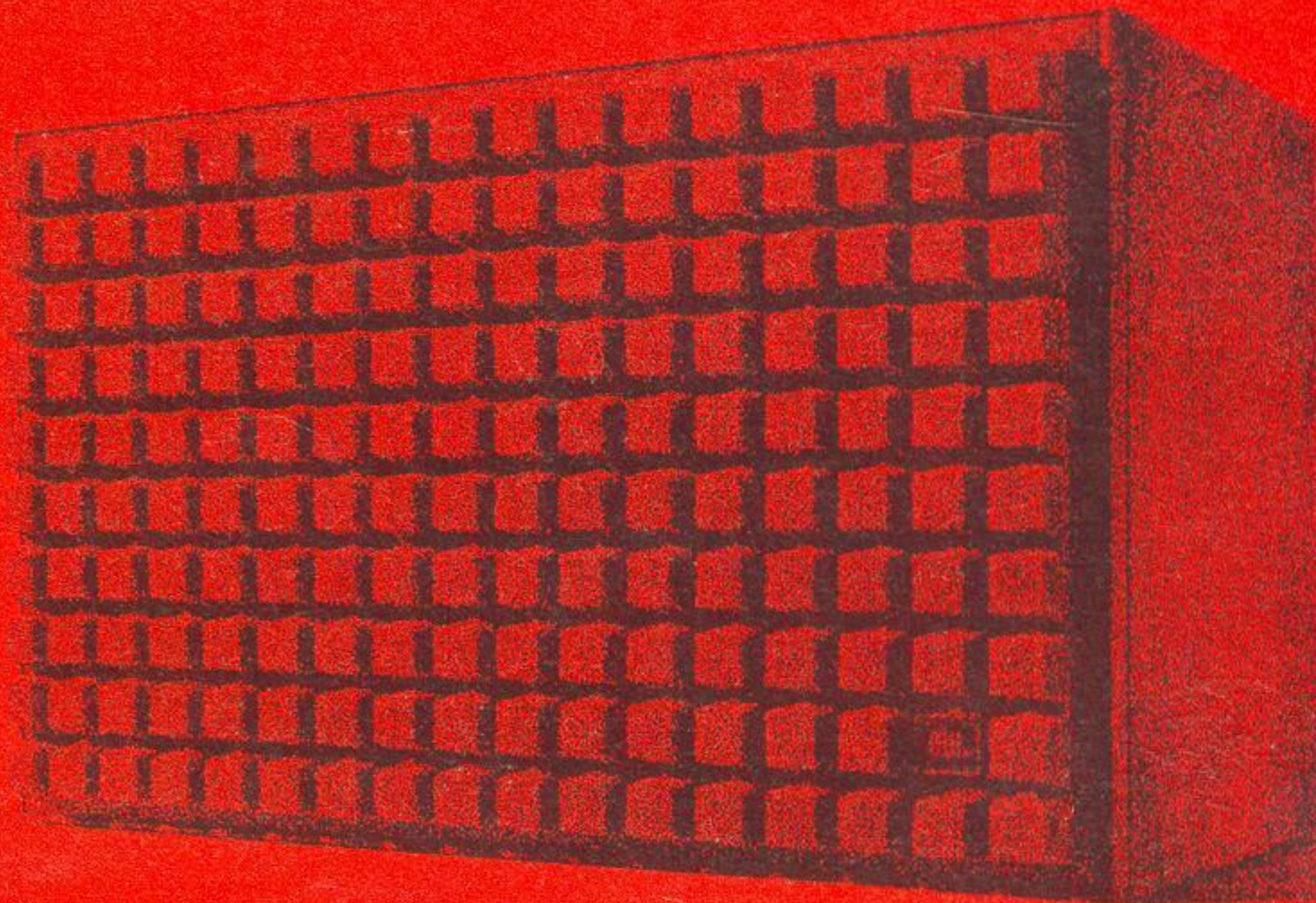


Owner's Manual

L100

Century

JBL



Excellence is an elusive quality. It is so easy to recognize and so difficult to attain.

JBL craftsmen have been involved in the art of sound for more than a generation—signal and source, wood and fabric, transducers and acoustics—all of it.

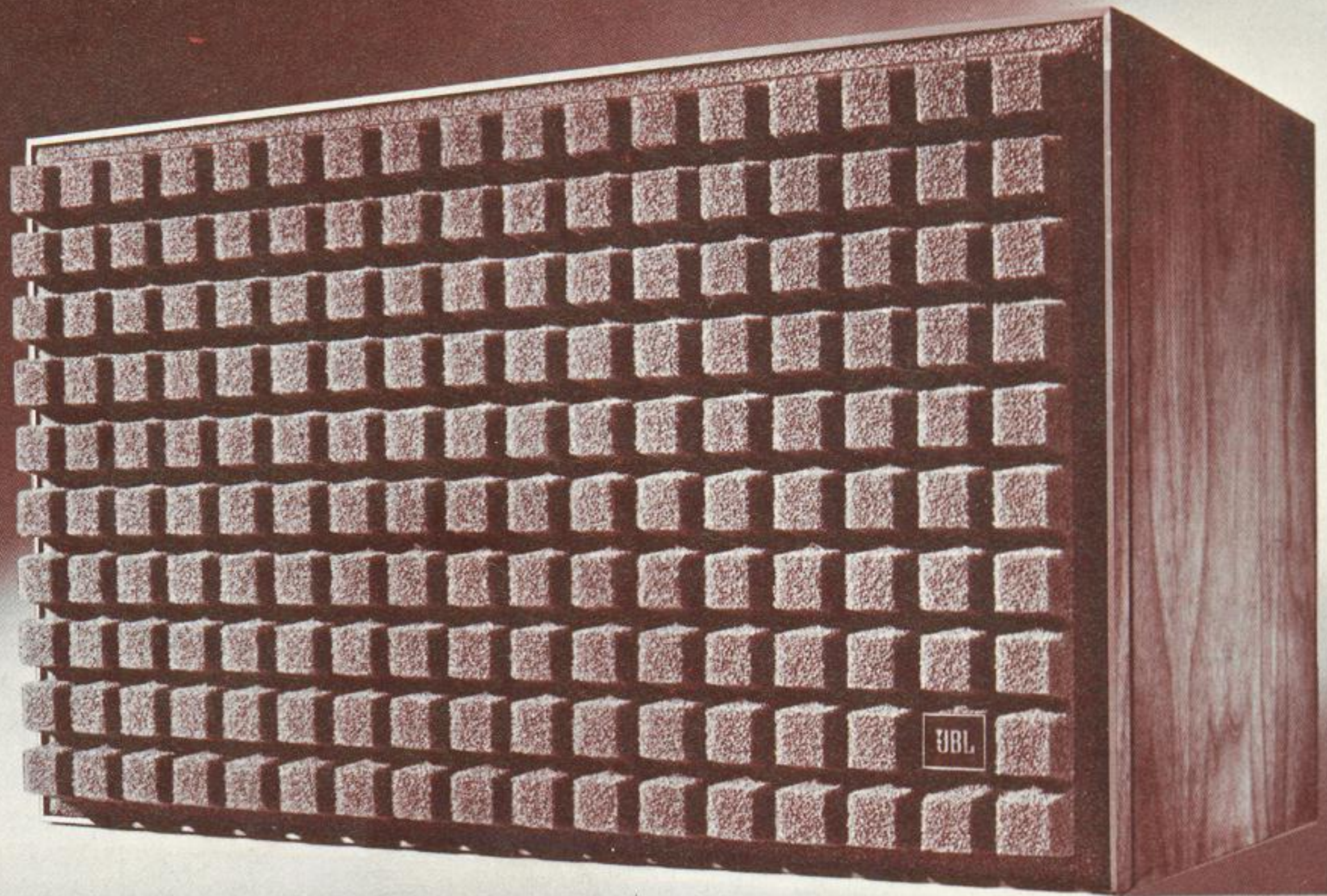
Today these craftsmen continue to perform to the most rigid standards any craftsmen can submit to: those they impose upon themselves.

