CONCEPT CE-1

Owner's Manual

Introduction

Thank you for choosing the Concept Constant Energy Heil Air-Motion Transformer speaker sustem. We think you'll most appreciate CONCEPT if you understand its design philosophy, so before you set up your speakers, take a few minutes and read this manual. It contains all the necessary hook-up information, plus a technical discussion of what makes the CONCEPT Constant Energy speaker the latest step towards achieving the ultimate in sound reproduction.

Placement Connections

For the ideal “stereo image, ” your speakers should be facing the same direction, at the same distance from your main listening area, and at least 5 feet apart. The Constant Energy Heil Air-Motion Transformer of the Concept CE-1 is a very wide dispersion *bipolar* high-frequency radiator, projecting equal amounts of energy to the front and rear, and also considerable energy to the sides and top. This additional radiation provides the spaciousness and depth necessary for truly accurate sound reproduction, so try to avoid placing the speakers against a wall with very absorbent surfaces such as draperies. The optimum distance from a wall will depend on your particular room acoustics; if possible, experiment with the placement. Corner placement is not recommended because it may overemphasize and color the bass output, and could also cause some undesirable reflections at the midrange and high frequencies.

We recommend that you use 18-gauge lamp cord ("zip cord”) to connect your K speakers to your amplifier or receiver. Lighter-gauge wire has more electrical resistance and its use will restrict the flow of current to the speaxers, impairing the high frequencies. If you need more than 50 feet of wire to reach a speaker, use heavier, 16-gauge cord. (You can use heavier wire for shorter runs too.) Both 18 and 16-gauge cord are readily available at hardware stores.

The connecting terminus are located on the rear of the speaker. To make the connection, clip off *only* ’/4-inch of insulation. Twist strands tightly, press in on movable part of the terminal and insert the bare wire in hole at the back of the terminal. Release the terminal; the spring loading provides a safe, positive connection.

Connect the right-hand speaker to the right-channel terminals on the amplifier or receiver. Make sure the red speaker terminal is connected to the + terminal (usually also red) on the receiver. The black speaker terminal should be connected to the –

receiver terminal (usually also black). Follow the same procedure in connecting the left-hand speaker to the left-channel receiver terminals. This will insure that your speakers are connected *in phase,* working together, not in opposition. Speaker cord either has ridges or a different color showing through on one side of the insulation, so you can easily identify which side is + and which is -.

Speakers that are connected out of phase will lack proper bass response; if you have any doubts, the following listening test will help. First aim the speakers toward each other and angled a little toward the listening area. With a stereo record playing, slightly advance the bass control of your receiver, and switch between stereo and mono. If there seems to be less bass in the mono position, *turn off* the receiver, reverse the leads at *one* speaker and repeat the test. When the quantity of bass seems similar in stereo *and* mono, the speakers are phased correctly.

Multiple Speaker Connections

Because the CONCEPT CE-1 has a nominal impedance of 6 ohms, *avoid* prolonged, simultaneous operation of other speakers connected to the "B'' or “C terminals on your receiver. These terminals are always in a parallel circuit configuration with the "A" terminals, and when speakers are connected in parallel, their total impedance is *lowered.* Any speaker in parallel with the Concept CE-1 will present a total impedance below the 4-ohm safe minimum of your amplifier or receiver. Only use the speakers on *one* channel to determine total impedance, using the following formula:

$$\frac{\text{Impedance A} \times \text{Impedance B}}{\text{Impedance A} + \text{Impodance B}} = \text{Impedance total}$$

For example, using the 6-ohm CONCEPT in combination with an 8-ohm speaker would give you a total impedance of

IT! ‘ i! = 3.43 ohms.

Transistorized receivers and amplifiers are not designed for sustained or high volume operation into impedances of less than 4 ohms.

