



**RUBICON10, 12 and 15
Subwoofers**

**OWNER'S MANUAL AND
INSTALLATION GUIDE**

SOUNDSTREAM[®]
T E C H N O L O G I E S



RUBICON 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.

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 RUBICON! woofers perform well in infinite baffle, sealed, vented and bandpass enclosures.
- **Quality Steel Frame Basket** provides rigidity and damping with **Blue Powder Coat Finish** for durability and scuff resistance.
- **Ultra-High power handling Voice Coil with Kapton-Epoxy Former** increases power handling and performance. Aerospace grade adhesives and materials insure longevity and high performance.
- **High Efficiency Design - Computer Numerically Controlled (CNC)** machined magnets and steel plates ensure close tolerances helping to precisely focus the magnetic energy for optimum performance.
- **High Emissivity Coating** on the steel plates improves power handling.
- **Vented Pole Piece** for greater voice coil cooling.
- **Custom-designed High Strength Spider** controls the long travel cone assembly.
- **Superb Engineering and Attention to Detail** - ensure high quality, consistent assembly and ensure your woofers will perform to specification for many years.
- **Designed and Manufactured in the U.S.A.**

SPECIFICATIONS & THIELE/SMALL PARAMETERS

	RUBICON 10	RUBICON 12	RUBICON 15
Freq. Response	32-500 Hz	30-500 Hz	28-500 Hz
Sens. 2.83v/1m	91 dB	93 dB	95 dB
Impedance (nom. z)	4 ohms	4 ohms	4 ohms
Rated Program Power	250 watts	250 watts	300 watts
Fs	34 Hz	29 Hz	29 Hz
Qts	.43	.42	.45
Qms	11.5	8.47	6.80
Qes	.45	.44	.49
EBP (Fs/Qes)	75.5	65.9	59.3
Vas (ft ³)	1.61	3.89	5.58
Vas (liters)	45.4	110.2	158.2
Vas (m ³)	.045	.110	.158
Cms (um/N)	209	247	170
DCR (ohms)	3.60	3.62	3.35
Levc (mH) @ 1 KHz	2.90	3.08	3.53
BL (Tesla m)	13.38	13.47	14.90
Sd (in ²)	60.7	86.9	125.4
Sd (m ²)	.039	.056	.081
Sd (cm ²)	391	560	809
X max; one way (linear mm)	4.7	4.7	6.35
X max; one way (peak mm)	21	21	28
Vd (linear cm ³)	184	263	514
Vd (peak cm ³)	821	1176	2265
Vd (linear m ³)	.000184	.000263	.000514
Vd (peak m ³)	.000821	.001176	.002265
Mms (grams)	104	121	178
Magnet Assembly (oz)	112	112	180
Magnet Weight (oz)	37	37	68
Vf (volume of frame)	120 in ³	135 in ³	300 in ³
Coil length (mm)	19	19	25
Coil diameter (in)	2	2	2
TP (mm)	9.7	9.7	12.8
Mounting Dia. (in)	9 1/8	11 1/8	13 7/8
Mounting Depth (in)	4 1/2	5 1/4	7

SELECTING AN ENCLOSURE

There are several different enclosure designs for different applications. The RUBICON 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 passenger compartment.

Pros

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

Cons

- Lower power handling
- Low to medium efficiency

Sealed Enclosure

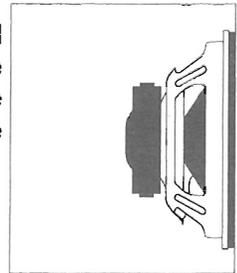
Sealed enclosures are relatively simple to build and install, as all that is required is an airtight box. The larger the sealed enclosure, the more the performance resembles that of an infinite baffle installation.

Pros

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

Cons

- Medium efficiency



Sealed (S)

Vented Enclosure

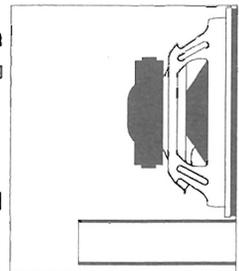
Vented enclosures use a sealed enclosure with a vent or port in the box which is tuned to resonate at a specific frequency.

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 (V)

Sealed Bandpass Enclosure

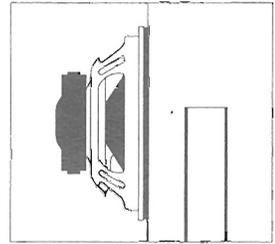
Sealed bandpass enclosures enclose both sides of the woofer(s). An airtight enclosure is built around the front and back of the woofer and one chamber is ported to a specific frequency.

