

VIPER[®]

AUDIO

OWNER'S
MANUAL



models | **550.2**
650.2

CONGRATULATIONS

Congratulations for choosing Viper Audio neodymium two-way component speakers from Directed Electronics.

Directed Electronics has been the industry leader in high-quality automotive security and audio equipment since 1990, and with the introduction of the Viper Audio line of high-quality loudspeakers for the automobile, Directed continues to set new standards of performance, reliability, and affordability in the mobile electronics industry.

Featuring titanium dome tweeters, proprietary die-cast aluminum baskets,

pressed fiberglass woofer cones and high-grade neodymium motors, the Viper Audio line of automotive loudspeakers will excite and delight the auto sound enthusiast with years of high quality audio reproduction.

Viper Audio loudspeakers are covered by one-year limited warranty. Be sure to retain your original sales receipt, and refer to the warranty section of this guide for full details about your coverage.

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LIMITED TWO-YEAR CONSUMER WARRANTY

Directed Electronics, Inc. (DEI) promises to the original purchaser, to replace this product should it prove to be defective in workmanship or material under normal use, for a period of two years from the date of purchase from the dealer as indicated by the date code marking of the product PROVIDED the product was installed by an authorized Directed dealer. During this two-year period, there will be no charge for this replacement PROVIDED the unit is returned to DEI, shipping pre-paid. If the unit is installed by anyone other than an authorized Directed dealer, the warranty period will be one year from the date of purchase by the dealer as indicated by the date code marking of the product. This warranty is non-transferable and does not apply to any unit that has been modified or used in a manner contrary to its intended purpose, and does not cover damage to the unit caused by installation or removal of the unit. During this one-year period, there will be no charge for this replacement PROVIDED the unit is returned to DEI, shipping pre-paid. This warranty is void if the product has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in materials or construction. Units which are found to be damaged by abuse resulting in thermally damaged voice coils are not covered by this warranty but may be replaced at the absolute/sole discretion of DEI. ALL WARRANTIES INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY,

WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, AND WARRANTY OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY ARE EXPRESSLY EXCLUDED TO THE MAXIMUM EXTENT ALLOWED BY LAW, AND DEI NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCT. DEI HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS. Unit must be returned to DEI, postage pre-paid, with bill of sale or other dated proof of purchase bearing the following information: consumer's name, telephone number, and address, authorized dealer's name and address, and product description. Note: This warranty does not cover labor costs for the removal and reinstallation of the unit. IN ORDER FOR THIS WARRANTY TO BE VALID, YOUR UNIT MUST BE SHIPPED WITH PROOF OF INSTALLATION BY AN AUTHORIZED DEI DEALER. ALL UNITS RECEIVED BY DEI FOR WARRANTY REPAIR WITHOUT PROOF OF DEI DEALER INSTALLATION WILL BE COVERED BY THE LIMITED 1 YEAR PARTS AND LABOR WARRANTY. Note: This warranty does not cover labor costs for the removal and reinstallation of the unit. BY PURCHASING THIS PRODUCT, THE CONSUMER AGREES AND CONSENTS THAT ALL DISPUTES BETWEEN THE CONSUMER AND Directed SHALL BE RESOLVED IN ACCORDANCE WITH CALIFORNIA LAWS IN SAN DIEGO COUNTY, CALIFORNIA.

FEATURES

Woofers

- Pressed-fiberglass cone for stiffness and low mass.
- Four-layer inductance-optimized voice coil.
- Proprietary die-cast aluminum basket.
- High-grade neodymium motor structure.

Tweeters

- Vapor-laminated titanium diaphragm for extended high-frequency response.
- Copper-clad aluminum voice coil to reduce mass and increase high-frequency response.
- Synthetic rubber nitrile edge roll reduces distortion.

