Project Everest DD66000

Product Commentaries and User Guide

Thank you for purchasing the Project Everest DD66000 loudspeaker system.

Before using the system, please take the time to read through this user guide to understand this product well and also to use it properly.

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PREFACE

Thank you for selecting the Project Everest DD66000 loudspeaker system. It represents the culmination of our research and developmental efforts in sound reproduction over the last half century. We have labored to create a loudspeaker system with no acoustical or electrical limitations whatsoever. While the Project Everest DD66000 is itself a new development, the goal that it achieves goes back to the earliest days of the original James B. Lansing Sound Company.

However, it is the level of your listening pleasure that ultimately determines how successful we are in this endeavor. To ensure a perfect listening experience, we ask you to carefully follow the setup and operation procedures outlined in this Project Everest DD66000 User Guide.

This manual serves several purposes. It contains all necessary background information and detailed instructions for setting up your Project Everest DD66000 loudspeaker system, including unpacking the loudspeaker, selecting the correct location, speaker wire, wiring method and amplification, and connecting it to its associated electronics. This information will be found in Chapters 3 through 7. In addition, we have included a detailed description of your Project Everest DD66000 loudspeakers (Chapter 2) so that you may become thoroughly acquainted with the unique design and technical features.

Despite the formidable nature of the Project Everest DD66000, the setup procedure for this loudspeaker system is relatively simple. Again, we strongly urge you to read this manual thoroughly before you begin, and then consult it frequently throughout the process. Certain considerations must be made in placing the speakers; their physical characteristics make it imperative that you become familiar with the entire setup process in advance.

Also, we believe that the historical and technical information included will add immeasurably to your complete enjoyment of your system. As a loudspeaker, Project Everest DD66000 is unparalleled in the field of sound reproduction. The story and principles behind it are an interesting, informative and fitting start to a lifetime of musical enjoyment.

CHAPTER 1

Legacy – the Historical Development of the JBL Project Loudspeakers

Of those who have sought perfection in sound reproduction, only a few have actually come close. For one thing, it is a costly process. It is rare indeed when an individual or group is able to triumph over the constraints of economic and technological realities even once.

At JBL, this has happened eight times. In each case, our engineers were told to build the speaker system they had always wanted to build. Whatever resources were required would be made available. Thus began an ongoing search for new frontiers in sound reproduction, beginning in the mid-1950s and continuing to the present day.

The products that have resulted from this venture are now known as the JBL Project loudspeakers. Each represents the absolute peak of every technological, material and engineering innovation available at the time, combined into a single system. They are Hartsfield, Paragon, Everest DD55000, K2 S9500/7500, K2 S5500, K2 S9800 and K2 S5800. The newest is Project Everest DD66000.

Although differing in performance details and physical attributes, all of the Project loudspeakers have shared a common objective – to elevate sound reproduction to levels defined only by the limitations of existing materials and technology. The fact that all Project loudspeakers have many common features, despite a spread of nearly sixty years, is a testimony to the excellence of the technology and manufacturing techniques upon which JBL was built.

Defining the Project Concept

The Hartsfield began a tradition at JBL that continues today. First, engineer a product as close to perfection as possible. When it reaches that level, make it better.

In 1954, the Hartsfield was significant in that it represented not new technology, but rather a new level of technical manufacturing, in the spirit of the approach pioneered by James B. Lansing some twenty years before. Like its Project series successors, it was a high-efficiency system incorporating compression driver technology and combining the qualities of high-output, low-distortion, exceptional stereo imaging and fatigue-free listening. Most important, it was the first loudspeaker system available to consumers to do all this.

Project Everest DD66000, the most advanced and sophisticated loudspeaker in the world today, is the latest expression in technology that is deeply rooted in more than 60 years of tradition. JBL's president in 1954, William Thomas, described the Hartsfield as the "speaker system we have always wanted to build [with] the finest components ever made available to serious listeners."

He went on to describe the process behind the creation of the Hartsfield: "Most people who own and appreciate fine sound reproduction equipment look forward to the day when they will be able to assemble a system without limitation in just exactly the way they think it should be done. Periodically a manufacturer gets this same feeling.... The science of acoustics has provided us with the basic principles available to all for achieving precision reproduction. It is only a matter of incorporating these methods into a system design, and then taking every bit of trouble necessary to build a system precisely to the design."

He added, "It isn't easy, but that's the way it is done."

The Ranger-Paragon, JBL's second Project system, was the first serious attempt at a reflecting speaker system, and broke ground in the new concept of stereo imaging. Basically two independent full-range speaker systems installed in a handsome, curved cabinet nearly 9 feet (2.7 meters) long, the Paragon's enclosure was treated as an extension of its transducers. In essence, the system had its own "built-in acoustics." In many respects, the Paragon anticipated loudspeaker developments that would occur years and even decades later. This "built-in acoustics" concept is present in the latest Project Everest DD66000.

For nearly 30 years, the Paragon remained the most acoustically perfect speaker system for the home. Today, along with the Hartsfield, it is still the most sought-after speaker in the world.

In 1986, JBL introduced a new Project system that retained the Paragon's overall sense of musicality while upgrading its character by incorporating three decades' worth of continuous development in every facet of its design. Its name – Project Everest – reflected the pinnacle of achievement it represented. This was the original Project Everest DD55000.

For the first time, the rest of the sound reproduction chain – and not the loudspeaker or its transducers – would impose limits on overall system performance. Like the Paragon and Hartsfield, Project Everest was built around compression driver technology and addressed a more refined stereo image than was previously considered technically feasible.

Since the original Project Everest was introduced, sound recording and playback technology has undergone a revolution of its own. With the advent of the CD, extremely demanding recorded signals became the rule rather than the exception – the typical source material used by the average audio enthusiast became superior to the best demonstration material of even just a few years prior. In overall dynamics and transient response, transducers became once again a potentially weak link in the high-end audio reproduction chain.

It was in this environment that JBL set out to create its fourth and fifth Project loudspeakers, K2 S9500 and K2 S5500. As with Hartsfield, the simplicity of a two-way system was considered the most promising design track. Advances in transducer design and low-frequency alignment would make possible the construction of a two-way system of unprecedented physical and acoustical scale. Our engineers took the core components – the low- and high-frequency drivers – and optimized them by redesigning their magnetic structures, diaphragms and framework for greater linearity, dynamic capability and transient response.

In the years following the introduction of the K2 S9500 and K2 S5500, sound reproduction technology underwent another series of revolutionary changes, with the introduction of DVD-Video, Dolby® Digital, DTS®, DVD-Audio and Super Audio CD (SACD™). Frequency responses to 50kHz, as well as three-digit dynamic range and signal-to-noise ratios, have now become commonplace. In order to faithfully reproduce such robust sonic properties, the loudspeaker needed to undergo drastic improvements to its transducer, network and enclosure technologies.

