Alpha 1200s
Powered Subwoofer

SERVICE MANUAL

Infinity Systems Incorporated
250 Crossways Park Dr.
Woodbury, New York 11797

Rev1 4/2004

- CONTENTS -

Infinity Alpha 1200s Basic Specifications

Frequency Response	28Hz – 150Hz (±3dB)
Maximum Amplifier Output	500 watts RMS (20Hz – 150Hz with no more than 0.1% THD)
Crossover Frequencies	50Hz – 150Hz, 24dB/octave, continuously variable
Driver	12" (305mm) C.M.M.D.
Dimensions (H x W x D)	17-1/2" x 17-1/4" x 18-1/4" (445mm x 438mm x 464mm)
Weight	45 lb (20.5kg)
Optional Accessory	Bass Optimization Test & Measurement Kit Infinity Part Number: 335852-002

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

Alpha 1200s Powered Sub/ Plate Amp

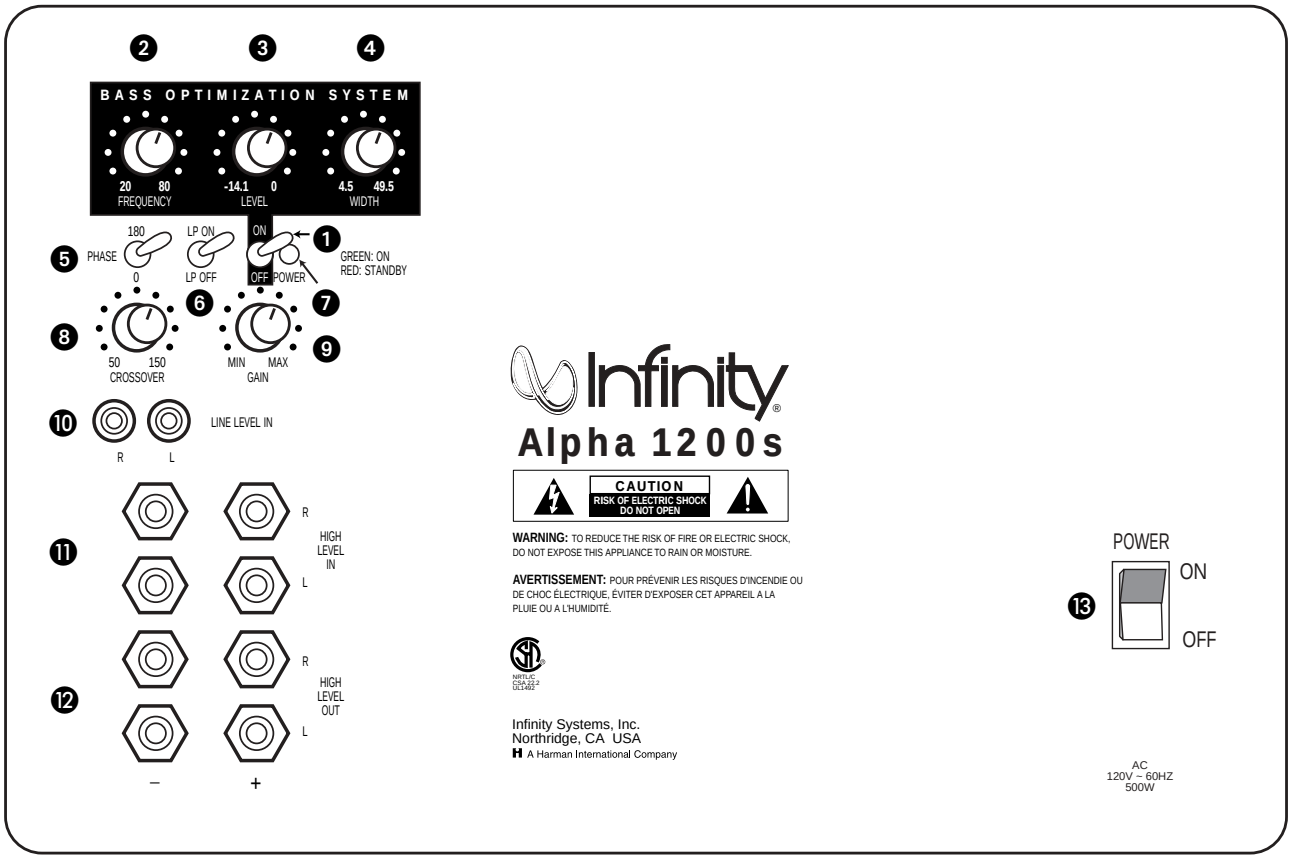
LINE VOLTAGE	Yes/No	Hi/Lo Line	Nom.	Unit	Notes
US 120vac/60Hz	Yes	108-132	120	Vrms	Normal Operation
EU 230vac/50-60Hz	Yes	207-264	230	Vrms	Normal operation, MOMS required

Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
Amp Section					
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)	6	Ohms	n/a	Nominal	
Rated Output Power	275	Watts	220	1 input driven	Limiter prevents continuous power to exceed 240 Watts.
THD @ Rated Power	0.1	%	1	22k filter	
THD @ 1 Watt	0.1	%	0.2	22k filter	
DC Offset	10	mV-DC	60	@ Speaker Outputs	
Damping factor	>50	DF	23	Measured at amplifier board	Measured at the speaker cable. 200 Watts, measured at speaker output terminals located at the amp board.
Input Sensitivity					
Input Frequency	30	Hz	30	Nominal Freq.	
L&R	446	mVrms	±2dB	To 200 Watts	Single input driven, Ap Zo=600 Ohms, LP ON
LP Off Mode selected	446	mVrms	±2dB	To 200 Watts	Single input driven , Ap Zo=600 Ohms, LP OFF
Speaker/Hi Level Input	6.225	Vrms	±2dB	To 200 Watts	Single input driven, Ap Zo=600 Ohms, LP ON
Signal to Noise					
SNR-A-Weighted	100	dBA	85	relative to rated power	A-Weighting filter
SNR-unweighted	90	dBr	85	relative to rated power	22k filter
SNR rel. 1W-unweighted	55	dBr	50	relative to 1W Output	22k filter
Residual Noise Floor	0.5	mVrms	1	Volume @max, using RMS reading DMM/VOM (or A/P)	
Residual Noise Floor	0.5	mVrms(max)	1	Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics)	
Input Impedance					
Line Input (L, R,LFE)	10K	ohms		Nominal	
Speaker/Hi Level Input	10K	ohms		Nominal	
Filters					
LP 4th order variable	50-150	Hz	± 10		
Subsonic filter (HPF) 3rd Orde	Fixed	Hz	± 10		
Low pass filter OFF	Fixed	Hz	± 10	L or R input driven, LP Filter OFF	
BOS					
Frequency Control		--			
Range	20-80	Hz	functional	21 detent pot (0.1 oct. steps)	
Level Control		--	--		
Range	-14.1 to 0	dB	functional	21 detent pot (0.5dB steps)	
Width(Q) Control		--	--		
Range	4.5% to 49.5%	octave	functional	21 detent pot (5steps/0.1 octave)	
Limiter					
THD at Max. Output Power	YES		functional	Maximum Output Power	
Features	--				
Auto - On -Off	YES	--	functional		No switch provided, Refer to ATO section
Phase switch	0-180	deg	functional		
Volume pot Taper (lin/log)	LOG	--	functional		A Taper
Variable crossover 50-150 Hz	YES		functional		4th Order LP Variable crossover
HP Speaker out	YES		functional		Pass Through from the speaker input section
LP On- Off Select switch	YES	--	functional		Disables LP filter, intended for LFE
Input Configuration					
Line In (L,R) & LFE	YES	--	functional		Dual RCA jack
Spkr/Hi Level In	YES	--	functional		Binding post connector L&R
Signal Sensing (ATO)					
Auto-Turn-On (yes/no)	YES		functional	Auto - on selection switch in Auto	
ATO Input test frequency	50	Hz	functional	"	
ATO Level LFE Input	2	mV	functional	"	
ATO Level Speaker in	50	mV	functional	"	

Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
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
Power on Delay time	3	sec.	4	AC Power Applied	
Transients/Pops					
ATO Transient	5	mV-peak	n/a	@ Speaker Outputs	
Turn-on Transient	50	mV-peak	2v-pp	@ Speaker Outputs	AC Line cycled from OFF to ON
Turn-off Transient	50	mV-peak	2v-pp	@ Speaker Outputs	AC Line cycled from ON to OFF
Efficiency					
Efficiency	70	%	65	Rated power	Nominal Line voltage 120 VAC
Stand-by Input Power	12	Watts	15	@ nom. line voltage	Maximum allowable input power under nominal Input voltage and frequency, in stand-by mode (HOT or COLD operation).
Power Cons. @ rated power	340	Watts	375	@ nom. line voltage	230 Watts @ 6.0 Ohms nominal line voltage
Protection					
Short Circuit Protection	YES		functional	Direct short at output	Amplifier should resume operation after short circuit condition removal
Thermal Protection	YES		functional	@1/8 max unclipped Power	Temperature rise in accessible metal parts should 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 or crowbar (for driver/fire protection),
Line Fuse Rating					
USA-Domestic	4	Amps		Type-T or Slo Blo-250 V	
EU	2	Amps		Type-T or Slo Blo-250 V	Internal fuse with UL/SEMKO rated holder

Controls

Rear Panel



Bass Optimization Controls (see page 5)

❶ Bass Optimization System Selector

❷ Center-Frequency Adjustment

❸ Bass Optimization System Level Adjustment

❹ Bass Optimization System Bandwidth Adjustment

❺ Phase Switch

❻ Low-Pass Filter Selector

❼ Power Indicator

❽ Crossover Adjustment

❾ Subwoofer Gain (Volume) Control

❿ Line-Level Inputs

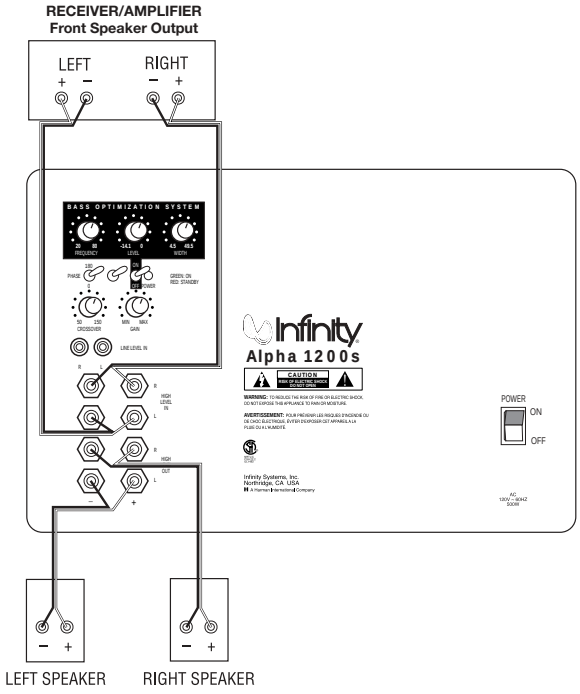
⓫ High-Level (Speaker) Inputs

⓬ High-Level (Speaker) Outputs

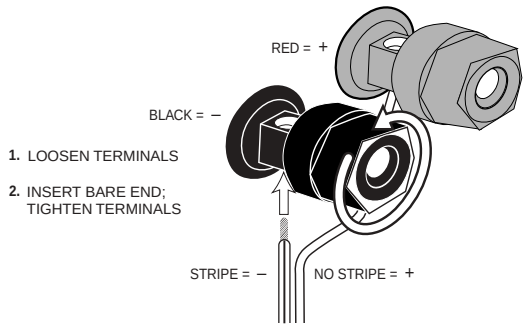
⓭ Power Switch

CONNECTIONS

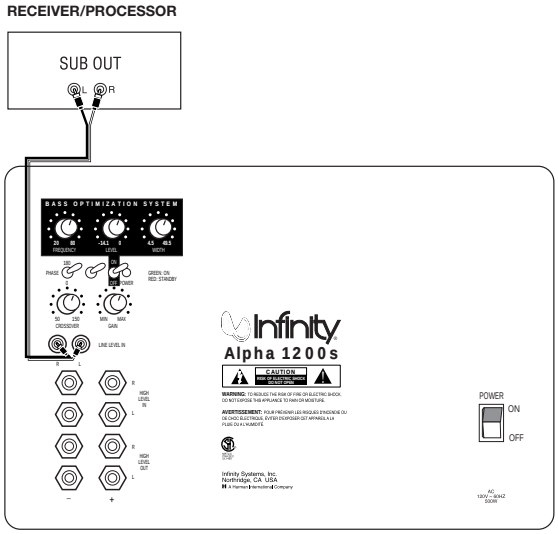
If your receiver/amplifier does not have subwoofer outputs for the left and right channels or an LFE output:



- Set Low-Pass Filter to "On."



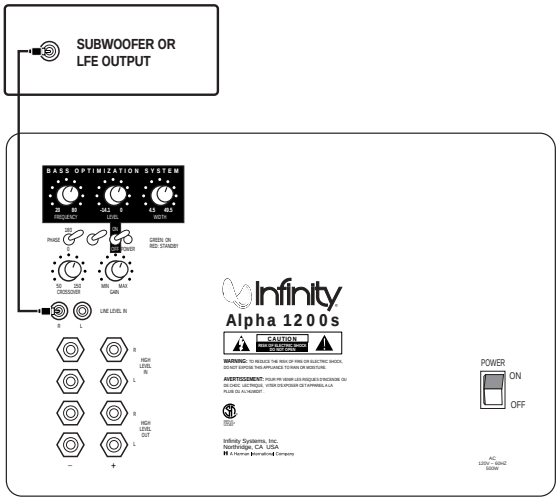
If your receiver/processor has subwoofer outputs for the left and right channels:



- Set Low-Pass Filter to "On."

NOTE: Some receivers have a single subwoofer output (do not confuse this with a single LFE output as described below). In that case, it is recommended that you use a Y connector (not included) to maximize performance.

