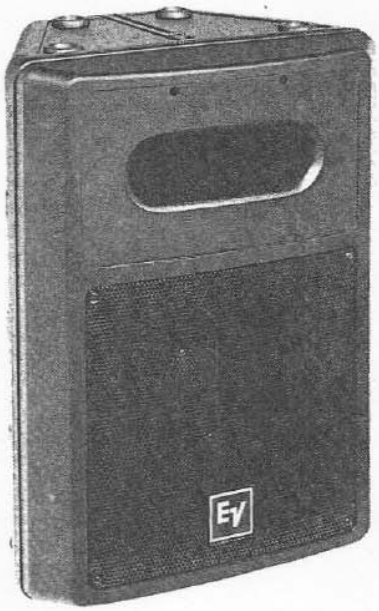
Electro-Voice®

S_b120

300-Watt Nonpowered Bass Module



- **Lightweight and compact (32 lb)**
- **Very strong structural-foam enclosure with integral handle and hanging points**
- **Stand mountable and arrayable**
- **300-W continuous power handling (1,200 watts short term) for high output**
- **DL12sb 12-inch woofer with shallow-cone/deep-frame geometry for ultrahigh excursion of nearly one inch**
- **Paralleled Neutrik Speakon® high-current connectors**

SPECIFICATIONS:

Axial Frequency Response (swept sine-wave input, 4 Volts at 10 Feet on axis, anechoic environment, normalized for 1 watt/1 meter; see Figure 1):
50-500 Hz

Low-Frequency 3-dB-Down Point:
50 Hz

Usable Low-Frequency Limit with X_p200 Controller (10-dB-down point):
43 Hz

Half-Space Reference Efficiency:
3.7%

Long-Term Average Power-Handling Capacity per EIA RS-426A (see Power-Handling Capacity section)
300 watts

Maximum Acoustic Output:
11.1 watts

Sensitivity (SPL at 1 meter, 1 watt input, anechoic environment, band-limited pink-noise signal, 50 to 200 Hz):
94 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses:
Essentially omnidirectional

Distortion, 0.1 Full Power Output,
Second Harmonic,
100 Hz: 5.0%
Third Harmonic,
100 Hz: 1.7%

Distortion, 0.01 Full Power Output,
Second Harmonic,
100 Hz: 1.7%
Third Harmonic,
100 Hz: <0.01%

Transducer Complement:
DL12sb 12-inch woofer

Box Tuning Frequency:
55 Hz

Recommended Crossover Frequency:
100 to 200 Hz (12-dB-per-octave minimum slope)

Impedance,
Nominal:
8 ohms
Minimum:
6 ohms

Input Connectors:
Two paralleled Neutrik Speakon® NL4MP connectors (allows paralleling of multiple speakers)

Enclosure Materials and Colors:
Black polypropylene structural foam

Supplied Accessory:
Input cable connector (Neutrik Speakon® NL4FC) (see S_b120 Connections section)

Optional Accessories:
100BK mounting stand
M_b200 mounting bracket

Other Product Available for Enhancement of S_b120 Performance:
X_p200 electronic system controller

Hanging Inserts:
Three metric M6 x 14 mm

Dimensions (see Figure 2),
Height:
58.7 cm (23.1 in.)
Width:
42.9 cm (16.9 in.)
Depth:
31.2 cm (12.3 in.)

Net Weight:
14.6 kg (32.2 lb)

Shipping Weight:
16.0 kg (35.3 lb)

GENERAL DESCRIPTION

The Electro-Voice S_b120 bass module is a compact, low-frequency enhancement system designed for sound reinforcement. Through the extensive use of computer-aided design and modeling, Electro-Voice engineers have developed a state-of-the-art portable system that combines the advantages of a long-throw 12-inch woofer in a high-impact polypropylene structural-foam cabinet that is light in weight (only 32.2 lb overall).

