23. Outdoor Experiments with UST Speaker at 7.2 and 11.4 V and vertical UST Mics with reflectors and Kobitone Mics **Prelimiary Draft 1.0**

UFO Doctor, Jan13th, 2012

1. Introduction

The indoor experiments in report 22 promised good results with 4-Quadrant UST Speaker and vertical Kobitone Mics.
The PLL Baud Rate capacitor CF (C12) is now set to 22pF for faster response.

2. Test Setup

Fig.1. Outdoor Test Setup

Behind: Baby Duck at Scope
Front: Mama Duck

Note:
1. House wall to the right!
   Area not free from reflections, sorry!
2. Stone-markers on the floor at
   0, 2, 4, 6, 8 and10 meters

3. Test at optimal conditions

- UST Mic with radial reflector
- 4-Quadrant UST Speaker at 3-Cell Lipo 11.4V

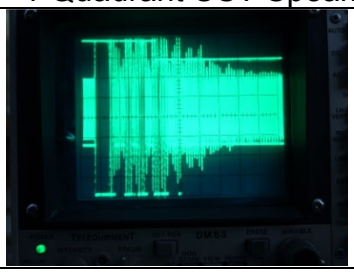


Fig. 2a: distance 2m

Fig. 2b: distance 4m

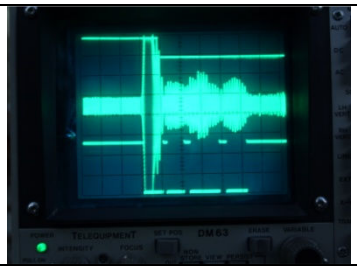


Fig. 2c: distance 6 m

Fig. 2d: distance 8 m

Fig. 2e: distance 10m

Fig. 2.
Osci Settings:
Time base: 5msec/Div
Top: Synch 5V/Div
Middle: BP-out, 20mV/Div
Bottom: PLL-out, 2V/div

4. Discussion

Very good results up to a distance of 10 meters!
But we do not understand the tremendous amplitude variation switching from frequency f1 to f2.
The amplitude of the pilot tone f1 is well above 10 mV, so this is fine
Hard to understand are the reflections after the f1/f2 change, but we not care about this at the moment.

5. Test at lower acoustic power conditions

- UST Mic with radial reflector
- 4-Quadrant UST Speaker at 2-Cell Lipo 7.2 V

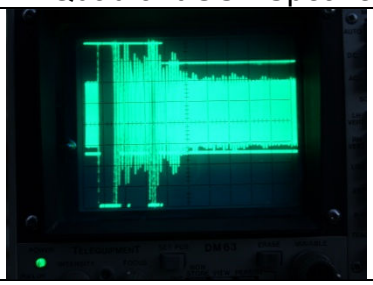
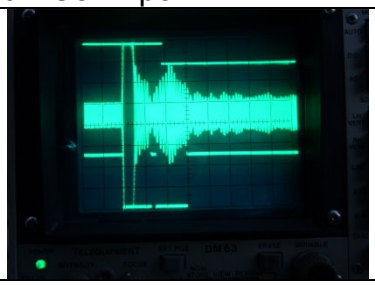
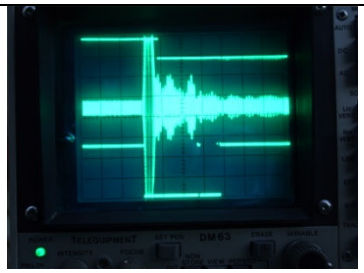
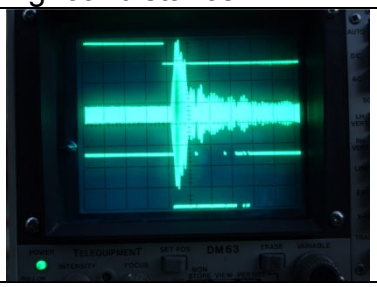
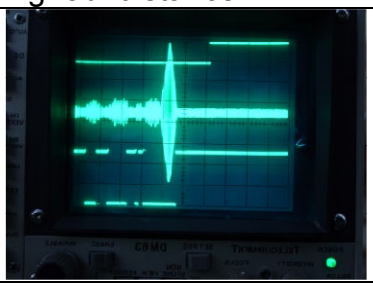
		

