ARC SUB10/DS-10

Powered Subwoofer

SERVICE MANUAL

JBL Consumer Products Inc.
250 Crossways Park Drive
Woodbury, N.Y. 11797
1-800-336-4JBL in the USA

A Harman International Company

Rev A 10/2000

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 personnel ONLY!

Caution

This unit does not have a power switch. Hazardous voltages are present within the unit whenever it is plugged in.

Before the 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 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 the schematic diagram designate components in which safety can be of special significance when replacing a component 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

F1	Fuse SLO BLO 0.63A 250V T type. UL approved
PWRCORD	SPT-2 or better with polarized plug, UL approved wired with the hot side to fused side. Use with factory replacement panel strain relief only.
TRX	Transformer. Use only factory replacement.
DBR	Bridge diode. Use only factory replacement.
C1, 2	3300uF, 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.
C6	10uF 50V ±20% Elect. Radial NP ***Safety Part*** **See Page 15 Service Bulletin**
R29	470 0.25W ±5% METAL OXIDE ***Safety Part***
S53AMI	Power Amp module. Use only factory replacement
CMC1	mc4438 ***Safety Part***
L1	mc4436 ***Safety Part***

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GENERAL SPECIFICATIONS

Amplifier Power (RMS)	100 watts	
Driver 10"	High-Polymer Laminate	
Inputs	Line Level and Speaker Level	
Outputs	Speaker Level (only active if Speaker Level Inputs are used)	
High-Pass Frequency	High-Pass filter at 180Hz (only active if Speaker Level Inputs are used)	
Frequency Response	50Hz - 150Hz (determined by crossover setting)	
	ARC SUB10	**DS-10**
Dimensions (H x W x D)	11-1/2 x 17-1/8 x 16-1/2" (292 X 435 X 419mm)	14-1/4 x 14-1/4 x 16" (362 x 362 x 406mm)
Weight	27 lbs/12.3 kg	27 lbs/12.3kg

DETAILED SPECIFICATIONS

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	100	Watts		1 input driven	Peak power
THD @ Rated (RMS) Power	0.3	%	1	22k filter	50 Watts
THD @ 1 Watt	0.1	%	0.5	22k filter	
DC Offset	10	mV-DC	20	@ Speaker Outputs	
Damping factor	50	DF	40	Measured at amplifier board	Measure at amp board THD < 0.1% 50 Watts @ 50Hz
Input Sensitivity					
Input Frequency	40	Hz	50	Nominal Freq.	
Line input	100	mVrms	2dB	To Rated power/Vol @ Max	Single input driven Un-Balanced GND Zo=600
Speaker/Hi Level Input	2.6	Vrms	2dB	To Rated power/Vol @ Max	Single input driven Un-Balanced GND Zo=600
Signal to Noise					
SNR-A-Weighted	100	dBA	70	relative to rated power	A-Weighting filter
SNR-unweighted	80	dBr	70	relative to rated power	22k filter
SNR rel. 1W-unweighted	65	dBr	55	relative to 1W Output	22k filter
Residual Noise Floor	1	mVrms	2	Volume @max, using DVM or A/P (BW=20 KHz)	
Residual Noise Floor	1.5	mVrms(max)	2		Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics) (BW=20 Khz)
Input Impedance					
Line Input	10K	ohms	n/a	Nominal	Zin Minimum, (test frequency 1 Khz)
Speaker/Hi Level Input	4.7K	ohms	n/a	Nominal	Zin Minimum, (test frequency 1 Khz)
Filters					
Speaker in LP 2nd order variable	50-150	Hz	10	-3db Point	
Subsonic filter (HPF) 2nd order	25	Hz			
Speaker out HP filter					
Left & Rigth	200	Hz	10	Speaker input - Spkr out 4 Ohms	
Left & Rigth	100	Hz	10	Speaker input - Spkr out 8 Ohms	

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		
HP Speaker out			functional		Refer to filter section
Input Configuration					
Line In & LFE	YES	—	functional		LR dual RCA jack
Spkr/Hi Level In	YES	—	functional		Spring type connector
Signal Sensing (ATO)					
Auto-Turn-On	YES		functional	Auto - on selection switch in Auto	Bicolor LED (Green=signal/ red= No signal)
ATO Input test frequency	40	Hz	functional	"	
ATO Line level in	5	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 3 > T < 15 Minutes
Power on Delay time	0.1	sec.	5	AC Power Applied	
Transients/Pops					
ATO Transient	5	mV-peak	50		
Turn-on Transient	2	Vpk-pk	2	@ Speaker Outputs	AC Line cycled from OFF to ON
Turn-off Transient	2	Vpk-pk	2	@ Speaker Outputs	AC Line cycled from ON to OFF
Efficiency					
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 3 > T < 15 Minutes
Power Cons. @ rated power	76	Watts	80	@ nom. line voltage	75 Watts @ 4 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 IEC Noise using driver load	Temperature rise in accessible metal parts should not exceed 35K rise for 120v version or 30K rise for European versions (refer to requirements sheet).
Line Fuse Rating					
US (120v) version		Amps	0.6	Type-T or Slo Blo-250 V	Internal fuse
EU		Amps	TBD	Type-T or Slo Blo-250 V	External fuse with UL/SEMKO rated holder

ARC SUB10/DS-10 CONTROLS AND THEIR FUNCTION

1. Volume Control - adjusts the level of volume of the subwoofer relative to the rest of the system.

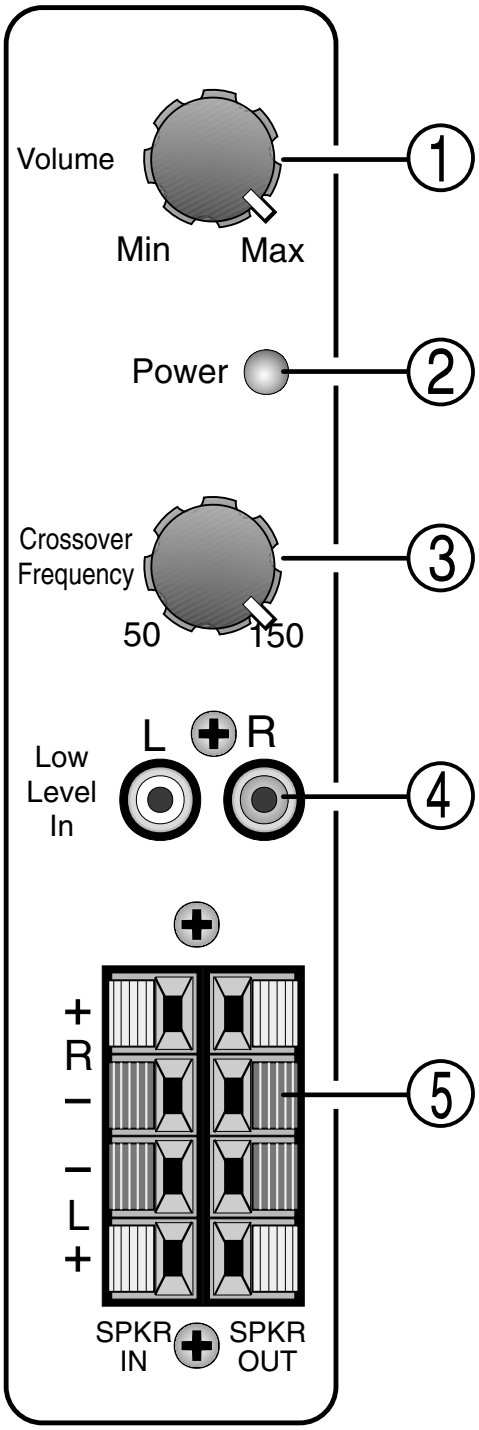
2. Power LED - This light will be RED when the unit is plugged in and not receiving a signal; when the unit receives a signal, the light will cycle to GREEN. If no signal is received after 5 minutes the light will cycle back to RED (standby) until a signal is present again.

3. Crossover Frequency - This controls the highest frequency the subwoofer will reproduce. It allows a seamless transition from the subwoofer to the satellite speakers. When the control is at the “50” position, very few high frequencies will be heard. This position is best suited to large main speakers. For most applications, the control should be set somewhere near the mid position. For listeners using very small speakers, best results will be obtained with the control at the “150” position.

4. Low Level Input Jacks - These left and right Line Level Inputs are normally used when the receiver/ processor has line-level “pre-amp out ” or “subwoofer out” jacks.

5. High Level Inputs - These High Level Inputs are for receivers that do not have line-level “pre-amp out” or “subwoofer out” jacks. When a pair of main or satellite speakers are attached to the OUTPUT terminals, frequencies below 180 Hz are attenuated by the high-pass filter.

Note: DS-10 controls are shown here



CAUTIONS AND WARNINGS

BEFORE THIS AMPLIFIER IS PLUGGED IN, make sure its rated voltage corresponds to the voltage of the AC power source to be employed. Failure to use the correct voltage could cause damage to the amplifier when the AC power cable is plugged in. Do not exceed the rated voltage by more than 10%; operation below 90% will degrade performance or cause the unit to shut off.

1. TROUBLE SHOOTING BEFORE OPENING

Check connections, control settings, driver and other possible external problems. If there is Output, determine if all controls and Inputs function properly. Rotate Pots over full range while applying lateral and vertical oscillating forces to locate possible intermittent function. High Level Inputs should be tested individually both differentially (signal from "-" to "+" with normal output) and in common mode (signal from low level ground to both "+" and "-" shorted together, giving virtually no output). While passing a signal, corner drop the enclosure a few inches to expose possible intermittent problems. Check woofer for rubbing of voice coil or tears in cone or surround. Check cabinet for loose extraneous articles which may have been pushed into port.

