

# Contents

<b>Specifications .....</b>	<b>2</b>
<b>Acoustimass® 10 Bass Module Description .....</b>	<b>3</b>
Figure 1. AM-10 Bass Module .....	4
<b>Disassembly/Assembly Procedures .....</b>	<b>5-6</b>
Figure 2. Bass Module Exploded View .....	7
Figure 3. Cube Array Exploded View .....	7
<b>Test Procedures .....</b>	<b>8-9</b>
<b>Part List Notes .....</b>	<b>10</b>
<b>AM-10 Bass Module Part List .....</b>	<b>11</b>
Figure 4. Bass Module Exploded View .....	11
<b>Crossover Part List .....</b>	<b>12</b>
Figure 5. Schematic Diagram REV 01 .....	12
<b>Crossover Mechanical Part List.....</b>	<b>13</b>
Figure 6. Crossover PCB Mechanical Layout .....	13
Figure 7. Crossover PCB Etch Layout REV 01 .....	13
<b>Cube Array Part List.....</b>	<b>14</b>
Figure 8. Cube Array Exploded View .....	14
<b>AM-10 Packaging Part List .....</b>	<b>15</b>
Figure 9. Packaging Exploded View .....	15

This service manual has been updated with information from supplement 188532-S1.  
This affects part numbers for the satellite speaker pivot o-ring, the satellite connectors and the surround and center channel satellite Twiddlers. These changes resulted in changing the service manual revision from Rev. 00 to Rev. 01.

This service manual has also been updated with information from supplement 188532-S2.  
This affects part numbers for the woofers used in the bass module.

# SPECIFICATIONS

**Dimensions**

Cube Arrays: 6.3" x 3.0" x 4.8" (16 x 7.62 x 12.2 cm)  
Bass Module: 13" x 7.5" x 20.5" (33 x 19 x 52.1 cm)

**Weight**

Single Cube: 2.1 lbs (0.91 kg)  
Bass Module: 23 lbs (10.5 kg)  
Packed System: 40 lbs (18.2 kg)

**Crossover Frequencies**

Cubes: (L& R) 300Hz at 6 dB/Oct (CTR, SURR) 200Hz at 6 dB/Oct

**System Protection**

Left, Right, Center and Surround: PTC and Lamps

**Cube Protection**

Left and Right: Lamps  
Center and Surround: None

**Impedance**

6Ω nominal, 4.8Ω minimum from 20Hz to 20kHz

**Power Handling**

Left, Center, and Right Channels: 100W continuous per IEC-268-5, Recommended amp/receiver power 10-200 watts/channel  
Left and Right Surround Channels: 50W continuous per IEC-268-5, Recommended amp/receiver power 10-100 watts/channel

**Flux Leakage (Cubes):**

2.0 Gauss max. at 30 mm from any surface of the cube

PROPRIETARY INFORMATION

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF BOSE® CORPORATION WHICH IS BEING FURNISHED ONLY FOR THE PURPOSE OF SERVICING THE IDENTIFIED BOSE PRODUCT BY AN AUTHORIZED BOSE SERVICE CENTER OR OWNER OF THE BOSE PRODUCT, AND SHALL NOT BE REPRODUCED OR USED FOR ANY OTHER PURPOSE.

# Acoustimass® 10 Bass Module Description

(Refer to Figure 1)

## **Left woofer**

Reproduces all left channel low frequency information. This woofer is loaded by the Acoustimass 10 enclosure in such a way as to produce deep bass energy.

## **Right woofer**

Reproduces all right channel low frequency information. This woofer is loaded by the Acoustimass 10 enclosure in such a way as to produce deep bass energy.

## **Surround woofer**

Reproduces all left and right surround channel low frequency information. This woofer uses a dual voice coil that electromagnetically sums the left and right surround channel bass energy. The woofer cone then reproduces the summed left and right surround channel and sends it into the energy summing chamber (acoustic spring C).

## **Acoustic Spring A**

This is the volume of air in the rear chamber (in front of the left and right channel woofers). This volume of air acts like a spring and acoustically couples the fronts of the left and right woofers to acoustic mass A.

## **Acoustic Mass A**

This is the longer of the two internal ports and, together with Acoustic spring A, serves to reproduce the lower frequencies of the bass module, while reducing the cone excursion of the left and right woofers over this lower frequency range (35Hz to 60Hz).

## **Acoustic Spring B**

This is the volume of air in the middle chamber (behind the left and right channel woofers). This volume of air acts like a spring and acoustically couples the rear of the left and right woofers to acoustic mass B.

## **Acoustic Mass B**

This is the shorter of the two internal ports and, together with Acoustic spring B, serves to reproduce the upper frequencies of the bass module, while reducing the cone excursion of the left and right woofers over this upper frequency range (120Hz to 200Hz).

## **Acoustic Spring C (The Energy Summing Chamber)**

This is the front most volume of air inside the AM-10 bass module. This is where the bass is summed. Within this chamber, the front channel bass energy is received via acoustic mass A and B, the surround channel bass energy is received directly from the surround woofer.

