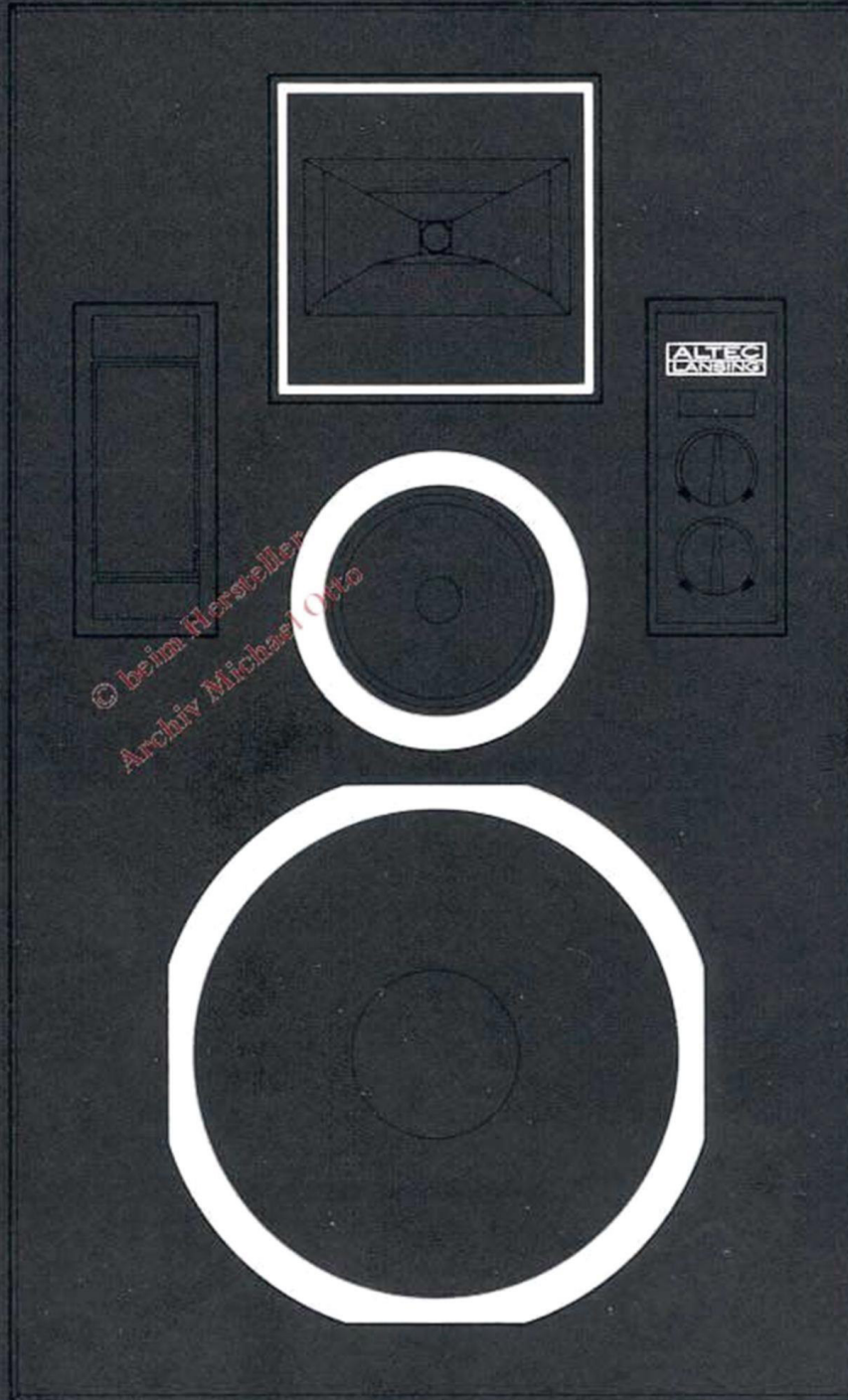


A New Generation of Speaker Systems for the Home

ALTEC  
LANSING



## THE CHOICE OF PROFESSIONALS

During its first half-century, the modern science of sound was little more than a curiosity. There was no signal processing, no magnetic tape, no electronics, not even loudspeakers. Everything was mechanical.

Then came the marriage of the phonograph and telephone technology. The result: Electronically amplified sound. Its first major commercial application was in motion picture sound. "The Talkies" were born, and with them came Electrical Research Products Inc., a fledgling division of Western Electric, dedicated to the development and refinement of professional uses of sound.

About a decade later this division declared its independence from Western Electric, in the process changing its name to All Technical Products Company, or, for short, Altec. A few years later Altec merged with the Lansing Manufacturing Company to become Altec Lansing.

