



SOUNDSTREAM
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USA8

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Subwoofers

**OWNERS MANUAL AND
INSTALLATION GUIDE**

USA SUBWOOFERS

CONGRATULATIONS!

You have chosen a superior product for reproducing true high fidelity in the car. This precision component, when properly installed, is capable of audiophile-quality performance. The USA woofers are well-suited for sealed, vented and sealed **bandpass** enclosures. They also work well in infinite baffle installations at one-half the power rating.

Should your woofer ever require service or replacement, recording the information below for your own records will help protect your investment.

Model Number: _____

Serial Number: _____

Dealer's Name: _____

Date of Purchase: _____

Installation Shop: _____

Installation Date: _____

DESIGN FEATURES

- **Installation Flexibility** - The USA woofers perform well in infinite baffle, sealed, vented and **bandpass** enclosures. Regardless of the application, USA woofers perform!
- **Dual 4 Ohm Voice Coils** for added installation flexibility and performance; series wiring for 8 Ohms, parallel wiring for 2 Ohms.
- **High Efficiency Design** - The USA woofers use high efficiency magnet structures and Dual Density Bonded Polyether Foam surrounds to ensure high efficiency, as well as durability.
- **Computer Numerically Controlled (CNC)** machined magnet plates precisely focus the magnet energy for optimum performance.
- **Custom-designed High Strength Spider controls** the long travel cone assembly.
- **Blue Powder Coat Finish** for durability and scuff-resistance.
- **Heavy Steel Frame Basket** for extra rigidity and damping.
- **Vented Pole Piece** for greater voice coil cooling.

THIELE/SMALL PARAMETERS

• All specifications measured with the voice coils in parallel (2 Ohms)

	USA 8	USA10	USA1 2	USA15
Freq. Response	45-500 Hz	37- 500	33- 500 Hz	30- 500
Sens. 2.0v/1m	92 dB	93dB	95dB	98dB
Impedance (nom. z)	2 ohms	2ohms	2ohms	2ohms
Rated Program Power	150 watts	200watts	250watts	250watts
FS	48Hz	37Hz	33Hz	30 Hz
Qts	0.64	0.460	0.49	0.40
Qms	11.9	12.00	12.04	11.5
Qes	0.61	0.478	0.52	0.41
Vas (ft ³)	0.70	1.57	3.66	8.7
Vas (liters)	20	44.5	103.7	247
Vas (m ³)	0.020	0.0445	0.1037	0.247
Cms (um/N)	290	287	260	220
DCR (ohms)	1.34	1.25	1.18	1.14
Levc (mH) @ 1 kHz	1.1	1.0	1.0	1.3
BL (Tesla m)	4.88	6.25	6.43	8.15
Sd (in ²)	34.14	54.3	86.7	131.0
Sd (m ²)	0.022	0.035	0.0531	0.0845
Sd (cm ²)	220	350	531	845
X max; one way (linear mm)	3.5	4.8	4.8	6.25
X max; one way (peak mm)	18	21	21	25
Vd (linear cm ³)	78	168	255	528
Vd (peak cm ³)	396	735	1115	2112
Vd (linear m ³)	0.000078	0.000168	0.000255	0.000528
Vd (peak m ³)	0.00040	0.000735	0.001115	0.002112
Mms (grams)	35	60.8	86.4	128
Magnet Assembly (oz)	66	112	112	180
Magnet Weight (oz)	28	38	38	64
Vf (volume of frame)	75 in ³	120 in ³	135 in ³	300 in ³
Coil length (mm)	15.2	19	19	25
Coil diameter (in)	1.5	2	2	2
TP (mm)	8.2	9.4	9.4	12.8
Mounting Dia. (in)	7.125	9.125	11.125	13.875
Mounting Depth (in)	3.5	4.5	5.25	7

SELECTING AN ENCLOSURE

There are several different enclosure designs for different applications. The USA subwoofers work very well in **all** the following enclosure designs. It is up to you to select the specific enclosure that will work the best for your particular application.