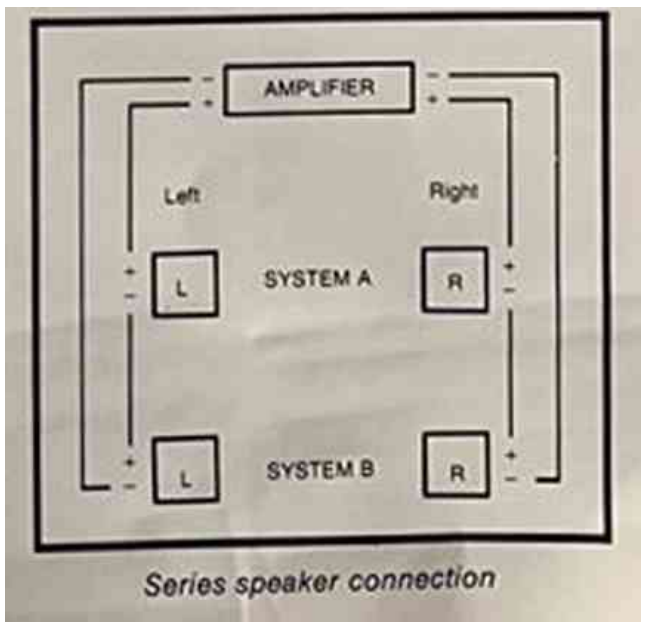
If you require operating a second pair of speakers, you can connect them in a *series* circuit configuration, using only *one* set of speaker connections on your amplifier or receiver (see illustration). The total impedance of a series circuit equals the combined impedances of the speakers (Impedance A + Impedance B = Impedance total), e.g. an 8-ohm speaker in combination with the 6-ohm Concept in a series circuit will present a total impedance of 14 ohms. This is a perfectly safe load for any amplifier. Be aware, however, that the greater impedance of a series circuit will somewhat reduce the available power from a transistorized amplifier or receiver. You will also lose the capability to switch one pair off.

The Concept CE-1 has midrange and high frequency level controls located in the aluminum panel below the grille. These are not *ordinary* tone controls, but rather are provided to let you compensate for your room acoustics. The *f* = position of the controls provides flat frequency response, or constant energy, under laboratory conditions; your room may well differ from the ideal and some adjustment of the controls could be desirable.

Room Acoustics

A room with hardwood floors, plaster walls, non-upholstered furniture and lightweight (or no) curtains would be considered acoustically "live." Such a room has a highly active reverberant sound field; sounds produced there are emphasized and may seem “brittle" or "hard." A bathroom shower is an exaggerated example of an extremely "live" room.

On the other hand, a living room with thick carpets, heavy drapes and stuffed furniture will tend to be acoustically "dead,” with an insufficient reverberation



Series speaker connection

field. Sounds will seem “soft or “dull." Most living rooms are somewhere in between the above extremes; the ideal room would have equal amounts of absorptive and reflective surfaces, and they would be opposite each other. For instance, if the ceiling were hard plaster, the floor would be carpeted; a bare wall would face one with heavy drapes.

Use the level controls to compensate for your room. If it's “live,” reduce the appropriate energy levels by turning the controls down from the *f* = position; if “dead," you will probably want to turn the controls past *f* =. The CONCEPT CE-1 level controls incorporate sufficient adjustment to provide satisfactory frequency response in almost any room. Because of the CE-1’s exceptionally accurate frequency balance over a very wide dynamic range, it is generally not necessary to use the loudness control on your amplifier or receiver.

You can also use the level controls to compensate for your other components. The Constant Energy Heil Air-Motion Transformer is accurate to such a degree that it will not mask hitherto unsuspected faults in associated equipment, such as crossover notch distortion in an amplifier or mistracking of a pickup. You may want to slightly reduce the high frequency level control of the CE-1 to make your system more listenable.

Power Monitors

The front panel also has a pair of LED Power Monitors, which give instantaneous indication of the power being fed to the speaker. The green LED will begin to flash at an input of 2 watts, and will flash more frequently as the input increases. At an input of 10 watts, the green LED will glow steadily. The red LED will begin to flash at a 28-watt input, and will reach a steady glow at 75 watts. Be assured that a steady input of 75 watts will drive the CONCEPT to an *extremely* loud sound level (about 105 to 107 dB at a six-foot distance). Very little music will ever require more than a momentary input of 75 watts, or an *instantaneous* input of 150 watts. The speaker can be played with the red LED just at the beginning of its “constantly on" point for 30 to 40 minutes before it will sustain damage. The speaker may, however, be played indefinitely at the level at which the red LED begins to flicker (about 101 to 102 dB) in an average room), as for a party in a large room.