All front and surround channel bass energy is summed within this chamber in much the same way as a room would sum the bass energy from two separate bass modules. The key difference with internal bass summing is the results of summation are much better controlled because the summation conditions are already known (in a room with two bass sources, their distance from each other and their location within the room heavily influence bass summation and the loudspeaker designer cannot predict that ahead of time).

Another important purpose of this chamber is it interacts with Acoustic Mass C to provide an extra stage of low pass filtering to create a steeper high frequency roll off slope for the bass module, which serves to reduce localization.

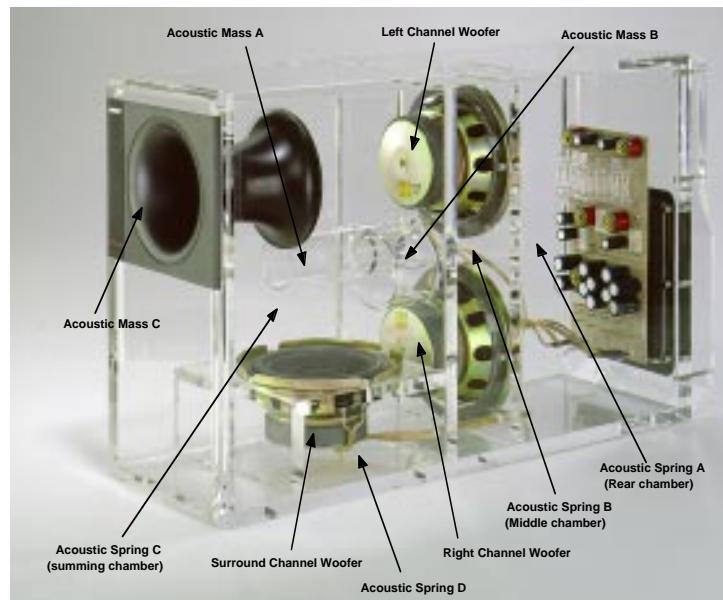
### Acoustic Mass C

This is the exit port of the bass module and serves to launch the bass energy into the room on a column of air (purifying, of course). This port also interacts with Acoustic Spring C to reproduce the middle range of frequencies of the bass module, while reducing the cone excursion of all the woofers over this middle range (60Hz to 120Hz).

This port is flared to eliminate any internal air turbulence, which significantly improves the efficiency of the entire bass module at high listening levels.

### Acoustic Spring D

This is the volume of air enclosing the rear portion of the surround channel woofer. Its main purpose is to load the surround woofer and to help reduce cone excursion.



**Figure 1. AM-10 Bass Module**

# DISASSEMBLY/ASSEMBLY PROCEDURES

BASS MODULE	20 pins on the terminal cup line up with the PCB. Press the PCB and the terminal cup together.  <b>4.2</b> To prevent buzzes, make certain that the lamps are not touching one another.  <b>4.3</b> Replace the three screws (1) that secure the PCB to the terminal cup.  <b>5. Woofer Removal</b>  <b>5.1</b> Perform procedure 1 first.  <b>5.2</b> Remove the four screws (6) that secure the woofer (3) to the baffle.  <b>5.3</b> Lift the woofer out and cut the wires on both sides of the baffle as close as possible to the baffle. <b>Note:</b> Do not cut the wires going to the surround woofer.  <b>6. Woofer Replacement</b>  <b>6.1</b> Drill a hole in the baffle, close to the hole where the woofer wires are fed through the baffle.  <b>6.2</b> Insert the new wire harness (part number 187097) into the hole and connect it to the woofers (3). Apply Mortite to the hole in the baffle to prevent air leaks around the new wire harness hole.  <b>6.3</b> Replace the four screws (6) that secure the woofer to the baffle.  <b>6.4</b> Perform procedure 2.
<b>1. Terminal Cup Removal</b>  <b>1.1</b> Remove the eight screws (6) that secure the terminal cup (5) to the bass module.  <b>1.2</b> Lift up on the terminal cup at the end where the input connections are located. Disconnect the two cables from the PCB (2).  <b>1.3</b> Lift the terminal cup out of the bass box in the direction of the input connectors.  <b>2. Terminal Cup Replacement</b>  <b>2.1</b> Lower the terminal cup (5) into the bass box so that the PCB (2) enters first.  <b>2.2</b> Replace the two connectors that attach to the PCB (2). The wire color sequence label next to the connector should match the wires on the cable.  <b>2.3</b> Replace the eight screws (6) that secure the terminal cup to the bass module.  <b>3. Crossover PCB Removal</b>  <b>3.1</b> Perform procedure 1 first.  <b>3.2</b> Remove the three screws (1) that secure the PCB (2) to the terminal cup (5).  <b>3.3</b> Lift the PCB straight up. It might be necessary to slightly wiggle the PCB back and forth.  <b>4. Crossover PCB Replacement</b>  <b>4.1</b> Place the PCB (2) onto the terminal cup (5) so that the lamps overhang the output terminal end. Make certain that the	

# DISASSEMBLY/ASSEMBLY PROCEDURES

## CUBE ARRAY

**Note:** Numbers in parentheses correspond to the item call outs in Figure 3.

### 1. Grille Removal

**1.1** Grasp the grille **(13)** at the top and bottom. Catches on the sides hold the grille to the cube **(2)**. Squeeze and pull the grille off.

