**Formulas for Tuning a Subwoofer**

Now that you know the basics of speakers and subwoofers, how they work, and you’ve chosen one; it is time now that we build a box.

BEFORE I SAY ANYTHING: Building your own box will not necessarily bring better quality to your sound, professionally made boxes are equally as good if not any better.

Formulas and what they mean:

Select an equation to solve for a different unknown

efficiency bandwidth product

|  |  |
| --- | --- |
| efficiency bandwidth product | efficiency bandwidth product |
| speaker resonance frequency | speaker resonance frequency |
| speaker electrical Q | speaker electrical Q |

box or enclosure volume

|  |  |
| --- | --- |
| box volume | box or enclosure volume |
| speaker total Q at fs | speaker total Q at fs |
| air volume with same acoustic compliance | air volume with same acoustic complianceas the speaker suspension |

box or enclosure tuning frequency

|  |  |
| --- | --- |
| box or enclosure tuning frequency | box or enclosure tuning frequency |
| air volume with same acoustic compliance | air volume with same acoustic complianceas the speaker suspension |
| box or enclosure volume | box or enclosure volume |
| speaker resonance frequency | speaker resonance frequency |

box or enclosure tuning frequency

|  |  |
| --- | --- |
| minus three decibel half power frequency | minus three decibel half power frequency |
| air volume with same acoustic compliance | air volume with same acoustic complianceas the speaker suspension |
| box or enclosure volume | box or enclosure volume |
| speaker resonance frequency | speaker resonance frequency |

peak sound pressure level

|  |  |
| --- | --- |
| peak sound pressure level | peak sound pressure level |
| speaker total Q at fs | speaker total Q at fs |
| equivalent air compliance | equivalent air compliance |
| box enclosure volume | box enclosure volume |

sound pressure level

|  |  |
| --- | --- |
| sound pressure level | sound pressure level |
| free air reference efficiency | free air reference efficiency |

maximum air volume displaced by cone excursion

|  |  |
| --- | --- |
| maximum air volume displaced by cone excursion | maximum air volume displaced by cone excursion |
| cone effective radiation area | cone effective radiation area |
| cone peak linear displacement | cone peak linear displacement |

cone effective radiation area

|  |  |
| --- | --- |
| cone effective radiation area | cone effective radiation area |
| cone diameter plus one third of surround | cone diameter plus one third of surround |

port or vent length

|  |  |
| --- | --- |
| port or vent length | port or vent length |
| volume of enclosure or box | volume of enclosure or box |
| tuning frequency | tuning frequency |
| end correction factor | end correction factor |

minimum port or vent diameter

|  |  |
| --- | --- |
| minimum port or vent diameter | minimum port or vent diameter |
| maximum air volume displaced  | maximum air volume displaced by cone excursion |
| tuning frequency | tuning frequency |
|  |  |

Courtesy of: <http://www.ajdesigner.com/phpsubwoofervented/box_tuning_frequency_equation.php>

Since all of these formulas seem quite daunting and confusing to most of us, instead of explaining each and everyone thoroughly enough and wasting your time, I’m going to list a few sites with calculators for these formulas.

Subwoofer Box Design Sites:

Subwoofer Box Calculator for Sealed, Ported, or Bandpass

<http://www.ajdesigner.com/fl_subwoofer/subwoofer.php>

Free Software Download for bandpass, sealed and ported subwoofer boxes

<http://www.ajdesigner.com/speaker/index.php>

Top of the page it brings you too… the lower part of the page explains each software in a summary

For most of the speakers/subwoofers you buy, you will get a data sheet with all of the numbers to punch in on the calculator, it may even be on their website.

Courtesy of: <http://www.ajdesigner.com/fl_subwoofer/subwoofer.php>