Do not greatly increase the volume beyond the level at which the red LED remains on constantly. Also, do not use high power sine wave test tones; they are far more demanding than music. If you have a high-powered amplifier or receiver, we recommend using caution when tuning between stations, switching between functions, or cleaning the stylus. Turn the volume down in these instances. Always turn the power off when chanqinn input leads.

High Frequency Driver

The CONCEPT CE-I employs a specially constructed Constant Energy Heil Air-Motion Transformer to cover the frequency ranqe from 1500 Hz to 23 kHz — well beyond audibility. The special Heil Air-Motion Transformer is the most accurate high-frequency transducer in existence, and the only one that can approach the performance level of today's best electronics. The CONCEPT CE-1 Constant Energy Heil Air-Motion Transformer has been designed to produce a highly desirable comb-filter frequency distribution for unmatched spaciousness and depth. In addition, the driver has no resonances of its own which helps it reproduce the input with absolute clarity.

The radiating diaphragm of the Heil is a sheet of very thin, nearly weightless teflon film covered with conducting strips of 0.7 mil (.0007") aluminum. The diaphragm is pleated, much in the manner of living room draperies, and is totally contained between the poles of a powerful 6V2-pound (2.95 kg) magnet assembly.

When the electrical current of the audio signal is passed through the conducting strips, the plej*® alternately narrow and widen.

Information

The rate at which the pleats open and close varies directly with the frequency of the audio signal. As the pleats narrow, air is squeezed out, and this air movement generates the sound. The Heil Air-Motion Transformer, like other loudspeakers, is a transducer; that is, it converts one form of energy to another (from electrical to acoustic). It is also called a transformer, because it produces air-motion 5.3 *times greater* than its own movement. This ‘‘transformation ratio” results in extraordinarily high efficiency, and the extremely lightweight diaphragm gives the Concept air-motion transformer near-perfect transient response.

The aluminum conducting strips cover over 50% of the actual radiating surface of the Heil, resulting in an evenly applied driving force totally within the magnetic field, as well as high power-handling capability. The audible benefit of this is very wide dynamic range with exceptional linearity, hence the designation Constant Energy. Even the best conventional tweeters are actually driven over a small fraction of their radiating area, and inevitably exhibit phase distortion in addition to poor linearity. Distortion in the Constant Energy Heil driver is quite low — so low, in fact, that it approaches the excellent performance of top amplifiers.

Another advantage of the ingenious Constant Energy air-motion transformer is that it can achieve its great dynamic range without sacrificing the small radiating area necessary for good dispersion and accurate stereo imaging. In addition, the CE-1's Constant Energy driver is a bipolar radiator, with significant amounts of energy dispersed laterally and vertically as well. We engineered the CONCEPT CE-1 enclosure to take full advantage of this wide, 120° horizontal radiation pattern.