2. REMOVING THE AMPLIFIER.

WARNING

There are voltages and hot components at many points in the amplifier which can, if contacted, cause personal injury. Be extremely careful. Any adjustments or service procedures that require operation of the amplifier out of its enclosure should be performed only by trained service personnel. Refer to PCB drawings for locations of hazards and familiarize yourself with their locations before starting.

A. Remove the subwoofer grille.

B. Remove the (4) 1” Black PPH screws attaching the woofer to the cabinet.

C. Remove the woofer, unplug the two connecting wires.

D. Remove the (8) ¾” screws black pph screws attaching the ampifier assembly to the cabinet.

E. Remove the ampifier assembly.

F. For access to the input panel, first remove the three outer screws. Remove knob and nuts from potentiometers. Cut away the sealant securing the cover to the faceplate. The input PCB should now pull out completely.

3. TROUBLE SHOOTING AFTER REMOVAL

WARNING

Verify AC plug is disconnected. See WARNINGS in section 2.

WARNING

To prevent loose hardware from reducing safety spacings, it is essential that all hardware be replaced in the same manner as it was removed, with lock washers under all nuts, proper torque on screws and thread locking sealer on the transformer nuts.

CAUTION

If line core or strain relief are replaced, it is necessary to seal them completely to panel with an approved conformal coating to prevent air "whistling" through any openings from woofer pressure.

WARNING

To reduce the risk or electric shock and/or fire, replace items as marked on schematic with the safety marking only with the exact replacements listed in the safety component list, page 2. If exact replacements are not available, order them from the factory or an authorized service center.

A. Check fuse F1. If blown visually check transformer for discoloration, and large capacitors (C1, C2) for bulges or venting. Check for shorts with an Ohmmeter, (see schematic).

B. With ohmmeter, verify voice coil of woofer is 3.9 ohms, and windings of transformer are continuous.

C. Examine board and wiring for obvious damage, broken or poorly soldered connections, or discoloration.

D. Repair or replace items identified above.

E. For live power testing, attach a 4 ohm 100 watt resistor to the output wires.

F. If the LED is not on, check for fuse continuity and then for cold solder joints on CMC1 and bridge diode.

G. With a signal present at the input, the output to the power amp is at pin #8 of U1. If the signal is not present at pin 8, there is a problem with preamp section. Most likely, a cold solder joint will be the

problem. Track back the signal path to locate problem.

H. If signal present at pin 8, but still no sound, check for cold solder joints on all power resistors, R4a and R4b and the the power amp module. If C24 is blown, C6 is not soldered or is defective. Check the signal at R2. On the down signal side, the voltage signal should be very small. If signal is similar on both sides of R2, the amp module is likely defective.

I. If you hear a mechanical clicking noise from the amp module, this indicates that the short circuit protection has been engaged. Check that Q3, Q4 and Q5 are soldered correctly. Also check that Q3 is not shorted to power amp case.

J. If you have to replace the power module, be very, very patient with the solder removal from this single sided PCB. **COMPLETELY REMOVE SOLDER BEFORE TRYING TO REMOVE THE MODULE!** (See page 23)

K. Assembly notes. Top side soldering as below:

J5: solder both ends

J3: solder both ends

J1: solder both ends

R48: solder GND end

At junction of C7a/C7b: Pin to GND

Crossover pot Gnd wire from PDB pad to POT barrel. (Only physical contact required between pot body and faceplate).

CAUTION

After repair, inspect for possible safety hazards, including loose hardware, missing lock washers, correct fuse and lead dress of primary wires (these must be held in position with cable ties so that they cannot touch secondary components). With ohmmeter, check that panel is connected to signal ground.

WARNING

It is essential that the following safety insulation test be performed prior to returning the Power SubWoofer to the customer, using one of the following methods.

A) Insulation Resistance Test

With a 500VDC Insulation Tester, Check insulation from the outer metal contact of the RCA jack (chassis) to the line neutral of AC cord. Resistance should be >100M .

B) Hi-Pot Test

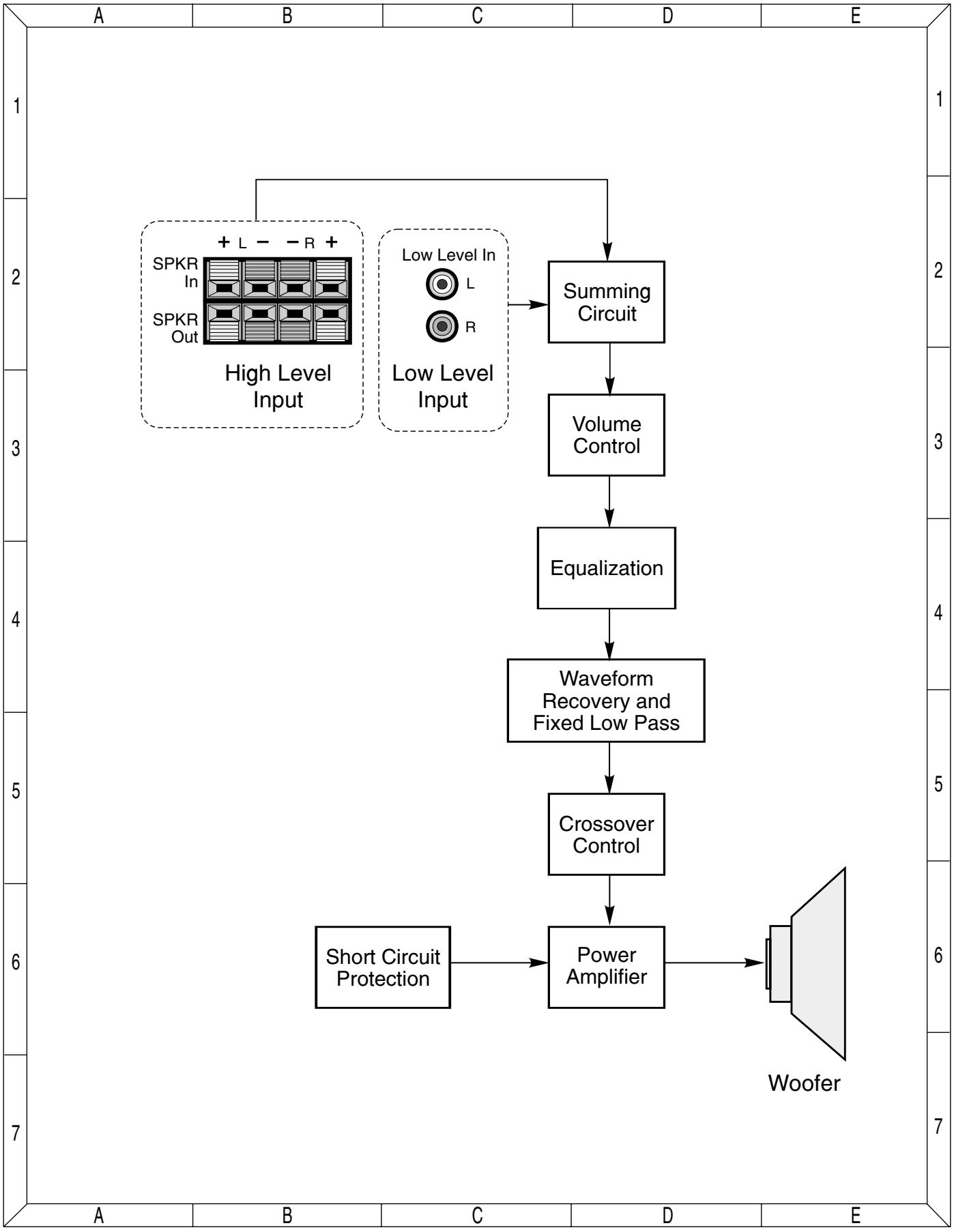
If a UL approved Hi-Pot tester is available, test line & neutral of AC cord to outer shell of RCA jack (chassis) at 1100VAC for 2 seconds. Observe all of instrument manufacturer's instructions and safety warnings in performing this test.

Connect subwoofer system to a music source. Play at high level while checking for air leaks around panel edge, driver, panel jacks and controls, and voice coil problems such as rubbing or loose turns. With the crossover "frequency" set to 50Hz, very little of the voice content should be heard.

4. REASSEMBLY

Follow all disassembly instructions in reverse order. If the input plate has been removed, it must be re-sealed with a small bead of silicon seal or air leaks may result.

