

The JBL logo is displayed in white text on a black square background.

Northridge™ E-Series

E150P

Powered Subwoofer

Service Manual



JBL Consumer Products  
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Woodbury, New York 11797

Rev2 2/2004

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### E150P SPECIFICATIONS

Amplifier Power (RMS):	150 Watts
Peak Dynamic Power *:	250 Watts
Driver:	10" (254mm) PolyPlas™
Inputs:	Line Level (switchable to LFE) and Speaker Level with 5-way binding posts
Low-Pass Frequency:	Variable from 50Hz to 150Hz
Frequency Response:	27Hz – Low-pass crossover setting
Dimensions (H x W x D):	17-3/4" x 12-1/4" x 14-1/2" (451mm x 311mm x 368mm)
Weight:	33.5 lb/15.2kg

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.

\* The Peak Dynamic Power is measured by recording the highest center-to-peak voltage measured across the output of a resistive load equal to minimum impedance of the transducer, using a 50Hz sine wave burst, 3 cycles on, 17 cycles off.

## SAFETY INFORMATION

### Warning

Any person performing service of this unit will be exposed to hazardous voltages and the risk of electric shock. It is assumed that any person who removes the amplifier from this cabinet has been properly trained in protecting against avoidable injury and shock. Therefore, any service procedures are to be performed by qualified service personal ONLY!

### Caution

Early revisions of the unit did not have a power switch. Hazardous voltages are resent within the unit whenever it is plugged in.

Before amplifier is plugged in, be sure its rated voltage corresponds to the voltage of the AC power source to be used. Incorrect voltage could cause damage to the amplifier when the AC power cord is plugged in. Do not exceed rated voltage by more than 10%: operation below 90% of rated voltage will cause poor performance or may shut the unit off.

### Leakage/Resistance Check

Before returning the unit to the customer, perform a leakage or resistance test as follows:

**Leakage Current.** Note there is no power switch on early revisions of this unit. When the power plug is plugged in, the unit is live. Connect the unit to its rated power source. Using an ammeter, measure the current between the neutral side of the AC supply and chassis ground of the unit under test. If leakage current exceeds 0.5mA, the unit is defective. Reverse the polarity of the AC supply and repeat.

**Resistance.** Measure the resistance from either side of the line cord to chassis ground, If it is less than 500k ohms, the unit is defective.

**WARNING! DO NOT** return the unit to the customer if it fails one of these tests until the problem is located and corrected.

### Critical Components



All components identified with the IEC symbol in the parts list and schematic diagram designate components in which safety can be of special significance when replacing identified with. Use only the replacement parts designated in the parts list or parts with the same rating of resistance, wattage or voltage.

### List of Safety Components Requiring Exact Replacements

Part Number/ Designator	Description
F1 093-205209-300	Line Fuse Slo Blo 1.25A 5x20mm
083-041802-009	250V UL approved SPT-2 or better with polarized plug, UL approved wired with the hot side to fused side. Use with factory replacement panel strain relief (70305) only.
PT1 042-010052-003	Power Transformer. Use only factory replacement.
BR1 052-400080-000	Bridge diode. Use only factory replacement.
C6,8 034-470745-200	4700uF 50V electrolytic filter caps. Be sure replacement part is at least the same working voltage and capacitance rating. Also the lead spacing is important. Incorrect spacing may cause premature failure due to internal cabinet pressure and vibration.
063-531808-000	Rear Amp Cover Use only factory replacement
Inductor 043-560200-000	L1 - Use only factory replacement
Inductor 043-300101-000	L2 - Use only factory replacement
Inductor 043-700101-000	L3 - Use only factory replacement
Inductor 043-324300-000	L4 - Use only factory replacement

JBL E150P 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		Class D Preferred...Sink required for Class AB
Load Impedance (speaker)	4	Ohms	n/a	Nominal	Z-curve required
Rated Output Power	75	Watts	70	1 input driven	
AVG RMS Dynamic Power	150	Watts	135		Average RMS power, 3/20 Cycles 50 Hz, Driven 6dB above its input sensitivity sensitivity
THD @ Rated Power	0.3	%	1	22k filter	75 Watts
THD @ 1 Watt	0.1	%	0.5	22k filter	
DC Offset	10	mV-DC	30	@ Speaker Outputs	
Damping factor	50	DF	35	Measured at amplifier board	Measured at the amplifier board THD < 0.1% 75 Watts @ 50Hz
Input Sensitivity					
Input Frequency	50	Hz	50	Nominal Freq.	
L&R	128	mVrms	±2dB	To 75 Watts	Single input driven LP defeat switch OFF
LFE	128	mVrms	±2dB	To 75 Watts	LP defeat switch ON- Single input driven
Speaker/Hi Level Input	1.28	Vrms	±2dB	To 75 Watts	Single input driven
Signal to Noise					
SNR-A-Weighted	100	dB	70	relative to rated power	A-Weighting filter
SNR-unweighted	80	dB	70	relative to rated power	22k filter
SNR rel. 1W-unweighted	65	dB	60	relative to 1W Output	22k filter
Residual Noise Floor	1	mVrms	2	Volume @max, using DVM or A/P (BW=20 KHz)	Line level inputs must be terminated using 1KOHM
Residual Noise Floor	1.5	mVrms(max)	2	Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics) (BW=20Khz)	Line level inputs must be terminated using 1KOHM
Input Impedance					
Line Input	10K	ohms	n/a	Nominal	
Speaker/Hi Level Input	>4.7K	ohms	n/a	Nominal	
Filters					
Speaker in LP 2nd order variable	60-150	Hz	± 10		
Subsonic filter (HPF) fixed 6th	Fixed				
LFE Low pass 2nd order fixed	200>LP<1K	Hz		Single input driven	
Speaker out HP filter					
Left & Right outputs	200	Hz	± 10	Speaker input driven - Speaker out loaded with 4 Ohms	(Applies only to 230V Model)
<b>Note: 120V Models do not have speaker output</b>	100	Hz	± 10	Speaker input driven - Speaker out loaded with 8 Ohms	(Applies only to 230V Model)
Limiter					
THD at Max. Output Power	n/a	n/a	functional	Maximum Output Power	Maximum THD as a result of limiting.
Features					
Volume pot Taper (lin/log)	LOG	--	functional		A Taper
Phase switch	0-180	deg	functional		
LP Defeat switch	YES		functional		LFE function selection
Input Configuration					
Line In & LFE	YES	--	functional		LR 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	4	mV	functional	"	
ATO Level Speaker in	50	mV	functional	"	
ATO Turn-on time	5	ms	functional	Amp connected and AC on, then input signal applied	
Auto Mute/ Turn-OFF Time	15	minutes	17	T before muting, after signal is removed	Auto turn of time (T) must be 5 > T < 15 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

Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
Turn-off Transient	50	mV-peak	2v-pp	@ Speaker Outputs	AC Line cycled from ON to OFF
<b>Efficiency</b>					
Efficiency	65	%	64		Nominal Line voltage 120 VAC / 230 VAC
Stand-by Input Power	15	Watts	18	@ nom. line voltage	Auto turn of time (T) must be 5 > T < 15 Minutes
Power Cons. @ rated power	115	Watts	120	@ nom. line voltage	75 Watts @ 4 Ohms nominal line voltage
<b>Protections</b>					
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).
DC Offset Protection	YES		-	DC present at Speaker Out leads	Design must insure no Offset at the speaker output under any operating condition including abnormal operation
<b>Line Fuse Rating</b>					
US Domestic version	1.25	Amps	1.25	Type-T or Slo Blo-250 V	Internal fuse with UL/SEMKO rated holder
EU	0.8	Amps	0.8	Type-T or Slo Blo-250 V, Low Breaking capacity	Internal fuse with UL/SEMKO rated holder
4. ALL SPECS SHOULD BE MEASURED AT NOMINAL LINE VOLTAGE.					

## SPEAKER CONNECTION

When we designed the E150P and E250P powered subwoofers, our goal was to offer the user the best possible performance combined with the most flexible and complete installation options. Please look over the following three examples to determine which description best matches your system and follow the corresponding hookup instructions.

To use the binding-post speaker terminals with bare wire, unscrew the collar until the hole through the center post is visible under the collar. Insert the bare end of the wire

through the hole in the post, then screw the collar back down until the connection is tight. The holes in the center of the collars are intended for banana-type connectors.

Speakers and electronics terminals have corresponding positive (+) and negative (-) terminals. It is important to connect both speakers identically: positive (+) on the speaker to positive (+) on the amplifier and negative (-) on the speaker to negative (-) on the amplifier. Wiring "out of phase" results in thin sound, weak bass and a poor stereo image.

**NOTE:** The speaker-level connection method described on the next page is not a preferred connection and should only be resorted to if your receiver/processor does not have a line-level or subwoofer output. The customer is responsible for proper connections, and any damage to JBL or other equipment due to improper connections will not be covered by your JBL warranty. Consult with your JBL dealer or an audio-installation expert if you have any questions about how to connect your subwoofer using the speaker-level inputs.

# Analog Receiver/Processor – Speaker-Level Connections

Use this installation method *only* with an analog receiver/processor that does not have digital processing or bass management, and also does not have a subwoofer output or a volume-controlled preamp (line-) level output:

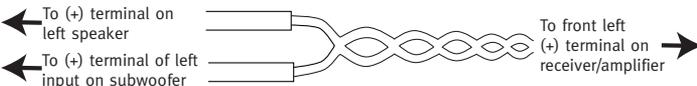
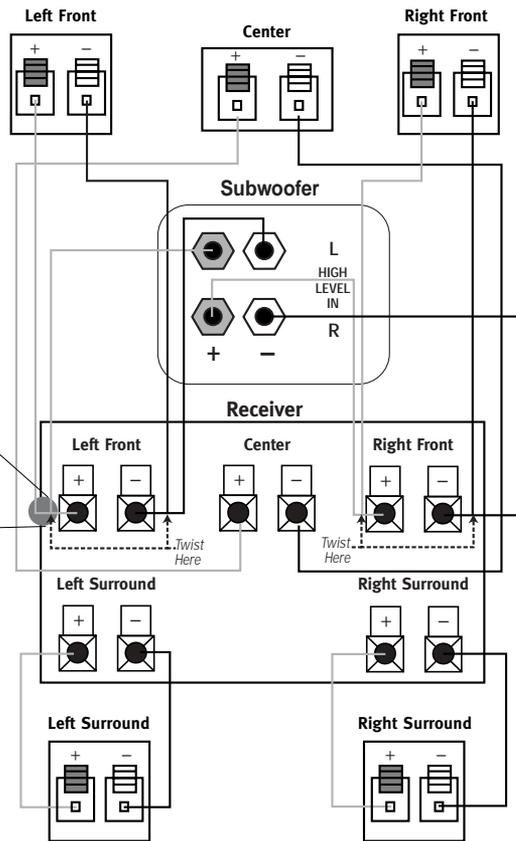
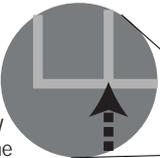
Connect the speaker wires for both your main left and right speakers, and for the subwoofer, to the same speaker terminals on your receiver or amplifier. The wires may be joined by twisting together the bare ends of the two leads that will be connected to each terminal on the receiver/amplifier, as shown in the diagram. This procedure should be done only four times (involving a total of eight bare-wire ends), and only for those wire ends that are being connected to the terminals on your receiver/amplifier. ***It is important that you avoid joining any other wires.*** Do not twist together wire ends that are being inserted into terminals on any speaker or on the subwoofer. Do not twist together wire ends that will be used for any speakers other than the front left and right speakers or the subwoofer. Refer to the connection diagram for guidance.