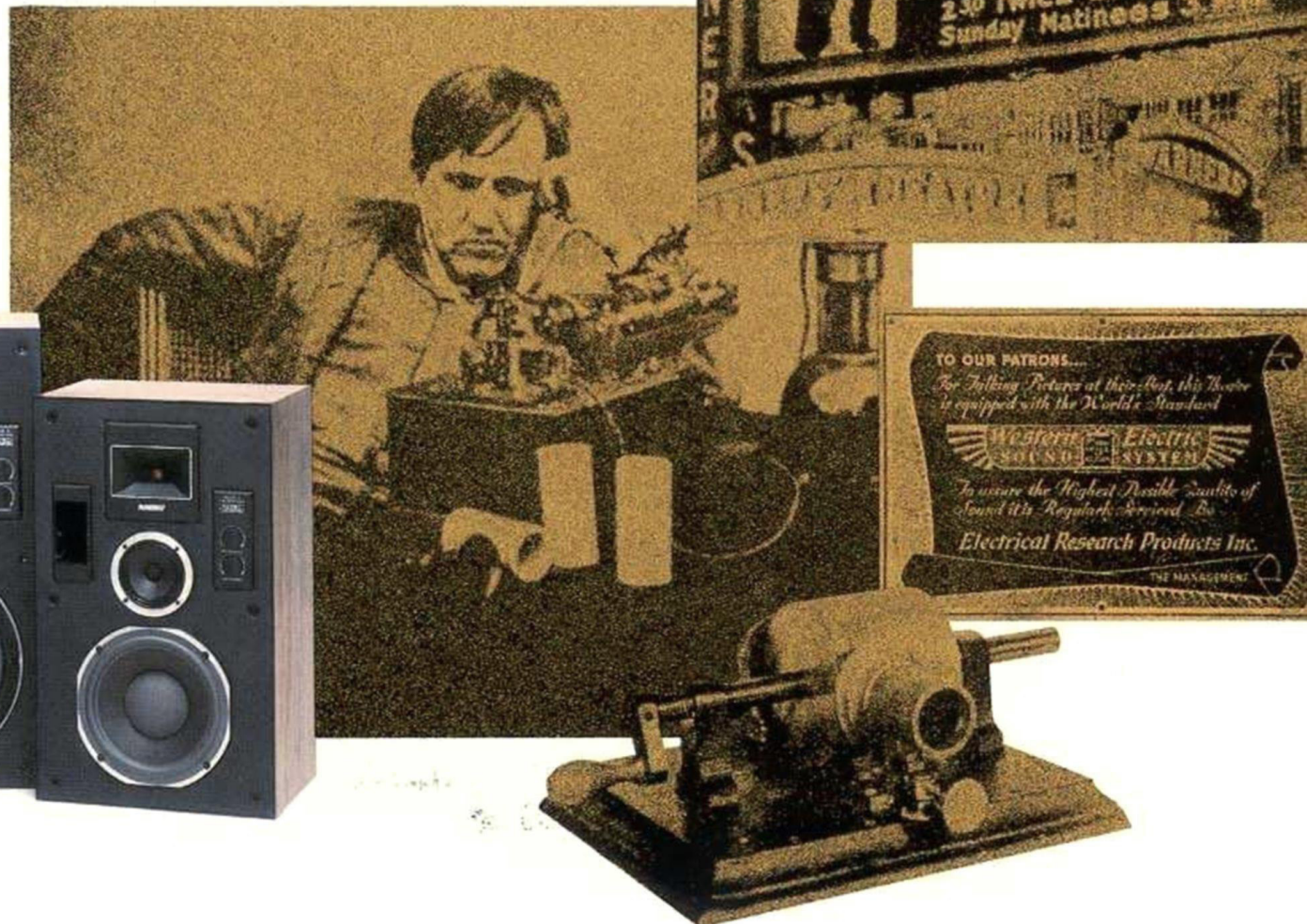
From these beginnings Altec Lansing has grown to become widely recognized among audio industry professionals for superior sound equipment and technology.

Altec Lansing's accomplishments include the first stereo and quadraphonic theatre sound systems, "Acousta-Voicing", a patented process for electronically equalizing the acoustics of rooms; the radial

phase plug for improved compression driver performance; constant-directivity horns; and the Voice of the Theatre, the motion picture industry's **world standard** for sound.

Today Altec Lansing products are widely used throughout the world in recording studios, stadiums, live concerts, and discoteques. Voice of the Theatre speakers are used consistently by the Academy of Motion Picture Arts and Sciences when quality judgments regarding motion picture sound are made. The list of Altec Lansing accomplishments in professional sound is matchless.

With its capabilities solidly established, Altec Lansing presents the most refined speaker systems for home use it has ever developed. A study in affordable perfection, the new models Four, Six, and Eight represent some of the most advanced concepts of the loudspeaker engineers science and art.



