KICKER®

U.S.A.

SEPARATES™ SERIES

COMPETITION & FREEAIR DRIVERS

CONGRATULATIONS! You've just purchased an exceptional component driver from Stillwater Designs! KICKER Separates bring one philosophy to car audio - high performance. Get ready for a demonstration of pure musical quality and sheer sonic power as you "Listen to the Legend!"

FEATURES OF KICKER SEPARATES

ISD (Inverted Structural Dome) Cone	- High rigidity under pressure for accurate linear control
Airtight Polymineral Cones	- Stops enclosure pressure loss to reduce "pump-down"
	- High internal dampening
	- Excellent sunlight, pollution and moisture resistance
Stitched Surround	- Prevents cone/surround separation at high excursions
Blackened Pole Piece	- Improved heat transfer
Unipiate	- Improved thermal and magnetic transfer between pole and backplate
Extended Pole Piece	- Cooler operation increases power handling
	- Improved magnetic field linearity around the voice coil gap
Vented Pole Piece	- Pressure relief under the center dome improves low bass
Extended Backplates	- Prevent damaging voice coil "bottoming"
Optimum Magnet Size	- Excellent efficiency and bass performance
HI-Temp Kapton Voice Coil Formers	- Prevents cone "meltdown" -Eliminates warped, rubbing voice coils
Long Throw Voice Coil	- Enormous cone excursion capabilities
High Power Tinsel Lead Wires	- Stops lead breakage
	- Reduces power robbing resistance losses

FEATURES OF KICKER SEPARATES

Enclosure construction: Your enclosure should be made of 1/2" (8" drivers and smaller) or 3/4" (10" drivers and larger) material, minimum. Avoid low density materials such as common particle board. The recommended materials are high density particle board, medium density fiberboard (MDF) or high quality, void free 7-or-13-ply plywood such as marine plywood.

Include glue blocks to strengthen the corners of your box, and add cross-braces if you detect panel vibration. Use quality wood glue such as Elmer's Professional or Titebond (NOT silicone rubber, hot glue or caulk!), and seal inside joints with a pressed-in bead of silicone rubber to be absolutely certain that no air leaks exist. If your design includes multiple woofers operated at high power, seal each woofer in its own enclosure.

WARNING! - the use of silicone rubber to seal in a woofer will void your warranty! If any sealing is needed in addition to the speaker's gasket, use caulking cord or vinyl weather strip.

Loosely fill a sealed box about half full with polyester fiber (typically used as pillow filling). Line the inside of a vented box with 1" fiberglass insulation.

Schedule 40 PVC pipe is recommended for making port tubes for vented enclosures. The pipe should be "roughed up" before gluing it into the box with silicone rubber or epoxy. The inside end of the vent should be at least one diameter from the nearest cabinet wall. Rounded edges on the vent can be useful in reducing vent "chuffing" noises.

Remember to observe polarity. Hooking up one or more woofers in reverse phase will drastically reduce bass output.

FREEAIR MOUNTING™

The specialized design of KICKER Freeair woofers allow these speakers to work effectively in infinite baffle applications. This does not mean, however, that the driver doesn't need an enclosure. What it means is that the "enclosure" can be of very large volume, such as a car door, dash, rear panel or trunk. In these applications the driver needs a relatively rigid panel to mount to, as excess vibration will color the sound and reduce efficiency.

Also, the panel should effectively "seal" the air behind the panel from the air in front of it. If your mounting panel doesn't meet these two requirements, you may need to modify it with bracing or an additional panel "sandwiched" onto it in some manner. Dash mountings are almost impossible to "seal", however this is not too critical since the drivers used in this application are for midbass and midrange and only low bass performance is sacrificed.

KICKER Freeair woofers are also well suited for use in vented enclosures. When used in their recommended enclosures, these woofers exhibit a "boosted" bass response which is often popular for rap or rock music.

POWER HANDLING

Power handling ratings on Competition and Freeair woofers reflect the largest power amplifiers suitable for use with each speaker model. We feel that this rating is more useful to the consumer than misleading "music power", "continuous" or other ratings often used.

Stillwater Designs' power ratings are based on "clean" power, with minimal amplifier clipping. Amplifier clipping produces an extremely distorted signal that is capable of destroying drivers and may void your warranty.

