

Loudspeaker Enclosure Designer for sealed and vented alignments, v0.5
 by David Kakenmaster, 1992.

INSTRUCTIONS:

- 1) The driver data and max flat design area can be accessed by pressing ALT-F. Press ALT-I to return to these instructions.
- 2) DATA MAY BE ENTERED IN HIGHLIGHTED AREAS ONLY!
- 3) You can either enter a driver's parameters in cells B23 - B31 or press ALT-R to import an existing driver data file.
- 4) The diameter (B33) and number of ports (B34) are user selected and may be changed to calculate different port sizes in a given enclosure. Port parameters are ignored for sealed alignments.
- 5) LED automatically recalculates all alignments whenever you change any parameters. You may enter data in highlighted areas only.
- 6) After importing or entering driver & port parameters, you can view the maximally flat alignments (as calculated) on the right.
- 7) Press ALT-Q or ALT-W to load the USER1 or USER2 alignment screens.
- 8) ALT-G loads the graph menu. F10 views the selected graph.
- 9) ALT-P prints the selected graph.
- 10) ALT-H loads the hot-key help menu.

Date:

Loudspeaker Enclosure Designer for sealed and vented alignments, v0.5

Driver:		The optimum enclosure for		
Brand:		this driver is:		
Fs:	0.0000Hz			
Vas:	0.0000ft^3	#DIV/0!dB (free air) efficiency		
Qts:	0.0000			
Qms:	0.0000			
Qes:	0.0000	MAX FLAT AMTUDE ALIGNMENTS		
Sd:	0.0000M^2	Sealed Box (BW):		Vented Box (B4
Xmax:	0.0000mm	Vb:	ft^3	Vb:
		Fc(Hz):	#DIV/0! Hz	Fb(Hz):
Port dia:	3.00inches	F-3dB:	#DIV/0! Hz	F-3dB:
# ports:	1	Peak:	0.000 dB	Ripple:
		Qtc:	0.707	Port L:
ALT-G for graph menu		Pmax:	#DIV/0! watts	Pmax:
F10 to view graph		SPLmax:	#DIV/0! dB	SPLmax:
				Ql:
Date:		ALT-H for help		
4/22/92		ALT-Q for user 1 alignments		

User specified alignments for: 0

USER1: Solve for desired Vb

Enter:

for sealed:

Vb: 1.50ft³

for vented:

Vb: 2.00ft³

Port dia: 3.00inches

ports: 1

ALT-H for help
ALT-G for graph menu
F10 to view graph

Date: 4/22/92

USER1ALIGNMENTS

Sealed Box:	Vented Box:
Fc(Hz): 0.000 Hz	Fb(Hz):
F-3dB: #DIV/0! Hz	F-3dB:
Qtc: 0.000 dB	Ripple:
Peak: 0.000dB in	Port L:
Pmax: #DIV/0! watts	Pmax:
SPLmax: #DIV/0! dB	SPLmax:
	Ql:

ALT-W for user 2 alignments

User specified alignments for: 0

USER2: Solve for: desired Qtc or Fb and Vb

Enter:

for sealed:

Qtc: 1.000

Qtc=0.57' Bessel alignment
Qtc=0.70' Butterworth alignment
Qtc>=0.8' Chebychev alignments

for vented:

Vb: 2.50ft³

Fb: 25.00Hz

Port dia: 3.00inches

ports: 1

ALT-H for help
ALT-G for graph menu
F10 to view graph

Date: 4/22/92

USER2ALIGNMENTS

Sealed Box:	Vented Box:
Vb: #DIV/0! ft ³	
Fc(Hz): #DIV/0!Hz dB	Ripple:
F-3dB: #DIV/0!Hz	F-3dB:
Peak: 1.249dB in	Port L:
Pmax: #DIV/0! watts	Pmax:
SPLmax: #DIV/0! dB	SPLmax:
Qts: 0.000	Ql:

Optimal internal enclosure dimensions:

Port design by calculated
minimum port diameter:
(Enter # of ports used)

