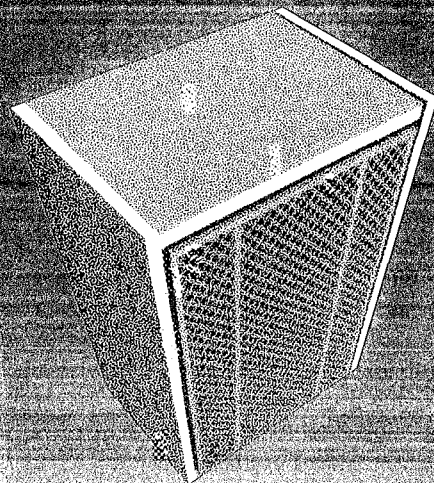


Owner's Manual

L101

Lancer 101



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

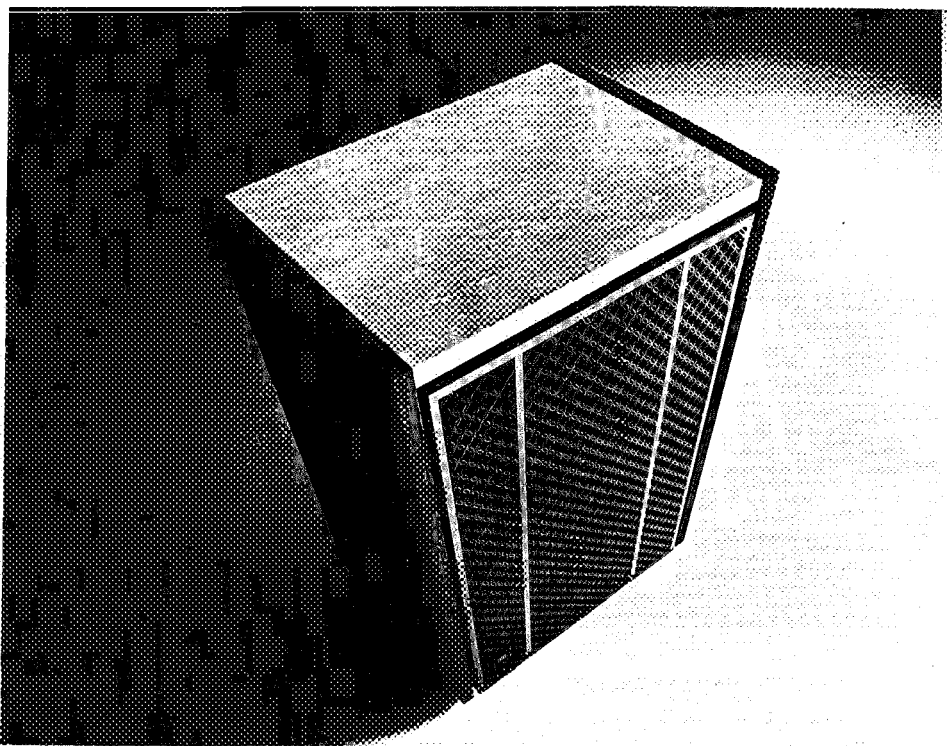
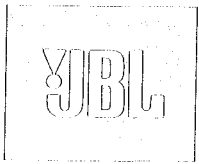
JBL craftsmen have been involved in the art of sound for more than a generation—signal and source, wood and fabric, transducers and acoustics—all of it.

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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The Lancer 101

A handsome addition to any listening environment, the Lancer 101 reflects JBL's tradition for excellence in performance and craftsmanship.

The Lancer 101 is the ideal loudspeaker for the perfectionist desiring an outstanding, compact free-standing loudspeaker system featuring high power handling capacity, uniform spatial distribution and smooth frequency response—all within an enclosure having an internal volume of only two cubic feet.

Performance Characteristics

The Lancer 101 exhibits all the realism and clarity of a live performance. Brasses, guitar, strings and voice are natural and vibrant. The L101 is capable of thunderous acoustic output, yet its response is totally accurate, even at the lowest volume levels.