ARC SUB10/DS-10 BLOCK DIAGRAM

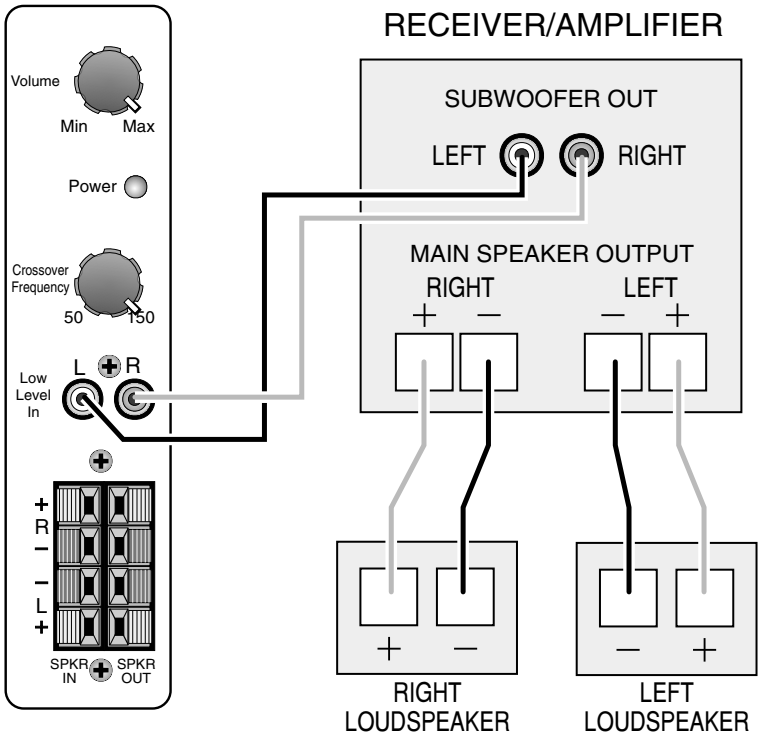


SPEAKER CONNECTIONS

Note: DS-10 controls are shown here

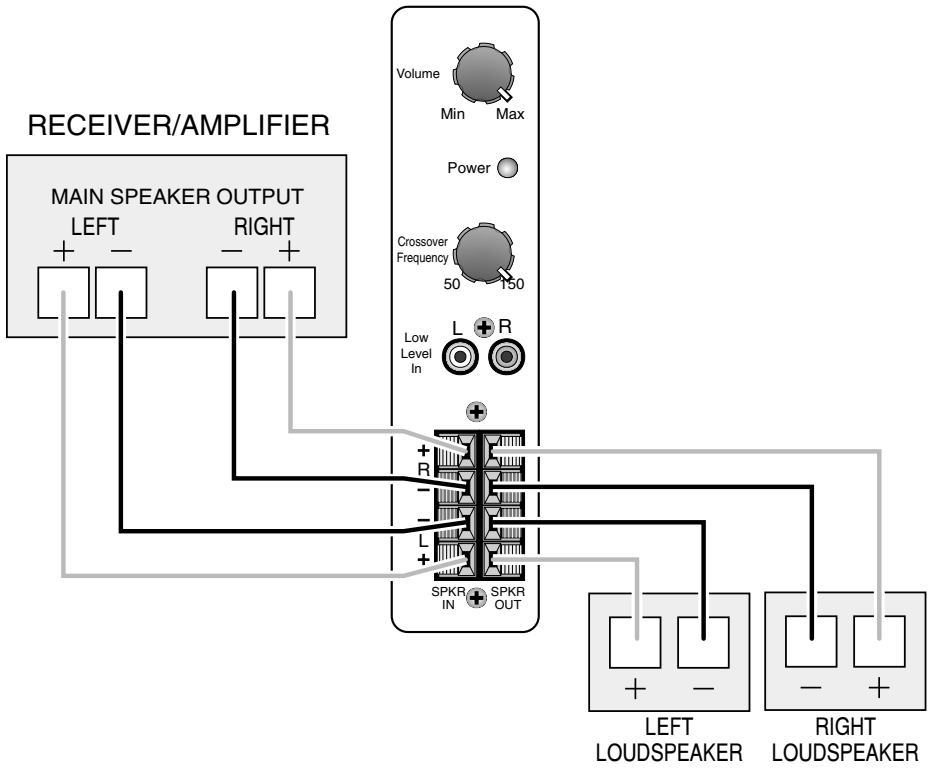
Line Level

Note: Some receivers/amplifiers have a single (mono) subwoofer output. In this case, it is recommended that you use a “Y”-connector (not included) to connect to both right & left inputs and maximize the subwoofers performance.



Speaker Level

Note: When using the speaker-level connections, the built-in high-pass filter will also limit the low frequencies being sent to the satellite speakers. This means that your satellites won’t have to try to reproduce the information the subwoofer is playing.



TROUBLESHOOTING

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

- Receiver/amplifier is on and a source is playing.
- Powered subwoofer is plugged in.
- Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
- Review proper operation of your receiver/amplifier.

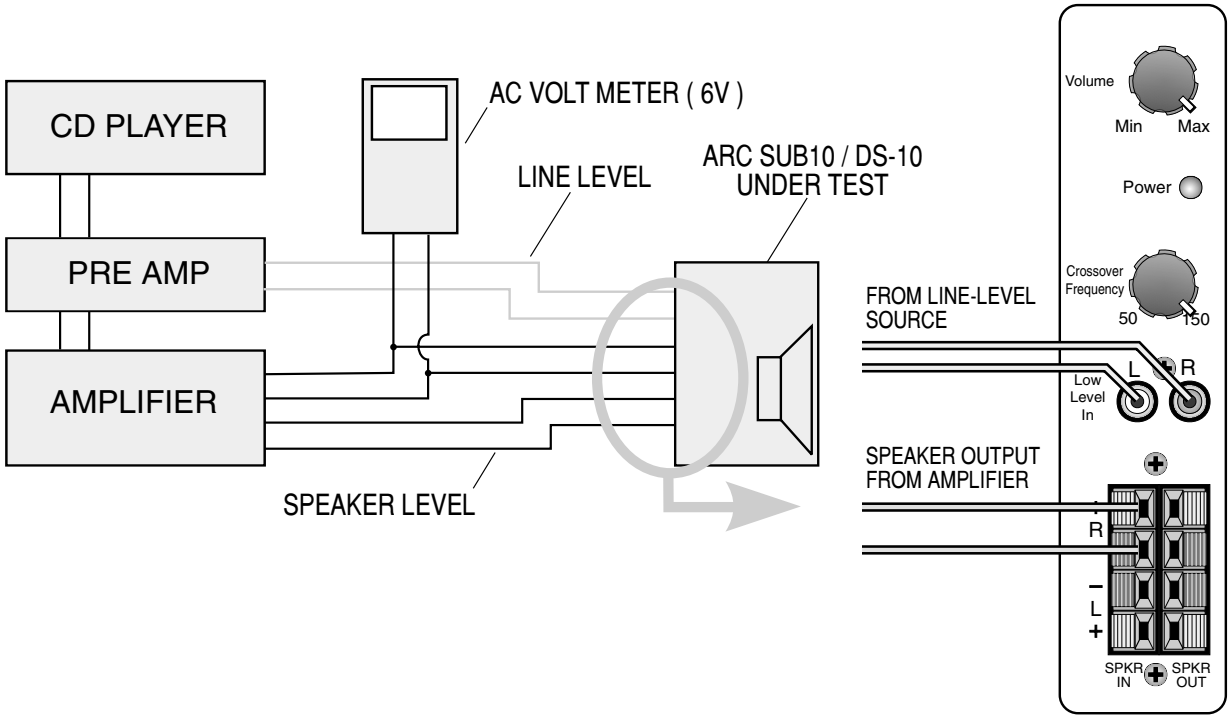
If there is low bass output, check the following:

- 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.
- Adjust the crossover point.
- 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 the following:

- Receiver/amplifier is on and a source is playing.
- Powered subwoofer is plugged in.
- Check all wires and connections between receiver/amplifier and subwoofer. Make sure all wires are connected. Make sure none of the wires are frayed, cut or punctured.
- Review proper operation of your receiver/amplifier.

ARC SUB10 / DS-10 TEST SET UP AND PROCEDURE



General Function

UUT = Unit Under Test

1. Connect both right and left line level inputs (RCA) to signal generator and UUT. Use Y-cable if necessary from mono source. VOLUME control should be full counterclockwise.
2. Turn on generator, adjust to **50mV, 50 Hz.**
3. Plug in UUT; red LED should be ON. Turn VOLUME control full clockwise.
4. LED should turn Green; immediate bass response should be heard and felt from port tube opening.
5. Turn off generator, turn VOLUME control fully counterclockwise, 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 **2.0V, 50 Hz**. Turn VOLUME control full clockwise.
8. Green LED should light, immediate bass response should be heard and felt from the port tube opening.

Sweep Function

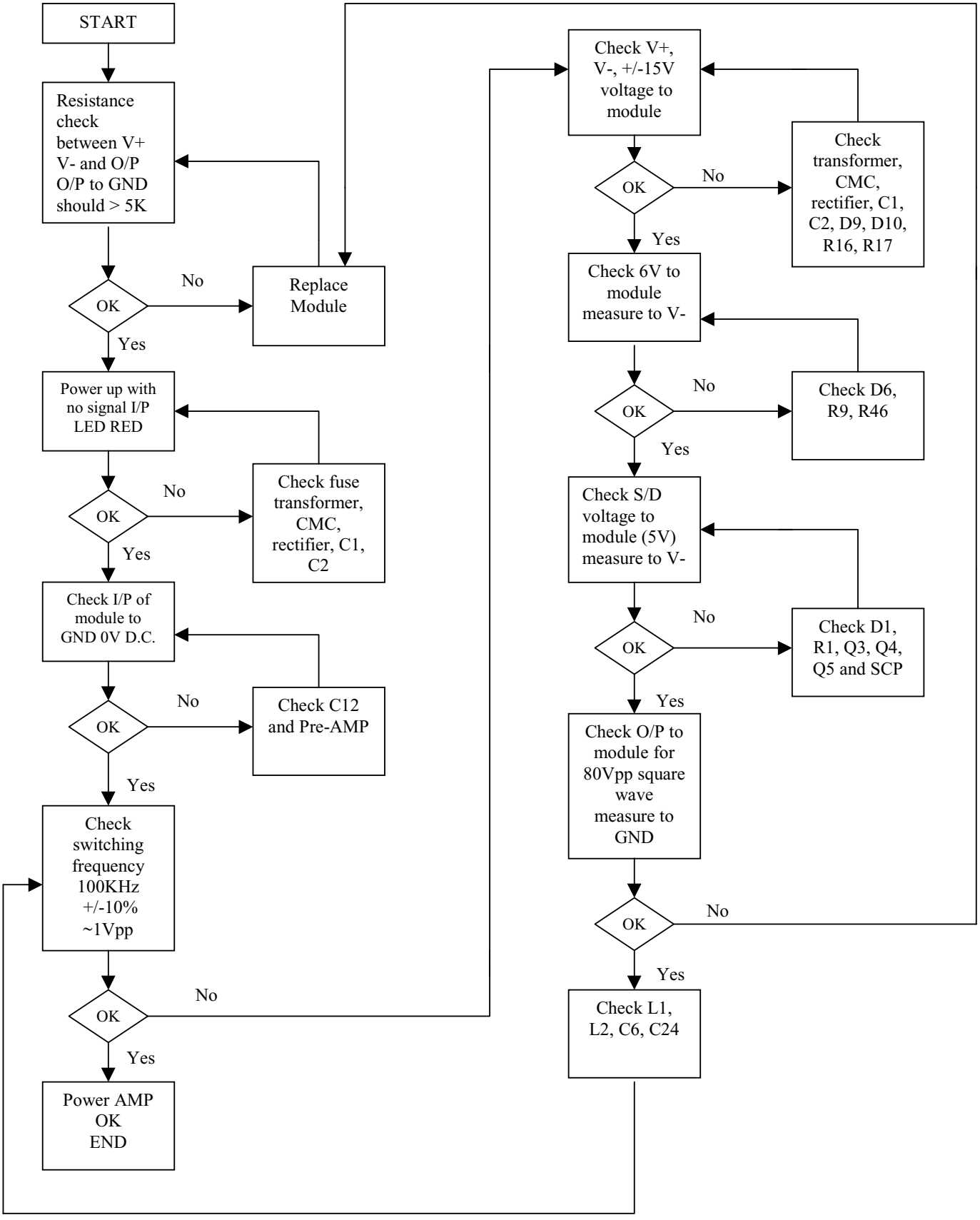
1. Follow steps 1-4 above, using a sweep generator as a signal source.
2. Sweep generator from 20Hz to 300Hz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove driver and test.

