The 210 Split

Domesticating the Giant Altec 210 Bass Cabinet

by Michael Frye

If you can domesticate the 210, you're pretty good at that kind of work

The Altec VOT A5 and later A7 system using the 825 and 828 enclosures have been featured in a number of excellent articles in the pages of *Sound Practices*. A few of the modification suggestions to the enclosures have been straightforward and have enabled me to get much more from the upgraded boxes.

Changing woofers has also made some difference. The 803A with its thin straight wall cone and higher (40-50 Hz) resonance offered improvement in the lower mids while the 515 with its lower cone resonance and larger magnet seemed to improve the mid-bass output and snap somewhat.

I speculated that better bass extension, improved bass and midrange clarity, and the elusive quality of articulation and detail might be more easily realized using a full bass horn design. It seemed to me that a longer bass horn with its lower horn cut off would be a choice worthy of exploration.

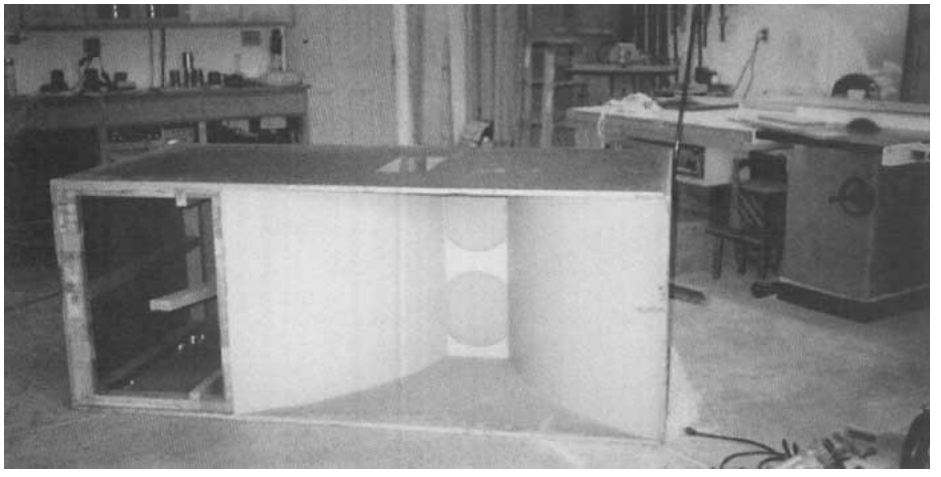
Fortunately, I had access to a large number of Altec's big 210 bass horn enclosures and more than enough Minneapolis cold weather shut-in time to experiment.

ALTEC 210 HORN DESCRIPTION

The 210 bass cabinet is clearly built for the auditorium. Its physical dimensions measure 84 H x 34 W x 39.5 D. These dimensions are so unruly for home use that about the only door through which it can be maneuvered is a wide front door or a large patio door. Most interior doorways are 30 or 32 inches, so unless one has a very large foyer that serves as a listening room, this behemoth is not going to work.

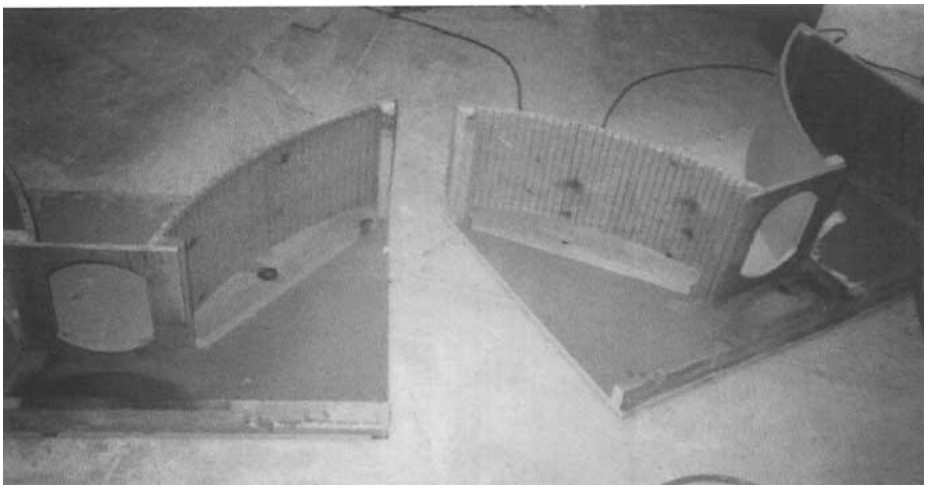
However, the Altec 210 has the potential to produce better articulation and a deeper, smoother, more continuous response than its smaller sibling, the A5 bass enclosure. In part, this is due to the bass horn's nominally lower free air cut off frequency (70 Hz versus 180 Hz). This free air response is going to be quite a bit lower in a listening room because among other things coupling the enclosure to the floor in the right places within a room may give perhaps another octave (35 Hz) of range. I later found out that usable bass output in my room extends even lower.

