Subject: Hey Wayne! Didn't Nelson Faraday invent Baseball? (Way too long)
Posted by BillEpstein on Thu, 23 Jan 2003 21:43:13 GMT
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So how's come we have Farads on our crossovers? And why are they trillionths? Do those giant transformer sub-station thingy's have REALLY big caps that measure an entire Farad?"Wow! Did you see that one Farad cap? It was as big as a house!"Anyway, I'm curious about farads 'cause while waiting for the parts to build the 800 Hz cross I decided to fool around with the 1.6k cross. Speakerman suggested 30 to 40 ohms of attenuation on the 811's and I saw from the 800 Hz cross that you used a 2.2uF cap. So I strung together 2 15 ohm Mills and bypassed with the only big cap I had, a 3.3uF. I found out the hard way how bright and harsh too much capacitance is! I tossed the 3.3 and went way back the other way to .47uF. The 16 Ohm 811/806A combo with the 30 Ohm/.47uF cap attenuation is unbelievable. Perfect integration of the the horn with the Woof. And all the virtues of the 811: detail, light, air and none of the pitfalls:brassy, brash, Hi-Fi'ish sound.The first time I've heard the Reference Recording of Harry James, "King James Edition" sound as good as I remember my late, lamented Acoustat 1+1's and Bedini 25/25 and VPI HW-III combo.I can't overstate that; until now nothing I've tried has sounded remotely as good as I recall it.What an amazing change from the PSD-2002's. They are easy to listen to but become congested with the Paramours at higher levels. With the 811's, you crank up the gain and the music just gets louder. Effortless. Mormon Tabernacle Choir SACD pure DSD "The Sound of Glory" is a tough test. The hall is apparently not the greatest. Had "Battle Hymn of the Republic" really smokin on the PSD's, not too good. With the 811's and the 3.3 cap there were only tenors and sopranos! But the same cut with the .47 cap, Wow! No strain. All the voices. And trumpets with excellent attack. Then there's the drum solo on Pat Barber's Cafe Blue, track 2. That cat swings. And the cymbals are right there in the room. You can read "Zildjian" on them and see the light reflecting off the hammering of the brass.I called off from work!LOL I got nothing done on Ella even tho' the .10 caps came in the mail, just listening to music.So Wayne, what I wanted to know was, if 3.3uF is crazy too much and .47 is just right for the 1k6a012dB, where does that leave the 2.2 that is spec'd for C1 on the 800a009dB? Does this thing that causes a capacitor to be 1000 times less resistive at 20,000Hz than 20 Hz have something to do with it?

Subject: Bypass capacitors in compensation networks
Posted by Wayne Parham on Fri, 24 Jan 2003 07:46:25 GMT
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The goals of components R1, R2 and C1 are to match the woofer and tweeter levels, and to provide a transfer function that is the conjugate of the driver's power response. This may sound like a mouthful, but bear with me. What it essentially means is the response curve output from the tweeter circuit is exactly the opposite of the respoonse curve of the raw compression driver, as it is when mounted on a plane wave tube. This works very well on horns that provide constant directivity because the on-axis sound is the same as the raw driver. Off-axis within the pattern too, for that matter, because that's what constant directivity means.The thing is, Altec 811 horns are not CD. They have collapsing directivity which provides some acoustic EQ on axis. Because of this, you don't want as much rising response from the tweeter circuit. You'll need the level

matching, but not nearly as much top-octave compensation. They can use a little, just not as much. So capacitor C1 should be smaller when using Altec 811 horns. I probably wouldn't even install it.Something else worth noting is the larger you make C1, the less the R1/R2 voltage divider does its job. What we want is for the attenuation circuit to lower the midrange band and then as frequency gets higher, the bypass capacitor acts to allow more and more energy to couple across unattenuated. So if you make C1 too large, it couples energy at a low enough frequency that the attenuator is completely bypassed. That's not what you want.For example, let's consider a CD horn crossed over at 800Hz needing 10dB attenuation. This attenuation can be gradually remove at high frequency to compensate for mass rolloff. You want a capacitor that begins to bypass at 3kHz to 4kHz, no lower. But if the capacitor is made so large that it begins to bypass at say 400Hz, then you can see how the whole compensation network is defeated. You might as well hook the tweeter up directly, without any compensation circuitry at all, because the circuitry is effectively shorted by the overvalued C1 capacitor anyway.