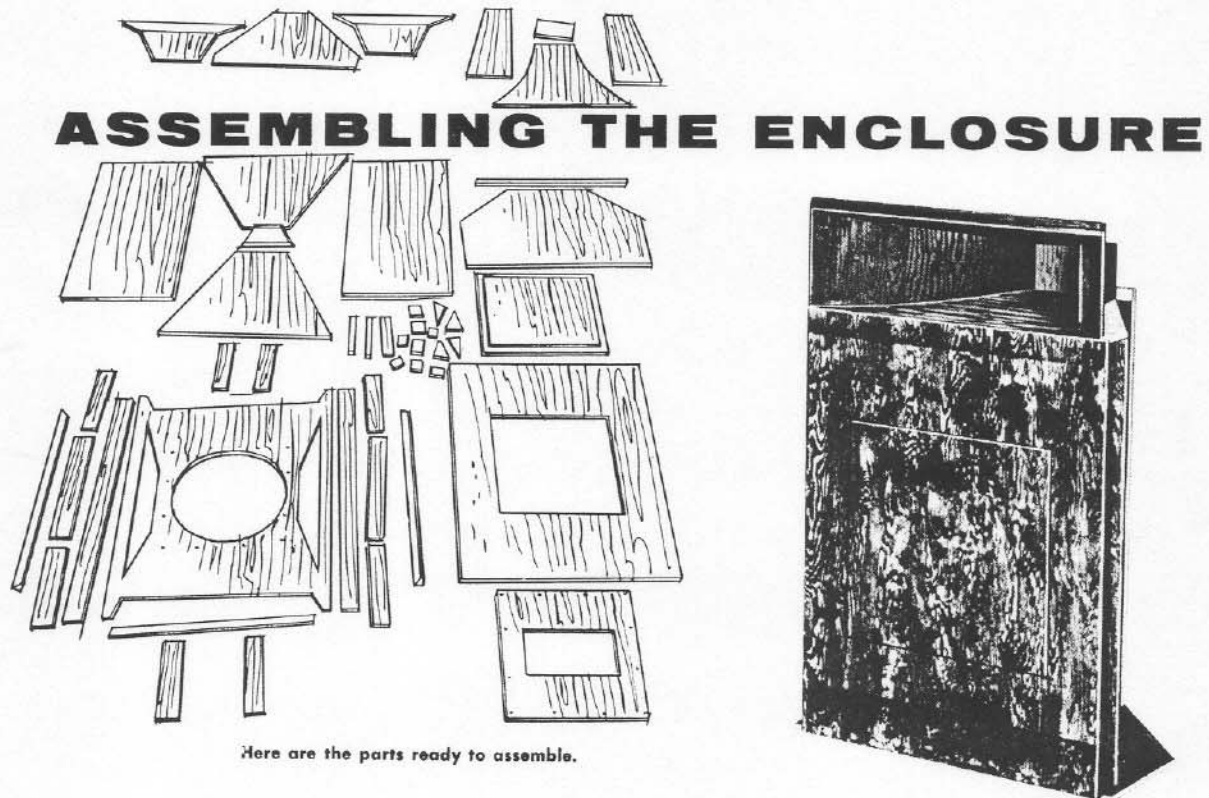


Building a *Patrician IV* FROM STOCK MATERIAL



TOOLS YOU WILL NEED

HAMMER
SAWS—CROSSCUT, KEYHOLE
SCREW DRIVER—PHILLIPS
PLANE
BEVEL GAGE—PROTRACTOR
RULER
PENCIL
SAW HORSES
PLASTIC GLUE
C-CLAMPS
SANDING BLOCK
CALKING IRON
DRILL
BITS
COUNTERSINK
SCREWS—NAILS
CALKING COMPOUND

Electro-Voice® do-it-yourself project



GLUE

The old idea of hot glue and long setting intervals has vanished like most of the other traditional cabinetmaking procedures. Plastic glue comes ready mixed, is squirted out of a nozzle, is spread with your finger, dries slowly if spread thick, and is very patient in the hands of a bungling amateur. If the job goes together wrong, it can be taken apart at once, the glue scraped off with a putty knife, and the whole procedure started over from the beginning. There are a number of plastic glues, one of which is "Elmer's", available at most hardware stores and supermarkets. If you have a preference, use the glue of your choice and apply it according to directions, but remember, the quick setting types don't give you much leeway on pulling plywood panels into position with wood screws.



SCREWS

There is only one reason for using wood screws. The reason—most people don't own a set of cabinet clamps. The screws PULL the panels into position. The glue HOLDS them there. The screws can be taken out after the glue sets with no decrease in holding ability. Phillips head screws are easier to drive in awkward positions, Fig. 12.

The use of nails to draw panels into position is satisfactory if one is very sure of himself. Nails, however, are not easy to release and a rework job quickly takes on complications. The use of snake-tooth or cement coated nails produces a junction which cannot be taken apart. The heads will pull off these nails before they will release their grip. Ordinary, smooth nails do not hold plywood and had best be avoided. The use of nails to tack awkward panels in position while the screws are started is good practice and is advocated. The nails are pulled out when their mission is completed.



PLYWOOD WRAPPING

Side panel 1 will be under considerable tension by the time it is screwed securely to template 25. By the time it is wrapped around top, 15, there will be considerable twist introduced. Let the twist stay for the moment and install back board 9. This piece may have to be hand fitted as the curves of 1 introduce a flare of several degrees. Tap into place, Fig. 13, and when the mating edges have been planed down sufficiently to create a tight joint, secure with glue and screws. This will take away a good portion of the twist. The horn assembly is now positioned and secured to top panel 3. Line carefully and check angles with a square. Use lots of glue.

The battens 25, upper and 2 are now glued and screwed in place. If they do not appear to fit well at first, press into position and the spring in the plywood will fit the contour. Use clamps, Fig. 10 to secure the ends while the glue sets, as screws will not hold so close to the end.