Driver Function

1. Remove driver from cabinet; detach + and - wire clips.
2. Check DC resistance of driver; it should be **3.2 to 3.9** 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.

ARC SUB10 / DS-10 POWER AMP MODULE TESTING FLOW CHART



SERVICE BULLETIN JBL9903 - APRIL 1999

To all JBL Service Centers
Model: ARC SUB10 / DS-10

This considered a Minor repair

Subject: Check Solder Joints in Event of Failure

Some performance related complaints in the ARC SUB10 / DS-10 powered subwoofer may be caused by cold Solder connections between the 28 pins of the Power Amp Module and the main circuit board. When troubleshooting, failure to check these joints can result in erroneous conclusions or wasted time.

In the event you receive a ARC SUB10 / DS-10 Subwoofer with the complaints "Dead, or No Output, or Motorboating (Oscillation)", perform the steps listed below first before any further troubleshooting takes place:

1) Unplug all cables, lay the subwoofer on a padded surface.

2) Remove all Philips screws around the outer perimeter of the amplifier faceplate.

3) Remove amplifier assembly; you should be able to remove the amplifier far enough out of the cabinet to service it without removing the woofer wires.

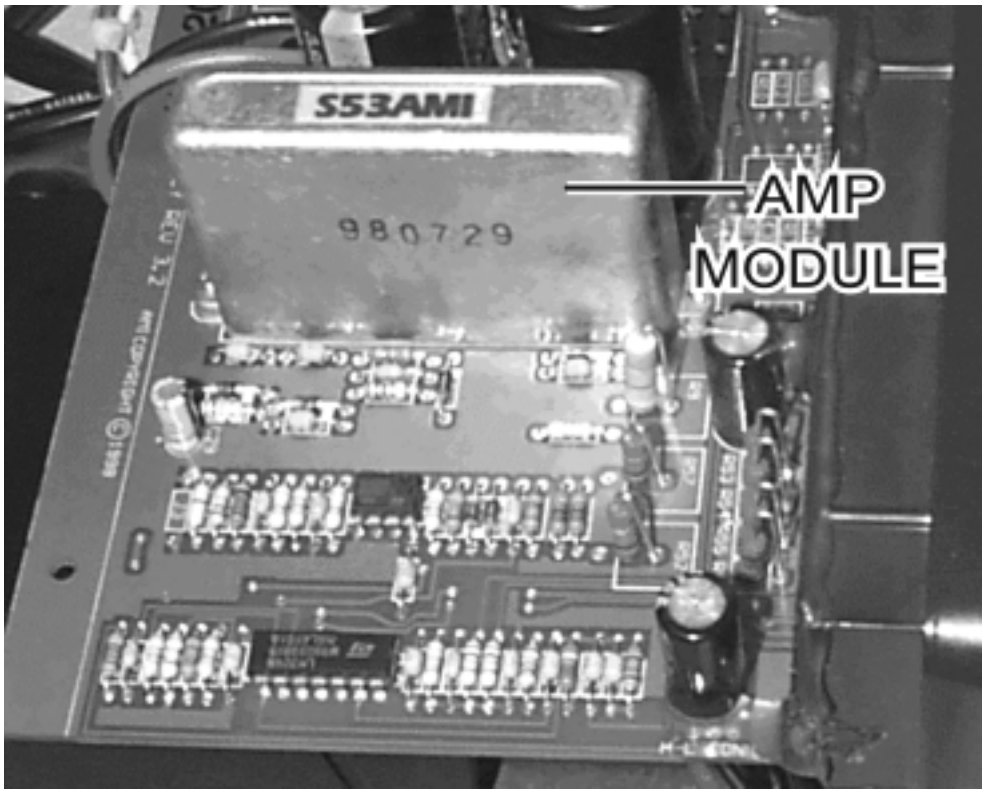
4) Locate the Power Amp Module; it is the large gray component with a metal case. On the Solder side of the circuit board are the 28 Solder connections to the Module.

5) Regardless of whether you can visibly see breaks in any of the connections or not, carefully re-Solder all 28 pin connections, adding 60/40 rosin core Solder. Take care not "bridge" any connections on the board with Solder.

6) Inspect the Solder joints to the main filter capacitors C1 and C2 on the main PCB and re-Solder if needed.

7) Replace the amplifier assembly back into the cabinet; replace the screws.

8) Test the unit by applying a signal from a music source, adjust the volume to a moderate level and confirm the original problem has been corrected.



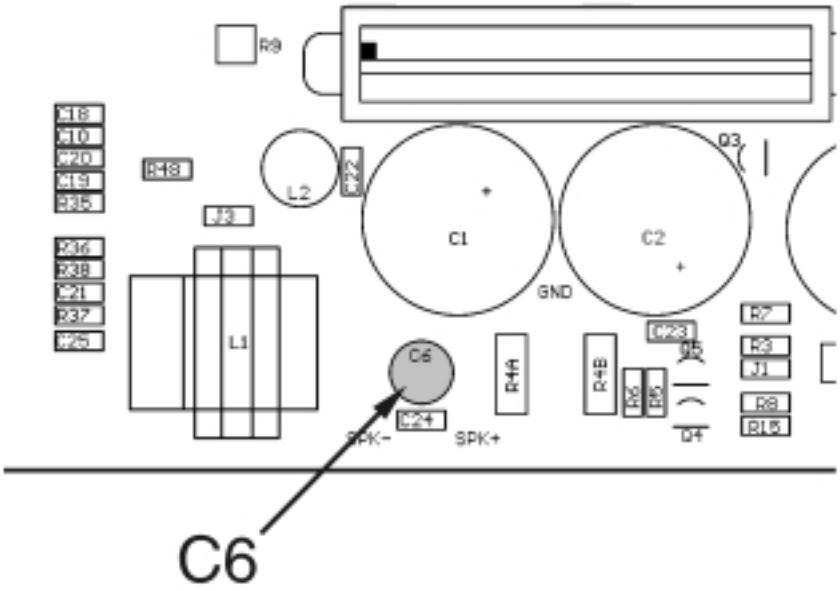
SERVICE BULLETIN JBL2000-01 - JANUARY 2000

To all JBL Service Centers
Model: ARC SUB10 / DS-10

Warranty labor rate: MINOR repair

Subject: Failure of C6

In the event you receive a JBL subwoofer corresponding to one of the above models with the complaint “no output” and capacitor C6 (10uf 50v NPE) is damaged in the amplifier, replace with the following part: JBL part# 30712 (10uf 100v NPE)



General reference for location only; not all parts or designators may conform to these drawings

It is also recommended following the repair that the instructions included in bulletin #JBL9903 are followed.

Models	Serial number 120/230V	Status	Action
ARC SUB10 / DS-10	All serial numbers affected	Replace if damaged	Replace C6 with JBL part# 30712

TROUBLESHOOTING TIPS AND SOLUTIONS TO COMMON SERVICE PROBLEMS

For models: ARC SUB 8, ARC SUB 10 TIP# JBLTT2000-01

Complaint:

How do you replace or service any of the front panel components on the Subwoofer faceplate for model ARC SUB 10 ?

Probable Cause:

The High level Input terminals, potentiometers, RCA jack, and switch(es) are behind a sealed cover to protect the air-tight integrity of the cabinet enclosure.

Solution:

1) Unplug all external cables from the subwoofer; place the cabinet on a padded surface.

2) Remove any subwoofer grille; remove the woofer from the cabinet. Detach the two connections from the woofer terminals.

