

**FINAL YEAR PROJECT REPORT
DIPLOMA IN MECHANICAL ENGINEERING
MARA UNIVERSITY OF TECHNOLOGY
SHAH ALAM**

ROTOR BLADE WING

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CHAPTER 1

GENERAL PRINCIPLES

1.1 INTRODUCTION

Human power helicopter has been researched for a long time. Many have taken up the challenge of achieving flight in a human powered helicopter. The past failures and victories give us some ideas to researching deeply on how to increase its performance by analyzing the mechanical design.

In this project, one section of rotor blade wing of Human Powered Helicopter known as DAE-11 has been selected. The scope of the project is to fabricate a section of the rotor blade wing from scratch. This includes fabrication of airfoil, spar and styrene foam trimming besides assembling them to make a wing. In addition properties of the wing such as weight, center of gravity and mass moment of inertia was calculated.

The basic engineering elements needed in the design phase ranges from the knowledge of aircraft structure, static, fluid mechanic and aerodynamic. The plans and the drawing are sketched using AutoCAD software while calculations was performed using Microsoft Excel.

Figure 1.1 indicates a Human Powered Helicopter is tested in a big hall while figure 1.2 shows a structure of the wing (inside the white box in fig.1.1) from top view.

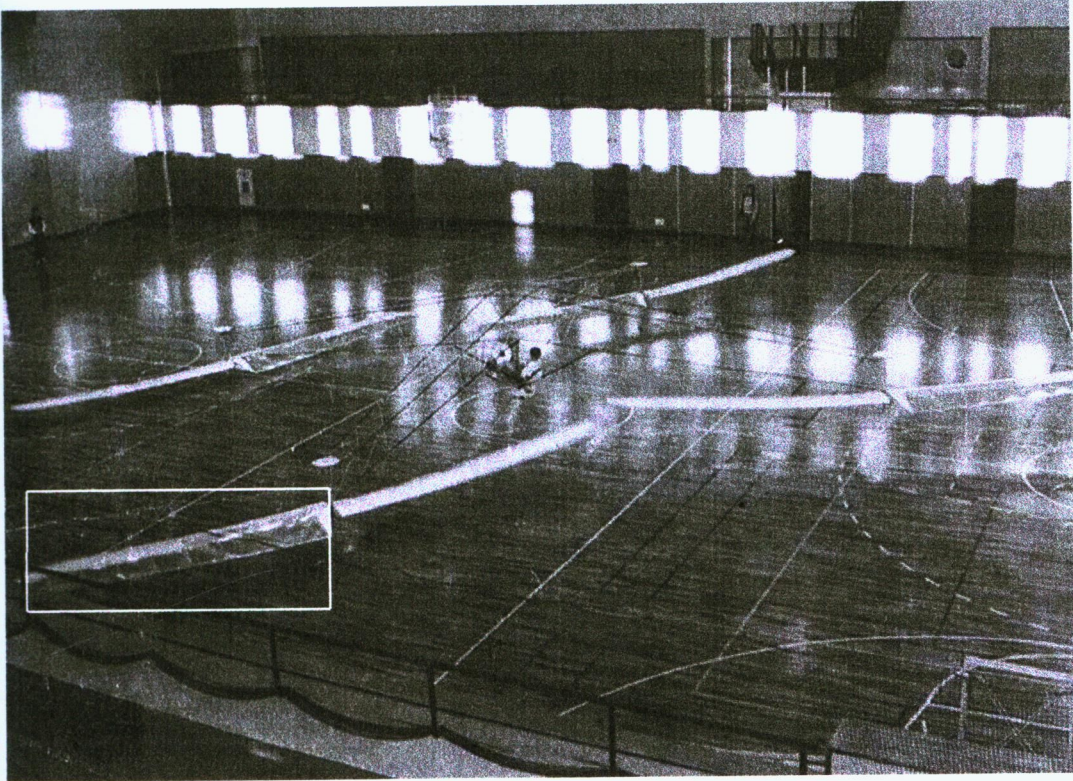


Figure 1.1: YURI 1 Human Powered Helicopter

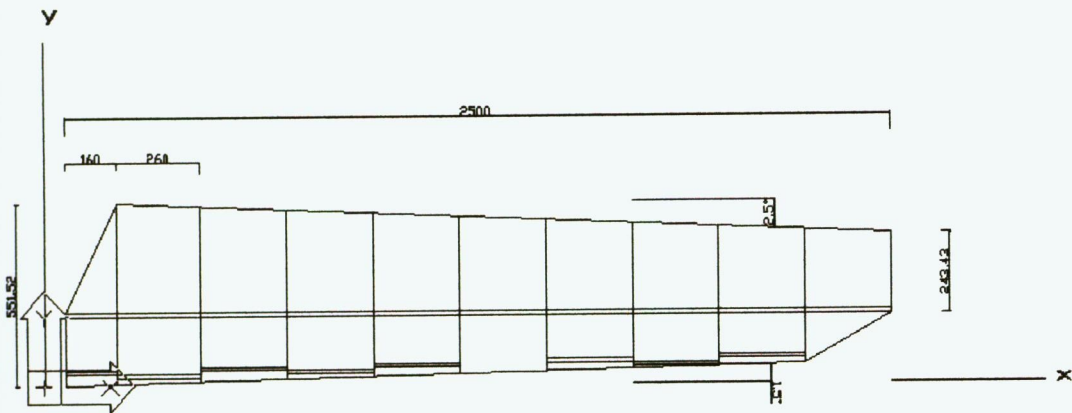


Figure 1.2: A rotor wing blade