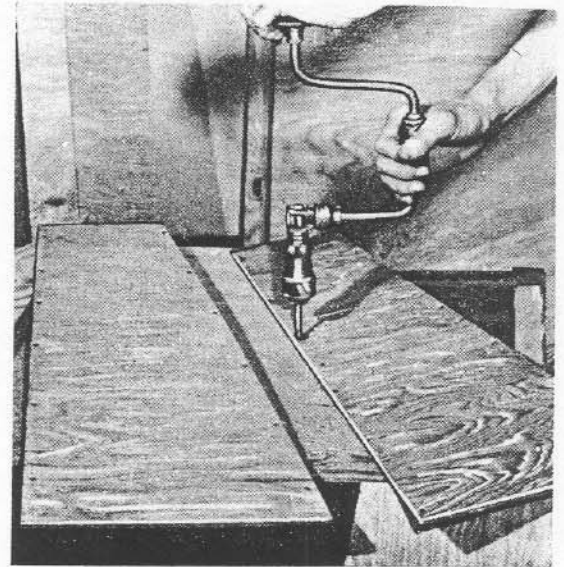


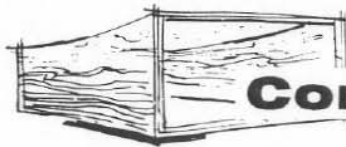
Fig. 11—Countersinking Screw Holes.



Fig. 12—Drawing the Joint Snug.



Fig. 13—Positioning Backboard.



Completing 200-cycle horn

The purpose of the battens is to stiffen the horn walls acoustically so they will not resonate and vibrate like a boat whistle. For this reason, use extreme care and as many screws as are required to pull the battens into positive contact their ENTIRE length. It is now that the merits of Phillips screws become apparent. By using a stubby screwdriver it is possible to seat the batten from the inside of the horn, using the left hand if more convenient. Now, and in all like instances, drill pilot holes for the screws first. If you cut your own parts and the screwholes are not indicated, line up the part between pencil marks and drill for screws as shown further on in Fig. 15, working from the outside. If assembling the kit, you will notice slight variations due to the use of machine fixtures in parts fabrication.

CALKING AIR LEAKS

Bass, or long Sound waves will go through a crack which is water-tight and almost air tight. Ordinarily this wouldn't be of much importance, but in the Patrician the special acoustic design requires good seals for perfection, and you will come mighty close to getting perfection by following instructions. The generous use of glue will take care of the smaller cracks. An additional calking with gummed tape, marine seam-compound or shellac filler will reduce leakage to an unmeasurable point. It is better to go too far than to stop too soon because the Patrician is VERY heavy. If lightly built, it may open up when moved in the usual ordeal of housecleaning. Once open, resealing is not easy. It practically means rebuilding the unit.

THE BASS HORN

While larger and heavier, work goes faster than on the 200-cycle horn, or at least appears to go faster because every piece installed adds considerably to the bulk of the assembly.

You start by laying piece 22, the front panel, across a pair of sawhorses and then position pieces 12, 13, 14, 17 and 18. You will notice there are two or four of most of these, so your stock pile goes down fast right from the start. If you cut them out yourself, position as shown in Fig. 14, mark the outlines with a pencil, Fig. 15 and drill screw holes. Pieces 14 are flush with the edges and can be screwed down first. Glue is smeared on the mating surfaces and the screws are driven up from the bottom. Pieces 12 are flush with the panel opening, and are glued and screwed on next. 13 and 18 are used to complete the assembly. Which goes on first depends upon how you work. 13 can be nailed in place after gluing as it supports no weight, only provides a bearing surface. These "boomerangs" are dead air cavities which increase the enclosed area behind the speaker cone and MUST be calked with extreme care. It is best to calk the lower surfaces from the inside, then finish the outside after speaker mounting panel 21 is in place. As usual, use plenty of glue, and don't be in a hurry.

Pieces 17 are positioned with the ends flush against the center opening and are each seven inches out from the centerline of the panel. That is, they are 14 inches apart from each other.

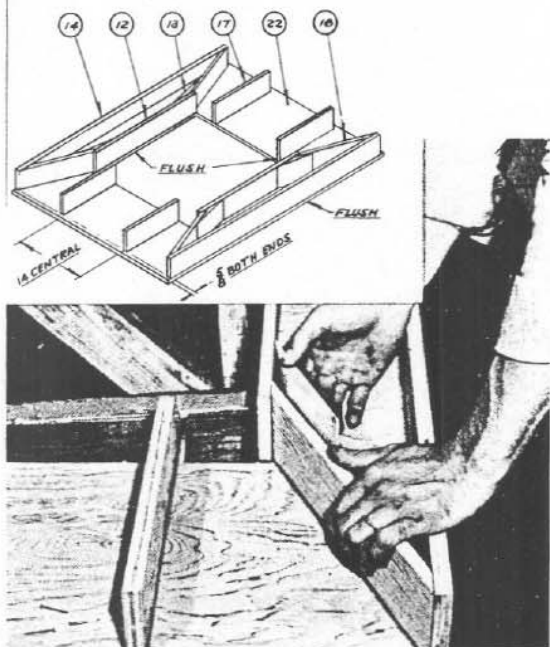


Fig. 14—Laying out parts for marking.



Fig. 15—Drilling for Assembly.

Fig. 16—Constructing the sealed cavity requires all the skill and ability you can muster. Work slowly—carefully and accurately.

