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BUILD:

- **UHF-TV Converter**
- **2-Meter Receiver**
- **Folded Horn Enclosure**
- **Stereo Intercom**



Tape-Off-The-Air
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By
ROALD E. DYBVIG

The MELLO MONSTER

You asked for it!
A hi-fi speaker enclosure
with a "monstrous" folded
horn compressed into a
relatively small cabinet

HOW WOULD YOU LIKE to have a complete speaker system that sounds as though it were worth hundreds of dollars—for an actual cost of about \$25.00? You can—by building the "Mello Monster." Very little equipment or wood-working skill will be required. And, after hearing this system, you and your friends will find it hard to believe that such wonderful sound can be obtained from a single 8" speaker.

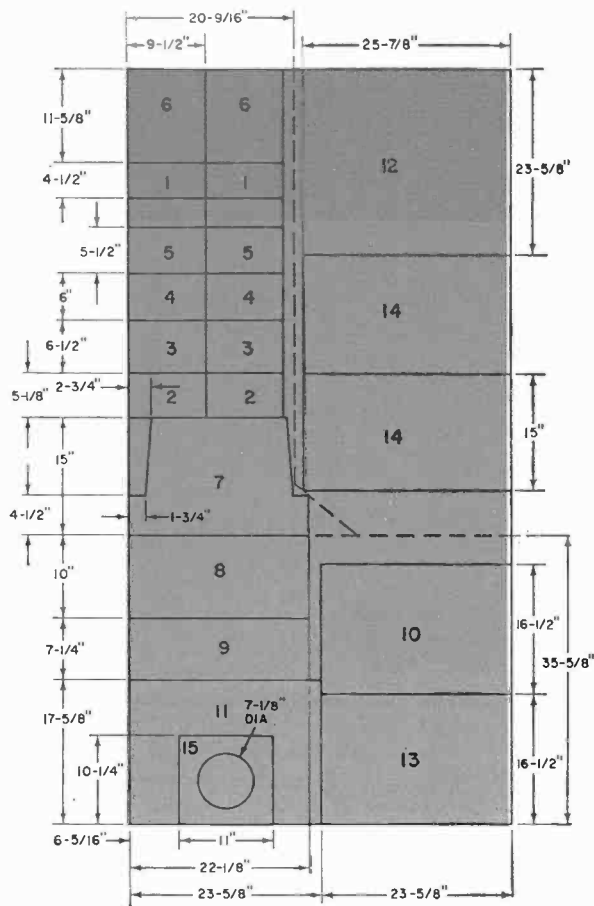
Speaker Enclosure Theory. It's pretty much common knowledge that the greatest problem in designing a speaker system is getting maximum coupling between the speaker cone and the air at all desired frequencies. By way of explanation, a speaker has the job of converting electrical energy into acoustical energy. And, just as important, its enclosure has the task of coupling the speaker to its load—the air.

The enclosure which many audio experts concede to be the best compromise for overall reproduction is the exponential horn. This type of enclosure gives the necessary bass reinforcement, and it does so "musically"—its sound or *timbre* isn't "boomy" like some bass-reflex enclosures or "mushy" like some infinite-baffle types.

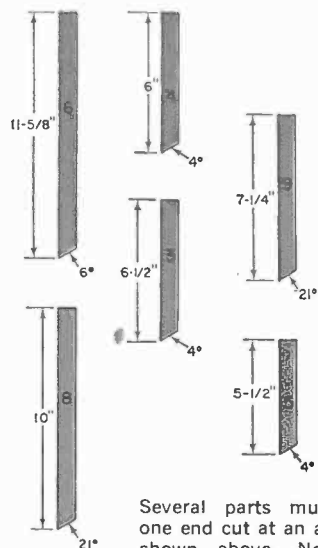
In case you don't agree with these statements, keep in mind that we enter an area that is downright intangible whenever tone qualities come up for discussion. The whole matter boils down to personal preference, since no one is in a position to say what sounds good to someone else's ear (the ear is notoriously unreliable at best, but it remains the only thing we have to hear with). Therefore, it's necessary to compare speaker enclosures on a basis of which one *sounds* best to your ear.

But let's get back to that word *timbre*—"the characteristic quality of sound produced by a particular instrument or voice." Singers who achieve wide public acclaim presumably have voices with a pleasing *timbre*. Speakers, too, have their individual "timbre" characteristics, and so do speaker enclosures.