Twist together the (+) leads at one end of the speaker wires that you have designated for the left front speaker and for

the left high-level inputs on the subwoofer. Insert the joined (twisted) wires into the left front (+) terminal on your receiver/amplifier. Connect the free end of the (+) lead for the left front speaker to the (+) terminal on the back of the speaker. Connect the free end of the (+) lead for the left input on the subwoofer to the left binding-post terminal. Repeat this process for the (-) connections for the left front

speaker and left input on the subwoofer, and then for the (+) and (-) connections for the right front speaker and right high-level inputs on the subwoofer.

Connect your receiver or amplifier's center and surround speaker terminals to the corresponding terminals on the back of your center and surround speakers.



## Analog Receiver/Processor – Line-Level Connections

Use this installation method with an analog receiver/processor that does not have digital processing or bass management, and that is equipped with a full-range subwoofer output or a volume-controlled preamp (line-) level output:

Use RCA-type interconnect cables to connect the line-level subwoofer outputs on your receiver or amplifier to the line-level inputs on the subwoofer.

**IMPORTANT:** Make sure that the LFE toggle switch on the subwoofer is in the “Normal” position. Do not use the “LFE” position with Dolby\* Pro Logic\*-only processors.

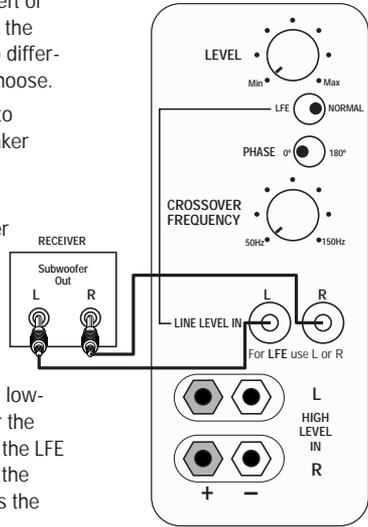
Note: If your receiver or amplifier has only one subwoofer output jack, then you

may connect the subwoofer output on your receiver/pre-amplifier to either the left or right line-level input on the subwoofer. It makes no difference which jack you choose.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure your receiver or processor is configured so that the subwoofer is “On.”

Note for advanced users: If your receiver/processor has a built-in low-pass crossover filter for the subwoofer output, then the LFE switch should be set to the “LFE” position to bypass the subwoofer’s internal crossover.



## Digital Receiver/Processor – LFE Connection

Use this installation method for Dolby Digital, DTS® or other digital surround processors that have bass-management programming, or for analog receivers/processors that have a filtered subwoofer output:

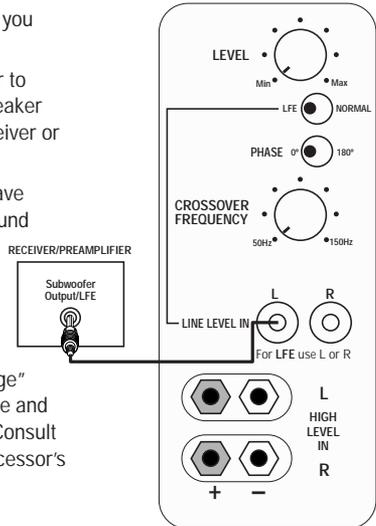
**IMPORTANT:** Make sure that the LFE toggle switch on the subwoofer is in the “LFE” position. Use the line-level input jacks for the Low-Frequency Effects channel. Connect these jacks to the LFE output or subwoofer output on your receiver or amplifier.

Note: If your receiver or amplifier has only one subwoofer output jack, you may connect the subwoofer output on your receiver/pre-amplifier to either

the left or right line-level input on the subwoofer. It makes no difference which jack you choose.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure that you have configured your surround sound processor for “Subwoofer On” or “LFE On.” The front, center and surround speakers should be set to “Small” or “Large” depending on their size and frequency response. Consult your receiver’s or processor’s owner’s manual.



## OPERATION

### Power

When the unit is plugged in and the power switch is on and no signal is received, the LED on the top of the unit will turn red. When a signal is present, the LED will turn green.

Note: It will take several minutes for the LED to turn from green to red after the input signal to the subwoofer is removed. Due to JBL's unique high-output, high-efficiency amplifier design, power consumption is minimal when the

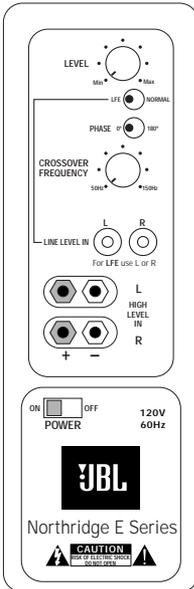
subwoofer is not receiving a signal. Of course, the subwoofer can be turned off, whenever desired, if you do not wish to leave it in auto (standby) mode.

### Level Control

The subwoofer Level Control adjusts the volume of the subwoofer relative to the rest of the system. Proper level adjustment depends on several variables such as room

size, subwoofer placement, type of main speakers and position. Adjust the subwoofer level so that the volume of the bass information is pleasing to you.

### Crossover Adjustments



The Crossover Frequency Control 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 low-pass crossover control to a higher setting, between 120Hz and 150Hz. This control is not used when the LFE switch is in the "LFE" position.

## Phase Control



The Phase Control determines whether the subwoofer's piston-like action moves in and out in phase with the main speakers or opposite the main speakers. There is no correct or incorrect setting. 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.

Remember, every system, room and listener is different. There are no right or wrong settings; this switch offers the added flexibility to adjust your subwoofer for optimum performance for your specific listening conditions without having to move your speakers.

If at some time in the future you happen to rearrange your listening room and move your speakers, you should experiment with the phase switch in both positions, and leave it in the position that maximizes bass performance.

## TROUBLESHOOTING

**If you used the high-level (speaker) inputs and there is no sound from any of the speakers:**

- Check that the receiver/ amplifier is on and a source is playing.
- Check that the powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between the receiver/ amplifier and the speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured, or touching each other, except for the wires for the front left and right speakers, which may be joined with the wires for the subwoofer at the receiver/ amplifier end only, if you are using the speaker-level connections
- Review proper operation of your receiver/ amplifier.

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

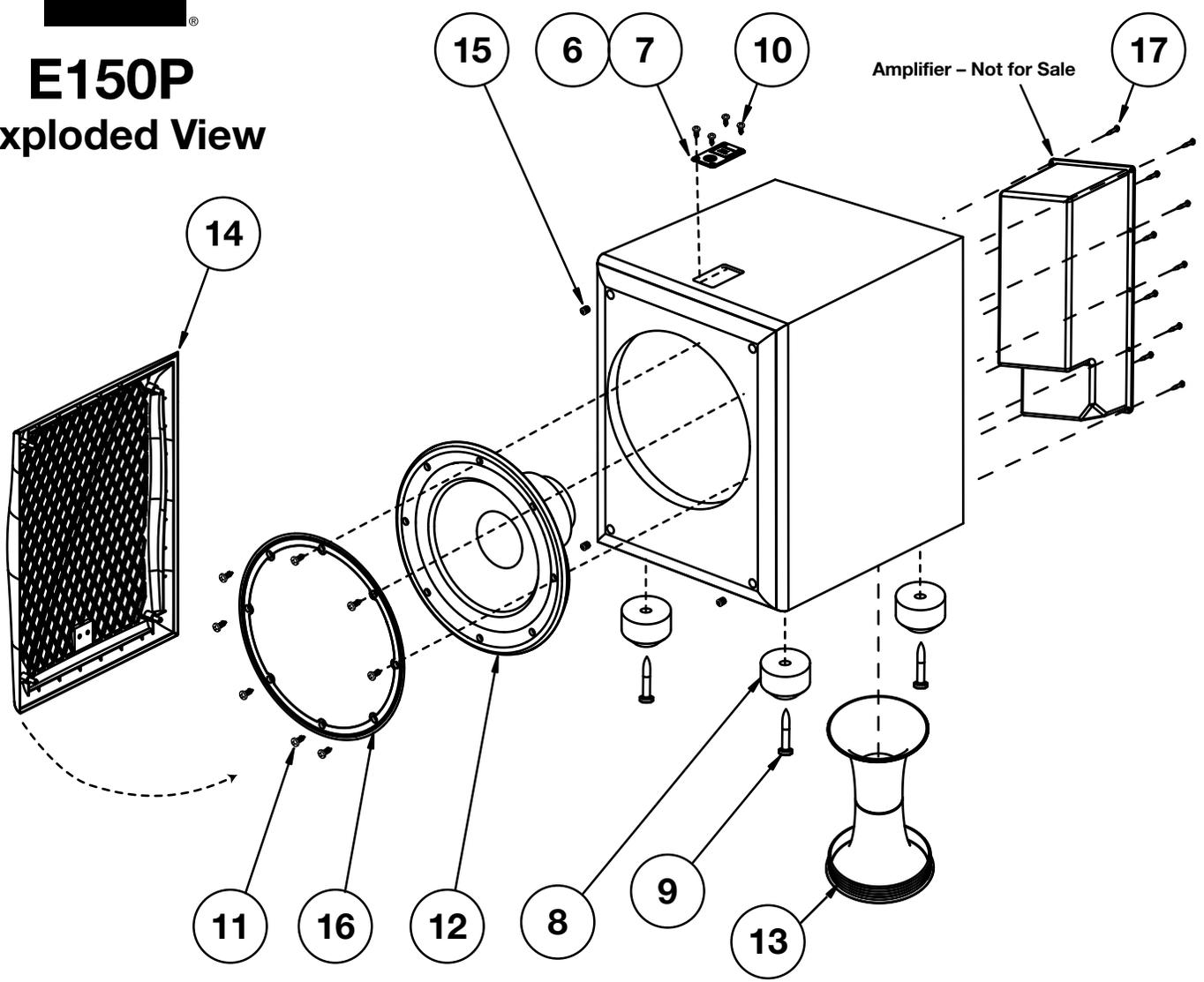
- Make sure the connections to the left and right "Speaker Inputs" have the correct polarity (+ and -).
- Make sure that the subwoofer is plugged into an active electrical outlet and switched on.
- Adjust the crossover point.
- Flip the Phase Control switch to the opposite position.
- If you are using a Dolby Digital/DTS receiver or processor, make sure that the subwoofer adjustments on the receiver/processor are set up correctly.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.