JBL loudspeakers are carefully engineered instruments, painstakingly crafted and assembled to watchmakers' standards. JBL enclosures express the excitement of creative design; they are elegant, solid and flawlessly finished. JBL transducers and electronics offer what has been characterized by devoted music listeners as the "incomparable JBL sound."

By following the few simple suggestions contained in this booklet, you can look forward to superb high fidelity reproduction that will retain its clarity and realism year after year.

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JBL



Development of the Century

The most demanding requirements for loudspeaker excellence come from recording studios.

The playback monitor is the standard by which recordings are judged—from initial microphone placement through mixing, dub-down and on to final mastering.

JBL's reputation for building the ultimate in accurate full-size monitors prompted a group of engineers from leading recording studios to request a new, compact control room monitor. The requirements were stringent: unprecedented power-handling capacity, high acoustic output without distortion, smooth frequency response throughout the entire audio spectrum—all within a cabinet limited to 1.6 cubic feet in volume. The size limitation was dictated by today's sophisticated recording techniques which often require that as many as 24 separate monitor loudspeakers be located in a single control room.

After two years' work, many conferences, modifications and final field testing, the product

arrived. It was introduced by the Professional Division and was an immediate success.

The new JBL system was soon established as the standard for compact studio monitors throughout the industry. Studios switching to JBL equipment include Angel, Capitol, Deutsche Grammophon, Elektra, EMI, London/Decca, MGM, RCA, Reprise, Vanguard and Warner Bros.

When it was found that musicians, engineers and other discriminating professionals in increasing numbers purchased the studio monitor for home use, JBL introduced the L100 Century—acoustically identical to the studio monitor, yet offering provocative styling appropriate to the home environment.

Truncated pyramids of the Quadrex 2 grille dramatize the unique lineage and advanced engineering of the L100 Century. New methods of sculpting semi-rigid foam material gave JBL the freedom to explore texture, color and shape. This reticulated (open-pore) foam—substantially the same material used for quality microphone windscreens—has proved to be even more acoustically transparent than cloth. The grille frame and loudspeaker system enclosure are finished in

hand rubbed oiled walnut on all four sides and can be placed horizontally or vertically.

Performance Characteristics

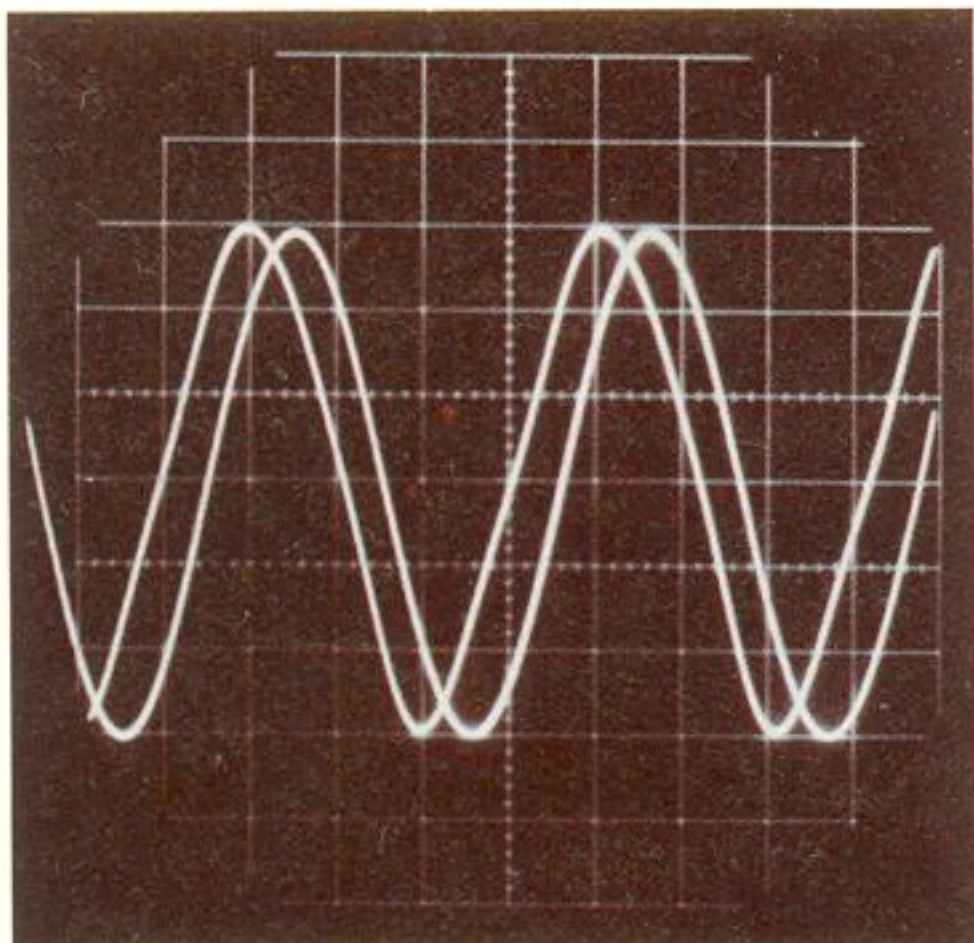
Whether played at background music level or at concert hall volume, the performance of the L100 loudspeaker system is rich and robust. Low frequencies are solid and well-defined, avoiding the "boominess" of unnatural accentuation. Midrange frequencies, the heart of the audio spectrum, are reproduced with the incredible crispness and presence which have long been characteristic of JBL loudspeakers. Highs are delineated with utter clarity and transparency. Moreover, the inherent smoothness and lack of distortion of the L100 Century virtually eliminate aural fatigue, even after listening to the system for many hours.

To accurately test the loudspeaker system, a set of evaluation parameters was developed and specifications derived from measurements made under standard laboratory test conditions. The L100 was mounted in the measured center of a large flat baffle in a reverberation-free environment, and

a calibrated condenser microphone was suspended at a specified distance from the sound source. All electronic equipment was checked and calibrated before tests were run.