The stock cabinet takes two 15 inch woofers per side. Loaded with a pair of Altec 515 woofers, it should produce about 110 db/1 watt/1meter given Altec's 104 dB rating for a single 515 without horn loading. Like the 825/828 cabinet the 210 has an approximately 2 foot high port area



Above—Even without "wings," the 210 cabinet is a giant at 84" tall

Right—210 bass horn bisected on the workshop floor.



In particular, bracing and damping suggestions improved the VOT system's definition in the lower mids and upper bass and make an otherwise excellent loudspeaker better. Any change to tame the stock crossover has to be an improvement and several suggestions (issues #2 and #11) are worthy of consideration.

beneath the bass horn. In contrast with the 825/828 horn, the non flared sides of the 210 horn are parallel. (The two non-flared sides of the very early 825 cabinets were parallel.) These sides in the 210 are 5 feet in length at the mouth of the horn. All in all, this is one impressive looking horn!

DOMESTICATING THE 210

The kernel of the idea to tame this giant for use in a home listening room derived in part from the design of the JBL 4550 cabinet. The JBL is a dual woofer design along the lines of the 210, but it is a full horn load and is claimed to have usable response to 50 Hz in JBL's literature. Compared with the 210, the 4550's dimensions seem almost manageable at 60" H x 36" W x 32.5"D. Although the 4550 doesn't pass the doorway test either, it is physically smaller because it lacks the two foot port section found on the 210.

My solution for the 210 was to cut off the two foot port a la the JBL 4450 and, since the saw would already be out, cut the enclosure in a vertical line, right down the center.

In the process of creating an enclosure that met the doorway test, cutting the enclosure halved the number of woofers one would need for a stereo pair. After the cuts were made, new plywood was cut, glued, and screwed to create new bottoms and sides.

The result is visually quite stunning (at least to a horn aficionado). With its 17.75" x 39.5" footprint it occupies slightly less floor area the standard A7/A5 and is just 18 inches taller. The surgery had reduced the footprint by half but also reduced the total volume to less than 37% of its original size, while maintaining the original horn geometry.

The clean, sweeping curves of the horn flares and the slim frontal aspect makes for a modern, elegant looking enclosure. Looking into that 5 foot vertical horn mouth made me want to load it up real fast and see what this beauty could do.

