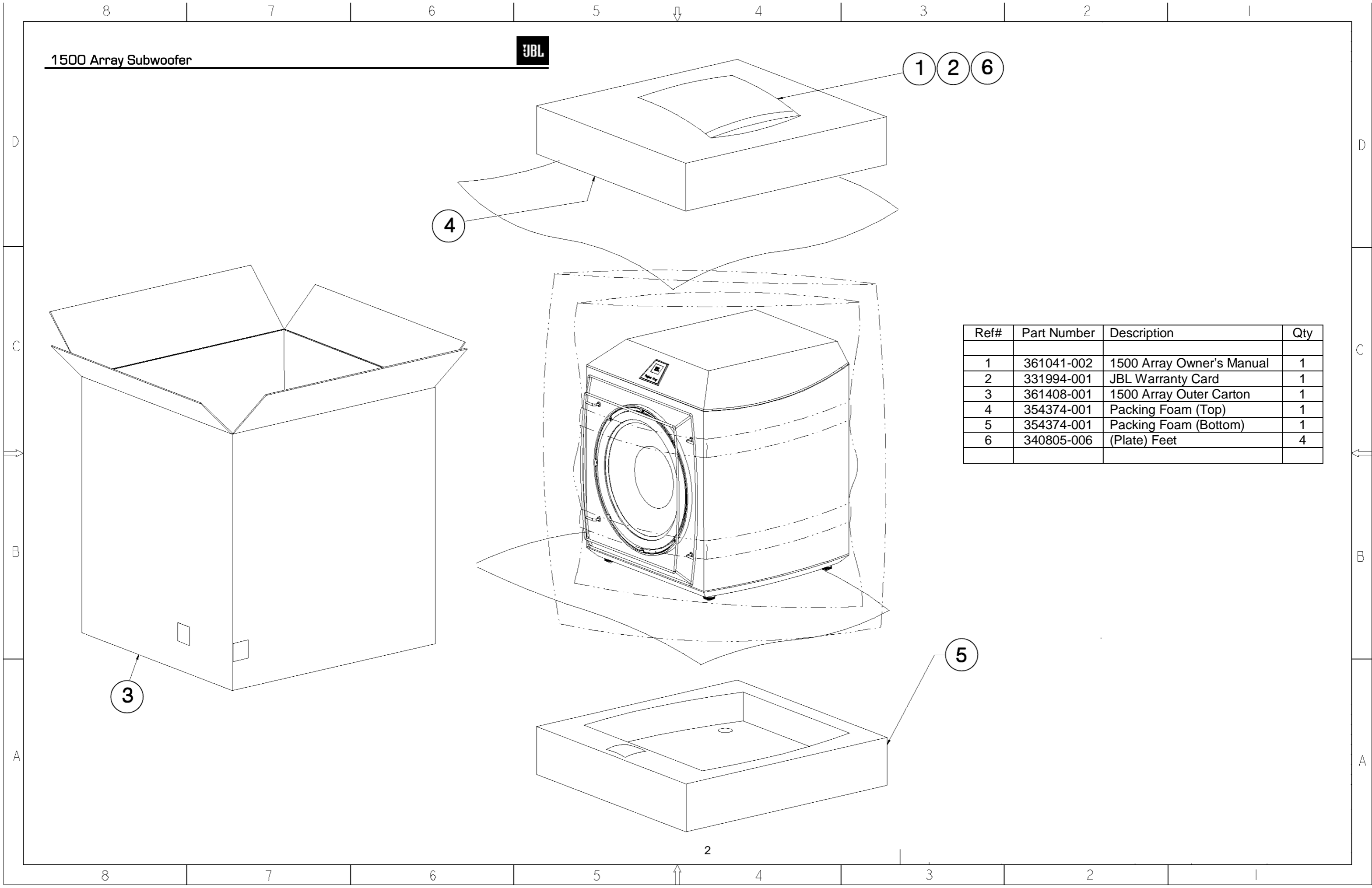
### 1500 ARRAY SPECIFICATIONS

#### General

Output	1000W
Low-Frequency Transducer	W1500H 15" Pulp-cone driver
Frequency Response (-3dB)	25Hz – 400Hz, variable
Crossover Frequencies	40Hz-140Hz HP
Port	4" Flared
Dimensions (H x W x D)	23" x 19-1/2" x 19" (584mm x 495mm x 483mm) 21" (533mm) Deep with grille
Weight	125 lb (57kg)

JBL continually strives to update and improve existing products, as well as create new ones. The specifications and details in this and related JBL publications are therefore subject to change without notice.

1500 Array Subwoofer



Ref#	Part Number	Description	Qty
1	361041-002	1500 Array Owner's Manual	1
2	331994-001	JBL Warranty Card	1
3	361408-001	1500 Array Outer Carton	1
4	354374-001	Packing Foam (Top)	1
5	354374-001	Packing Foam (Bottom)	1
6	340805-006	(Plate) Feet	4

# 1500 Array Subwoofer

1500 Array Powered Sub/ Plate Amp					
LINE VOLTAGE	Yes/No	Hi/Lo Line	Nom.	Unit	Notes
US 120VAC/60Hz	YES	108-132	120	Vrms	Normal Operation
EU 230VAC/50-60Hz	YES	207-264	230	Vrms	Normal operation, MOMS required
Asia 100VAC/50Hz	YES	90-110	100	Vrms	Normal operation, MOMS required
Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
<b>Amp Section</b>					
Type (Class AB, D, other)	D	n/a	n/a		Bridge type amplifier, None of the speaker terminals must be connected to system GND at any time.
Load Impedance (speaker)	8	Ohms	n/a	Nominal	
Rated Output Power	650	Watts	593	1 input driven	Test frequency 100 Hz
THD @ Rated Power	0.5	%	1	22K filter	
THD @ 1 Watt	0.1	%	0.2	22K filter	
Dynamic Power	700	Watts	690	Power is the average measurement of the first four consecutive peaks of the burst signal	3/20 Cycles @ 50 Hz, burst test into 8 Ohms, input driven with 800mV RMS
DC Offset	20	mV-DC	100	@ Speaker Outputs	
Damping factor	>20	DF	15	Measured at amplifier board	Measured at the speaker cable. 500 Watts, measured at speaker output terminals located at the amp board.
<b>Input Sensitivity</b>					
Input Frequency	100	Hz	100	Nominal Freq.	
Line level input	11.69	mVrms	±2dB	To 1 Watt	Single input driven, Ap Zo=600 Ohms, LFE mode, Volume ctrl. at max.
<b>Signal to Noise</b>					
SNR-A-Weighted	100	dBA	95	Relative to rated power (650 Watts)	A-Weighting filter
SNR-unweighted	95	dBr	90	Relative to rated power (650 Watts)	22K filter
SNR rel. 1W-unweighted	70	dBr	65	Relative to 1W Output	22K filter
Residual Noise Floor	0.5	mVrms	1	Volume @max, LFE Mode, using RMS reading DMM/VOM (or A/P)	
Residual Noise Floor	0.5	mVrms(max)	1	Volume @max, LFE Mode, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics)	
<b>Input Impedance</b>					
Line Input	10K	ohms	n/a	Nominal	
<b>Filters</b>					
LP 4th order variable	40-140	Hz	± 10		
Subsonic filter (HPF) 3rd Order	Fixed	Hz	± 10		
LFE Mode	Fixed	Hz	± 10	LP Mode switch at LFE	
<b>Features</b>					
Line Level output	YES		functional		RCA Line buffered line level output
Volume pot Taper (lin/log)	LOG	--	functional		A Taper
Variable crossover 40-140 Hz	YES		functional		4th Order LP Filter, 2nd order fix and 2nd order variable.
LP Selector switch LFE-Normal	YES		functional		Pass through from the speaker input section
Phase switch	YES	--	functional		Disables LP filter, intended for LFE
Auto- On-Off selector	YES		functional		Switch located at the back panel
<b>Input Configuration</b>					
Single Line input	YES	--	functional		Single RCA jack (BLK Color)
<b>Line output configuration</b>					
Single Line level output	YES		Functional	Gain=0dB respect to line level input, Zo=600 Ohms	Single RCA jack (BLK Color)
<b>Signal Sensing (ATO)</b>					
Auto-Turn-On (yes/no)	YES		functional	Auto - on selection switch in Auto	
ATO Input test frequency	50	Hz	functional	"	
ATO Level, Line Input	2.5	mV	functional	"	
ATO Turn-on time	2	seconds	functional	Amp connected and AC on, then input signal applied	
Auto Mute/ Turn-OFF Time	15	minutes	17	(T) Time before muting, after input signal is removed	Auto turn of time (T) must be 10 > T < 17 Minutes
<b>Power on Delay time</b>					
ATO mode	4	sec.	5		After applying the minimum ATO voltage (2mVRMS)
ON mode	2	sec.	2		After turning the stand-by knob to ON position

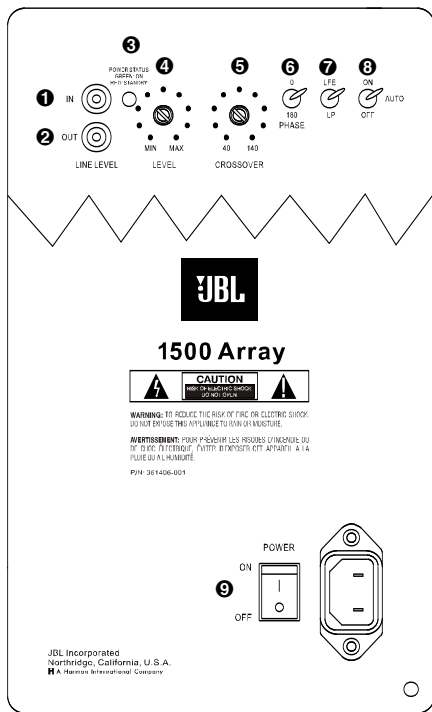
# 1500 Array Subwoofer



Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
<b>Transients/Pops</b>					
ATO Transient	5	mV-peak	n/a	@ Speaker Output	
Turn-on Transient	50	mV-peak	1V-pk-pk	@ Speaker Output	AC Line cycled from OFF to ON
Turn-off Transient	50	mV-peak	1V-pk-pk	@ Speaker Output	AC Line cycled from ON to OFF
<b>Efficiency</b>					
Efficiency	73	%	70	500W of output power into rated impedance	Nominal Line voltage
Stand-by Input Power	2		3	@ nominal line voltage, Amp in OFF state, RED LED activated	Maximum allowable input power LED in RED, Class D inactive
Stand-by Input Power	10	Watts	8	@ nom. line voltage, Amp in On state, Green LED activated	Maximum allowable input power under nominal Input voltage and frequency, in stand-by mode (HOT or COLD operation, LED GREEN). Class D active but no stimulus signal applied.
Power Cons. @ 500W	678	Watts	714	@ nom. line voltage	500 Watts into rated impedance 8 Ohms
<b>Protection</b>					
Thermal Protection	YES		functional	@ 1/8 max unclipped Power	not exceed 35K rise for domestic version or 30K rise for European versions (refer to requirements sheet). Unit is protected for over-temperature conditions
DC Offset Protection	YES		-	DC present at Speaker Out leads	Relay opens during a DC output condition
Line Fuse Rating					
Japan 100V & USA- Versions	6.3	Amps		Type-T or Slo Blo-250 V	UL, PSE Approved
Europe 220-240V	3.15	Amps		Type-T, Low breaking capacity-250V	SEMKO Approved

## SPEAKER CONNECTIONS

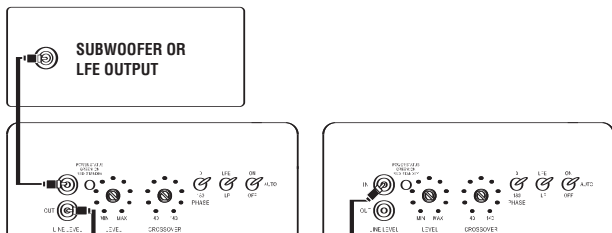
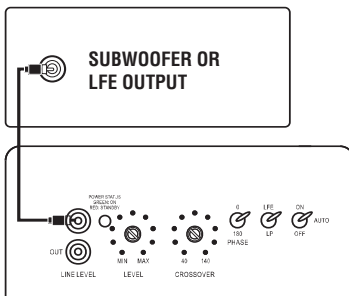
### Subwoofer Controls and Connections (1500 Array Only)



- 1 Line-Level Input
- 2 Line-Level Output
- 3 Power Indicator
- 4 Subwoofer Level (Volume) Control
- 5 Crossover Adjustment
- 6 Phase Switch
- 7 LP/LFE Selector
- 8 On/Off Auto Switch
- 9 Power Switch

#### Connection:

If you have a Dolby® Digital or DTS® receiver/processor with a low-frequency-effects (LFE) output, set LFE/LP switch to LFE. If you prefer to use the crossover built into the 1500 Array, set the LFE/LP Switch 7 to LP.