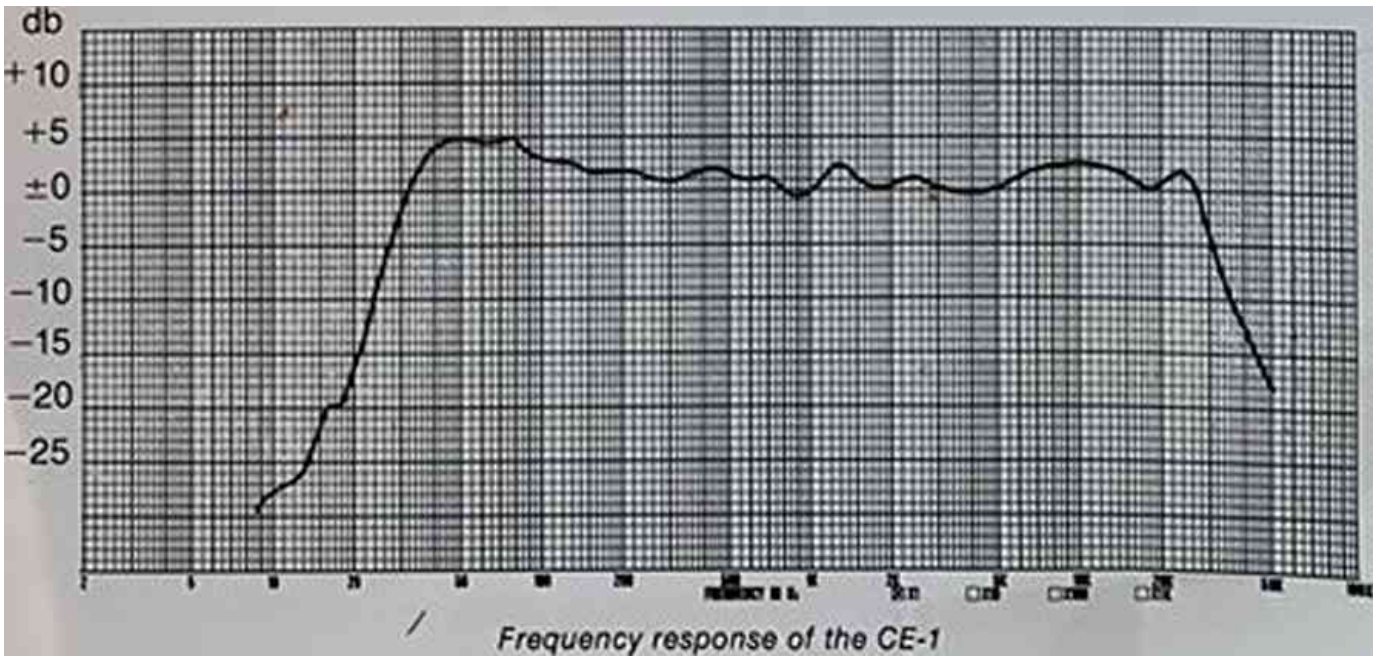
Low-Frequency Driver And Passive Radiator

Frequencies below 1500 Hz are handled by a 10-inch woofer and reinforced by a 12-inch mass-loaded passive radiator at the lowest octaves. The woofer incorporates a 1 Vi-inch copper voice coil, bonded with high-temperature epoxy on a precision aluminum form. The woofer with its powerful magnet assembly is constructed with a die-cast aluminum frame to minimize uncontrolled resonances inherent in stamped-basket speakers. It assures long-term adherence to the close CONCEPT tolerances.

The CONCEPT CE-1 utilizes a passive radiator to achieve the profound low bass normally associated with the finest acoustic suspension designs *and* the high efficiency typical of vented or ported enclosures. Careful design eliminates both back-wave *coloration and* fatiguing resonances. The passive radiator is specifically calibrated to the back wave *of* the woofer to reinforce low frequency output below 100 Hz and maintain efficiency. The passive driver itself is a low-resonance styrene foam laminated to a damping skin, and it is also mounted in a die-cast aluminum frame. Bass response of the CONCEPT CE-1 is essentially flat down to 30 Hz.

Crossover Network

Optimal blending of the Constant Energy Heil driver with the low-frequency driver is achieved by a 3-pole crossover network that rolls off the response of the Heil driver at an unusually steep 18 dB/octave below 1500 Hz. The response of the 10-inch woofer is more gently rolled off at 6 dB/octave above that frequency. These slopes are calculated to permit constant energy response and maintain the drivers in perfect phase.

