

You Can  
Build  
Your Own

# HI-FI

## SPEAKER SYSTEMS

### 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



TRI-PLEX



IMPERIAL

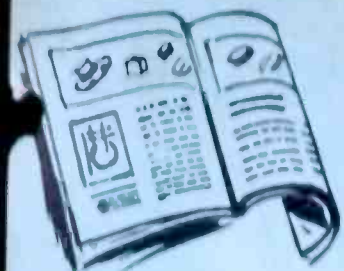
SELECT THE HI-FI SPEAKER SYSTEM THAT FITS YOUR BUDGET AND SPACE FROM THE PLANS IN THIS MANUAL. HAVE FUN AND SAVE BY BUILDING OR BUILDING-IN YOUR OWN CABINET. COMPLETE YOUR SYSTEM WITH AN EASY TO INSTALL JENSEN AUTHENTIC HIGH FIDELITY SPEAKER KIT.

Authentic  
HIGH-FIDELITY

"DO-IT-YOURSELF" DESIGNS

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

PRICE  
50c



# A note about this Manual

This manual has been compiled to meet the needs of all who are interested in the construction of modern authentic high fidelity loudspeaker systems. The architect, contractor, cabinet maker and interior decorator, will find this manual an invaluable guide to the space, structure, components and assembly aspects of fine modern speaker systems.

The enclosure is an important functional acoustic element of the complete speaker system. Enclosure size and acoustic principle must be coordinated with the loudspeaker components in order to secure the best results with the available space and sought-for degree of performance. Of the scores of enclosure types and variations that have been proposed, those advocated in this manual are considered to be the most suitable. They are the up-to-the-minute results of a continuous enclosure research program carried on by Jensen. Individual speaker installations may vary widely as to requirements of space allocation, special appearance features and the choice of free-standing or built-in units. For this reason, the construction drawings are basic and hints as to exterior trim details and permissible size modifications are given.

Choice of the speaker system is made easy by discussion of the relative performance of various combinations of Jensen speakers and speaker system kits in the enclosures suggested for them.

## and a note about **Jensen**

The Jensen Manufacturing Company was founded in 1927 for the original purpose of manufacturing what was then a totally new concept, a "dynamic" loudspeaker with high-efficiency and high power rating. This was an important step toward today's highly developed high fidelity loudspeaker equipment. Since then the Jensen name has been continuously associated with important advances in every phase of loudspeaker research and development.

A large staff of engineers with specialized skills, training and experience devote their full time to our only business—loudspeaker equipment. This specialization has resulted in many Jensen "firsts"—the first high-efficiency direct radiator speaker; the first permanent magnet loudspeaker in the United States; the first bass reflex enclosure design; the first commercial coaxial 2-way loudspeaker; the first "tweeter"; the first unitary 3-way loudspeaker system (TRIAXIAL\*), to name but a few.

Jensen manufactures a complete line of loudspeaker equipment for high fidelity, including complete reproducer systems in cabinets; coaxial and TRIAXIAL\* two-way and three-way unitary speaker assemblies; single-unit direct radiator types; "woofer" and "tweeter" low frequency, mid frequency and high frequency units; crossover networks, level controls, impedance adjusting transformers, and cabinets. Of particular interest to readers of this manual are the new High Fidelity Kits, each of which includes in one package all of the loudspeaker units, crossover elements, mounting brackets, wiring materials and instructions needed to build a high performance hi-fi speaker system. Literature is available without cost describing all of these items.



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# SELECTING THE JENSEN SPEAKER SYSTEM KIT

With the aid of this manual the choice of the proper reproducing system should no longer be a technical problem but rather one based on space and cost considerations. We know of no other enclosures which will offer better performance in a given size category than the ones described in this manual. Choose the largest enclosure you can accommodate whether it be the free standing form or one of the build-in types. This will insure the

best performance at the lower end of the music spectrum; it is essentially true that the larger the enclosure the better the l-f performance. The h-f performance will be essentially independent of the enclosure; the h-f performance is determined by the quality of the h-f units themselves. Therefore, choose the best loudspeaker system kit you can justify for the particular enclosure chosen.

## IF COST AND SPACE ARE UNLIMITED:

Money cannot buy better performance than that of the Imperial back-loading folded-horn enclosure using the KT-31 Imperial 3-way speaker system kit. Choose the free standing enclosure for corner or side wall use or the build-in version for side wall or where it will be built in.

## IF COST IS UNLIMITED BUT THERE IS MODERATE SPACE LIMITATION:

Choose the largest enclosure which can be accommodated and equip it with the best loudspeaker system kit recommended for that particular enclosure. Remember that with the clever use of build-in types you may "discover" more space than you thought available.

## IF BOTH COST AND SPACE ARE SOMEWHAT LIMITED:

Analyze carefully the various enclosures and the loudspeaker system kits. Long range plans may alter the decision in favor of a superior speaker system kit in anticipation of a better enclosure at a later date. Of course, considerable savings will result for the individual who builds his own enclosure. A good "rule of thumb" is to spend at least as much for the speaker system kit as for the amplifier. The best Jensen speaker kits are inexpensive considering the performance possible.

## IF SPACE RESTRICTIONS ARE QUITE SEVERE:

Consider the BASS ULTRAFLEX\* enclosure for 8" speakers and the various Duette\* enclosures and speaker system kits. These designs include forms for bookshelf, as well as chairside tables (also suitable for supporting that table TV set). Analyze also the possibilities of building-in an enclosure — bookshelves, cupboards or chests may be available for easy conversion.

## IF BUDGET IS SEVERELY LIMITED:

Choose the KDU-12 Budget Duette speaker system kit and any one of the Duette enclosures or the Bass Ultraflex enclosures for 8-in. speakers. Here is the lowest cost speaker system that can qualify as authentic high fidelity.

## IF AN EXISTING LOUDSPEAKER IS TO BE USED:

Choose the enclosure recommended for the Jensen speaker system kit most nearly conforming to the existing loudspeaker system. Review the speaker equipment carefully and replace questionable components with Jensen authentic high fidelity components which are available separately.

## IF AN EXISTING CABINET IS TO BE USED:

Analyze its construction and see how you can modify it to incorporate one of the enclosure designs described in this manual. This can perhaps be done without altering the exterior appearance of a valued furniture piece. Choose the suitable loudspeaker system kit recommended for the modified enclosure.

## IF FREE STANDING ENCLOSURES ARE NOT ACCEPTABLE:

This manual describes many ways that superior loudspeaker enclosures fully equal to the free standing types can be built into any available space. Choose the design most suitable for the space and choose the speaker system kit accordingly.

## IF THERE SEEMS TO BE NO SPACE FOR A LOUDSPEAKER ENCLOSURE:

Analyze existing cupboards, chests and cabinets — perhaps that breakfront can be modified to incorporate one of the Bass Ultraflex enclosure designs and still preserve its elegant styling. A portion of a closet or stairwell with a wall common to the listening room may supply space not in active use. Consider also the possibility of a room divider or storage wall — even the build-in Imperial folded horn may prove not too large. Rare indeed is the household where ingenuity cannot find a space for a loudspeaker enclosure.

## IF CABINETS ARE DESIRED FOR THE ENTIRE HIGH FIDELITY SYSTEM:

Architects, interior decorators and custom builders can easily design cabinets for amplifier, tuner, record player and tape recorder. With this manual they can also incorporate a loudspeaker enclosure for exceptional performance — in a size and shape to fit any requirement. With this added "know-how" fine results are assured.

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## SPEAKER SYSTEM SELECTION CHART

Kit or Speaker	Kit or Speaker Price	Enclosure	Approx. Enclosure Size	System Description	Described on Page
KT-31 Kit	\$184.50	Imperial	28 cu. ft.	3-way Divided System Horn H-F & M-F • 15" L-F Large Back-Loading Folded Horn	5, 9
G-610 Speaker	\$252.75	Imperial	28 cu. ft.	3-way Unitary 15" TRIAXIAL* System Horn H-F & M-F Large Back-Loading Folded Horn	5, 9
KT-32 Kit	\$169.50	Triplex	10 cu. ft.	3-way Divided System Horn H-F & M-F • 15" L-F Compact Enclosure	15
G-610 Speaker	\$252.75	Bass Ultraflex—15	10 cu. ft.	3-way Unitary 15" TRIAXIAL* System Horn H-F & M-F • Compact Enclosure	12
KT-21 Kit	\$ 99.50	Concerto—15	10 cu. ft.	2-way Divided System Horn H-F • 15" L-F Compact Enclosure	18
H-530 Speaker	\$129.50	Bass Ultraflex—15	10 cu. ft.	2-way Unitary 15" Coaxial System Horn H-F • Compact Enclosure	12
KT-22 Kit	\$ 73.00	Concerto—12	6 cu. ft.	2-way Divided System Horn H-F • 12" L-F • Small Enclosure	24
H-520 Speaker	\$ 79.50	Bass Ultraflex—15	10 cu. ft.	2-way Unitary 15" Coaxial System Horn H-F • Compact Enclosure	12
H-222 Speaker	\$ 54.50	Bass Ultraflex—12	6 cu. ft.	2-way Unitary 12" Coaxial System Horn H-F • Small Enclosure	21
K-310A Speaker	\$ 37.60	Bass Ultraflex—15	10 cu. ft.	2-way Unitary 15" Coaxial System Cone H-F • Compact Enclosure	12
K-210 Speaker	\$ 24.85	Bass Ultraflex—12	6 cu. ft.	2-way Unitary 12" Coaxial System Cone H-F • Small Enclosure	21

## SMALL SPEAKER SYSTEM SELECTION CHART

Kit or Speaker	Kit or Speaker Price	Enclosure	Approx. Enclosure Size	System Description	Described on Page
KDU-10 Kit	\$ 24.75	Bass Ultraflex—8	2¾ cu. ft.	2-way Divided System Horn H-F • 8" L-F Very Small Enclosure	26
KDU-10 Kit	\$ 24.75	Treasure Chest Duettes*	1¾ cu. ft.	2-way Divided System Horn H-F • 8" L-F Shelf Type Enclosure	28
KDU-11 Kit	\$ 23.75	Table Duettes*	2½ cu. ft.	2-way Divided System Horn H-F • 6x9" Oval L-F Low Table Enclosure	30
KDU-12 Kit	\$ 10.50	Bass Ultraflex—8	2¾ cu. ft.	2-way Divided System Cone H-F • 6x9" Oval L-F Very Small Enclosure	26, 32
KDU-12 Kit	\$ 10.50	Treasure Chest Duettes*	1¾ cu. ft.	2-way Divided System Cone H-F • 6x9" Oval L-F Shelf Type Enclosure	28, 32
KDU-12 Kit	\$ 10.50	Table Duettes*	2½ cu. ft.	2-way Divided System Cone H-F • 6x9" Oval L-F Low Table Enclosure	30, 32

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# USING THE SPEAKER SYSTEM SELECTION CHARTS

The charts on page 3 are designed to assist in the selection of the best loudspeaker reproducing system your money can buy. Here we list the speaker system kits and outstanding unitary TRIAXIAL\* and coaxial speaker assemblies and associate them with the recommended enclosure types. The various speaker units and their enclosures should be carefully design-coordinated to insure the great satisfaction of fine music reproduction — here are such systems for "authentic high fidelity".

The systems are rank-ordered as nearly as possible according to their excellence. To the column showing price of speaker units

must be added the enclosure cost to obtain your total expenditure.

The column headed "Approx Enclosure Size" is important as a guide to space requirement or to choose the best system for the space available. It is the total exterior volume required (not the interior volume of the enclosure). Note that in many cases the shape can be chosen to meet any particular need.

A column "System Description" outlines size and type of speaker units as well as enclosure types. Finally a column shows where the enclosure details appear in this manual along with the installation and connection information for the system

## ABOUT LOUDSPEAKER ENCLOSURE CONSTRUCTION

Perhaps the most important single factor in loudspeaker enclosure construction is rigidity. The loudspeaker baffle is *not* a sounding board such as used in a piano or violin to amplify the sound but rather it is a device for controlling the *sound waves* created by the loudspeaker unit. Any vibrations in the cabinet structure absorb power and reradiate sound waves of their own at certain frequencies. The result may be rattles or at least response variations due to interference patterns. Therefore, the use of thicker materials is recommended or, better yet, adequate use of bracing cleats of solid lumber. The plans in this manual show  $\frac{3}{4}$ -in. plywood for all enclosures except the very small ones used with 8-in. l-f units where  $\frac{1}{2}$ -in. material will suffice. Bracing cleats are best used turned on edge for greater stiffness. These cleats should be fastened securely with glue and screws. The best test for adequate rigidity is to thump the center of all panels with clenched fist; a vibrating panel will quickly reveal its existence by the hollow, drummy sound indicating that further bracing is necessary.

In all enclosure designs joints should be air-tight. Recommended procedure is a liberal use of glue and wood screws for pulling joints tight. This is particularly important in horn type enclosures. Caulk all joints after the enclosure is completed with a material such as linoleum cement which will not become brittle with aging.

Avoid any restrictions, cavities or openings which are not specifically called for in the enclosure plans. These create resonance effects which destroy realism in the reproduced signal. Enclosures of peculiar shape may have resonance effects often called organ pipe effects at some frequencies, these are the result of "standing waves". The use of absorption material (specified in some plans) will eliminate any ill effects. Absorption material should be located at the ends of the longest dimension which forms the "organ

pipe". No absorption material is necessary or desirable in horn type enclosures.

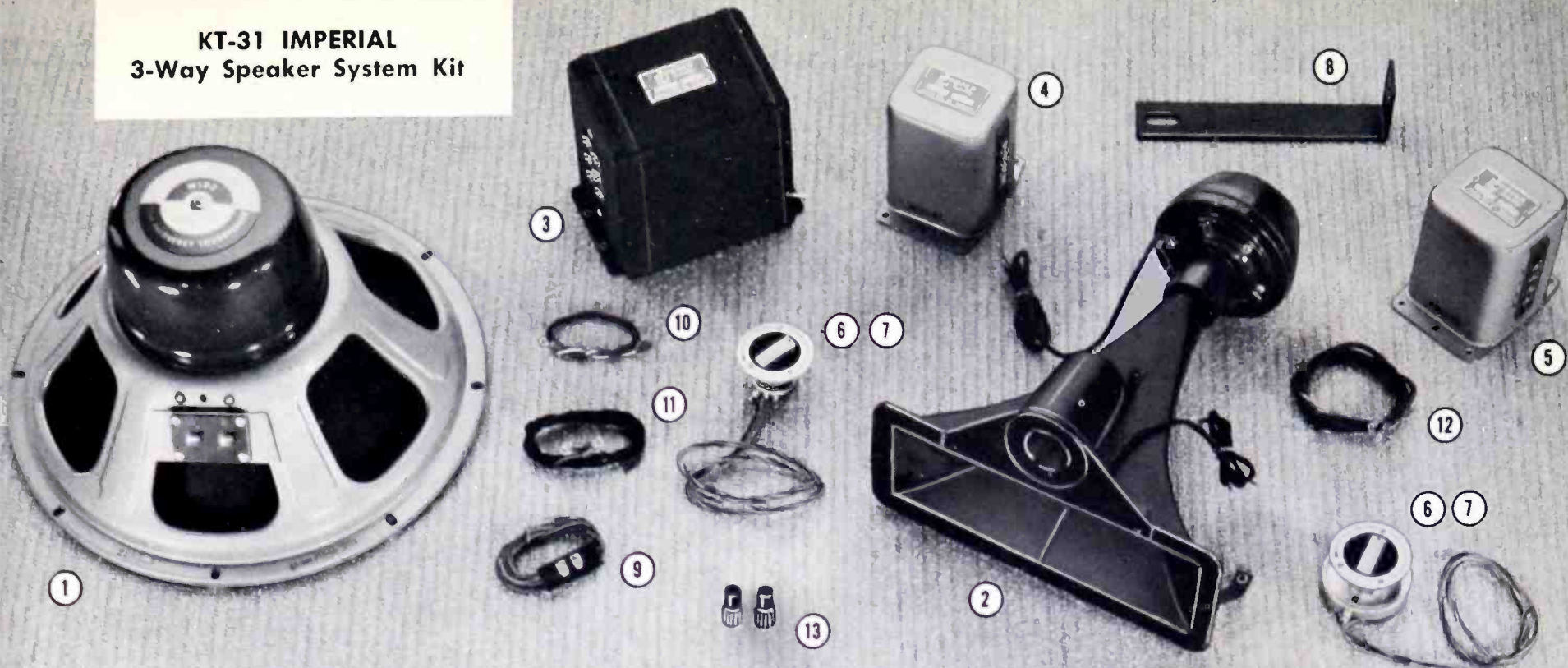
A section near the back of this manual describes techniques for dressing up the enclosure for better appearance. Obviously it is difficult to make fine furniture without the proper tools, but building a good loudspeaker enclosure from the performance standpoint is not difficult. Fine woods, veneers and solid material can be used with proper finishing techniques to great advantage. Judicious use of grille cloth, metal grilles and trim moldings will do a great deal in improving appearance. The interior of the enclosure may be treated with a sealer such as shellac to prevent moisture absorption and thus prevent warping and splitting of the wood. No other finish is necessary on the inside of the cabinet.

The loudspeaker unit should be fastened tightly to the speaker cutout so that no air can leak through from front to back of the speaker. Most speaker units are provided with a sealing gasket to implement this procedure. Do not use flexible mounting supports for the loudspeaker unit. If you do encounter feedback, either mechanical or acoustical, use shock mounts on your other equipment rather than on the speaker unit. The use of shock mounts or the existence of air leak around the speaker will substantially impair the performance characteristics of any good enclosure design.

Note that the loudspeaker enclosure is a very definite part of the reproducing system at the lower frequencies and the particular design is directly related to the loudspeaker unit. The performance of high frequency units is essentially independent of the enclosure except for secondary effects. The h-f units are usually of the horn type. Attach them tightly to the enclosure so that no air can leak at these points; use gaskets of felt if necessary. Any leaks here will impair the performance of the l-f unit-enclosure combination.

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**KT-31 IMPERIAL  
3-Way Speaker System Kit**



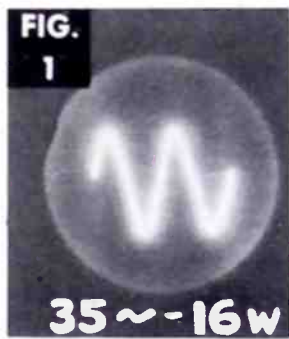
**JENSEN IMPERIAL REPRODUCER  
FREE STANDING TYPE FOR CORNER OR SIDEWALL**

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.

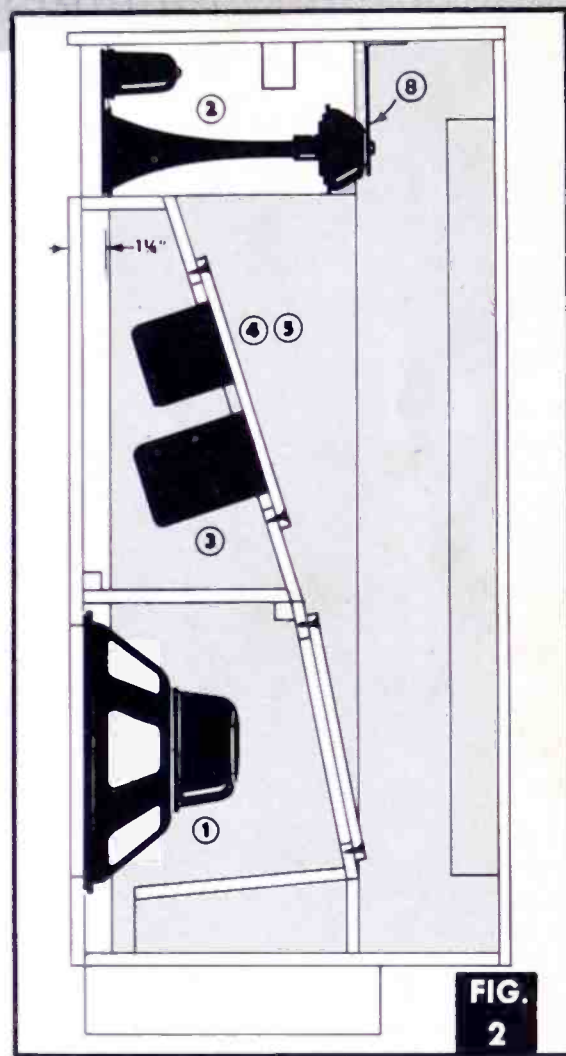
It is widely recognized that such a system must incorporate design-coordinated speaker units for full realization of the potential performance. The Jensen KT-31 Imperial Speaker System Kit illustrated above, includes the units which assembled in the Imperial back-loading folded horn comprise such a system 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.

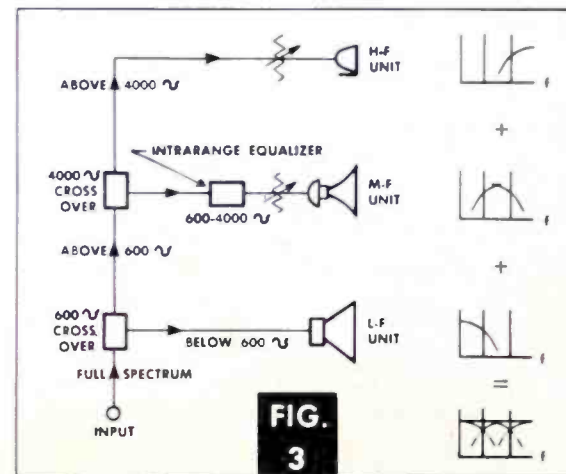


The Imperial back-loading folded horn is carefully matched to the special 15-inch l-f unit for reactance annulling, and the horn flare is also of the hyperbolic-exponential family mentioned above. Deceivingly simple in construction, this horn makes possible better low end system performance than any 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.

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MATERIAL LIST			
KT-31 IMPERIAL 3-WAY SPEAKER SYSTEM KIT			
ITEM	QTY.	MODEL	DESCRIPTION
1	1	P15-LL	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

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## BUILDING THE IMPERIAL FOLDED HORN

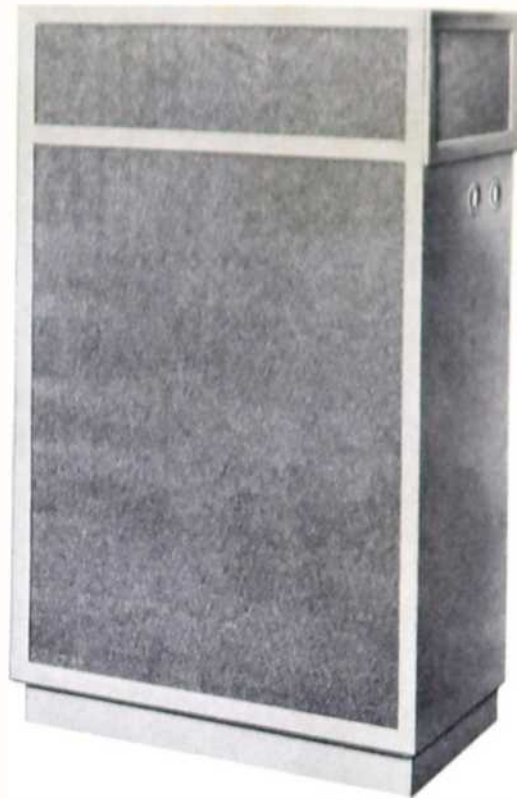
First study the construction drawings on page 7. The pull-apart drawing shows at a glance how the various parts go together. An important point to remember in building your cabinet is that all joints must be accurately fitted and that it must be made as rigid as possible to obtain the best results. Except for such parts as the base, posts, cleats and stiffening members,  $\frac{3}{4}$ -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  $\frac{3}{4}$  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  $13\frac{1}{4}$ -in. speaker opening is centered in the front panel and on a line  $11\frac{3}{4}$  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  $\frac{3}{4}$  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  $\frac{3}{4}$  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  $\frac{3}{4}$  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  $20^\circ$ . 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  $20^\circ$  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  $23\frac{1}{8}$  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,  $16\frac{3}{4}$  x  $41\frac{1}{4}$  in., and is beveled  $45^\circ$  along the rear edge

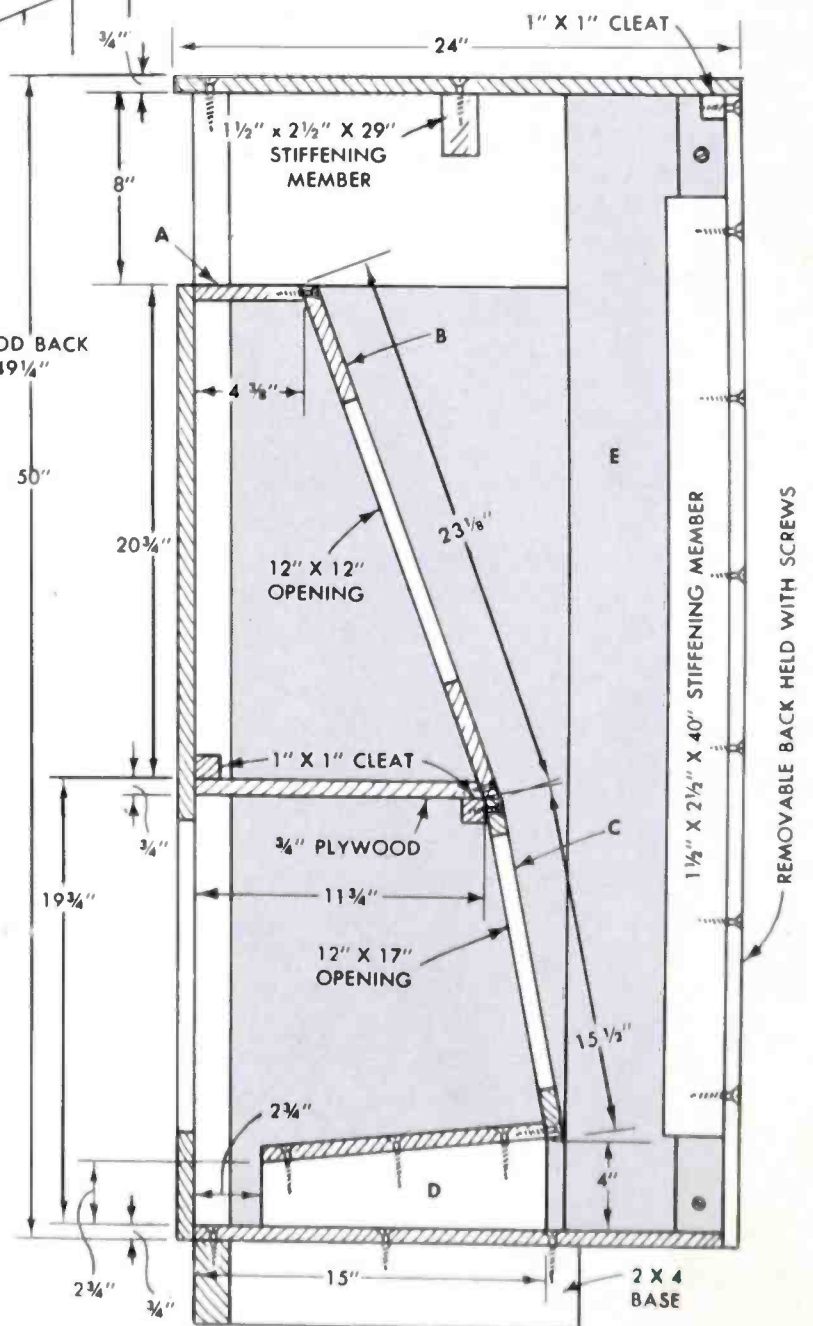
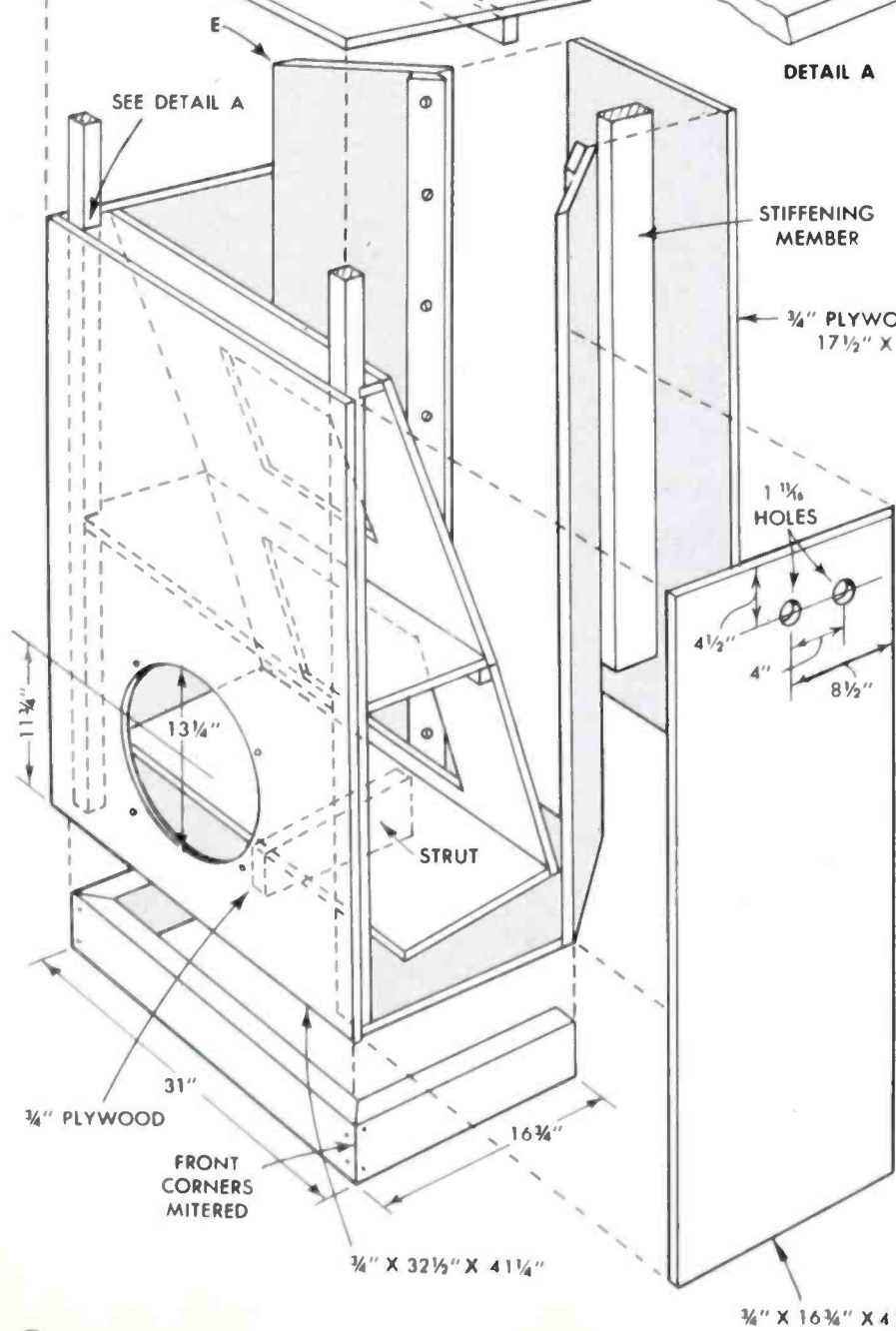
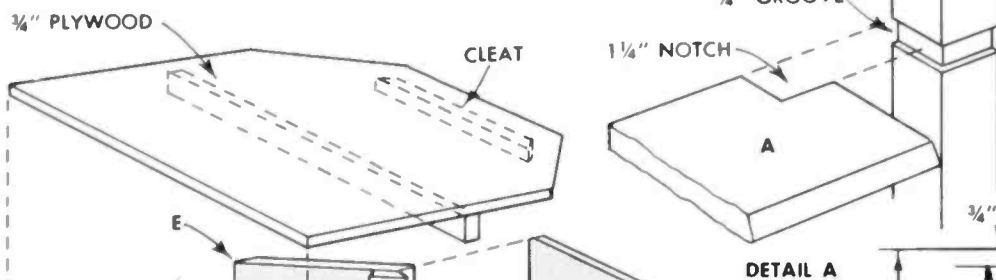
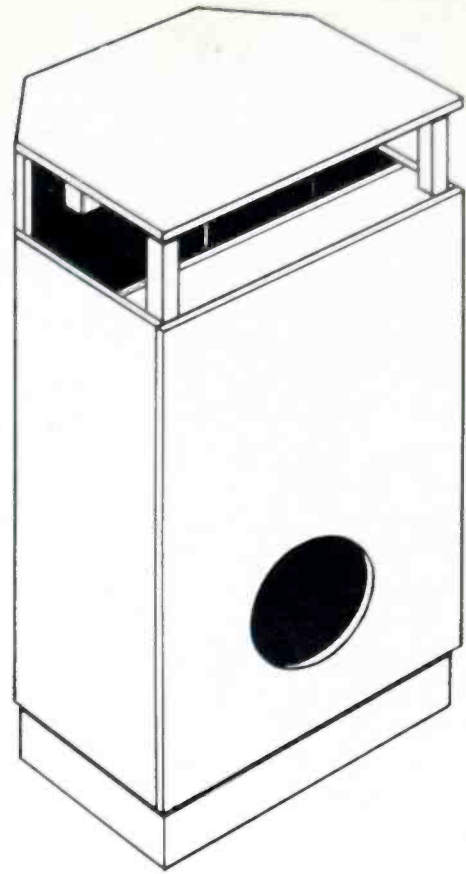
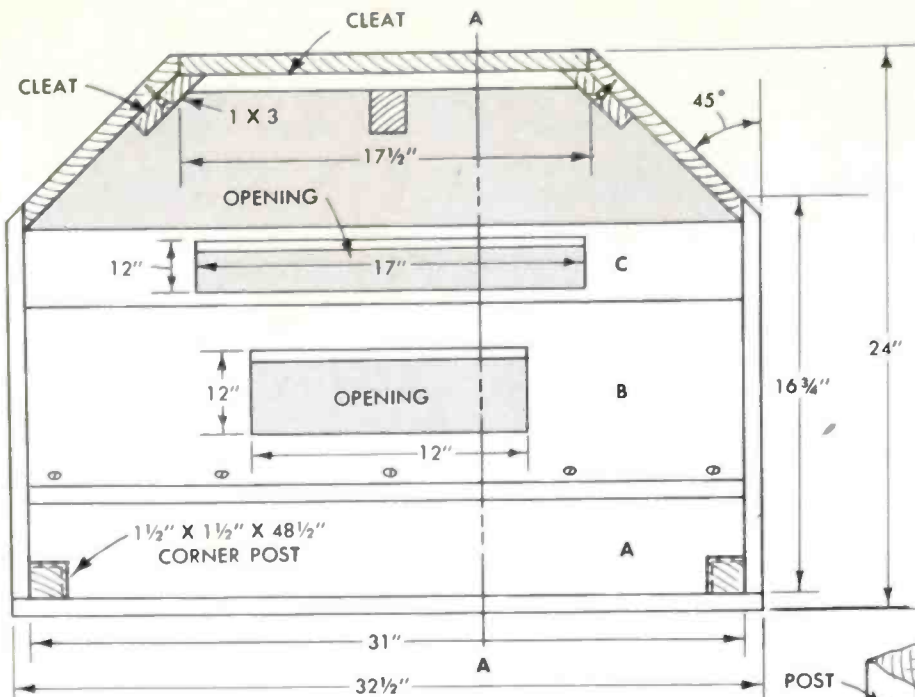