The 1500 Array includes a line output. This output allows you to “daisy chain” one 1500 Array to multiple 1500 Array subwoofers. Simply connect the first subwoofer as described above and then run a subwoofer cable from the line output(s) to the line input on the next sub.

## 1500 ARRAY OPERATION

### Power On

Plug your subwoofer's AC cord into a wall outlet. Do not use the outlets on the back of the receiver.

Initially set the Subwoofer Level (Volume) Control ④ to the "min" position.

Turn on your sub by pressing the Power Switch ⑨ on the rear panel.

### Auto On/Standby

With the Power Switch ⑨ in the "on" position, the Power Indicator LED ③ will remain backlit in red or green to indicate the On/Standby mode of the subwoofer.

RED = STANDBY (No signal detected, Amp Off)

GREEN = ON (Signal detected, Amp On)

The subwoofer will automatically enter the Standby mode after approximately 10 minutes when no signal is detected from your system. The subwoofer will then power ON instantly when a signal is detected. During periods of normal use, the Power Switch ⑨ can be left on. You may turn off the Power Switch ⑨ for extended periods of non-operation, e.g., when you are away on vacation.

If the Auto Switch ⑧ is in the "on" position, the subwoofer will remain on.

### Adjust Level

Turn on your entire audio system and start a CD or movie soundtrack at a moderate level. Turn up the Subwoofer Level (Volume) Control ④ about halfway. If no sound emanates from the subwoofer, check the AC-line cord and input cables. Are the connectors on the cables making proper contact? Is the AC

plug connected to a "live" receptacle? Has the Power Switch ⑨ been pressed to the "on" position? Once you have confirmed that the subwoofer is active, proceed by playing a CD or movie. Use a selection that has ample bass information.

Set the overall volume control of the preamplifier or stereo to a comfortable level. Adjust the Subwoofer Level (Volume) Control ④ until you obtain a pleasing blend of bass. Bass response should not overpower the room but rather should be adjusted so there is a harmonious blend across the entire musical range. Many users have a tendency to set the subwoofer volume too loud, adhering to the belief that a subwoofer is there to produce lots of bass. This is not entirely true. A subwoofer is there to enhance bass, extending the response of the entire system so the bass can be felt as well as heard. However, overall balance must be maintained or the music will not sound natural. An experienced listener will set the volume of the subwoofer so its impact on bass response is always there but never obtrusive.

### Crossover Adjustments

NOTE: This control will have no effect if the LP/LFE Selector Switch ⑦ is set to "LFE." If you have a Dolby Digital or DTS processor/receiver, the Crossover Frequency is set by the processor/receiver. Consult your owner's manual to learn how to view or change this setting.

The Crossover Adjustment Control ⑤ determines the highest frequency at which the subwoofer reproduces sounds.

If your main speakers can comfortably reproduce some low-frequency sounds, set this control to a lower frequency setting, between 50Hz and 100Hz. This will concentrate the subwoofer's efforts on the ultradeep bass sounds required by today's films and music. If you are using smaller bookshelf speakers that do not extend to the lower bass frequencies, set the Crossover Adjustment Control to a higher setting, between 120Hz and 150Hz.

### Phase Control

The Phase Switch ⑥ determines whether the subwoofer speaker's pistonlike action moves in and out with the main speakers (0°) or opposite the main speakers (180°). Proper phase adjustment depends on several variables, such as subwoofer placement and listener position. Adjust the Phase Switch to maximize bass output at the listening position.

## **BASIC TROUBLESHOOTING**

### **If there is low (or no) bass output**

- Make sure the connections to the left and right “Speaker Inputs” have the correct polarity (+ and –).
- Make sure the subwoofer is plugged into an active electrical outlet.
- Make sure the Power Switch is on.
- In Dolby Digital or DTS modes, make sure your receiver/processor is configured so that the subwoofer and LFE output are enabled.
- Adjust the Subwoofer Level Control

8 7 6 5 4

1500 Array Subwoofer

1500 ARRAY SUB EXPLODED VIEW

8 PLCS. 10

9

2

12

5

6

13

1

3

11

X RAY VIEW FOR ILLUSTRATIVE PURPOSES ONLY

DAMPING MATERIAL NOT SHOWN

4

7 4 PLCS.

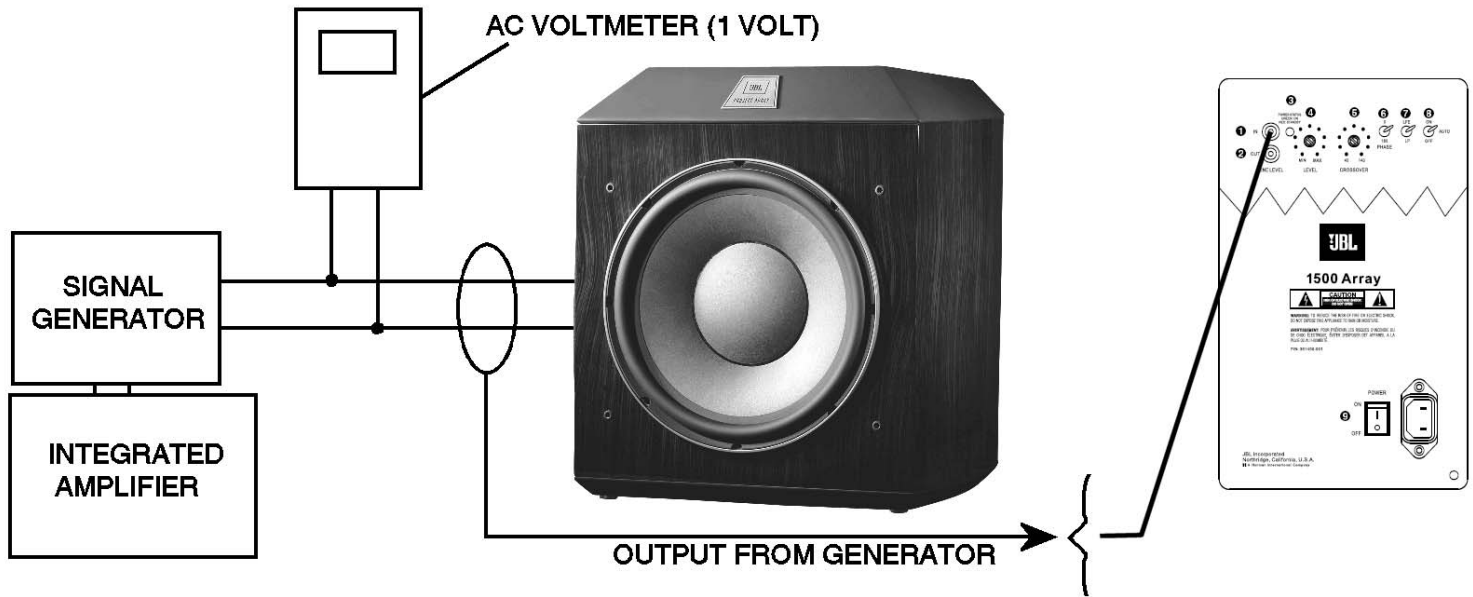
8 4 PLCS.

**1500 ARRAY MECHANICAL PARTS LIST**

Item #	Description	Part Number	Qty
1	CABINET ASSEMBLY-1500 ARRAY	Not for Sale	1
2	15" WOOFER-W1500H	353721-001	1
3	AMPLIFIER ASSEMBLY,120V-ARRAY	Not for Sale	1
4	POWER TRANSFORMER-1500 ARRAY BG	361407-001	1
5	PORT TUBE -1500 ARRAY	360806-001	1
6	CARBOARD TUBE,4 1/4x4x1/8x6-4338	47909-68	1
7	FOOT,NUT,INSERT,BLK	340805-004	4
8	FOOT,SPIKE,BLK	340805-005	4
9	GRILLE,FRONT, 1500 ARRAY	354507-001	1
10	WOOFER SCREW,10-32 X 1,FIL,PH,BLK ZINC,LCS	804-01110-16	8
11	AMPLIFIER SCREW,8 X 1,PAN,PH,PB,BLK ZINC,LCS	883-41110-16	10
12	GASKET,DRVR,15"	338073-001	1
13	LOGO-JBL	360813-001	1

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## 1500 Array TEST PROCEDURE



### Equipment needed:

- Function/signal generator/sweep generator
- Multimeter
- RCA cable

### General Unit Function (UUT = Unit Under Test)

#### Switch/Controls:

GAIN control full Counterclockwise (Min)

CROSSOVER (Hz) Full Clockwise (140)

PHASE switch - either position

LFE/LP – LP position

- 1) From the signal generator, connect one line level (RCA) cable to the Line In jack on the UUT.
- 2) Turn on generator; adjust to **200mV, 50 Hz**.
- 3) Plug AC power cord in UUT, turn power switch ON.
- 4) LED should be ON (faceplate). Turn up LEVEL control to full Clockwise (Max).
- 5) LED should be Green; Bass response should be heard and felt vigorously from woofer and port tube.
- 6) Turn LEVEL control full Counterclockwise (Min). Turn power switch OFF.

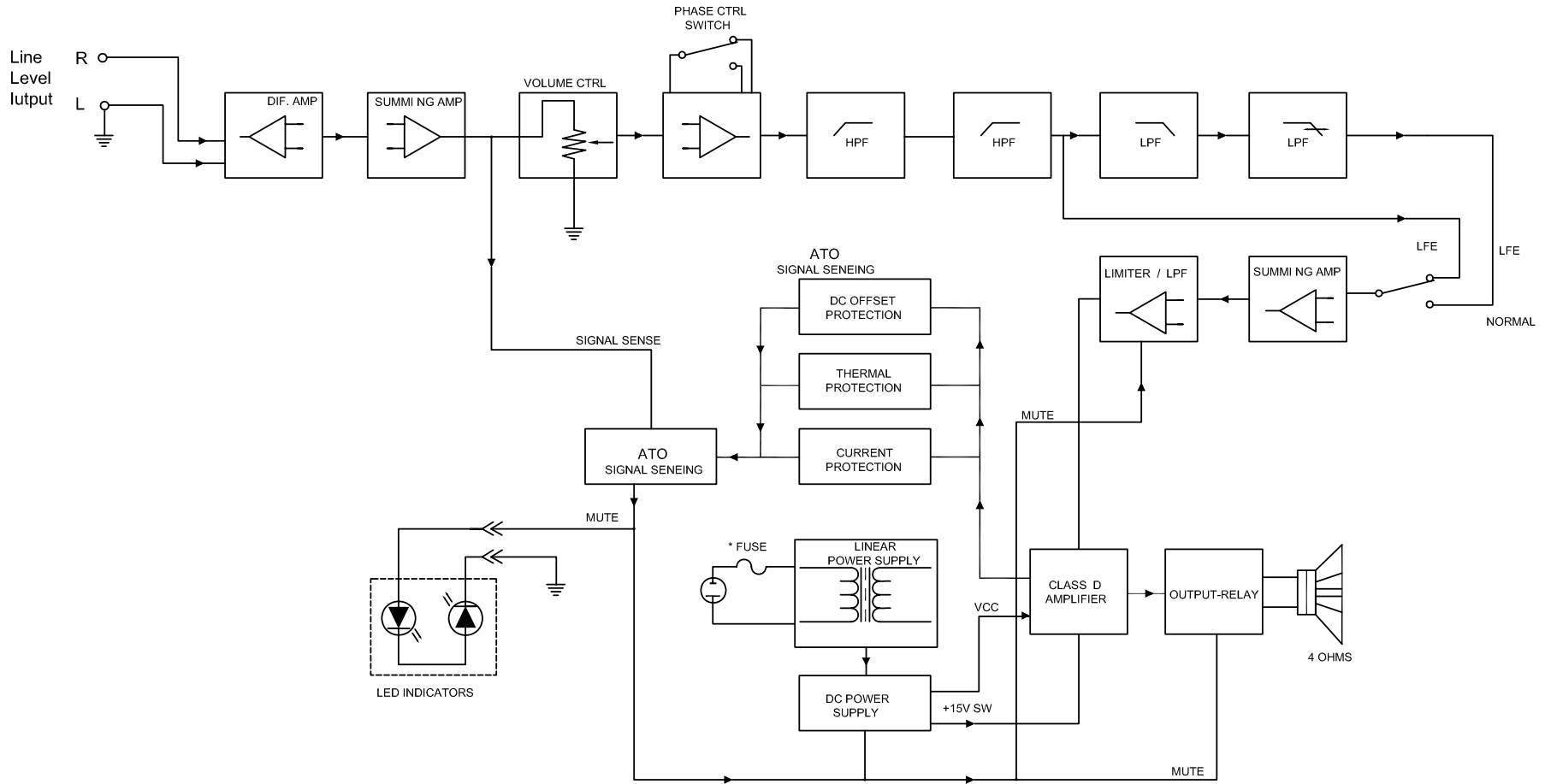
### Sweep Function

- 1) Follow steps 1-5 above, using a sweep generator as a signal source – adjust the generator to **75mV, 50 Hz**.
- 2) Sweep generator from 20Hz to 300Hz. Listen for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, test woofer according to the instructions below.

