Subject: Tuba18 Sub
Posted by GarMan on Mon, 12 Sep 2005 13:16:52 GMT
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I had a couple of weeks off prior to Labour Day and was able to work on a few projects fulltime, including this Tuba18 horn subwoofer. Details on this speaker design can be found at Bill's forum: http://audioroundtable.com/BillFitzmaurice/Design ObjectivesFirst off, I think typical subwoofers are ugly. They are large bland boxes that, even when hidden in corners, are still ugly. You can never completely hide them, so I opted to blend this one in as a piece of furniture. The subwoofer was built for my sister to supplement a pair of Tangband ELF1.5's, so I leaned towards the "girly" side on its design.Material and ConstructionThe unit was built entirely from two 5x5 sheets of baltic birch ply. One sheet of 1/2" and one 3/4" with very little leftover. The only panels that were not BB-ply were the drawer bottom and the top backing panel. These were 1/4" V.C. oak ply that I had leftover from a previous project.All internal dimensions for the Tuba were the same as per Bill's plans. However I deviated from the plan in a few areas:- Obviously, the sides were extended up to accommodate the drawers and table top.- Sides, Tuba top, bottom and table top were 3/4" ply.- 1/4" deep rabbets instead of 1/8" were used to attached inside panels to sides- 1/2" braces instead of 1/4"Pre-FinishingHorns are unique in that you have visual access to internal panels on the completed unit. I like to ensure that anything you see, even if it's in the back is finished consistently. Pre-finishing these internal panels and braces prior to assembly (or cutting) makes life a lot simpler.LayoutBill's plans make it straightforward to layout the horn-path on the side panels. However, instead of marking up the right and left side panels individually with measurement tools, it's simpler and more accurate to mark one side and then transfer that directly to the second panel. I did this by extending all the key-lines out to the edge of the first panel, transfer the edge markings to the second, then use the edge marking to draw key-lines on the second panel.By the way, Bill recommends you test for driver fit in the back chamber after glue up. I recommend you do that after layout before any cuts are made.I also made the rough cut of the porthole right after dado cuts instead of after glue-up. Here why: tear-outs from a jigsaw happen on surface top. If you rough cut the porthole after glue-up, you risk tear-out on your outer surface. Rough-cut before glue-up allows you to cut from the inside of the panel where tear-out doesn't matter (as much).Tools and JigsI'm not saying you can't build this sub without a tablesaw, but it makes life a whole lot easier if you had one. Bill said 90 degree cuts for internal panels are fine as long as there's enough glue to fill the edges. But if you have a tablesaw, it's very easy to cut exact angles. Just copy the angles from your side panels to your saw with a sliding bevel.For routing out the dadoes on the side panels, a routing guide is indispensable. If you don't have one already, spend 15 minutes to make one. It'll save you hours. The routing guide works on exactly the same principle as a cutting board.Glue-upI did not use the dado-to-edge/slide-in-panel assembly method recommended by Bill. Dadoes were routed only where they were needed. Internal panels were first glued to one side panel and each other. The second side panel was then attached to the assembly. Rounding-over the edges of the internal panels helped a lot with fitting the second side panel. The 3/4" outer panels were rabbet down to fit the 1/2" dadoes.Port CoversBill recommended that you trace the shape of the port from the inside onto a piece of material and cut it out freehand. In my efforts to make things more complicated than they need to be, I took a template approach. After flush cutting the port hole, cut a 7/16" rabbet. I used a template guide on my router and cut a template out on 1/4" hardboard. Template was then used to cut port covers. Use a block plane to shave down for a snug fit. Gaskets were cut from sub-flooring

material.DrawerI was taught to fit drawers the old fashion way, meaning each panel edge is shaved down with a plane until you get a snug fit. Esoteric, but in this case, I thought it would be very important to ensure no rattles or buzz from the vibrations.Dovetails are handcut. I learned how to cut dovetails over a year ago and have not practiced since then, so some of the corners are a little sloppy. I've never had much patient for blind dovetails so I cut a set of fake ones for the drawer front (ie. Cut through-dovetails then glue a panel over it)FinishBaltic birch does a decent imitation of cherry if stained properly. In this case, I used cherry coloured gel for the colouring. I fell in love with water-based aniline dye this summer but did not want to through the hassle of grain-raising for this project. Baltic birch is terrible when it come of fuzzing when hit with water. Kind of regret not using the aniline dye though as the gel stain does not even come close to the depth, uniformity and colour of dye.I also love the new Miniwax Wipe-on finish I discovered this summer. However, it has a bit of that hard plastic shine that all poly finish tends to show. To soften up the finish, I first coat the surface with tung-oil and let it "semi-dry" for about three hours. Then I wipe on the Poly-Wipe to get a soft smooth and slippery finish. Three to four coats of Poly-Wipe usually does it. Always wipe everything off; never leave a film to dry to ensure a mark-free finish.Final ThoughtsThis project took me four full days (approx 40 hours) to complete, not including final finishing which took 15 minutes each day for another four consecutive days. Of course, I made it a lot more complicated than it needed to be. I'd imagine that if a builder had a couple of bass-reflex projects under his belt, a simple T18 would only take a full days, provided a tablesaw is available.The design looks daunting at first, but it's no more complicated than a very well braced BR sub. If you follow Bill's plans for bracing, you end up with a very stiff and well braced box. In fact, walls and other furniture around the T18 tend to vibrate more than the T18 itself.When I look at the unit now, there's close to a hundred things I would have changed or wished I did better, but overall, I'm very happy on how it turned out.Gar.
Tuba18 Photos