FM TUNERS

02367

NOVEMBER-DECEMBER 1978 $1.35

hi-fi/stereo BUYERS' GUIDE®

TUNING IN ON TUNERS

SELECTIVITY
SENSITIVITY
CAPTURE RATIO
DISTORTION
FREQUENCY RESPONSE
AND OTHER
SPECS
TO LOOK FOR

MODELS & BRAND NAMES
TO CHOOSE FROM

IMPROVE RECEPTION
WITH AN
FM ANTENNA
MATCHED TO YOUR LOCALE

GADGETS & GIZMOS
FOR ALL YOUR AUDIO
CARE NEEDS

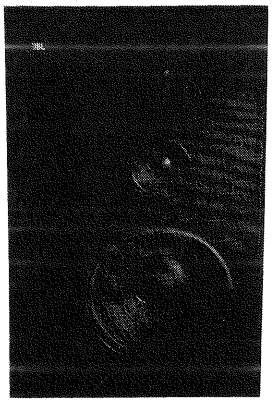
USER-ADJUSTABLE
CASSETTE TAPE BIAS
WHY IT'S IMPORTANT

SOUND PROBE

Long ago, it seems, tolerances for amplifiers, tape head performance, stereo groove cutting, and a whole host of other audio standards were agreed on. But this is not the case for loudspeakers! Everyone admits they are still the most difficult link. This is true for many reasons, but the biggest cause is *taste*. Instruments used to analyze signals from phono cartridges and pre-amps can establish pretty well what is "flat" and what is not. To a limited extent this holds for loudspeakers, too. That is, a microphone in front of a speaker in an anechoic chamber can give you graphed data to work with. But put that same "flat" speaker and another just like it into a home environment, add the bewildering variety of acoustic phenomena in any home, flavored with knob twirling at the amplifier, and different playing volumes . . . and things begin to happen. Suddenly, uniformity is compromised, right in your living room. Since we feel most of our readers want speakers evaluated under realistic conditions roughly like their own, our function is not to conduct a lab test but to throw all the variables at a speaker under home living conditions. We play recordings we know well. We use our ears to best advantage by fiddling with loudspeaker placement, with the many "presence" controls on our amplifier. We give you subjective opinions, obviously. But as you read them, you will find little difficulty figuring out how we listen and how we stand.

by CHRISTOPHER GREENLEAF and HANS FANTEL

JBL L110



Circle No. 73 On Reader Service Card

Description

The JBL L110 is a 3-way system with an elegantly walnut-finished ported enclosure, distinguished by both high efficiency and high power handling capacity. Its front grille is semi-transparent, permitting the outlines of the drivers (10-inch woofer, 5-inch midrange, 1-inch tweeter) to be seen. With dimensions of 23½ x 14¼ x 11¼ inches, it may be used either as a floor-standing model or a bookshelf speaker. In the latter case, the shelves had better be able to support the 50 lb. weight of each speaker. Nominal impedance is 8 ohms. The price is $348 each.

Performance

We had scheduled our listening test for three in the afternoon. But, after a break for a couple of lamb chops, we were still listening at eleven. Not that any difficulties dragged out the test. It was simply that we enjoyed listening to the JBL L110 so much that we kept on playing our favorite records because now—for the first time—we could hear things we had never known to be in their grooves.

For example, in the Vaughan Williams *Tuba Concerto* we heard those toneless little puffs of air that proceed the actual sound of a tuba. And even the bottom notes of this bottom-heavy instrument didn't sound tubby—never mind what they say about tubas—but retained their clear, weighty definition all the way down. By the same token, the lowest pedal notes of the pipe organ never got smeared or mushy. Each retained its identity as a definite pitch. Such bass response would be remarkable for any speaker, but for a bookshelf speaker it's spectacular.

Though the bass happened to strike us first (one *does* tend to try out such an obviously audible aspect at the start), the same clear tonal definition prevails all the way up to the top. Though the basic character of the speaker (at least in small rooms) tends to be somewhat bright, the highs don't jump at you. They're just naturally there, and they're *all there*. And the midrange blends in so smoothly that you get a fine feeling of solidity in orchestral music, where the total sound spectrum is projected.

Most of our records, as we mentioned, sounded better on this speaker than we had heard them before, so we finally put on what we consider one of the musically and technically finest discs ever made: "Seventeenth Century Italian Music," on Gale Records —one of the ultra-high fidelity British labels distributed in this country by Audio Technica. The best way to describe our reaction to this vividly recorded set of performances by the London Early Music Ensemble is to say we were bowled over.

