

Select full scale drawing number  
part number 13. Make sure  
and tape the plan to the part  
the screw or nail locations,  
from the parts. Drill through  
size drill. This will insure  
partitions. For those who  
of the proper size is recom  
the screw head at the same

Remove the nails holding it

Select full scale drawing number 3. Place carbon paper between the drawing and the part number 13. Make sure the four corners of the drawing and the part are aligned and tape the plan to the part. Trace the layout of all the partitions and mark all of the screw or nail locations, as shown on the drawing number 3. Remove the drawing from the parts. Drill through both pieces at the screw hole locations using a 1/16 inch size drill. This will insure proper location of the screws or nails into the various partitions. For those who may prefer to use wood screws for assembly, a screw drill of the proper size is recommended. This will drill the lead hole and countersink for the screw head at the same time.

Remove the nails holding item number 7 to item number 13.

Assemble parts 1, 2 and 3 per drawing #1 and #6. All connections are to be glued and screwed or glued and nailed throughout the assembly. Use plenty of glue to insure a tight job. Here I suggest using finishing nails to hold the parts together until you can drill holes and insert screws. The nails can remain in the parts. In fact, if you wish to save some labor, #8 finishing nails can be used in conjunction with plenty of good cabinet glue to assemble the entire cabinet. I have built some cabinets in this fashion and cannot see but what these cabinets are adequately solid and strong, and the physical effort is certainly much less.

Assemble two of part number 6 to part number 7.

Assemble the two sub assemblies consisting of parts number 1, 2 and 3 to part number 7. At this point it is well to mention the possible use of plastic wood or small quarter-round moulding to close up any cracks remaining where the partitions join part number 7. This technique will be used to seal any cracks throughout the remainder of the enclosure assembly.

Assemble two of part number 5 per assembly drawing #1 and #6. Use nails to hold the pieces in place to part number 2. Screws or nails through part number 7 and later through the top, part number 13, will hold these partitions securely. Do not forget to use plenty of glue on all connections. Wood connections properly glued, will result in great strength. Very likely the wood will tear before the actual glued connection will break.

Assemble part number 4 to part number 7 per the assembly drawing #1 and #6. This completes the assembly of the upper labyrinth.

Lay the upper labyrinth assembly on a flat surface. The speaker opening shall be down. Place a straight edge piece of wood across the top of the speaker box (parts number 1 and parts number 6), and temporarily nail in place. The cabinet top part number 13 may be used for this purpose. If so, temporarily nail the top in place. This will establish the correct height for the sides when they are assembled.

Lay the cabinet sides part number 14, on top of each other. Select full scale drawing number 4. Place carbon paper between the drawing and the work. Align the corners of the drawing and the part and tape drawing in position. Trace the layout of the cabinet partitions parts number 7, 8 and 9. Mark screw or nail holes where indicated on the drawing. Drill holes through both side pieces using a 1/16 inch drill.

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Assemble part number 14 (cabinet sides) per the assembly drawings #1 and #6. Apply glue and screw or nail sides to part number 7. Remove straight edge or top which was temporarily nailed in place.

Select full scale drawing #5 and the cabinet back, part number 12. Using the same technique as before, trace the locations of cabinet partitions and screw or nail holes. Drill hole locations using  $1/16$  inch drill.

Apply glue to all surfaces of the assembly that are to join with the back. Use four nails to fasten back to sides. Use a square and make sure all the corners are square where the back joins the sides. When you have the corners perfectly square, drive one additional nail through the back into part number 7, to insure that the corners will remain square. Insert all the screws or nails indicated to secure back in place.

Assemble part number 10 to the cabinet with glue and nails or screws.

Assemble part number 8 to the cabinet with glue and nails or screws.

Assemble part number 9 to the cabinet with glue and nails or screws.

Before assembling the front panel to the enclosure, glue and nail in place the four  $3/4$  by 1 inch cleats as indicated on drawings #1 and #6. These cleats will support the front panel and the top of part number 15.

Assemble part number 11 to the cabinet. Use four nails to hold panel in place while you match drill holes into all partitions. Insert screws or nails and tighten. Add two  $3/4$  inch square by  $8 1/4$  long cleats at sides of cabinet port.

Before attaching the cabinet top it is a good idea to install the speaker leadwires. Use a length of POSJ parallel lamp cord. Allow ample slack in the speaker box so the cord will be easy to connect to the speaker. Drill a hole through the cabinet back just above part number 7 and exactly centered on the cabinet back (this location is shown on drawing #5). Pull the cord through this hole and attach to a two terminal Jones strip or equivalent terminal strip. Do not drill this lead wire hole any larger than necessary to accommodate the wires. In fact it is a good idea to fill the hole around the wires with plastic wood to prevent any air leakage.

Assemble part number 13 to the cabinet. Before actually attaching the top to the cabinet it is essential that we make sure that all the partitions in the upper labyrinth are exactly the same height and the same height as the sides, back and front. Use a straight edge laid across the top to determine any high or low places. Use a plane to reduce the high places to the proper height. Plastic wood can be used to build up any low spots. Keep in mind the fact that any air leakage over or under the partitions within the enclosure will impair the operation of the enclosure. Once the top is glued and screwed in place it is too late to make any further improvements on your assembly. Take your time and do a good job as you go along.



Select part number 15 which was cut from the front panel part number 11, and cut a hole 7-1/8 inches in diameter in the center of part number 15. Use of a fly cutter in a drill press to cut this hole is preferred. Cut half way through from one side, turn the piece over and finish the cut from the other side, or you may use a keyhole saw, a scroll saw or a coping saw. After the speaker hole is cut, lay your MiSco F-8-HF speaker over the hole and mark the speaker mounting holes. Drill these holes 3/16 inch in diameter. Use four #10-24 x 1 1/2 flathead machine screws and mount the speaker on the panel.

