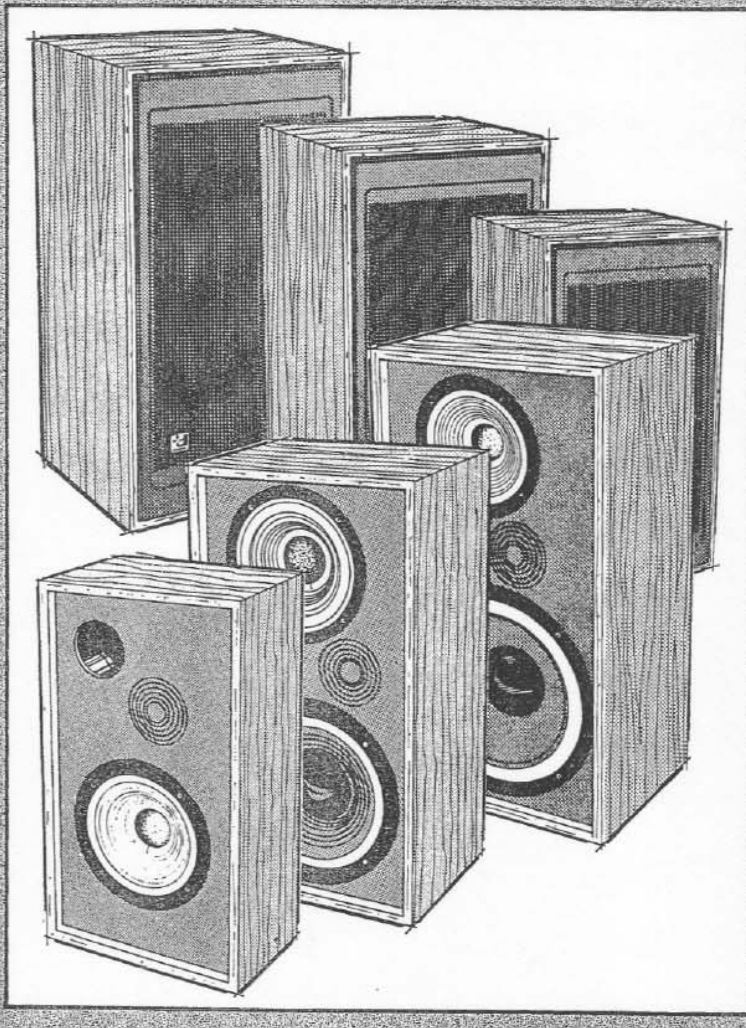
Interface™: 1,2,3



Owner's Manual

INTERFACE:1, 2, & 3 OWNER'S MANUAL

The Interface:1, 2, and 3 systems offer significant performance advantages over most conventional high-fidelity speaker systems. Their optionally vented woofer design provides the basis for a truly unique combination of high accuracy, wide bandwidth, high efficiency and modest size. We have tried to provide clear and detailed unpacking, connecting and operating instructions. Please follow them closely to assure correct and trouble-free operation.

The most basic and widely applicable information has been printed on a grey background. This information should be sufficient for most installations.

The other information covers more advanced, detailed system and application considerations. Nevertheless, in a manual of this scope, it is difficult to cover every possible concern in great depth. We suggest consultation with your dealer and, additionally, welcome your inquiries at Electro-Voice. Address and telephone information is part of the warranty statement at the end of this manual.

Good listening!

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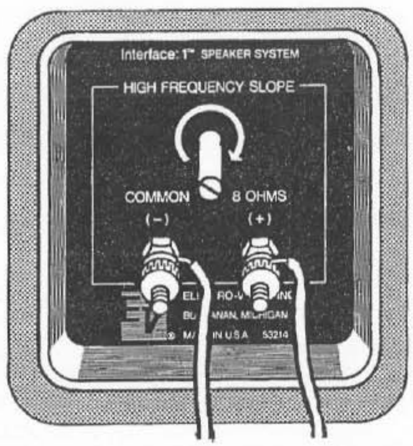
UNPACKING

Unpacking the Interface:1, 2, and 3 speaker systems is straightforward, with no special precautions necessary. However, if at all practical, *retain all packing materials for possible future use* (see "Customer Service" section).

CONNECTING THE SPEAKER SYSTEMS

Input Connections



The two terminals on the terminal board at the rear of the speaker enclosure are the input connections. The left-hand terminal (common, −) should be connected to the common output terminal of the amplifier; the right-hand terminal (8 ohms, +) should be connected to the amplifier's 8-ohm output terminal. Place each bare wire end between the washer and the knurled nut and tighten the knurled nut firmly, using only finger pressure. Use of tools is not required. Make certain the bare wires do not touch each other.

