

### 2.1 BASS MANAGEMENT POWERED SUBWOOFER SYSTEM



#### APPLICATIONS:

- Recording Studio
- Mastering Lab
- Professional Surround Systems
- Screening Rooms
- Discriminating Home Theater

#### ISUB2-18 DESCRIPTION:

The ISUB2-18 is a self powered professional subwoofer system. It employs stereo summing management combining Two inputs for a mono summed bass system.

The signal is processed by the INFRA dual integrator driving a 700 watt power amplifier into a front firing 18" cone loudspeaker in a sealed box. This provides a flat acoustical response down as low as 8 Hertz. Two isolated inputs allow the combining of a stereo signal for mono summed bass. Two units can be used separately for stereo bass systems.

The internally set Dynamic Filter protection maintains undistorted audio reproduction under accidental overload conditions. An optional remote indicator module may be placed in a convenient visible location to indicate the dynamic filter protection threshold has been reached.

#### INFRA™ TECHNOLOGY DESCRIPTION:

The INFRA driver is operated below resonance and flattened with an electrical boosting circuit, the INFRA dual integrator. Operating 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 with 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 Sound Pressure Level on a calibrated SPL meter. This is because the INFRA subwoofer maintains the bass energy in a tight packet, aligned with the upper range signal, providing a greater body impact and a seamless musical connection with the main loudspeakers.

Objectively, the INFRA system exhibits superior frequency and phase response.

#### 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.

#### SPECIFICATIONS

##### Input Configuration:

2 Isolated Balanced XLR female line level

##### Input Mode:

2 Summing inputs

##### INFRA Module:

8 Hz dual integrator

##### INFRA Frequency Response:

±3 dB 8 Hz to 95 Hz (2p Steradians)

INFRA system -6 dB frequency 95 Hz (not adjustable)

##### INFRA Level Control:

Adjustable level

##### INFRA Cutoff Frequency:

Internally set 8 Hz or 16 Hz

##### INFRA Overload Protection:

Preset threshold Dynamic Filter circuitry

##### INFRA Polarity:

± Push button switch

##### RTI:

**Optional Remote Threshold Indicator**  
Threshold exceeded indication red LED

##### Amplifier Output Power:

700 Watts continuous sine wave

##### Low Frequency Transducer:

EL-18R 18" Cone

**Enclosure:** 13 ply birch plywood

##### AC Power Requirements:

Auto sensing 100 to 250 VAC

**Finish:** Black textured finish or optional high gloss automotive finish

**Grille:** Black nylon cloth on frame

##### Dimensions:

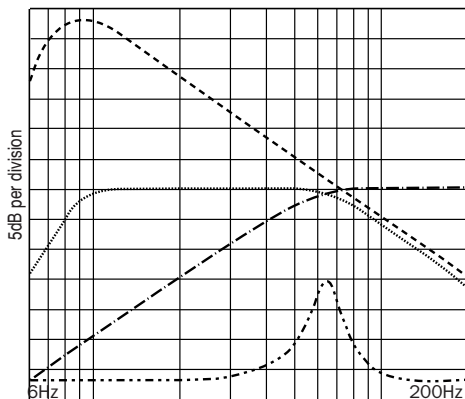
22"h x 21"w x 18"d  
55.8cm x 53.3cm x 45.7cm

**Weight:** 75lbs - 34kg

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The Dynamic Filter threshold is not user adjustable. It has been factory set to 3 dB below the amplifier overload point.

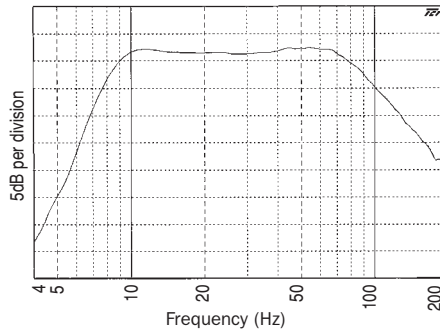
The Dynamic Filter is fundamentally different from the commonly used limiter which reduces the level of the entire subwoofer output and is much more audible when engaged. It is more natural not to hear the lowest frequencies and still hear the upper bass unaffected, as often there are sounds in nature without low bass content. It is very noticeable when the entire bass range limits to protect itself. When used in moderation the Dynamic Filter is very subtle and conceals the overload condition very well. 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, more amplifiers and speakers are required to achieve the desired level along with the extended low frequency response.



----- Electrical frequency response of the INFRA™ dual integrator  
 ..... Acoustical output of the INFRA™ system  
 -.-.-.- Acoustical frequency response of the INFRA™ loudspeaker in a sealed box  
 ..... Impedance amplitude of INFRA™ loudspeaker in a sealed box

In a playback system used for personal enjoyment or professional presentation it is reasonable and acceptable to allow some Dynamic Filter protection to occur without noticeable reduction in bass extension or overall fidelity. In a studio environment during mixing or mastering it is not acceptable for the Dynamic Filter protection to occur

Fig. 1



without the knowledge of the mixing engineer. For this reason the remote indicator is useful and may be placed in a convenient location for visual monitoring.

### 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 its excellent phase response and extended frequency response, it can more accurately represent the character of the sound being fed into the system when compared to conventional designs and their long signal delays.

### HOW LOUD AT 8 HERTZ:

While the ISUB2-18 will reproduce down to 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, as shown in figure 1, 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 system 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.

### OPERATING INSTRUCTIONS:

Connect a line level source such as a professional mixing console or surround processor output to send a full frequency range signal via shielded cables to the XLR line level inputs.

The bass signal from both inputs combine and is then adjusted by the level control before going to the INFRA dual integrator, to the built in amplifier and on to the cone bass speaker.

You will achieve a higher fidelity sound by sending a full range signal to the inputs and allow the dual integrator to perform the upper roll off function. We do not recommend a low pass filter in line before the inputs. When using the output from a surround sound processor you have the option to set the bass management mode in the surround sound processor so there is no subwoofer output. This directs the bass information on the effects channel to the other outputs, bypassing the low pass filter. This setting has demonstrated an improvement in fidelity.

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Use the LEVEL control to match the level of the ISUB2-18 to your upper range speakers. Use the POLARITY SWITCH, if necessary, to reverse the acoustical polarity of the ISUB2-18. Reversing polarity can, in some cases, be helpful to achieve a seamless blend between the sound of the subwoofer and your upper range speakers.

The Dynamic Filter XLR connector is connected via a standard XLR microphone cord to the remote threshold indicator intended to be placed near the mixing console for visual Dynamic Filter threshold monitoring.

#### 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 other applications, you can set the bass 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 instruments character.



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