Connect lead wires to the speaker. Install part number 15 with speaker mounted in cabinet front. TRY OUT UNIT FOR SOUND!

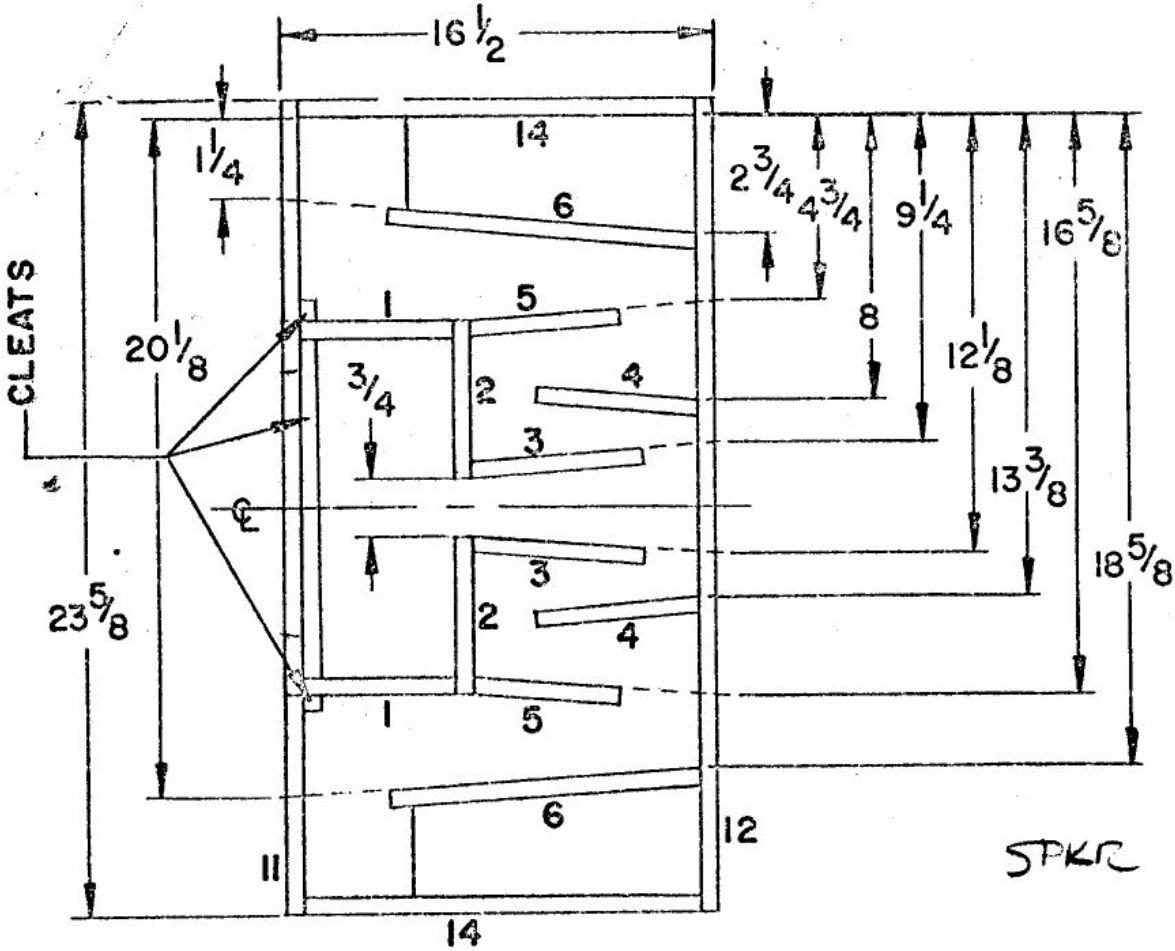
### SECTION III: FINISHING CABINET

There are many ways that this may be accomplished and I am not going to attempt to describe them all. I will, however, describe what I feel is the easiest approach for the do-it-yourself man. This finish requires the application of wood grained formica to the sides and top of the cabinet and the fabrication of a frame for the front of the cabinet to the back of which will be stapled grill cloth which will either contrast or harmonize with the formica that has been selected. See drawing #7.

For those who wish to economize on material, the top and sides of the cabinet could be covered with wood grained paper after the surfaces of the cabinet have been filled and smoothed.