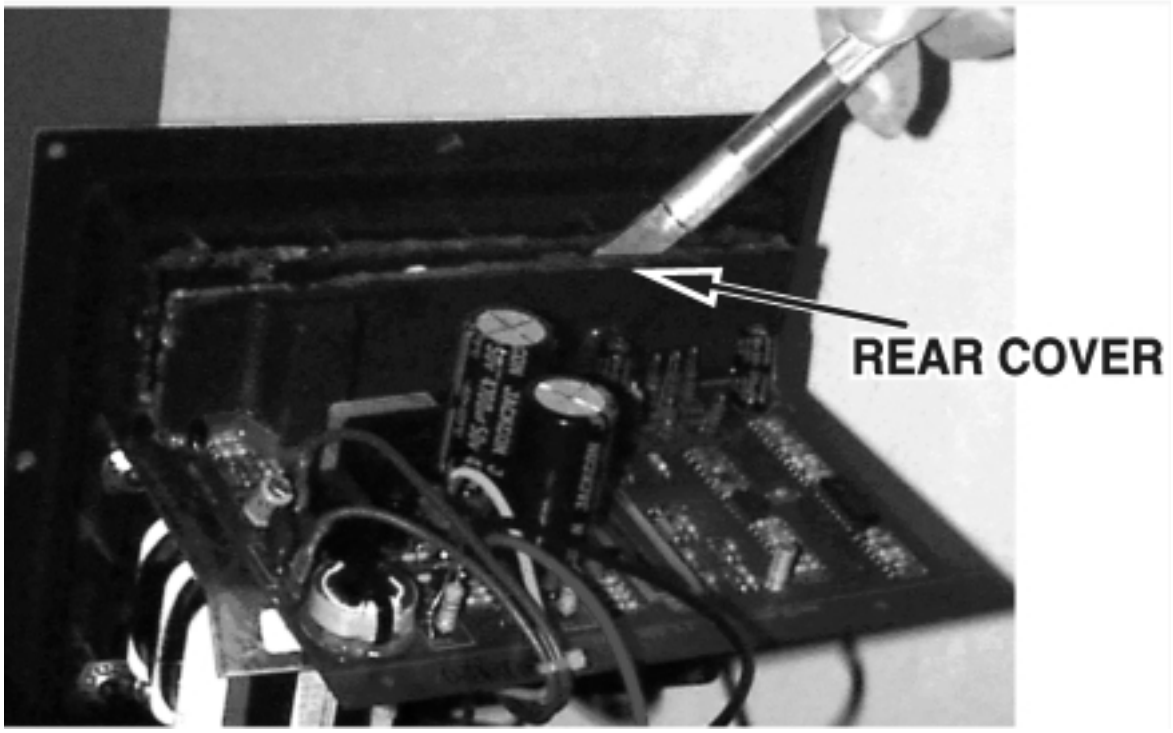
3) Remove all Phillips screws holding the amplifier to the cabinet; remove the amplifier.

4) Remove all knobs, nuts, and Philips screws from the outer control section of the amplifier faceplate.

5) Locate the sealed cover on the inside of the amplifier faceplate (see illustration); the bead of adherent must be broken to remove the main PCB with front panel components from the plastic faceplate. This is most easily accomplished by CAREFULLY using a box cutter, exacto knife, or similar sharp instrument. First scrape all excess material from the three surfaces; then force the blade into the groove between the rear cover and the faceplate. DO NOT attempt to remove the rear cover from the main PCB.

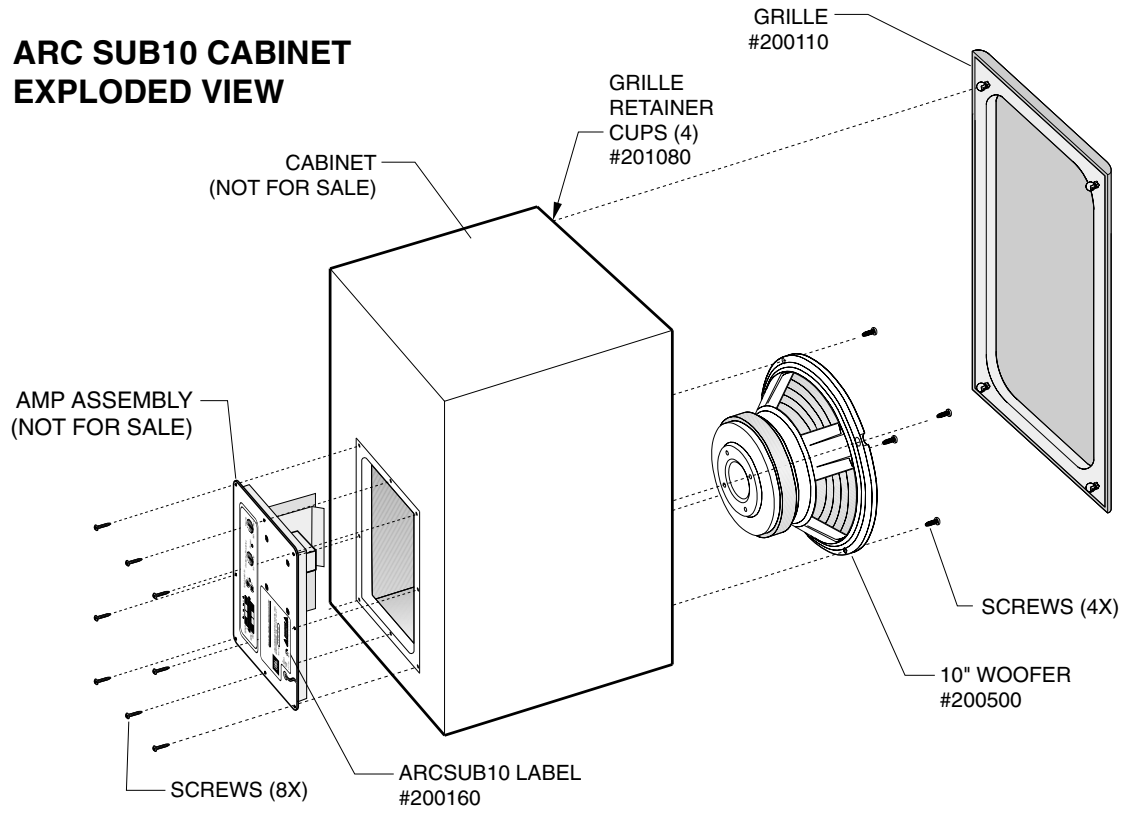
6) When enough material is removed, the main PCB with cover can be pulled away from the faceplate, exposing the components.

7) After servicing, a bead of “silicon seal” or similar adherent must be applied to all surfaces where it was removed. Reassemble the rest of the components in reverse order.