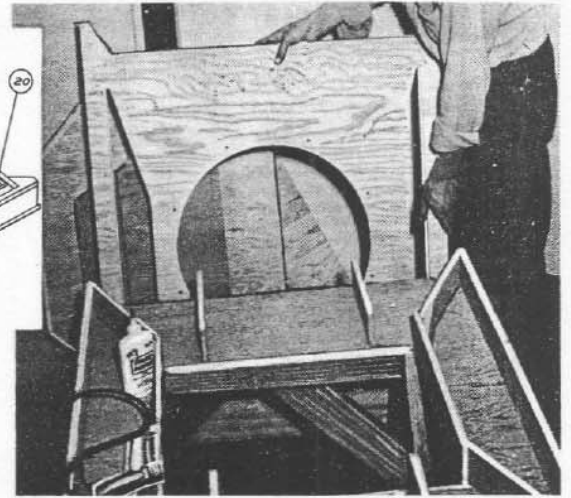
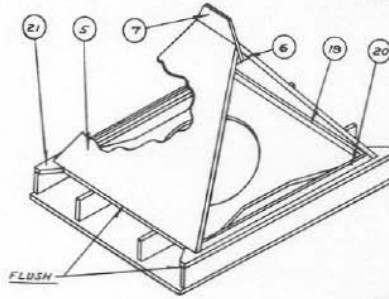


Fig. 17—Panel 21 goes in place first.

DEAD AIR CAVITY (MUST BE AIR TIGHT)

Now you start getting into the dynamics of sound propagation. Behind the speaker cone is a sealed cavity, Fig. 16 which acts exactly the same as the dashpot on a Corliss engine. It is tuned, balanced and regulated to give the exact response desired. Basically it takes the backwash of the speaker cone, stores the shockwave in the form of undissipated energy like a spring, and then uses it to push the cone back to zero position. This becomes an actual visible impulse, because a deep note of sufficient amplitude can pull the cone better than an inch. The return thrust snaps up the cycling and in terms of the hi-fi, puts "soup" into the speaker. Right now all you have to do is create that cavity, and it *HAS* to be AIR TIGHT.

YOU START by gluing and screwing part 21 in place, Fig. 17, making certain the two boomerang cavities are WELL calked. Part 17 requires no calking as it does not separate, only stiffens.

Parts 6, 7 and 5 go together in an unorthodox manner Fig. 18. They could be built up from the bottom, like pitching a roof, but it is easier to put them together from the top, Fig. 19 and lower the assembly in place as a unit. In the kit the edges all have the proper bevel and only need to be matched. If you cut the parts yourself, they may require hand fitting. Start with piece 7. Glue and screw pieces 6 to it, flush with the wide edge. Parts 5 must be matched air tight to the unit 6-7. Let the glue dry before handling the assembly. If in doubt, as you have good reason to be, screw parts 5 on dry, and position on part 21. Edges of 5 should be flush top and bottom. Parts 19 and 20 are sealing battens to which 5 are secured. Lay these in place and clamp; then position 5, tack lightly with casing nails and mark locations of 19 and 20. Remove 5 and clamps and glue and screw 19 and 20 into position. Now position 5, secure with the casing nails and screw down before the glue dries. Calk ALL of the seams, inside and out, as far as possible.

SEALING THE CAVITY is accomplished by installing panels 4. These must first be lightly nailed, Fig. 20 and the joints inside tested with a spatula or feeler gage for angle and tightness. If satisfied they can be drawn up snugly, go ahead and glue and screw, lining up top and bottom ends. Seal and calk to the best of your ability, Fig. 21.

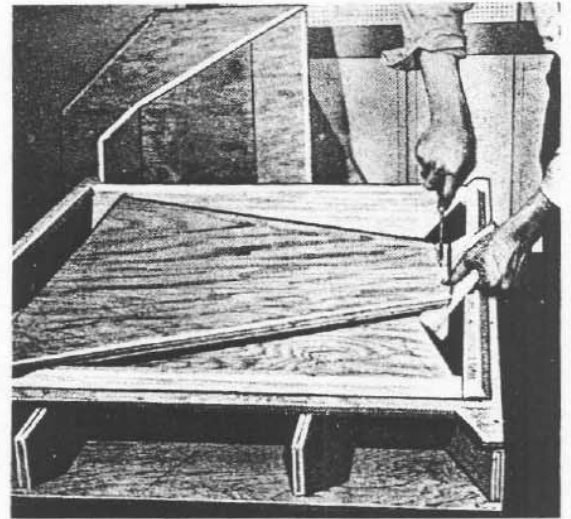


Fig. 18—Screw parts 5, 6, 7 together for a "Dry Fit" check before gluing.

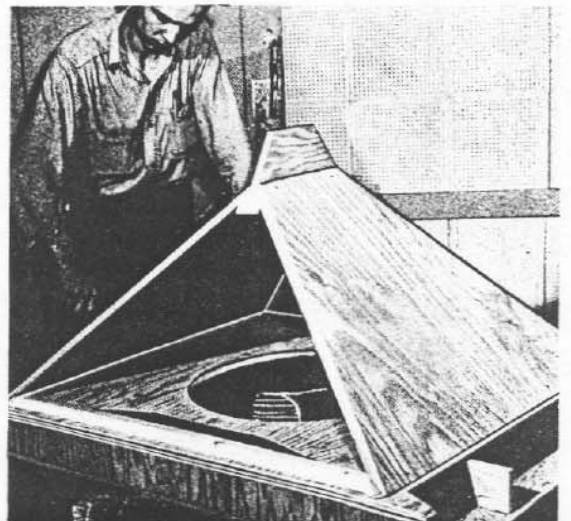
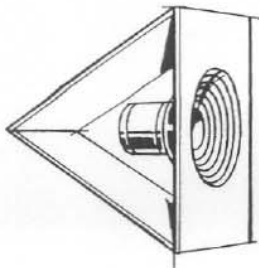


Fig. 19—The Glued Assembly is lowered in place like a Gable Roof.



THE AIR COLUMN

There is six feet of exponential horn folded back on itself within the enclosure. Most of this horn has already developed without your realizing it. By placing pieces 10 and 11, the air column suddenly assumes a recognizable shape, Fig. 22. They are secured to parts 4, in such a way that top and bottom, 3 and 8 fit flush all the way around. This is asking a lot, because there is bound to be a slight warp in at least one of the panels, and it must be drawn snug. What you have to do, is position all the parts so there will be no hand fitting required before they can be secured.