to be even with part E. (see top view). Note in the case of the right-hand side that two holes are bored in it near the top for the H-F and M-F Balance Controls. Glue is applied to all surfaces that the side panel will touch and screws or finishing nails are used to fasten it securely.

The lower speaker compartment is added next. Looking at the sectional view you will see that the lower shelf, which is  $12\text{-}5/16$  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  $6^\circ$ ) 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  $12^\circ$ ) 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  $45^\circ$  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  $\frac{3}{4}$  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  $\frac{3}{4}$ -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.





# INSTALLING THE SPEAKER UNITS

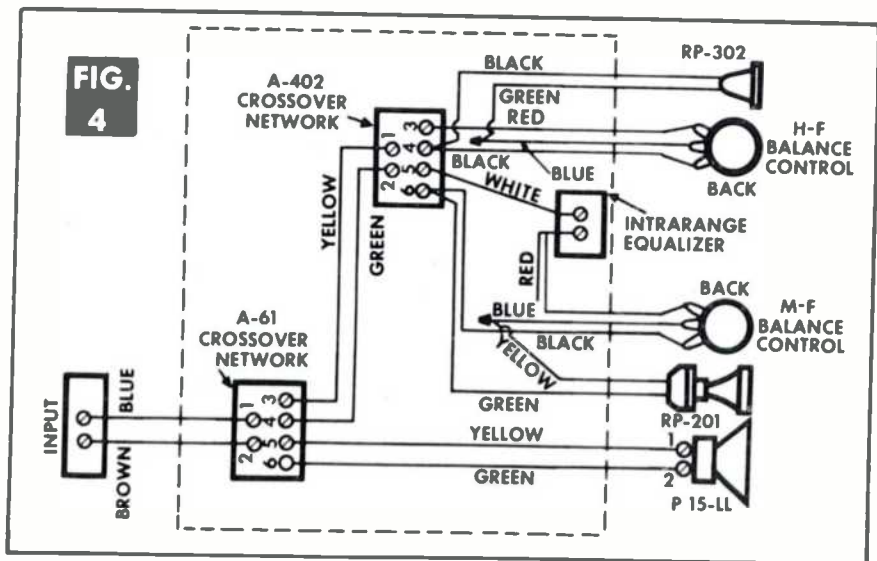
Figure 2 shows the placement of the KT-31 speaker units in the Imperial back-loading folded-horn enclosure. Lay the cabinet on its face and install the P15-LL special 1-f driver unit (Item 1) with terminal screws up by means of 8 #10 x 1 in. long R. H. wood screws and flat washers, tightening carefully 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 ¾ 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 excess cable into the network compartment and caulk all holes air tight 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 41¼	Front
1	17½ x 49¼	Back
1	4¾ x 31	Part A
2	11¾ x 49¼	Part E
2	16¾ x 41¼	Sides
1	11¾ x 31	Center Shelf
1	12¾ 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	1¾ x 3¾ x 64½	Base
2	¾ x 2¾ 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 35 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 for 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.

\*TM Registered, Jensen Mfg. Co.

# 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.

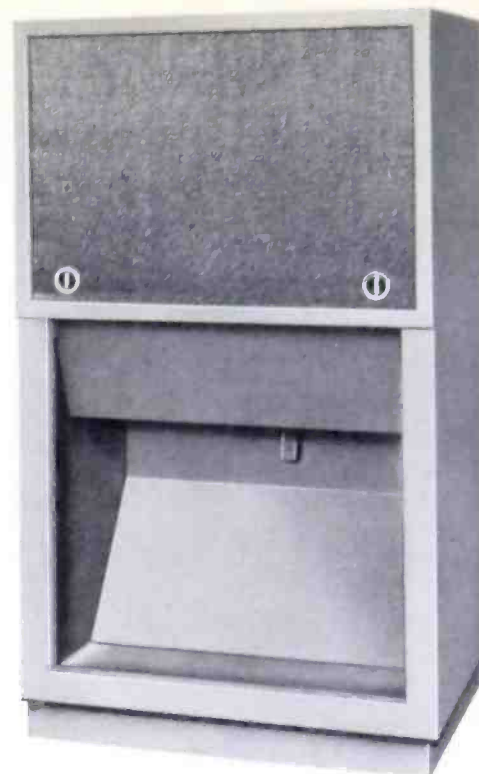
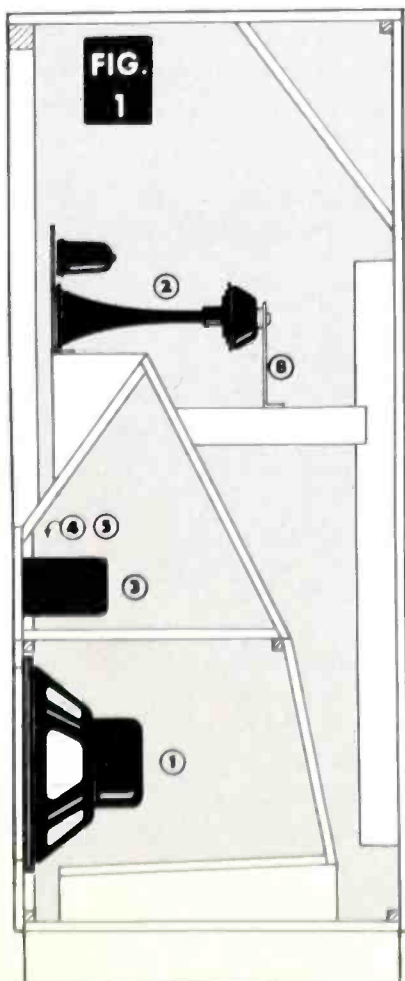
The build-in Imperial is design-coordinated with the KT-31 Imperial 3-way system kit and Figure 1 below shows placement of these units in the enclosure. Attach the P15-LL special l-f driver unit (Item 1) to the back of the removable speaker baffle using 8 #10 x 1" R.H. wood screws and flat washers. Tighten 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 1 1/4" 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 3/4 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-1131 intrarange equalizer (Item 5) to the back of the control panel between the two balance controls using #8 x 1/2" 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 1/2" 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.

\*TM Registered, Jensen Mfg. Co.

### MATERIAL LIST IMPERIAL FOLDED HORN BUILD-IN TYPE

	3/4-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	Parts 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.

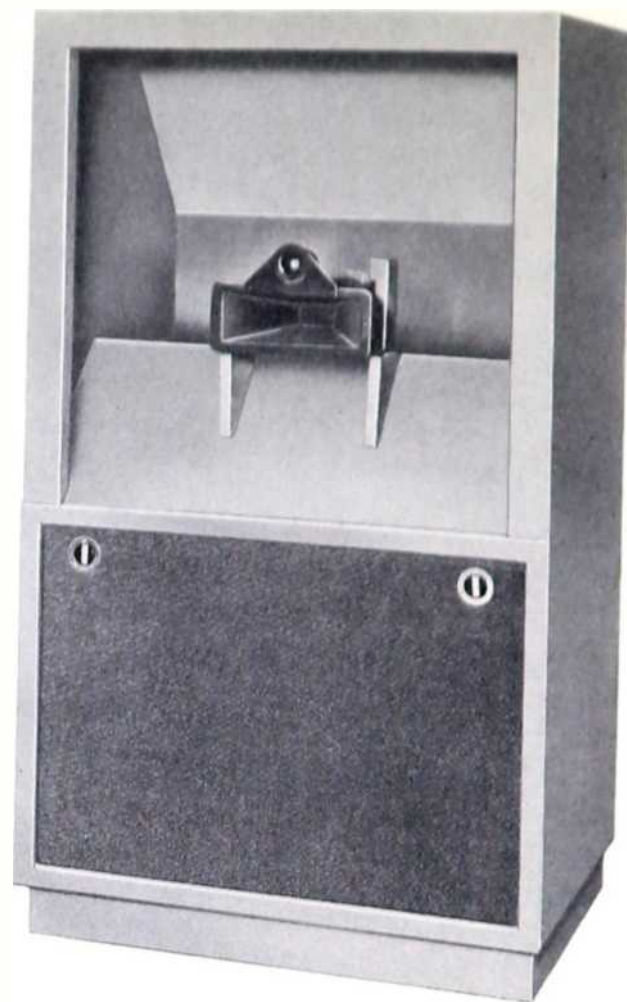
Begin by laying out the bottom. In looking at the side-view drawing, you'll see that the back and front of the cabinet lap the edges at the bottom. This is true of the sides, also. The bottom measures 24 in. wide and 36 in. long. As with all parts, it is important that the bottom be cut squarely since 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 9⅞ 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, 2⅜ 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 18⅞ in. up from the bottom and set in ¾ in. from the front edge.

Next, cut and add part E. This is 15⅜ 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 30 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 10⅞ 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.

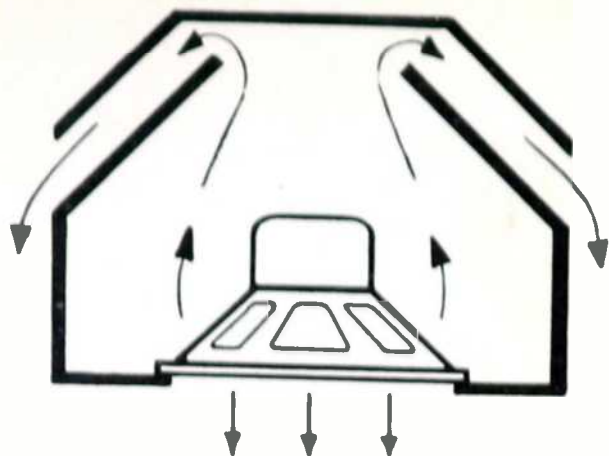
The upper part of the cabinet at the front is strengthened by framing the three sides with 2 x 2-in. pieces, driving the screws into the sides and top from the inside. A speaker-baffle opening is framed in the lower part of the cabinet at the front by adding 8½ x 19⅜-in. pieces at each side. These pieces (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 17⅞ in. long and are screwed in place from the inside. The speaker baffle is held with screws only, and the 13¼-in. circular opening is centered at a point 10⅞ 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 7⅜ 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.



# A BASS ULTRAFLEX ENCLOSURE FOR 15-INCH SPEAKERS



The BASS ULTRAFLEX\* enclosure is a unique Jensen design in which the loudspeaker is attached to the front panel in orthodox fashion but in which the radiation from the back of the speaker is coupled by a large air chamber through ducts or channels to the outside. It can be termed a duct-loaded bass reflex enclosure since the operation is similar but with ducts connecting the opening ports to the inner chamber. These ducts give certain design advantage available in no other way.

Not to be confused with a folded horn this Bass Ultraflex design for 15-inch speakers is suitable for corner or sidewall. With performance superior to any design in a similar size, its use is indicated wherever a large folded horn such as the Jensen Imperial cannot be accommodated.

## BUILDING THE BASS ULTRAFLEX-15

For good results all joints must be accurately fitted and adequately glued and if not screwed, nailed securely with 2½-in. finishing nails. With the exception of the base and cleats ¾-in. plywood is used throughout.

Start by laying out the bottom of the cabinet which measures 17 x 24 in. Note that both rear corners of the bottom are cut off at a 45-deg. angle at a point 12 in. from the front. The bottom of the cabinet is ¾ in. smaller all around than the top to allow the sides, front and back to lap the edges of the bottom. Since panels A rest on top of the bottom, it is necessary to add ¾-in.-sq. filler blocks to the edges of the bottom as indicated in detail A. These filler blocks, which widen the bottom at these points, are glued and nailed to the bottom later. As with all parts, it is important that the bottom be cut out squarely since it must fit the sides, front and back tightly.

Next, cut the front for the cabinet. This measures 25½ in. wide and 35¼ in. high. This makes the front 1½ in. wider than the bottom to let the front lap the sides. The 13¼-in. speaker opening is centered in the front panel on a line 16¼ in. up from the bottom. This can be cut out nicely with a jigsaw or by hand with a keyhole saw. The bottom and front of the cabinet are now joined together, using glue and nails, and watching to see that the bottom sets in ¾ in. on each side and flush with the bottom edge. Brace the two parts temporarily to hold them at right angles.

Next, the sides are added. These measure 8¼ in. wide and 35¼ in. high; the rear edge of each is beveled 45 deg. Note the two control-mounting holes in the right-hand side near the top as shown in the detail. The sides are glued and nailed securely to the edges of both the bottom and front members of the cabinet. Note that a 1 x 2 cleat is glued and screwed to the front panel on the inside 10 in. down from the top. This cleat adds additional rigidity to the front. Another cleat, 1 x 1-in. sq., is screwed and glued across the top of the front on the inside; this is used to help fasten the top of the cabinet.

\*TM Registered, Jensen Mfg. Co.

At this stage the filler blocks are added to the rear corners of the bottom. You'll notice that the ends of the blocks are cut 45 deg. so they will match the 45-deg. bevel on the sides as well as the angular shape of the bottom. Use glue and nails to attach the blocks. Panels A are fitted next. These are cut ¼ in. shorter than the sides since they rest on top of the bottom. One edge of each panel is beveled 45 deg. Note that a 1 x 1-in. cleat is used to fasten each panel to the bottom of the cabinet. These cleats are placed at a 45-deg. angle on a line even with the beveled edge of the sides. The panels are glued and nailed to the beveled edges of the sides and then screwed to the cleats previously screwed to the bottom of the cabinet. Next, three ¾-in. thick spacer blocks 1-15/16 in. wide are cut to the shape shown and glued to the rear faces of panels A. These blocks, besides adding rigidity to panels A and B, help support the removable back of the cabinet. Detail B shows the approximate locations of the blocks.

Panels B are added next. These are cut 8¼ in. wide, and since they lap the edges of the bottom, they are made 35¼ in. high like the sides and front. Both panels are beveled 45 deg. along the outer edge. Panels B are fastened to the edges of the bottom and to the spacer blocks. The two panels, A and B, now form a sound passage 1-15/16 in. wide at each side of the cabinet. The top of the cabinet is cut to be even with the outside all around; nail and glue down into the edges of the plywood.

The back panel is fastened in place with screws so it may be removed easily. Note how the vertical edges are beveled 45 deg. for snug fit against the square edges of panels B. Note too that the beveled edges are faced with a strip of sponge rubber to assure a tight seal when the screws are drawn tight. A 1 x 1-in. cleat, angle-cut 45 deg. at the ends, is placed across the back of the cabinet at the top. This cleat is glued and screwed securely to the underside of the top, ¾ in. in from the edge, and provides a place for driving the screws that hold the back panel to the top.

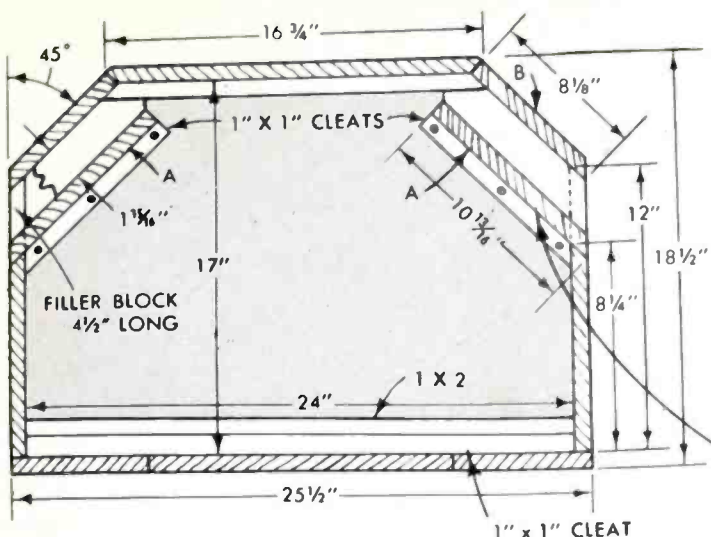
Although optional, the set-back base adds a finished look to the cabinet; it consists of three pieces of 2 x 2 material (actually 1⅝ in. sq.) mitered at the corners; the base sets in ¾ in. at front and sides. All exposed nail and screw heads can be sunk slightly below the surface and puttied over to conceal them. Add 1-in. thick absorption material to top and bottom as shown; jute rug padding or dense fiberglass board are recommended.

### MATERIAL LIST

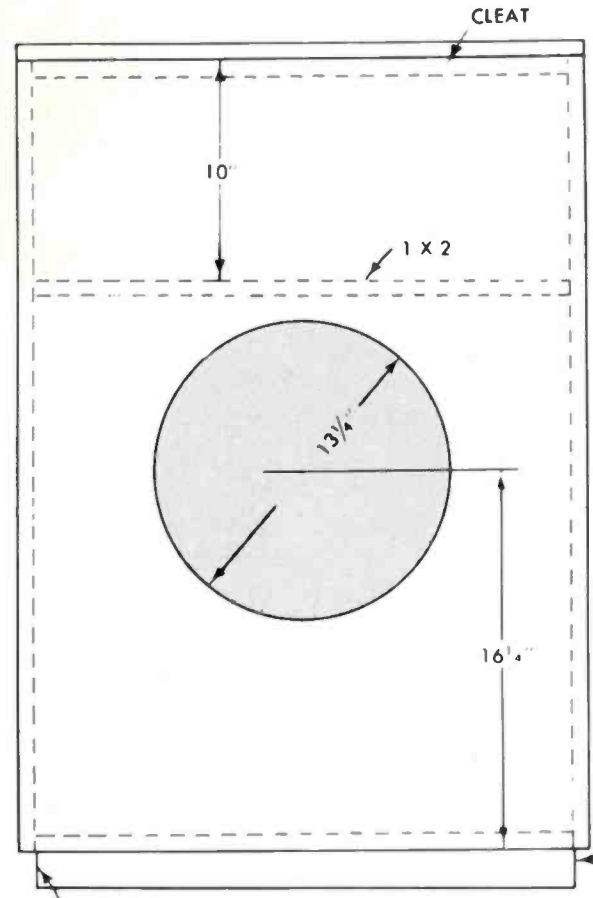
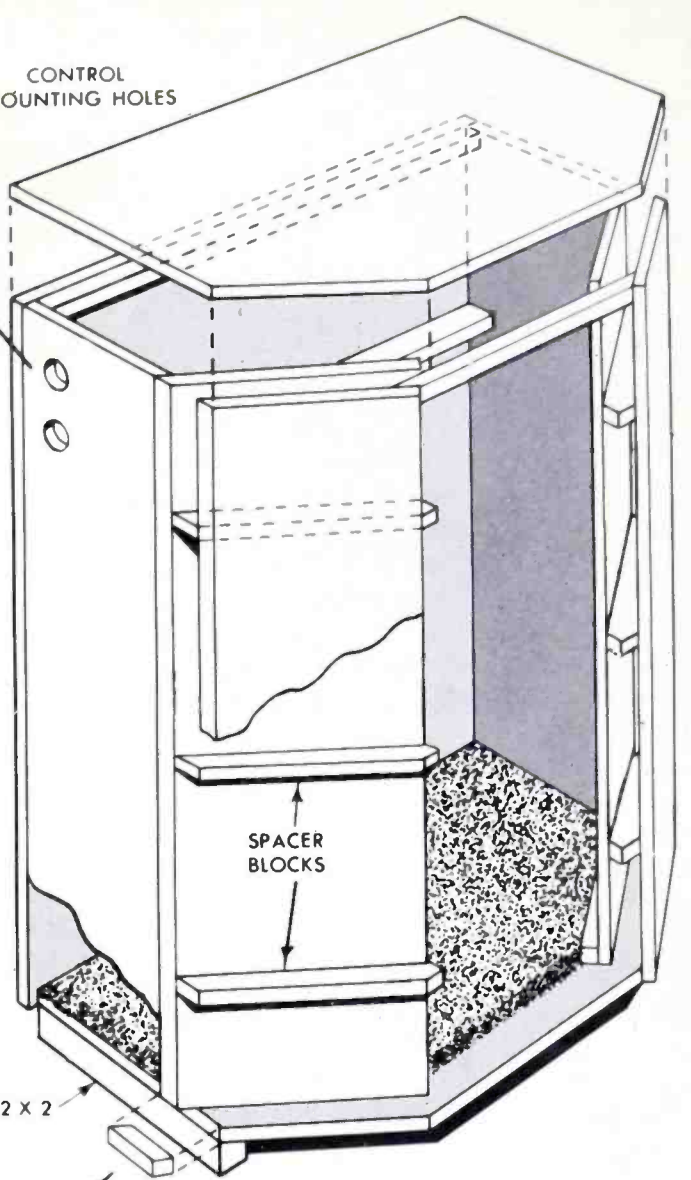
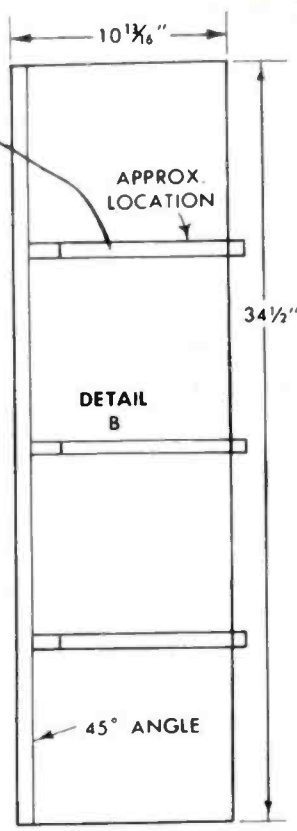
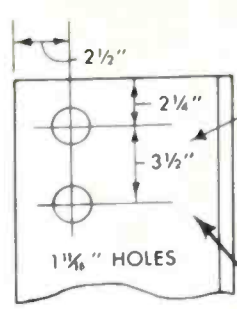
#### BASS ULTRAFLEX-15 ENCLOSURE FREE STANDING TYPE FOR CORNER OR SIDEWALL

¾-in. Plywood		
1	25-1/2 x 35-1/4	Front
1	17 x 24	Bottom
1	18-1/2 x 25-1/2	Top
2	8-1/4 x 35-1/4	Sides
2	10-13/16 x 34-1/2	Panels A
2	8-1/8 x 35-1/4	Panels B
1	16-3/4 x 35-1/4	Back
Lumber		
1	1-5/8 x 1-5/8 x 48	Base
1	1 x 1 x 66	Cleats
1	1 x 2 x 96	Cleats

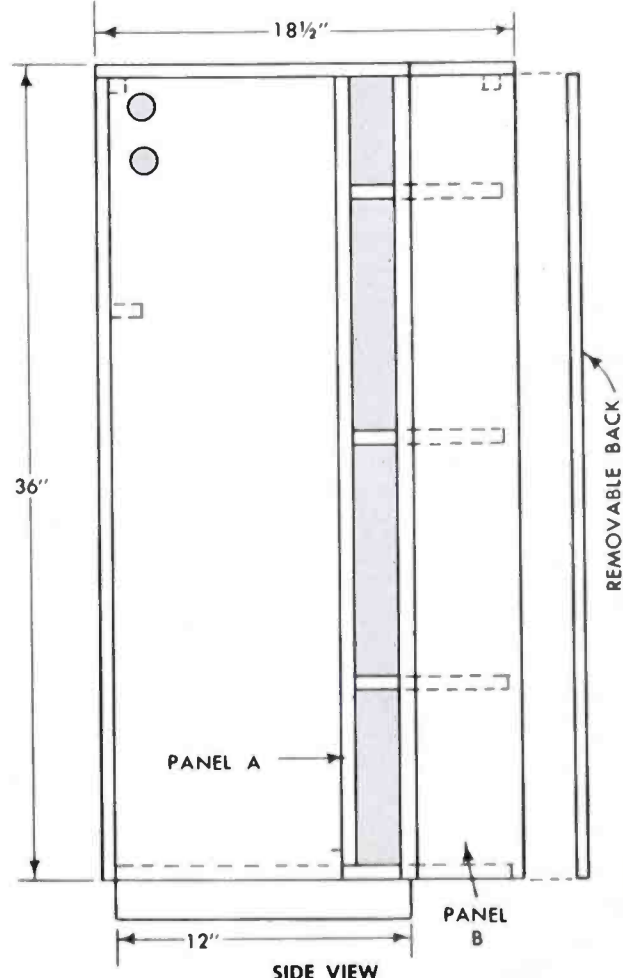
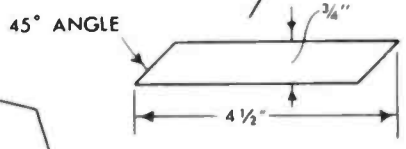
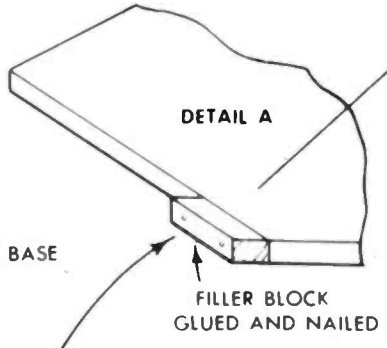
All dimensions in inches.



