

***Owner's Manual,  
Infinity Reference Standard  
Beta Speaker System***



(p/n .930...4418)

Congratulations on purchasing one of the finest audio products available, the Infinity Reference Standard Beta. In order to insure optimum performance from this speaker system, it is highly recommended you take the time to read this instruction booklet thoroughly before installation.

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## A WORD OF WARNING

Improper connection of the IRS Beta's low-frequency circuit will trigger the Servo Control Unit's protection circuit. Such misconnections include:

1. Reversing the accelerometer cables, left accelerometer input to the right woofer tower and vice-versa.
2. Reversing the signal connecting cables from the LOW FREQ SERVO OUTPUTS of the Servo Control Unit to the INPUTS of the low-frequency power amplifier(s), right to left and left to right.
3. Reversing the left and right channels of the woofer speaker leads.

The protection circuit of the Servo Control Unit will prevent excessively loud low frequency tones generated by misconnection; however it is advisable to make every effort to connect the servo system properly. Check and retrace the connecting cables making sure of polarity and right and left channels prior to turning on your system. These are critical connections and, therefore, they must be accurate.

## UNPACKING

Check your speakers and Servo Control Unit carefully. If they have been damaged in transit, contact your Infinity dealer and/or whoever delivered the cartons *immediately*.

The IRS Beta speakers are quite heavy; it is, therefore, recommended that you obtain the help of a friend before unpacking. Care should be exercised while unpacking to avoid scratching or otherwise damaging the speakers. Be especially careful to protect the black surfaces of the midrange/tweeter sections.

Keep the original cartons and packing material in the event of future need. (The cartons fold flat for easy storage.) Protect the packing materials from exposure.

## ASSOCIATED COMPONENTS

Your IRS Beta speaker system will accurately reproduce whatever you feed into it. For this reason the choice of associated components as well as the quality of listening material is important.

The system may be used with either two stereo amplifiers or four mono amplifiers. One stereo amplifier (or two matched mono amps) should be used to power the midrange/tweeter sections while the other stereo amplifier (or two matched mono amps) should power the woofer columns.

The mid/high-frequency amplifier(s) should be rated between 75 and 300 watts-per-channel into 4 ohms. The low-frequency power amplifier(s) should be able to deliver between 100 and 500 watts-per-channel into 4 ohms. In all cases, each amplifier must be able to deliver its full rated power into a 4 ohm load at all audio frequencies with absolute stability. The IRS Beta is a low-impedance speaker system and damage could result to the speakers and/or amplifiers if the power amps are unable to deliver the required, undistorted power. Your Infinity dealer will be able to assist you in acquiring suitable amplifiers.

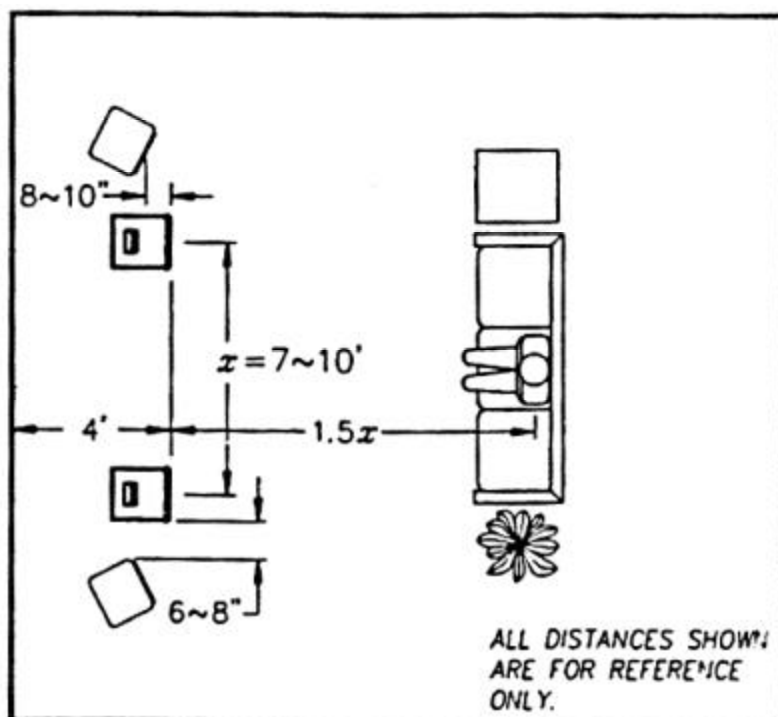
With high-powered amplifiers, it is essential that all necessary measures are taken to avoid acoustic feedback (discussed on page 16) and other non-musical input signals. Make sure that each power amplifier is **TURNOFF** before connecting or disconnecting your speakers or low-level cables, and always turn the amplifier (or preamp) volume control(s) to minimum whenever the cartridge of a turntable is being raised or lowered onto a record, or whenever a change is made from one mode or another (ie, TAPE to PHONO), or when changing from station to station if your tuner does not have a muting circuit.

## POSITIONING

Room acoustics vary widely depending upon the size and shape of the listening room, furniture, ceiling height and so on. Since even a slight change in the position of your speakers will affect the sound, it is worthwhile to experiment with different room positions, listening for the best results.

For the best stereo image, the mid/tweeter sections should be two to three meters (seven to ten feet) apart and not less than the same distance from the primary listening area (see figure 1 for a suggested starting position).

Figure 1:



The spacial relationship between the mid/tweeter section and the woofer towers will affect how well the bass and middle frequencies blend together (the low-to-mid coherence of the system). Moving the mid/tweeter sections further away from the rear wall will give the sound more depth. Moving the woofer towers closer to corners and walls will add more bass.

For optimum results, avoid placing your Beta speaker system directly in front of acoustically absorbent surfaces such as heavy draperies, open windows, etc.

Due to the driver configuration the mid/tweeter sections may tend to be front-heavy. As a result they lean forward a bit when placed on plush carpeting or similar surfaces. This can be compensated for by adjusting the levelers located under their front edges.

The IRS Beta is shipped with a set of pointed steel feet which you may choose to use for optimum coupling of the speakers to your listening room floor. Ask your audio dealer's resident expert for his advice as to whether or not these devices would be beneficial in your particular application.