Fig. 3a: distance 2m	Fig. 3b: distance 4m	Fig. 3c: distance 6 m
		Fig. 3. Osci Settings: Time base: 5msec/Div Top: Synch 5V/Div Middle: BP-out, 20mV/Div Bottom: PLL-out, 2V/div
Fig. 3d: distance 8 m	Fig. 3e: distance 10m	

6. Discussion

Very good results up to a distance of 8 meters
Unclear results (Fig. 3e) at a distance of 10 m (false triggering?)
The amplitude of the pilot tone f1 is well above 3 mV, so this is fine

7. Test with Kobitone Mics at high acoustic power

- Kobitone Mic upwards
- 4-Quadrant UST Speaker at 3-Cell Lipo 11.4 V,

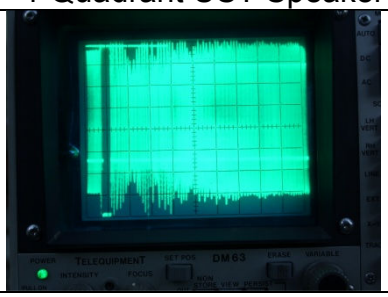
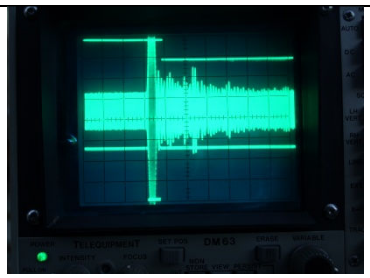
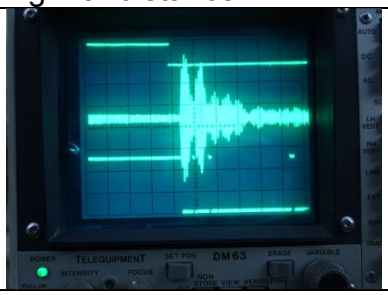
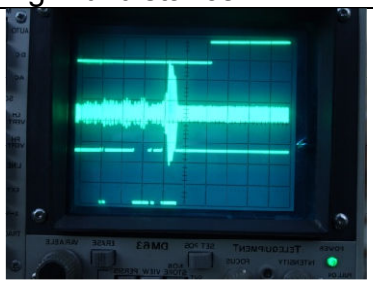
		

Fig. 4a: distance 2m	Fig. 4b: distance 4m	Fig. 4c: distance 6 m
		Fig. 4. Osci Settings: Time base: 5msec/Div Top: Synch 5V/Div Middle: BP-out, 20mV/Div Bottom: PLL-out, 2V/div
Fig. 4d: distance 8 m	Fig. 4e: distance 10m	

8. Discussion

Very good results up to a distance of 8 meters
Unclear results (Fig. 4e) at a distance of 10 m (false triggering?)
The amplitude of the pilot tone f1 is well above 10 mV, so this is fine

