

# My two-way bookshelf project

prashant

# Drivers

- Tweeter: peerless TL26SG
- $F_s$ :596Hz
- Sensitivity 94dB
- Impedence 6Ohm
  
- woofer: peerless M13NH, 5.25 midbass
- $F_s$ :69.54
- Sensitivity 89.8dB
- Impedence 4 Ohm

# Unibox Simulations

A	B	C	D	E	F	G	H	I	J	K
<b>Vented Box</b>										
<i>Port</i>										
No of ports	1									
Inside port dia.	7.00 cm									
Port area	38.48 cm <sup>2</sup>									
Port end correction	0.646									
<i>Standard Design</i>										
Vb	10.3 l									
Fb	63.64 Hz									
F3	61.31 Hz									
Port min dia.	5.49 cm									
Port length	23.18 cm									
<i>Design by Vb, Fb and Q</i>										
Physical Vb	20.0 l									
Absorption, Qa	20									
Leakage, Ql	30									
Port, Qp	120									
Alpha, a	0.366									
Vb	21.2 l									
Fb	52.70 Hz									
F3	45.71 Hz									
Response peak	0.77 dB									
Peak at	53.95 Hz									
Port min dia.	5.71 cm									
Port length	15.17 cm									
Port 1. resonance	886 Hz									
Include effect of port resonance	<input checked="" type="checkbox"/>									

**Vented Box** 1x peerless m13nh

<b>Damping</b>	Walls covered ▼	<b>Recal</b>	
<b>Leakage</b>	Minimal leaks ▼	<b>Recal</b>	
<b>Port type</b>	One flared end ▼	<b>Recal</b>	

<b>Wanted tuning peak</b>	0.00 dB
<b>Optimise Fb for wanted peak</b>	<b>Start</b>

<b>Graphs updated</b>	<b>Update</b>
<b>Frequency response</b>	<b>Update</b>

<b>Export frequency response</b>	<b>FRD</b>
<b>Export speaker impedance</b>	<b>ZDA</b>

# Unibox Simulations

Export GIF

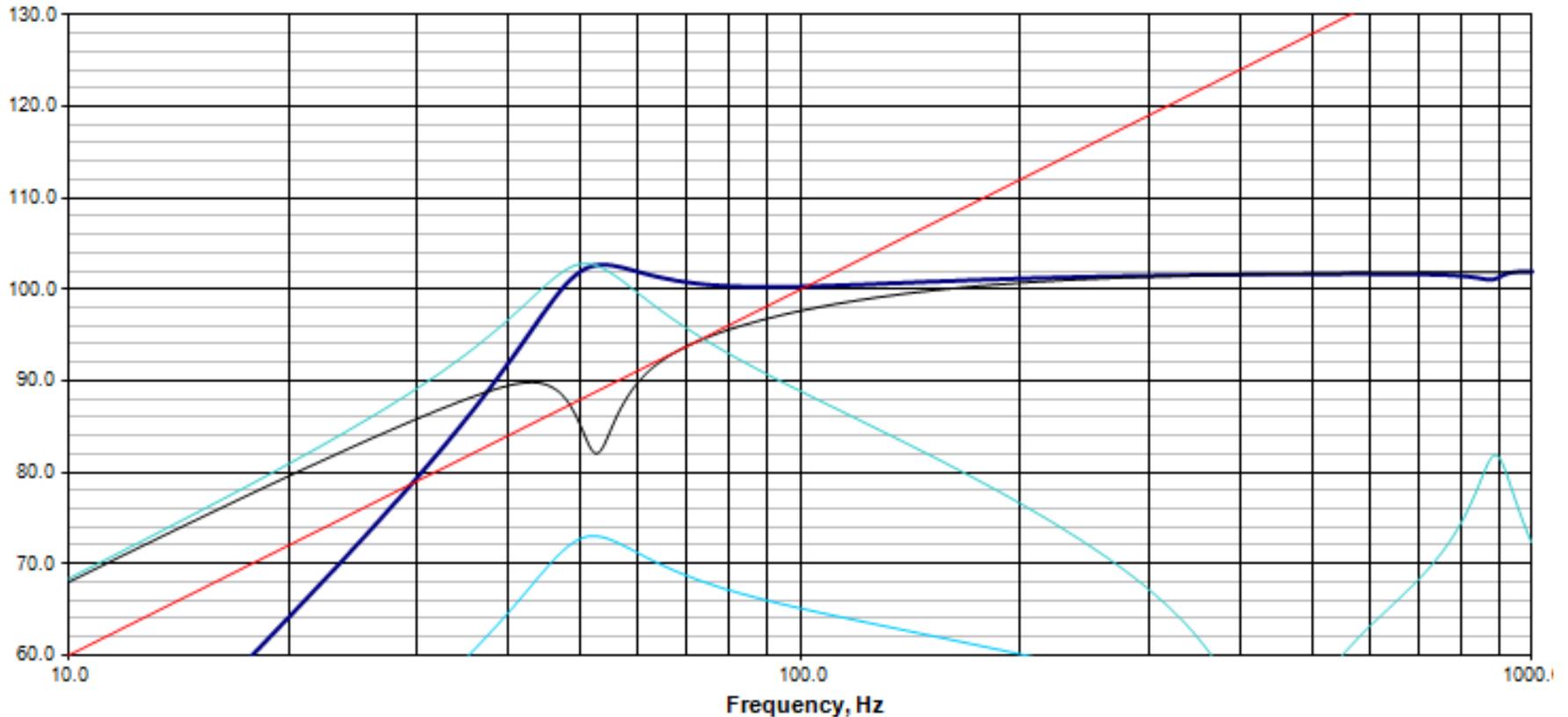
Vented Box,  $V_b = 20 \text{ l}$   
1x peerless m13nh

