Introduction to BoxDesigner

BoxDesigner is the enclosure design simulation software,
it's based on the Thiele/Small theory and pursued usability.

Use method of BoxDesigner is described concisely here.

In order to use BoxDesigner, you need to download at least 4 points of
BoxDesigner.app, BoxDesignerDB.app, Speaker Data Folder and
Activation_Keys and install and activate BoxDesigner.

The parameters necessary to enclosure making are the volume
of enclosure (Vb Liter) and the vent size.
The size of the vent is decided by the volume and the tuning frequency (Fb Hz).

Open Speaker Data Folder
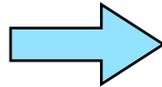
This icon is double-clicked
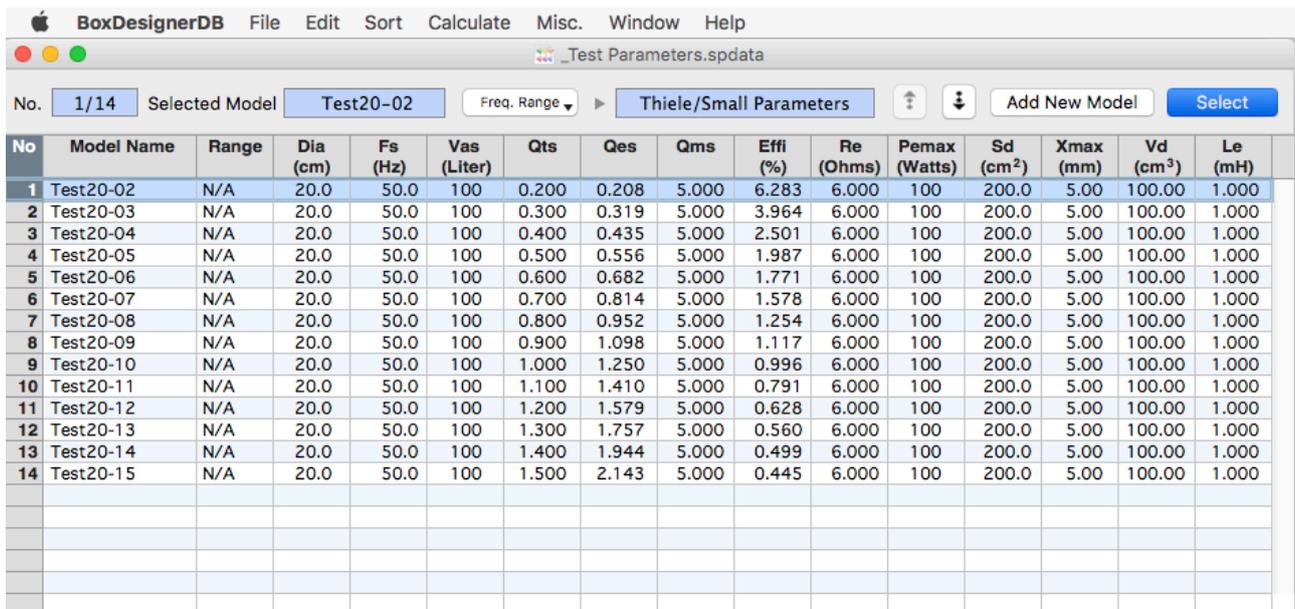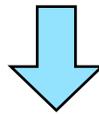
No	Model Name	Range	Dia (cm)	Fs (Hz)	Vas (Liter)	Qts	Qes	Qms	Effi (%)	Re (Ohms)	Pemax (Watts)	Sd (cm²)	Xmax (mm)	Vd (cm³)	Le (mH)
1	Test20-02	N/A	20.0	50.0	100	0.200	0.208	5.000	6.283	6.000	100	200.0	5.00	100.00	1.000
2	Test20-03	N/A	20.0	50.0	100	0.300	0.319	5.000	3.964	6.000	100	200.0	5.00	100.00	1.000
3	Test20-04	N/A	20.0	50.0	100	0.400	0.435	5.000	2.501	6.000	100	200.0	5.00	100.00	1.000
4	Test20-05	N/A	20.0	50.0	100	0.500	0.556	5.000	1.987	6.000	100	200.0	5.00	100.00	1.000
5	Test20-06	N/A	20.0	50.0	100	0.600	0.682	5.000	1.771	6.000	100	200.0	5.00	100.00	1.000
6	Test20-07	N/A	20.0	50.0	100	0.700	0.814	5.000	1.578	6.000	100	200.0	5.00	100.00	1.000
7	Test20-08	N/A	20.0	50.0	100	0.800	0.952	5.000	1.254	6.000	100	200.0	5.00	100.00	1.000
8	Test20-09	N/A	20.0	50.0	100	0.900	1.098	5.000	1.117	6.000	100	200.0	5.00	100.00	1.000
9	Test20-10	N/A	20.0	50.0	100	1.000	1.250	5.000	0.996	6.000	100	200.0	5.00	100.00	1.000
10	Test20-11	N/A	20.0	50.0	100	1.100	1.410	5.000	0.791	6.000	100	200.0	5.00	100.00	1.000
11	Test20-12	N/A	20.0	50.0	100	1.200	1.579	5.000	0.628	6.000	100	200.0	5.00	100.00	1.000
12	Test20-13	N/A	20.0	50.0	100	1.300	1.757	5.000	0.560	6.000	100	200.0	5.00	100.00	1.000
13	Test20-14	N/A	20.0	50.0	100	1.400	1.944	5.000	0.499	6.000	100	200.0	5.00	100.00	1.000
14	Test20-15	N/A	20.0	50.0	100	1.500	2.143	5.000	0.445	6.000	100	200.0	5.00	100.00	1.000