What makes the L110 sound that way? Surprisingly, there is nothing radically unorthodox about this speaker. The design is basically conventional but refined to the highest attainable standards.

It is a three-way system using a newly designed 10-inch woofer whose effectiveness is maximized by a large diameter (3 inches) voice coil. The large circumference of this coil transmits motion more smoothly to the cone, thereby reducing buckling and other sources of distortion, even with extremely heavy bass thrusts. Moreover, the coil itself is made of a flat-ribbon wire wound on edge by hand. This type of coil construction places more coil material within the field of the massive 7½ lb. magnet, thereby improving efficiency and transient response. The fin-like projections of the edge-wound ribbon coil also provide for better heat dispersion and thus increase the power handling capacity of the speaker to where it can endure a continuous input of 75 watts. The very effective port in the enclosure helps considerably, too.

The woofer works in a vented enclosure based on the principles developed by Thiele and Small in Australia, which we have described in this column before and which are increasingly being

adopted by American speaker manufacturers. They give the speaker a relatively high degree of efficiency while keeping the woofer cone properly loaded and controlled at all frequencies, thus attaining a remarkably tight bass. Apropos efficiency: 10 watts will drive this speaker and 150 watts won't faze it.

The 5-inch cone-type midrange driver also has an exceptionally large voice-coil (⅞ inch) to give it true piston action, without buckling or distortion. What's more, the entire midrange unit is housed in a separate "enclosure within an enclosure" to isolate it acoustically from the other drivers and prevent mutual interference through back radiation.

The last member of this exceptional trio of drivers is a 1-inch wide dispersion dome tweeter with a 1-inch voice coil—the coil size thus being equal to the tweeter diameter. This, plus an extra heavy (1.5 lb.) magnet to keep tight control of the light phenolic dome, accounts for the outstanding accuracy, efficiency, and power handling ability of the tweeter.

But the real kicker in this triple line-up of fine drivers is hidden in the box. It's a newly developed crossover network, about which JBL won't say very much, but which—we suspect—is highly sophicticated in its phase and impedance parameters, in such a way as to keep the drivers doing their remarkable best throughout the audible range. The crossover points in the system are located at 1000 and 4000 Hz. Linked to this network are two continuous level controls, one for the treble and one for the midrange, that should help make this speaker at home in many different acoustic environments.

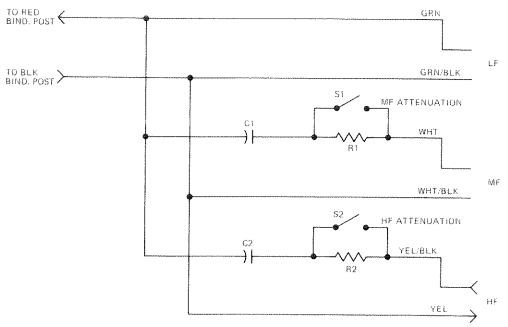
To talk about externals on a speaker this good seems almost beside the point. But the very choice oiled walnut veneer is a pleasure to look at—especially if the L110 is to be used as a floor standing speaker. Even the wire-connecting terminals are just about the best we have seen. You poke the wire into an easily (yes easily!) visible tapered hole and then lock it into place (without danger of shorting by loose strands or of shearing the wire) by giving each terminal a firm twist to the right.

JBL sends along an 18 page instruction manual with the L110. Its clear, uninflated language covers any conceivable adjustment, maintenance, or repairs a moderately handy person can undertake, if so inclined. It carefully explains the principle behind each driver's operation and provides an unusually down-to-earth troubleshooter's guide that bears looking at, for those who want good sense well put.

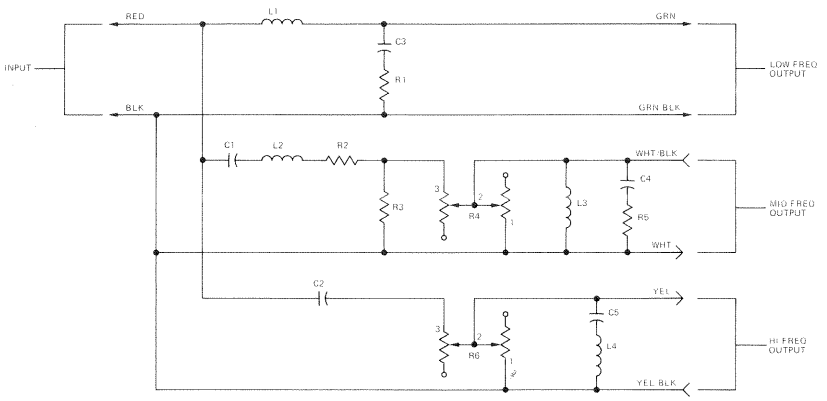
Little details like this reflect the kind of thinking that has evidently gone into every aspect of this design. As the price tag tells you, there was no skimping on cost at any point. But you *can* hear the difference and will have to decide for yourself if it's worth the money. ▲

JBL exposes the L110 crossover network.

