Subject: Re: Looking for suggestions - EBS Alignment?
Posted by AstroSonic on Sun, 28 Sep 2003 20:42:20 GMT
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Wayne provided a 'graphic' illustration of what an EBS alignment is. I would only add that tuning still lower will produce a saddle and peak, tuning a little higher (to maximally flat) will produce a 'flat' response from the speaker, and tuning still higher will produce peaking again. The peaking is really the acoustic output from the cabinet (helmholtz resonance). IME, an alignment either side of maximally flat can yield excellent results. The advantages of the EBS alignment are that you can often gain about 10 Hz of deep bass extension, and, even though the output from the speaker is shelved down a few db, naturally occurring room lift will restore response to approximately flat. Room placement makes a big difference. The maximally flat alignments tend to sound too bass prominent due to room lift. Moving the speakers away from room boundaries (wall,corners and,yes, the floor - stand mounting)can usually help resolve this issue. Room placement is much less of an issue with an EBS alignment, and you gain some deep bass extension.In answer to your comment about tuning the enclosure to Fs to limit cone excursion at resonance consider the following: the only maximally flat acoustic (i.e., without electronic compensation) BR alignment with Fb equal to Fs is for drivers with a Qt of 0.383. Drivers with a lower Qt have Fb greater than Fs, while those with higher Qt's have Fb below Fs. The resonant blurring of the sound is easily avoided by using alignments with minimal peaking from below maximally flat and to above maximally flat. For each driver there is not one unique alignment that will produce high quality bass, but a continuum of alignments that can produce good results, from a minimally peaked EBS thru maximally flat up to those with a db or so of rise above flat.With respect to the need to damp the drivers resonance consider the following:1) Once enclosed in a BR cabinet the driver no longer resonates at Fs. The cabinet and driver interact, producing two resonances (Fl and Fh). The cabinet is generally tuned to produce bass extension with minimal peaking-whatever Fb is required to do this. Note that a response with minimal peaking is only possible over a relatively limited range of cabinet volumes. To (over?) simplify, the nearest analog to Fs in a BR is Fh, where the cabinet air stiffness is added to that of the driver raising its resonant frequency. Its resonant frequency has been moved upward due to interaction with the cabinet resonant system (mainly air stiffness), and - the new resonant frequency is Fh. At Fl, the port air mass has been added to that of the driver, producing a lower resonance. Hence the twin impedance peaks characteristic of BR's. This is somewhat of an over simplification but it does provide some insight into what is happening. The breakthrough of T & S was to quantitatively analyze the system as coupled resonant circuits via analog filter theory, allowing the accurate modeling of system response.With respect to damping of Fs, and the resonant booming and total distortion chaos that result when Fs is undamped consider that some very fine sounding low frequency systems have been designed using open baffles and drivers with high Qts. This is very similar to an IB of large volume. For most well designed drivers, if you stay within Xmax, distortion will not be a major problem.The only BRs I have heard that had resonance problems (and were properly located in the room) were those with fairly large peaking. I recall a Cerwin Vega that developed a low frequency howl when fed white noise (not all CV's did this). The salesman about lost it.Hope some of this is helpful.Regards,AstroSonic