The K2 S9800 employed a three-way design, incorporating an ultrahigh-frequency (UHF) compression driver and horn to reproduce high frequencies up to 50kHz. With the UHF driver handling the higher frequencies, the high-frequency (HF) transducer could then be upgraded to a new design using a 3-inch (75mm) diaphragm for better reproduction of lower frequencies and to blend better with the woofer than the older generations’ 2-inch (50mm) diaphragm did. Both compression drivers utilized newly developed beryllium diaphragms to provide the lowest distortion and flattest frequency response possible.

In order to re-create the extremely high dynamic range provided by today's audio sources, a brand-new low-frequency transducer was developed from the ground up, utilizing an alnico magnet, a 4-inch (100mm) edge-wound voice coil, and a 15-inch (380mm) cone. Extensive computer-aided engineering and design effort was necessary to develop the optimized port tuning employed in Project K2 S9800, and has resulted in a significant advance in the concept of state-of-the-art acoustic reproduction. As a result of the K2® efforts, a loudspeaker system with higher sensitivity and a wider dynamic range became a reality without power compression or distortion, even at extremely high drive levels.

The development of the Project Everest DD66000 loudspeaker system was undertaken as a celebration of JBL's 60th anniversary and as a realization of the potential engendered by the breakthroughs discussed above. The stately character of the Hartsfield, exceptional woodcraftsmanship of the Paragon, the "built-in acoustics" which treat the enclosure as an extension of the transducers, and the state-of-the-art transducer technologies that were built up from two generations of the Project K2 developments were all poured into this new challenge to extend the acoustic and electrical possibilities in the latest model of the Project Everest.

Despite its 21st century power and sophistication, Project Everest DD66000 is a synthesis of tradition and technology. It reflects the design, material, engineering and manufacturing expertise developed and refined through nearly six decades of experience that are the exclusive legacy of one loudspeaker builder – JBL.

CHAPTER 2

The Project Everest DD66000 Loudspeaker – a Triumph in Acoustics and Technology

The following sections describe the primary features and components of the Project Everest DD66000 loudspeaker system.

The basic system configuration is what JBL historically has referred to as an augmented two-way. In the 1950s and 1960s, JBL primarily built two-way systems with a 12- or 15-inch (305mm or 380mm) woofer crossed over to a large-format compression driver/horn combination. Some of the systems would be "augmented" by a UHF device, usually the 075 ring radiator which would operate above 8kHz. These systems would have only a single crossover point in the middle of the audio range, to minimize any sonic degradation caused by the dividing network. The DD66000 has a single midrange crossover at 700Hz, blending one 1501AL woofer to the 476Be compression driver and horn combination. The 045Be-1 UHF driver is brought in at 20kHz to cover an octave and a half of ultrasonic frequencies. A second 1501AL operates in the bass frequency range from below 30Hz to around 150Hz, where it is rolled off at a gradual 6dB/octave. The first-order slope ensures proper amplitude and phase summing between the two woofers over their total operating range. Both woofers operate below 150Hz, but only one of them extends up to the 700Hz crossover point. This is done to achieve proper directivity control throughout the entire woofer operating range, while delivering powerful and extended low-frequency performance. Above 700Hz, the HF compression driver and horn combination operates unassisted, all the way to 20kHz (Fig. 1).

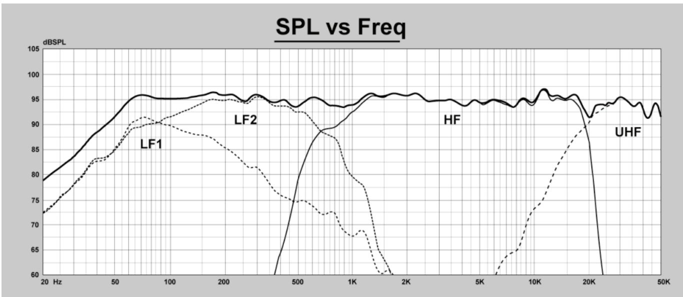


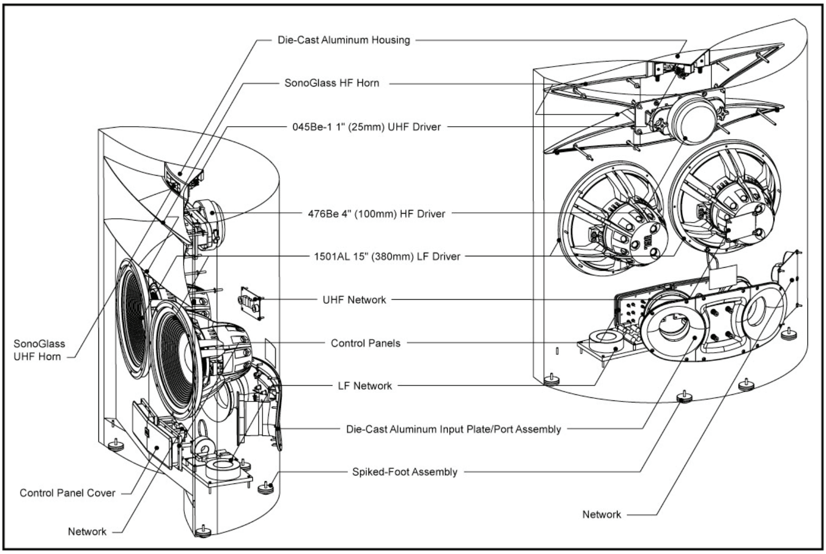
Figure 1 – On-axis response of the DD66000 system and of each of the transducers through its crossover network (2.83V @ 1m)

The transducers, horns and crossover networks are housed in a visually stunning enclosure that is reminiscent of both the Hartsfield and Paragon systems. The specially curved baffle provides the sidewalls for the main horn. The top and bottom horn flares are accomplished by the attachment of precision-molded SonoGlass® horn "lips" to the upper enclosure surface. The UHF driver is mounted to a SonoGlass horn which is itself mounted to the back of the die-cast aluminum housing.

The entire enclosure is constructed with 1-inch (25mm) MDF. The complex bracing is used to precisely hold the curved panels in exactly the correct shape, allowing exceptional fit and consistency.

The woofer baffle module is a six-sided shell, constituting an extremely rigid and secure structure. A leather-covered outer baffle is then applied, giving the total combined woofer baffle a thickness of 1-3/4 inch (45mm). The outer baffle is removable to enable repair or replacement of the leather surface, should that ever be necessary.