Bass reproduction is solid and well-defined. The massive 14-inch low frequency loudspeaker reproduces the most elusive waveforms with an open characteristic that is never accentuated or boomy. Treble response is clean and sharp. The horn-loaded compression driver reproduces the most explosive wavefronts and musical harmonics with the crispness, clarity and brilliance found only in JBL loudspeaker systems.

The total effect of the L101 loudspeaker system is *precise articulation over the full range of musical reproduction*—from extreme bass to the musical overtones lying at the upper limits of human audibility—that is accurate, smooth and totally conducive to extended listening, without the slightest hint of aural fatigue.

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 L101 was mounted in the measured center of a large flat baffle in a reverberation-free environment. 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 characteristic of the loudspeaker system components installed in the L101, frequency response measured up to 45° off-axis, horizontally or vertically, does not deviate more than 6 dB from on-axis response.¹

A number of loudspeaker systems can handle large amounts of power; others are highly efficient. JBL products are unique in their ability to combine both attributes. The L101, for example, will convert a 1 Watt input of "white noise" into a sound pressure level of 80 dB measured 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 L101 delivers substantial output from very little input power.

Specifications indicate that the Lancer 101 has impressive performance characteristics, yet they cannot convey the full impact of an extensive listening experience. The powerful bass fundamentals and life-like voice projection exhibited by the L101 are qualities found in few loudspeaker systems, regardless of size or price.

1. 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.

2. "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.

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° conical pattern
Crossover Frequency	1500 Hz
Efficiency	1 Watt input produces 80 dB Sound Pressure Level at a distance of 15'. (Note: 75-80 dB is a comfortable listening level.)
Finish	Oiled Walnut
Grille	Wood Fretwork
Top Surface	3/4" Adriatic Marble, variegated beige tones
Dimensions	24⁵/₈" x 17¹/₂" x 12³/₈" deep 62 x 44 x 31 cm deep
Shipping Wt.	86 lbs 39 kg

Low Frequency Loudspeaker

Nominal Diameter	14 inches
Voice Coil	4-inch edgewound copper ribbon
Magnetic Assembly Wt.	11.5 pounds
Flux Density	11,000 gauss
Total Flux	255,000 Maxwells
BI Factor*	3.4 pounds per ampere
EIA Sensitivity	44 dB

High Frequency Compression Driver

Throat Diameter	1 inch
Voice Coil	1 $\frac{3}{4}$ -inch aluminum ribbon
Magnetic Assembly Wt.	8 pounds
Flux Density	16,000 gauss
Total Flux	75,000 Maxwells
BI Factor	2.0 pounds per ampere
EIA Sensitivity	59 dB

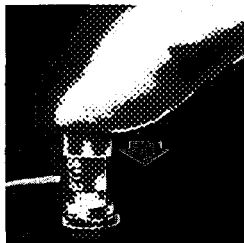
**BI Factor is a measurement of the loudspeaker's ability to convert electrical energy to mechanical force.*

Connecting the L101

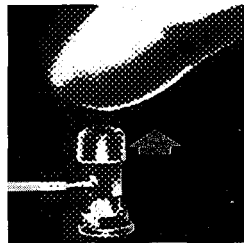
IMPORTANT: When connecting or disconnecting loudspeakers from an amplifier, the amplifier must be turned off. Making connections while the amplifier is operating could seriously damage the loudspeaker system and void the warranty.

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.



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.

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, 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. 9

Listening Room Acoustics

In addition to placement, the sound reflecting or sound absorbing qualities of the listening room will affect sound quality. 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.

If high frequency material (such as violin overtones, bells, triangles or chimes) seems over-emphasized, turn the control slightly to the left to lower high frequency output of the system. After each adjustment, listen to a variety of program material until the ear becomes attuned to the new sound and can compare it to the prior performance of the system. Experimentation with positioning of the loudspeakers, as previously outlined, will also be beneficial.

Once loudspeaker positioning and the network control have been set for optimum balance in the listening environment, compensation for differences in individual recordings should be made with the tone controls on the audio power source.



Power Capacity

The Lancer 101 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 rated power handling capacity of the loudspeaker system.

