

DEVELOPMENT OF AN ELECTRONIC BOARD AUTOMATIC TESTER

by

Christos Panayiotou

Project Report

Submitted to

the Department of Electrical Engineering
of the Higher Technical Institute

Nicosia, Cyprus

in partial fulfillment of the requirements
for the diploma of
TECHNICIAN ENGINEER

in

ELECTRICAL ENGINEERING

June 1990



Summary

Summary

Author : Christos Panayiotou

Project Title : Development of an Electronic Board Automatic Tester.

There are two cards, the Clock and the Decode, which operate together to generate a 3 minute pulse. These cards are constructed in bulk quantities and therefore it is required to find a way of testing them, to ensure that they can operate according to their design.

This project is a solution to the above problem. It utilizes a microprocessor which sends some signals to the cards, it receives their outputs, it elaborates them and finally it decides whether the cards are ok or not. If the processor detects a fault, it displays it, waits until the fault is repaired and continues the testing.

CONTENTS

0.	Introduction	1
----	--------------------	---

CHAPTER 1. The Boards Under Test.

1.0	Introduction	4
1.1	The Clock Card	5
1.2	Inputs and Outputs of the Clock Card	6
1.3	The Decode Card	6
1.4	Inputs and outputs of the Decode Card	8
1.5	How to Check the two Cards	8
1.5.1	Clock Card	9
1.5.2	Decode Card	10

CHAPTER 2. The Liquid Crystal Display

2.0	Introduction	12
2.1	Characteristics of the LCD Used	13
2.2	Pin Connections and Functions	14
2.4	Instruction Description	15
2.5	Procedure in order to Write	18
2.5.1	Programming of the LCD module	19
2.5.2	How to Send Commands and Data to the Module	20
2.5.3	How to Send Messages to the Display	22

CHAPTER 3. The Hardware Used

3.0	Introduction	25
3.1.1	The C.P.U. Card	25
3.1.2	Testing of the CPU	26
3.2	Interface with the LCD Module	28
3.3	Interface with the Cards under Test	30
3.4	Memory and I/O Map	32
3.5	Power Supply	33

CHAPTER 4. The Software

4.0	Introduction	35
4.1	Software Testing the Clock Card	35
4.2	Software Testing the Decode Card	40
4.3	The Routines Used	42

CONTENTS

Conclusions	43
Appendix A	
Circuit Diagrams	45
Appendix B	
Timing Diagrams	55
Appendix C	
Components Used	58
Appendix D	
Data Sheets	62
Appendix E	
Program Listings	73
References	