Own Your Custom-Built Be

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Even though you are not a cabinet maker, you can make simple and effective installations of radio and phonograph equipment at a fraction of what it would cost if you had someone else do it for you.

CUSTOM BUILDING—that is, the sometimes expensive correlation of audible and visible matter pleasant to any number of eyes and ears—is as complicated and time-consuming as one wishes to make it. When a tuner-amplifier-changer-speaker combination has torn a five-hundred-dollar hole in your entertainment budget, we assume you have used a goodly amount of care in your selection. If you plan to economize by compromising on the system housing, then you are about to become a custom builder. After all, cabinetry commensurate with the quality and quantity of these pieces of sound equipment is expensive—very expensive. Fir plywood, butt-jointed and nailed, say you, could never house this finest of equipment. Hardwoods are needed but rarely used. We like to assume good reasoning in the choice of equipment, better reason for the lack of hardwoods—money.

A fine sound system, properly contained in the woods and finishes of your choosing, is not an inexpensive item. It's not a casual addendum to your Saturday morning grocery list. Yet it is possible almost to halve the final cost of a good music reproduction unit by housing the sound system yourself in what can be an exceptionally attractive manner. We believe this cost-cutting applies to one-hundred- as well as one-thousand-dollar systems.

Manufacturers approve of this sort of thinking; it sells equipment. And most of these manufacturers devote a large swatch of their advertising dollar to the publishing of detailed instructions and templates for mounting that expensive tuner or amplifier in your living room. This data comes to you as part of the purchased item, so why not take advantage of it? Why not consider the actual size of this tuner and how best it could be mounted in a closet door or bookcase shelf or coffee table and ask a carpenter what the cost of a fronting panel for the tuner might be?

Is five dollars too much? Then buy a panel of fir plywood and cut it out yourself. This panel for the tuner can be less than a square foot of whatever wood you choose, and a matching finish isn't expensive. If your bookcases are painted, the cost can be measured in parts of dollars. Better still, the tuner might even come in a separate cabinet. No mounting expense required. Try a bookshelf for this sort of unit, using books as tuner-ends. The cabinet-mounted tuner becomes the center of that particular area of interest. And, it's accessible.

Any piece of sound equipment can be installed in such a manner. The acquisition of this equipment meant the acceptance of an entirely different concept of the mechanics for reproducing recorded and broadcast sound. So, having discovered the flexibility of your newest sound system, why not explore its decorative possibilities? These are just

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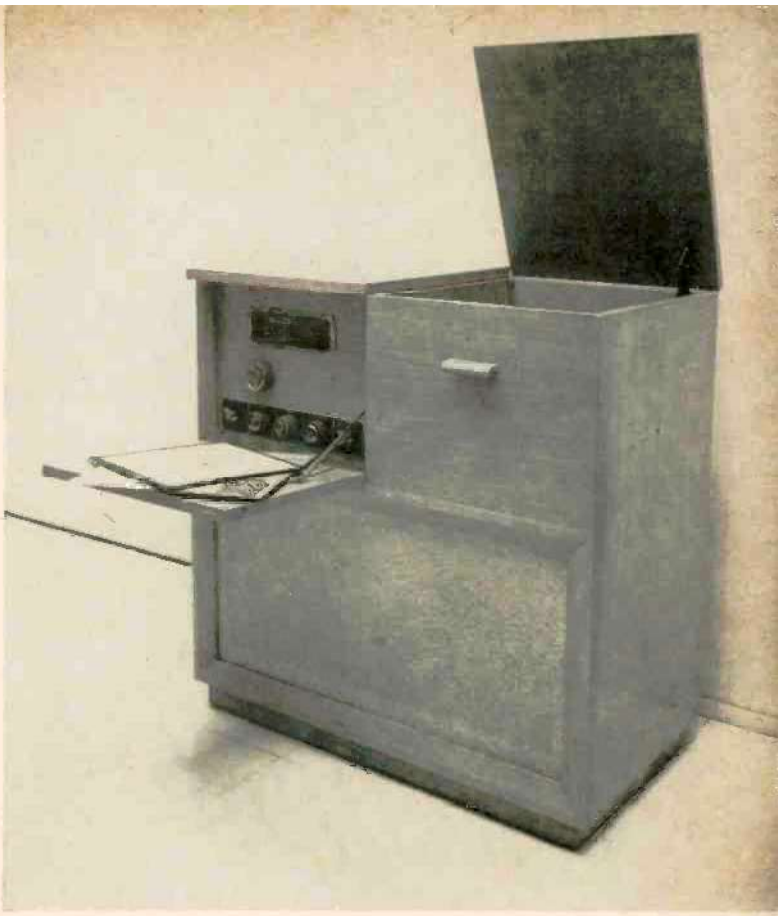
A simple but handsome cabinet such as the one shown in these two views suffices to hold the four basic elements of a home system—tuner, record player, amplifier, and speaker.