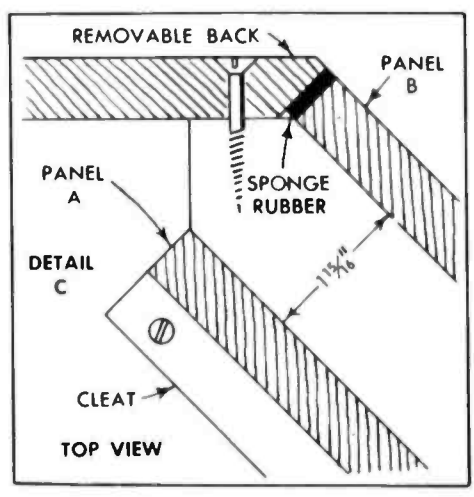
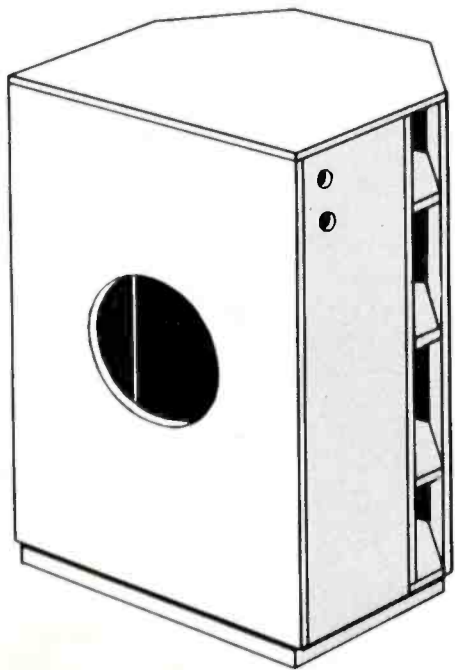
TOP VIEW—TOP REMOVED



FRONT VIEW



SIDE VIEW



## BUILD-IN FORMS OF THE BASS ULTRAFLEX-15

Many will prefer the more orthodox chest type enclosure. Such a form will permit integration into a "music wall"; that is, a group of cabinets in addition to the speaker enclosure for housing tuner, record player, amplifier, etc., and perhaps with record or book shelf space as well. Such an arrangement is shown at the top of the next column. Obviously the orthodox chest forms are also excellent as free-standing pieces as well.

Figure 1 shows a horizontal chest version of the Bass Ultraflex enclosure. Assembly procedure is evident from the drawing as is the various panel sizes. The front baffle is shown removable for easy access when the cabinet is built in. Figure 2 shows an upright form of the Bass Ultraflex. It is now evident that the particular shape is not important. What is important is the total interior volume, the duct area and the duct length. The following table shows several values for the various dimensions of this basic type of enclosure. If one of these does not meet your needs simply choose inside dimensions for height A, width B and depth C so that the total interior volume  $A \times B \times C$  equals 13,300 cu. in. Since the duct height is the cabinet height A, calculate the duct width D so that the total duct area (two ducts)  $2 \times A \times D$  equals 134 sq. in. The duct length must always be 8". It is not desirable to choose any one dimension greater than three times the smallest dimension; this encourages organ pipe resonance effects that are undesirable. Absorption material on top and bottom is recommended just as described for the corner type Bass Ultraflex.

Here then is an enclosure design you can tailor to any need. You can build it into that antique chest or fine-furniture obsolete radio console cabinet.

TABLE I  
TYPICAL DIMENSIONS FOR BUILD-IN BASS  
ULTRAFLEX ENCLOSURE FOR 15-IN. SPEAKERS  
(ALL DIMENSIONS IN INCHES)

A Height	B Width	C Depth	D Duct Width
24½	33	16¼	2¾
33	24½	16¼	2
30¼	30¼	14-9/16	2-3/16
31½	24	18	2½
24	31½	18	2-13/16

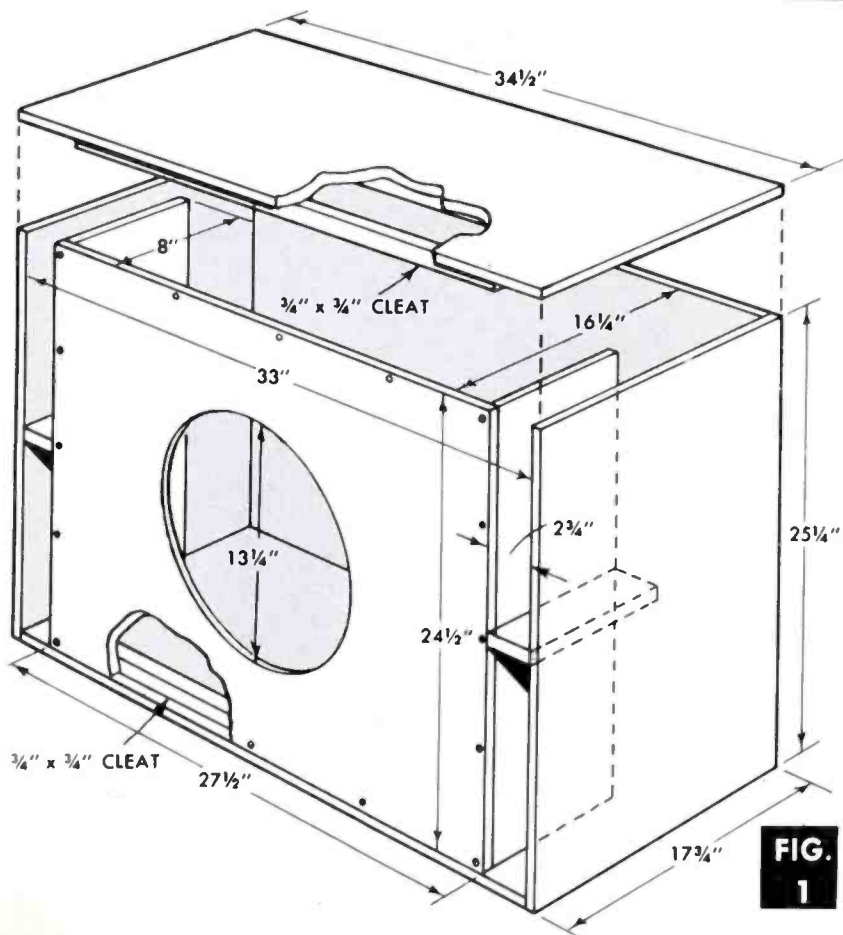
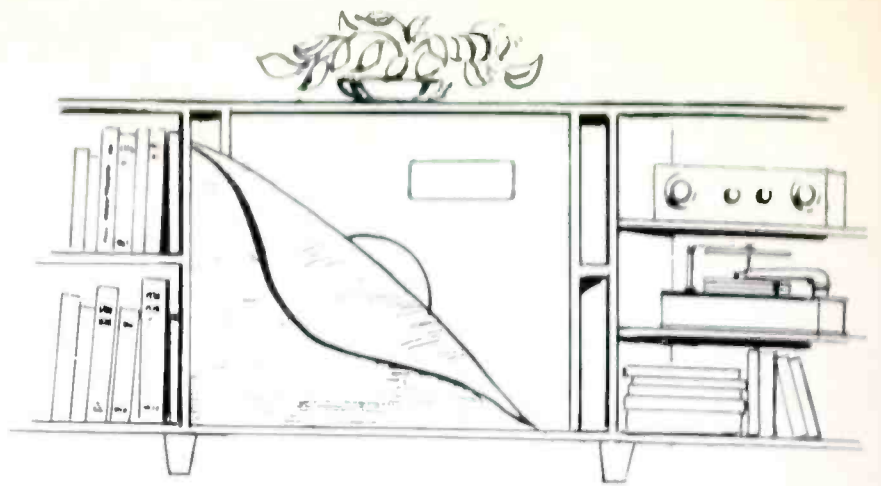


FIG.  
1



## INSTALLING SPEAKER UNITS

These Bass Ultraflex designs are ideally suited for the Jensen G-610 TRIAXIAL\*, a 15-inch 3-way unitary assembly, and the Jensen H-530 coaxial, an outstanding 2-way speaker. Considerable cost saving results by adopting other coaxial units some with direct radiator h-f units. Still further savings are possible with a good single radiator unit of the extended range type with some further sacrifice particularly in the upper register.

The above units or any 15-inch loudspeaker units are attached directly to the front panel. Lay the enclosure face down on the floor; place about four marks around the speaker cutout about 1-in. away from the edge. These marks will still be visible after lowering the speaker into position and provide a simple means for centering. Fasten securely with R.H. wood screws just long enough not to penetrate the front panel; tighten carefully so as not to distort the speaker frame.

The basic free standing enclosure described on the previous two pages includes two openings for the controls of the G-610 TRIAXIAL. One of these can be eliminated for speakers such as the Jensen H-530 with its single h-f balance control. Similar 1-11/16-in. holes can be located wherever convenient in the build-in forms.

For some deeper-than-usual speakers, notably the G-610 TRIAXIAL, the space between panels A of the free standing cabinet is too narrow. Simply cut out a notch between two of the spacer blocks to permit entry; this notch does not affect performance of the enclosure to any noticeable degree. Accessory networks are simply fastened inside the cabinet wherever convenient using wood screws.

\*TM Registered, Jensen Mfg. Co.

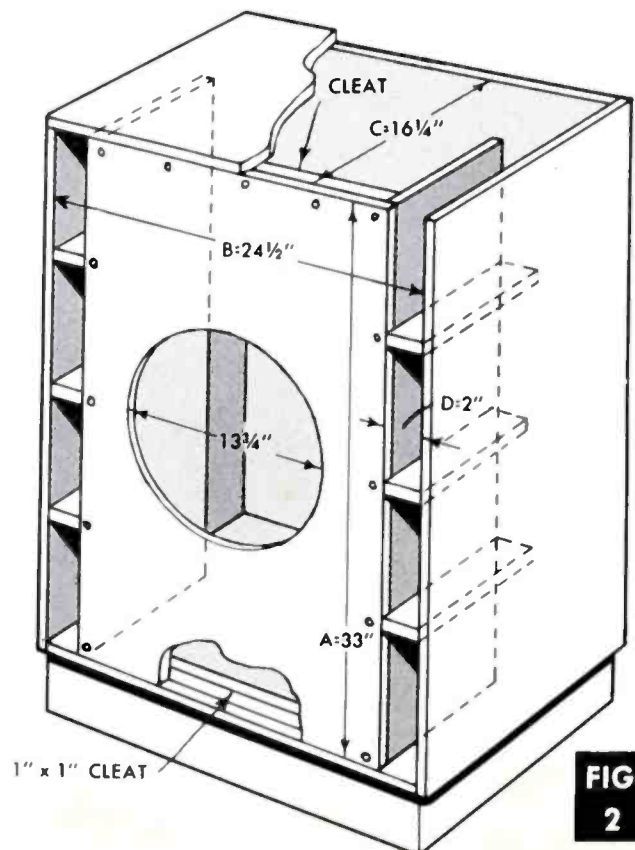
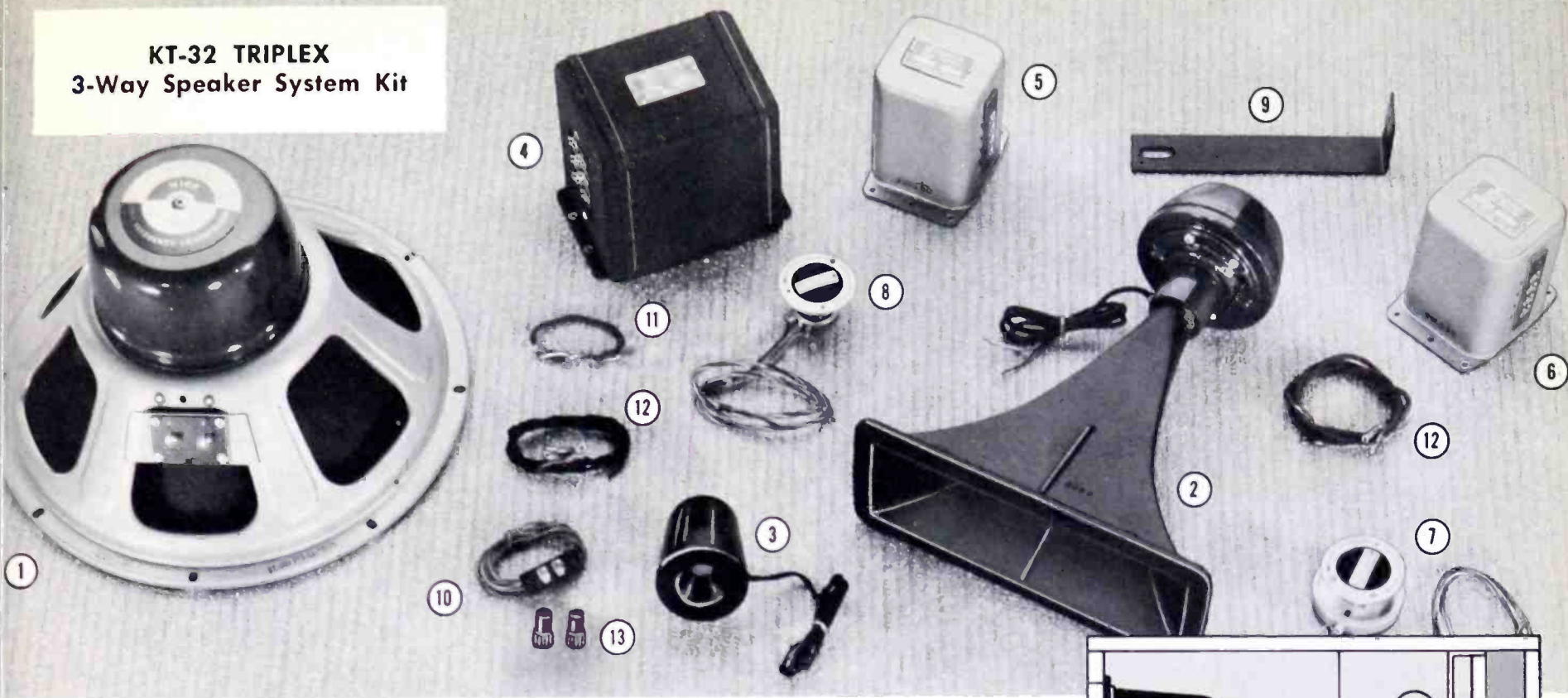


FIG.  
2



**KT-32 TRIPLEX  
3-Way Speaker System Kit**



**JENSEN TRIPLEX REPRODUCER**  
FREE STANDING AND BUILD-IN TYPES

The Jensen TRi-Plex is a 3-way divided system reproducer designed for the best performance possible, in a most practical size. Its use is indicated where superior reproduction quality is desired but where space limitations do not permit use of the Imperial with its large folded horn enclosure.

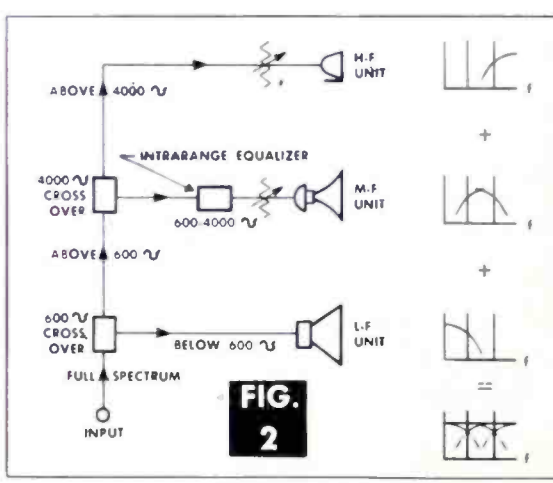
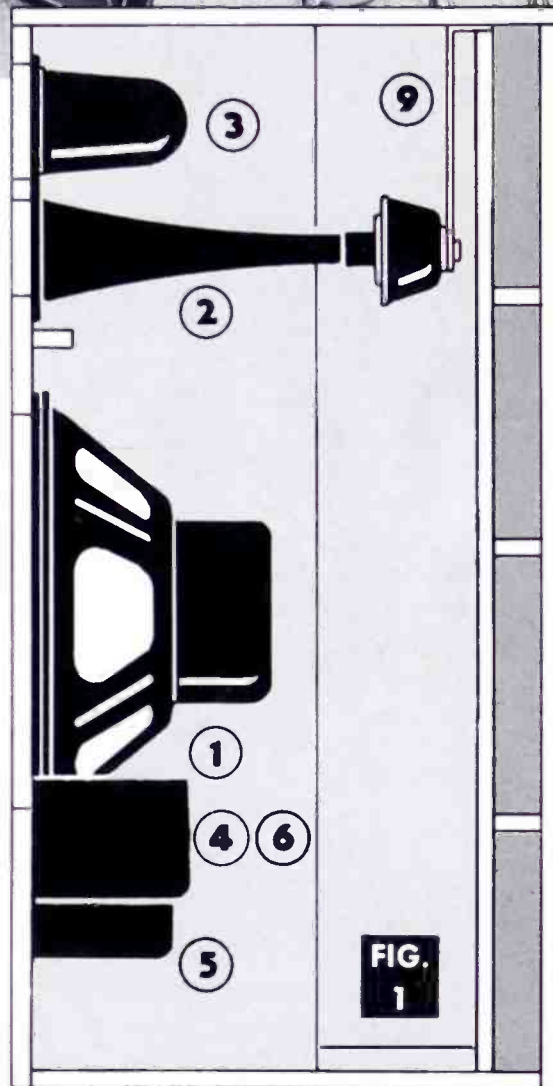
Figure 2 portrays how the Triplex 3-way system functions. The incoming signal from the amplifier includes the entire musical spectrum to be reproduced. A constant resistance type dividing network first splits this spectrum at 600 cycles. All the components below 600 cycles are then passed directly to the special 15-inch l-f unit used in the Bass Ultraflex\* enclosure, providing performance in this range available in no other way in an enclosure of such modest dimensions. This is the region where music has body and depth. Reproduction must be uniformly smooth, free of boominess and "hangover". How completely the Triplex has succeeded in this respect is revealed primarily by freedom from coloration; reed tones can easily be differentiated from string tones and percussion does not obscure this distinction.

All signal components above 600 cycles are again split by a second crossover network, also of the constant resistance type, at 4000 cycles. Components above 4000 cycles are reproduced by a precision horn type "super-tweeter". Due to its small size and special horn flare this h-f unit provides smooth output to the upper limits of audibility and with wide angular distribution throughout this range. An h-f balance control permits precise adjustment of the

output in this range for proper relationship to the other "channels". This is the range which gives music its sparkle and brilliance. Properly reproduced, we retain the shimmer of the cymbals and "tinkle" of the triangles present in the original concert.

The remaining range below 4000 cycles and above 600 cycles passes through a balancing and smoothing equalizer and is then reproduced by a horn type m-f unit of unusual power handling capability and negligible distortion. These characteristics as well as the wide angular dispersion throughout this range are the result of carefully designed and coordinated horn and driver unit. Here, as in the super-tweeter, a special horn flare in the hyperbolic-exponential\*\* family contributes importantly to this result. An m-f balance control permits adjustment of output in this range for the exact relationship required in any given listening room. This important mid-frequency range includes the greatest portion of the power in music and it is in this range where naturalness and "presence" may be won or lost. This ability to reproduce with great realism (apparent particularly in the "separation" of individual musical instruments) is outstandingly noticeable in the Triplex system.

It can readily be appreciated that such a system must use carefully design-coordinated speaker units to obtain the highest degree of performance of which it is capable. Jensen KT-32 Triplex Speaker System Kit shown in the photograph above includes such units.



\*T.M. Reg., Jensen Mfg. Co.

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

# BUILDING THE TRIPLEX ENCLOSURE

The Triplex enclosure is simply the Bass Ultraflex enclosure for 15-in. loudspeakers described previously, but with front panel changes to accommodate the horn type m-f and h-f units of the KT-32 Triplex Speaker System Kit. This modification can easily be made for the free-standing cabinet for corner or sidewall use and for the build-in type.

The details for the Bass Ultraflex enclosure for 15-in. loudspeakers appears on pages 12 to 14; follow these exactly except for the front baffle layout. Two additional openings must be cut in the front baffle; a 4-inch diameter circular opening permits mounting of the h-f unit with its flat metal baffle adaptor plate and a  $3\frac{3}{8} \times 10\text{-}\frac{3}{16}$ -in. rectangular slot provides the proper opening for the flanged horn of the m-f unit.

Figure 3 shows dimensional details for the size and location of the front baffle openings for the free-standing form of the Triplex enclosure for corner or sidewall use. Note that the location of the 15-inch l-f unit is unchanged and that the stiffening cleat remains. Carefully locate the center of the rectangular slot and lay out the opening as accurately as possible. Drill holes at the corners and cut out with key hole saw; file the edges to exact size and for square corners. Accuracy is important to provide adequate screw fastening of the flange and so as not to obstruct the horn mouth opening. Locate the center of the 4-inch diameter opening and draw its outline with compass; drill a starting hole and cut out with keyhole saw. The location and size of this opening need not be precise. Fasten the front baffle to the Bass Ultraflex cabinet exactly as described on page 12.

Figure 4 shows the cutout details for the front baffle of the build-in version of the Triplex enclosure. Here the front baffle is removable for ready access when the enclosure is built into a music wall or other integrated array. Note the  $13\frac{1}{4}$ -in. diameter cutout for the 15-in. l-f unit is lowered. The size of the rectangular opening must be accurate for the reasons mentioned



above, but location of openings is not critical. Lay out and cut these openings as described above. Fasten the front baffle to the enclosure proper with wood screws on approximately 6-in. centers.

The photograph at the top of this page shows a free-standing Triplex reproducer constructed according to these plans; a section at the back of this manual describes a number of ways to "dress up" your enclosure for better appearance just as in this example.

Another example is shown in the photograph at the top of page 17. Here the Triplex build-in type enclosure has been integrated with other cabinetry housing TV, record player, tuner, preamplifier and main amplifier with storage space for records. Note the removable grille cloth frame.

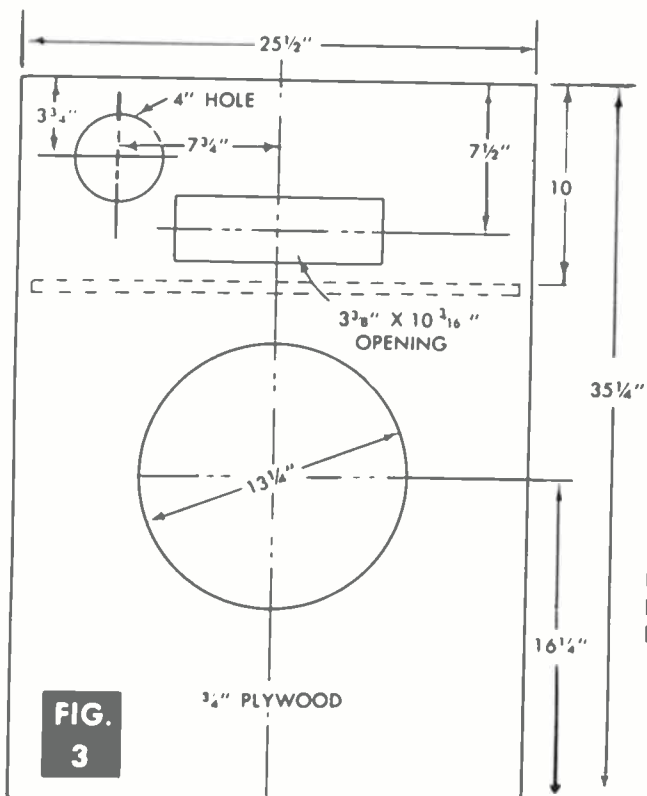
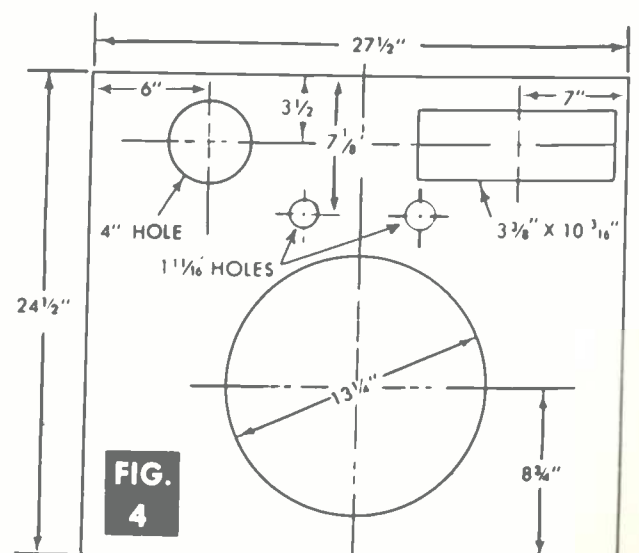


Figure 3. Front Baffle Cutout Details for Free-Standing Triplex Reproducer.

Figure 4. Removable Front Baffle Cutout Details for Build-In Version of the Triplex Reproducer.

MATERIAL LIST			
KT-32 TRIPLEX 3-WAY SPEAKER SYSTEM KIT			
ITEM	QTY.	MODEL	DESCRIPTION
1	1	P15-LL	15" L-F Unit
2	1	RP-201	M-F Unit
3	1	RP-302	H-F Unit/Plate Ass.
4	1	A-61	600 Cycle Network
5	1	A-402	4000 Cycle Network
6	1	M-1131	Intrange Equalizer
7	1	ST-917	M-F Balance Control
8	1	ST-901	H-F Balance Control
9	1	—	L Bracket
10	1	—	Input Cable Assembly
11	1	—	8" White Lead Wire
12	2	—	10" 2-wire Cable
13	2	—	Solderless Connectors



# INSTALLING THE TRIPLEX SPEAKER UNITS

The placement of the KT-32 speaker units in the Triplex enclosure is shown in Figure 1. Lay the cabinet on its face and make four marks on the baffle around the large circular opening about 1 in. out; these marks will be exposed after the 15-in. l-f speaker is in place and will make it easy to center the unit. Lower the P15-LL l-f driver unit (Item 1) into position on the front baffle with terminal screws down. Fasten to the baffle with 8 #10 x 1 in. long R. H. wood screws and flat washers, tightening carefully to prevent distortion of the speaker frame. Recommended procedure wherever wood screws are used is to drill small guide holes; this prevents splitting and simplifies tightening.

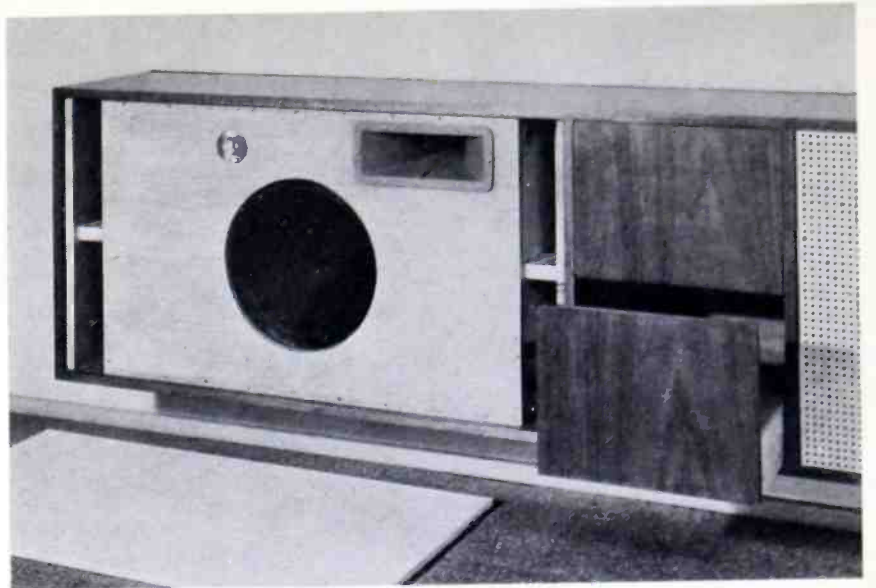
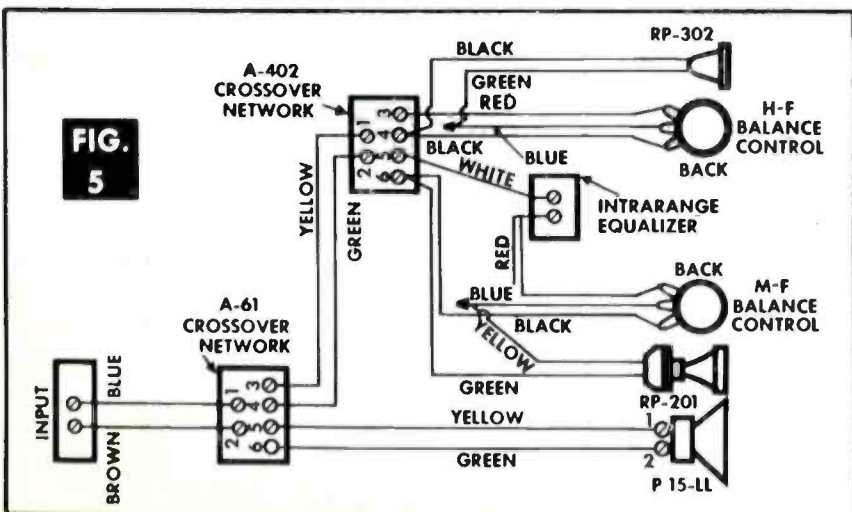
Next locate the RP-201 M-F unit (Item 2) behind the main baffle cut-out using the same technique as above for centering; that is place marks about 1 in. away from the opening which are visible after the unit is in place. Fasten the unit to the front baffle with #8 x 3/4 in. long R. H. wood screws. Remove the cover mounting bolt and replace through the long leg of the L bracket (Item 9). Fasten the foot of this bracket to the cabinet top with #8 x 1/2 in. long R. H. wood screws. After standing the cabinet upright adjust the RP-201 for level position and tighten the cover bolt.

Now install the RP-302 H-F/baffle plate assembly (Item 3) behind the 4-in. cutout of the front baffle again using marks for centering. Fasten the assembly in place by means of #8 x 1/2 in. long R. H. wood screws through the adaptor plate.

Install escutcheon cups of the M-F and H-F Balance Controls (Items 7 and 8) using the small O. H. brass wood screws provided. Place the "M-F Balance Control" cup in the upper cut-out. Attach the two balance controls with lugs down using the locking nuts provided. Next install the A-61 (Item 4) and A-402 (Item 5) Crossover Networks and the M-1131 Intrarange Equalizer (Item 6) near the bottom of the front baffle, using #8 x 1/2 in. long R. H. wood screws. Place the networks so that all screw terminals are accessible. Preferred location is with A-61 at the left and M-1131 at the right with A-402 centered and below the other networks; input terminals of the A-402 should face left.