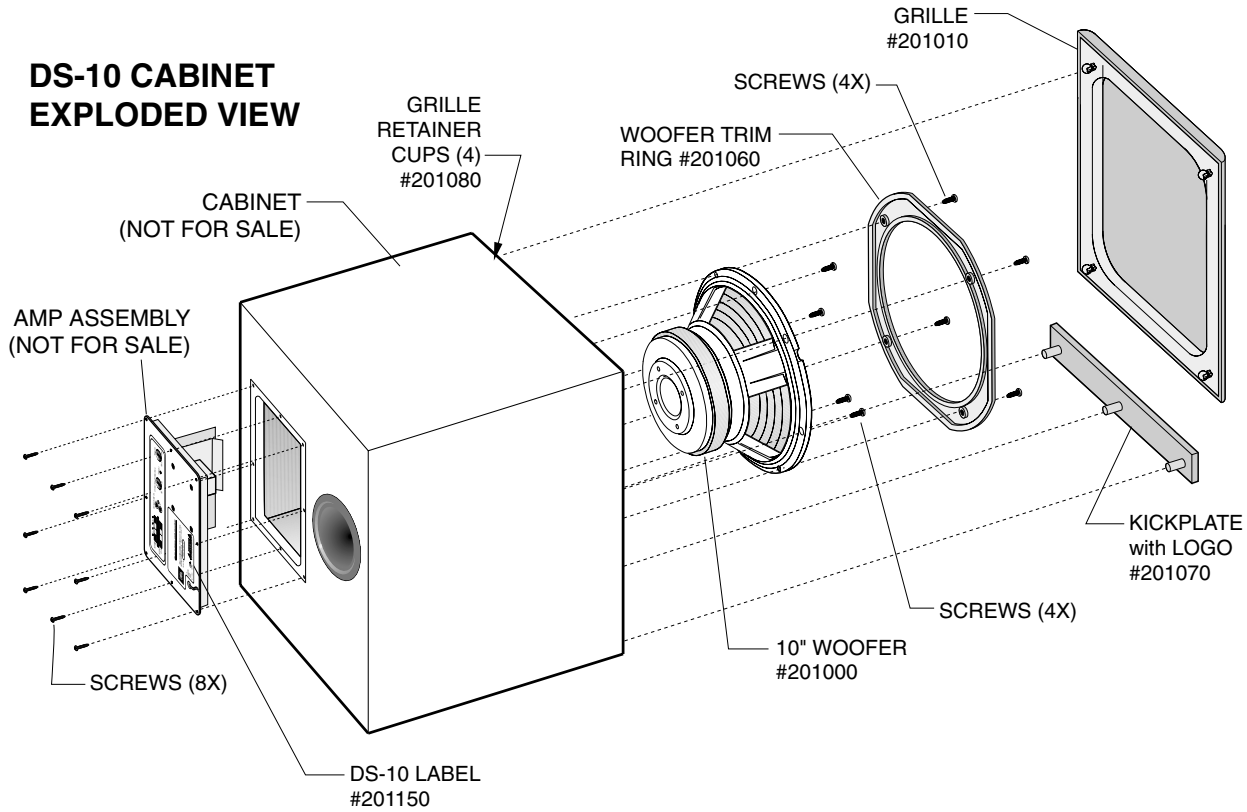


CABINET EXPLODED VIEWS

ARC SUB10 CABINET EXPLODED VIEW



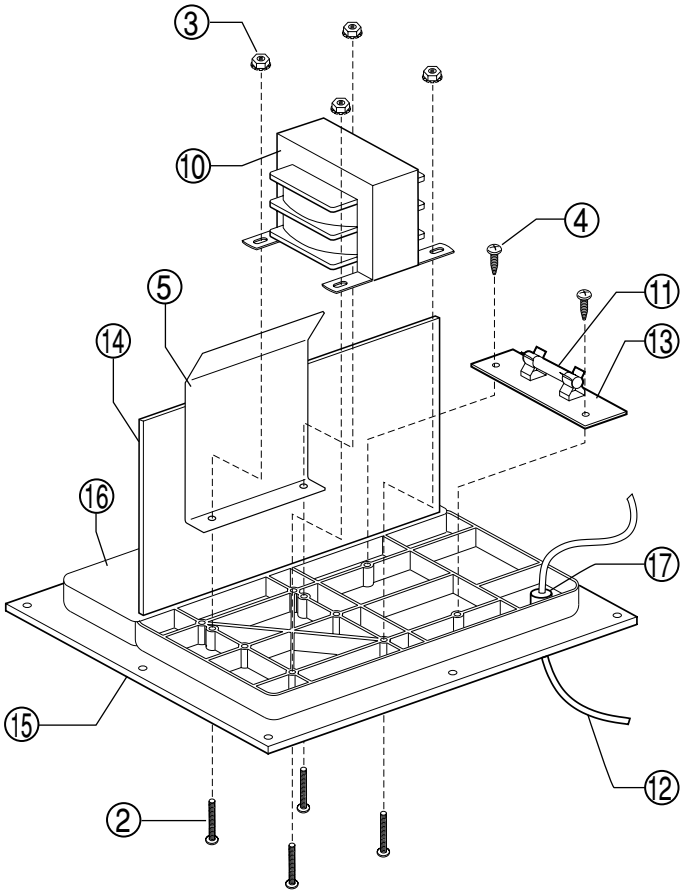
DS-10 CABINET EXPLODED VIEW



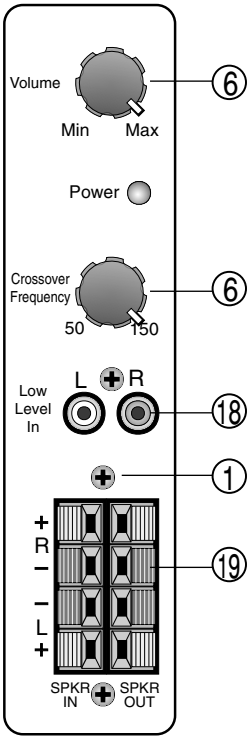
AMPLIFIER EXPLODED VEIW

Ref.#	Part #	Description	Qty
1	70170	#4x0.5" screws to secure input jacks	3
2	70171	#10 x 1" machine screw bolts for transformer 4 per unit	4
3	70172	#10 keps nuts for transformer	4
4	70173	#6 x 0.5" screws for fuse PCB	2
5	A70301	Hum shield Metal bracket mounted on transformer	1
6	A70302	Knobs	2
10	⚠80108	**TRX** Transformer #4340 SAFETY PART	1
11	80109	**F1** 250V, 0.63A, T type slo blo fuse	1
12	⚠80105	Power cord, 2 conductor SAFETY PART	1
13	⚠80106	Fuse PCB complete with connectors SAFETY PART	1
14	⚠80107	Main PCB Motherboard SAFETY PART	1
15	⚠200603 ⚠201003	ARCSUB10 Faceplate with labels SAFETY PART DS-10 Faceplate with labels SAFETY PART	1 1
16	⚠A70304	Air leak cover SAFETY PART	1
17	⚠70305	Pwr cord strain relief SAFETY PART	1
18	108320	Dual RCA input jacks	1
19	108115	High level input and output terminals	1

