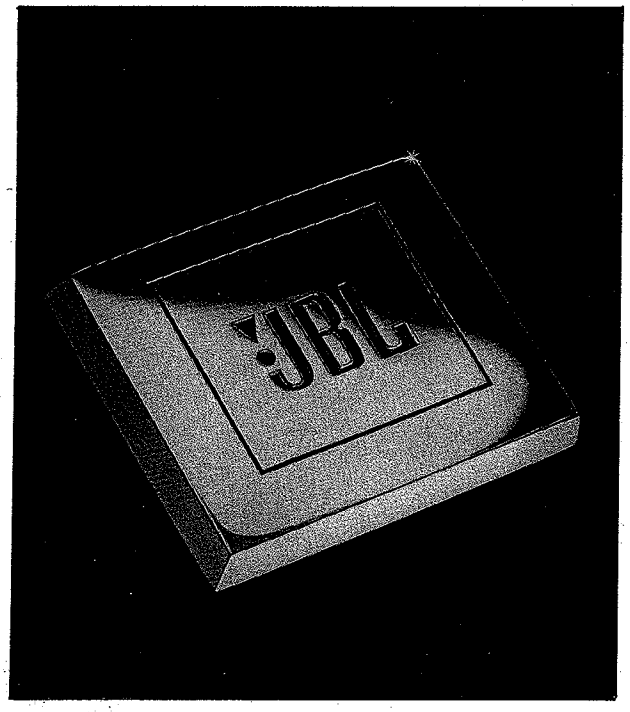
250Ti Instruction Manual

250Ti Notice d'emploi



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The 250Ti

The 250Ti is the most advanced loudspeaker JBL has yet built for the home, a definitive expression of JBL's quality and craftsmanship. From the singular shape of the enclosure to the design of the level controls, JBL has spared no effort, overlooked no performance factor necessary to building the most accurate loudspeaker possible.

The 250Ti will sound as good as your equipment and program source will allow. Imaging is precise and stable. Frequency response, both on and off axis, is nearly ruler-flat to well beyond the audible bandwidth. Distortion is held to levels more typical of fine electronics than of loudspeakers.

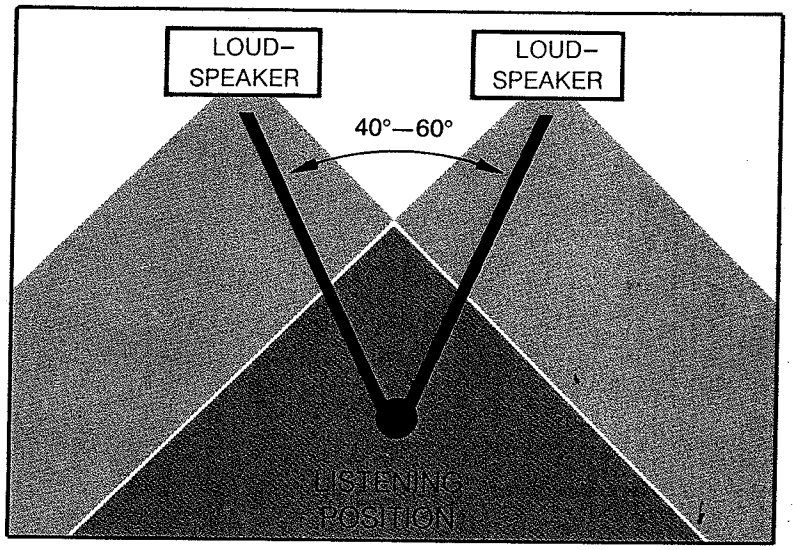
The woodworking complements the engineering. Carefully crafted in hardwood veneers and matching solid pieces, each enclosure is finished by hand.

Despite its sophistication, the 250Ti is not difficult to set up properly. The brief instructions that follow will help you realize the full potential of the system. We have also included a technical information section that examines the design goals and the methods we used to achieve them.