## MAKING THE BEST TECHNOLOGY AFFORDABLE

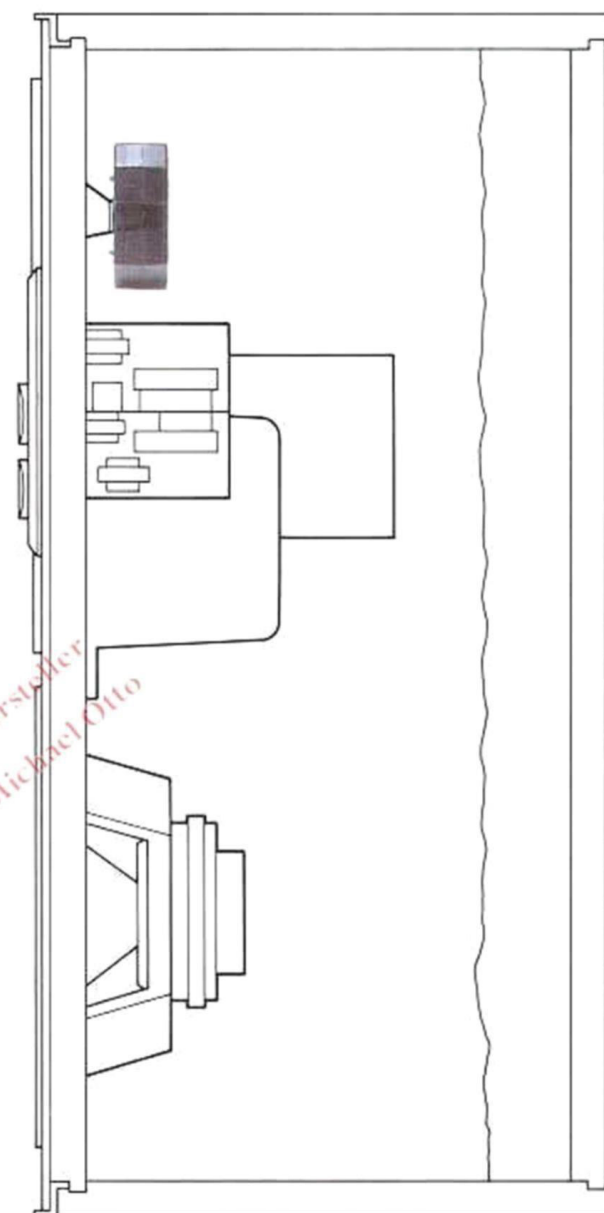
### LZT Ultra High-Frequency Driver

One of the technological themes that has been a part of Altec Lansing since its beginnings is the compression driver—by far the most efficient, wide-band high-frequency loudspeaker. While compression drivers have found their way into many Altec Lansing studio monitors, professional systems, and expensive home models, putting one into a modestly-sized and priced speaker system for the home has been elusive.

But no longer. Value engineering, the science of getting the most from the least through advanced technology, has been at work at Altec Lansing. One result is a new type of compression driver, with many of the same characteristics of its larger brothers, but at a much lower cost and in a much smaller package.

The new driver uses technology originally developed for sonar. It has no magnet, no voice coil, not even metal parts. Instead, it's made of a semiconductor which **directly** converts electrical signals into sound motion, without the need to be transformed into the customary intermediary step, magnetism. This new compound is called **lead-zirconate-titanate**, or, for short, **LZT**.

The new LZT driver has several advantages over conventional devices found in home speakers. It has extremely good ultra-high-frequency response, very low distortion, and superior power capacity. In addition, it makes use of Altec's unique radial phase plug, **Tangerine**, and can be coupled to another Altec exclusive, the **Mantaray** constant-directivity horn, which provides non-beaming high-frequency dispersion, an unheard of commodity in medium-sized speakers.



*Traditional Altec Lansing compression driver for professional use and LZT.*

LZT Ultra High-Frequency Driver  
Pass-Band-Stable Network • Automatic Power Control  
Construction

Tangerine® Radial Phase Plug  
Mantaray™ Constant-Directivity Horn  
Anechoic Damping • Precision Enclosure Tuning

## Pass-Band-Stable Network\*

Because the LZT is different from traditional loudspeakers, its electrical behavior is also different. Traditional crossover network designs just don't work with this unique device. So a new approach had to be found.

The answer was found in, of all places, the aerospace industry, where the design of networks for conserving energy in wide-band, ultra-high-frequency circuits is common.

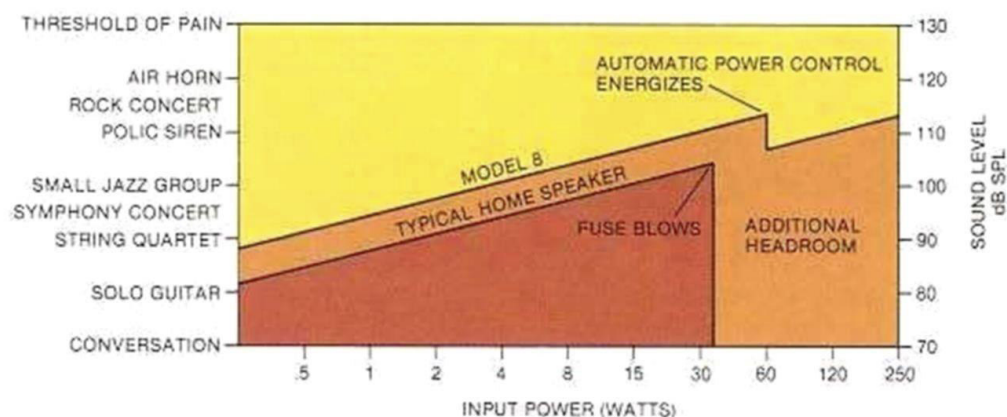
In applying a design that was once the exclusive domain of telemetry engineers, we have given it a new name: **Pass-Band Stable**.

The pass-band is the exact range of frequencies we are interested in hearing from a driver in a multi-way system. No more, no less. The pass-band-stable network developed especially for the LZT provides an increase in high-frequency sensitivity by limiting the pass-band to only those frequencies desired. Through the action of the network, the LZT's surplus bandwidth is transformed into additional high-frequency amplitude.

In addition, the network provides an extremely stable high-frequency load for the amplifier, causing it to work less and sound cleaner. Also, substantial reduction in LZT's already low distortion is achieved with this unique network design.



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## Automatic Power Control

The incredible demands placed on loudspeakers by today's music and the continuing expansion of record performance has created a new need: More durable speakers.