You can't drive nails in unsecured panels 4 due to the spring and bounce, so drill pilot holes for the screws, Fig. 23, tack with nails first, then replace with screws when satisfied the fit is correct. Use lots of glue, Fig. 24 and keep drawing up on the screws, Fig. 25 until the joints are all snug. If two can work on this job, so much the better. It is awkward to hold parts and drive screws with only two hands when one or more panels insist on springing and pulling out the nails. If the spring proves excessive, resort to hand fitting rather

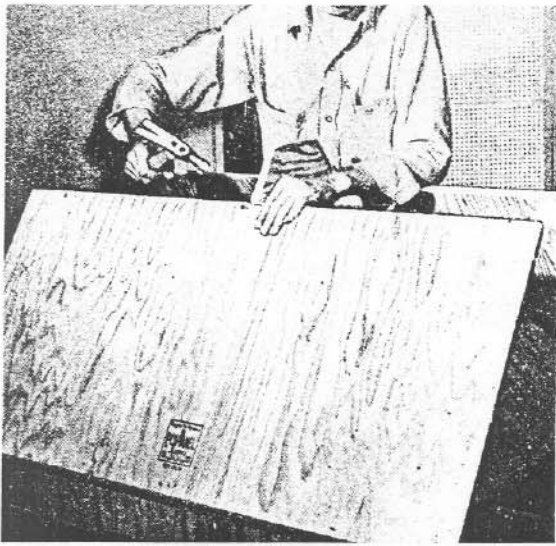


Fig. 20—Test Fitting Panel 4.



Fig. 21—Calking seams with Marine Glue.

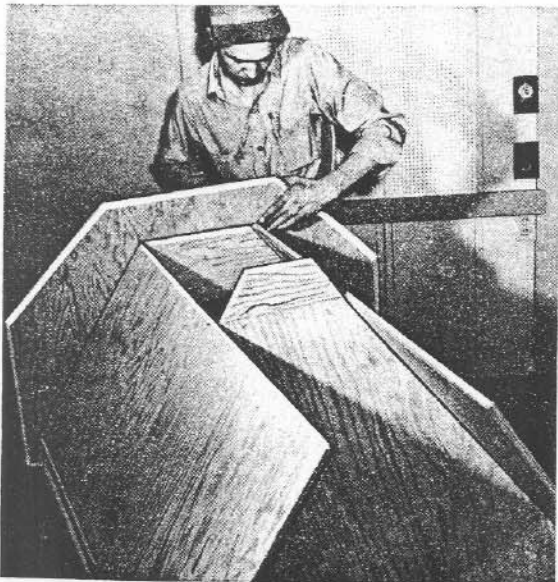


Fig. 22—Checking Bottom Fit.

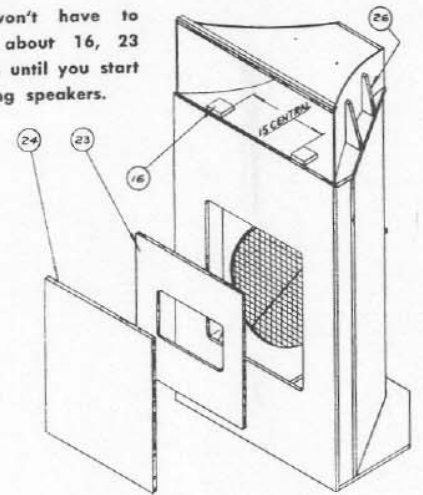


Fig. 23—Drilling for 10 and 11.

than forcing. In most cases the spring is in the panel, itself, not in faulty cutting or jointing. When the screws are once in place, the spring vanishes and the parts line up correctly, or they should, if no error was made in fitting.

When parts 10 and 11 are installed top and bottom, you are ready to seal off the horn and call it completed. Install the bottom, 8, first, Fig. 22. Drive in as many screws as are needed to secure it until the glue holds. Warpage is often bad in large panels, especially in humid weather and it is difficult to predict exactly HOW MANY screws may be needed. Keep inserting them until the bottom fits snug against parts 14, 17, 21, 4, 10 and 11. Calking is not important but do it anyway, just to play safe.

You won't have to worry about 16, 23 and 24 until you start installing speakers.



INSTALLING 200-CYCLE HORN

With the horn already in position on the top, 3, it proves a bit awkward to insert screws in some of the prescribed locations. Counterbore through battons 25, Fig. 26 to enable the screws to sink deep enough to grab. It may be necessary to reach up between parts 17 and 18 to mark the underside of 3 so pilot holes can be drilled in location. You can't reach part 11 at all, and there is really no need to, so smear on lots of glue and let nature takes its course. Part 10 can be screwed up from the bottom.

Before the horn is mounted permanently, remove and install the mechanical fittings as detailed on page 31, Fig. 20. You will use these to secure the speaker units when the time comes.

Now install the top panel, 3, permanently, and once it is in place you have reached the point of no return, your unit is sealed and ready for the installation of the electrical equipment.

There is one optional feature. If the enclosure is to be operated without a cabinet, even for testing, screw a 1 by 10-inch board between 3, 7 and 8, so it acts as a deflector plate for the air column. This board is removed when the enclosure is placed in a cabinet.