If you have a Dolby* Digital or DTS® receiver/processor with a low-frequency-effects (LFE) output:



- Set Low-Pass Filter to "Off."

NOTE: In this case, you do not need to use a Y connector. Simply connect the LFE output on your receiver/processor to either the left or right input on the subwoofer.

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 Gain (Volume) Control ❾ to the "min" position.

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

Auto On/Standby

With the Power Switch ⓭ in the ON position, the Power Indicator LED ❼ 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 ⓭ can be left on. You may turn off the Power Switch ⓭ for extended periods of nonoperation, e.g., when you are away on vacation.

Adjust Gain

Turn on your entire audio system and start a CD or movie soundtrack at a moderate level. Turn up the Subwoofer Gain (Volume) Control ❾ about half way. 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 ⓭ been pressed to the "On" position? Once you have confirmed that the subwoofer is active, proceed by playing a CD, record or cassette. 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 Gain (Volume) Control ❾ until you obtain a pleasing blend of bass. Bass response should not overpower the room but rather 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

The Crossover Adjustment Control ❽ 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 – 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 – 150Hz.

Note: This control will have no effect if the Low-Pass Filter Selector Switch ❻ is set to "Off." 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.

Phase Control

The Phase Switch ❺ determines whether the subwoofer speaker's piston-like 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 room size, subwoofer placement and listener position. Adjust the phase switch to maximize bass output at the listening position.

Bass Optimization System™

Infinity's Bass Optimization System is a simple-to-use, yet sophisticated, low-frequency calibration system. Each Interlude subwoofer contains a parametric equalizer that you can adjust following the directions below. By following these instructions, you can improve the sound of your system.

The Bass Optimization System Goal

It is a fact of audio that what we hear at low frequencies is determined as much or more by the listening room than by the loudspeaker itself. Placement of the loudspeakers and listeners and the acoustical characteristics of the room surfaces are all important determinants of bass quantity and quality. In most practical situations, there is little that can be done about this, except for patient trial-and-error repositioning of the loudspeakers and listeners. Usually, the practical constraints of a living space and the impracticality of massive acoustical treatment mean that equalization is the only practical solution.

Professional sound engineers routinely employ sophisticated measurement systems and equalizers to optimize speakers to the installation. This was never practical for the home audiophile. This is why the Bass Optimization System was created. It enables you to identify the dominant low-frequency response characteristic of your room. Once you know the problem, the Bass Optimization System provides the tools needed to optimize the low-frequency characteristics of the speakers to the room they are in, exactly as the professional sound engineers do it.

Preparations

Before beginning the bass tests, please check the following:

- Make sure all three Bass Optimization System controls on the subwoofer are turned fully clockwise.
- Make sure the loudness contour (if any) on your receiver/processor/preamp is turned off.
- Set the receiver's/processor's tone controls (Bass and Treble) to their center or flat positions.
- Bypass all surround and effects features of your receiver/processor/preamp or set to Stereo Bypass.
- If you are using a multichannel surround processor or receiver, make sure all bass-management features are properly set. The Audio channels should all be set to "Small" or "High-Pass" and the subwoofer set to "On."
- Set the Bass Optimization System Selector ❶ to "On."

For best results, it is recommended that all major furnishings are in place and that all doors and windows in the listening area are in their normal positions. That is, if you normally listen to music with all doors closed, then this is how they should be during this procedure.

To solve a problem, it helps to first identify whether you have one and, if so, what it is. First, play a variety of music and films with energetic bass sounds, like bass guitar, kick drum, keyboards, etc. A kick drum should produce a tight "thump," not a flabby "boom." Bass melody or harmony lines should have notes that are about equally loud. If some notes disappear, or stand out because they are consistently too loud, there is a problem. Disappearing notes have to be handled by moving the listening position, or the loudspeakers, to slightly different locations. Often, but sadly not always, this will be enough. Excesses in bass tend to be most annoying, and energetic resonances that cause "boomy" or "lumpy" bass can be truly aggravating over a period of time. Infinity's Bass Optimization System can fix this.

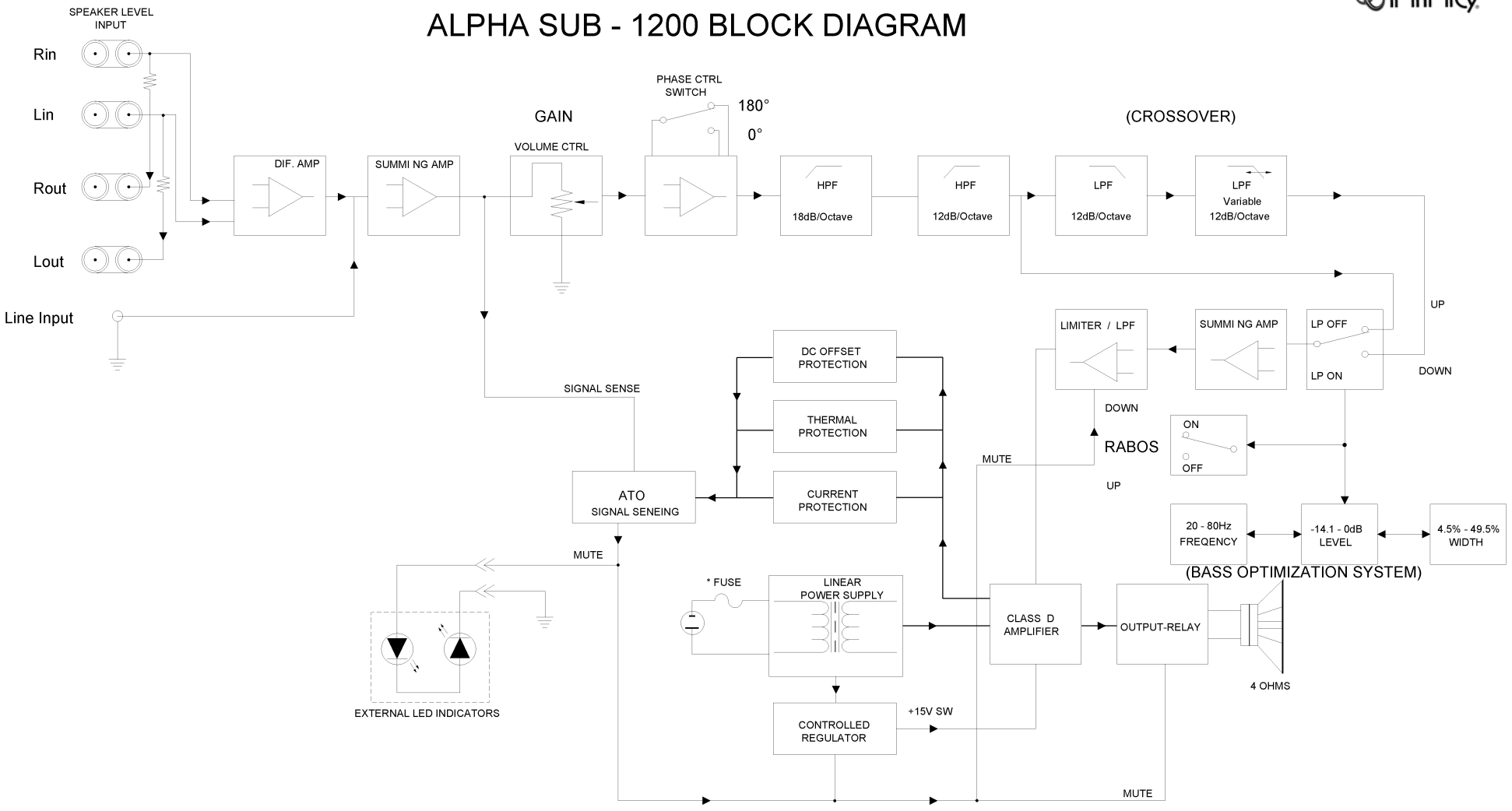
So, the first step is to exercise your music collection, and listen for low-frequency problems that crop up in several different recordings. Something that only happens in one recording is likely to be a problem in the recording – it happens! If you identify something that is consistently wrong, select a record that shows it very clearly, and put your CD/DVD player into a repeat mode (A-B repeat is especially helpful, because you can isolate a short musical passage).

Set the Bass Optimization System Bandwidth Adjustment Control ❹ to a middle position (10 clicks from a fully clockwise position) and set the Level adjustment ❸ for a –6dB (8 clicks from a fully clockwise position). Then, while the music is playing, sit in your favorite chair and have somebody else slowly adjust the Center-Frequency control ❷ from fully clockwise to fully counter-clockwise. At a certain frequency, you should hear the problem lessen and the overall bass performance improve. When you are satisfied that you have found the best frequency, have your assistant vary the Level ❸ slowly up and down until you have maximized the improvement. If you have really keen ears, you can also have the Bandwidth Adjustment control ❹ adjusted for maximum benefit.

While the Bass Optimization System allows the listener to fine-tune the bass response to sound best in a particular room, some listeners don't have the skill or desire to adjust their system by ear. In order to facilitate quicker and more accurate results, Infinity has developed an optional test and measurement kit that allows the user to perform a series of measurements and aids him/her in properly setting the Bass Optimization System controls. With the addition of this kit, the Bass Optimization System becomes truly room-adaptive. The kit consists of the following: a test CD, a sound-level meter that is specifically calibrated for low frequencies, and something we call a "Q-Finder," a device to help find the width of the measured curve and, finally, a measurement template. It works as follows. The listener plays the tones from the test CD and records the relative output level of each test tone, using the sound-level meter, on the provided measurement template. After all the tones are complete, the template contains a response curve for the frequencies below 100Hz. The user simply notes the frequency of the largest bass peak, calculates the correct amount of attenuation, and uses the "Q-Finder" to determine the width of the curve. These three values are dialed into the Bass Optimization System controls located on the speaker. The entire process takes less than twenty minutes.

If your dealer does not stock the Bass Optimization System test and measurement kit, you may purchase it directly from Infinity. U.S. residents can visit our Web site at www.infinitysystems.com or call 1.800.553.3332. Canadian residents should contact their dealer or call 1.800.567.3275.

ALPHA SUB - 1200 BLOCK DIAGRAM



NOTE :
120 VAC 4A-250V
230 VAC 1.8A-250V

Service Bulletin

Service Bulletin INF2004-01 – March 2004

This is considered a Minor repair

To: All Infinity Service Centers

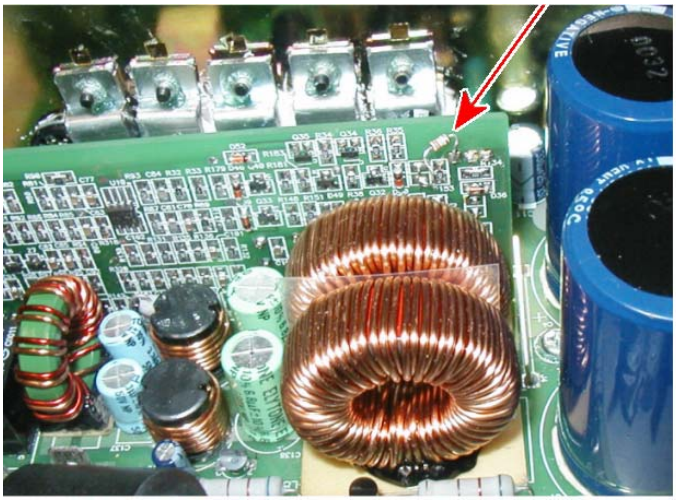
Model: Alpha 1200s

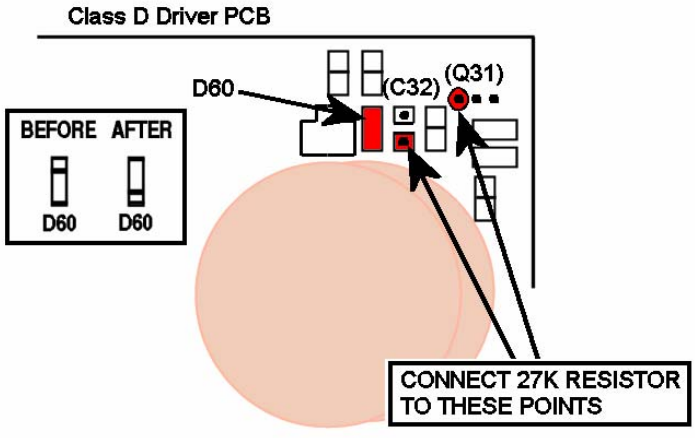
Subject: Distortion When Coming Out Of Standby

In the event you receive an Alpha 1200s subwoofer with the complaint "There is a brief chirping sound, or short oscillation that occurs when the unit is in the AUTO mode, in Standby, when it's triggered ON with a music signal", follow the procedure below to correct this condition:

Synopsis: Replace D60 (RLS4148 diode) with a 3.6V Zener Diode; add new Resistor.

