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SR6500

White Paper



# SR6500

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### Overview - The Ultimate Listening Experience

The Polk Audio Signature Reference SR6500 is the ultimate expression of Polk's 22 year experience of developing superior performance mobile speakers. We drew upon several exclusive Polk technologies to produce a speaker system with the best performance, flexibility and fit in Polk's history of mobile loudspeaker design. It is designed with the serious listener in mind—a listener who is serious about the accurate reproduction of music and movie soundtracks in a mobile environment. The stunning realism of the SR6500 will remind listeners of the finest studio sound systems and live performances, not just a "car stereo."

### Performance objectives of the SR6500:

**Ruler-flat on-axis response.** Superior speaker performance depends on many factors, but the cornerstone is flat frequency response. Excellent performance on all other aspects of design cannot overcome major errors in frequency response. Speaker systems with large frequency response errors may sound flattering on some program material but over a broad range of music types will come up short in listener satisfaction.

**Smooth off-axis response** with gentle high frequency roll-off. Overly broad high frequency dispersion can ruin the sound of an otherwise good mobile system. High frequencies bouncing off windows and interior panels result in an overly bright tonal balance with a smeared image and vague sound staging. The goal is smooth and balanced midrange response with a gentle high frequency roll-off.

**Extended bass response.** The wider the range of frequencies the main speaker can reproduce, the better the performance of the entire system. Over-reliance on the subwoofer to produce "kidney punch" mid-bass results in boomy bass, poor imaging (the woofer "drags" the image to the back of the vehicle), congested vocals and poor definition. By delivering superior bass response, the SR6500 allows the installer to set a lower crossover point to the woofer for cleaner, tighter, higher-definition performance, from the low bass through the midrange with realistic, "up front" sound staging.

**Extended high frequency response.** By extending the high-frequency response well beyond 20kHz, annoying resonant peaks are driven above audibility. Extended response also appears to have a beneficial effect on midrange detail and a general sense of "air."

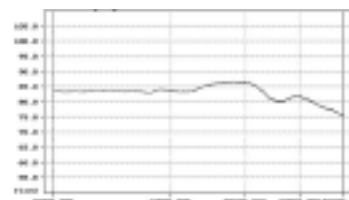
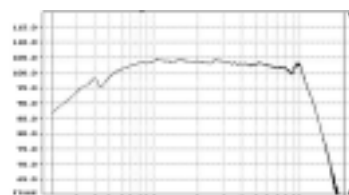
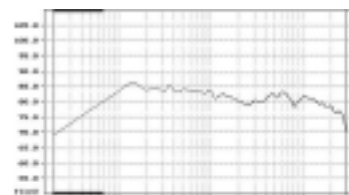
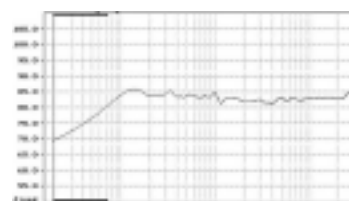
**Low distortion.** The key to obtaining greater detail and transparency is maintaining low distortion from whisper to live concert levels.

**High power handling.** Even a system designed for sound quality, such as the SR6500, needs to be able to play loud, handle the full output of top-of-the-line amplifiers and play at realistic volumes without audible distress or damage.

### Other objectives of the SR6500:

**Fit.** All the performance in the world is useless unless you can fit it into available spaces in your vehicle. The SR6500 requires installation by an experienced installer, but the goal was to design it so that it could fit in the vast majority of vehicles without major modification.

**Versatility.** Sometimes a coaxial speaker is preferable to a component system. The SR6500 can be converted from component system to coaxial and back again within minutes.

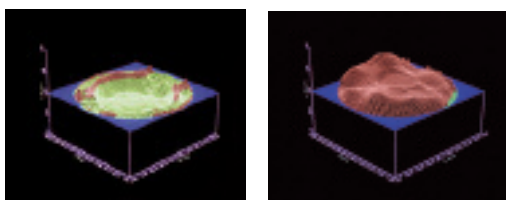


### Technologies

#### A Better Driver

##### *Cone:*

The perfect cone material would be low in mass (light) so that it could rapidly accelerate and decelerate for superior detail and transparency. Also, light cones are easier to move, meaning they are more efficient and require less amplifier power to play loudly. The ideal cone would also be infinitely stiff, as stiffness determines the bending wave velocity and hence the frequencies at which resonance will occur. A stiff cone resists torsion and flexing that would cause resonance, a root cause of frequency response error and distortion. At the same time, the ideal cone would have high internal damping to suppress any resonance or "ringing" that may occur on the cone.



Laser Interferometer Images Showing Resonance on Speaker Cones

Of course this ideal material does not exist, because these three requirements (low mass, stiffness and damping) tend to be mutually exclusive. Make a structure stiffer, and it is more likely to ring. Damp that stiff structure with a soft material, and you just added mass. Well-damped materials are not stiff. All cone materials seek to hit an ideal balance between these three elements.

The best analogy to understand the principles at work here is that of an iron rod and a garden hose. The iron rod is stiff but when you strike it, it rings like a bell. The garden hose doesn't ring when struck because it has good damping properties, but it is not stiff. If you were to insert the iron rod into the hose, you would have a structure that was both stiff and well-damped (good) but it would also be high in mass (heavy).

Polk Audio's Laser Interferometer research has helped us develop and discover new materials and combinations of materials that strike the best balance between stiffness, damping and mass. The best material we have found to date is Aerated Polypropylene (APP). We use this material for the cones in our top-of-the-line award-winning LSi in-home loudspeakers that have been widely praised for their exceptional accuracy.

So what exactly is Aerated Polypropylene (APP) and why is it so good? It is mineral-filled Polypropylene that has been "puffed up" with injected air to form a honey-comb-like structure. Take a look at the scanning electron microscope photo of the cross section of an APP cone (**Figure A**). You can see that near the surfaces the material is densely packed. In fact at that layer the material is hard and stiff—we call it the crunchy outside. The added thickness of the material contributes to stiffening the structure, because stiffness increases with the cube of thickness. In the middle layer you can see air pockets in the material. This soft material provides good internal damping. We call that the chewy center.

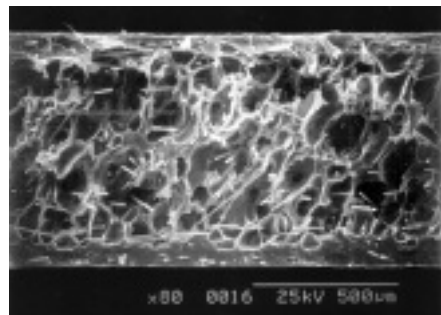


Figure A



Matthew Polk and University Researcher inside Laser Interferometer Lab

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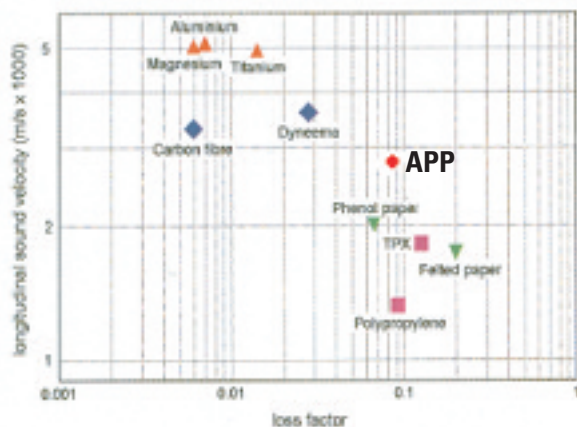


Figure B

Take a look at the chart in **Figure B**. It plots the stiffness and damping properties of various cone materials. The ideal material would have both high stiffness and high damping and would appear in the upper-right hand corner of the chart. You can see that the metal cones are very stiff but low in damping. Remember the iron bar analogy? Soft, well-damped materials, like plain Polypropylene, have high damping but low stiffness just like the garden hose. Paper makes a good compromise between stiffness and damping but it deteriorates, especially in a humid environment and, therefore, is not a good choice for mobile audio. Only the APP cone approaches the ideal balance of high stiffness with high damping and high resistance to moisture, UV and temperature extremes. Factor in that its mass is only about 60% of normal Polypropylene, and it's even more impressive.

We could have combined a material that scored high in stiffness with a highly damped substance, but the result would be a cone that was unacceptably high in mass (heavy). Heavy cones are less efficient (need more amp power

to play loud) and have poorer transient response and less detail. Using virtually mass-less air to stiffen the cone is the ideal solution to achieve higher performance with no loss of efficiency and transient detail.