In-phase Speaker Operation

Connecting the speakers as described above produces in-phase operation, an important condition for best stereo performance. This ensures that the speaker cones are moving in unison when the same signal is present at each set of amplifier output terminals. Such a signal condition occurs with monaural program material and, in stereo, with soloists or groups located midway between the two speakers.

In-phase operation results in a satisfyingly "solid" center image. Out-of-phase operation produces a spread, indefinite center image that changes location and character as the listener moves a foot or two back and forth between the speakers. Also, out-of-phase operation may reduce bass response, depending on room dimensions and speaker/listener locations.

An experienced listener can successfully test for in-phase operation by noting the quality of the center image on monaural program material. However, the least ambiguous check is to set the two speakers facing each other, an inch or two apart. Use program material with fairly prominent bass content and switch the amplifier to the monaural mode. This is usually accomplished by pressing a Mono or A+B button or lever, or moving a rotary switch to a similarly labeled position. Reverse the wires to *one* of the speakers (either at the speaker end or the amplifier end, *but not at both).* This will either increase or decrease the bass output. The correct connection is the one that produces the most bass.

Wire Selection

To avoid any significant amplifier power loss in the speaker lines, 18-gauge stranded wire (commonly called lamp cord or zip cord) is satisfactory for lengths up to 30 feet. If longer speaker lines are required, use progressively larger wire sizes: 16-gauge to 50 feet, 14-gauge to 75 feet and 12-gauge to 125 feet. Always use a separate pair of wires for each speaker, even if your amplifier permits using a common ground. Resistance in a common ground wire can degrade stereo separation.

SYSTEM PLACEMENT

Placement of stereo speakers is more often determined by floor plan and furniture arrangement than by acoustic considerations. There are some general guidelines which may be helpful, however.

Preferred Locations

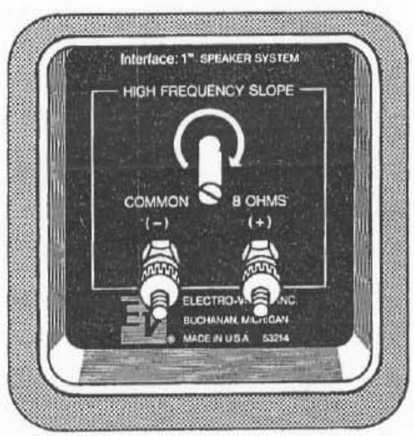
Usually it is possible to select a normal listening area (a sofa, chair grouping, or whatever) in the listening room. The speakers should face the listener and should be at approximately ear level. Spacing between the speakers is also dependent upon the listening room. If the speakers are too close together, stereo separation will be reduced. Conversely, if the speakers are too widely spaced, the stereo image may be disjointed with a gap in the middle. In most rooms, a speaker separation of 6 to 12 feet will provide a good stereo image. Feel free to experiment.

Sound Quality and Speaker Location
There is no doubt that different listening rooms and changes of speaker location within a given room can affect sound quality to an extent important to many enthusiasts. Some changes are subtle, while others are quite noticeable.

It is possible to theoretically predict and categorize many effects if room characteristics can be simply defined. However, real listening rooms are usually sufficiently irregular and complex to dilute and alter the clear-cut effects that might be predicted theoretically. Therefore, ear-level placement remains valid, especially when coupled with a plea to experiment. The following broad statements about the major effects of speaker location change should help the experimentation.

Moving speakers close to the floor (or ceiling) will increase the amount of bass and mid-bass heard. Moving speakers into the corners of the room will provide an even greater increase. The Interface:1, 2, and 3 are designed for balanced performance in the more normal ear-level locations fairly close to one wall, as previously discussed. However, the relatively wide, uniform high-frequency dispersion of the Interface:1, 2, and 3 makes them less sensitive than many other designs to less-than-ideal floor or corner placement.

Also, placing speakers in corners or on the floor tends to move the tweeter away from your ears, as well as providing (for carpeted floors) somewhat increased absorption of high-frequency output. This sometimes creates a "heavy" sound. Again, the excellent high-frequency dispersion of the Interface:1, 2, and 3 tends to alleviate the effect. In any case, the absorption can be favorably modified by aiming floor-located speakers up at 10 to 20 degrees, toward ear level.