$F_3 = 046 \text{ Hz}$   $F_b = 053 \text{ Hz}$

Response peak = 001 dB

$Q_a = 20$   $Q_l = 30$   $Q_p = 120$

- SPLtot at 20 W power input
- SPL produced by driver
- SPL produced by port
- SPL produced by leaks
- SPL produced by driver at 04 mm peak excursion



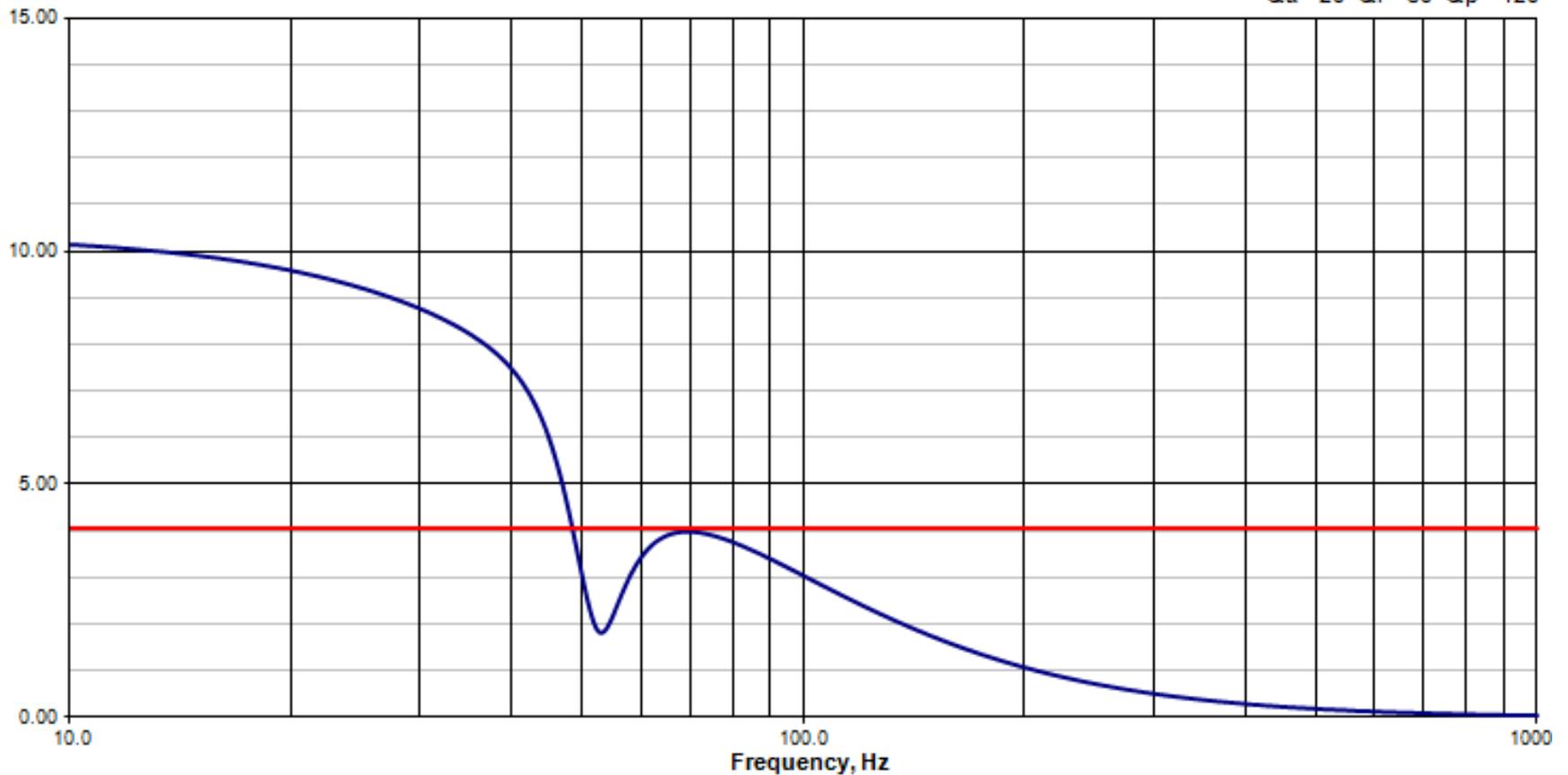
# Unibox Simulations

Peak Cone Excursion  
1x peerless m13nh  