### Surround

The cone is bonded to the basket with a soft Butyl Rubber surround that acts to further suppress cone resonance. If an unwanted resonance develops in the cone it travels through the cone like a wave in a pool. Like a water wave reflecting off the side of a pool, if the cone resonance wave hits a hard boundary, it will reflect back through the cone (**Figure C**). The surround of the SR6500 is soft injection-molded Butyl Rubber, tuned to absorb unwanted cone resonance. As well as helping make for a superior sounding driver, this surround is impervious to Ultra Violet rays (sunlight), temperature extremes and humidity for ultimate long life and reliability.

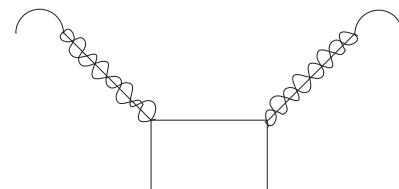


Figure C

### Phase Plug

OK, we admit it, that bullet-shaped thing in the middle of the driver does look really cool, but it plays a vital role in ensuring smooth, flat, off-axis frequency response. Higher frequencies radiate from the driver near the center of the cone. If the short high frequency waves radiated from one side of the cone (**Figure D**) meet the same sound waves from the other side of the driver (and they will), those sound waves will interfere to cancel and reinforce each other. The result is uneven frequency response and poor off-axis performance. The phase plug prevents those short high frequency wavelengths from bumping into and interfering with each other (**Figure E**). The benefit is flatter, smoother high-frequency response both on- and off-axis.

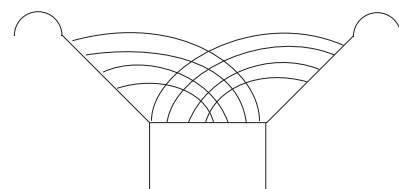


Figure D

The phase plug can be removed to convert the SR6500 into the best coaxial speaker on the planet—more on that later.

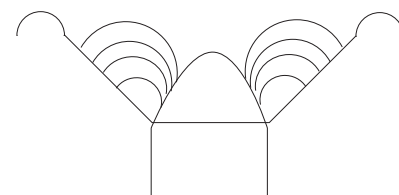


Figure E

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### Basket

The best cone in the world would be undone by being mounted on a weak, crummy basket. The SR6500's basket is cast aluminum, rigid enough to hold all the active speaker parts in precise alignment, even when firmly screwed to a vehicle panel. Its high mass suppresses mechanical resonance and ringing.

But there's more. The basket and magnet cover are one piece with heat sink fins that serve to draw heat away from the voice coil, increasing power handling and reliability.

The basket is vented to equalize the air pressure on both sides of the suspension (**Figure F**) to allow free and linear movement of the spider and cone in both directions of travel (in and out). This is just one of the dozens of construction details that contribute to the incredibly flat response and low distortion of the SR6500.

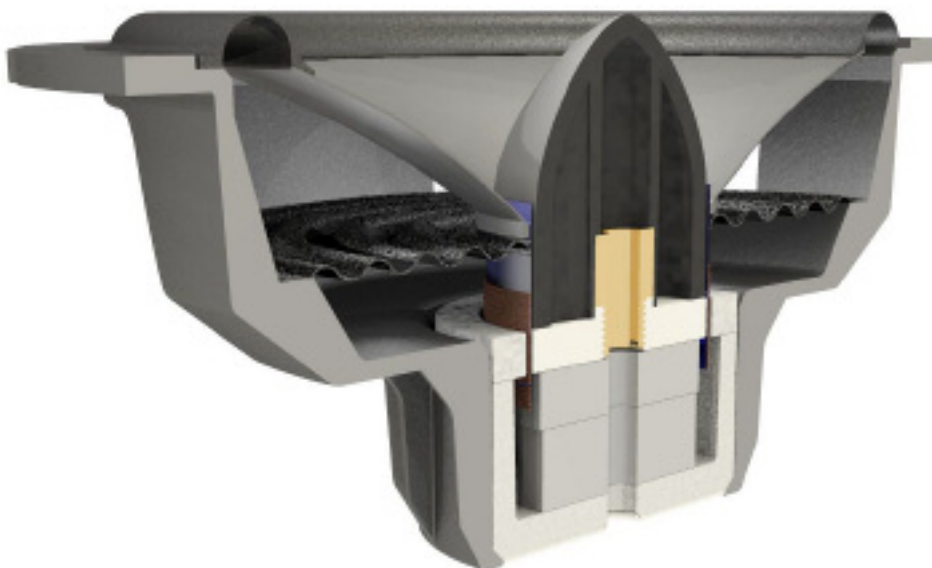
We made the SR6500 as easy a fit as any premium component system. Euro, Asian and American mounting screw patterns are accommodated by the 19 screw mounting holes along the circumference of the basket (**Figure G**). With a top-mount depth of only 2 1/2" and 2 supplied spacer rings per driver, the SR6500 will fit in even shallow door panels such as Subaru Imprezas and Honda Civics.



**Figure F:** Vent holes equalize air pressure on both sides of the spider for more linear cone travel.



**Figure G**



### Voice Coil, Former & Magnet

The voice coil is wound around a 1-1/2" diameter low-mass, high temperature Polyimide-glass former. The large diameter coil contributes to the high bass output and high power handling of the driver (125 Watts Continuous, 250 Watts Peak). To save weight and mounting depth without any sacrifice in strength, we used a Neodymium magnet that packs the flux power of a ceramic magnet 10 times its size. Cooling fins molded into the basket cover draw heat away from the voice coil and magnet for superior power handling and reliability.

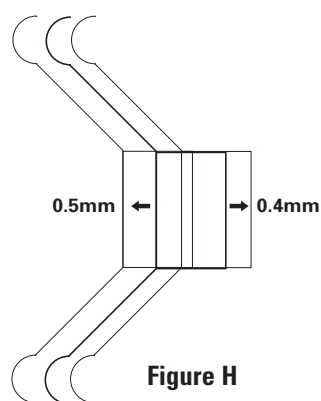
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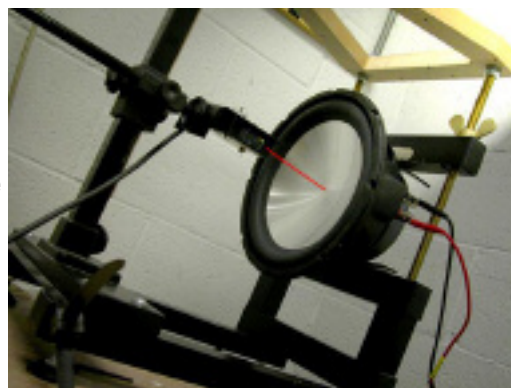
### Klippel Optimization

Of greater importance than the voice coil material, magnet type or size is where the coil sits in the magnetic structure and how it moves within that structure. In order for a driver to reproduce complex sounds accurately, the cone must move in exactly the same distance and manner in both directions of travel. To illustrate what we mean, take a look at **Figure H**. If the cone moves 0.5 mm in the forward direction and only 0.4 mm in the backward direction in response to a given sine wave signal, the sound will be distorted. In order for the driver to move accurately in both directions, equal force must be applied to the cone, and the cone must be able to move as far and as freely in both directions. You'd think that would be easy—but it isn't.



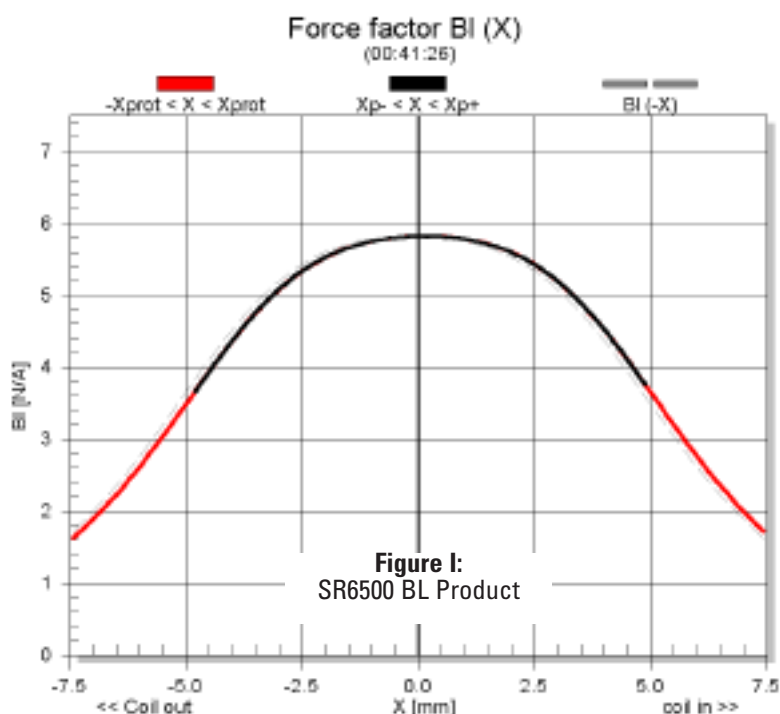
**Figure H**

Thankfully, Polk Audio owns a Klippel Distortion Analyzer—a device that uses a laser and sophisticated software to do large-scale analysis of drivers in motion. With this state-of-the-art tool we can optimize the motor structure, voice coil alignment and suspension to yield the best possible performance.



