

**66. Longhorn experiments with asymmetric mouth and internal air chamber**  
 UFO Doctor, May 29<sup>th</sup>, 2013

**1. Test Setup**

	<p><b>Fig.1. Test Setup</b></p> <p>1: Device under test                  2: Rotating Mama                  3: Fan for air turbulence                  (Shock wind at middle of the tests)                  4: Trigger delay device                  5: Scope</p> <p>Mama Rotation at <math>D=1m</math>, <math>R=0.4m</math>,                  Angle +/- 24 Deg</p> <p>Ear distance 40mm</p>
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**2. Test Subjects (see drawing)**

Kobiton Mic with Longhorn Type 6, with inner tube D2x8 between Mic and Horn.  
 Horn: D15x20mm, throat 2mm, with and without mouth cut and air chamber

<p>Fig. 2a: Longhorn Original</p>	<p>Fig. 2b: Longhorn with 45 deg cut at mouth</p>	<p>Fig. 2c: Longhorn with 45 deg cut at mouth and internal air chamber</p>

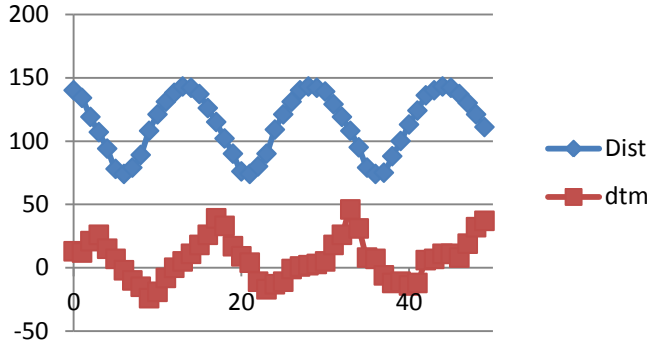
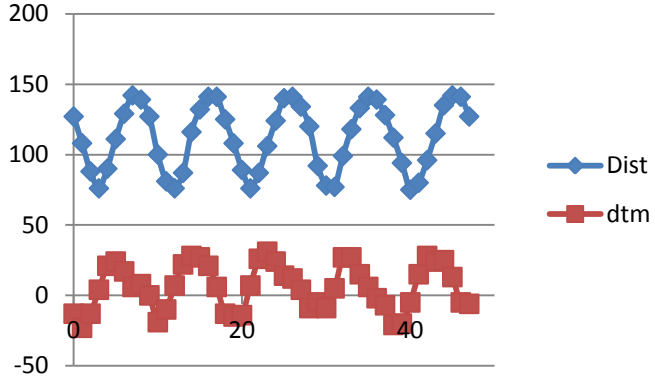
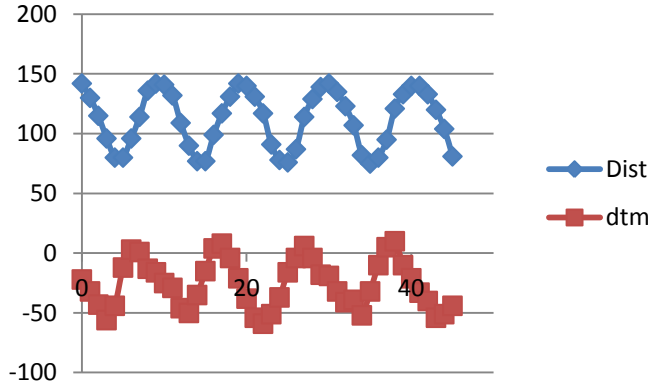
**3. Scope Data**

Top: BP left, 0.1V/Div,  
 Middle: BP right, 0.1V/Div,  
 Below: Analog PLL Out, 2V/Div,  
 Timing: Scope 0.5msec/Div, Trigger delay 2.8 msec

