



Obbligato

Operating Instructions

Congratulations on your choice of The Angstrom *Obbligato!*

Designed, engineered and manufactured in Canada to exacting standards, these loudspeakers will give outstanding performance for years to come. We recommend that you take the time to read these instructions carefully. They will provide valuable information that can improve the musical performance of your entire audio system.

Turn off your Amplifier/Receiver

Turning off your Amplifier/Receiver when connecting your loudspeakers prevents short circuits which can damage your system. You should NEVER change any connection without turning off your Amplifier/Receiver.

Use dedicated speaker cables

Loudspeakers are normally excited by fairly low voltages (typically less than 40 volts), but the current they receive, which is measured in amperes, is quite high. Therefore, the cables that connect your Angstrom loudspeakers to the receiver or amplifier should be dedicated loudspeaker cables.

Loudspeaker cables are designed to operate with pulsating signals of widely varying voltage, current and frequency, and should be designed specifically as loudspeaker cable. When choosing cables, careful considerations should be given to the technical design of the amplifier/receiver, the distance between the amplifier/receiver and the loudspeaker, and last but not least, the impedance of the loudspeaker. We suggest you consult your reseller to ensure a correct audio match. Angstrom recommends loudspeaker cable manufactured by 'Audioquest' from the United States.

Preferably, your *Obbligatos* should be 'bi-amplified' for optimum performance. Bi-amplification requires the use of two stereo amplifiers or four mono amplifiers. We suggest that the amplifiers be placed as close to the *Obbligatos* as possible. One amplifier should drive one loudspeaker, the other amplifier the other loudspeaker.

One channel of the amplifier should drive the woofer section, the other, the mid range and treble units. Bi-amplifying ensures more sonic detail. Loudspeakers are normally connected by means of a 'twin-lead' cable or wire, (i.e. with one side for plus signals and one for minus signals).

However, as loudspeakers also consume widely varying currents in the bass, mid-range and treble, it is advantageous to connect separate cables to the loudspeaker's respective inputs. By so doing, the current drawn is distributed across twice the sectional area, and the cable with current destined for delicate high frequencies need not simultaneously supply current to power hungry bass drivers. The result is an audibly purer musical reproduction with greater precision in the breadth and depth of the stereo image. These very special cables should be kept as short as possible.

Bi-amplifying also makes it possible to select larger diameter cables with particularly good conducting capabilities to the bass, whereas the choice of thinner cables for the treble is a more advantageous one; experience has shown that thinner cables ensure a subtler, more "liberated" reproduction of delicate overtones in the music.

When bi-amplifying your *Obbligatos*, please note that the **positive** connections for both the woofer section and the treble/midrange section are *beside each other on the inside of the four binding posts*. The *outside binding posts are the negative posts*. The woofer connections are on the side of the woofer. If you are using amplifiers of unequal power, it would be necessary to use the same amplifier for the woofer section of both loudspeakers and the other amplifier for the treble/midrange. It is our recommendation that the more powerful amplifier be used for the woofer sections in this case.

If you do not 'bi-amplify' your *Obbligatos*, they should be 'bi-wired'. Bi-wiring allows for specific cables for the woofer and treble/midrange with the use of a single stereo amplifier. Your Angstrom reseller will be happy to custom design specific cables for your application.

Making the proper connection

Left and right loudspeakers operate together to reproduce audio signals that should appear in a stereo image with depth, breadth and height.

Both loudspeakers must play in unison, they should also reproduce a positive electrical pulse as high pressure, and a negative pulse as low pressure. In other words, the loudspeakers must be correctly 'phased' and to this end they are supplied with colour-coded terminals. "Plus" is marked in red and "minus" in black. The terminals on your receiver/amplifier are colour-coded in the same way.

All quality loudspeaker cables are marked to ensure correct loudspeaker 'phasing' during installation. Typically, one of the leads will be colour-coded, marked or will have a ridge in the insulation. You should connect the lead that is marked to "plus" on the amplifier and to the "plus" (red terminal) on your *Obbligato* loudspeakers. The other lead should be connected to "minus" (black). Gold plated 'banana plugs' fit easily into the holes on the loudspeaker terminals and provide good electrical connection. They are highly recommended. (Dual banana plugs will NOT fit, please use separate plugs).