Due to the wide-angle sound dispersion characteristics of the loudspeaker system components installed in the L100, frequency response measured up to 45° off-axis, horizontally or vertically, does not deviate more than 6 dB from on-axis response.

A dual-trace oscilloscope was utilized to compare a 50 Watt RMS input at 50 Hz directly with the acoustic output of the system. A laboratory microphone was connected directly to the oscilloscope and the display photographed. The left trace, representing the generated low frequency input, is identical to the output trace, demonstrating the verbatim signal reproduction of the L100.



Sustained performance at this intensity would not be encountered during normal use. A 50 Watt RMS test signal is far more difficult for a speaker to reproduce than its rated capacity of 50 Watts program material, specially in the lowest register of the audio spectrum. Nevertheless, it can be seen that the L100 produces a virtually perfect replica of the input signal.

A number of compact loudspeaker systems can handle large amounts of power; others are highly efficient. JBL products are unique in their ability to

combine both attributes. The L100 Century, for example, will convert a 1 Watt input of "white noise"¹ into a sound pressure level of 76 dB at a distance of 15 feet.² This is approximately twice as loud as ordinary conversation and represents a comfortable listening level, demonstrating that the L100 delivers substantial output from very little input power.

1. *"White noise" is a rigorous test simulating average musical program material under laboratory conditions. It provides a controlled means of energizing all the transducers of a loudspeaker system simultaneously. "White noise" encompasses all audible frequencies just as white light includes all the colors of the visible spectrum. Produced in the laboratory by a signal generator, "white noise" sounds very much like the hiss heard between FM radio stations.*

2. *A decibel (dB), in this context, is a unit expressing relative loudness of sound. Three dB is approximately equal to the smallest change in loudness of program material ordinarily detectable by the human ear.*

Specifications

JBL attributes major importance to the validity of published information. Rather than repeat the ambiguity of most technical specifications, JBL has traditionally refrained from listing data for which no widely-accepted test procedure has been established. In the absence of such standards, any well-equipped laboratory can legitimately produce a variety of frequency response curves for a loudspeaker, depending on the conditions selected. At JBL the final analyses are comprised of extensive listening sessions. Although laboratory data are an integral part of the process, the trained ear is the ultimate criterion. The success of this philosophy is reflected in the enthusiastic acceptance of JBL systems by recording studio engineers, producers and performers—professionals whose artistic achievements are closely related to the equipment they use. In every critical listening situation—wherever the sound of the loudspeaker must be depended upon—JBL is the overwhelming professional choice.

Power Capacity*	50 Watts continuous program
Nominal Impedance	8 ohms
Dispersion	90° horizontal and vertical
Crossover Frequencies	1500 and 6000 Hz
Efficiency	1 Watt input produces 76 dB Sound Pressure Level at a distance of 15'. (Note: 75-80 dB is a comfortable listening level.)
Finish	Oiled Walnut
Grille	Sculptured Air foam, Quadrex 2 design
Grille Color Options	Ultra Blue, Chocolate Brown or Burnt Orange
Dimensions	14¼" x 23½" x 13⅝" deep 36 x 60 x 35 cm deep
Shipping Wt.	55 lbs 25 kg

Low Frequency Loudspeaker

Nominal Diameter	12 inches
Voice Coil	3-inch, edgewound copper ribbon
Magnetic Assembly Wt.	6 pounds
Flux Density	10,000 gauss
Sensitivity**	40 dB

Midrange Transducer

Nominal Diameter	5 inches
Voice Coil	7/8-inch, copper
Magnetic Assembly Wt.	2.75 pounds
Flux Density	16,500 gauss
EIA Sensitivity	46 dB

High Frequency Direct Radiator

Nominal Diameter	1.4 inches
Voice Coil	5/8-inch, copper
Magnetic Assembly Wt.	1.6 pounds
Flux Density	15,000 gauss
EIA Sensitivity	47 dB

** Based on a laboratory test signal.
See Power Capacity section for amplifier power recommendation.*

*** Since the major portion of the energy reproduced by the low frequency loudspeaker lies below 800 Hz, this specification has been developed by using a test signal warbled from 100-500 Hz, rather than the conventional 1 kHz sine wave test signal on which the EIA sensitivity rating is based.*

Connecting the L100

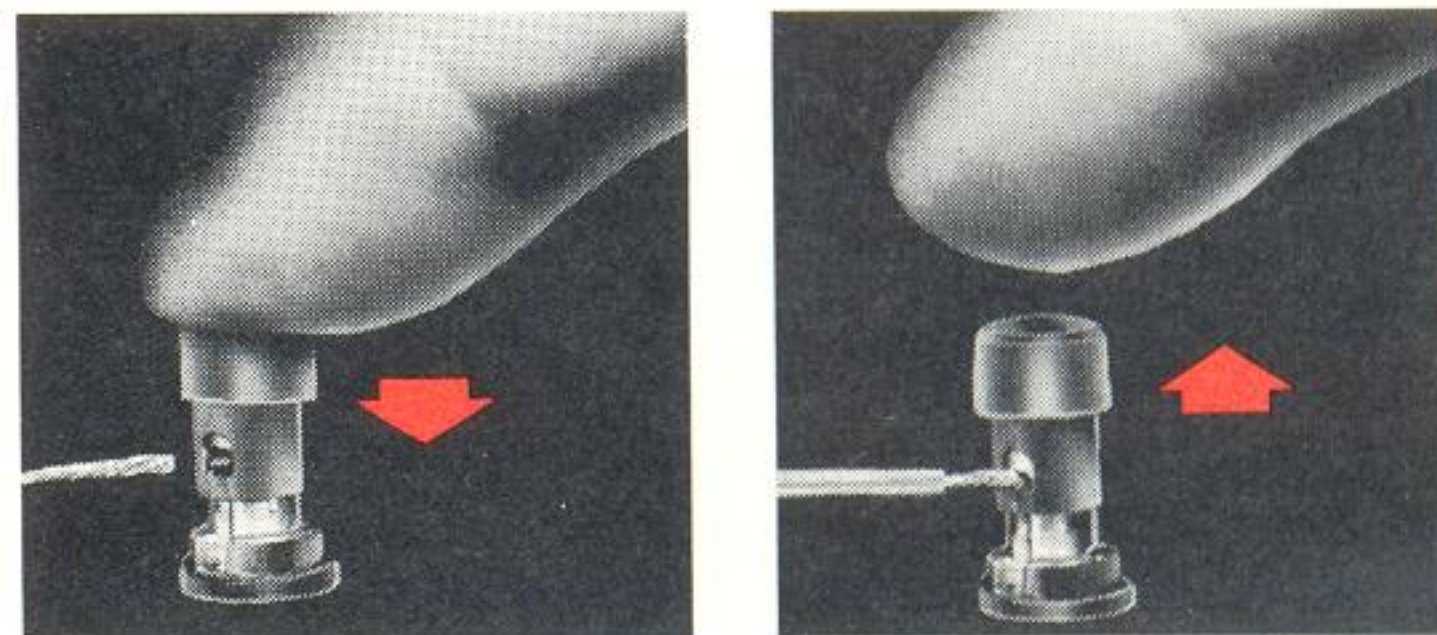
IMPORTANT: When connecting or disconnecting loudspeakers from an amplifier, the amplifier must be turned off. Making connections while the amplifier is operating could seriously damage the loudspeaker system and void the warranty.