	SEALED	VENTED	
MAX FLAT:	0.00FT ³ 0.00" H 0.00" W 0.00" D	0.00FT ³ 0.00" H 0.00" W 0.00" D	#NUM!Hz (Fb) #NUM!" ID each #NUM!" L each 1
USER 1:	1.50FT ³ 22.25" H 13.74" W 8.52" D	2.00FT ³ 24.49" H 15.12" W 9.37" D	#DIV/0!Hz (Fb) #DIV/0!" ID each #DIV/0!" L each 1
USER 2:	#DIV/0!FT ³ #DIV/0!" H #DIV/0!" W #DIV/0!" D	2.50FT ³ 26.38" H 16.29" W 10.10" D	25.00Hz (Fb) 0.00" ID each 0.00" L each 1

OUTPUT CALCULATIONS - IN-ROOM

		VENTED			SEALED		
Max flat		User 1	User 2	Max flat		User 1	
Hz	dB	dB	dB	Hz	dB	dB	
1.000	#DIV/0!	#DIV/0!	#DIV/0!	1.000	#DIV/0!	#DIV/0!	
4.000	#DIV/0!	#DIV/0!	#DIV/0!	4.000	#DIV/0!	#DIV/0!	
7.000	#DIV/0!	#DIV/0!	#DIV/0!	7.000	#DIV/0!	#DIV/0!	
10.000	#DIV/0!	#DIV/0!	#DIV/0!	10.000	#DIV/0!	#DIV/0!	
15.000	#DIV/0!	#DIV/0!	#DIV/0!	15.000	#DIV/0!	#DIV/0!	
20.000	#DIV/0!	#DIV/0!	#DIV/0!	20.000	#DIV/0!	#DIV/0!	
25.000	#DIV/0!	#DIV/0!	#DIV/0!	25.000	#DIV/0!	#DIV/0!	
30.000	#DIV/0!	#DIV/0!	#DIV/0!	30.000	#DIV/0!	#DIV/0!	
35.000	#DIV/0!	#DIV/0!	#DIV/0!	35.000	#DIV/0!	#DIV/0!	
40.000	#DIV/0!	#DIV/0!	#DIV/0!	40.000	#DIV/0!	#DIV/0!	
45.000	#DIV/0!	#DIV/0!	#DIV/0!	45.000	#DIV/0!	#DIV/0!	
50.000	#DIV/0!	#DIV/0!	#DIV/0!	50.000	#DIV/0!	#DIV/0!	
55.000	#DIV/0!	#DIV/0!	#DIV/0!	55.000	#DIV/0!	#DIV/0!	
60.000	#DIV/0!	#DIV/0!	#DIV/0!	60.000	#DIV/0!	#DIV/0!	

65.000	#DIV/0!	#DIV/0!	#DIV/0!	65.000	#DIV/0!	#DIV/0!
70.000	#DIV/0!	#DIV/0!	#DIV/0!	70.000	#DIV/0!	#DIV/0!
75.000	#DIV/0!	#DIV/0!	#DIV/0!	75.000	#DIV/0!	#DIV/0!
80.000	#DIV/0!	#DIV/0!	#DIV/0!	80.000	#DIV/0!	#DIV/0!
90.000	#DIV/0!	#DIV/0!	#DIV/0!	90.000	#DIV/0!	#DIV/0!
100.000	#DIV/0!	#DIV/0!	#DIV/0!	100.000	#DIV/0!	#DIV/0!
115.000	#DIV/0!	#DIV/0!	#DIV/0!	115.000	#DIV/0!	#DIV/0!
130.000	#DIV/0!	#DIV/0!	#DIV/0!	130.000	#DIV/0!	#DIV/0!
145.000	#DIV/0!	#DIV/0!	#DIV/0!	145.000	#DIV/0!	#DIV/0!
160.000	#DIV/0!	#DIV/0!	#DIV/0!	160.000	#DIV/0!	#DIV/0!
175.000	#DIV/0!	#DIV/0!	#DIV/0!	175.000	#DIV/0!	#DIV/0!
190.000	#DIV/0!	#DIV/0!	#DIV/0!	190.000	#DIV/0!	#DIV/0!
215.000	#DIV/0!	#DIV/0!	#DIV/0!	215.000	#DIV/0!	#DIV/0!
240.000	#DIV/0!	#DIV/0!	#DIV/0!	240.000	#DIV/0!	#DIV/0!
265.000	#DIV/0!	#DIV/0!	#DIV/0!	265.000	#DIV/0!	#DIV/0!
290.000	#DIV/0!	#DIV/0!	#DIV/0!	290.000	#DIV/0!	#DIV/0!
315.000	#DIV/0!	#DIV/0!	#DIV/0!	315.000	#DIV/0!	#DIV/0!
355.000	#DIV/0!	#DIV/0!	#DIV/0!	355.000	#DIV/0!	#DIV/0!
395.000	#DIV/0!	#DIV/0!	#DIV/0!	395.000	#DIV/0!	#DIV/0!
435.000	#DIV/0!	#DIV/0!	#DIV/0!	435.000	#DIV/0!	#DIV/0!
475.000	#DIV/0!	#DIV/0!	#DIV/0!	475.000	#DIV/0!	#DIV/0!
515.000	#DIV/0!	#DIV/0!	#DIV/0!	515.000	#DIV/0!	#DIV/0!
565.000	#DIV/0!	#DIV/0!	#DIV/0!	565.000	#DIV/0!	#DIV/0!
615.000	#DIV/0!	#DIV/0!	#DIV/0!	615.000	#DIV/0!	#DIV/0!
665.000	#DIV/0!	#DIV/0!	#DIV/0!	665.000	#DIV/0!	#DIV/0!
715.000	#DIV/0!	#DIV/0!	#DIV/0!	715.000	#DIV/0!	#DIV/0!
765.000	#DIV/0!	#DIV/0!	#DIV/0!	765.000	#DIV/0!	#DIV/0!
865.000	#DIV/0!	#DIV/0!	#DIV/0!	865.000	#DIV/0!	#DIV/0!
965.000	#DIV/0!	#DIV/0!	#DIV/0!	965.000	#DIV/0!	#DIV/0!