ARC SUB10/DS-10
Amplifier Assembly
Exploded View

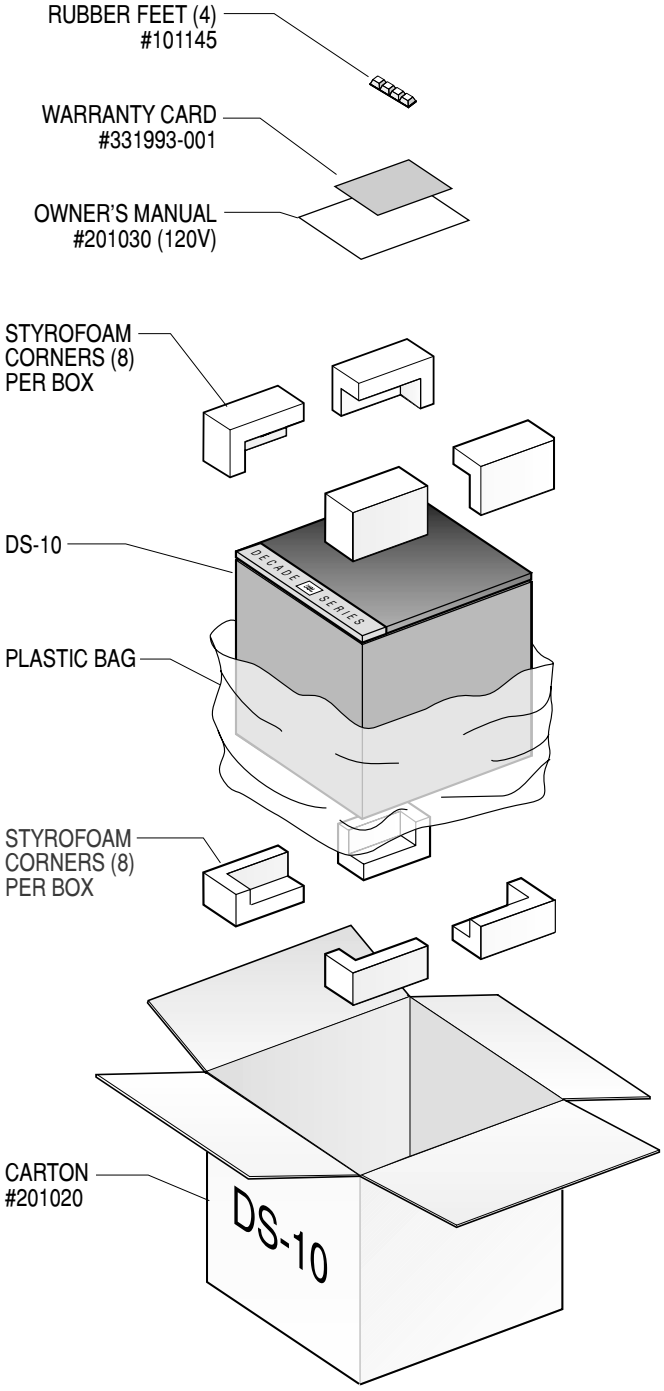


DS-10 Shown

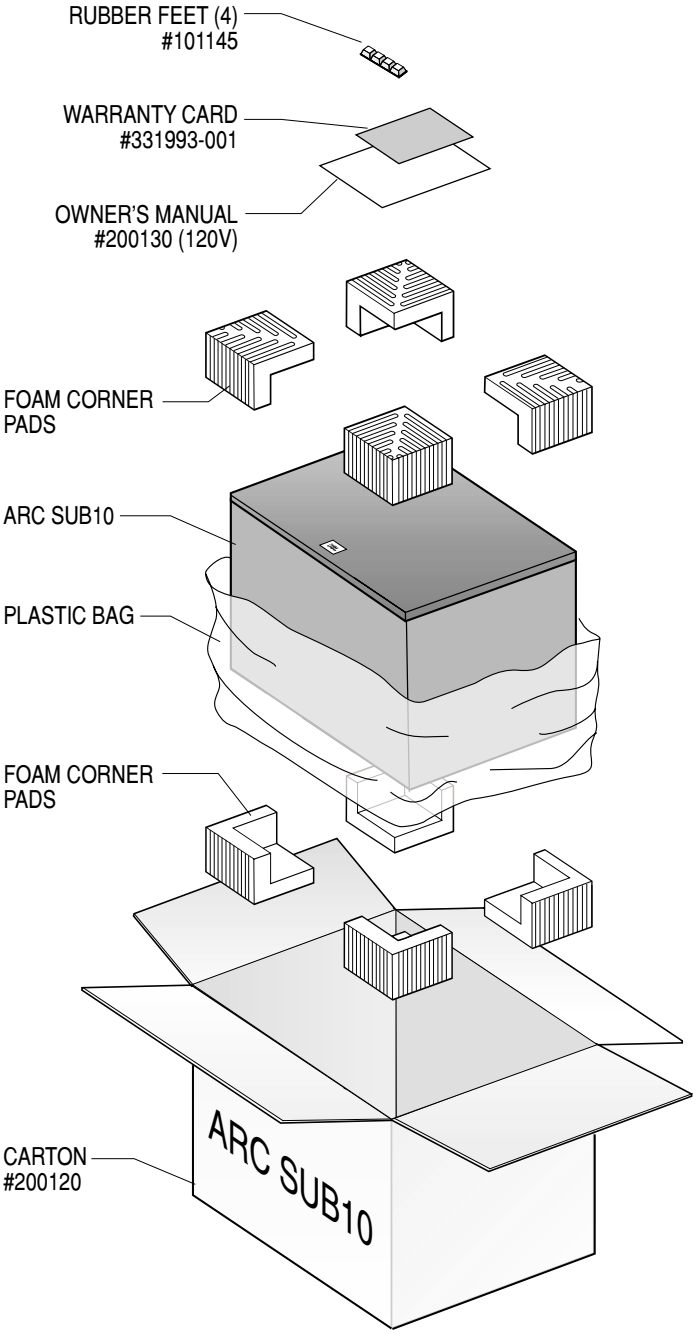


ARC SUB10/DS-10 PACKING EXPLODED VIEWS

DS-10 PACKING



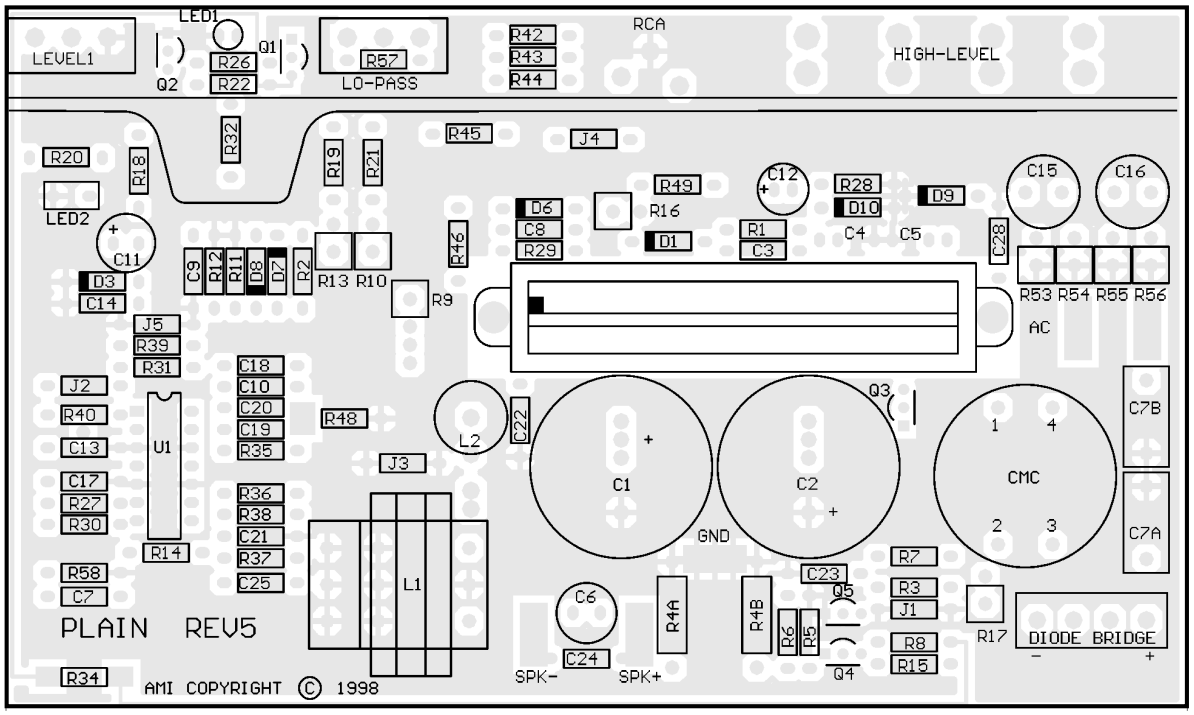
ARC SUB10 PACKING



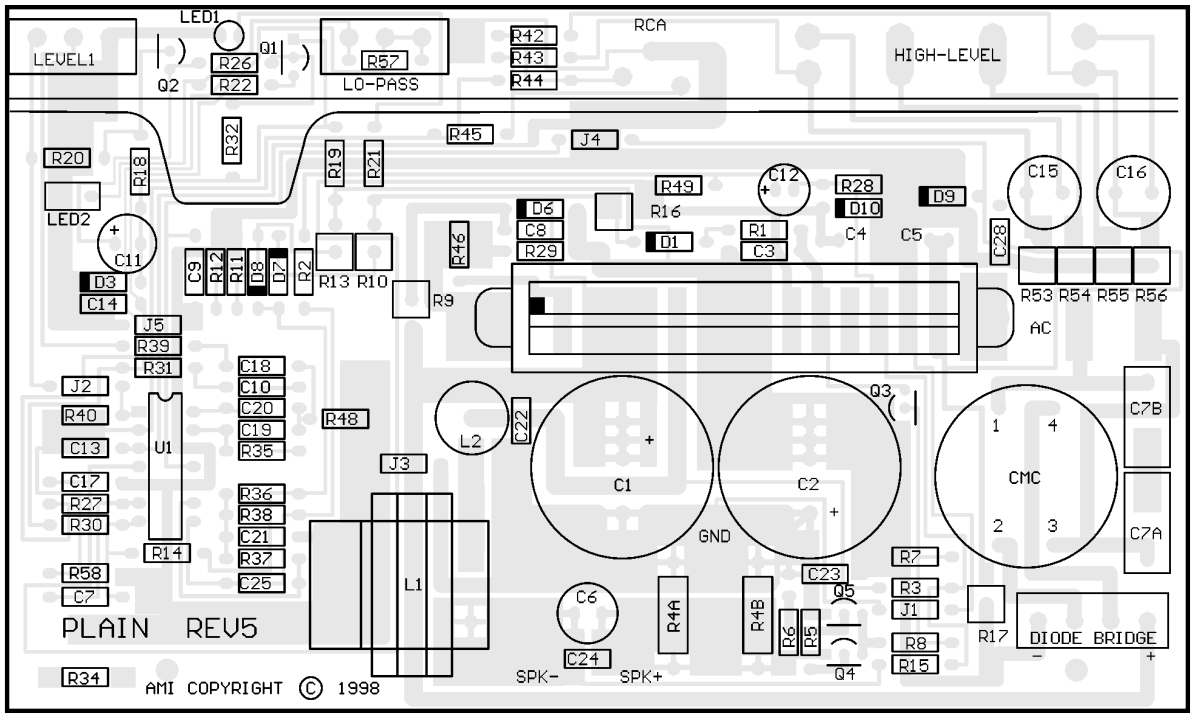
ARC SUB10 Version 5 PCB

The PLAIN 5 PCB was used in ARCSUB10

PLAIN 5 - Component Side Trace

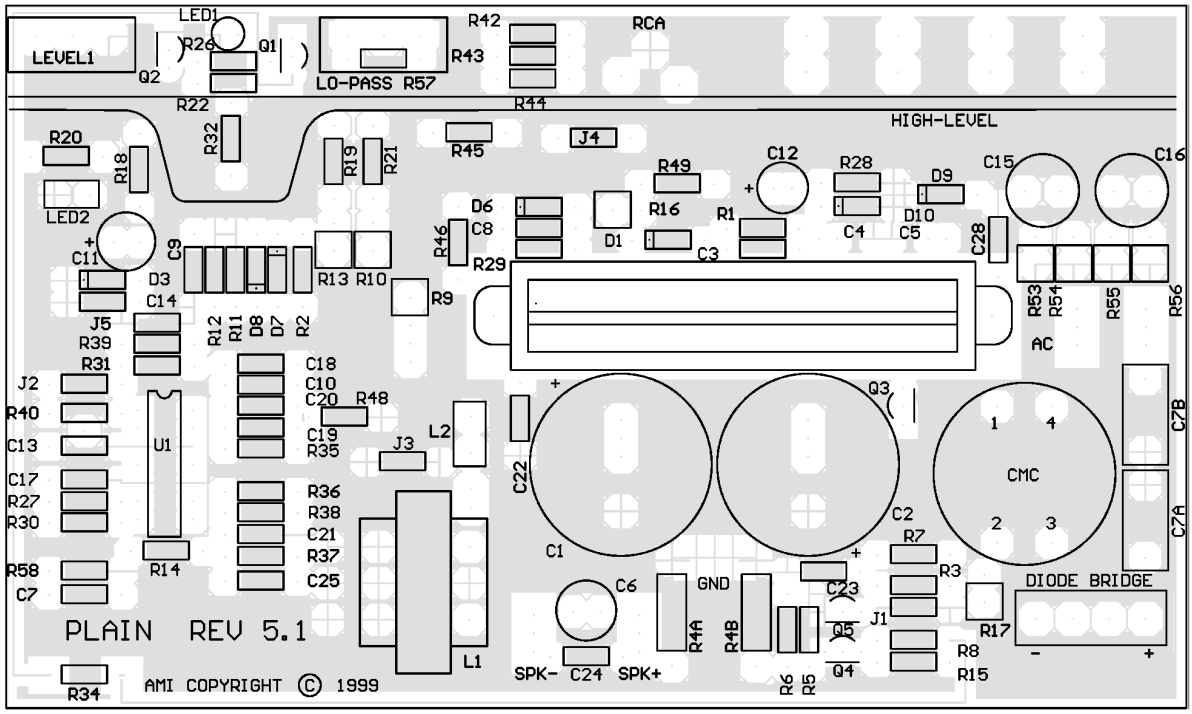


PLAIN 5 - Solder Side Trace Layer as viewed through the board

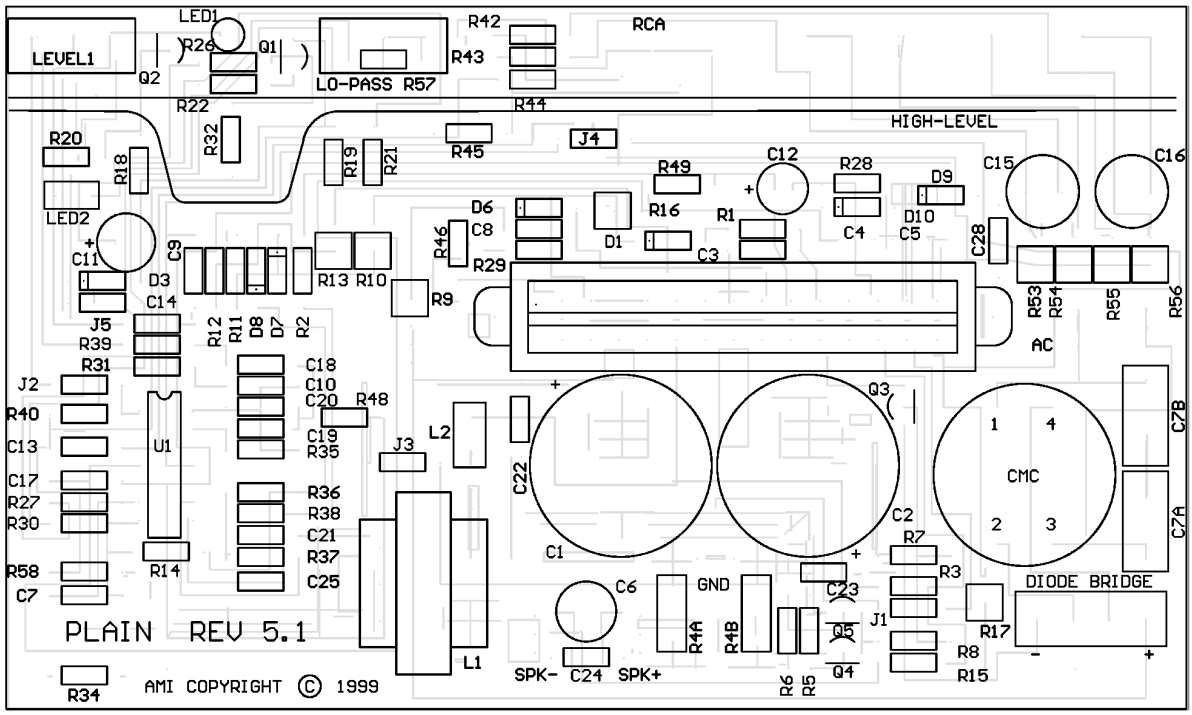


ARC SUB10/DS-10 Version 5.1 PCB

PLAIN 5.1 - Component Side Trace



PLAIN 5.1 - Solder Side Trace Layer as viewed through the board



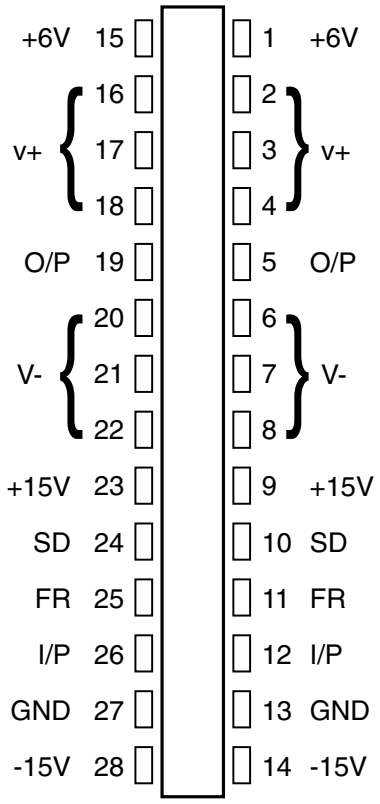
ARC SUB10/DS-10 ELECTRICAL PARTS LIST

Product Safety Notice: Components identified by the IEC symbol in the part list and on the schematic designate safety components in which safety can be of special significance. When replacing a Active component with the symbol ⚠. Use only replacement parts with the same rating hardware designated in the parts list.

Ref. #	Part Number	Description	Qty
Capacitors			
C1, C2	30701 ⚠	3300uF 50V ±20% Elect. Radial ***Safety Part***	2
C3, 4, 5, 8, 9, 10, 14, 17, 18, 19, 20, 24	30502	100nF 50V ±10% Mono-ceramic axial	12
C6	30705 ⚠	10uF 100V ±20% Elect. Radial NP ***Safety Part*** **See Page 15 Service Bulletin**	1
C7A, B	30505	100nF 100V ±20% Metal Polyester Rad	2
C7	30509	2.7nF 50V ±10% Mono-ceramic axial	1
C10	30504	100nF 50V ±10% Mono-ceramic axial	1
C11	30702	100uF 35V ±20% Electrolytic Radial	1
C12	30714	10uF 35V ±20% Electrolytic Radial	1
C13	30506	1nF 50V ±10% Mono-ceramic axial	1
C15, 16	30704 *or* 30707	220uF 50V ±20% Electrolytic Radial Bipolar	2
C21, 28	30507	10nF 50V ±20% Mono-ceramic axial	2
C25	30503	2.2nf 50V ±10% Mono-ceramic axial	1
Diodes			
DBR	50100 ⚠	Bridge Rect 200V 4A ***Safety Part***	1
D1	50101	1N5256B 30V ±5% 0.5W Zener	1
D3	50102	1N4749A 24V ±5% 1W Zener	1
D6	50103	1N5234B 6.2V ±5% 0.5W Zener	1
D7, 8	50104	1N4148 100V ±5% 0.1A	2
D9,10	50105	1N4744A 15V ±5% 1W Zener	2
LED 1 or 2	50106	Dual Cir LED (2 legged)	
Integrated Circuit			
U1	60100	LM324 Quad OpAmp +/-15	1
Resistors			
FRQ pot	40401	100k 0.25W ±10% Single Log Pot	1
VOL Level pot	40402	5k 0.25W ±10% Single Linear Pot	1
R1	40403	2.2M 0.25W ±5% carbon film	1
R2	40408	8.45k 0.25W ±1% metal film	1
R3	40412	33.2k 0.25W ±1% metal film	1
R4A, B	40105	0.1 0.5W ±5% 2pcs.	2
R5, 6	40420	1k 0.25W ±5% carbon film	2
R7	40718	3.3k 0.25W ±5% carbon film	1
R8	40417	47k 0.25W ±5% carbon film	1
R9	40421	3.9k 5W ±5% 3W can be used	1
R10, 13	40748	2k 2W ±5% carbon film	2
R11, 12	40112	665 0.5W ±5% carbon film	2
R14, 20	40405	4.7k 0.25W ±5% carbon film	2
R15, 42, 43, 57	40406	100k 0.25W ±5% carbon film	4
