

**MODULAR
LOUDSPEAKERS**



**Angstrom's latest
contribution to one of life's great
pursuits.....Music!**

www.angstromloudspeakers.com

A New Approach.....

Not just another 'me too' design, Angstrom - in our passion to do it right - have rejected outdated and conventional doctrine in favour of loudspeakers designed to be the building blocks of a modular system. Yesterday's 'off the shelf' philosophy built loudspeakers to be placed in any room. Angstrom has created a design meant for a particular room. Guesswork is eliminated and the customer gets an audiophile system designed just for him.

Why we do it?....

Consumers are demanding better products that suit their individual lifestyles.

Because the 'room' is the biggest problem for any listening environment.

We know there is a better way!

How do you buy a MODULAR system?

Because our new loudspeakers are modular in design, they may be added to or modified at a future date. **Adaptability** and **Flexibility** allow the sales person to design a system with you. **You design the system** together for your unique needs. We must consider individual preferences and environments. Nothing is absolute and therefore there is NO perfect solution to 'getting the best sound'. We have included ideas that we believe will give the most satisfying results from the relatively easy setup in a rectangular room to the very complex set up in a difficult environment.

The correct MODULAR Loudspeaker for the room will depend on several factors:

- ◆ size, shape, construction and contents of the room
- ◆ cubic volume of the room
- ◆ application, A/V or audio
- ◆ budget and current electronics

Ask to be seated comfortably without distractions.
Provide answers to the following questions and fill in the 'Design Sheet' which the reseller will provide.

What are the dimensions of the room?

What is the cubic volume of the room? (*Calculate this based on the provided dimensions*)

Is this an audio or A/V installation?

Will this be a dedicated audio or A/V room?

Do you need new electronics?

Are there windows in the room? (Note them on the form)

What floor coverings and furniture are in the room?
(*Note where they are*)

Where are the entrances to the room? (Note where they are)

With this information you can now tailor a complete audio or home theatre system for your home. Use our recommendations as the basis for your audio video system. These systems will perform admirably in the home environment. However, you may want an even grander acoustic event. The MODULAR series of loudspeakers can be configured in any combination to satisfy the most discriminating consumer.

The Demonstration

Be involved. Bring your own CDs and DVDs; Material with which you are familiar.

"Angstrom, it's a Canadian company with a unique product. Canada has earned quite a reputation for making fine loudspeakers. We will show you". It is recommended that you listen to the Model Two as a stereo pair without the use of either LFT (sub woofer) first. The second demonstration should then include either the Model Eight LFT or the Model Ten i LFT. This will give you a sample of just how dynamic Angstrom MODULAR loudspeakers really are. Make sure that the tweeter in any system is at ear height when you are seated. Angstrom loudspeakers are designed to operate most effectively when the tweeter is between 75 cm to 93 cm (34" to 42") from the floor.

The recommended system will sound even more impressive in your home, *the environment for which it was designed*. All our MODULAR Loudspeakers have the same sonic signature. They employ the same drivers for complete tonal accuracy. The big difference from model to model is the fact that the next model will produce more sound in a larger room. Let the salesperson show you what you **need** and **explain** what you **want**. You may want more bass or more presence. You may just want the larger Model 4 when the Model Two is the recommended loudspeaker. It is possible to use either the Model Three or Four as the front loudspeakers mated with Model Twos for the rear in 5.1 and 6.1 or rear back in 7.1 systems. Any combination is possible. Having evaluated the system in an honest, open fashion with your reseller you have made sure the system is what you want and need for your home and family.

Amplifier power recommendations:

The MODULAR models, TWO, THREE, FOUR and SIX will work well with any high quality, high current, 50 watt RMS per channel amplifier.

Sweating The Details.....