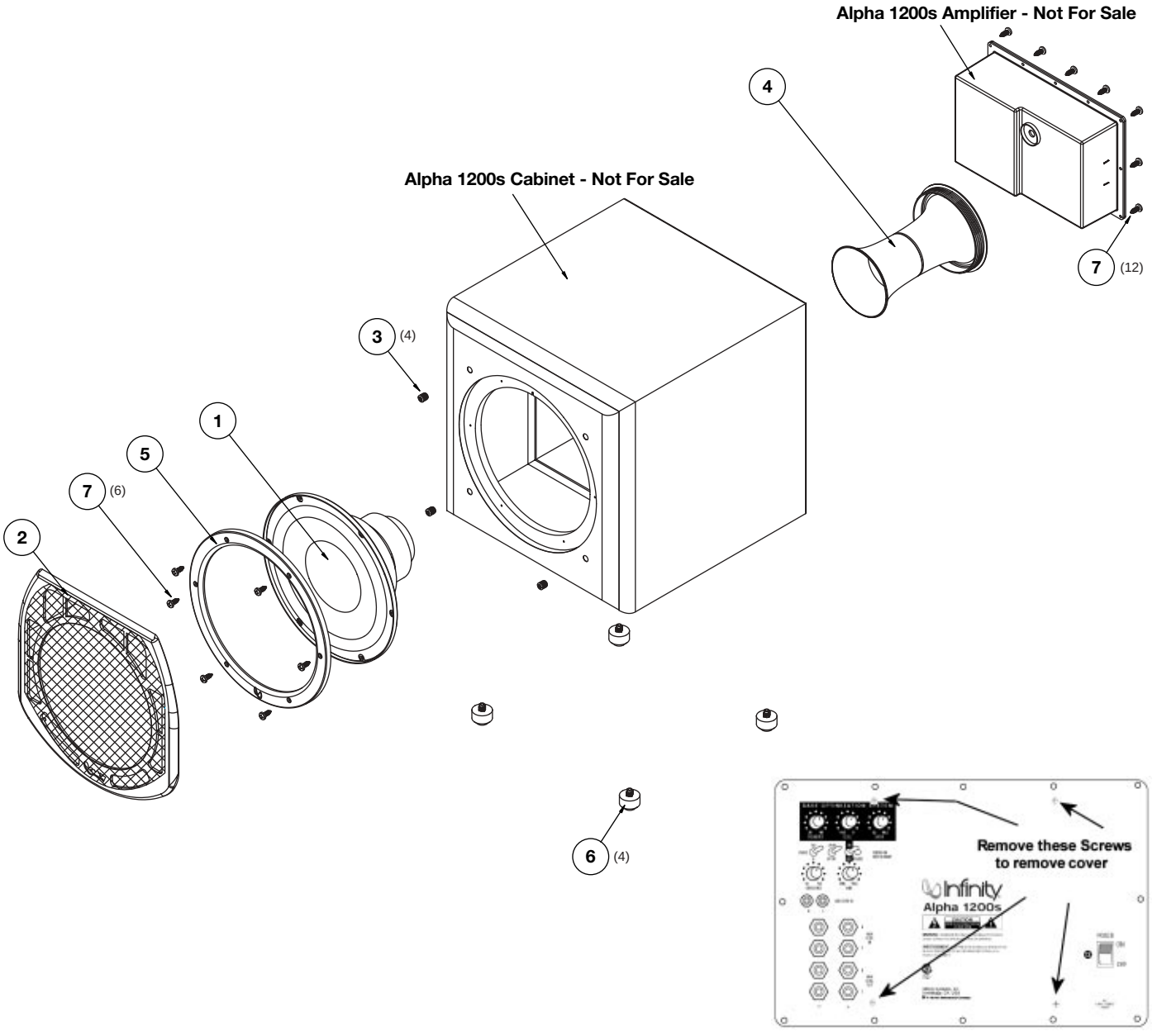
1) Remove the amplifier assembly from the subwoofer cabinet (12 Phillips screws).
2) Remove the Plastic Amp Cover from the faceplate (4 Phillips screws).
3) The area of concern is on the Class D Driver PCB (Small Upright PCB on the MAIN AMP PCB). A long, thin, soldering iron tip is recommended. Care must be taken not to damage surrounding components, like large inductor pair L8.
4) Locate, remove D60 (RLS4148 diode); replace with a 3.6V zener diode, Infinity Part# ZMM5227BCT-ND. When replacing D60 the polarity of the new (zener) diode should be reversed.
5) Add new 27KΩ resistor, Infinity Part# 299-27K, to the indicated connections. (This component, electrically, will be in parallel with R37, reducing its value to <22KΩ). Assure the leads do not come into contact with any other connections; insulate the leads if necessary.
6) Replace amp cover and return amplifer assembly to cabinet.
7) Test the subwoofer to assure the distortion is no longer present.





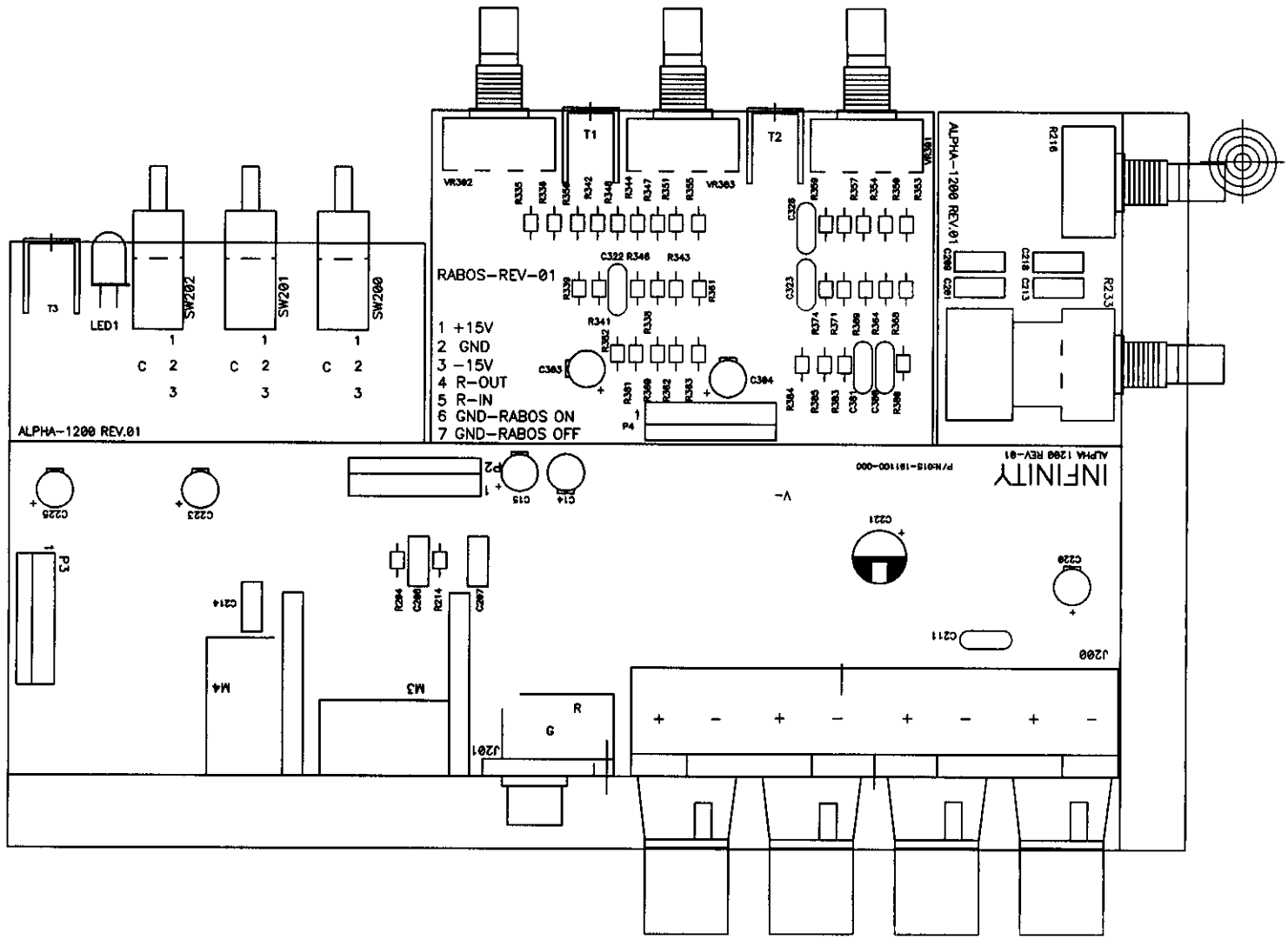
Alpha 1200s

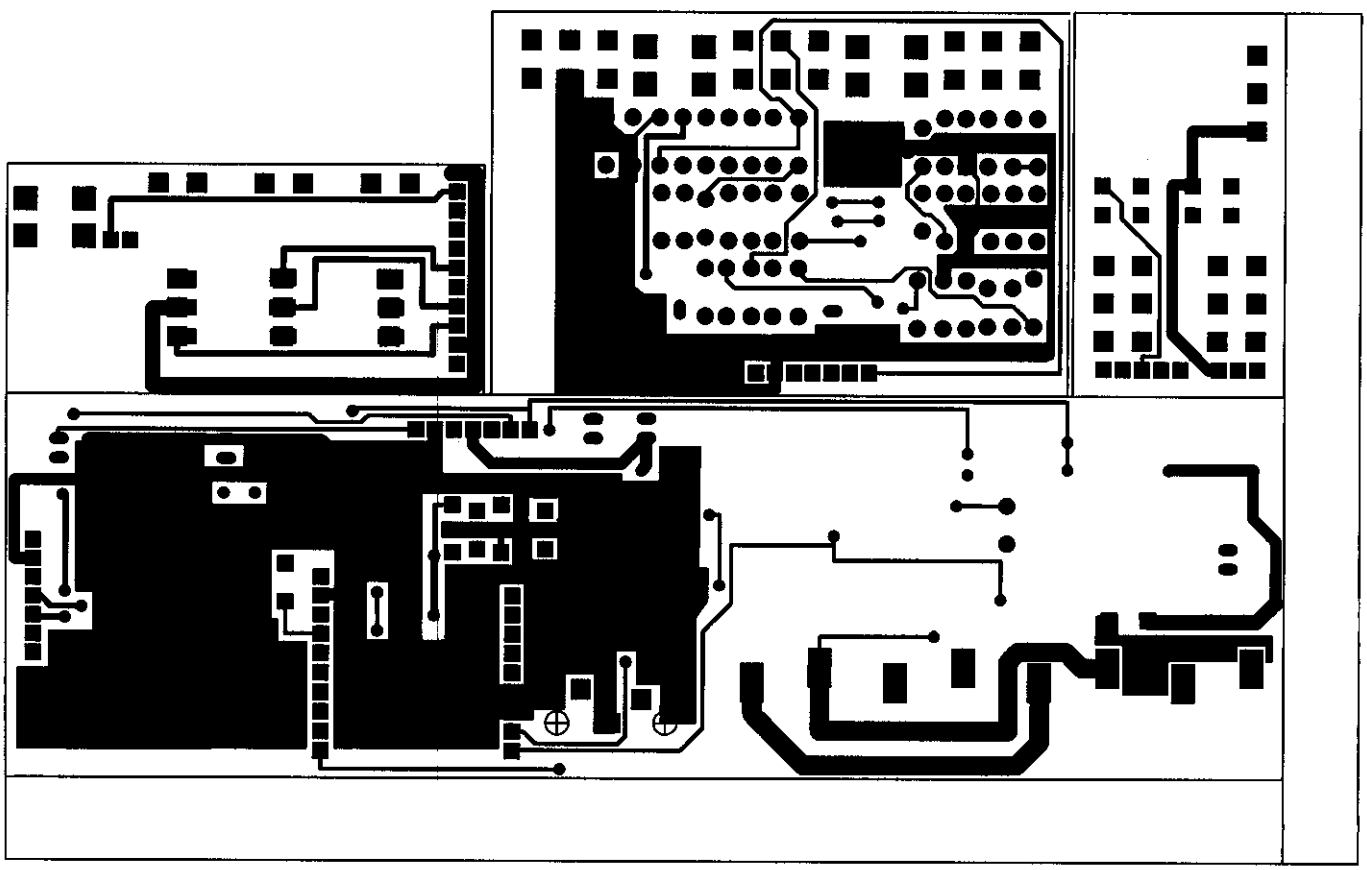
EXPLODED VIEW

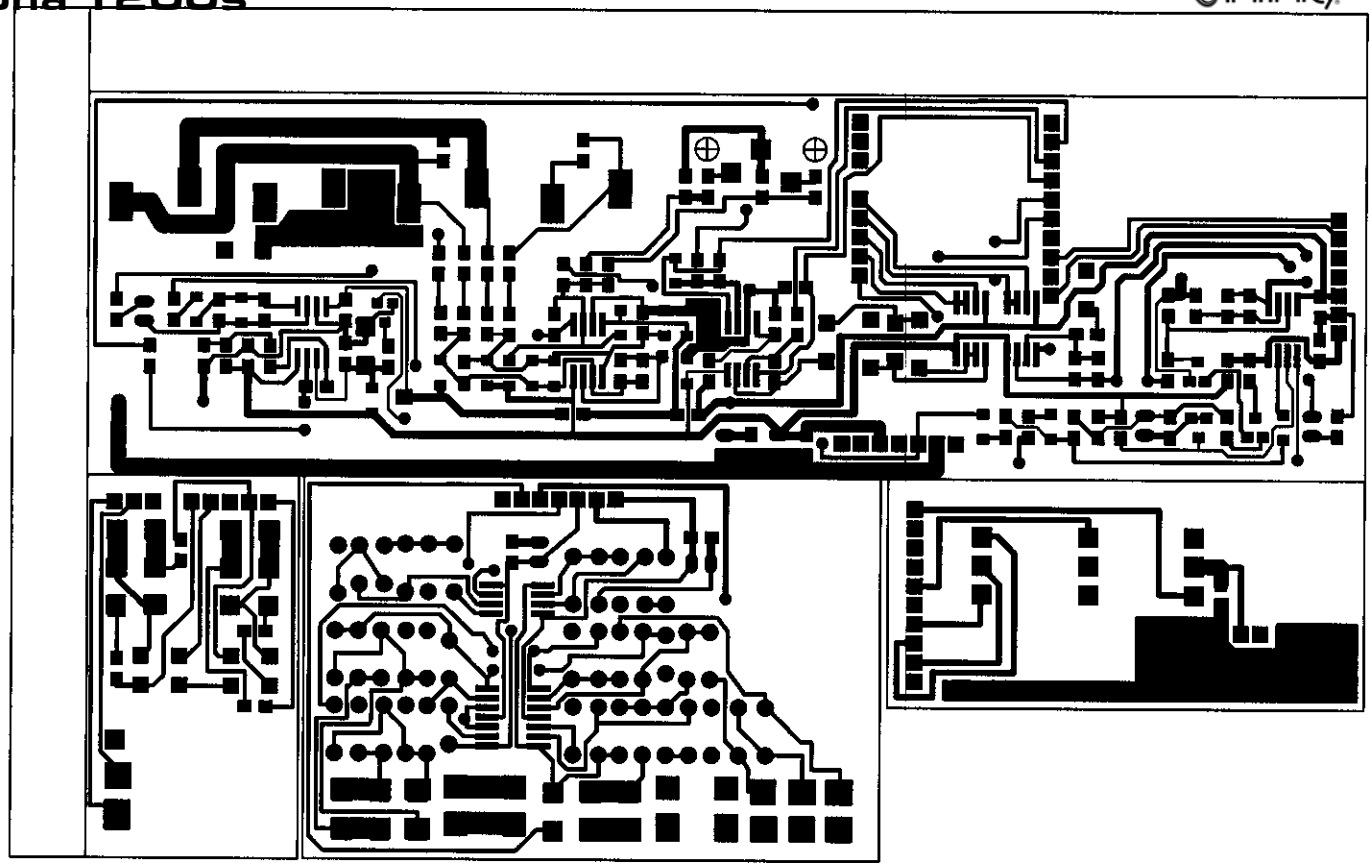


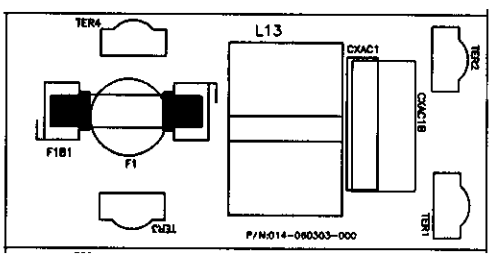
ITEM NO.	DESCRIPTION	QTY.	PART NO.
1.	Woofer, 12," C.M.M.D.", Shielded, 3.4 ohms ±10%	1	336056-001
2.	Front Grille	1	339945-001
3.	Grille Retainer	4	9330070
4.	Port Tube	1	336799-001
5.	Trim Ring	1	339944-001
6.	Rubber Foot Ass'y	4	338037-001