### Driver Function

- 1) Remove woofer from the enclosure.
- 2) Check DC resistance of woofer; it should be **5.9  $\Omega$   $\pm$ 10%**,
- 3) Connect a pair of speaker cables to woofer terminals. Cables should be connected to an integrated amplifier fed by a signal generator. Turn on generator and adjust so that speaker level output is **6.0V**.
- 4) Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.

1500 ARRAY BLOCK DIAGRAM



NOTE :  
 120 VAC T6.3A-250V  
 230 VAC T3.15A-250V

1500 Array 120V Electrical parts list			
Part number	Qty	Description	Reference Designator
<b>DRIVER PCB</b>			
<i>Resistors</i>			
024-000098-120ZS	4	GS SMD Resistor 0R 1/8W J 0805	R313,314,318,320
024-100298-120ZS	4	GS SMD Resistor 10R 1/8W J 0805	R89,90,140,150
024-100498-120ZS	10	GS SMD Resistor 1K 1/8W J 0805	R81,85,96,97,131,137,142,147,162,179
024-100598-120ZS	12	GS SMD Resistor 10K 1/8W J 0805	R75,83,92,98,132,133,151,156,163,164,183,82,
024-110598-120ZS	2	GS SMD Resistor 11K 1/8W J 0805	R74,99
024-200598-120ZS	4	GS SMD Resistor 20K 1/8W J 0805	R95,141,148,181
024-220398-120ZS	2	GS SMD Resistor 220R 1/8W J 0805	R136,167
024-220498-121ZS	1	GS SMD Resistor 2K2 1/8W J 0805	R134
024-220598-120ZS	1	GS SMD Resistor 22K 1/8W J 0805	R37
024-220798-120ZS	2	GS SMD Resistor 2M2 1/8W J 0805	R87,93
024-270498-120ZS	3	GS SMD Resistor 2K7 1/8W J 0805	R80,84,157
024-390498-120ZS	2	GS SMD Resistor 3K9 1/8W J 0805	R130,161,
024-390598-120ZS	2	GS SMD Resistor 39K 1/8W J 0805	R86,94
024-470398-120ZS	1	GS SMD Resistor 470R 1/8W J 0805	R91
024-470498-120ZS	4	GS SMD Resistor 4K7 1/8W J 0805	R34,36,152,153
024-470598-120ZS	1	GS SMD Resistor 47K 1/8W J 0805	R35
024-470698-120ZS	2	GS SMD Resistor 470K 1/8W J 0805	R32,33
024-560598-120ZS	1	GS SMD Resistor 56K 1/8W J 0805	R38
024-680498-120ZS	2	GS SMD REsistor 6K8 1/8W J 0805	R135,166
<i>Capacitors</i>			
031-100244-100ZS	4	GS SMD Ceramic cap. 0u01/50V K 0805 X7R	C108,118,131,140
031-100343-100ZS	2	GS SMD Cap. 100pF/50V J 0805 NPO	C81,84
031-100344-100ZS	6	GS SMD Cap. 0u1/50V K 0805 X7R	C75-78,82,85
031-180344-100ZS	2	GS SMD Cap. 0u18/50V K 0805 X7R	C80,83
031-470244-102ZS	4	GS SMD Cap. 0u047/50V K 0805 X7R	C93,94,101,124
031-560243-100ZS	4	GS SMD Cap. 56pF/50V J 0805 NPO	C92,102,105,125
031-560343-102ZS	1	GS SMD Cap. 560pF/50V J 0805 NPO	C79
034-100614-300ZS	1	GS Elec. Cap. 100uF/16V M (R)0611 P:2.5	C117
<i>Semiconductors</i>			
054-000100-100ZS	2	GS SMD DIODE: PN:ES1D 200V 1A	D35,43
054-005501-100ZR	1	GR SMD ZENER DIODE PN:BZV55C3V6 (PHILIPS)	D60
054-007200-100LZS	2	GS SMD IC: (JRC) M072M-DUAL OP-AMP	U9,10
054-008406-000ZR	2	GR SMD ZEN DIODE:(PHILIPS) BZX84C10-7-F SOT-23	D42,49
054-008408-000ZR	2	GR SMD ZEN DIODE:(PHILIPS) BZX84C5V6-7-F SOT-23	Z7,8
054-033906-100ZR	2	GR SMD Transistor (ON) PN:MMBT3906LT1G SOT23	Q34,35
054-414803-100ZS	5	GS SMD DIODE: PN:LL4148 MINI-MELF	D36,39,46,52,61
054-540100-100ZR	2	GR SMD Transistor PNP (ON SEN) MMBT5401 LT1 SOT-23	Q33,40
054-555100-100ZR	1	GR SMD Transistor (NPN) PN:MMBT5551 LT1R (ON)	Q32
051-222200-100ZR	2	GR Transistor NPN (ON SEM) PN:MPS2222ARLRAR TO-92	Q20,22
051-555100-000ZR	2	GR Transistor NPN PN:2N5551 TO-92	Q21,23
051-000600-100ZR	1	GR Transistor NPN PN:MPSW06RLRA TO-92 (ON)	Q31
053-211100-000ZR	2	GR IC:DIP,HALF-BRIDGE DRIVER PN:IR2111 8PIN (IR)	U7,8
<i>Miscellaneous</i>			
072-040229-000ZR	1	GR HEADER Right Angle PN:211-107-000-400 7PIN	PIN2
072-040230-000ZR	1	GR HEADER Right Angle PN:211-111-000-400 11PIN	PIN1
<b>PREAMP PCB</b>			
<i>Resistors</i>			
024-000097-120ZS	5	GS SMD Resistor PN:1206J000 0R 1/4W J 1206	R258,290,297,302,303,
024-100497-100ZS	4	GS SMD Resistor PN:1206F102 1K 1/4W F 1206	R238,264,288,291
024-100598-121ZS	15	GS SMD Resistor 10K 1/4W J 1206	R202,206,207,212,222,235,252-254,257,228,229,262,268,284
024-150498-121ZS	1	GS SMD Resistor 1K5 1/4W J 1206	R251
024-150598-100ZS	1	GS SMD Resistor 15K 1/8W F 0805	R223,
024-200597-100ZS	5	GS SMD Resistor PN:1206F203 20K 1/4W F 1206	R256,208,209,231,232
024-220298-121ZS	1	GS SMD Resistor 22R 1/4W J 1206	R249

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Part number	Qty	Description	Reference Designator
<b>PREAMP PCB</b>			
024-220397-120ZS	1	GS SMD Resistor 220R 1/4W J 1206	R255
024-237598-120ZS	1	GS SMD Resistor 23K7 1/8W F 0805	R281
024-270498-121ZS	1	GS SMD Resistor 2K7 1/4W J 1206	R237
024-330397-120ZR	2	GR SMD Resistor 330R 1/4W J 1206	R211,282
024-330498-121ZS	1	GS SMD resistor 3K3 1/4W J 1206	R240
024-330598-121ZS	4	GS SMD resistor 33K 1/4W J 1206	R298,406,408,414
024-365697-100ZR	1	GR SMD resistor 365K 1/4W F 1206	R285
024-402597-100ZS	1	GS SMD resistor 40K2 1/4W F 1206	R260
024-432598-100ZR	1	GR SMD resistor 43K2 1/8W F 0805 TPAING	R214
024-470598-121ZS	1	GS SMD resistor 47K 1/4W J 1206	R280
024-470698-121ZS	1	GS SMD resistor 470K 1/4W J 1206	R259
024-470797-100ZS	2	GS SMD resistor 4M7 1/4W F 1206	R244,243
024-536597-100ZR	1	GR SMD resistor 53K6 1/4W F 1206	R283
024-560598-121ZS	1	GS SMD resistor 56K 1/4W J 1206	R224
024-620398-121ZS	2	GS SMD resistor 620R 1/4W J 1206	R221,226,
024-680498-121ZS	1	GS SMD resistor 6K8 1/4W J 1206	R247
024-680598-121ZS	1	GS SMD resistor 68K 1/4W J 1206	R250
024-820598-121ZS	1	GS SMD resistor 82K 1/4W J 1206	R263
021-432598-100ZS	1	GS Metal film 43K2 1/8W F	R214
021-475498-100ZR	1	GR MF resistor 4K75 1/8W F	R204
026-500495-005ZS	1	GS VR 5K PN:RD163111R22B-5K15A-EJ GAIN	R216
026-500595-267ZS	1	GS VR 50KBx4 PN:RD1631411001D-50KBx4	R233
<i>Capacitors</i>			
031-100244-101ZS	2	GS SMD cap. 0u01/50V K 1206 X7R	C12,13
031-100344-102AZS	8	GS SMD cap. 0u1/50V K 1206 X7R	C227,229,230,232-235,200
031-100344-104AZS	1	GS SMD cap. 100pF/50V K NPO 1206	C222
031-220344-106AZS	3	GS SMD cap. 220pF/50V K X7R 1206	C215,216,204
031-270244-100ZR	1	GR SMD cap. 0u027/50V K 0805 X7R	C280
031-270444-101	1	SMD cap. 2700pF/50V K 1206 X7R	C224
031-470144-101AZS	2	GS SMD cap. 0u0047/50V K 0805 X7R	C2G1,C281
031-680144-100ZS	1	GS SMD cap. 0u0068/50V K 0805 X7R	C212
034-100515-304ZS	2	GS elec. Cap. 10uF/16V M (R)0511 P:2.5 TAPIN	C220,237
034-100615-301ZS	1	GS Elec. Cap. 100uF/16V M (R)0611 P:5	C221
034-220516-301ZS	6	GS elec. Cap. 22uF/16V M (R)0511 P:2	C223,416,14,15,411,415
035-100343-300ZS	1	GS PE Cap. 0uF1/50V J P:5	C213
035-220243-100ZR	1	GR PE Cap. FE-M 0u022/63V J P:5m/m	C202
035-330293-300ZR	2	GR PE Cap. PN:ESK063S33JT 0u033/63V J P:5	C209,218
035-470353-302ZR	2	GR PE Cap. P:5 0u47/63V J P/N:R82DC347DQJ	C207,208
035-680253-300ZR	1	GR PE Cap. FE-M PN:ESK063S68JT 0u068/63V J P:5mm	C201
033-330515-300ZS	2	GS NPE cap. 33uF/16V M (R)0511 P:2	C214,225
<i>Semiconductors</i>			
054-007200-100LZS	6	GS SMD IC: (JRC) M072M-DUAL OP-AMP	U200-205
054-011400-100ZR	1	GR SMD Transistor PN:DTC114TKA SMT3 (ROHM)	Q202
054-390402-100ZR	2	GR SMD Transistor (SC00044) PN:MMBT3904TR(Fairchild)	Q203,204
054-414803-100ZS	14	GS SMD DIODE: PN:LL4148 MINI-MELF	D201,204,207,209,212,216,218,219,405,413,414,217,203,200,
054-523701-100ZR	1	GR SMD ZENNER DIODE: (GMT) GMBZ5237B 8V2 SOT23	D206
050-505200-001ZS	1	GS LED PN:LT-2402-21	LED1
051-011100-100ZR	1	GR JFET N-Channel PN:J111 TO-92 (FAIRCHILD)	Q200
<i>Miscellaneous</i>			
072-010360-000ZR	1	GR RCA JACK PN:B217CK	J201
072-040008-110ZS	1	GS Terminal housing PN:JS-1001-08 8P P:2.5	P2
074-030002-000ZR	2	GR TOGGLE SW PN:L101-T2B4QE LFE, PHASE	SW201,202
074-030018-000ZR	1	GR TOGGLE SW PN:L103-T2-B4 AUTO ON-OFF	SW200
<b>FUSE PCB</b>			
073-050001-000ZS	2	GS FUSE CLIP P/N:CT-FH1206	for F1
091-000132-000ZR	1	GR FUSE T6.3A/250V GSL-6.3 $\phi$ 5x20m/m	F1
072-040039-000ZR	3	GR (PCB TYPE) PC205 (t=0.8m/m) T205MA	T2,TER5,6,
072-040064-000ZR	1	GR Terminal (PCB TYPE) PC250 (t=0.8m/m) T250MA	TER1
039-220384-100ZR	2	GR X2 Safety Cap. 0u22/250V HQX0.22K275VX2 18x16.5x8.5	CXAC1,CXAC2
043-155300-000ZR	1	GR COIL PN:YT-13192 155uH $\pm$ 10%	L7

