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Your Own

# HI-FI

## SPEAKER SYSTEMS

TECHNICAL MANUAL 1060

### 18 SIMPLIFIED Jensen PLANS

COMPLETE INSTRUCTIONS FOR BUILDING SELF-CONTAINED OR BUILT-IN SINGLE SPEAKER AND 2-WAY & 3-WAY SPEAKER SYSTEMS; "DUETTE", BASS-ULTRAFLEX AND BACK-LOADING FOLDED HORN CABINETS. INCLUDES COMPLETE PARTS LISTS AND SPEAKER DATA FOR ALL TYPES OF ENCLOSURES.



TREASURE CHEST



CONCERTO



TV-DUETTE



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IMPERIAL

SELECT THE HI-FI SPEAKER SYSTEM THAT FITS YOUR BUDGET AND SPACE FROM THE PLANS IN THIS MANUAL. HAVE FUN AND SAVE BY BUILDING OR BUILDING-IN YOUR OWN CABINET. COMPLETE YOUR SYSTEM WITH AN EASY TO INSTALL JENSEN AUTHENTIC HIGH FIDELITY SPEAKER KIT.

Authentic  
HIGH-FIDELITY  
"DO-IT-YOURSELF" DESIGNS

by **Jensen**

JENSEN LOUDSPEAKERS - WORLD'S-QUALITY STANDARD FOR MORE THAN A QUARTER CENTURY

PRICE  
50c

KT-31 IMPERIAL  
3-Way Speaker System Kit



### JENSEN IMPERIAL REPRODUCER FREE STANDING TYPE FOR CORNER OR SIDEWALL

The Jensen Imperial is a superlative reproducer of the 3-way divided system type in a large back-loading folded-horn cabinet to provide a reproducing system without compromise capable of the highest degree of high fidelity performance—truly approaching perfection.

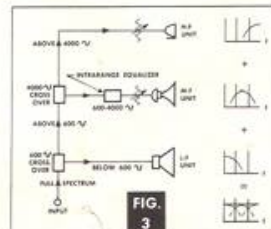
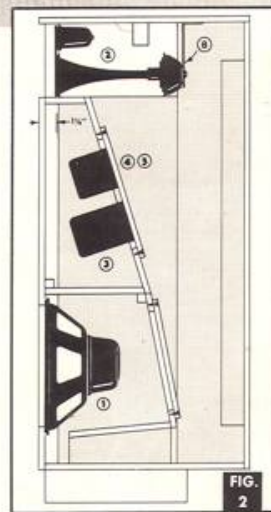
Figure 3 shows how the full music spectrum is first divided at 600 cycles, about an octave above middle C on the piano. All music components below this frequency are passed on to the low frequency unit. All components above 600 cycles are divided again at 4000 cycles—about the highest note of the piano. Everything above this frequency—the rich overtone structure and the fundamentals of many instruments—are passed through a level control to the horn type "super-tweeter." The important middle frequency range—between 600 and 4000 cycles passes through a special balancing and smoothing equalizer and a level control to the horn type m-f unit.

It is widely recognized that such a system must incorporate design-coordinated speaker units for full realization of the potential performance. The Jensen KT-31 Imperial Speaker System Kit illustrated above, includes the units which assembled in the Imperial back-loading folded horn comprise such a system with performance unexcelled. Coded wiring cables and the special mounting brackets are provided for greatest ease in assembly.

The horns for the m-f and h-f units are carefully designed and integrated with the compression driver units to provide wide angular coverage through the entire range. This is accomplished by a special horn flare formula\* similar to that used in the Jensen HYPEX\*\* projectors, famous in the commercial sound field.

The Imperial back-loading folded horn is carefully matched to the special 15-inch l-f unit for reactance annulling, and the horn flare is also of the hyperbolic-exponential family mentioned above. Deceptively simple in construction, this horn makes possible better low end system performance than any other loading system known today. Figure 1 shows the perfectly reproduced waveform of a 30 cycle pure musical tone at a level of 16 watts—well above normal signal level.

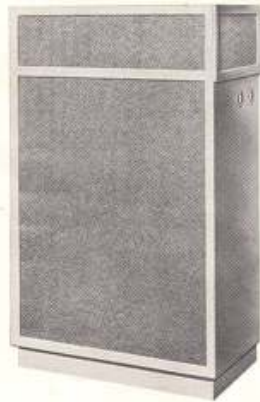
\*\*TM Registered, Jensen Mfg. Co.