The system is ported on the rear with a tuning frequency of 34Hz. Two large 4-inch (100mm)-diameter flared ports are combined with the input connections on a massive three-piece die-cast aluminum structure. The entire enclosure rests on four stainless-steel foot assemblies. Stainless-steel coasters are included to protect wood and tile floors from damage from the spike feet. The grille assembly is constructed of MDF and uses a thick, perforated metal sheet, to provide the curved shape. The grille is securely attached to the enclosure with metal pins and rubber cups.



The 1501AL and 476Be are both designed to be absolute-minimum-distortion drive units. Although they are capable of tremendous acoustic output, they are designed to be completely linear in every way, up to a reasonable drive level. This enables the system to sound the same, regardless of playback level.

TRANSDUCERS

The 1501AL Low-Frequency Driver

The 1501AL low-frequency driver is very similar to the 1500AL used in the K2 S9800 system. It incorporates a new high-impedance voice coil to allow a pair of woofers to be used while still maintaining an 8-ohm system impedance. The voice-coil length has been increased to 1-3/16 inch (30.5mm) – from 13/16 inch (20.3mm) – and its milling width has been reduced slightly. This was done to allow greater clearance from the outer diameter of the coil to the laminated top plate and to provide a larger area of coil surface for heat dissipation. These coil improvements allow the 1501AL to handle up to 25 percent more power than the 1500AL.

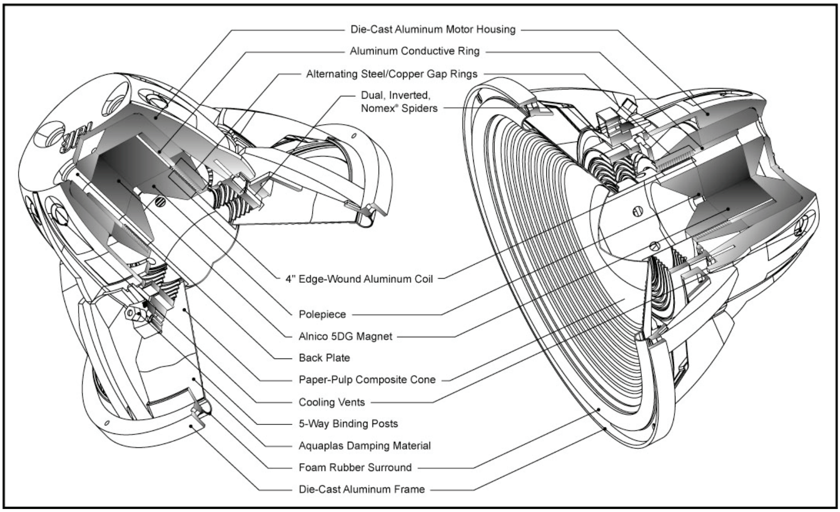


Figure 2 – 1501AL section view

The 1501AL low-frequency driver is a 15-inch (380mm)-diameter device with a 4-inch (100mm) voice coil completely immersed in a radial field generated by an alnico 5DG magnet. Alnico was chosen because of its stable operating point. This material is insensitive to temperature changes and back EMF from the coil. JBL has overcome the tendency of alnico to demagnetize with high drive by utilizing a massive shorting ring at the base of the motor assembly. The top plate is constructed of alternating copper-steel laminations. The presence of the copper rings linearizes the magnetic properties of the gap to all but eliminate eddy current distortion.

The outer suspension is made of EPDM foamed rubber, which has the longevity and frequency response characteristics of traditional rubber surrounds, but with a low density very close to that of foam surrounds. Low-loss EPDM material was chosen so that the transient detail of musical signals could be preserved. Dual inverted Nomex® spiders are employed for the cancellation of even-order distortion components. All suspension elements are tailored for maximum mechanical displacement linearity.

The cone consists of a special layered paper-pulp matrix with proprietary Aquaplas damping, which offers more pistonic behavior throughout the woofer's operating bandwidth, and controlled cone breakup beyond it.

A thick-wall, cast-aluminum frame is used to rigidly support the motor structure. This fully vented frame and motor design also serves to minimize the back pressure under the dome and spider, helping to reduce harmonic distortion to even lower levels. JBL's Vented Gap Cooling™ (VGC) is incorporated within the motor structure, and lowers the operating temperature of the coil during moments of high power operation.

All together, these design factors provide reduced harmonic distortions at very low and high acoustic output, improved power handling, reduced power compression, and more consistent spectral balance, with varying input drive level.

476Be High-Frequency Compression Driver and Bi-Radial® Horn

The 476Be high-frequency compression driver makes use of a 4-inch (100mm)-diameter, pure-beryllium diaphragm with a 4-inch (100mm) aluminum edge-wound coil, operating into JBL's existing rapid-flare-type, coherent-wave phasing plug. The use of an efficient neodymium rare-earth motor structure with a new copper-sleeved polepiece maintains maximum gap flux and reduced coil inductance at a minimal size and weight. The combination of these features has resulted in a driver that can deliver superior sound quality, regardless of acoustic power output, with very little distortion and power compression.

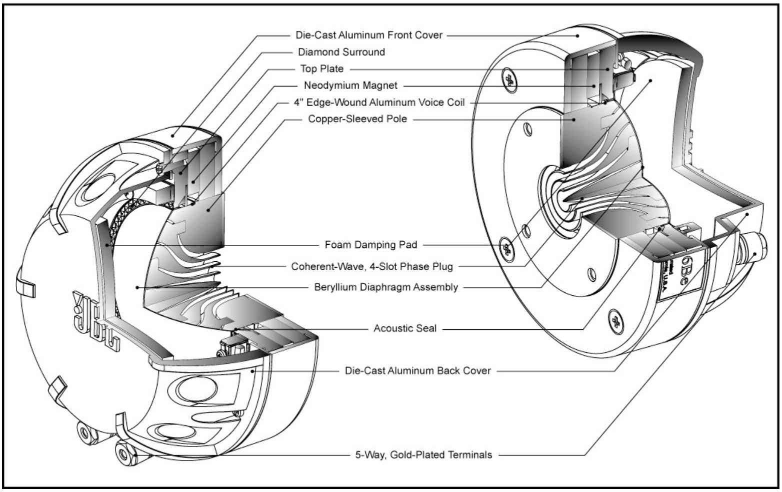


Figure 3 – 476Be section view

A high-purity copper sleeve is used for the polepiece. This greatly improves the electrical conductivity of the copper sleeve for lower coil inductance and thus greater high-frequency output at 15kHz and above. The copper-sleeved pole quickly wicks away heat generated by the coil, thereby contributing to a reduction in dynamic power compression. To compensate for the higher resistance caused by the use of a copper-sleeved polepiece, a large magnet area has been used, in conjunction with special high-grade and high-temperature-grade neodymium.