LOW-FREQUENCY DRIVER DESCRIPTION

The DL12sb low-frequency driver was specially developed for the S_b120. Its shallow-cone/deep-frame geometry provides a very high peak-excursion ability of nearly one inch. At the heart of this driver is a magnetic structure optimized to yield the best possible Thiele-Small parameters to match the tuned enclosure.

A specially modified magnet structure is used so that it is physically impossible for the voice coil to ever hit the back plate ("bottom out"). Also, there is added clearance between the spider and the speaker frame, so the spider cannot strike the frame, another problem usually encountered in woofers used for long-excursion applications. The woofer features beryllium copper lead wires, a low-mass edge-wound voice coil and high-temperature materials. The part of the magnet structure adjacent to the coil is insulated using the exclusive EV PROTEF™ process (U.S. Patent #4,547,632). The coil is driven by a massive, 16-lb magnet structure.

ENCLOSURE DESCRIPTION

The enclosure is constructed of high-impact polypropylene structural foam. It provides a stiff and extremely durable enclosure. Molded into the cabinet are an integral carrying handle and a stand socket for mounting on 1 3/8-inch stands such as the Electro-Voice model 100BK. Rubber feet that are attached to the bottom of

FIGURE 1 — S_b120 Frequency Response
(1 watt/1 meter, anechoic environment)

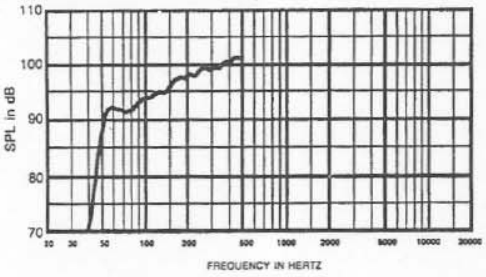


FIGURE 2 — S_b120 Dimensions

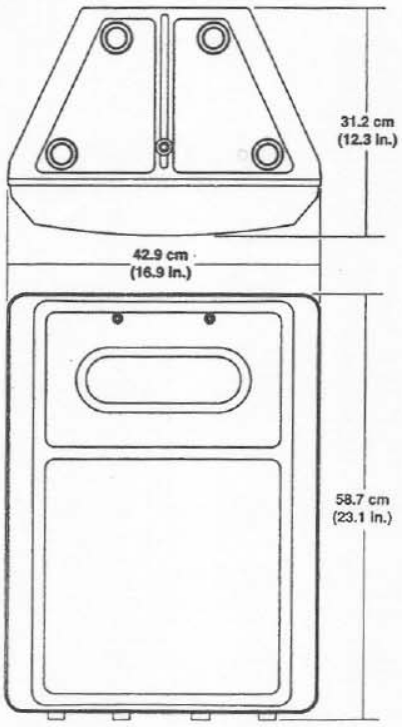
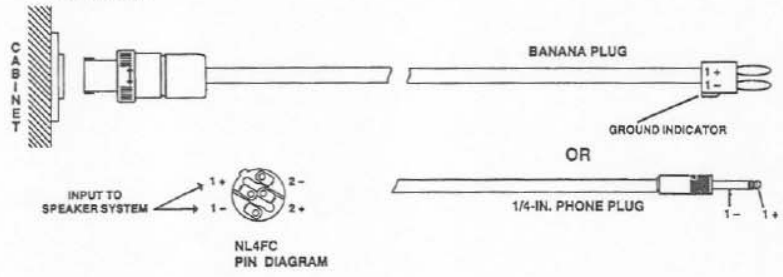


FIGURE 3 — Two-Conductor Cable Configurations for S_b120 Speaker System Using Neutrik Speakon® NLF4C Four-Pin Connector



the cabinet and the mating sockets that are molded into the top provide a means of stacking systems. Three hanging inserts are also provided (three metric M6 x 14 mm).

XP200 ELECTRONIC SYSTEM CONTROLLER

The optional X_p200 electronic system controller complements the characteristics of the S_b120. Its mono-summed subwoofer outputs provide crossover and infrasonic protection (see Crossover and Subpassband Protection sections). 24-db-per-octave filters roll off response below 37 Hz and above 134 Hz. The X_p200 also includes a special low-frequency profile circuit that enhances the performance of the S_b120. The amount of enhancement can be adjusted to suit the user's personal preference.