Intermediate calcs for:
(max flat alignments)

Port area:

1.5

Pmax/SPLmax:

0

#DIV/0!

Intermediate

Max flat (vented) calculations:

4/22/92

l):

0.000
#NUM!
#NUM!
#DIV/0!
#NUM!
#NUM!
#NUM!
7.000

Hz	#NUM!	#NUM!
1	#DIV/0!	#DIV/0!
4	#DIV/0!	#DIV/0!
7	#DIV/0!	#DIV/0!
10	#DIV/0!	#DIV/0!
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25	#DIV/0!	#DIV/0!
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35	#DIV/0!	#DIV/0!
40	#DIV/0!	#DIV/0!
45	#DIV/0!	#DIV/0!
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55	#DIV/0!	#DIV/0!
60	#DIV/0!	#DIV/0!
65	#DIV/0!	#DIV/0!
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75	#DIV/0!	#DIV/0!
80	#DIV/0!	#DIV/0!
90	#DIV/0!	#DIV/0!
100	#DIV/0!	#DIV/0!
115	#DIV/0!	#DIV/0!
130	#DIV/0!	#DIV/0!
145	#DIV/0!	#DIV/0!
160	#DIV/0!	#DIV/0!
175	#DIV/0!	#DIV/0!

	190	#DIV/0!	#DIV/0!
	215	#DIV/0!	#DIV/0!
	240	#DIV/0!	#DIV/0!
	265	#DIV/0!	#DIV/0!
	290	#DIV/0!	#DIV/0!
	315	#DIV/0!	#DIV/0!
	355	#DIV/0!	#DIV/0!
	395	#DIV/0!	#DIV/0!
	435	#DIV/0!	#DIV/0!
	475	#DIV/0!	#DIV/0!
	515	#DIV/0!	#DIV/0!
	565	#DIV/0!	#DIV/0!
#DIV/0!	615	#DIV/0!	#DIV/0!
0.000	665	#DIV/0!	#DIV/0!
Err:502	715	#DIV/0!	#DIV/0!
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#DIV/0!	965	#DIV/0!	#DIV/0!
7.000			

Intermediate

0.00001Max flat (sealed) calculations:

	10000	#DIV/0!	#DIV/0!
Hz			
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	25	#DIV/0!	#DIV/0!
	30	#DIV/0!	#DIV/0!
	35	#DIV/0!	#DIV/0!
Err:502	40	#DIV/0!	#DIV/0!
0.000	45	#DIV/0!	#DIV/0!
9.997	50	#DIV/0!	#DIV/0!
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User 2
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	115	#DIV/0!	#DIV/0!
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	315	#DIV/0!	#DIV/0!
0	355	#DIV/0!	#DIV/0!
0	395	#DIV/0!	#DIV/0!
0	435	#DIV/0!	#DIV/0!
	475	#DIV/0!	#DIV/0!
	515	#DIV/0!	#DIV/0!
	565	#DIV/0!	#DIV/0!
	615	#DIV/0!	#DIV/0!
	665	#DIV/0!	#DIV/0!
	715	#DIV/0!	#DIV/0!
	765	#DIV/0!	#DIV/0!
	865	#DIV/0!	#DIV/0!
	965	#DIV/0!	#DIV/0!