The aim, then, is to bring together a speaker and an enclosure which will complement each other and produce pleasing sounds. Authorities agree that optimum tonal quality will result only when the enclosure is designed with the charac-



A 4' x 8' sheet of $\frac{3}{4}$ " plywood supplies bulk of parts. For ease in handling, the sheet can be cut into three separate sections, as indicated by the dotted line.



Several parts must have one end cut at an angle, as shown above. Note that there are two identical pieces for Parts 3, 4, 5, and 6, both of which are beveled.

BILL OF MATERIALS

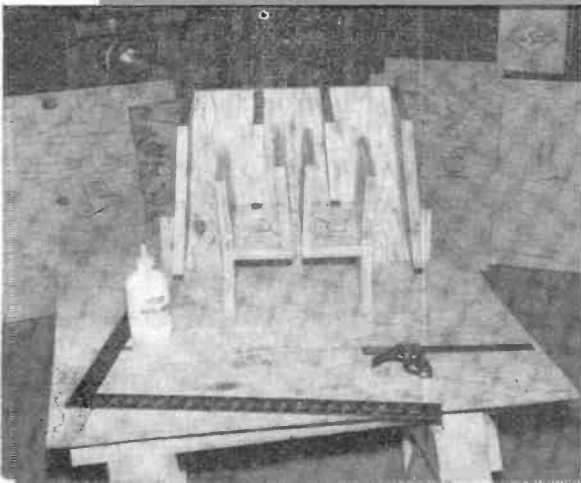
- 1—4' x 8' sheet of $\frac{3}{4}$ " plywood
- 1—Square yard of grille cloth
- 1—8" hi-fi speaker

Misc.—Glue, flat-head wood screws, black screen enamel, molding, Formica sheet, etc.

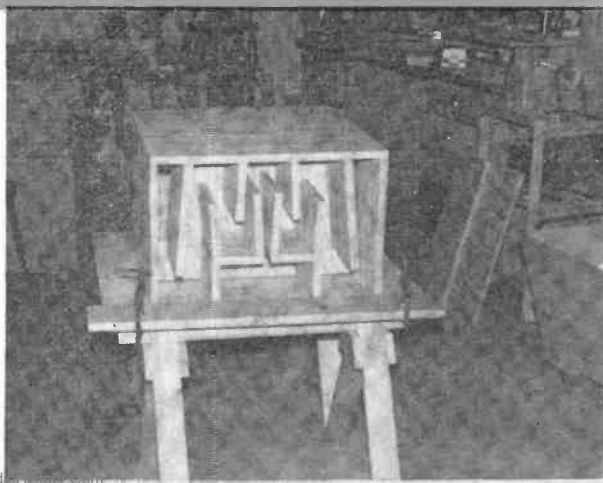
Tools You'll Probably Need

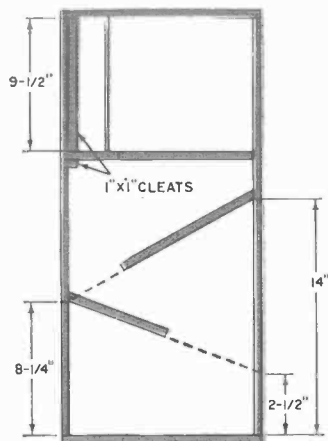
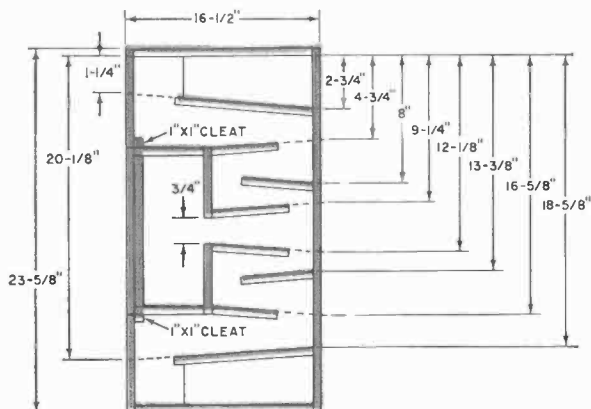
- | | |
|----------------------|---------------------|
| Hand saw | Plane |
| Keyhole or saber saw | Paint brush |
| Screwdriver | Hammer |
| Square | Scissors (or knife) |

A Upper labyrinth is most complicated section of the Mello Monster and the first to be completed. This photo shows it lying face down, with all parts securely glued in place.



B Once the sides (Part 14) have been added, the next step is to attach the back (Part 12). Like every other part in this system, the back must make an air-tight fit with all parts that touch it.