The phasing plug is of JBL's traditional rapid-flare, coherent-wave four-slot design. This coherent-wave design shapes the wave output, producing a truly coincident wave front as the sound enters the Bi-Radial horn. The diaphragm is formed of pure beryllium foil that is manufactured with a proprietary high-temperature and pressure-forming process. This process enables the integrated JBL diamond-pattern surround to be formed as one piece with the dome. Compared to other methods, forming the diaphragms out of sheets of beryllium foil yields greater reliability and resistance to failures due to fatigue. If breakage ever does occur, the diaphragm does not shatter into pieces or harmful dust. Beryllium has a stiffness-to-density ratio of about five times that of aluminum, magnesium, titanium and iron. This maintains pistonic behavior up to 20,000Hz, eliminating diaphragm modal breakup and keeping the upper frequency response very smooth, with minimal distortion spikes. Compared to the 475Nd compression driver used in JBL's original K2 S9500 system, this is about a 45 percent reduction in moving mass. With such a low mass, the moving assembly is able to respond even quicker to musical transients, to further enhance detail and microdynamic nuances.

JBL's proprietary diamond-pattern surround is utilized to maintain proper control and tuning of the second diaphragm resonance (the surround resonance mode). The proper control and placement of this surround resonance is critical for good high-frequency shape, extension and level.

These features, when taken as a whole, create a new large-format compression driver with the greatest high-frequency extension, lowest distortion, smoothest response and greatest sonic detail.

045Be-1 Ultrahigh-Frequency Compression Driver and Bi-Radial Horn

Like the original 045Be, the 045Be-1 uses a 1-inch (25mm) beryllium diaphragm and 2-inch (50mm) neodymium magnetic structure. The pure-beryllium diaphragm is less than 0.04mm thick and has a mass of only 0.1 gram. The single-layer aluminum-ribbon voice coil is wound without a former and is attached directly to the diaphragm. The driver employs the smallest annular-slit phasing plug that JBL has ever designed. The 045Be-1 has been designed to improve manufacturing yield and consistency. Small changes have been made to the top plate and some significant improvements were made to the surround shape and clamping methodology. As a result, the driver has picked up nearly 5dB of increased output above 30kHz. A section view of the 045Be-1 driver is shown in Figure 4.

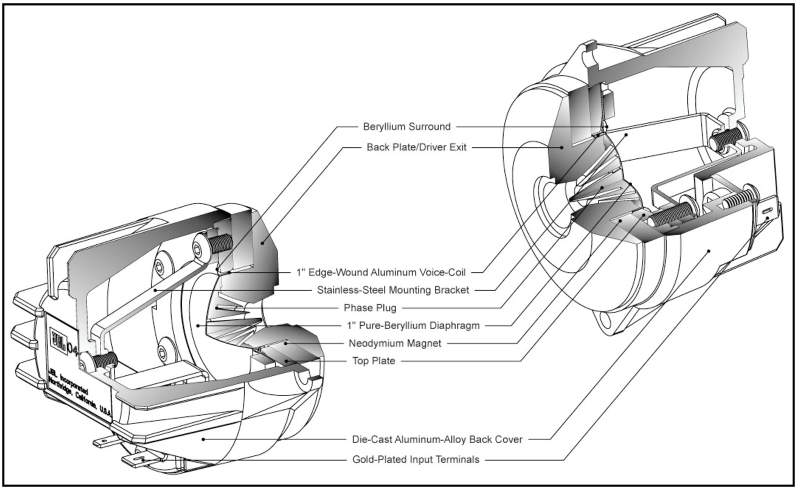


Figure 4 – 045Be-1 section view

The extremely low mass of the moving system, high magnetic flux density and high rigidity of beryllium produce response that is very smooth from below 8kHz to beyond 50kHz.

The response curve has a slight downhill tilt, due to the constant-directivity nature of the horn used in this system. The Bi-Radial horn is properly scaled to maintain a coverage angle of 60 degrees in the horizontal plane and 30 degrees in the vertical plane over the frequency interval from 10kHz to 50kHz.

Internal Crossover Network

The circuit topology, combined with the acoustic behavior of the 1501AL and 476Be, provides a 24dB-per-octave transition at 700Hz. This is the primary crossover point of the system. Additionally, the 045Be-1 is turned on above 20kHz to provide extended response to beyond 50kHz. A second 1501AL woofer is used from below 30Hz to around 150Hz, at which point it is gently rolled off at 6dB per octave. The design intent is to use both woofers in the bass frequencies and slowly transition to a single woofer in the midrange. This technique allows a primary crossover point between just two drivers and permits proper control of the directivity pattern of the system, while providing tremendous power and air movement capabilities at the lower frequencies. As a result, the speed and power of the DD66000 system are unmatched, from the lowest to the highest frequencies.

All of the electrical components are of the highest quality and exhibit the lowest internal loss. The inductors used are “air core” so as not to introduce nonlinear hysteresis effects. Capacitors are constructed using polypropylene foil, which is known for having minimal distortion caused by dielectric absorption nonlinearities. The mid-, high- and ultrahigh-frequency networks employ battery bias to operate the capacitors effectively in a Class A mode. Every attempt is made to present as smooth a system impedance as possible to the driving amplifier. This design element is often overlooked in many loudspeaker systems, yet amplifiers work their best when they are given a smooth, level load impedance in which to deliver current (Fig. 5).

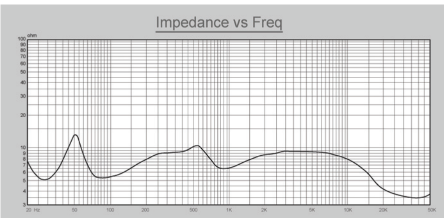


Figure 5 – DD66000 system impedance

The aggregate of these attributes allows the DD66000 system to translate the electrical signal from source material into an accurate and unencumbered three-dimensional sound field. The system can do this at any desired listening level, from whisper-quiet to big-band loud, while at the same time maintaining unchanged acoustic characteristics.

CHAPTER 3

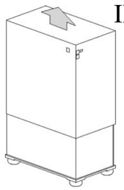
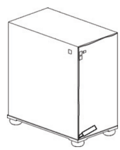
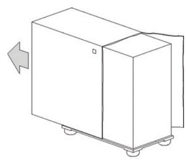
Unpacking the Project Everest DD66000 System

All components of the Project Everest system have been very carefully packed for maximum protection against damage. As with any superior audio product, it is advisable to keep the original packing materials, in case it is necessary to transport the Project Everest system. Because of the bulk and weight of this loudspeaker, at least two people are required to unpack it in the following manner.

