

COMPUTER ANALYSIS
OF
THERMODYNAMIC CYCLES

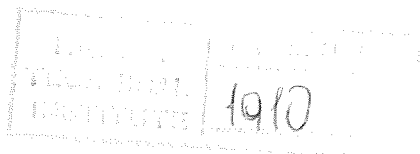
by
Argyris Monoyios

Project Report
submitted to
the Department of Mechanical Engineering
of the Higher Technical Institute
Nicosia Cyprus
in partial fulfillment of the requirements
for the diploma of
TECHNICIAN ENGINEER

in

MECHANICAL ENGINEERING

June 1991



Acknowledgements

I gratefully acknowledge the kind encouragement and valuable assistance from Mr. P. Demetriou and Mr. C. Theopentou , lectures at the H.T.I.

I also thank my family for the support that they gave to me.

This (work) project is devoted with all my love and respect to my parents.

Summary

Computer Analysis of the Thermodynamic Cycles By Monoyios Argyris (3M2)

The analysis of the project was based on the following objectives :

- a/ Analysing the most common thermodynamic Cycles
- b/ Creating a computer program for analysing the chosen cycles.
- c/ Solution of common problems using the program.
- d/ the program must be suitable for educational purpose.

The chosen cycles are :

Carnot , Rankine , Otto , Diesel , Brayton

The theory of the cycles was analysed and also a variation of some of the above cycles were discussed too.

The program was chosen to be written using the Pascal language , because of the advantage that the language can give to the programmer.

The project as a whole will be very helpfull to the Mechanical Students because will cover theory of the cycles and will include an instruction-manual of the program.

C O N T E N T S

Aknowledgements	I
Summary	II
Introduction	III
<u>Chapter One</u> - Thermodynamics	1
1.1 Introduction to Thermodynamics	2
1.2 Power Thermodynamic Cycles	3
1.2.1.1 Carnot Cycle - Vapour	4
1.2.1.2 Carnot Cycle - Air	7
1.2.2.1 Rankine Cycle	11
1.2.2.2 Rankine Cycle - Reheater	13
1.2.3 Otto Cycle	15
1.2.4 Diesel Cycle	18
1.2.5.1 Brayton Cycle	21
1.2.5.2 Brayton Cycle - Regenerator	24
1.2.5.3 Brayton Cycle - Intercooling	25
1.2.6 Gas Turbine Unit	26
1.3 Problem Selection	31
<u>Chapter Two</u> - Computer Program	32
2.1 Introduction to Computers	33
2.2 Pascal Language	35
2.3 Customise Thermodynamics	36
Conclusions	39
Appendices	41
References	