Crossover

- LEAP-optimized third order high-pass, first order low-pass design to achieve symmetrical third order Butterworth acoustic response.
- Mylar capacitors in all series pass positions.
- Zobel-stabilized woofer impedance.
- DC and current-limit tweeter protection.
- Four position tweeter level adjustment.
- Standard stereo and bi-wire inputs with input parallel switch.
- Glass epoxy PCB for better system power handling.
- Unique, Viper amplifier-styled crossover housing with removable trim panel for easy switch access.

WARNING



High-powered car audio systems may produce sound pressure levels that exceed the threshold at which hearing loss may result.

They may also impair a driver's ability to hear traffic sounds or emergency vehicles. Use common sense and practice safe listening habits when listening to or adjusting your audio system.

SOUND QUALITY

Obtaining the highest quality sound reproduction in the mobile environment requires installation techniques and knowledge of vehicle interiors that go far beyond simple replacement of stock speakers. Speaker location, orientation, phasing, and the vehicles interior materials are important considerations when

designing and installing an auto sound system.

To achieve the best sound quality possible from your Viper Audio loudspeakers, Directed recommends the installation be performed by an MECP certified technician.

INSTALLATION PRECAUTIONS

The Viper 550.2/650.2 neodymium separates are designed for installation into factory speaker locations, custom mounting enclosures or any flat mounting surface inside the vehicle with sufficient rear clearance. The following precautions and instructions cover the basic and most common types of installation.

- Check behind panels for clearance of metal brackets, hoses, and wire harnesses before making any cuts.
- When mounting speakers into doors, roll the window up and down to check clearance of the glass and window regulator.
- Make sure the mounting holes are the correct size for the speaker. Undersized holes can cause speaker

distortion or shorting of the speaker leads to the chassis ground. Oversized holes will not allow the mounting screws to make sufficient contact with the panel, allowing the speaker to become loose.

- Always protect the wires when routing by avoiding sharp metal edges, moving parts such as heater or vent controls, clutch pedals, brake pedals, steering columns, and power window motors and gears.
- When routing wires through metal panels and doorjamb always use vinyl tubing and grommets for protection and a professional-looking installation.

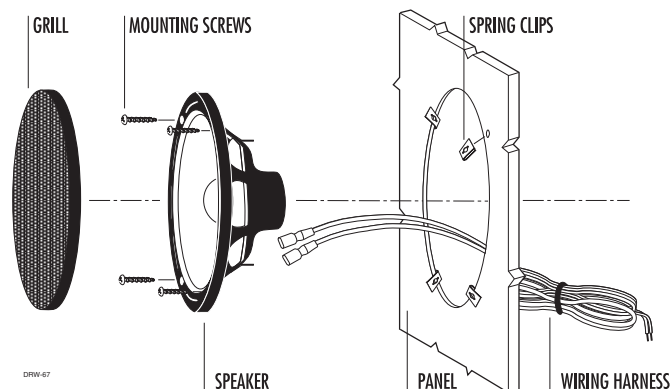
WOOFER INSTALLATION

Review the *Installation Precautions* section of this guide before proceeding.

1. Place the cutout template against the mounting surface in the desired location for the woofer.
2. Draw the speaker hole and mounting screw locations on the panel with a marker.
 - The 550.2 woofer requires a 4-7/8" hole
 - The 650.2 woofer requires a 5-3/4" hole.
3. Remove the cutout template and carefully cut the speaker hole to the proper size. If there is a pre-existing hole that is undersize, mark it and cut it to the proper size. If the hole is oversize, it is recommended that a spacer be built to compensate.
4. Pre-drill the holes for the mounting screws using a 1/8" drill bit.
5. Route the supplied wires through the speaker location to the crossover.
6. Install the screw speed clips if not installing into a metal panel.
7. Connect the speaker wire to the woofer taking care to observe proper speaker polarity.
8. Place the woofer into the hole and attach using the supplied screws. Take care at this time not to slip with a tool while mounting or the speaker could be damaged.
9. Place several pieces of the butyl compound on the edge of the speaker grill, then press the grill into the speaker-mounting flange.

NOTE: A supply of butyl compound is included and can be used to attach the speaker grill as well as prevent rattles.