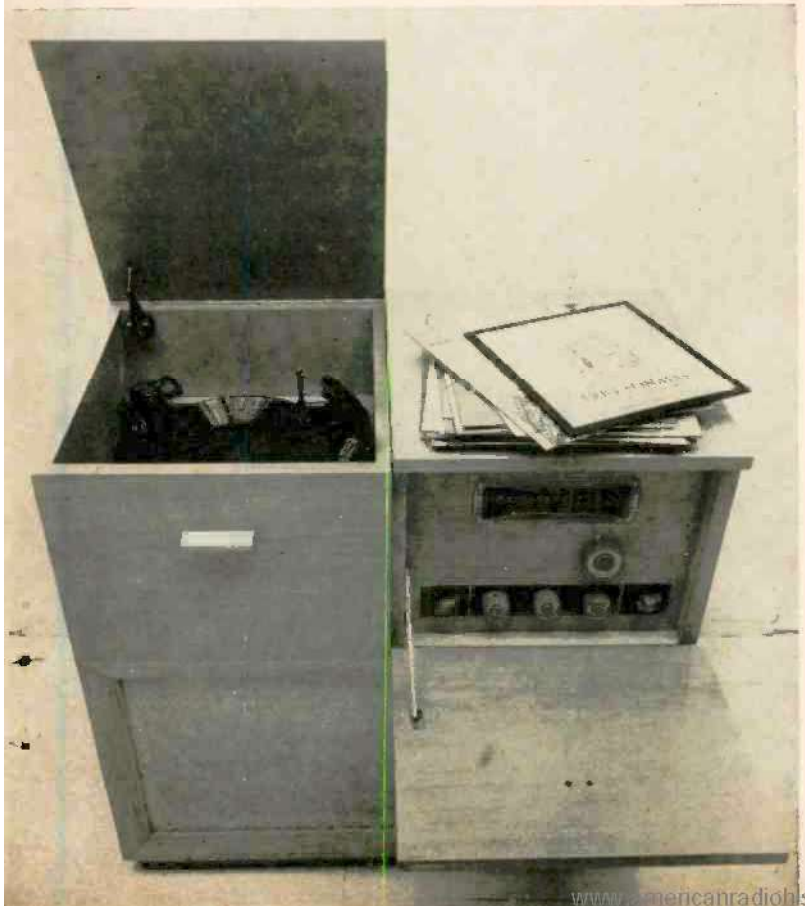


as many and as varied as the many and varied sound systems available today. Too, the ownership of this equipment hints at appreciation of arts other than music—design, literature, the dance. In other words, why sate but one sense? The more ear-pleasing your system, the better it should look. Using existing furniture or planning and building economical cabinetry, such eye-appeal is possible.

Think of the FM tuner you might have coveted. It can be placed a fair distance from its amplifier . . . in whatever setting you wish or can imagine. Would you like it facing your favorite listening spot from an attractive setting in a bookcase? If not this, have you thought of it being mounted facing upward in the top shelf of a low bookcase that might contain your record player and other controls? Or build it into that pine commode or that corner cabinet using as a dial panel the bottom of a drawer from one of those units. Try wherever possible to match in woods and finishes the eventual housing of your unit.

Tuners, should you have forgotton, require only a rectangular cutout for the dial and from one to seven ⅜-in. holes for the knobs. Most tuners are sold with attractive escutcheons to frame the dial cutout, so your lack of skill with a small saw doesn't show. Even if holes splinter, the knobs usually are large enough to cover your shortcomings as a cabinet-maker. The shelf within the tuner enclosure can be anything wooden—just locate it conveniently. Repairs someday may be needed.

Stringing connecting cables from the tuner to amplifier should be your neatest work. Care at this point of installation could save you many dollars later when a serviceman may be needed. Let him spend several hours undoing your complex installation when removing a faulty item, and you will lose money. Too, parts houses usually offer an *F.O.B. The Shop* clause in the equipment guarantee. It means when a tuner or other unit acts up the repair guarantee becomes effective only when the unit is returned to the dealer (or manufacturer). Accessibility of these units within the installation means a saving to you of time, and, more important, money.



Tuner mountings, then, can be as different or practical or complex as you care to make them. Again, this applies to the entire system with the exception, perhaps, of the loudspeaker. On tuners, try the parts catalog again. This time consider the decorative possibilities of the many advertised tuners. Iconoclastic though this may seem, you'll notice that each unit differs from the next in a way that may prove the answer to your particular problem. Many of these differences are physical, their performance characteristics being almost identical. Why not use the one best suited to the way you intend to use it?