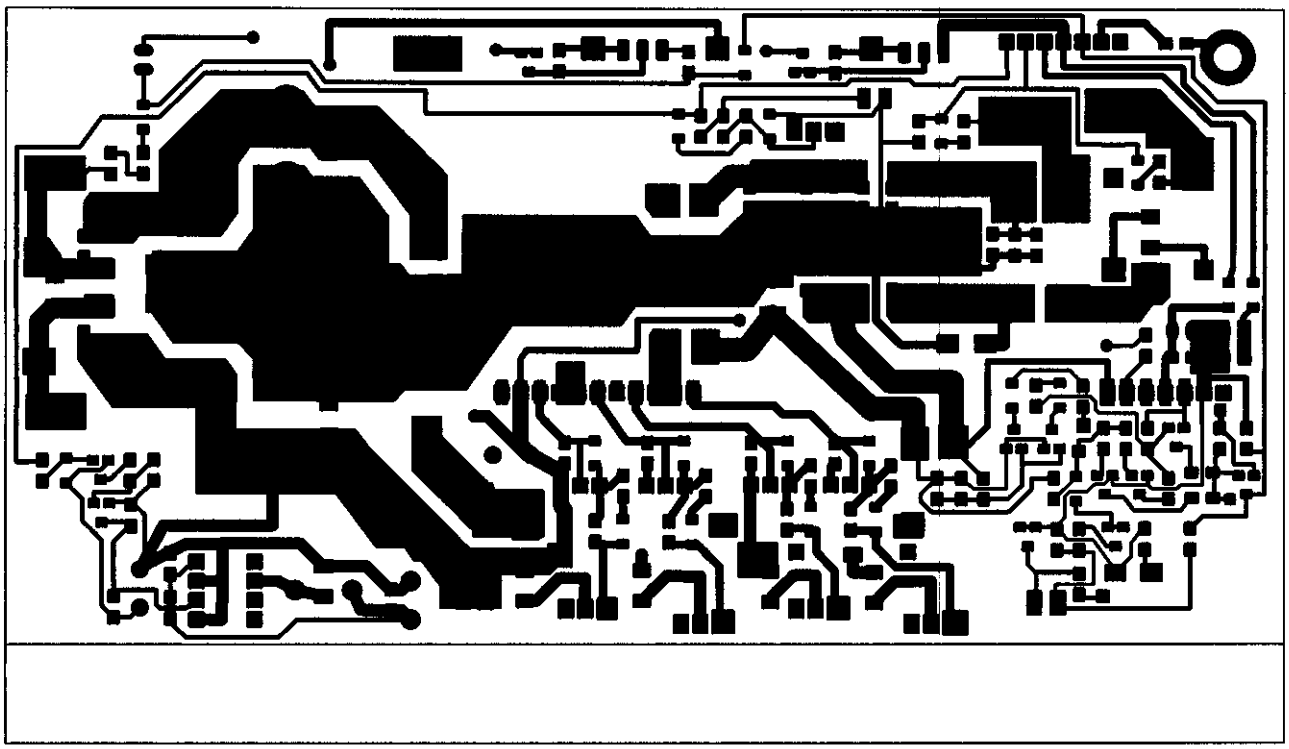
ITEM NO.	DESCRIPTION	QTY.	PART NO.
7.	Screw Torx HD, 3.9 x 30mm (12 Amp Assembly and 6 Woofer)	18	9412730
8.	Spike Foot Kit	1	338076-001
9.	Outer Carton	1	350613-001
10.	Top and Bottom End Pads	2	350615-001
11.	Owner's Manual	1	350614-001
12.	Warranty Card	1	335841-002

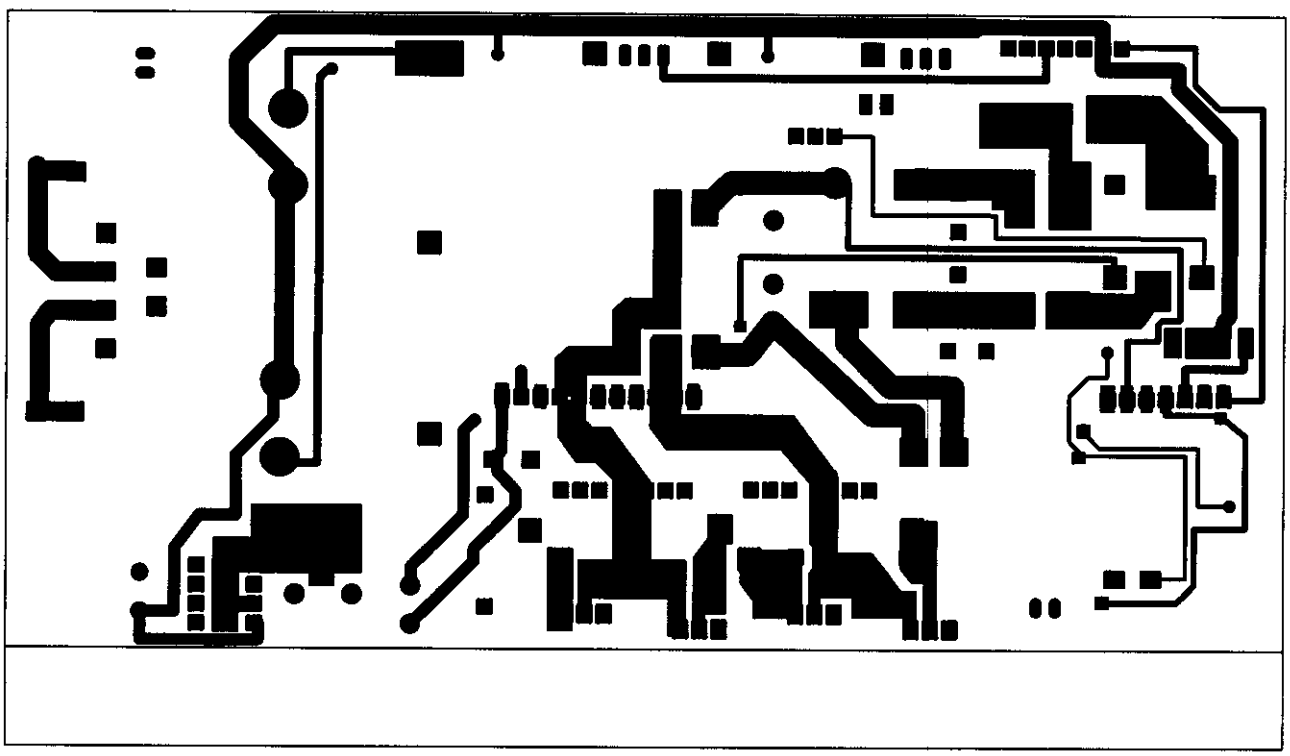

RABOS-REV-01
1 +15V
2 GND
3 -15V
4 R-OUT
5 R-IN
6 GND-RABOS ON
7 GND-RABOS OFF
ALPHA-1200 REV.01
INFINITY
T1
T2
T3
LED1
SW202
SW201
SW200
P1
P2
P3
P4
J200
J201