FIGURE 1—WOOFER INSTALLATION



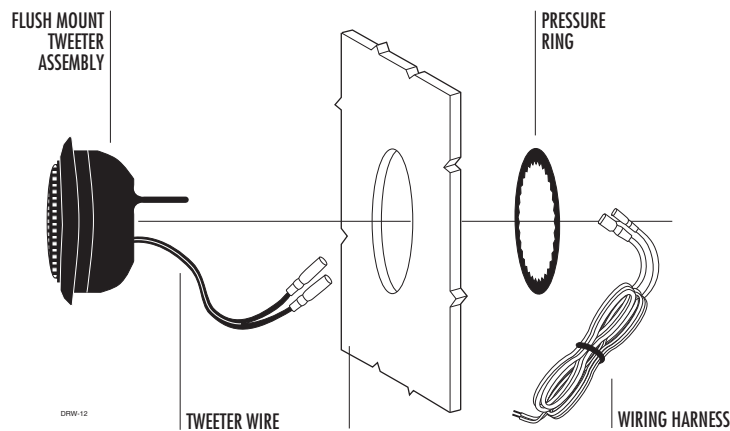
TWEETER INSTALLATION

Review the *Installation Precautions* section of this guide before proceeding.

Flush Mounting into Removed Panels

1. Determine the tweeter mounting location, then route the wires from the crossover to the tweeter location.
2. Mark the center point of the tweeter location.
3. If using a hole saw, first drill a pilot hole, then cut out the hole using a standard 2-1/8" hole saw.
4. If not using a hole saw, use either the cardboard packaging for the tweeters or the surface mount trim ring as a template to mark the proper size hole. Cut out the hole.
5. With the tweeter assembled, route the wires through the hole and the pressure ring and slip the pressure ring over the tweeter assembly.
6. Align the tweeter so the Viper logo faces the desired direction then push the pressure ring on to the rear of the tweeter assembly until the tweeter is snugly mounted to the panel.
7. Connect the speaker wires observing the correct polarity and re-assemble the panel.

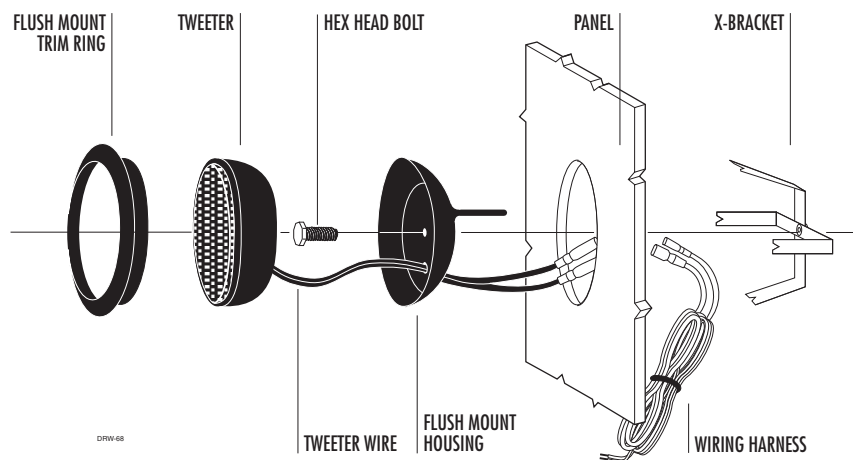
FIGURE 2—FLUSH MOUNTING REMOVED PANELS



Flush Mounting into Mounted Panels

1. Determine the tweeter mounting location, then route the wires from the crossover to the tweeter location.
2. Mark the center point of the tweeter location.
3. If using a hole saw, first drill a pilot hole, then cut out the hole using a standard 2-1/8" hole saw.
4. If not using a hole saw, use either the cardboard packaging for the tweeters or the surface mount trim ring as a template to mark the proper size hole. Cut out the hole.
5. Remove the tweeter from the flush mount housing and insert the proper length machine bolt through the center hole of the housing and connect to the spring steel X-bracket. (See Figure 3.)
6. Connect the speaker wires observing the correct polarity.
7. Press the X-bracket portion of the assembly through the hole until its legs spring open.
8. Screw the bolt in until the tweeter housing is firmly mounted to the panel. (Make sure the arrow at the rear of the tweeter housing is pointing in the desired direction.)
9. Insert the tweeter into the housing and attach trim ring. (Refer to the trim ring information at the end of this section.)

