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Subject: Re: Bypassing Caps

Posted by [Poindexter](#) on Wed, 19 Jan 2005 02:33:48 GMT

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Would anyone be so kind as to try and explain why and how bypassing electrolytic caps in a PS with small polyprops can restore the lost high frequencies due to the electrolytics, to the signal? They don't, really. What happens with large value caps of any type (especially electrolytics generally) is that their ESR (equivalent series resistance) starts to rise again at high frequencies.

Thus, hi-freq noise will 'float across the top' of these caps. The little film cap addresses this problem, taking over from the big electro at these freqs to keep the DC supply quiet, and so allow the extreme highs of the signal to be better perceived, being now higher above the noise floor. This trick is not without its hazards. Since all capacitors have residual inductance and resistance, any combination of two or more of them may (or not) create a resonant LCR filter which will ring at its own resonant frequency or frequencies. My own experience indicates that bypassing is not a foolproof fix for bad electros in the filter; the bypass value and type must be experimentally evaluated by ear and scope (since the residual R and L values are almost always not cited in the specs, being example dependent), and this can be laborious. A better tactic is to use caps (electrolytic or otherwise) as power supply 'tanks' that minimize these effects in the first place. Motor runs, Unlytics, Black Gates, Cerafines. The best of the currently manufactured 'lytics that I know of are Panasonic TSHA, available up to 400v, and cheap enough to series for more voltage economically. I get these from Cheryl at Digi-Key for less than five clams each; better if I get ten. Clear, quiet, transparent, and I save the price of the bypass; they end up practically free! 2¢ for free, Poinz

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