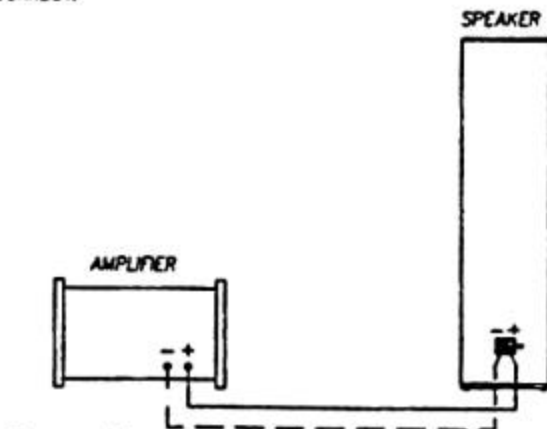
## CONNECTING THE SYSTEM

All connections must be made with high-quality audio connector cables *only*.

Connections from your amplifier(s) to the speakers should be made with very heavy-gauge (#14 or better) two-conductor stranded wire with a polarity coding (typically a ridge or stripe along the insulation of one of the conductors). It is *vital* that the speakers are connected "in-phase". Use the polarity coding to ascertain that the "+" outputs of the power amplifiers connect to the "+" (red) input terminals of the speakers, and the "-" outputs ("grounds") connect to the "-" (black) input terminals. (See figure 2.)

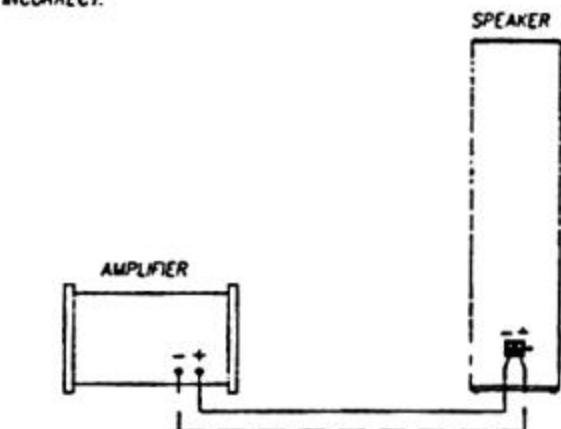
Figure 2:

CORRECT:



Correct (in-phase) connection:  
Plus (red) goes to plus.  
Minus (black) goes to minus.

INCORRECT:



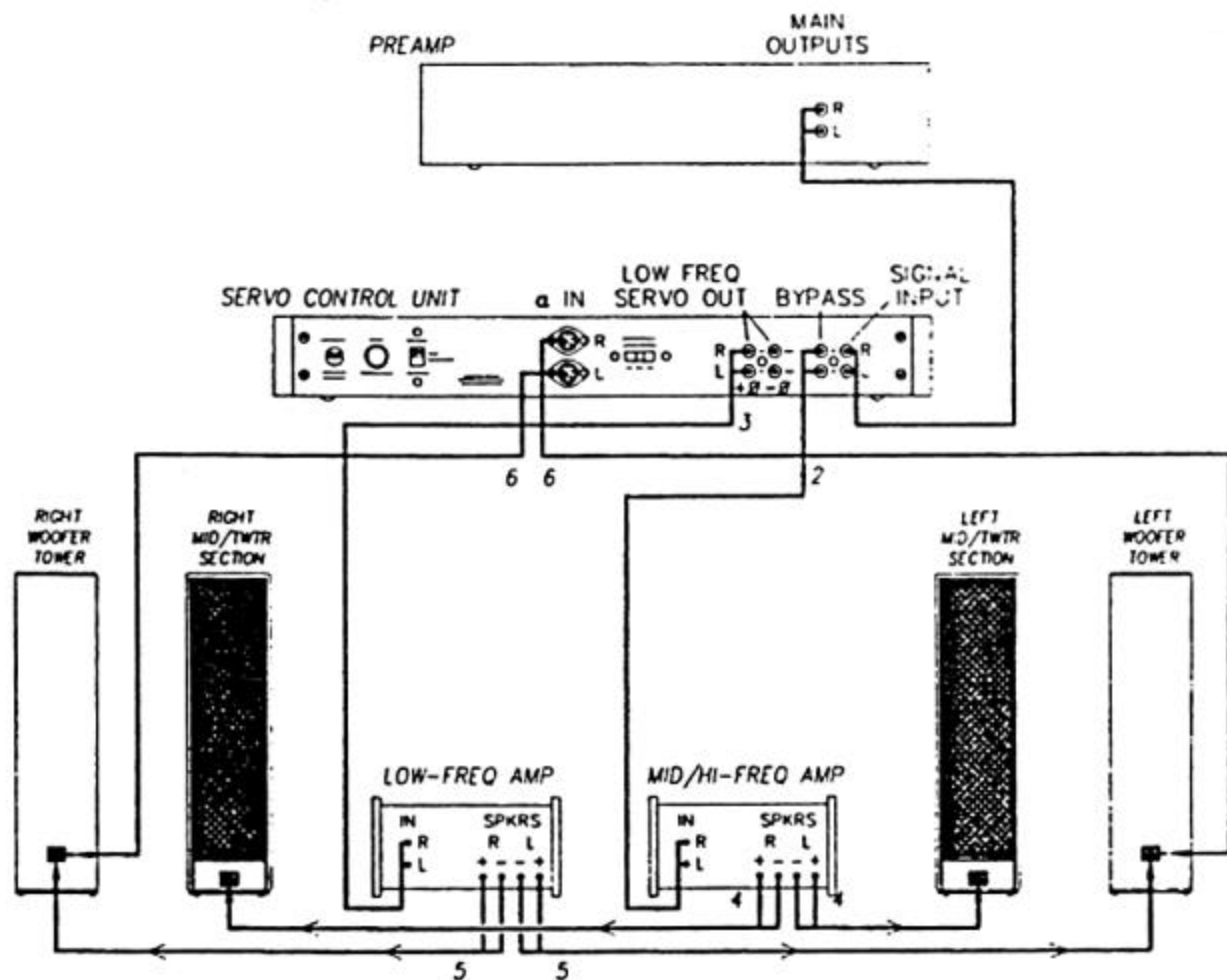
Incorrect (out-of-phase) connection:  
Plus-to-minus, minus-to-plus.  
Results in distorted sound, poor imaging,  
triggering of Servo Unit protect circuit.