### 2. Grille Replacement

**2.1** Line up the grille **(13)** so that the curved edges are located at the top and bottom. Push the grille onto the cube **(2)** until it snaps into place. The bottom grille should have the Bose® logo in the lower right hand corner.

### 2. Twiddler™ Removal

**2.1** Perform procedure 1 first.

**2.2** Remove the four screws **(9)** that secure the twiddler **(11)** to the cube array **(2)**. Lift the twiddler out of the cube array.

**2.3** Cut the wires as close as possible to the twiddler.

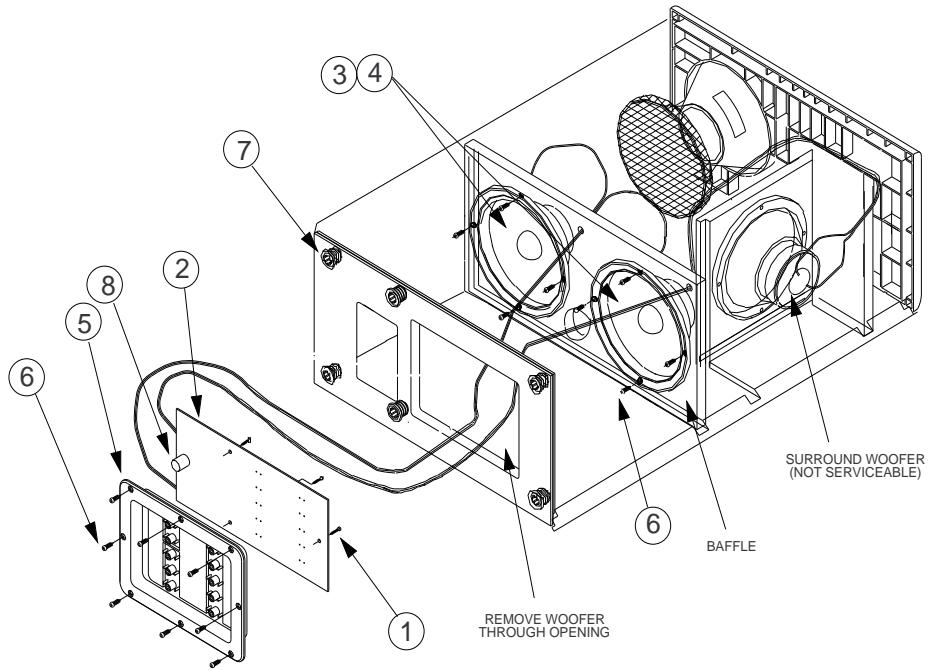
**Note:** Make a note of the wiring configuration.

### 3. Twiddler Replacement

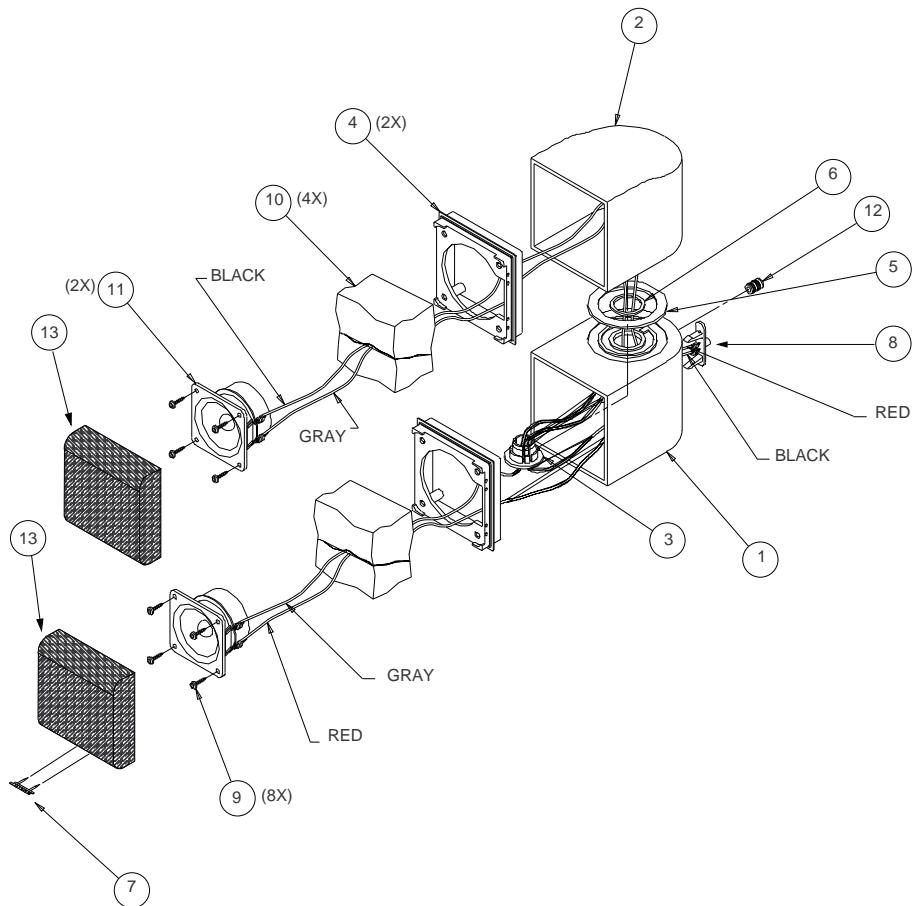
**3.1** Connect the wires to the twiddler **(11)**.