Placement

Ideally, the systems should be placed at least three feet from any walls. The two systems should be equidistant from your primary listening position; the distance should be determined by the distance between the speakers. We recommend that the angle between the speakers, at the listening position, be 40° to 60° (see illustration). For example, if the systems are 8 feet apart, your listening position should be 8 to 12 feet from each speaker. To widen the area in which the best stereo image will be perceived, we also recommend turning the speaker to face the primary listening position.

It is not important which 250Ti is assigned to the right channel and which to the left.



Connections

The binding posts on the rear panel of the 250Ti will accept most types of audio cable and connectors, including banana plugs. They will also accept bare wire.

For each channel, connect the red terminal on the 250Ti to the red (+) terminal on your amplifier. Connect the black 250Ti terminal to the black (−) terminal of the amplifier. Connecting the systems in this manner ensures that they will operate in phase; i.e., will work together rather than in opposition. Connecting the systems out of phase will not damage them but will adversely affect the sound.

The 250Ti has level adjustments for the lower midrange, midrange, and high frequency drivers, located on the rear panel. The controls consist of attenuators selected by connecting a bus bar across a set of terminals. All you will need is a straight-blade screwdriver.

Remove the bus bar from the "0" setting, select the amount of attenuation you want, and reconnect the bar across the appropriate set of terminals. The level adjustments are subtle and will not change the essential character of the 250Ti's sound. Nevertheless, we recommend that level adjustments be made one step at a time and carefully evaluated.

Grille

A loudspeaker grille is a mixed blessing. It protects the trandsucers from pets and children and enhances the appearance of the system in many rooms. But even the most acoustically transparent grille affects the sound. On the 250Ti the effect is minor but apparent. Therefore, for serious listening, we recommend that the grille be removed. For casual listening or background music, the effect is less significant.

General Care

The Model 250Ti has an oiled finish, and cleaning should be done with an untreated dust cloth. Do not use conventional furniture waxes and polishes, which are not designed for oiled finishes. If touch-up is necessary or the finish appears to be drying out, it may be re-oiled with a commercially available *oil* finishing preparation. Do not use any solvents on the finish.

The grille may be gently vacuumed. Stains may be removed with an aerosol cleaner, following its instructions. Do not use solvents on the grille, either.

Service

Should your speakers require service, return them to the JBL dealer from whom they were purchased. If this is impractical, write or call the JBL Customer Service Department, describing the problem in detail. Products returned to the factory should be shipped freight prepaid to the JBL Customer Service Department, 8500 Balboa Boulevard, Northridge, California 91329 U.S.A. (818) 893-8411. Products should not be returned to the factory without prior authorization.

Technical Information

The design goal of the 250Ti was to optimize the combination of several attributes: tonal accuracy, transient accuracy, high ouput capability with low distortion, and accurate, stable stereophonic imaging. With its unique titanium high frequency driver and overall advanced technology, the 250Ti combines these attributes in greater measure, with fewer compromises, than any other loudspeaker system we've built.

The 250Ti Drivers

The drivers in the 250Ti have been designed as part of the total system. Each takes advantage of the latest technology and is constructed, in the JBL tradition, from the highest quality materials. For instance, the high frequency dome is fabricated from titanium, one of the lightest and strongest materials known. It produces response that's smooth and extended — to 28 kHz. In addition, the driver handles the highest musical peaks with ease. The upper midrange driver combines polypropylene cone technology with high power handling to offer exceptional accuracy and dynamics. The lower frequency drivers have special laminated cones and JBL's unique SFG magnetic structures that dramatically reduce distortion. JBL's expertise in cone suspensions gives complete freedom from dynamic instabilities.