RECOMMENDED ENCLOSURES

The table below shows suitable enclosures for Competition and Freeair drivers. F3 values listed indicate the -3 dB "down-point" of the system. Fb represents the tuning of the vented enclosure. Remember that while a vented speaker has a slight theoretical advantage in output, a sealed enclosure produces more low bass because of its much slower roll-off below the -3 dB point. In addition, cone motion is more controlled in a sealed box, reducing the chance of mechanical damage to the woofer.

Stillwater Designs has been using sealed enclosures in its show vehicles for a number of years. They have proven to be very reliable, with highly predictable performance, even under extreme power demands. The sealed enclosure sound is very tight and controlled, yet very "full" and solid, with extended low bass response.

Note that a large box improves low bass performance and a small box produces more mid-bass "bump". A vented box also produces lots of "bump" because of the output from the vent. Some prefer this "boosted bass" sound, while others favor accuracy of the sealed enclosure. Consider the type of "sound" you want, and choose your enclosure to produce it.

SEALED ENCLOSURE
Competition™ Series Drivers

Model	Box Volume Cubic Feet	F3 -3 dB
C-18	4.44 (+20%) Maximum	35
	3.70 Recommended	37
	2.96 (-20%) Minimum	39
C-15	3.60 (+20%) Maximum	31.5
	3.00 Recommended	33.5
	2.40 (-20%) Minimum	35
C-12	2.10 (+20%) Maximum	37
	1.75 Recommended	38
	1.40 (-20%) Minimum	41
C-10	1.50 (+20%) Maximum	48
	1.25 Recommended	49
	1.00 (-20%) Minimum	50
C-8	0.78 (+20%) Maximum	57
	0.65 Recommended	58
	0.52 (-20%) Minimum	59
C-6.5	0.42 (+20%) Maximum	78
	0.35 Recommended	79
	0.28 (-20%) Minimum	80

VENTED ENCLOSURE
Freeair™ Series Drivers

Model	Box Volume Cubic Feet	Vent Diameter (qty) Inches	Vent Length Inches		Fb Hz	F3 -3 dB
F-15	3.60 (+20%) Maximum	(1)	4	4.25	32	34
	3.00 Recommended	Or (2)	3	6	35	37
	2.40 (-20%) Minimum	"	"	"	39	41
F-12	2.10 (+20%) Maximum	(1)	3	4.75	32	35
	1.75 Recommended	"	"	"	35	37.5
	1.40 (-20%) Minimum	"	"	"	41	44
F-10	1.50 (+20%) Maximum	(1)	3	5.25	36	34.5
	1.25 Recommended	"	"	"	40	38
	1.00 (-20%) Minimum	"	"	"	45	40.5
F-8	0.78 (+20%) Maximum	(1)	2	5.00	36	41
	0.65 Recommended	"	"	"	40	43.5
	0.52 (-20%) Minimum	"	"	"	45	47
F-6x9	0.78 (+20%) Maximum	(1)	2	5.00	36	41
	0.65 Recommended	"	"	"	40	43.5
	0.52 (-20%) Minimum	"	"	"	45	47
F-6.5	0.42 (+20%) Maximum	(1)	1.5	4.25	40	40
	0.35 Recommended	"	"	"	45	44
	0.28 (-20%) Minimum	"	"	"	50	49

THIELE-SMALL PARAMETERS

T/S parameters are used to design sealed, vented and other types of speaker enclosures. The information is provided for users who have computer speaker CAD programs or wish to calculate box parameters long hand.

Random samples of each model were selected for parameter testing from shipping stock. Each driver was broken in by driving it at its resonant frequency to an excursion of Xmax for a period of two hours before testing. This break-in settled the driver's parameters which shift slightly during the first few hours of use. Multiple test were taken of each driver and averaged for accuracy.

Test equipment used included an Audio Precision test instrument driven by a PC computer. Additional data was calculated or verified by LEAP (Loudspeaker Enclosure Analysis Program) on a PC computer.

Because parameters shift during break-in, optimum low bass performance should be expected after approximately four to five hours of normal use.

