The Citation Thirteen

Omnidirectional Speaker System

harman kardon

Instruction Manual

Introduction

Your new Harman-Kardon Citation Thirteen speaker represents a departure from conventional tranducer design. It has been developed to take full advantage of either vacuum tube or transistor amplifiers and will deliver absolute realism in music and voice reproduction.

The Citation credo is quite basic: faithfulness in music reproduction is not merely a compilation of impressive specifications. Final judgement always comes from listener appreciation and the ability to enjoy many hours of music without strain and fatigue.

Strict application of this principle has resulted in the design of a unique speaker system that is impressive in its unobtrusiveness. The Citation Thirteen speaker cannot be described as brilliant or deep-throated. In fact, it has virtually no characteristic sound of its own. It is not a "high fidelity" system which goes beyond reality to impart super-projection and super-clarity to the sound. The Citation Thirteen speaker offers superlative instrument definition realistically reproducing the shimmer of the violins, the snarl of the brasses and the full impact of the tympani with amazing lifelike clarity. These unusual performance capabilities are the result of Harman-Kardon's uncompromising approach to sound reproduction.

Technical Information

Sound distribution of the Citation Thirteen speaker is multi-directional in all planes through use of uniquely designed speaker cones and a novel method of mounting the drivers in the upper section of the baffle. All drivers are fastened to a thick, non-resonant mounting board which is tilted at 14 degrees off the horizontal plane. This equalizes transit time at the mid and high frequencies and produces a natural blending of direct and reflected sound for the proper spatial representation of instrument placement in the orchestra.

Three 7" low frequency drivers are loaded by a double-chambered enclosure which makes it possible for the speaker to reproduce bass frequencies down to 30 hertz without doubling. By tuning the double chambers an octave apart, the higher frequency creates acoustic loading in the middle bass region, while the lower frequency maintains loading down to a suitable low frequency limit. One of the most important advantages of a well-designed double-chambered system is that the leveling-out of impedance is a result of acoustic loading on the speaker cone. This increases efficiency while lowering distortion—a significant and worthwhile combination. The degree of pressure loading is such that the whole forces acting on the cone at resonance are many times greater than the forces acting on the cone due to its own suspension. Low frequency mechanical resonance of the drivers are therefore completely damped out and no longer are an active parameter in the speaker's performance.

The enclosure is constructed of high density, 1" non-resonant particle board and all internal tolerances are held to close design specifications. Special bracing in employed to control panel resonance and flexing which could result in the loss of bass clarity.

Warranty/Service Policy

POLICY

We warrant each Citation Thirteen Speaker to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions set forth below. Should a defect occur within the period specified, and provided that the unit is returned to either HARMAN-KARDON or an authorized HARMAN-KARDON warranty station, transportation prepaid, and which our examination shall disclose to our satisfaction to be defective, we will:

a) For a period of one (1) year from date of purchase either replace or repair and install any defective parts of the speaker free of charge.

b) After the first year, until five (5) years from date of purchase either replace or repair any defective parts of the speaker charging only for labor.

UNPACKING

After you have unpacked your Citation Thirteen speaker, inspect it carefully for signs of transit damage. The speaker was subject to numerous quality control inspections prior to packing and should therefore be in perfect condition. If damage is visible, please notify your dealer at once. If the speaker was shipped to you, notify the transportation company. Harman-Kardon will cooperate with you in such instances, but only you can file claim with the carrier for damages incurred during shipment.

REGISTRATION

To obtain service under the terms of this policy, it is necessary to return the enclosed warranty card for "factory validation" within ten (10) days from the date of purchase.

This card will be assigned a "warranty registration number" and returned to you. If service is required within the warranty period, it is mandatory that the validated card or the warranty registration number be presented or your warranty will not be honored.

EXCEPTIONS

This warranty does not include any obligation as to

a) Repair or replacement of the speaker cabinet or grill cloth.

b) transportation charges to and from the factory or an authorized warranty station.

This warranty is not applicable to any speaker which shall have been repaired or altered in any way so as, in our judgment, to affect its stability or reliability or has been subject to neglect, misuse, abuse, negligence, or accident; or which has had the serial number altered, effaced or removed.

Neither shall this warranty apply to any speaker which has been connected other than in accordance with instructions furnished by us.

SERVICE

HARMAN-KARDON has a special customer service division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write to us at any time and we shall endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts, we may wish to refer you to a local authorized repair agency or we may prefer to authorize the return of your unit to the factory. In the event it must be returned, an authorization form and proper packing instructions will be forwarded to you. This authorization form, together with the warranty registration number, MUST BE RETURNED with your unit.