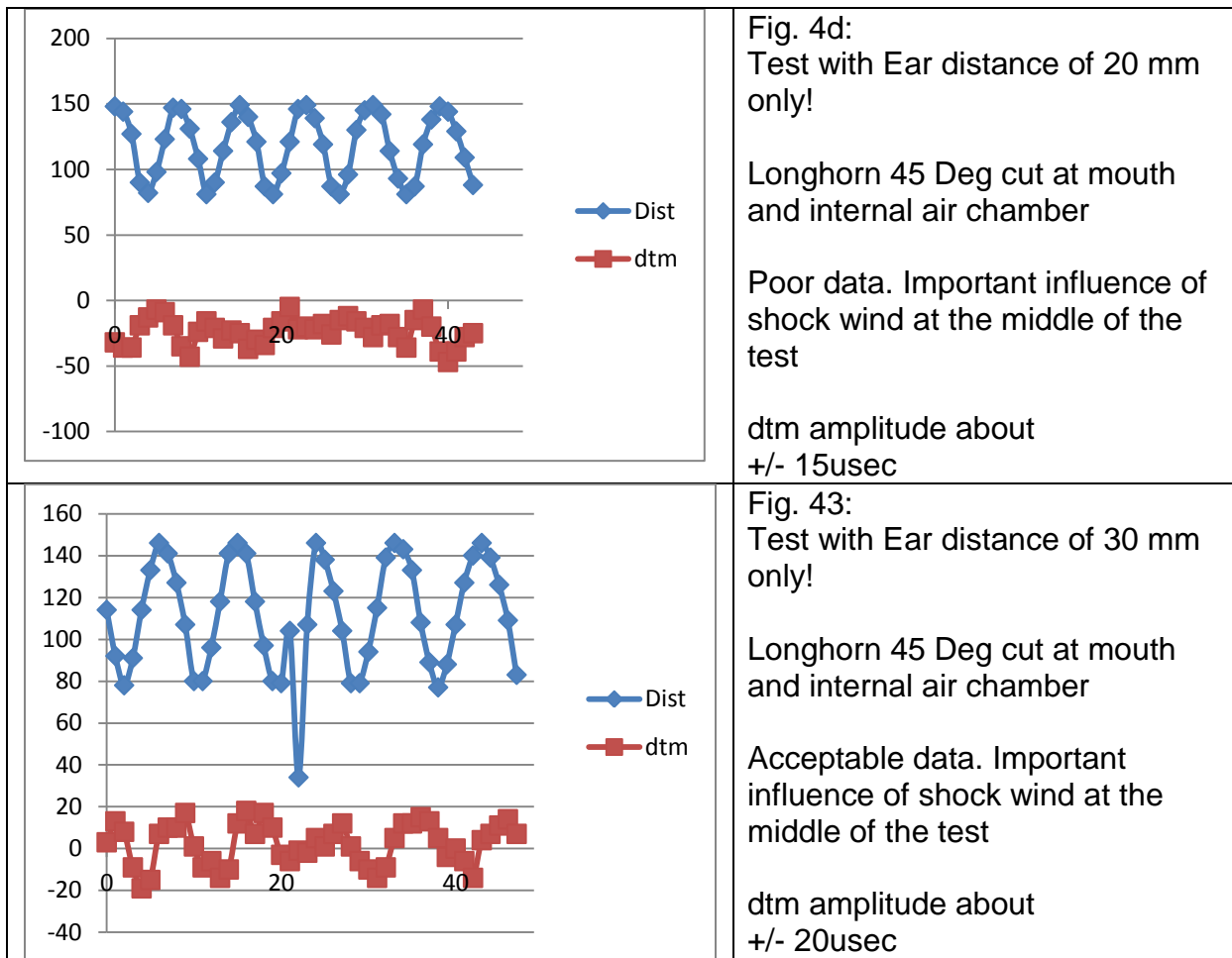
<p>Fig. 3a: Longhorn Original</p>	<p>Fig. 3b: Longhorn with 45 deg cut at mouth</p>	<p>Fig. 3c: Longhorn with 45 deg cut at mouth and internal air chamber</p>

#### 4. HyperTerminal Data

- Mama Rotation D=1m, R=0.4m, Angle=24 Deg
- Shock wind by 12V ventilator, powered by 7.4V in the middle of the test
- dtm: Time difference between left to right ear

	<p>Fig. 4a: Longhorn original</p> <p>Good data. Little influence of shock wind at the middle of the test</p> <p>dtm amplitude about +/- 30usec</p>
	<p>Fig. 4b: Longhorn 45 Deg cut at mouth</p> <p>Good data. Little influence of shock wind at the middle of the test</p> <p>dtm amplitude about +/- 30usec</p>
	<p>Fig. 4c: Longhorn 45 Deg cut at mouth and internal air chamber</p> <p>Excellent data. Minor influence of shock wind at the middle of the test</p> <p>dtm amplitude about +/- 30usec</p>