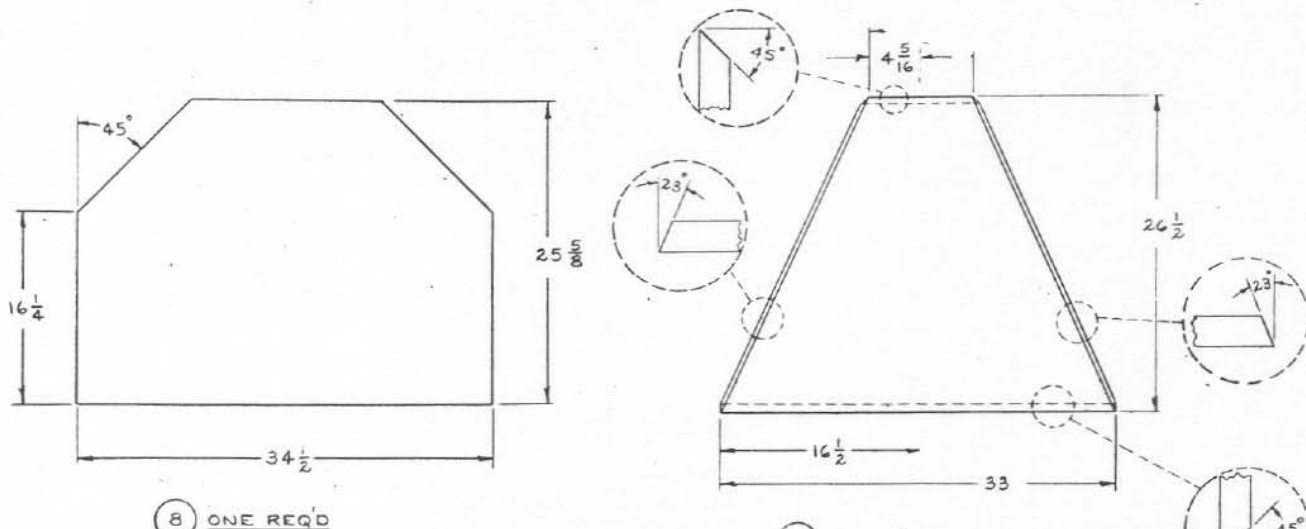
Fig. 24—Prime the joint surface with a thin coating, then put on a thick layer and assemble at once. Plastic glue will set in about thirty minutes.



Fig. 25—Draw up screws till glue squirts out of joint top and bottom.



Fig. 26—Drill holes in 25 large enough to admit screw driver.

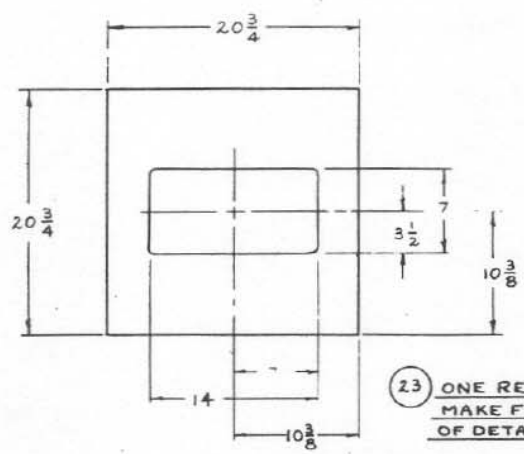


8 ONE REQ'D

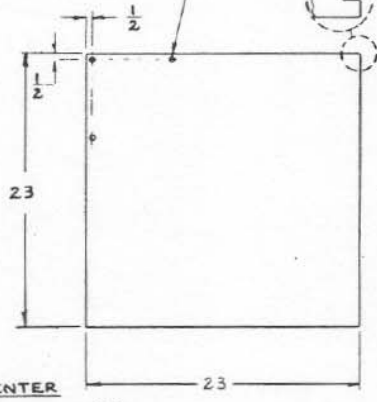
5 2 REQ'D BACK VIEW, FLAT

DRILL FOR WOOD SCREW MIN. #8 & NOT LESS THAN 12 HOLES EQUALLY SPACED

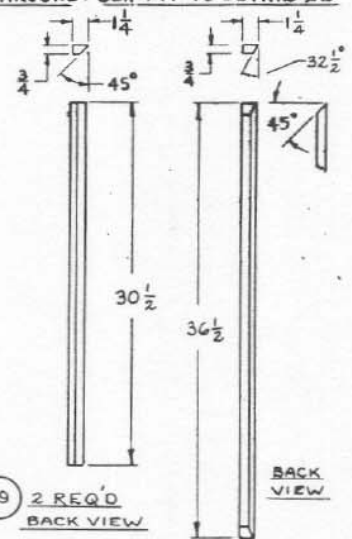
OPTIONAL: LEAVE FULL THICKNESS OR RABBET 3/8" LIP ALL AROUND. SLIP FIT TO DETAIL 22