**3.2** Replace the four screws **(9)** that secure the twiddler to the cube array **(2)**.

**3.3** Perform procedure 2.



**Figure 2. Bass Module Exploded View**



**Figure 3. Cube Array Exploded View**

# TEST PROCEDURES

<b>1. Woofer Rub and Tick Test</b>  <b>1.1</b> Apply a <b>10Vrms, 10Hz</b> signal to the front left and right input.  <b>Note:</b> No extraneous noises such as rubbing, scraping or ticking should be heard. To distinguish between normal suspension noise, rubs and ticks, displace the cone on the woofer with your finger. If the sound can be made to go away or get worse, it's a rub or tick and the woofer should be replaced. If the noise stays the same, it's normal suspension noise and it will not be heard with regular program material. Perform this test for the surround channel.	<b>4.2</b> Disconnect the left surround channel. If the sound output from the bass module drops by 1/2, the woofer is in phase. If the sound output from the bass module increases, stays the same or stops completely, check for incorrect wiring at the crossover assembly. <b>Note:</b> The surround woofer is not serviceable.
<b>2. Power Sweep Test</b>  <b>2.1</b> Apply a <b>10Vrms, 10Hz</b> signal to all the bass module inputs.  <b>2.2</b> Sweep the oscillator slowly from <b>10Hz</b> to <b>1KHz</b> and back to <b>10Hz</b> .  <b>2.3</b> Listen carefully for any buzzes, rattles or extraneous noises coming from the bass module or cubes. <b>Note:</b> Redress any wire or component that buzzes.	<b>5. Air Leak Test</b>  <b>5.1</b> Apply a <b>10Vrms, 10Hz</b> signal to the left and right surround channel input.  <b>5.2</b> Listen at the bass module port for internal air leaks coming from inside the unit.  <b>5.3</b> Apply a <b>10Vrms, 50Hz</b> signal to all the bass module inputs.  <b>5.4</b> Listen for air leaks from the bass module.
<b>3. Woofer Phase Test, Front Channels</b>  <b>3.1</b> Apply a <b>10Vrms, 50Hz</b> signal to the left and right front channels.  <b>3.2</b> Disconnect the right channel. If the sound output from the bass module drops by approximately 1/2, the woofer is in phase. If the sound output from the bass module increases, stays the same or stops completely, the woofer may be wired incorrectly or be defective.	<b>6. Twiddler™ Phase Test</b>  <b>6.1</b> Apply <b>9V DC</b> to the cube input terminal. Connect the positive side of the DC supply to the positive side of the cube. Connect the negative side of the DC supply to the negative side of the cube. The twiddler should move outward. <b>Note:</b> The DC voltage should only be momentarily applied to avoid possible damage to the twiddler.
<b>4. Woofer Phase Test, Surround Channel</b>  <b>4.1</b> Apply a <b>10Vrms, 50Hz</b> signal to the left and right surround channels.	

# TEST PROCEDURES

## 7. Crossover Test

**7.1** Both woofer harnesses should be disconnected. Connect an  $8.2\Omega$  resistive load to the cube speaker output being tested. Apply a **1Vrms** signal to the input at the frequency listed in the following table. Reference a dB meter to the applied signal. Measure the output listed in the following table.

Input/Output	Frequency	Min (dB)	Max (dB)
Left or Right	200Hz	-6	-4
Left or Right	2kHz	-4.9	-3.8
Center, Left and Right Surround	200Hz	-1.5	-0.5
Center, Left and Right Surround	2kHz	-2.2	-0.8

**Note:** If the Crossover fails any of these tests, refer to the table below.

Input/Output Frequency	Check
Left or Right 200Hz	C11,12 Left Channel C31, 32 Right Channel
Left or Right 2kHz	C13, L11, R11 Left Channel C33, L31, R31 Right Channel
Center, Left and Right Surround 200Hz	C21, C22 Center Channel C41, C42 Left Surr Channel C51, C52 Right Surr Channel
Center, Left and Right Surround 2kHz	C23, L21, R21 Center Channel C43, L41, R41 Left Surr Channel C53, L51, R51 Right Surr Channel

## PART LIST NOTES

1. This part is not normally available from Customer Service. Approval from the Field Service Manager is required before ordering.
2. The individual parts located on the PCB are listed in the part list.