## 5. Additional tests with reduced Ear distance:



### Discussion 1

The ear distance might be reduced down to about 30 mm if required

## 6. Test with small Longhorn, ear distance 30mm only

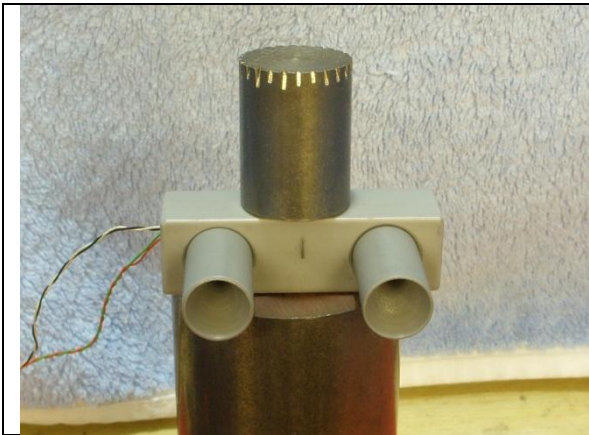


Fig. 6a: Small Longhorn, ear distance 30 mm

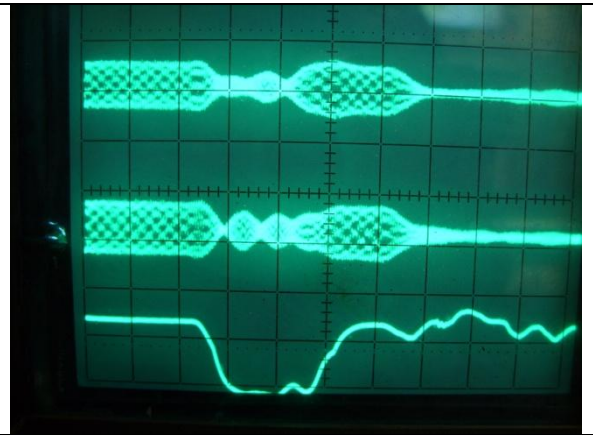


Fig. 6b: Scope data, same scope settings, Amplitude about 3dB below Standard Longhorn, but still ok.

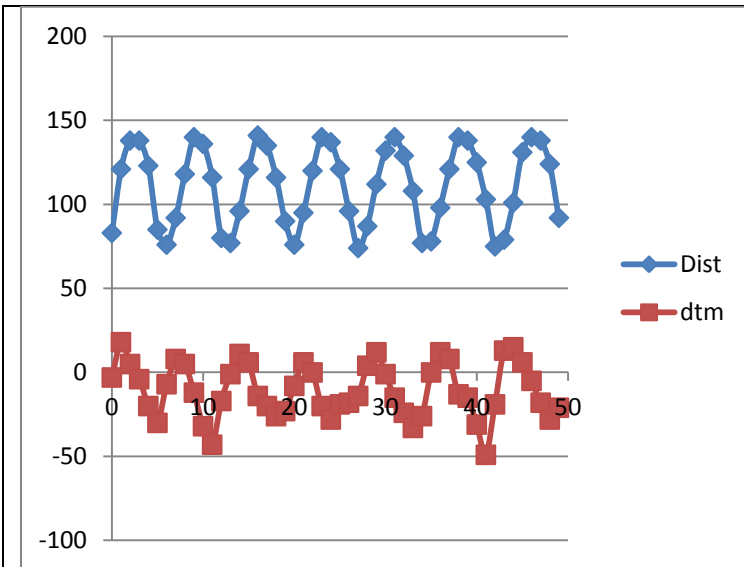


Fig.6c:  
HyperTerminal data

Quite good data.

Little influence of shock wind at the middle of the test

dtm amplitude about +/- 20usec

## Discussion 2

The direction result of the small longhorn with 30mm ear distance is adequate for an application in a small Baby Duck head!