Stainless-steel round feet are installed on the bottom of the speaker cabinet.
In order to avoid damage to the floor, we strongly advise unpacking on a well-protected surface, such as a thick carpet or cardboard. (Your loudspeaker system is packed with a protective wrapping, but this is omitted in drawings below.)

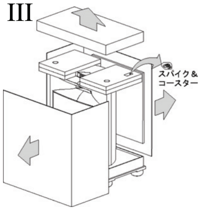
I. Cut the straps securing the carton with scissors or a knife. (Please be careful so that the cut straps don't spring up and hit your face or hand.)
II. Slowly lift the top cover up and remove it. If there is not enough room above the box to pull off the top cover, cut the side and top of it with a knife (drawing II-2) and pull it horizontally (drawing II-3).

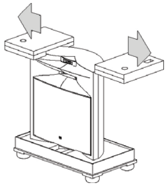
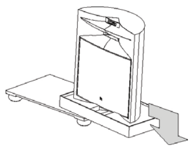
I II II-2 II-3

III. Remove the cardboard and packing materials. Please do not forget to take the accessories out from the upper endpads.
IV. Remove the upper endpads.
V. Slide the loudspeaker system down from the bottom board, together with the bottom cardboard.

III IV V

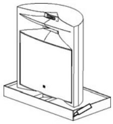


VI. Cut tapes at the corners of the bottom cardboard (drawing VI), slide the loudspeaker system out toward you, together with bottom endpads (drawing VI-2).

VII. Lift the system slightly on the right and left, in turn, to remove the bottom endpads.

VIII. Remove the protective wrapping.

VI

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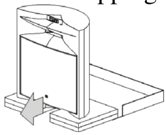
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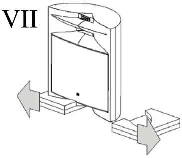
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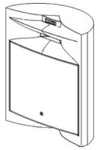


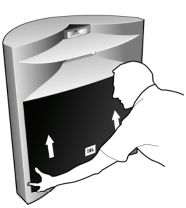
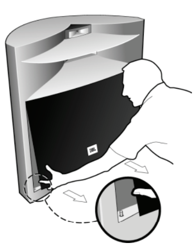
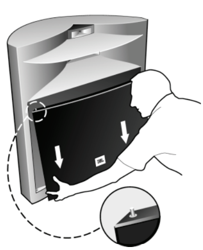
Products are shipped with round-tipped spikes on the bottom of the cabinet. If you would like to use pinpoint spikes, remove round-tipped spikes and replace them with pinpoint spikes. In case they are hard to loosen, please use an 11/16-inch (18mm) wrench.

Four metal coasters are also provided. These are to be placed between the foot and the floor, should further protection of the floor coverings be required.

Grille Removal

The Everest DD66000 is shipped with its grille on the system. You can remove the grille with the following procedures.

Step 1: Hold the lower parts of the grille with both hands and pull it up.
Step 2: Pull the grille toward you in order to take the grille out of the pins from the cabinet.
Step 3: Pull the grille down and remove it from the enclosure.

Grille Removal - Step 1

Grille Removal - Step 2

Grille Removal - Step 3


Repeat the above procedures in reverse order in order to place the grille back on the enclosure.

CHAPTER 4

Selecting Cable

Speaker wire and interconnecting cables are an important component in any audio system. With a system such as the Project Everest, they assume a new level of importance.

The Project Everest loudspeakers are internally wired with proprietary, high-quality copper cables, specially designed for JBL. The same care that was given to the selection of the internal system wiring should be afforded to the selection and application of the cables that will connect Project Everest loudspeakers to other system components.

It is advisable to use high-quality wire and to select the highest grade wire available from the manufacturer. Many manufacturers produce audiophile cables worth considering for Project Everest. As with all electronics and associated components, however, every manufacturer offers products of varying quality to suit a range of budgets and applications.

We recommend using an audiophile-quality speaker wire of not less than 16-gauge for connections of up to 15 feet (5 meters) as a minimum requirement. Project Everest specialist dealers have the experience and knowledge to recommend suitable speaker wire to best complement a particular system.

For maximum signal purity, it is advisable to place the amplifier(s) as close as possible to the loudspeakers, even if this means that a longer distance will be needed between the amplifier(s) and preamplifier.

The left and right speaker/amplifier connections should be the same length. If the distance between one speaker and the amplifier(s) is greater than the other speaker and amplifier(s), use the longer length of wire for both connections.

For bi-wire connections, the same type of wires may be used for both low-frequency and high-frequency sections to reduce wire effects (resistance, inductance, etc.) and to avoid intermodulation of low and high frequencies in the wires. Specialized wires for low-frequency and high-frequency sections may yield excellent results. Whatever wires are used, be sure that the low-frequency wires are as short as possible, and the left and right wires for each section are the same length.

To ensure a secure connection, we recommend Y- or U-type plugs.

CHAPTER 5

Amplifier Recommendations

No single type of amplifier is specified for use with the Project Everest DD66000 system. The speakers are highly efficient and will operate adequately with an amplifier or receiver of 70 – 100 watts.

However, the transient response and audio definition of a high-end system such as Project Everest DD66000 will pick up all the inefficiencies and distortion in an amplifier system. For full-range operation, the Project Everest DD66000 system should not be used with an amplifier/receiver of less than 100 watts. High-quality amplifiers/receivers of 100 – 500 watts will ensure optimal system performance.

There is no effective limit to the power handling capabilities of the Project Everest DD66000 loudspeakers when driven by consumer audio amplifiers. No damage will occur when used with high-powered components. Source impedance is an important criterion in selecting an appropriate unit; the selected amplifier(s) should have a very high current capacity and must be capable of driving a low-impedance load.

For bi-wiring or bi-amplification applications, four identical amplifiers or two dual-channel units may be used, although specialized low-frequency and high-frequency amplifiers offer clear advantages. (If four amplifier channels are used, the high-frequency amplifier may be up to 6dB less powerful than the low-frequency amplifier. Due to the power-versus-frequency distribution of the music, the low-frequency section requires approximately four times the power of the high-frequency section.)

Project Everest DD66000 dealers can recommend amplification to best suit individual needs. In all cases, the left and right amplifiers for each section must be identical. Make sure that the input sensitivity of the two amplifiers is equal or that input level controls are provided to maintain the proper low to mid/high balance. If two identical stereo amplifiers are chosen, each amplifier may be located near a loudspeaker and drive low-frequency and high-frequency sections through short wire runs.