Eighteen-gauge insulated wire (ordinary household lampcord) is the minimum size recommended for loudspeaker connections up to 50 feet. Beyond this distance, heavier gauge insulated wire is recommended; 16-gauge from 50 to 100 feet and 14-gauge from 100 to 200 feet. If lampcord is used, wires can be differentiated by noting that one of the insulating jackets is smooth, while the other has a distinct ridge. By considering the ridged jacket "red" and the smooth jacket "black," wiring connections can be made as if using color-coded wire.

Connections to the audio power source are made using the two pushbutton terminal posts located on the back of the loudspeaker system enclosure.

The holes in JBL terminal posts do not allow the connecting wire to pass all the way through, preventing the possibility of a short to the other terminal post or to nearby electrical conductors.

To make a secure connection, strip approximately $\frac{1}{4}$ inch of the insulation from the end of the wire, push down the spring-loaded terminal post cap, push down the spring-loaded terminal post cap,



1. *Depress colored button, exposing hole in terminal post.*

2. *Push stripped end of lead wire into hole and release button. Never apply twisting force to the terminal post.*

insert the bare wire into the exposed opening of the terminal post and release. (Insertion of the wire into the opening will be easier if the stripped wire is first tinned with a soldering tool and solder).

Locate the loudspeaker output terminals on the back of the receiver or power amplifier. For each loudspeaker system, connect the wire from the black terminal post to the amplifier output terminal labeled "common," "ground" or (—), and the wire from the red terminal post to the remaining 8-ohm speaker output.³

Note that many amplifiers have a chassis grounding terminal which is usually isolated from the other connectors. This should not be confused with the "ground" designation sometimes used to describe two of the terminals in each set of loudspeaker connections.

The specified 8-ohm impedance rating is a nominal figure which suggests a connection giving the most efficient power transfer between amplifier and loudspeaker system. However, 4- or 16-ohm amplifier terminals can be used without danger.

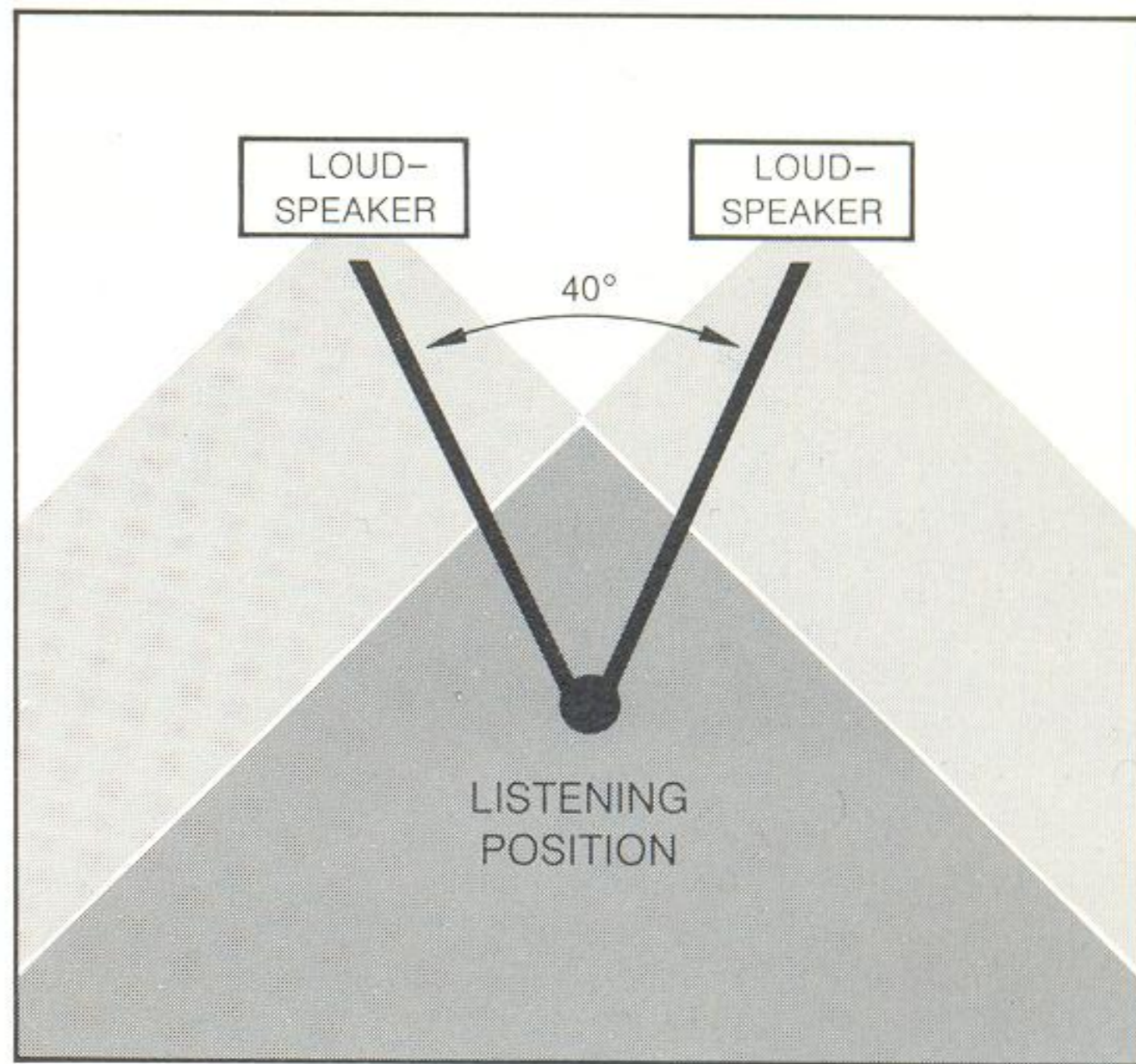
3. Connecting both speakers as described will insure proper "in phase" operation; i.e., their cones will respond to a monophonic signal by moving simultaneously in the same direction, and not opposite to each other. Inadvertent out-of-phase operation (which occurs when one set of speaker wires is reversed with respect to the other) will not harm the system, but may cause some acoustical "cancellation" which will have the audible effect of reducing low frequency response.

Placement

Although JBL loudspeakers have a wide sound dispersion pattern, the final sound of the completed installation is affected by the location of the enclosure within the listening environment. If possible, experiment with placement of each loudspeaker system before deciding on a final arrangement.