USING THE HIGH FREQUENCY SLOPE CONTROL
The continuously variable High Frequency Slope control is located on the terminal board at the rear of the speaker enclosure. It produces a gradual response rolloff above the crossover frequency of 1500 Hz. The control helps tailor speaker output to different room acoustics, speaker location, and program material. High frequency output is maximum when the control is full clockwise.

The control's effect on frequency response is smooth, with a greater effect at higher frequencies than at the lower frequencies close to the crossover point. The result is a useful variation in sound quality that does not compromise the basic sound quality of the Interface:1, 2, and 3.

Flatest overall response is obtained with the high frequency slope control at maximum. We prefer this setting for most room conditions and with high-quality, low-noise program material. Many listeners would consider the maximum setting as "normal." If the sound seems "bright" or tape hiss is excessively audible, try a midway control position. Response at 10,000 Hz will be reduced by about 3 dB. A fully counter clockwise control setting attenuates response about 6 dB at 10,000 Hz, resulting in a sound character similar to the "duller" high fidelity systems available. This setting produces the most listenable results from program sources having high levels of distortion and/or noise, perhaps in addition to restricted high-frequency content.

USING SYSTEM TONE CONTROLS
Generally speaking, the more sophisticated the listener, the less he uses tone controls. The Interface:1, 2, and 3 have been designed for accurate reproduction of the input signal. While the same degree of control flexibility used with other speaker systems may be employed, we suggest that minimal use of Loudness, Bass, and Treble will provide most listening pleasure and best overall performance.

AMPLIFIER POWER AND SOUND PRESSURE LEVEL RECOMMENDATIONS
Casual discussions of amplifier power requirements usually result in a wide range of "answers." This is so because power levels vary *immensely* with speaker efficiency, room acoustics, and desired listening levels. Nevertheless, the following commentary should help produce an answer that is right for you. Fortunately, the bulk of the discussion can be simplified by fixing some of the variables. First, the efficiency of the Interface:1, 2, and 3 has been assumed. Second, the recommendations are based on a listening room of average acoustics (a precise description of these "average acoustics" follows in the section entitled "Room Acoustics and Amplifier Power"). With these variables fixed, we must deal only with the question of appropriate listening levels and the amplifier power required for these levels.

Understanding The Recommendations
The "Detailed Specifications Summary" section of this manual

specifies the rated amplifier power requirements for a broad range of listening levels. The text of recommendations which follows illustrates these specifications and is designed to relate them to the real-world listening experience of the audio enthusiast.

Notes on Amplifier Power Ratings. All amplifier power recommendations are given in average sine wave watts (sometimes called "RMS" or "continuous" watts) per channel, all channels operating, over a minimum frequency range of 40 to 15,000 Hz. Common deviations from this rating method will not change attainable listening levels significantly. Also, to simplify the discussion, it is assumed that the amplifier is well behaved when operating at or slightly beyond its power output capability.

Notes on Listening Levels. All listening levels are expressed as sound pressure levels in decibels (dB). The dB is a term frequently used in audio but often misunderstood. For example, very few people have a real conception of what a "90 dB" sound pressure level sounds like. We hope to clarify this situation. Furthermore, the audible effect of specific increases and decreases in sound pressure level are not commonly known. A 1 dB change in overall program level is just audible to the critical ear. A 3 dB change is noticeable, but would be interpreted as only a modest change in level. Yet a 3 dB level increase requires a *doubling* of amplifier power output. A 6 dB change in level would seem fairly substantial; such an increase requires four times amplifier power.

Notes on Listening Position. The sound pressure levels noted below are those observed when the listener is in the "reverberant field" of the listening room. Sound pressure levels are highest very near the speakers. As the listener moves away from the speaker, the sound pressure level drops, as would be expected. However, in a room with average acoustics and with the Interface:1, 2, and 3, this drop in level *stops* at about 6 feet from the speaker. Beyond this distance, the listener is in the reverberant field and the sound pressure level of wide-range program material remains virtually constant because nearly all of the audible sound energy is reflected energy.

Minimum Recommendations

Sound Pressure Level. It has been said that a sound pressure level of 85 dB is the maximum average intensity people want to experience in their homes.[1] However, it is our considered opinion that a quality music system should be able to provide a long-term average program level of approximately 90 dB in order not to be found inadequate by nearly every serious music listener at some time. It is this so-called long-term average level that the ear interprets as a given loudness over any several-second musical crescendo. Also, it is this average level that is expressed by the relatively slow-moving indicator of a sound pressure level meter.