23 ONE REQ'D MAKE FROM CENTER OF DETAIL 22

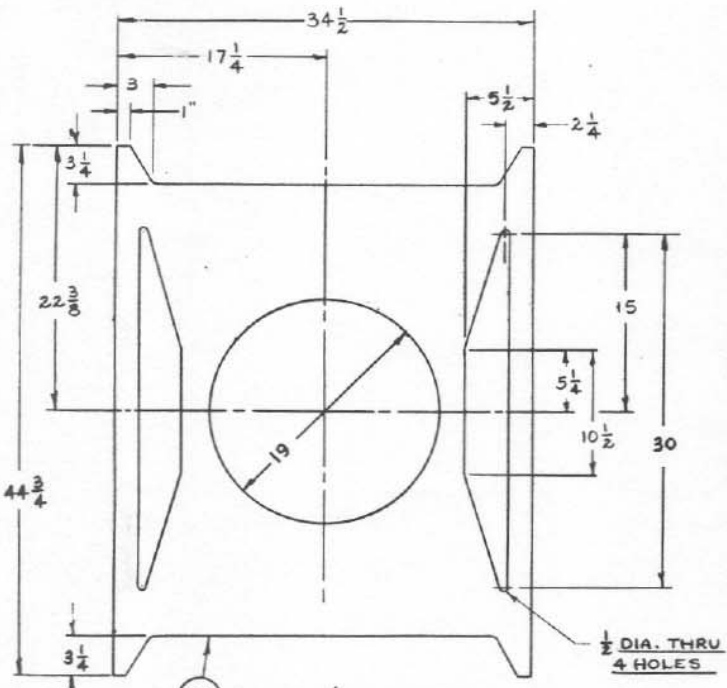


24 ONE REQ'D 3/4 THICK

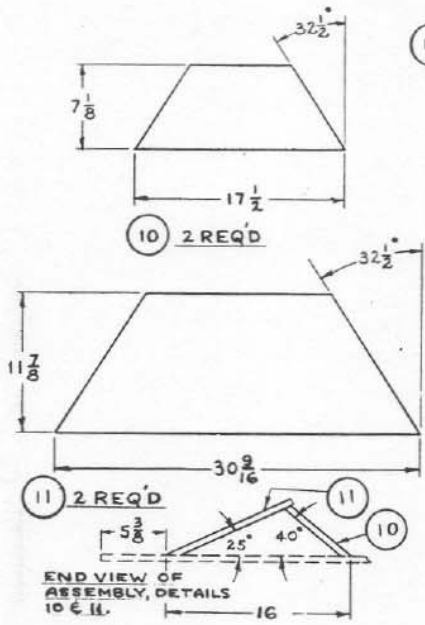


19 2 REQ'D BACK VIEW

20 2 REQ'D



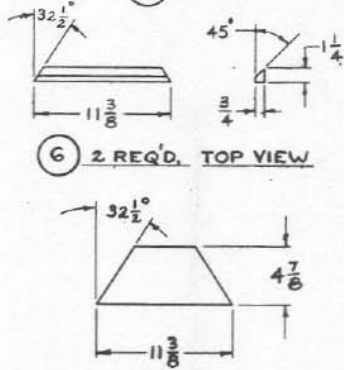
21 ONE REQ'D FRONT VIEW



10 2 REQ'D

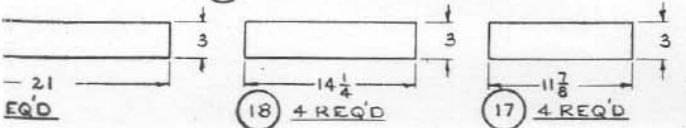
11 2 REQ'D

END VIEW OF ASSEMBLY, DETAILS 10 & 11.



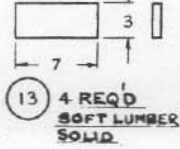
6 2 REQ'D TOP VIEW

7 ONE REQ'D TOP VIEW



18 4 REQ'D

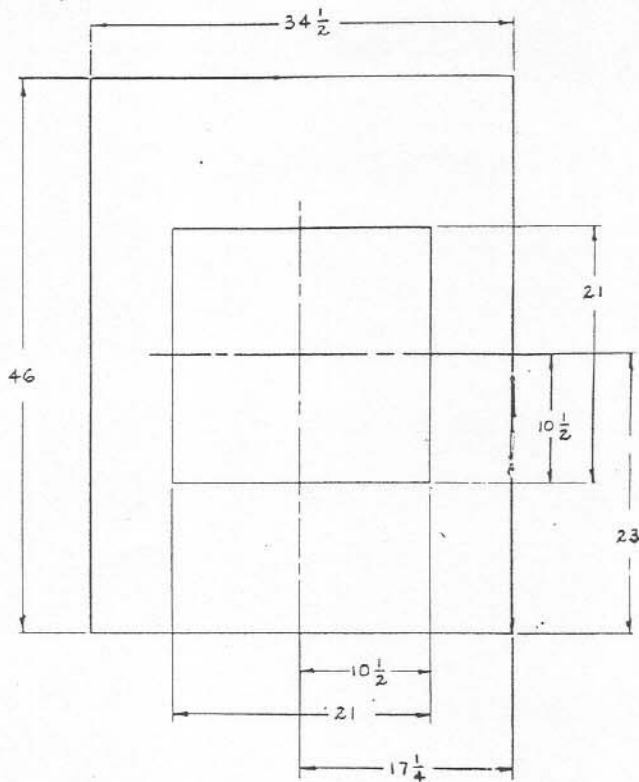
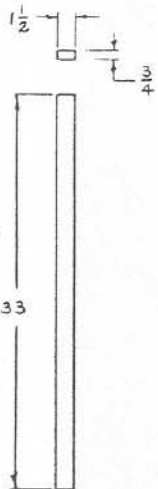
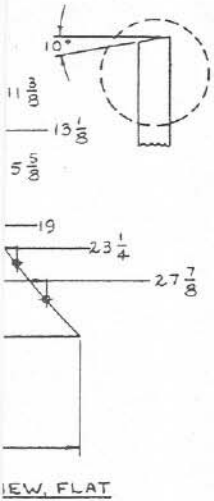
17 4 REQ'D