Referring to the color coded wiring diagram, Figure 5, connect the input cable and terminal strip assembly (Item 10) to the input terminals of the A-61 network. Connect the 8-in. white lead (Item 11) from the Intrarange Equalizer to A-402, one of the 10-in. 2-wire cables (Item 12) from the A-61 to A-402 and the other 10-in. 2-wire cable from A-61 to P15-LL l-f unit.

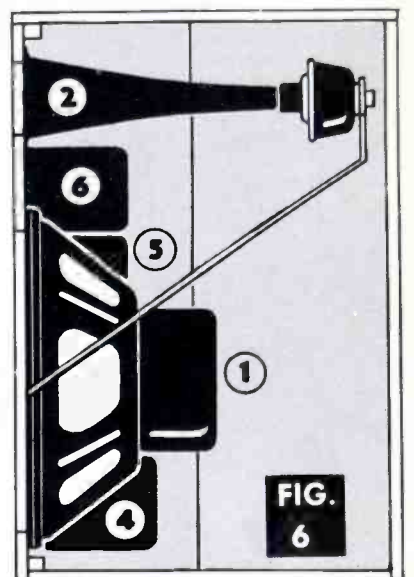
Now connect the remaining speaker units and controls to the networks. Note that one lead of each balance control is spliced to one lead of a driver unit; twist the wire ends tightly and then simply screw on the solderless connector (Item 13) tightly.



Wall Installation of Build-In Triplex as Part of Entertainment Center.  
Architect: John and Jean Wehrheim

Cut a slot approximately 1/2 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 to the cabinet securely by means of wood screws on approximately 6-in. centers.

Figure 6 shows unit placement for the build-in Triplex. Procedure is exactly the same except that the L bracket (Item 9) is not used. Instead bend a metal strap so as to support the back of the RP-201 unit from the front baffle; Figure 6 shows a suitable form—the exact dimensions are not important. Input terminal strip may be more conveniently located on the inside of the cabinet rather than on the outside back; incoming cable from the amplifier can pass through an airtight hole in the side or wherever convenient, and connection made to the input terminal strip.



## OPERATION OF THE TRIPLEX

Simply connect the two input terminals of the Triplex to the 16 ohm output terminals of any good quality amplifier. Ordinary lamp cord is satisfactory for distances up to 50 feet. Like the Imperial the Triplex is quite efficient and only a few watts are necessary for usual home listening levels, although some reserve power is always desirable. Power to the Triplex in excess of its rating of 35 watts may cause distortion and if prolonged possibly damage. However, amplifiers having greater power rating—say 50 watts—will be perfectly satisfactory but should not be operated at their full power capability.

The balance controls permit adjustment of the loudness of the m-f and h-f output for proper overall "balance." For average room conditions, set the m-f balance control knob just above straight up and the h-f balance control knob just a little below straight up. Check the setting of h-f balance setting by rotating counterclockwise to the off position and then increase until the quality of the music seems to "blossom out" and the presence of the h-f unit is just noticeable. Just below this setting is about right. Now check the m-f balance setting in the same way—finally recheck the h-f balance setting again because it may now become a little different. When you are definitely conscious that sound is coming from the "super-tweeter" when listening some distance away, then the h-f balance setting is too high. All listening should be done with high quality music as a source.

**KT-21 CONCERTO-15  
2-Way Speaker System Kit**



**JENSEN CONCERTO-15 REPRODUCER**  
**FREE STANDING AND BUILD-IN TYPES**

The Jensen Concerto-15 is an outstanding reproducer of the 2-way divided system type designed for best possible performance in a most practical size and at moderate cost. Two separate and distinct loudspeaker units each designed for only a limited portion of the full music spectrum are used in a large Bass Ultraflex\* enclosure. Using a 15-in. special direct radiator unit the l-f performance is fully equal to the Triplex reproducer. Lower cost results from the single horn type h-f unit reproducing the upper range with quality of performance unexcelled in a 2-way system. Therefore, use of the Jensen Concerto-15 reproducer is indicated where outstanding reproduction quality is desired in a most practical size but at more moderate cost than the Triplex reproducer with its 3-way system.

Figure 2 is a drawing indicating how the Concerto-15 reproducer operates. The incoming signal from the amplifier is connected to the system INPUT; it includes the entire music spectrum to be reproduced. A constant resistance type dividing network splits this spectrum at 2000 cycles, about the second C above middle C on the piano keyboard. Experts agree on the advantages of the constant resistance type of network for frequency division. Using two air core inductors and two wax filled capacitors, this type of network provides best crossover characteristics and least disturbance of amplifier performance with negligible aging effects.

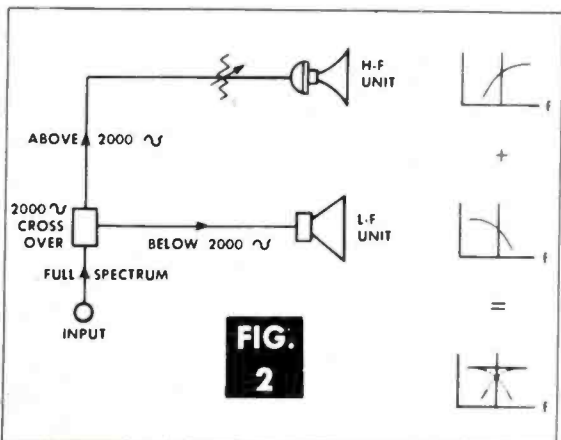
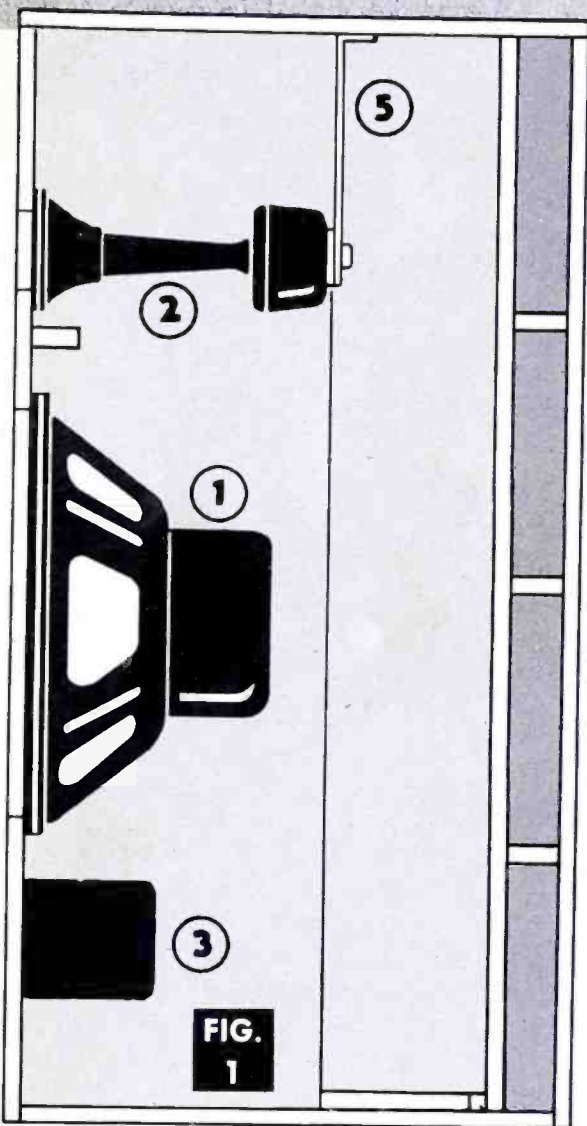
All music components below 2000 cycles are then passed directly to the special 15-in. l-f unit used with the Bass Ultraflex enclosure providing performance in this range available in no other way in an

enclosure of such modest dimensions. The lower portion of this region provides the body and depth of music and reproduction must be free of boominess and "hang-over." The success of the Concerto-15 in this respect can be noted primarily in its lack of coloration; reed and string tones are easily identified and percussion does not obliterate this distinction. The upper portion of this range includes the greatest portion of the power in music. Here the important qualities of "presence" and naturalness exist and the ability of the Concerto-15 to reproduce music realistically is apparent particularly in the "separation" of musical instruments.

All music components above 2000 cycles are passed through a level control and reproduced by a compression type h-f unit. As with the horn type units of the Triplex and Imperial reproducers, a special flare formula in the hyperbolic-exponential\*\* family is used to attain best overall performance and widest angular coverage throughout the range it covers. The control permits precise adjustment of the output in this range to give proper balance with the output of the low frequency range. It is this h-f range which contributes the sparkle and brilliance present in the original music. Properly reproduced in the Concerto-15 we retain the rich overtone structure of the higher tones in music so often lost.

One can easily recognize that to achieve the highest degree of performance in such a system, carefully designed-coordinated speaker units must be employed. Jensen KT-21 Concerto-15 speaker system kit is such a group of speaker units.

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



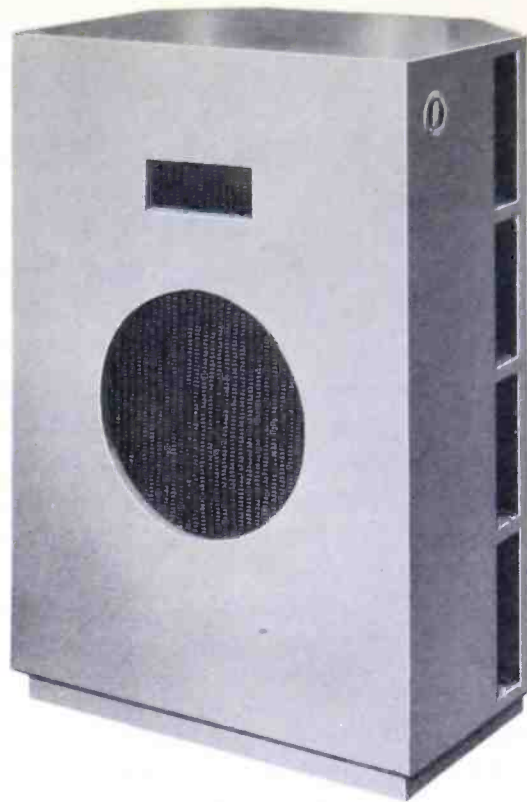
# BUILDING THE CONCERTO-15 ENCLOSURE

The Concerto-15 enclosure is simply the Bass Ultraflex enclosure for 15-in. loudspeakers described previously with front panel changes to accommodate the horn type h-f unit of the KT-21 Concerto-15 speaker system kit. The Bass Ultraflex enclosures for 15-in. loudspeakers were described in detail on pages 12-14. Follow the procedure outlined except for the front panel layout. A  $2\frac{3}{4} \times 6\frac{7}{8}$ -in horizontal rectangular slot provides the proper opening for the flanged horn of the h-f unit. The Concerto-15 reproducer uses only *one* control and therefore only the upper opening shown in the Bass Ultraflex enclosure drawing should be cut.

Figure 3 shows dimensional details for the size and location of the front panel openings for the free standing form of the Concerto-15 enclosure for corner or sidewall use. The placement of the  $13\frac{1}{4}$ -in. diameter opening for the 15-in. l-f unit is unchanged and note that the horizontal stiffening cleat is retained. Carefully locate the center of the rectangular slot and lay out the opening accurately. Drill starting holes at the corners and cut out with keyhole saw; file the edges to exact size and for square corners. Accuracy is important to provide adequate screw fastening of the horn flange and to prevent obstruction of the horn mouth opening. Fasten the front panel to the Bass Ultraflex enclosure exactly as described on page 12.

Figure 4 shows cutout details for the front panel of the build-in version of the Concerto-15 enclosure. Here the front baffle must be removable to give ready access when the enclosure is incorporated in a music wall or other composite structure. Note the opening for the 15-in. l-f unit has been lowered to provide space for the h-f unit. Locate the center of the  $2\frac{3}{4} \times 6\frac{7}{8}$ -in rectangular slot opening and lay out accurately; drill starting holes and cut out exactly as described above. Although the size must be accurate the location need not be precise. Fasten the front baffle to the basic enclosure using  $1\frac{1}{2}$ -in. long wood screws on approximately 6-in. centers.

Note that the shape of your Concerto-15 enclosure can be altered to suit your exact needs just as described in the section describing construction of the Bass Ultraflex enclosure for 15-in. speakers.

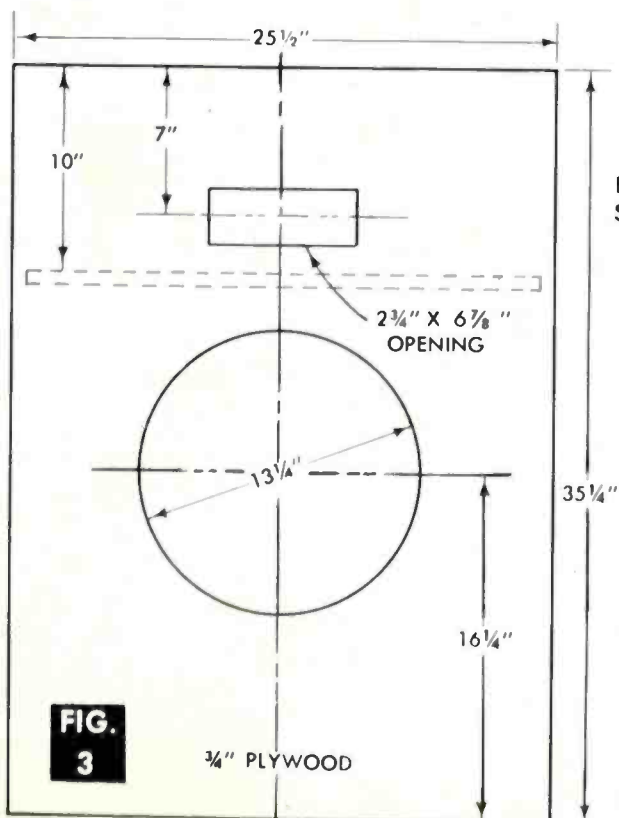


## MATERIAL LIST KT-21 CONCERTO-15 2-WAY SEPAKER SYSTEM KIT

ITEM	QTY.	MODEL	DESCRIPTION
1	1	P15-LL	15" L-F Unit
2	1	RP-102	H-F Unit
3	1	A-204	2000 Cycle Network
4	1	ST-901	H-F Blaance Control
5	1	—	L Bracket
6	1	—	Input Cable Assembly
7	1	—	10" 2-wire Cable
8	1	—	Solderless Connector

The photograph at the top of this page shows a Concerto-15 reproducer of the free standing type for corner or sidewall use constructed from these plans. Here the enclosure is painted and only the speaker openings are covered with grille cloth; such a form would be suitable for recreation room or utility use.

The drawing on page 14 shows a typical music wall in which the build-in type Concerto-15 reproducer is integrated with other cabinets housing tuner and record player and with other storage units. This is suggestive of the many variations to meet any special need. A later section of this manual discusses how your cabinets may be treated to obtain any desired appearance.



Front Panel Cutout Details for Free-Standing Concerto-15 Reproducer.

Removable Front Baffle Cutout Details for Build-In Version of the Concerto-15 Reproducer.

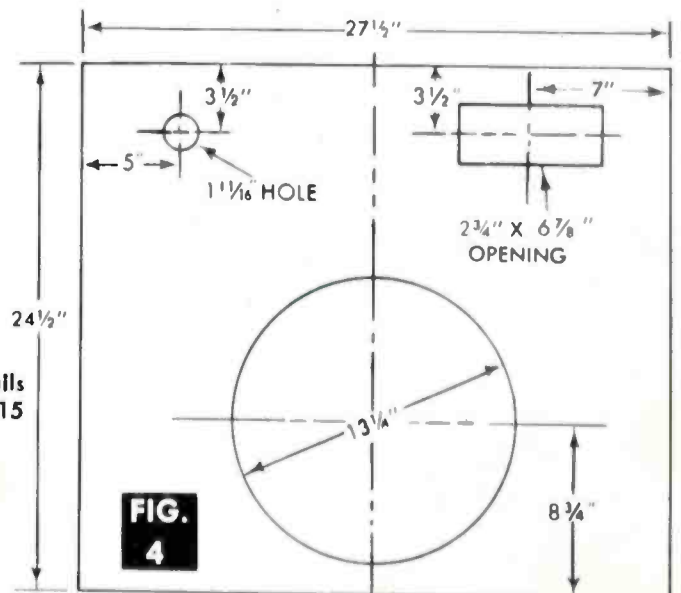


FIG. 4

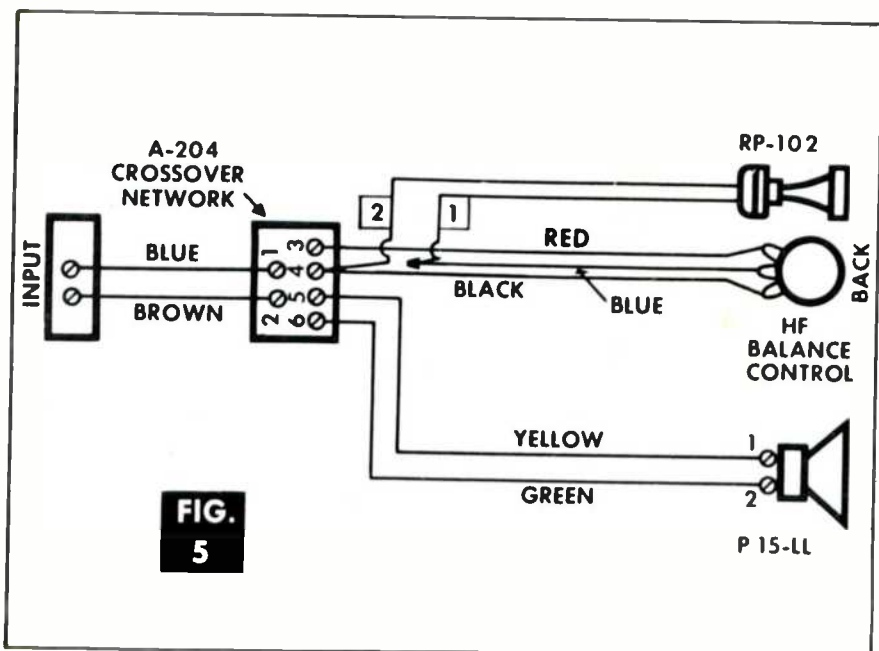
# INSTALLING THE CONCERTO-15 SPEAKER UNITS

Figure 1 on page 18 shows placement of the speaker units of the KT-21 speaker system kit in the Concerto-15 enclosure. Lay the cabinet on its face with back cover removed. Make about four marks on the baffle around the large circular opening about 1 in. from the edge of the cutout. Lower the P15-LL l-f speaker unit (Item 1) into position on the front baffle with terminal screws toward the bottom of the cabinet. The four marks will be exposed and offer a simple means for centering the l-f unit. Fasten the 15-in. unit in place with 8 #10 x 1-in. long R. H. wood screws and flat washers; tightening carefully to prevent distortion of the speaker frame. Wherever wood screw fastening is specified, use of small guide holes will prevent splitting and simplify tightening.

Next install the RP-102 h-f unit (Item 2). Locate accurately over the rectangular opening on the front panel using the same technique as above for centering; that is place marks about 1-in. away from the cutout edges so that they are exposed when the horn flange is in place. Fasten the horn flange to the front panel with #8 x 3/4-in. long wood screws. Remove the cover mounting bolt and replace through the end slot in the long leg of the L bracket (Item 5). Fasten the foot of this bracket to the cabinet top with #8 x 1/2-in. long R. H. wood screws. After standing the cabinet upright adjust the RP-102 to a level position and securely tighten the cover mounting bolt.

Note that only one control is used in the Concerto-15 reproducer. Install the escutcheon cup of ST-901 h-f balance control (Item 4) to the cabinet side using the small O. H. brass wood screws provided. Attach the control to the escutcheon cup with the terminal lugs down, using the large lock nuts provided. A locating pin in the control fits into a small hole in the back of the escutcheon cup for positive locking tighten securely with pliers. The A-204 crossover network (Item 3) is next installed on the front panel just below the 15-in. l-f speaker unit with terminals left and right for easy access. Fasten with #8 x 1/2-in. long R. H. wood screws.

Figure 5 is a color coded wiring diagram showing details of the circuit connections. First connect the leads of input cable assembly (Item 6) to input terminals "1" and "2" of the A-204

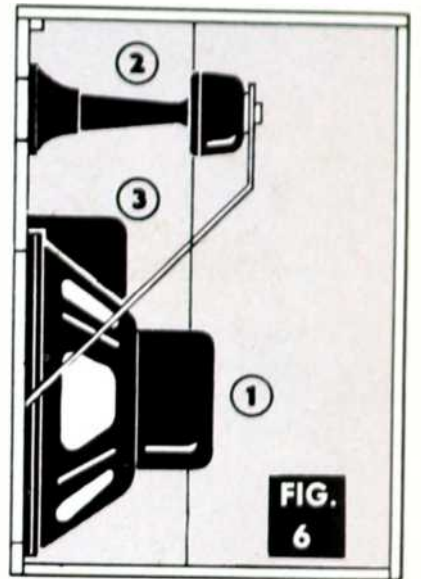


crossover network. Next connect the 10-in. 2-wire cable (Item 7) from l-f terminals "5" and "6" of A-204 to the terminals of the P15-LL l-f unit. Connect the RP-102 h-f unit and ST-901 h-f balance control to the A-204 network observing carefully the wiring diagram for correct color coding. Note that *both* lead "2" of the RP-102 and the BLACK lead from the control connect to terminal "4" of A-204 network. Note also that the BLUE lead of the control is spliced to lead "1" of the RP-102; simply twist the wire ends tightly and then screw on solderless connector (Item 8) securely.

Cut a slot about 1/2 x 1-in. near the center of the removable back cover of the enclosure; pass the input terminal strip through this slot and fasten to the outside with small wood screws. Attach the back cover to the enclosure securely using wood screws on approximately 6-in. centers.

Speaker unit placement for a build-in type Concerto-15 reproducer is shown in Figure 6. Assembly procedure is exactly the same except that L bracket (Item 5) is not used. Because the front baffle must be removable for access, the RP-102 h-f unit must be supported solely from the front baffle. A metal strap bent as shown in Figure 6 is suggested for this purpose—its exact dimensions are not important.

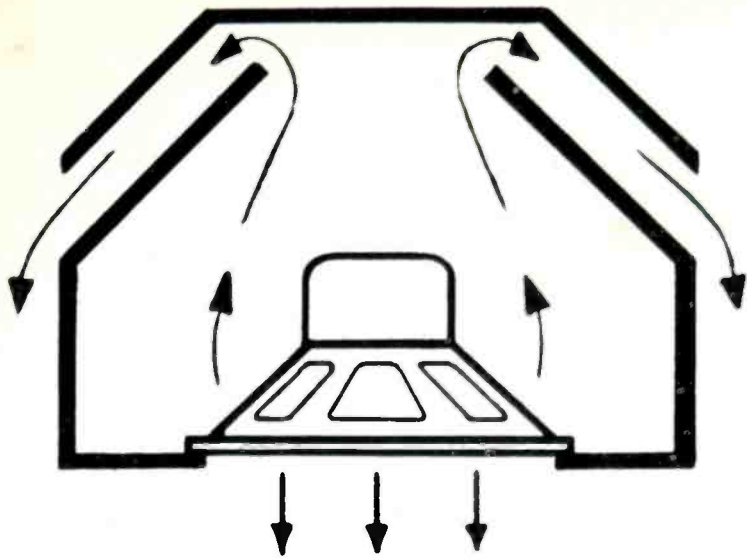
The color coded circuit diagram of Figure 5 applies for the build-in version as well. The input terminal strip may be more conveniently located inside the cabinet rather than on the outside back which may not be accessible. Incoming cable from the amplifier can pass through an airtight hole in the side or wherever convenient, and connection made to the input terminal strip.



## OPERATION OF THE CONCERTO-15

The nominal impedance of the Concerto-15 reproducer is 16 ohms and its nominal power rating 30 watts. Simply connect the 16 ohm terminals of any high quality amplifier to the terminal strip of the reproducer using ordinary lamp cord for distances up to 50 feet. Only a few watts of power are needed for the average listening room and therefore almost any amplifier will be adequate. Although some reserve power is desirable, power substantially in excess of 30 watts may cause distortion and if prolonged possible damage. Amplifiers with high power ratings—say 50 watts—are quite satisfactory but must not be used at their full capacity.

The h-f balance control permits precise adjustment of the output level of the h-f unit for proper balance relative to the output of the l-f unit. This important control must be accurately set for best results. For the average listening room the control should be nearly straight up. Check this setting by rotating left to the extreme or "off" position; then increase the setting, while listening to wide range music reproduction, until the music seems to "blossom out" or come to life. Just below this position is usually the correct setting. When listening at some distance away you should not be conscious that the h-f range is coming from a separate unit—if so the balance setting is too high.



## A BASS ULTRAFLEX ENCLOSURE FOR 12-INCH SPEAKERS

TABLE I  
TYPICAL DIMENSIONS FOR BUILD-IN BASS ULTRAFLEX ENCLOSURE FOR 12-INCH SPEAKERS (ALL DIMENSIONS IN INCHES)

A	B	C	D
Height	Width	Depth	Duct Width
20-5/8	27-1/2	13-3/4	1-1/8
20-5/8	32-5/16	12	1-1/8
27-1/2	20-5/8	13-3/4	7/8
32-5/16	20-5/8	12	3/4
25	25	12-13/16	15/16

A unique Jensen enclosure design of modest size is the BASS ULTRAFLEX\* for 12-inch speakers. In this design the loudspeaker is attached to the front panel in orthodox fashion the radiation from the back of the speaker is coupled by a large air chamber to the outside through a pair of ducts or channels. This enclosure can logically be termed a duct-loaded bass reflex since its operation is somewhat similar but with ducts connecting the outside port openings to the interior coupling chamber. These ducts give certain design advantages available in no other way.

Not to be confused with a folded horn the Bass Ultraflex design yields performance superior to any other design in a cabinet of comparable size; the design is suitable for corner or sidewall use as well. Recommended whenever the larger Bass Ultraflex enclosure with 15-inch speakers cannot be accommodated, this deceptively simple structure offers many advantages. Shape flexibility, for example, permits you to tailor your enclosure to meet your special needs as discussed below.

### BUILD-IN TYPES OF THE ENCLOSURE

The following two pages show constructional details for a free standing Bass Ultraflex enclosure for corner or sidewall use. However, some may prefer the more orthodox form of cabinet. Figure 1 shows a "lowboy" or chest type cabinet for 12-in. speakers using the Bass Ultraflex principle giving exactly the same performance. The construction is quite simple and all panel dimensions are easily obtained from the drawing.

The chest type Bass Ultraflex is ideal for integration into a "music wall". The enclosure provides for good loudspeaker performance and is combined with other cabinets to house radio, TV, record changer, records, etc. Note that the front panel or speaker baffle is removable for easy access in such an installation. Other shapes are perfectly feasible and just as satisfactory in performance. For example, an upright cabinet may make a better enclosure to fit your particular need. Simply choose the shape you desire with inside dimensions of height A, width B, and depth C so that the total interior volume  $A \times B \times C$  equals 7990 cu. in. Since the duct height is the same as the cabinet height A, calculate the duct width D so that the total duct area (two ducts)  $2 \times A \times D$  equals 47 sq. in. The duct length must always be  $7\frac{1}{2}$ ". Avoid dimensions where the largest is more than three times the smallest; such elongated shapes encourage organ pipe resonance effects that are undesirable. Table I lists dimensions for several cabinet shapes showing duct width required.

As in the basic type described on the next page, the use of absorption material on top and bottom is recommended. Note that short wrought iron or wood legs can easily be attached to the lowboy chest for attractive and modern styling. Simple platform bases are usually best for the upright cabinets.

Here is an enclosure design whose shape can be altered to suit your exact needs. It is ideal for building into that antique chest or treasured fine-furniture radio console cabinet.

### INSTALLING SPEAKER UNITS

All of the Bass Ultraflex designs described in this section are shown with single baffle cutout for 12-inch loudspeakers. They are ideally suited for use of 12-inch coaxial units. The Jensen H-222 12-inch coaxial with compression type h-f unit offers outstanding performance in the various forms of this enclosure. Where cost compromises must be made use the Jensen K-210 12-inch coaxial with direct radiator h-f unit. Further compromise in the upper register with resulting cost savings can be made by adopting a single radiator loudspeaker of the Extended Range type such as the Jensen P12-RX.

The above units or any 12-inch single radiator or unitary (coaxial) assemblies are attached directly to the front panel. Lay the enclosure face down on the floor; place about four marks around the speaker cutout about 1 in. away from the edge. These marks will still be visible after lowering the speaker into position and provide a simple means for centering. Fasten securely with R.H. wood screws just long enough not to penetrate the front panel; tighten carefully so as not to distort the speaker frame.

Note that the basic enclosure described on the next page provides a cutout for the r-f balance control of such speakers as the Jensen H-222; the photograph at the top of the next page illustrates the corner type Bass Ultraflex enclosure with the H-222 installed. A similar 1-11/16-in. diameter hole can be located wherever convenient in the build-in forms. A later section discusses front panel changes for separated unit multiple channel systems typified by the Jensen Concerto-12 system.

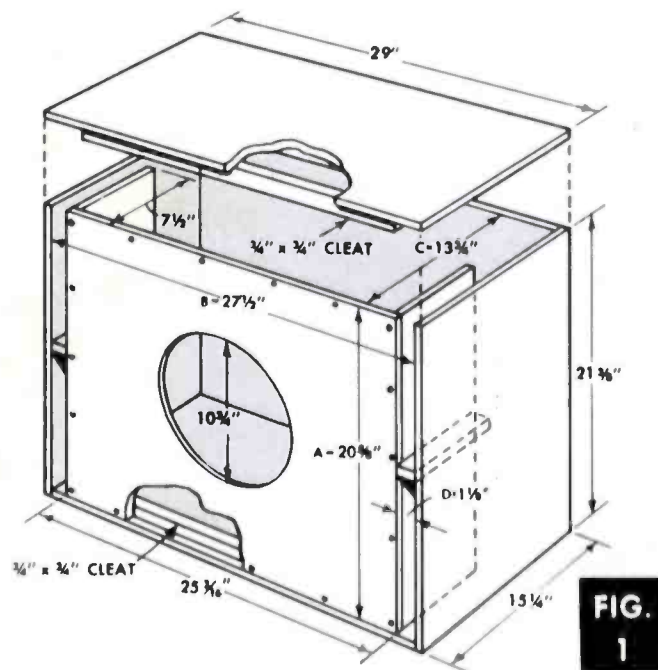


FIG. 1

\*TM Registered, Jensen Mfg. Co.