In almost all cases, the volume level generated by a JBL loudspeaker system will become noticeably discomforting before it 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" (IHF) 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 aluminum castings. Magnetic structures are precisely machined of low-reluctance iron, energized by high grade Alnico V magnets. Voice coils are fabricated of wire milled to a flat ribbon wound on the ribbon's edge by hand. Stamped frames, punched ceramic 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 superior transient response—qualities that have become JBL hallmarks.

Avoid moving the cone by hand. The clearance between the voice coil and magnet assembly is so small that any attempt to move the cone manually can easily force it out of alignment.

The components installed in the Lancer 101 are acoustically identical to the JBL S1 loudspeaker system kit. The S1 consists of the LE14A low frequency loudspeaker, LE175DLH high frequency driver/horn/lens assembly and the LX10 frequency dividing network.

Low Frequency—Information from 30 Hz to the crossover frequency is reproduced by a 14-inch low frequency loudspeaker incorporating an exceptionally large cone, massive low-loss magnetic assembly and a 4-inch edgewound copper ribbon voice coil. The voice coil is exactly centered in an intense magnetic field, allowing precise control of the specially treated cone. The low-loss magnetic assembly concentrates all of the essential magnetomotive energy provided by the powerful Alnico V magnet in the one place where it contributes most to loudspeaker performance—the voice coil gap.

The low frequency cone utilizes the exclusive JBL Lansaplas treatment and has a highly flexible ring suspension to extend bass response and allow extreme excursion with perfect linearity. The Lansaplas coating adds stiffness and mass to the cone for optimum accuracy of bass response and smoother performance through the vital midrange region. Lansaplas is inert, self-damping and impervious to environmental changes. It is this damping compound which gives the cone its white color.

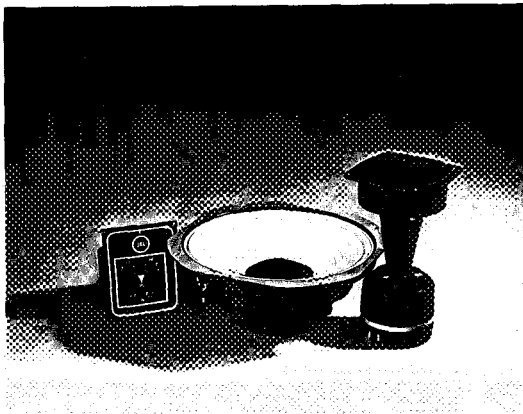
Extreme linear excursion, large radiating area, optimum cone density and edgewinding of the voice coil are important engineering advances that enable this 14-inch transducer to reproduce clean, solid low frequencies without audible distortion, even at very high power levels. Efficiency and dynamic range are further increased by the use of an enclosure having a ducted port, carefully tuned for optimum bass performance.

High Frequency—Information above the crossover frequency of 1500 Hz is reproduced by a high frequency compression driver coupled to a unique JBL horn/lens assembly. The 1¾-inch edgewound aluminum voice coil drives a diaphragm pneumatically drawn to shape from .002-inch dural aluminum alloy. A pure silver impedance-controlling ring counteracts voice coil inductance, resulting in greatly improved efficiency through the highest audible frequencies. Energy from the diaphragm is directed through the precisely engineered concentric channels of a phasing plug which conducts sound waves to the horn throat in perfect phase relationship.

The compression driver is coupled to a heavy cast aluminum exponential horn and acoustic lens to project the acoustic output and to spread it evenly through a 90° pattern, horizontally and vertically. The lens functions in a manner analogous to a light diffracting prism. It consists of a series of perforated plates having graduated center cutouts assembled to form the diffracting surface. The combined horn/lens assembly produces the wide dispersion characteristic of the L101.

Dividing Network—Smooth, imperceptible transition between loudspeaker components is controlled by a dividing network carefully designed and tested to complement the specific characteristics of the loudspeaker system. The function of a precision dividing network is considerably more complex than merely feeding low frequencies and high frequencies to their respective reproducers. Vitally important to the total sound of a JBL loudspeaker system is the way the network controls the loudspeakers in the frequencies through which transition is made. The Lancer 101 network has a continuously variable high frequency attenuation control, permitting adjustment of the system to accommodate individual preference and the acoustic properties of the listening room.