Open BoxDesignerDB

The model would like to use is chosen ⇨ "Select" button is clicked.

Select Launch Application

Selected Model Is
Test20-02

BoxDesigner

BoxDesignerMid

BoxDesignerFA

Cancel   Quit
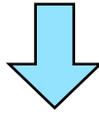
"BoxDesigner" button is clicked on "Select Launch Application"

System Select

High Pass System   Band Pass System

Infinite Baffle   Closed Box   Vented Box   Passive Radiator

Serial Vented   Parallel Vented   Complex Closed   Complex Vented

Model Name : Test20-04   ▶   Cancel   Select
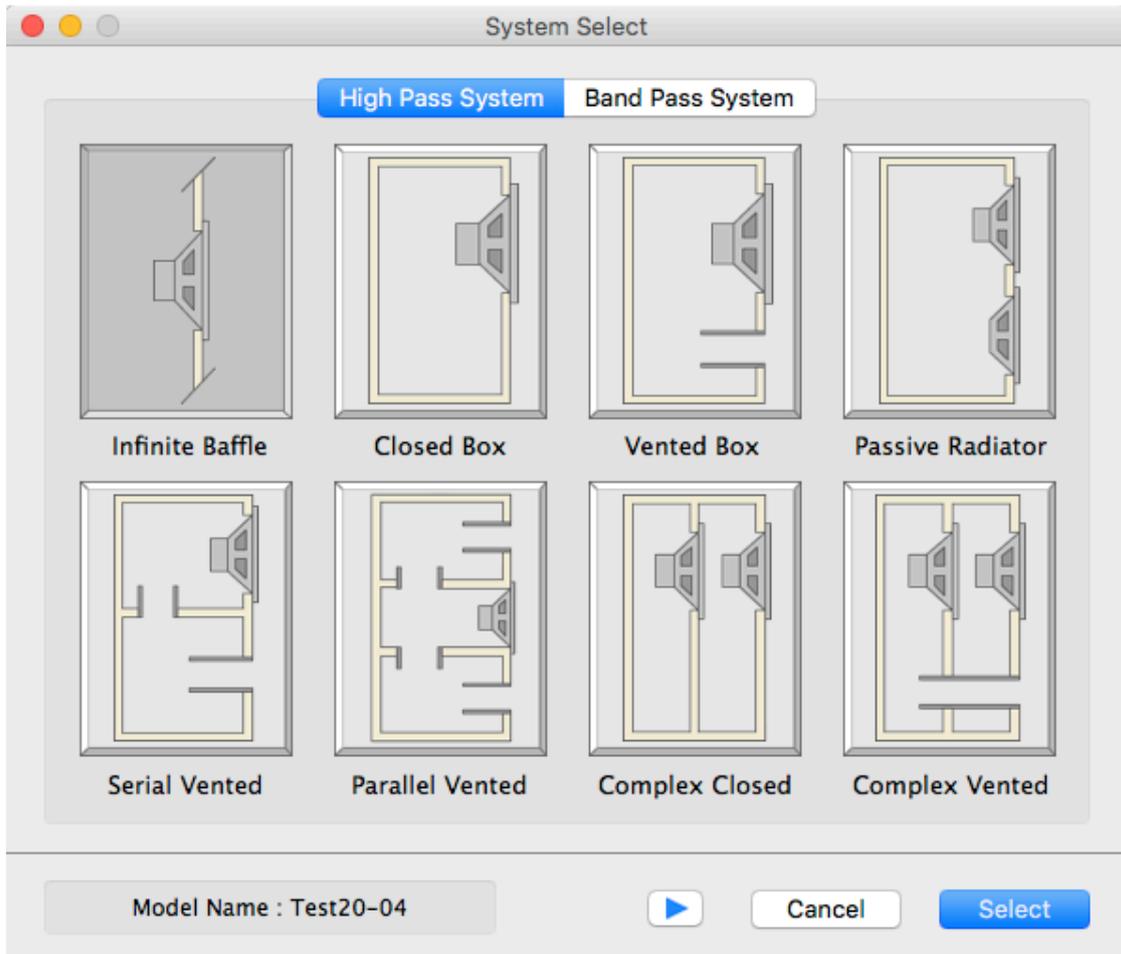
"Vented Box" is chosen by "System Select" ⇨ "Select" button is clicked.
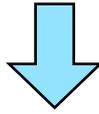
Enter Electrical Input Power