Loudspeaker placement has the most profound effect on acoustics in a home. We can't stress this enough. Our experiments have confirmed our belief in an irrational mathematical progression from the 12th century by an Italian named Fibonacci. Active nodes in a listening room are a major concern when locating loudspeakers in a rectangular room. A 'node' results when loudspeakers and walls interact. This happens at several frequencies and is proportional to the distance from the walls to the loudspeakers. As Fibonacci's progression is irrational, using the formula for loudspeaker placement greatly reduces nodes. Please note Diagram A. It shows loudspeaker placement for a rectangular room. Of course this is 'ideal' and we fully realize what happens in real world situations. However, if you are able, try it out. You will not be disappointed. Set the distance from the centre of the woofers of both the left and right loudspeakers to the side wall as follows; width of the room, times .276, ie. $RW \times .276$. If the room is 16' wide, then the distance from the side wall to the center of the woofer would be, $16 \times .276 = 4.41'$. Then as both loudspeakers are 4.41' from the side wall, they are the 7.18' apart. ($16' - 4.41' - 4.41' = 7.18'$) Calculate the distance from the front of the loudspeaker to the rear wall as follows; $RW \times .447$, i.e. $16 \times .447$ or 7.15' This number determines the ideal distance the loudspeakers should be from the rear wall and how far the listener should be from the loudspeakers. This places the listener in a 'near field' listening position providing the best acoustical effect, the sweet spot – an equilateral triangle, 7.18' x 7.18' x 7.18'.

Typical layouts for audio/video systems are on the back page. Use these to help locate the clients system on the Client's Design Sheets. For all audio only applications try to position the clients system in an equilateral triangle as explained above.

Additional Issues....

Cabinets

- constructed from superior grade 19 mm MDF
- front baffle boards made of superior ranger grade 25 mm MDF, covered with a special LAMINEER™ coating to eliminate baffle run-on and resonance
- the LAMINEER™ finish is a powder coating process for MDF. The result is a hard finish that will last virtually forever.
- all models are available in Black Ash or Light Markham Maple

Drivers

- new fibre glass, Pentacone, 112mm **woofers** with NRSC (non-resonant system coupling) designed in collaboration with Vifa Loudspeakers of Denmark
- *five-sided*, glass, ultra-light, rigid cones designed to greatly reduce resonance much better than conventional designs particularly in the critical mid-band region providing 30% to 40% greater excursion than other similarly sized drivers
- *double-vented basket* and a *vented voice coil former* with a *butylized rubber surround* designed to operate under extreme conditions, thus enabling the loudspeaker to handle incredible dynamic range and power without fatigue
- drivers are magnetically shielded for use in multi-media applications
- spectacular 19 mm woven silk dome **tweeter** from Vifa, operating without distortion to beyond *the threshold of human hearing*, extending above 25 KHz with exceptional accuracy
- *ferro fluid cooled* with excellent off axis response

Crossovers / dividing networks

- 1st and 2nd order Butterworth designs
- polypropylene capacitors with 24 carat gold plating
- air core inductors with non-inductive resistors

Powered LFTs (Low Frequency Transducers) UNIQUE VERSATILITY

The model EIGHT and TEN i are the foundations that convert either the models TWO, THREE or FOUR to true 3-way loudspeaker systems. When used with the model FOURTEEN Modifier, they become the base driver in a 3-piece audio system. They may be used as a 'sub woofer' in home theatre applications. The EIGHT is also a stand for the model TWO, THREE or FOUR.

- powered by a 115 watt RMS, analogue, class a/b amplifier with discreet outputs and a high current power supply. Many of the current crop of 'sub woofer' manufacturers use a low input sensitivity and over-rate the power output of their products. Their products are always in 'soft clipping'. Soft clipping is an industry term used to describe distortion. In fact, they are over-driven into distortion most of the time. When an amplifier exceeds it's maximum output the amplified sine wave is 'cut off' or 'clipped'. The sound is harsh and boomy and gives the consumer the impression of 'loudness and power'. The product sounds louder in the store, but is seldom satisfying when used at home. With either the Angstrom model EIGHT or TEN i there is no such problem. The Angstrom amplifiers operate at less than 25% of their output capacity and they are never worked beyond their SOA (safe operating area). The customer is guaranteed a product that performs **beyond** the specifications not below them.