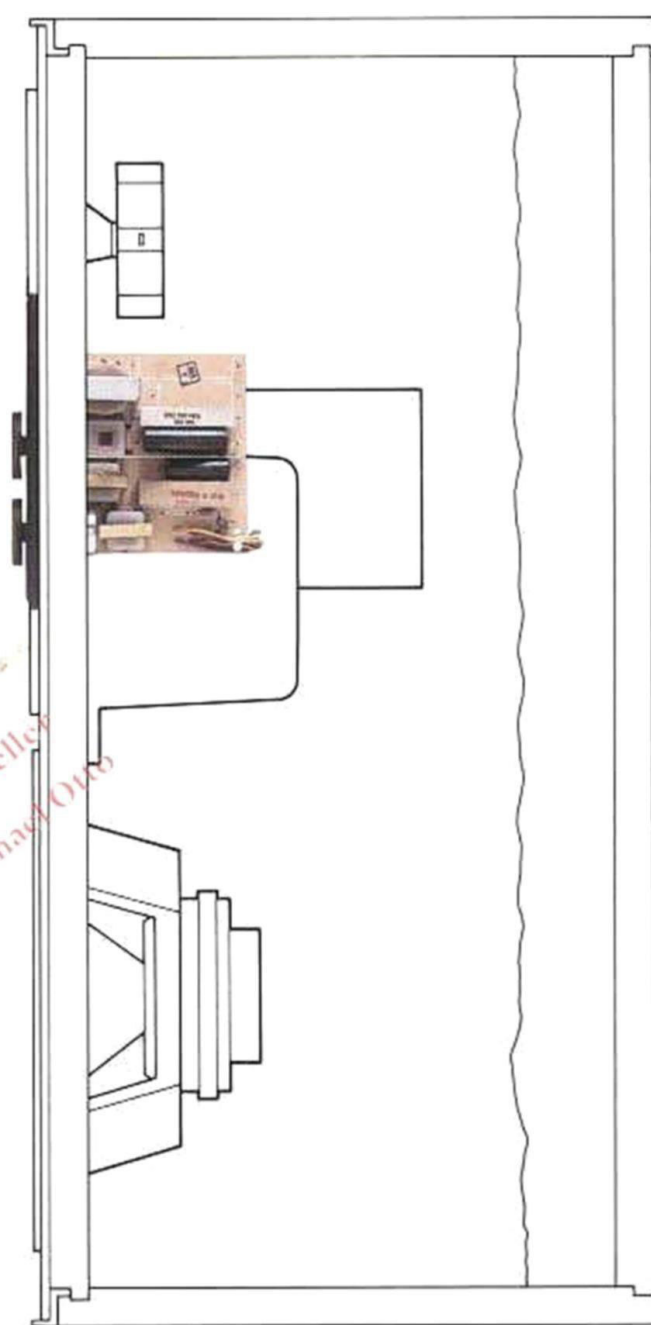
To this end Altec has developed a circuit called

**Automatic Power Control.** We hope that you will never need it, but, if you do, you'll be very glad you have it.

In short, it's a speaker protection device. But, unlike traditional fuses and circuit breakers, it **doesn't shut the system off.** Instead, it **lowers** the power that the speaker receives, automatically. And when it does, the words "Automatic Power Control" light up on the front panel of the cross-over network, so you'll **know** when your loudness is too high. The semi-transparent grille fabric

lets you see when this is happening, even when the grilles are in place.

Automatic Power Control is not a fail-safe system. What it is, though, is a reasonable indication of when you have reached the limits of the speaker, without first doing damage or causing you to fetch a new fuse every time you play your system a bit too loud.



Pass-Band-Stable Network • Automatic Power Control  
Construction

Tangerine® Radial Phase Plug

Mantaray® Constant-Directivity Horn

Anechoic Damping • Precision Enclosure Tuning

## AN IRONY OF DESIGN:

### State-Of-The-Art Technology Housed in the Beauty of Nature.

A product created from nature is today a rare commodity. Repeatedly we are deluged by synthetics that are supposed to look like the real thing, but have such a boring, repetitious, man-made look about them that their apparent perfection is a giveaway to the fact that they grew out of a bottle rather than from a tree.

An enduring part of Altec Lansing tradition has been the hand-crafting of natural wood enclosures. This commitment to nature is now reaffirmed by introducing a species of wood never before used for production speaker cabinets.

The new species is called Endriana; indigenous to the islands of the South Pacific. In its finished form it has a luster and radiance seldom seen in production furniture. Its heavily figured cross-fired grain is a celebration of variation. No two are exactly alike; true of all things created by nature.

Endriana is a **protected** species (not **endangered**, but **protected**). This means that its availability is not limitless. However, in order for Endriana to prosper, a certain amount of it **must** be cut every season to assure continued growth of the younger members of the forest. It is from this enforced cutting that Altec selects its veneers.

You may be asking yourself what difference using Endriana makes to what the speaker sounds like. In reality, there is no acoustical difference between a cabinet covered with Endriana and one covered in any other kind of veneer, laminate, or even vinyl, for that matter. What is significant is that Altec Lansing is diligent in developing creative new materials and processes for everything associated with its products: The way they look; the way they are made; even the way they are packaged for shipment. Pride and commitment go into every aspect of an Altec product.



### Mechanical Design and Construction

The enclosures for models Four, Six, and Eight are crafted from Edriana-veneered particle board of a special construction. Most modern speaker enclosures are particle board, but this new material has some properties that make it especially good for speaker enclosures.

Traditional particle board is made of wood that is ground up and pressed into sheets using glue as a binder. So is our new material, but with some very special changes.

