

### 1. Introduction

The Baby Head Shell shows a quite difficult geometry: Outer surface similar to a realistic Duck head, inner structure adapted to the head platform with sensors and lock mechanism.

This head shell will be manufactured later by a 3D-Printer, the presented shell prototype might be scanned and combined with 3D drawings of the inside structures.

### 2. Baby Head Shell



Fig. 1: Head Shell side view

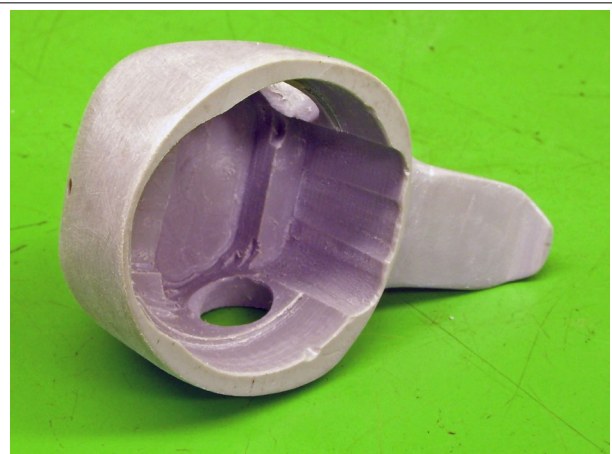


Fig. 2: Head Shell bottom view

### 3. Production Steps

#### 3.1. Eccentric bores by lathe

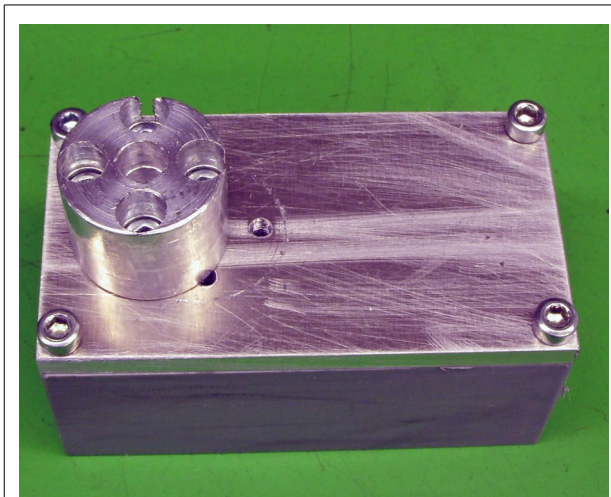


Fig. 3: Tool for eccentric turning by a lathe,  
centers at 0 and 7 mm.