**If you used the line-level inputs and there is no sound from the subwoofer:**

- Check that the receiver/ amplifier is on and a source is playing.
- Check that the powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between the receiver/ amplifier and the subwoofer. Make sure all wires are connected. Make sure none of the wires are frayed, cut or punctured, or touching each other.
- Review proper operation of your receiver/ amplifier.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.
- Make sure that you have configured your receiver/ processor so that the subwoofer/LFE output is on.

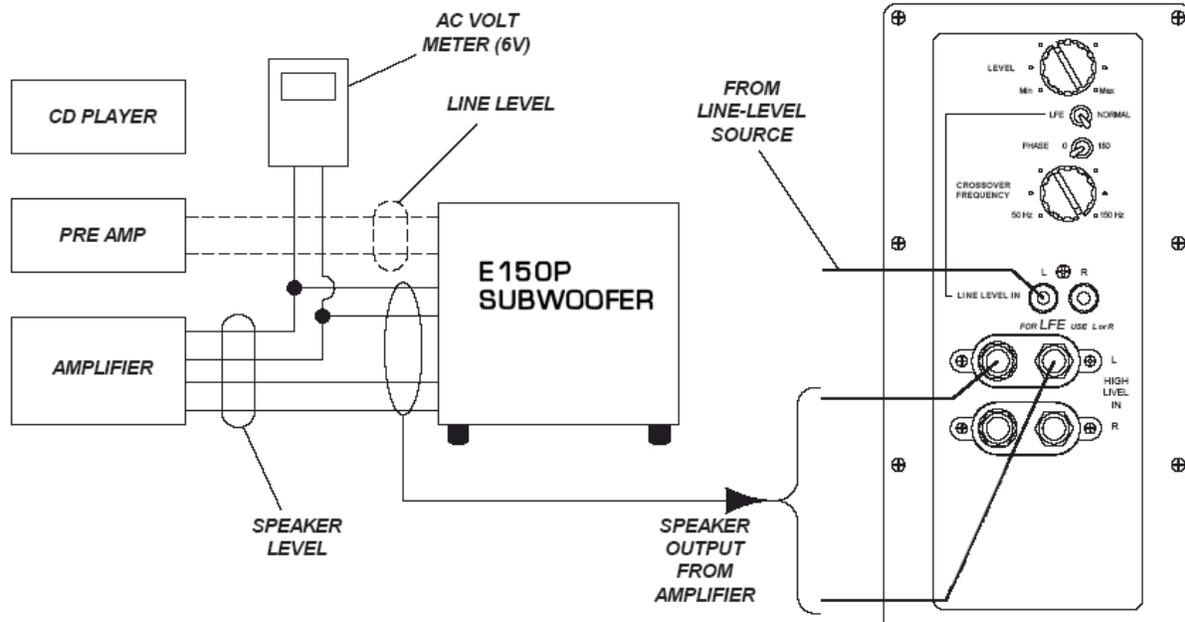


# E150P Exploded View



Ref#	Part Number	Description	Qty
1	350883-001	MANUAL, OWNER-E150P/E250P	1
2	350884-002	CARTON, MASTER-E150P (BEECH MODEL)	1
	350884-001	CARTON, MASTER-E150P (BLACK MODEL)	1
	350884-003	CARTON, MASTER-E150P (CHERRY MODEL)	1
3	350885-001	PAD, END, TOP-E150P	1
4	350885-002	PAD, END, BOT-E150P	1
5	338381-001	WARRANTY CARD, 1/5YR, JBL	1
6	351348-001	PLATE, LED/LOGO-E150P/E250P	1
7	338125-002	ASY, LED-E150P/E250P	1
8	336486-001	ASY, FOOT, PLSTC- E150P	4
9	763-31110-40	SCREW, 8 X 2 1/2, TR, PH, PB, BLK ZINC, LCS (FOOT)	4
10	908302-012	SCREW, PB, HXS, #6x.75, ZINC (LOGO PLATE)	4
11	903802-016	SCREW, PB, HXS, #8x1", ZINC (WOOFER)	8
12	338127-002	ASY, WOOFER, 10" DCR 5.8 Ω	1
13	336804-001	ASY, PORT TUBE	1
14	351219-001	ASY, GRILLE, BLK, FRNT	1
15	333249-003	CUP, GRILLE, TITANIUM, (BEECH MODEL) (CHERRY MODEL)	4
	333249-001	CUP, GRILLE (BLACK MODEL)	4
16	351242-001	RING, TRIM, 10"-E150P	1
17	903401-012	SCREW, 6 X 3/4, PAN, PH, PB, BLK ZINC, LCS (AMPLIFIER)	10

## TEST SET-UP AND PROCEDURE



### General Function

#### UUT = Unit Under Test

- 1) Connect one line level input cable (RCA) from signal generator to either Right or Left Level input on UUT. LEVEL control should be full counterclockwise (MIN). Make sure the LFE/Normal switch is in the NORMAL position.
- 2) Turn on generator, adjust to **100mV, 50Hz**.
- 3) Plug in UUT; Turn Main Power switch ON. LED's on the top panel may be either Red or Green. Turn LEVEL control full clockwise (MAX). Low Pass control should be set fully clockwise (150Hz).
- 4) LED should turn Green; immediately bass response should be heard and felt from port tube opening.
- 5) Turn off generator, turn LEVEL control fully counterclockwise (MIN), disconnect RCA cables.
- 6) Connect one pair of speaker cables to either high level input terminal on UUT. Cables should be connected to an integrated amplifier fed by the signal generator.
- 7) Turn on generator and adjust so that speaker level output is **1.0V, 50Hz**. Turn LEVEL control full clockwise (MAX).
- 8) Green LED should light, immediate bass response should be heard and felt from the port tube opening.

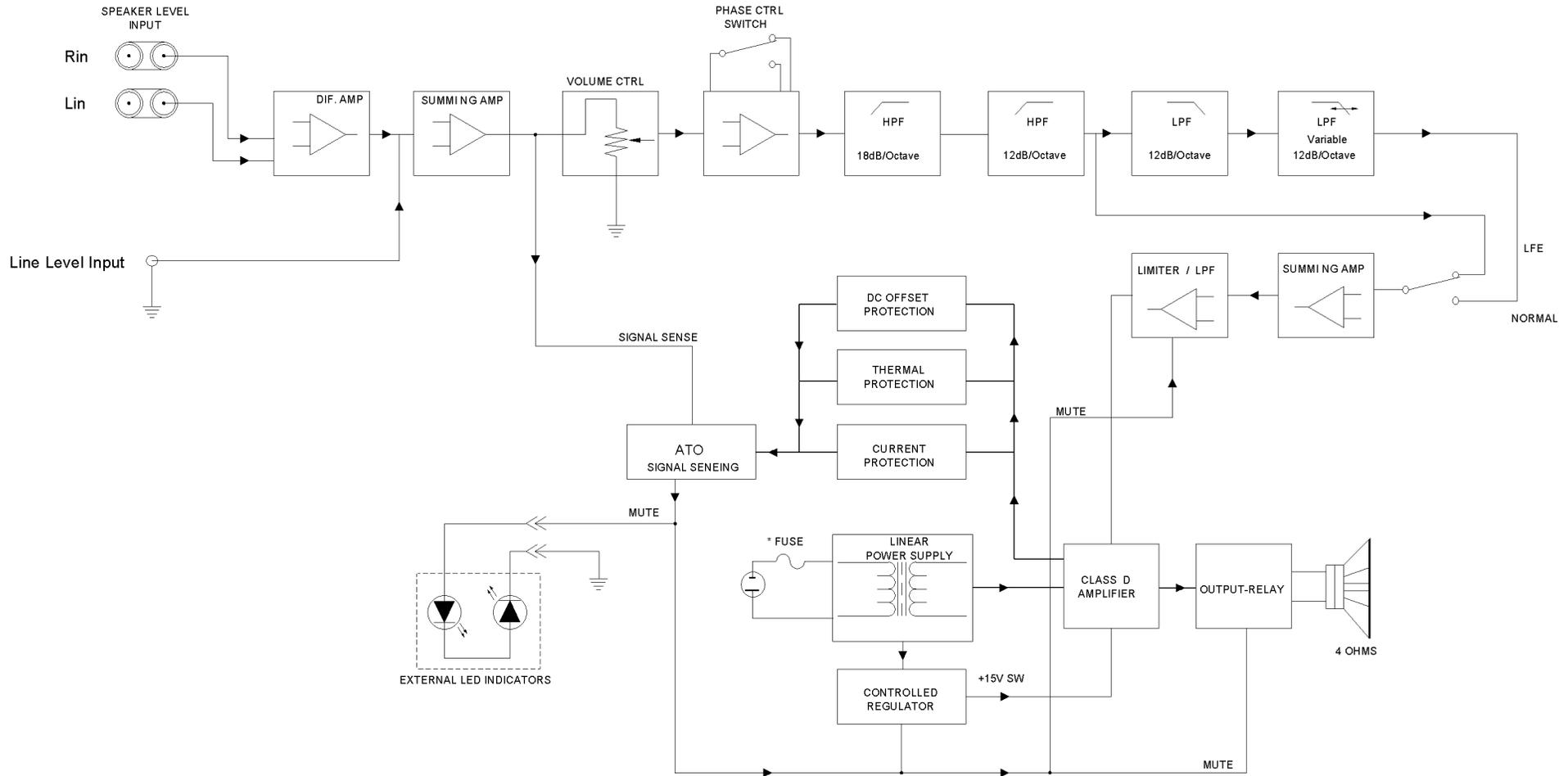
### Sweep Function

- 1) Follow steps 1-4 above, using a sweep generator as a signal source.
- 2) Sweep generator from 20Hz to 300Hz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove driver and test.

### Driver Function

- 1) Remove driver from cabinet; detach + and - wire clips.
- 2) Check DC resistance of driver; it should be **5.8 ohms**.
- 3) Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator and adjust so that speaker level output is **5.0V**.
- 4) Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.

# E150P



FUSE RATING :  
 E150P  
 120 VAC T1.25A-250V  
 230 VAC T0.8A-250V  
 E250P  
 120 VAC T2A-250V  
 230 VAC T1.25A-250V

Designed by	Checked by	Approved by	Model No.	Issue No.
			E150P/250P	01
Title			Edition	
Dwg No.			Sheet No.	
			01 OF 7	



## TECH TIPS

### Troubleshooting tips and solutions to common service problems

For models: E150P, E250P and PB10, PB12 (Revision 2) \*

TIP# JBLTT2003-04 Rev1

**Subject:** Replacing MOSFETS Q18, Q22

In the event you need to replace MOSFET transistors Q18 or Q22 as part of a repair, it is important to use

ONLY the JBL part# FE106401110 *or* only the brands: International Rectifier, or Fairchild.

