

Protection of Compression Drivers

Whenever a midrange or high frequency compression driver is connected directly to a power amplifier, it is recommended that a capacitor be wired in series with the driver in order to attenuated unwanted low frequency and switching transient signals, and to block DC components, any of which can damage the driver. This applies to most biamplified and triamplified systems employing compression drivers. (In conventional systems with passive, high-level dividing networks, the network comes between the power amplifier and the driver(s) so the protection is already built-in.)

NOTES:

- 1. In all JBL monitors which are designed for biamplification, the dividing networks already incorporate the required attenuation capacitors between the input(s) and the compression driver(s).
- 2. Series capacitors are not required for low frequency and midrange cone or dome type transducers.

CAUTION: It is imperative that each output of the 5234A electronic frequency dividing network be properly connected. Inadvertent exchange of low and high frequency output connections (at the 5234A, the power amplifiers, or the transducers) may result in severe damage to midrange or high frequency loudspeaker system components. If in doubt, always test the low frequency loudspeaker(s) first, since the presence of high frequencies there will be less apt to cause damage than the converse.

The low frequency series protection capacitors should be non-polarized electrolytics, either mylar, metallized polyester or polyester type with working voltages of at least 50 V. DO NOT USE POLARIZED ELECTROLYTIC CAPACITORS. Maximum capacitance depends not only on the crossover frequency used for the driver, but also on the driver's impedance, as listed in Table 1. Suitable 10% tolerance capacitors are available directly from a JBL professional products dealer or JBL directly; the recommended values for specific cutoff frequencies, and their JBL part numbers, are listed in the Table 2.

Crossover Frequency	Capacitor Values (Driver Impedance)		
	16Ω	8Ω	4Ω
250 Hz to 500 Hz	40μF	80μF	150μF
500 Hz to 5000 Hz	20μF	40μF	80μF
Above 5000 Hz	2μF	5μF	8μF

Table 1: Maximum Values for Low Frequency Attenuating Protection Capacitors

Capacitor Value	JBL Part Number	For Optimum Results at These Crossover Frequencies (Based on Driver Impedance)		
		16Ω	8Ω	4Ω
72 μF	52938	275 Hz	550 Hz	1100 Hz
52 μF	52939	400 Hz	750 Hz	1500 Hz
20 μF	53881	1000 Hz	2000 Hz	4000 Hz
16.5μF	10358	1200 Hz	2500 Hz	5000 Hz
13.5μF	10359	1500 Hz	3000 Hz	6000 Hz
12 μF	10434	1700 Hz	3500 Hz	7000 Hz
8 μF	10391	2500 Hz	5000 Hz	10000 Hz
7 μF	57529	3000 Hz	6000 Hz	11000 Hz
6 μF	10296	3500 Hz	7000 Hz	13000 Hz
4 μF	41040	5000 Hz	10000 Hz	-----
3 μF	11937	7000 Hz	13000 Hz	-----

Table 2: JBL Protection Capacitors for Compression Drivers

NOTES:

- 1. The optimum value cited in Table 2 assumes that the capacitor is active at approximately one octave below the listed crossover frequency, assuring minimum acoustical interference with crossover region performance while maintaining a good degree of protection.
- 2. Somewhat smaller capacitor values may be required for additional protection in high-power sound reinforcement systems.
- 3. To shunt the reactive component of the compression driver's impedance below horn cutoff, a 50 W resistor having a value of two to three times the rated impedance of the compression driver should be connected across the driver's terminals.

CAUTION: Below the cutoff frequency of the capacitor, the power amplifier will be unterminated. If the power amplifier has an output transformer (typical of vacuum tube amps and some solid state amps designed to drive constant voltage lines), a 20 W resistor equal to ten times the compression driver impedance should be installed across the amplifier output terminals.