# 1500 Array Subwoofer

Part number	Qty	Description	Reference Designator
<b>FUSE PCB</b>			
043-324300-000ZR	1	GR INDUCTOR 324uH YT-10778	L13
025-006000-000ZR	1	GR Thermister P/N:CL-60	TH3
<b>POWER PCB</b>			
<i>Capacitors</i>			
032-100484-200ZS	3	GS END Mylar cap. 1uF/250V K P:15	C410,418,427
034-680794-200ZR	4	GR Elec. Cap. (LP) 85 °C 6800uF/80V M (R)3050 P:10	C420-423,
030-180384-300ZR	1	GR Ceramic cap. 180pF/250V K X7R P:5	C419( in series with R403 T400 pin2-5)
031-220364-100ZS	1	GS SMD Cap. 0u22/100V K 1206 X7R	C424
031-100384-100RZS	2	GS SMD cap.0u1/250V K 1206 X7R	C428,429
031-100344-102AZS	4	GS SMD cap. 0u1/50V K 1206 X7R	C417,401-403,
031-100244-101ZS	3	GS SMD cap. 0u01/50V K 1206 X7R	C404-406
034-220625-300ZS	2	GS electrolytic cap. 220uF/25V M (R)0812 P:5	C414,413
034-330625-300ZS	1	GS elec. Cap. 330uF/25V M (R)1013 P:5	C412
034-470415-300ZS	1	GS electrolytic cap. 4u7/50V M (R)0511 P:2.0	C407
034-470515-200ZR	1	GR elec. Cap. 47uF/16V M (R)0511 P:2.5	C408
034-220516-301ZS	6	GS electrolytic cap. 22uF/16V M (R)0511 P:2	C223,416,14,15,411,415
035-100464-300ZR	2	GR ESK mylar cap. 1u/100V K P:5	C425,426
<i>Resistors</i>			
028-100301-020ZR	1	GR FUSIBLE RES 100R 1W J	R403(C419 in sereis with C403 T400 pin2-5)
024-910498-120ZS	2	GS SMD resistor 9K1 1/8W J 0805	R413,415
024-470398-121ZS	2	GS SMD resistor 470R 1/4W J 1206	R401,402
024-100598-101ZS	4	GS SMD resistor PN:1206F103 10K 1/4W F 1206	R409,416,417,405
024-220498-120ZS	1	GS SMD resistor 2K2 1/4W J 1206	R400
<i>Semiconductors</i>			
054-008407-000ZR	3	GR SMD ZEN DIODE:(PHILIPS) PN:BZX84C15-7-F SOT-23	D400,402,403
054-000100-100ZR	4	GR GS SMD DIODE: PN:ES1D 200V 1A (PANJIT)	D406-409
050-013000-100	1	DIODE TVZ:DIP PN:P6KE130A (CONCORD)	D404
051-000600-100ZR	1	GR transistor NPN PN:MPSW06RLRA TO-92 (ON)	Q406
051-0005600-100ZR	1	GR transistor PNP PN:MPSW56RLRAR TO-92 (ON)	Q408
051-003100-000ZS	1	GS transistor NPN PN:TIP 31C TO-220 (MOSPEC)	Q404
054-390402-100ZR	1	GR SMD Transistor (SC00044) PN:MMBT3904TR(Fairchild)	Q402
052-150400-000ZR	1	GR bridge rectifier PN:GBJ1504	BR400
053-010200-000	1	IC:DIP PN:TOP102YAI (PWM Switch)	U400
<i>Miscellaneous</i>			
044-100100-000ZS	3	GS SMD FERRITE BEAD PN:321611 600R/100MHz 1206	FB403-405
044-100103-000ZS	1	GS SMD FERRITE BEAD PN:321611 800R/100MHz 1206	FB406
043-560200-000ZR	1	GR INDUCTOR 56uH YT-10779	L400
072-040064-000ZR	2	GR Terminal (PCB TYPE) PC250 (t=0.8m/m) T250MA	TER401,404
042-010115-000ZR	1	GR X'former PN:YT-13167 KAPPA-1000	T400
<b>DAUGHTER PCB (Attached to Power PCB)</b>			
054-033904-100ZR	1	SMD (TRANSISTOR) PN:MMBT3904LT1G SOT23 ING	Q403B
054-033906-100ZR	1	SMD transistor (ON) PN:MMBT3906LT1G SOT23 ING	Q405B
054-414803-100ZS	1	GS SMD DIODE:PN:LL4148 MINI-MELF ING	D410B
024-100598-120ZS	2	GS SMD resistor 10K 1/8W J 0805 ING	R404B,R407B
024-220298-120ZS	1	GS SMD resistor 22R 1/8W J 0805 ING	R412B
034-100444-300ZR	1	GR electrolytic cap. 1uF/50V K (R)0511 P:5 TAING	C430B
072-040337-000ZR	1	HEADER Right Angle PN:211-110-000-400 10PIN	CONNECT
<b>MAIN PCB</b>			
<i>Resistors</i>			
024-100498-120ZS	1	GS SMD resistor 1K 1/8W J 0805	R119
024-100598-120ZS	17	GS SMD resistor 10K 1/8W J 0805	R1,4,7,16,121-123,126,128,138,165,168,170,125,143,169,19,
024-100698-120ZS	1	GS SMD resistor 100K 1/8W J 0805	R120
024-130598-120ZS	1	GS SMD resistor 13K 1/8W J 0805	R118

# 1500 Array Subwoofer

Part number	Qty	Description	Reference Designator
<b>MAIN PCB</b>			
024-150598-100ZS	2	GS SMD resistor 15K 1/8W F 0805	R20,21
024-220298-121ZS	2	GS SMD resistor 22R 1/4W J 1206	R28,29
024-220498-121ZS	4	GS SMD resistor 2K2 1/8W J 0805	R17,31,110,139
024-220598-120ZS	1	GS SMD resistor 22K 1/8W J 0805	R127
024-332498-100ZS	1	GS SMD resistor 3K32 1/8W F 0805	R22
024-332598-101ZS	2	GS SMD resistor 33K2 1/8W F 0805	R60,60B
024-392498-100ZR	1	GR SMD resistor 3K92 1/8W F 0805	R63
024-470398-120ZS	4	GS SMD resistor 470R 1/8W J 0805	R145,155,177,186
024-470598-120ZS	2	GS SMD resistor 47K 1/8W J 0805	R3,171
024-560298-120ZS	4	GS SMD resistor 56R 1/8W J 0805	R24-27
024-560498-120ZS	1	GS SMD resistor 5K6 1/8W J 0805	R30
024-560598-120ZS	1	GS SMD resistor 56K 1/8W J 0805	R15
024-680498-120ZS	1	GS SMD resistor 6K8 1/8W J 0805	R23
<b>Capacitors</b>			
031-100144-103ZS	1	GS SMD cap. 0u001/50V K 0805 X7R	C130
031-100144-106ZS	2	GS SMD cap. 0u01/50V K 0805 X7R	C27,28
031-100344-100ZS	1	GS SMD cap. 0u1/50V K 0805 X7R	C116
031-100364-100ZS	7	GS SMD cap. 0u1/100V K 1206 X7R	C5,6,69,112,115,135,138
031-100384-100RZS	1	GS SMD cap. 0u1/250V K 1206 X7R	C39B
031-220344-300ZS	1	GS SMD cap. 220pF/50V K 0805 NPO	C40
031-470144-101ZS	1	GS SMD cap. 0u0047/50V K 0805 X7R	C1G1
031-470344-100ZS	1	GS SMD cap. 470pF/50V K 0805 X7R	C123
034-100715-300ZS	2	GS elect. Cap. 1000uF/16V M (R)1017 P:3.5	C109,132
034-330615-301ZS	1	GS elec. Cap. 330uF/16V M (R)0812 P:3.5 loose package	C32
032-100484-200ZS	5	GS END mylar cap. 1uF/250V K P:15	C30,37,39,C31,38
033-330494-270ZS	2	GS NPE cap. ELYTONE 3u3/63V K10 (R) 8x13 TBE	C114,137
033-680464-270ZS	2	GS NPE cap. ELYTONE 6u8/100V K10 (R)1020 GNE	C113,136
034-820794-200ZR	2	GR elec. Cap. (LP) 85 °C 8200uF/80V M (R)3545 P:10	C1,4
034-100625-300ZS	1	GS elect. Cap. 100uF/25V M (R)6.3x11 P:5	C62
034-220525-300ZR	2	GR elec. Cap. 22uF/25V M (R)5x11 P:2.5 TAPIN	C25,26
034-220615-300ZS	1	GS elect. Cap. 220uF/16V M (R)0611 P:2.5	C8
034-220625-300ZS	1	GS elec. Cap. 220uF/25V M (R)0812 P:5	C100
<b>Resistors</b>			
021-100402-021ZS	2	GS MOF resistor 1K 2W J FK TYPE	R173,48
022-005105-020ZS	1	GS resistor PN:SQM 0R05 5W J 25x13	R2
020-220496-100ZS	1	GS film resistor 2K2 1/2W J	R6
<b>Semiconductors</b>			
054-000100-100ZS	5	GS SMD DIODE: PN:ES1D 200V 1A	D23,37,40,44,47
054-008409-000ZR	1	GR SMD ZENER DIODE:(PHILIPS) BZX84C3V0-7-F SOT-23	D32
054-033904-100ZR	7	GR SMD (TRANSISTOR) PN:MMBT3904LT1G SOT23	Q28,29,50,51,127,128,130
054-033906-100ZR	2	GR SMD transistor (ON) PN:MMBT3906LT1G SOT23	Q30,38
054-290701-100ZR	1	GR SMD transistor (ON) PN:MMBT2907ALT1 SOT-23	Q52
054-414803-100ZS	15	GS SMD DIODE:PN:LL4148 MINI-MELF	D1,4-6,21,22,31,33,34,38,41,45,48,53,54
054-540100-100ZR	3	GR SMD transistor PNP (ON SEN) MMBT5401 LT1 SOT-23	Q1,2,26
054-555100-100ZR	1	GR SMD transistor (NPN) PN:MMBT5551 LT1R (ON)	Q25
051-359400-000ZR	4	GR MOSFET N-CHANNEL PN:2SK3594-01SC (FUJI)	Q11,13,15,17
051-290700-100ZR	4	GR Transistor PNP (ON) PN:MPS2907A RLRAR TO-92	Q12,14,16,18
051-540101-000ZR	1	GR Transistor PNP(FAIRCHILD PN:2N5401 TO-92	Q3
<b>Miscellaneous</b>			
072-040039-000ZR	8	GR terminal (PCB TYPE) PC205 (t=0.8m/m) T205MA	TER402,403,406,407,TER2,4,8,3
044-100100-000ZS	2	GS SMD FERRITE BEAD PN:321611 600R/100MHz 1206	FB1,2
025-010300-000ZR	1	GR thermister PN:NTSE103K2072 K L:50mm	TH1
025-210100-000ZS	1	GS thermister (PTC) PN:PTMS2101RP516Y	TH2
043-110300-000ZR	1	GR COIL PN:YT-13141 110uHx2±10%	L8 (L8+L11)
043-300101-000ZR	2	GR INDUCTOR PN:YT-10033 30uH	L9,10
043-560200-000ZR	1	GR INDUCTOR 56uH YT-10779	L12
072-040007-000ZS	1	GS terminal housing SWA101 PN:JS-1001-07 7P	P9
072-040008-110ZS	1	GS terminal housing PN:JS-1001-08 8P P:2.5	P1
072-040064-000ZR	2	GR terminal (PCB TYPE) PC250 (t=0.8m/m) T250MA	T1,TER7
073-111003-000ZR	1	GR shorting strap 54.9x13.6x1mm	J7