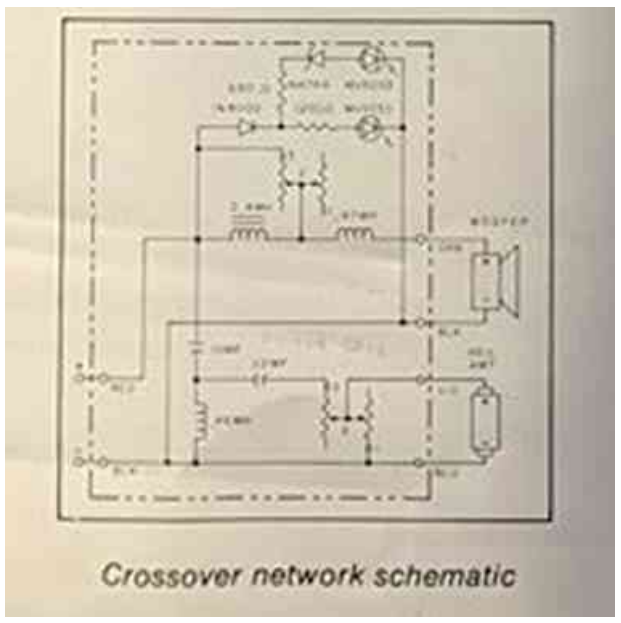


Frequency response of the CE-1

InCase of Difficulty

The precision elements in the 18 dB/octave portion of the crossover consist of two high-voltage capacitors for long life, and an air-core coil to avoid saturation losses. The 6 dB/octave portion utilizes both an air-core coil and a high-density iron-core choke. The high-frequency wire-wound level control adjusts shelving: any change in the control setting adjusts the energy output of the Heil driver evenly over its entire frequency range. At its maximum setting, the control produces a slightly rising response. The midrange wire-wound level control acts only on the upper range of the 10-inch driver; the control permits a gradual rolloff at 3 dB/octave above about 300 Hz. The control produces a slightly rising response above that frequency at its maximum setting.

The crossover network design assures a proper electrical relationship. The physical position of the drivers is calculated so that the radiating surfaces are on the same plane, assuring phase coherency over the entire range of the speaker. The elimination of time-delay distortion contributes significantly to the clarity and absolute realism of the CONCEPT CE-I.



Crossover network schematic

If trouble develops in your CONCEPT speaker, first check all system connections, and amplifier or receiver fuses and protection circuits. It is highly improbable that both speakers could fail simultaneously; no sound at all is a certain indication of malfunction in associated equipment.

If just one speaker seems to have failed, you can ascertain whether the trouble is in the speaker or another component by switching the leads to the right and left channel speakers. If the speaker still exhibits the same behavior, the speaker may be at fault. However, if the *other* speaker now malfunctions, the trouble is in an associated component. If your tests indicate a speaker failure, consult your Concept dealer.

To spare you the possible trouble of transporting the whole, heavy speaker system, the CE-1 driver elements have been designed for easy removal. However. DO NOT REMOVE A DRIVER UNLESS SO INSTRUCTED BY YOUR CONCEPT DEALER.

To remove the Air-Motion Transformer, first remove the front grille by gently pulling along the edges. Then reach inside and push out along the edges of the top grille to release the Velcro fasteners holding it; remove the top grille. The Heil driver can be removed by first removing the two Phillips-head bolts that fasten it to the cabinet. These are located behind the driver, on metal tabs that protrude from the driver assembly. The leads from the crossover are connected to the driver with a plug attached to the rear of the driver. Disconnect the leads by inserting a finebladed screwdriver (or knife) into the hole above each lead to release the catch, then gently pull the lead away from the plug. The leads are color-coded; to reconnect, simply match the colors. Be careful not to touch the Heil diaphragm during this operation, and *never* attempt to remove the diaphragm from the driver assembly. Such an attempt requires a special tool and in any case could void your warranty.

The woofer may also be carefully unscrewed and the leads unplugged. Hold the woofer *only* by its frame; *never* touch the cone area. To reconnect, the green lead is positive (+) and should be matched to the red dot on the woofer assembly. Be careful when remounting the woofer that your screwdriver does not slip and damage the woofer cone.

The design of the passive radiator precludes malfunction.

A failure of the crossover network requires special test equipment, and you should not attempt to remove it yourself.

Consult your CONCEPT dealer in the unlikely event of trouble, and *before* you remove any of the speaker elements.

The cabinet of the CONCEPT CE-1 is finished in a handsome oiled walnut veneer. The fine finish can be maintained by a periodic furniture-finish treatment such as a non-aerosol linseed oil.