UNDER NO CIRCUMSTANCES SHOULD YOUR UNIT BE SHIPPED TO THE FACTORY WITHOUT PRIOR AUTHORIZATION.

This warranty is in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this speaker.

OMNIDIRECTIONAL DISPERSION

WHAT DOES IT MEAN? HOW DOES IT WORK? CAN ONE HEAR THE DIFFERENCE? WHY IS IT SUPERIOR TO DIRECT SOUND?

A practical guide to omnidirectional sound is to state that the common light bulb used universally is "Omnidirectional". Conversely, an automobile headlight is directional.

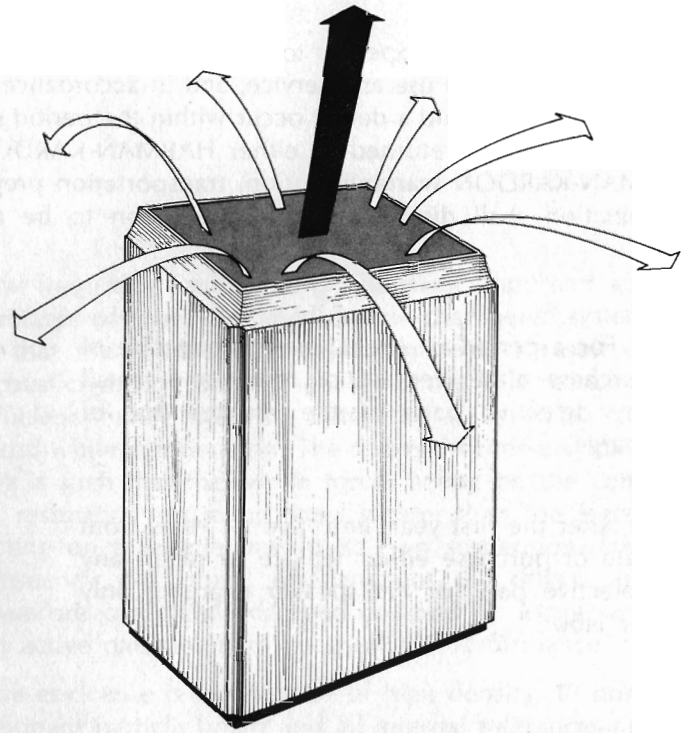
The sonic beam from conventional loud speakers is similar to the light beam of an automobile headlight: It is narrow and direct. This bears little relationship to the beam or wave shape produced by musical instruments, which is radial, spherical, omnidirectional.

Sonically, there is no front or back to a flute, piano violin, french horn, kettledrum, triangle, tuba or bassoon. The sound pattern produced by musical instruments is omnidirectional, similar to the light pattern produced by the ordinary light bulb which radiates light over its entire surface.

Approximately 80% of the sound one hears in the concert hall is generated in this manner; the sound on stage being bounced and reflected off the floor, walls and ceiling, result in a full frequency response in all seating areas of a concert hall. The sound may not be absolutely uniform, but it spreads out the full width, depth, and height of the hall. Which is what happens with the light bulb, and sonically is what happens with the new Citation Thirteen omnidirectional speaker.

Imagine trying to light your room with a headlight. You would have one bright spot. Conventional speakers set up for stereo are not much better. They produce two bright hot spots of sound. The measured sound pattern of the Citation Thirteen, however, is much like the light bulb. As a result you are no longer bound by old rules as to "absolute", or "correct" placement for stereo. In most cases you may suit convenience and in some situations solve problems where suggested placement is impossible. Don't regard the Citation Thirteen's as separate left and right speakers,