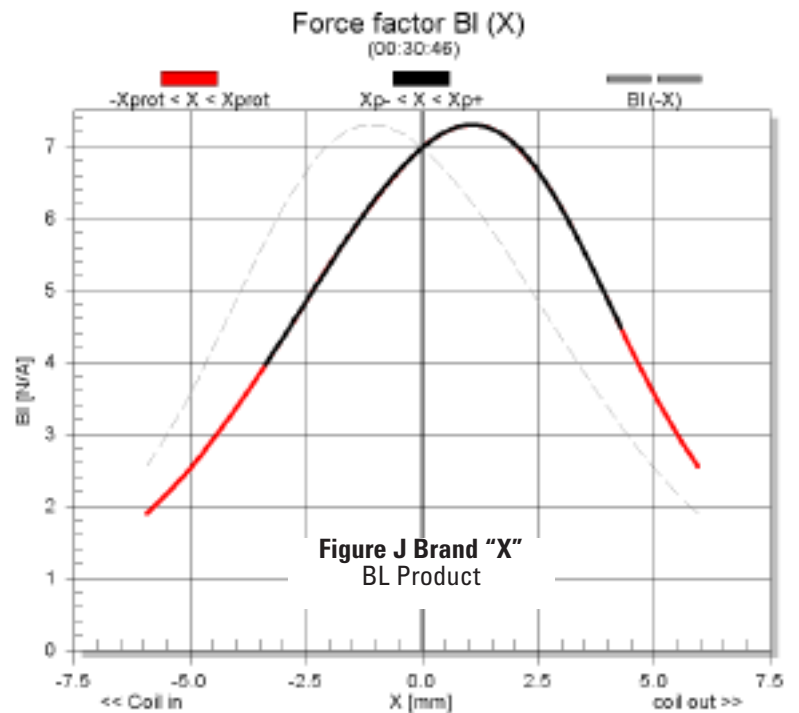
Dr. Klippel's  
Marvelous Machine

**Figure I** is a graph of the BL product of the SR6500 driver. BL Product is the product of the motor's magnetic flux density times the length of voice coil in the gap. Put more simply it is a measure of the motive force applied to the driver cone. The important thing isn't whether you have more or less BL product, but whether you have the right amount for the mass of the driver and whether the BL is applied uniformly. Ideally you would like to have the same amount of BL product applied to the cone at every distance of excursion in both directions of travel. The perfect driver would have a straight line graph plot. In the real world drivers have limitations. In these graphs the center "0.0" vertical line represents the cone at the center "rest" position. To the left of center line is forward cone movement; to the right is backward cone movement. In this kind of graph, you're looking for a symmetrical curve, centered on the "0.0" line and a broad, flat shape.

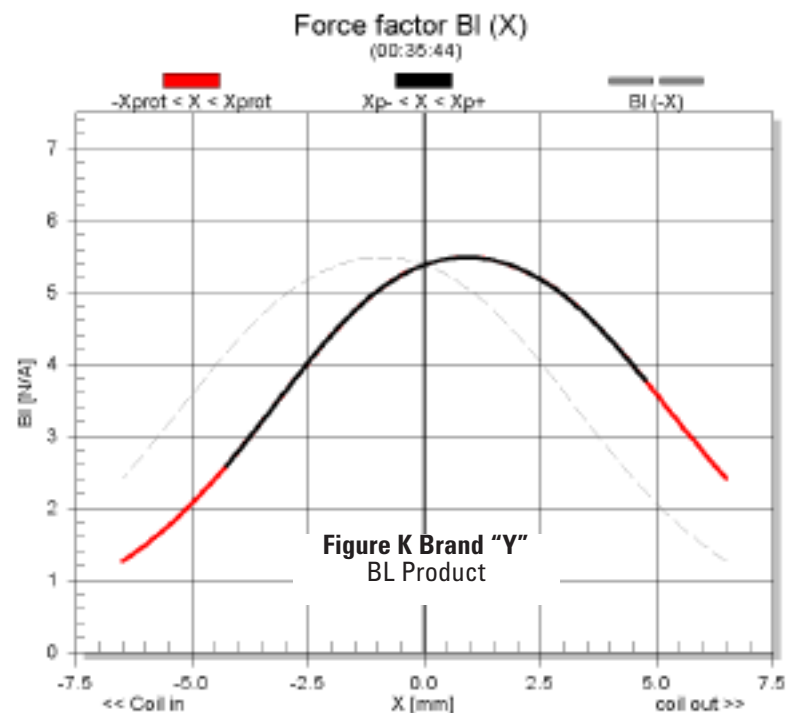


**Figure I:**  
SR6500 BL Product

**Figure J** is the BL Product curve of a competitive 6-1/2" component driver from a system that retails for \$1,000. Notice how the BL drops off in strength more rapidly as the cone moves from the center rest position and that the BL peak is reached a full millimeter from the center rest position.



**Figure K** is another competitive product that retails for \$1200. It has a flatter and broader curve than Brand X but it too is not symmetrical around the centerline and drops off more rapidly than the SR6500 driver. These competitive systems are excellent sounding, well regarded product which we respect for their many fine qualities. We are comparing our product directly to these two simply to point out how thoroughly and carefully we engineered the SR6500.



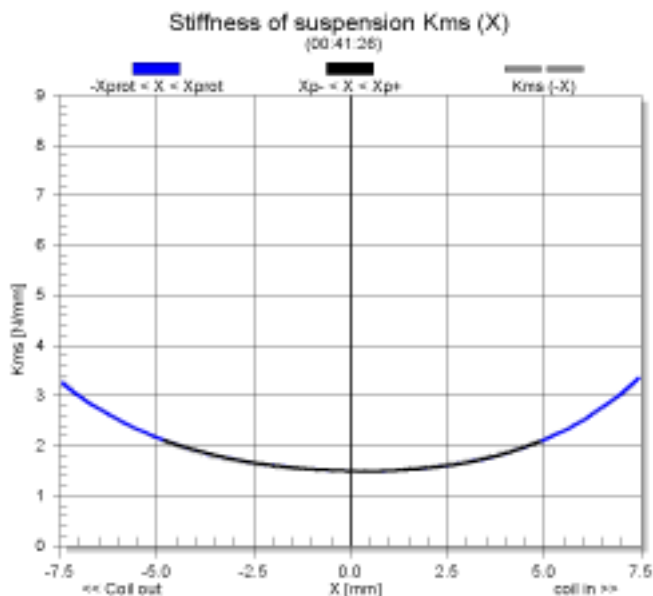


Figure L: SR6500

Another important Klippel analysis is that of stiffness or “springiness” of the suspension. Again, you’d like to have a symmetrical, broad, flat curve indicating that the tension strength of the suspension is consistent over a broad range of cone travel in both directions. Greater or lesser stiffness is immaterial, what is important is consistency. **Figure L** is the SR6500 showing a symmetrical and linear suspension stiffness over a broad excursion range.

**Figure M** is the \$1000 Brand X product showing a less consistent stiffness over a shallow range of travel. **Figure N** is the \$1200 competitor with a nice looking curve over a broad range of travel. Good job but still not as good as the SR6500. The dashed curve in the graphs is the mirror image of the measured curve, and it’s there to show symmetry (or lack thereof). Perfect symmetry results in identical curves. In our case, you can’t see it because it lays right on top of the measured curve. On the other two, it’s visible because they’re not as symmetrical.