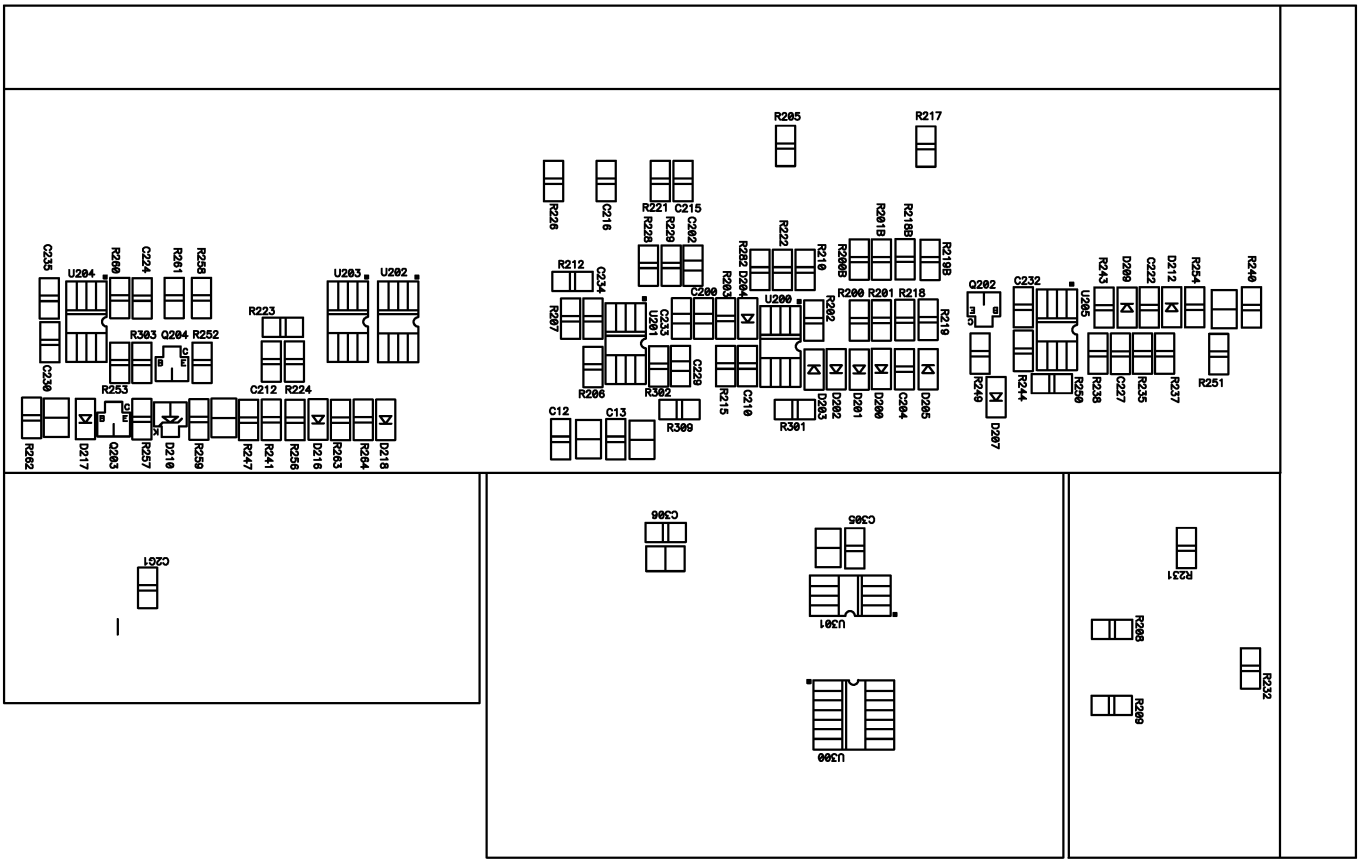


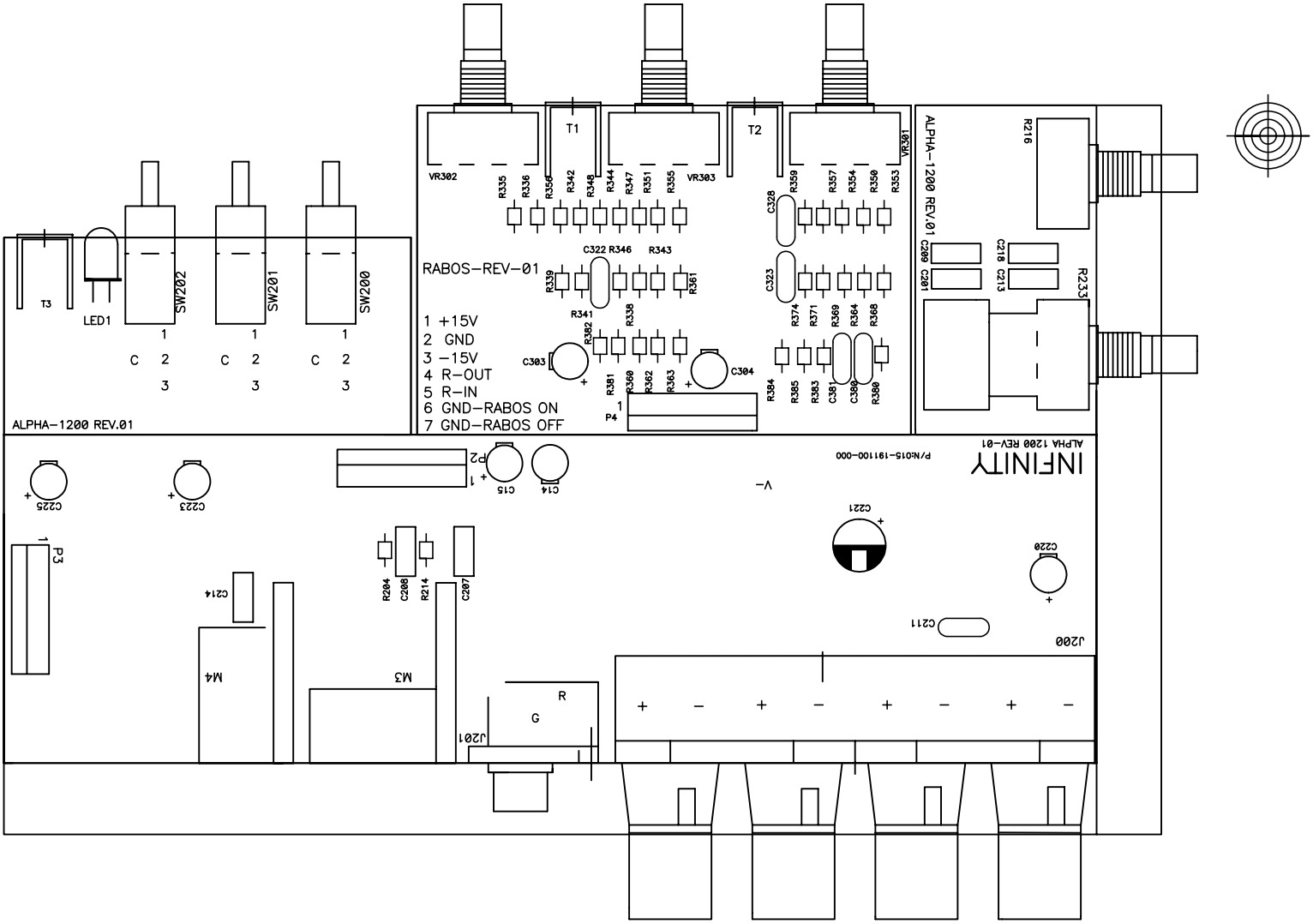


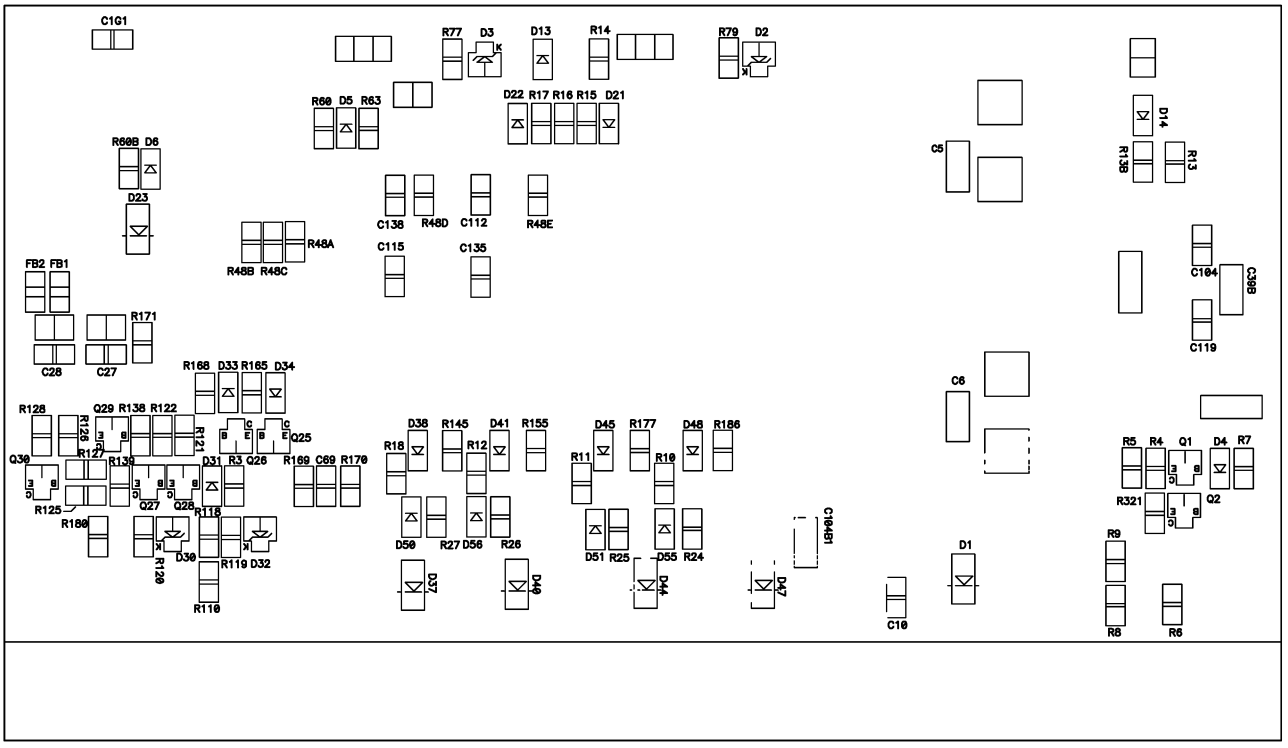

TER4
L13
CXAC1
TER2
CXAC18
F1B1
F1
TER3
TER1
P/N:014-060303-000

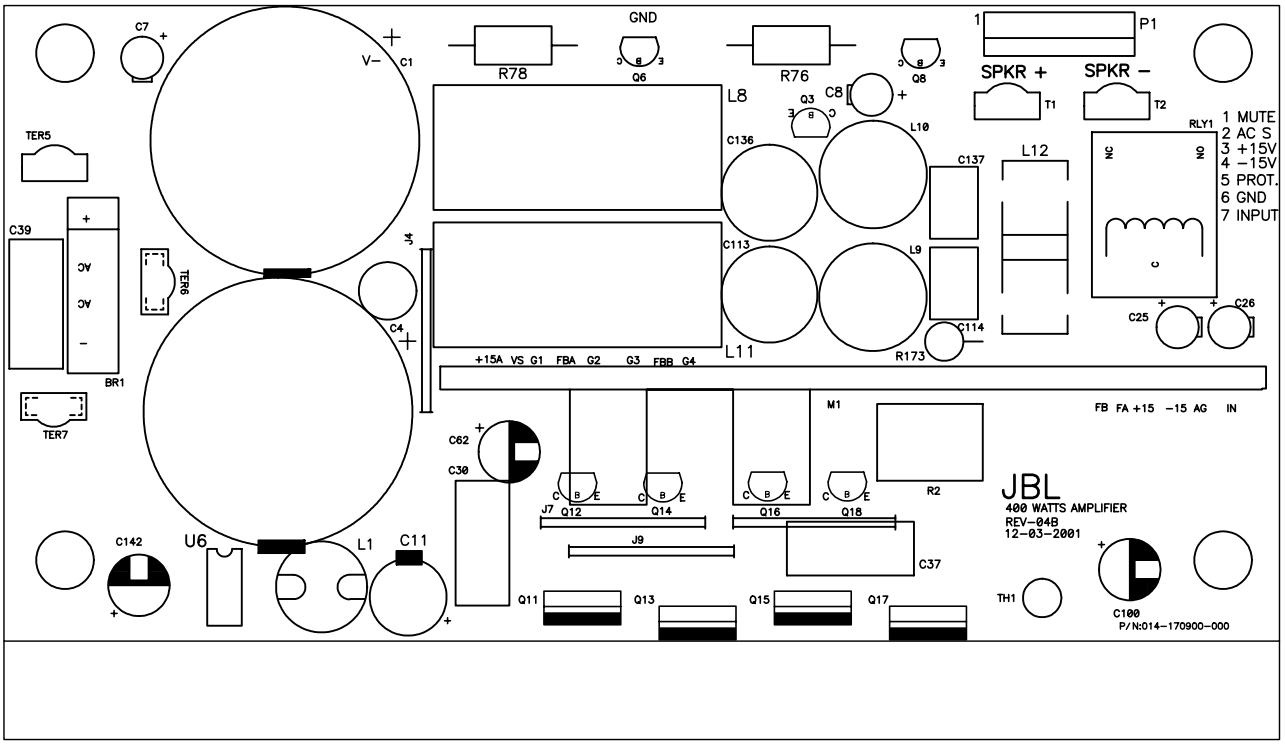







RABOS-REV-01
1 +15V
2 GND
3 -15V
4 R-OUT
5 R-IN
6 GND-RABOS ON
7 GND-RABOS OFF
ALPHA-1200 REV.01
ALPHA-1200 REV.01
INFINITY
P/N:015-191100-000
SW202
SW201
SW200
LED1
T1
T2
VR302
VR303
J200
J201
P2
P3
P4


C1G1
R77 D3 D13 R14 R79 D2
R60 D5 R63
D22 R17 R16 R15 D21
R60B D6
D23
R48A
R48B R48C
C138 R48D C112 R48E
C115 C135
FB2 FB1
R171
C28 C27
R168 D33 R165 D34
R128 R126 R127 R121 Q25
Q30 R130 D31 R3 Q26 R169 C69 R170
R125 R180 Q27 Q28 R115
R120 D30 R119 D32
R110
D38 R145 D41 R155
R16 R12
D50 R27 D56 R26
D37 D49
D45 R177 D48 R186
R11 R18
D51 R25 D55 R24
D44 D47
C104 R13B D14 R13
C5
C104 C398 C119
C6
R5 R4 Q1 D4 R7
R321 Q2
R9
R8 R6
C10 D1


C7
V– C1
GND
R78 Q6
R76 Q8
Q3 C8
L8
L10
C136
C137
L12
L9
C113
C114
L11
R173
P1
SPKR + SPKR –
T1 T2
RLY1
1 MUTE
2 AC S
3 +15V
4 –15V
5 PROT.
6 GND
7 INPUT
C25 C26
TER5
C39
TER6
BR1
TER7
J4
C4
+15A VS G1 FBA G2 G3 FBB G4
FB FA +15 –15 AG IN
M1
R2
C62
C30
J7 Q12 Q14 Q16 Q18
J9
C37
JBL
400 WATTS AMPLIFIER
REV–04B
12–03–2001
C142
U6
L1
C11
Q11 Q13 Q15 Q17
TH1
C100
P/N:014–170900–000

Alpha 1200s Electrical Parts List

Part Number	Description		Reference Designator
AMP ASS'Y			
Resistors			
021-100401-020	MOF Resistor	1K 1W J FK TYPE	R173
021-560305-020	MOF Resistor	560R 5WS J 8x25 KINK	R76
022-005105-020	Cement Resistor	PN:SQM 0R05 5W J 25x13	R2
022-470307-020	KNP Resistor	470R 7W J (KNP-700S)	R78
024-000098-120	SMD Resistor	0R 1/8W J 0805	R8
024-100498-120	SMD Resistor	1K 1/8W J 0805	R110,169
024-100598-120	SMD Resistor	10K 1/8W J 0805	R5,7,16,118,121,122,125,126
024-100698-120	SMD Resistor	100K 1/8W J 0805	R15,120
024-150498-120	SMD Resistor	1K5 1/8W J 0805	R119
024-160598-100	SMD Resistor	16K 1/8W F 0805	R13,13B
024-220498-121	SMD Resistor	2K2 1/8W J 0805	R17
024-220598-120	SMD Resistor	22K 1/8W J 0805	R127
024-330498-120	SMD Resistor	3K3 1/8W J 0805	R77,79
024-330598-120	SMD Resistor	33K 1/8W J 0805	R4,6,14,60,60B
024-470298-120	SMD Resistor	47R 1/8W J 0805	R24-27
024-470398-120	SMD Resistor	470R 1/8W J 0805	R145,155,177,186
024-470598-120	SMD Resistor	47K 1/8W J 0805	R3,171
024-510498-120	SMD Resistor	5K1 1/8W J 0805	R48A,48B,48C,48D,48E
024-910498-120	SMD Resistor	9K1 1/8W J 0805	R63
025-010300-000	Thermister	TSE-103 K L:50mm	TH1
Capacitors			
031-100184-100	SMD Capacitor	0u01/250V K 0805 X7R	C104,119
031-100244-100	SMD Ceramic Cap.	0u01/50V K 0805 X7R	C27,28
031-100344-100	SMD Capacitor	0u1/50V K 0805 X7R	C10,69,112,115,135,138
031-100384-100R	SMD Capacitor	0u1/250V K 1206 X7R	C5,6
031-470144-101	SMD Capacitor	0u0047/50V K 0805 X7R	C1G1
032-100484-200	END Mylar Cap.	1uF/250V K P:15mm	C37,39,30
033-330444-270	NPE Capacitor	3u3/50V K10 (R)8x13 SBE	C114,137
033-680464-270	NPE Capacitor	6u8/100V K10 (R)1020 GNE	C113,136
034-100614-300	Electrolytic Cap.	100uF/16V M (R)0611 P:2.5	C8
034-100625-300	Electrolytic Cap.,	100uF/25V M (R)6.3x11 P:5	C62
034-100695-300	Electrolytic Cap.	100uF/63V M (R)1012 P:5	C142
034-100895-204	Electrolytic Cap.	10000uF/63V M R30x51 85deg	C1,4
034-220525-300	Electrolytic Cap.,	22uF/25V M (R) 5x11 P:2.5	C25,26
034-330625-300	Electrolytic Cap.,	330uF/25V M (R)1013 P:5	C11,100
034-470415-300	Electrolytic Cap,	4u7/50V M (R)0511 P:2.0	C7
Semiconductors			
051-000600-100	NPN Transistor	PN:MPSW06RLRA TO-92 (ON)	Q6
051-005600-100	PNP Transistor	PN:MPSW56RLRA TO-92 (ON)	Q8
051-290700-100	PNP Transistor	PN:P2N2907A TO-92 (ON)	Q12,14,16,18
051-540101-000	PNP Transistor	PN:2N5401 TO-92	Q3
051-640001-000	MOSFET N-Channel	PN:IRF640N TO-220 (IR)	Q11,13,15,17
052-400080-000	Bridge Regulator	PN:RS804 400V,8A	BR1
053-257400-100	IC;DIP,Regulator	PN:LM2574 HVN-15V 8PIN (NS)	U6
054-000100-100	SMD DIODE	PN:ES1D 200V 1A	D1,23,37,40,44,47
054-001002-100	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	D32
054-001501-100	SMD ZENER DIODE	PN:BZX84C15 15V SOT-23	D2,3