Replace both Q18 and Q22 MOSFET's in the circuit, even if only one seems to be damaged.

Do NOT mix & match these components from different manufacturers, or batches. They should be identical.

\* Late version PB10 or PB12 subwoofers (Revision 2 in the service manual) can be identified by:

- Amplifier serial number starts with "HA"
- Output transistors in the open, on a large black heatsink
- Large plastic cup enclosing the rear of the amp assembly
- Main PCB, bottom, solder-side contains all SMD devices

# DETAILED TROUBLESHOOTING

## A. Power Amp Section

Resistance Check	Resistance from S+ (SPK O/P) to GND should be $>1M \Omega$ (NO LOAD)
	Resistance from V+ (C6 P+) to V- (C8 P-) gradually Fully CHARGED should read $>10k \Omega$
	Resistance from V+ (C6 P+) to S+ (SPK O/P) should read $>1M \Omega$
	Resistance from V- (C8 P-) to S+ (SPK O/P) should read $>1M \Omega$

## 2. Power Up LED RED

With a 5mV signal to Low level input, LED should change to GREEN

-Voltage measurements (DVM)

LED	OP AMP	
	P-U4(1)	P-U4(7)
RED	0Vrms	8VDC
GREEN	6.3Vrms	-10.7VDC

## 3. D.C. Operation

-Voltage measurements (DVM) on CLASS D POWER AMP

Between	V+	Q4(E)	Q1(C)	Q10(C)	U7(1)	U7(2)	U7(4)	U7(6)	U7(7)	U7(8)
And This Point	GND	V-	GND	GND	GND	GND	GND	GND	GND	GND
Get this Reading	45.9V	0V	-45.9V	0V	-45.9V	-45.7V	-45.5V	0V	0V	4.7V

## 4. Check Switching Frequency

- Oscilloscope - **USE THE PROBE TIP TO U6(7) TO GND**
- Reading 100kHz +/-10%,22Vp-p

## B. Pre Amp Section

### Line Level Input Sensitivity

-Set up Turn level, X'OVER FREQ POT Fully CW and LFE switch off  
Generator Set at 100mV@50Hz  
Signal to Line level input

## DETAILED TROUBLESHOOTING (CONT'D)

- Voltage measurements

OP AMP									SPEAKER O/P
U2(1)	U2(14)	U2(8)	U3(7)	U3(1)	U3(14)	U3(8)	U5(7)	U5(1)	
133.6mV	200.2mV	245.9mV	314.8mV	314.9mV	350mV	1.67V	1.452V	2.098V	15.3V

### 2. High Level Input Sensitivity

-Set up            Turn level, X'OVER FREQ POT Fully CW and LFE switch off  
                       Set Generator at 1.15V@50Hz  
                       Signal to High level input

-Voltage measurements 15.3V at speaker output

### 3. Low-Pass

-Set up            Set Generator at 100 mV@100Hz  
                       Signal to Line level input  
                       Measure voltage at S+ speaker output

-Voltage measurement

X'OVER FREQ. Setting	Output
CW	10.72V
CCW	2.165V

### 4. LFE

-Set up            Set Generator at 100mV@200Hz  
                       Signal to Line level input  
                       Measure voltage at S+ speaker output

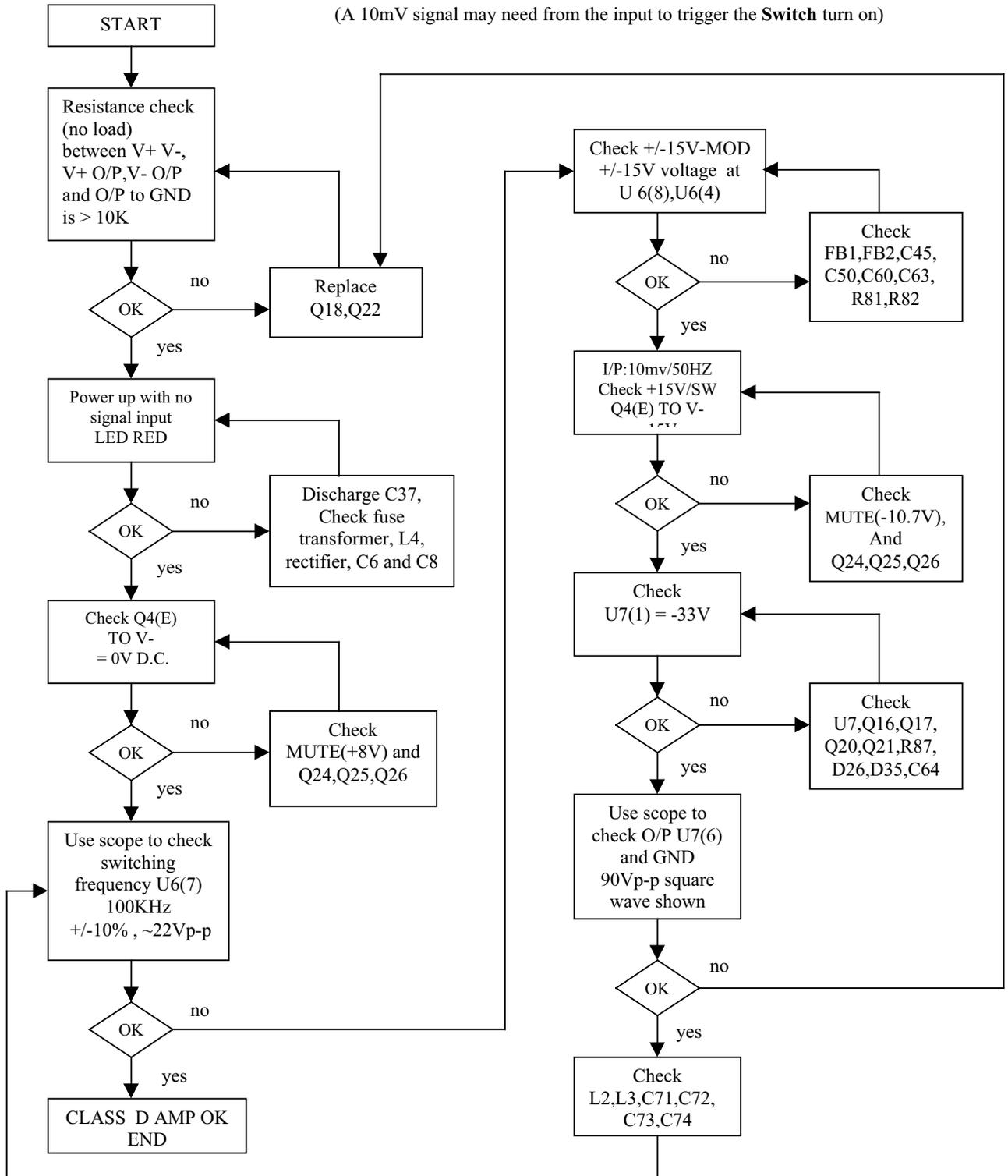
LFE switch Setting	Output
Normal	2.9V
LFE	7.62V

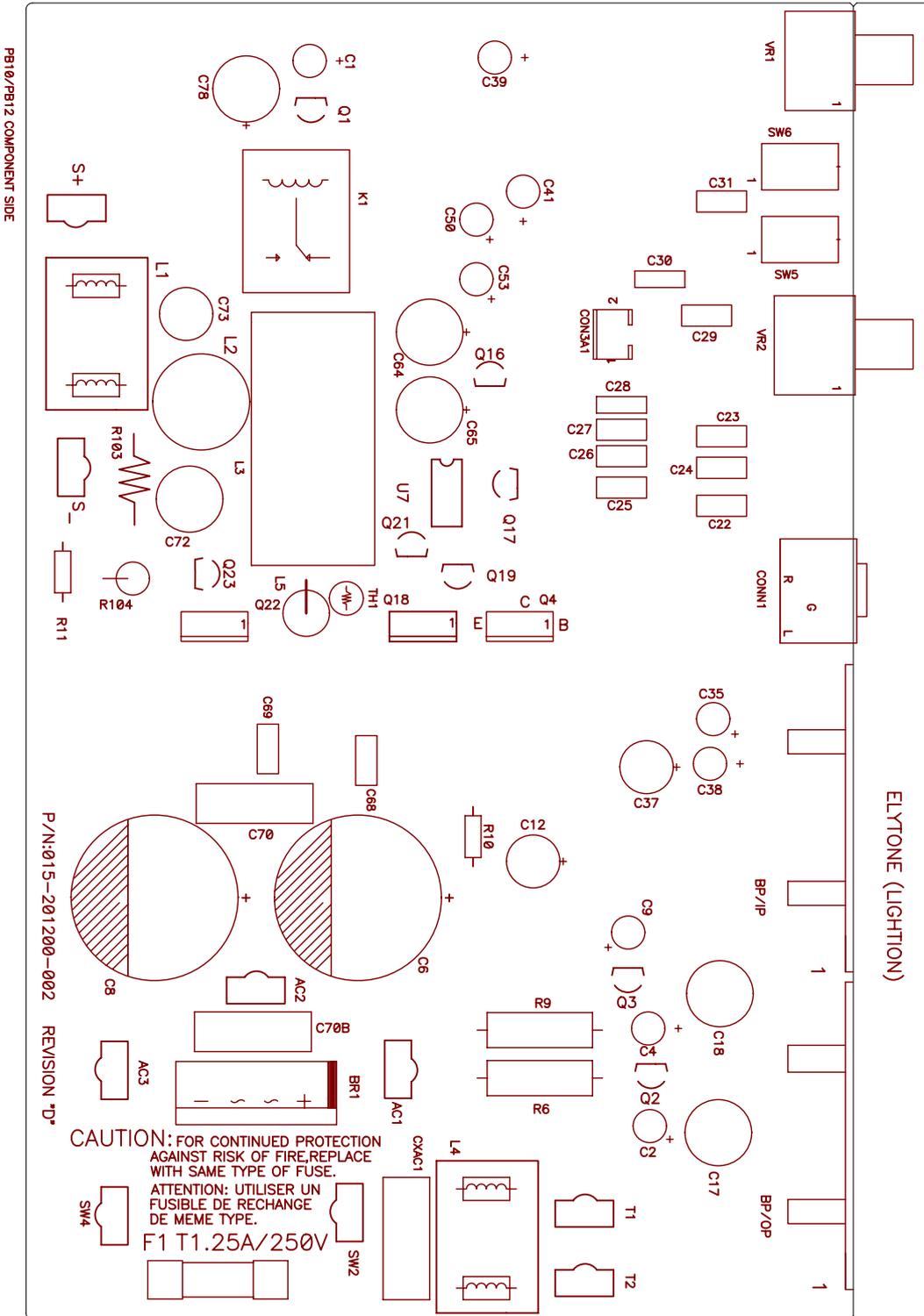
See flow chart next page for diagnostics.