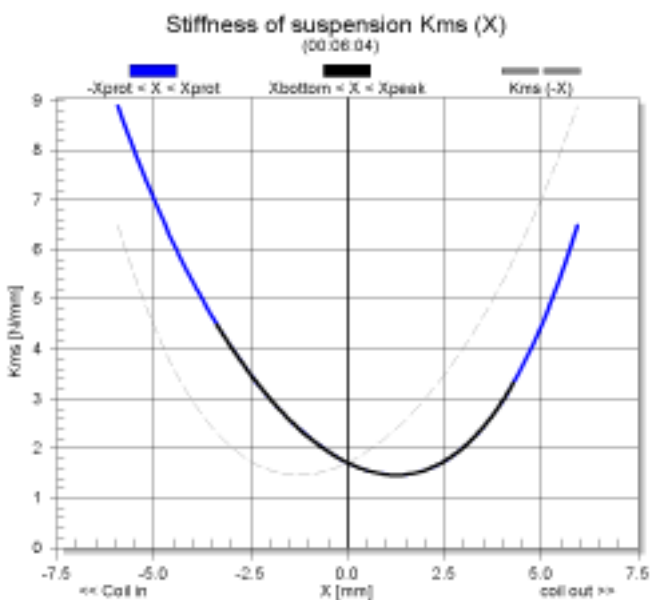


Figure M: Brand “X”

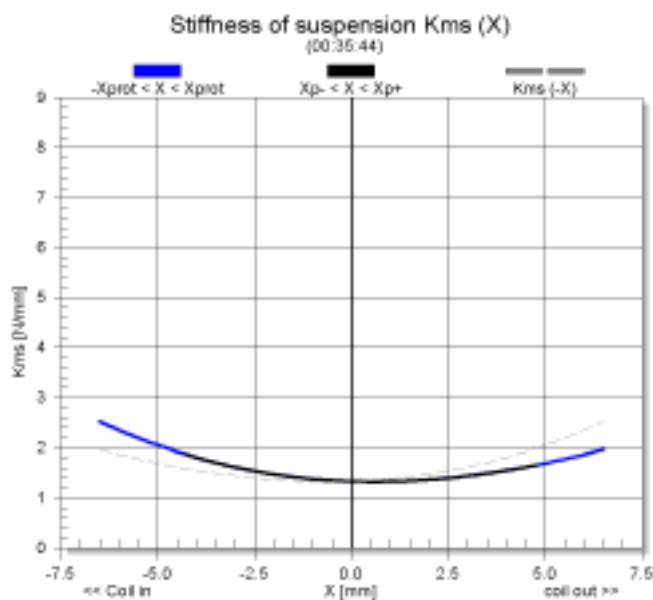


Figure N: Brand “Y”

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### *Final Word*

The bottom line is that the SR6500 6.5" driver has remarkable performance. Thanks to its well-designed motor/voice coil/suspension system, the SR6500's driver produces exceptionally deep, tight and accurate bass with vanishingly low levels of distortion. Because the cone is stiff, it produces exceptional bass for a cone of its size. Thanks to its well-damped cone and the phase plug, the SR6500 driver's frequency response is smooth and accurate without annoying peaks and dips—you hear all the music that's on the recording and nothing more. And because the cone is light, it can accelerate quickly to reveal details in the music that you've never heard before.

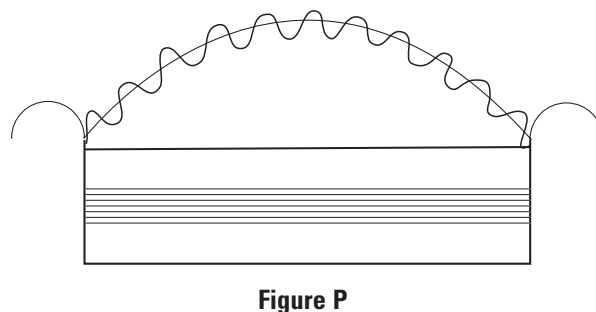
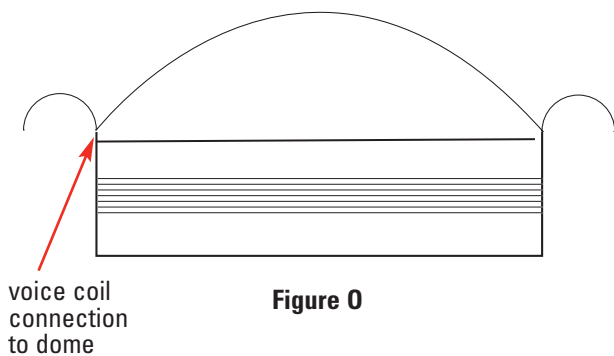
### **Ring Radiator Tweeter**

The SR6500's is a Ring Radiator design—an advanced technology used in high-end audiophile home speakers costing as much as \$35,000. There are simply no other mobile audio speakers in this price range with a tweeter as good as this remarkable tweeter. The Ring Radiator Tweeter gives the SR6500 its incredible accuracy and astonishing detail. It reveals all the nuances of your favorite CDs and DVDs, as well as unlock the full-fidelity potential of today's high-definition software formats such as DVD-Audio and SACD.

### *Diaphragm*

Just like driver cones, tweeter diaphragms are prone to material resonance that cause frequency response errors and distortion. Careful choice of material is important, as is the geometry of the diaphragm.

Tweeter diaphragms must be able to vibrate at least 20,000 times per second! That's fast, and it stands to reason that light weight is especially important in tweeters. But as we saw earlier, light, well-damped materials are not stiff and even a tweeter needs to be stiff to avoid "decoupling" and other problems. A dome shape helps give the diaphragm greater structural integrity and stiffness. Take a look at **Figure O** to see a cross-section of a typical tweeter dome. You can see that the dome is supported by the voice coil only along its circumference. That means there is a vast area of diaphragm that is not supported, making the tweeter prone to resonance developing in the dome material (**Figure P**).



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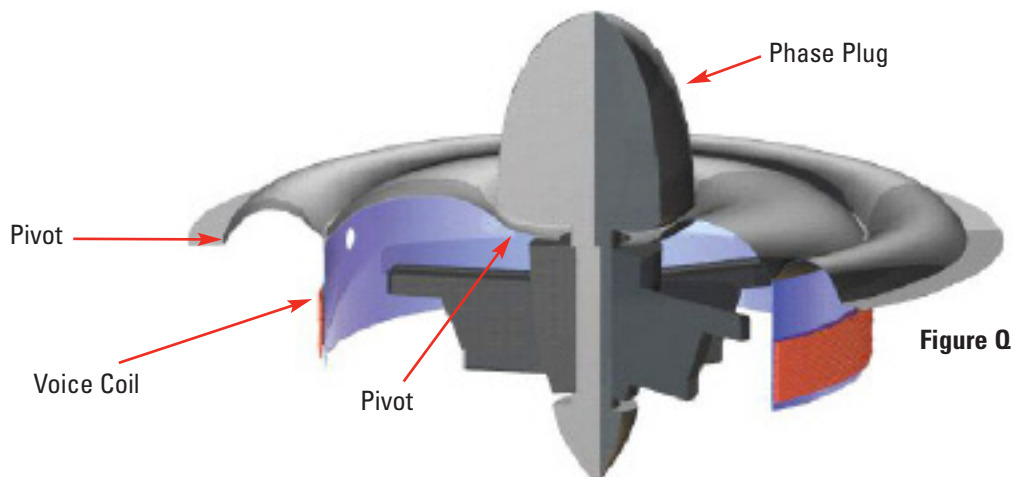
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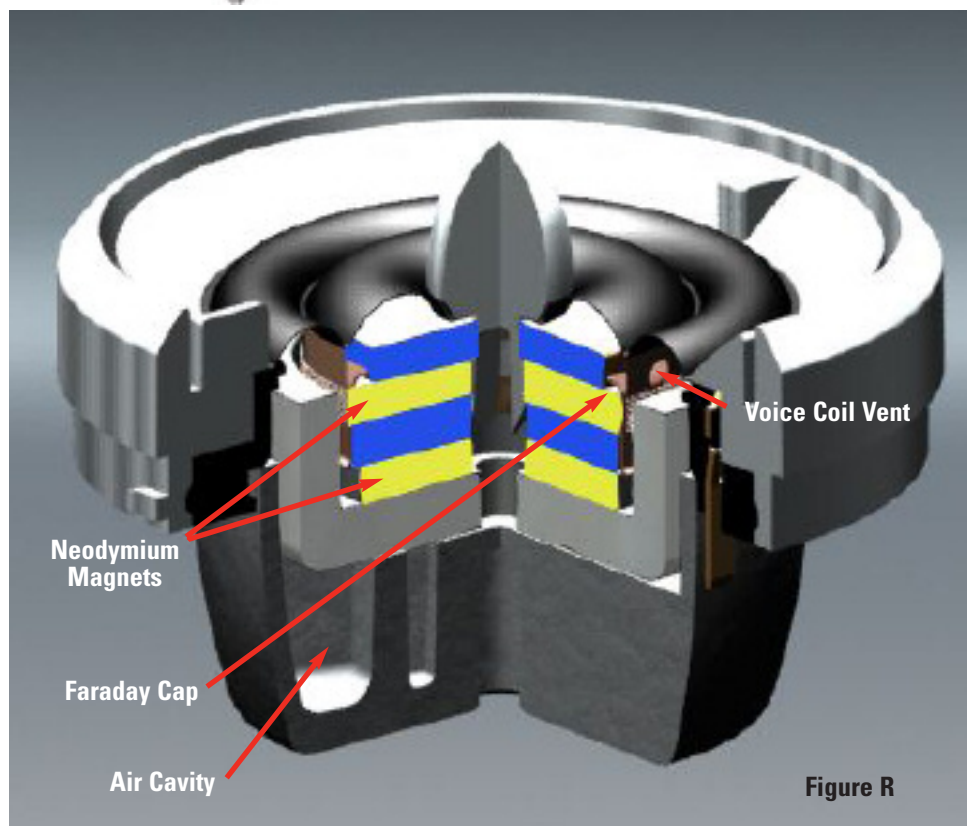
Now take a look at **Figure Q**, the cross-section of the Ring Radiator tweeter diaphragm used in the SR6500. The ultra-light, woven diaphragm is supported at two pivot points, with the voice coil attached roughly midpoint between the two pivots. With very small areas of unsupported material, there's less opportunity for performance-robbing resonance to develop. The integrated phase plug prevents phase cancellations to maintain flat, smooth response both on- and off-axis.



