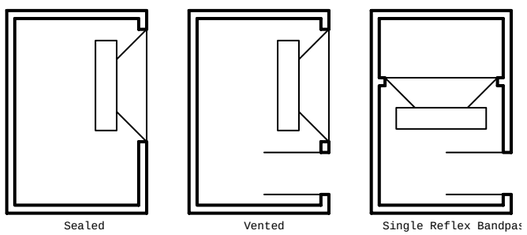
ENCLOSURES	Net Volume cubic feet/liters	Vent diameter (qty) inches/mm	Vent length inches/mm	V_b box tuning frequency in Hz	F_3, -3 dB point in Hz
1508SPS					
Sealed box	1.5 / 42.5	n/a	n/a	87 (resonance)	72
Small vented box	3.0 / 84.9	(2) 4" / 102	6-7/8"/ 175	45	51
Medium vented box	4.0 / 113.3	(2) 4" / 102	5" / 127	43	45
Large vented box	5.0 / 141.6	(2) 4" / 102	4-3/8" / 111	40	41
Single Reflex Bandpass box	Sealed 2.25 / 63.7 Vented 1.75 / 49.6	(2) 6" / 152	7-3/8" / 187	83	48 - 138
1508cu					
Small vented box	2.0 / 56.6	(2) 4" / 102	10-5/8" / 270	47	53
Medium vented box	3.0 / 84.9	(2) 4" / 102	6-7/8" / 175	45	45
Large vented box	4.0 / 113.3	(2) 4" / 102	5" / 127	43	41
1508he					
Small vented box	3.0 / 84.9	(2) 6" / 152	7-3/4" / 197	60	60
Medium vented box	4.0 / 113.3	(2) 6" / 152	5-1/8" / 130	58	55
Large vented box	5.0 / 141.6	(2) 6" / 152	4-3/8" / 111	54	50
1208SPS					
Sealed box	0.65 / 18.4	n/a	n/a	106 (resonance)	105
Small vented box	0.8 / 22.6	(1) 4"/102	4-1/2"/ 114	70	79
Large vented box	1.4 / 39.6	(1) 4"/102	1-7/8"/ 48	65	61



REPLACEMENT OF SPEAKER BASKET ASSEMBLY

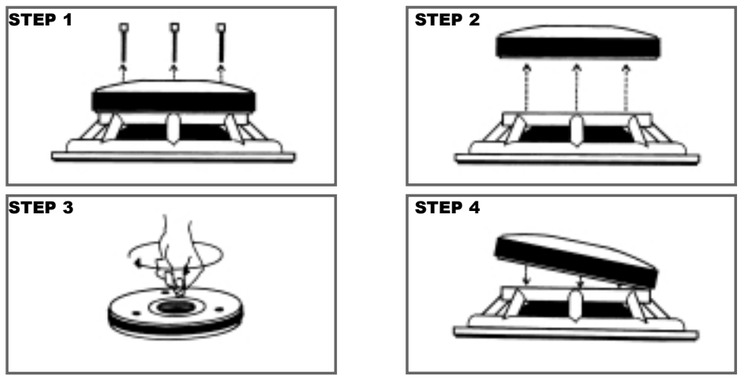
1. Prior to replacement procedure, clean work area of all metal objects and other debris.

2. With speaker lying face down, remove the three screws on back of magnet structure with 7/16" nut driver.

3.. After screws are removed, lift the magnet structure off the basket frame.

4. Clean the voice coil "gap" before magnet structure is put on new replacement basket. (See illustration.) Fold a piece of masking tape over on itself several times, sticky side out, and insert it into the voice coil "gap." Run it all the way around the "gap" several times to remove all particles of metal and other trash before magnet structure is put on new replacement basket.

5. Holding magnet structure in slanted position, gently lower the structure down into the basket so that it rests inside the magnet structure counter bore, being sure to align the screw holes, and lower the structure down into place. Insert screws and tighten.



ONE YEAR LIMITED WARRANTY

NOTE: For details, refer to the warranty statement. Copies of this statement may be obtained by contacting Peavey Electronics Corporation, P.O. Box 2989, Meridian, MS 39305

Features and specifications subject to change without notice.