The two loudspeaker systems should be arranged symmetrically on each side of the listener. As a general rule, a person sitting in the usual listening position should see an angle of about 40° between the two sound sources. The distance from one loudspeaker enclosure to the other is determined by their distance from the listener and by the 40° "listening angle."

Loudspeakers may be positioned at any height above the floor, although locating the high frequency direct radiator near ear level usually gives the most realistic suggestion of a live performance. Bass response will be augmented if the enclosures are placed near adjacent room surfaces, such as in a corner or on a wall near the floor or ceiling.



40° "Listening Angle"

Sound energy from each loudspeaker blends to form a stereo "wall of sound." The stereo image will be intensified and the area of best stereo perception increased if the two systems are rotated slightly toward the preferred listening position.

Listening Room Acoustics

The sound reflecting or sound absorbing qualities of the listening room will affect the sound quality of a loudspeaker system. Room acoustics can be tested by listening to the echo of a sharp sound, such as hand clapping.

A room having large windows, paneled walls and a hardwood floor or ceiling will be acoustically "live" and will echo noticeably. A room containing overstuffed furniture, carpeted floors or draped windows will be acoustically "dead" and will echo very little or not at all.

Ideally, there should be a reasonable balance between absorptive material and sound reflecting surfaces. If there are two large reflecting surfaces facing each other, the "bounce" between them will make sounds run together and the music will lack definition. Large, flat wall surfaces should be broken up with bookshelves, drapes, screens or tapestries.

Adjusting the System

The L100 is provided with a Presence control to regulate the relative loudness of the midrange transducer and a Brilliance control to adjust the volume or level of the high frequency direct radiator. These controls adjust the output of the component loudspeakers to achieve realistic tonal balance in a variety of room conditions.

The controls are calibrated in terms of a laboratory standard reference level, indicated by a "0" on the instruction plate. When both the Presence and Brilliance controls are set at this level, the loudspeaker system will be adjusted for balanced performance characteristics in a reverberation-free environment. Since most listening rooms possess varying degrees of high frequency absorption and reflection, some adjustment of the controls is usually preferred.

The loudspeaker system should be adjusted while reproducing normal program material with the amplifier tone controls set at the middle (generally referred to as "flat") position. Begin by placing

both of the loudspeaker system controls at the reference level and listening to a variety of program material long enough to become accustomed to the system's performance.

After the ear has become attuned to the "0" setting, evaluate the presence and brilliance qualities of the loudspeaker's performance. The most valid evaluation will be obtained by listening to the loudspeaker played monaurally. (This can be accomplished in stereo or quadraphonic installations by setting the amplifier mode control for monaural reproduction and using the balance control to select the individual loudspeaker system to be adjusted.) The evaluation should be made while seated in the normal listening position.

To arrive at the specific setting for each of the loudspeaker system controls, proceed as follows:

1. Set the Presence control at "0" and rotate the Brilliance control to the extreme left of its travel. This will attenuate high frequency performance so that the ear will perceive only the balance between the low frequency loudspeaker and the midrange transducer.

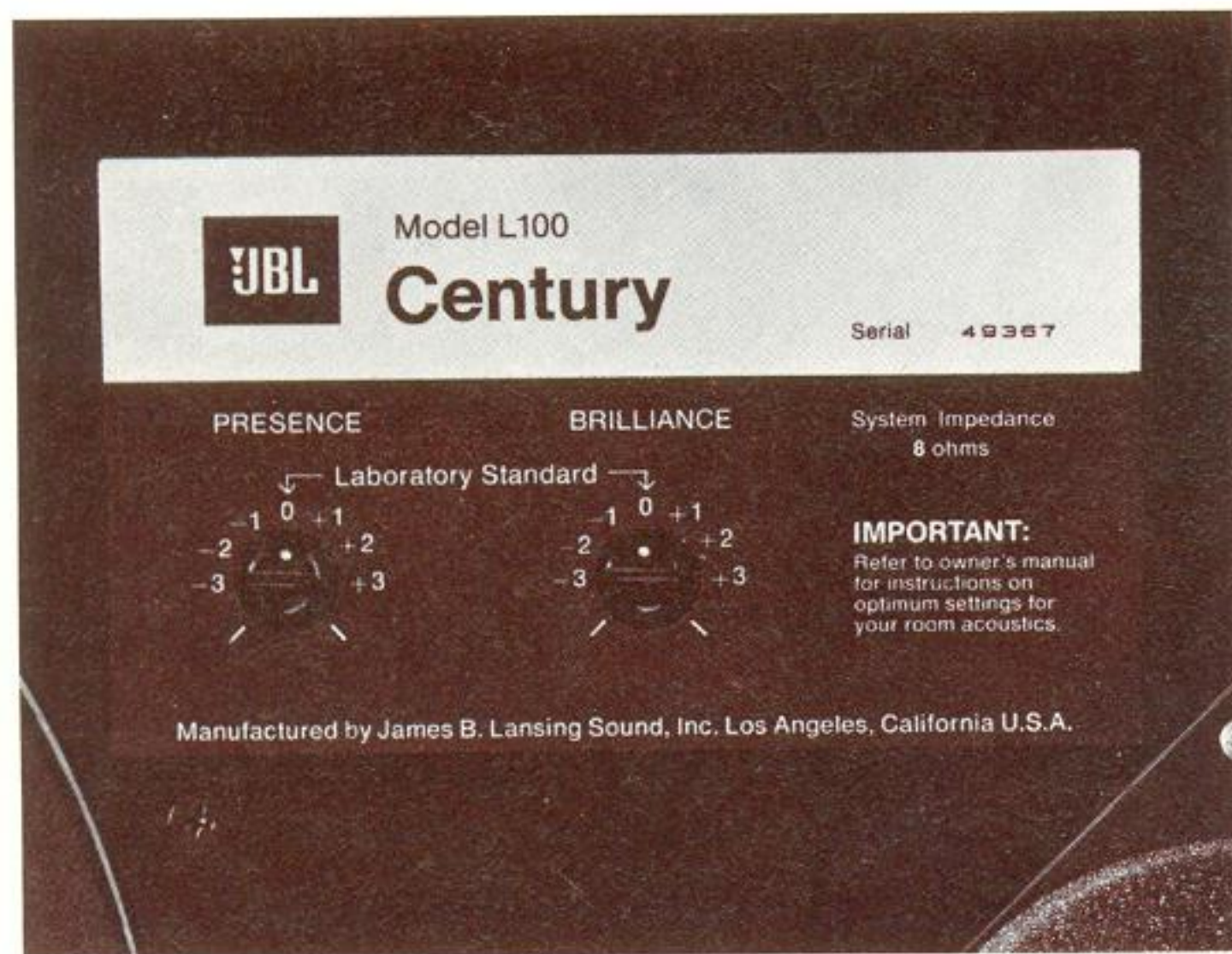
2. If midrange material—such as violin, piano or guitar—seems too close or overemphasized, use a coin or screwdriver to reduce the setting of the Presence control by rotating it to the left.