MATERIAL LIST			
ITEM	QTY.	MODEL	DESCRIPTION
1	1	P15-L	Special 15" L-F Unit
2	1	—	M-F/H-F Unit Assembly
3	1	A-61	600 Cycle Network
4	1	A-402	4000 Cycle Network
5	1	M-1131	Introrange Equalizer
6	2	—	Balance Controls
7	1	—	Accessory Kit
8	1	—	L Bracket
9	1	—	Input Cable Assembly
10	1	—	8" White Lead Wire
11	1	—	36" 2-wire Cable
12	1	—	10" 2-wire Cable
13	2	—	Solderless Connectors

\*U.S. Patent No. 2,338,262

## BUILDING THE IMPERIAL FOLDED HORN



First study the construction drawings on page 7. The pull-apart drawing shows at a glance how the various parts go together. An important point to remember in building your cabinet is that all joints must be accurately fitted and that it must be made as rigid as possible to obtain the best results. Except for such parts as the base, posts, cleats and stiffening members,  $\frac{1}{4}$ -in. plywood is used throughout. All joints should be adequately glued and if not screwed, nailed securely with 2 $\frac{1}{2}$ -in. finishing nails. A material list appears on page 8.

Begin by cutting out the bottom for the cabinet. The top and sideview drawings give the dimensions to follow in laying it out. You'll note that the bottom of the cabinet is  $\frac{1}{4}$  in. smaller all around than the top to let the sides of the cabinet overlap the edges of the bottom. As with all parts, it is important that the bottom be cut squarely since it must fit the sides and front tightly. Next cut the front panel for the cabinet. This measures 32 $\frac{1}{2}$  in. wide and 41 $\frac{1}{4}$  in. high. As indicated in the top-view drawing, the front overlaps the edges of the sides. The 15 $\frac{3}{4}$ -in. speaker opening is centered in the front panel and on a line 11 $\frac{1}{4}$  in. up from the bottom edge. Use a compass and keyhole saw to cut the speaker opening. Each front corner of the cabinet has a 1 $\frac{1}{2}$ -in. sq. post 48 $\frac{1}{2}$  in. long. Detail A shows how each post is grooved on two faces to receive the notched ends of part A. The grooves are cut  $\frac{1}{4}$  in. deep and  $\frac{1}{4}$  in. wide at a point 8 in. down from the top of the post. These are easily cut by machine with a dado head or by hand with a saw and chisel.

The bottom and front of the cabinet now can be joined together, using glue and screws or nails, and watching to see that the bottom sets in  $\frac{1}{4}$  in. on each side and flush with the bottom edge. This joint should fit tight at all points. Brace the two parts temporarily to hold them at right angles. Like the bottom, each post is placed  $\frac{1}{4}$  in. in at the corners and fastened to the front panel with flat head wood screws from the inside. This should bring the grooves in the posts even with the top edge of the front. Part A is made next. This is 4 $\frac{3}{8}$  in. wide and 31 in. long and has a 1 $\frac{1}{4}$ -in. notch at each front corner to enter the grooves in the posts for a distance of  $\frac{1}{4}$  in. The rear edge of part A is beveled approximately 20°. Now apply glue to the grooves in both posts and along the front edge of the piece and fit it in place. The joint across the front should fit tightly like the others. Screws can be used to draw it up tight.