This program is distribu

It was written specifically for Q
well within other Lotus or Quat

No guarantees of any kind are o
distribute this program, as long

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charged for distribution materia
LEDV0_5.WQ1, SPKRDATA.
in unmodified form.

An upgraded version of this ter
information regarding this upgr:

For the small price of \$20.00, y

Version 1.0: Calculates and plo
this program
If you're seri
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- There are ma
- 30 preform
- User adjus
- Built-in su
- Built-in su
- More flexi
- And much

To obtain this program, send \$2

Press <ENTER>

HOT KEY HEL

HOT KEY

ALT-Q
ALT-W

ALT-E

ALT-F

ALT-G

ALT-H

ALT-I

ALT-O

ALT-P

ALT-R

ALT-S

ALT-V

Press <ENTER>

l, ie diskettes, and that the files
WQ1, LDSPKR05.DOC and READ.ME are all included

uplicate is available. Press <ENTER> for
aded version, LED v1.0.

Press <ENTER> to continue.
ou can get the upgraded version of
Loudspeaker Enclosure Designer:

ts 5 TIMES as many data points as
(version 0.5).
ous about modeling your box designs, this
| give you the power to do it! Note that you
otal of 525k of free RAM (conventional +
| load and operate this program.

ny more features, too, including:
atted graph functions
table Q1
pport for multiple driver arrays.
pport for normal or compound driver mount.
ble user design areas.
, MUCH more.

0.00 to:

to continue.

David Kakenmaster
890 N. Tabor Ct.
Castle Rock, CO 80104-9715

.P FOR LED v0.5 IN AS EASY AS.

FUNCTION

Load USER 1 design work area.
Load USER 2 design work area.

Load optimum diameter port design and optimum enclosure dimensions work area.

Load MAX FLAT alignment and driver data work area.

Load to graph menu

Load hot key help area (this area).

View basic instructions for LED v0.5.

Print current graph in draft (fast) mode.

Print current graph in NLQ mode.

Load data file import menu.

Save entire design file for a specific driver.

Load in-room output calculations area.

to return.

```

/gnd{?}~q      {home} {pgdn} .                0
                                                    2592
{home} {pgdn 2}{home} {pgdn 3                #DIV/0!
                                                    0
{home} {goto}E{HOME} {goto}                3456
                                                    4320
{home} {pgdn 5/pdgggqq
{home} {pgdn 4/pdpggqq
/fa{?}~      /snrl154..s173~{home} {goto}l154~{goto}m173~{?}/snhl154..

```

Intermediate

User2 (vented) calculations:

		Vented		
#DIV/0!	#DIV/0!	#DIV/0!	In-car corrective	
#DIV/0!	#DIV/0!	#DIV/0!	Hz	+dB
#DIV/0!	#DIV/0!	#DIV/0!	1	61
#DIV/0!	#DIV/0!	#DIV/0!	4	45
#DIV/0!	#DIV/0!	#DIV/0!	7	36.8
#DIV/0!	#DIV/0!	#DIV/0!	10	30.7
#DIV/0!	#DIV/0!	#DIV/0!	15	23.9
#DIV/0!	#DIV/0!	#DIV/0!	20	19
#DIV/0!	#DIV/0!	#DIV/0!	25	15.2
#DIV/0!	#DIV/0!	#DIV/0!	30	12
#DIV/0!	#DIV/0!	#DIV/0!	35	9.3
#DIV/0!	#DIV/0!	#DIV/0!	40	7.2
#DIV/0!	#DIV/0!	#DIV/0!	45	5.5
#DIV/0!	#DIV/0!	#DIV/0!	50	4.4
#DIV/0!	#DIV/0!	#DIV/0!	55	3.5
#DIV/0!	#DIV/0!	#DIV/0!	60	3
#DIV/0!	#DIV/0!	#DIV/0!	65	2.6
#DIV/0!	#DIV/0!	#DIV/0!	70	2.33
#DIV/0!	#DIV/0!	#DIV/0!	75	2.14
#DIV/0!	#DIV/0!	#DIV/0!	80	1.98
#DIV/0!	#DIV/0!	#DIV/0!	90	1.73
#DIV/0!	#DIV/0!	#DIV/0!	100	1.53
#DIV/0!	#DIV/0!	#DIV/0!	115	1.28
#DIV/0!	#DIV/0!	#DIV/0!	130	1.08
#DIV/0!	#DIV/0!	#DIV/0!	145	0.92
#DIV/0!	#DIV/0!	#DIV/0!	160	0.78
#DIV/0!	#DIV/0!	#DIV/0!	175	0.68