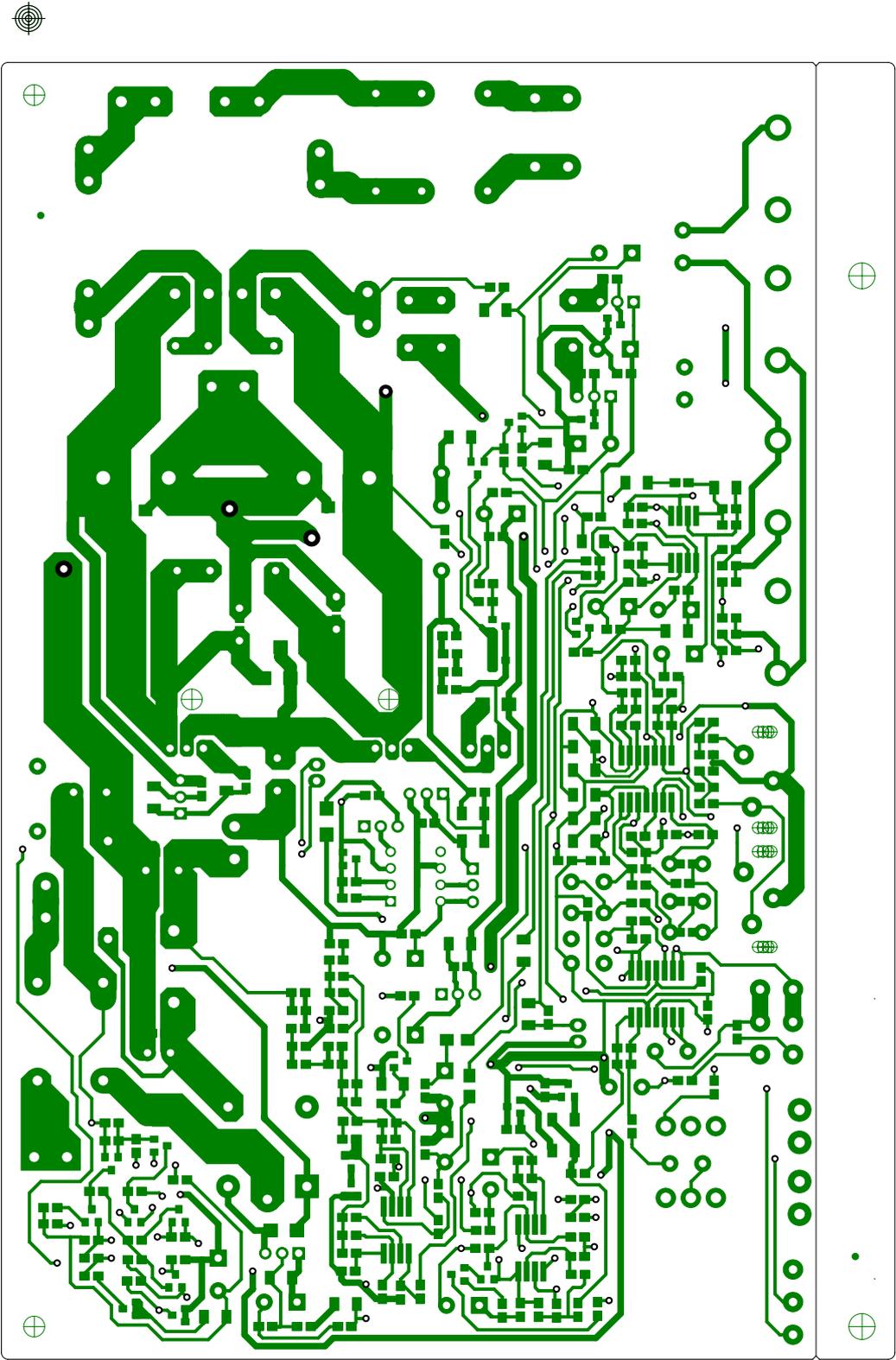
# DETAILED TROUBLESHOOTING (CONT'D)

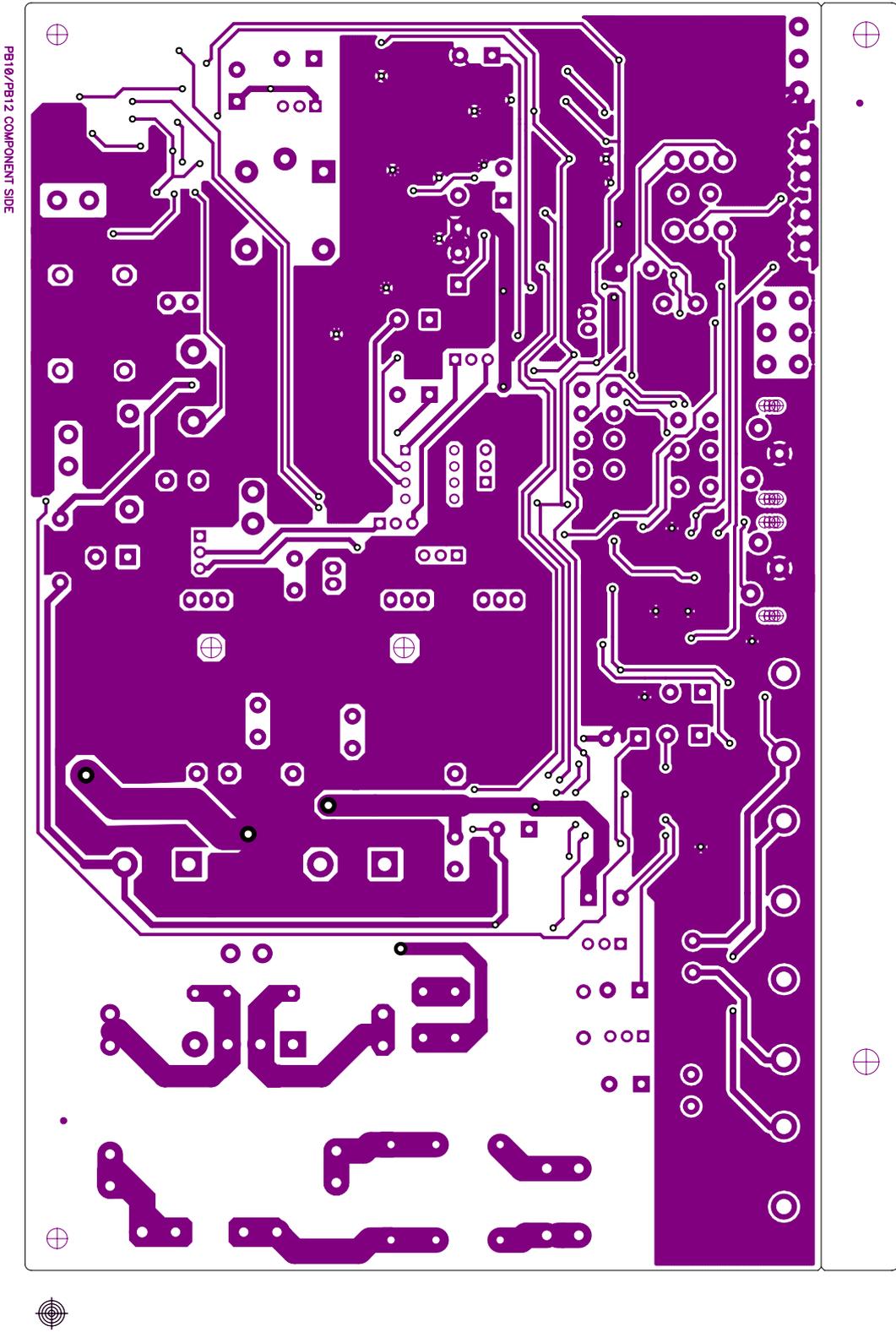
## FLOW CHART

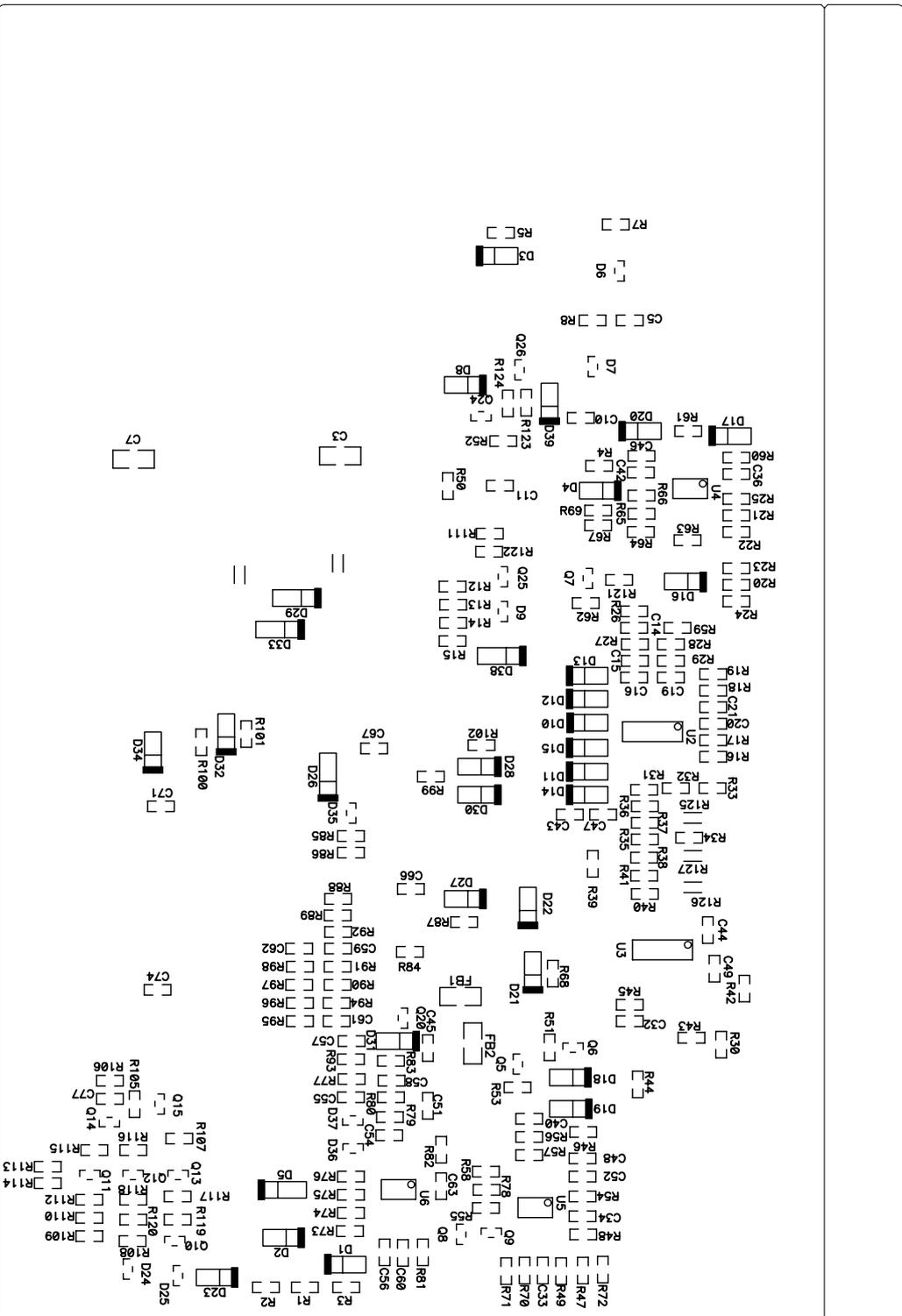
CAUTION : SPEAKER OUTPUT IS FLOATING AND IS **NOT** PROTECTED AGAINST A SHORT TO GROUND. ALL TEST INSTRUMENTS CONNECTED TO THE OUTPUT **MUST** BE FLOATING. ATTACH THE SCOPE PROBE TIP TO S - and REFERENCE LEAD TO S+.