R16	40101	820 2W ±5% carbon film	2
R17	40407	330k 0.25W ±5% carbon film	1
R18	40423	270k 0.25W ±5% carbon film	1
R19	40422	1k 0.5W ±5% carbon film	1
R22	40410	2.2k 0.5W ±5% carbon film	1
R26	40701	1.0M 0.25W ±5% carbon film	1
R27	40411	24.9k 0.25W ±1% metal film	1
R29	40103 ⚠	470 0.25W ±5% METAL OXIDE ***Safety Part***	1
R30	40413	274k 0.25W ±1% metal film	1
R31	40414	49.9k 0.25W ±1% metal film	1
R32	40415	470k 0.25W ±5% carbon film	1
R35	40424	332k 0.25W ±1% metal film	1
R36, 38, 40	40417	47k 0.25W ±5% carbon film	3
R37	40418	22k 0.25W ±5% carbon film	1
R39, 48	40419	6.04k 0.25W ±1% metal film	2
R46	40111	4.7 0.25W ±5% carbon film	1
R49	40431	68k 0.25W ±5% carbon film	1
R53, 54, 55, 56	40106	100 2W ±5% carbon film	4
Transistors			
Q1	60151	MPS A13 30V NPN(Darl) Transistor	1
Q2	60152	2N3906 40V PNP Transistor	1
Q3	60156	2N4401 40V NPN Transistor	1
Q4, 5	60154	MPS A56 80V PNP Transistor	2
Miscellaneous			
S53AMI	60301 ⚠	Power Amp module ***Safety Part***	1
CMC1	80100 ⚠	2.2mH Choke ***Safety Part***	1
L1	80101 ⚠	110uH Choke ***Safety Part***	1
L2	80102	2.2uH Ferrite Bead	1
TRX	80108 ⚠	TRANSFORMER #4338 ***Safety Part***	1
F1	80109 ⚠	FUSE 250V, 0.63A, T type Slo-Blo ***Safety Part***	1

ARC SUB10/DS-10 INTEGRATED CIRCUITS & TRANSISTORS

S53AMI/S64AMI - Power Amp module SAFETY PART



NOTE: THE FOLLOWING PROCEDURES MUST BE FOLLOWED WHEN INSTALLING NEW S53AMI/S64AMI AMP MODULES: FAILURE TO FOLLOW ONE OR MORE OF THESE STEPS MAY RESULT IN THE INSTANT DESTRUCTION OF THE MODULE WHEN POWERED UP.

1) Align white indent marker on Amp Module with indent marker on main PCB; alternately observe position of label on the top of the module; incorrectly replacing the Module 180 in the PCB slot will result in its destruction.

2) All AC powered test instruments (meters, oscilloscopes, etc.) must have a floating ground, i.e. be connected to an isolation transformer.

3) Align and position the Amp Module before soldering.

4) Attach the amp Module with the mounting screws before soldering or powering up.

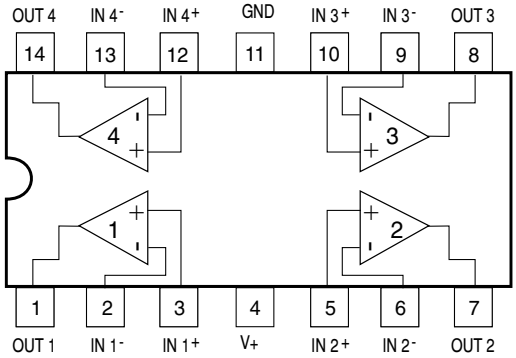
5) Use only rosin-core or non-acid core solder; thoroughly de-flux the surfaces after soldering.

If the new S53AMI/S64AMI Amp Module has larger mounting hole(s) in the case, and the stock screws no longer will fit, and screws of the proper type cannot be obtained locally order:

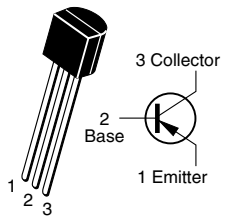
(2) part# 60301S (screws)

(2) part# 60301N (nuts)

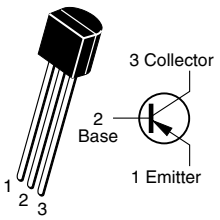
U1 - (LM324) Quad Op Amp



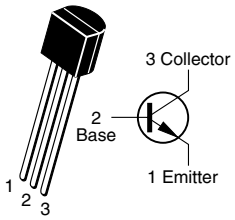
Q4, 5 - (MPS A56)
80V PNP Transistor



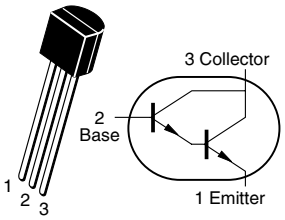
Q2 - (2N3906)
40V PNP Transistor



Q3 - (2N4401)
40V NPN Transistor



Q1 - (MPS A13)
30V NPN(Darl) Transistor



ARC SUB10/DS-10 SCHEMATIC