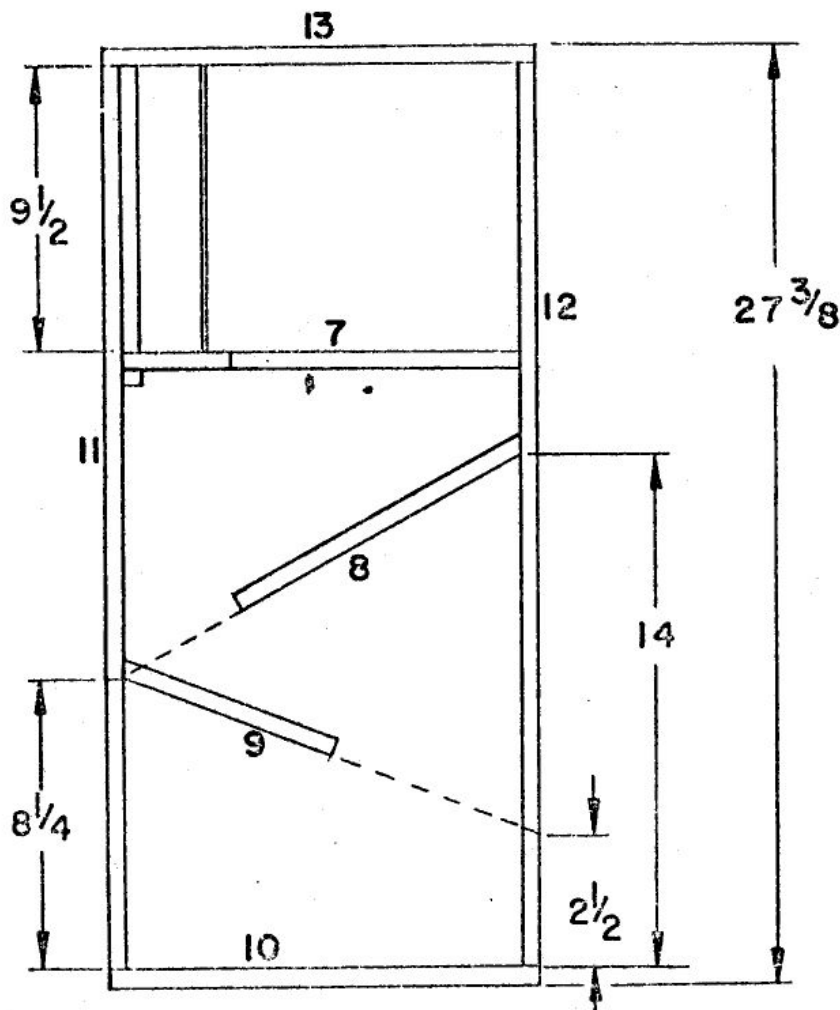
The formica for the top and sides should be purchased cut to the approximate size desired. It is a good idea to get the pieces a little oversize to allow for the finished enclosure being a little out of square. After the formica has been applied to the box, the excess can be removed with a rasp or a file, if the excess is small, or by sawing if the overlap is quite large. A sharp plane will finish up the edges quite nicely. Install the two side pieces before the top piece. Then the top will cover the edges of the sides and the finished job will look better. Contact cement is used to secure the formica to the cabinet. A coat of the cement is applied to both the cabinet and to the piece of formica. I use a cheap paint brush to apply the cement. Allow an hour or so for the cement to dry, then press the formica into place on the cabinet. Once the piece of formica is in contact with the cabinet, it is impossible to re-position the piece, so you must position the piece perfectly on the first try. Some people place wrapping paper on the cabinet, position the piece of formica on top of the paper and then draw the paper out, allowing the cemented surfaces to join. Better have a helper if you try this approach. It is suggested you pre-size the formica pieces so you will have only about 1/32 inch to remove by filing or sanding. Use care in sawing formica as it is brittle and will chip easily. After the formica has been installed and fitted to the cabinet, the front, back, bottom and inside of the cabinet port should be painted black. Screen enamel is recommended for this purpose because it is thin and penetrates the wood, and is less expensive than regular enamel.

Assemble the grille frame using the 1 x 2 pine strip. Make this frame to fit the box front. Should your box not be perfectly square, make your grille frame not perfectly square too. Glue and nail frame together using glue blocks in the corners. When glue dries paint frame black. Allow paint time to dry thoroughly before proceeding to apply grille cloth.

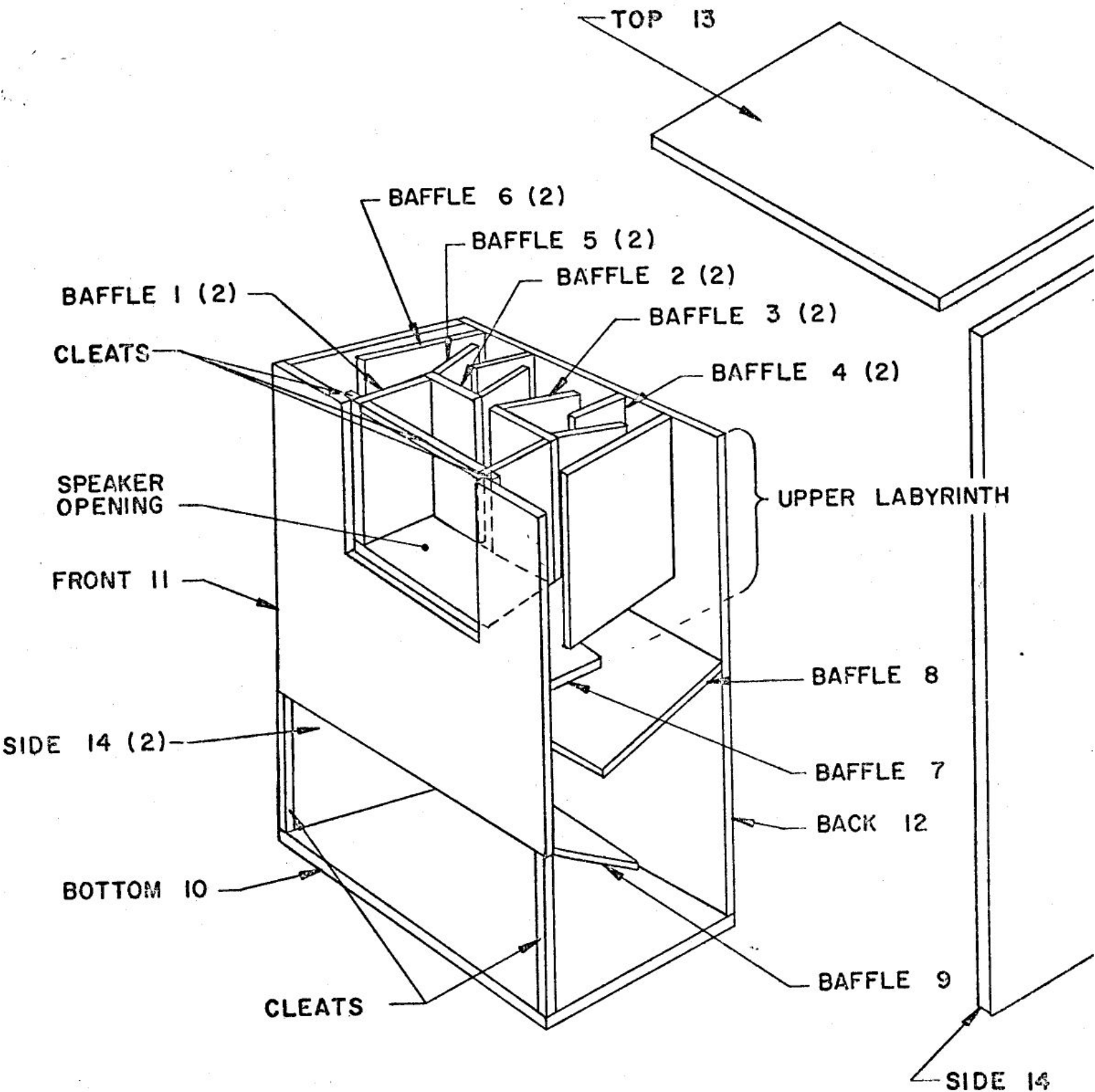


TOP VIEW--  
TOP REMOVED (#13)