If your new amplifier has its own controls, remove the volume control from the tuner—hack saw will do the trick. Now there's only a tuning knob. The installation becomes more manageable with fewer knobs to confuse the eye. If the tuner hums while the record player is on, mount an unobtrusive ON-OFF switch elsewhere on the control panel for the tuner.

Amplifiers present a somewhat different mounting problem. Inexpensive units with tone controls and selector switches on the same chassis are actually more difficult to place than an expensive amplifier with the same controls in a remote unit. The latter

might be used as just that without bothering to install it permanently. It's a compact unit, usually quite attractive. Mounted, it could show directly under or next to the tuner. All controls then are inches apart. If space is not available for the tuner and amplifier you want, and the amplifier just won't fit in the same enclosure as the tuner, place the amplifier back of the tuner chassis and use flexible shaft extenders. You'll have the amplifier controls next to the tuner, but only the depth of the enclosure, not the height, will be used. Think of the amplifier as the center of the system. Your tuner, record player unit, and loudspeaker find a junction in the amplifier. If it doesn't use a remote control unit, the controls will have to be accessible. All of which leave you with a cable-stringing problem.

We think it best to control the power sources for the tuner and record player from the control switch on the amplifier. None of these units can be used until the amplifier has been turned on. But, if the tuner and player are installed as remote pieces of cabinetry, this matter of cable-stringing can become messy. The tuner has three cables—antenna line, a.c. power cord, and audio output. The record player, lacking antenna, has the other two. Four times this amount of hookup line isn't easily hidden. Try connecting the a.c. cord from each component to the nearest wall outlet, and then use the smallest insulated cable available for the connection to the amplifier. (We use phono cable 1/16-in. in diameter; it hardly can be seen.)

For connecting the speaker case, use inconspicuous telephone hookup line, or, to hide it completely, try 300-ohm antenna line under the living room rug. It's flat and pretty sturdy.

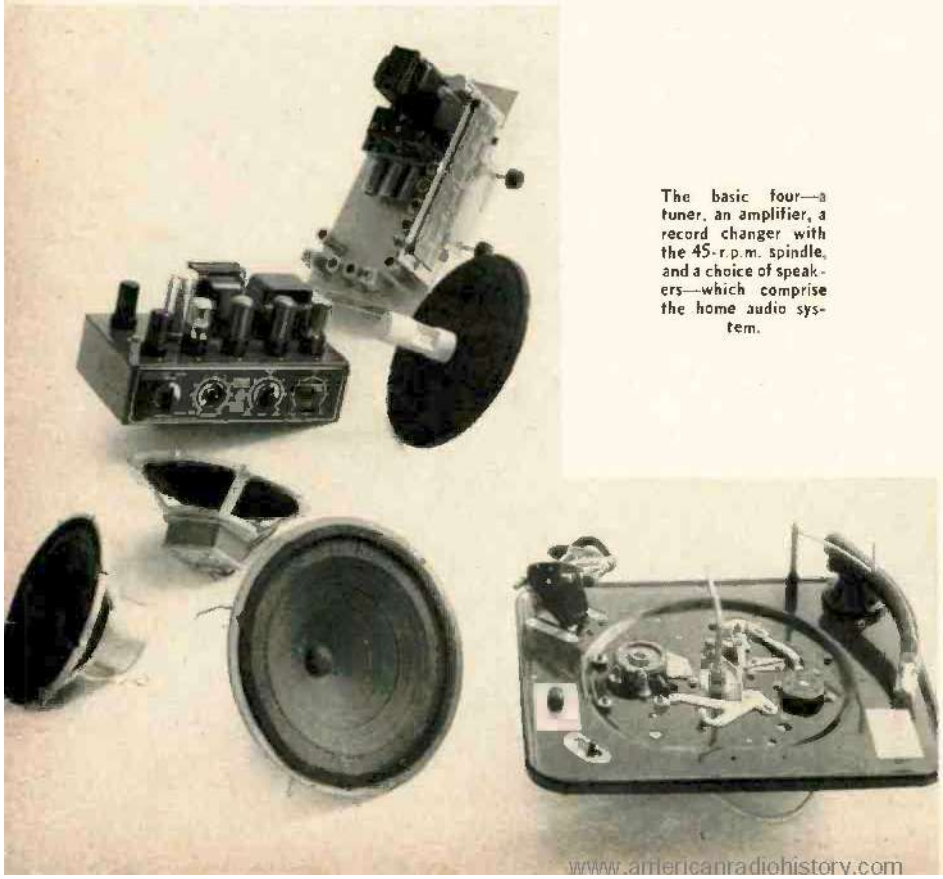
With these units mounted in the same cabinet, however, problems other than neatness of wiring begin to show themselves, and, what's worse, begin to make themselves unpleasantly heard. If the mounting is a horizontal one (as on a bookcase shelf), remember that a magnetic cartridge too close to a transformer will hum. In such a case, install the phonograph at the far left. Record players in such arrangements sometimes seem much the less practical devices than they might. Changer vibration (we call it rumble) is transmitted through the system, sometimes through lack of care in mounting the system. It's not an insurmountable problem. Foam rubber, placed under tuner and changer mounting boards, can sometimes remove this unmusical type of disturbance. Try the foam rubber underneath the speaker baffle, even though it's in another part of the room. If the amplifier must be located near the cartridge and there's hum, try reloading the amplifier within its enclosure until you have found a placement causing the least hum.