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SPECS

PEAVEY ELECTRONICS

Black Widow® BWX

00452830 1208-8sps BWX
00452840 1208-4sps BWX
00452850 1508-8sps BWX
00452860 1508-4sps BWX
00452870 1508-8cu BWX
00457680 1508-8he BWX

INTRODUCTION

The 1508 and 1208 driver series represent a new level of power and performance for Black Widow loudspeakers. Power handling is increased by 40% over other comparable models, along with reduced distortion and higher overall sound quality.

The series includes 12" and 15" models in both 4 and 8 Ohm impedances.

DESIGN

The '08 BWX series uses a new cone that is a variation on the existing Kevlar® - impregnated cones used on all Black Widows. The new cone is stronger and tougher, highly water resistant, and has a specially designed surround – a deep-roll accordion design on the 15", and an innovative asymmetrical-M style on the 12" that improves mid-range clarity. The dust cap is also made of the same extremely strong material.

Voice coil assemblies on the new drivers use thermoset-insulated aluminum or copper ribbon wire, bonded onto an incredibly durable, heat resistant polyimide composite former. The coil wires are solderless diffusion welded to high-conductivity OFHC copper foil leads, which are embedded inside the former assembly and soldered to the tinsel leads with high temperature silver solder. The solder joint is then coated with a special thermally-conductive silicone adhesive for encapsulation and heat dissipation.

The voice coil assembly is bonded to the Kevlar cone and new super-tough nylon composite spider using a thermoset epoxy originally developed for attaching nose cones on ICBM missiles –truly an aerospace-grade adhesive. The spider and surround are bonded to the frame with a high strength toughened-cyanoacrylate adhesive, which is also used to bond the dust cap to the cone.

The magnet structure includes subtle changes to its geometry that improve power handling. While it appears the same as the standard structure, and replacement baskets from the '08 BWX series will fit on standard BW magnet structures, the improved power handling will be compromised if the standard structure is used.

These new drivers also adhere to the familiar features of Black Widow products: cast aluminum frames, replaceable basket assemblies, Rubatex gaskets and high reliability, spring-loaded terminals are all used.

APPLICATIONS

The 1508 and 1208 drivers are excellent choices for a wide range of sound reinforcement, high-level playback, subwoofer, and monitor applications.

The 1508sps driver is an excellent choice for general purpose sound reinforcement, and is available in both 4 and 8 Ohm versions. Enclosure size is reasonable and bass / mid-bass performance is strong. Its versatility includes sealed and bandpass enclosure designs.

The 1508cu produces amazing bass performance in small enclosures, along with flat mid-bass response for an accurate, clean sound quality.

The 1508he is best used as the bottom end of a full range enclosure. It has very high efficiency for superior output in the mid-bass and mid-range. However, for pure subwoofer applications, the 1508sps or 1508cu are better choices.

The 1208sps works well in sealed or vented enclosure designs, and its smooth, extended frequency response makes it an excellent mid-range performer. It is available in 4 and 8 Ohm versions.

Because the 1208sps's low frequency output is limited, it should be used along with a subwoofer when response below 60 Hz is needed. The best application for the 1208sps is in compact enclosures and very high quality mid-bass/mid-range reproduction at high sound pressure levels.

The 15" drivers can work with crossover points as high as 2.0 kHz but work best below 1.5 kHz. The 12" drivers are usable to 3.5 kHz but perform best below 2.5 kHz.

ENCLOSURES

To assist with the growing interest in home-built enclosure designs, Peavey provides complete parameter data on these drivers as well as several recommended enclosures for each model. This information and much more can be found at www.peavey.com.

Enclosures should be built of best-quality 3/4" marine or other high grade plywood. Particle board and MDF enclosures can be easily damaged and are not recommended for portable applications, but may be acceptable for permanent installation. If construction plywood must be used, inspect each sheet thoroughly and use at least BC grade.

Use a quality wood glue, fit joints tightly, and add internal bracing to stiffen the panels of the enclosure. Look at commercially designed enclosures for ideas on good brace placement. Use wood screws or a pneumatic nailer to assemble the enclosure during gluing, to maximize joint strength.