Infinite Baffle

Infinite baffle is the simplest type of subwoofer installation. In this type of installation, the woofer(s) is mounted to a baffle which is then mounted to either the rear deck or back seat of the vehicle. The best results are achieved when the trunk area is virtually airtight and isolated from the

Pros

- Excellent low frequency extension
- Excellent transient response
- Uses almost no trunk space

passenger compartment.

Cons

- Lower power handling
- Low to medium efficiency

Sealed Enclosure

Sealed enclosures are relatively simple to build and install, as all that is required is an airtight box. The

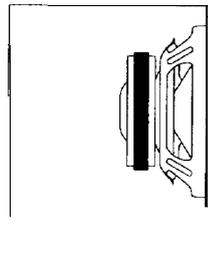
Pros

- Very good low frequency extension
- Very good transient response
- High power handling

more the performance resembles that of an infinite baffle installation.

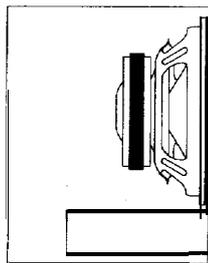
Cons

- Medium efficiency



Sealed (S)

larger the sealed enclosure, the



Vented (v)

Vented Enclosure

Pros

- Good low frequency extension down to the tuning frequency
- High power handling down to the tuning frequency
- Higher output than sealed enclosures

Cons

- Low power handling below the tuning frequency
- Almost no output below the tuning frequency

Vented enclosures use a sealed enclosure with a vent or port in the box which is tuned to resonate at a specific frequency.

Sealed Bandpass Enclosure

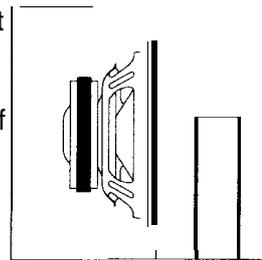
Sealed **bandpass** enclosures enclose both sides of

Pros

- High power handling within the operating frequencies
- Very high output within the range of the operating frequencies

Cons

- Low power handling beyond the tuning frequency
- Poor to moderate transient response
- Poor low frequency extension



Sealed Bandpass (SBP) the woofer(s). An airtight enclosure is built around the front and back of the woofer and one

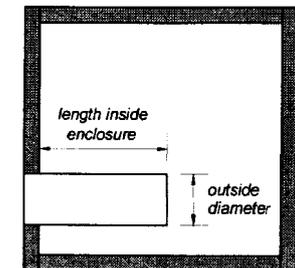
chamber is ported to a specific frequency.

CALCULATING (NET) INTERNAL ENCLOSURE VOLUMES

When constructing any type of enclosure, you must be aware that the outside dimensions DO NOT represent the true (Net) volume inside. Such things as woofers, ports, thickness of enclosure material, dividing wall septums, and any internal bracing will reduce the total amount of the actual air space available. The following worksheet has been designed to provide you with the necessary steps to accurately calculate the absolute (Net) internal volume of any given enclosure.

Calculating Cylindrical Port Volume

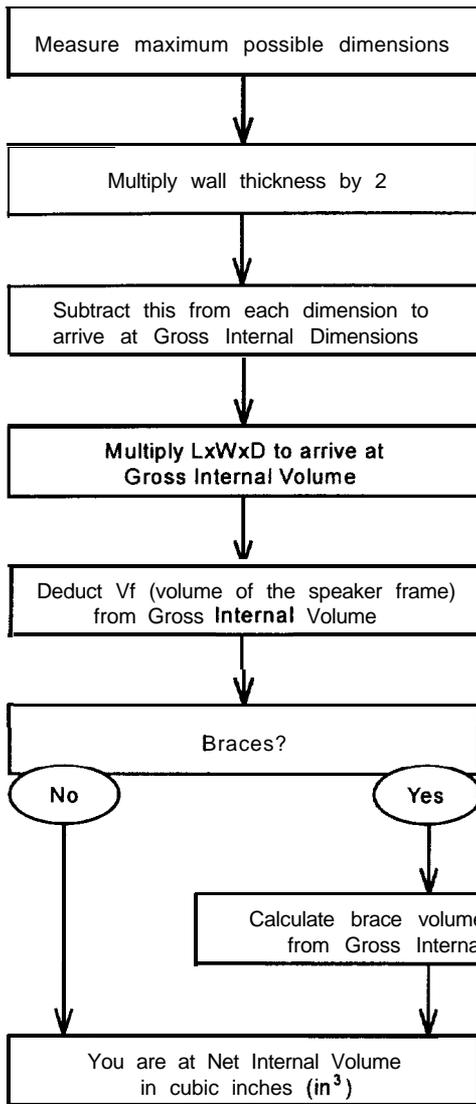
1. Measure the outside diameter of the port and divide by 2 for the radius.
2. Square the radius and multiply by 3.14 (π) to arrive at outside port area.
3. Multiply the area by the length of the port *inside* the enclosure for the port volume.