# AM-10 BASS MODULE PART LIST

Item Number	Description	Part Number	Notes
1	Screw, Tapp, 6-13 x .375, pan	172783-06	
2	Crossover Assy	187854-01	1, 2
3	Woofer, 5.25"	141393	
4	Gasket, Woofer	104794-08	
5	Terminal Cup	183641-1	
6	Screw, Tapp, 8-11 x .75, Pan	172672-12	
7	Grommet	117995	
8	Bumper	187093	
-	Harness Assy, Main	187097	
-	Harness Assy, Surround	187098	

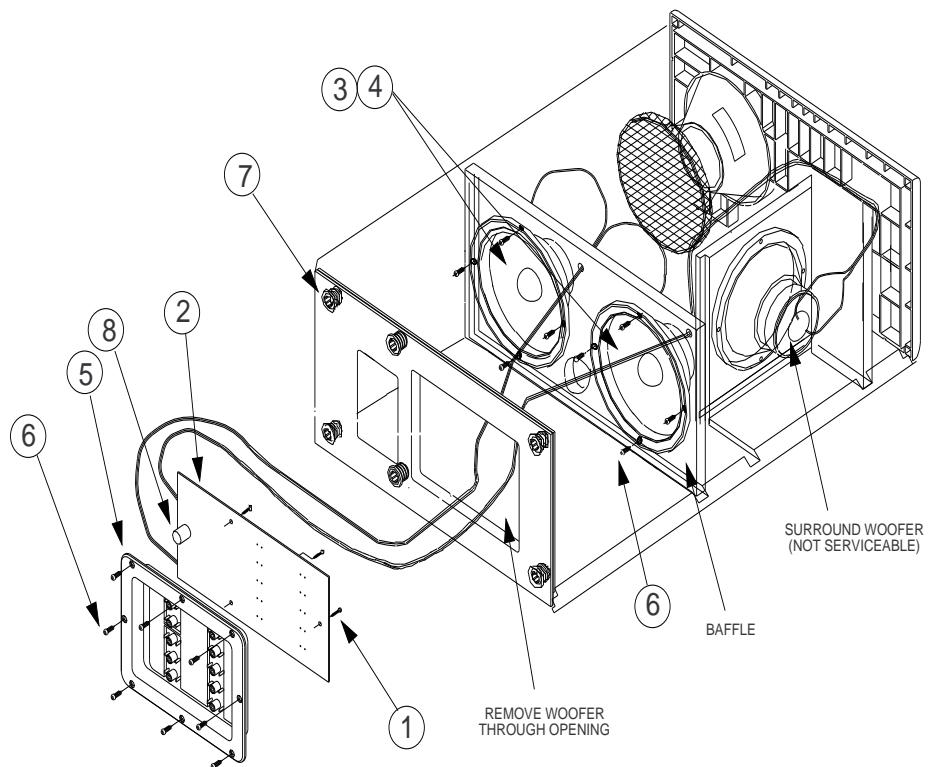


Figure 4. Bass Module Exploded View

# CROSSOVER PART LIST

Reference Designator	Description	Part Number
PTC 11, 31	Polyswitch, 50V, 4mm	175233-1
PTC 21, 41, 51	Polyswitch, 60V, Disc, Rad	147185
DS11-13, 31-33	Lamp, 2.5A, 24VDC	117805
DS21, 41, 51	Lamp	141989
C21, 22, 41, 42, 51, 52	100uF, 50V, 20%, EL, BP, 85	142065
C11, 12, 31, 32	33uF, 50V, 20%, EL, BP, 85	131974
C23, 43, 53	22uF, 50V, EL, BP	142300
C13, 33	15uF, 50V, 20%, EL, BP, 85	132079
R11, 31	5.1Ω, 5W, 10%	132105-5R1
R21, 41, 51	6.8Ω, 5W, 10%	132105-6R8
L21, 41, 51	125uH	187756
L11, 31	300uH	131973