CROSSOVER

The S_b120 should be used in conjunction with an active crossover to roll off response above 100-200 Hz, so that bass enhancement does not "muddy up" vocals or call attention to the physical location of the S_b120. (The closer the roll-off point is to 100 Hz, the least the overall sound quality will be affected by the enhancement of the bass module.) The roll-off rate should be a minimum of 12 dB per octave.

The optional X_p200 electronic controller provides a 24-dB-per-octave roll-off above 134 Hz.

SUBPASSBAND SPEAKER PROTECTION

The S_b120, like all other vented systems, experiences rapidly increasing cone excursion below the box tuning frequency (55 Hz for the S_b120). Acoustic output is also decreasing rapidly. Therefore, it is sensible to protect the S_b120 and maximize its undistorted output by inserting an active high-pass filter at a corner frequency somewhat below box tuning. The roll-off rate should be at least 12 dB per octave. At this minimum rate, a corner frequency of about 0.8 the box tuning frequency (47 Hz for the S_b120) is appropriate. For higher roll-off rates, lower corner frequencies are permissible and provide essentially equivalent protection.

The sub output of the optional X_p200 electronic system controller provides a 24-dB-per-octave roll-off at 37 Hz.

POWER-HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test related to real-life conditions. First, a random noise input signal is used because it contains many frequencies simultaneously, just like the real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than the typical program, adding an extra measure of reliability. Third, the test signal includes not only the overall "long-term average" or "continuous" level—which our ears interpret as loudness—but also short-term peaks which are many times higher than the average, just like the actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine-wave test signals sometimes used have a much less demanding peak value rela-

tive to their average level. In actual use, long-term average levels exist from several seconds on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the S_b120 is designed to withstand the power test described in the EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth analyzer (1/3-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz with a 3-dB-per-octave slope above 1,200 Hz. This shaped signal is sent to the power amplifier set at 300 watts into the 6.3-ohm EIA equivalent impedance (43.5 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 1,200 watts peak (86.9 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure models.

AMPLIFIER POWER RECOMMENDATIONS

As noted in the Power-Handling Capacity section, above, the S_b120 has a random-noise power capacity of 300 watts long term (1,200 watts peak) per EIA Standard RS-426A. The following guidelines will help relate this number to an appropriate power amplifier output rating.

1. To use the S_b120 to full capacity, skilled experts in sound system installation and operation will obtain the best results if the power amplifier is 2.0 to 4.0 times the long-term average noise power rating of the speaker system (600 to 1,200 watts).

   The **caution** cannot be made strongly enough, however, that **this arrangement is only for experts** or for those who can discipline themselves against "pushing" the system for ever-higher sound levels and who can avoid "accidents" such as catastrophic feedback or dropped microphones.

2. A more conservative, "normal" amplifier size, which will produce audible results nearly equal to those of the "expert" recommendation, is 1.0 to 1.4 times the long-term average noise power rating of the speaker. For the S_b120 this is 300 to 420 watts.

3. To be very conservative, one can use an amplifier rated at 0.5 to 0.7 times the long-term average noise power rating of the loudspeaker. For the S_b120 this is 150 to 210 watts.

Request P.A. Bible Addition No. Two ("Power-Handling Capacity") for more background on these recommendations.

S_b120 CONNECTIONS

The S_b120 is equipped with two paralleled Neutrik Speakon® NL4MP connectors, selected for their ability to reliably deliver to the speaker components the high currents delivered by high-wattage power amplifiers. An NL4FC mating connector is supplied. The NL4FC is a four-pin connector, and Figure 3 shows how the usual two-conductor speaker cable should be wired to pins 1+ and 1– of the connector. Two typical connectors at the power amplifier end of the cable are shown: banana and 1/4-inch phone plugs. (The banana plug provides the more reliable connection.)