radius and multiply arrive at outside

by the length of the enclosure for the

ENCLOSURE VOLUME FLOWCHART



To convert to LITERS:
Divide in^3 by 61.03

To convert to CUBIC FEET:
Divide in^3 by 1728

BUILDING THE ENCLOSURE

- Determine the dimensions of your enclosure.
- Be certain the box you have designed will fit into the location you have chosen. Sometimes making a cardboard box with the same outside dimensions is helpful.
- Use $\frac{3}{4}$ inch thick Medium Density Fiberboard (MDF) or High Density Particleboard. It is preferable to cut the wood with a table saw to ensure straight, even joints. If a table saw is not available, a circular saw is acceptable.
- Use a "T" square to verify precise right angle gluing.
- Use a high quality wood glue and air nails or wood screws to assemble the enclosure. Elmer's® woodworker's glue and Weldwood® work well. To guarantee an airtight box, seal each inside joint with RTV silicone glue.
- For Sealed Enclosures, stuff the chamber with 50-75% filling (approximately 1.5 pounds per cubic foot) of fiberglass insulation or Dacron®.
- For Vented Enclosures, staple 1 inch thick fiberglass insulation or Dacron to all walls of the enclosure except the baffle to which the woofer is mounted.
- Use the supplied gasket to seal the woofer in the enclosure and eight(8) wood screws or T-nuts and bolts. Progressively tighten each of the bolts or screws to prevent warping the woofer frame.
- Use slide-on connectors to attach speaker wires. Do not solder wires to the provided terminals as this may cause damage to the factory wire connection. This may also void the speaker's warranty.

SUGGESTED ENCLOSURES

The following designs include a variety of enclosure sizes and types. Each design has two frequency response curves; one showing predicted "In-Car" response, and the other showing "Half-Space Anechoic" (out-of-car) frequency response. The performance difference between the two curves is a result of the natural acoustics of an "average" automotive environment. This "average" transfer function is only an approximation of what you may expect to see in your car. Every car is different. Each curve was generated using 2.0 Volts across paralalled voice coils (2Ω) and measured at 1 meter. Also, each frequency response curve includes a 12 dB/octave low pass filter at 100 Hz. The response curves can help you visualize relative performance differences between designs. Read through the descriptions given for each enclosure and select the one that suits your needs.

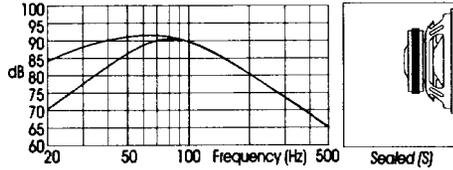
Remember: all suggested enclosure volumes are Net, and DO NOT include woofer, port, and bracing displacement!

Infinite Baffle

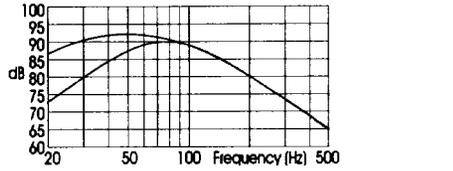
- Excellent performance for all types of music at moderate levels

Sealed

- 0.5 ft³ - *Good linear response, excellent small enclosure. Great for multiple high SPL small enclosures.*