Part Number	Description		Reference Designator
054-033904-100	SMD Transistor	PN:MMBT3904LT1 SOT23 (ON	Q25,28,29
054-033906-100	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	Q26,27,30
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 C36	D30
054-414803-100	SMD DIODE	PN:LL4148 (Wishay)	D4-6,13,14,21,22,31,33,38
054-540100-100	SMD Transistor	PN:MMBT5401 LT1 SOT-23	Q1
054-555100-100	SMD Transistor	PN:MMBT5551 LT1 (ON)	Q2
Miscellaneous			
043-300101-000	INDUCTOR	30uH YT-10033	L9,10
043-560200-000	INDUCTOR	56uH YT-10779	L12
043-700100-000	INDUCTOR	70uHx2 YT-10024	L8
043-820300-000	INDUCTOR	820uH YT-10034	L1
044-100100-000	SMD FERRITE BEAD	PN:321611 600R/100MHz 1206	FB1,FB2
072-040039-000	Terminal PCB type	PC205 (t=0.8m/m) T205MA	T1
072-040064-000	Terminal PCB type	PC250(t=0.8),T250MA	T2,TER6
072-040096-000	Terminal T187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	TER5,TER7
072-040250-000	CONNECTOR	7 PIN JS-1001-7 P:2.5mm	P1
073-111003-000	Shorting Strap	54.9x13.6x1m/m	J7
073-111004-000	Shorting Strap	29.5x12.4x0.8m/m	J4,9
074-300018-000	RELAY	PN:943-1C-48D	RLY1
INPUT PCB ASS'Y	(3 PCB's)		
Resistors			
021-226598-100	MF Resistor	22K6 1/8W F	R214
021-576498-100	MF Resistor	5K76 1/8W F	R204
024-000097-120	SMD Resistor	0R 1/4W J 1206	R301,302,303,309
024-100398-121	SMD Resistor	100R 1/8W J 1206	R249
024-100498-121	SMD Resistor	1K 1/8W J 1206	R238,264
024-100598-101	SMD Resistor	10K 1/8W F 1206	R200B,201B,218B,219B
024-100598-121	SMD Resistor	10K 1/8W J 1206	R202,205-207,212,217
024-100698-101	SMD Resistor	100K 1/8W F 1206	R200,201,218,219
024-150498-121	SMD Resistor	1K5 1/8W J 1206	R251
024-150598-121	SMD Resistor	15K 1/8W J 1206	R223
024-200598-121	SMD Resistor	20K 1/8W J 1206	R256
024-226598-100	SMD Resistor	22K6 1/8W F 1206	R208,209,231,232
024-270498-121	SMD Resistor	2K7 1/8W J 1206	R237
024-300398-121	SMD Resistor	300R 1/8W J 1206	R258
024-300598-121	SMD Resistor	30K 1/8W J 1206	R260
024-330498-101	SMD Resistor	3K3 1/8W F 1206	R203,215
024-330498-121	SMD Resistor	3K3 1/8W J 1206	R240,247
024-470498-121	SMD Resistor	4K7 1/8W J 1206	R210
024-470698-121	SMD Resistor	470K 1/8W J 1206	R259
024-470798-121	SMD Resistor	4.7M 1/8W J 1206	R243,244
024-510398-121	SMD Resistor	510R 1/8W J 1206	R261
024-560598-121	SMD Resistor	56K 1/8W J 1206	R224
024-620398-121	SMD Resistor	620R 1/8W J 1206	R221,226
024-680598-121	SMD Resistor	68K 1/8W J 1206	R250
024-750798-121	SMD Resistor	7M5 1/8W J 1206	R241
024-820598-121	SMD Resistor	82K 1/8W J 1206	R263
026-500595-254	VR 50KA	P/N:RK163111R405-EJ	R216
026-500595-267	VR 50KBx4	PN:RD1631411001D-50KBx4 (EJ)	R233

Part Number	Description		Reference Designator
Capacitors			
031-100244-101	SMD Capacitor	0u01/50V K 1206 X7R	C12,13,224
031-100344-102L	SMD Capacitor	0u1/50V K 1206 X7R	C227,229,230,232-235
031-100344-104	SMD Capacitor	100pF/50V K NPO 1206	C204,222
031-220244-103L	SMD Capacitor	0u022/50V K 1206 X7R	C202
031-220344-103	SMD Capacitor	220pF/50V K NPO 1206	C200,210,215,216
031-470444-101	SMD Capacitor	4700pF/50V K X7R 1206	C2G1
031-680444-100	SMD Capacitor	6800pF/50V K X7R 1206	C212
034-100515-300G	Electrolytic Cap.,	10uF/16V M (R)0511 P:2	C220
034-100615-301	Electrolytic Cap.,	100uF/16V M (R)0611 P:5	C221
034-220516-301	Electrolytic Cap.	22uF/16V M (R)0511 P:2	C223,225
034-220525-300	Electrolytic Cap.,	22uF/25V M (R) 5x11 P:2.5	C14,15
035-330293-300	ESK Cap.	0u033/63V J P:5	C209,218
035-560393-300	PE Cap.	0u56/63V J P:5	C207,208
035-680253-300	PE Cap.FE-M	0u068/63V J P:5m/m	C201,213
035-680353-300	ESK Cap.	0u68/63V J P:5 PN:ESK063P68JA	C214
Semiconductors			
050-505200-001	LED	PN:LT-2402-21	LED1
054-007200-100	SMD IC	PN:TL072CDR SO-8 (TI)	U200-205
054-033904-100	SMD Transistor	PN:MMBT3904LT1 SOT23 (ON	Q203,204
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 TAPI	D210
054-211400-100	SMD Transistor (NPN)	PN:DTC114EK SMT3 (ROHM)	Q202
054-414803-100	SMD DIODE	PN:LL4148 (Wishay)	D200-205,207,209,212,216, 217,218
Miscellaneous			
072-010058-000	RCA JACK 2P	PN:0502000W1G (Red,White)	J201
072-040039-000	Terminal (PCB TYPE)	PC205 (t=0.8m/m) T205MA	C211
072-040250-000	CONNECTOR	7 PIN JS-1001-7 P:2.5mm	P2,3
072-040253-000	HEADER Right Angle	PN:211-103-000-400 3PIN	M3
072-040337-000	HEADER Right Angle	PN:211-110-000-400 10PIN	M4
072-040338-000	HEADER Right Angle	PN:211-105-000-400 5PIN	M3
072-060219-000	BINDING POST (gold plated)	PN:A807A-RB 8PIN 1/2K red+blk	J200
073-010021-000	Screw holder	PN:PCB-2(M3) 4PIN	T1,2,3
074-030002-000	Toggle Switch	P/N L101	SW200-202
RABOS PCB ASS'Y			
Resistors			
021-100398-100	MF Resistor	100R 1/8W F	R339
021-100498-100	MF Resistor	1K 1/8W F	R363,381
021-100598-100	MF Resistor	10K 1/8W F	R338,342,343,346,348,353
021-100798-100	MF Resistor	1M 1/8W F	R356
021-100898-100	MF Resistor	10M 1/8W F	R362
021-110698-100	MF Resistor	110K 1/8W F	R347
021-121598-100	MF Resistor	12K1 1/8W F	R354,369
021-140598-100	MF Resistor	14K 1/8W F	R380
021-150198-100	MF Resistor	1K5 1/8W F	R341
021-162398-100	MF Resistor	162R 1/8W F	R384
021-267498-100	MF Resistor	2K67 1/8W F	R336
021-340398-100	MF Resistor	340R 1/8W F	R357,371
021-357498-100	MF Resistor	3K57 1/8W F	R335

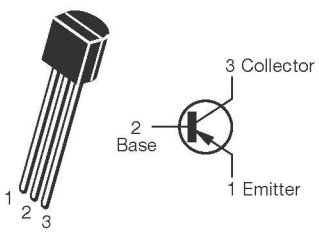
Part Number	Description		Reference Designator
021-549398-100	MF Resistor	549R 1/8W F	R344
021-590498-100	MF Resistor	5K9 1/8W F	R382
021-619498-100	MF Resistor	6K19 1/8W F	R359,374
021-680398-100	MF Resistor	680R 1/8W F	R360
021-698598-100	MF Resistor	69K8 1/8W F	R383
021-787398-100	MF Resistor	787R 1/8W F	R350,364
021-909398-100	MF Resistor	909R 1/8W F	R385
021-931498-100	MF Resistor	9K31 1/8W F	R351
026-100595-346	VR 10KAx2 (Level,Width)	PN:RV16A01-20-15K-A14-3E53	VR302,303
026-100595-347	VR 10KCx2 (Frequency)	PN:RV16A01-20-15K-C14-3E53	VR301
Capacitors			
031-100345-300	SMD Capacitor	0u1/50V M 1206 X7R	C305,306
034-220525-300	Electrolytic Cap.,	22uF/25V M (R) 5x11 P:2.5	C303,304
035-100293-300	ESK Mylar Cap.	0u01/63V J P:5	in parallel with C328
035-100363-300	PE Cap.	0u1/100V J P:5m/m	C322,323,328
035-680253-300	PE Cap. FE-M	0u068/63V J P:5m/m	C381
038-150393-300	MPE Cap. P:5	0u15/63V J	C380
Semiconductors			
054-007200-100	SMD IC	PN:TL072CDR SO-8 (TI)	U301
054-007400-100	SMD IC;(OP)	PN:TL074CDR (TI)	U300
072-040250-000	CONNECTOR	7 PIN JS-1001-7 P:2.5mm	P4
FUSE PCB ASS'Y			
039-220180-100	X2 Safety Cap. 0u22/250V	18x16.5x8.5mm PN:XG275M224VH	CXAC1
043-324300-000	INDUCTOR	324uH YT-10778	L13
072-040064-000	Terminal (PCB TYPE)	PC250(t=0.8),T250MA	TER2
072-040096-000	Terminal T187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	TER1,3,4
073-050001-000	FUSE CLIP	P/N:CFFH1206	F1,B1
091-000128-000	FUSE	T4A/250V φ5x20m/m	
PRE DRIVER AMP PCB			
Resistors			
024-000098-120	SMD Resistor	0R 1/8W J 0805	R313,314,318,320
024-100298-120	SMD Resistor	10R 1/8W J 0805	R89,90,140,150
024-100498-120	SMD Resistor	1K 1/8W J 0805	R81,85,96,97,131,137,142
024-100598-120	SMD Resistor	10K 1/8W J 0805	R75,82,83,92,98,132,133
024-100698-120	SMD Resistor	100K 1/8W J 0805	R37
024-100798-120	SMD Resistor	1M 1/8W J 0805	R32,33
024-110598-120	SMD Resistor	11K 1/8W J 0805	R74,99
024-200598-120	SMD Resistor	20K 1/8W J 0805	R95,141
024-220398-120	SMD Resistor	220R 1/8W J 0805	R136,167
024-220498-121	SMD Resistor	2K2 1/8W J 0805	R134
024-220798-120	SMD Resistor	2M2 1/8W J 0805	R87,93
024-270498-120	SMD Resistor	2K7 1/8W J 0805	R80,84,157
024-390498-120	SMD Resistor	3K9 1/8W J 0805	R130,161
024-390598-120	SMD Resistor	39K 1/8W J 0805	R86,94
024-470398-120	SMD Resistor	470R 1/8W J 0805	R91
024-470498-120	SMD Resistor	4K7 1/8W J 0805	R151-153,183,34,36
024-470598-120	SMD Resistor	47K 1/8W J 0805	R35