Do not use silicone-based spray polish (such as Pledge); this will eventually harm the veneer.

You can gently vacuum the grille to remove dust.

Years of research have preceded this final production version of the CONCEPT CE-1. Every transducer design available or in development underwent exhaustive laboratory and listening tests, and it became clear that the Constant Energy Heil Air-Motion Transformer was without a doubt superior. Further tests on many prototypes were done to engineer the exact drivers and crossover that worked best with the Constant Energy speaker. The result is your CONCEPT CE-1, designed for the most accurate sound reproduction possible. In keeping with the CONCEPT tradition, unusual care has also been taken with the appearance. The handsome enclosure has been finished in genuine oiled walnut veneer, and the grille material was carefully chosen for the optimum acoustical and visual properties.

Only a most exceptional speaker could bear the CONCEPT name. The CE-1 is the ultimate in sound reproduction.

Frequency response: ±3 dB
30 Hz•23kHz
Minimum dispersion: 30° vertical.
120° horizontal, up to 23 kHz
Minimum power required: 20 watts
RMS at less than 0.3% THD
Maximum power capacity: 280 watts
unclipped music power
Power indicators: Dual LED s
Efficiency: 91 dB at 1 meter, with
1 watt input
Crossover frequency: 1.5 kHz
Roll-off: 6 dB/octave woofer;
18 dB/octave Heil air-motion
transformer
Range of controls:
Midrange 300 Hz - 3 kHz;
High freq. 2.3 kHz-23 kHz
Woofer:
Size = 10 in. (25.4 cm)
Frame = cast aluminum
Magnet = 20 oz. (.56 kg)
Flux density = 11,500 gauss
“Constant Energy” Heil air-motion transformer:
Radiating pattern bipolar
Magnet = 6.5 lb. (2.95 kg)
Flux density = 5.100 gauss
Transformation ratio = 5.3 to 1
Passive radiator:
Size = 12 in. (30.48 cm)
Material = open cell foam (6.4
mm); styrene foam (1.2 mm)
Overall dimensions:
Height = 40 in. (101.6 cm)
Width = 15% in. (39.7 cm)
Depth = 15 in. (38.1 cm)
Finish: hand-rubbed oiled walnut
Weight: 85 lbs. (38.6 kg)
Shipping weight: 91 lbs. (41.3 kg)

Limited Warranty

Your CONCEPT speaker is protected with a limited warranty against defects in materials and workmanship, effective for 3 years from your purchase date. During that time, authorized CONCEPT dealers will make all necessary repairs and parts replacement, free of charge.

Your purchase receipt must be retained and presented as proof of ownership when requesting warranty repairs.

The following conditions and/or occurrences will void the warranty:

Serial number removed or defaced:

Alteration, misuse, accident or neglect;

Service performed by unauthorized persons.

Exceptions to this warranty are transportation costs and charges for unauthorized service which are not reimbursable under this warranty.

CONCEPT assumes no liability for property damage of any sort which may result from the failure of this speaker. Any warranties implied by law are limited to the duration of this express limited warranty.

Some states do not allow exclusion or limitation on incidental or consequential damages, or time limitation on implied warranties. Therefore, some or all of this section may not apply to you. This warranty provides you with specific legal rights and you may also have other rights, which vary from state to state.

Authorized service for your CONCEPT speaker is available most rapidly at Pacific Stereo stores. Check the Yellow or White Pages of your telephone directory for the location nearest you. If additional assistance is required, please write to CONCEPT at the address provided below and describe the malfunction. CONCEPT will send directions in writing.

Service Manager
CONCEPT
CBS Inc.
1601 W. Glenlake Avenue
Itasca, Illinois 60143

CONCEPT

The Ultimate in Sound Reproduction

BS Inc. 1601 W. Glenlake Ave., Itasca, Illinois 60143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CONCEPT
WANT TO RELAX TO BEAUTIFUL MUSIC
WELCOME
WE HAVE GOOD HIFI AT YOUR SERVICE
PLEASE WAIT HERE & A MEMBER OF OUR TEAM WILL BE WITH YOU SHORTLY.
Or press finger HERE