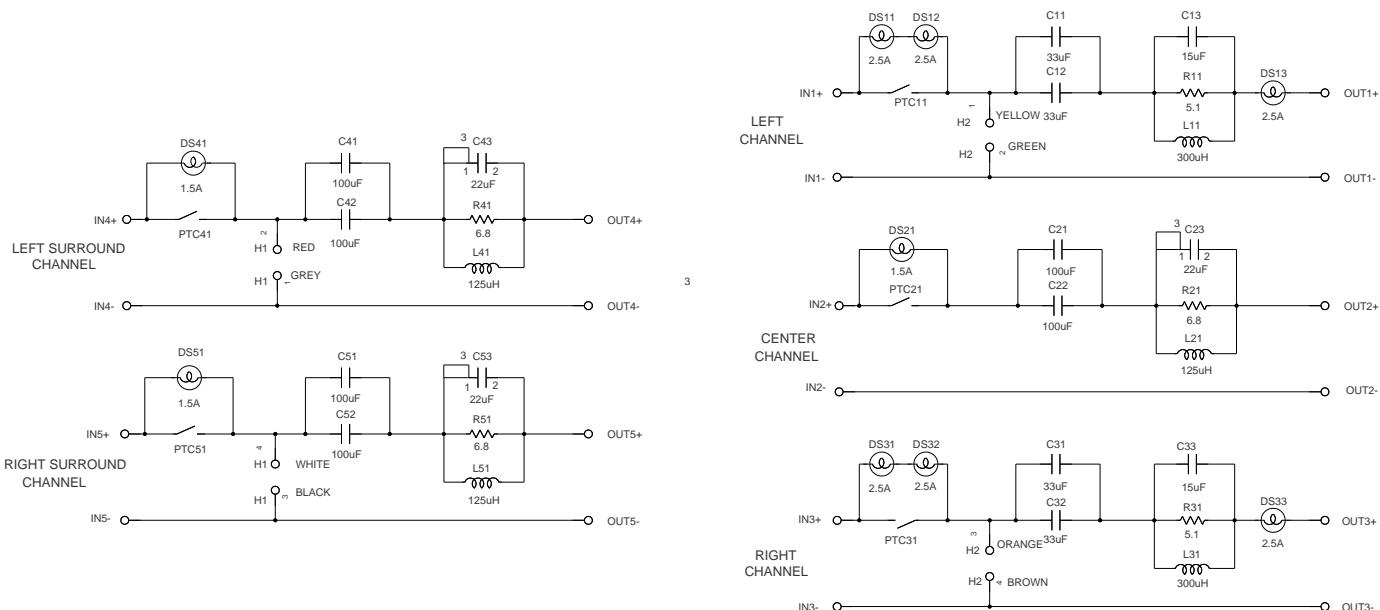


Figure 5. Schematic Diagram REV 01

# CROSSOVER MECHANICAL PART LIST

Item Number	Description	Part Number	QTY	See Note
1	Conn, Terminal, 1 POS, Female	147946	20	
2	Conn, Header, .15	137489-04	2	
3	Tape, Foil, W/Liner	134636	3	1
4	Washer, Flat, .141", #5	108258-05	5	
5	Screw, Mach, 4-40 x 1, Pan, Xrec	103146-16	5	
6	Nut, Hex, 4-40	103234-440	5	