## BASIC SYSTEM CONNECTION

PLEASE NOTE: On various audio equipment, the connectors are not always labeled "left" and "right", so use the guideline: 1 = left = A; 2 = right = B.

Make sure that all components are turned off before making connections. Refer to figure 3 for an illustration.

Figure 3:  
(System viewed from behind)



1. Connect the MAIN OUTPUTS of your preamp to the SIGNAL INPUTS of the Servo Control Unit (Left to Left and Right to Right).
2. Connect the BYPASS pair of signal jacks on the Servo Control Unit to the INPUTS of the mid/high-frequency power amplifier(s) (Left to Left and Right to Right).
3. Connect the +0 LOW FREQ SERVO OUT pair of signal jacks on the Servo Control Unit to the INPUTS of the low-frequency power amplifier(s) (Left to Left and Right to Right).

NOTE: Most stereo power amplifiers DO NOT INVERT phase from input to output (ie they are NON-INVERTING). A few power amplifiers DO INVERT phase from input to output. If an "inverting" amplifier is to be used, use the - 0 LOW FREQ SERVO OUTPUT pair of jacks to connect to the power amplifier(s). If in doubt about your low-frequency power amplifier being INVERTING, consult it's owners manual or contact the manufacturer.

4. Connect the SPEAKER OUTPUTS of the mid/high-frequency power amplifier(s) to the Beta midrange/tweeter sections' input posts observing polarity ("+" to "+" and "-" to "-") and left/right channel orientation (left to left, right to right).

5. Connect the SPEAKER OUTPUTS of the low-frequency power amplifier(s) to the woofer towers' input posts. It is imperative to maintain proper polarity ("+" to "+" and "-" to "-") in each wire pair along with proper channel orientation (left to left and right to right).

6. Connect the supplied ACCELEROMETER FEEDBACK cables (the two 50' 4-pin DIN cables) to the system as follows: One of the cables has a piece of red tubing at each end, just below the connector. Use this cable for the RIGHT channel connection *only*. Connect one end of the cable with the red tubing into the jack on the back of the RIGHT woofer tower; the other end into the RIGHT accelerometer input (aIN, R) on the back of the Servo Control Unit. Connect the remaining cable to the LEFT woofer tower and the Servo Control Unit's LEFT accelerometer input (aIN, L) in the same manner. Be sure to insert the connectors fully into the jacks.

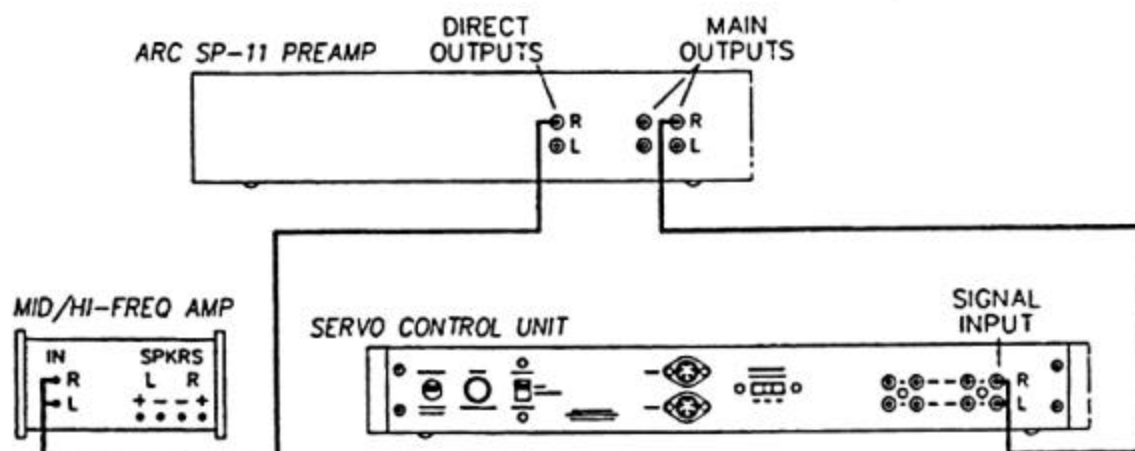
7. It is *EXTREMELY* important to get the connections to the WOOFER SYSTEM correct (accelerometer cables, speaker leads to the woofer towers, signal leads to the low-frequency power amplifier) because the Beta woofer system is a FEEDBACK CONTROL SYSTEM that reduces woofer distortion, extends low frequency response and renders low frequency transients more acoustically correct. In order to accomplish this the feedback has to be *negative*. If, for instance, the polarity of the cables connecting the low-frequency power amplifier(s) to the woofer towers is incorrect (ie, "+" of an amplifier output to the "-" terminal of a woofer tower) the feedback becomes *positive*, resulting in an attempt at full power oscillation at about 60 Hz. The Servo Control Unit has a protection circuit that prevents such continuous full power oscillation from occurring. The result of an incorrect connection will be short bursts of full power oscillation which will indicate that one or more of the connections are incorrect. This condition could also occur when a NON-INVERTING power amplifier is connected at the - 0 LOW FREQ SERVO OUTPUTS or when an INVERTING (rare) power amplifier is connected at the + 0 LOW FREQ SERVO OUTPUTS.

## ALTERNATE CONNECTIONS

7A. "Purer signal path" for the mid/high-frequency power amplifier(s). "Purer" here means less interconnections - less signal jacks and cables in the signal path. Some preamps have two pairs of MAIN OUTPUTS. If this is the case with your preamp, connect the INPUTS of the mid/high-frequency power amplifier directly to one of the pairs of MAIN OUTPUTS on your preamp.

The Audio Research Company's SP-11, for example, has two MAIN OUTPUTS and a DIRECT OUTPUT. The preferred way to use the SP-11 with the Beta system is to connect its DIRECT OUTPUTS to the INPUTS of the mid/high-frequency power amplifier(s) and connect one pair of the MAIN OUTPUTS to the SIGNAL INPUTS of the Servo Control Unit. (See figure 4.)