Additionally, we feel that a music system must be able to reproduce short-duration peaks (on the order of 10 milliseconds) 10 dB higher than the average, or 100 dB. Musical signals are full of such peaks. While they contribute very little to perceived loudness, they are essential to accurate reproduction.

A 90 dB average level will seem quite loud to many people, certainly far above a background music level (60 dB) or the level of ordinary conversation (65 dB). A 90 dB average level is very likely to represent a practical upper limit-of-pleasure for many commercial recordings where compression and background noise have compromised the integrity of the original signal.

Amplifier Power. One Interface:1, 2, or 3 speaker system will produce the sound pressure levels described above with a 3.6 watt amplifier. The 90 dB average level is reached with an input of only .36 watts, with the full 3.6 watts producing the 100 dB instantaneous peaks.

This amazingly modest requirement is due to the high efficiency of the Interface: 1, 2, and 3, about 6 dB higher than typical acoustic suspension speaker systems. This means that amplifier power requirements are one-fourth that often recommended for typical acoustic suspension systems.

Typical Requirements

Sound Pressure Levels. Although the 90 dB minimum recommended average level capability will satisfy a broad range of listeners, this level falls far short of the levels associated with most live music. Many enthusiasts will find live music levels enjoyable for the highest quality commercial program sources and well-executed live recordings, For example, while "loud" classical music reaches only the relatively modest level of 80 dB, "very loud" classical music goes well beyond the 90 dB "minimum" – ranging from 90 to 100 dB. The short-duration peaks required for realistic reproduction can be another 20 dB higher. Loud rock music is on the order of 115 dB average level.[1] It is therefore our opinion that many enthusiasts will find average level capabilities in the 95-100 dB range most appropriate. This means that the sound pressure levels of most live classical music can be attained. For contemporary rock and electronic music, the 95-100 dB capability represents a reasonable compromise among several variables: the actual levels of live rock, typical program sources, and neighbors.

Amplifier Power. One Interface:1, 2, or 3 speaker system will produce the sound pressure levels noted with amplifiers ranging in capability from 11 (95 dB average level) to 36 watts (100 dB average level). Such levels would require amplifiers from 43 to 140 watts for typical acoustic suspension designs. The long-term average levels are produced by 1.1 to 3.6 watts with only the instantaneous peaks utilizing the full capacity of 11 to 36 watts.

Maximum Recommended Power

Amplifiers much larger than the minimum recommended may be used:

up to around 200 watts per channel. However, care and intelligence are required to see that the high power is used *only* to reproduce the harmless, short-duration program peaks that are 10 to 20 dB above the average levels. When this condition is fulfilled, the long-term average power delivered by the amplifier will be within the ratings of the Interface 1, 2, and 3: 20 watts for the woofer, up to 1500 Hz, dropping gradually above 1500 Hz to 5 watts at 10,000 Hz. (Because of the relatively small high-frequency content of most program material, the reduced tweeter power capacity, typical of nearly all speaker systems, is usually not a limiting factor). The required condition is virtually assured if the signal from the amplifier is distortion-free and accidental inputs are avoided. Accidental inputs include insertion or unplugging of the power cord or audio connectors while the amplifier is operating, rewinding a tape recorder without tape lifters and with the volume at normal playback levels, and dropping the phonograph pickup arm on the record surface under similar volume conditions.

Sound Pressure Level. With a 200-watt amplifier, a single Interface:1, 2, or 3 will produce an average mid-band level of 107 dB. (In this context, "mid-band" refers to the frequency range from about 100 to 1500 Hz, where most program energy is concentrated. This frequency range is handled by the woofer).[2] For many program sources, this means that the levels of live rock music can be approached to a degree satisfactory to most rock aficionados. Many high-fidelity speaker systems are incapable of providing such high levels, even with the largest permissible amplifiers.

Users of high-power amplifiers should refer to the section entitled "Speaker Protection at High Listening Levels."

Room Acoustics and Amplifier Power

Description of "Average Listening Room." The professional acoustician would describe the average listening room used in the preceding discussion as a reverberant space having a room constant (R) of 200 ft^2. This specification is a direct function of the room's surface area in square feet and the average percentage of sound energy absorbed by the room's surfaces and furnishings. For illustrative purposes, a room constant of 200 ft^2 would result from the following specifics:

1. "Average" sound absorption (average absorption coefficient = .15). This would be provided by plaster ceiling and walls, carpeted floor, some draped surfaces, and typical soft furniture.
2. "Average" surface area (about 1100 ft^2) such as would result from a 19 ft x 15 ft room with an 8 ft ceiling.