### *Voice Coil, Former & Magnets*

The voice coil filament is Copper clad Aluminum combining the lightweight property of Aluminum with the superior high frequency conductivity of Copper.

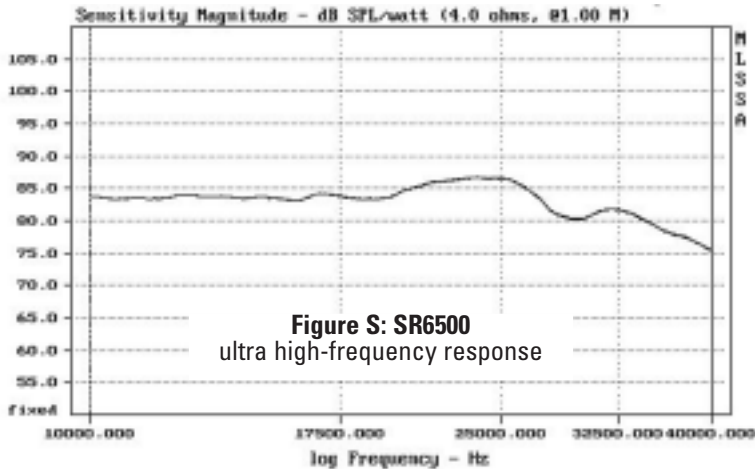
A Copper "Faraday Cap" (**Figure R**) on the top of the magnet stack flattens the impedance curve, lowers distortion, extends and improves high-frequency response. Dual Neodymium magnets bathe the voice coil in powerful magnetic flux while retaining compact dimensions. An air cavity below the diaphragm acts much like the enclosure in a woofer system to extend and control low-frequency response for flatter, more accurate response near the crossover frequencies.



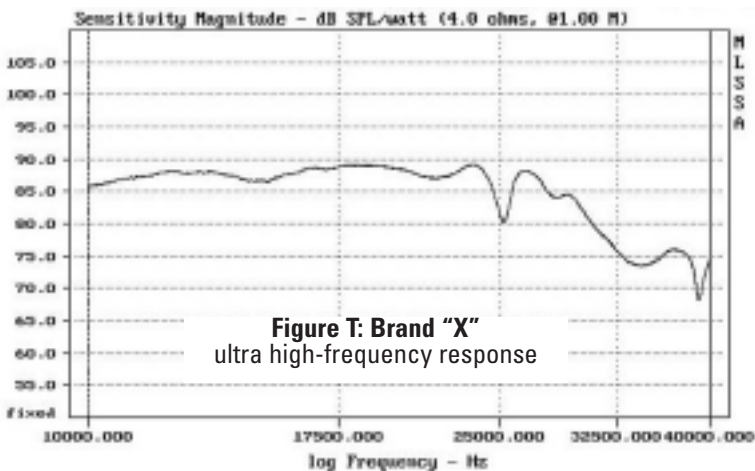
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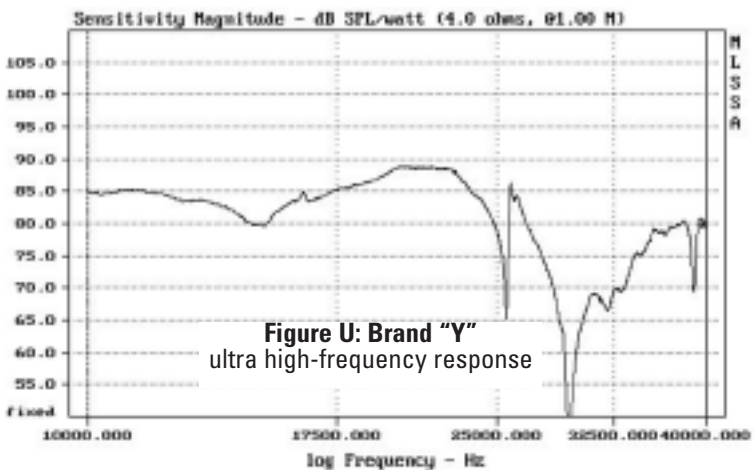
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The performance of this tweeter is stunning. Take a look at **Figure S**, the frequency response of the SR6500 tweeter from 10kHz to 40kHz. High-frequency response this flat and extended is vital for truly life-like and accurate sound quality. The SR6500's sound is clear, natural and rich with "air" and musical details you've never heard before in a mobile audio system.



**Figures T and U** are brands X and Y again, measured over the same frequency range of 10kHz to 40kHz.



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### *Tweeter Mounting*

The SR6500 is a 2-way "compaxial" speaker system; it can be used as either a separate component or as a coaxial system. When used as a component system, the tweeter can be mounted with either a straight flush-mount cup or with a 15° angled cup—both supplied with the product.

When used as a coaxial speaker, simply unscrew the Phase Plug and screw in your choice of tweeter posts. Both straight and 15° angled tweeter posts are supplied.

The tweeter coaxial mounting posts have computer-smoothed geometry (**Figure V**) to minimize performance-robbing diffraction effects that plague competing coaxial systems. The SR6500 midrange is smooth, open and clear.



**Figure V**



Coaxial angle mount



Coaxial straight mount



Component angle  
flush cup

### **Crossover**

Great drivers and tweeters will get you great full-range performance only if they're working together perfectly—and that's the job of the crossover. The Low Pass section of a crossover filters out high frequencies from the driver (it filters the highs and passes the lows, hence Low Pass) while the High Pass section filters out the low frequencies from the tweeter (it filters lows and passes highs, hence High Pass). The frequency the two filters overlap is called the crossover frequency, and the rate at which the filtering is done is called the crossover slope or roll-off rate. The quality of the crossover design and of the component parts can have an enormous effect on the sound of the complete speaker system.



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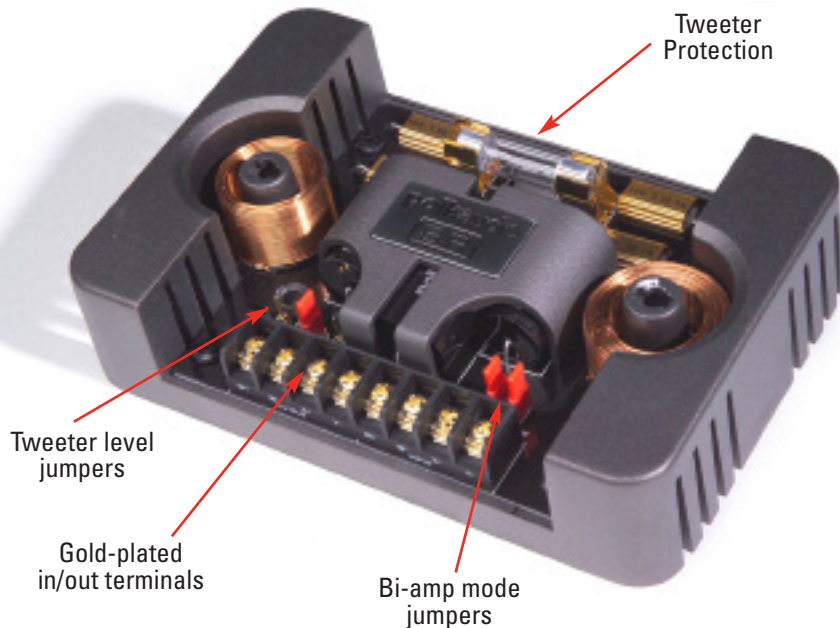
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### Highest quality parts

The SR6500 crossover uses 1% tolerance Resistors and Capacitors. That means their actual value is within +/- 1% of their nominal value. A nominal 30 Micro Farad (30  $\mu$ F) capacitor with a +/-10% capacitor could have a value as low as 27 $\mu$ F while the same value cap in the other channel could have an actual value as high as 33 $\mu$ F for a 6 $\mu$ F total difference. With those kinds of loose tolerances, the performance of the two speakers in the pair would be large enough to make an audible difference in timbre and imaging. A poorly matched pair of speakers would have a hard time maintaining a solid, stable and convincing stereo image. In our 30 $\mu$ F capacitor example, the capacitors in the SR6500 crossover would be no lower in value than 29.7 $\mu$ F and no higher than 30.3 $\mu$ F for near-perfect unit-to-unit consistency and rock-solid lifelike imaging.