Vented Box,  $V_b = 20$  l

Export GIF

F3 = 046 Hz Fb = 053 Hz  
Response peak = 001 dB  
Qa = 20 Ql = 30 Qp = 120

— Cone excursion (mm peak) at 20 W  
— Max linear peak cone excursion = 04 mm



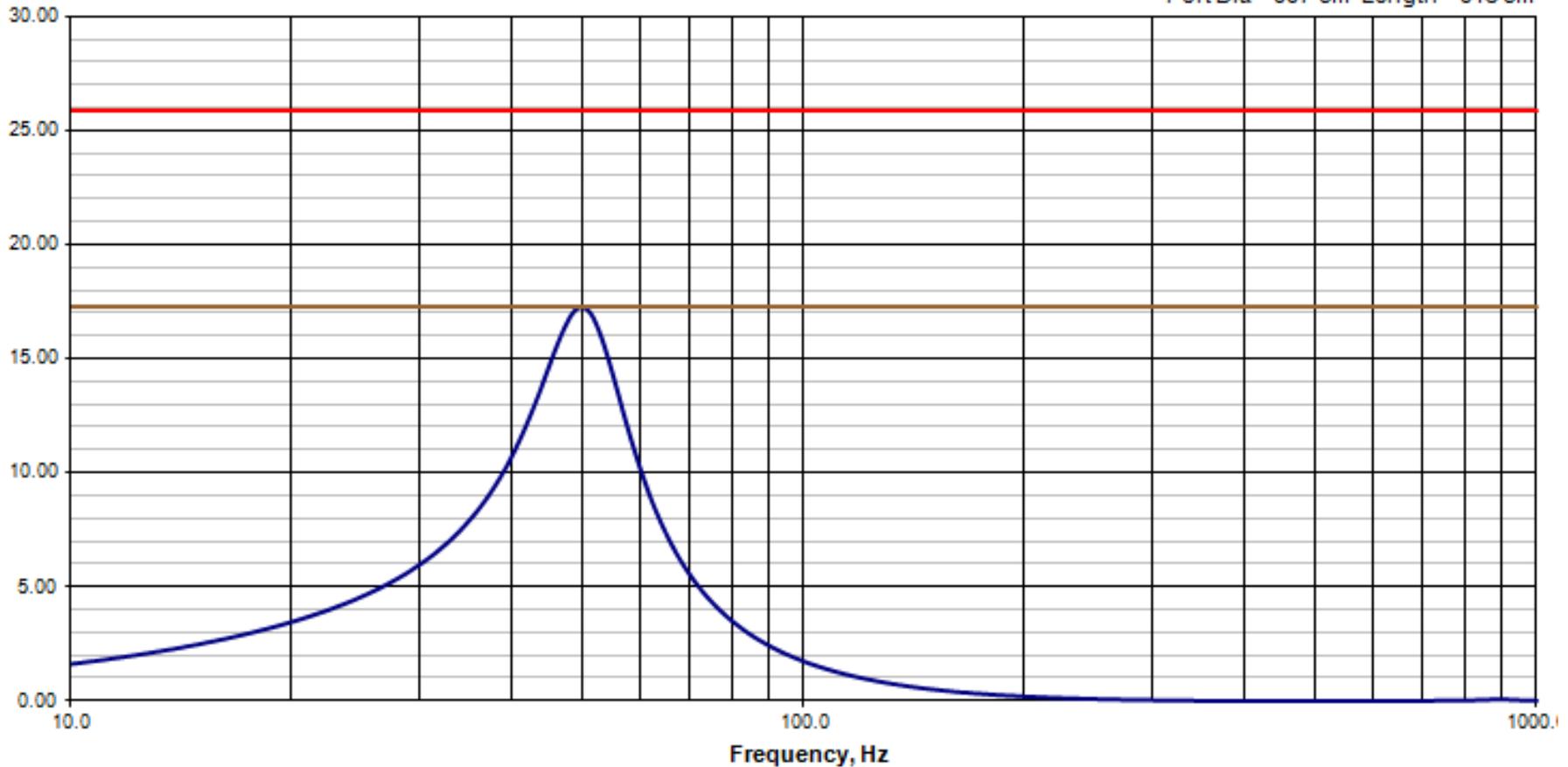
# Unibox Simulations

Export GIF

- Port airspeed (m/s peak) at 20 W
- 08% of sound speed = 26 m/s
- 05% of sound speed = 17 m/s