How Amplifier Requirements Vary with Room Acoustics. Room acoustics affect the amplifier power required to achieve a given sound pressure level. Rooms larger than the average room have a larger surface area and thus require more amplifier power. Smaller rooms require less power. Rooms with more sound absorption than our average room (with "dead" acoustics) require more amplifier power. Rooms with less absorption ("live" acoustics) require less power.

A really complete treatment of the effects noted above cannot be given here. However, some examples will be useful in providing general guidelines:

1. A 10 ft x 20 ft x 30 ft "large" room with average absorption will require approximately twice the amplifier power as the average room.
2. A "medium-live" (average absorption coefficient = .1) room with the same dimensions as the average room will require approximately 40% less amplifier power.
3. A "medium-dead" room (average absorption coefficient = .25) with the same dimensions as the average room will require approximately twice the amplifier power.

SPEAKER PROTECTION AT HIGH LISTENING LEVELS

Protection Should Not Be Necessary with Intelligent Use

With no special speaker protection, we regularly use the Interface:1, 2, and 3 with amplifiers of widely differing power capabilities including amplifiers of the maximum recommended output of 200 watts per channel. We do studiously avoid the accidental, non-musical inputs described earlier With this caution, we rarely if ever have damaged speaker components. However, carelessness or inexperience can cause excessive long-term average power inputs to either the tweeter or both speaker components, especially when high listening levels are sought. This situation is aggravated by certain rock and synthesizer program sources which have a higher-than-usual high-frequency energy content.[2] The following commentary on excessive long-term average power inputs should be helpful.

Detection of Excessive Long-Term Average Power Inputs

Usually, the audio enthusiast will not be able to measure accurately average power inputs. However, careful listening for "peak clipping" distortion (a rough, raucous sound quality as volume is turned up) provides evidence of potentially damaging average levels.

Some background: average power levels are usually 10 to 20 dB lower than program peaks of a few milliseconds duration. These peaks are basically harmless but are necessary for truly high quality reproduction. As the volume is turned up, program peaks will eventually be "clipped" or "flat-topped" as the amplifier runs out of power capacity, even though the average power level poses no problem for the amplifier. While moderate clipping of program peaks is inaudible on most types of program material, such clipping eventually produces the rough, raucous sound quality noted above.[3] This quality is often mistaken for "speaker distortion" when in fact the speaker system is only faithfully reproducing a distorted signal, rich in high-frequency distortion components and of high average level.

Audible peak clipping, then, is your evidence that average power levels are rising and may be only 3 to 6 dB below maximum amplifier output. For a 200-watt amplifier, this means that average levels from 50 to 100 watts are being produced, which would almost certainly damage the usual speaker system. If the listener can tolerate highly audible distortion, even amplifiers of modest capabilities can produce high long-term average outputs. In fact, small amplifiers pushed to beyond their volume capabilities probably damage more speakers than larger amplifiers even at very loud levels. For example, a 50-watt unit will deliver 12 to 25 watts average if clipped program peaks are only 3 to 6 dB above the average. This situation is potentially damaging, especially to system tweeters.

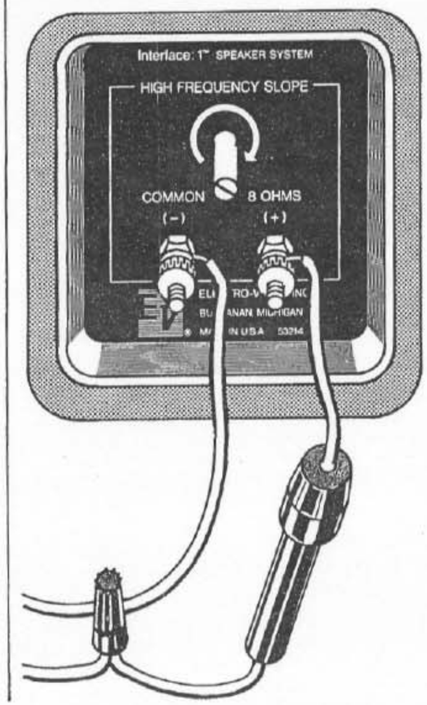
Protection Limitations

If you choose to employ the following recommendation, keep in mind that any speaker protection system is a trade-off between two extremes: guaranteed protection and high listening levels. We feel that our recommendations do not excessively limit listening levels, yet provide a very reasonable assurance of protection. As a result, however, there are conceivably some program materials that fail to actuate the protection circuitry yet result in speaker damage. Our experience indicates that such damage should be rare.