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



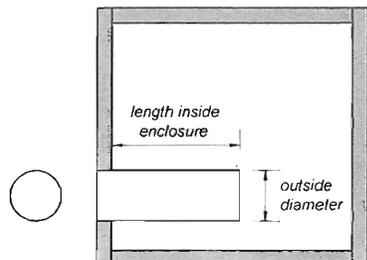
Sealed Bandpass (SBP)

■ CALCULATING (NET) INTERNAL ENCLOSURE VOLUMES ■

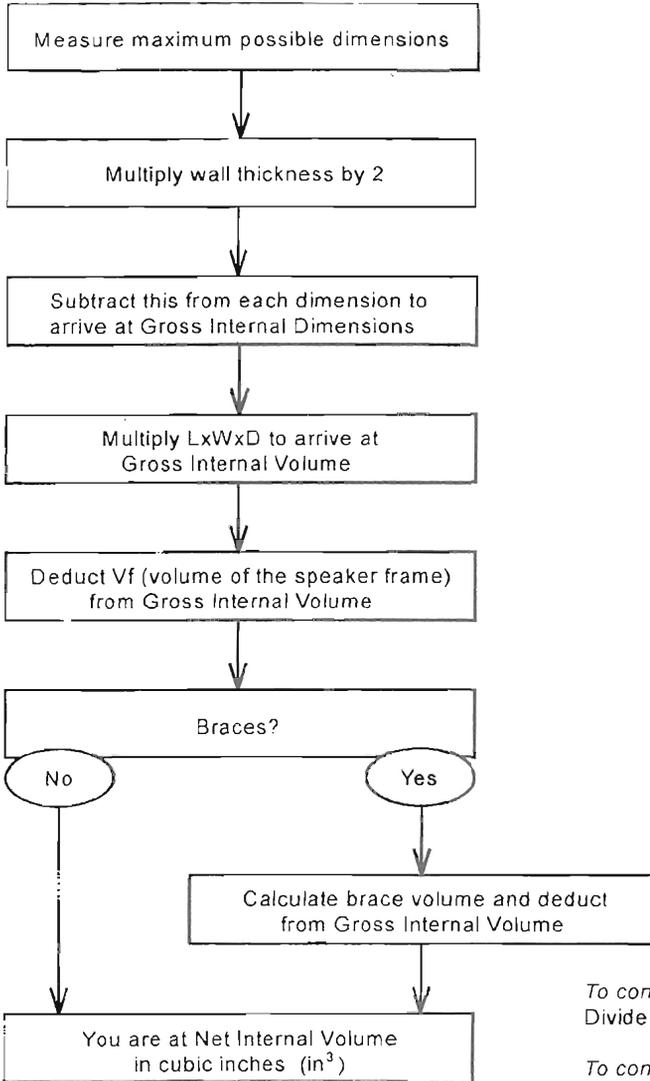
When constructing any type of enclosure, you must be aware that the outside dimensions DO NOT represent the true (Net) volume inside. Such things as woofers, ports, thickness of enclosure material, dividing walls, and any internal bracing will reduce the total amount of the actual air space available.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



ENCLOSURE VOLUME FLOWCHART



To convert to LITERS:
Divide in³ by 61.03

To convert to CUBIC FEET:
Divide in³ 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 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 silicone sealant.
- 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

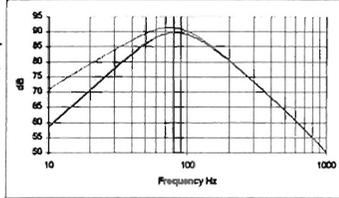
The following designs include a variety of enclosure sizes and types. Each design has two frequency response curves; one showing predicted "In-Car" response, and the other showing "Half-Space Anechoic" (out-of-car) frequency response. The performance difference between the two curves is a result of the 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 2.83 Volts across both voice coils in parallel and measured at 1 meter. Also, each frequency response curve includes a 12 dB/octave low pass filter at 100 Hz for sealed and vented enclosures and 200 Hz for bandpass enclosures. 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.