Part Number	Description		Reference Designator
024-560598-120	SMD Resistor	56K 1/8W J 0805	R38
024-680498-120	SMD Resistor	6.8K 1/8W J 0805	R135,166
Capacitors			
031-100244-100	SMD Ceramic Cap.	0u01/50V K 0805 X7R	C108,118,131,140
031-100343-100	SMD Capacitor	100pF/50V J 0805 NPO	C81,84
031-100344-100	SMD Capacitor	0u1/50V K 0805 X7R	C75-78,82,85
031-180344-100	SMD Capacitor	0u18/50V K 0805 X7R	C80,83
031-470244-102	SMD Capacitor	0u047/50V K 0805 X7R	C93,94,101,124
031-560243-100	SMD Capacitor	56pF/50V J 0805 NPO	C92,102,105,125
031-560343-102	SMD Capacitor	560pF/50V J 0805 NPO	C79
034-100625-303	Electrolytic Cap.	100uF/25V M (R) P:2.5	C117
034-100715-202	Electrolytic Cap. 85 deg	1000uF/16V M (R) 10x17 P:5	C109,132
034-330615-301	Electrolytic cap.	330uF/16V M (R)0812 P:3.5	C32
Semiconductors			
051-000600-100	NPN Transistor	PN:MPSW06RLRA TO-92 (ON)	Q31
051-222200-100	NPN Transistor (ON SEM)	PN:MPS2222ARLRA TO-92	Q20,22
051-555100-000	NPN Transistor	PN:2N5551 TO-92	Q21,23
053-211100-000	IC;DIP,DRIVER	PN:IR2111 8PIN (IR)	U7,8
054-000100-100	SMD DIODE	PN:ES1D 200V 1A	D35,43
054-001002-100	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	D42,49
054-007200-100	SMD IC	PN:TL072CDR SO-8 (TI)	U9,10
054-033906-100	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	Q34,35
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 TAPI	Z7,8
054-414803-100	SMD DIODE	PN:LL4148 (Wishay)	D36,39,46,52,60,61
054-540100-100	SMD Transistor	PN:MMBT5401 LT1 SOT-23	Q33,40
054-555100-100	SMD Transistor (NPN)	PN:MMBT5551 LT1 (ON)	Q32
Miscellaneous			
072-040229-000	HEADER Right Angle	PN:211-107-000-400 7PIN	PIN2
072-040230-000	HEADER Right Angle	PN:211-111-000-400 11PIN	PIN1
008-060302-032	GASKET (S12P) CR	28x20mm t=5mm C4305	X'FORMER
008-061215-000	GASKET C4305	12x15 t=5mm CR	Thermister
008-062001-000	GASKET CR C4305	196x10mm t=1mm	COVER(front)x2,COVER(Rear)x2
008-063001-000	GASKET CR C4305	320x10mm t=1mm	COVER(Front)x2,COVER(Rear)x2
042-014107-001	Transformer 120V/60Hz	EI-125 YT-9313-2	
061-001052-000	Knob	PN:49001-W (18)D=15.1 H=14.5	For R233,216,VR301-303
061-100016-000	Partition post	PN:BCMS-8 L=8mm NY 66(UL)	Power PCB
061-314002-000	Strain Relief	P/N SB4F-2	PANEL,COVER
061-700035-000	Thermal Isolator	PN:TO-220AWO	For Q11,15
061-700044-000	Mica	13x18mm TO-220	For Q13,17
063-010010-000	Bracket for Transistor	P/N:TRK-2	For Q11,13,15,17,TH1
063-332101-000	Amp Cover	12.83"x8.33"x3.93" ABS 94V0	
063-332103-000	PANEL(ALPHA SUB 1200)	12.83x8.33" t=0.984"SPCC	
065-040102-090	UL PVC sleeve 300V 105deg	φ1mm blk	
073-014044-000	Bracket black	6.64"x3.50"x3.20" SPCC cadium	
074-020018-000	ROCKER SW (POWER)	PN:RF1003-BB4-0	
086-021836-000	Power Cord	SPT-2 #18 12'+T187	
181-911622-148	Wire #16AWG UL1007	red L=720 T250 terminal + sleeve	SPE+
181-911800-338	Wire #18AWG UL1007	blk L=110mm+7mm	C211
181-921600-000	BLK Wire #16 UL1015	T187 transparent sleeve L:140mm	
181-921699-000	WHT Wire #16 UL1015	T187 transparent sleeve L:160mm	

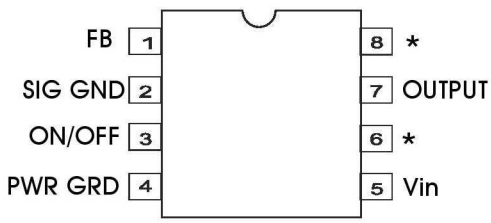
Integrated Circuit/Transistor Diagrams

MPSW56, 2N2709A, 2N5401

Q3,8,12,14,16,18

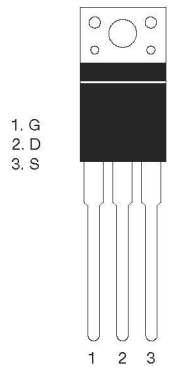


LM2574
U6



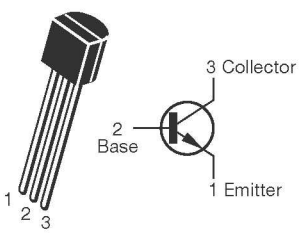
* No internal connection, but should be soldered to PC board for best heat transfer.

MOSFET IRF640
Q11,13,15,17



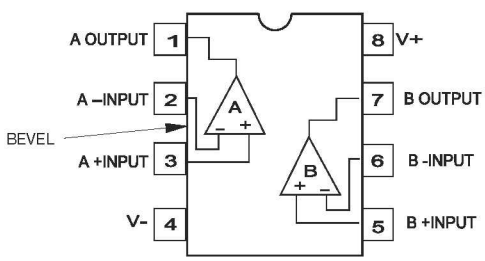
MPS2N222
MPSW06, 2N5551

Q6, 20-23,31

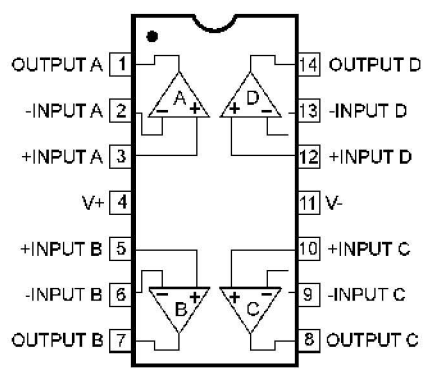


OPAMP, DUAL
TL072CDR SO-8,

U9,10,200-205,301

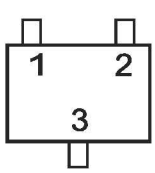


OPAMP, QUAD 14P DIL TL074
U300



* MMBT3904LTI SOT23,
* MMBT3906LTI SOT23,
DTC114TK SMT3,
* MMBT5401 LTI,
* MMBT5551 LTI

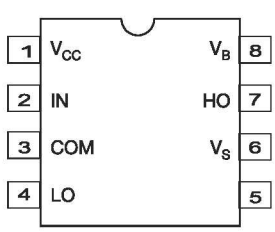
Q1,2,25-30,32, 33-35,40,202-204



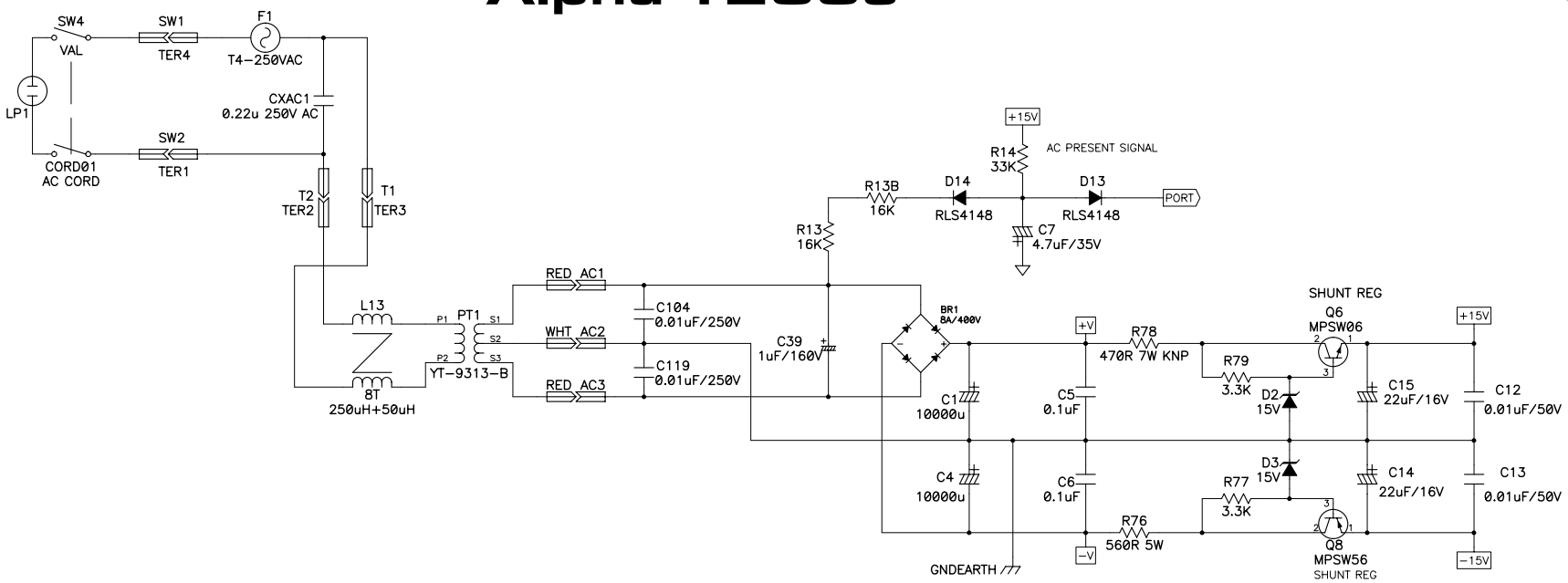
1) Emitter
2) Base
3) Collector

* PREFIX MAY BE "FMMT"

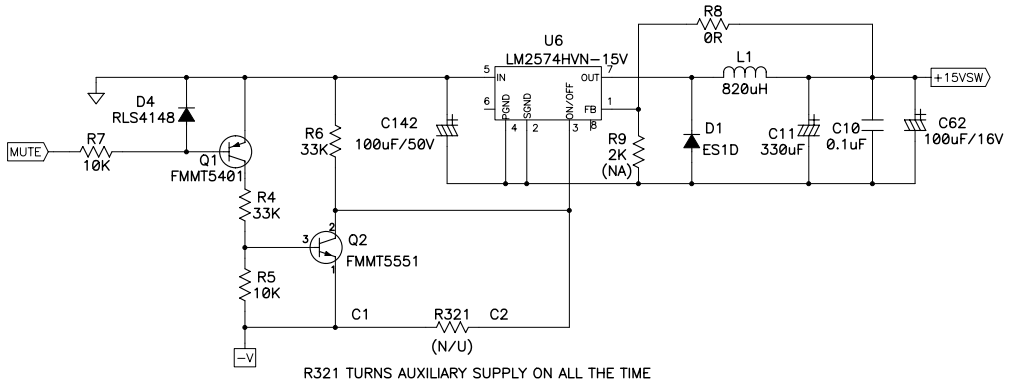
IR2111 HALF-BRIDGE DRIVER
U7,8



Alpha 1200s

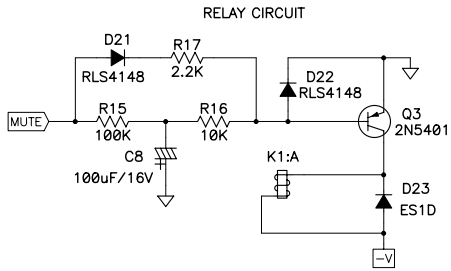


STEP-DOWN-REGULATOR 15V-SW



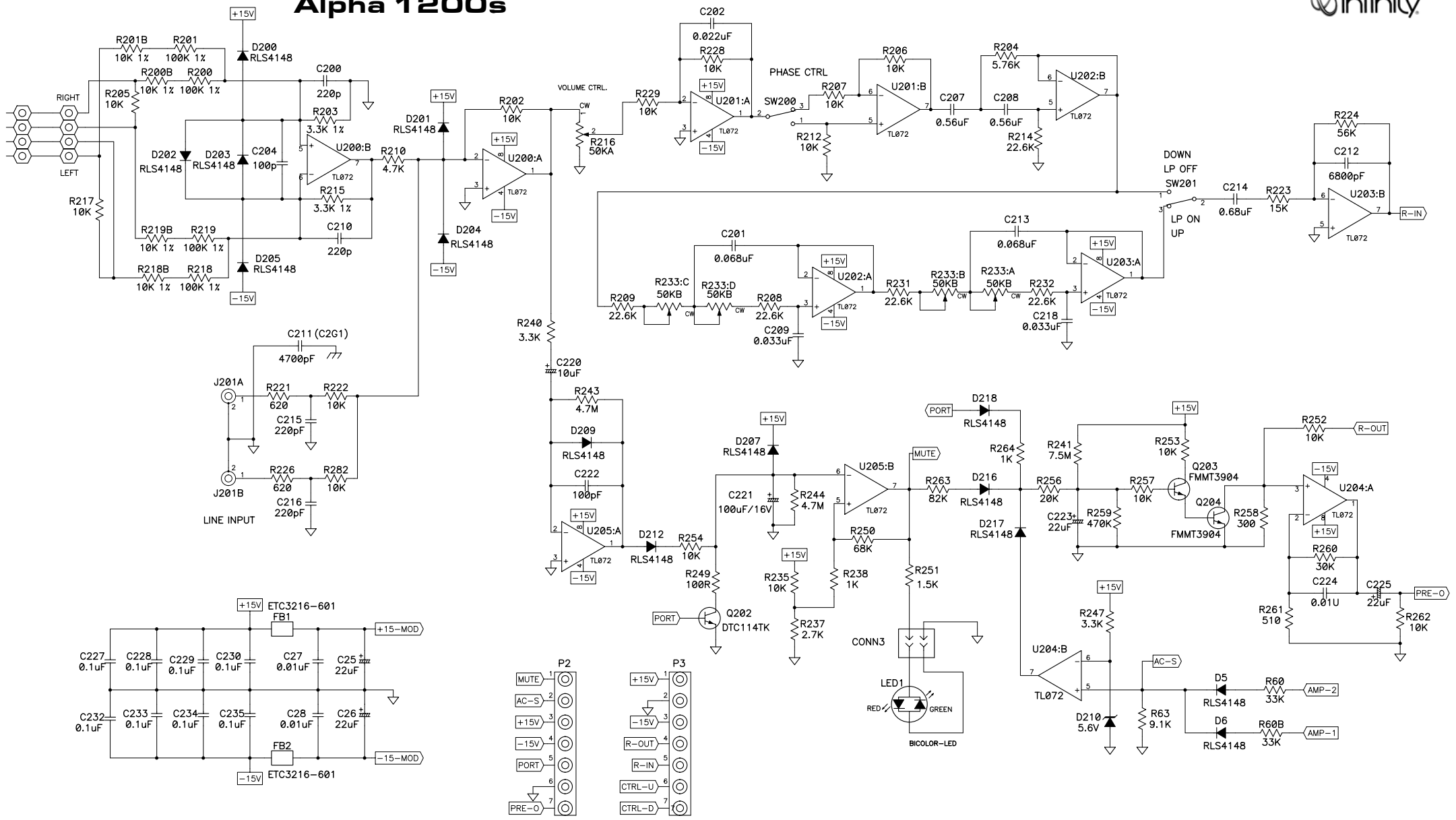
R321 TURNS AUXILIARY SUPPLY ON ALL THE TIME