Fusing for Protection

Speaker fusing should rarely be required. However, when the possibility of carelessness or inexperience is combined with high listening levels and large power amplifiers (say, in excess of 60 watts per channel) it is wise to fuse each speaker system.

A Littlefuse brand 3AG "Slo-Blo" fuse of 1-ampere rating is recommended for each Interface:1, 2, or 3 speaker system. This particular fuse has been found to have a good current-versus-time characteristic, allowing higher (yet satisfactorily limited) current for relatively short periods of time and increased protection for more extended periods. (The same Littlefuse type with 3/4-ampere rating is not recommended, since it actually



provides less protection than the 1-ampere version for time periods under four seconds. Also, other brands of slow-blow fuses and standard-blow fuses tend to provide inadequate protection for short time periods and are therefore not recommended).

A fuse should be inserted in one of the speaker leads feeding each system. In-line fuse sockets may be used, or a fuse block may be glued to the rear of each enclosure. Both types of holders are readily available. A typical fuse installation is shown on page 10.

References:

1. For a lucid treatment of live-music sound pressure levels and perceived loudness: C. Stark, "The Dynamic Range of Music," **Hi Fi/Stereo Review**, June, 1968, and C. Stark, "The Sense of Hearing," **Stereo Review**, September, 1969.
2. For a good introduction to the frequency distribution of various program materials: L. Feldman, "Mystery of the Failing Tweeters," **Radio-Electronics**, October, 1976.
3. For an excellent introduction to the audible effect of peak clipping: R. Allison, "Loudspeaker Power Needs," **Stereo Review**, September, 1973.

DETAILED SPECIFICATIONS SUMMARY

The following specifications summary is extraordinarily complete by industry standards, complete enough to warrant some explanation. "Specs" are very popular with audio enthusiasts. They are often treated by manufacturers as a major ingredient in a successful advertising program. Other firms ignore specifications altogether, on the basis that no industry measurement standards exist and, if they did, could not begin to predict how a speaker will sound in your listening room.

At Electro-Voice, we subscribe to neither the "advertising" or "ignore-them" approach to specifications. Our design goal is to design an *accurate* transducer, one which changes the input as little as possible, which makes efficient use of amplifier power, which reproduces the dynamic range and sound pressure levels of live music when called upon to do so, and which sacrifices no single important performance characteristic for another.

The most valuable tool we have to assess our pursuit of accuracy is our ears. We listen to music, live and recorded, and we try to make our speakers *sound like music.* But our listening-based pursuit of accuracy is very much aided by a host of objective measurements. While even a state-of-the-art complete set of measurements cannot predict how a speaker will sound, such measurements are immensely helpful in explaining *why* a speaker sounds as it does, so we can do something about it if necessary.

With this background, we present to you the following detailed specifications summary. A truly complete set of measurements and appropriate commentary is not possible here; some measurements would have to be presented in graphical form to be most meaningful. Nonetheless, you will find these specifications an indication of our commitment to accurate reproduction as well as a useful shorthand guide to what performance you may expect in your listening room.

12.

INTERFACE:1 – EACH SPEAKER SYSTEM
(High Frequency Slope control maximum)

Frequency Response, 1 Meter on Axis, Swept One-Third Octave Random Noise, Half-Space Anechoic Environment
±4 dB 54-18,000 Hz

Total Acoustic Power Output vs. Frequency, Anechoic Environment
±4.5 dB 54-18,000 Hz

Low-Frequency Acoustic Power Output vs. Frequency (Below 100 Hz), Small Signal
3-dB-Down:
54 Hz
10-dB-Down:
44 Hz

Dispersion Angle Included by 6-dB-Down Points, Indicated Bands of Random Noise, Horizontal and Vertical Planes, Anechoic Environment
500-8,000 Hz Octave Bands:
$125^\circ \pm 30^\circ$
16,000 Hz 1/3-Octave Band:
50°

Sound Pressure Level at 1 Meter, 1 Watt into Nominal Impedance, 300-10,000 Hz Average, Anechoic Environment
92 dB

Suggested Amplifier Power Ratings, Continuous Average Power per Channel at 8 Ohms (long-Term Average Power Capacity not to be exceeded)
Minimum:
3.6 watts
Typical:
11 to 36 watts
Practical Upper Limit:
110 watts
Maximum:
200 watts

Long-Term Average Sound Pressure Levels, with Instantaneous Peaks 10 dB above Average, at Midband Frequencies (100-1500 Hz), in Reverberant Field of Typical Living Room (R = 200 square ft), at Indicated Watts per Channel Available
Medium/Loud (90 dB)
3.6 watts
Loud (95 dB)
11 watts
Loud/Very Loud (100 dB)
36 watts
Very Loud (105 dB)
110 watts
Maximum (107 dB)
200 watts