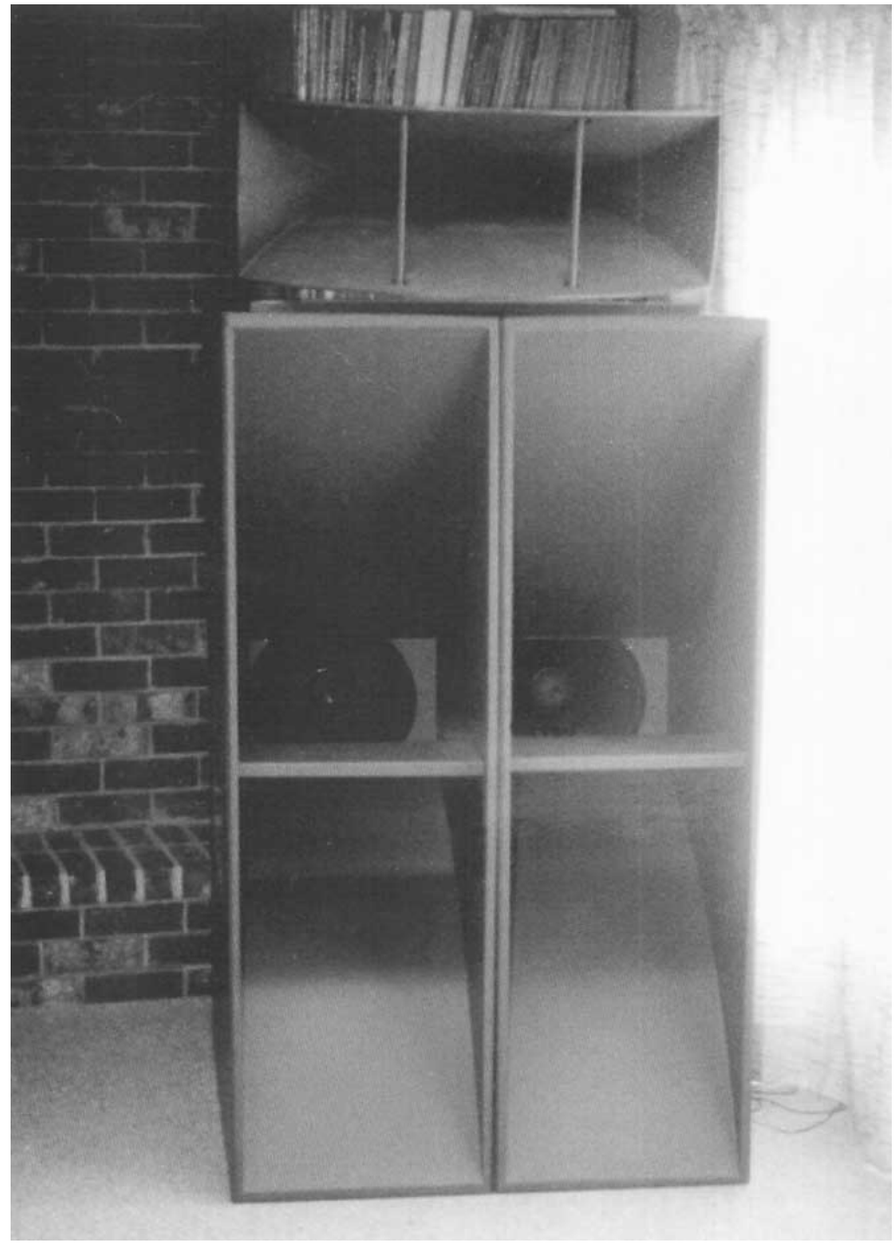
LISTENING AND ADJUSTMENTS

After loading the modified cabinets with my favorite woofers and adding high frequency horns, drivers, and crossovers, it was clear that this rig had great potential. One of the first adjustments I made was to add a strut across the mouth of the bass horn. The large, unsupported area of plywood on the 5 foot sides resonated and rattled at certain frequencies causing some bass muddiness.

Since the horn mouth was essentially unchanged from the original Altec design except for halving the distance from side to side, I wondered why Altec or JBL, for that matter, did not address the matter of cabinet resonance caused by these large unsupported panels. Earlier RCA bass bins from the 1940s had horizontal and vertical struts across the mouth to eliminate the resonances that naturally results from large unsupported panels. Two more struts added internally further cut cabinet resonances.

Originally, the split 210 cabinet was intended to be a fully horn loaded bass enclosure just like JBL's 4550. While changing woofers, I left the center section of the three part back off. The effect of this "accidental" rear port was to increase the range of bass response. In addition, there seemed to be no sacrifice in the upper bass clarity with the reflex port in the rear of the cabinet as there was with a front reflex port. I found that I enjoyed the noticeably lower bottom end with the accidental port and decided to stick with a reflex port contrary to my original plan to have a full horn load.

I cut different-sized center board sections according to whether I would be using a Jensen, Altec, JBL, or EV woofer. The calculated effective interior volume of these modified bass horns was found to be 12



Right—"Double" modified 210 configuration with Altec 329A HF horn plus a 288 driver

cubic feet. At this volume, there is supposed to be no advantage in using a reflex port. However, after a good deal of experimentation, I found that a rear port of approximately 64 square inches seemed slightly preferable to a full horn loading in my listening room.

Now that the enclosure was about right, I tried two bass cabinets per side in both the upright position and then one stacked upon another in the horizontal position. Though not particularly practical for my narrow listening room, the horizontally placed double cabinets per side certainly sounded great. The two vertically placed cabinets per side with a nice 329A high frequency horn resting on top looked as cool as they sounded.

Cool as they looked to me, the females of the family opined that a single enclosure per side sounded every bit as good and had a nice, slim, minimalist look that was quite appealing. You judge for yourself from the photos.

SP readers wishing to share their experiences can write to me at 18435 5th Ave. N., Minneapolis, MN 55447. By the way, I might still have access to some 210 cabinets if anyone is interested...

Right—Single 15" modified 210 with early wood 808 horn/802 driver