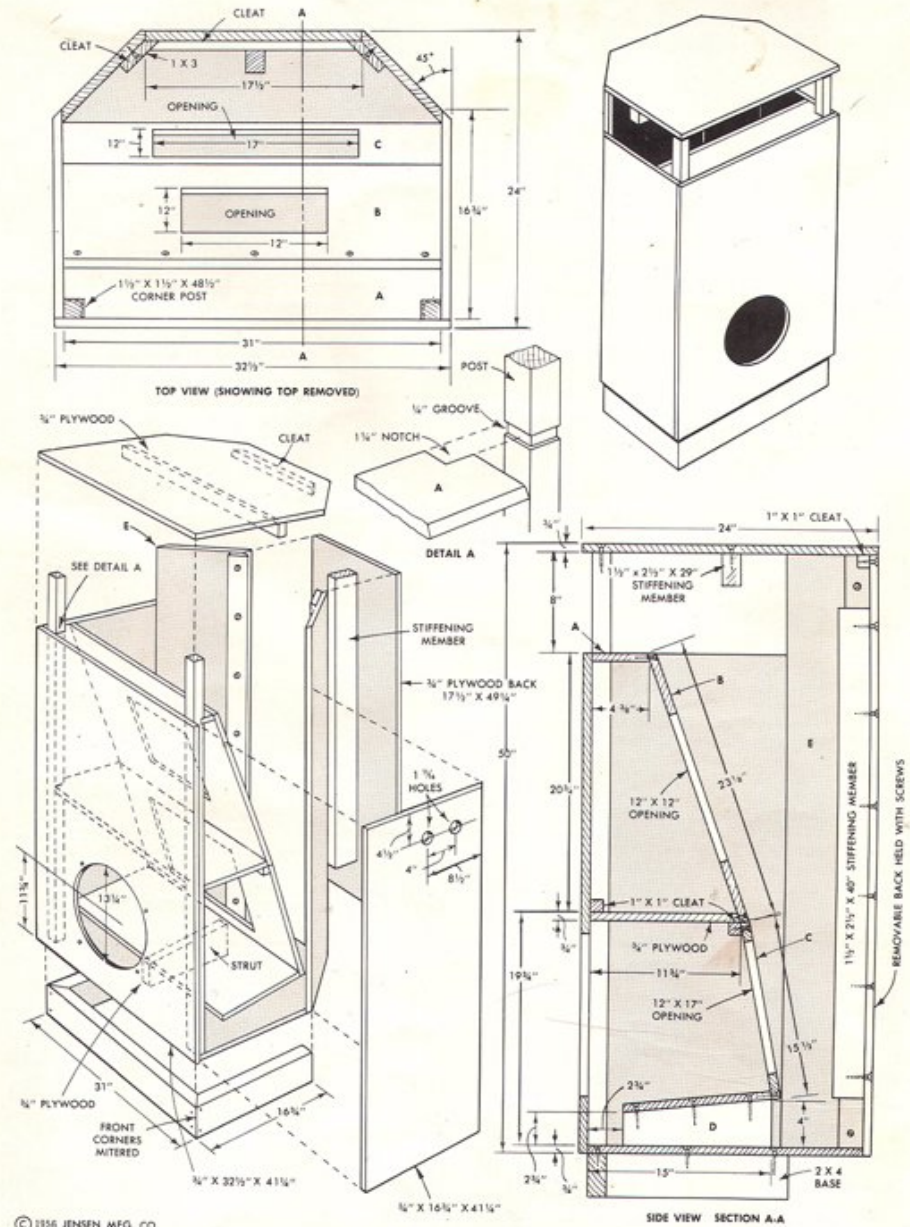
The network and speaker compartments are installed next. The center shelf is made 11 $\frac{3}{4}$  in. wide and 31 in. long. The rear edge is beveled 20 deg. to match the beveled edge of part A, and the two front corners are notched to fit around the 1 $\frac{1}{2}$ -in. posts. Part B measures 23 $\frac{1}{4}$  in. long and 31 in. wide and has a 12-in.-sq. opening cut in the center. Both top and bottom edges of the piece are beveled as shown.

Now lay the cabinet assembly face down. The notched center shelf is attached to the front panel with a 1-in.-sq. cleat which is cut to fit between the posts and glued and screwed at a point 20 $\frac{3}{4}$  in. down from the top edge of the front panel. The notched shelf is glued and screwed in turn to the cleat and posts, after which part B is glued and screwed to the beveled edges of part A and the shelf. At this point it is best to add a side to the cabinet to give support to the bottom. Each side measures the same, 16 $\frac{1}{4}$  x 41 $\frac{1}{4}$  in., and is beveled 45 deg. along the rear edge

to be even with part E. (see top view). Note in the case of the right-hand side that two holes are bored in it near the top for the H-F and M-F Balance Controls. Glue is applied to all surfaces that the side panel will touch and screws or finishing nails are used to fasten it securely.

The lower speaker compartment is added next. Looking at the sectional view you will see that the lower shelf, which is 12-5/16 in. wide and 31 in. long, is held at a slant by center support D. This part is 4 in. high at the rear and 2 $\frac{3}{4}$  in. high at the front and is glued and screwed to the bottom of the cabinet 2 $\frac{3}{4}$  in. in from the front panel. The shelf in turn is butted against the side of the cabinet and screwed to the top of the support. A slight bevel is necessary (approximately 6 deg.) at the back edge. Nails are driven through the side and into the end of the shelf. The speaker compartment is enclosed with a 15 $\frac{1}{2}$  x 31-in. panel, part C, which has a 12 x 17-in. access opening cut in the center. The lower edge is glued and screwed to the rear edge of the shelf, while the upper edge is fastened to a 1-in. (approximately 12 deg.) beveled cleat which is first glued and screwed to the underside of the center shelf. With part C in place, turn the cabinet on its side and install the other side panel, first applying glue to all contacting surfaces. Both sides of the cabinet can be completed now by adding the full length panels, part E. Note in the top view that both vertical edges of these panels are beveled 45 deg. and that rabbets for the removable back are formed with 1 x 3-in. cleats. Like the sides, these panels overlap the edges of the bottom.