Angstrom uses Darlington output devices designed and manufactured by Texas Instruments. Better parts translate directly to better sound. Both the Model EIGHT and TEN i include:

- 5-way gold plated binding posts
- gold-plated phono jacks
- 180 degree phase switch
- Late Night Theatre switch that gives a 6db boost at 45Hz
- continually variable crossover from 50Hz to 180Hz

- The model EIGHT has a made in Canada 20.4 cm side-firing woofer, mounted to a reinforced baffle in a triple chambered, acoustic suspension cabinet, damped with roxul and with two 19 mm open air braces. The unique columner design solves many placement problems

- The model TEN i is ISOBARIC in design with 2 polymer coated 25.5 cm woofers and roxul damped.

7 YEARS.....

All modular loudspeakers have a **7 year warranty**. (*Amplifiers are covered by a 2 year warranty*)

TrueSpecs™

Our way of publishing audio specifications that actually have value to the customer and are true and supportable.

All measurements are taken in a room with a cubic volume of 3800 cu. Ft. using the Fibonacci golden cuboid theory, at 2m from the center of a stereo pair.



MODULAR TWO

2- WAY

Nominal Impedance: 6 ohms

Operational Frequency Response:
60Hz – 22KHz

Sensitivity: 2.83 v, 1 metre, Pink Noise, no weighting, 85 db

Amplifier: 8 Watts/channel RMS produces 90 db spl

Cross over frequency: 4500 Hz

Weight: 6.8 Kg / 15 lb

Dimensions: 17.5w / 30d / 26.9h cm (7" x 12" x 10.75")



MODULAR THREE

2 – WAY, D'APPOLITO CONFIGURATION

Nominal Impedance: 6 ohms

Operational Frequency Response:
60Hz – 22KHz

Sensitivity: 2.83 v, 1 metre, Pink Noise, no weighting, 88 db

Amplifier: 4 Watts/channel RMS produces 90 db spl

Cross Over Frequency: 4500 Hz

Dimensions: 17.5w / 26.95d / 42.5h cm (7"x 10.75" x 16.5")



MODULAR FOUR

2.5 – WAY, BI-POLAR

Nominal Impedance: 6 ohms

Operational Frequency Response:
60Hz - 22KHz

Sensitivity: 2.83 v, 1 metre, Pink Noise, no weighting, 86.5db

Amplifier: 6 Watts/channel RMS produces 90 db spl

Weight: 10.2 Kg / 22.5 lb

Dimensions: 17.5w / 26.9d / 42.5h cm (7" x 10.75" x 16.5")



MODULAR SIX C (Centre Channel)

2-WAY

Nominal Impedance: 6 ohms

Operational Frequency Response:
60Hz - 22Hz

Sensitivity: 2.83 v, 1 metre, Pink Noise, no weighting, 85db

Amplifier: 8 Watts RMS produces 90 db. spl

Weight: 8.6 Kg / 19lb

Dimensions: 38.75w / 26.9d / 17.5h cm (15.5" x 10.75" x 7")



MODULAR EIGHT

Powered low frequency transducer, 120 Watts RMS

Frequency Response: 30 – 180Hz, variable from 50 – 180Hz

Weight: 20.45 Kg / 50lb

Dimensions: 17.5w / 41.25d / 77.5h cm (7" x 16.5" x 31")



MODULAR TEN I

Powered low frequency transducer, 120 watts RMS, Isobaric, dual woofers

Frequency Response: 30 – 180Hz, variable cross-over from 50 – 180Hz

Weight: 21.1Kg / 46.5lb.

Dimensions: 33w / 42d / 43h cm (13" x 17" x 16.5")

MODULAR FOURTEEN

Passive L-FED (Low Frequency Effect Divider), stereo high level to mono low level.

Further thoughts on GREAT AUDIO SYSTEM DESIGN

The cubic volume of a room:

In order to operate, loudspeakers must move air. A larger room will require larger amounts of air to be moved to have the same acoustic output as a small room. The maximum recommended cubic volume room requirements for each Angstrom MODULAR loudspeaker follows:

MODULAR TWO	950 / 1700 cu ft.
MODULAR THREE	1500 / 2200 cu ft.
MODULAR FOUR	2000 / 2800 cu ft.
MODULAR TWO + EIGHT or TEN i	2000 / 4000 cu ft.
MODULAR THREE + EIGHT or TEN i	2500 / 5000 cu ft.
MODULAR FOUR + EIGHT or TEN i	3000 / 6000 cu ft.