The grind of the chips is of greater variety than ordinary board. A special process causes the finer chips to find their way to the outermost edges, while the larger chips remain inside. This results in excellent panel stiffness and superb strength-to-weight ratio. Further, the finely ground chips form a very dense outer edge, permitting closer machining tolerances for a tighter, better built, more rigid cabinet.

Most wood speaker cabinets are finished with a simple, one-coat covering of a stain/oil/wax mixture. Models Four, Six, and Eight are meticulously finished using a three-step process: Stain, sealer, then a catalyzed lacquer is applied. This produces a more practical, durable finish.

All non-wood components are constructed of either precision alloy die castings or high pressure injection moldings. These no-compromise techniques produce extremely tight fit, superior rigidity for unwavering performance over long periods of time, and excellent surface finish and atmospheric resistance.

The cheaper, non-precision forming processes traditionally found in many speaker systems such as metal stamping, vacuum forming, sand casting, and so on, have been avoided.



Conventional particle board.



New design particle board.

Note density variation in new board.

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**Tangerine®\* Radial Phase Plug.**

Over the years a number of different types of high-frequency drivers have been used in speaker systems. Almost all were found to be unable to reproduce the extreme upper limits of the sound spectrum.

Because of this, many speaker designers chose to add a specialized driver called a super tweeter to their systems. This added to the complexity of the designs, usually resulting in compromises in other aspects of the system's performance.

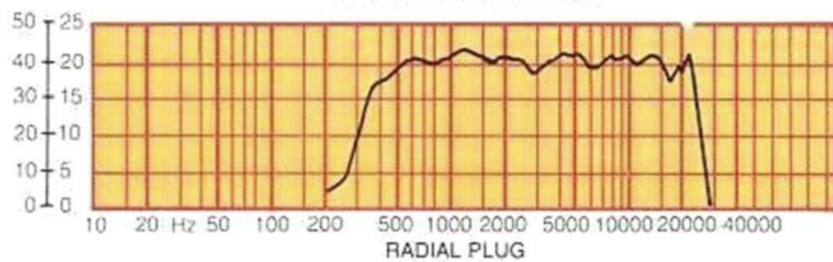
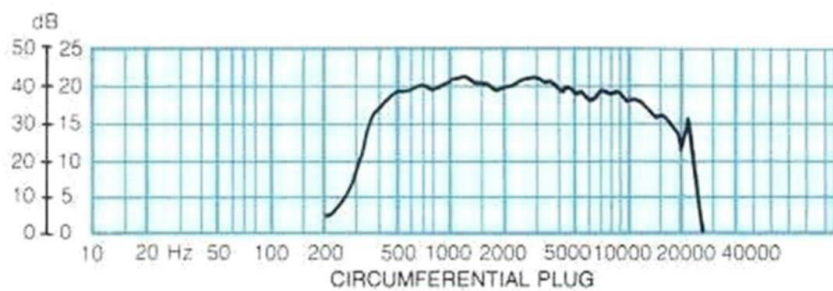
Rather than add more components, we chose to improve the performance of what was already the most sensitive high-frequency device available—the compression driver.

Compression drivers have traditionally been equipped with circumferential phase plugs. These older drivers forced their high-frequency energy through equidistant circular slots. But, because of the design of these plugs, some of the higher frequencies were lost.

The radial phase plug, nicknamed "Tangerine", utilizes a unique radial slot design which allows a free flow of high-frequency energy and results in an honest frequency response to beyond 20 kilohertz.

The LZT driver would not be possible if not for the Tangerine, because the same principles governing ultra-high-frequency propagation apply to both LZT and traditional electro-dynamic compression driver designs. But the combination of LZT and Tangerine produce the clean, clear, transparent highs previously known only to larger, Tangerine-equipped professional systems and larger home floor models.