The top of the cabinet is of the same shape as the bottom except being  $\frac{3}{8}$  in. larger all around. A stiffening member is added to the underside of the top to increase rigidity and reduce vibration. The top is supported by the posts and parts E to which it is fastened with glue and finishing nails. This leaves the removable back of the cabinet which is held with screws. Like the top, it, too, is fitted with a stiffening cleat placed in the center. Finally, a 1-in.-sq. cleat is fitted across the opening at the top to provide a screwing surface for the removable back panel. The 2 x 4-in. base is optional although it does improve the looks of the cabinet. This may be added at a time of construction when it is convenient to drive screws down through the bottom. Screws in counter-bored holes in the base also may be used to attach it. While not shown in the sectional view, the access openings to the speaker and network compartments are covered with  $\frac{3}{8}$ -in. plywood panels about 2 in. larger in each dimension and which are held with screws. All nail and screw heads can be sunk slightly below the surface and puttied over to conceal them.



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## INSTALLING THE SPEAKER UNITS

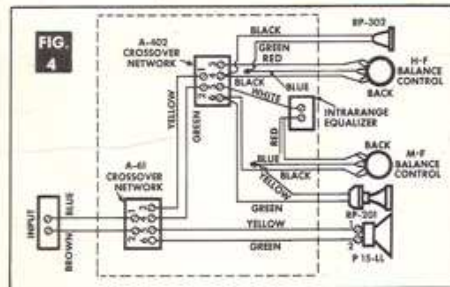
Figure 2 shows the placement of the KT-31 speaker units in the Imperial back-loading folded-horn enclosure. Lay the cabinet on its face and install the P15-LL special 1-f driver unit (Item 1) with terminal screws up by means of 8 #10 x 1 in. long R. H. wood screws and flat washers, tightening carefully to prevent distortion of the speaker frame. Place four marks on the baffle about 1 in. out from the edge of the speaker cutout; these marks will be visible after placing the speaker and makes centering a simple matter. Recommended procedure wherever wood screws are used is to drill small guide holes; this prevents splitting and simplifies tightening. Drill a small hole in the center shelf and pass the 36-in. 2-wire cable (Item 11) through connecting to the P15-LL terminals. Attach the cover of the 1-f speaker compartment securely with 1½ in. long wood screws on approximately 6-in. centers.

Now stand the cabinet upright and install the M-F/H-F Unit assembly (Item 2) with its face approximately 1¼ in. back of the cabinet front using #8 x ½ in. long R. H. wood screws through the front brackets. Remove the center bolt holding the back cover of the larger unit and replace through the long leg of L bracket (Item 8). Fasten the foot of this bracket to the cabinet top with #8 x ½ in. long R. H. wood screws; adjust the horn array for level position and tighten the cover bolt. Drill a small hole near the top of network compartment back (piece B) and pass both cables through into the interior.

Next install the balance control escutcheon cups from Accessory Kit (Item 7) using the small O. H. brass wood screws provided. Place the "M-F Balance Control" cup in the opening nearest the front. Now attach both (Identical) Balance Controls (Item 6) to the cups; lock the M-F balance control so that the knob will be vertical when about at ¼ full rotation and the H-F balance control for about half rotation. Drill a second hole near the top of network compartment back (piece B) and pass both cables through into the interior. Mark *one* cable with knot or tape for later identification. Pull all *extra* cable into the network compartment and caulk all holes airtight with small felt strips.

Fasten crossover networks (Items 3 and 4) and Intrarange Equalizer (Item 5) to the inside of the network compartment cover, using #8 x ½ in. long R. H. wood screws. Place the networks so that all terminal screws are accessible. Drill a small hole through this cover and pass input Cable Assembly leads (Item 9) through from the opposite side connecting to the A-61 crossover network. Connect 8-in. white lead (Item 10) from Intrarange Equalizer to A-402 and 10-in. 2-wire cable (Item 12) from A-61 to A-402. Color-coded wiring diagram, Figure 4, shows proper connections.