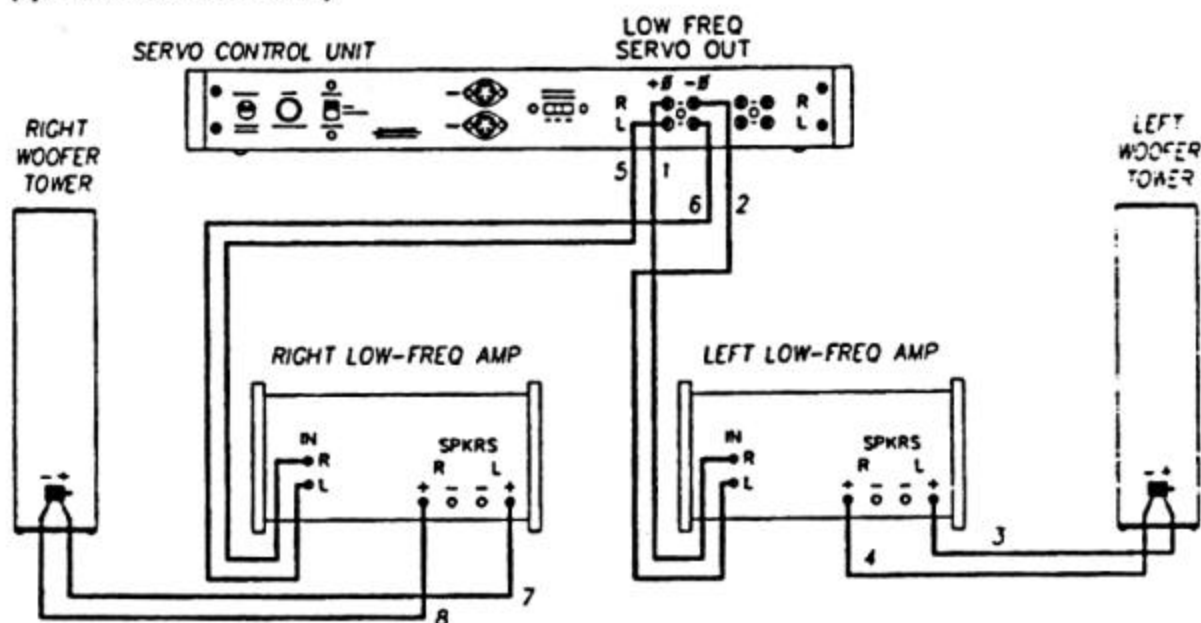
Figure 4:





7B. Use of two stereo power amplifiers for driving the woofer towers. The Servo Control Unit contains provisions for "bridging" a stereo power amplifier, turning it into a higher-powered mono unit. (See figure 5)

Figure 5:  
(System viewed from behind)



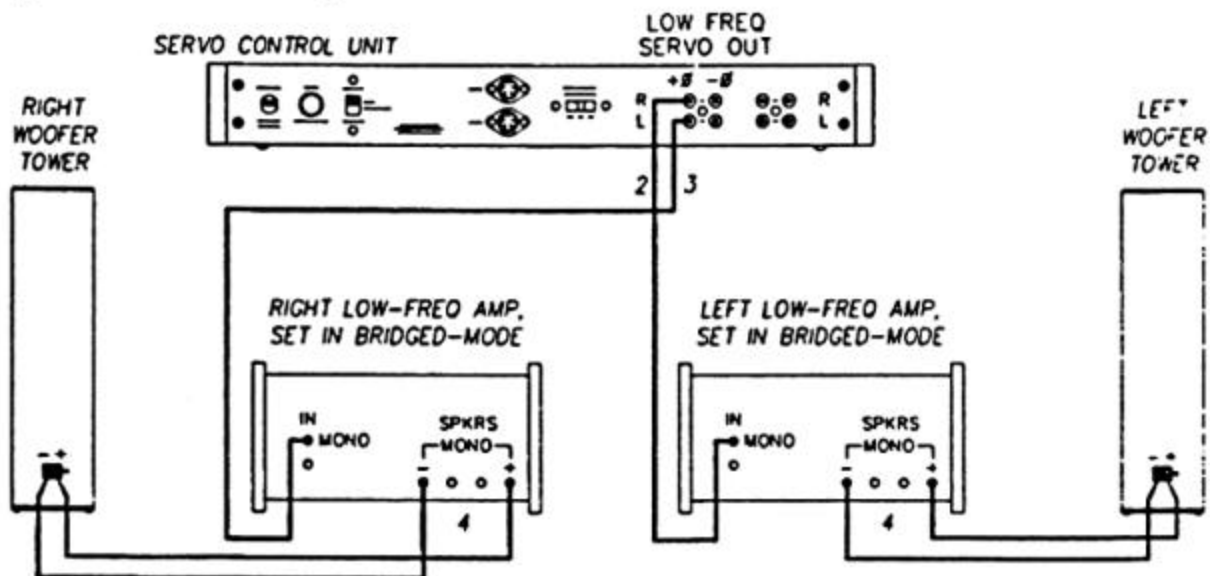
1. Connect one end of a signal cable to the *right-channel* INPUT of the stereo power amplifier that will drive the RIGHT woofer tower. Connect the other end of this cable to the RIGHT +0 LOW FREQ SERVO OUT jack of the Servo Control Unit.
2. Connect another signal cable from the RIGHT -0 LOW FREQ SERVO OUTPUT to the *left-channel* INPUT of the same amplifier.
3. Connect this amplifier's *right-channel* "+" SPEAKER OUTPUT to the RIGHT woofer tower's "+" input terminal.
4. Connect the amp's *left-channel* "+" SPEAKER OUTPUT to the "-" input terminal of the RIGHT woofer tower
5. Connect one end of a signal cable to the *right-channel* INPUT of the other stereo power amplifier that will drive the LEFT woofer tower. Connect the other end of this cable to the LEFT +0 LOW FREQ SERVO OUT jack of the Servo Control Unit.
6. Connect another signal cable from the LEFT -0 LOW FREQ SERVO OUTPUT to the *left-channel* INPUT of the same amplifier.

7. Connect this amplifier's *right-channel* "+" SPEAKER OUTPUT to the LEFT woofer tower's "+" input terminal.
8. Connect the amp's *left-channel* "+" SPEAKER OUTPUT to the "-" input terminal of the LEFT woofer tower.

All other connections per figure 3, BASIC SYSTEM CONNECTIONS.

7C. Use of two stereo power amplifiers that are bridgeable by switching for driving the woofer towers. (See figure 6.)