JBL network component tolerances are much more stringent than normal industry practices. For example, JBL networks use non-inductive Mylar dielectric capacitors—*not* electrolytic types—individually tested to meet rigid production tolerances. The special inductors used in JBL networks have extremely low insertion loss so that none of the driving power to the loudspeaker system is wasted in the network.



*14-inch Low Frequency Loudspeaker
Horn-Loaded High Frequency Compression Driver
Acoustic Lens
Matched Frequency Dividing Network*

Component Removal

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

Grille—The grille is secured to the enclosure by strips of hook-and-pile mounting tape located at each corner of the assembly. To remove the grille, grasp it at the bottom edge and gently lift it from the enclosure. A “ripping” sound will be heard, indicating the normal disengagement of the mounting tape. This procedure may be repeated hundreds of times without damage. To replace the grille, reposition it on the enclosure and apply light pressure at the corners.

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 attached to 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.

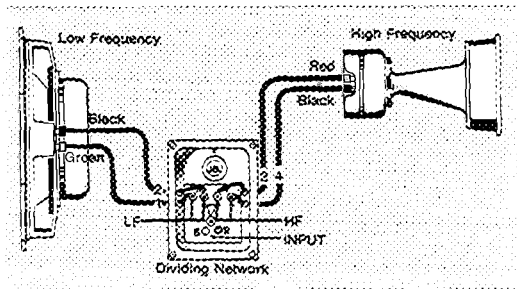
High Frequency—The high frequency driver/horn/lens assembly is removed as a unit. Place the enclosure on its back, remove the four screws on the front of the enclosure that secure the lens mounting flange to the baffle panel, reach into the enclosure through the low frequency loudspeaker opening and lift the complete unit out of the enclosure. Place the assembly on the baffle panel and disconnect the lead wires at the pushbutton terminals on the compression driver.

The horn/lens can be disassembled from the compression driver by removing the three 7/16-inch cap screws at the rear flange of the horn. Save the white gasket on the mounting flange of the horn and the fiber gasket on the face of the compression driver for reinstallation.

Dividing Network—The dividing network is located on the rear of the enclosure and is removed while the enclosure is in its normal upright position. Gently remove the four screws at the corners of the dividing network mounting flange and lift the unit from the enclosure. The wire leads to the transducers may be disconnected at the pushbutton terminals on the dividing network. The white gasket used to maintain an airtight seal between the network and the enclosure should be retained for reinstallation.

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

Wiring—When reconnecting the wire leads between the dividing network and the components, observe the following polarity:



Although JBL loudspeakers are extremely rugged, the cone and other moving parts are subject to accidental damage. Exercise extreme caution whenever using a screwdriver or other tools in their immediate vicinity. Whenever the horn is removed from the compression driver, the mouth of the driver should be covered with plastic tape. An intense magnetic field exists in the mouth of the driver, and it is extremely important that foreign objects such as iron chips, mounting hardware, tools or other metal items be kept from the area.

The Lancer 101 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; edge veneering is flawless; 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 Lancer 101 enclosure is finished in hand-rubbed oiled walnut. Occasional dusting with a clean, soft cloth will maintain the original beauty of the finish. 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 obvious, 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 sanding them out with 500 grit wet/dry sandpaper and applying oil to the entire panel. Very deep scratches, dents or other serious damage should be repaired only by a qualified furniture refinisher.

The top can be treated with silicone polish specifically intended for use on marble surfaces. The polish will enhance the natural luster of the marble and afford a degree of stain protection. In the event of spillage, the surface should be wiped clean immediately with a damp cloth. If the marble becomes damaged, it can easily be replaced by any quality marble contractor.

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 troublesome 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.

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.

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.

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 a 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 two-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 Lancer 101 exemplifies JBL's reputation for leadership in acoustic and visual design. It is our sincere belief that the L101—like all JBL products—will provide undiminished listening pleasure for many years to come.

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.