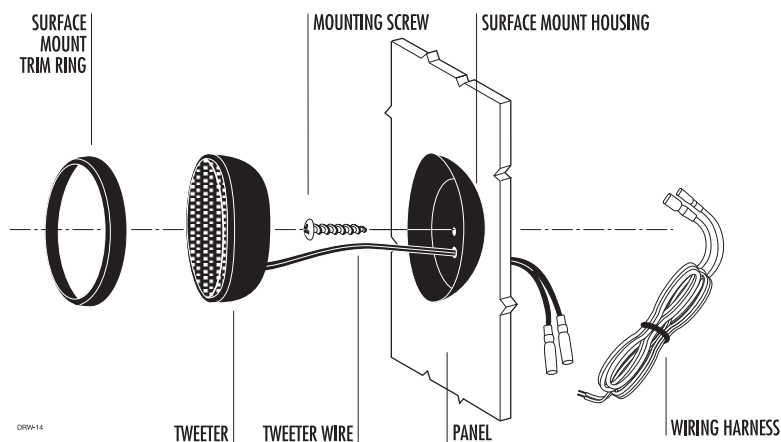
FIGURE 3—FLUSH MOUNTING MOUNTED PANELS



Tweeter Surface Mounting

1. Determine the tweeter mounting location, then route the wires from the crossover to the tweeter location.
2. Place the surface mount housing against the panel and mark the two holes at the rear of the housing.
3. Drill the smaller center hole using a 1/8" drill bit. This is the mounting screw hole.
4. Drill the larger off-center hole using a 3/8" drill bit, insert a grommet and route the speaker wire from the crossover through the grommet.
5. After removing the surface mount tweeter assembly trim ring, route the tweeter wires through the larger hole in the housing and connect to the speaker wires from the crossover. (See Figure 4.)
6. Insert the excess speaker wire into the hole and position the housing so the housing will not pinch the wires after final mounting.
7. Attach the housing using the supplied screws of the correct length for a solid mount.
8. Insert the tweeter into the housing and attach the trim ring.

FIGURE 4—TWEETER SURFACE MOUNTING



Removing Trim Rings

Hold the tweeter housing while gently turning the trim ring in a clockwise direction until it releases. The trim ring can then be easily lifted away from the tweeter housing.

Installing Trim Rings

- **Flush Mount Assembly** - With the arrow in the tweeter housing facing up, place the trim ring into the

housing with the Viper logo at the bottom and turn in a counter clockwise direction until the trim ring clicks into place.

- **Surface Mount Assembly** - Insert the trim ring into the housing and turn in a counter clockwise direction until the trim ring clicks into place.

CROSSOVER INSTALLATION

Review the *Installation Precautions* section of this guide before proceeding.

Crossover Adjustment and Wiring Connections

This Viper crossover has the ability to work in car audio systems from basic single amplifier systems to the most sophisticated multiple amplifier systems with signal processors and amplifier channels dedicated to each speaker.

Control Switches

The control switches can be accessed under the removable elliptical cover next to the input connector. Pry up the cover to make crossover adjustments.

Input Switch

The input switch tells the crossover what type of amplifier system is being used.

If a single amplifier channel will power both the tweeter and the woofer, follow the Single Amplifier Input instructions. (See Figure 5.)

If an amplifier channel will power the tweeter and another channel will power the woofer, follow the Dual Amplifier Input instructions. (See Figure 6.)