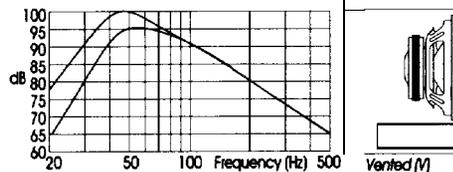


- 1.0 ft³ - *Good linear response, excellent all around enclosure.*

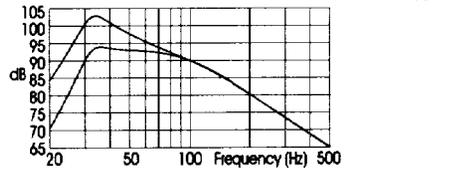


Vented

- 0.9 ft³ @ 45 Hz (3" x 6.0" port) - *High output with good low frequency extension. Good small enclosure.*

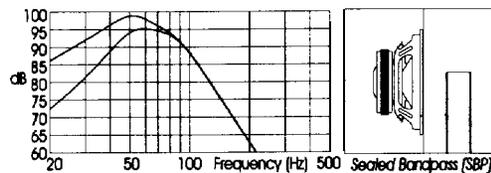


- 1.5 ft³ @ 35 Hz (4" x 12.0" port) - *High output with excellent low frequency extension. Great for Rock music.*

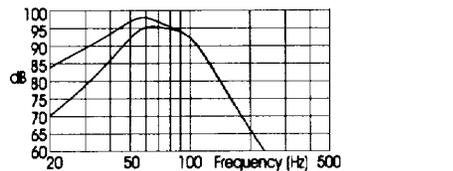


Sealed Bandpass

- Enclosure #59
Rear = 0.6 ft³ sealed
Front = 0.5 ft³ @ 65 Hz (4" x 10.0" port) - *Very high output. Excellent for Rap or Rock.*



- Enclosure #60
Rear = 0.4 ft³ sealed
Front = 0.4 ft³ @ 75 Hz (4" x 9.125" port) - *High output, small enclosure. Good for most applications.*

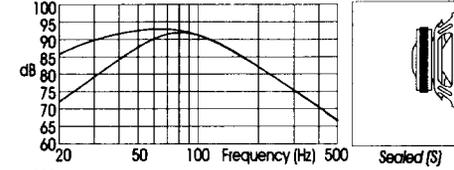


Infinite Baffle

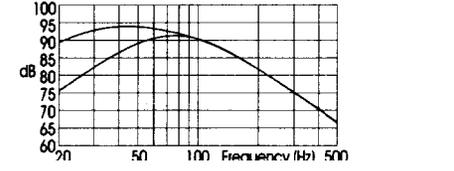
- Excellent performance for all types of music at moderate levels

Sealed

- 0.5 ft³ - *Good linear response, excellent small enclosure. Great for multiple high SPL small enclosures.*

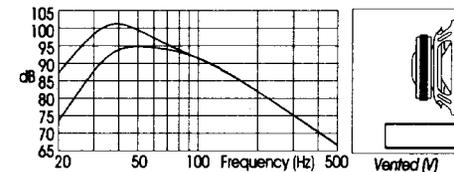


- 1.0 ft³ - *Good linear response, excellent all around enclosure.*

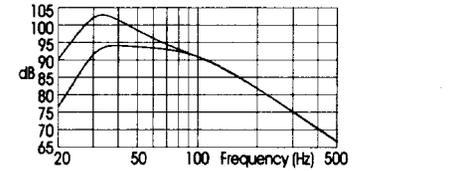


Vented

- 1.3 ft³ @ 36 Hz (3" x 6.75" port) - *High output with good low frequency extension. Good small enclosure.*

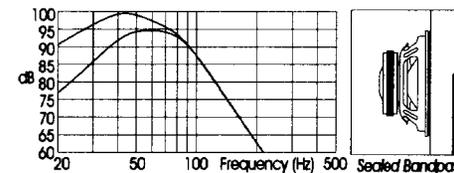


- 1.8 ft³ @ 32 Hz (3" x 6.0" port) - *High output with excellent low frequency extension. Great for Rock music.*

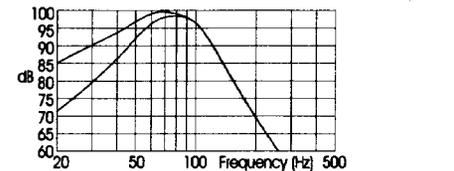


Sealed Bandpass

- Enclosure #61
Rear = 0.9 ft³ sealed
Front = 0.6 ft³ @ 60 Hz (4" x 9.75" port) - *Very high output. Excellent for Rap or Rock.*