Figure 6:  
(System viewed from behind)



1. Consult the amplifier's owners manual to determine whether its MONO INPUT is its LEFT or RIGHT INPUT jack in the bridged mode.
2. Connect the Servo Control Unit's RIGHT +B LOW FREQ SERVO OUTPUT to the MONO or BRIDGED-MODE INPUT of the stereo power amplifier that will drive the RIGHT woofer tower
3. Connect the LEFT +B LOW FREQ SERVO OUTPUT to the MONO or BRIDGED-MODE INPUT of the stereo power amplifier that will drive the LEFT woofer tower.
4. Consult the amplifier's owners manual as to which OUTPUT terminals will serve as the "+" and "-" in the bridged-mode. Connect the woofer towers to the amplifiers, maintaining proper polarity and left/right channel orientation.
5. Set the two amplifiers to their MONO or BRIDGED mode (consult their owners manuals).

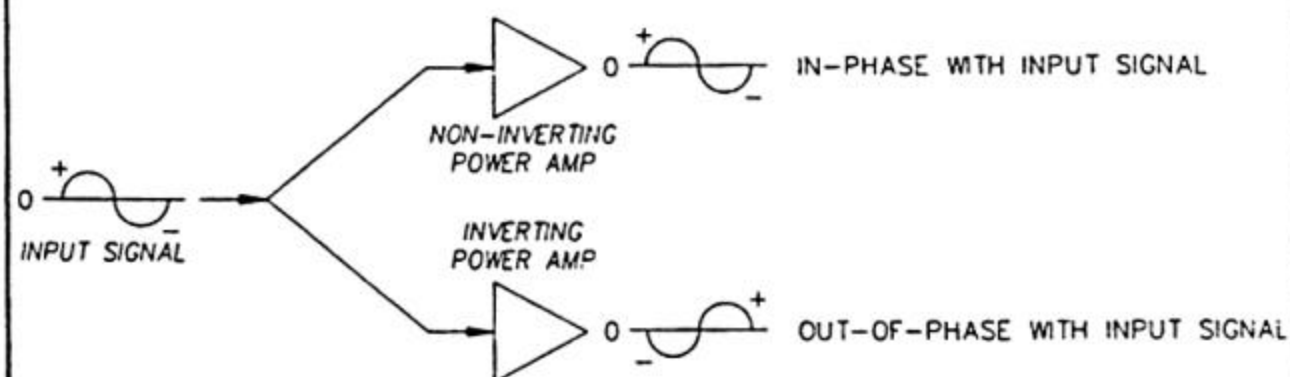
**NOTE:** In the event this connection INVERTS phase within the stereo power amplifiers when used in their bridged modes and causes bursts of loud low frequency signals out of the woofer towers upon system power-up, use the -B LOW FREQ SERVO OUTPUTS in steps 2 and 3.

## A WORD ABOUT ABSOLUTE PHASE

In order to obtain the proper results from the IRS Beta speaker system, and to avoid triggering the protection circuit in the Servo Control Unit and possible subsequent damages, it is essential to maintain *absolute phase* throughout the entire audio system.

Consider a sine wave being fed into two amplifiers, one NON-INVERTING, the other one INVERTING. The output of the NON-INVERTING amplifier is *in-phase* with the input signal, while the output of the INVERTING amplifier is now *180-degrees out-of-phase* with the input. (See figure 7.)

Figure 7:

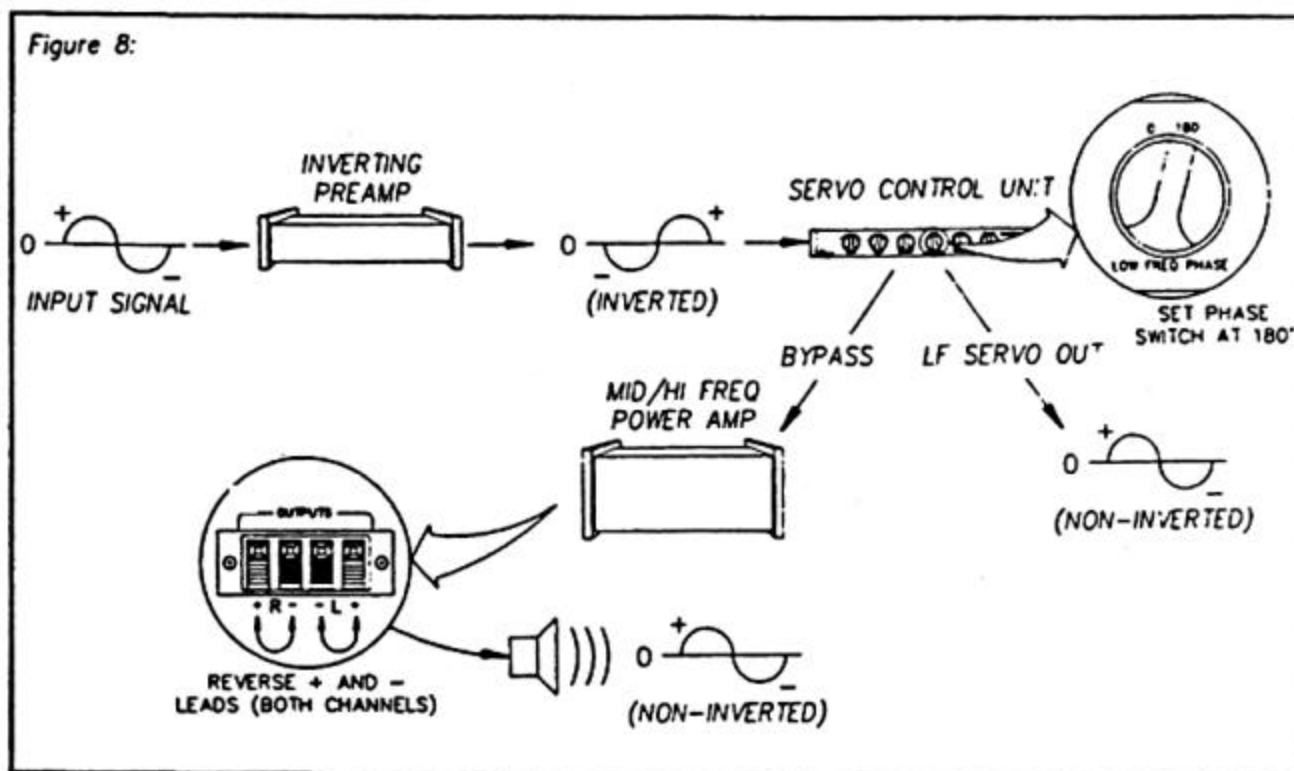


Determine if any of your audio components are INVERTING. (If this information is not provided in the owners manuals, consult your audio dealer or the equipment manufacturer.)