Room cubic volume examples:

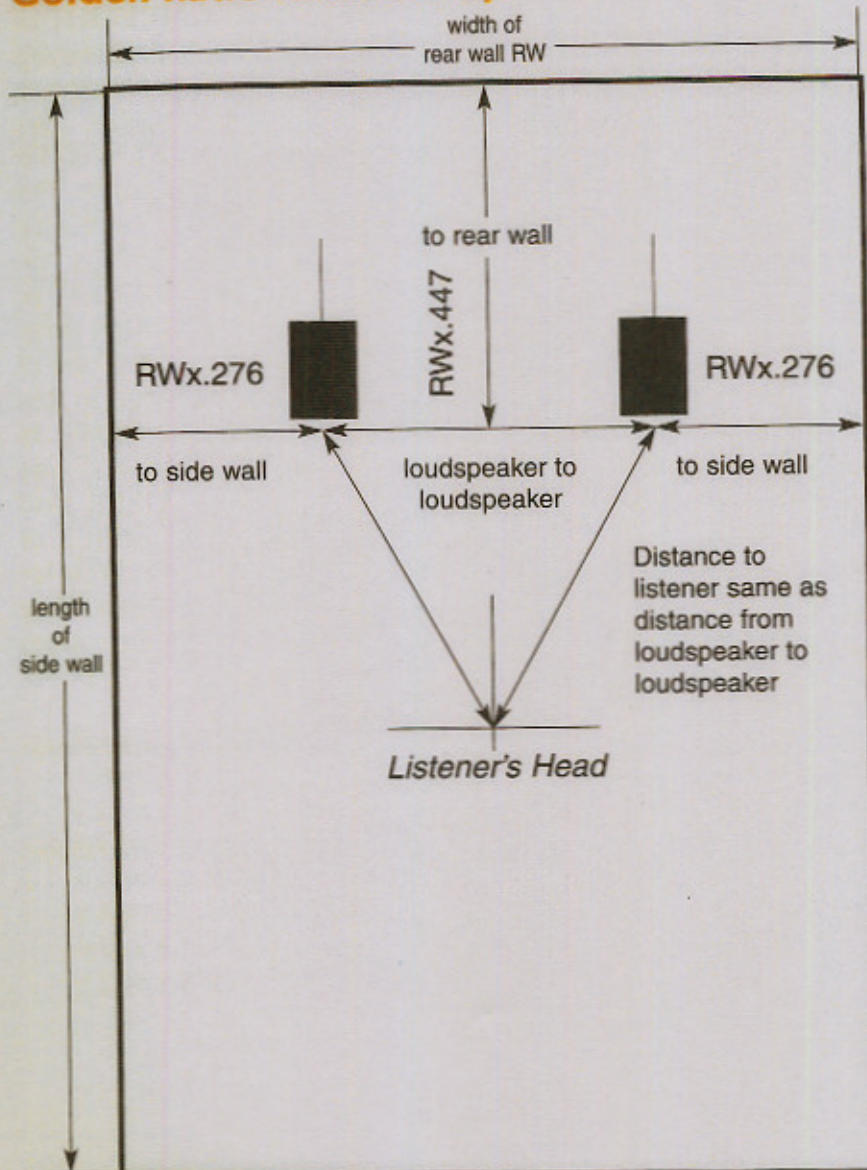
3m x 3.65m x 2.4m = 26.28 cu metres	10' x 12' x 8' = 960 cu ft.
3.65m x 4.27m x 2.4m = 37.4 cu metres	12' x 14' x 8' = 1344 cu ft.
4.27m x 4.88m x 2.4m = 50 cu metres	14' x 16' x 8' = 1792 cu ft.
4.27m x 5.49m x 2.4m = 56.3 cu metres	14' x 18' x 8' = 2016 cu ft.
4.27m x 6.1m x 2.4m = 62.5 cu metres	14' x 20' x 8' = 2240 cu ft.
4.88m x 6.7m x 2.4m = 78.5 cu metres	16' x 22' x 8' = 2816 cu ft.
4.88 x 6.7m x 3m = 98.1 cu metres	16' x 22' x 10' = 3520 cu ft.
4.88m x 7.3m x 3m = 106.9 cu metres	16' x 24' x 10' = 3890 cu ft.