Then there's a matter of heat. Did you know that some transformers are partially filled with pitch? It's only a stuffing around the working parts of the unit. If you don't provide adequate ventilation for your amplifier (or other units), you will soon realize this important fact of transformer life—expensively. Hot enough, the pitch will melt and pour out of the transformer. By then, the transformer has ceased to function and you need a repairman. Ventilating holes can be carefully cut, tastefully covered with metallic grillwork. Sometimes, and we've done it many times, the ventilating holes can be an integral part of the amplifier design.

On most amplifiers you will find an escutcheon plate inscribed with various legends. Remove it by taking off the knobs and the control knob nuts. Mount it on the outside of your new dial panel, or, if it lacks an esthetic appeal, buy decals from a radio parts house, applying whatever legends you feel necessary to operate the unit. On matters esthetic, incidentally, try a razor blade on the glass dial of your new tuner. If it's silk-screened, the sharp edge quickly removes any advertising and unnecessary tuning information on the dial. If the flocking behind the glass offends your critical eye—it's usually plum-colored—ordinary ink in a shade of your choosing will do the trick and will give your tuner dial the original touch you sought when you bought it.

Mounting the record player isn't too much of a problem unless space is critical. If a changer must be used, then remember that some domestic units require as little as thirteen inches in depth. Even this measurement extends beyond the depth of the average bookcase, and if such an installation is needed, here is one suggestion. Most changer companies sell wood and metal bases for their changers. Find a base for your changer, fix to the inside of a hinged front for one section of your bookcase. You will need no more than ten inches of depth and the average bookshelf offers more by one or two inches. Or mount the base on inexpensive metal slides anywhere in any piece of furniture offering the needed space.

And so to speakers. And, with our ideas, to fewer friends. We assume you have the speaker (or speaker system) best-suited to your budget-wise ear. We assume, too, that budget limitations will determine the eventual placing and housing of your speaker. And again we assume you have plumbed the many and varied speaker baffles for the buying and building. Assuming this much, we offer a practical, money-saving baffling idea—try a "tuned" baffle. You are not restricted to [*Continued on page 57*]



The basic four—a tuner, an amplifier, a record changer with the 45-r.p.m. spindle, and a choice of speakers—which comprise the home audio system.

BE YOUR OWN CUSTOM-BUILDER

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one baffle form, nor does the tuning process apply to but one speaker. You need to know only the resonance of the speaker (check the manufacturer's specifications for this figure), the volume of the cabinet, then apply the following formula:

$$A = \frac{V^2 f^4}{6 \times 10^8}$$

where A = area of the port in square inches

f = frequency at which you desire to tune the enclosure

V = internal volume of enclosure in cubic feet

$6 \times 10^8 = 6{,}000{,}000$

Example: Suppose you are given an 8-cu. ft. enclosure housing an RCA LC-1A speaker. This model has a resonant frequency of approximately 35 cps, so you choose to tune the enclosure at 30 cps, i.e., about 5 cps below the resonant frequency of the speaker, so that in effect the resonance of the enclosure extends the lower range of efficiency of the speaker where it starts to fall off sharply below its resonant frequency. Thus

$f = 30$ cps

$V = 8$ cu. ft.

Therefore,

$$A = \frac{8^2 \times 30^4}{6 \times 10^8}$$

$$= \frac{64 \times 810{,}000}{6{,}000{,}000}$$

$= 8.7$ square inches.

The resulting figure will give you the area of the tuning port for your particular baffle. But, brace the cabinet well. Scraps of wood, glued and screwed, can make your cabinet rigid as a brick wall (and what could be better?). Don't spare the sound-proofing material inside your baffle and you'll come away with a nicely matched unit for far less—considering the performance—than a specially-made speaker baffle.

Finally, we do offer this all-important suggestion: read carefully what the manufacturer has to say about his product. If you question your interpretation of his explanations, then write him, or call him. Critical comment or questioning is welcomed and properly answered. These people are proud of their products, the guaranty enclosed with each piece of audio equipment displays their pride. Should you find trouble, use that warranty. And most important, take advantage of the advice each manufacturer offers you. It means the proper answer to your need: better and more attractive reproduction of recorded and broadcast sound.