Note also that Neutrik Speakon® cables, connectors and wiring accessories are available from Pro Co Sound, Inc., and Whirlwind Music Distributors, Inc. To find your local Pro Co, Whirlwind or Neutrik dealer, contact:

Pro Co Sound, Inc.
135 E. Kalamazoo Ave.
Kalamazoo, MI 49007
616/388-9675

Whirlwind Music Distributors, Inc.
P.O. Box 1075
Rochester, NY 14603
716/663-8820

Neutrik USA, Inc.
195-S3 Lehigh Ave.
Lakewood, NJ 08701
908/901-9488

MULTIPLE USE

The S_b120 may be used in multiples to increase acoustic output. A 6-dB increase in maximum acoustic output occurs when two speaker systems are placed side by side and paralleled (yielding a 4-ohm load). For operation at very low frequencies, the woofer cones "mutually couple," acting as one system with twice the effective cone area and power-handling capacity. Efficiency is doubled by the increased cone area to provide 3 dB more output, while the doubled power capacity provides the potential for an additional 3-dB gain in maximum acoustic output.

Mutual coupling occurs when the center-to-center distance between woofers is less than one-half the wavelength. For the S_b120 crossed over at 137 Hz (the frequency provided by the optional X_p200 electronic system controller), the maximum distance for mutual coupling across the band is about 1.25 m (4.1 ft). When the woofers are spaced greater than one-half the wavelength, the level increase is limited to the 3-dB input-power increase.

The S_b120 is connected using one of the Neutrik Speakon® jacks marked "input." A parallel woofer can be connected using the other jack. This halves the impedance the amplifier "sees," from 8 to 4 ohms. Care must be taken not to abuse the amplifier by connecting impedances which are too low (refer to amplifier specifications).

LOUDSPEAKER RESPONSE DUE TO THE ACOUSTICAL ENVIRONMENT

Several factors must be considered when determining the overall response of a speaker system in any listening environment. Physical characteristics of the room itself and placement of the speakers and listener can have considerable affect on SPL capability, perceived and/or measured frequency response and stereo imaging.

The low-frequency response of the S_b120 can be adversely affected by poor placement. The S_b120 was designed for quarter- or half-space use. This requires that the speaker system be positioned as close as possible to floor or wall surfaces (half space) or a floor/wall junction (quarter space). Corner placement, in most cases, will reinforce low frequencies the most. Also, placement in loose cavities or resonant mountings can seriously degrade the overall response.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker system shall consist of a 12-inch long-throw low-frequency transducer mounted in a two-piece vented enclosure made of black textured injection-molded polypropylene structural foam.

The system shall exhibit a 50- to 500-Hz frequency response with a sensitivity of no less than 94 dB (1 watt/1 meter, 50- to 200-Hz band-limited pink noise). It will be capable of handling 300 watts of power by the test described in the EIA Standard RS-426A. There will be two paralleled NL4MP Neutrik Speakon® connectors (allowing paralleling of multiple speakers) and three metric M6 x 14-mm hanging inserts capable of supporting the system in a permanent installation application.

The loudspeaker shall be have a black, perforated metal grille covering the woofer. Overall dimensions shall be 58.7 cm (23.1 in.) high, 42.9 cm (16.9 in.) wide, 31.2 cm (12.3 in.) deep. The weight shall be 14.6 kg (32.2 lb).

The loudspeaker system shall be the Electro-Voice model S_b120.

ELECTRO-VOICE UNIFORM LIMITED WARRANTY STATEMENT

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice

at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831) and/or Electro-Voice West, at 8234 Doe Avenue, Visalia, CA 93291 (209/651-7777 or 800/825-1242). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Electro-Voice Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.

ELECTRO-VOICE a MARK IV company **600 Cecil Street, Buchanan, Michigan 49107**
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ OKLAHOMA CITY, OK ■ GANANOQUE, ONT.

Part Number 532141 — 9402