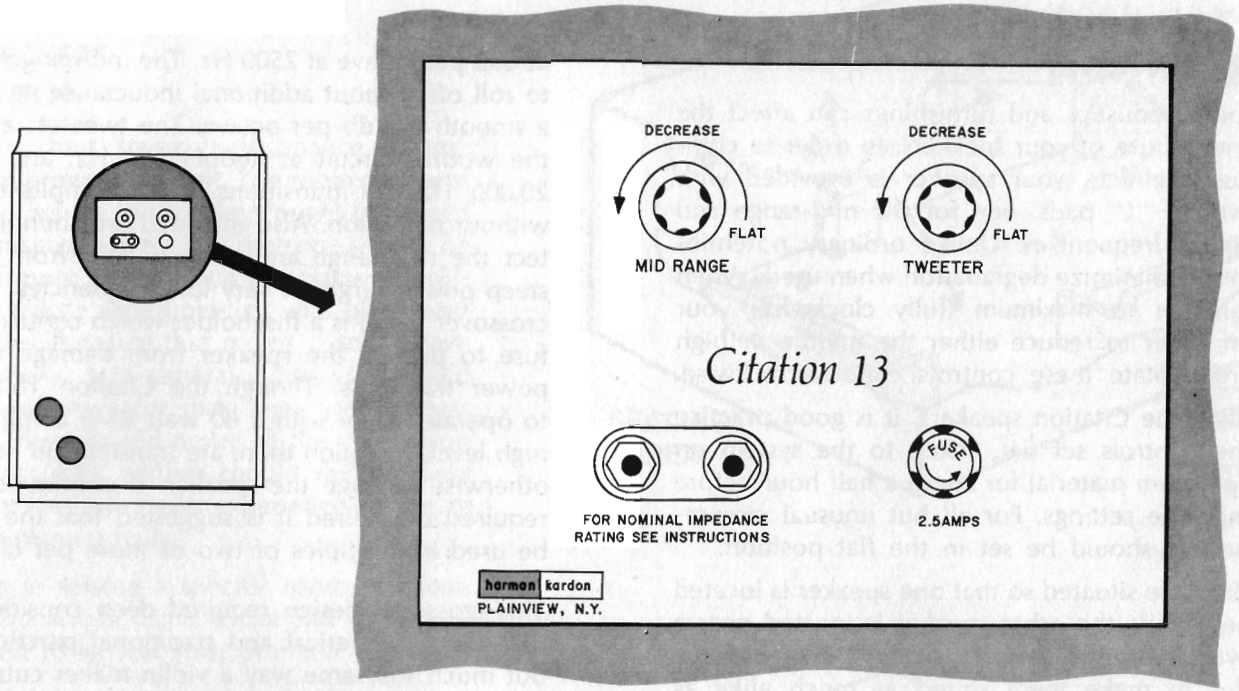
ILLUSTRATION #1



but as a continuous left-all-the-way-to-right sound front; a spacious distribution of all frequencies in all planes to fill your room with natural sound.

Illustration #1 shows the general acoustic radiation pattern of the Citation Thirteen loudspeaker. The main axis is slightly stronger (dark arrow) and the hollow arrows indicate a more consistent or uniform energy characteristic. Due to the 14 degree vertical presentation and the diffraction effect of the enclosure design, the main axis, as finally heard, will be weakened to equal the uniformity of the other reflections and radiation from the speaker; resulting in an omnidirectional display acoustically akin to that of musical instruments.

ILLUSTRATION #2



SPEAKER CONNECTIONS

Illustration #2 shows a rear view of the Citation Thirteen crossover network to which you will make your connections to the amplifier with the appropriate speaker cable and also adjust the brilliance of the mid-range and tweeter by means of the two variable controls.

The special terminals on the rear of your speaker are extremely versatile and can accommodate several different types of connectors. Observe polarity between the speaker and the power amplifier or receiver.

1. Using heavy connecting wire (#16 or #18) measure the length required to connect the speaker to the amplifier.
2. Strip and twist each wire at the ends of the two conductor speaker cable.
3. Connect one end of the cable (one wire) to the + output terminal (RED) and the other wire to the — output terminal (BLACK) of the speaker. The other end of the cable should be connected to the rear speaker terminals of your amplifier. Be sure to observe polarity. (Speaker + to amplifier + and speaker — to amplifier —).
4. Repeat the above procedure when connecting your second speaker to the system.

You will notice also, in the lower left rear, two 3″ holes covered with a cloth mesh. These are the ducts from the two chambers and should never be obstructed. A 2″ clearance from the wall is sufficient.

REAR SPEAKER CONTROLS

Differences in room acoustics and furnishings can affect the balance and sound texture of your speakers. In order to compensate for acoustic effects, your speaker is provided with two dual wire wound "L" pads, one for the mid-range and the other for higher frequencies. Unlike ordinary potentiometers, these controls minimize degradation when used. When these controls are set to maximum (fully clockwise) your speaker is flat. In order to reduce either the middle or high frequencies, merely rotate these controls counter-clockwise.

When first installing the Citation speakers, it is good practice to listen with the controls set flat. Listen to the system on various types of program material for about a half hour before deciding to change the settings. For all but unusual circumstances these controls should be set in the flat position.