Speaking of capacitors, the SR6500's caps are all Mylar for lower DC resistance. Trust us, that's a good thing.

Another critical part of the crossover is the Inductor or Coil. Inductors are used in both the High Pass and Low Pass filter sections of the Crossover. Many component systems use Iron Core Inductors—a coil of wire would around a solid core or bobbin of iron (**Figure W**). This type of coil is small and inexpensive but suffers from the problem of "saturation." As the current level coming into the coil rises and falls, the Inductor value changes. The audible result of saturation is audibly distorted sound with softened dynamic "punch." The Inductors used in the SR6500 are Air Core Inductors—where the wire is wound around a non-magnetic material or air core (**Figure Y**). The air core inductor passes current in a linear fashion and maintains a constant Inductor value. That boils down to consistent frequency response accuracy, wider dynamic range and more "punch" than crossovers with iron core Inductors.



**Figure W**  
Iron Core Inductor



**Figure Y**  
Air Core Inductor

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### Zobel network

The driver's voice coil acts like an Inductor. Of course, it is an Inductor! It is a coil of wire wrapped around an air-core bobbin, just like any other Inductor. That Inductance interacts with the crossover network to produce Impedance variations such as those shown in the top curve in **Figure Z**. A Zobel network is an RC circuit that negates the Inductance effect of the voice coil, thus flattening the high-frequency Impedance curve of the loudspeaker itself (bottom curve, **Figure Z**). The crossover filters behave more accurately, the amplifier "sees" an easier way to drive Impedance load and works more efficiently. You'll hear a better blended system for more lifelike midrange, and you'll get higher output and better dynamic range.

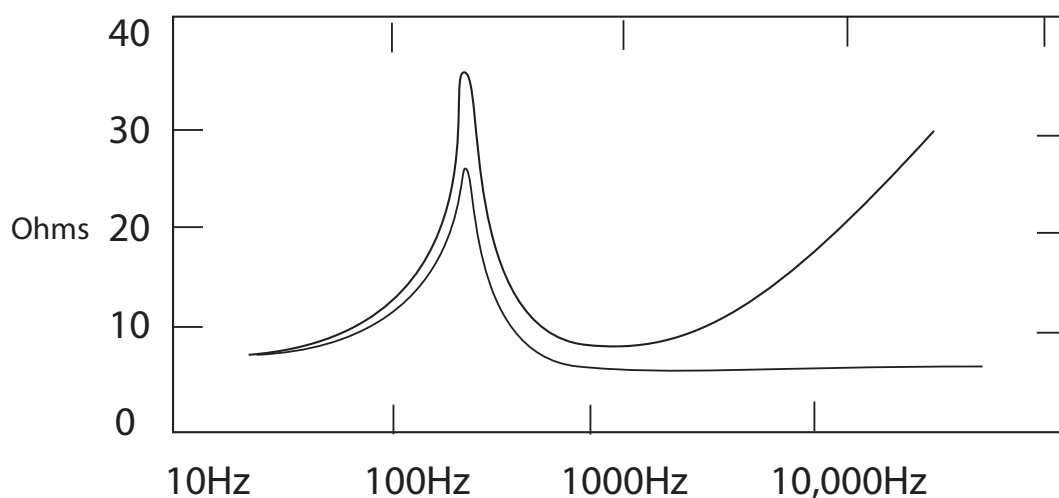
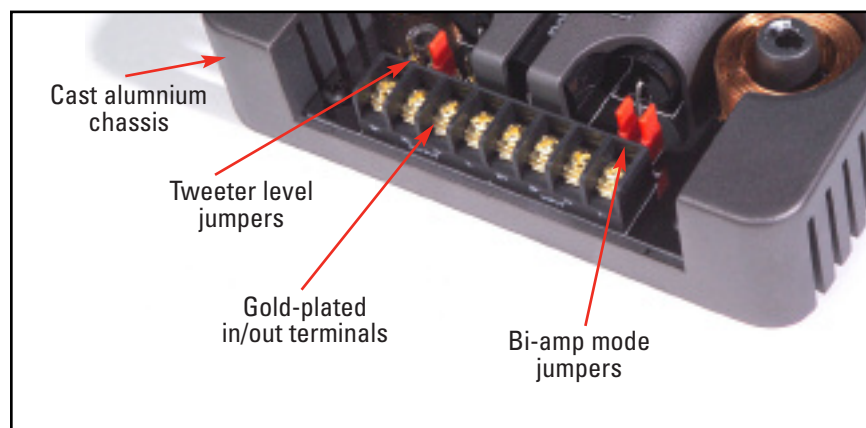


Figure Z

### Details, details

The SR6500 crossover has all that you expect from a premium system—gold plated screw terminals resist corrosion for secure and reliable connections; beyond safe power levels a Tweeter Protection device limits the current flowing into the tweeter for fail-safe reliability; a 4-position level selector (+1dB, 0dB, -1.5dB and -3dB ) allows you to adjust tweeter level for the tonal balance that's right for your car and system. Rather than using a switch that could corrode and malfunction in time, the SR6500 crossover uses a "jumper" system to select tweeter level. Another set of jumpers on the circuit board allow the SR6500 to be used in bi-amp mode. The chassis is solid cast aluminum to act as a heat sink for cooler operation and longer reliability. And quick-release screws give you quick and easy access to the crossover's innards and controls without the need for tools. Pop off the cover, secure the crossover chassis to the car, attach the wires and pop the cover back on for a clean, professional installation look.



# SR6500

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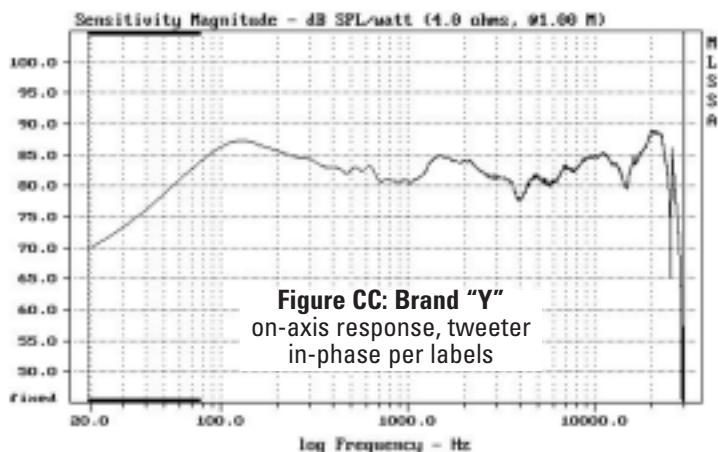
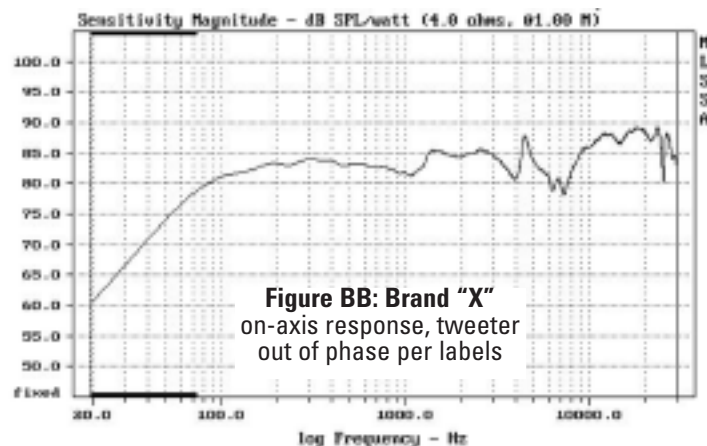
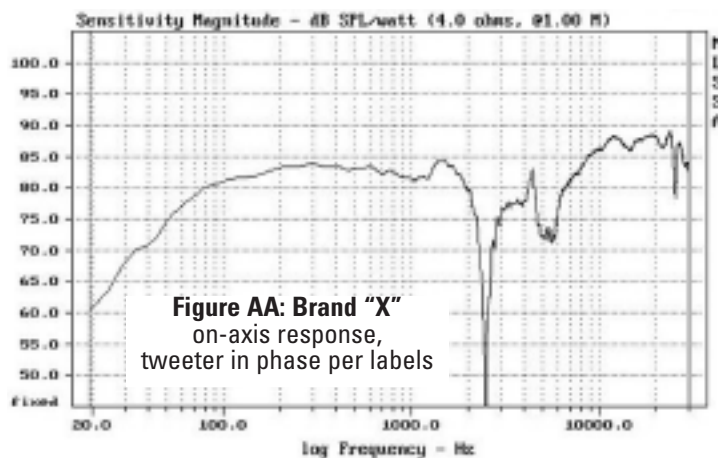
### The Proof