RELAY CIRCUIT



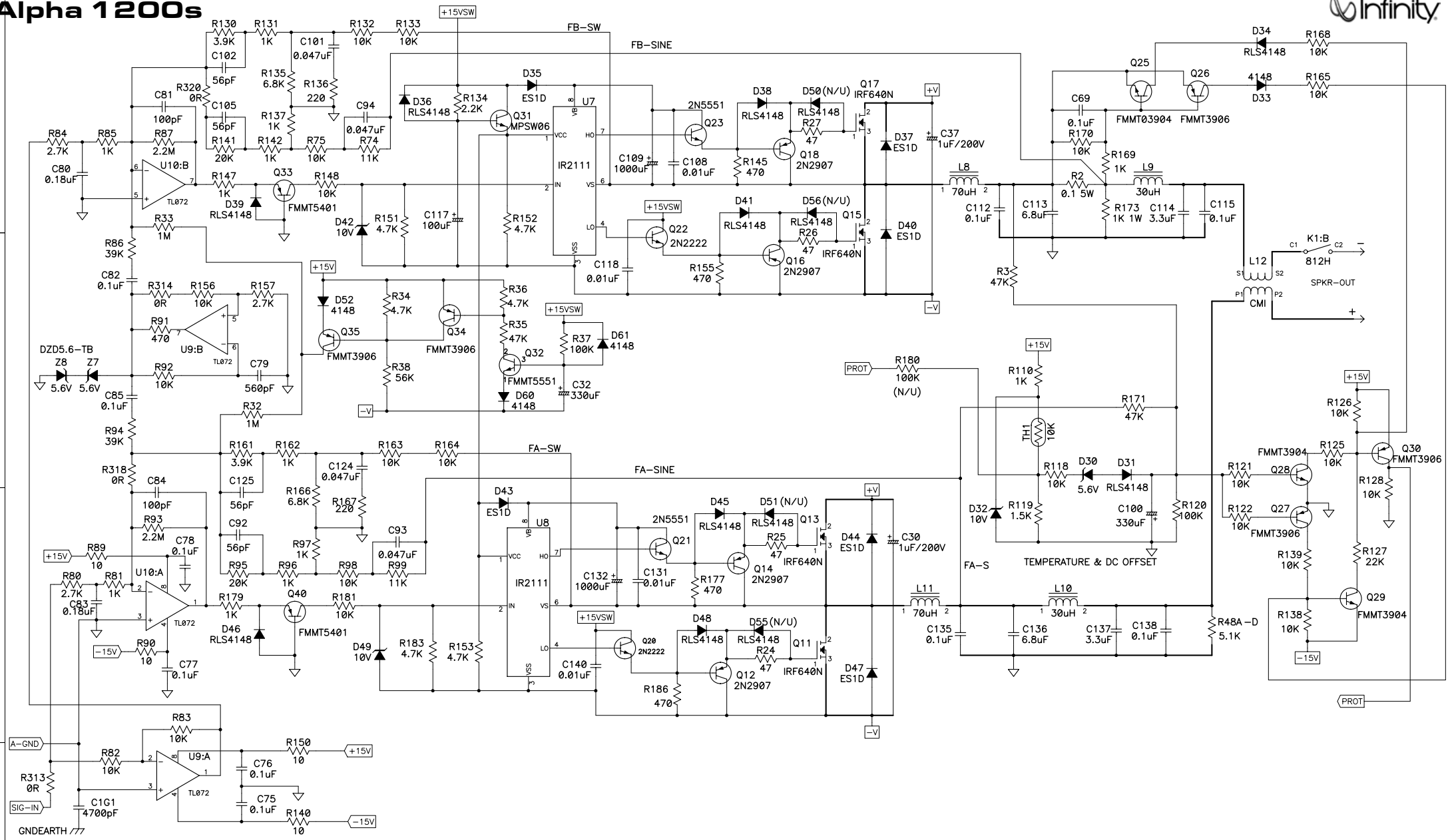
Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	HARMAN
P1A	NEW Design	2002/07/03							: 350089-001
P1B	CHANGE:R119,R224,R254	2002/07/26							Model no: ALPHA-SUB-1200
P1C	CHANGE:R76,R244,R249,R254,C221 DEL:D218,R264	2002/08/05							Sch name: ALPHA-SUB-1200-P1F
P1D	CHANGE:C224	2002/08/09							Issue no: ALPHA-SUB-1200
P1E	CHANGE:R78,R119	2002/09/04							Date: 2002/09/16
P1F	CHANGE:R32,R33,R249,C323,C328 ADD:D218,R264	2002/09/16							Sheet: 1 of 4 Rev: P1F
									Size: A2 Author: BELLE

Alpha 1200s



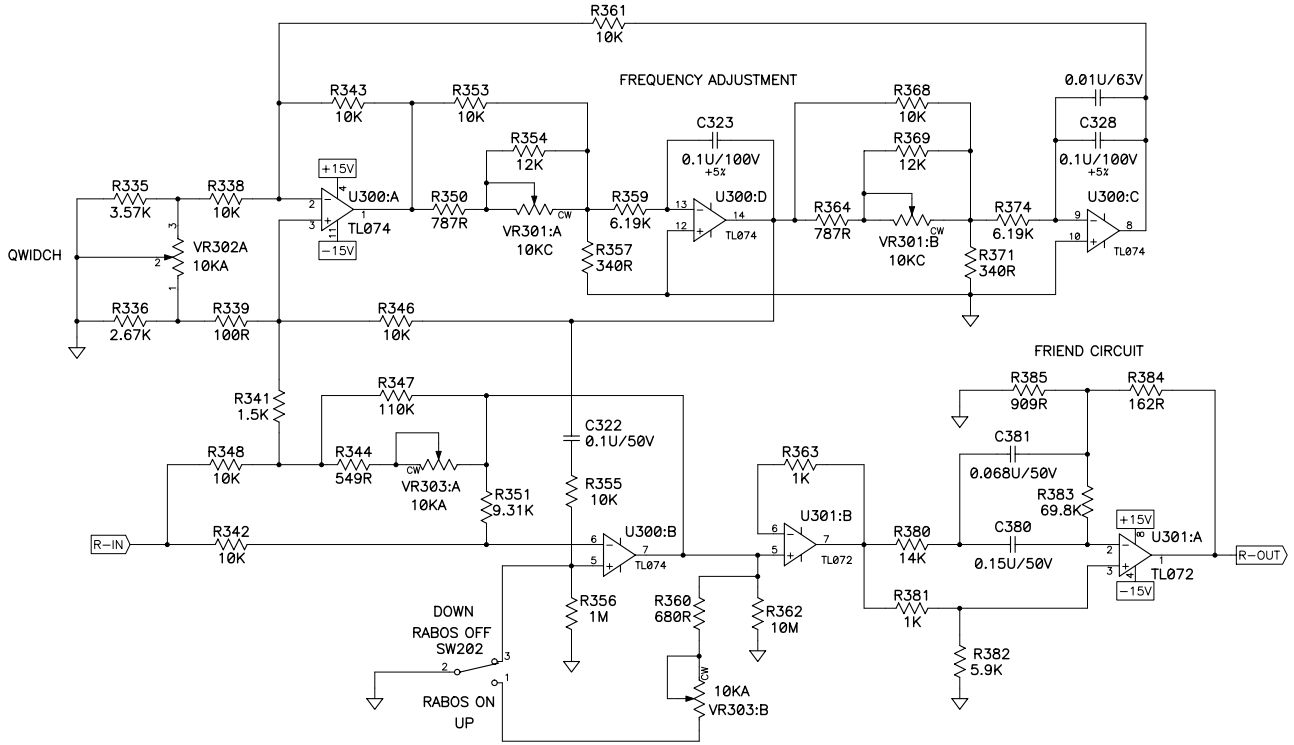
Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	HARMAN
P1A	NEW Design	2002/07/03							: 350089-001
P1B	CHANGE:R119,R224,R254	2002/07/26							Model no: ALPHA-SUB-1200
P1C	CHANGE:R76,R244,R249,R254,C221 DEL:D218,R264	2002/08/05							Sch name: ALPHA-SUB-1200-P1F
P1D	CHANGE:C224	2002/08/09							Issue no: ALPHA-SUB-1200
P1E	CHANGE:R78,R119	2002/09/04							Date: 2002/09/16
P1F	CHANGE:R32,R33,R249,C323,C328 ADD:D218,R264	2002/09/16							Sheet: 2 of 4 Rev: P1F
									Size: A2 Author: BELLE

Alpha 1200s



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	HARMAN
P1A	NEW Design	2002/07/03							: 350089-001
P1B	CHANGE:R119,R224,R254	2002/07/26							Model no: ALPHA-SUB-1200
P1C	CHANGE:R76,R244,R249,R254,C221 DEL:D218,R264	2002/08/05							Sch name: ALPHA-SUB-1200-P1F
P1D	CHANGE:C224	2002/08/09							Issue no: ALPHA-SUB-1200
P1E	CHANGE:R78,R119	2002/09/04							Date: 2002/09/16
P1F	CHANGE:R32,R33,R249,C323,C328 ADD:D218,R264	2002/09/16							Sheet: 3 of 4 Rev: P1F
									Size: A2 Author: BELLE

Alpha 1200s



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By
P1A	NEW Design	2002/07/03						
P1B	CHANGE:R119,R224,R254	2002/07/26						
P1C	CHANGE:R76,R244,R249,R254,C221 DEL:D218,R264	2002/08/05						
P1D	CHANGE:C224	2002/08/09						
P1E	CHANGE:R78,R119	2002/09/04						
P1F	CHANGE:R32,R33,R249,C323,C328 ADD:D218,R264	2002/09/16						

25

HARMAN

: 350089-001

Model no: ALPHA-SUB-1200

Sch name: ALPHA-SUB-1200-P1F

Issue no: ALPHA-SUB-1200

Date: 2002/09/16

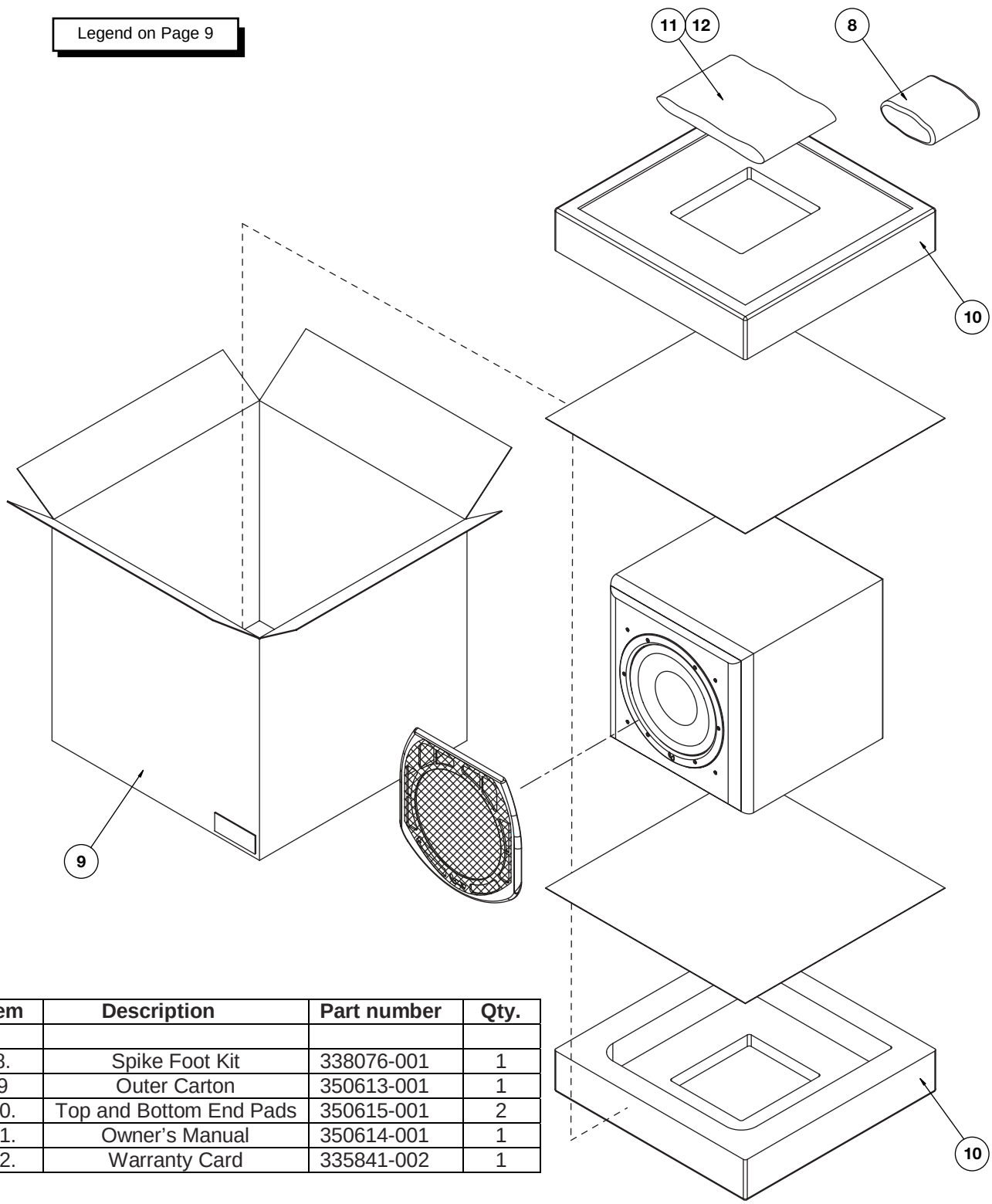
Sheet: 4 of 4 Rev: P1F

Size: A2 Author: BELLE

Alpha 1200s

PACKAGING

Legend on Page 9



Item	Description	Part number	Qty.
8.	Spike Foot Kit	338076-001	1
9	Outer Carton	350613-001	1
10.	Top and Bottom End Pads	350615-001	2
11.	Owner's Manual	350614-001	1
12.	Warranty Card	335841-002	1