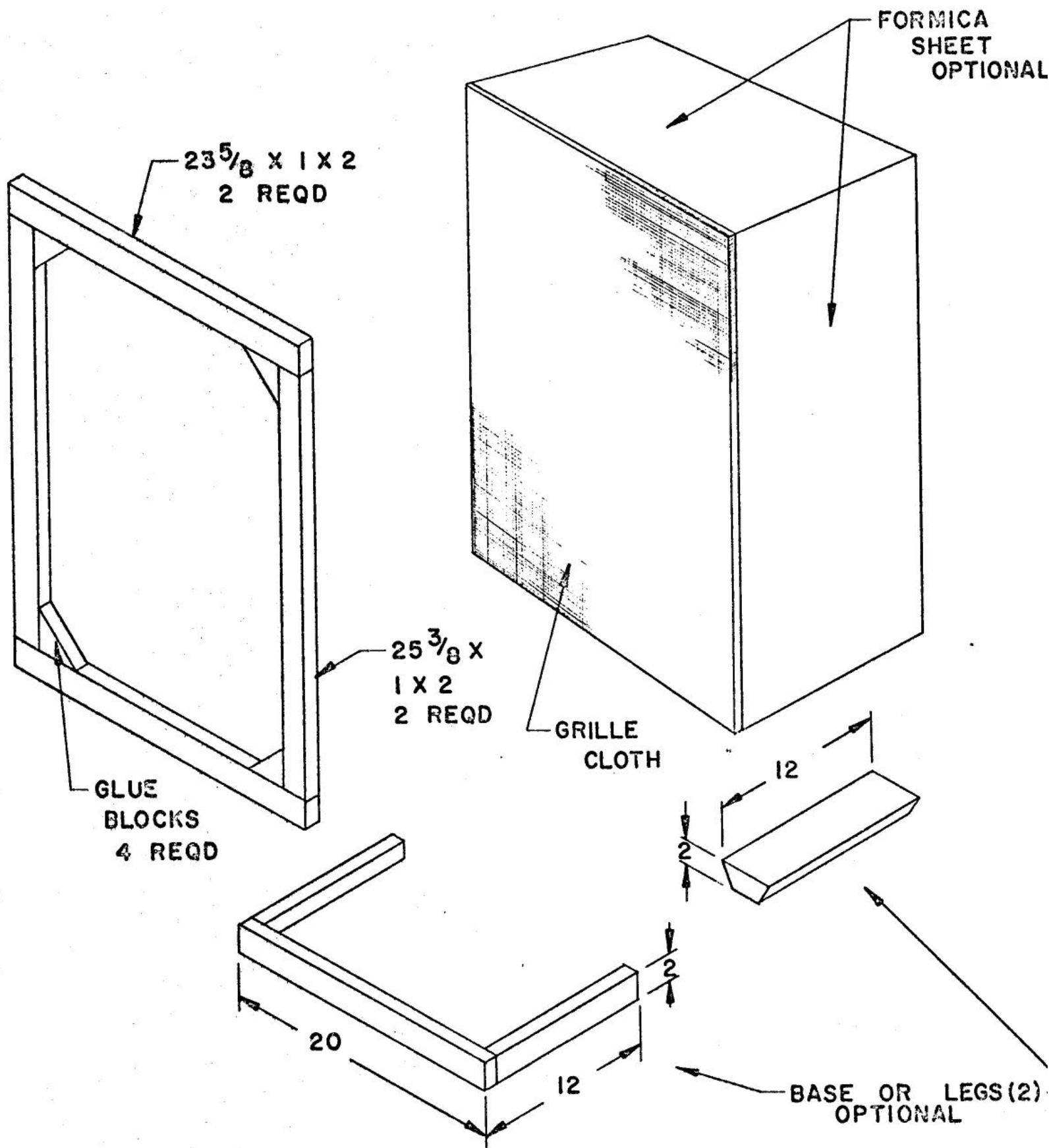
SPKR OPENING  
 $\frac{1}{2} = \frac{3\frac{9}{16}}{3\frac{1}{2}}$



SIDE VIEW--  
SIDE REMOVED (#14)



ENCLOSURE ASSEMBLY—  
TOP & SIDE REMOVED  
DWG #1



FINISHED ENCLOSURE -

DWG # 7



2754 Xenwood Avenue  
St. Louis Park 16, Minn.

Dear Sir:

I have received a number of requests for information regarding changes in the MELLO MONSTER to accommodate 10 and 12 inch loudspeakers.

Why would one want to use larger than an 8 inch speaker? I assume that it is thought that the bass response will be better. This is a wide spread belief throughout hi fi land. There is some element of truth in the idea, I must admit, when dealing with some enclosure types. However, I have built this same folded horn using a "twelve" and if there was anything to be gained by doing so, I could not find it. I have not been able to achieve the degree of coupling between the 12 inch speaker and the air column which makes for superior performance. I am not interested in achieving mediocre performance. This you can obtain by putting a speaker in an apple box. I am going to continue experimentation and in time I may find an optimum twelve inch combination. This Misco F8-HF speaker is so well coupled to the air column in the "Mello Monster" that it will shiver your timbers with low organ notes. You actually have to hear this unit to believe the response, and then some people, looking at it and hearing it, still think there must be some catch to it. "It just ain't possible" type of attitude. I get this information from a local radio house which has a pair of these units to demonstrate their hi fi gear.