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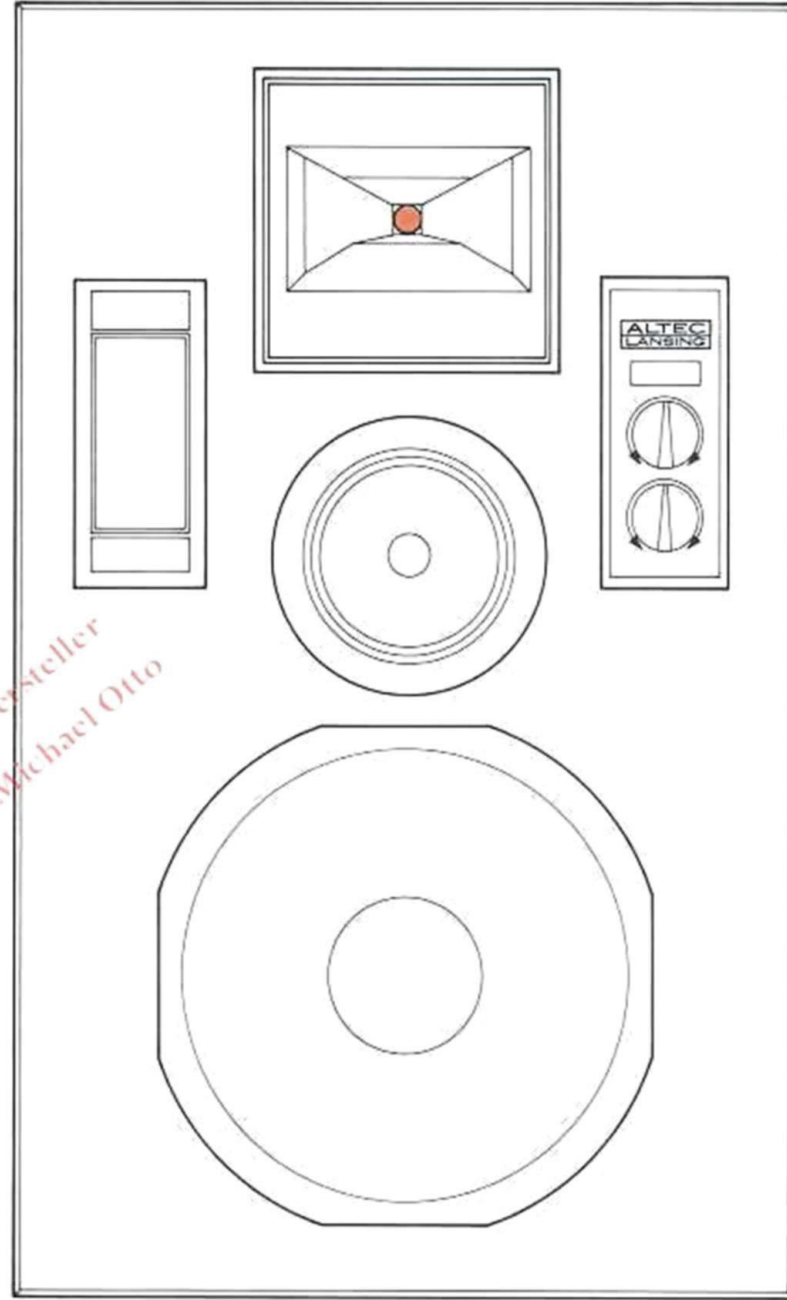




*Tangerine radial phase plug.*



*Circumferential phase plug.*



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## Mantaray®\* Constant-Directivity Horn.

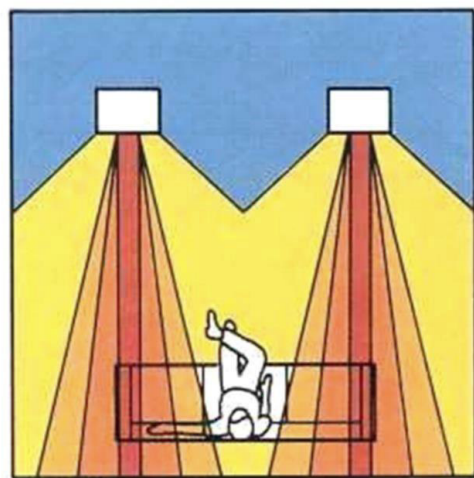
If you've been reading the speaker ads in your favorite magazine lately, you may have noticed that nearly everyone is claiming a wide, even dispersion pattern for their speakers. What they don't tell you is that this pattern is true only for certain frequencies.

The truth is that for all traditional speaker designs, whether they are horns, cones, domes, or whatever, the dispersion pattern depends on the frequency that the speaker is reproducing. As the frequency rises, the dispersion narrows or "beams". It's possible for a speaker to have very wide dispersion at low frequencies but very narrow dispersion at higher frequencies.

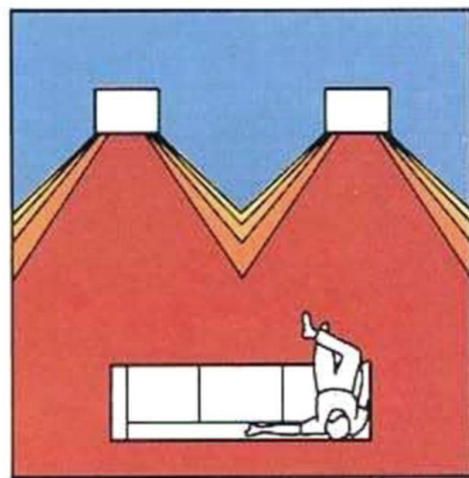
Since beaming occurs at different frequencies in different types and sizes of drivers, the more components a system has, the more complex the problem. In a typical multi-way system, every time there is a crossover from one driver to the next, a narrowing dispersion pattern must be coupled to a widening one. The result of this inconsistent dispersion is a speaker with a stereo image that is poorly defined and tends to wander.

At Altec Lansing we've been investigating beaming for several years. The result is a family of radically different looking and sounding horns called Mantarays. While it would be impossible to explain here why the Mantaray design works, we can explain what it does.

Mantarays produce sound in a continuous wedge of energy without regard to changes in frequency. Beaming is virtually eliminated. Because of this, the stereo image keeps its strength and clearly-defined shape, whether you sit in the traditional equidistant stereo listening position or off to the side. The "listening sweet spot" therefore is much larger than with conventional speaker designs.



*Beaming of conventional speaker. Dispersion angle varies from wide to narrow as frequency rises.*



*MANTARAY keeps dispersion angle constant for all frequencies.*

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During Mantaray's development we also discovered that it would be possible to precisely control the placement of this wedge of sound energy within the listening area. By maintaining an energy wedge that is shaped 100° horizontally and an asymmetrical 40° in the upper vertical and 20° in the lower vertical, the Mantaray allows the listening area to be engulfed in sound but keeps reflected sound to a minimum, minimizing the effects of room acoustics on high frequencies.