Infinite Baffle

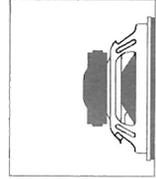
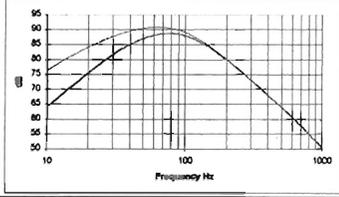
- Excellent performance for all types of music at moderate levels

Sealed

- 0.5 ft³ - *Good linear response, excellent sr:all enclosure.*



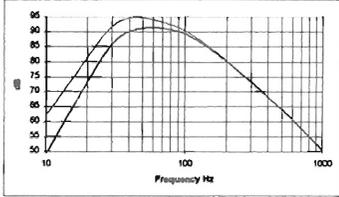
- 1.5 ft³ - *Good response, excellent SPL enclosure. Excellent for high SPL, multiple driver applications.*



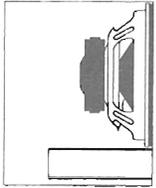
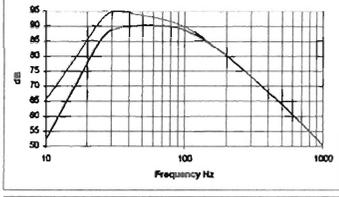
Sealed (S)

Vented

- 1.0 ft³ @ 33 Hz (3" x 11.75" port) - *Butterworth type – smooth, even response*

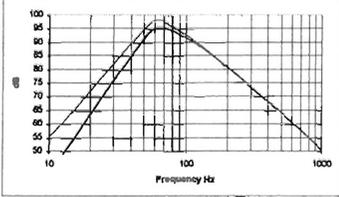


- 1.5 ft³ @ 28 Hz (3" x 10.75" port) - *Sub-tuned – great for classical*



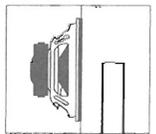
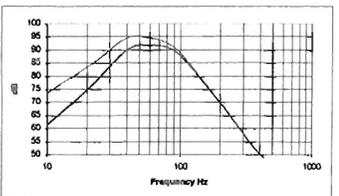
Vented (V)

- .75 ft³ @ 50 Hz (3" x 5.75" port) - *Good punch with high output and boom peak – Great for Rap music*



Sealed Bandpass

- Rear = .75ft³ sealed
Front = .50 ft³ @ 58 Hz (4" x 13.25" port) - *Very deep*

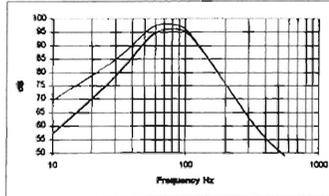
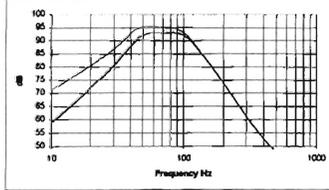


Sealed Bandpass (SBP)

RUBICON10

Sealed Bandpass (Cont'd)

- Rear = .50 sealed
Front = .40 @ 69 Hz (4" x 11.50" port)- *Good bass response in a small enclosure.*
- Rear = .40 sealed
Front = .50 @ 75 Hz (4" x 6.75" port)- *High output in 50 to 80 Hz range -- Good for Rap music.*



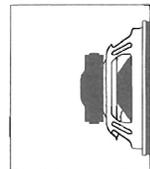
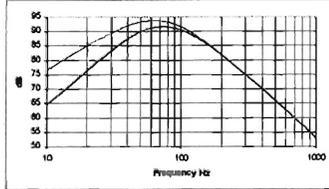
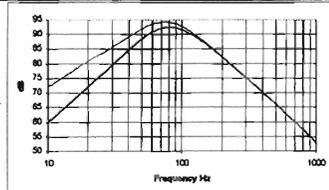
RUBICON12

Infinite Baffle

Excellent performance for all types of music at moderate levels

Sealed

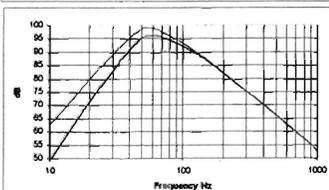
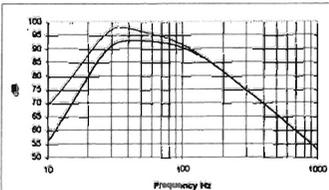
- .75 ft³ - *Good output in small enclosure.*
- 1.5 ft³ - *Deep, smooth response.*



Sealed (S)