A separate crossover network (not included) should be connected directly to the low- and high-frequency amplifiers driving this system, and is required if the system is to be bi-amplified.

CHAPTER 6

Placement and Setup Considerations

The Project Everest DD66000 loudspeaker system is designed to be less affected by room acoustics than conventional imaging systems. However, it is very sensitive to overall symmetry and proximity to walls, ceilings and corners.

Ideally, any listening room should contain a combination of live surfaces (e.g., walls and windows) and absorbent surfaces (e.g., drapes, carpets, upholstery). If the distance between the floor and ceiling is minimal, it is preferable that one surface has an absorbent covering. With Project Everest DD66000, it is very important to be able to accommodate the optimal listening area that is defined by the 100° horizontal/60° vertical coverage pattern of the horn.

In order to obtain the best stereo effect, the speakers should be placed at an equal distance from the listening position.

- The distances to the right and left speakers are determined by the relationship between the distance from the listening position to the speakers and the angles of the speakers. The imaging qualities enable the speakers to be placed relatively far apart from each other, but this weakens center imaging, such as vocals. Increasing the inward angle of the speakers toward the listener will improve the center imaging.
- The listener should be centered in front of the speakers, and furniture should be of an appropriate height so that when the listener is sitting, the ear level is about the same height as the high-frequency horn (approximately 35-1/2-inch/90cm), as illustrated on the right.

- The surrounding environment for the speakers affects bass quality. Placing the speakers closer to the wall behind them or to the side walls will result in an abundance of bass, but placing them too close will result in dull bass. On the other hand, too much distance will reduce the bass output but result in fast and sharp bass. The low-frequency alignment feature enables placing the speakers near (or even in) a corner without producing an overabundance of bass. This corner placement allows optimal performance, even in small rooms. Find the most suitable location by using various source materials.

The Project Everest DD66000 requires right or left speaker designation, depending on installed locations. Once speaker locations are decided upon, please refer to **System Orientation** in Chapter 7, in order to set it up.

Caution: Project Everest DD66000 is a massive system, consisting of materials chosen for their density, with its weight concentrated in a relatively narrow area. Verify the integrity of the floor surface before placing and setting up the speakers. See **Floor Requirements** (below). Remember that these speakers weigh close to 308 lb (140kg) each and cannot be easily moved, once they are installed.

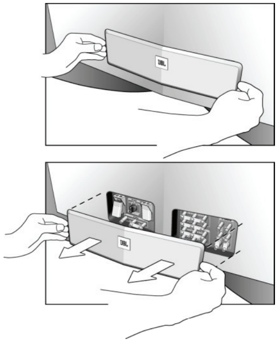
Floor Requirements

The floor at the location selected for setting up the Project Everest DD66000 speakers must be capable of supporting a load of 308 lb (140kg). Because of the coupling effect of the stainless-steel feet, a flat, hard surface such as wood or linoleum is preferable. However, the design of the loudspeakers' coupling system, along with the speakers' substantial weight, should result in excellent performance on any surface, even on carpets.

To prevent indentations on wood or linoleum floors, caused by the weight of the loudspeakers, always utilize the enclosed coasters. Do not set up the Project Everest DD66000 system directly on a ceramic tile floor; the concentrated weight might cause the tiles to crack.

CHAPTER 7

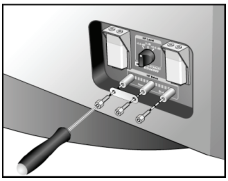
Project Everest DD66000 Switch Operations



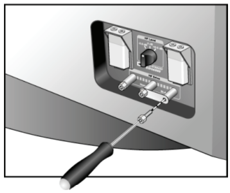
The DD66000 has two control panels under the cover at the center bottom of the front baffle. Shorting bars or switches inside the control panel allow you to switch orientation of the system, engage bi-amplification if desired and adjust woofer and high-frequency levels. They also provide access to the 9-volt batteries used for capacitor bias. Remove the control panel cover, referring to the illustrations on the right, and make necessary adjustments.

To change setups using shorting bars, use the supplied hexagonal driver to remove the screws securing the bar. Move the bar according to the setup you prefer and then put the screws back.

Shorting Bar Set-up - Step 1



Shorting Bar Set-up - Step 2



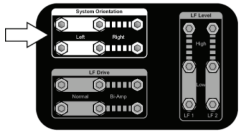
Attention: As loose mounting screws on the terminals could cause bad contact, make sure that they are firmly attached. However, if you overtighten, there is a risk of damaging the terminals themselves. Please use the supplied hexagonal driver and tighten screws with reasonable torque, by hand only. **Do not use powered screwdrivers of any type.**

The following adjustments are made by using the above procedure.

System Orientation

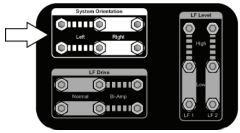
The two low-frequency drivers operate over different ranges, as described earlier. For proper imaging, it is necessary that the midrange woofer (LF2) be in the inboard position for the pair of systems. The proper setting of the system orientation jumper bars can configure a single DD66000 system as either a “left” or “right” system. It is necessary that both bars be moved together. Improper sound will result from staggering the bars. The bars select which woofer receives the low-frequency signals and which woofer receives the midrange signals. One system should be set to "left" and positioned as the left speaker system. The other system should be set to "right" and positioned as the right speaker.

Left Side Speaker



HF Drive/LF Drive

Right Side Speaker



This allows you to switch between normal drive (using a set of amplifiers) and bi-amp drive (using two sets of amplifiers). Move the shorting bar only in case of bi-amp driving.

Selection of the Bi-Amp position for the shorting bars bypasses the crossover function for the full-range woofer and the high-frequency driver. The low-frequency woofer and the ultrahigh-frequency drivers are unchanged. Use of this feature requires the addition of an external dividing network to provide the 700Hz primary crossover point for the system. The built-in attenuation and equalization for the 476Be remains in place. The high-frequency level trim remains operational, as does battery bias for both the low- and high-frequency sections. Normally, all three sets of bars (two LF and one HF) would be moved together. It is possible to operate the system with just the low-frequency system or the high-frequency system set to Bi-Amp. In this circumstance, it would be necessary to use a combination of an external dividing network and the internal network. However, this is not generally recommended. Figure 6 shows the low-frequency and high-frequency voltage drive functions necessary to properly bi-amplify a DD66000 system, using an external dividing network and two amplifier channels. Neither the low-pass nor the high-pass drive is a standard Butterworth alignment or, for that matter, a standard alignment at all. The provided drive curves were derived using the internal passive network and resulting acoustic low-pass and high-pass shapes. Duplicating these shapes will result in the same frequency response and directivity pattern as a passive DD66000. The low pass is made up of two cascaded second-order sections and the high pass is a single high-pass section. The values within a high-quality analog dividing network can usually be modified to achieve these results. Recent digital crossover units will have no problem duplicating these curves.