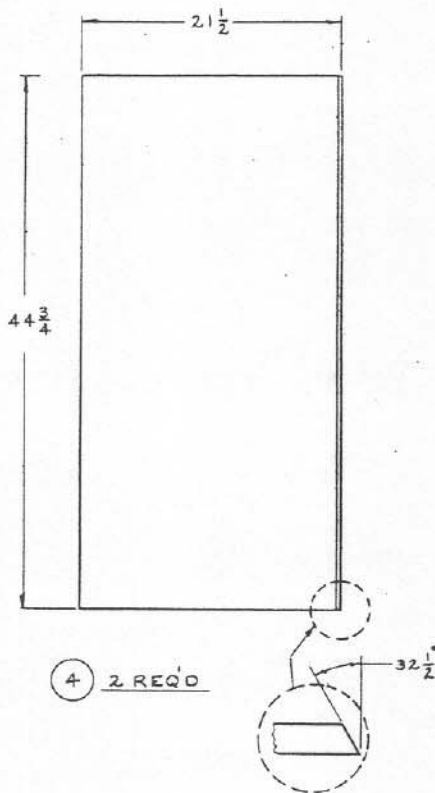
13 4 REQ'D SOFT LUMBER SOLID

PATRICIAN IV

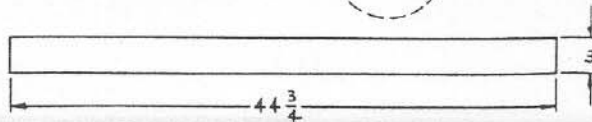
MODEL HOME CONSTRUCTION



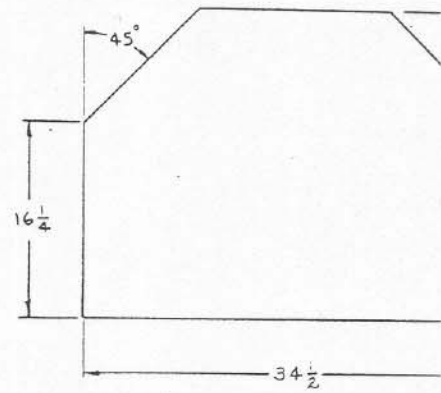
(22) ONE REQ'D



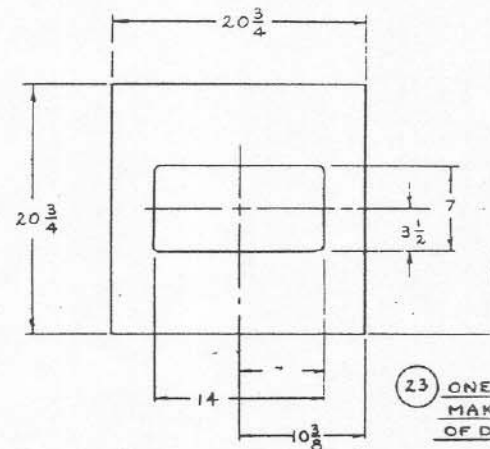
(4) 2 REQ'D



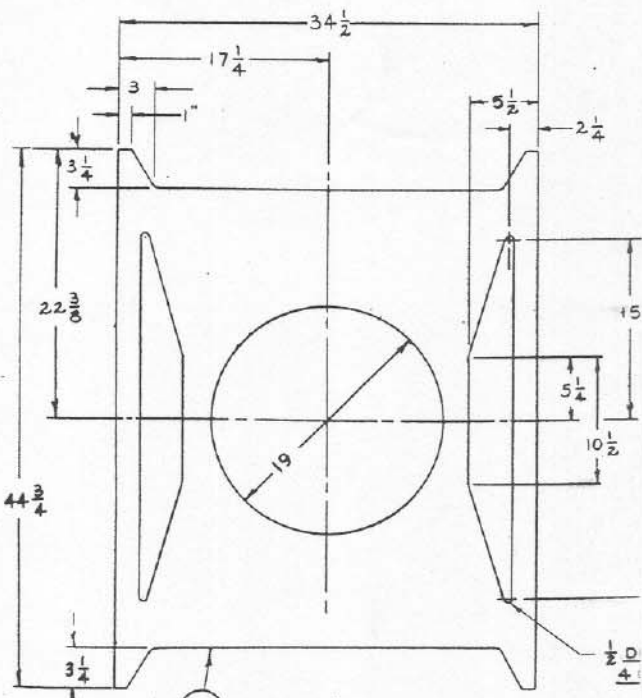
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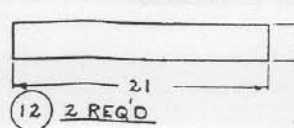
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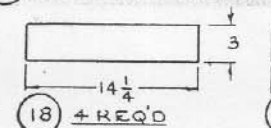
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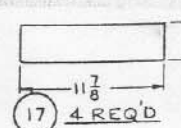
(21) ONE REQ'D FRONT VIEW