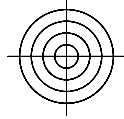
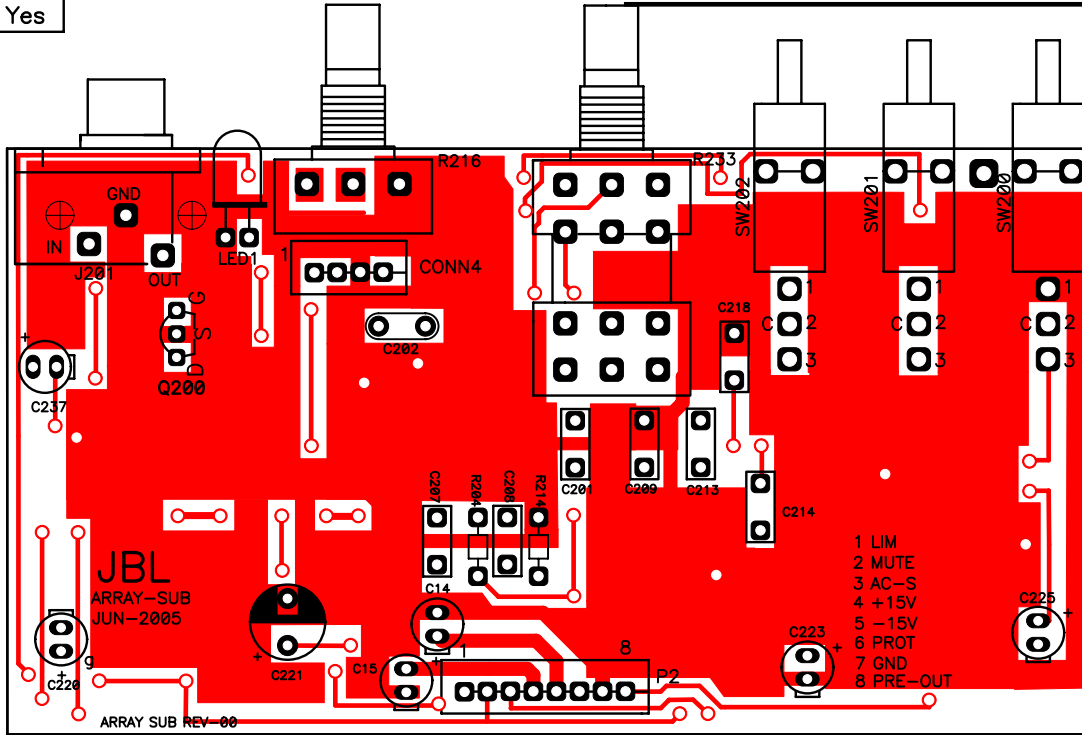
# 1500 Array Subwoofer

Part number	Qty	Description	Reference Designator
<b>Mechanical Parts</b>			
073-111004-000ZR	1	GR shorting strap 29.5x12.4x0.8m/m	J9
074-300018-000ZR	1	GR RELAY PN:943-1C-48D	K1
008-061215-000ZR	1	GR GASKET C4305 12x15 t=5mm CR spa	thermistor
008-061602-022ZR	2	GR GASKET CR4305 spa 155.8x16.8 t=1.5mm (UL94-HF1)	plate x2
008-063702-002ZR	2	GR GASKET CR4305 spa 372.3x16.1 t=1.5mm (UL94-HF1)	Plate x2
008-065757-002ZR	1	GR GASKET CR4305 spa 56.9x57.2 t=1.0mm (UL94-HF1)	X'FORMERPLATE
061-001052-000ZS	2	GS Knob w/white indicator 49001-W (18 t)D=15.1 H=14.5	GAIN, CROSSOVER KNOBS
061-100016-000ZR	7	GR post PN:BCMS-8 L=8mm NYLON 66(UL)	POWER PCBx4,FUSE PCBx3
061-700044-000ZR	2	GR mica 13x18mm TO-220 holeless	for Q13,17
061-700090-900ZR	2	GR ceramic washer 16x21mm t=2mm white	for Q11,15
061-700119-000ZR	1	GR insulator 114.3x84mm t=0.254mm FR700	POWER PCB
061-701003-000ZR	1	GR insulator w/adhesive M 467 170x85mm t=0.432mm	bracket+plate
063-010010-000ZR	5	GR Transistor Bracket P/N:TRK-2	for Q11,13,15,17,TH1
063-060606-000ZR	1	GR X'FORMER PLATE SPCC 56.9x57.2 t=2.0mm	
063-401602-000ZR	1	GR Plate SPCC (1500 Array) 402x156.8 t=2.3mm	
073-014103-500ZR	1	GR Bracket (HB5000) 6.64"x3.5"x3.2" SPCC	platex1
073-032141-600ZR	1	GR Heatsink (HB5000) 82.8x120.7x19.1mm black anodiz	bracketx1
074-020005-000ZR	1	GR 2-pin AC socket P/N 3516-T3C02	AC POWER Receptacle
074-020018-000ZR	1	GR ROCKER SW (AC POWER) PN:RF1003-BB4-0	SW4
086-021836-004ZR/120V	1	GR Power cord SJT 16AWGx2C L=3660mm WS004+WS002E	AC POWER Cord
<b>FOR MAIN POWER TRANSFORMER SEE EXPLODED VIEW</b>			