9. Test with Kobitone Mics at less acoustic power

- Kobitone Mic upwards
- 4-Quadrant UST Speaker at 2-Cell Lipo 7.2 V

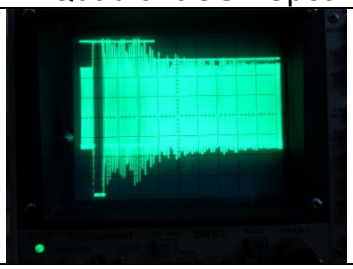
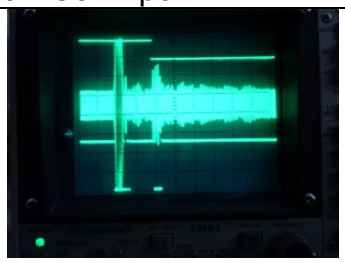
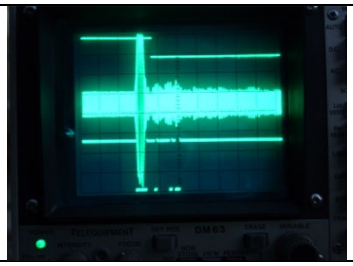
		

Fig. 5a: distance 2m	Fig. 5b: distance 4m	Fig. 5c: distance 6 m
		Fig. 5 Osci Settings: Time base: 5msec/Div Top: Synch 5V/Div Middle: BP-out, 20mV/Div Bottom: PLL-out, 2V/div
Fig. 5d: distance 8 m	Fig. 5e: distance 10m	

10. Discussion

Very good results up to a distance of 10 meters.
The amplitude of the pilot tone f1 is well above 5 mV, so this is fine

11. Hyper Terminal Outdoor Results

- Kobitone Mic upwards
- 4-Quadrant UST Speaker at 3-Cell Lipo 11.4 V

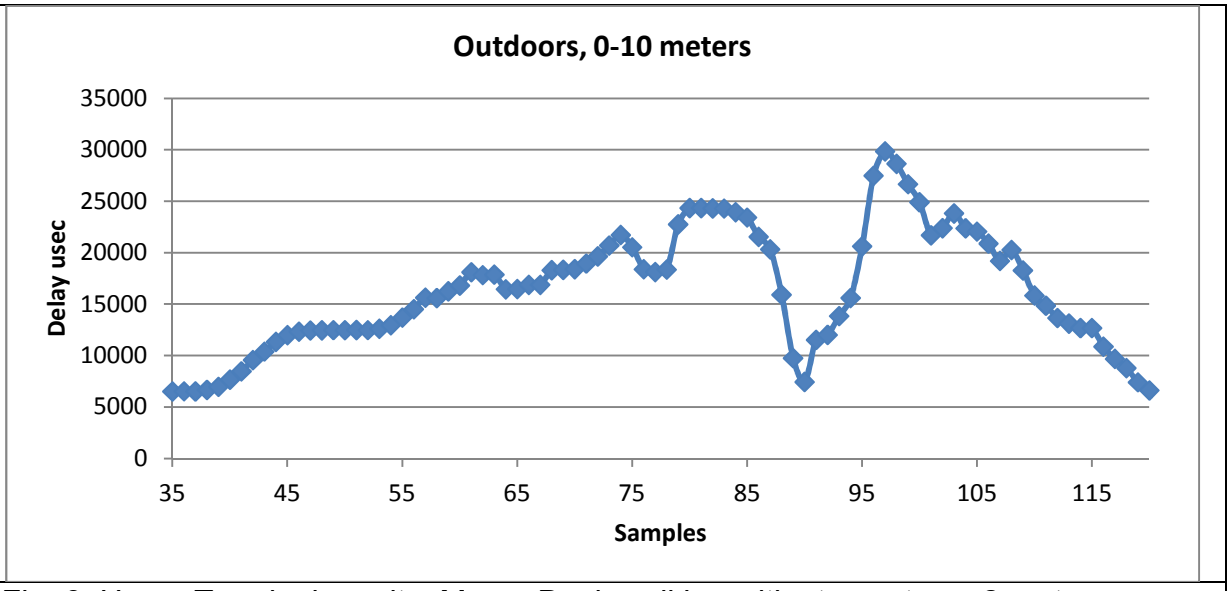


Fig. 6: Hyper Terminal results, Mama Duck walking with stops at any 2 meters

12. Discussion

Good results up to a distance of about 6 meters.
We are close to the practical solution!