Next prop up the cover supporting the networks so that the cables inside the compartment can be attached. Note that one



lead of each balance control is spliced to one lead of a driver unit; twist the wire ends tightly and then simply screw on the solderless connectors (Item 13) tightly.

Now tip the cover into place over the compartment opening and fasten securely with 1½ in. long wood screws. Cut a slot about ½ x 1 in. near the center of the back cover of the cabinet; pass the input terminal strip through the slot and fasten to the outside of the back cover with small wood screws. Fasten the back cover securely with 1½ in. long wood screws on approximately 6-in. centers.

### OPERATION OF IMPERIAL

Simply connect the two input terminals on the back of the Imperial to the 16-ohm terminals of any good quality amplifier. Ordinary lamp cord will suffice for distances up to 50 feet. Because of the high efficiency of the loudspeaker system, only a few watts will be necessary for the usual home listener, but an amplifier with more than enough power is desirable for best

#### MATERIAL LIST

IMPERIAL FOLDED HORN  
FREE STANDING TYPE FOR CORNER OR SIDEWALL  
¾-inch Plywood

1	22½ x 31	Bottom
1	24 x 32½	Top
1	32½ x 41½	Front
1	17½ x 49½	Back
1	4½ x 31	Part A
2	11½ x 49½	Part E
2	16½ x 41½	Sides
1	11¾ x 31	Center Shelf
1	12¼ x 31	Lower Shelf
1	23½ x 31	Part B
1	15½ x 31	Part C
1	4 x 12¼	Part D
Lumber		
1	1½ x 2½ x 29	Top Stiffener
1	1½ x 2½ x 40	Back Stiffener
1	1½ x 3½ x 64½	Base
2	¾ x 2½ x 48½	Cleats
1	1 x 1 x 76½	Cleats
2	1½ x 1½ x 48½	Posts

All dimensions in inches.

results. Power to the speaker system in excess of its 55 watt rating may cause distortion, and if prolonged, possible damage. Amplifiers of greater power rating—say 50 watts—are excellent but should be operated below full power capability.

The balance controls adjust the loudness of the m-f and h-f output. Their setting will vary under different room conditions; for average conditions set the balance control knobs straight up. Check h-f balance setting by rotating counterclockwise to the off position and then advance until the quality of the music "blossoms out" and the presence of the h-f unit is just noticeable. Probably just below this setting will be best. Next check the m-f balance setting in the same way—finally recheck the h-f Balance setting again since it may now be somewhat different. If you are conscious that sound is coming from the h-f unit when listening some distance back, then the h-f balance setting is too high. All this listening should be done with wide range music.

### USING OTHER SPEAKER SYSTEMS

The Imperial folded-horn cabinet is well suited to some other speaker systems as well; it is ideal for the Jensen G-610 TRIAXIAL® which is a 3-way unitary assembly speaker system.

For this application, invert the Imperial enclosure; that is the horn mouth should be toward the floor. This places the G-610 nearer ear level. The base of the enclosure should then be attached to the opposite end from that shown in the drawing. Fasten the crossover-control network to the network compartment cover. The plug and cable assembly can be passed through a notch in the back of the shelf between the speaker and network compartments, and held in place by the covers; caulk with felt if not airtight.

Similarly the Jensen H-530 or any other 15-in. coaxial 2-way speaker may be used in exactly the same way.

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## BUILD-IN TYPE IMPERIAL REPRODUCER

The build-in version of the Imperial back-loading folded-horn has the entire horn mouth opening on the front. Therefore, it is ideal for side wall free-standing use or for integration in storage walls, room dividers or any other arrangement including flush wall installation.

The build-in Imperial is design-coordinated with the KT-31 Imperial 3-way system kit and Figure 1 below shows placement of these units in the enclosure. Attach the P15-LL special 1-f driver unit (Item 1) to the back of the removable speaker baffle using 8 #10 x 1" R.H. wood screws and flat washers. Tighten the wood screws carefully so as not to distort the speaker frame. Next connect the 36-in. 2-wire cable (Item 11) to the P15-LL and pass it up through a hole in the top of the speaker chamber into the network compartment. The circuit details are the same as for the free standing Imperial reproducer, Figure 4, Page 8. Now the speaker baffle can be replaced and fastened securely with wood screws on approximately 6" centers.