For rooms over 1800 cu ft., because of the furnishings and shape of the room, it may be desirable to use a MODULAR EIGHT or TEN i LFT with the system. Rooms of over 3000 cu. ft. may require 2 LFTs. The MODULAR EIGHT and TEN i may be connected to the 'low level' or 'sub out' output on the receiver/amplifier. This connection limits the output from the amplifier to the LFT to 80 Hz and below and would be used for home theatre applications. The MODULAR EIGHT may be umbilically connected to additional MODULAR EIGHTs as required. For an audio versus an audio/video application, connect either the MODULAR EIGHT or TEN i via the 'high level' or loudspeaker outputs to the 'high level' inputs on the LFT. The MODULAR EIGHT will require the use of the MODULAR 14, LFED (low frequency effects device). In this configuration the LFT 'frequency control' operates through its entire range of 50Hz to 180Hz. This creates true 3-way loudspeakers systems of the MODULAR TWO, THREE and FOUR. It is also possible to use either the MODULAR THREE or FOUR as the front loudspeakers mated with MODULAR TWOS for the rear in 5.1 and 6.1 or rear back in 7.1 systems. Any loudspeaker combination is possible depending on room anomalies, and your personal needs.

Diagrams describing various 'hook up' possibilities are packed with every modular model.

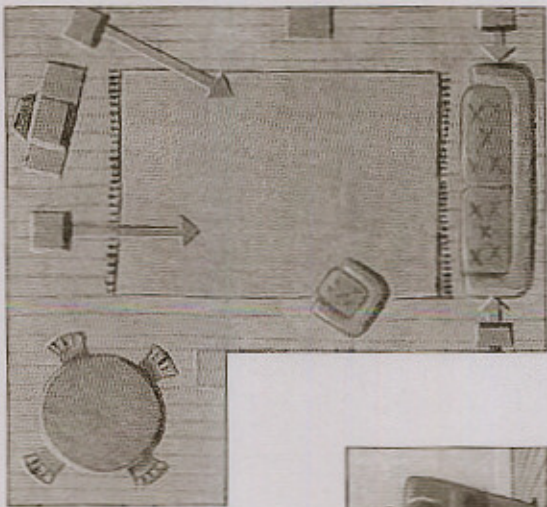
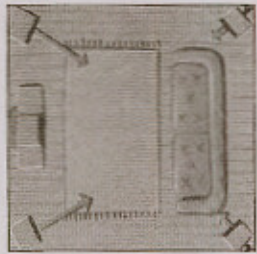
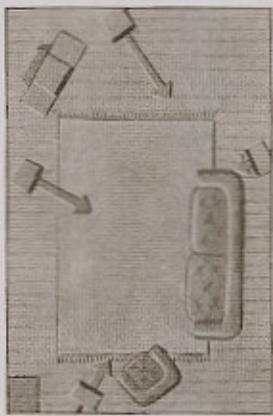
The MODULAR EIGHT may be placed flat on the floor and hidden from view.

Golden Ratio room set-up

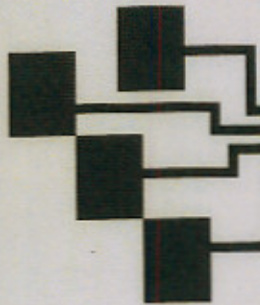



A Golden Ratio room set-up can be seen as a Fibonacci sequence. LPOD

TYPICAL VISUAL LAYOUTS:
Audio Visual



Compliments "WHAT HI*FI?" magazine.



MODULAR LOUDSPEAKERS

Angstrom
LOUDSPEAKERS

135 Anderson Avenue, Markham, Ontario, Canada L6E 1A4
Ph: 905-294-9383 • 1-800-775-4370 • Fax: 905-294-7670
Email: higher.fidelity@sympatico.ca