Getting back to the original question regarding adaptation to a 12 inch speaker. This requires making the upper labyrinth 12 1/2 inches high (it is now 9 1/2 inches). Overall cabinet dimensions have to be increased to the point where the cabinet is ungainly and too large for the average living room. So my advice to you is, build the "Mello Monster" as it is written up in Popular Electronics. My plans will save you the layout work of partitions and baffles. I know you will be very pleased with the results of your labor.

One other thought, I have also had some inquiries about the advisability of using a high priced 8 inch speaker in place of the Misco F8 HF. (Some want to use an 8 inch Co-ax.) I have tried many different 8 inch speakers in this cabinet. (A friend has a hi fi store and stocks many types of speakers) and this Misco unit is as good as any I've tried; regardless of cost. Many people seem to think that unless the price is high an item is no good. This is not true.

I hope this information will be of some value to you.

Sincerely,

*Roald E. Dybvig*  
Roald E. Dybvig

P.S. Your comments on the performance of the MELLO MONSTER will be appreciated. Please address them to Popular Electronics, 1 Park Ave., New York (16) New York.

(over)

Try this enclosure just as it is  
written up in the magazine, listen to  
it perform with any good amplifiers  
and you'll sell your 12" speakers.  
If you find you don't like the enclosure  
I'll bet you'll have no trouble doubling  
your investment by selling it; people  
are always trying to talk me out of  
my units, in fact I've made over  
a dozen of them in the last couple of years

Rosell E. Dybing

**RADIAL ARM SAW SEQUENCE  
FOLDED HORN TYPE #2A  
BY: CHARLES SKIPP**

**Letter Sheet (plywood) at corners clockwise:**

**Step #1**

Cross cut 4' x 8' sheet separating (A & B) from (C & D) 35 7/8" from sect. (C & D) factory edge with hand saw or equivalent.

\* Using the factory edge properly in the following cuts you will eliminate this edge.

**Step #2**

Rip apart sections (A & B) 22 1/8" from Sect. A factory edge - knerf towards Sect. B.

**Step #3**

Cross rip sect. (A) 15" and mark part #7. SET ASIDE FOR STEP #12. Leave saw set cross cut sect. (B) twice. Mark parts #14.

**Step #4**

Trim last of sect. (B) to exactly 23 5/8" and mark it part #12. Leave saw set and rip sect (C & D) twice (two passes).

**Step #5**

Rip remaining sect (A) exactly 9 1/2" twice (two passes). These are the baffle strips.

**Step #6**

Cross rip sect. (C) exactly 16 1/2" REPEAT (two passes) and mark parts #10 - 13.

**Step #7**

Cross rip sect.(D) 17 5/8". Mark it part #11.

Step #8

Trim (cutting off handcut edge) remaining sect. (D)  $17\frac{1}{8}"$  and mark parts:

8.

-----

9.

Now trim length to exactly  $22\frac{1}{8}"$

Step #9

Now cross rip baffles out of sect. (A) strips:

A)  $17\frac{1}{8}"$  and mark parts 5 & 6.

B)  $12\frac{1}{2}"$  and mark parts 3 & 4.

C)  $5\frac{1}{8}"$  and mark part #2.

D)  $4\frac{1}{2}"$  and mark part #1.

Step #10

E) Set saw angle to  $4^{\circ}$ . Separate parts 3 & 4  $6"$  from part #3 edge.

F) Set saw angle to  $4^{\circ}$ . Separate parts 5 & 6  $5\frac{1}{2}"$  from part #5 edge.