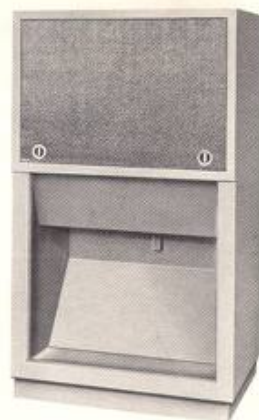
Next the M-F/H-F unit assembly (Item 2) is placed in position with the two feet resting on the triangular supports. The L bracket (Item 8) is attached to the back of the assembly by removing the cover bolt and replacing it through the end slot on the long leg. The foot of this L bracket rests on the fore-and-aft strut in the horn passage. Place the face of the M-F/H-F unit assembly approximately 1¼" back of the horn mouth and fasten the brackets to the supporting members. Adjust the assembly for level position and tighten the cover mounting bolt. Drill a small hole on the sloping panel below the front of the M-F/H-F unit assembly and pass both cables through into the network compartment.

Next install the m-f and h-f balance controls (Items 6 and 7); attach the escutcheon cup to the removable control panel with the

O.H. brass wood screws supplied. Place the "M-F BALANCE CONTROL" cup at the left end of the panel. Using the large lock nuts attach the two identical controls to the escutcheon cups. Lock the m-f balance control so that the knob will be vertical when about at ¼ full rotation and the h-f balance control for about half rotation. Attach the A-61 (Item 3), the A-402 (Item 4) crossover networks and the M-1151 intrarange equalizer (Item 5) to the back of the control panel between the two balance controls using #8 x ½" R.H. wood screws for fastening; place the units so that the terminals are accessible.

Connect 8" white lead (Item 10) from the intrarange equalizer to the A-402 and the 10-in. 2-wire cable (Item 12) from A-61 to A-402 observing the color coding shown in the circuit diagram.

Drill a small hole in the slop-



ing panel at the back of the network compartment; also cut a slot about ½" x 1" in the back panel directly behind this hole. Pass the leads of the input cable assembly (Item 9) through from the back fastening the terminal strip to the outside of the back panel with small wood screws and pass the leads on through the hole into the network compartment. Now pull the slack in all cables into the network compartment and caulk all holes with felt strips so that they are airtight. Prop the control panel up near its final position and connect all cables. Note that one lead of each balance control is spliced to one lead of a driver unit; twist the wire ends tightly and simply screw on the solderless connectors (Item 13) tightly. Next tip the cover into place and fasten securely with wood screws.

The build-in Imperial is also well suited to high quality 15-inch loudspeaker units such as the Jensen G-610 TRIAXIAL® 3-way unitary assembly and the H-530 coaxial. For such units the enclosure should be inverted and the base attached to the opposite end so that the speaker units are near ear level. The photograph at the top of this page shows such an arrangement using the G-610 TRIAXIAL.

Install the 15-in. speaker to the removable baffle; any separate networks are then attached to the control panel. A notch in the partition will permit cables to pass, but this opening must be airtight with the removable panels in place.

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#### MATERIAL LIST

IMPERIAL FOLDED HORN BUILD-IN TYPE

¾-inch Plywood		
1	24 x 36	Bottom
1	25-1/2 x 37-1/2	Top
1	36 x 60-3/4	Back
2	25-1/2 x 60-3/4	Sides
1	3-3/4 x 17-5/8	Part A
1	17 x 36	Part B
1	16 x 36	Part C
1	7-3/8 x 36	Part D
1	15-3/8 x 36	Part E
1	14-1/2 x 36	Part F
1	21 x 36	Part G
1	17-1/2 x 36	Part H
1	6-1/4 x 8-7/8	Part J
2	8-1/2 x 19-3/8	Part L
1	19 x 19-3/8	Speaker Baffle
Lumber		
1	1-1/2 x 2-1/2 x 51	Part K and Back Brace
2	1 x 3 x 17-1/8	Baffle Cleats
1	2 x 2 x 108	Front Stiffener
1	1 x 1 x 204	Cleats
1	2 x 4 x 84	Base

All dimensions in inches

## CONSTRUCTING THE BUILD-IN IMPERIAL

Remember in building the enclosure that all joints must be accurately fitted and that it must be made as rigid as possible to give the best results. All joints should be adequately glued and if not screwed, nailed securely with 2½-in. finishing nails. With the exception of the base, cleats and stiffening members, ¾-in. plywood is used throughout.