(12) 2 REQ'D



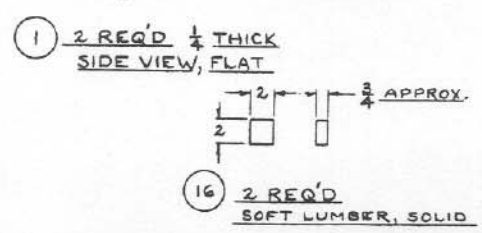
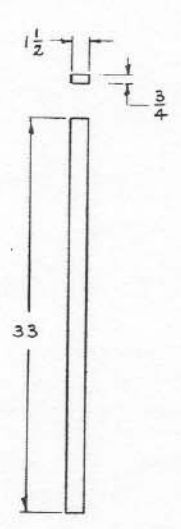
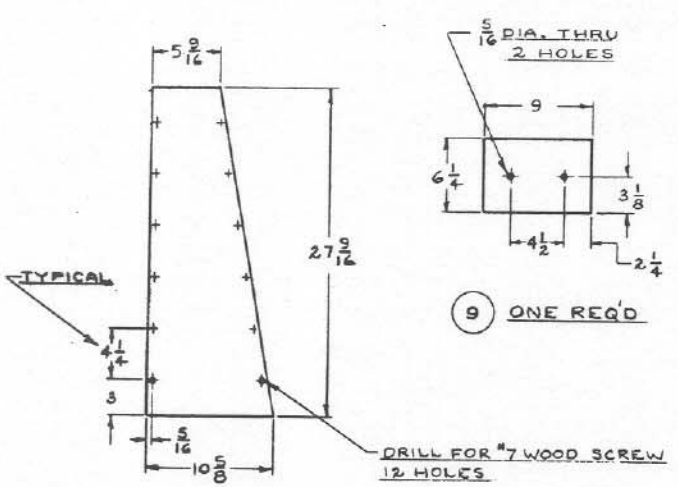
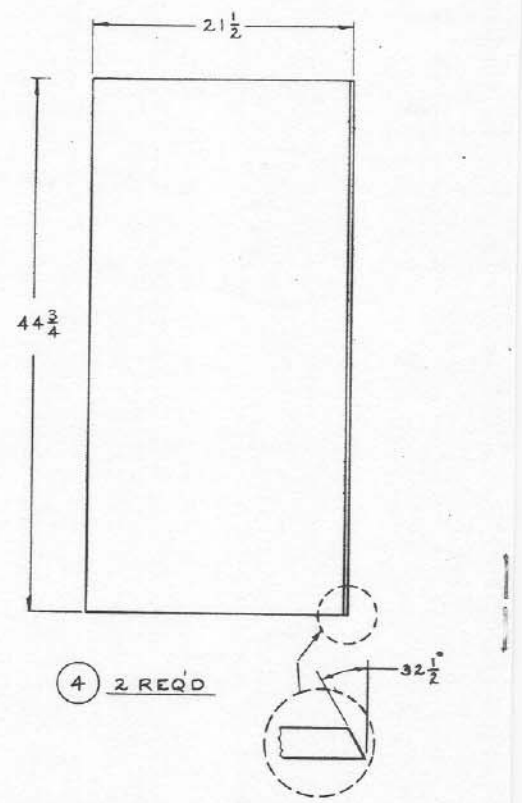
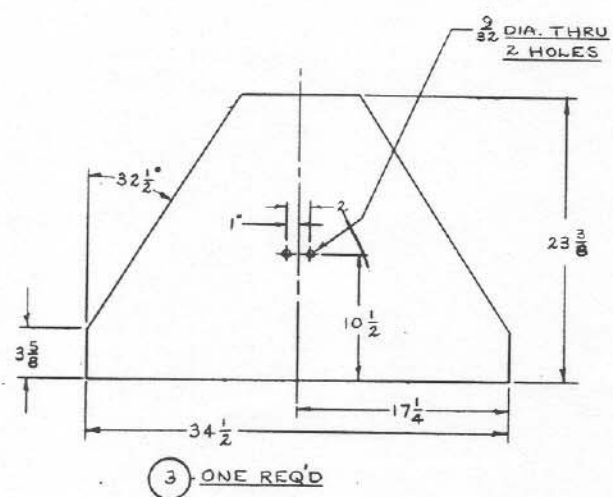
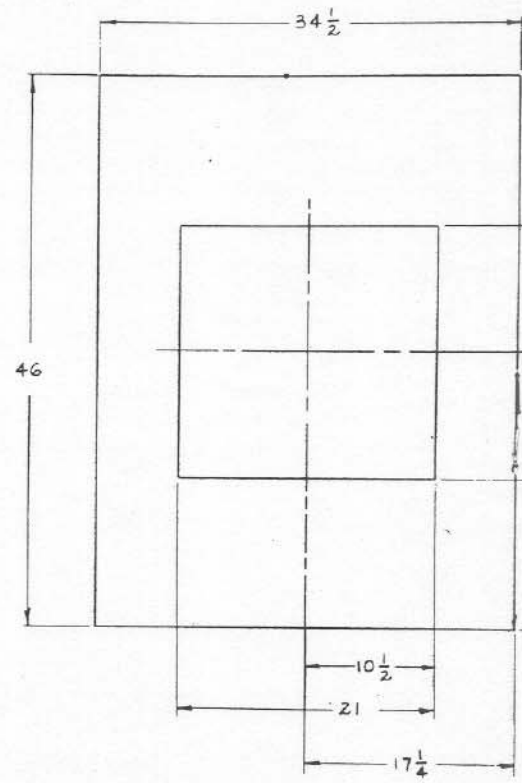
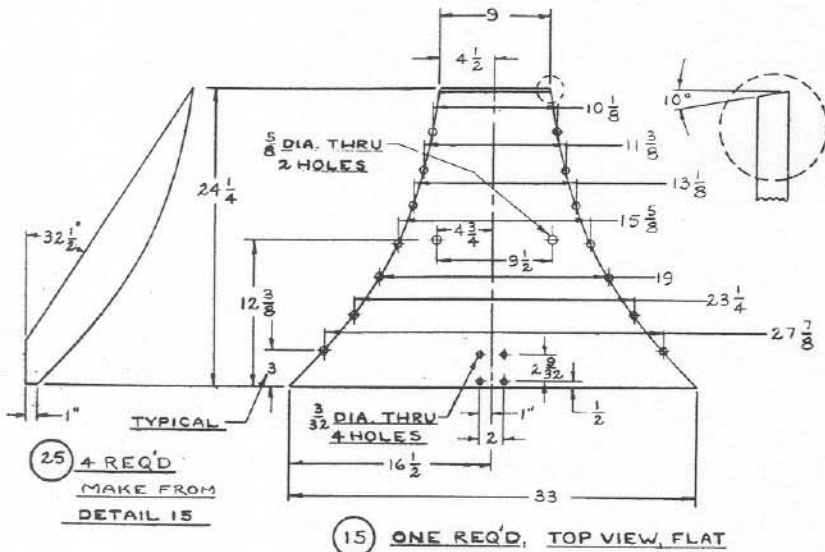
(18) 4 REQ'D



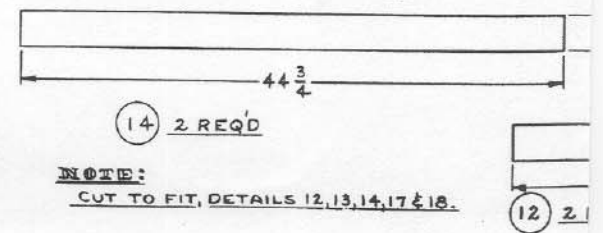
(17) 4 REQ'D

NOTE:
 $\frac{3}{8}$ STOCK UNLESS SPECIFIED.
FIR PLYWOOD A-B, OR BETTER.
ALL DIMENSIONS ARE FINISH.

NOTE:
CUT TO FIT, DETAILS 12, 13, 14, 17 & 18.



NOTE:
 5/8 STOCK UNLESS SPECIFIED.
 FIR PLYWOOD A-B, OR BETTER
 ALL DIMENSIONS ARE FINISH.



NOTE:
 CUT TO FIT, DETAILS 12, 13, 14, 17 & 18.