# BUILDING THE BASS ULTRAFLEX-12

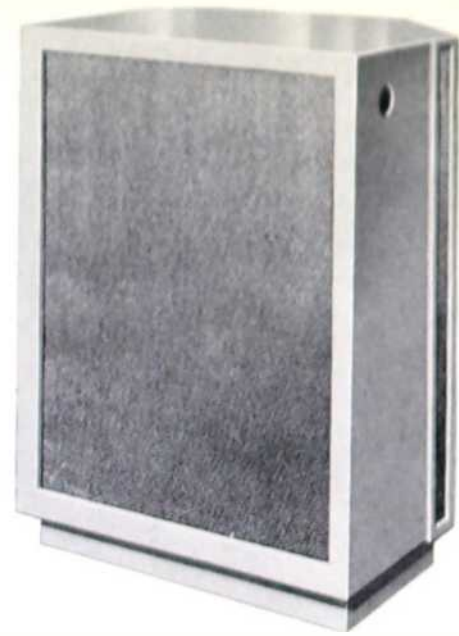
The pull-a-part drawing on page 23 shows at a glance how the various parts go together. An important point to remember in building the cabinet is that all joints must be accurately fitted and that it must be made as rigid as possible to obtain the best results. Except for such parts as the base, cleats and stiffening members,  $\frac{3}{4}$ -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.

Start by laying out the bottom of the cabinet. The bottom measures  $15\frac{1}{4} \times 20\frac{5}{8}$ -in. Note that both rear corners are cut off at a 45-deg. angle at a point  $10\frac{1}{2}$ -in. from its front edge. Note that the bottom of the cabinet is  $\frac{3}{4}$ -in. smaller all around than the top to let the sides, front and back lap the edges. It is necessary to add  $\frac{3}{4}$ -in.-sq. filler blocks to the edges of the bottom at the points indicated in detail A. These filler blocks, which widen the bottom at these points, are glued and nailed to the bottom later. As with all parts, it is important that the bottom be cut out squarely since it must fit the sides, front and back tightly.

Next, cut the front for the cabinet. This measures  $22\frac{1}{8}$  in. wide and  $27\frac{5}{8}$  in. high. This makes the front  $1\frac{1}{2}$  in. wider than the bottom to let the front lap the thickness of the sides. The  $10\frac{3}{4}$ -in. speaker opening is centered in the front panel on a line  $10\frac{1}{4}$  in. up from its bottom edge. This can be cut nicely with a jigsaw or by hand with a keyhole saw. The bottom and front of the cabinet are now joined together, using glue and nails, and watching to see that the bottom sets in  $\frac{3}{4}$ -in. on each side and flush with the bottom edge. This joint should fit tightly at all points. Brace the two parts temporarily to hold them at right angles.

Next, the sides are added. These measure  $8\text{-}3/16$  in. wide and  $27\frac{5}{8}$  in. high; the rear edge of each is beveled 45 deg. Note that a control mounting hole is cut in the right-hand panel near the top. The detail gives the proper spacing for this hole. The sides are glued and nailed securely to the edges of both the bottom and front members of the cabinet. Note that a 1 x 2-in. stiffening cleat is glued and screwed to the front panel on the inside 10-in. down from the top. Another cleat 1 x 1-in. sq., is screwed and glued across the top of the front on the inside; this is used to help fasten the top of the cabinet.

At this stage the filler blocks are added to the rear corners of the bottom. You'll notice that the ends of the blocks are cut 45-deg. so they will match the 45-deg. bevel on the sides as well



as the angular shape of the bottom. Use glue and nails to attach the blocks. Panels A are fitted next. These measure  $8\frac{3}{4}$  in. wide and are cut  $\frac{3}{4}$ -in. shorter than the sides since they rest on top of the bottom. Looking at the top view you will see that a 1 x 1-in. cleat is used to fasten each panel to the bottom of the cabinet. These cleats are placed at a 45-deg. angle on a line even with the beveled edge of the sides. One edge of each panel is beveled 45-deg. The panels are nailed to the sides and then screwed to the cleats previously screwed to the bottom of the cabinet. Next, three  $\frac{3}{4}$ -in.-thick spacer blocks  $\frac{7}{8}$  in. wide are cut to the shape shown and glued to the rear face of each panel. These blocks, besides adding rigidity to panels A and B, help to support the removable back of the cabinet. Detail B shows the approximate locations of the blocks which are fastened in place with glue and screws driven from the inside.

Panels B come next. These are cut  $7\frac{3}{4}$  in. wide and since they lap the edges of the bottom, they are made  $27\frac{5}{8}$  in. high like the sides and front. Both panels are beveled 45 deg. along the outer edges to conform with the angular shape of the bottom and be flush with the sides of the cabinet. Panels B are glued and nailed to the edges of the bottom and in turn glued and screwed to the spacer blocks. Panels A and B now form a sound passage  $\frac{7}{8}$ -in. wide at each side of the cabinet. The top of the cabinet is cut to rest on top and be even with the outside all around. Nail and glue the top down into the edges of the plywood.

The back panel is fastened in place with screws only so it may be removed easily. Note in detail C how the vertical edges are beveled 45 deg. to make them fit snugly against the square edges of panels B. Note, too, that the beveled edges are faced with a strip of sponge rubber to assure a tight seal when the screws are pulled up tight. A 1 x 1-in. cleat, angle-cut 45 deg. at the ends, is placed across the back of the cabinet at the top. This cleat is glued and screwed securely to the underside of the top  $\frac{3}{4}$ -in. in from the edge, and provides a place for driving the screws that hold the back panel at the top.

Although optional, the set-back base adds a finished look to the cabinet and consists of three pieces of 2 x 2-in. material, (actually  $1\frac{5}{8}$ -in. sq.) mitered at the corners so the base will set in  $\frac{3}{4}$ -in. at the front and sides. The base may be added at a time of construction when it is convenient to drive screws down through the bottom.

All exposed nail and screw heads can be sunk slightly below the surface and puttied over to conceal them. Add 1-in. thick absorption material to top and bottom as shown; jute rug padding or dense fiberglass board are recommended.

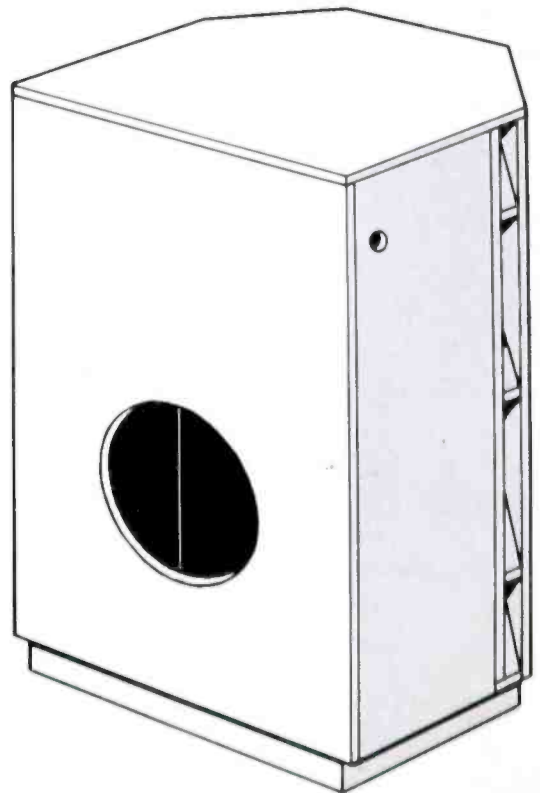
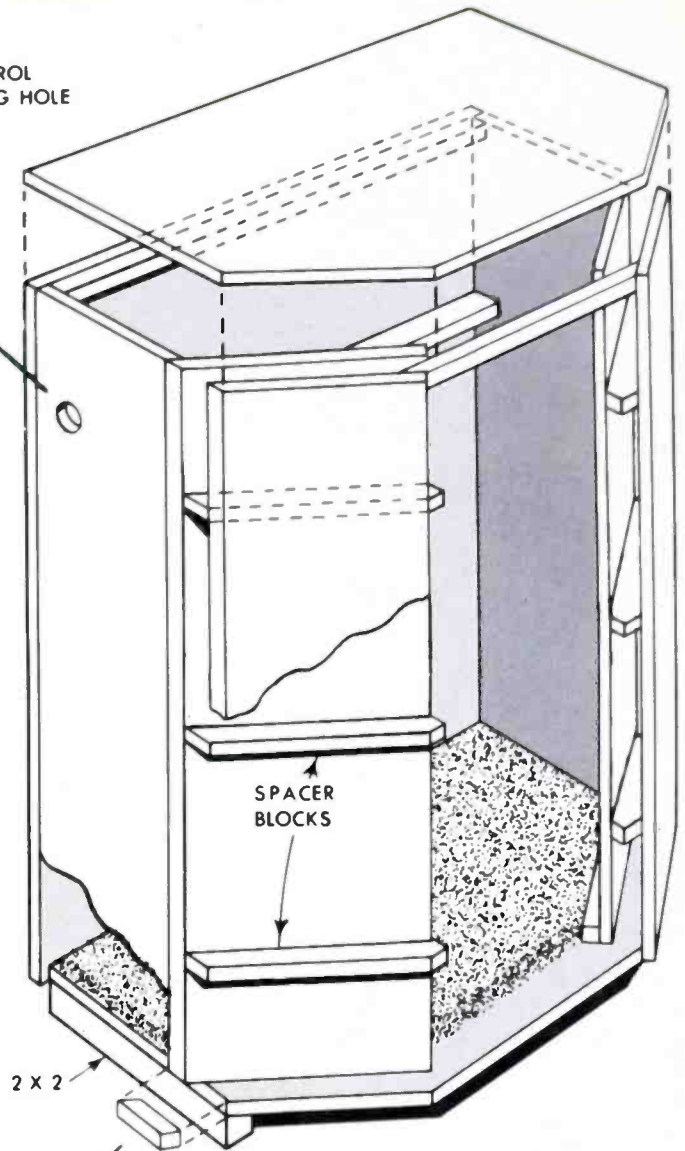
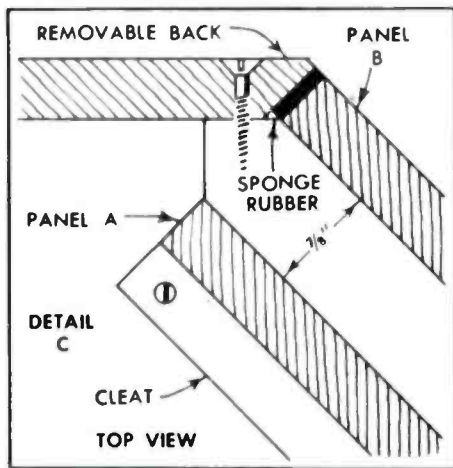
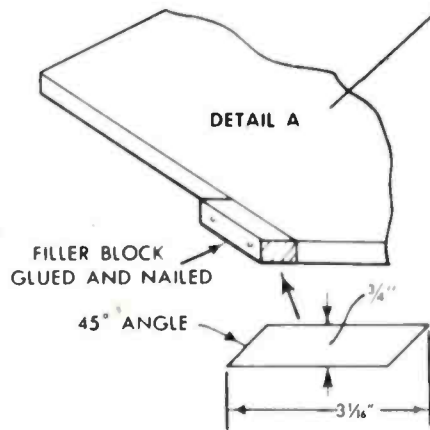
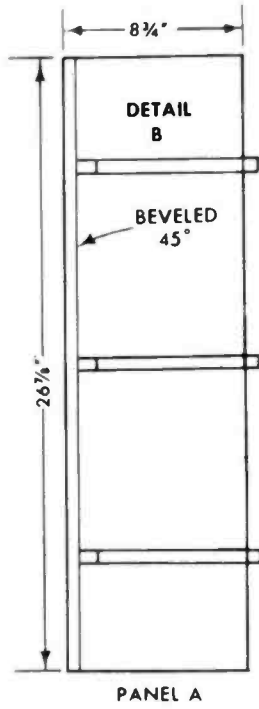
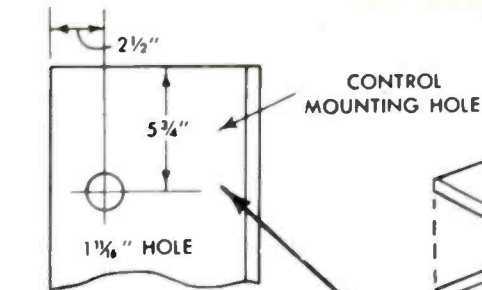
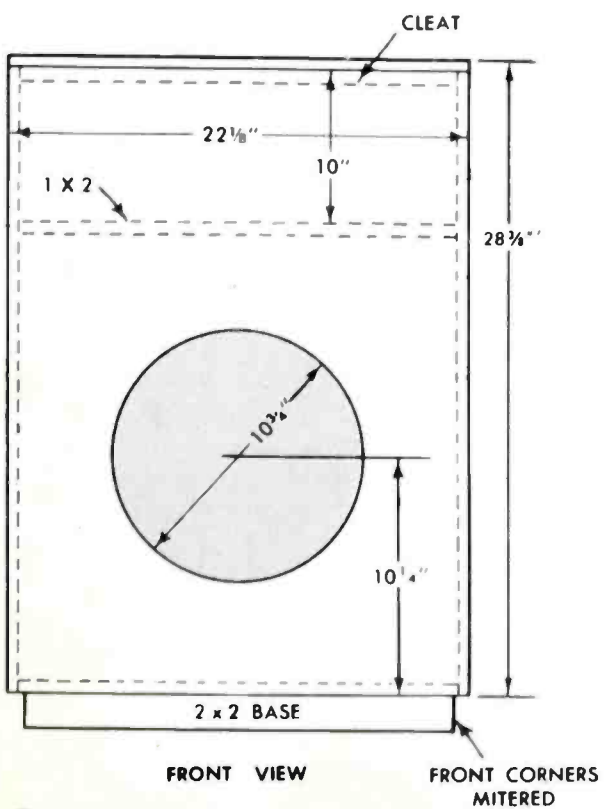
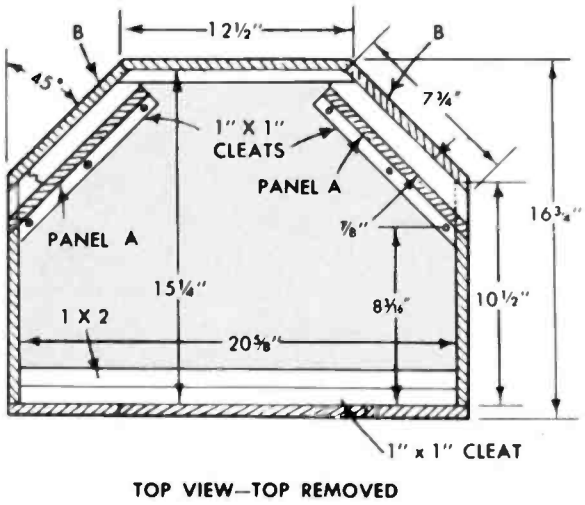
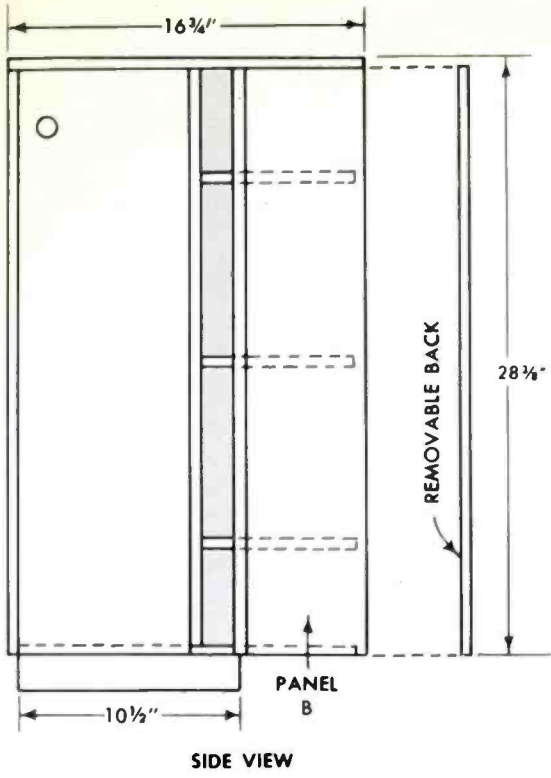
## MATERIAL LIST

### BASS ULTRAFLEX-12 ENCLOSURE FREE STANDING TYPE FOR CORNER OR SIDEWALL

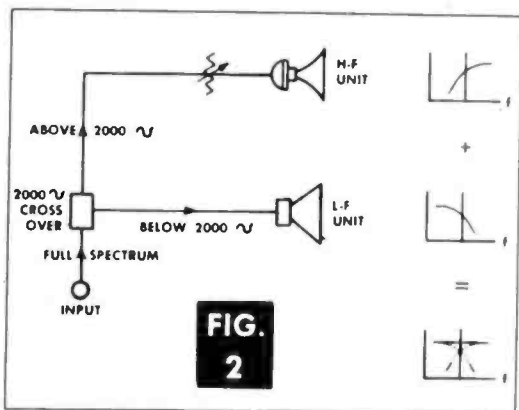
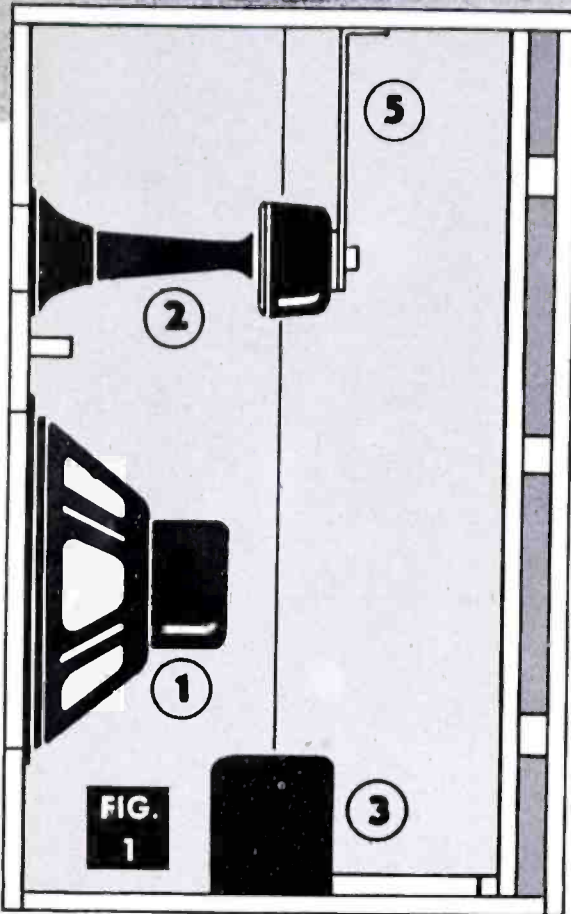
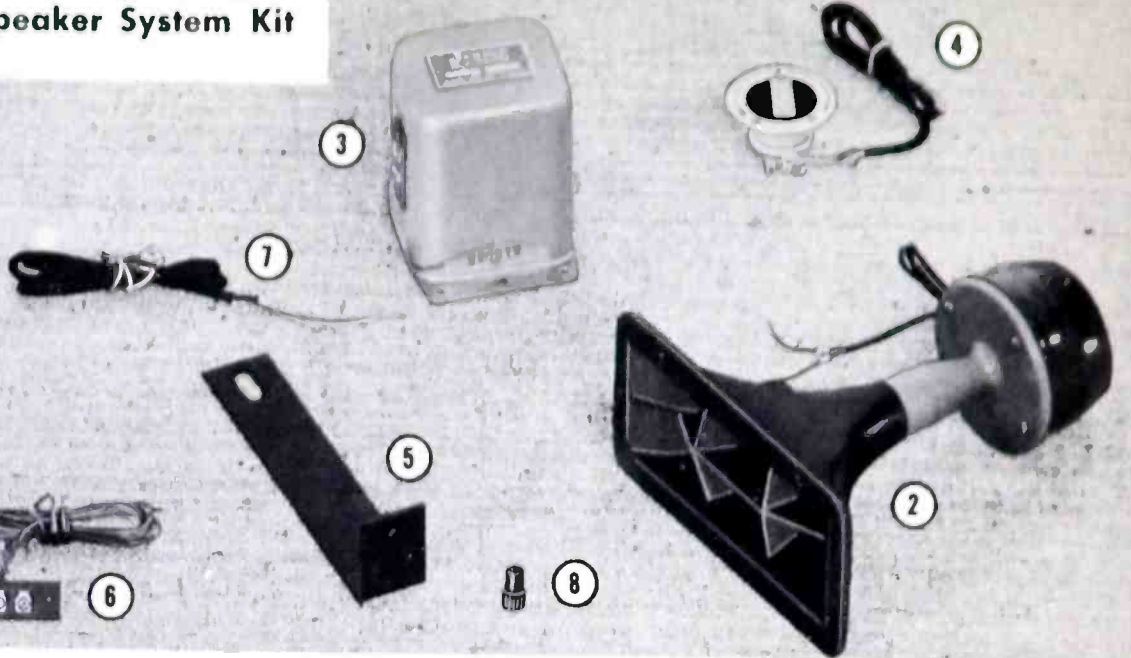
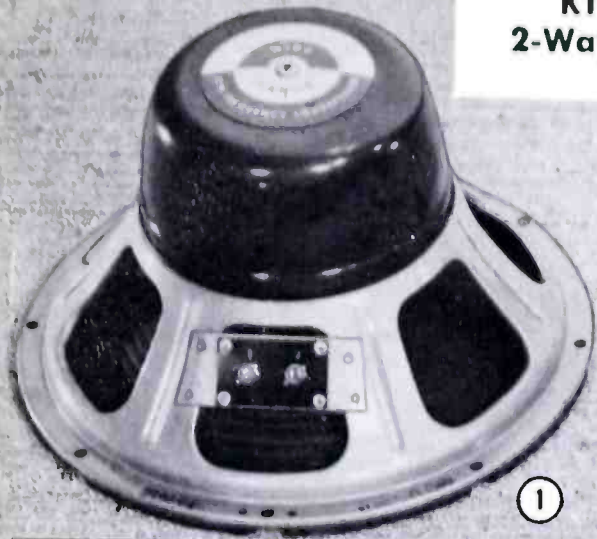
3/4-in. Plywood		
1	22-1/8 x 27-5/8	Front
1	15-1/4 x 20-5/8	Bottom
1	16-3/4 x 22-1/8	Top
2	8-3/16 x 27-5/8	Sides
2	8-3/4 x 26-7/8	Panels A
2	7-3/4 x 27-5/8	Panels B
1	12-1/2 x 27-5/8	Back
Lumber		
1	1-5/8 x 1-5/8 x 41-5/8	Base
1	1 x 1 x 120	Cleats
1	1 x 2 x 21	Stiffening Cleat

All dimensions in inches.





**KT-22 CONCERTO-12  
2-Way Speaker System Kit**



**MATERIAL LIST**

**KT-22 CONCERTO-12 2-WAY SPEAKER SYSTEM KIT**

ITEM	QTY.	MODEL	DESCRIPTION
1	1	P12-NL	12" L-F Unit
2	1	RP-102	H-F Unit
3	1	A-204	2000 Cycle Network
4	1	ST-901	H-F Balance Control
5	1	—	L Bracket
6	1	—	Input Cable Assembly
7	1	—	10' 2-wire Cable
8	1	—	Solderless Connector

**JENSEN CONCERTO-12 REPRODUCER**  
**FREE STANDING AND BUILD-IN TYPES**

The Jensen Concerto-12 is an excellent reproducer of the 2-way divided system type designed for the best possible performance where space is restricted and where cost reduction is important. Two separate loudspeaker units each designed to reproduce only a limited portion of the full music spectrum are used in a Bass Ultraflex\* enclosure of modest size. Incorporating the same superior h-f unit, reproduction in the upper range is fully equal to the Concerto-15 reproducer. The special 12-in. direct radiator unit permits a smaller enclosure and this combination therefore results in appreciable cost saving. Thus use of the Concerto-12 reproducer is indicated where excellent reproduction quality is desired but where size or cost rule out the Concerto-15 reproducer with its 15-in. l-f unit and larger enclosure.

Figure 2 shows how the Concerto-12 functions. The amplifier output signal contains the entire music range to be reproduced; it is connected to the INPUT of the Concerto-12 system. A precision device known as a dividing network splits the frequency scale at 2000 cycles; this is acknowledged as an ideal frequency for division in a 2-channel system. All music components below 2000 cycles are passed directly to the special 12-in. l-f unit; this 12-in. direct radiator or "cone" type unit in the Bass Ultraflex enclosure designed specifically for it yields l-f performance which can be attained in no other way in an enclosure of such modest size.

The lower portion of this l-f range, properly reproduced, provides the body

and depth of music; the upper portion includes the components of music having the greatest power and which contribute naturalness and "presence". The quality provided by the Concerto-12 in this important range is readily apparent; devoid of boominess and "hangover", reproduction has definition of tone values with "separation" of individual musical instruments even in the presence of heavy low tones and percussion.

All music components above 2000 cycles pass through a level control or h-f balance control and are recreated by a horn type h-f unit. As with the h-f unit in the Concerto-15 a special horn flare formula in the hyperbolic-exponential family\*\* is used with coordinated driver unit for greatest precision of reproduced signal and wide angular coverage throughout its range. The control permits precise adjustment of the output of this range so as to give proper balance, in any room environment, with the output of the l-f range.

In the h-f range lies the brilliance and sparkle of music; properly reproduced in the Concerto-12 we have, just as in the Concerto-15, reproduction of the rich overtone structure without "blurring"—music which sounds like the original.

From the above one can appreciate the necessity of carefully design-coordinated elements if the full potential is to be realized. The Jensen KT-22 Concerto-12 Speaker System Kit includes loudspeaker units meeting just this requirement. The photograph above shows the various parts of this kit further identified in the accompanying material list.

\*TM Registered, Jensen Mfg. Co.

\*\*U. S. Patent No. 2338262

# ASSEMBLING THE CONCERTO-12 REPRODUCER

The Concerto-12 enclosure is simply the Bass Ultraflex enclosure or 12-in. loudspeakers described on pages 21-23 with front panel changes to accommodate the horn type h-f unit of the KT-22 2-way speaker system kit. A  $2\frac{3}{4}$  x  $6\frac{7}{8}$ -in. horizontal rectangular slot in the front panel provides the proper opening for the flanged mouth of the h-f unit.

Figure 4 shows the size and location of the front panel openings for the free-standing type for corner or sidewall use. Note that placement of the  $10\frac{3}{4}$ -in. diameter opening for the 12-in. l-f unit is unchanged and that the stiffening cleat is retained. Carefully locate the center of the rectangular slot and lay out the opening accurately. Drill starting holes at the corners and cut out with a hole saw; file edges to exact size and corners square. Accuracy is important for adequate screw fastening of the horn flange without obstructing the horn opening.

Figure 3 shows size and location of openings in the removable front baffle for the build-in version. The opening for the l-f unit is lowered to provide space for the h-f unit. Lay out the rectangular slot accurately and cut as described above. Note also the  $1\frac{11}{16}$ -in. diameter hole in the baffle for a convenient location of the h-f balance control.

The build-in version can be almost any shape to meet your particular need just as described for the Bass Ultraflex enclosure or 12-in. loudspeakers.

## INSTALLING THE SPEAKER UNITS

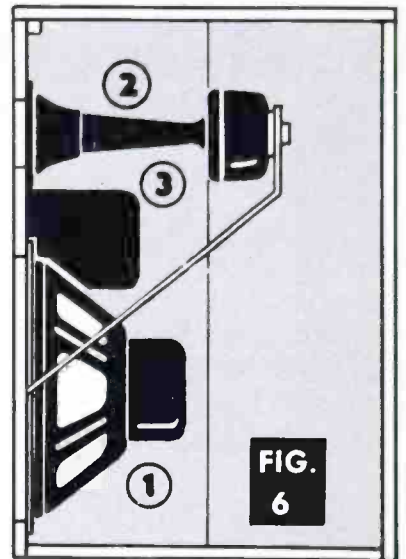
Figure 1 shows KT-22 speaker unit placement in the free standing Concerto-12 reproducer. Lay the enclosure on its face with back removed; make about four marks on the baffle around the large circular opening about 1 in. out from the edge. Lower the P12-NL l-f unit (Item 1) into place with terminal screws toward the cabinet bottom. Center the P12-NL within the exposed marks and fasten with 8 #10x1-in. long R. H. wood screws and flat washers; tighten carefully to prevent distortion of the speaker frame. Use of small guide holes is recommended wherever wood screws are specified to prevent splitting and simplify tightening. Next install RP-102 h-f unit (Item 2) centering the horn flange carefully over the rectangular opening by using the same marking technique as above. Fasten the horn flange to baffle with  $8 \times \frac{3}{4}$ -in. long R. H. wood screws. Remove cover mounting bolt and replace through the end slot in the long leg of the L bracket (Item 5). Fasten L bracket foot to the cabinet top with  $8 \times \frac{1}{2}$ -in. long R. H. wood screws. Stand the cabinet upright, adjust RP-102 to a horizontal position, and securely tighten cover mounting bolt. Now attach the escutcheon cup of ST-901 h-f balance control (Item 4) to the cabinet side using the small O.H. brass wood

screws provided. Attach the control to the escutcheon cup with terminals down using the large lock nuts; tighten with pliers. Be sure that locating pin in the control fits into the small hole in the escutcheon cup for positive locking. The A-204 crossover network (Item 3) is next installed on the cabinet bottom just below the l-f unit with terminals left and right for accessibility; fasten with  $\#8 \times \frac{1}{2}$ -in. long R. H. wood screws.