Conversely, if midrange material seems too distant, increase the output of the midrange transducer by rotating the control clockwise.

3. Once the Presence control has been adjusted to provide the most pleasing balance between the low frequency and midrange transducers, set the Brilliance control at "0." If high frequency material—such as cymbals, bells, triangles, violin overtones or vocal sibilants—seems too prominent, lower the setting of the Brilliance control. If greater high frequency output is desired, increase the setting of the control.

After each set of adjustments, again listen to a variety of program material until the ear has become attuned to the new characteristics and can compare them to the previous performance of the system. Once the Presence and Brilliance controls have been set for the most pleasing overall results, and the exact placement of each

loudspeaker has been determined, compensation for differences in individual recordings should be made with the tone controls on the amplifier or receiver.



Presence and Brilliance controls are conveniently located on the front of the enclosure, behind the removable grille assembly.

Power Capacity

The specified power capacity indicates the continuous program power level that can be accepted by a JBL loudspeaker system without damage. Its peak power capacity is considerably greater than the continuous rated value, as indicated by the remarkable transient response of JBL loudspeaker system components. The L100 will reproduce clean sound at comfortable listening levels when driven by an amplifier having an output of as little as 10 Watts RMS per channel.⁴

However, for reproduction of the full dynamic range of contemporary recordings at high volume, a quality amplifier delivering from 60 to 150 Watts RMS per channel will provide optimum performance. Such an amplifier has the reserve power necessary for accurate reproduction of transients, which can reach momentary peaks equivalent to ten times the average power level.

In almost all cases, the volume level generated by a JBL loudspeaker will become noticeably discomforting to the ear before the loudspeaker can be damaged by excessive power from the amplifier.

There is virtually no danger of damaging a JBL loudspeaker if it is operated within the following guidelines: 1) the signal from the amplifier, regardless of its rated power, is not distorted; 2) the amplifier is not driven into clipping (another form of distortion which occurs when the power output limitations of the amplifier circuitry are exceeded); and 3) the power cord or audio connectors are not inserted or unplugged while the amplifier is operating.

However, a powerful wide range amplifier can accidentally damage any loudspeaker under certain conditions. For example, rewinding a tape recorder with the playback volume turned up can generate "squeals" powerful enough to burn out the high frequency unit. Similarly, powerful low frequency pulses extending down into the subsonic range can eventually damage the low frequency loudspeaker. If the phonograph pickup is accidentally dropped with the volume control full up, or if the system is played very loudly with excessive bass boost, nearly the full rated power of the amplifier can be channeled into dangerous subsonic energy.

4. The RMS (root mean square) rating of amplifier power is the most stringent method currently used in the audio industry. An amplifier rated at 60 Watts RMS per channel, for example, is generally considered to be a high-powered unit. The same output expressed in terms of "Music Power" would be 160 Watts.

System Components

The components used in every JBL product are designed and produced by JBL personnel to exacting standards. JBL loudspeaker frames are massive rigid structures. Magnetic assemblies are precisely manufactured of low-reluctance iron, energized by large, high grade magnets. Voice coils are held to within one turn of design specifications. Stamped frames, punched magnetic structures and mass-produced voice coils would be less expensive; however, the resultant loss of structural integrity, magnetic force and acoustic efficiency would tend to degrade low-distortion performance and transient response—qualities that have become JBL hallmarks.

Do not move loudspeaker cones by hand. The clearance between the voice coil and magnet assembly is so small that any attempt to move a cone manually can easily force it out of alignment.

Low Frequency—Bass reproduction is accomplished by a powerful 12-inch, long-excursion loudspeaker. Its 3-inch edgewound copper ribbon voice coil, massive magnetic assembly and large

Alnico V magnet enable reproduction of powerful bass fundamentals with ease. The voice coil drives a molded cone, carefully damped with an exclusive JBL formulation, Lansaplas, to prevent spurious resonance and provide smooth performance through the vital midrange region. It is this damping compound which gives the cone its white color. The shallow, curved cone provides uniform wide-angle distribution of sound energy through the full low frequency range; the viscous-damped suspension allows extremely long



Loudspeaker System Components

12-inch Low Frequency Loudspeaker

5-inch Midrange Transducer

1.4-inch High Frequency Direct Radiator

excursion without distortion. Efficiency and dynamic range are further increased by the use of an enclosure having a tuned port for optimum bass performance.

Midrange—The midrange region, which includes vocal overtones and strings, is reproduced by a precision 5-inch transducer possessing peak-free, uniform sound distribution both on- and off-axis. Extreme sensitivity and high power handling capacity allow greater undistorted acoustic output than any other small cone loudspeaker. The unit is separately housed within the main enclosure to prevent acoustical interaction with the low frequency driver and to optimize the superior response characteristics of the transducer.

The midrange transducer is driven by a $\frac{7}{8}$ -inch copper voice coil immersed in an intense magnetic field provided by a massive 2.75-pound magnetic assembly energized by an Alnico V magnet. The coil is coupled to a molded cone having a viscous-damped suspension to prevent spurious resonance. The entire moving assembly is rigid, yet exceptionally light—a combination permitting outstanding transient reproduction.

High Frequency—Information above 6000 Hz is reproduced by a 1.4-inch direct radiator energized by a 1.6-pound magnetic assembly. Its $\frac{5}{8}$ -inch copper voice coil is unusually large in relation to cone size, providing exceptional efficiency and transient response. The precisely formed cone assembly is suspended at its outer edge by an impregnated cloth termination to insure linearity and absorb spurious resonance. The entire dynamic structure is surrounded by a ring of dense foam damping material to prevent unwanted radiation and reflections.

The small radiating surface of the cone and center dome is responsible for the wide high frequency dispersion pattern, assuring that each listener hears the same tonal balance and blend of direct and reverberant sound. The result is a precision transducer providing exceptionally transparent high frequency reproduction characterized by clarity and precise delineation of even the most complex treble waveforms.

Dividing Network—Allocation of each segment of the full musical spectrum to the appropriate

transducer is determined by the frequency dividing network. As with all JBL dividing networks, the network installed in the L100 is carefully designed and tested to complement the exact characteristics of the JBL transducers with which it is to be used. Transition between speakers is accomplished imperceptibly and without degradation of the linear response characteristics of the system.

The function of a precision dividing network is considerably more complex than merely feeding low and high frequency information to the appropriate reproducers. Since both loudspeakers operate through the crossover region, the control exerted by the dividing network is vitally important to the total sound the loudspeaker system. The circuit values of JBL dividing networks are adjusted so that acoustic output of each transducer remains smooth and uniform through the crossover region, assuring that the superior performance characteristics of the complete loudspeaker system are maintained through the full audio spectrum.

Thus, the effects of individual speaker characteristics, impedance fluctuations, and the physical separation of the individual sound sources are all taken into account in the complete system design.

The L100 network permits full control of tonal balance by regulating the power fed to the midrange and high frequency reproducers. The controls do not appreciably affect the crossover frequencies, nor do they limit the upper frequency response of the loudspeaker system.