Most crossover networks are a compromise; limited in circuitry and component parts. Here's an example, taken from a well-known 3-way system:



Compare this with the crossover network in the L110:



What does a good crossover network do for you?

A good crossover network will do a lot more than simply "cross over" the various parts of the spectrum into their respective transducers. If properly designed, it will control the *slopes* of the transitions and control the impedance the entire loudspeaker presents to the amplifier.

For example, in the low-frequency portion of the L110 network, L_1 provides a gentle 6-dB/octave roll-off for the woofer while C_3 and R_1, acting as a *conjugate* circuit, flatten out the naturally rising impedance characteristic of the woofer.

For the mid-frequencies, C_1 and L_2 provide the basic band pass action for the mid-range transducer. R_2 and R_3 reduce the level to the mid-range transducer, while L_3, C_4 and R_5 provide additional tailoring of the curve and smoothing of its impedance.

For the high-frequency section, C_2 provides the basic 6-dB/octave high-pass action while C_5 and L_4, a precisely tuned conjugate circuit, match the resonance frequency of the tweeter, smoothing both its response and impedance rise.

R_4 and R_6 are level controls for the mid- and high-frequency transducers, respectively. They reflect constant impedance regardless of their setting to eliminate crossover frequency shift.

On a more general note, we designed for the L110 transducers which were inherently "well behaved" and naturally suited for the particular frequency ranges required. We further felt that gentle, 6-dB/octave transition slopes marked to better advantage in maintaining a fairly constant dispersion angle over the widest possible range of frequencies. There is no question that the requirements of smooth phase response were best met through the use of these gentle slopes.

And these are some of the reasons why the reviewer was able to say:

"...for the first time—we could hear things we had never known were in the record groove."

THE LOUDSPEAKER THAT LOOKS AT MUSIC THE WAY YOU DO: JBL's NEW L110.

You're at a concert. The sound surrounds you. There's a guitar. A piano. Some horns.

You hear all of it.

But more than that, you hear each part of it. Each sound. Every sound. All the sound.

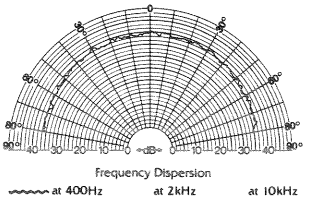
Most loudspeakers can't do that. They only meet you half way. Only left and right, all or nothing. JBL's new L110 goes all the way. It looks at music the way you do.

Left. Right. Front. Back.

The L110 has almost perfect stereo imaging—a result of precise, uniform dispersion at every frequency.

Inside the L110, there's a brand new, super-sophisticated crossover network designed specifically to match the new components.

There's a new 10" woofer which utilizes a massive 3" voice coil and 7½ lb. magnetic assembly—normally found in 12" woofers.



JBL's new L110 loudspeaker is part of the same research and development breakthrough that created our no-tradeoff, top-of-the-line L212 system.

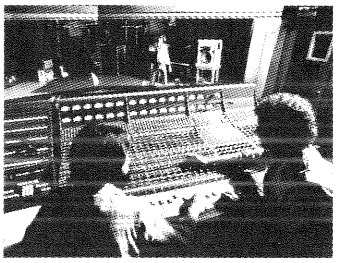
If this graph looks familiar, it should. The L212 produced an almost identical one.

The result is smooth, accurate bass, plus an amazing level of efficiency and power handling capability throughout the entire system. (One more nice: You get more headroom for your amplifier. Less clipping.)

Now look at the L110. The most acoustically transparent grille JBL has ever created is visually transparent, too. You can see right through to the satin black components inside.

If you'd like a lot more technical information on the L110, write us and we'll send you an engineering staff report. Nothing fancy. Except the specifications.

But you really should come listen to the L110. And ask for it by its first name: JBL. You'll be getting the same craftsmanship, the same components, the same sound heard in the very top recording studios in the world.



Over four hundred of the leading recording studios in the world—from Los Angeles to London to Muscle Shoals to Munich to Tokyo to Tennessee—use our sound to make theirs. Shown here is Capitol Records in Hollywood, California.

JBL

GET IT ALL.

James B. Lansing Sound, Inc., 8500 Balboa Blvd., Northridge, Calif. 91329. High fidelity loudspeakers from $207 to $3510.