If *all* of your components are NON-INVERTING, absolute phase will be maintained simply by observing proper polarity at all connections ("+" to "+", "-" to "-"), and by setting the LOW FREQ PHASE control of the Servo Unit to its 0 position. However, if *any* of your components are INVERTING some connection changes will be necessary to maintain absolute phase.

Example #1: If your preamp was your only INVERTING component, the signal would be 180-degrees out-of-phase from the preamp through the rest of the audio chain. Two changes are required to maintain absolute phase in this instance:

1. Set the LOW FREQ PHASE control of the Servo Control Unit to its "180" position. This corrects the low-frequency signal.
2. Reverse the polarity of the SPEAKER OUTPUTS of your mid/high-frequency power amplifier(s). (See figure 8.)



Example #2: If both your preamp and mid/high-frequency power amplifier(s) were INVERTING, and the rest of the components were NON-INVERTING:

1. Set the Servo Control Unit's LOW FREQ PHASE control to its "180" position.

Since the mid/high-frequency amplifier is also INVERTING, the signal which was inverted by the preamp will be phase-corrected when it passes through the mid/high amplifier.

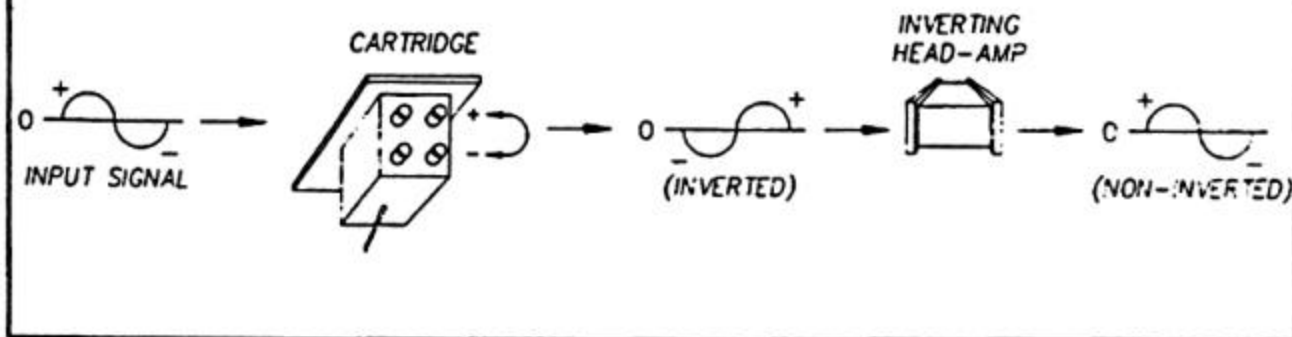
Example #3: If your mid/high frequency amplifier is your only INVERTING component:

1. Reverse the polarity of its SPEAKER OUTPUTS.

Example #4. If your turntable employs a head-amp (pre-amp for the cartridge), and if that head-amp is INVERTING:

1. Carefully reverse the "+" and "-" leads at the cartridge. (See figure 9.)

Figure 9:



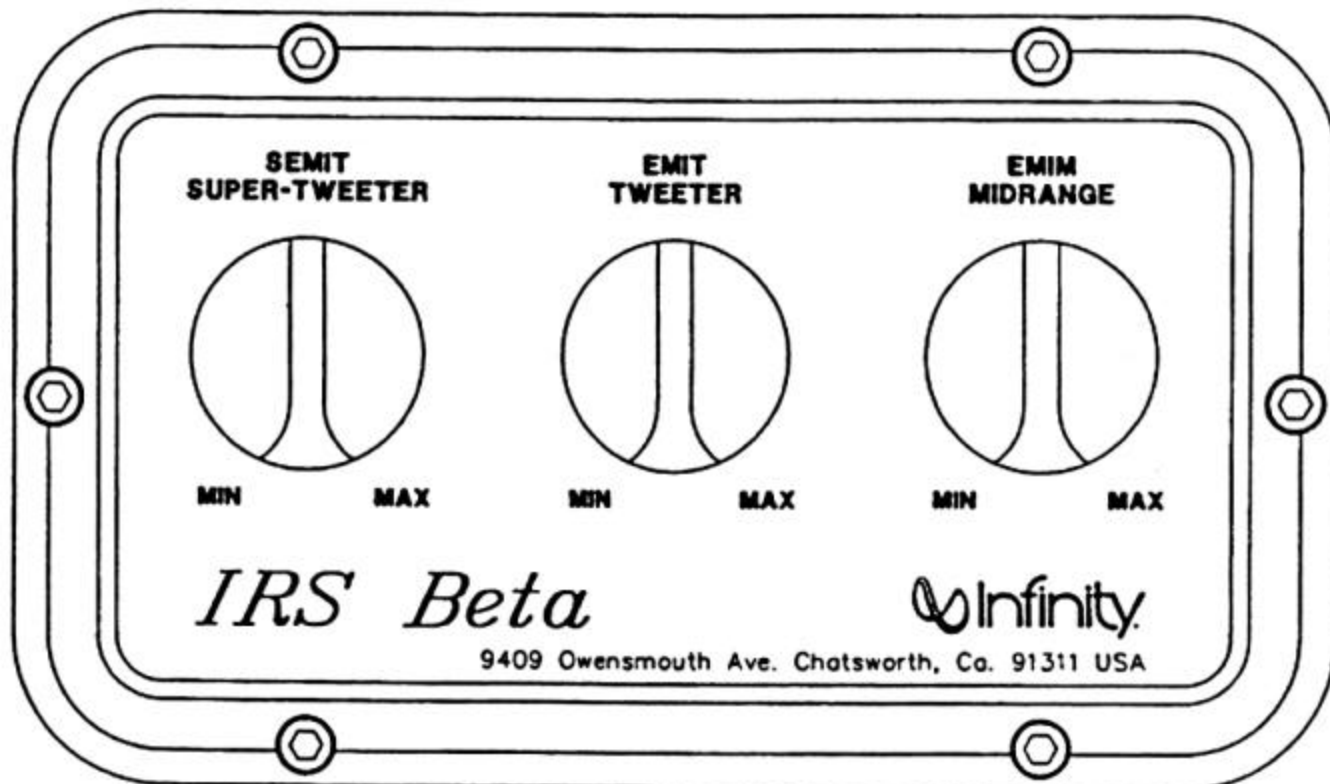
In short, if the number of inverting components that a signal must pass through is ODD, the signal will end up 180-degrees out-of-phase, or INVERTED. If the number of inverting components is EVEN, the signal will end up in-phase, or NON-INVERTED.