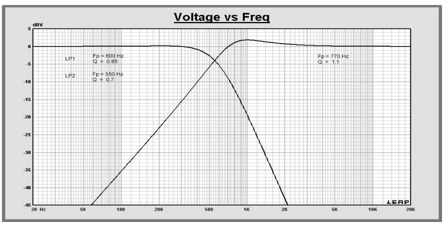
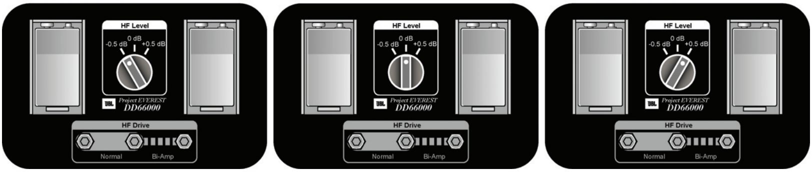


Figure 6

HF Level

This switch adjusts the attenuation applied to the 476Be (high-frequency unit) by approximately 0.5dB over the range of 1,000Hz to about 8,000Hz. The action is accomplished by trimming the main attenuation resistors. Midrange sound becomes softer by reducing the level and stronger by increasing the level. No additional parts are inserted in the signal path and there is no sonic deterioration by position or adjustment functions.

HF Level -0.5 dB HF Level 0 dB HF Level +0.5 dB

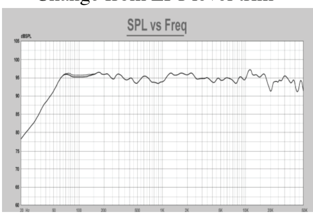


LF Level

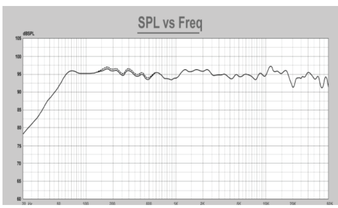
There is a level trim available for each of the two woofers (LF1 and LF2). Moving a bar from Low to High will increase the drive level to a portion of the frequency spectrum over which each woofer operates. LF1 refers to the low-range woofer (up to 150Hz) and will affect the output level in the range of 60Hz to 150Hz by about 0.5dB. LF2 refers to the main woofer and will affect the output level in the range of 150Hz to 700Hz. The purpose of these adjustments is to allow fine-tuning of the mid-bass and midrange response of the system to better integrate with varying room characteristics.

Normally, the control bars of LF1/LF2 are moved together to get the maximum effect (LF1 & LF2 = High, or LF1 & LF 2 = Low). Depending on room environment, you may get a good balance by moving one of them. In cases in which the speakers are placed close to corners of the room and the distance between the two speakers is great and you notice bass boost by reflections from walls, try to increase the LF1 level and decrease the LF2 level (LF1 = Low, LF2 = High). The adjustment is accomplished by a change in value of a parallel damping resistor in each woofer circuit. No series loss is caused by these controls.

Change from LF1 level trim



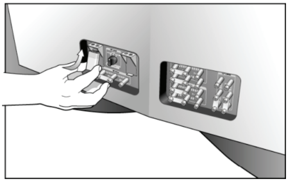
Change from LF2 level trim



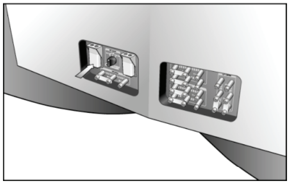
Battery Installation

The network of this system utilizes the proprietary JBL “charge-couple method” to activate capacitors by applying DC bias using battery power; this eliminates unwanted distortions. Please refer to procedures below and install the supplied batteries in the battery holders.

Battery Installation - Step 1



Battery Installation - Step 2



Battery Installation Procedures:

1. Remove the control panel cover at the bottom of the front baffle (refer to figures in Chapter 7).
2. Remove the packaging film from batteries and place these batteries into the battery holders inside the control panel, on the left. The connector is the snap type and has polarities. Push each battery up after making sure that the polarity orientation is correct.
3. Put the control panel cover back on the baffle.

Bias is applied to capacitors, which are insulation components; therefore, there is no current consumption in batteries. Thus, the battery life is the same as that for batteries with natural discharge (about two years in alkaline batteries).

Only 006P rectangular 9V alkaline batteries may be used. This battery can be easily found at electronic/appliance stores and convenience stores.

Please Note:

- The supplied batteries are for testing the bias function; they should be replaced with new batteries as soon as possible.
- Bias is applied to reduce distortion from the components. In the event of a flat battery, there is no effect on the network circuitry, and there is no symptom (e.g., no sound or intermittent sound from the system). However, you will notice an effect on the level of distortion reduction in the bias network circuitry after new batteries are installed.

The batteries provide a voltage bias to each of the capacitor positions in the various networks. The biasing of the capacitors is done through a large value resistor (2.2 MO) and thus draws no appreciable current. The expiration date printed on the battery generally coincides with the need to replace the batteries. Each capacitor position is actually made up of two capacitors connected in series. The battery voltage is applied to the center connection of the two capacitors. This produces a voltage potential between the two plates within the capacitor. When the two parts are taken as a whole, there is no DC voltage that appears across them, but individually they are each biased. The sonic result of the biasing is an increase in detail, increased smoothness and considerably more natural resolution of sounds within the music.

CHAPTER 8

Project Everest DD66000 Connections

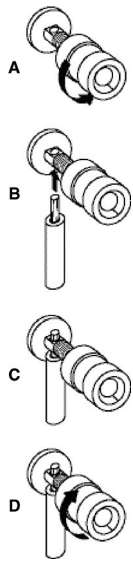
Caution: Turn all amplifiers off before connecting or disconnecting Project Everest DD66000 loudspeakers. Making connections while an amplifier is operating could seriously damage the loudspeaker system and void the warranty. All amplifiers must also be turned off before connecting or disconnecting cables at the amplifier or preamplifier inputs.

All connections between the amplifier(s) and the Project Everest DD66000 loudspeaker system are made at the terminals located on the back of the enclosure. The left-hand terminals (black letters) are negative, and the right-hand terminals (red letters) are positive. These correspond to the negative and positive conductors in the speaker wire.