Step #11

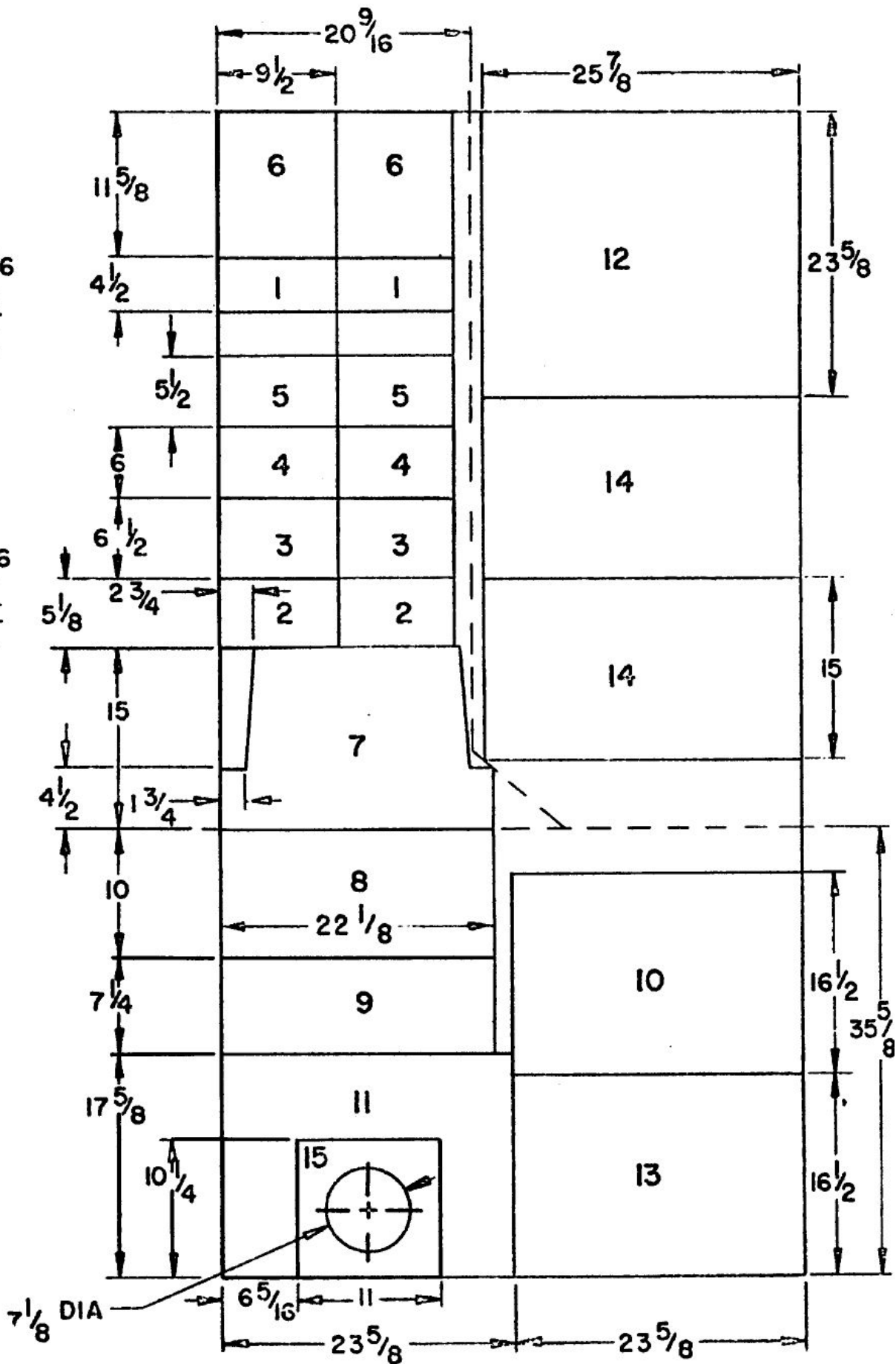
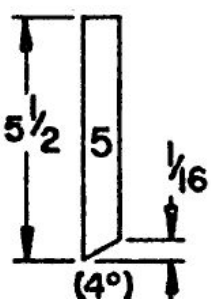
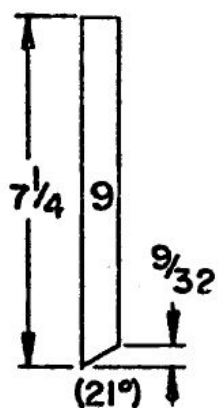
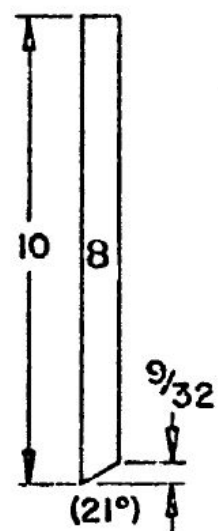
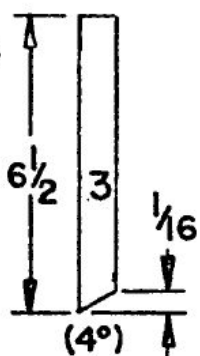
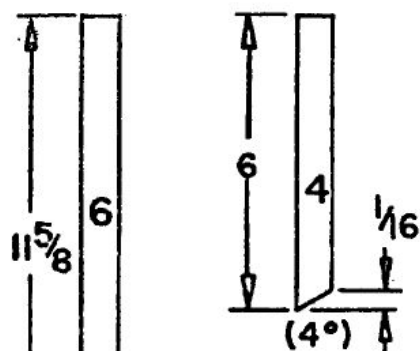
Separate parts 8 & 9. Set saw to  $21^{\circ}$  -  $10"$  from part #8 edge.

Step #12

finish part #7 as per detail:

Step #13

Finish parts # 11 - 15 as per detail:





## CONSTRUCTION DETAILS FOR THE MELLO MONSTER

### SECTION I: LAYOUT

Use a square and pencil, and lightly lay out enclosure parts on the plywood sheet per Drawing #2.

NOTE: It is very important that the parts that are cut are square. Do not rely on the plywood sheet being perfectly square when you start work. Check it first and lay out accordingly.

Cut the four foot by eight foot sheet of plywood into three sections for ease of handling before cutting the actual enclosure parts. This is more important if you are to use a bench saw. Handling the full sheet is quite a job, even with a helper. Cut the three sections as follows:

Cut 35-7/8 inches from one end of the sheet. The piece cut off will make the parts number 8, 9, 10, 11 and 13. Next saw the remaining part of the sheet lengthwise, 20-9/16 inches from one edge down to part number 7. Then saw in at an angle to separate the two pieces. Do not cut off the corner of part number 7. Now take one section of the sheet and lay out the first part. Cut the part out. In this manner cut all the remaining parts. This procedure will avoid error in part size due to the loss caused by the saw cut. Number each part, in accordance with Drawing #2, as you cut. If you are using a power saw, set up the rip fence to the designated dimension and saw the piece. Again let me stress the importance of cutting the parts square. If the parts are accurately cut to size and are square, assembly of the enclosure will be quite simple. Since a folded horn enclosure operates with internal air pressure, all partitions must be joined so as to be air tight. NO CRACKS ALLOWED!

Parts numbers 3, 4, 5, 6, 8 and 9 have one side bevelled as shown on the plan. Scribe a line to the dimension shown on the plan and use a plane to produce the desired angle. For power saw users, the angle for the blade is given on Drawing #2.

Part number 15, the speaker panel, is cut from part number 11, as per the plan. Drill a starter hole in one inner corner, and use a keyhole saw to make the inner cut.

### SECTION II: ASSEMBLY

To prepare for assembly, select part number 13 and part number 7. Lay part number 7 on part number 13 (top surface) and, using a scrap of 3/4 inch plywood as a gauge, locate part number 7 so as to be 3/4 inch in from all edges of part number 13. Drive two finishing nails into the two pieces to hold them together. Next lay the two pieces with the top, part number 13, up.

