DATA PROCESSING OF LABORATORY EXPERIMENTS

Project report submitted by

ORPHANOS YIANNAKIS

in part satisfaction of the award of the Diploma of Technician Engineer

in

Mechanical Engineering of the Higher Technical Institute, Cyprus.

Project supervisor: P.Demetriou Lecturer in Mechanical

Engineering, HTI

FPROJECT NO

2061

External Assessor:

Costas Karseras Mechanical Engineer

Type of project : Individual

HIGHER TOCHNOZZE

NSTITUTE

ABSTRACT

This project deals with the data processing of Laboratory experiments in the Higher Technical Institute and compiles a program to satisfy this requirement. It is divided in eight small chapters:

In the first four chapters an approach to the theory of the four experiments is done and they aim not to give an indepth analysis of the theory but as a reference, with a theory which will help the reader to understand the reasons these experimental readings have to be taken and what calculations should be done in each chapter, there are also the objectives of the experiments, the equipment required for the experiment and the procedure to carry out the experiment.

In chapter 5 are given the steps in constructing the computer program. This was the most difficult and time consuming process and a lot of assistance was required. In completing the computer program a lot of help was required from HTI Computer Science lecturers and laboratory assistants. Also in this chapter, some justifications are given for the solutions chosen.

In chapter 6, all the procedures used in the computer program are analysed for their use and their structure. This chapter is very important not only because the whole computer program is based on procedures but because it also helps someone to understand the computer program easily.

Chapter 7 deals with the structure of the graphs program and explains about the several messages appearing on the screen during it's operations. Furthermore, a suggestion of future modifications are given which would update the program and make it more "professional".

Finally, in chapter 8, a short account of data aquisition systems in given and expamines the possibility of intergrating this project in a future project involving data aquisition systems.

2

CONTENTS

Pages

Introduction		1 2
<u>Chapter 1 - Performance test on IC engine</u>		3
1.1	Introduction	4 4
1.2	Theory	5
1.3	Procedure	8
1.4	Results	9
1.5	Discussion	9
<u>Chap</u>	ter 2 - Performance characteristics of Air	
	Compressors	11
2.1	Introduction	12
2.2	Equipment used	12
2.3	Theory	13
2.4	Performancy characteristics	13
2.5	Procedure	17
2.6	Analysis	17
2.7	Comments	17
2.8	Discussion	18
Chap	ter 3 Water Pump Station Test	19
3.1	Introduction	20
3.2	Equipment used	20
3.3	Theory	21
3.4	Calculations	22
3.5	Analysis	24
3.6	Discussion	24

Chapter 4 Fan characteristics 27			
4.1	Introduction	28	
4.2	Equipment used	28	
4.3	Theory	28	
4.4	Calculations	30	
4.5	Procedure	32	
4.6	Analysis	32	
4.7	Discussion	32	
<u>Chapt</u>	ter 5 Steps in Constructing the program	34	
5.1	The units solution	35	
5.2	The EXEC procedure	35	
5.3	Running the program directly from DOS	36	
5.4	The introduction screen	36	
5.5	The graphs program	37	
5.6	Delay procedure	37	
<u>Chapt</u>	ter 6 Procedures and functions used	38	
6.1	Introduction	39	
6.2	Procedure waitkey	39	
6.3	Procedure Save 2 Arr	39	
6.4	Procedure Load Arr	40	
6.5	Procedure SortH2R	41	
6.6	Procedure Stats	41	
6.7	Procedure GetNumR	43	
6.8	Procedure GetNumI	44	
6.9	Procedure DoXAxis	44	
6.10	Procedure DoYAxis	46	
6.11	Procedure AnnXAxis	46	
6.12	Procedure AnnYAxis	47	
<u>Chapt</u>	ter 7 The main program	48	
7.1	Introduction	49	
7.2	Flow of the graph program	49	
7.3	Modifications to the program	50	

<u>Chap</u>	ter 8 Data Acquisition Systems	52
8.1	Introduction	53
8.2	Parts of data acquisition systems	53
8.3	Advantages of data acquisition systems	53
8.4	Data acquisition system as a future project	54

eneratory concerning are defined to a concerning are defined a first statement of a concerning and the second are defined to first statement of a concerning to a concerning are defined as a second statement of a concerning to a concerning to a concerning to a concerning to a concerning are defined as a second statement of a concerning to concerning to a concerning to a concerning to a concerning

> i anteriori. Se esteres di