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Positioning is important

It really does pay to experiment with the positioning of your *Obbligatos*. The difference between 'acceptable' and 'fantastic' audio reproduction is often only a question of a few simple adjustments to the room's acoustics, and to the positioning of the loudspeakers.

In general, loudspeakers should be positioned so that their drive units are approximately at ear level when you are seated in your favorite listening position. The distance between the two loudspeakers should be approximately 80% of the distance between the loudspeakers and the listening position. The loudspeakers may be turned slightly inwards. This will give better focus and precision to the audio signals in the center of the stereo image.

Tweeter Damping

Every *Obbligato* is supplied with four (4) pieces of a special felt damping material with a self adhesive backing. Two of the felt pieces are for experimentation, the other two for permanent installation. The felt dampers should be applied to the face of the tweeter on the inside edge, between the two screws that hold the tweeter to the front baffle.

Experiment. We have found that in some *room* situations, the *Obbligatos* benefit from the felt damping. Our tweeter has exceptional off-axis dispersion and in some cases there tends to be too much cross information at higher frequencies. The felt damping helps with this problem. No room is the same, please use your ears as the final test.

Adjusting the bass level

Small loudspeakers are, due to the laws of physics, relatively limited in their bass reproduction. However, the *Obbligatos* suffer from no such limitations.

These loudspeakers perform best when they are placed somewhere between 80 cm and 150 cm from the nearest wall. It is also important to remember that loudspeakers should be allowed to radiate the sound, without hindrance, through the air and towards your listening position. Therefore, upholstered furniture and similar objects should never be placed immediately in front of the loudspeakers or in front of the side firing woofers as this will damp the treble and upper mid-range, muddy the low frequencies and will render the sound inarticulate. The stereo image will lose its precision.

Some listening rooms are plagued by problems of 'standing waves' which cause a rumbling, distorted low bass response. In this case the *Obbligatos* should be placed a good distance away from the end and side walls, with the woofers firing outwards, so that the omnidirectional bass frequencies are able to be radiated unhindered. By following this procedure, the bass level is reduced by a few decibels but the output is controlled. The bass response will be tighter and more dynamic. If you feel that the bass is still too powerful, you can reverse the *Obbligatos* and have the woofers face each other and fire towards each other. Experiment; your listening room is the most important part of the

listening puzzle.

Spikes

Your *Obbligatos* have been fitted with rubber isolation bumpers for use on hard floor surfaces. If you place the *Obbligatos* on carpet, we recommend that you replace the rubber bumpers with the supplied hardened steel carpet spikes.

Loudspeakers must be run in

Just as a new car engine has to be 'run in', so do the moving parts of a loudspeaker before the system is able to perform optimally. The edge suspension of the diaphragms and the spiders are manufactured from materials that will stand up to many years of mechanical stress. While the loudspeakers are new, however, these parts are still stiff and perform sluggishly. They tend to restrict the movement of the diaphragm and the loudspeakers will not yet perform at their best. A few hours of playing at moderate levels will remedy this problem and the loudspeakers will begin to deliver a more subtle and impelling performance.

Loudspeakers will continue to improve in performance until their parts are mechanically stabilized. After a 'break in period' of approximately 200 hours, they will continue to play optimally for many years, providing that they are not overdriven or overloaded.

NB: It is practically impossible to wear out a pair of Angstrom Obbligato loudspeakers. Only continuous overloading (caused by excessive volume levels and/or amplifier chipping) will ruin their performance capability and shorten their life.

We welcome your comments

The *Obbligato* is not a mass produced, cookie cutter product. Natural wood and hand finishing take time and effort to manufacture. No two cabinets are the same, just as no two trees are the same. Every effort is made to produce a perfect product and every *Obbligato* is checked and tested before it leaves our factory.

We welcome any comments that you may have, be these, positive or negative. Your opinions will help us to produce even better products. Therefore, if you do have anything to tell us, please write or fax us at the following address:



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