ADVANTAGE

The features high-quality audio transformers, removable and solderless speaker terminals and a computer grade double-sided glass epoxy printed circuit board. Impedance matching jumpers multiply the impedance the amplifier "sees" by 2, 4 or 8 times allowing the parallel connection of multiple controls without damaging the amplifier. 12 level positions provide a maximum of 54dB of attenuation (see attenuation chart below). Each control includes a metal bracket plate, color-coded plastic insert, color-coded knob, wall plate and mounting screws.

Attenuation (dB)

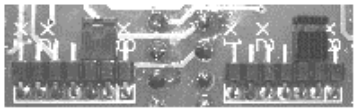
Jumper Position	Volume Knob Positions											
	1	2	3	4	5	6	7	8	9	10	11	12
X2	0	-3	-6	-9	-12	-15	-18	-21	-27	-33	-39	-48
X4	0	-6	-9	-12	-15	-18	-21	-24	-30	-36	-42	-51
X8	0	-9	-12	-15	-18	-21	-24	-27	-33	-39	-45	-54

Impedance Matching Jumpers:

These instructions assume that all system speakers are 8 ohm and all speakers require the same amount of power.

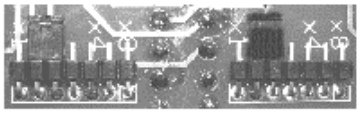
- Set all jumpers to the same setting for all controls regardless of the number of speakers connected to each control.

X1

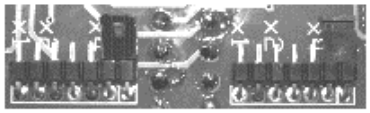


X4

- Multiple controls must be wired together in parallel. The combined parallel impedance of all controls must be greater than or equal to the lowest allowed amplifier impedance.



X2



X8

- Use the impedance chart below to determine the impedance of each control with various speaker loads and jumper settings. Find the number of 8-ohm speaker pairs across the top of the chart and read the impedance at various settings.

- Calculate the combined impedance of all paralleled controls using the following formula:

$$Z_t = \frac{1}{\frac{1}{Z_1} \quad \frac{1}{Z_2} \quad \frac{1}{Z_3}}$$

Where Zt = Combined impedance of all paralleled controls
Where Zx = Single control impedance

EXAMPLE: As an example, assume you have 3 Volume controls. The controls must all be connected in parallel to the same amplifier channels. Again as an example, assume Control #1 has 3 pairs of speakers connected, Control #2 has 2 pairs of speakers, and Control #3 has 1 pair of speakers. Setting all impedance multipliers to X4 results in 10.67 ohms for Control #1, 16 ohms for Control #2, and 32 ohms for Control #3. Using the formula above, the combined parallel impedance is 5.33 ohms (most high-quality amplifiers can handle impedances as low as 4 ohms). This method provides Control #1 with more power than the other 2. This is desirable since Control #1 must distribute power to 3 sets of speakers. With a 100-watt-per-channel amplifier, the scenario above would provide each speaker with 16.67 watts.

Jumper Position	Impedance per Controller (ohms) based on Pairs of Speakers							
	1	2	3	4	5	6	7	8
X1	8.00	4.00	2.67	2.00	1.60	1.34	1.15	1.00
X2	16.00	8.00	5.33	4.00	3.20	2.67	2.29	2.00
X4	32.00	16.00	10.67	8.00	6.40	5.33	4.57	4.00
X8	64.00	32.00	21.33	16.00	12.80	10.67	9.14	8.00

Wiring and Mounting:

1. Route amplifier and speaker wires into the j-box leaving enough slack for easy servicing.

2. Strip ¼" of insulation from each wire and twist the end to prevent fraying.

3. Insert each wire into the appropriate terminal. Tighten each wire's set screw with a #1 Phillips screw driver.

4. Carefully arrange excess wiring in the j-box to ensure no wire get pinched. Make sure the back of the circuit board is not touching the j-box or excess wires.

5. Secure the Control to the j-box using the supplied hardware.