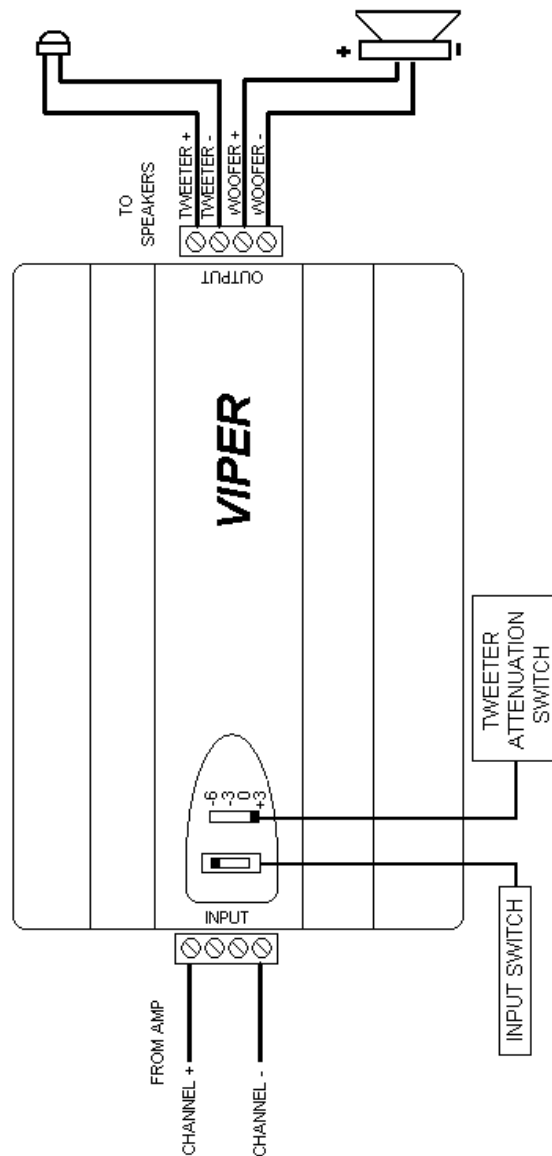
Attenuation Switch

The tweeter attenuation switch can adjust the tweeters from +3 dB to -6 dB to compensate for vehicle interior and mounting location. It is used to brighten or soften the tweeter response according to listener's preference. (See Figure 5.)

Connection/Adjustment Single Amplifier

1. Connect the amplifier channel output to the crossover input connector as shown, carefully observing amplifier output polarity.
2. Connect the tweeter and woofer wires to the output connector as shown, carefully observing speaker polarity.
3. Set the amplifier input switch to the single channel input setting as shown.

