

PARTS CONNEXION



Audio Myth: We don't need high-quality capacitors except in the direct signal path.

Audio Reality: The secondary signal paths are also sonically significant - a better capacitor in these non-coupling applications will improve the sonic performance of the component.

The increased sonic performance of high-quality capacitors in coupling applications has been well established in recent years. Few devotees of transistor amplifiers or digital components, however, recall that the sonic differences in audio capacitors were noted first (in late 1970s) in power supplies. Because these devices, and others, such as filter networks, are not in the direct signal path, many designers have avoided the use of fine capacitors in these applications.

However these networks do form a secondary path and the sonic qualities of capacitors in these applications are significant and greatly influence overall performance

POWER SUPPLIES

A power supply, whether regulated or unregulated, must perform two basic functions in audio components:

- Provide low impedance over a wide frequency range
- Provide energy for the circuit as fast as, or faster than, the audio signal

Capacitors aid in both functions. The ideal capacitor would serve both purposes: smoothing the rectified current and providing fast energy to accommodate the fast changes of the music signal.

Unfortunately there is no ideal capacitor. Audio designers use electrolytic capacitors in the power supply because they are efficient in size vs. capacitance - they are excellent in providing DC. But electrolytics are not fast, and therefore lag in responding to changes demanded by audio.

BY-PASSING ELECTROLYTICS WITH MULTICAPS - FOR SMOOTHNESS & SPEED

The REL MultiCap™ provides the lowest ESR ESL and dielectric absorption available in an audio capacitor today and therefore can supply the speed the circuit needs. By-passing the electrolytic capacitor with a MultiCap™ will give the circuit the required smooth DC and the speed to accommodate the music

The REL MultiCap™ makes an excellent by-pass cap in power supplies. REL recommends a by-pass that is at least 1 to 10 microfarads.

FILTER NETWORKS

A filter acts upon the signal to discriminate against some frequencies, for example, boosting certain frequencies in amplitude or reducing certain frequencies as opposed to others - in short, controlling or modifying the magnitude of a frequency - which they must do, in audio components, without adding distortions. Filter networks are found in many applications in audio. DC servo circuits and equalization networks are two important examples.

EQUALIZATION NETWORKS - or EQ - can be applied to many circuits: RIAA circuits, speaker crossovers, multi-band equalizers, and digital filter circuits - S/H, A/D, and D/A converters. These will all benefit from increased performance in the areas of inductance, capacitance, resistance, and dielectric absorption. The RIAA filter, for example, compensates for the high-frequency boost at the cutter head. Better caps in this filter will result in better sonics on the LP (so, incidentally, would better caps at the cutter head), because of decreased distortion. The excellent qualities of the REL MultiCap provide better performance of any equalization filter - better L, C, and R equals lower distortion.

THE DC SERVO CIRCUIT is a filter in the amplifier that removes all AC in the music signal at the output and leaves only the DC components, which it then feeds back to the amp's input. This DC feedback is used to correct for or null DC offset voltage at the amp's output.

You may hear that capacitor performance is not significant in some of these networks - especially in filters not in the direct signal path. But this is not the case. A high-quality filter should produce a signal with low noise and distortion - and to do this, a high-quality capacitor is necessary.

The MultiCap's™ qualities of low ESR, ESL, and dielectric absorption make it an ideal choice for all these applications because it will prevent the introduction of distortion.

In sum - the better the capacitor in any power supply or filter network, the better the sonic results. We must not overlook secondary signal paths in fine audio designs.