## 7. Test with small Longhorn with thin mesh, ear distance 30mm



Fig. 7a: Small Longhorn,  
 - Ear distance 30 mm,  
 - With a thin mesh provided by a sieve for milk

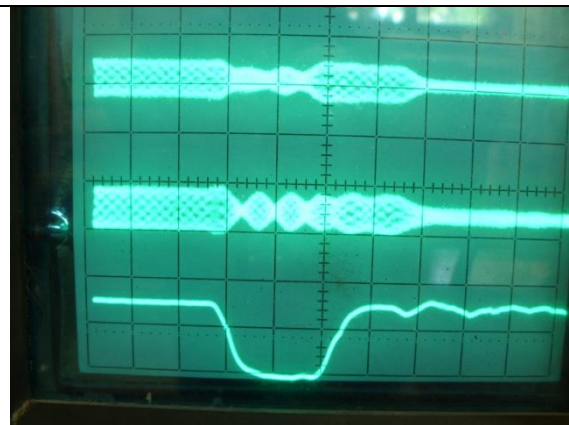


Fig. 7b: Scope data, same scope settings,  
 Amplitude about 4dB below Standard Longhorn, but still ok.

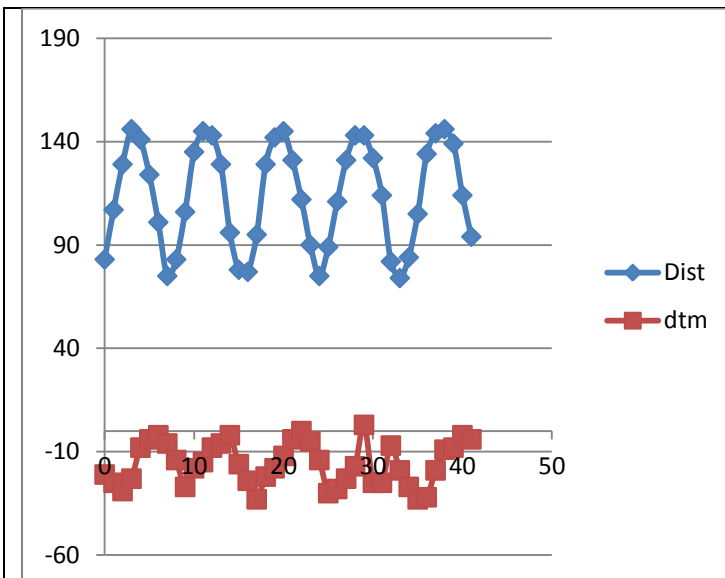


Fig.7c:  
 HyperTerminal data  
 Quite good data.  
 Little influence of shock wind at the middle of the test  
 dtm amplitude about +/- 20usec

### Discussion 3

A thin plastic mesh in front of the exponential horn does not decrease the performance.