Figure 5 is a color coded wiring diagram showing the correct color coding for all connections. Connect input cable assembly (Item 6) to A-204 and 10-in. 2-wire cable (Item 7) from A-204 to P12-NL. RP-102 h-f unit and ST-901 h-f balance control are next connected to A-204 carefully observing the circuit diagram of Figure 5. Note that one lead of the RP-102 is spliced to one lead of the control; simply twist the wire ends tightly together and screw on solderless connector (Item 8) securely.

Cut a slot about  $\frac{1}{2}$  in. and 1 in. near the center of the removable back cover; pass the input terminal strip through the slot and fasten to the outside with small wood screws.

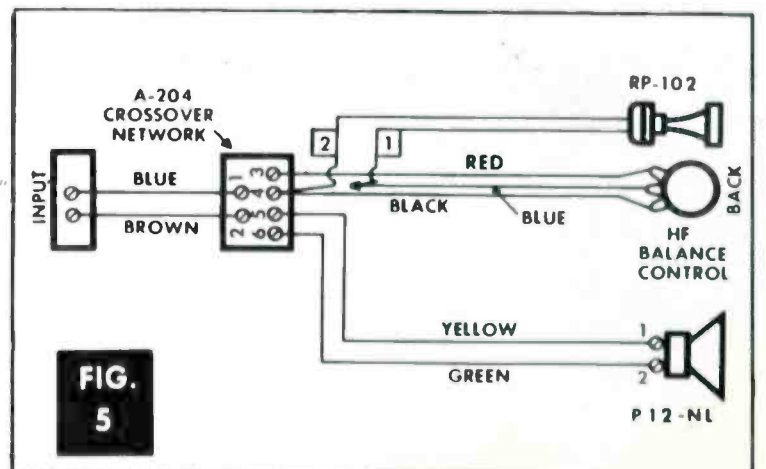
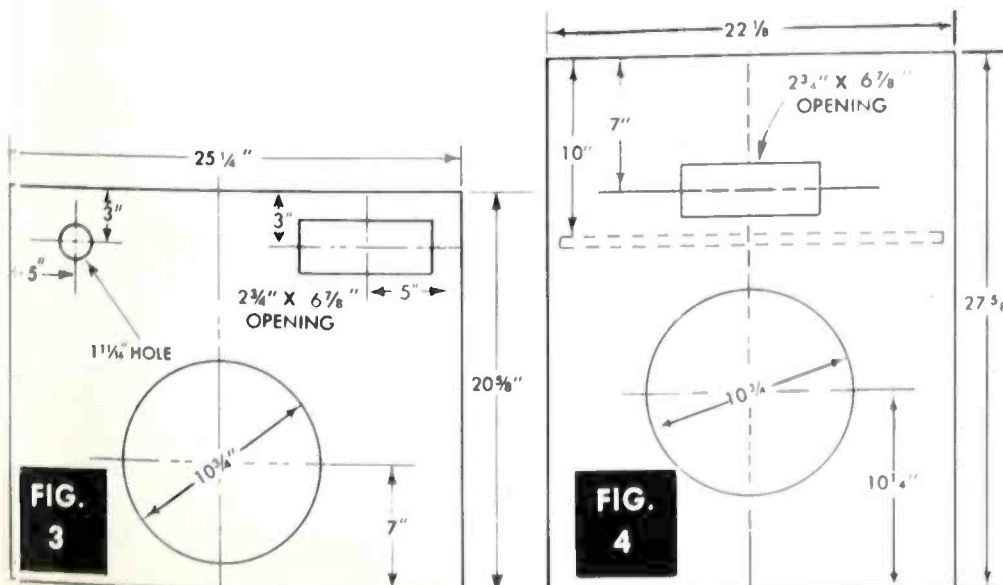
Figure 6 shows speaker unit placement for a build-in type Concerto-12 reproducer. Installation is exactly the same as above except L bracket (Item 5) is not used. Since the front baffle must be removable for easy access, the RP-102 h-f unit must be supported completely from the front baffle. Figure 6 shows a suggested form for a bent metal strap for this purpose—the exact dimensions are of no importance. Input terminal strip may be more conveniently located inside the enclosure; incoming cable from amplifier can pass through an airtight hole in the side or wherever convenient.



## OPERATION OF THE CONCERTO-12

Nominal impedance of the Concerto-12 is 16 ohms; for distances up to 50 feet ordinary lamp cord is suitable for connecting to the 16-ohm terminals of the amplifier. The power rating of the Concerto-12 is 25 watts; powers considerably in excess of this may cause distortion and damage if prolonged. Amplifiers of any power rating are suitable although some with high ratings—say 50 watts—should not be operated at their full capacity.

For average room conditions set the h-f balance control a little to the left of straight up. Check the exact setting by rotating left to the "off" position; then advance the setting until the music seems to "blossom out" or come to life. Just below this position is about right. If you are definitely conscious of sound coming from the h-f unit, the balance setting is too high.





## A BASS ULTRAFLEX ENCLOSURE FOR 8-INCH SPEAKERS

The sides are added next. These measure  $6\frac{5}{16}$  in. wide and  $21\frac{1}{2}$  in. high. The rear edge of each is beveled 45 deg. The sides are glued and nailed securely to the edges of both the bottom and front members of the cabinet. Notice in the front-view drawing that a 1 x 2 cleat is glued and screwed to the front of the cabinet on the inside  $6\frac{3}{4}$  in. down from the top. This cleat adds additional rigidity to the front. Another cleat,  $\frac{3}{4}$  x  $\frac{3}{4}$  in. sq., is screwed and glued across the top of the front on the inside. This one is used to help fasten the top of the cabinet.

At this stage the filler blocks are added to the rear corners of the bottom. You'll notice that the ends of the blocks are cut 45 deg. so they will match the 45-deg. bevel on the sides as well as the angular shape of the bottom. Use glue and nails to attach the blocks. Panels A are fitted next. These are cut  $\frac{1}{2}$  in. shorter than the sides since they rest on top of the bottom. Looking at the top view you will see that a  $\frac{3}{4}$  x  $\frac{3}{4}$ -in. cleat is used to fasten each panel to the bottom of the cabinet. These cleats are placed at a 45-deg. angle on a line even with the beveled edge of the sides. Panels A, beveled 45 deg., are glued and nailed to the beveled edges of the sides and then screwed to the cleats previously screwed to the bottom of the cabinet. Next, a  $\frac{3}{4}$ -in.-thick spacer block,  $11\frac{1}{16}$  in. wide, is cut to the shape shown and glued to the rear face of each panel. These blocks, besides adding rigidity to panels A and B, help support the removable back of the cabinet.

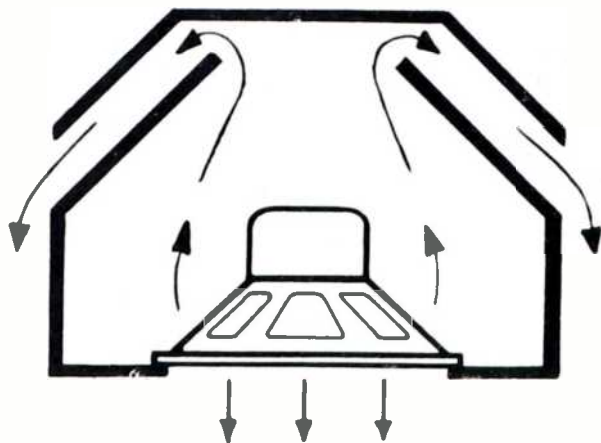
Panels B are added next. These are cut  $6\frac{3}{8}$  in. wide and since they lap the edges of the bottom, they are made  $21\frac{1}{2}$  in. high like the sides and front. Both panels are beveled 45 deg. along the outer edge to conform with the angular shape of the bottom and to be flush with the sides of the cabinet. Panels B are glued and nailed to the edges of the bottom and in turn glued and screwed to the spacer blocks. The two panels, A and B, form a sound passage  $11\frac{1}{16}$  in. wide at each side of the cabinet. The top of the cabinet is cut to rest on top and be even with the outside all around. Nail and glue the top down into the edges of the plywood.

The BASS ULTRAFLEX\* enclosure for 8-in. speakers is a unique Jensen design in which the loudspeaker is attached to the front panel with the usual opening for front radiation; the back radiation is coupled by a cavity or speaker chamber through two tunnels or ducts to openings on the exterior. With proper dimensions substantial improvement in performance at the low end of the music scale is achieved as compared to other enclosure designs of similar size.

In building the enclosure remember that all joints must be accurately fitted and that it must be made rigid. All joints should be adequately glued and if not screwed, nailed securely with 2-in. finishing nails. With the exception of the base, cleats and stiffening members,  $\frac{1}{2}$ -in. plywood is used throughout.

Start by laying out the bottom of the cabinet, following the dimensions given in the top-view drawing. This measures 12 x 16 in. Notice that both rear corners of the bottom are cut off at a 45-deg. angle at a point  $7\frac{1}{2}$  in. from the front. The bottom of the cabinet is  $\frac{1}{2}$  in. smaller all around than the top to allow the sides, front and back to lap the edges of the bottom.

Next, cut the front of the cabinet. This measures 17 in. wide and  $21\frac{1}{2}$  in. high. This makes the front 1 in. wider than the bottom to let the front overlap the edges of the sides. The  $6\frac{3}{4}$ -in. speaker opening is centered in the front panel on a line  $9\frac{1}{2}$  in. up from the bottom. This can be cut out nicely with a jigsaw or by hand with a keyhole saw. The bottom and front of the cabinet are now joined together, using glue and screws or nails, and watching to see that the bottom sets in  $\frac{1}{2}$  in. on each side and flush with the underside of the bottom. Brace the two parts temporarily to hold them at right angles.



### MATERIAL LIST BASS ULTRAFLEX-8 ENCLOSURE

1/2-in. Plywood			
1	17	x 21-1/2	Front
1	12	x 16	Bottom
1	13	x 17	Top
2	6-5/16	x 21-1/2	Sides
2	7-1/2	x 21	Panels A
2	6-3/8	x 21-1/2	Panels B
1	8-5/8	x 21-1/2	Back
Lumber			
1	1-5/8	x 1-5/8 x 36	Base
1	1 x 2	x 16	Front Stiffener
1	1 x 1	x 60	Cleats

All dimensions in inches

The back panel is fastened in place with screws only so it may be removed easily. Note in detail B how the edges are beveled 45 deg. to make them fit snugly against the square edges of panels B. Note, too, that the beveled edges are faced with a strip of sponge rubber to assure a tight seal when the screws are drawn up tight. A  $\frac{3}{4}$  x  $\frac{3}{4}$ -in. cleat, angle-cut 45 deg. at the ends, is placed across the back of the cabinet at the top. This cleat is glued and screwed securely to the underside of the top,  $\frac{1}{2}$  in. in from the edge, and provides a place for driving the screws that hold the back panel at the top.

\* TM Registered, Jensen Mfg. Co.

Although optional, the set-back base adds a finished look to the cabinet and consists of three pieces of 2 x 2 material, actually  $1\frac{3}{8}$  in. square, which are cut to the lengths given and mitered at the corners so the base will set in  $\frac{1}{2}$  in. at the front and sides.

All exposed nail and screw heads can be sunk slightly below the surface and puttied over to conceal them. Add absorption material to a thickness of about 1 inch to inside of top and bottom as shown. Jute rug padding or dense fiberglass board are suggested materials.

Recommended wherever size must be restricted rather severely, the Bass Ultraflex-8 is shown as a free standing cabinet for corner or sidewall use. In these smaller sizes a marked advantage is gained when an available corner is adopted. However the important factors in the design are the total interior volume, the duct area and the duct length. Therefore the shape can be modified as desired for special needs. For example, the enclosure can be an upright chest suitable for combining with additional cabinetry for other units of a high fidelity system.

For the orthodox chest form choose dimensions so that the inside volume (inside height x inside width x inside depth—all in inches) equals 3610 cu. in. The ducts, 7 inches long, can be located along the cabinet sides opening on the front behind the grille cloth. For two ducts extending the full height of the chest choose duct width so that the area ( $2 \times$  inside height x duct width, all in inches) equals 29 sq. in. Avoid shapes where

any dimension is more than three times as long as the smallest dimension. As in the basic design add absorption material to top and bottom.

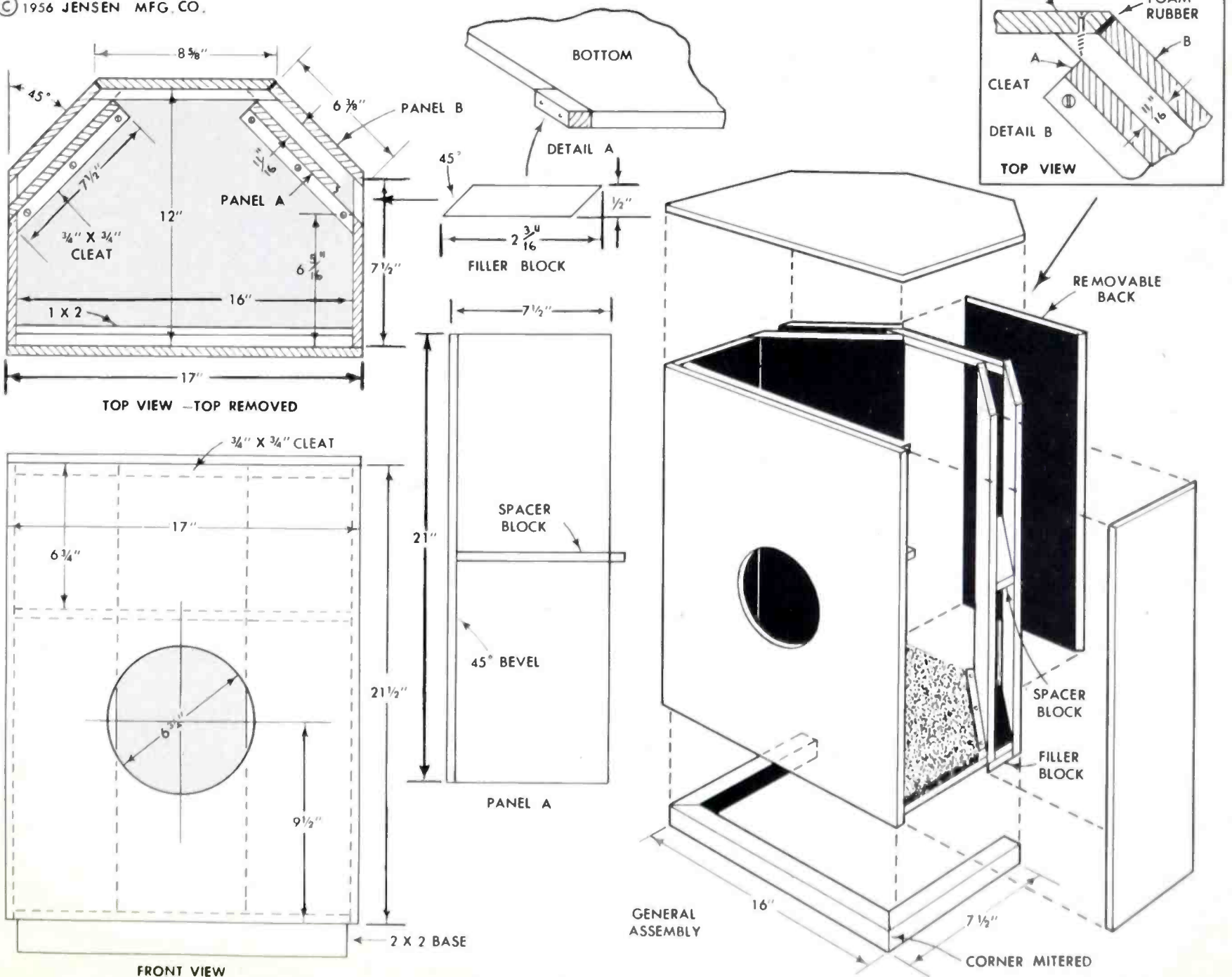
Here is an enclosure flexible in shape for any application where an 8-in. loudspeaker unit is desired—choose the shape to meet your special need.

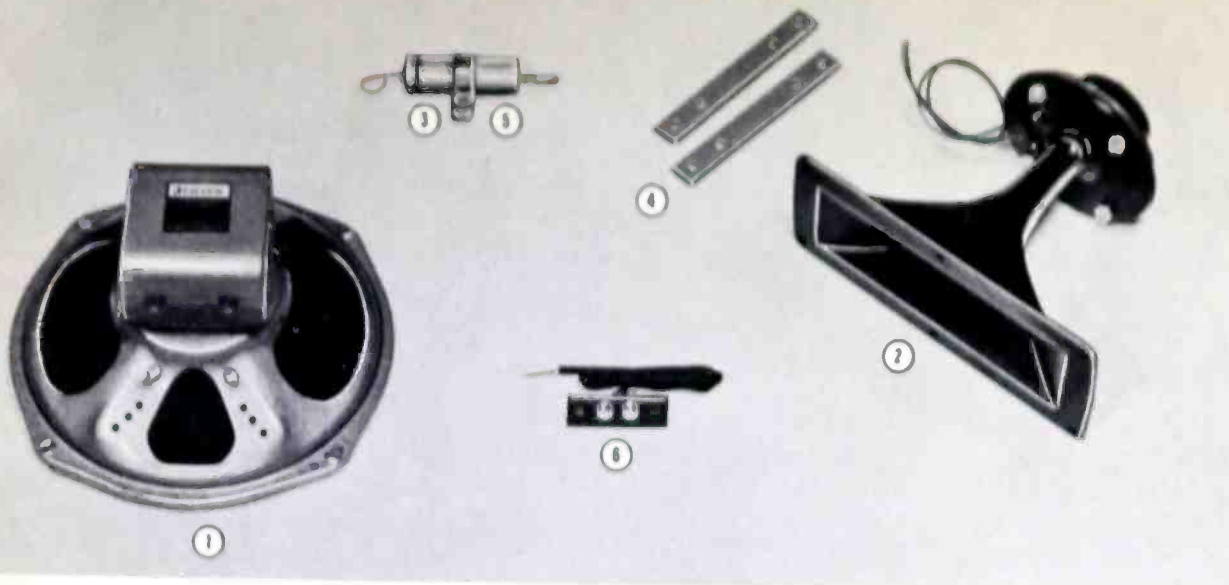
In the plan shown below a single cutout is provided for an 8-in. loudspeaker. Performance is excellent with high quality speakers of the extended range type such as the Jensen P8-RX and P8-SX. Simply attach the speaker unit to the inside front face using round head wood screws just long enough not to penetrate the panel; use flat washers and tighten carefully so as not to distort the speaker frame.

Installation of speaker units is simplified by laying the cabinet face down with back removed and lowering the units into place. About four marks around the cutout spaced about one inch from the edges of the cutout will make centering of the speaker units easy since these marks will be visible after the speaker unit is in place.

Following sections show how you can modify the front panel of the Bass Ultraflex-8 for use of 8-in. l-f unit and horn type h-f unit as well as 6 x 9-in. oval l-f unit and low cost direct radiator type h-f unit combinations for high quality low cost loudspeaker systems.

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## JENSEN TREASURE CHEST DUETTE

### USING THE KDU-10 2-WAY SPEAKER SYSTEM KIT

The Jensen Treasure Chest Duette\* is a reproducer of the 2-way divided system type with outstanding performance in book shelf size. Where small size is important the Treasure Chest Duette fills a great need. Here at relatively low cost in a minimum of space is performance exceeding that from many reproducers substantially larger in size.

Two separate loudspeaker units each designed for only a portion of the music spectrum are used. The incoming signal from the amplifier is connected directly to the special 8-inch l-f speaker unit. A carefully coordinated enclosure design is used with this l-f unit to reproduce the frequency range up to about 3000 cycles. This unit-enclosure combination affords the best performance obtainable in such compact size. In this l-f range lie the music components having the greatest power as well as the components giving body and depth to music. Reproduced properly by this combination, music is free of boominess and "hangover", often associated with small enclosures.

All music components above about 3000 cycles are passed on to the horn type h-f unit for best reproducing quality and widest angular coverage throughout this range. This is the range where the sparkle and brilliance of music exist. Properly recreated as in the Treasure Chest Duette, reproduction retains the rich overtone structure of the original concert to an amazing degree.

Figure 1 shows placement of the KDU-10 speaker units in the Treasure Chest enclosure. Lay the enclosure on its face

#### MATERIAL LIST

#### KDU-10 TREASURE CHEST 2-WAY SPEAKER SYSTEM

Item	Qty.	Model	Description
1	1	P8-RL	8" L-F Unit
2	1	RP-103	H-F Unit
3	1	—	Coupling Capacitor
4	2	—	Horn Mtg Brackets
5	1	—	Capacitor Clamp
6	1	—	Input Cable Assembly

\*TM Registered, Jensen Mfg. Co.

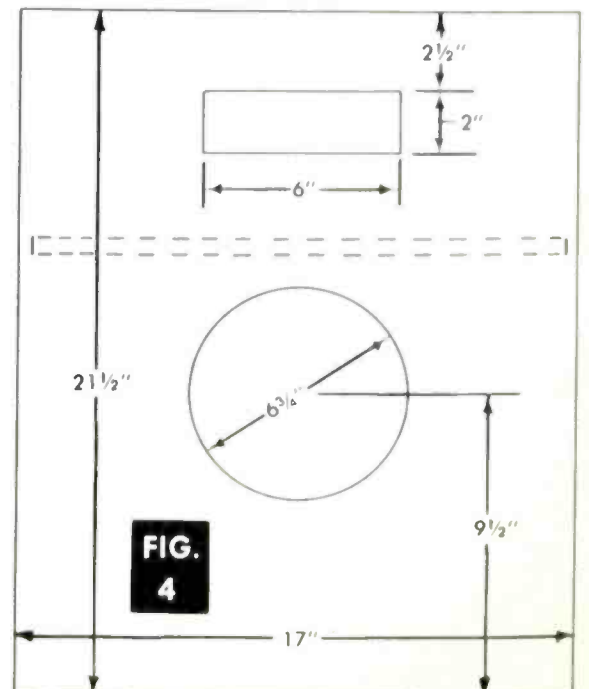
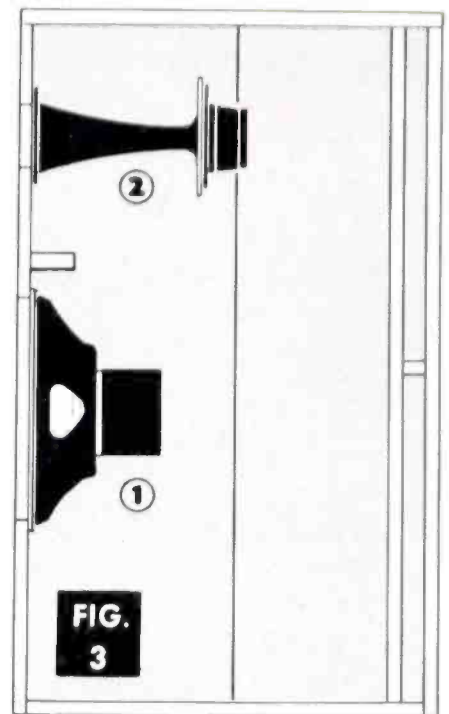
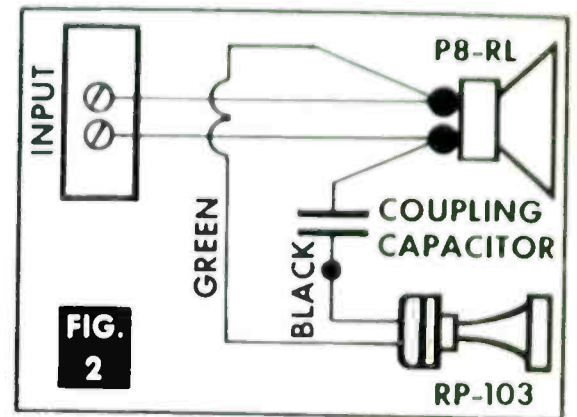
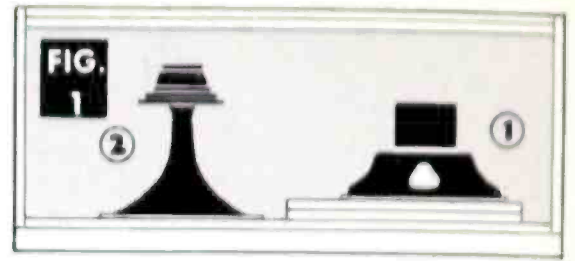
with back removed; make four marks on the baffle around the circular opening about 1" from the edge. Place the P8-RL 8-inch l-f unit (Item 1) on the front baffle and fasten with 4 #8 x 1/2" long R.H. wood screws and flat washers centering the unit inside the four marks still exposed. Tighten screws carefully to prevent distortion of the speaker frame.

Next install the RP-103 h-f unit (Item 2) locating it accurately over the rectangular opening by again using marks. Fasten the horn flange to the front panel with the two horn mounting brackets (Item 4) and #8 x 1/2" long R.H. wood screws. Now fasten coupling capacitor (Item 3) to the front between the speaker units using capacitor mounting clamp (Item 5) and a small wood screw.

Figure 2 shows the wiring. Connect the leads of the input cable assembly (Item 6) to the two terminals of the P8-RL. Next connect one lead of RP-103 to one terminal of the P8-RL and one lead of the coupling capacitor to the other terminal of the P8-RL. Finally splice and solder the remaining lead of the RP-103 to the remaining lead of the coupling capacitor. Tape the splice to prevent possible contact with any metallic object. Solder all connections to the two P8-RL terminals. Pass the terminal strip through the slot in the back and fasten to the outside with small wood screws.

Figure 3 shows the placement of KDU-10 Duette 2-way speaker system kit units in the BASS ULTRAFLEX\* enclosure for 8-inch speakers. Installation and wiring procedures are just the same as described for the Treasure Chest arrangement.

Operation is simple; connect the 8-ohm terminal of the amplifier directly to the input terminals of this 8-ohm Treasure Chest Duette reproducer. Ordinary lamp cord is satisfactory to distances as great as 30 feet. The power rating of the Treasure Chest Duette is 20 watts. Adequate listening levels are achieved with almost any amplifier whether separate or part of other equipment.



## BUILDING THE TREASURE CHEST

The Treasure Chest is quite simple to build. Except for the cleats and the front frame, 1/2-in. plywood is used throughout. All joints should be adequately glued and if not screwed, nailed securely with 2-in. finishing nails.

Cut out the front first. This measures 10 1/4 in. wide and 22 1/2 in. long. Lay out the speaker openings according to the sizes given. Cutting can be done with either a jigsaw or a keyhole saw by first drilling a hole to start the blade. The 7 1/8-in. circular opening is framed on the back with three cleats. These are 1/2 x 3/4 in. and the dotted lines in the front-view drawing show where they go, the end cleat being placed 1 3/8 in. in from the end of the board and the others even with

### MATERIAL LIST TREASURE CHEST DUETTE

1/2-in Plywood		
1	10-1/4 x 22-1/2	Front
1	9-1/8 x 22-1/2	Bottom
1	9-1/8 x 23-1/2	Top
2	9-1/8 x 10-3/4	Ends
1	10-1/4 x 22-1/2	Back
1	10-1/4 x 10-1/4	Sub-baffle
Lumber		
1	3/4 x 7/8 x 72	Front frame
1	1/2 x 3/4 x 30	Sub-baffle cleats
1	1/2 x 3/4 x 66	Back cleats

All dimensions in inches

the top and bottom edges. A 1/2-in. plywood sub-baffle, having a 7 1/8-in. hole cut in it, is later screwed to these cleats to provide a sound passage as the left-hand side. Be sure that the joints between the cleats are airtight so that the sound passage will function properly.

The bottom is cut next. This is the same length as the front, 22 1/2 in., and is 9 1/8 in. wide. The bottom laps the front and is glued and nailed in place even with the edge. Check to see that it is at right angles. This, as well as all other joints, should fit tight. Next come the ends. These are 9 1/8 in. wide and 10 3/4 in. high and you'll notice that they lap the bottom and front. Nails and glue are used to fasten the ends to the bottom and front. The top laps the front and ends and thereby must measure 9 1/8 in. wide and 23 1/2 in. long. It is nailed and glued in place like the other pieces.