Tonal Accuracy

Tonal accuracy refers to the smoothness of the loudspeaker's response over the entire audio range. This includes the frequency response as measured on axis, and also includes the system's response measured off axis (power response). The on-axis response indicates the sound that first reaches your ears; flat response is important because these sounds determine the naturalness of instrumental timbres and provide localization cues. Power response measures the total acoustical power radiated by the loudspeaker in all directions. Because most of the sound that reaches your ears has been reflected at least once, smooth power response is necessary for the best overall response in an actual listening environment.

Several features of the 250Ti contribute to its flat response both on and off axis. The 250Ti is a four-way system, and each transducer is only operating over that portion of its frequency range at which it exhibits flat axial frequency response *and* uniform power response. The frequency dividing network does minimal response shaping, further contributing to smooth output. The rounded edges and tapered shape of the baffle design minimize diffraction effects and the associated peaks and dips in response.

Transient Accuracy

Often called "transient response," transient accuracy indicates how well a loudspeaker can reproduce a steep waveform; e.g., a rifle shot — or a plucked string. A loudspeaker with high transient accuracy will maintain the original time relationship among the frequency components of this waveform. Any alteration in the time relationships, and subtle details will be lost; the musical transients will "blur."

The four transducers in the 250Ti have inherently excellent transient accuracy. To allow them to reach their potential, the 250Ti incorporates a highly sophisticated version of JBL's high resolution network design. Borrowing from electronics design practice, polypropylene and polystyrene "bypass" capacitors are wired in parallel with the network's larger capacitors. The large capacitors are necessary for high power handling, but, by themselves, they exhibit a hysteresis effect on signal waveforms; they alter the time relationship among the frequency components of the waveform. The highly linear bypass capacitors allow the waveforms to pass unaltered and do not affect the power handling capacity of the larger capacitors. Adding a second bypass capacitor gives still further improvement, and the 250Ti uses paired bypass capacitors (of unlike dielectric) where appropriate.

The gentle crossover slopes which help achieve the flat power response also introduce the minimum delay errors between drivers, so that transients involving more than one transducer remain unaltered. The tilted baffle corrects any timing errors introduced by driver positioning

to within 200 microseconds (well below the threshold of detectability).

High Power Handling with Low Distortion

A loudspeaker's ability to produce high sound pressure levels with low distortion is especially important as the new technologies preserve actual peak relationships in recordings. A loudspeaker system may be called upon to reproduce peaks of up to 15 dB above the average power level — a power increase of 32 times. The loudspeaker must not only handle that power, but do so without dynamic compression, a phenomenon in which the transducer's output falls off as its voice coil heats up.

JBL loudspeakers have long been known for their power handling, and the 250Ti is very much in that tradition. All of the transducers of the 250Ti have cast frames that maintain precise voice coil and magnetic gap geometry. The SFG (Symmetrical Field Geometry) magnetic structure of the 14-inch and 8-inch drivers allows long cone excursions with minimum distortion. The dividing network too is ruggedly built: all reactive components have high current and voltage ratings and can handle any expected power input without exhibiting nonlinearities. All resistors are wire-wound, noninductive types. Level adjustments are made with fixed-value, low-loss stepped attenuators employing high-current bus bars. This attenuator system combines the sonics and power handling of hard wiring with the flexibility to optimize system output for various environmental conditions.

In addition to their high power handling the two midrange transducers have considerable headroom. This is important, because most musical energy lies in the mid frequencies, and the headroom gives the drivers the power reserves to handle the highest peaks.

The rugged construction carries over to the enclosure. Constructed of ¾-inch (19 mm) particle board throughout, the enclosure is extensively braced and heavily damped to eliminate resonances.

Stereo Imaging

A pair of loudspeakers should produce both a lateral image and a depth image (with good recordings). Loudspeakers that do not, no matter what their other qualities, will not accurately re-create the original performance.

The 250Ti achieves its outstanding imaging through the careful design of the system elements and their proper placement. The 250Ti is designed as a mirror-imaged line array; the stereophonic imaging it will produce (with a good recording) is very accurate and very stable.