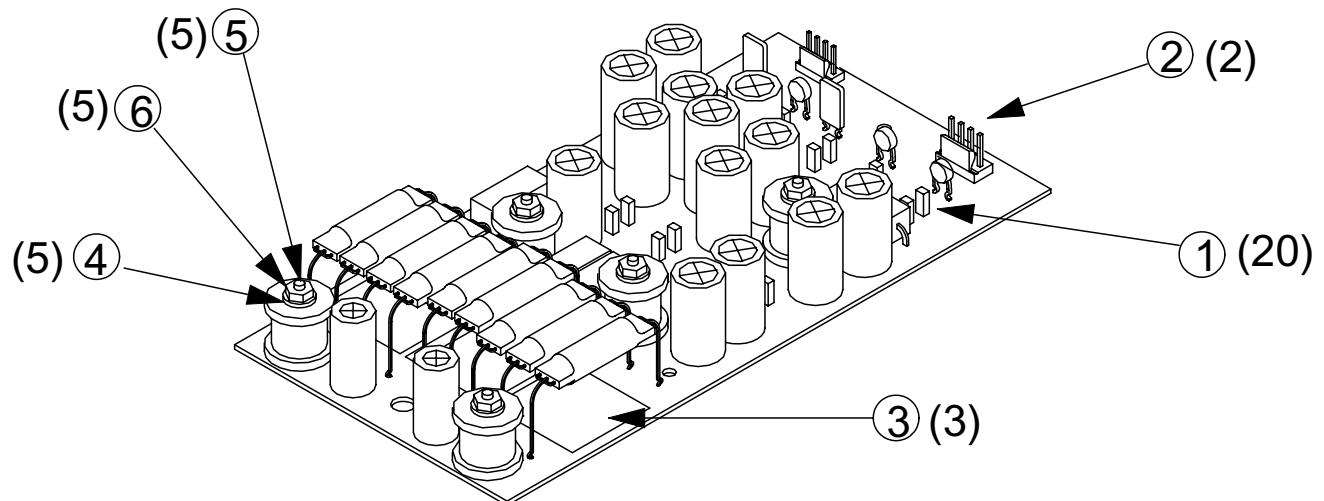


Figure 6. Crossover PCB Mechanical Layout

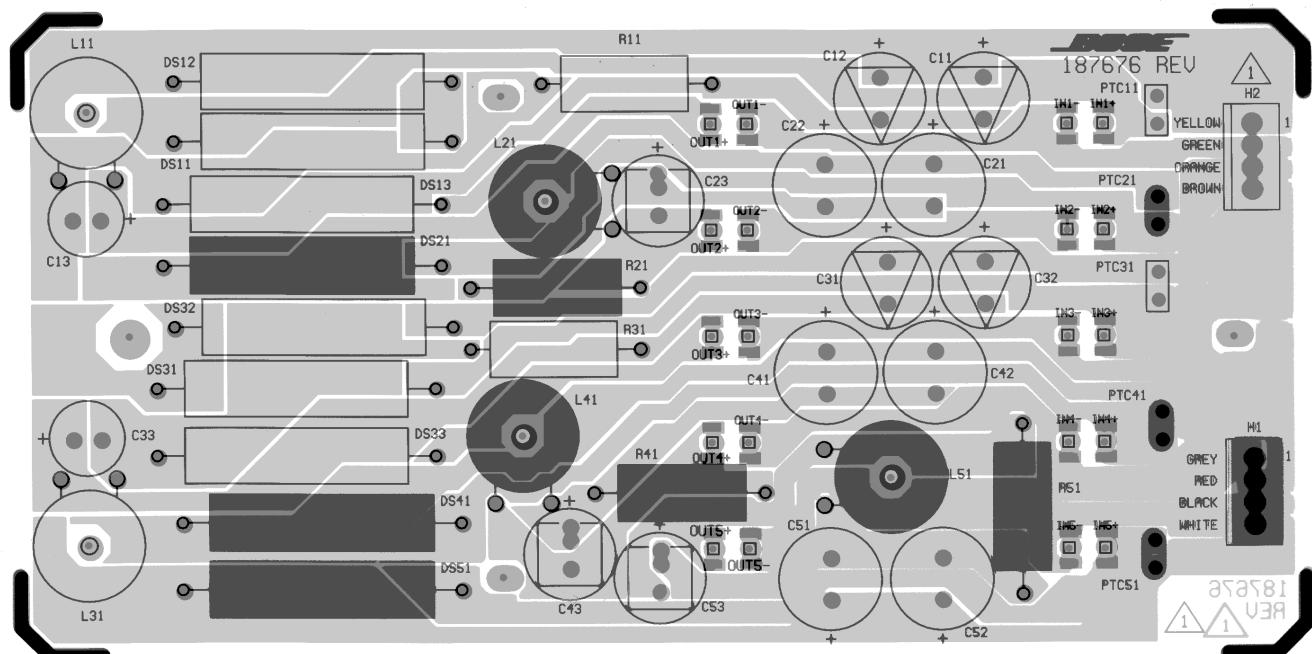


Figure 7. Crossover PCB Etch Layout REV 01

# CUBE ARRAY PART LIST

Item Number	Description	Part Number	Notes
1	Encl., Lower, Black Encl., Lower, Arctic White	141396-1 141396-2	1
2	Encl., Upper, Black Encl., Upper, Arctic White	141397-1 141397-2	1
3	Pivot, Black	182604-1	
4	Baffle, Red Baffle, Black	173188-1 141398-1	1
5	Washer, Black Washer, Flat White	141402-1 141402-2	
6	O-Ring, Pivot	141403	
7	Nameplate, Black Nameplate, Arctic White	184247-1 148949-2	
8	Conn., Terminal, Main Conn., Terminal, Surr, Cent	190550-001 190549-001	11/2000
9	Screw, Tapp, 8-11 x .625	172672-10	
10	Batting	144225	1
11	Twiddler™, Main Twiddler, Surr, Cent	184473 184478	
12	Threaded Insert	139612	1
13	Grille, Black Grille, Arctic White	175177-1 175177-2	