If your two speakers are situated so that one speaker is located near heavy drapes, while the other speaker is located near a hard reflective wall, the adjustment for each speaker will be different in order to make them sound as much alike as possible.

CROSSOVER NETWORK

The crossover network is a module which is built with heavy duty, close tolerance components. Electrically it is a two way branch circuit. The woofers are blended into the mid-range at 6dB per octave at 2500 Hz. The mid-range dome is designed to roll off without additional inductance at about 9000 Hz, at a smooth 7-8 db per octave. The tweeters are branched from the woofer circuit at about 7500 Hz, and have a range to 20,000 Hz. All transitions are accomplished smoothly and without distortion. Also included are shunting chokes to protect the mid-range and tweeter coils from burn out due to steep power surges at very low frequencies. Accessible on the crossover panel is a fuseholder which contains a 2½ amp-3AG fuse to protect the speaker from damage due to enormous power transients. Though the Citation Thirteen is designed to operate safely with a 60 watt RMS amplifier, very often at high level operation there are transients in music which would otherwise damage the speaker. If continuous high levels are required or desired it is suggested that the Citation Thirteen be used in multiples of two or more per channel.

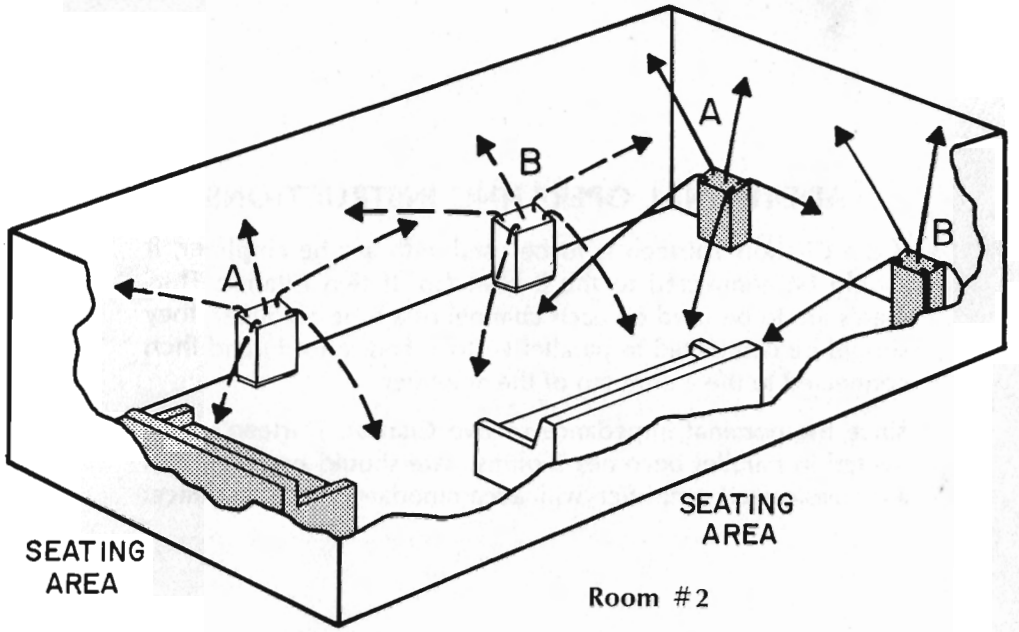
This crossover design required deep consideration for departure from theoretical and traditional parctice. It was worked out much the same way a violin maker cuts a new bridge or sound post. The object being the most natural sound, not theoretical justification.

The nominal impedance of the Citation Thirteen is 6 ohms, being an end result of all the design considerations. There was no attempt to enslave the design to a typical 4 or 8 ohm rating.