Use the previous guidelines to determine what changes, if any, need to be made in the polarity of the connections in your audio system, and where to set the LOW FREQ PHASE control of the Servo Control Unit, and make all necessary changes prior to operating the system.

## THE PASSIVE CROSSOVER CONTROLS

Each of the midrange/tweeter sections of the IRS Beta speaker system have three level controls, located behind the speakers on the top surface of the crossover enclosures. (See figure 10)

Figure 10:



The SEMIT SUPER TWEETER control adjusts the output level of the ultra-high-frequency reproducing SEMIT tweeter which operates above 10kHz. The EMIT TWEETER control adjusts the output level of the EMIT tweeter which operates from 4500 to 10kHz. The EMIM MIDRANGE control adjusts the output level of the EMIM midrange driver operating from 750 to 4500Hz.

Begin with all of the controls at their 12 o'clock position and audition some of your favorite recordings, making small adjustments in the settings of each of the controls, as well as the position of the speakers. While such fine-tuning may seem tedious, the results will be well worth the time and effort.

Due to the differences between listening rooms and equipment, we can not prescribe exact settings that will best suit your particular application. We do, however, offer the following guidelines.

If your listening room has many smooth, reflective surfaces, and lacks heavy draperies, plush carpeting, or other such acoustically absorbent materials, you may wish to turn the SEMIT and EMIT controls towards their "MIN" positions.

If your listening room has an abundance of acoustically absorbent surfaces, try turning the SEMIT and EMIT controls towards their MAX positions.

Adjustment of the EMIM controls will provide for a smooth blend of midrange-to-high frequencies, and will have an effect on how near or distant the vocals and instruments in the vocals range appear.

## THE TWEETER/MIDRANGE PROTECTION CIRCUITS

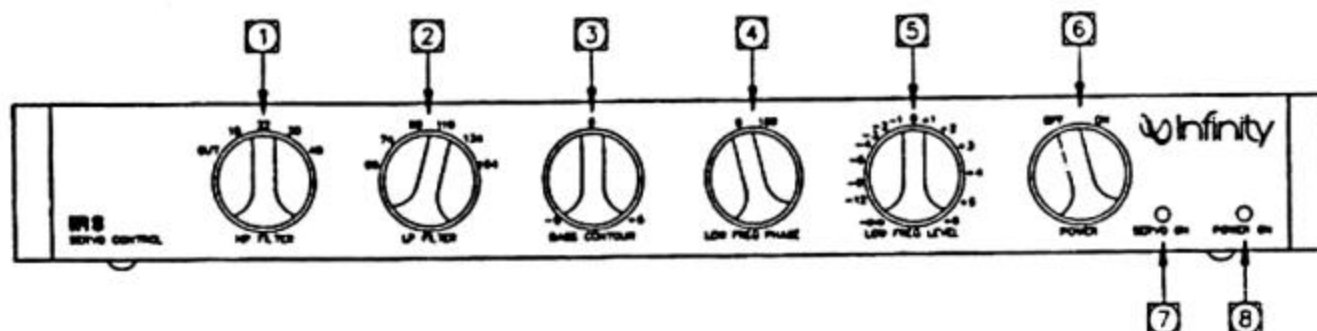
The IRS Beta mid/tweeter sections employ internal, automatic protection circuits to help protect the tweeters and midrange drivers from damages due to hazardous energy levels. In the event you hear the tweeters and/or midrange drivers cutting in and out, chances are that the power amplifier is clipping (its output is distorted due to being pushed beyond its capabilities). Reduce the volume until the condition stops, or check your mid/high-frequency amplifier for possible internal damage.

## ACOUSTIC FEEDBACK

If, while listening to record albums, the bass seems boomy, or you detect a low-frequency howl, and/or if you notice excessive woofer excursion, the cause may be acoustic feedback. (The low-frequency output of the woofer towers is being picked up by the tonearm/cartridge of your turntable.) Some methods of eliminating this problem include placing the turntable on a solid stand, as far from the woofer towers as possible. Also, some combinations of tonearm/cartridge are more susceptible than others; consult your audio dealer if the problem persists.

## THE SERVO CONTROL UNIT

Front Panel:



1. **HIGH PASS FILTER** sets the low-frequency limit of woofer operation. The numbers refer to the 3dB-down point of the filters. The normal setting is the "22Hz" position; adjust to eliminate excessive woofer excursion if necessary.

**NOTE:** The filter cutoff in the "OUT" position is 1.5Hz: **DO NOT USE** in the "OUT" position with records (to help avoid acoustic feedback) and caution with CD's and tapes.

2. **LOW PASS FILTER** sets the upper-frequency limit of woofer operation. The numbers are the 3dB-down point of the filters. The normal setting for the IRS Beta is 110.

3. **BASS CONTOUR** puts boost or cut slope, 20Hz - 100Hz, up or down by as high as 5dB at 20Hz. This control is useful for contouring the bass range to accommodate differing listening environments.

4. **LOW FREQ PHASE** sets the absolute acoustic phase of the woofer output. For a **NON-INVERTED** signal source, set this control to 0. For an **INVERTED** signal source, set the control to its 180 position (refer to the section on Absolute Phase to find out what other changes, if any, need to be made in the connections).