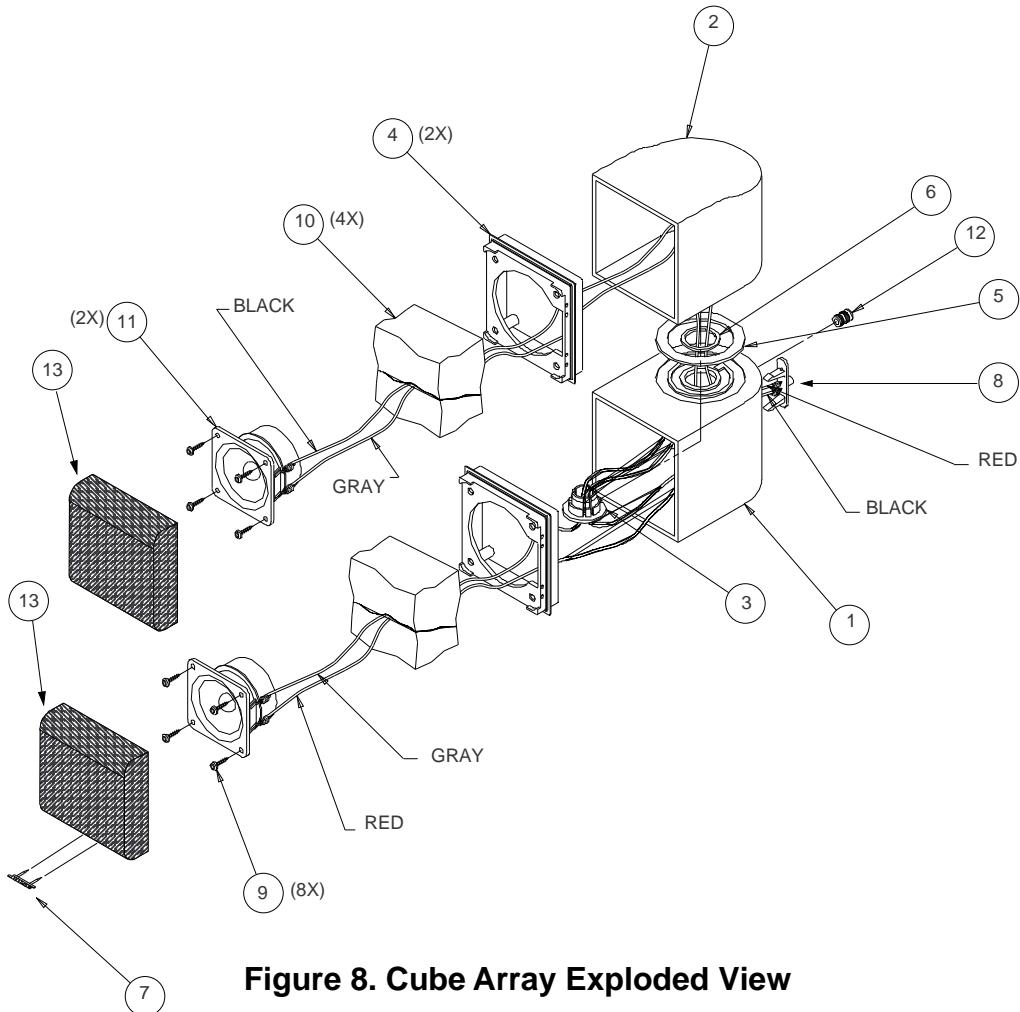


Figure 8. Cube Array Exploded View

# AM-10 PACKAGING PART LIST

Item Number	Description	Part Number	QTY/Assy
1	Bumper, Recessed, Foot	142839	4
2	Carton, 2SC, AM10	184913-00	1
3	Bag, Poly, 13 x 33.5 x 11.5 x 3 mil	137847	1
4	Packing, Corner Post, Bass Mod	148044	2
5	Tray, Packing, Kraft	184914	1
6	Cable Assy, 20' x 5, RCA, BLK	183655-1	1
	Cable Assy, 20' x 5, RCA, WHT	183655-2	
7	Cable Assy, 20' x 3, RCA, BLK	183656-1	1
	Cable Assy, 20' x 3, RCA, WHT	183656-2	
8	Cable Assy, 50' x 2, RCA, BLK	183657-1	1
	Cable Assy, 50' x 2, RCA, WHT	183657-2	
9	Guide, Quickstart, AM-10	183643	1
10	Manual, Owners, AM-10	183644	1
11	Bag, Poly, 14.38 x 9.87 x 2 mil	103351	1
12	Card, Info, Warranty, U.S.	181357	1
	Card, Info, Warranty, Multi Lang	181460	1
13	Brochure, All Products	141478	1
14	List, Warranty Service Stations	122766	1
15	Satellite Assy, Main, BLK	183650-1	2
	Satellite Assy, Main, WHT	183650-2	
16	Satellite Assy, Surr, BLK	183649-1	3
	Satellite Assy, Surr, WHT	183649-2	
17	Foot, Clear, .312 x .085	178321-04	1pkg
18	Packing, Insert, EPS Bass Mod	184912	2
19	Cover, AM-10, BLK	187096-1	1
	Cover, AM-10, BLK	187096-2	
20	Carton, Cube, Main	148365	2
	Carton Cube, Surround	183659	3
21	Poly Bag, Cube	144677	5

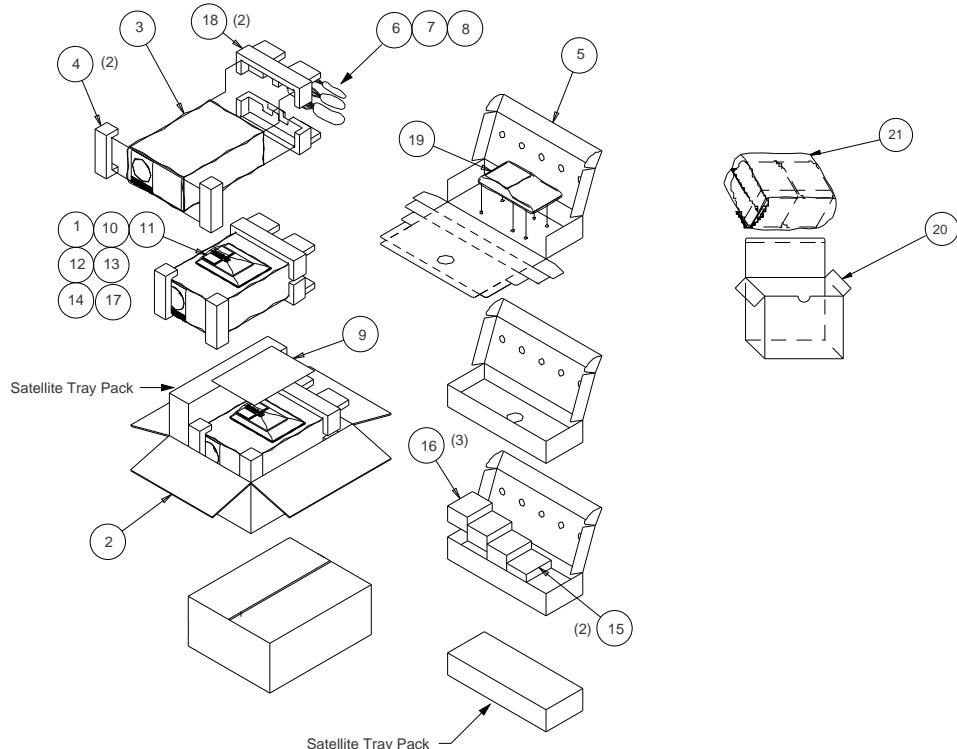


Figure 9. Packaging Exploded View

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE WITHOUT NOTICE

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THE MOUNTAIN  
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# **ACOUSTIMASS® -10 HOME THEATER SPEAKER SYSTEM**