SIDE BOTTOM S1:BPV\01BP

E150P Electrical Parts List				
Part Number		Description	Reference Designator	Qty
<i>Resistors</i>				
020-000498-120	Carbon Film	0R 1/4W J	R10,11	2
021-100401-120	MOF Resistor	1K 1W J	R103	1
021-820303-020	MOF Resistor	820R 3WS J 8x20	R6,9	2
022-500003-020	KNP Resistor	0R05 3WS J FK TYPE	R104	1
024-100298-120	SMD Resistor	10R 1/8W J 0805	R81,82	2
024-100398-120	SMD Resistor	100R 1/8W J 0805	R62	1
024-100498-120	SMD Resistor	1K 1/8W J 0805	65,79,83,92,95,96,105,108	8
024-100598-120	SMD Resistor	10K 1/8W J 0805	R2,37,54,58,63,69,71,72,74	9
024-100698-120	SMD Resistor	100K 1/8W J 0805	R3,112,22-25	6
024-110598-100	SMD Resistor	11K 1/8W F 0805	R98	1
024-113598-100	SMD Resistor	11K3 1/8W F 0805	R34	1
024-120498-120	SMD Resistor	1K2 1/8W J 0805	R51,53	2
024-130498-100	SMD Resistor	1K3 1/8W F 0805	R35,110	2
024-137598-120	SMD Resistor	13K7 1/8W F 0805	R42,43	2
024-137698-100	SMD Resistor	137K 1/8W F 0805	R32	1
024-150498-120	SMD Resistor	1K5 1/8W J 0805	R67,68,12-15	6
024-150598-120	SMD Resistor	15K 1/8W J 0805	R29	1
024-200598-120	SMD Resistor	20K 1/8W J 0805	R94	1
024-220398-120	SMD Resistor	220R 1/8W J 0805	R90	1
024-220498-121	SMD Resistor	2K2 1/8W J 0805	R1,87,61	3
024-220598-120	SMD Resistor	22K 1/8W J 0805	R50,52,118	3
024-220798-120	SMD Resistor	2M2 1/8W J 0805	R80,121	2
024-237598-120	SMD Resistor	23K7 1/8W F 0805	R48	1
024-237698-100	SMD Resistor	237K 1/8W F 0805	R45	1
024-243698-100	SMD Resistor	243K 1/8W F 0805	R36	1
024-270498-120	SMD Resistor	2K7 1/8W J 0805	R64,73	2
024-300398-120	SMD Resistor	300R 1/8W J 0805	R55	1
024-300598-120	SMD Resistor	30K 1/8W J 0805	R56	1
024-330498-120	SMD Resistor	3K3 1/8W J 0805	R7,8,59	3
024-330598-120	SMD Resistor	33K 1/8W J 0805	R4,5,122	3
024-332498-100	SMD Resistor	3K32 1/8W F 0805	R26,27	2
024-360498-120	SMD Resistor	3K6 1/8W J 0805	R28	1
024-390498-120	SMD Resistor	3K9 1/8W J 0805	R93	1
024-390598-120	SMD Resistor	39K 1/8W J 0805	R77	1
024-430498-100	SMD Resistor	4K3 1/8W F 0805	R78	1
024-453598-100	SMD Resistor	45K3 1/8W F 0805	R30	1
024-470298-120	SMD Resistor	47R 1/8W J 0805	R101,102	2
024-470398-120	SMD Resistor	470R 1/8W J 0805	R76,99,100	3
024-470498-120	SMD Resistor	4K7 1/8W J 0805	R85,86	2
024-470598-120	SMD Resistor	47K 1/8W J 0805	R44,47,49,107	4
024-470698-120	SMD Resistor	470K 1/8W J 0805	R70	1

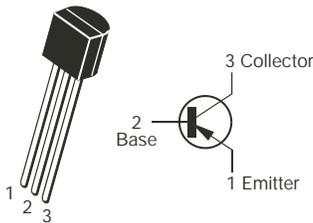
Part Number		Description	Reference Designator	Qty
024-470798-120	SMD Resistor	4M7 1/8W J 0805	R60	1
024-560498-120	SMD Resistor	5K6 1/8W J 0805	R40,41	2
024-604598-100	SMD Resistor	60K4 1/8W F 0805	R39	1
024-620398-120	SMD Resistor	620R 1/8W J 0805	R16,18,57	3
024-680498-120	SMD Resistor	6K8 1/8W J 0805	R46,91	2
024-680598-120	SMD Resistor	68K 1/8W J 0805	R31,33,66	3
024-909498-100	SMD Resistor	9K09 1/8W F 0805	R38	1
025-010300-000	Thermister	TSE-103 K L:50mm		1
026-200595-269	Freq Pot 20K	PN:RD163121R03D-20KBx2(EJ)	VR2	1
026-500495-252	Level Pot 5K	PN:RK163111R52B-5KA (EJ)	VR1	1
<i>Capacitors</i>				
031-100244-100	Ceramic Capacitor	0u01/50V K 0805 X7R	C5,10,33,45,51,66,67	7
031-100343-100	SMD Capacitor	100pF/50V J 0805 NPO	C36,58,16	3
031-100344-100	SMD Capacitor	0u1/50V K 0805 X7R	C11,42-44,46-49,52,54,55,60,63,71,74,77	16
031-100384-100R	SMD Capacitor	0u1/250V K 1206 X7R	C3,7	2
031-150244-100	SMD Capacitor	0u0015/50V K 0805 X7R	C32	1
031-220344-100	SMD Capacitor	220pF/50V J 0805 NPO	C20,21,19,14,15	5
031-330444-300	SMD Capacitor	3300pF/50V K 0805 X7R	C40,34	2
031-470244-102	SMD Capacitor	0u047/50V K 0805 X7R	C62,59	2
031-560243-100	SMD Capacitor	56pF/50V J 0805 NPO	C57,61	2
031-560343-102	SMD Capacitor	560pF/50V J 0805 NPO	C56	1
032-100464-202	Mylar Capacitor	1uF/100V K P:10	C70,70B	2
033-470444-270	NPE Capacitor	4u7/50V K10 (R)8x13 SBE	C73	1
033-680464-270	NPE Capacitor	6u8/100V K10 (R)1020 GNE	C72	1
034-100525-300	Electrolytic Capacitor	10uF/25V M (R)0511 P:5	C35	1
034-100625-300	Electrolytic Capacitor	100uF/25V M (R)6.3x11 P:5	C64	1
034-220525-301	Electrolytic Capacitor	22uF/25V M (R)5x11 P:5	C39,50,53,41,4,9	6
034-220615-301	Electrolytic Capacitor	220uF/16V M (R)0611 P:5	C37	1
034-330525-300	Electrolytic Capacitor	33uF/25V M (R)0511 P:5	C1	1
034-330615-300	Electrolytic Capacitor	330uF/16V M (R)0812 P:5	C12,78	2
034-470415-301	Electrolytic Capacitor	4u7/50V M (R)0511 P:5	C2	1
034-470615-301	Electrolytic Capacitor	470uF/16V M (R)0812 P:5	C65	1
034-470745-200	Electrolytic Capacitor	4700uF/50V M (R)2236	C6,8	2
038-100363-300	MPE Capacitor	0u1/100V J	C68,69,27	3
038-220393-300	MPE Capacitor	0u22/63V J	C25-26,29,31	4
038-330393-300	MPE Capacitor	0u33/63V J	C22,23,24	3
038-470293-300	MPE Capacitor	0u047/63V J	C28,30	2
039-100384-100	Safety Capacitor	HQX0.1K275VACx2 18x6x12mm	CXAC1	1
<i>Semiconductors</i>				
051-000600-100	NPN Transistor	PN:MPSW06RLRA TO-92	Q2,Q16	2
051-003100-000	NPN Transistor	PN:TIP 31C TO-220 (MOSPEC)	Q4	1
051-005600-100	PNP Transistor	PN:MPSW56RLRA TO-92	Q3	1