JBL network tolerances are much more stringent than normal industry practices. For example, JBL networks use non-inductive, non-polarized capacitors—not electrolytic types—individually tested to meet rigid production tolerances. The special inductors used have extremely low insertion loss so that none of the driving power to the loudspeaker system is wasted in the network. To meet JBL production tolerances, each inductor is calibrated on a sensitive electronic bridge and its value set precisely.

Component Removal

If it should be necessary to remove the loudspeaker system components for testing or repair, disconnect the loudspeaker system from the amplifier and proceed as follows:

Grille—The grille is secured to the enclosure by dowel pins located near the four corners of the grille frame. To remove the grille, grasp the frame at both top or both bottom corners and gently pull the assembly away from the enclosure. To replace the assembly, reposition it on the enclosure and apply light pressure to reseal the grille frame on the dowel pins.

When replacing the grille be sure that the large circular cutout on the underside of the grille frame is located over the 12-inch low frequency transducer. Align the dowel pins with the matching holes in the grille assembly and gently apply pressure at the corners of the framework adjacent to the dowels. Note that one of the dowel pins is offset to insure that the grille can only be replaced when positioned correctly.

Low Frequency—Place the enclosure on its back on a clean padded surface. The low frequency loudspeaker is mounted from the front of the baffle panel and held in place by four Phillips-head screws threaded into T-nut fasteners which are anchored on the back of the panel. Carefully unscrew the machine screws without applying pressure that might dislodge the T-nuts. When the mounting screws have been removed, gently lift the edge of the loudspeaker frame from the baffle panel, disconnect the wires at the binding posts and remove the loudspeaker from the enclosure.

Midrange—The midrange transducer is held in place by four wood screws at each corner of its frame. Carefully remove the screws, lift the unit from the enclosure and disconnect the leads at the push button binding posts.

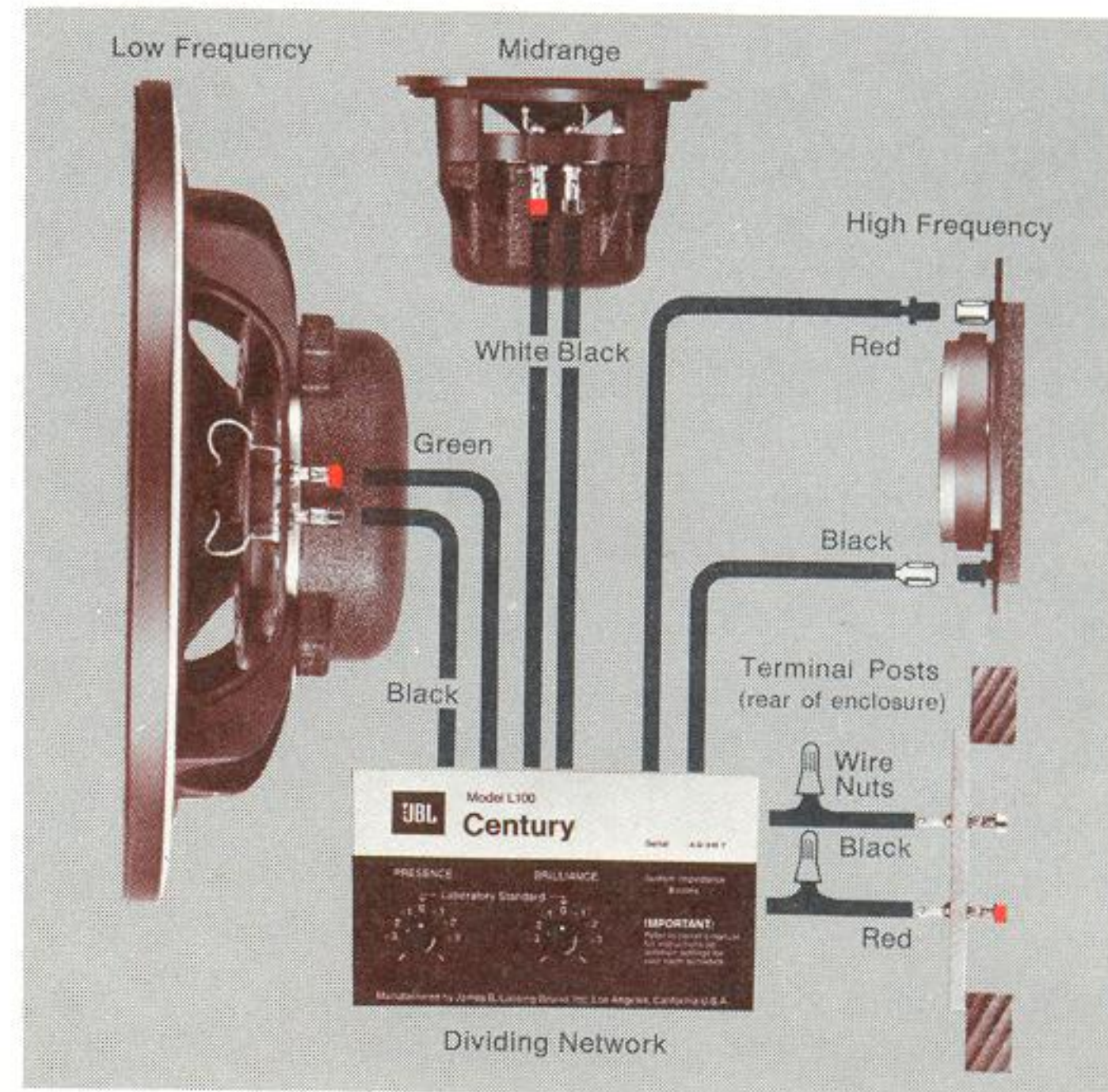
High Frequency—The high frequency direct radiator is secured to the enclosure baffle panel by wood screws at each corner of its frame. The unit is removed by carefully taking out the mounting screws and lifting the complete assembly out of

the enclosure. The two leads from the dividing network can then be disconnected at the tab connectors on the back of the frame.

Dividing Network—The dividing network is installed behind the baffle panel and held in place by four screws and T-nuts. To gain access to the network, remove the transducers as previously described, carefully peel off the serialized foil nameplate, remove the wire nuts connecting the network leads to the terminal binding posts at the back of the enclosure, remove the mounting screws, and lift the network out through the low frequency loudspeaker opening. (Note: Malfunction of the network being highly unlikely, and since the nameplate is generally destroyed in removal, it is not recommended that the network be removed simply for the purpose of inspection.)

Although JBL loudspeakers are extremely rugged, the cone and other moving parts are subject to accidental damage. Exercise extreme caution when using a screwdriver or other tools in their immediate vicinity.

Replacement—Reverse the removal procedure to replace the loudspeaker system components. Mounting screws should be tightened evenly to avoid the possibility of frame warpage, and just enough to prevent air leaks between the components and the enclosure. Avoid excessive force.