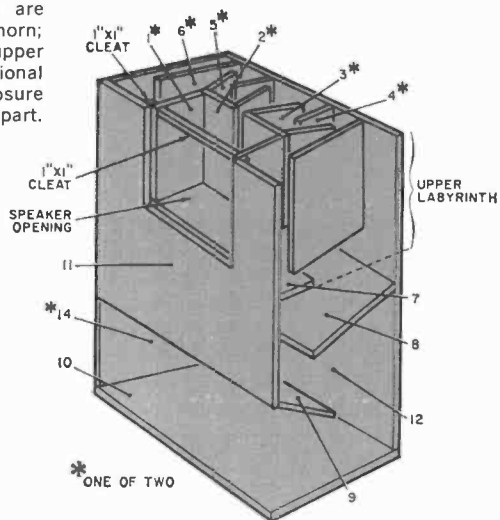




Internal construction of the Mello Monster can be gathered from the drawings on this page. Top view (above) with top of enclosure removed shows how various pieces are angled to approach the flare of an exponential horn; side view (right, above) shows relative location of upper labyrinth and baffle "plates" 8 and 9. Three-dimensional drawing (right, below) with top and one side of enclosure removed, indicates general location of every major part.

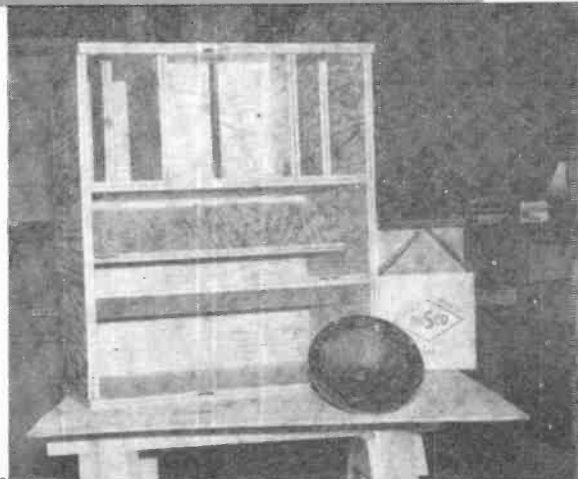
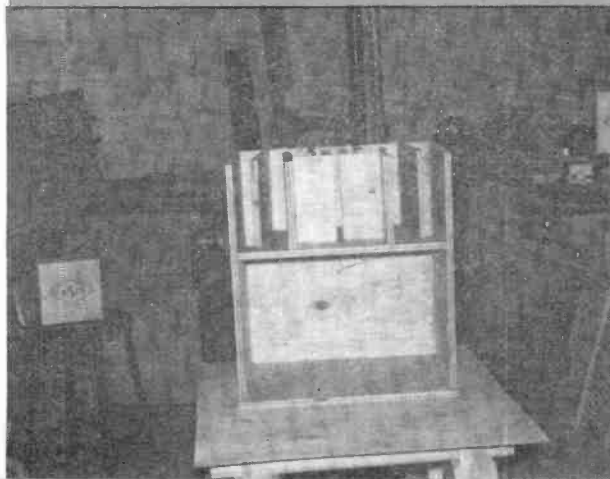
teristics of the speaker in mind. The flux density, the size of the cone, the mass of the voice coil, and so on, all influence the enclosure's design.

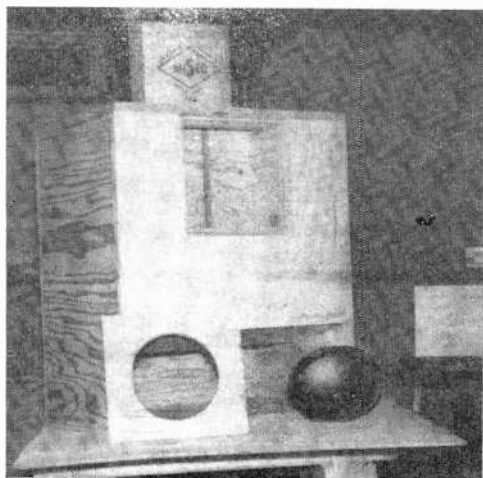
Testing the Theory. The "Mello Monster" described here uses a single 8" hi-fi speaker, and the enclosure has been carefully adjusted to complement the speaker. But we don't mean to imply that this horn is theoretically correct, since, in theory, a port approximately 7' x 9" and a horn as long as 30'



C Set the assembly upright, and you'll see that the Mello Monster is beginning to "take shape." Here, only top (Part 13), baffle "plates" (Parts 8 and 9), and front panel (Part 11) remain to be added.