Maximum Long-Term Average Sound Pressure Levels, with Instantaneous Peaks 10 dB above Average, at Indicated Frequencies, in Reverberant Field of Typical Living Room (R = 200 square ft), with Maximum Long-Term Average Power Applied
Midband (100-1500 Hz):
107 dB
10,000 Hz:
91 dB

Long-Term Average Power Capacity at 8 Ohms
54-1500 Hz:
20 watts
1500-20,000 Hz:
20 watts, dropping to
5 watts at 10,000 Hz

Short-Term Power Capacity (10 ms) at 8 Ohms
54-1500 Hz:
200 watts
1500-20,000 Hz:
200 watts, dropping to
50 watts at 10,000 Hz

Half-Space Reference Efficiency
1.3%

Maximum High-Frequency Acoustic Power Output (10,000 Hz)
Long-Term:
.0065 watts
Short-Term (10 ms):
.065 watts

Maximum Midband Acoustic Power Output (100-1500 Hz)
Long-Term:
.26 watts
Short-Term (10 ms):
2.6 watts

Crossover Frequencies
Acoustic:
76 Hz
Electrical:
1500 Hz

Impedance
Nominal:
8 ohms
Minimum:
5 ohms

Transducer Compliment
8" dynamic woofer
2-1/2" cone tweeter

Controls
High Frequency Slope,
continuously variable

Dimensions
11-1/2 in X 21-1/4 in X 10-1/2 in deep

Cabinet
Simulated walnut-grained vinyl

Net Weight
23 lb

13.

INTERFACE:2 – EACH SPEAKER SYSTEM
(High Frequency Slope control maximum)

Frequency Response, 1 Meter on Axis, Swept One-Third Octave Random Noise, Half-Space Anechoic Environment
±4 dB 47-18,000 Hz

Total Acoustic Power Output vs. Frequency, Anechoic Environment
±4.5 dB 47-18,000 Hz

Low-Frequency Acoustic Power Output vs. Frequency (Below 100 Hz), Small Signal
3-dB-Down:
47 Hz
10-dB-Down:
39 Hz

Dispersion Angle Included by 6-dB-Down Points, Indicated Bands of Random Noise, Horizontal and Vertical Planes, Anechoic Environment
500-8,000 Hz Octave Bands:
$125^\circ \pm 30^\circ$
16,000 Hz 1/3-Octave Band:
50°

Sound Pressure Level at 1 Meter, 1 Watt into Nominal Impedance, 300-10,000 Hz Average, Anechoic Environment
92 dB

Suggested Amplifier Power Ratings, Continuous Average Power per Channel at 8 Ohms (Long-Term Average Power Capacity not to be exceeded)
Minimum:
3.6 watts
Typical:
11 to 36 watts
Practical Upper Limit:
110 watts
Maximum:
200 watts

Long-Term Average Sound Pressure Levels, with Instantaneous Peaks 10 dB above Average, at Midband Frequencies (100-1500 Hz), in Reverberant Field of Typical Living Room (R = 200 square ft), at Indicated Watts per Channel Available
Medium/Loud (90 dB)
3.6 watts
Loud (95 dB)
11 watts
Loud/Very Loud (100 dB)
36 watts
Very Loud (105 dB)
110 watts
Maximum (107 dB)
200 watts

Maximum Long-Term Average Sound Pressure Levels, with Instantaneous Peaks 10 dB above Average, at Indicated Frequencies, in Reverberant Field of Typical Living Room (R = 100 square ft), with Maximum Long-Term Average Power Applied
Midband (100-1500 Hz):
107 dB
10,000 Hz:
91 dB

Long-Term Average Power Capacity at 8 Ohms
47-1500 Hz:
20 watts
1500-20,000 Hz:
20 watts, dropping to
5 watts at 10,000 Hz

Short-Term Power Capacity (10 ms) at 8 Ohms
47-1500 Hz:
200 watts
1500-20,000 Hz:
200 watts, dropping to
50 watts at 10,000 Hz

Half-Space Reference Efficiency
1.3%

Maximum High-Frequency Acoustic Power Output (10,000 Hz)
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Short-Term (10 ms):
.065 watts

Maximum Midband Acoustic Power Output (100-1500 Hz)
Long-Term:
.26 watts
Short-Term (10 ms):
2.6 watts