Competition™ Series Drivers

MODEL	C18a		C15a		C12a		C10a		C8a		C8.5a	
Nominal Impedance	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω
SPL 1W/1M	91.8dB	92.44dB	90.57dB	90.67dB	89.56dB	90.1dB	89.75dB	90.1dB	88.57dB	89.2dB	87.31dB	87.82dB
Displacement, cc	4720.28	4720.28	2677.31	2677.31	1523.68	1523.68	945.04	945.04	408.04	408.04	368.41	366.41
Displacement, Cuin	288.05	288.05	163.38	163.38	92.98	92.98	57.67	57.67	24.9	24.9	22.38	22.36
Hole Cutout, in. dia.	16 1/2"	16 1/2"	14"	14"	11 7/8"	11 7/8"	9 7/8"	9 7/8"	7 7/8"	7 7/8"	5 5/8"	5 5/8"
Mounting Depth, in.	7 1/2"	7 1/2"	6"	6"	5"	5"	4 3/8"	4 3/8"	3 3/8"	3 3/8"	2 1/8"	2 1/8"
Revc	3.23Ω	5.85Ω	3.59Ω	6.07Ω	3.59Ω	6.07Ω	3.59Ω	6.07Ω	3.48Ω	6.37Ω	3.48Ω	6.37Ω
Sd, SqM	0.1201	0.1201	0.0830	0.0830	0.0531	0.0531	0.0340	0.0340	0.0214	0.0214	0.0133	0.0133
BL	13.32	17.13	10.28	12.08	9.61	11.79	9.32	10.55	6.68	8.21	7.79	8.97
Vas, Liters	707.32	691.49	556.54	494.04	444.43	397.82	177.76	180.36	70.84	71.43	19.23	19.39
Vas, CuFt.	24.82	24.26	19.53	17.33	15.59	13.98	6.24	6.33	2.49	2.51	0.67	0.68
Mms, gms	215.18	199.05	118.17	114.56	81.78	78.63	50.40	44.57	26.97	23.60	23.20	19.31
Fs	18.5	19.4	19.4	20.9	16.7	18	21.5	22.3	29.3	31.2	37.7	41.1
Qms	6.719	6.660	6.551	5.186	8.985	7.347	8.107	8.475	7.497	6.913	3.881	5.180
Qes	0.454	0.484	0.492	0.628	0.334	0.388	0.282	0.340	0.387	0.438	0.315	0395
Qts	0.425	0.451	0.457	0.560	0.318	0.369	0.272	0.327	0.368	0.412	0.291	0.367
Pmax, watts	1000	1000	500	500	400	400	300	300	200	200	150	150
Xmax,mm	11.12	10.48	7.68	7.32	7.68	7.32	7.68	7.32	4.80	4.10	4.80	4.10
Freq. Response (Hz)	20-200	20-200	20-200	20-200	20-200	20-200	25-200	25-200	30-600	30-600	30-600	30-600
Magnet Weight (Oz.)	110	110	60	60	38	38	32	32	20	20	20	20
Voice Coil (Kapton)	3"	3"	2"	2"	2"	2"	2"	2"	1.5"	1.5"	1.5"	1.5"

Freeair™ Series Drivers

MODEL	F15a		F12a		F10a		F8a		F69a		F8.5a	
Nominal Impedance	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω
SPL 1W/1M	90.39dB	90.5dB	88.7dB	89.87dB	89.74dB	90.05dB	88.25dB	88.31dB	87.28dB	88.78dB	89.96dB	87.21dB
Displacement, cc	2677.31	2677.31	1523.68	1523.68	945.04	945.04	408.04	408.04	383.46	383.46	368.41	368.41
Displacement, Cuin	163.38	163.38	92.98	92.98	57.67	57.67	24.9	24.9	23.4	23.4	22.38	22.36
Hole Cutout, in. dia.	14"	14"	11 7/8"	11 7/8"	9 1/8"	9 1/8"	7 1/8"	7 1/8"	Oval	Oval	5 5/8"	5 5/8"
Mounting Depth, in.	6"	6"	5"	5"	4 3/8"	4 3/8"	3 3/8"	3 3/8"	3 3/8"	3 3/8"	2 1/8"	2 1/8"
Revc	3.59Ω	6.07Ω	3.59Ω	6.07Ω	3.59Ω	6.07Ω	3.48Ω	6.37Ω	3.48Ω	3.48Ω	3.48Ω	6.37Ω
Sd, SqM	0.0830	0.0830	0.0531	0.0531	0.0340	0.0340	0.0214	0.0214	0.0204	0.0204	0.0133	0.0133
BL	10.38	11.9	9.61	11.51	8.69	10.47	7.08	8.3	7.56	9.36	7.43	8.76
Vas, Liters	246.93	223.00	146.89	148.22	81.95	78.28	19.28	23.26	22.91	19.62	14.73	15.12
Vas, CuFt.	8.66	7.82	5.15	5.20	2.88	2.75	0.68	0.82	0.80	0.69	0.52	0.53
Mms, gms	122.59	115.33	90.99	78.27	45.46	44.14	29.86	26.64	28.98	27.27	23.02	20.28
Fs	28.6	31.0	27.6	29.3	32.4	33.7	53.5	51.5	49.2	52.8	43.2	52.8
Qms	8.038	7.893	8.650	6.687	5.395	6.524	6.145	7.744	4.368	5.362	6.121	7.991
Qes	0.734	0.964	0.813	0.681	0.440	0.517	0.696	0.798	0.508	0.658	0.395	0.481
Qts	0.673	0.859	0.572	0.601	0.407	0.479	0.625	0.724	0.455	0.586	0.371	0.454
Pmax, watts (Vented)	500	500	400	400	300	300	200	200	200	200	150	150
Pmax, watts (Freeair)	300	300	250	250	200	200	150	150	150	150	100	100
Xmax,mm	7.68	7.32	7.68	7.32	7.68	7.32	4.80	4.10	4.80	4.10	4.80	4.10
Freq. Response (Hz)	20-200	20-200	20-200	20-200	25-200	25-200	30-600	30-600	30-600	30-600	30-600	30-600
Magnet Weight (Oz.)	60	60	38	38	32	32	20	20	20	20	20	20
Voice Coil (Kapton)	2"	2"	2"	2"	2"	2"	1.5"	1.5"	1.5"	1.5"	1.5"	1.5"