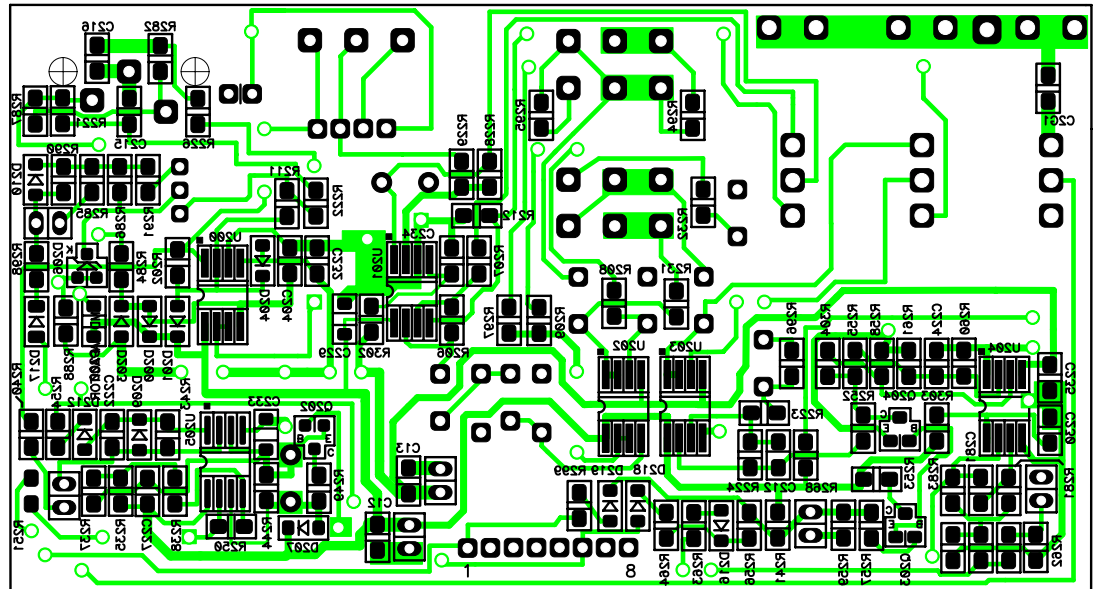
4	Yes
17	Yes
78	Yes
19	Yes
17	Yes
3	Yes

TOP SILKSCREEN TSKP

# 1500 Array Subwoofer



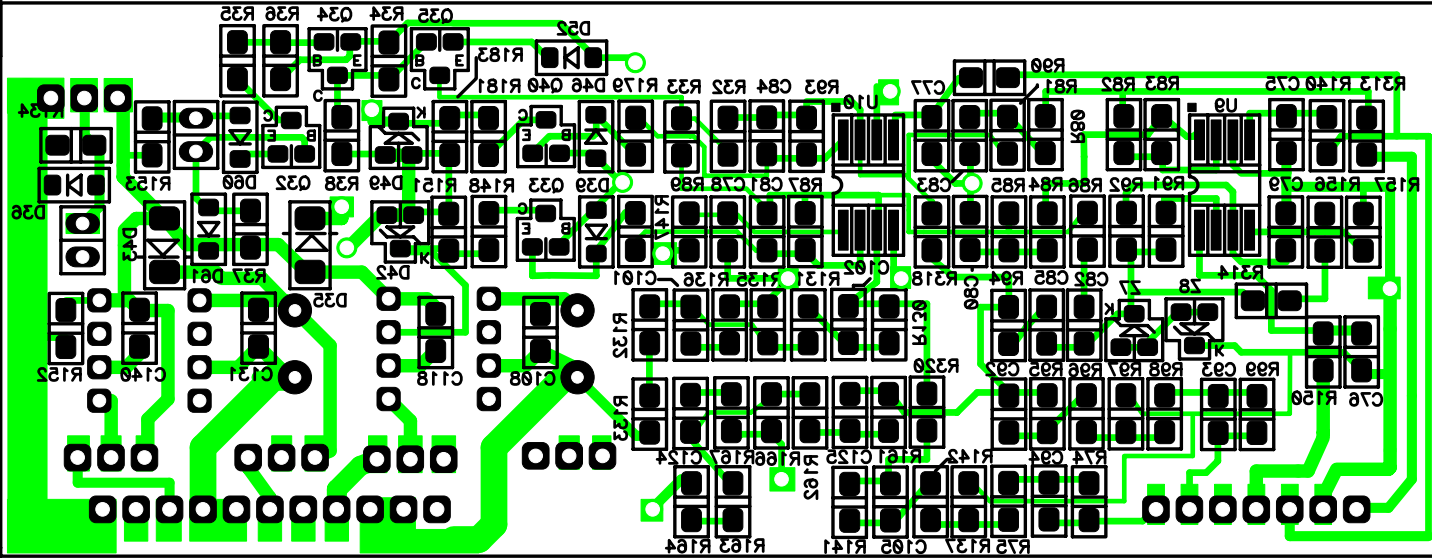
BOTTOM SILKSCREEN BSK



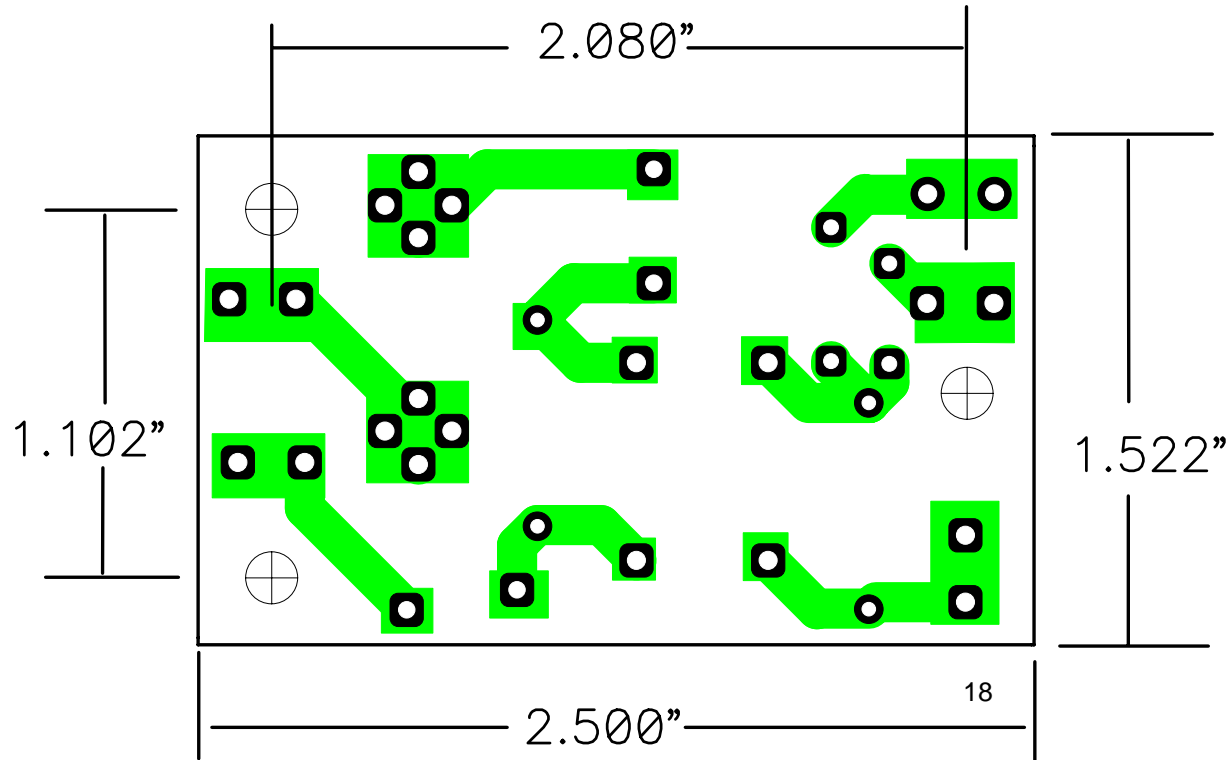


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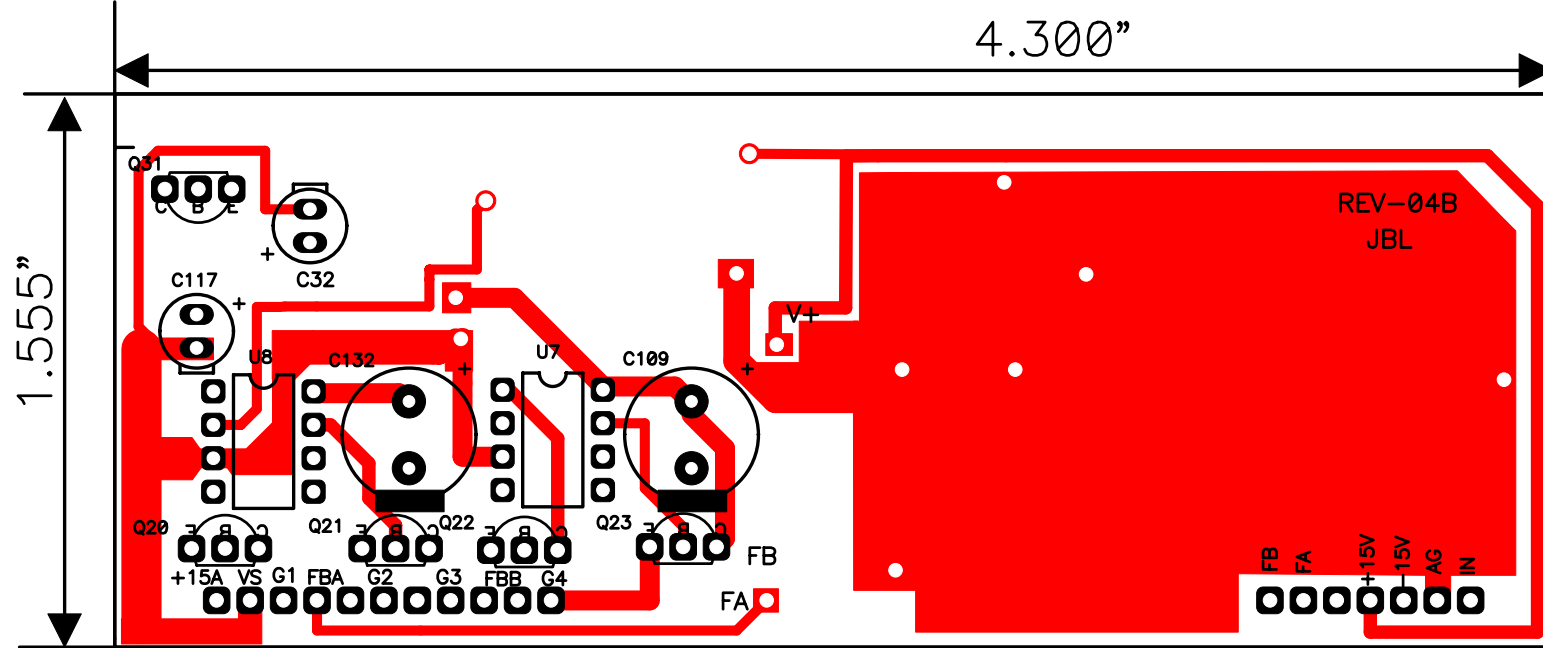
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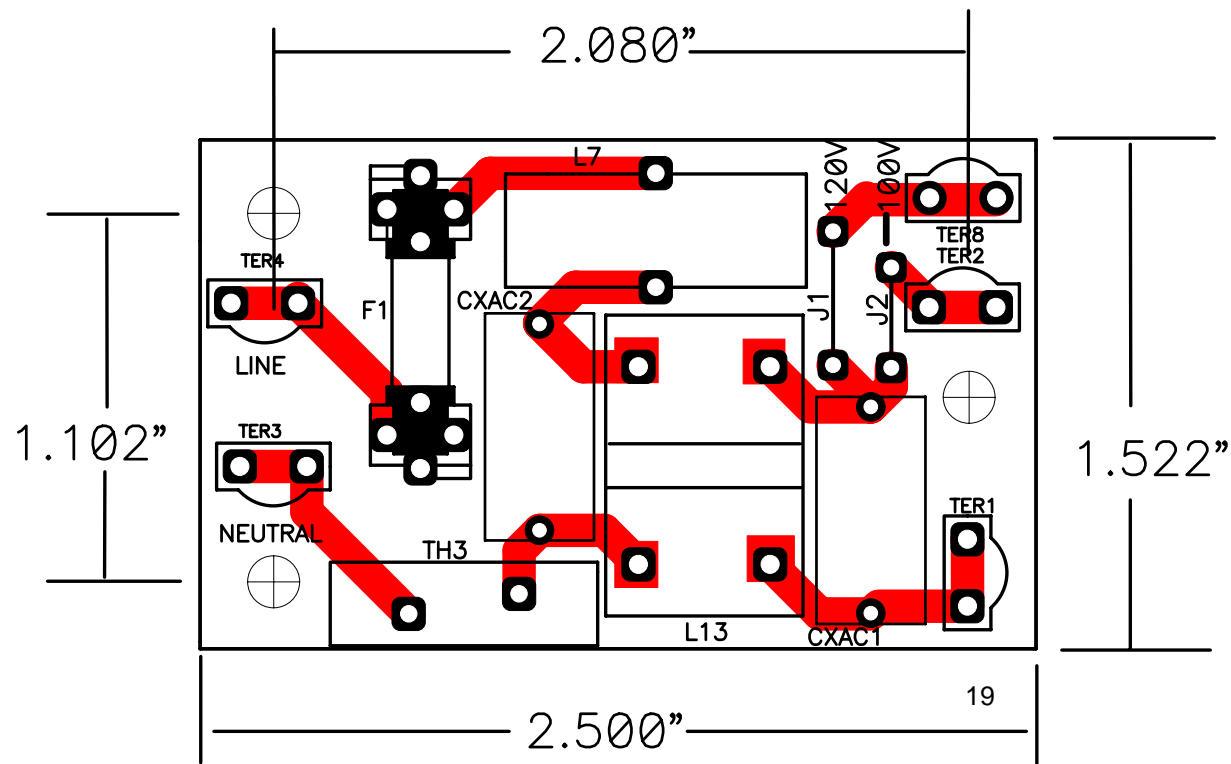
1500 Array Subwoofer



18



1500 Array Subwoofer

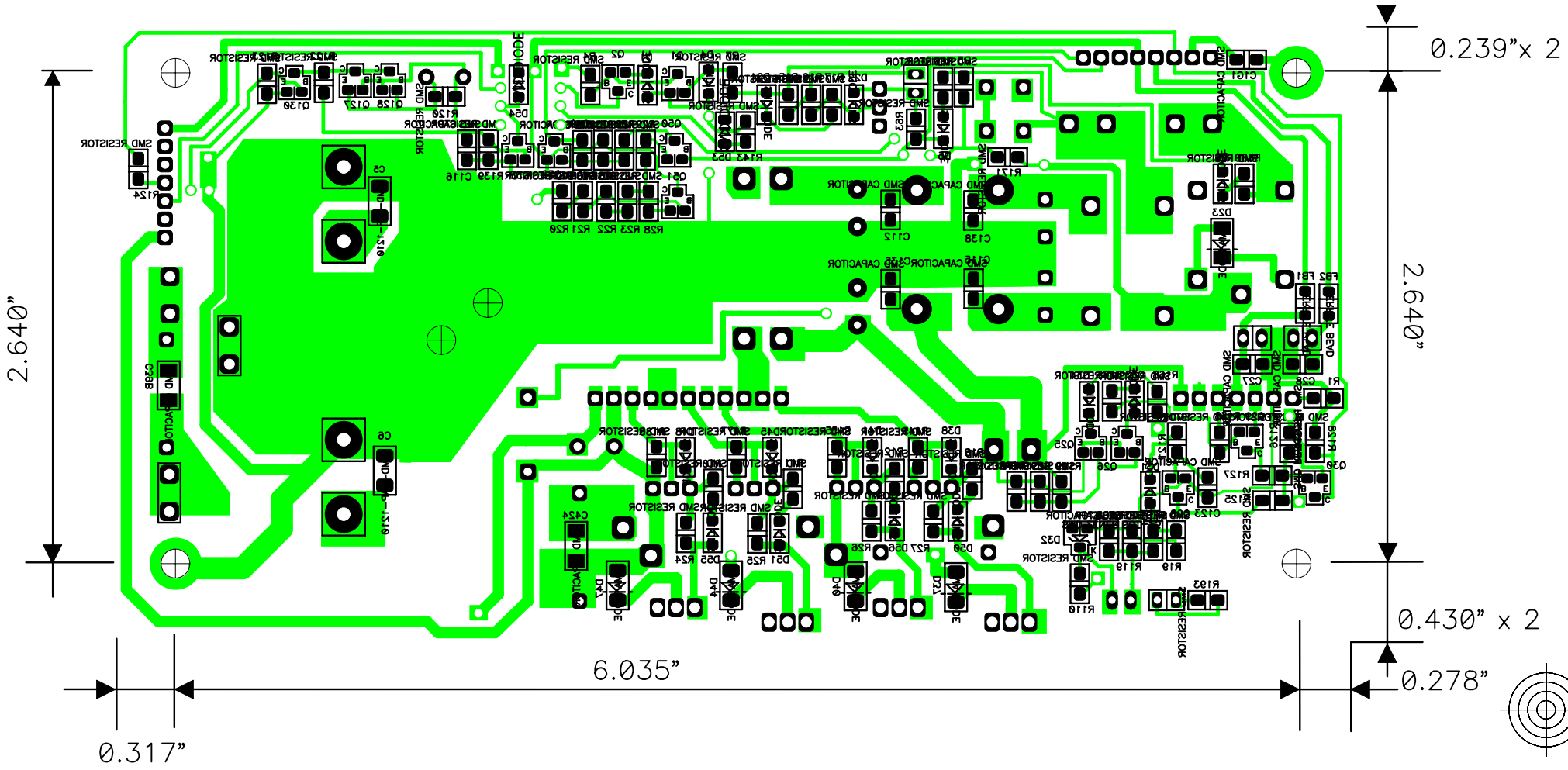




BOTTOM VIEW SCREEN BSK

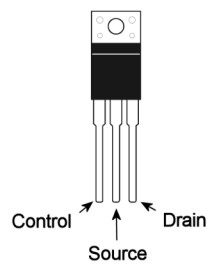


# 1500 Array Subwoofer

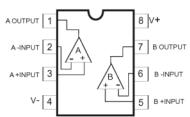


## Integrated Circuit Diagrams

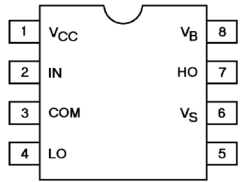
**TOP100-4**  
TOPSwitch Family  
Three-terminal Off-line PWM Switch