Platform fixed on PVC head block

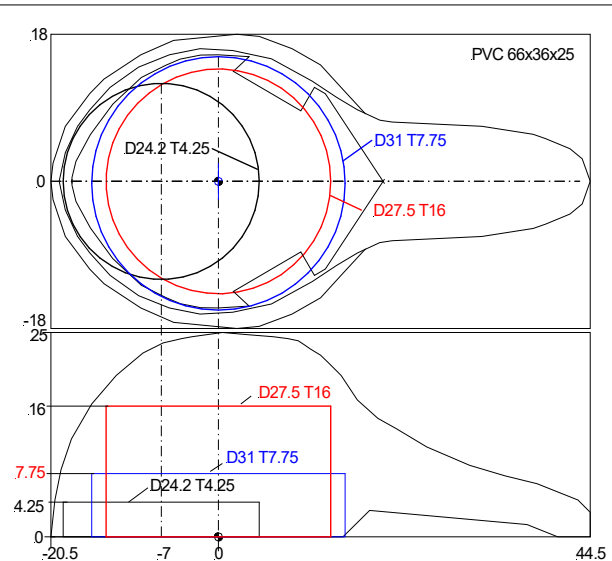


Fig. 4: Sketch of the initial bores

### 3.2. Milling of the inside structures

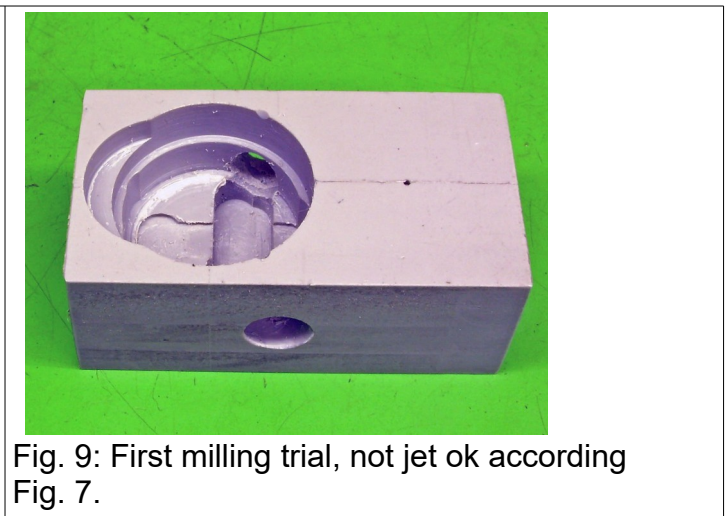
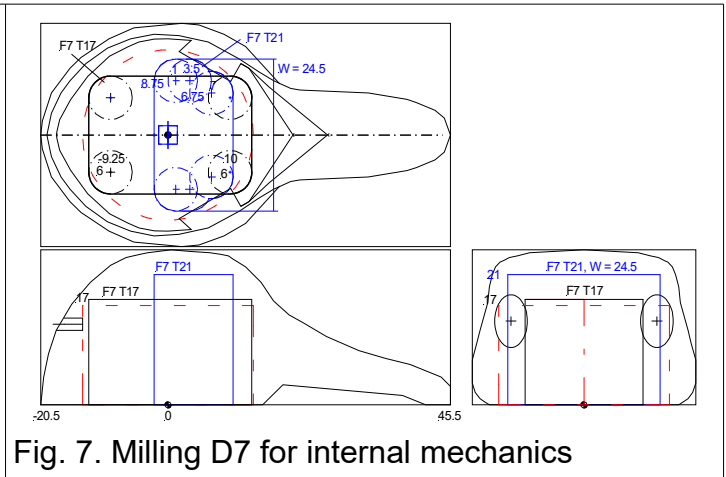
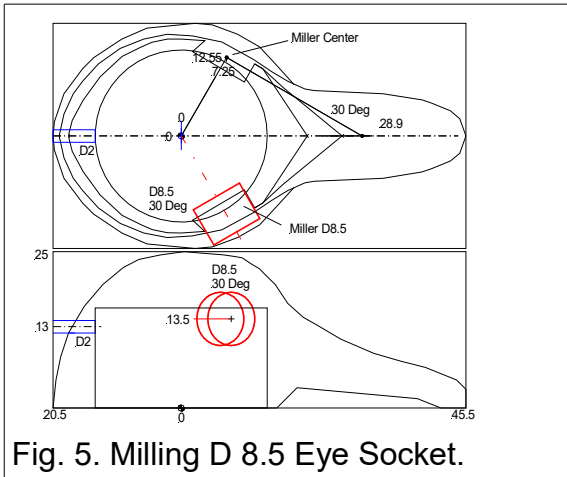
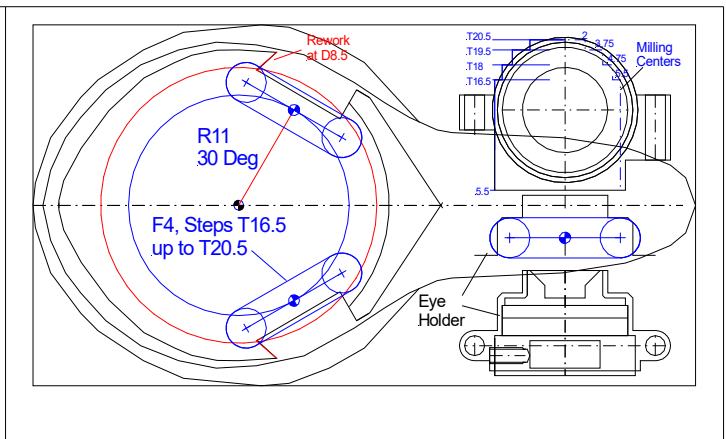


Fig. 10: Milling of the inner eye socket by staircase steps.  
 Take care, there is little space to the top of the skull!



### 3.3. Shaping the outer head shell surface



Fig. 11: Template glued on PVC block

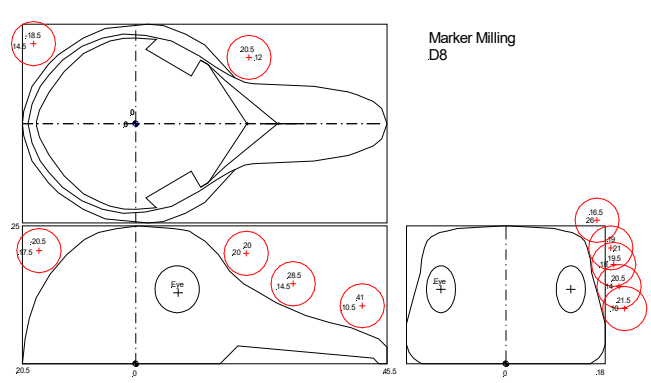


Fig. 12: Sketch of the templates

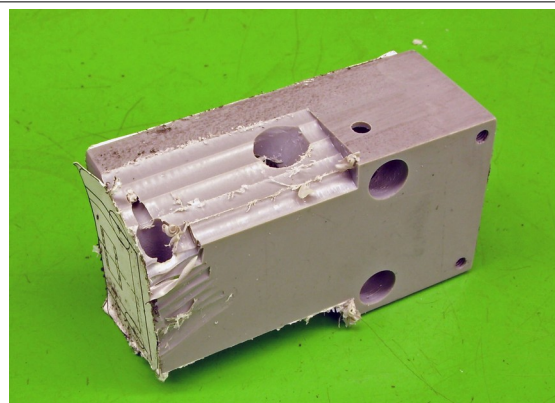


Fig.13: Milled Head Step1



Fig.14: Milled Head Step 2

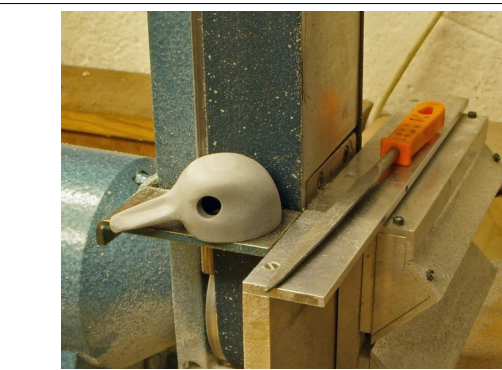


Fig. 15: Sand and rasp



Fig. 16: Check always wall thickness!

#### General comments

The manufacturing of the Prototype Baby Head was quite easy with the right tools and with good drawings.

The main problem was the creation of accurate 2D to 3D drawings of the difficult outer head shape and to avoid dimension conflicts with the inner mechanics.

Modern 3D software or scanning an existing model would be appreciated!