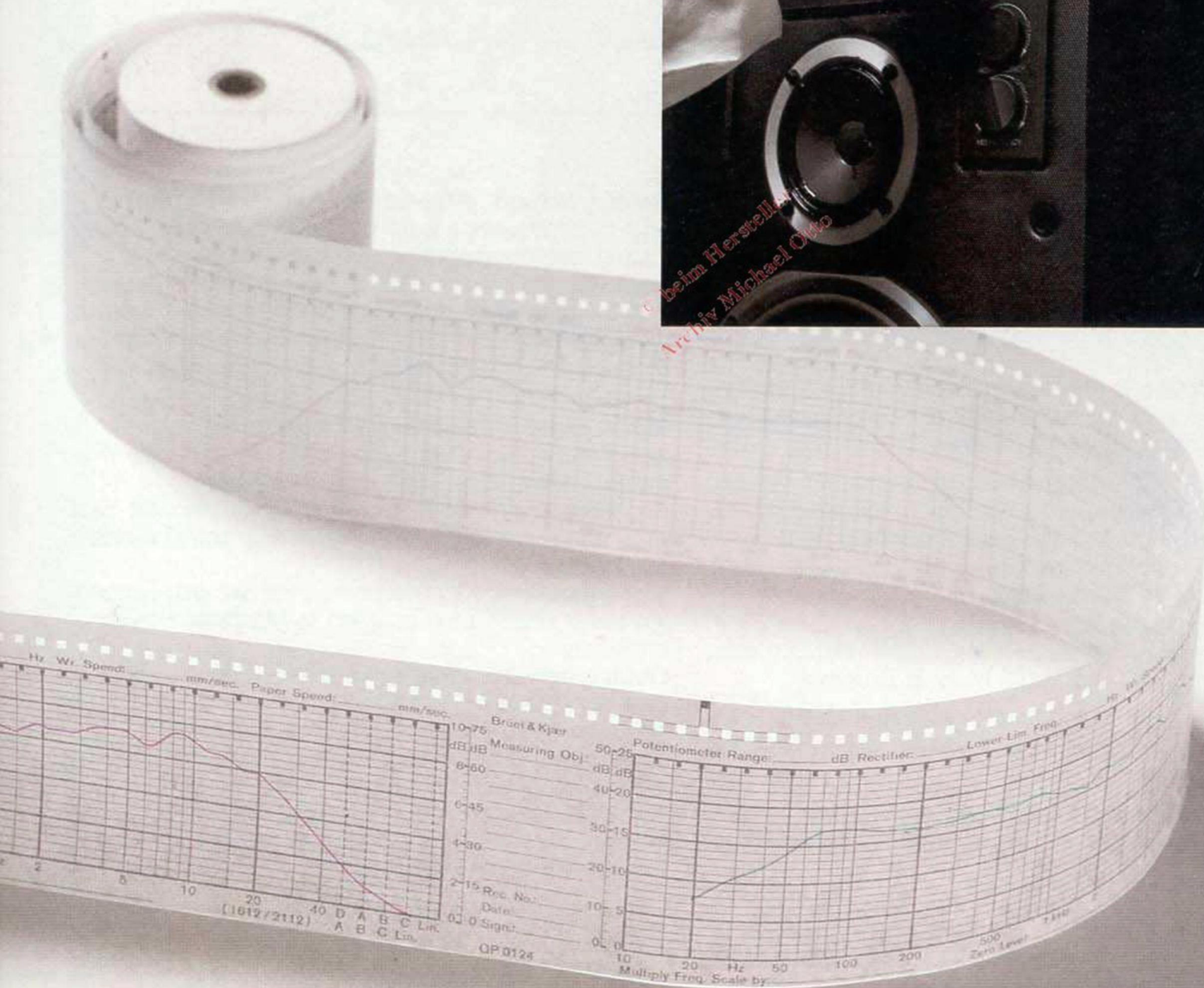
Since Mantaray delivers so little of its sound energy to walls and rugs, it doesn't require the super-critical room placement that reflecting-type speakers need. As an added advantage, this low degree of environmental sensitivity means that Mantaray-equipped systems are much more likely to sound as good in your home as they do in your dealer's showroom.

What all this means is that, probably for the first time, you can hear the delicate balance of the all-important upper harmonic structure no matter where you sit within the listening area, without sound coloration due to room reflections and with the most solid, three-dimensional stereo image you've ever heard.





Soft baffle covering absorbs, rather than reflects sound.



## A NEW GENERATION OF SPEAKER SYSTEMS FOR THE HOME.

For nearly half a century Altec Lansing has been making our world sound better. Chances are that your life has been touched by an Altec Lansing sound system used for reaching mass audiences with music and information.

In addition to its importance to the professional sound industry, Altec Lansing has maintained its commitment to home entertainment. And now, with the introduction of models Four, Six, and Eight, these two paths become more intertwined than ever. The use of professional sound technology to fill home entertainment needs has never been so extensive.

All three models utilize Mantaray horns, compression drivers with radial phase plugs, pass-band-stable networks, anechoic damping, and automatic power control. The Eight has the greatest dynamic range and fullest sound, while the Four utilizes these same new technologies to achieve impressive performance for an equally impressive low price.

### **Model Four Two-Way System**

**Low Frequency:** 25cm bass driver with die-cast alloy frame and deep-well ferrite magnet structure.

**High Frequency:** LZT compression driver with Tangerine radial phase plug coupled to Mantaray constant-directivity horn.