Assign one of the two conductors as the negative conductor and the other as the positive conductor. Use these same designations for all system wiring. Always connect the conductors of the speaker wire appropriately to the corresponding negative and positive terminals on all system components. This will ensure that all components will work together ("in phase"). Connecting the speakers out of phase will not damage them but will result in reduced low-frequency output and impaired stereo effect.

Speaker wires may be fastened to the terminals by several methods. The most positive connection is often made by directly connecting clean, bare connectors (exposed by stripping the ends of the wire) to the terminal posts.

For this type of connection, loosen the knobs on the terminals and insert the exposed (bare) end of each speaker wire into the hole exposed on the terminal shaft (+ to +, – to –). Retighten the knob on each terminal so that a snug positive connection is achieved. Do not apply excessive force and do not overtighten. To avoid a short circuit, trim off any excess wire that is not in contact with the binding post contact surfaces.



Project Everest DD66000 terminals are also designed to accept spade- or banana-type connectors, which are fastened to the ends of the wires and, in turn, are attached to the terminal posts.

Two sets of input terminals of Project Everest DD66000 are designed for use with bi-wire and bi-amp connections. Read the following explanations and use the suitable method.

I. Passive Connection Method

The passive method requires one amplifier and one set of wires. Connections are made to either the upper terminals or the lower terminals. Do not remove the shorting straps.

II. Bi-Wire Connection Method

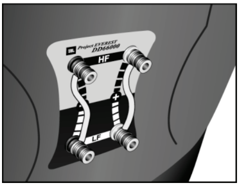
The bi-wire connection method requires one amplifier and two sets of speaker wires. By removing the shorting straps, connections may be made to the individual network sections using four connectors, high-frequency wires to the upper terminals and low-frequency wires to the lower terminals.

III. Bi-Amp Connection Method

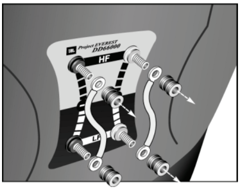
The bi-amp connection method requires two amplifiers, one for the low-frequency unit and one for the high-frequency unit, and a crossover network. By removing the shorting straps, connections may be made in the following way. Wires from the high-frequency amplifier are connected to the upper terminals, and wires from the low-frequency amplifiers are connected to the lower terminals.

Project Everest DD66000 is shipped with a twisted pair of shorting straps installed. In case the bi-wire or bi-amp connection method is to be employed, remove the straps from the terminals (referring to the figures below) and retighten the terminals. If the amplifiers are connected to the Project Everest DD66000 loudspeakers in the bi-wire or bi-amp mode with the shorting straps still on, the amplifier outputs will be shorted, which could result in costly amplifier damage when power is switched on.

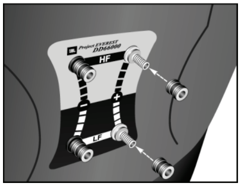
Strap Removal - Step 0



Strap Removal - Step 1



Strap Removal - Step 2



- In case shorting straps are used, make sure the conductors and sleeves of the straps are firmly fastened at the terminals.
- For the best connection, a cable termination with either a spade- or banana-type connector is recommended.

As mentioned earlier, the Project Everest DD66000 loudspeakers may be connected to the amplifier(s) by one of three methods: passive, bi-wire and bi-amp. Each method described above has its own advantages, and the Project Everest DD66000 loudspeaker system will deliver superb performance with any method.

Final Checklist:

- Connect and plug in all other system electronics.
- Check all connections. In case of bi-amping or bi-wiring, make sure both shorting straps are removed.
- Make sure the system orientation and HF/LF drive switching in the control panel are correctly set.

The system is now ready for use. The Project Everest DD66000 loudspeaker system is fully functional as soon as it is set up. There may be subtle tonal changes in bass output over the first week to 10 days of operation. These are caused as the movement of the low-frequency drivers becomes more fluid and the parts settle in. This process is completely normal and natural with transducers of this caliber. Even during this initial period, there is no restriction on the amount of amplification that may be applied. Enjoy!

CHAPTER 9

Project Everest DD66000 Care and Maintenance

The Project Everest DD66000 loudspeaker system requires no maintenance other than occasional dusting with a soft, dry, lint-free cotton cloth. The horns may also be wiped with a soft cloth. Treat the lacquered surface very carefully to avoid scratching the finish. To remove fingerprints and smudges, apply a small amount of diluted ammonia-free or alcohol-free neutral detergent to the cloth and gently clean the surface.

Never use any abrasive cleaners or chemicals to clean the enclosure. If the enclosure becomes noticeably scratched or otherwise damaged, consult a qualified furniture repair shop.

All wiring connections should be inspected and cleaned or remade periodically. The frequency of maintenance depends on the metals involved in the connections, atmospheric conditions, and other factors. Consult your Project Everest DD66000 dealer for specific recommendations.

CHAPTER 10

Troubleshooting and Service Guide

Project Everest DD66000 loudspeakers are designed to provide years of trouble-free service. No maintenance, aside from occasional battery replacement, is required.

If a problem occurs, make sure that all connections are properly made and clean. If a problem exists in one loudspeaker, reverse the speaker wires to the left and right speakers. If the problem appears in the opposite speaker, the cause is in another component or cable. If the problem remains in the same speaker, then the fault is in the loudspeaker. In this event, consult your Project Everest DD66000 dealer for assistance.

The Project Everest DD66000 System Specifications

Low-Frequency Driver	15" (380mm) Pulp-cone woofer (1501AL) x 2
High-Frequency Driver	4" (100mm) Beryllium compression driver (476Be)
Ultrahigh-Frequency Driver	1" (25mm) Beryllium compression driver (045Be-1)
Maximum Recommended Amplifier Power	500 Watts
Frequency Response (–6dB)	45Hz – 50kHz
Low-Frequency Extension (–10dB)	32Hz
Nominal Impedance	8 Ohms 5.5 Ohms @ 85Hz 3.5 Ohms @ 40kHz
Sensitivity (2.83V@1m)	96dB
Horn Directivity (Horizontal x Vertical)	
High-Frequency	100° x 60°
Ultrahigh-Frequency	60° x 30°
Crossover Frequency	150Hz (LF1 6dB/octave) 700Hz (LF2 24dB/octave) 20kHz (UHF 24dB/octave)
Control Function	HF level control (–0.5dB/0dB/+0.5dB) LF level control (low/high) LF/HF drive mode switch (normal/bi-amp) System orientation switch (left/right)
Dimensions (H x W x D) (Including Feet)	38" x 43-5/8" x 18-1/2" (965mm x 1,109mm x 469mm)
Weight	302 lb (137kg) without grille 312 lb (142kg) with grille
Package Weight	383 lb (174kg)

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