Port Air Speed  
1x peerless m13nh  
Vented Box, Vb = 20 l

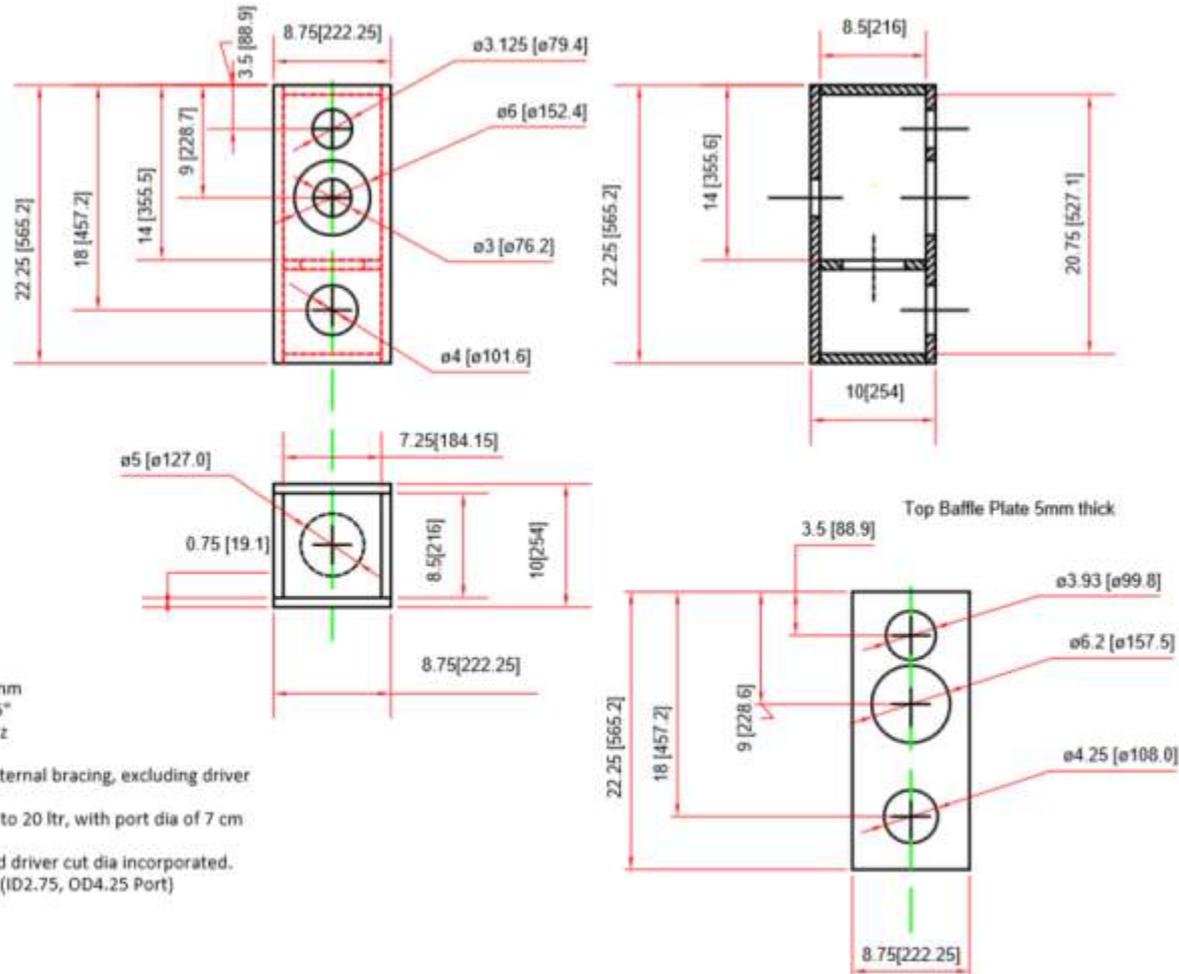
F3 = 046 Hz Fb = 053 Hz  
Response peak = 001 dB  
Qa = 20 Ql = 30 Qp = 120  
Port Dia = 007 cm Length = 015 cm



# Unibox simulation summary

- Box Tune Frequency:  $F_b: 52.7\text{Hz}$
- Box  $F_3: 45.71$
- Unibox Calculations are tuned to 20 ltr, with port dia of 7 cm and 152cm length
- Total Box Volume (including internal bracing, excluding driver volume)- 20.326ltr. (assumption that driver volume is 0.326 ltr)

# Enclosure design



1. Tweeter: Peerless TL26SG, 26mm
2. Woofer: Peerless M13NH, 5.25"
3. Box Tune Frequency: Fb:52.7Hz
4. Box F3: 45.71
5. Total Box Volume (including internal bracing, excluding driver volume)- 20.326ltr.
6. Unibox Calculations are tuned to 20 ltr, with port dia of 7 cm and 152cm length
7. TL26 SG Baffle flush mount and driver cut dia incorporated.
8. Port Cut out dia incorporated (ID2.75, OD4.25 Port)