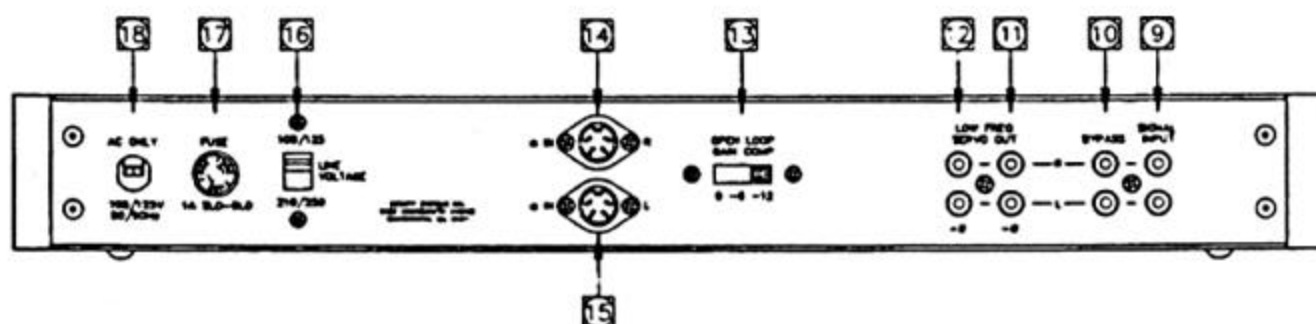
5. LOW FREQ LEVEL sets the amount of low-frequency output from the woofers. Adjust the level to obtain the best balance of bass to mid/high-frequencies.

6. POWER switches the A.C. power to the unit. (There is a 12 to 15 second delay before the woofers begin playing after power is turned on.)

7. SERVO ON indicator comes on after the 12 to 15 second woofer delay and indicate that the servo is on and active.

8. POWER ON indicator stays on while the unit is turned on.

*Rear Panel:*





16. **LINE VOLTAGE** selector sets the primary strapping of the power transformer for the line voltage to which the unit is connected. Use the tip of a flatblade screwdriver in the slot of the switch to slide it into the proper position.

17. **FUSE** protects the unit against possible internal damages in the event of power surges or a malfunction inside the Servo Control Unit. To avoid the possibility of electrical shock or other damages, replace the fuse with the specified size and type **ONLY**:

105/125 VAC:	1-amp slow-blow
210/250 VAC:	1/2-amp slow-blow

18. **POWER CORD** connects to a suitable source of A.C. power.

## OPERATING THE SYSTEM

After finalizing all connections, and double-checking proper polarity and channel orientation of all leads and signal cables, set the controls of the Servo Control Unit as follows (all other components are OFF at this time).

HP FILTER	22
LP FILTER	110
BASS CONTOUR	0
LOW FREQ PHASE	Refer to the section on Absolute Phase
LOW FREQ LEVEL	FULL CCW
POWER	ON

Remove the grille from one of the woofer towers and *gently* tap the cone of the woofer located second from the top, along its vertical axis between the dust cap and the foam surround with your fingernail. Under normal operating conditions, you will hear tapping reproduced in the woofers. (NOTE: Do not tap or poke the woofer along its horizontal axis, since the control woofer may react adversely to this.) Repeat for the other woofer tower.

If the reproduced taps are not present, double-check all connections to the Servo Control Unit, the accelerometer cables, and the power supply to the Servo Unit. If the woofers still seem inoperative, contact your Infinity dealer or Infinity's Customer Service department.

Turn on all of your audio components and slowly bring the volume of a record, tape or disk up to a comfortable listening level. (At this time you will not have low-frequencies reproduced.) Turn the balance control to fully the right and verify output from the **RIGHT** mid/tweeter section *only*. Turn the balance fully to the left and verify output from the **LEFT** mid/tweeter section *only*. Return the balance control to center.

Slowly bring the Servo Control Unit's **LOW FREQ LEVEL** control up until there is a balance of low-frequencies being reproduced with the output of the mid/tweeter sections. Repeat the balance test for the woofer towers.

Infinity strives always to improve existing products, as well as create new ones. Therefore the specifications and construction details in this and other Infinity publications are subject to change without notice.

## LIMITED WARRANTY

### Who is protected by the warranty?

Your Infinity warranty protects the original retail purchaser and all subsequent owners for a period of five (5) years (parts and labor) from any failure as a result of an original manufacturing defect so long as: (1) your Infinity loudspeakers were purchased within the fifty United States or by military personnel from an authorized military outlet and (2) the *original dated bill of sale* is presented whenever service is required during the warranty period. This warranty does not apply to products purchased elsewhere. Other purchasers should contact their local Infinity distributor for warranty information.

### What does the Infinity warranty cover?

Except as specified below, this warranty covers all defects in original materials and workmanship. The following are *not* covered: damage caused by accident, misuse, abuse, neglect, product modification; damage occurring during shipment; damage caused by failure to follow instructions in the owners' manual, including failure to perform recommended periodic or routine maintenance; damage resulting from repairs by someone not authorized by Infinity; claims based upon any misrepresentations by the seller, and any Infinity product on which the serial number has been altered, defaced or removed.

### Who pays for what?

During the period of this warranty, subject to the above conditions, Infinity will pay all of the labor and material expenses to repair a warrantable defect.

### How can warranty service be obtained?

In the event that your Infinity loudspeaker(s) should require service, you should first contact the Infinity dealer from whom the product was purchased or, if this is not practical, contact Infinity directly (ATTN: Customer Service) at 9409 Owensmouth Avenue, Chatsworth, CA 91311 (818) 709-9400. We may direct you to an authorized service center for Infinity products or ask you to send them to us for repair. In either case you will have to present your *original dated bill of sale* to establish warranty coverage. Do not send your speaker(s) to us without prior *written* authorization! You are responsible for transporting your product for repair and for payment of any and all shipping charges; however, Infinity will pay the return shipping charges if the repairs are covered by this warranty. If you experience difficulty in transporting your speaker(s) or need adequate packing materials, please contact us and we may be able to suggest alternative procedures or provide adequate packing.

**LIMITATION OF IMPLIED WARRANTIES:** All implied warranties, including fitness for a particular purpose and merchantability are limited in duration to the length of this warranty.

**LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES:** Infinity is not responsible for any incidental or consequential damages of any kind. Our liability is limited to the repair or replacement, at our option, of a defective product. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion of incidental or consequential damages so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

(Because Infinity strives always to improve existing products, specifications and prices are subject to change without notice.)