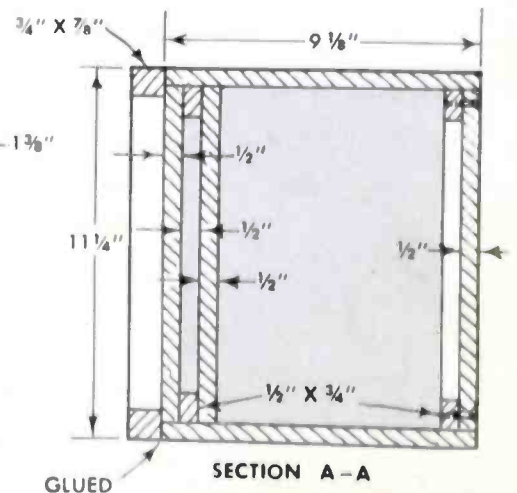
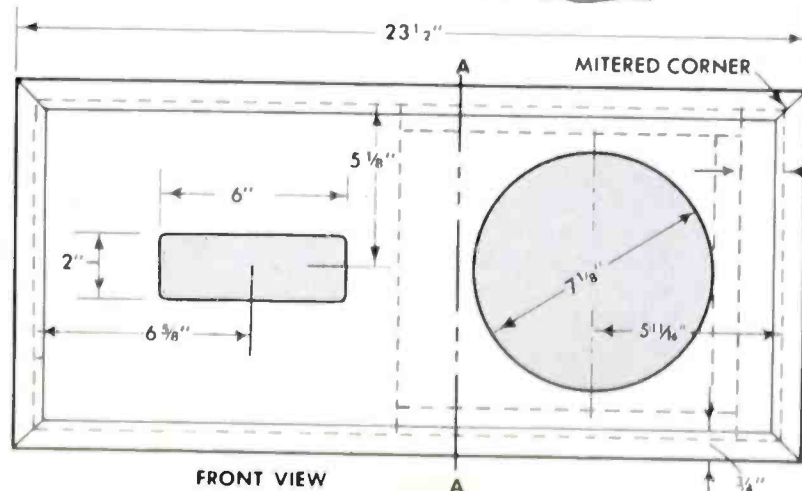
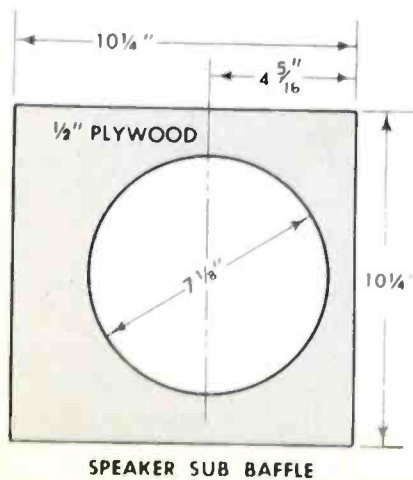
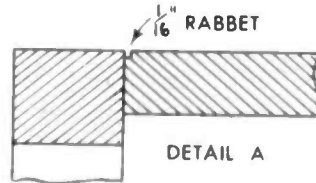
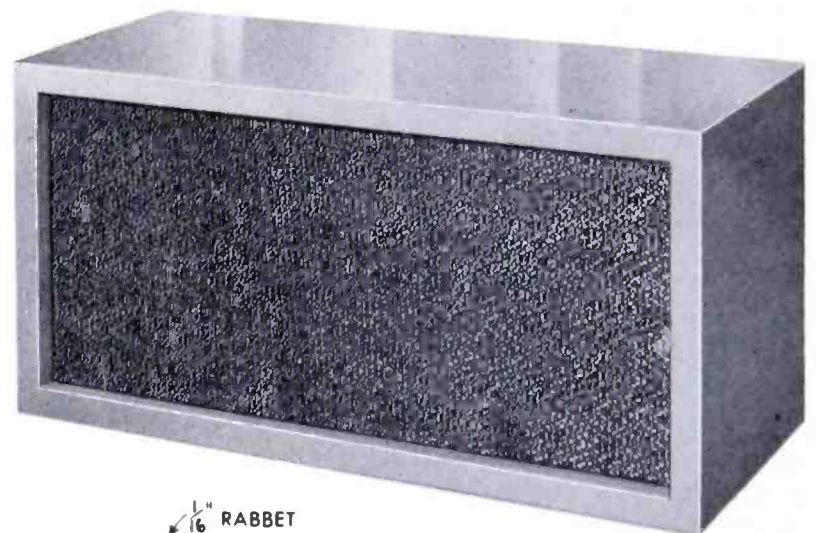
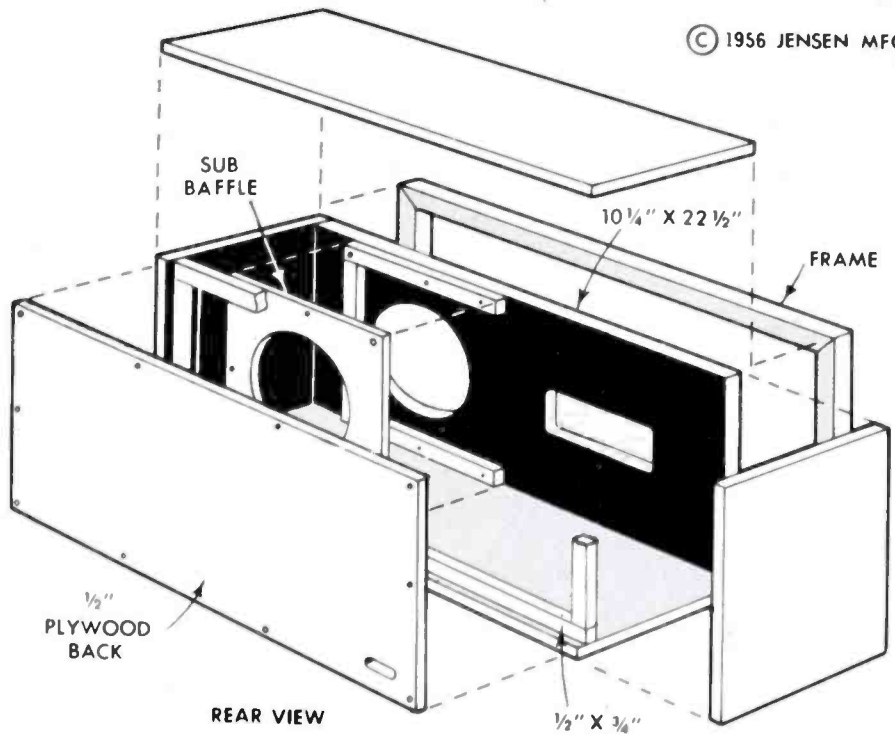
Now the outside front edges of the ends and top are rabbeted 1/16 in., detail A. While this step is optional, the rabbet does add a decorative touch and simplifies trying to make a perfect-matching joint at the time the front frame is added. The rabbet amounts to nothing more than a saw cut obtained by adjusting the blade on your circular saw to make just a shallow cut.

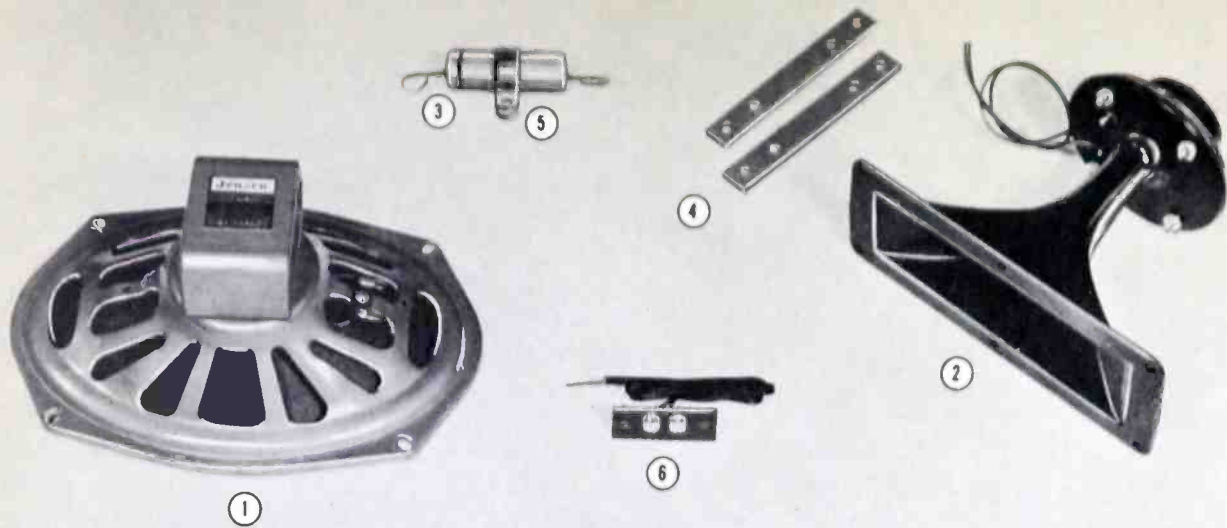
The overall width and height of the frame must equal that of the cabinet. It is made separately, mitering and nailing the corners like a picture frame. Before the frame is edge-glued and clamped to the front of the cabinet, grille cloth is applied to the front, keeping it 1/2 in. in from the edges all around. Draw the cloth smoothly and hold it so by applying glue to the edges.

All that remains is cutting the removable back. It fits inside the ends, top and bottom and is fastened in place with screws driven into 1/2 x 3/4-in. cleats. The cleats are glued and nailed to the inside of the cabinet at the back, placing them 1/2 in. in from the edge.

Note also that the Jensen KDU-10 Duette speaker system kit can also be used in the Bass Ultraflex enclosure for 8-in. loudspeakers with the same brilliant performance in the h-f range but with even somewhat improved l-f performance due to the larger enclosure size. Figure 4 shows front panel details; simply add a 2" x 6" horizontal rectangular slot above the opening for the 8-in. speaker. Drill starting holes at the corners and cut out with keyhole saw. Fasten the front panel to the enclosure exactly as described on page 26.

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## JENSEN TABLE DUETTE

### USING THE KDU-11 2-WAY SPEAKER SYSTEM KIT

The Jensen Table Duette\* is an outstanding 2-way reproducer designed in low table form for use at chairside or to support a table top TV receiver. The enclosure design employs the famous Duette arrangement with special oval l-f unit to give low form and the same reproducing quality achieved with the Treasure Chest Duette. It is low in height with width and depth to suit most table top TV receivers.

Two separate loudspeaker units each designed to cover only a portion of the full frequency range are used in the table Duette enclosure to give performance far superior to that obtainable from the small loudspeakers normally used in TV receivers. The incoming signal from the TV receiver or from a separate phonograph or tuner-amplifier is connected directly to the special oval l-f unit and this unit along with the carefully coordinated table Duette enclosure reproduces the frequency range below about 3000 cycles. The lower portion of this frequency range provides depth and body to music and the upper portion includes the components having the greatest power. Properly reproduced by this oval "woofer" in this special table Duette enclosure, reproduction has unusual definition and realism without the boominess and "hangover" often encountered in small enclosures.

The special characteristics of the l-f unit combined with the coupling capacitor channels the frequency range above 3000 cycles to the horn type h-f unit. This unit with its special horn flare provides wide

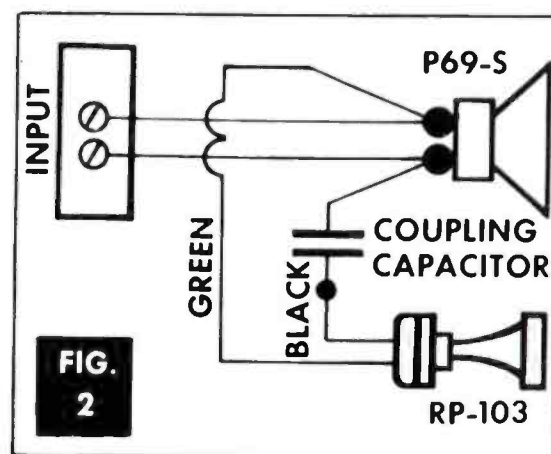
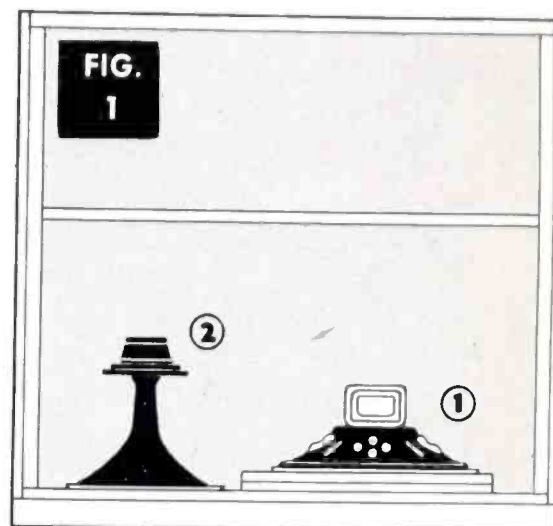
angular coverage and accurate reproduction throughout its range. Properly reproduced in the table Duette this range is noted for the brilliance and sparkle apparent in the original concert.

Figure 1 shows placement of the KDU-11 speaker units in the table Duette enclosure. Carefully center the 6 x 9-in. oval P69-S l-f unit (Item 1) over the cutout provided and fasten with four #8 x 1/2-in. long R.H. wood screws. Similarly, center the RP-103 h-f unit (Item 2) over the rectangular opening and clamp it into place on the front baffle by means of the two horn mounting brackets (Item 4) and four #8 x 1/2-in. long R. H. wood screws. Next, fasten the coupling capacitor (Item 3) to the cabinet front between the speaker units using the capacitor clamp (Item 5) and a small wood screw.

Figure 2 shows the circuit wiring for the table Duette. Connect the input cable leads (Item 6) to the two terminals of the P69-S. Next connect one lead of the RP-103 to one of the P69-S terminals and one lead of the coupling capacitor to the other P69-S terminal. Now splice and solder the remaining lead of the RP-103 to the remaining lead of the coupling capacitor. Tape this splice to prevent possible contact with metallic objects. Also solder all connections to the two terminals of the P69-S. Pass the input terminal strip through the slot in the back of the speaker chamber fastening it to the outside of this panel with small wood screws.

Nominal power rating is 20 watts but almost any amplifier will supply sufficient level for the average room.

Connect the amplifier directly to the input terminal strip. The nominal impedance is 4 ohms and ordinary lamp cord will be satisfactory. The table Duette can be substituted for the internal speaker of phonograph, tape recorder or TV receiver simply by removing the leads from the internal speaker and connecting them directly to the terminal strip.



#### MATERIAL LIST

##### TV OR CHAIRSIDE TABLE DUETTE

		1/2-in Plywood	
1	20-3/4 x 24	Top	
2	8-1/4 x 20-3/4	Sides	
1	7-1/4 x 23	Partition	
1	13 x 23-3/4	Removable bottom	
1	8-1/4 x 23-3/4	Fixed bottom	
1	7-1/4 x 23	Speaker baffle	
1	6-1/2 x 11	Sub-baffle	

#### Lumber

2	3/4 x 1-1/4 x 23	Back members
2	3/4 x 3/4 x 19-1/2	Reinforcing cleats
1	3/4 x 1-1/4 x 66	Front Frame

All dimensions in inches.

#### MATERIAL LIST

##### KDU-11 TABLE DUETTE 2-WAY SYSTEM KIT

Item	Qty.	Model	Description
1	1	P69-S	6" x 9" L-F Unit
2	1	RP-103	H-F Unit
3	1	—	Coupling Capacitor
4	2	—	Horn Mtg. Brackets
5	1	—	Capacitor Clamp
6	1	—	Input Cable Assembly

\*TM Registered, Jensen Mfg. Co.



## BUILDING THE TABLE DUETTE

Note that the rear portion of the enclosure is not part of the loudspeaker chamber and simply provides a suitable size for the top of the table. The depth can be whatever desired for any specific purpose with the speaker chamber remaining unchanged. The width of the enclosure can also be changed but note that this will change the width of the speaker chamber as well. Be sure to compensate for this change by an opposite change in the speaker chamber depth so as to keep the same total internal volume.

Begin by cutting the sides. These are of  $\frac{1}{2}$ -in. plywood and measure  $8\frac{1}{4}$  in. wide and  $20\frac{3}{4}$  in. long. The section detail through the side shows how the top and bottom rest in rabbets made in the sides. Notice particularly the top rabbet. This is cut just shy of a full  $\frac{1}{2}$ -in. deep, or an amount equal to the thickness of the top ply of the plywood, so that when rabbets are formed in the edges of the top, the thin lip remaining will cover the edge grain and produce a joint that is practically invisible. Let the lip extend past the side a bit so that after gluing it

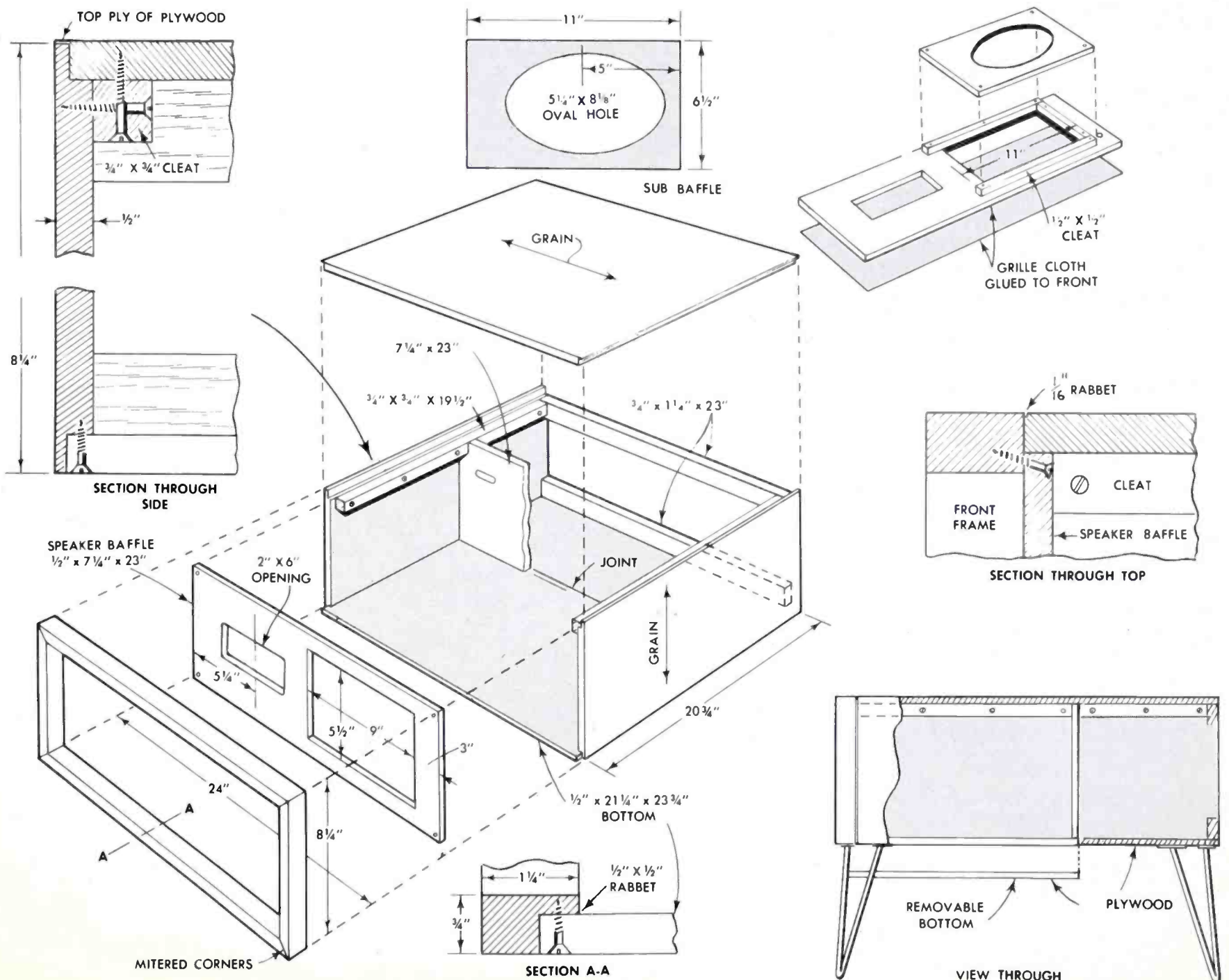
may be sanded off flush. Before assembling the sides and top, run a shallow sawcut,  $\frac{1}{16}$  in. wide, at the very front edges of the three pieces; this will make a neat decorative joint.

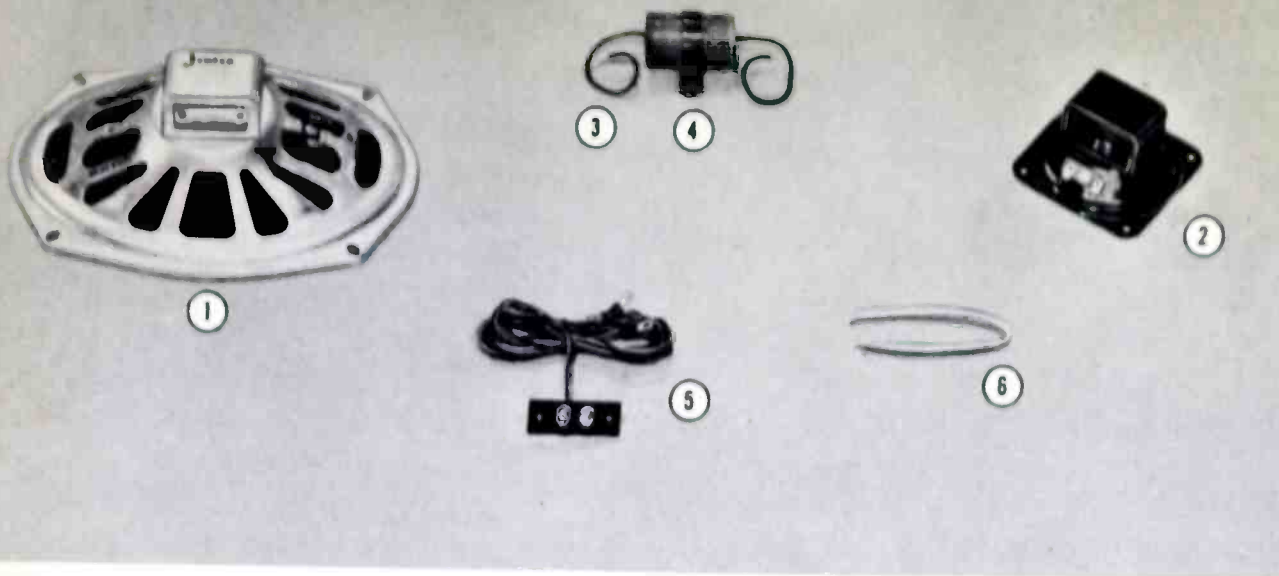
The upper corners of the cabinet are reinforced on the inside with  $\frac{3}{4}$ -in.-sq. cleats. These are cut  $19\frac{1}{2}$  in. long and are kept  $\frac{1}{2}$  in. in from the front. Both glue and screws are used to fasten the cleats in place, driving the screws into both sides and top. The partition is installed next. This measures  $7\frac{1}{4}$  in. wide and 23 in. long. A  $\frac{3}{4}$ -in.-sq. notch is cut in the upper corners of the piece to fit snugly around the corner cleats. The partition is installed by coating the edges with glue and nailing through the sides of the cabinet 12 in. back from the front. Next, two  $\frac{3}{4} \times 1\frac{1}{4} \times 23$ -in. pieces are fitted across the open back of the cabinet.

The bottom of the cabinet is in two separate sections, the rear section being permanently fastened in place with nails and glue. Make the front frame next. This consists of  $\frac{3}{4} \times 1\frac{1}{4}$ -in. solid material which is mitered at the corners and assembled into a frame measuring  $8\frac{1}{4}$  in.

high and 24 in. long. You'll notice in section detail A-A that the bottom member of the frame is rabbeted before assembly to provide a screwing surface for the front edge of the removable bottom. The frame is butt-glued and clamped to the front edges of the cabinet and later sanded smooth and flush with the sides and top.

This leaves the speaker baffle and its sub-baffle to be cut. The speaker baffle is cut  $7\frac{1}{4}$  in. wide and 23 in. long and the sub-baffle  $6\frac{1}{2}$  in. wide and 11 in. long. Openings in the speaker baffle are jigsawed to the sizes given and then the larger opening is framed on the rear side with  $\frac{1}{2}$ -in.-sq. cleats, glued and nailed to three sides. The sub-baffle has an oval hole jigsawed in it and is screwed to the  $\frac{1}{2}$ -in. cleats. This provides a sound passage at the end. The face of the speaker baffle is covered with grille cloth and then inserted in the cabinet behind the front frame which conceals the edges of the grille cloth. The section detail through the top shows how the baffle is held with screws. Standard wrought-iron legs attached to the bottom members of the cabinet at the corners complete the table Duette.





## JENSEN KDU-12 BUDGET DUETTO

### LOW COST 2-WAY SPEAKER SYSTEM KIT

Here is the simplest 2-way loudspeaker system kit which qualifies for authentic high fidelity reproduction. The photograph above shows the parts of the JENSEN KDU-12 Budget Duetto\* Speaker System Kit. Two separate loudspeaker units are used each covering only a portion of the full music spectrum. Figure 1 shows the circuit arrangement for these units. The incoming signal is connected directly to the terminals of a 6x9-inch oval l-f unit. This l-f unit can be incorporated in a number of enclosures described previously to give outstanding performance in the frequency range below approximately 3000 cycles. The music components above this frequency pass through a coupling capacitor to a 3 1/2-inch direct radiator type h-f unit. Such a 2-way loudspeaker system certainly offers the lowest cost for a system having excellent performance characteristics.

The KDU-12 Budget Duetto Kit can be installed in the BASS ULTRAFLEX\* enclosure for 8-inch loudspeakers described on pages 26-27 simply by changing the front panel; Figure 2 shows cutout details for the substitute front panel. The Treasure Chest Duetto enclosure for book-shelf use can be used with front panel changes shown in Figure 3. With this front panel use the speaker sub-baffle shown for the 6x9-inch oval speaker in the Table Duetto drawing on page 31. Also the Table Duetto enclosure with its functional advantages can be used. Figure 4 shows the front panel change for the direct radiator type h-f unit; the 6x9 inch l-f unit, of course,

\*TM Registered, Jensen Mfg. Co.

#### MATERIAL LIST

#### KDU-12 BUDGET DUETTO 2-WAY SPEAKER SYSTEM/KIT

Item	Qty.	Model	Description
1	1	69J10	6" x 9" L-F Unit
2	1	P35-VH	3 1/2" H-F Unit
3	1	—	Coupling Capacitor
4	1	—	Capacitor Clamp
5	1	—	Input Cable Assembly
6	1	—	8" White Lead

uses the same cutout and sub-baffle as specified for the original unit.

Installation is quite simple. Both the l-f and h-f units should be centered carefully over the baffle openings provided. This is easily accomplished by making about four marks around the openings on the back of the front panel and sub-baffle about 1" from the edges of the openings. These marks are plainly exposed after the units are in place thus simplifying centering. Fasten both speaker units with #8 x 1/2" R.H. wood screws. Carefully tighten to prevent distortion of the speaker frames. Attach coupling capacitor (Item 3) to the front between the speaker units by means of capacitor mounting strap (Item 4) and a small wood screw.

Figure 1 shows the circuit details. Connect the leads of the input cable assembly (Item 5) to the two terminals on the 69J10 l-f unit (Item 1). Next, connect the 8" white lead (Item 6) to one terminal of the P35-VH h-f unit (Item 2) and to one terminal of the 69J10 l-f unit. Connect one lead of the coupling capacitor to the other terminal of the 69J10 and the remaining lead of the coupling capacitor to the remaining terminal on the P35-VH.

Operation of the budget Duetto systems is quite simple. Nominal input impedance is 3-4 ohms and nominal power rating is 15 watts. Connect the input terminals of any high quality amplifier using ordinary lamp cord. Only a few watts of power are needed for the average room and, therefore, almost any amplifier will be adequate. Power greatly in excess of the speaker system rating may cause distortion and possible damage and so amplifiers with greater power ratings should not be used at their full capacity. It is desirable to use amplifiers having bass and treble controls to permit the adjustment for the best reproduction quality. A fair amount of bass boost is desirable and it can be used without creating "booniness" or boxiness.

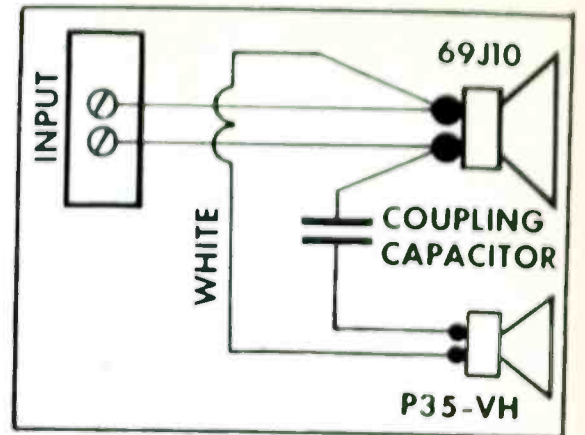


FIG. 1

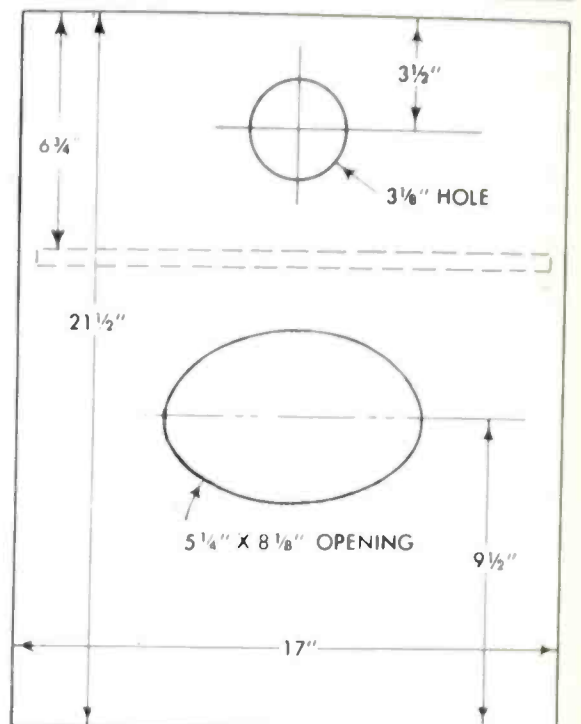


FIG. 2

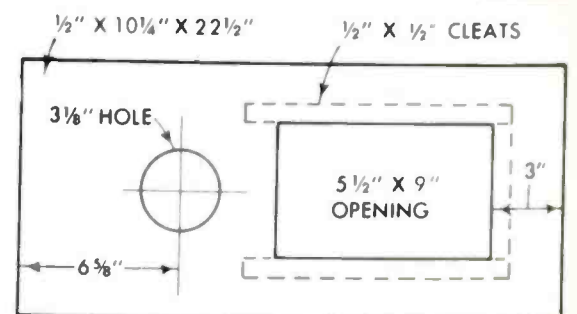


FIG. 3

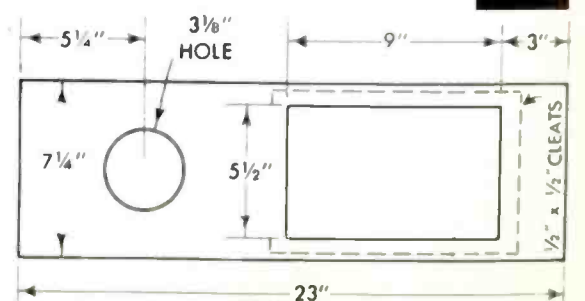
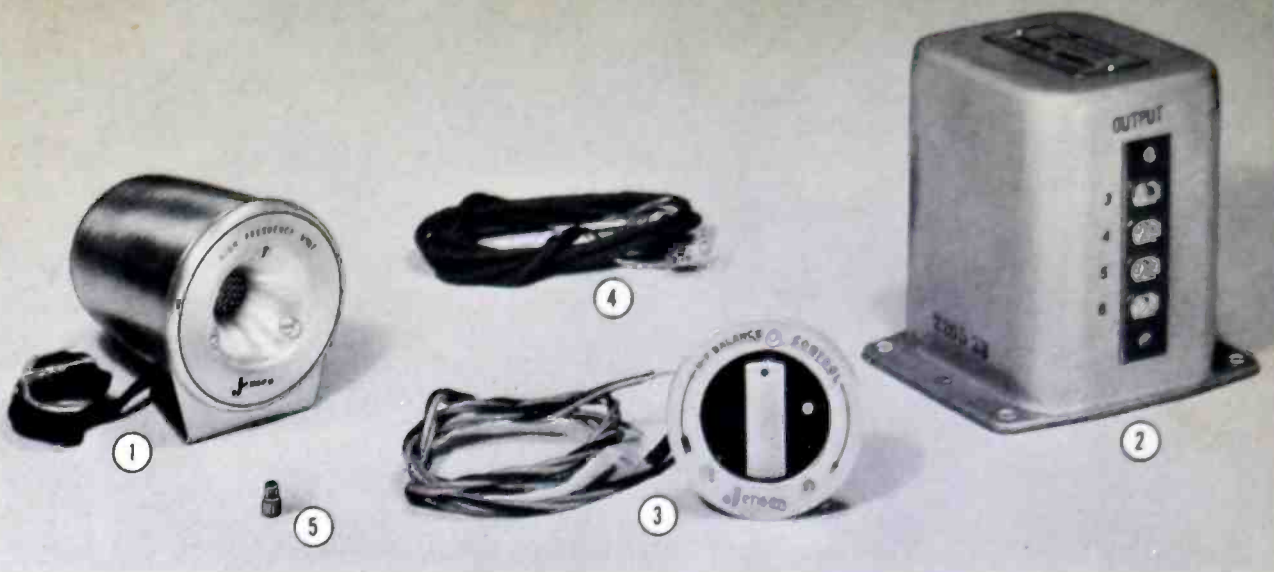
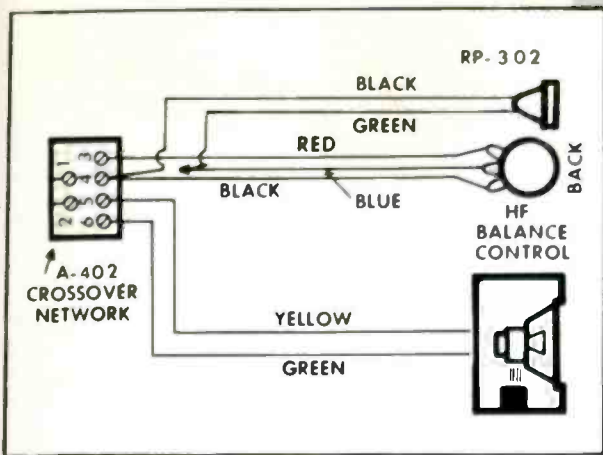


FIG. 4



## IMPROVING SPEAKER SYSTEMS WITH JENSEN KTX-1 RANGE EXTENDER SUPERTWEETER KIT

The Jensen KTX-1 Range Extended Supertweeter Kit is comprised of the very same units used for the top channel in the Jensen Imperial and TRi-Plex 3-way reproducers and in the Jensen G-610 TRIAXIAL\* 3-way unitary loudspeaker assembly. Unless an existing loudspeaker system now includes the RP-302 Ultra H-F Unit you can obtain significant improvement by adding the KTX-1 kit illustrated above.