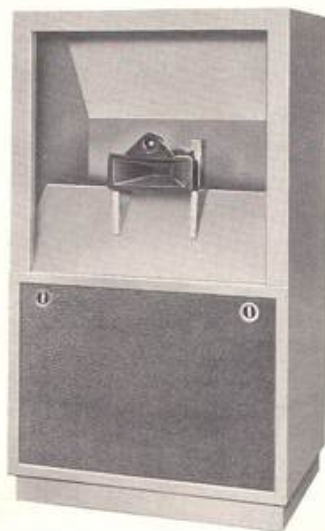
Begin by laying out the bottom. In looking at the side-view drawing, you'll see that the back and front of the cabinet lap the edges at the bottom. This is true of the sides, also. The bottom measures 24 in. wide and 36 in. long. As with all parts, it is important that the bottom be cut squarely since it must fit the sides, front and back members tightly. After the bottom is cut to size, you can add the base. This consists of three pieces of 2 x 4-in. material, two being cut 24 in. long and the other 36 in. long. These are mitered, glued and nailed together at the front corners and then attached to the bottom of the cabinet with screws driven down through the top. After this, a 1 x 1-in. cleat is fitted along both the front and rear edges of the bottom, keeping each cleat flush with the edge. These cleats provide additional support for the back panel and the front members of the cabinet.

The back of the cabinet is made next. This is merely a panel 36 in. wide and 60¾ in. long which is glued and nailed securely to the rear edge of the bottom. Check the two members with a square to see that they are at right angles and then brace temporarily to hold them so. You'll notice that a 1½ x 2½ x 39-in. stiffening member is added to the center of the back, on the inside, 5 in. up from the bottom. Before this is attached with glue and screws, a ¾ x 2½-in. notch is cut in the front edge 9¾ in. down from the top. A 1 x 1-in. cleat fitted across the top on the inside completes the back.

The sides of the cabinet are cut 25½ in. wide and 60¾ in. high. At this stage, one side panel is added to help strengthen the assembly made thus far. Glue and nail this adequately to the edges of both the back and the bottom.

The compartments can be pre-assembled and then installed as a separate unit, or they can be built up, piece by piece, within the cabinet. All the pieces in the speaker compartments are made exactly 36 in. long, the width of the bottom. The side-view drawing gives the widths of the various parts which are keyed to the material list for reference. Start with part A. This is a center strut that supports part B and is glued and screwed securely to the bottom of the cabinet, 2½ in. in from the front edge. Part B is 17 in. wide and 36 in. long and is beveled 7 deg. along the rear edge. Install part B by applying glue and driving nails down into the strut and in through the sides of the cabinet. Cut part C next. This is cut 16 in. wide and 36 in. long and is beveled 35 deg. along the rear edge. A 1 x 1-in. cleat is fastened to the underside along both the front and rear edges, the rear cleat being beveled 35 deg. to match the bevel on part C. Part C is installed 18½ in. up from the bottom and set in ¼ in. from the front edge.

Next, cut and add part E. This is 15½ in. wide and 36 in. long and is beveled 11½ deg. along the upper edge. It is glued and nailed to the edge of part B and screwed to the rear cleat attached to part C. The compartments are completed by cutting parts F and G. Part F is cut 14½ in. wide and 36 in. long and is beveled 55 deg. along the lower edge and 50 deg. along the upper edge. Part G is cut 21 in. wide and 36 in. long and is beveled 55 deg. along the upper edge and 25 deg. along the lower edge. This leaves part H to be fitted across the back of the cabinet at the



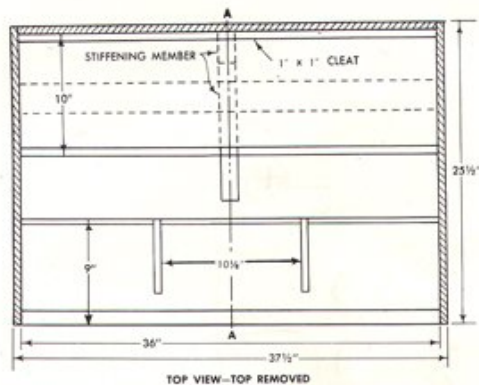
top. This piece is 17½ in. wide and 36 in. long and is beveled 35½ deg. along one edge and 54½ deg. along the other. This is glued and screwed to the back, 14 in. down from the top, and also glued and nailed to the side of the cabinet, driving the nails in through from the outside.

Now place the cabinet on its side to add the other side panel and apply glue to all contacting edges. Nail the side in place from the outside as before. The top measures 25½ in. wide and 37½ in. long and is nailed to the top edges of the back and sides. Parts J and K are added next. Parts J are triangular speaker-mounting blocks, spaced 10½ in. apart, and are fastened to part F with screws from the inside. Part K is a brace that fits the notch in the stiffening member at the back and rests against part G to which it is glued and nailed.