**Dividing Network:** Pass-band-stable network with high-frequency level control; automatic power control with disappearing overload indicator.

**Enclosure:** Computer-assisted enclosure tuning; anechoically damped baffle; high stiffness board; quick-connect terminals; Endriana veneer; catalyzed lacquer finish; precision-fit grille covered in semi-transparent black knit fabric.

### **Model Six Three-Way System**

**Low Frequency:** 25cm bass driver with die-cast alloy frame and deep-well ferrite magnet structure.

**Mid Frequency:** 13cm midrange driver with die-cast alloy frame in sealed, high-pressure injection molded sub-enclosure.

**High Frequency:** LZT compression driver with Tangerine radial phase plug coupled to Mantaray constant-directivity horn.

**Dividing Network:** Pass-band-stable network with high- and mid-frequency level controls; automatic power control with disappearing overload indicator.

**Enclosure:** Computer-assisted enclosure tuning; anechoically damped baffle; high stiffness board; quick-connect terminals; Endriana veneer; catalyzed lacquer finish; precision-fit grille covered in semi-transparent black knit fabric.

### **Model Eight Three-Way System**

**Low Frequency:** 30cm bass driver with die-cast alloy frame and massive ferrite magnet structure.

**Mid Frequency:** 13cm midrange driver with die-cast alloy frame in sealed, high-pressure injection molded sub-enclosure.

**High Frequency:** LZT compression driver with Tangerine radial phase plug coupled to Mantaray constant-directivity horn.

**Dividing Network:** Pass-band-stable network with high- and mid-frequency level controls; automatic power control with disappearing overload indicator.

**Enclosure:** Computer-assisted enclosure tuning; anechoically damped baffle; high stiffness board; quick-connect terminals; Endriana veneer; catalyzed lacquer finish; precision-fit grille covered in semi-transparent black knit fabric.



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FEATURES	FOUR	SIX	EIGHT		FOUR	SIX	EIGHT
LZT UHF Driver	X	X	X	Midrange Sub-Enclosure		X	X
Tangerine Radial Phase Plug	X	X	X	Deep-Well Magnet Structure	X	X	
Mantaray Constant-Directivity Horn	X	X	X	High-Pressure Moldings	X	X	X
Pass-Band-Stable Network	X	X	X	Anechoic Damping	X	X	X
High-Frequency Level Control	X	X	X	Computer-Assisted Enclosure Tuning	X	X	X
Mid-Frequency Level Control		X	X	High-Stiffness Board	X	X	X
Automatic Power Control	X	X	X	Endriana Veneer	X	X	X
Disappearing Overload Indicator	X	X	X	Catalyzed Lacquer Finish	X	X	X
Cast Alloy Midrange		X	X	Quick-Connect Terminals	X	X	X
Cast Alloy Bass Driver	X	X	X	Precision-Fit Grille	X	X	X

SPECIFICATIONS	FOUR	SIX	EIGHT
<b>Speaker Components</b> Low Frequency: Mid Frequency: High Frequency:	25cm (10")  Radial phase plug compression driver mounted to Mantaray constant directivity horn	25cm (10") 13cm (5") Radial phase plug compression driver mounted to Mantaray constant directivity horn	30cm (12") 13cm (5") Radial phase plug compression driver mounted to Mantaray constant directivity horn
<b>Nominal Impedance:</b>	8 ohms	8 ohms	8 ohms
<b>Crossover Frequency:</b>	2000Hz	700Hz; 5000Hz	700Hz; 5000Hz
<b>Enclosure Type:</b>	Vented	Vented	Vented
<b>Sensitivity</b> Measured at 1 meter, 1 watt input, using broad-band pink noise.	88 dB SPL	90 dB SPL	92 dB SPL
<b>Frequency Response:</b>	60-20kHz, $\pm 3$ dB	60-20kHz, $\pm 2.5$ dB	55-20kHz, $\pm 2.5$ dB
<b>Dynamic Range:</b> Minimum crest factor above 60 dB SPL at 1 meter	45 dB	47 dB	50 dB
<b>Amplifier Operating Range:</b> Recommended minimum and maximum amplifier	20-200 watts	20-200 watts	20-200 watts
<b>Maximum Long Term Acoustic Output:</b> Measured at 1 meter using broad-band pink noise	105 dB SPL	107 dB SPL	110 dB SPL
<b>Directivity:</b> Minimum coverage angles	100° wide 40° up 20° down	100° wide 40° up 20° down	100° wide 40° up 20° down
<b>Finish:</b>	Catalyzed Lacquer on Endriana	Catalyzed Lacquer on Endriana	Catalyzed Lacquer on Endriana
<b>Grille:</b>	Acoustically-transparent black knit fabric mounted to removable frame	Acoustically-transparent black knit fabric mounted to removable frame	Acoustically-transparent black knit fabric mounted to removable frame
<b>Dimensions:</b> Height: Width: Depth:	58.5cm 23" 37cm 14½" 31cm 12¼"	64.8cm 25½" 39.4cm 15½" 34.3cm 13½"	75cm 29½" 42cm 16½" 35.5cm 14"
<b>Net Weight:</b>	13.6Kg 30 lbs	16.8Kg 37 lbs	23.1Kg 51 lbs
<b>Shipping Weight:</b>	16.3Kg 36 lbs	20.0Kg 44 lbs	27.2Kg 60 lbs



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