

HIGHER TECHNICAL INSTITUTE
ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

**DEVELOPMENT OF AN ELECTRONICALLY CONTROLLED
HATCHER**

by
SHAILOS ALEXANDROS (E/965)

JUNE 1995

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

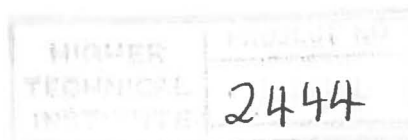
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DEVELOPMENT OF AN ELECTRONICALLY CONTROLLER HATCHER

by

Shailos Alexandros

Project Report

Submitted to

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of the diploma of

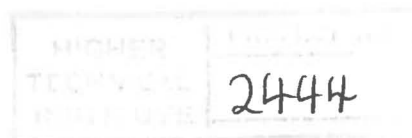
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HIGHER TECHNICAL INSTITUTE
NICOSIA-CYPRUS

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

1994/95

Project Number: E.965

Title:

Development of an Electronically Controlled Hatcher

Objectives

1. To design, construct and test an Electronically Controlled Hatcher with adequate reserve control capacity.
2. To design, construct and test a digital thermometer.

Terms and Conditions

1. The Hatcher should have at least three independent temperature controllers, i.e. one phase controller, such as TDA2086, one Integral Cycle Controller, such as CA3059 and one manual controller.
2. The manual controller should be de-activated automatically when the Hatcher is not attended.
3. The thermometer should ^{be} 2716-Eprom controlled.

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Supervisor : Mr S Hadjioannou

External Assessor :

SH"/DP
1.95(6)

INTRODUCTION

It is generally believed, that nowadays technology has reached great levels of performance and reliability trying to do human's life easier and more productive. Especially at the section of electronics technology has done miracles.

Hatcher is a device which uses electronic circuits to control the temperature. The purpose of controlling the temperature is for hatching eggs. At temperature of 38 degrees Celcius and for duration of about 20 days eggs are hatched.

Three individual temperature controllers were used , for this purpose, to the hatcher under consideration.

- IC TDA2086A
- IC CA3059
- DIMMER, manual way of controlling the temperature.

TDA2086A and CA3059 temperature controllers include a sensor, thermistor-NTC, to provide the input signal. The thermistor used is of negative temperature coefficient (NTC) i.e. when the temperature increase the resistance decreases and vice versa.

The general way of working the controllers is to read the temperature inside the hatcher, through the sensors, and switch ON or OFF the heaters to increase or decrease the temperature according to the desired one.

The heaters used are tungsten lamps of 100W.

Also a digital thermometer should be designed, constructed and tested to display the inside temperature of the hatcher.

To supply the thermometer a power supply is needed to give +5V, 0V, -5V.

The hatcher is a wooden box of dimensions 40x40x45 cm.

Thermal insulating material (Polystyrene) was placed inside the box covering all the surfaces of the internal area, to achieve maximum thermal insulation.

To achieve equal temperature at any point in the inside area of the box, a fan was placed at the back surface of the box to circulate the interior air and at the front of the fan, about at the middle of the height, a Tupperware with water was placed so that the circulating area includes moisture which is better for hatchery