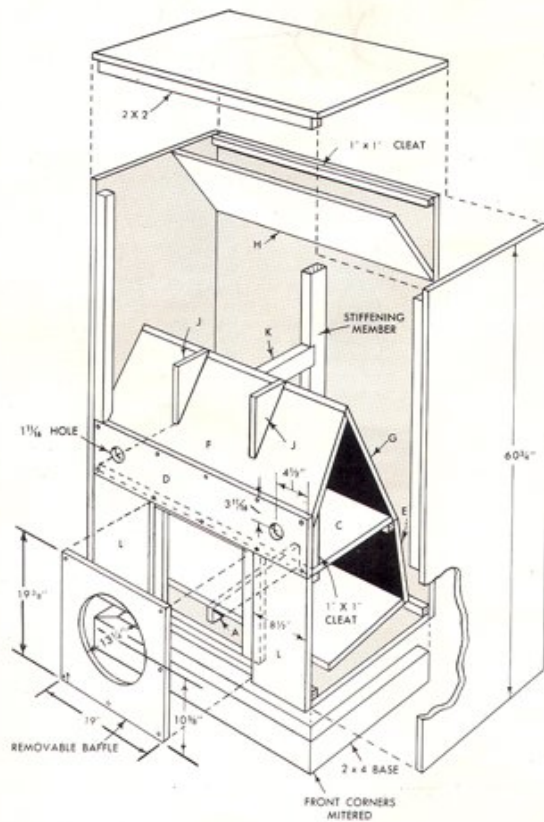
The upper part of the cabinet at the front is strengthened by framing the three sides with 2 x 2-in. pieces, driving the screws into the sides and top from the inside. A speaker-haffle opening is framed in the lower part of the cabinet at the front by adding 8½ x 19¾-in. pieces at each side. These pieces (parts L) are supported at the top by the cleat provided and nailed to the front edge of the bottom. Nails also are driven through the sides of the cabinet. One by three inch cleats, straddling the inner edges of these pieces, provide rabbeted edges to support the removable speaker baffle. These cleats are 17½ in. long and are screwed in place from the inside. The speaker baffle is held with screws only, and the 15¼-in. circular opening is centered at a point 10½ in. up from the bottom.

All that remains is cutting and fitting part D. This, like the speaker baffle, is held with screws only and measures 7½ in. wide and 36 in. long. A 1-11/16-in. hole is bored at each end for controls and these are centered 4½ in. from the ends and 3-11/16 in. down from the top edge. The ends of part D are supported by cleats which are screwed to the sides of the cabinet. Screws are driven into these cleats, as well as into the edges of parts C and F.

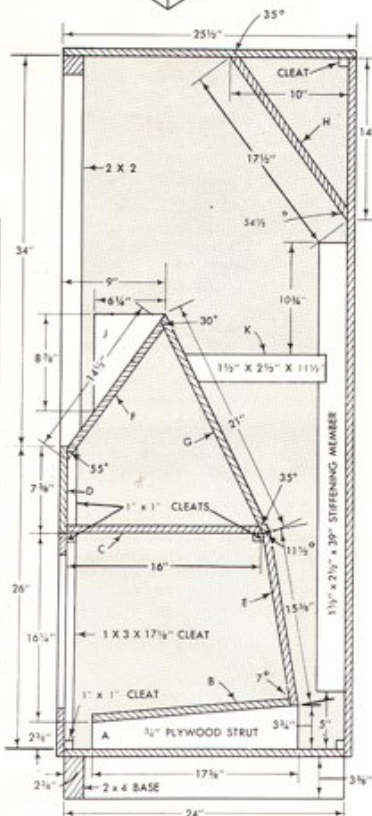
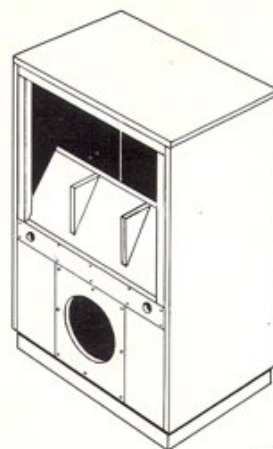
All exposed nail heads and screws can be sunk slightly below the surface and puttied over to conceal them.



TOP VIEW—TOP REMOVED



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SIDE VIEW—SECTION A-A