Subject: 2¢ more
Posted by Wayne Parham on Sun, 29 May 2005 16:57:09 GMT
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Thanks for the link, Charlie.That's an excellent resource, particularly in regards to Altec history and driver specifics.I do want to offer 2¢ worth though. I think some additional comments are in order. For example, the writer indicates that he believes the reflex chamber is "too large" but doesn't specify woofer or tuning frequency. He recommends the 515, but again, doesn't specify tuning. He suggests 12dB/octave crosovers, but would settle for 24dB/octave crossovers instead. These are sort of "seat of the pants" suggestions and I think probably a little more specificity is called for.The various models of Altec woofers have widely varied electro-mechanical parameters. For example, look at the 515E with Vas of 23.5ft3 compared with the 515-8G with Vas of 12.4ft3. The 416 is different too, with fts tuned nearly an octave lower than most 515's, making the 414-8B or 414-8C most like the 515-8LFE.Generally, I'd say that the 515-8G is best used in cabinets from 2.0ft3 to 8.0ft3 tuned to 50Hz.The 416-8B and 8C are best in larger boxes, tuned lower. They work best in cabinets from 5.5ft3 to 18.0ft3 tuned to 30Hz.You can split the difference and average box size and come up with a 6.0ft3 to 8.0ft3 cabinet tuned to 40Hz for an acceptable compromise, but if you're optimizing parameters, that's not what you're looking for. So I don't think that driver substitution without consideration of cabinet tuning makes sense.On the subject of crossovers, I probably would not recommend a symmetrical crossover for a loudspeaker like this. The drivers are very different, and they're placed fairly far apart. It is most likely that an asymmetrical crossover would work best. A single frequency 2nd/2nd crossover might be acceptable, but I seriously doubt it will provide the best performance, whether active or passive.While I would agree that bi-amping is good, I do not agree that passive is necessarily bad. Further, I think the biggest improvement is due to the bandwidth reduction requirements of the amplifiers, not because of improved properties of the crossover and certainly not because of the drivers.To illustrate, consider these two systems: One is a loudspeaker with a passive crossover using premium components and configured precisely for the system, optimized by modeling and fine tuned with actual measurements. Compare that with the same loudspeaker and drivers, but "upgraded" using an active crossover bought off-the-shelf, with crossover points and slope set by guess.I don't say these things because I think active units are inferior - far from it - But I think that an optimized passive unit is very good. I've heard plenty of active setups that weren't right, so in my opinion, that's not the holy grail to strive for. It's a means, not an ends.I think the worst thing about old passive crossovers (and some modern ones) is cheap electrolytic capacitors. Electrolytic capacitiors in passive crossovers should be replaced with polypropylenes or premium electrolytics, like Black Gate N-Types. Make sure any coils used are of adequate size that DC resistance is low. Use air core where possible. If a coil with magnetic core is used, find one that doesn't saturate easily. If resistors are used, be sure they are good quality non-inductive parts and upsize the power ratings. You don't want the resistors to get hot, so use large power resistors.Another thing about passive crossovers is conjugates. They aren't optional. If the crossover is higher than first-order, a conjugate network must be included, or response anomalies will result. The most noticeable problem is peaking near the crossover frequency. A damping component is required. Lots of speakers don't use Zobels, and I don't think they are installed in stock Altec speakers. But a passive crossover greater than first-order must have a damper or it sounds bad.There was a figure mentioned in the article for insertion loss of passive crossovers. I think the writer must have just made a guess, but whatever the case, it is wrong. To say that passive crossovers have a 25% insertion loss is just not accurate. As with all things, the

performance depends on several factors, configuration, quality and so on.Measure the low bass from a woofer and then put a low DCR coil in series. Measure the low bass again. You will find that the deepest bass is at the same volume level. Do the same thing with a tweeter using a good quality capacitor, measuring the highest frequencies. The 25% figure of insertion loss quoted is, in a word, wrong. There is more loss from speaker cables, in most cases, especially in installations like theaters with long wire runs.Switch to an electronic crossover if you'd like. But whether active or passive, some modeling is in order to find the best crossover slope and frequency points. Measure the final result to make its right, tailor if necessary. I think crossover optimization has been overlooked for vintage speakers like these for the most part.Wayne