INSTALLING THE SPEAKERS FOR STEREO OPERATION

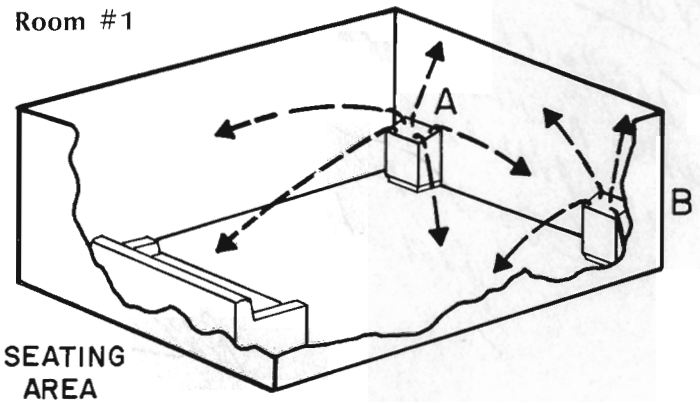
In order to achieve the best stereo performance, proper speaker positioning could prove important. The room diagrams will give you some idea of where the speakers might be placed with relation to the main seating area. The speakers should be approximately 9 feet or more apart. Since all rooms are different in size and shape a little experimenting with placement may be worthwhile. You will notice that rooms 2 and 3 have alternate suggested positions. As a general guide, you should be seated opposite the speakers for maximum spaciousness and concert hall effect. There should never be the impression of two separate sound sources, neither should the speakers be so close to each other that you never experience the depth and spaciousness of the concert hall.

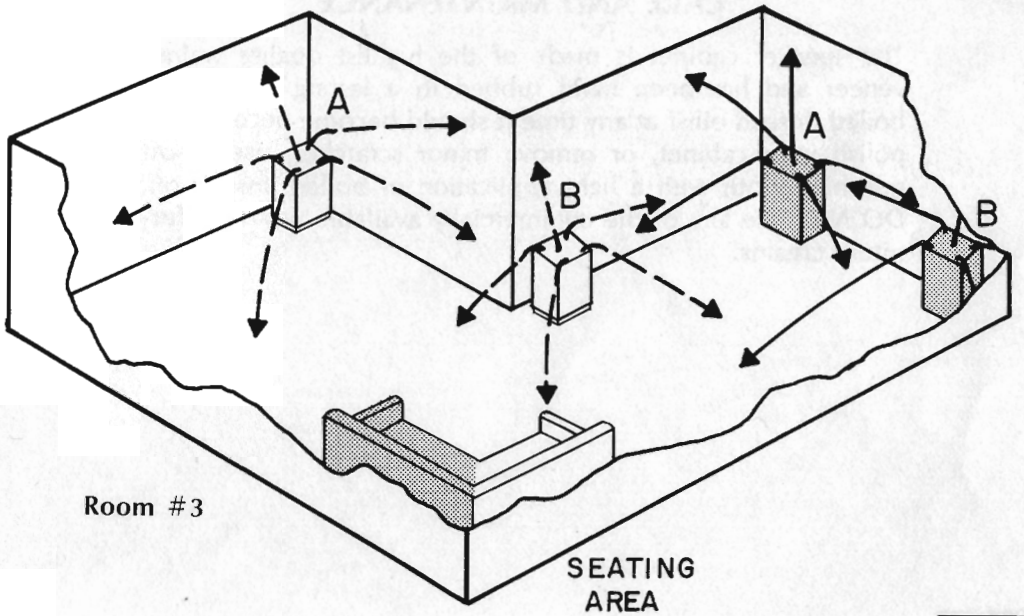
Should you require help in solving a specific room problem, please write and include a simple room layout and its dimensions. We will be pleased to review your problem and offer a solution.



Room #2

Room #1





Room #3

ADDITIONAL OPERATING INSTRUCTIONS

If the Citation Thirteen is to be used with a tube amplifier, it should be connected to the 8 ohm tap. If two Citation Thirteen's are to be used on each channel of a tube amplifier, they should be connected in parallel (— to — and + to +) and then connected to the 4 ohm tap of the amplifier.

Since the nominal impedance of two Citation Thirteen's connected in parallel becomes 3 ohms, care should be taken that a transistorized amplifier will accommodate this impedance.

CARE AND MAINTENANCE

The speaker cabinet is made of the highest quality walnut veneer and has been hand rubbed to a lasting finish with boiled linseed oil. If at any time it should become necessary to polish your cabinet, or remove minor scratches, use a soft polishing cloth with a light application of boiled linseed oil. *DO NOT* use any of the commercially available waxes or furniture creams.

SPECIFICATIONS

Nominal Impedance	6 Ohms
Frequency Response	30 Hz — 20 KHz
Power Handling Capacity	60 Watts
Dimensions	29¼" H, 14¾" D, 20¾" W
Shipping Weight	95 Lbs.

Detailed technical information including performance curves and measurements are available upon request. Simply write to Harman-Kardon, Inc., Dept. CIT-S and ask for this informative literature.

NOTE - TECHNICAL DATA WAS NEVER FORMALIZED IN PUBLICATION FORM (DOES NOT EXIST) Per L.B. 9/3/76