Strength of the completed enclosure has a great effect on the bass performance of the finished system. Box panels that aren't stiff enough will vibrate – cancelling bass produced by the woofer, and creating undesired sounds of their own. If your box vibrates or you don't think the box panels are stiff enough, add more bracing.

Vents used in the examples require standard Schedule 40 PVC pipe for vent construction. The pipe should be dadoed tightly into the back of the baffle and glued firmly in place with high quality epoxy or high strength industrial grade hot glue. Rough up the outside of the pipe to improve the glue bond.

Be sure to account for the displacement of the vent, bracing, horn (if used) and woofer or your enclosure before building it, or it will be smaller than its intended volume. This can reduce bass output and mis-tune the enclosure.

Line the inside of the enclosure with polyester fiber batting such as quilt stuffing. The batting material should conform to California bedding fire codes. Attach the batting with spray adhesive or staples, and keep it away from the end of the vent tube where it could be pulled in by air flow. Handles, protective corners, cabinet covering, grille materials and crossovers are available through Peavey Accessories.

When building a bandpass enclosure, design a panel or door to be removable for access to the woofer. Use foam weather-strip to seal the panel along with enough screws and bracing to prevent leaks and buzzes. Fill the sealed volume loosely with polyester fiber, but leave the vented volume empty. Place the magnet of the woofer in the vented side for improved cooling.

Peavey does not supply hardware required for the manufacturing of flying systems, and recommends that builders should not suspend or fly any enclosure not certified for such applications.

These instructions are a general guideline for design. Proper construction techniques, good planning and common sense will result in a reliable, high quality, high performance system.

Peavey in no way accepts liability for any damage, accidents or injury that may result from construction or use of enclosures using this information.

Features and specifications are subject to change without notice.

PARAMETERS

Thiele-Small parameters for Black Widow® 1208 and 1508 drivers follow. This data is for use in designing enclosures. Numerous software packages are available that use this data to simulate the response of the driver and enclosure together for optimum performance in any application.

PARAMETER DEFINITIONS

Z_{nom}: The nominal impedance of the driver in Ohms.

R_{evc}: DC resistance of the driver in Ohms. Also known as Re.

S_d: The functional radiating surface area of the cone assembly, in meters^2.

BL: Efficiency of the voice coil and magnet system in Telsa Meters.

F_o: Also known as Fs, the free air resonance of the driver.

V_{as}: Volume of air having the same compliance (springiness) as the driver's suspension.

C_{ms}: Restorative force of the driver's suspension in micrometers/Newton.

M_{ms}: The total mass of the moving parts of the loudspeaker, including the air load, in grams.

Q_{ms}: Resonance characteristics of the mechanical factors of the loudspeaker.

Q_{es}: Resonance characteristics of electrical factors of the loudspeaker.

Q_{ts}: Resonance characteristics of the electrical and mechanical factors combined together.

X_{max}: Distance the cone can move in one direction before the coil begins to leave the magnetic gap.

L_e: Inductance of the voice coil in millihenries.

SPL: Typical sound pressure level at 1 Watt, 1 meter.

n_o: Electrical-to-acoustical conversion efficiency in percent.

V_d: Air displacement of the driver from negative Xmax to positive Xmax, in milliliters.

P_{max}: Maximum continuous program power in Watts.

Disp: Volume displaced by the driver inside the cabinet when mounted on its rear flange, in inches^3.

Kevlar® is a registered trademark of DuPont.

Rubatex® is a registered trademark of Rubatex Corporation.

Nomex® is a registered trademark of DuPont.