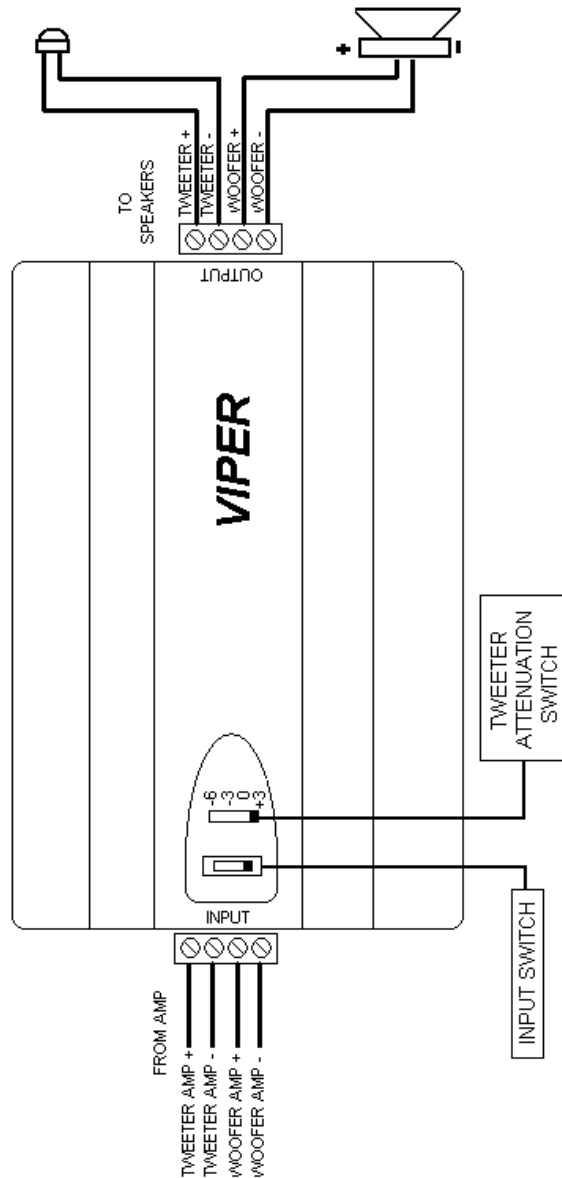
FIGURE 5—SINGLE AMPLIFIER



Connection/Adjustment Dual Amplifier

1. Connect the amplifier tweeter and woofer channel outputs to the crossover input connector as shown, carefully observing amplifier output polarity.
2. Connect the tweeter and woofer wires to the output connector as shown, carefully observing speaker polarity.
3. Set the amplifier input switch to the dual amplifier setting as shown.