#DIV/0!	#DIV/0!	190	0.6
#DIV/0!	#DIV/0!	215	0.48
#DIV/0!	#DIV/0!	240	0.4
#DIV/0!	#DIV/0!	265	0.33
#DIV/0!	#DIV/0!	290	0.28
#DIV/0!	#DIV/0!	315	0.24
#DIV/0!	#DIV/0!	355	0.19
#DIV/0!	#DIV/0!	395	0.15
#DIV/0!	#DIV/0!	435	0.12
#DIV/0!	#DIV/0!	475	0.11
#DIV/0!	#DIV/0!	515	0.09
#DIV/0!	#DIV/0!	565	0.08
#DIV/0!	#DIV/0!	615	0.06
#DIV/0!	#DIV/0!	665	0.05
#DIV/0!	#DIV/0!	715	0.04
#DIV/0!	#DIV/0!	765	0.04
#DIV/0!	#DIV/0!	865	0.03
#DIV/0!	#DIV/0!	965	0.02

Intermediate

User2 (sealed) calculations:

#DIV/0!	#DIV/0!	#DIV/0!	Sealed #DIV/0!In-car corrective	
			Hz	+dB
#DIV/0!	#DIV/0!	#DIV/0!	1	61
#DIV/0!	#DIV/0!	#DIV/0!	4	45
#DIV/0!	#DIV/0!	#DIV/0!	7	36.8
#DIV/0!	#DIV/0!	#DIV/0!	10	30.7
#DIV/0!	#DIV/0!	#DIV/0!	15	23.9
#DIV/0!	#DIV/0!	#DIV/0!	20	19
#DIV/0!	#DIV/0!	#DIV/0!	25	15.2
#DIV/0!	#DIV/0!	#DIV/0!	30	12
#DIV/0!	#DIV/0!	#DIV/0!	35	9.3
#DIV/0!	#DIV/0!	#DIV/0!	40	7.2
#DIV/0!	#DIV/0!	#DIV/0!	45	5.5
#DIV/0!	#DIV/0!	#DIV/0!	50	4.4
#DIV/0!	#DIV/0!	#DIV/0!	55	3.5
#DIV/0!	#DIV/0!	#DIV/0!	60	3
#DIV/0!	#DIV/0!	#DIV/0!	65	2.6
#DIV/0!	#DIV/0!	#DIV/0!	70	2.33

#DIV/0!	#DIV/0!	75	2.14
#DIV/0!	#DIV/0!	80	1.98
#DIV/0!	#DIV/0!	90	1.73
#DIV/0!	#DIV/0!	100	1.53
#DIV/0!	#DIV/0!	115	1.28
#DIV/0!	#DIV/0!	130	1.08
#DIV/0!	#DIV/0!	145	0.92
#DIV/0!	#DIV/0!	160	0.78
#DIV/0!	#DIV/0!	175	0.68
#DIV/0!	#DIV/0!	190	0.6
#DIV/0!	#DIV/0!	215	0.48
#DIV/0!	#DIV/0!	240	0.4
#DIV/0!	#DIV/0!	265	0.33
#DIV/0!	#DIV/0!	290	0.28
#DIV/0!	#DIV/0!	315	0.24
#DIV/0!	#DIV/0!	355	0.19
#DIV/0!	#DIV/0!	395	0.15
#DIV/0!	#DIV/0!	435	0.12
#DIV/0!	#DIV/0!	475	0.11
#DIV/0!	#DIV/0!	515	0.09
#DIV/0!	#DIV/0!	565	0.08
#DIV/0!	#DIV/0!	615	0.06
#DIV/0!	#DIV/0!	665	0.05
#DIV/0!	#DIV/0!	715	0.04
#DIV/0!	#DIV/0!	765	0.04
#DIV/0!	#DIV/0!	865	0.03
#DIV/0!	#DIV/0!	965	0.02

