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Subject: Roll off those lows, hold the feedback-- it is hurting my ears!

Posted by [martinleewin](#) on Thu, 23 Sep 2004 01:15:11 GMT

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I don't know what circuit you were referring to, but I do know the purpose of cathode bypass capacitors. THEY CONTROL (limit) THE LOW END FREQUENCY RESPONSE! If you had some negative feedback signal applied at that point, it would also be rolled off. That effect may be desirable and intentional, but is not why the cap is there. A capacitor across the cathode resistor bypasses mid to high frequency signals--effectively making a short to ground for stronger bias and amplification. Low frequencies cannot pass through the bypass cap, must flow through the resistor, and are amplified less. Hence, low frequency rolloff. The book passages you refer to are describing why cathode follower circuits are inherently lower distortion than plate coupled circuits. The cathode resistor and/or the plate resistor determine the DC grid-to-cathode voltage and thus the gain and the quiescent (idle) current. A cathode follower has an electrical feedback effect within that stage-- but totally confusing when lay people only hear of interstage feedback. Cathode followers can not be used for all circuits and tube types, so lets not start a purist movement on that horse, please. Negative feedback is often injected back to a preceding stage tube cathode because that is the easiest way to accomplish "global" feedback for reduced distortion. Most amps feed back from the output transformer secondary to the phase splitter cathode. This keeps distortion down in those two tube stages. Quick and dirty and it works (unless you are a minimalist/SE purist, yata yata yata), with some loss of damping factor and transient response. Any primary amplification frequency shaping at that point takes design precedence over feedback signal rolloff. You could compensate by shaping the feedback signal before it gets there. Guitar amp techs play around with cathode bypass cap values to tweak the sound (fatness, drive, growl) in the 80-160Hz range since that is the lowest octave played. Rolloff corner frequency is like 60-100Hz in this scenario. Harp players want even less low end since their range starts an octave higher. Audio amps usually have their frequency shaping set as low as it can be and still stable. But with the electrolytic caps one can find +80/-20% new values that make audible differences on low end response. Older/cheaper caps could make an even bigger difference. Just clearing the air, Martin W.

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