FIGURE 6—DUAL AMPLIFIER



SPECIFICATIONS

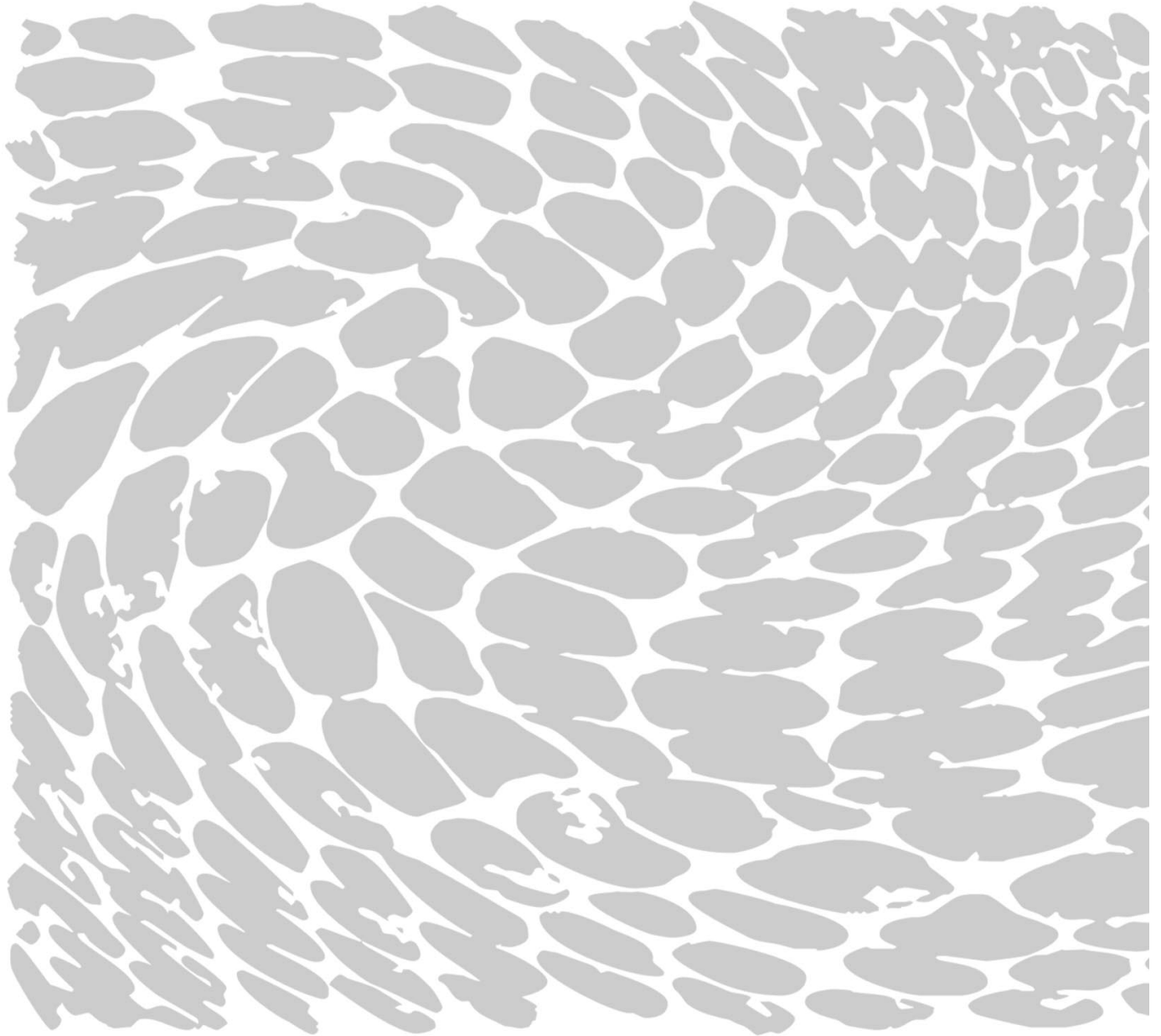
Viper model	550.2	650.2	Tweeter
Fs (Hz)	71.1	51.7	1534.54
Vas (cu.ft.)	0.19	0.63	n/a
Vas (L) 5.5	17.9	n/a	
Qms 7.19	5.91	1.16	
Qes 0.50	0.45	2.76	
Qts 0.47	0.42	0.82	
Re (ohms)	3.8	3.8	3.36
Z (ohms)	4	4	4
Le (mh)	0.49	0.483	0.01
SPL (dB 1w@1m)	87.86	89.29	91
XMAX (inches)	0.2	0.2	0.02
XMAX (mm)	4.8	4.8	0.5
Pe (watts) RMS	100	125	100
Pmax (peak / music power)	150	175	160
Mmd (grams)	8.35	10.52	0.21
Mms (grams)	8.77	11.30	0.22
Cms (mm/N)	571	839	49
Bl (Tesla-M)	5.46	5.565	1.6
EBP	142	115	556
Sd (sq. m.)	0.008	0.012	n/a
Sd (sq. in)	0.0013	0.0019	n/a
Sealed Box (cu. ft.) avg	0.25	0.35	n/a
Avg Box F3 (Hz)	106	87	n/a
Avg Box Fb (Hz)	100	86	n/a
Avg Box Q	0.7	0.7	n/a
Vented Box (cu.ft.)	0.334	0.785	n/a
Port Tuning Freq. (Hz)	59	47	n/a
Port Diameter Round (inches)	2	2.5	n/a
Port Square (inches)	3.14	4.91	n/a
Port Length (inches)	5.8	5.61	n/a
Other Parameters	5.25"	6.75"	1"
Magnet Size (neodymium, oz.)	1.728	1.728	0.72
Magnet Dia.	25mm	25mm	25mm
Voice Coil Dia. (in.)	1	1	1
Mounting Depth (in.)	2.75	3.25	1
Mounting Hole Dia. (in.)	4.875	5.75	2.125
Frame Dia. (in.)	6.25	7.25	2.5
Frequency Range (Hz)	65-5K	58-3K	3K-25k
System Frequency Response	65-25K	58-25K	n/a
System Efficiency in dB	90	90	n/a

Directed[®] ELECTRONICS, INC.

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The company behind this system is Directed Electronics, Inc. Since its inception, Directed has had one purpose, to provide customers with the finest vehicle security, car stereo products, rear seat entertainment, and accessories available. The recipient of more than 20 patents in the field of advanced electronic technology, Directed is ISO 9001 registered.

Directed[®] is committed to delivering world-class quality products and services that excite and delight our customers.



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