The crossover network splits the full frequency range at 4000 cycles and everything below this point is reproduced by the original speaker system. All music components above 4000 cycles are reproduced by a highly efficient compression type h-f unit especially designed for this extreme frequency range. Minimized mass of the moving parts, small clearances and rigid tolerances are largely responsible for the smoothness of reproduction to the upper limits of human hearing. A special horn flare of the hyperbolic-exponential\*\* family and the small size of the unit provide unusually broad angular coverage throughout its range.

In this latter frequency range lie the components of music which contribute sparkle and brilliance. Properly reproduced by the RP-302, the rich overtone structure and the highest fundamental tones in music are clearly evident in such sounds as the tinkle of the triangle and shimmer of the cymbal.

### INSTALLING THE UNITS

The RP-302 h-f unit can be attached to a block behind the grille cloth in the mouth opening of a horn enclosure or in the port opening of a bass reflex type cabinet by means of the L bracket provided. Figure 2 shows how the L bracket is removed for attachment simply by removing the cover held by a single screw and the flanged horn held by three screws visible from the front. Another method is to cut a 1-11/16-in. hole in the front panel of the cabinet. The attractive horn flange is then mounted in front of the panel hiding the edges of the cutout; discard the L bracket. Use the longer cover mounting screw provided running the lock nut against the head before inserting through the cover and then tighten lock nut to hold the cover securely.

You can also completely hide the RP-302 leaving the appear-

ance unchanged. Remove the front panel or speaker baffle from the cabinet. Next remove the grille cloth and cut a 4-in. hole where the RP-302 is to be located; now replace the grille cloth and the speaker baffle. Next cut a baffle adaptor about 5 in. sq. with a 1-11/16-in. hole in the center. Attach the RP-302 to the adaptor plate and this assembly back of the hole in the speaker baffle using wood screws for fastening.

The H-F Balance Control (Item 3) also requires a 1-11/16-in. hole at any convenient location. Attach the escutcheon cup to the panel with the small O.H. brass wood screws provided; attach the control to the cup with the terminals down using the large lock nuts. Be sure that the locating pin on the control engages the small hole in the escutcheon cup for positive locking; tighten with pliers and press on the bar knob.

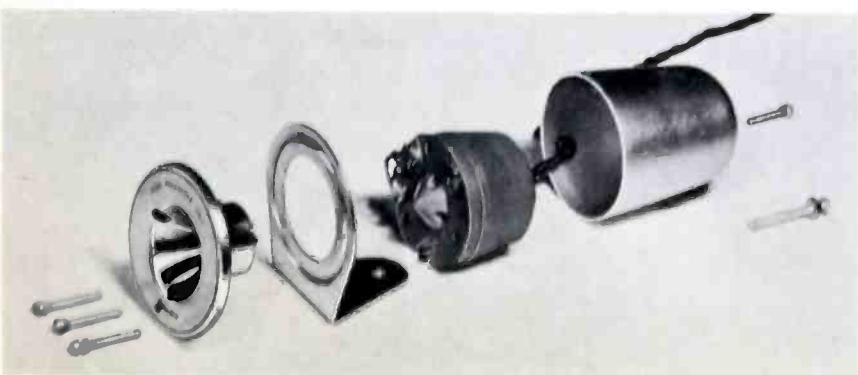
Figure 1 shows the recommended circuit arrangement. The 16-ohm output leads of the amplifier are disconnected from the original speaker system and connected instead to the A-402 network (Item 2). The original loudspeaker system is then connected by means of the 2-wire cable (Item 4) to the A-402. Next connect the RP-302 and the h-f balance control to the A-402 observing the color coding shown in Figure 1. Note that the BLUE lead of the control and the GREEN lead of the RP-302 are spliced together; simply twist the wire ends together tightly and screw on the solderless connector (Item 5) securely.

If the original loudspeaker system has an impedance rating of 4 or 8 ohms, use Jensen Autotransformer Z-3422 to properly match to the 16-ohm network. If your amplifier does not provide 16-ohm connections then another such transformer will be needed here as well.

### OPERATION

The Jensen RP-302 h-f unit is designed for use as the third channel in 3-way systems. Any speaker system to which it is added should be capable of reproducing music properly in the frequency range up to 4000 cycles and should preferably be a 2-way system. The KTX-1 units are designed for use in systems with music power ratings up to 35 watts.

Proper balance is quite important; for the usual high efficiency loudspeaker systems a control position near straight-up is about right. Check this setting by turning counter-clockwise to the off position and then advance until the music "blossoms out." If you can notice that sound is coming directly from the RP-302 then the balance setting is too high.



### MATERIAL LIST

ITEM	QTY.	MODEL	DESCRIPTION
1	1	RP-302	Ultra H-F Unit
2	1	A-402	4000 Cycle Network
3	1	ST-901	H-F Balance Control
4	1	—	36" 2-wire Cable
5	1	—	Solderless Connector

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

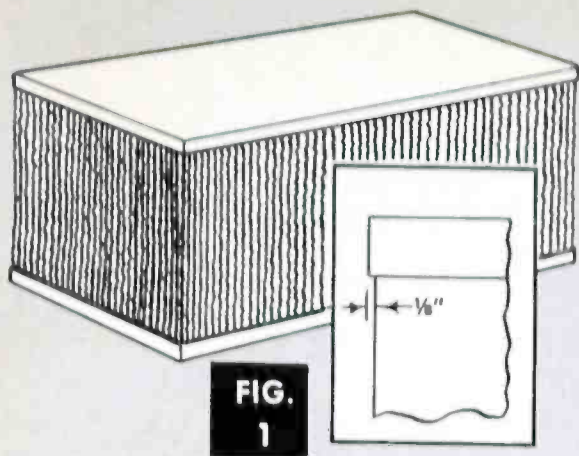


FIG. 1

## HOW TO DRESS UP THE SPEAKER ENCLOSURE

Up to now the speaker enclosure you have built is nothing more than a plain simple box-like structure that could hardly be considered in its present state as a piece of furniture. However, there are several different ways that you can dress up the cabinet to make it attractive and harmonize with other room furnishings.

One way is to cover the front and sides with grille cloth, as shown in figure 1. This is the most practical on small cabinets, and especially where the cabinet has been made of inexpensive fir plywood since the cloth covering conceals the wood as well as all exposed joints and edges. In following this method, the neatest job is obtained by letting the top and bottom extend  $\frac{1}{8}$  in. beyond the sides and front at the time the cabinet is made. The  $\frac{1}{8}$ -in. overhanging lip conceals the edges of the cloth at the top and bottom, and thus makes an exceptionally neat looking job. Where the top and bottom of the cabinet is originally made flush with the sides and the front, separate molding can be applied to the edges of the top and bottom to create an overhanging lip for the cloth covering. In each case, the top of the cabinet and the edge of the bottom are painted, or stained and varnished, as preferred. The photograph at the top of Page 26 is a typical example of this latter procedure.

Grille cloth can also be used over an entire face of a cabinet even though the speaker opening occupies only a relatively small portion of this panel. For example, the photograph at the top of Page 6 shows grille cloth over the entire front of the cabinet. Below the horizontal crossbar there is only one loudspeaker opening  $1\frac{3}{4}$ -in. diameter.

Wooden moldings are available in many forms and they can be used to add a finished look to a plain cabinet. Figure 2 shows what the addition of a heavy bevel molding will do when applied around the front of a cabinet. Such a molding can be ripped diagonally from a square or rec-

tangular piece after which a shallow rabbet is formed on the back before the ends are mitered. Assemble the molding like a picture frame. The grille cloth is first applied to the front of the cabinet before the frame is actually attached. The rabbet is just deep enough to accommodate the grille cloth. For a more modern effect the bevel moldings and square moldings are perhaps best. The more ornate forms may prove useful with certain cabinet styles. In general, choose the smaller moldings for the smaller cabinets and heavier moldings for the larger cabinets.

Note in the photograph at the top of page 16 the horizontal crossbar on the front. This is made of flat molding with a thickness equal to that at the inside edge of the bevel molding around the sides, top and bottom.

In using moldings do not encroach on the required openings in a loudspeaker enclosure. In some cases the space is not adequate for suitable moldings. For example, in the case of the free-standing Imperial folded-horn enclosure described on page 6 the top of the cabinet forms the boundary of the mouth opening and it is only  $\frac{3}{4}$  in. thick. One way of obtaining additional space to support a suitable molding is to add a second layer of plywood or, in other words, a double top. This was the procedure used in the enclosure shown in the photograph at the top of page 6. The  $1\frac{1}{2}$  in. thick top provides adequate space for the bevel molding. Incidentally, the two 2 x 2-in. corner posts are framed out so as to support the vertical pieces of molding in the enclosure illustrated.

A sunken effect similar to that with beveled molding is gained by adding a plain  $\frac{3}{4}$ -in. frame to the front edges of the sides, top and bottom as shown in Figure 3. This permits the grille cloth to be wrapped around the speaker baffle, tacked on the back and then inserted in place against the projecting front frame.

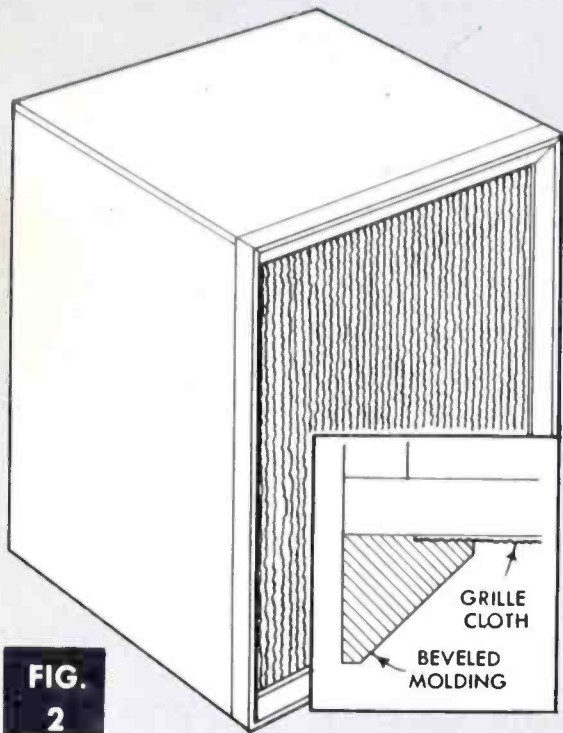


FIG. 2

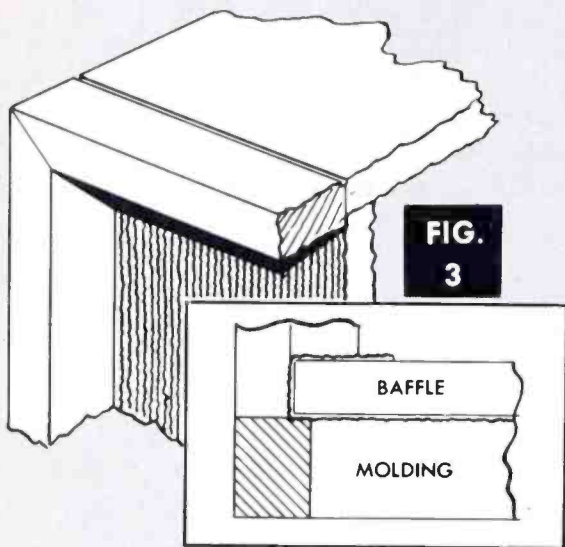


FIG. 3

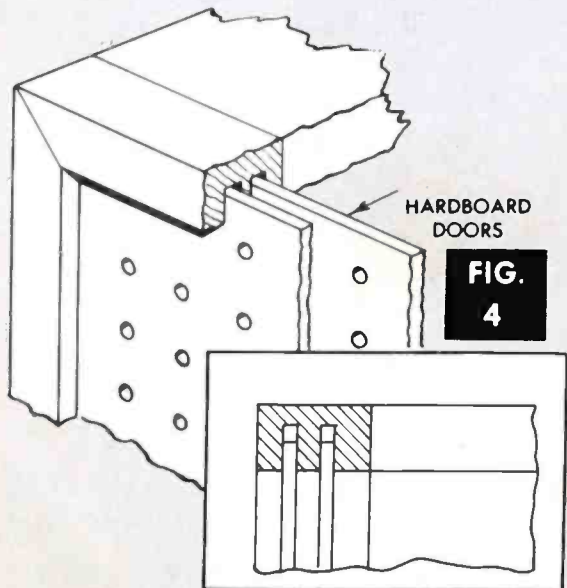


FIG. 4

A very similar effect can be achieved by allowing the sides, top and bottom to project forward ahead of the cabinet front by perhaps one inch. Then the grille cloth can be stretched over a light framework which will just slip inside the projecting edges up against the front panel. If desired this frame can be tacked to the cabinet front with small finishing nails through the openings of the grille cloth. This is the treatment used in the enclosure shown in the photograph at the top of page 17 in this manual. The grille cloth and frame have been removed and are shown below the cabinet.

In many cabinet installations the use of sliding doors of perforated hard-board will prove very helpful. These add a modern look to grouped wall units and room divider type cabinet. They are particularly useful with storage units for amplifiers and other types of equipment as well as record storage space. Figure 4 shows how sliding doors of this kind are installed. Use care in planning the cabinet arrangement when using sliding doors because only half of the door area can be open at one time. This problem can be solved by careful thought; for example, the record storage space and the television receiver can be behind a pair of sliding doors since neither will be used when the other is in operation.

Figure 5 shows how full length hinged doors of fancy-grain hardwood plywood can be fitted to individual cabinets. These are more often used on the fancier cabinets. The top and bottom of the cabinet are allowed to project at the front so that the doors may be hinged to the top and bottom with special flat pin hinges. Properly fitted these doors can swing around the sides of the cabinet.

Metal grilles can be used in many ways to add a professional look to plain cabinetry. These grilles can be used in conjunction with wooden molding; the metal grille is applied over the grille cloth and a rabbet in the molding conceals the edges of both. A great variety of patterns are available in metal grilles. Metal grilles, as well as grille cloth in various patterns, are available from the larger radio parts supply houses. Also, metal stampings are available and can be used for interesting effects; for example, these can be finished with gold bronze paint.

In many cases picture-frame type overlays of flat and half-round moldings will

dress up a plain cabinet. These can be applied to the sides as well as to the front in the manner suggested in Figure 6. A number of interesting possibilities of this kind exist.

Perhaps the most important contribution for the home work shop in recent years has been the durable, decorative laminates (often known as counter-top material) available in rich, simulated wood grains. A plain plywood cabinet of the most inexpensive wood can be made into a beautiful piece of furniture by covering it with this material. The new contact cements make it easy for anyone to apply the laminate since clamping is not necessary.

A choice can be had of several ready-made legs that will give any low-boy cabinet a smart modern look. Most popular of these perhaps is the hairpin type of wrought iron legs which can be purchased in various lengths at almost any hardware or department store. In addition to the hairpin type, there is the straight rubber-tipped diagonal leg, which like the hairpin leg is attached solidly to the cabinet bottom with wood screws as shown in Figure 7. Wooden legs fitted with brass ferrules are also available. These go into separate metal mounting brackets which hold the legs at an angle and which are attached with screws like the others. The photograph near the top of page 30 illustrates an application using commercially available legs.

Simple platform bases are quite satisfactory in most cases and will improve the appearance considerably. These need be nothing more than a three-sided frame attached to the bottom of the cabinet with screws. Figure 8 shows an arrangement of this kind which is also shown in numerous plans in this manual. Two x 2-in. or 2 x 4-in. material mitered at the front corners will do very well for these bases.

Of course, if the cabinet is made of select hardwood-faced plywood it can be beautifully finished, light or dark, with one of several finishing techniques. The new rubbed-effect varnishes and lacquers allow the inexperienced worker to produce a professional looking job almost the very first time. Sealers and wax alone will produce an excellent finish on certain cabinet woods. Paint stores usually can provide adequate information on finishing fine hardwood veneers.

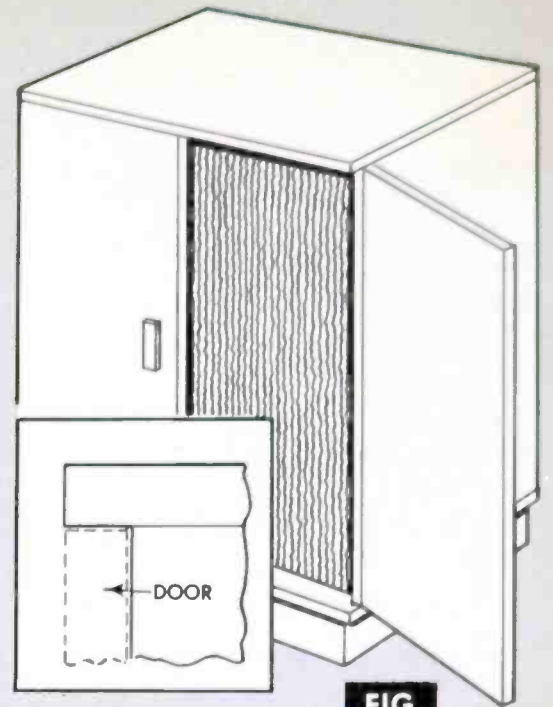


FIG. 5

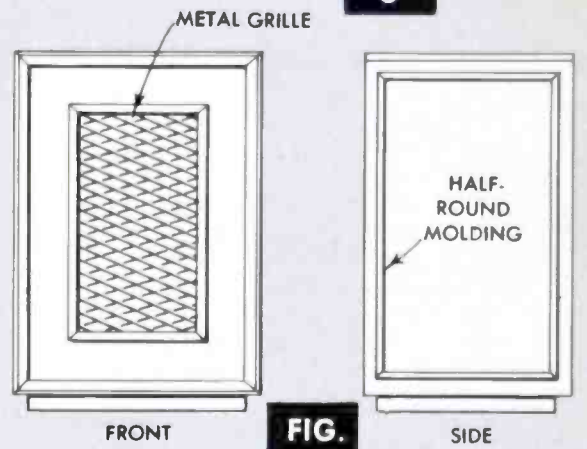


FIG. 6

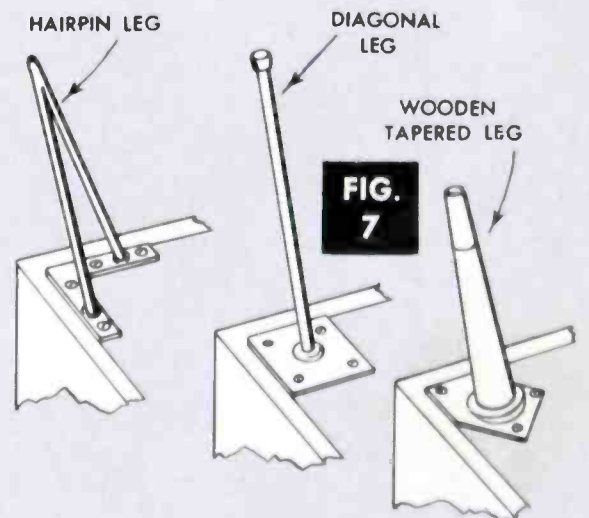


FIG. 7

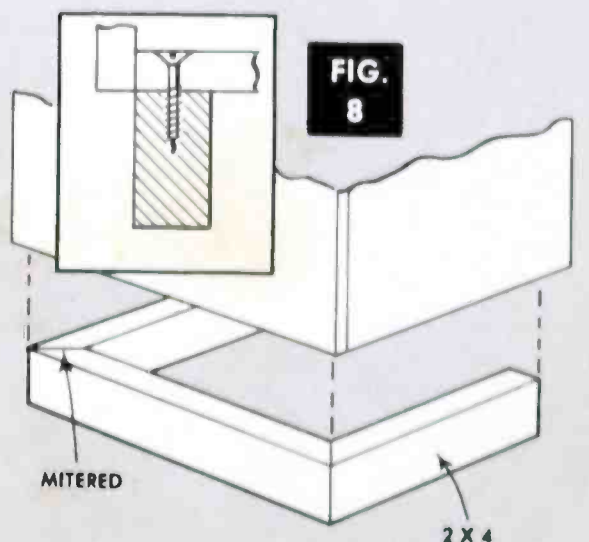


FIG. 8

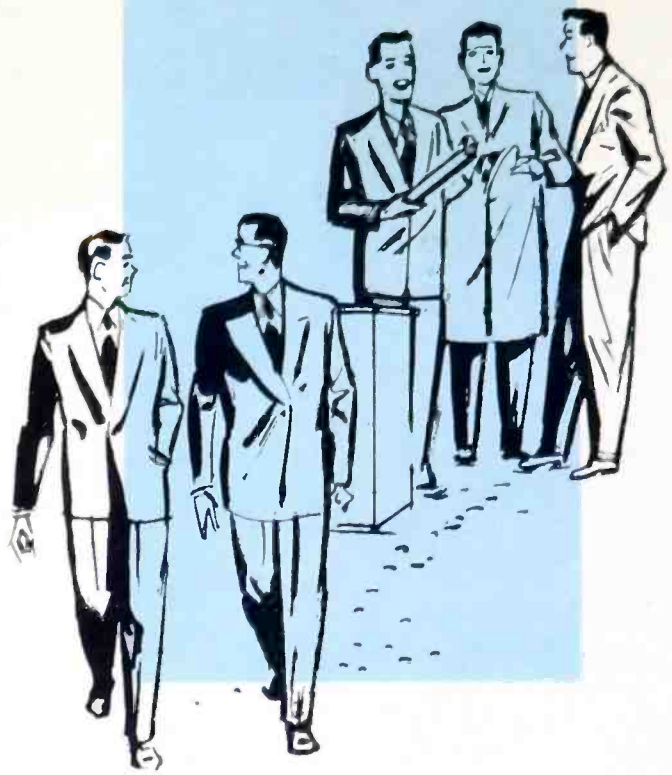
# JENSEN SPEAKERS AND SPEAKER SYSTEM KITS FOR POPULAR COMMERCIAL ENCLOSURES

This is an index of the more popular loudspeaker enclosures and equipment cabinets with provision for loudspeakers showing the recommended Jensen loudspeakers and speaker system kits. In most cases these speaker units can be installed directly in the cabinet as supplied. Special cutouts may be required for the m-f and/or h-f units of the speaker system kits. These cabinets us-

ually are available on special order with the exact cutouts shown in the previous sections applying to the particular speaker system kit. Often the user can easily cut these or add a suitable sub-baffle so cut. The cabinet manufacturers will be glad to consult with you on any special problems you may encounter.

Manufacturer and Models	RECOMMENDED JENSEN SPEAKERS		
	Kits	Coaxial 2-way and TRIAXIAL *3-way	Extended Range
<b>ARGOS PRODUCTS CO.</b> 310 Main St. Genoa, Illinois			
DBR-2 (15-inch)	KT-32, KT-21	G-610, H-530, H-520, K-310A	P15-NX
DBR-2 (12-inch)	KT-22	H-222, K-210	P12-NX, P12-RX, P12-SX
<b>CABINART</b> 99 N. 11th St. Brooklyn 11, N. Y.			
Equipment Cabinets 10, 65, 800, 800U, 90 (15-inch)	KT-32, KT-21	G-610, H-530, H-520, K-310A	P15-NX
10, 65, 800, 800U, 90 (12-inch)	KT-22	H-222, K-210	P12-NX, P12-RX, P12-SX
Speaker Cabinets 22, 27, 27U, 27K, 7115, 8115 (15-inch)	KT-32, KT-21	G-610, H-530, H-520, K-310A	P15-NX
22, 27, 27U, 27K, 7112, 8112 (12-inch)	KT-22	H-222, K-210	P12-NX, P12-RX, P12-SX
Klipsh Rebel KR-3, KR-3U, K-3, KR-15, K-15 KR-4/12, K-12 KR-5, KR-5P, KR-5U (8-inch)	KT-32, KT-21 KT-22	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX P8-RX, P8-SX
Corner Folded Horns 63 61	KT-32, KT-21 KT-22	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX
Wall Storage Series ST-5, KST-5 (15-inch) ST-5, KST-5 (12-inch)	KT-32, KT-21 KT-22	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX
<b>JENSEN MANUFACTURING CO.</b> 6601 S. Laramie Ave. Chicago 38, Illinois			
BL-250, C151 BL-220, C121 C-81	KT-32, KT-21 KT-22	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX P8-RX, P8-SX
<b>KARLSON ASSOC. INC.</b> 1610 Neck Rd. Brooklyn 29, N. Y.			
15M, 15B, 15F6M, 15F6B, 15CF 12M, 12B, 12U, 12K 8K, 8U, 8P, 8B, 8M	..... ..... .....	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX P8-RX, P8-SX
<b>KLIPSCH &amp; ASSOC.</b> Hope, Arkansas			
K-36 (15-inch) K-36 (12-inch)	KT-32, KT-21 KT-22	G-610, H-530, H-520, K-310A H-222, K-210	P15-NX P12-NX, P12-RX, P12-SX
<b>RIVER EDGE SALES CORP.</b> 80 Shore Rd. Port Washington, N. Y.			
Equipment Cabinets 1348-H, CH-45H, 1460-Z, S5024 (15-inch)	KT-32, KT-21	G-610, H-530, H-520, K-310A	P15-NX
8136-A, 8536-A, 2436-A, 112-A, 105 (15-inch)	.....	G-610, H-530, H-520, K-310A	P15-NX
1348-H, CH45-H, 1460-Z, 1460-TV, S5024 (12-inch)	KT-22	H-222, K-210	P12-NX, P12-RX, P12-SX
8136-A, 8536-A, 2436-A, 112-A, 112-N, 112-TV, 105 (12-inch)	.....	H-222, K-210	P12-NX, P12-RX, P12-SX
Speaker Cabinets 965, 900, C450, S8124, S8524 (15-inch)	KT-32, KT-21	G-610, H-530, H-520, K-310A	P15-NX
962900, C450, S8124, S8524, UR-522, UR-323 (12-inch)	KT-22	H-222, K-210	P12-NX, P12-RX, P12-SX

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## AT YOUR SERVICE...

A Technical Service Department has been established here at Jensen to provide consulting service on your individual problems in connection with the use of Jensen loudspeakers. We invite your inquiry on any questions which may arise about the loudspeaker enclosure plans and the loudspeaker kits described in this manual, or any other speaker problem you may have.

Various publications are available discussing special phases of sound reproduction. A series of Technical Monographs treat in a comprehensive and fundamental way the general problems; a group of Technical Bulletins cover the "how to do it" phases and special notes discuss particular application problems of more limited interest. Ask your dealer or write directly to us for a list of these publications (some are priced to cover cost of publication).

We are glad to assist interior decorators, architects, contractors and custom installers, in the planning of high fidelity systems for the home and for comprehensive commercial installations for all purposes. There is no charge or obligation of any kind for this service.

*Address your inquiry to:*

**TECHNICAL SERVICE DEPARTMENT**  
**Jensen Manufacturing Company**  
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CHICAGO 38, ILLINOIS

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