Vented

- 3.0 ft³ @ 28 Hz (4" x 8.75" port) - *Flat response -- good general enclosure.*
- 1.5 ft³ @ 40 Hz (4" x 8.75" port) - *High output for both Rock and Rap music.*

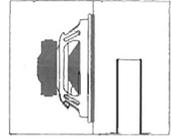
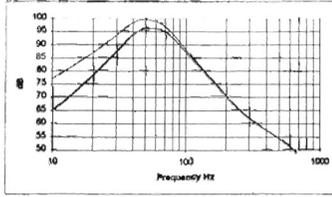


Vented (V)

RUBICON12

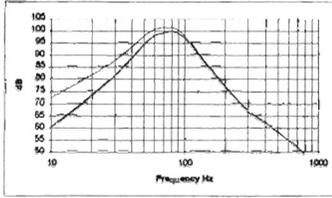
Sealed Bandpass

- o Rear = 1.5ft^3 sealed
Front = 1.5ft^3 @ 53 Hz
(two 4" x 9 1/4" ports) -
Deep bass, high output --
great for all types of music.



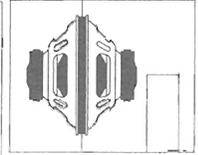
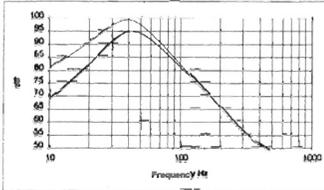
**Sealed
Bandpass
(SBP)**

- o Rear = .75 sealed
Front = 1.25 @ 73 Hz (1" ::
8" port)- *very high output,*
solid bass to 50 Hz -- great
for Rock or Rap.



Isobaric Bandpass

- Rear = .1.5 sealed
Front = 1.0 @ 42 Hz (4" x
12.75" port)- *Very high*
output in small enclosure,
solid bass to 30 Hz --



**Isobaric
Sealed
Bandpass
(ISOBP)**

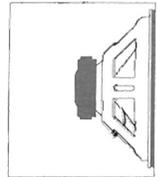
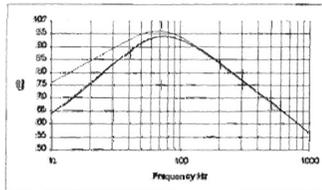
RUBICON15

Infinite Baffle

Excellent performance for all types of music at moderate levels

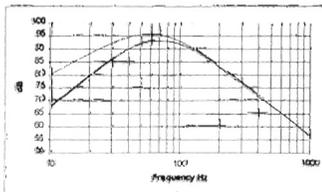
Sealed

- 1.5ft^3 - *Good output in small*
enclosure. All around good
enclosure.



Sealed

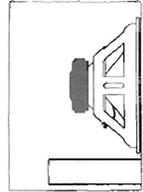
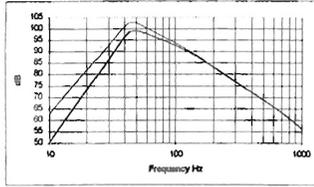
- 3.0ft^3 - *Deep, smooth*
response. Great for Jazz
and Classical music.



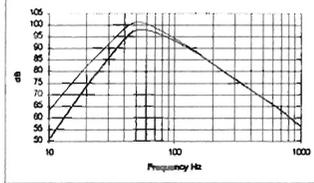
RUBICON15

Vented

- 3.0 ft³ @ 40 Hz (three 4" x 10.5" ports) - *Very high output -- Great for Rock and Rap music.*
- 2.5 ft³ @ 40 Hz (two 4" x 10.0" ports) - *High output for both Rock and Rap music.*

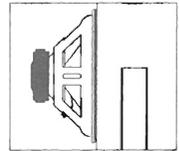
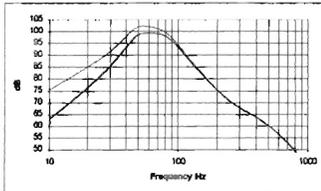


Vented



Sealed Bandpass

- Rear = 1.3 ft³ sealed
Front = 2.0 ft³ @ 62 Hz (four 4" x 9.25" ports) - *Deep bass, very high output in a small box -- great for all types of music.*
- Rear = 3.0 ft³ sealed
Front = 3.0 ft³ @ 47 Hz (two 4" x 4.5" ports) - *Very high output, solid bass to 40 Hz -- great for Rock or Rap.*



**Sealed
Bandpass
(SBP)**