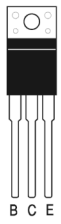
OPAMP, DUAL 8PIN  
**TL072**



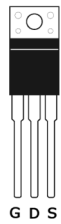
**IR2111**



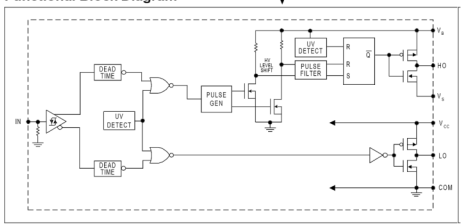
TRANS, NPN T0220  
**TIP31C**



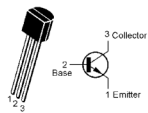
MOSFET, T0220  
**2SK3594**



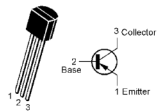
**IR2111**  
Functional Block Diagram



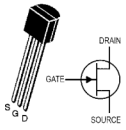
TRANS NPN MPSW06,  
MPS2222A, 2N5551



TRANS PNP  
MPSW56, 2N2907A,  
2N5401



JFET  
**J111**

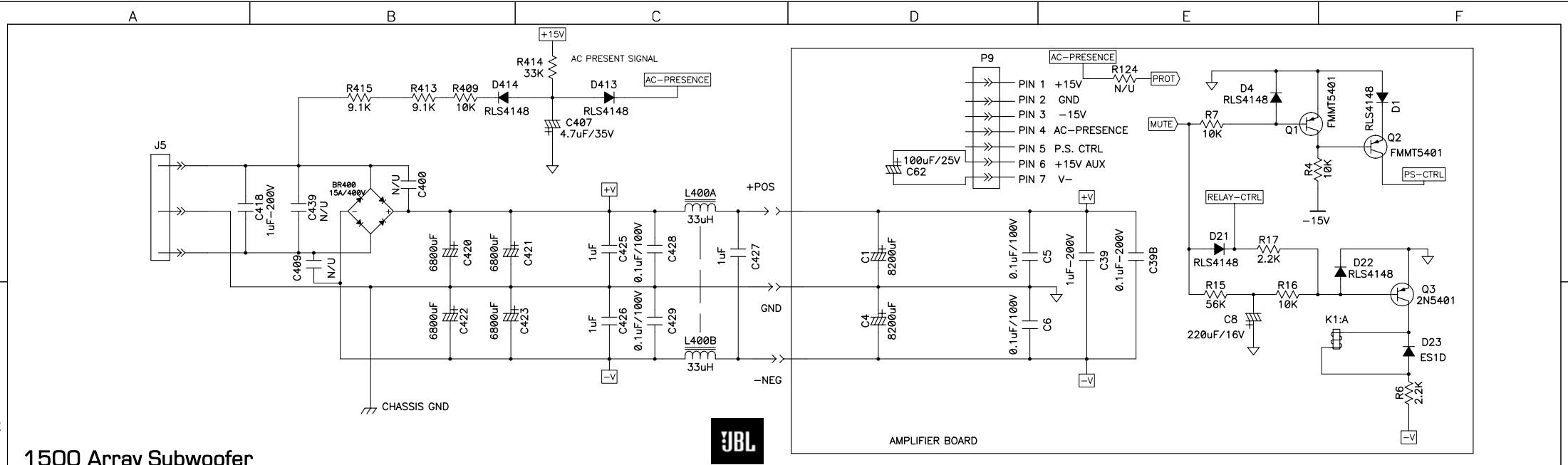


- \* MMBT2907A
- \* MMBT3904LTI SOT23,
- \* MMBT3906LTI SOT23,
- \* DTC114TK SMT3
- \* MMBT5401 LTI
- \* **MMBT5551**

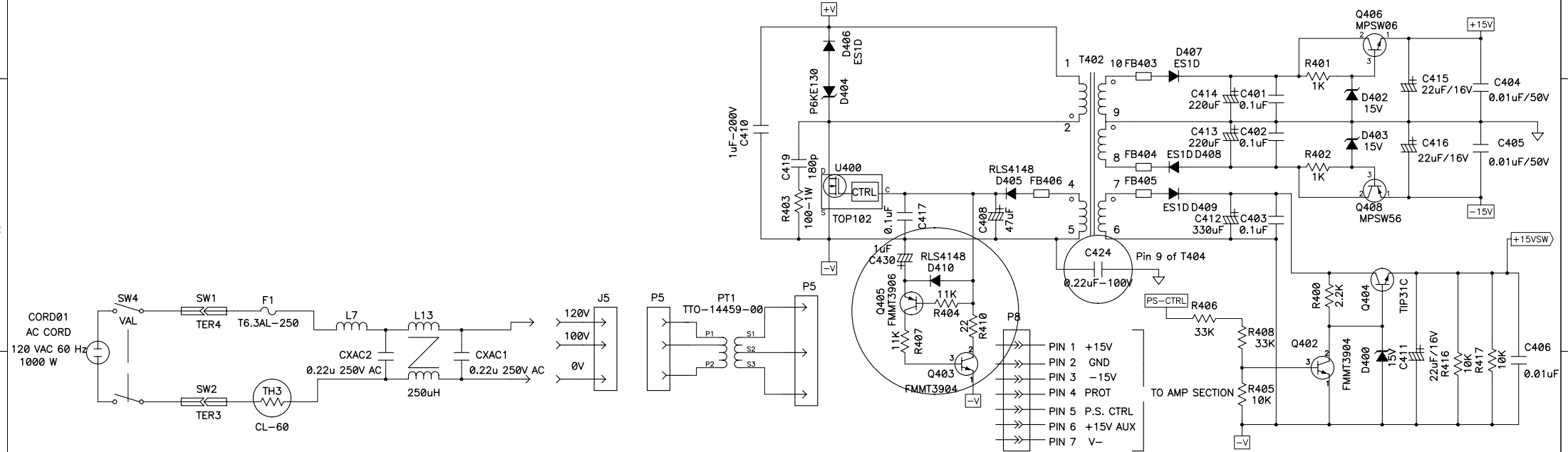


- 1) Emitter
- 2) Base
- 3) Collector

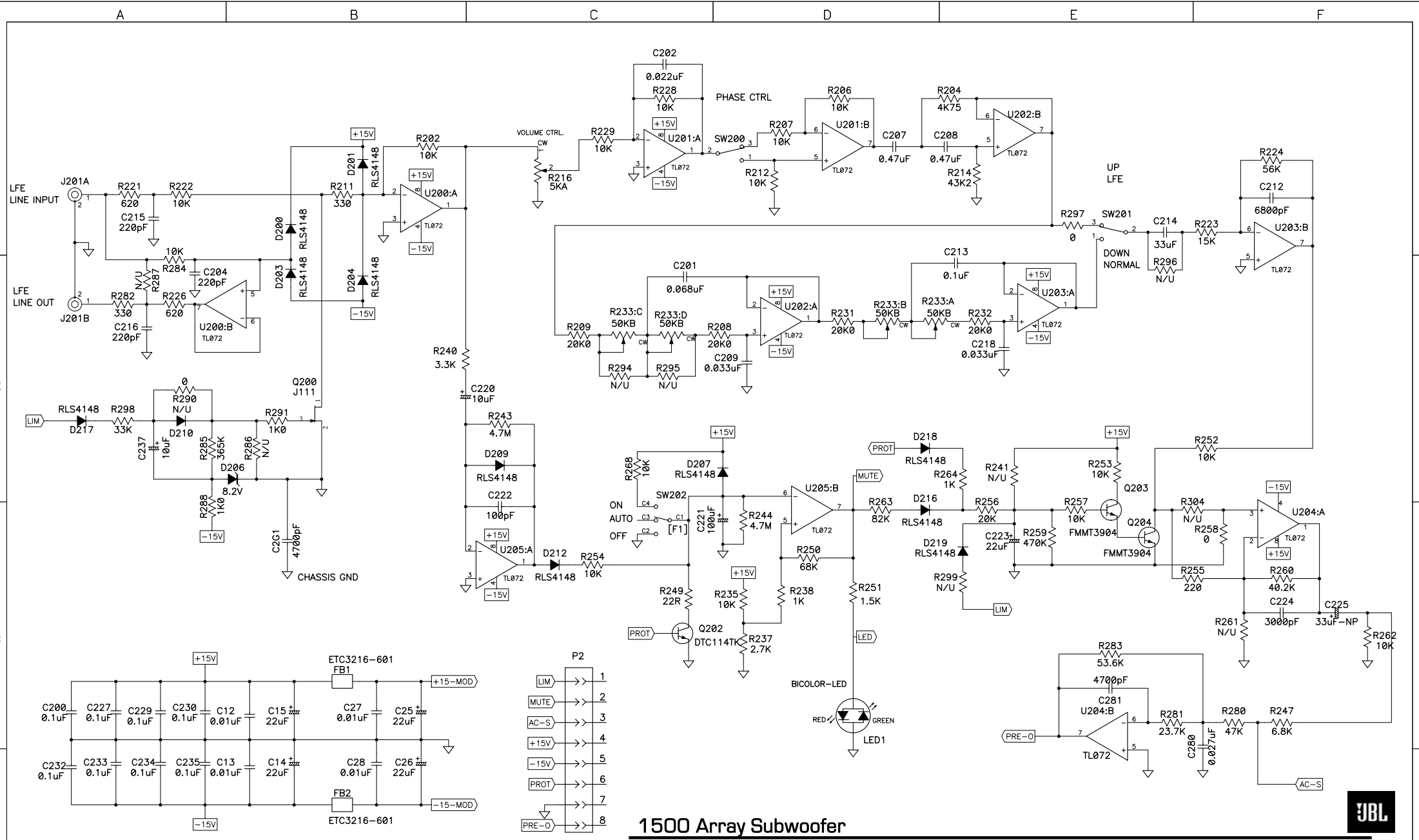
\* PREFIX MAY BE "FMMT"



# 1500 Array Subwoofer



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	Harman Consumer Group
01	New Sub design originated from HB5000 Platform	07/25/2005							:416-0590901
02	ADD C430,C424,D410,Q405,403,R404,140,407	2006/02/16							Model no: 1500 Array-Sub-120V
									Sch name: Array-Sub-120V-012006-02
									Issue no: ET-01-21-5463
									Date: 2006/02/16
									Sheet: 15 Rev: 02
									Size: A2 Author: AMM/George