D Mello Monster is now taking on the appearance of the true "folded-horn" that it is. Author used a F-8-HF speaker made by Minneapolis Speaker Co., but any 8" hi-fi speaker will do.





E With front panel in place, you're ready to install speaker leads. Standard lamp cord makes suitable conductor and can be run to two-terminal, screw-type connector mounted on back of unit.



F Entire front panel (including speaker panel itself) should be carefully coated with black screen enamel to hide various joints behind grille cloth. Take care not to touch speaker with brush.

would be required to reproduce 40 cycles. Obviously, "correct" theoretical design must be compromised to get an enclosure size practical for use in an average room.

And how does the "Mello Monster" sound? Well, this system has been acclaimed by novices who just "liked what they heard," by audiophiles with trained ears, and by professional musicians whose standards of comparison are live performances.

At a hi-fi show in the Midwest, two "Mello Monsters" were placed behind drapes, and people were asked to guess what kind of speaker system they were listening to. Nearly everybody guessed "big speaker" or "multiple speaker" systems. When shown the system in actual use, some wouldn't believe that such sound could come from a single 8" speaker! Some even examined the enclosures very carefully, trying to find the hidden speakers!

Since all who have heard this system agree that it is truly amazing, let's gather the necessary materials together and get started!*

Putting It Into Practice. You can save yourself a good deal of time and trouble by getting a local lumberyard or cabinet

shop to saw all the pieces to size. If you elect to do the sawing yourself, take your time and make sure the parts are exactly the right size. Number the parts as you saw them for ease in identification.

Note that Parts 3, 4, 5, 6, 8, and 9 have one side cut at an angle. Part 15 (the speaker panel) is sawed from Part 11, and the speaker hole is then cut from Part 15. A keyhole or saber saw will be required to saw both Part 15 and the speaker hole.

To assemble the various parts, first collect all the partitions used in the upper labyrinth (two each of Parts 1, 2, 3, 4, 5, and 6). Attach all of the labyrinth partitions to Part 7, using plenty of glue and screws (see Photo A). Add the sides of the baffle (two Part 14's) to this upper assembly, making sure that the tops of the sides and those of the various partitions are flush with one another.

Next, attach the back of the baffle (Part 12), gluing and screwing it to all surfaces that join it (see Photo B). Attach the bottom (Part 10)—see Photo C—and then the top (Part 13), again gluing and screwing all adjoining surfaces. This done, you can install the baffle "plates" (Parts 8 and 9) as shown in Photo D, then the 1" x 1" cleats around the speaker opening. Finally, attach the

(Continued on page 97)

*Full-scale drawings and step-by-step construction details for building the "Mello Monster" are available for \$2.00 a set. Mail your check or money order to Mr. Roldal E. Dybbvig, 2754 Xenwood Ave., St. Louis Park 16, Minn.



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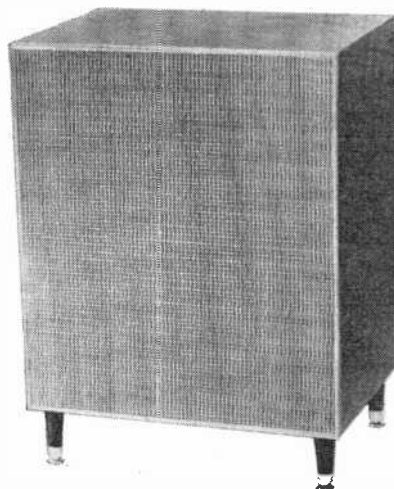
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Completed Mello Monster makes attractive addition to any listening room. The enclosure can be finished in a number of ways, depending on personal preferences in woods, fabrics, and colors.

you've drilled these holes, you can attach the speaker to the panel, and solder the lead wires to the speaker. Next, mount the speaker panel in the cabinet opening, using four #8 x 1½" flat-head wood screws. Don't glue this panel, since you may find it necessary to service the speaker some day.

Finalizing the Project. This is the time to stop work, hook up the system, and listen to the fruits of your labors. Chances are you'll want to congratulate yourself for having started the project, and then proceed to apply the finishing touches.

There are many ways to finish the enclosure. One of the easiest is to apply Formica sheet to the top, sides, bottom, and back, using "contact-bond" cement to hold it in place. For the front, a coat of black screen enamel is desirable (see Photo F); this prevents the cabinet openings from showing through the grille cloth.

Fabricate a frame from some molding (you'll find a large variety at almost any lumber yard) to fit the cabinet front; then finish the frame to match the covering you've applied to the cabinet. Staple the grille cloth to the frame, attach the assembly to the enclosure front, and you can sit back and listen with pride!

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