The SR6500 clearly contains some awesome technology and premium parts. But what does all that add up to? It adds up to performance accuracy that rivals or exceeds the very finest and most expensive mobile speakers ever made. What makes it even more impressive is that the SR6500 costs hundreds of dollars less than speakers with inferior performance. Let's take a look at the broadband frequency response measurements of the SR6500 versus those of Brands "X" and "Y."

#### On-axis response

**Figure AA** is the on-axis frequency response of Brand X (\$1000 MSRP) with the tweeter wired in phase according to the polarity labels on the product. The huge divot in the upper midrange surprised us. We surmise that that manufacturer purposely wired the tweeter out of phase with the driver to improve off-axis response so we reversed the polarity and measured on-axis response and got a big improvement as seen in **Figure BB**. These measurements correlated very well with our subjective listening impressions as the speaker sounds very "bright."

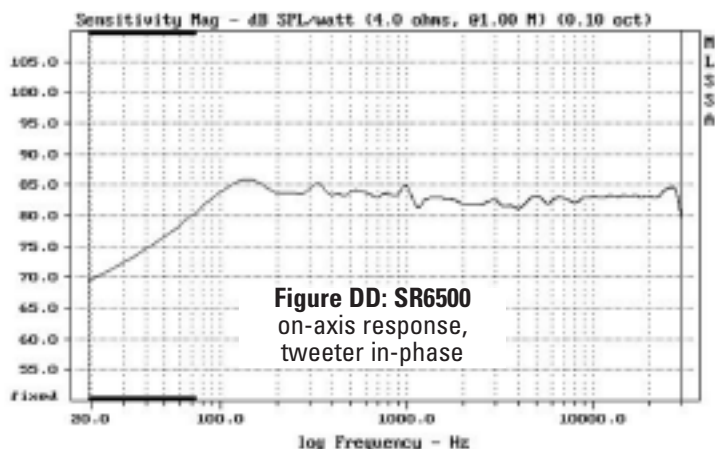
Now let's take a look at the on-axis response of Competitor "Y" (\$1200 MSRP) in **Figure CC**. In this case the manufacturer appears to have labeled polarity correctly. This speaker sounds a lot like you'd expect from looking at this "smile curve"—somewhat exaggerated mid-bass, with a sizzling high end and recessed midrange.



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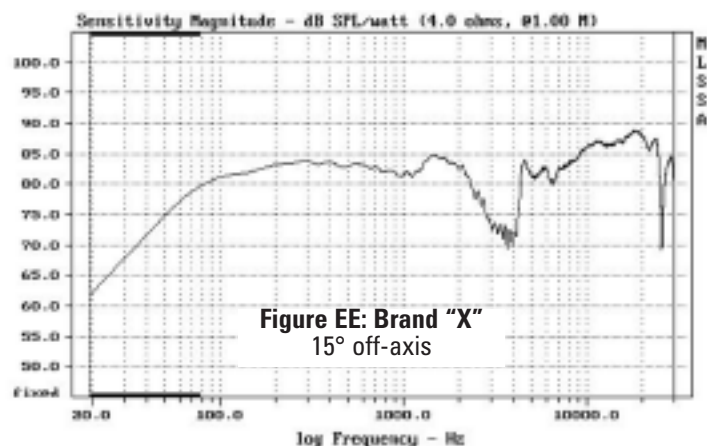
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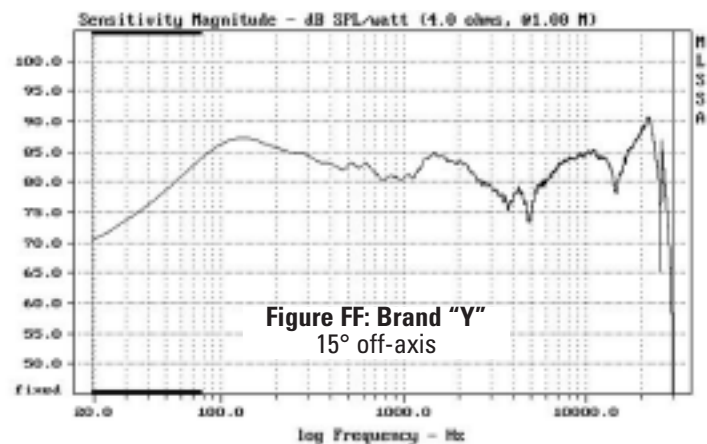
The SR6500 on-axis response curve is shown in **Figure DD**. It sounds like it looks—accurate, utterly lifelike and smooth.

### Off axis response

While on-axis response is an important indicator of good design and excellent performance, one often listens to mobile speakers off-axis. What kind of response curve should we be looking for there? A smooth curve without large rapid peaks or divots is always good on- or off-axis, and correlates well to a natural audible result. A gently rolled off high-frequency response is good as well because excessive reflections of high frequencies off of windows and hard interior parts results in overly bright sound, smeared imaging and loss of detail.



**Figure EE** is the 15 degree off-axis response of Competitor "X" wired in-phase according to the polarity markings on the product.



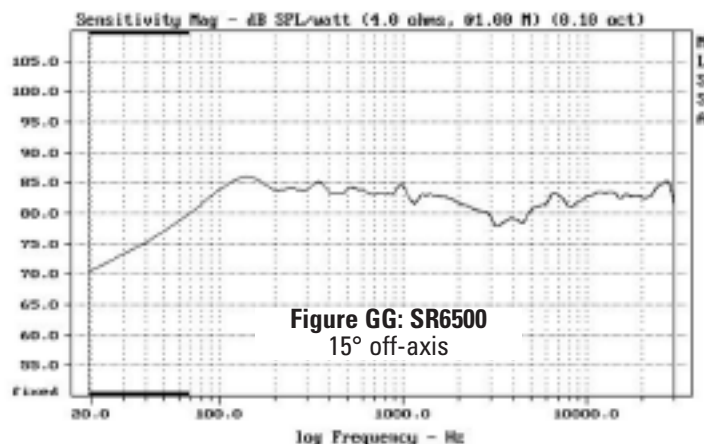
**Figure FF** is Competitor "Y" 15 degrees off-axis, wired in-phase according to the polarity markings on the product.

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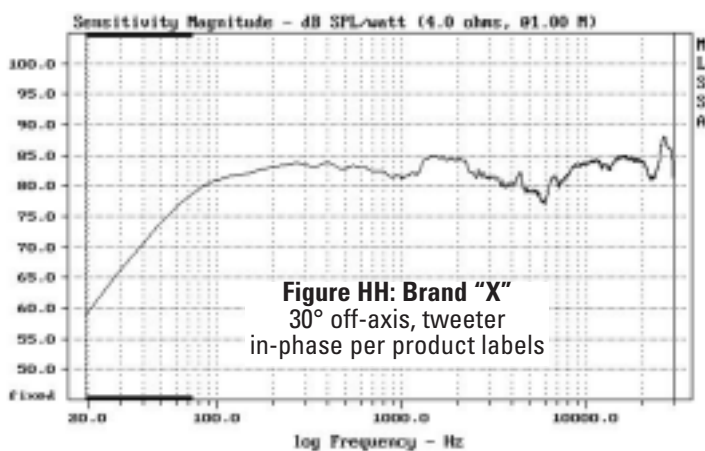
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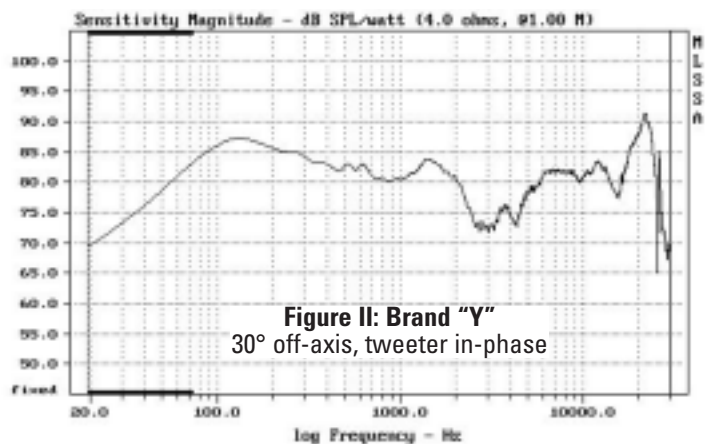
And here in **Figure GG** is the Polk Audio SR6500 15 degrees off-axis, tweeter in-phase.