Wiring—When reconnecting the wire leads between the dividing network and the components, observe the polarity shown at the left.

The Century Enclosure

JBL cabinetry represents the finest quality available in the high fidelity industry, uniquely styled and solidly constructed to last a lifetime. Designed to complement the characteristics of the loudspeaker components, JBL enclosures feature tight, wood-welded, lock-mitered joints and acoustic padding to eliminate undesirable resonance and warpage. Only the finest compressed woods, furniture hardwoods and hardwood veneers are used—carefully selected, skillfully prepared and hand-rubbed to a rich, lustrous finish enhancing the natural beauty of individual grain structure and color. Detail work is obvious: hand-fitted joints are expertly closed; scratches, dents, gluelines and other defects are non-existent. Typical assembly line procedures are not followed. Each cabinet receives all of the personal attention it must have before it can bear the JBL medallion—the symbol for quality throughout the world.

The L100 enclosure is finished in hand-rubbed oiled walnut. Occasional dusting with a clean, soft cloth will maintain the original beauty of the finish. The grille can be easily cleaned by gently dusting it with a household vacuum cleaner. Since moisture cannot penetrate the oiled surface, most household stains can be easily removed with a damp cloth. The surface should be treated only with wax specifically formulated for use on oiled finishes. Conventional furniture waxes, polishes or cleaners are not recommended.

As the oil penetrates deeper and deeper into the walnut, the finish may appear to be drying out. Many owners find it desirable to re-oil the enclosure surface from time to time. With each application, the beauty of the finish will become more apparent and a warm, rich patina will eventually be obtained.

To re-oil a JBL finish, use any one of the several clear oil finishing preparations available through furniture or hardware outlets. Apply a liberal amount of the preparation over the entire finished

surface of the enclosure. In ten to fifteen minutes wipe off the remaining oil with a soft, clean, dry cloth. Small surface scratches can usually be removed by gently rubbing them out with very fine steel wool (000 grit) and applying oil to the entire panel. Very deep scratches, dents or other serious damage should be repaired only by a qualified furniture refinisher.

Caution: Improper storage of wiping rags could result in spontaneous combustion. They should be thrown away or spread out to dry in a well-ventilated area before storage or disposal.

In Case of Trouble

A JBL loudspeaker system responds with verbatim accuracy to the signal supplied by the audio power source; it will therefore reproduce extraneous noises just as accurately as it reproduces desired program material. Noise seldom originates in the loudspeaker system. Its presence usually indicates that one of the other components of the music system, or the program material itself, is faulty. In rare instances when something does go wrong with the loudspeaker system, one or more of the component loudspeakers will stop working altogether or a distinct rattling or scraping sound (indicating a rubbing voice coil) will be heard whenever the system is operating.

If one channel of a stereo installation is not operating, examine the loudspeaker wiring and check the balance control. If wiring instructions were followed correctly, if the connections are clean and tight, and if centering the balance control does not remedy the situation, reverse the right and left loudspeaker connections at the amplifier,

taking care to turn the amplifier off before each connection or disconnection. If the previously non-functional loudspeaker system operates, the amplifier or one of the component program sources (tuner, phono, tape deck, etc.) is malfunctioning. In the event that the suspect loudspeaker system is still inoperative, it is probably defective.

To determine whether the defect lies in the amplifier or in one of the component program sources (after verifying that the loudspeaker systems are not defective) reverse the right and left cables from the program source at the amplifier. If the original channel is still inoperative, the amplifier is defective; if the previously inoperative channel functions, the program source is defective.

If the amplifier is not faulty, alternately check each program source until the defective unit has been isolated. It is unlikely that more than one program source will be faulty at any given time.

Extraneous interference such as static or radio broadcast signals can be picked up by the component devices. When this occurs, the trouble-

some unit can be identified by disconnecting inputs from the receiver or amplifier until the interference stops. Again, if the interference persists with none of the input devices operating through the power source, the receiver or amplifier itself is probably defective. Shorting plugs, available from your JBL Audio Specialist, should be inserted in unused phono inputs to help eliminate stray hum or signal pickup.

Fuzzy or indistinct high pitched sounds can usually be traced to the recording itself, a defective cartridge, a worn stylus or insufficient tracking force. Problems with low frequency reproduction are usually the result of room acoustics or placement of the speaker system. Excessive bass boost or incorrect loudness compensation tend to give a muddy or "boomy" quality to reproduced music. The music system can be checked for turntable rumble or other extraneous low frequency signals by removing the loudspeaker grille assembly and observing the motion of the low frequency cone while the system is playing at high volume.

If the cone continually moves in and out more than 1/2 inch or so, excessive low frequency power is being fed to the loudspeaker system.

Hum may be caused by locating a turntable or tape recorder directly over or underneath the amplifier or receiver. The farther the audio power source is located from the phonograph cartridge or tape heads, the less chance there will be of picking up hum. The AC leads and shielded cables should be as widely separated as possible; AC lines should never cross cables or speaker wiring. Power line interference can be further attenuated by using a heavy duty line interference filter between the audio power source and the AC wall outlet.

Acoustic feedback is the result of mechanical vibrations produced by excessive bass at very high

volume levels. The loudspeaker system can produce enough low frequency energy to vibrate other objects in the room—including the record player and, by direct mechanical transmission, the stylus itself. These vibrations are reamplified again and again, producing very loud “rumble,” or even a sustained howl that increases in intensity as the volume or bass control is turned up. Possible solutions: 1) locate the speaker cabinets as far as possible from the turntable, 2) adjust or replace the turntable shock mountings, 3) place the turntable on a rubber or sponge mat to further absorb vibrations. If the low frequency tone is still audible, it is probably the result of inherent turntable rumble rather than acoustic feedback.

Service

Should your JBL loudspeaker system require service, return it to the JBL dealer from whom it was purchased. If it is not possible to contact a dealer, write directly to the JBL Service Department describing the difficulty as fully as possible. Products returned to the factory must be sent prepaid and will not be accepted unless written authorization has first been obtained. The warranty is recognized only when the unit is repaired by JBL or an authorized JBL Service Agency and if the serial number of the unit has not been defaced or removed.

In addition to the established five-year warranty, JBL will, at its option, repair the speakers free of charge during their entire normal life if factory inspection discloses an original manufacturing defect. To establish the warranty, fill out and mail the warranty card, packed with every JBL loudspeaker system, within ten days of purchase.

Summary

The L100 Century epitomizes JBL's reputation for leadership in acoustic and visual design. It establishes a pinnacle of quality for music reproduction in the home, just as it has in the recording studio. It is our sincere belief that the L100 Century—like all JBL products—will provide undiminished listening pleasure for many years to come.

For Additional Information

If you have difficulty in achieving the fine performance of which your JBL loudspeaker system is capable, consult the JBL Audio Specialist from whom the system was purchased. He is equipped with the knowledge required to provide expert advice and assistance. If for some reason the JBL dealer is unable to assist you, write directly to the JBL Technical Information Department explaining the difficulty in detail.