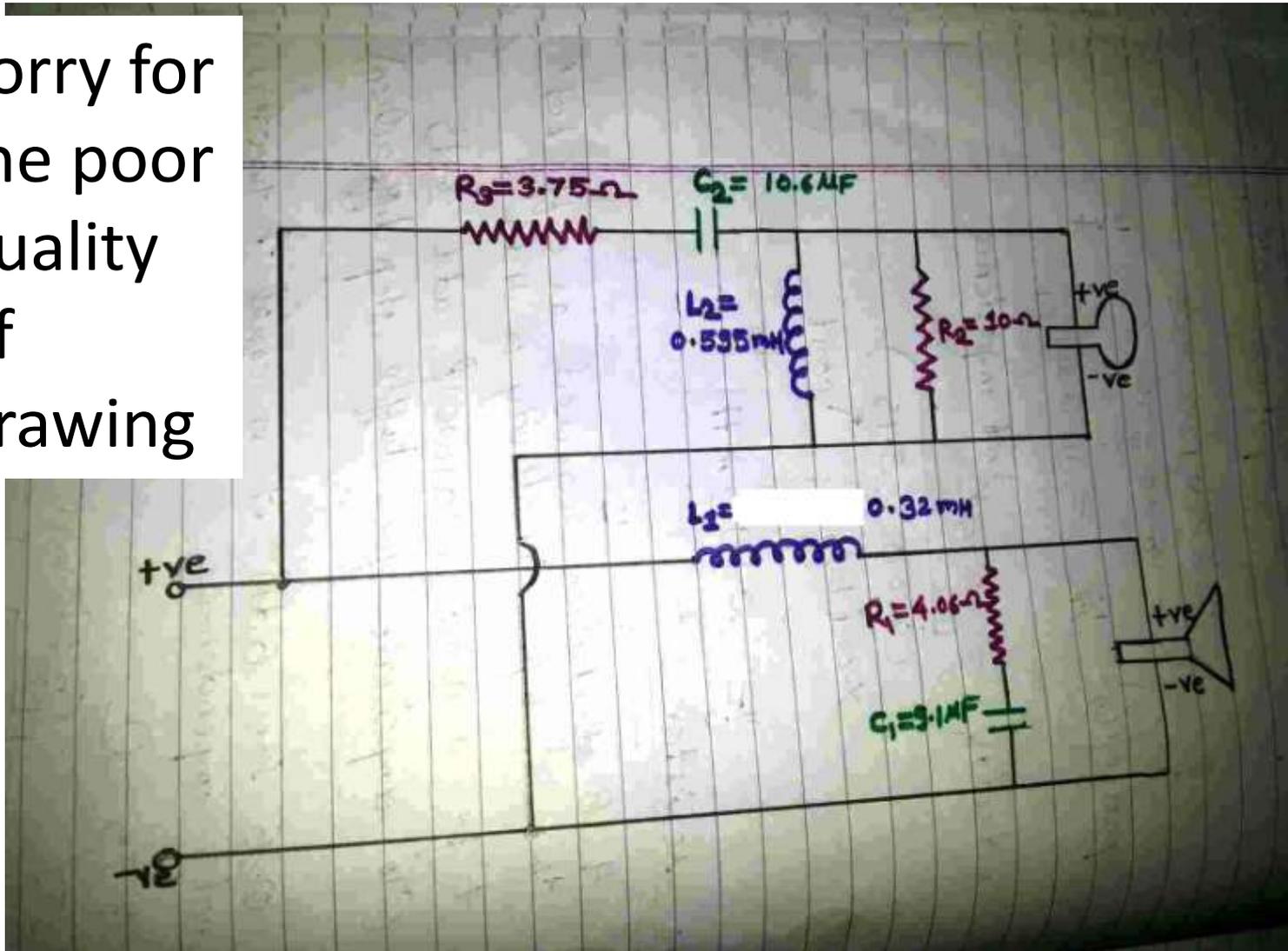
Main Units are in Inches, Units in brackets are in mm

# Crossover circuit

- Woofer impedance: 4 Ohm
- Tweeter impedance: 6 Ohm
- Crossover frequency: 2000Hz
- First order crossover considered
- L: pad attenuator is used to reduce the tweeter o/p and flatten impedance
- Zobel network is used to flatten the woofer's impedance

# Crossover circuit

Sorry for  
the poor  
quality  
of  
drawing



# queries

- Whatever I have done till now, does it make sense?
- Can anybody tell me whether
  - 20ltr volume is too much for M13NH?
  - Will it sound boomy?
- Whether the crossover network design is correct?
- Will the damn thing perform acceptably (not audiophile acceptability)
- This is my first project, so I want to just try out to see if it can work.....
- Thanks a lot....