10	Watts

Pemax Ref. 30 Watts

Enter Thickness of Port cut in Baffle

20 mm

Cancel   OK

"OK" button clicks on "Initial Setup"

This can be changed later.

BoxDesigner   File   Edit   Response   View   Alignment   Vent   Misc.   Window   Help

System Info Palette

Model Name : Test20-04
SPL @1W1m : 96 dB
Input Power : 10 Watts

Vb
Fb
Qb

Vent

System Figure

Response

Amplitude
'Vented Box System'

Total   Direct   Vent

Custom Palette

Driver Parameters
Fs .... 50 Hz
Vas .... 100 Liter
Qts 0.4

Box Parameters
Vb .... 95 Liter
Fb .... 50 Hz
Qb 7

Alignment   Snap   Calc.
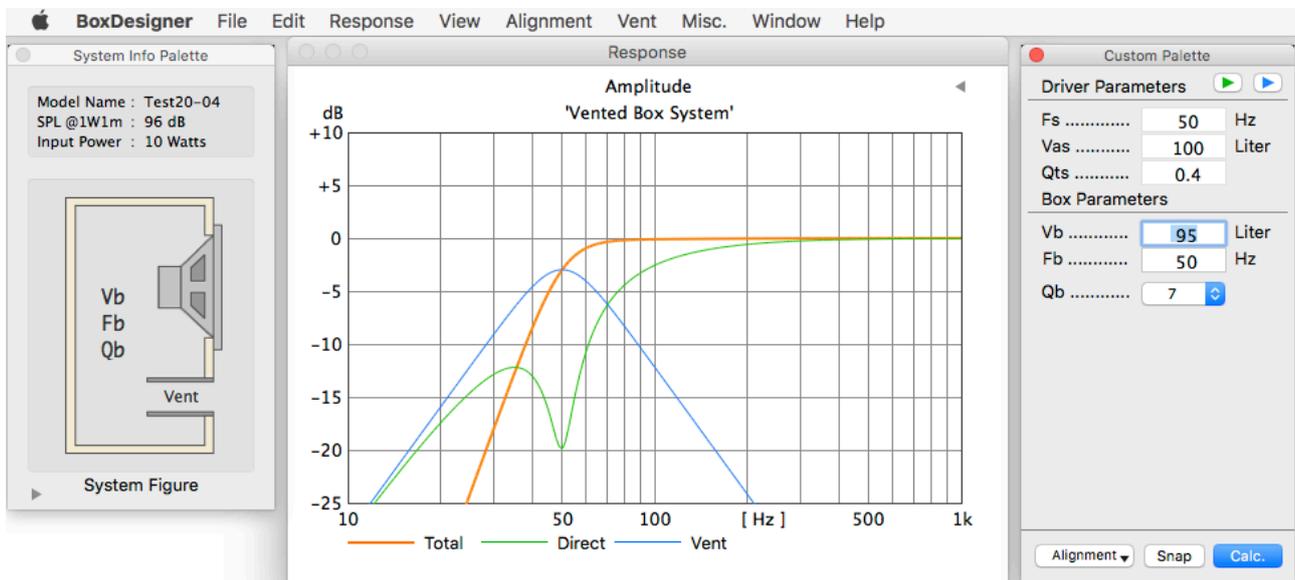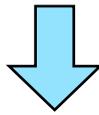
The main windows of BoxDesigner are displayed.
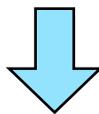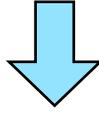
View	Alignment	Vent	Misc.