SPECIFICATIONS

Model Name:	1508-8sps	1508sps-4	1508-8cu	1508-8he	1208-8sps	1208-4sps
Part #:	00452850	00452860	00452870	00457680	00452830	00452840
Size: inches/mm	15" / 380 mm nominal	15" / 380 mm nominal	15" / 380 mm nominal	15" / 380 mm nominal	12" / 305 mm nominal	12" / 305 mm nominal
	Frame OD 15-1/4" / 387 mm	Frame OD 15-1/4" / 387 mm	Frame OD 15-1/4" / 387 mm	Frame OD 15-1/4" / 387 mm	Frame OD 12-1/4" / 311 mm	Frame OD 12-1/4" / 311 mm
	Bolt circle 14-9/16" 370 mm, 8 holes	Bolt circle 14-9/16" 370 mm, 8 holes	Bolt circle 14-9/16" 370 mm, 8 holes	Bolt circle 14-9/16" 370 mm, 8 holes	Bolt circle 11- 5/8" 295 mm, 8 holes	Bolt circle 11- 5/8" 295 mm, 8 holes
	Cutout diameter 14" / 356 mm	Cutout diameter 14" / 356 mm	Cutout diameter 14" / 356 mm	Cutout diameter 14" / 356 mm	Cutout diameter 10 15/16" / 278 mm	Cutout diameter 10 15/16" / 278 mm
	Depth 4-31/32" 126 mm	Depth 4-31/32" 126 mm	Depth 4-31/32" 126 mm	Depth 4-31/32" 126 mm	Depth 3-17/32" 90 mm	Depth 3-17/32" 90mm
Impedance:	8 Ohms	4 Ohms	8 Ohms	8 Ohms	8 Ohms	4 Ohms
Power Capacity:	2000 W peak	2000 W peak	2000 W peak	2000 W peak	2000 W peak	2000 W peak
	1000 W program	1000 W program	1000 W program	1000 W program	1000 W program	1000 W program
	500 W continuous per AES 2-1984, 50 Hz - 500 Hz	500 W continuous per AES 2-1984, 50 Hz - 500 Hz	500 W continuous per AES 2-1984, 50 Hz - 500 Hz	500 W continuous per AES 2-1984, 50 Hz - 500 Hz	500 W continuous per AES 2-1984, 65 Hz - 650 Hz	500 W continuous per AES 2-1984, 65 Hz - 650 Hz
Sensitivity:	96.7 dB 1 Watt / 1 meter	97.5 dB 1 Watt / 1 meter	97.2 dB 1 Watt / 1 meter	100.3 dB 1 Watt / 1 meter	96.9 dB 1 watt / 1 meter	96.6 dB 1 watt / 1 meter
Usable frequency range:	35 Hz ~ 2 kHz	35 Hz ~ 2 kHz	35 Hz ~ 2 kHz	40 Hz ~ 2 kHz	50 Hz ~ 3.5 kHz	50 Hz ~ 3.5 kHz
Cone:	Kevlar® impregnated cellulose	Kevlar impregnated cellulose	Kevlar impregnated cellulose	Kevlar impregnated cellulose	Kevlar impregnated cellulose	Kevlar impregnated cellulose
Voice coil diam:	4.0" / 100 mm	4.0" / 100 mm	4.0" / 100 mm	4.0" / 100 mm	4.0" / 100 mm	4.0" / 100 mm
Voice coil material:	Aluminum ribbon wire	Aluminum ribbon wire	Copper ribbon wire	Aluminum ribbon wire	Aluminum ribbon wire	Aluminum ribbon wire
	Polyimide-impregnated fiberglass former	Polyimide-impregnated fiberglass former	Polyimide-impregnated fiberglass former	Polyimide-impregnated fiberglass former	Polyimide-impregnated fiberglass former	Polyimide-impregnated fiberglass former
	Nomex® stiffener	Nomex stiffener	Nomex stiffener	Nomex stiffener	Nomex stiffener	Nomex stiffener
	Solderless diffusion welded OFHC copper leads	Solderless diffusion welded OFHC copper leads	Solderless diffusion welded OFHC copper leads	Solderless diffusion welded OFHC copper leads	Solderless diffusion welded OFHC copper leads	Solderless diffusion welded OFHC copper leads
Net weight:	17 lbs. / 7.7 kg	17 lbs. / 7.7 kg	17 lbs. / 7.7 kg	17 lbs. / 7.7 kg	16 lbs. / 7.3 kg	16 lbs. / 7.3 kg
Driver Parameters						
Z_{nom}(Ohms)	8	4	8	8	8	4
R_{evc} (Ohms)	5.27	3.30	5.91	5.32	5.43	3.47
S_d (M^2)	0.084	0.084	0.084	0.084	0.052	0.052
BL (T/M)	15.37	12.72	20.84	16.04	15.13	14.09
V_{as} (liters)	185.9	163.6	199.6	182.4	54.6	66.2
F_o, Hz.	41.9	45.9	36.7	51.2	56.1	55.4
C_{ms} (uM/N)	158.5	163.3	199.2	182	142.2	172.5
M_{ms} (gm)	77.6	73.5	93.9	52.9	50.7	47.9
Q_{ms}	10.357	11.197	9.314	10.604	9.513	7.085
Q_{es}	0.457	0.433	0.295	0.352	0.448	0.311
Qts	0.437	0.417	0.286	0.341	0.428	0.298
X_{max} (mm)	4.7	2.3	4.7	1.9	4.7	2.3
L_e (mH)	0.418	0.211	0.583	0.336	0.359	0.186
SPL (1W 1m)	96.7	97.5	97.2	100.3	96.9	96.6
n_o (%)	2.9	3.6	3.3	6.7	3.1	2.9
V_d (milliliters)	789	386	789	319	488	302
Pmax (w. pgm.)	1000	1000	1000	1000	1000	1000
Disp in^3 / ml	197 / 3229	197 / 3229	197 / 3229	197 / 3229	109 / 1797	109 / 1797