Dear Audio Enthusiast,

Here are your construction details and full scale layout drawings for building the "MELLO MONSTER". When you are finished with this project, I am certain you will begin to construct the second enclosure to complete your stereo system.

With a properly constructed MELLO MONSTER and an eight inch loudspeaker, such as the MiSco F-8-HF, I believe you will agree with me that no finer an eight inch loudspeaker system exists. In fact, few twelve inch systems will maintain the realistic, musical reproduction of the MELLO MONSTER.

Thank you for your order, and - - - GOOD LISTENING.

R. E. Dybvig

## CONSTRUCTION DETAILS FOR THE MELLO MONSTER

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Remove the nails holding item number 7 to item number 13.

Assemble parts 1, 2 and 3 per drawing #1 and #6. All connections are to be glued and screwed or glued and nailed throughout the assembly. Use plenty of glue to insure a tight job. Here I suggest using finishing nails to hold the parts together until you can drill holes and insert screws. The nails can remain in the parts. In fact, if you wish to save some labor, #8 finishing nails can be used in conjunction with plenty of good cabinet glue to assemble the entire cabinet. I have built some cabinets in this fashion and cannot see but what these cabinets are adequately solid and strong, and the physical effort is certainly much less.

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Connect lead wires to the speaker. Install part number 15 with speaker mounted in cabinet front. TRY OUT UNIT FOR SOUND!

### SECTION III: FINISHING CABINET

There are many ways that this may be accomplished and I am not going to attempt to describe them all. I will, however, describe what I feel is the easiest approach for the do-it-yourself man. This finish requires the application of wood grained formica to the sides and top of the cabinet and the fabrication of a frame for the front of the cabinet to the back of which will be stapled grill cloth which will either contrast or harmonize with the formica that has been selected. See drawing #7.

For those who wish to economize on material, the top and sides of the cabinet could be covered with wood grained paper after the surfaces of the cabinet have been filled and smoothed.

The formica for the top and sides should be purchased cut to the approximate size desired. It is a good idea to get the pieces a little oversize to allow for the finished enclosure being a little out of square. After the formica has been applied to the box, the excess can be removed with a rasp or a file, if the excess is small, or by sawing if the overlap is quite large. A sharp plane will finish up the edges quite nicely. Install the two side pieces before the top piece. Then the top will cover the edges of the sides and the finished job will look better. Contact cement is used to secure the formica to the cabinet. A coat of the cement is applied to both the cabinet and to the piece of formica. I use a cheap paint brush to apply the cement. Allow an hour or so for the cement to dry, then press the formica into place on the cabinet. Once the piece of formica is in contact with the cabinet, it is impossible to re-position the piece, so you must position the piece perfectly on the first try. Some people place wrapping paper on the cabinet, position the piece of formica on top of the paper and then draw the paper out, allowing the cemented surfaces to join. Better have a helper if you try this approach. It is suggested you pre-size the formica pieces so you will have only about 1/32 inch to remove by filing or sanding. Use care in sawing formica as it is brittle and will chip easily. After the formica has been installed and fitted to the cabinet, the front, back, bottom and inside of the cabinet port should be painted black. Screen enamel is recommended for this purpose because it is thin and penetrates the wood, and is less expensive than regular enamel.

Assemble the grille frame using the 1 x 2 pine strip. Make this frame to fit the box front. Should your box not be perfectly square, make your grille frame not perfectly square too. Glue and nail frame together using glue blocks in the corners. When glue dries paint frame black. Allow paint time to dry thoroughly before proceeding to apply grille cloth.

Lay grille cloth on flat surface. Lay frame on cloth. Fold cloth over one side of frame and tack or staple to frame. Draw cloth taut and fasten side opposite to that first tacked. Repeat operation for the remaining sides.

Use finishing nails to fasten frame to cabinet. The nail heads will pull right through the cloth and no show.

The finished cabinet can sit directly on the floor, on low risers, or a low recessed base may be used, as shown on drawing #7.

#### MATERIAL LIST:

1 sheet - 4 x 8 x 3/4 A-D interior plywood

8 lineal feet of 1" x 2" pine strip

Glue as required

2 lbs. #8 finishing nails OR One gross #8 x 1 1/2 F.H. wood screws

Grille cloth 30" x 28"

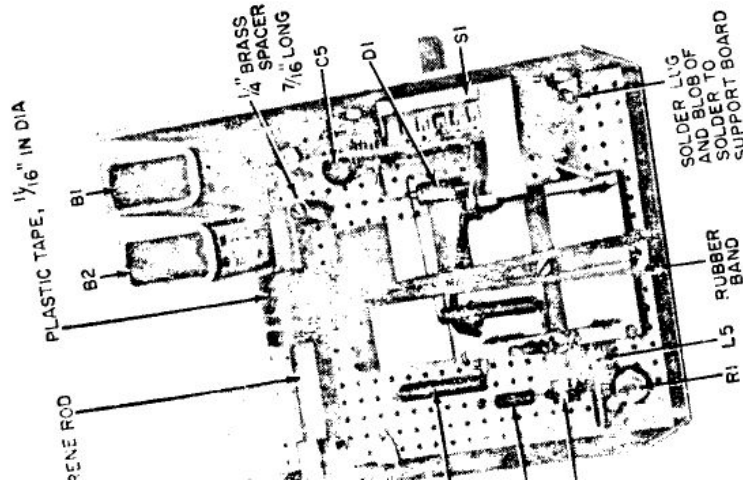
1 loudspeaker MiSco F-8-HF or MiSco F-8-HFD