Part Number		Description	Reference Designator	Qty
051-222200-100	NPN Transistor	PN:MPS2222ARLRA TO-92	Q21	1
051-290700-100	PNP Transistor	PN:MPS2907A RLRA TO-92	Q19,23	2
051-540101-000	PNP Transistor	PN:2N5401 TO-92	Q1	1
051-555100-000	NPN Transistor	PN:2N5551 TO-92	Q17	1
051-640001-000	MOSFET N-Channel	PN:IRF640N TO-220 (IR)	Q18,22	2
052-400080-000	Bridge Regulator	PN:RS804 400V,8A	BR1	1
053-211100-000	IC;DIP,Driver	PN:IR2111 Half-Bridge Driver	U7	1
054-000100-100	SMD DIODE	PN:ES1D 200V 1A	D5,26,29,33,38	5
054-001002-100	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	D35	1
054-001501-100	SMD ZENER DIODE	PN:BZX84C15 15V SOT-23	D6,7,9	3
054-007200-100	SMD IC; (Dual OP-Amp)	PN:TL072CDR SO-8	U5,6	2
054-007400-100	SMD IC;(Quad OP-Amp)	PN:TL074CDR	U2,3	2
054-011400-100	SMD Transistor	PN:DTC114TKA SMT3	Q7	1
054-033904-100	SMD Transistor	PN:MMBT3904LT1 SOT23	Q11,14,13,5,8,9	6
054-033906-100	SMD Transistor	PN:MMBT3906LT1 SOT23	Q6,10,12,15	4
054-045580-100	SMD IC; (Dual OP=Amp)	PN:NJM4558M-TE3 DMP-8	U4	1
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23	D24,36,37	3
054-414803-100	SMD DIODE	PN:LL4148 (Wishay)	D1-4,8,10-23,27,30	21
054-540100-100	SMD Transistor	PN:MMBT5401 LT1 SOT-23	Q20,24,26	3
054-555100-100	SMD Transistor	PN:MMBT5551 LT1	Q25	1
050-505200-001	LED	PN:LT-2402-21	D1B	1
<i>Miscellaneous</i>				
065-050400-000	Sleeve	φ3.5mm BLK F32 (125 □)		
065-100200-000	UL Sleeve	φ2.5 F32-2.5(blk) 125 □		
082-022640-000	Wire Set #26 UL1007	L=400mm blk/wht 2P Housing +5TT		
091-000182-000	LED Holder	PN:LED5-2A		
041-115001-000	Bead Coil	YT-10911	L5	1
042-010052-003	Transformer	YT-10615-4	PT1	1
043-300101-000	Inductor	30uH YT-10033	L2	1
043-324300-000	Inductor	324uH YT-10778	L4	1
043-560200-000	Inductor	56uH YT-10779	L1	1
043-700101-000	Toroidal Inductor	70uH YT-10682	L3	1
044-100100-000	SMD Ferrite Bead	PN:321611 600R/100MHz 1206		
061-020000-000	Knob ABS	φ20x15m/m UL94V-0 BLK		
061-314002-000	Strain Relief	P/N SB4F-2		
061-400014-000	Rubber Foot	ID:6.2 OD:11.5 t=2mm blk		
061-700044-000	Mycar	13x18mm TO-220		
063-010012-000	Bracket for pwr trans	P/N:TRK-1		
063-321100-001	Plate	322x105.7x15mm BLK (94V0)ABS		
063-531808-000	Bucket	322x105.7x146.5mm BLK (94VO)		1
066-120300-900	Cable Tie	CV-120S		
071-100608-100	Fiber washer	OD=8mm ID=3.2 t=1 (red)		
071-100851-000	Washer	ID=5.1 OD=12 t=1m/m		
072-010007-000	RCA Jack	SCJ-1020 2P(G) wht,red		
072-040039-000	Terminal	PC205 (t=0.8m/m) T205MA		
072-040064-000	Terminal	PC250(t=0.8),T250MA		

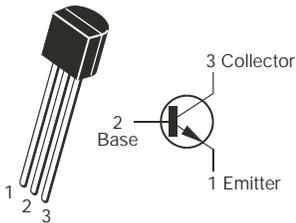
Part Number		Description	Reference Designator	Qty
072-040096-000	Terminal	(t=0.8mm) PC187(0.8)		
072-040169-000	Connector	2 PIN JS-1001-2 P:2.5mm		
072-060170-000	B.P.	W / Accessory parts		
073-032316-601	Black anodized	70x42x20mm		
073-050001-000	Fuse Clip	P/N:CFFH1206		
074-020018-000	Rocker SW	PN:RF1003-BB4-0		
074-030002-000	Toggle SW PHASE	PN:L101-T2B4QE	SW5	1
074-300018-000	Relay	PN:943-1C-48D	K1	1
082-022241-001	Wire set #22 UL1007	L=410mm blk/wht		
083-041802-009	UL Power Cord	SPT-2 blk #18 T187		
093-205209-300	Fuse	1.25A 250V 5x20mm	F1	1
181-911600-161	Wire #16AWG UL1007	blk L=610mm T205		
181-911655-135	Wire #16AWG UL1007	green L=610mm T250		
181-921600-000	blk wire #16 UL1015	T187 L:140mm		
181-921699-000	wht wire #16 UL1015	T187 L:160mm		
008-061215-000	Gasket C4305	12x15 t=5mm CR		
008-062002-002	Gasket	L-32 200x20mm t=5mm PORON		
008-062002-012	Gasket	200x20mm t=2mm CR4305		
008-063208-000	Gasket C4305	321x8 t=1mm CR		
008-069304-000	Gasket C4305	93x4 t=1mm CR		

# Semiconductor Pinout Diagrams

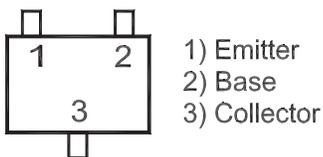
2N5401  
Q1



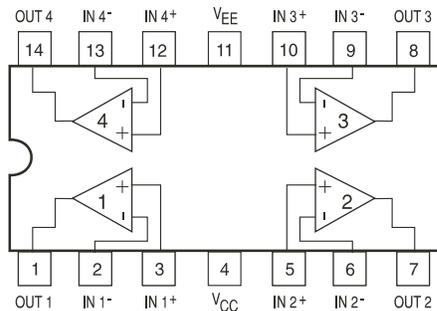
MPSW06RLRA,  
MPSW56RLRAMPQ,  
MPS2222ARLRA,  
2N2907A, 2N5551,  
Q2, 16, 3, 21, 19, 23, 17



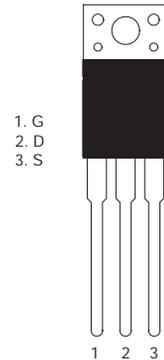
MMBT3904LTI SOT23,  
MMBT3906LTI SOT23,  
DTC114EK SMT3,  
MMBT5401 LTI,  
MMBT5551 LTI  
Q11, 14, 13, 5, 8, 9, 6, 10,  
12, 15, 7, 20, 24, 26, 25



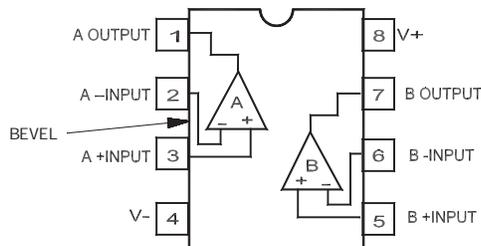
OPAMP, QUAD  
TL074CDR  
U2, 3



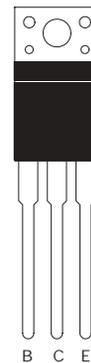
MOSFET IRF640  
Q18, 22



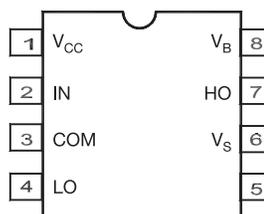
OPAMP, DUAL  
TL072CDR SO-8,  
NJM4558M-TE3  
U5, 6, 4



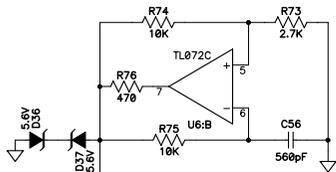
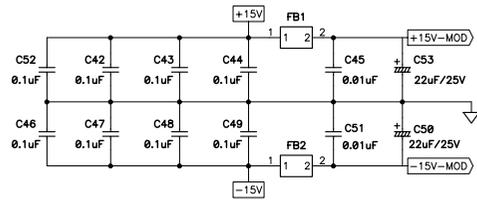
TIP31C  
Q4



IR2111 HALF-BRIDGE  
DRIVER  
U7

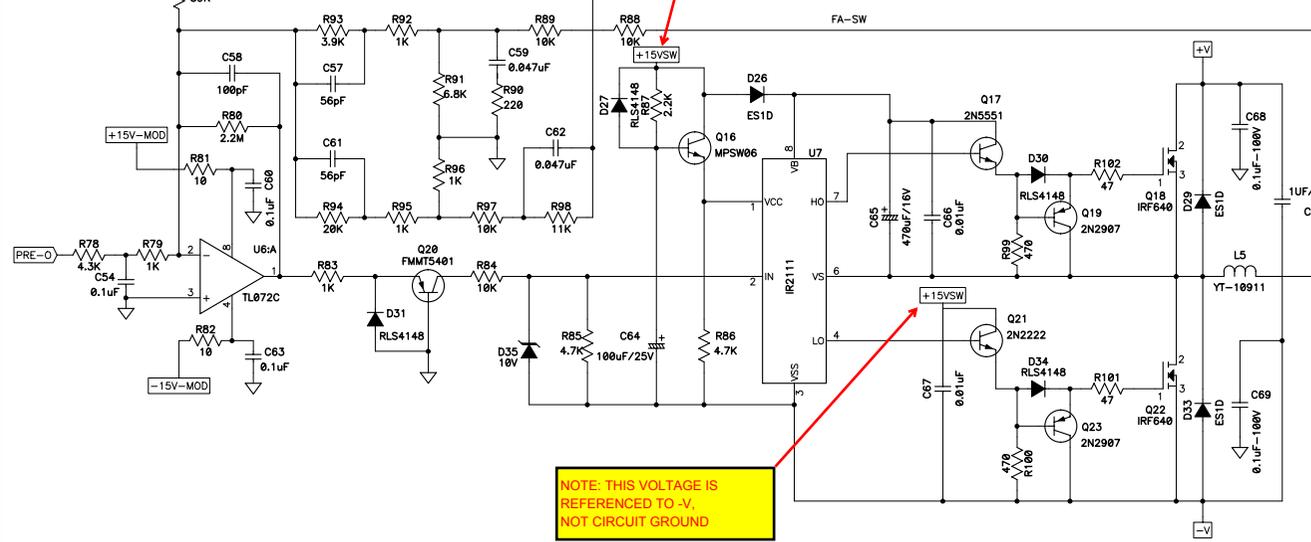
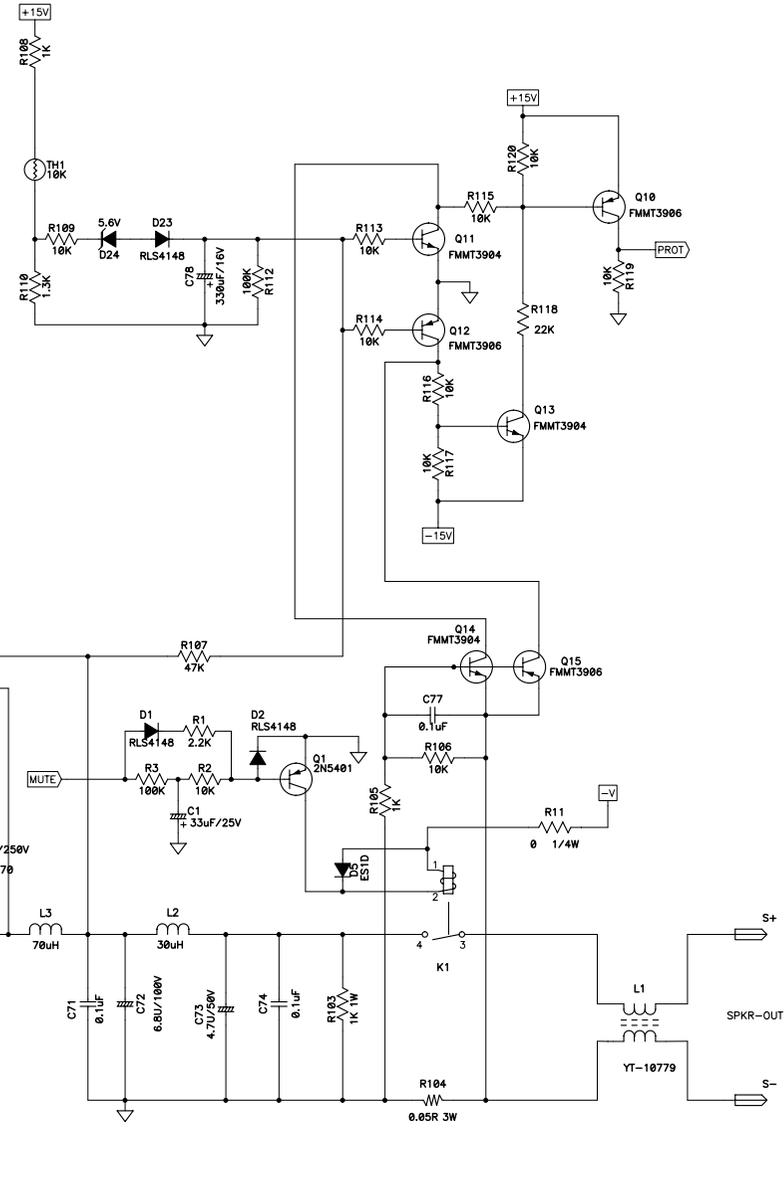