## 8. Drawings of the two Longhorns

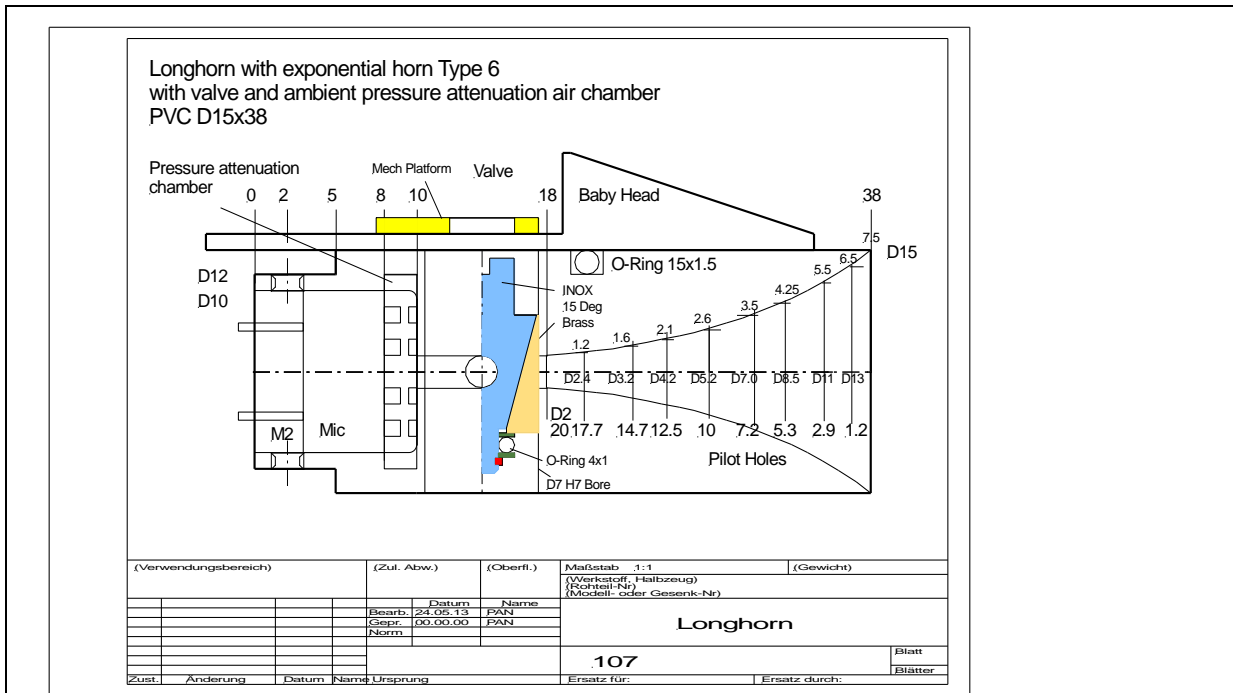


Fig. 8a: Drawing of the standard longhorn

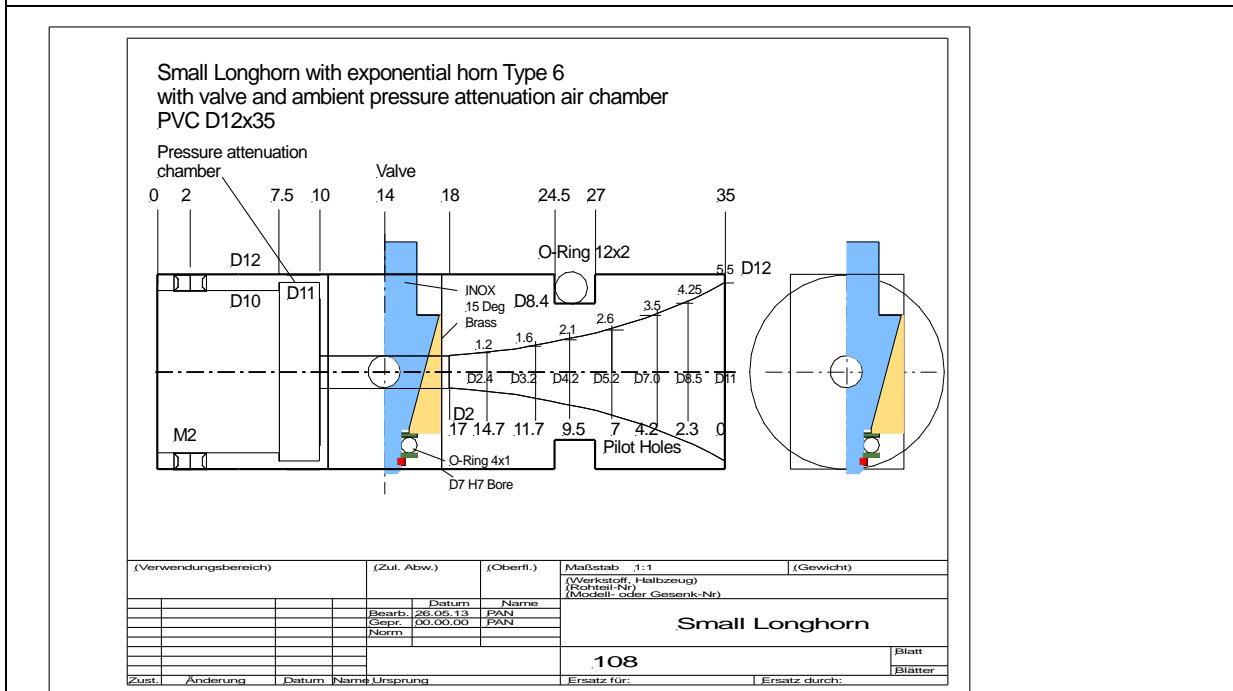


Fig. 8b: Drawing of the small longhorn