✓ Relative	⌘J
Absolute	⌘K
✓ 5dB per div	⇧⌘5
10dB per div	⇧⌘1
Total Only	⌘F
✓ All Characters	⌘G
Comparison IB	⌘I
Hide Custom Palette	
Hide System Info Palette	
Gather Windows	⇧⌘W

"All Characters" is chosen by the "View" menu.

It wasn't indicated by default, the special quality of "Vent" indicates "directly",

so it'll be help with a design.

"All Characters" is chosen by the "View" menu.

It wasn't indicated by default.

"Direct" : the direct sound from the corn

"Vent": output sound from a vent

Those are indicated, so it'll be help with a design.
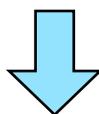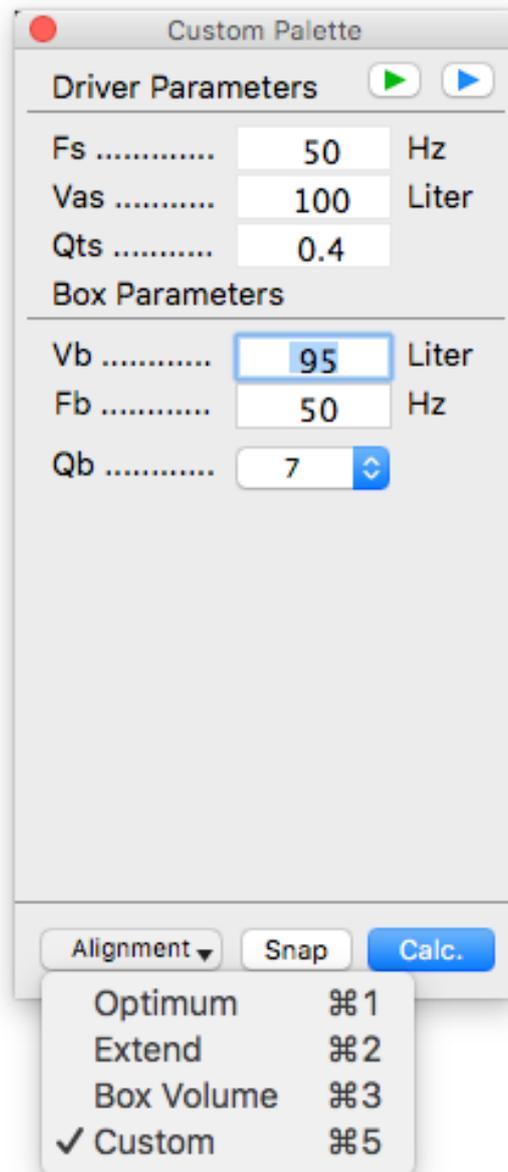
Then the optimum Vb and Fb calculate default of "Optimum" Alignment.
"Extend" is the alignment to low extended.
"Box Volume" is optimum value is calculated by inputting the box volume "Vb".
Change in the values becomes possible to choose by "Custom".
You decide about Vb, Fb and Qb so that there'll be the favorite quality.
(Qb is a loss factor of a box, it's OK by the default value.)

After the degree special quality by which the price of the vent is initialized is
decided that the numerical value is changed.
The person who moved to Vent Design can work efficiently.

A green triangle button ▶ on "Custom Palette" is clicked.
⇨ It's switched a "System Select" window.

A blue triangle button ▶ on "Custom Palette" is clicked.
⇨ It's switched a "BoxDesignerDB" window.

Vent Design Window

If the favorite characteristics changes the values of Box Parameters,
and is decided.
You decide about the size of the vent by "Vent" menu ⇨ "Vent Design Window".
"Ported" is a diameter of the vent decided uniquely by a thickness of a baffle is
indicated.
"Ducted" inputs the inside diameter of the vent (Dv) to well, is calculated.
It can be done it than default, but when Lv is too short, "Alart" is indicated,
and a diameter of a vent is reset by the default value.
"Number of Vents" can change the number of the installed vent.
It's possible to get the basic parameters necessary to enclosure making
by the above mentioned procedure.

The vented system public designing method of BoxDesigner

1. The capacity of the box Vb Liter and resonant frequency Fb Hz is decided.
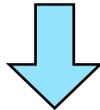
2. The size of the vent is designed in Vent Design Window (Vent Menu) from Vb and Fb.
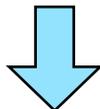
3. The number of times of the vent necessary to a system does the above.