

HIGHER TECHNICAL INSTITUTE  
MECHANICAL ENGINEERING COURSE

DIPLOMA PROJECT

PART PROGRAMMING ON A CNC VERTICAL  
MILLING MACHINE  
AND DESIGN OF A MILLING FIXTURE

M/888

TSIAPPOS ANDREAS

JUNE 2000

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HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3176
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PART PROGRAMMING ON A CNC VERTICAL  
MILLING MACHINE

By  
TSIAPPOS ANDREAS

PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF  
MECHANICAL ENGINEERING OF THE  
HIGHER TECHICAL INSTITUTE

NICOSIA-CYPRUS

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR  
THE DIPLOMA OF TECHICAL ENGINEER IN MECHANICAL  
ENGINEERING

2000

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3176
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THIS PROJECT IS DEDICATED  
TO MY FAMILY  
AND  
TO MY UNCLE GEORGE MATZILA

## ACKNOWLEDGMENT

I would like to express my appreciation and thanks to my supervisor **Dr. Vassilios Messaritis** lecture in the Mechanical Department at Higher Technical Institute for his guidance and assistance given during the project period.

Tsiappos Andreas  
3<sup>rd</sup> year student in  
Mechanical Engineering  
Higher Technical Institute  
June 2000

## **DIPLOMA PROJECT 1999/2000**

**Project Number:** M/888

**Title:** *"Part Programming on a CNC Vertical Milling Machine and Design of a Milling Fixture"*.

### **Objectives:**

1. Study the programming and machining characteristics of the Bridgeport IMKII (with TNC 115 Heidenhein control) CNC vertical milling machine.
2. Produce detail drawings of the components to be manufactured.
3. Design a milling fixture to ensure location support and clamping of the component to be manufactured. Detailed drawing of the proposed fixture must be prepared.
4. List the procedure to be followed for machining each component each of the two components.
5. Write a part program for the manufacture of each component.
6. Make use of linear interpolation, circular interpolation and canned cycles.
7. Test of the above programmed on the Heidenhein control simulation facility

### **Terms and conditions:**

1. All recommendations should be according to ISO.
2. Selection of components for the milling fixture should be according to standard components.

**Student:** Tsiappos Andreas (3ME1)

**Project Supervisor:** Dr. Vassilios Messaritis

## **ABSTRACT**

The main objectives of this project are to manufacture components by use of the CNC vertical milling machine and to construct a milling fixture to locate, support and clamping of the components.

In order to manufacture the components the programming characteristics of the Bridgeport IMKII (with TNC 155 Heidenhein control) CNC vertical milling machine must be studied.

Finally all part programming has to be performed by using linear, circular interpolation and canned cycles.

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