Here is Competitor "X" in **Figure HH**, this time 30 degrees off axis, the tweeter wired in-phase according to polarity markings on product.



**Figure II** is Competitor "Y" at 30-degrees off-axis, tweeter in-phase. The midrange divot could be fixed by wiring the tweeter out-of-phase relative to the driver, but that unfortunate tweeter peak isn't ever going away!



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White Paper

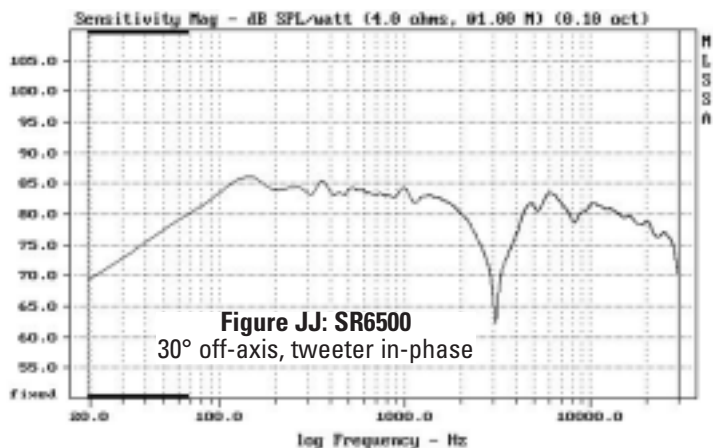


Figure JJ is the SR6500 30-degrees off-axis, tweeter wired in-phase.

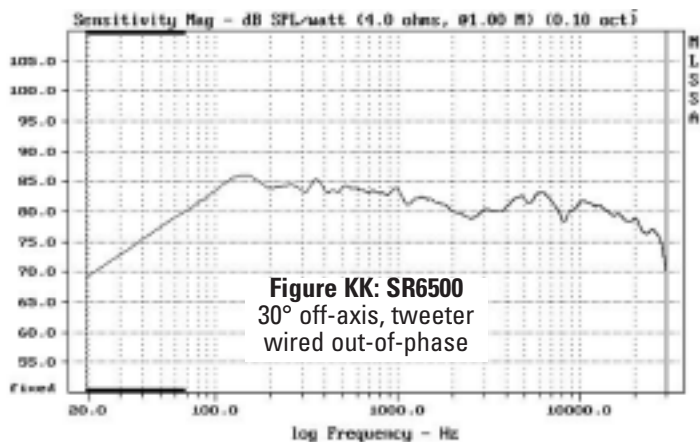
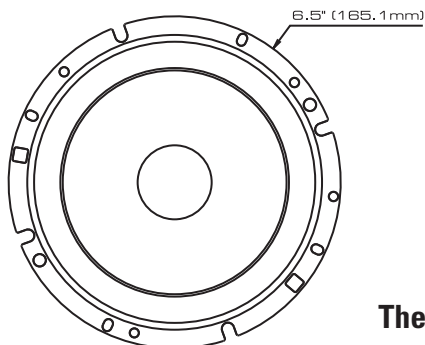
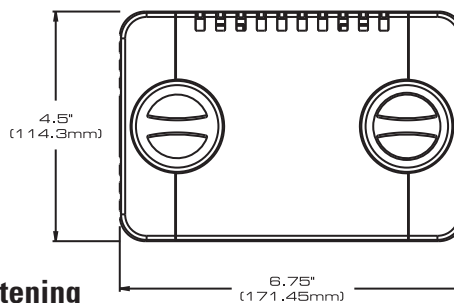


Figure KK is the SR6500 with the tweeter wired out of phase as per the instruction manual suggestion for off-axis installations (such as on the rear deck). Notice the smooth overall response and gently sloping high-frequency response.



The Bottom Line-Listening



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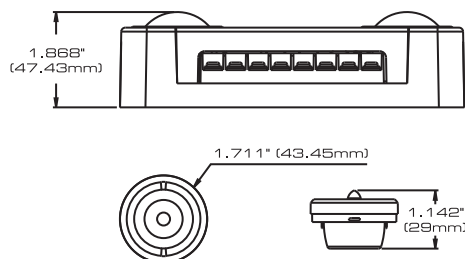
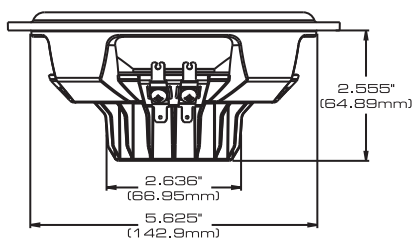
White Paper

Before auditioning a brand new Polk Audio SR6500, break in the product first. Right out of the box the suspension parts are stiff and have not reached their final compliance parameters. Play the speakers at a moderate level for several hours using bass-heavy program material. You'll notice an audible improvement from deep bass through upper midrange within a few hours with smaller improvement over the course of a week of normal use.

What kind of sound should you expect from the SR6500? Once they've been broken in, you'll hear surprising bass response. One Beta tester who listened to a pair of SR6500 prototypes in his truck thought his double 12" woofers were on when they were not! Listen to the SR6500 without subwoofers on to start. You'll be stunned by how deep and powerful the bass sounds. You should re-adjust your subwoofer's low-pass crossover and level settings to achieve proper blending with the SR6500. You may find that you can set the sub's Low Pass crossover to a lower frequency and still maintain plenty of kidney punch. That will keep the bass image "up front" where it belongs for SQ trophy winning soundstaging.

In the midrange area you will find the SR6500 to be open and highly detailed with no "chestiness" or mid-bass bloom. Vocals will be clear and articulate without being "shouty." The highs may sound a bit soft at first, but that is because most folks are used to hearing overly bright rip-your-head-off highs from ordinary mobile sound speakers. The SR6500's highs are all there all the way to 40K and in perfect balance with the rest of the frequency range. You'll notice details in the music that you never heard before with a wonderful sense of spaciousness and "air." And you'll be able to listen at high volumes for extended periods of time, without suffering from listener fatigue and high-frequency distortion-induced headaches.

If you are comparing the SR6500 to other premium component systems (as we have), you may find a piece of music here or there that favors the competition. But you won't find another speaker that sounds as consistently good on ALL kinds of music and movie soundtracks as the SR6500. And if you're ever in doubt as to which speaker is "right," just remember the measurements you've seen in this white paper. That's right, it is the SR6500 that delivers the most correct and accurate sound quality in mobile audio loudspeakers.



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### Specifications

Nominal Woofer Diameter:	6.5 in.
Woofer Cut Out Dim:	5.625in
Woofer Mounting Depth:	2.55in
Woofer Magnet Type	NdFeB (Neodymium)
Woofer Grilles Included:	Yes
Tweeter Size and Type:	22mm Ring Radiator
Tweeter Cut Out Dim	2"
Tweeter Flush Mounting Cup Depth:	1"
Continuous Power Handling:	125
Peak Power Handling	250
Recommended Amplifier Power:	50 - 250WPC
Nominal System Impedance:	4 Ohms
System Efficiency:	90db
System Frequency Response (useful output range)	30Hz - 40kHz
System Frequency Response: (-3dB)	40 - 30kHz
Crossover Frequency	3100Hz
HP Slope	3rd order
LP Slope	2nd order
Crossover Dimensions	6.75"W x 4.5"D x 1.875"H
Tweeter Level Setting (-db)	+1.0,0,-1.5,-3.0
Can Bi-Amp (y/n)	Y
Fs(Hz)	60
Re (Ohms)	3.5
QES	0.69
Qms	10.3
Qts	0.65
Mms (g)	15.6
vc (mH)	0.39
Hbob (mm) (winding height)	12.5
Hgap (mm)	6
Amax (mm) ( Xmax peak-peak)	6.5 (Xmax peak-peak)
Sd (cm <sup>2</sup> )	135
Vas (l)	11
BL	5.6