

# Higher Technical Institute

*Mechanical Engineering Course*

*Diploma Course*

*Design and Construction of  
a Constant Temperature Incubator*

**Kallides Charris**

**JUNE 1997**

HIGHER TECHNICAL INSTITUTE	PROJECT NO 2702
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*Design and Construction of a  
Constant Temperature Incubator*

*by*

**Kallides Charris Nicolas**

This project is submitted to

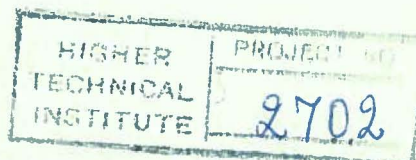
*the Department of Mechanical Engineering  
of the Higher Technical Institute*

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**In partial fulfillment of the requirements  
for the diploma of**

**TECHNICIAN ENGINEER  
in  
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# Acknowledgments

After five months of hard work, this project has finally been completed. Without the assistance of some people, this project would not have been achieved without the assistance of some people. Their help and useful knowledge on specific subjects.

I would like to express my sincere appreciation to my supervisor, Dr. Heflinger, for offering me the best assistance and resources at every step of this process, and for my completed successfully.

I would also like to thank Mr. Christoph Everts, who has been present and offered me the workshops of the Higher Technical Institute for some days, during the last few days.

Finally, I would like to thank the management of the Higher Technical Institute, also my father for sponsoring this project.

***To my family***

Katharina Everts

June 1997

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I would also like to thank Mr. Christophi Costas, who has been present and offered me the workshops of the Higher Technical Institute for some days, during the Easter holidays.

Finally, I would like to thank the management of the Higher Technical Institute and also my father for sponsoring this project.

*Kallides Charris*

*June 1997*

# Summary

**Title:** Design and construction of a constant temperature incubator.

**Author:** Kallides Charris Nicolas

The main idea of this project, is the design first and then the construction of a constant temperature incubator.

As a first step, the design of the incubator was made and scaled drawings were drawn.

Then, according to the demands and the conditions that were to be maintained by the machine, the selection of the appropriate materials was made and the construction was off to start.

Considerable weight was distributed to the mechanical parts of the machine since this project is to be submitted to the Mechanical Engineering department.

The electrical parts and the controllers were bought, assembled and then programmed and fitted to the machine.

Finally, the result was not the construction of a high capacity, and high technology incubator, but the construction of an incubator that presents the main functions required and can be used as a model for investigation or improvement for better future results.

# TABLE OF CONTENTS

<b>Part One</b>		
<b>General</b>		
		<u>Pages</u>
Introduction		1
<b>Part Two</b>		
<b>Report</b>		
		<u>Pages</u>
Chapter One - Incubation Techniques and the Design		3
1.1	History and evolution of incubation	3
1.2	Incubation and uses of incubation	5
1.3	Design requirements of the general purpose incubator	7
1.3.1	The basic framework	7
1.3.2	The front of the structure	9
1.3.2.1	Access door to the interior	9
1.3.2.2	Access door to the water vessel	9
1.3.2.3	The control panel	10
1.3.3	The rear part of the structure	11
1.3.4	The inside parts and mechanisms of the structure	12
1.3.4.1	Turning mechanism	
1.3.4.2	Egg-trays	13
1.3.4.3	The water vessel	13
1.3.4.4	The ventilation mechanism	13
1.3.5	The Outside cover	14
1.3.6	The assembly	15
Chapter Two - Construction		16
2.1	Selection of the necessary components and materials for the construction of the incubator	16
2.2	Construction of the incubator	18
2.3	Economic evaluation of the construction	19
Chapter Three - Testing and settings		20

3.1	General Testing	20
3.2	Temperature settings/calibration	21
3.3	Humidity settings/calibration	23
Chapter Four - Conclusions/Comments		24

### **Part Three**

#### **Appendices**

1.	Instructions	29
	a) The eggs	29
	b) Description of egg-trays	30
	c) Where to install the incubator	31
	d) Preparation and starting of the incubator	31
	e) Prescription for brooding	31
	f) Warnings	32
	g) Incubation schedule	33
2.	Electrical circuit	34
3.	Instructions of the temperature controller	35
4.	Heat losses from the incubator	43
5.	References	56

# INTRODUCTION

For the design of this machine and for its construction, the conditions that are to be maintained for an egg were taken under consideration, in order that the embryo of this egg may be developed appropriately, to give a nestling.

Chicken eggs were taken as reference, though the specific device can hatch various eggs and bacteria.

The eggs that are to be stored in the device must be maintained for a specific interval of time (in case of chicken eggs, twenty one days) under constant temperature (38 °C) and humidity (85% relative humidity).

For best results the temperature must not be varied continuously, so we come to the result that a good insulating material would prevent the pitch of the temperature.

Also a way to keep the humidity at constant level was found and special reference will be made on this later in the project.

The controllers used, though they could be more accurate, if better quality was used, they give satisfactory outputs and good results for egg hatching.

All the parts of the machine were smartly assembled together, and all the safety precautions were taken under consideration, so the whole structure gives a good impression to the viewer, or user of it.