SPEAKER SYSTEMS LIMITED WARRANTY

Stillwater Designs warrants this product to be free from defects in material and workmanship under normal use for a period of **one (1) year from date of original purchase.** Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction during the first year from date of original purchase, Stillwater Designs will replace or repair (at its discretion) the defective merchandise at no charge.

This warranty is valid only for the **original purchaser** and is not extended to owners of the product subsequent to the original purchaser. Any applicable implied warranties are limited in duration to a period of the express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you.

This warranty gives you specific legal rights; however you may have other rights that vary from state to state.

WHAT TO DO IF YOU NEED WARRANTY OR SERVICE

Defective merchandise must be returned to your local Authorized Stillwater Designs (Kicker/Impulse) Dealer for warranty. Assistance in locating an Authorized Dealer can be obtained by writing or calling Stillwater Designs directly. You can confirm that a dealer is authorized for service by the display of a current "Authorized Dealer" window decal.

If it becomes necessary for you to send defective merchandise, package all defective items in the original container or in a package that will prevent shipping damage, and return to:

Stillwater Designs, 5021 North Perkins Road, Stillwater, OK 74075

Return only defective components. Return of entire cabinets, system packs, pairs, etc. increases your return freight charges. Non-defective items received will be returned freight collect.

Include a **dated proof-of-purchase** from an Authorized Dealer. Warranty expiration on items returned without proof-of-purchase will be determined from the manufacturing date code. Coverage may be invalidated if this date is greater than one (1) year previous to the date item is sent in. Freight must be prepaid; items received freight collect will be refused.

Failure to follow these steps may void your warranty. Any questions may be directed to the Warranty Department at (405)624-8510.

WHAT IS NOT COVERED?

This warranty is valid only if the product is used for the purpose for which it was designed. It does not cover:

- Install slips (screwdriver holes)
- Damage caused by exposure to water and/or excessive heat.
- Damage through negligence, misuse, or accident.
- Items physically damaged due to abuse.
- Freight damage.
- The cost of shipping product to Stillwater Designs Service.
- Items previously repaired by any unauthorized repair facility.
- Items returned from unauthorized individuals or dealers.
- Return shipping on non-defective items.
- Speakers damaged due to amplifier clipping or distortion.
- Speakers with silicon caulk used for gasket material.

HOW LONG WILL IT TAKE?

Stillwater Designs maintains a goal of 24-hour service for all returns. Delays may be incurred if lack of replacement inventory or parts is encountered.

INTERNATIONAL WARRANTY

Contact your International Stillwater Designs dealer or distributor concerning specific procedures for your country's warranty policies.

P.O. Box 459 • Stillwater, Oklahoma 74076 • U.S.A. • 405 624-8510

STILLWATER Designs®

WARNING: KICKER drivers are capable of producing sound levels that can permanently damage your hearing! Turning up a system to a level that has audible distortion is more damaging to your ears than listening to an undistorted system at the same volume level. The threshold of pain is always an indicator that the sound level is too loud and may permanently damage your hearing. **Please use common sense when controlling volume!**