BAG END
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INFRASUB-18
SELF POWERED SUB WOOFER

USERS GUIDE

The Bag End INFRA subwoofers are designed as no-compromise, hi-fidelity musical systems. We believe they are the finest subs available at any price.

Applications

Home Stereo - Home Theater - Project Studio

Finishes

Available in Studio Black

Infrasub-18 Description

The INFRASUB-18 is a self powered sub woofer system employing a direct radiating 18" cone loudspeaker in a sealed enclosure, and a 400 watt power amplifier mounted to an aluminum plate on the back of the enclosure. The circuitry also includes an INFRA dual integrator providing a flat acoustical response down to 8 Hertz, and Left, Center, and Right channel line level inputs and hi-pass filtered outputs.

Infra Description

The reason that the INFRA type subwoofers sound dramatically better than the others is because of their superior time domain performance. The INFRA subwoofer maintains the bass energy in a tight packet, aligned with the upper range signal, providing a seamless musical connection with the main loudspeakers. This is achieved by making the system have a very wide, very flat frequency domain response.

The INFRA driver is operated below resonance and flattened with an electrical boosting circuit, the INFRA dual integrator. Below resonance the INFRA system exhibits predictable, uniform response and reproduces each note with the same emphasis, reducing the influence of the resonances found in conventional above resonance bass systems. In addition, the use of a low pass filter is eliminated (and with it the associated long variable delay) and replaced with the INFRA dual integrator and its short uniform delay.

Upon close listening it is clear that the impression of power and impact is greater with an INFRA system when compared to conventional bass systems. This is true even when the two systems will measure the exact same SPL on a calibrated dB meter. The superior transient response of the INFRA subwoofer provides a greater body impact than a conventional subwoofer does, at all listening levels.

Objectively the INFRA system exhibits superior frequency and phase response.

Response Down to 8 Hertz

The INFRA is a no compromise technology with a great degree of flexibility. By extending the frequency response down a full octave below what is considered to be the lowest musical note, low C on a pipe organ (16 Hz), we improve the phase response and reduce the delay throughout the entire audible bass range. This excellent phase response and short signal delay is why subjectively the INFRA system is known for its quick, tight, and musically connected bass sound throughout the entire bass range, not just the lowest frequencies. With itís good phase and extended frequency response, it can more accurately represent the character of the sound being fed into the system than conventional designs and their long signal delays.

Dynamic Filter

The Dynamic Filter circuit is a complimentary technology to the INFRA dual integrator. It insures that unexpectedly large signals will not overload the system resulting in possible damage or audible distortion. This allows high level operation close to the maximum system capabilities without fear of accidental overload.

The Dynamic Filter circuit dynamically reduces the bass extension to prevent overload. It is inherent in the INFRA design that an overload condition will occur with the lowest notes first, as they require the greatest amount of amplifier power and driver excursion. In an overload condition the Dynamic Filter circuit will reduce the lowest frequencies to their maximum safe level while not affecting the bass content above the frequency that exceeded the threshold.

The INFRASUB-18 Dynamic Filter threshold is not user adjustable. It has been factory set to 3 dB below the amplifier overload point. The maximum sine wave output power from the amplifier is 400 watts. With the Dynamic Filter detector engaged, the maximum sine wave output power is 200 watts. The full power of 400 watts or more is reserved and available for short duration impact.

The Dynamic Filter is fundamentally different from the commonly used limiter which reduces the level of the entire sub woofer output, and is much more audible, when engaged. It is more natural not to hear the lowest frequencies and still hear the upper bass unaffected, as often there are sounds in nature without low bass content. It is not natural, and very noticeable, when the entire bass range limits to protect itself. When used in moderation the Dynamic Filter is very subtle and conceals very well the fact that it is working. When the system is turned up too far, the low bass is reduced to the point that only the upper bass is heard. If the user requires this much sound pressure, then more amplifiers and speakers are required to achieve the desired level along with the extended low frequency response.

How Loud at 8 Hertz ?

While the INFRASUB-18 will reproduce 8 Hz, it is not audible nor does it have enough acoustical power for you to feel it. The measurements are taken at close range with sensitive instruments. To achieve a flat response, full amplifier power is used at the lowest frequencies and very little (<1 watt) in the upper frequency range. The INFRA dual integrator provides the correct signal strength and therefore amplifier power at each frequency. As the frequency is lowered the power and excursion required to maintain a flat acoustical response at high SPL become enormous and not practically attainable for a single driver system. Fortunately the improved phase response, one of the main benefits of an extended subsonic acoustical response, is preserved because the music content is typically not demanding high power subsonic reproduction.

The ideal listening scenario is to have a full bandwidth 8 Hz playback system and play a good recording without low frequency noise present on it. The playback system can then benefit from the improved phase response without requiring excessive power in the lowest octave or engaging the Dynamic Filter circuit.

Setting the Bass Level

If your application is in a recording studio, you should use professional acoustical measurement instrumentation to set the bass level correctly. For home applications you can set the INFRA level as desired for your personal taste. You will probably find large variations in the amount of bass energy on various recordings. Until recently there has not been enough attention to low bass monitoring in the recording studio, post production and mastering process to insure a low noise, uniform low bass response on the recording. With an INFRA subwoofer system, you are able to hear the bass with definition and clarity never before available, making it easier to identify not only the basic level discrepancies, but also the subtleties of the recording environment ambiance and the bass instrument character.

Amplifier Overload Protection

The duty cycle of even the most demanding bass heavy musical material played at full level is below the high temperature protection shut off setting. Occasionally, when playing a poorly mastered CD with high level sub-sonic noise on it, or when running very dense material highly concealed, the system will self protect and shut off for a short time. If this occurs, turn the level down and/or examine the source material.

Operating Instructions

If you have a line level source (such as a preamp output, surround processor output, or tape monitor insert points on a receiver), send a full frequency range signal via shielded cables to the RCA jack line level inputs. The INFRASUB will send the Left, Center, and Right channel signals to the built-in hi-pass filters. The resistor network installed at Bag End sets the -6 dB frequency to 95 Hertz. The line level outputs of the hi-pass filters are available at the Left, Center, and Right channel RCA jacks. Send these signals back, via shielded cables, to the inputs of their corresponding power amplifiers.

If you have a speaker level source (the output of a power amplifier), send a full frequency range signal to the Left and Right channel spring terminal speaker level inputs. As the impedance of this input is high, it is not necessary to use heavy gauge speaker wire for these connections. We recommend running separate cables in parallel with your normal speaker wires connected either directly from your amplifier outputs, or from the terminals on your left and right speaker enclosures. Please take care to maintain the correct signal polarity by connecting the red or + terminals from your amplifier or speaker to the red speaker level inputs on the INFRASUB. Note that there are no hi-pass filtered speaker level output signals available. In this configuration best results will be achieved when using satellite speakers with limited bass response.

The INFRASUB combines the signals from all of the inputs and sends them through the INFRA dual integrator and to the built-in 400 watt power amplifier and the specially designed Bag End EL-18P 18" driver. Use the LEVEL control to match the volume of the INFRASUB to your satellite speakers. Use the POLARITY SWITCH, if necessary, to reverse the polarity of the INFRASUB. This can be helpful to achieve a seamless blend between the sound of the INFRASUB and your satellite speakers.

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