Subject: Re: The shunt capacitance of grid and anode chokes
Posted by MQracing on Sun, 04 Dec 2005 13:53:48 GMT
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Hi Damir:I've been thinking about the topic being discussed and the interest in this phenomenon... well... here are several thoughts on the subject...first thought... we should separate out anode (plate) chokes from grid chokes. As they perform different functions and are used and spec'd differently. the plate choke must ordinarily be designed to accomadate unbal dc plate currents and thus generally requires an air gap. A "grid choke" typically is used with a dc blocking condensor and is designed as an "ac only" device. The magnitude of L that you want from each may also be quite different.second thought....the example you provided... quoted below...:::300pF in parallel with 80pF input capacitance of 300B is 380pF. And with high impedance driver (cascode, pentode, high rp tubes common cathode...), say Rout~15kOhms, we have f-3= 1/(2*3,141*15000*380*10^-12) = 27,9 kHz , limited frequency response of the driver.:::this is with a very high impedance tube... and generally when you want to drive a 300B grid your going to use a tube with a much, much lower internal plate resistance. Say anything btwn a low of 800 ohms to 5000 ohms or even 7000 ohms would be much more typical (I think)... with a low impedance driver and a high shunt capcitance the -3db cutoff frequency would then still be much greater than 27.9khz.as with all devices and circuits... the designer must optimize his/her circuit and use a topology that makes sense and produces good results. For example... it is much tougher to build a plate choke for a tube with an r sub p of 15K... and generally these tubes are operated at much less plate current.... so they are not even generally spec'd or used to drive the grids of triodes which do have higher internal capacitances... so with triodes most designers aim at using a tube with much lower r sub p and perhaps greater bias currents. if your going to use a tube with an r sub p of 15K I would *most* (not absolutely though) likely not recommend that you use a plate choke and instead might recommend a plate resistive load instead.third thought.... the whole issue of shunt capacitance also applies to any transformer that carries an audio signal through it...push pull output transformers will have shunt capactances across the primary... single ended output transforemrs will have these same capacities...so... why the focus on shunt capacitance (in seeming isolation) of a plate choke or a grid choke? In most real world apps... shunt capacitance is only one of dozens of parameters and quantities that must be taken into account in achieving a good design...whenever the focus of any discussion on the merits or demerits of a design boils down to ONE parameter... it's bound to lead to mischief...the trick in design is not to aim at or focus on optimizing any single parameter... whether it be minimizing shunt capacitance, maximizing inductance, minimizing DCR, or minimizing flux density level, or etc...good designs are designs that pay attention to a whole range of factors or considerations that go into a design and optimizing for the "whole" of the device and not just any single paramter...as an addendum to this post I will put up a link to a post written by voltsec which I think you may enjoy reading.cheers,msl