SUGGESTED ENCLOSURES

For those who want to build their own enclosures, but don't want to go through the design process using driver parameters, we provide the following optimized designs:

FOR 1508-4/8sps:

Sealed enclosure
May be preferred for stage monitors to control boominess and low frequency feedback on stage. F_3 is 73 Hz.

Small vented enclosure
Excellent performance for compact, general purpose use. Warm mid-bass response. F_3 is 51 Hz.

Medium vented enclosure
Terrific compromise of bass performance and enclosure size. Warm mid-bass response. F_3 is 45 Hz.

Large vented enclosure
Big box, big bass! Great response as a subwoofer or the bottom end of a large multi-way enclosure design. F_3 is 41 Hz.

Single reflex bandpass enclosure
Special enclosure design that uses the enclosure as an acoustic filter for shaped response. Great choice for a compact subwoofer system. Response is 48 Hz – 138 Hz.

FOR 1508-8cu:

Small vented enclosure
An incredibly small enclosure with outstanding bass performance for its size. F_3 is 53 Hz.

Medium vented enclosure
Small box with powerful bass and predictable, flat response down to an F_3 of 45 Hz.

Large vented enclosure
Strong, flat response with bass extension to an F_3 of 41 Hz. Deep, predictable bass quality for great subwoofer and multi-way system performance.

FOR 1508-8he:

Small vented enclosure
Small box, big voice. Very high efficiency and good bass performance in a small enclosure. F_3 is 60 Hz.

Medium vented enclosure
Super-high efficiency in a popular enclosure size. F_3 is 55 Hz. Great choice for use in a full-range system.

Large vented enclosure
Big and loud! Super efficiency and strong bass performance to an F_3 of 50 Hz. However, for subwoofer-only use the sps and cu versions which are better performers.

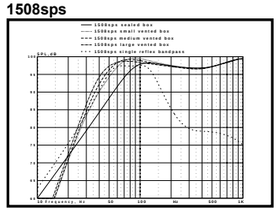
FOR 1208-4/8sps:

Sealed enclosure
Excellent choice for a dedicated mid-bass/mid-range in a multiway system, or stage monitor. F_3 is 105 Hz.

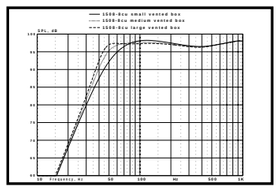
Small vented enclosure
Very small system with excellent voice range perforance. Great choice as the mid-range of a sub/satellite system. F_3 is 79 Hz. Also good for use in a stage monitor.

Large vented enclosure
Still not all that large, with very usable bass response. Great for a compact, 2-way box. F_3 is 61 Hz.

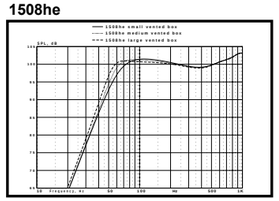
1508sps



1508-8cu



1508he



1208sps