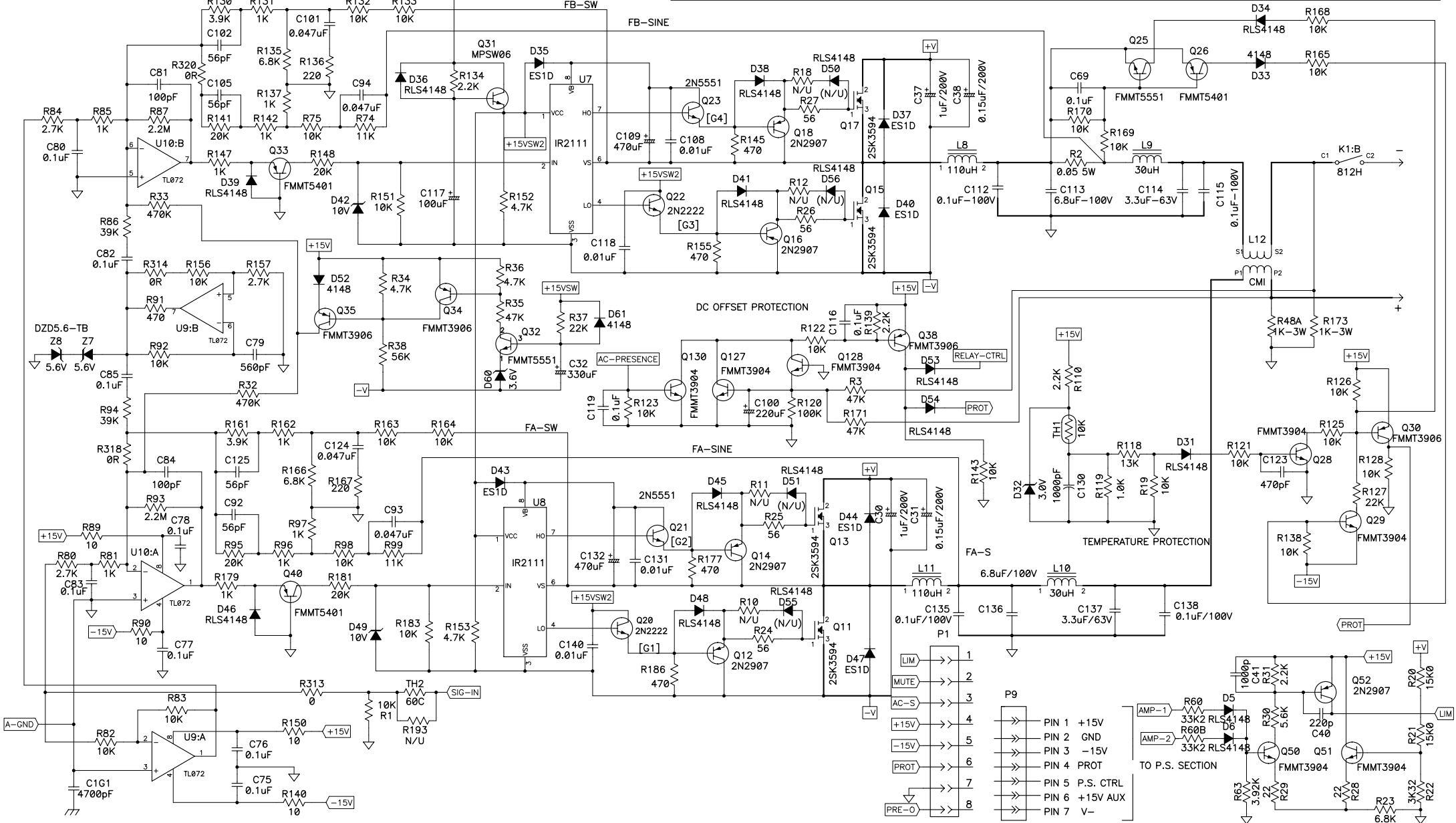


### 1500 Array Subwoofer



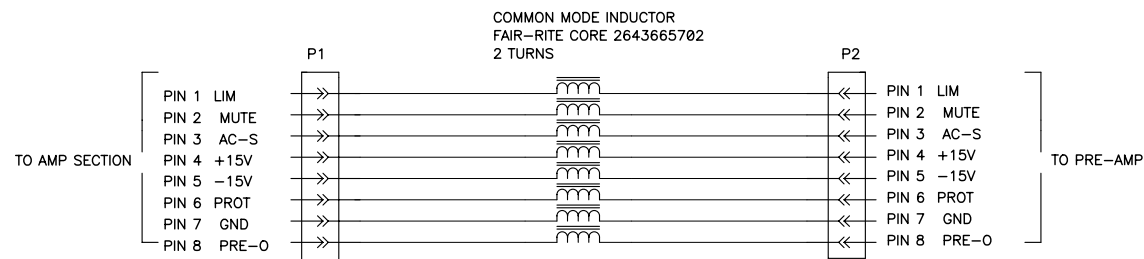
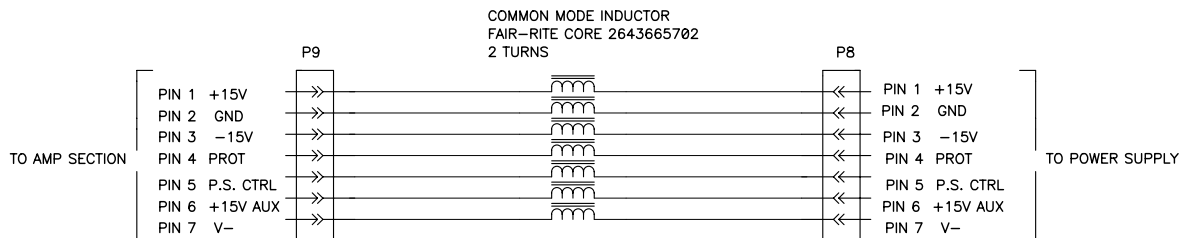
Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	Harman Consumer Group
01	New Sub design originated from HB5000 Platform	07/25/2005							:416-0590901
02	ADD C430,C424,D410,Q405,403,R404,140,407	2006/02/16							Model no: 1500 Array-Sub-120V
									Sch name: Array-Sub-120V-012006-02.sch
									Issue no: ET-01-21-5463
									Date: 2006/02/16
									Sheet: 16 Rev: 02
									Size: A2 Author: AMM/George

# 1500 Array Subwoofer



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									Issue no: ET-01-21-5463
									Date: 2006/02/16
									Sheet: 14 Rev: 02
									Size: A2 Author: AMM/George

# 1500 Array Subwoofer

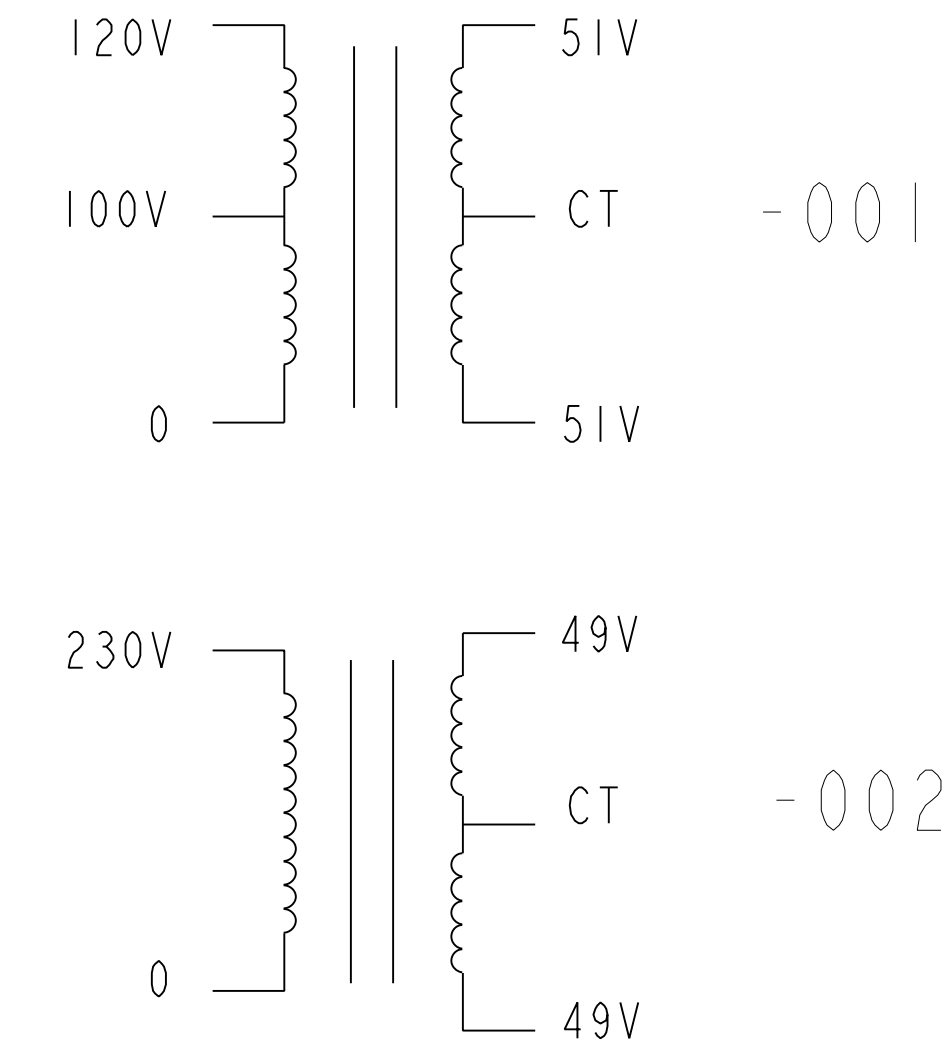
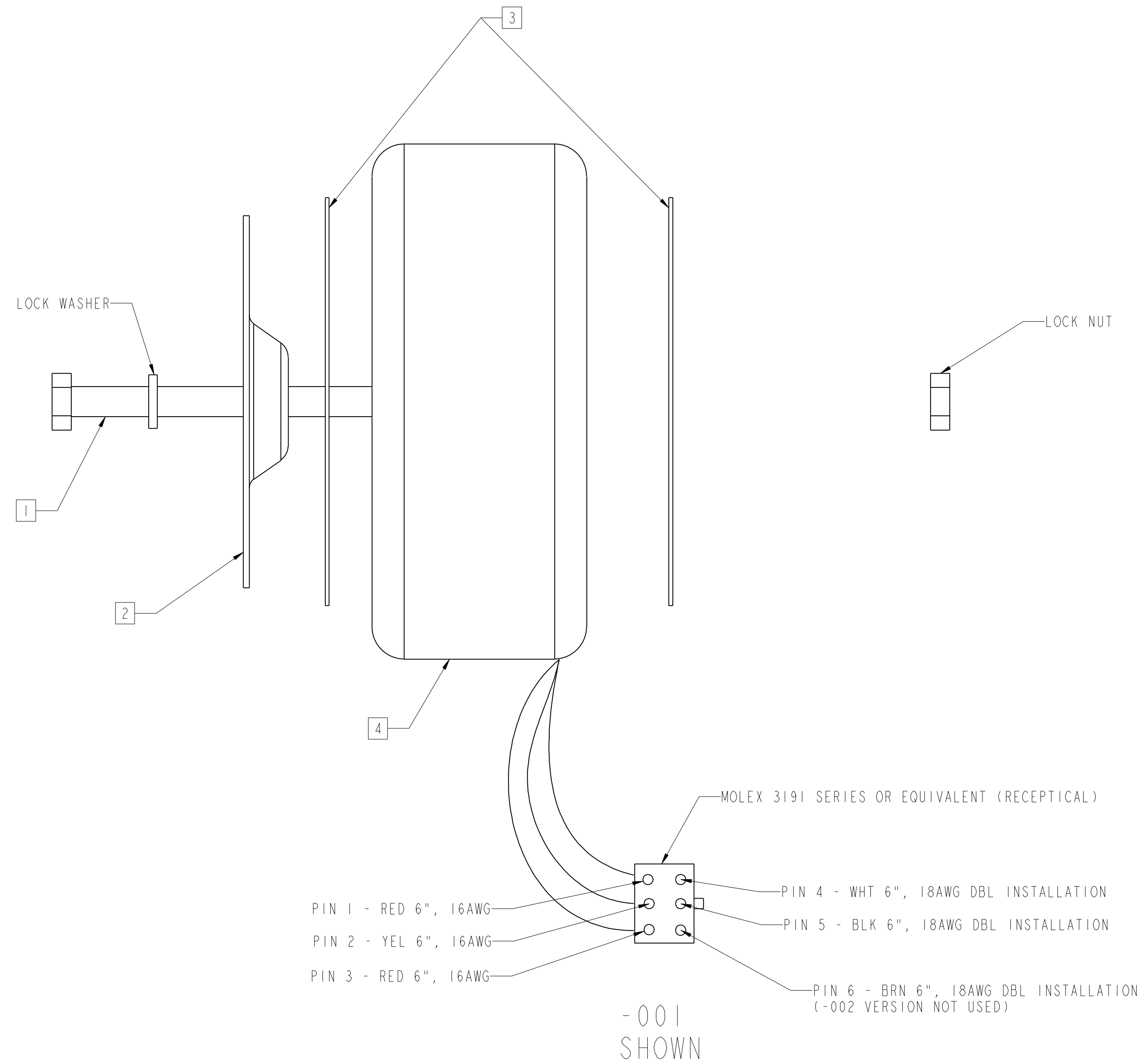


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									Date: 2006/02/16
									Sheet: 14-1 Rev: 02
									Size: A2 Author: AMM/George

1500 Array Subwoofer



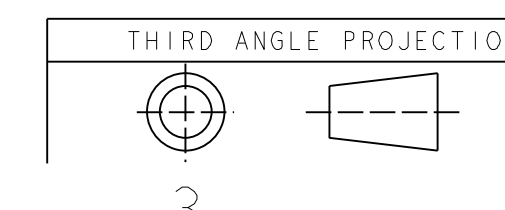
REVISIONS						
CHG	LTR	DESCRIPTION	DRFT	CHK	DATE	APPR
30736	A	REL FOR PROD	DM	JM	8/12/05	JM
31120	B	ADDED WIRE INFO	DM	JM		JM



TOROID	PRIMARY VOLTAGE	SECONDARY VOLTAGE	RATING	FREQUENCY
361751-001	100V - 120V	102CVT	510VA	50 - 60Hz
361751-002	230V	98.08CVT	510VA	50 - 60Hz

- 4 TOROID OUTER DIAMETER NOT TO EXCEED 6.60 INCHES
- 3 MATERIAL: 1.5mm THICK RUBBER (EPDM, BUTYL, OR EQUIV.)
- 2 MATERIAL: 2.0mm THICK STEEL (ASTM 570, GRADE 30 OR EQUIV.) FINISH: ZINC PLATE
- 1 100mm LONG X Ø10mm THREAD X 34mm MINIMUM THREAD LENGTH GRADE 5 OR EQUIVALENT

NOTES: (UNLESS OTHERWISE SPECIFIED)



361751-002	KIT, XFMR	----
361751-001	KIT, XFMR	HB5000
PART NO.	DESCRIPTION	REMARK
TABULATION		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCH-SIZES BREAK SHARP EDGES .016 INCH		DRAWN D MARTH CHECKER JM ENGR JM MODELS USED ON
TOLERANCES (UNLESS OTHERWISE SPECIFIED) .xxx ± .005 INCH .xx ± .01 INCH .x ± .02 INCH ANGULAR TOLERANCE OF 0°±30° FRACTIONAL DIMENSIONS ± 1/32 ALL DIMENSIONS ARE FINISHED DIMENSIONS		
DO NOT SCALE DRAWING		<p>harman consumer group A Harman International Company Northridge, California 91329 U.S.A.</p> <p><b>KIT, XFMR</b></p> <p>SIZE D DRAWING NO. 361751 REV B</p> <p>SCALE 1/1 SHEET 1 OF 1</p>