Crossover Frequencies
Acoustic:
66 Hz
Electrical
1500 Hz

Impedance
Nominal:
8 ohms
Minimum:
5 ohms

Transducer Compliment
10" low-frequency radiator
8" dynamic woofer
2-1/2" cone tweeter

Controls
High Frequency Slope,
continuously variable

Dimensions
13-3/4 in X 24-1/2 in X 11-1/4 in deep

Cabinet
Simulated walnut-grained vinyl

Net Weight
28 lb

INTERFACE:3 – EACH SPEAKER SYSTEM
(High Frequency Slope control maximum)

Frequency Response, 1 Meter on Axis, Swept One-Third Octave Random Noise, Half-Space Anechoic Environment
±4 dB 40-18,000 Hz

Total Acoustic Power Output vs. Frequency, Anechoic Environment
±4-1/2 dB 40-18,000 Hz

Low-Frequency Acoustic Power Output vs. Frequency (Below 100 Hz), Small Signal
3-dB-Down:
40 Hz
10-dB-Down:
34 Hz

Dispersion Angle Included by 6-dB-Down Points, Indicated Bands of Random Noise, Horizontal and Vertical Planes, Anechoic Environment
500-8,000 Hz Octave Bands:
$125^\circ \pm 30^\circ$
16,000 Hz 1/3-Octave Band:
50°

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Loud/Very Loud (100 dB)
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Very Loud (105 dB)
110 watts
Maximum (107 dB)
200 watts

Maximum Long-Term Average Sound Pressure Levels, with Instantaneous Peaks 10 dB above Average, at Indicated Frequencies, in Reverberant Field of Typical Living Room (R = 200 square ft), with Maximum Long-Term Average Power Applied
Midband (100-1500 Hz):
107 dB
10,000 Hz:
91 dB

Long-Term Average Power Capacity at 8 Ohms
40-1500 Hz:
20 watts
1500-20,000 Hz:
20 watts, dropping to
5 watts at 10,000 Hz

Short-Term Power Capacity (10 ms) at 8 Ohms
40-1500 Hz:
200 watts
1500-20,000 Hz:
200 watts, dropping to
50 watts at 10,000 Hz

Half-Space Reference Efficiency
1.3%

Maximum High-Frequency Acoustic Power Output (10,000 Hz)
Long-Term:
.0065 watts
Short-Term (10 ms):
.065 watts

Maximum Midband Acoustic Power Output (100-1500 Hz)
Long-Term:
.26 watts
Short-Term (10 ms):
2.6 watts

Crossover Frequencies
Acoustic:
57 Hz
Electrical:
1500 Hz

Impedance
Nominal:
8 ohms
Minimum:
5 ohms

Transducer Compliment
12" low-frequency radiator
8" dynamic woofer
2-1/2" cone tweeter

Controls
High Frequency Slope, continuously variable

Dimensions
14-3/4 in X 26-3/4 in X 12-1/2 in deep

Cabinet
Simulated walnut-grained vinyl

Net Weight
33 dB

CUSTOMER SERVICE

Shipping Damage
Electro-Voice products are packed to provide protection well in excess of the shipping requirements of the Interstate Commerce Commission. Responsibility for delivery in good condition was accepted by the carrier, and therefore any damage claims must be made by the receiver against the carrier. If shipping damage has occurred, contact the carrier immediately, requesting inspection and instructions; or contact the dealer from whom the unit was purchased.

Reshipment
We strongly encourage you to retain all packaging materials for possible future use. Only original packaging materials are certain to provide full protection, whether used for units requiring service or simply for normal household moving. Bear in mind that a carrier can refuse a damage claim if *they judge* substitute packaging to be inadequate.

When necessary, Electro-Voice can supply replacement packaging for a nominal charge. Contact the Service Department.

WARRANTY (Limited)
Interface:1, 2, and 3 are guaranteed against malfunction due to defects in workmanship and materials. If such malfunction occurs, Interface:1, 2, or 3 will be repaired or replaced (at our option) as follows:

Speaker systems will be repaired or replaced without charge for parts or labor for a period of five years from date of original purchase.

All units must be delivered prepaid to the proper Electro-Voice service facility and will be returned prepaid. Warranty does not cover finish or appearance items or malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

For instructions on return of Electro-Voice products for repair to the factory or authorized service agencies, please write: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan, 49107 (Phone 616/695-6831) or 7473 Avenue 304, Visalia, CA 93277 (209/625-1330,-1).

Electro-Voice also maintains complete facilities for non-warranty service.