# E150P

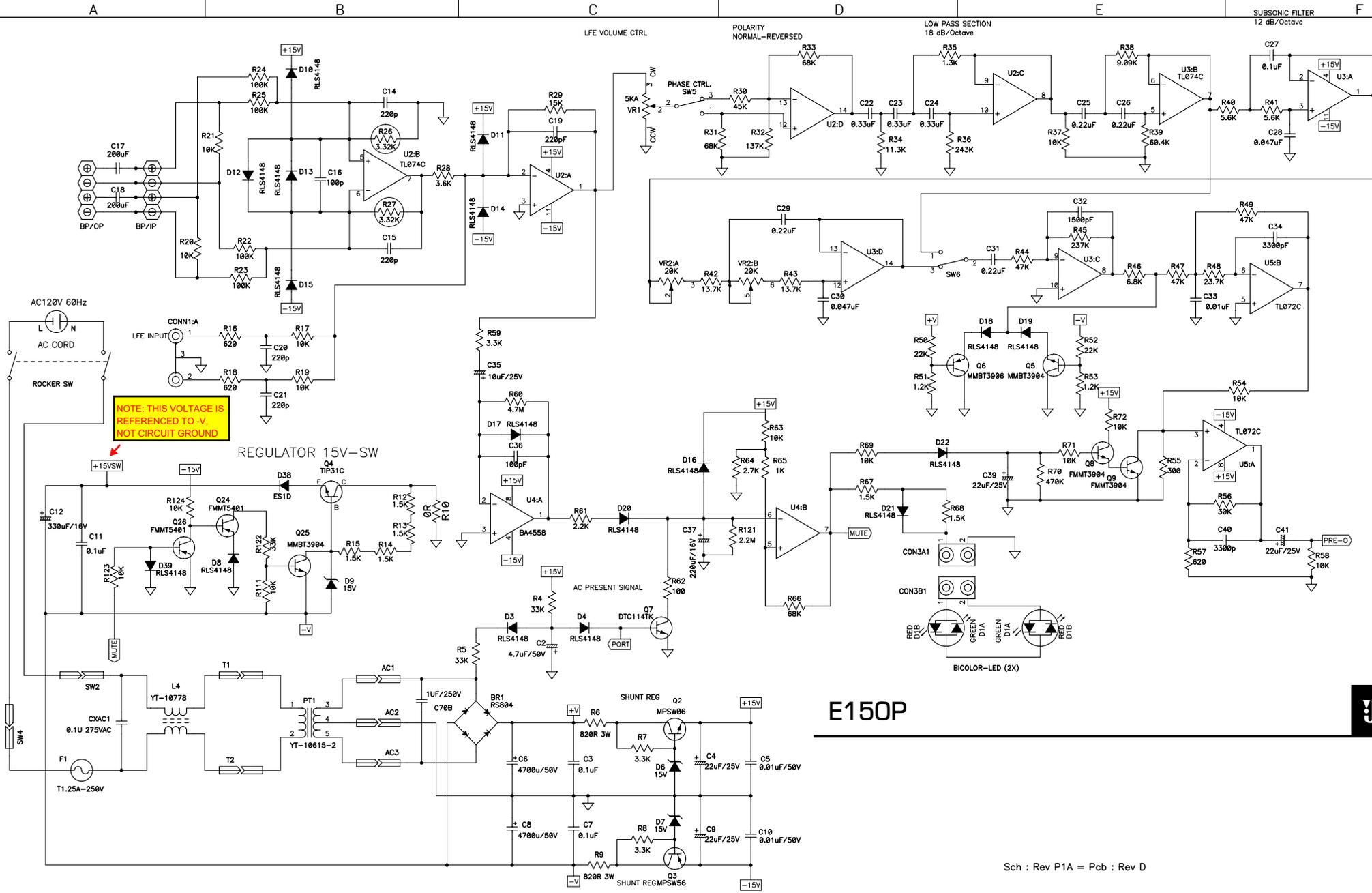


NOTE: THIS VOLTAGE IS REFERENCED TO -V, NOT CIRCUIT GROUND

NOTE: THIS VOLTAGE IS REFERENCED TO -V, NOT CIRCUIT GROUND



Rev:	Notes:	Date:	Rev:	Notes:	Date:	Draw by	Designed by	Checked by	Approved By	Customer: JBL
										P/N:
										Model no: E150P(120V)
										Sch name: POWER AMP PCB
										Issue no:
										Date: 2003/02/25
										Sheet: Rev: P1A
										Size: A2 Author: VITA



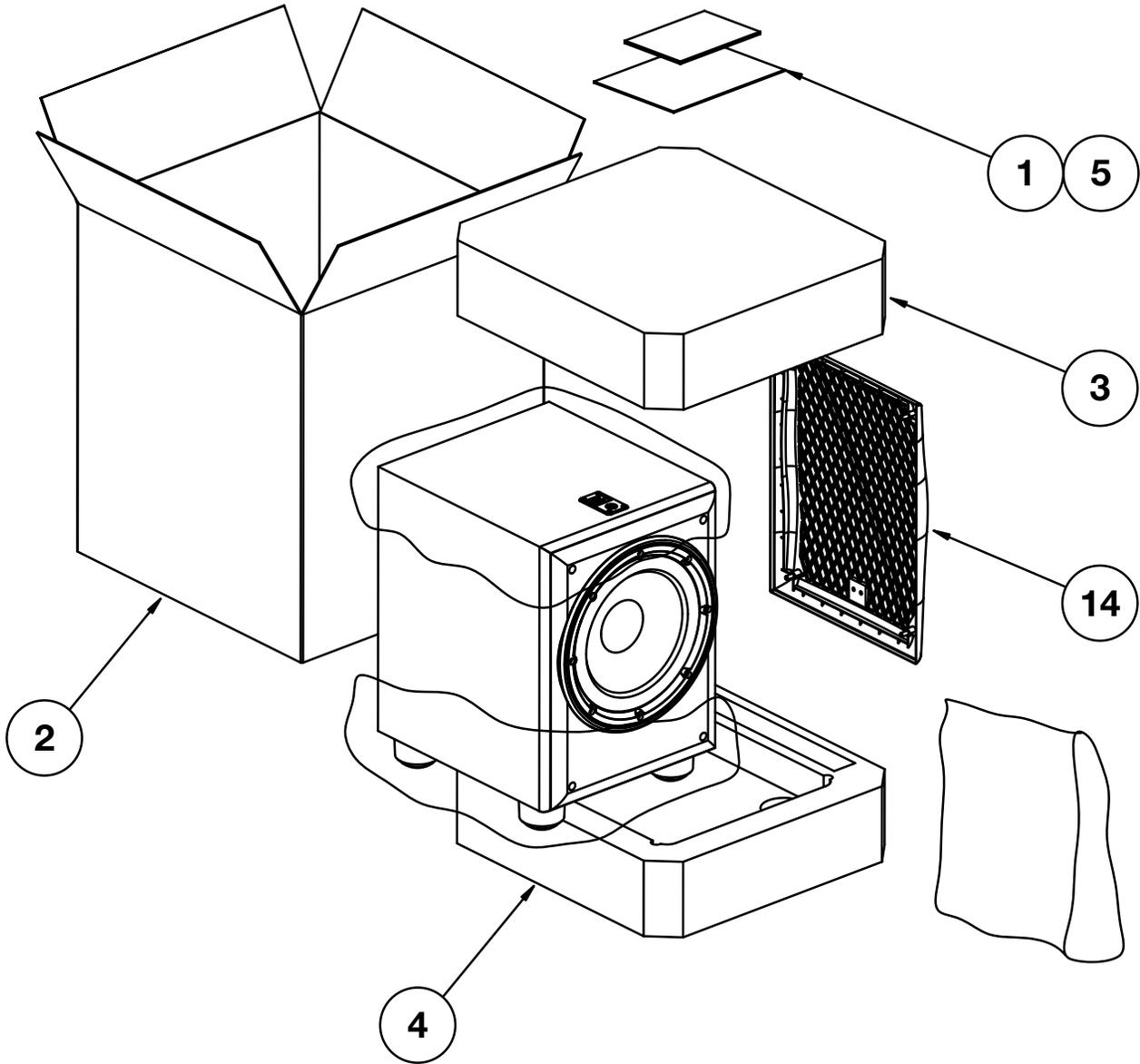
**E150P** 

Sch : Rev P1A = Pcb : Rev D

Rev: P1A	Notes: E150P(120V) Design	Date: 2003/02/25	Rev:	Notes:	Date:	Draw by	Designed by	Checked by	Approved By	Customer: JBL
										P/N:
										Model no: E150P(120V)
										Sch name: PRE AMP PCB
										Issue no:
										Date: 2003/02/25
										Sheet: Rev: P1A
										Size: A2 Author: VITA



# E150P Packaging



Ref#	Part Number	Description	Qty
1	350883-001	MANUAL, OWNER-E150P/E250P	1
2	350884-002	CARTON, MASTER-E150P (BEECH MODEL)	1
	350884-001	CARTON, MASTER-E150P (BLACK MODEL)	1
	350884-003	CARTON, MASTER-E150P (CHERRY MODEL)	1
3	350885-001	PAD, END, TOP-E150P	1
4	350885-002	PAD, END, BOT-E150P	1
5	338381-001	WARRANTY CARD, 1/5YR, JBL	1
14	351219-001	ASY, GRILLE, BLK, FRNT	1