- Enclosure #62
Rear = 0.4 ft³ sealed
Front = 0.6 ft³ @ 82 Hz (Two 4" x 10.0" ports) - *High output, small enclosure. Good for most applications.*

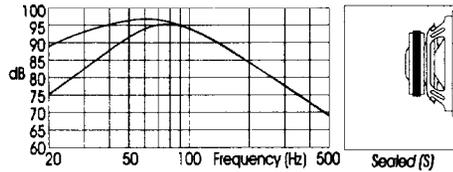


infinite Baffle

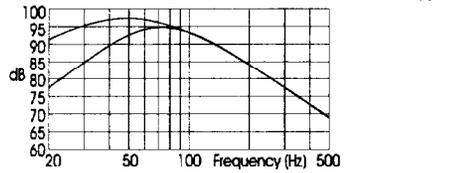
- Excellent performance for all types of music at moderate levels

Sealed

- 1.0 ft³ - Good linear response, excellent small enclosure. Great for multiple high SPL small enclosures

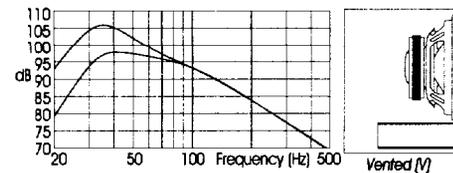


- 1.5 ft³ - Good linear response, excellent all around enclosure



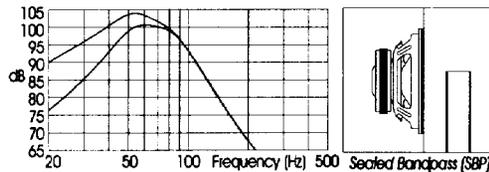
Vented

- 3.5 ft³ @ 33 Hz (4" x 11.0" port) - Deep bass suitable for Rock or Rap. Large enclosure.

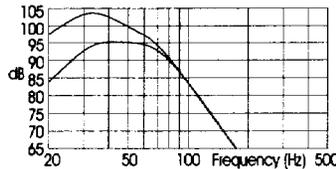


Sealed Bandpass

- Enclosure #63
Rear = 1.0 ft³ sealed
Front = 1.65 ft³ @ 65 Hz (Two 4" x 4.0" ports) - Very high output capability.



- Enclosure #64
Rear = 3.0 ft³ sealed
Front = 1.5 ft³ @ 47 Hz (Two 4" x 13.0" ports) - Very high output with deep extension.

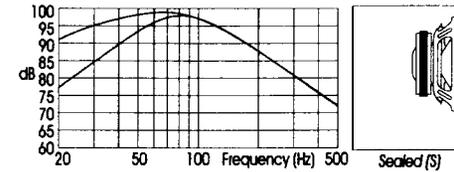


infinite Baffle

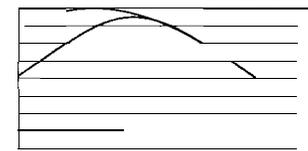
- Excellent performance for all types of music at moderate levels

Sealed

- 1.5 ft³ - Good linear response, excellent small enclosure. Great for multiple high SPL small enclosures

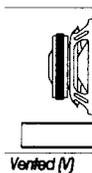


- 2.5 ft³ - Good linear response, excellent all around enclosure



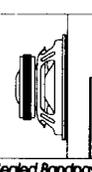
Vented

- 2.0 ft³ @ 35 Hz (4" x 8.25" port) - Small enclosure suitable for Rock or Rap.



Sealed Bandpass

- Enclosure #165
Rear = 1.5 ft³ sealed
Front = 2.0 ft³ @ 77 Hz (Four 4" x 4.125" ports) - Very high output, Good for Rock or Rap.



- Enclosure #66
Rear = 3.5 ft³ sealed
Front = 2.5 ft³ @ 55 Hz (Three 4 x 6.375" ports) - Very deep response. Good for home theater or Rock music.