4 #10-24 x 1 1/2 flathead machine screws

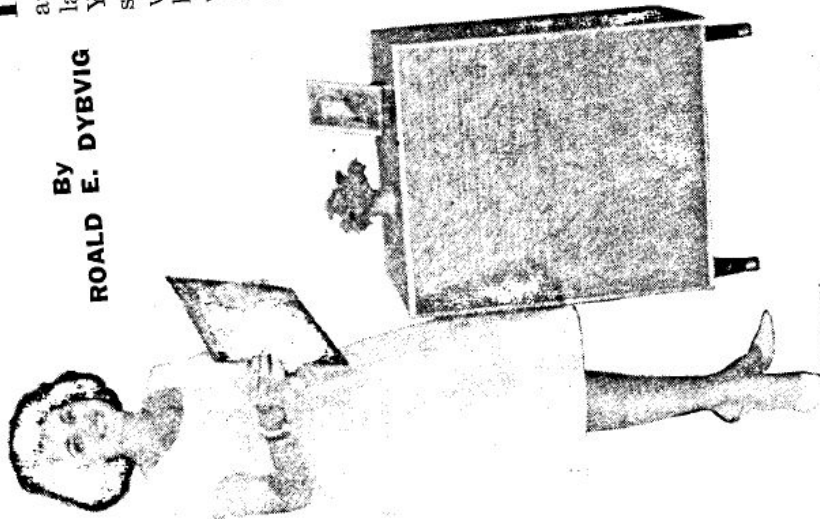
4 #10-24 nuts

1 pint black screen enamel

1 two-connection terminal strip, screw type



wire and wind the other end around the "built up" portion of the phenolic rod. Set the vernier dial to zero and secure the thread with a drop of cement. When the dial is rotated from zero to ten, the slide assembly should move smoothly out approximately 1 1/16". When the dial is turned back to zero, the slide should retract fully. If there is binding, the slide should be filed until the motion is free (a small amount of vaseline may be helpful here). The UHF converter is very easy to use. Connect your present 300-ohm VHF antenna lead-in to the antenna terminals on the 300-ohm twin-lead from the antenna terminals of the converter to the antenna TV set of your TV set. Switch the tuning channel 5 or 6 (whichever is unused in your area) and set the fine tuning potentiometer.



By  
ROALD E. DYBVIG

**H**OW 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 woodworking 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 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

# THE MELLO MONSTER

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

# STRUCTURAL CONCEPTS

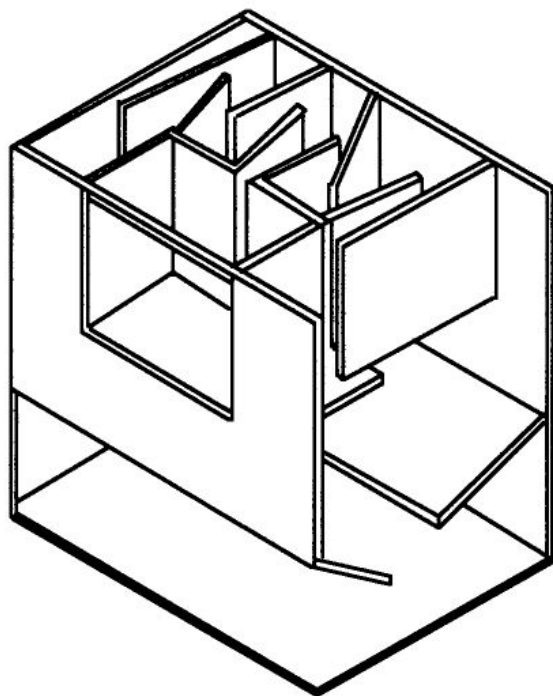
## PRESENTS

**H**ome theater Enclosures for the custom home builder and others interested in home surround sound have resurfaced from the past a design first appearing over 30 years ago Long before digital reproduction and the tremendous improvements in speaker drivers. Why bring back this Folded Horn design? With the growing demand for home theaters and custom homes with built-in "Media Rooms" that's why! No other Enclosure comes close to providing this quality of sound using "disposable" speaker drivers; Yes that's right disposable drivers. Current replacement costs can be less than \$20 dollars per speaker driver. Most speaker systems made today are built under the philosophy of using expensive drivers placed in to veneer covered particle board boxes. When the driver wears out or even worse blows out you

are now faced with a decision. Spend big bucks to buy replacement drivers for your worn enclosures or trash them and start over. Structural Concepts has a better way. Build an Enclosure that is designed and constructed so well (lifetime Warranty) that expensive drivers are not required. The enclosures are constructed of solid 3/4" plywood, plenty of glue and a whopping 176 heavy duty square drive screws. These 80 pound enclosures are virtually indestructible, made to last a lifetime. A proven mathematical design enables this enclosure to reproduce the sound amplification of a 14' horn (megaphone) attached to the speaker. This is accomplished by folding the horn 7 times with a series of 3/4" plywood baffles placed within the enclosures dimensions. With only two inexpensive drivers one an 8" woofer the other a 3 1/2" tweeter you won't believe they

Structural Concepts Home Theater speakers are designed to be your systems front (main) speakers. They require approximately 8 square feet of wall space. You simply won't believe your ears. With the speaker

covers in place you will soon forget the small size of its single bass driver. Its timbre will shake and rattle your bones. These enclosures will eliminate the need for a sub-woofer in most instances. Recreate the sounds action films were meant to have. Definitely not for apartment dwellers or the faint hearted. With this unique design the bigger your home theater is, the better these Enclosures will perform. Because the drivers are small and need little power to operate, they run on almost any receiver. These enclosures are made to be built-in\*, or you can finish them yourself. They will be shipped to you unfinished. Because the drivers are designed to removed from the front



of the enclosure, they are ready for easy installation into your stud wall fully protected from damage due to further construction. Several driver configurations are available. Your enclosures are custom built for you so please allow two weeks for construction and delivery. Return the enclosed card for driver configuration and price list

Basic enclosures starting at:

**\$499** pr

\*Installation / free standing kits optional. For more Information Write to:

Structural Concepts

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