## HIGHER TECHNICAL INSTITUTE NICOSIA-CYPRUS

## ELECTRICAL ENGINEERING DEPARTMENT

## DEVELOPMENT OF A COMPUTER INTERFACE CARD FOR AN OSCILLOSCOPE OPERATION

Student's name: Marios Constantinou Koudounias

Supervisor's name: Marios Kassinopoulos



## <u>ABSTRACT</u>

This project deals with the design and construction of a computer interface card for an oscilloscope operation. Also software is provided, written in BASIC language, which uses some functions of an oscilloscope.

TAE	BLE OF CONTENTS	page no
Ackn	owledgment	1
Table of contents		2
Abstract		4
Introduction		5
Chapter 1: Introduction to the design		6
Chap	ter 2: Hardware design	9
	2.1: Clock generator	
	2.2: Input signal to A/D converter	
	2.2.1: Input signal	
	2.2.2: A/D converter	
	2.3: RAM control	
	2.3.1: Multiplexer	
	2.3.2: Address counter	
	2.3.3: RAM	
	2.4: Control from PC	
	2.5: Tri-state buffer	
Chap	ter 3: Software design	17
	3.1: Headings and utilities of software	
	3.1.1: Selection of screen colors and defined arrays	
	3.1.2: Identify function keys	
	3.1.3: Constants, variables and music	
	3.1.4: Data input	
	3.1.5: Headings	
	3.1.6: View of the oscilloscope screen	
	3.1.7: Identify switch position	
	3.2: Function keys	
	3.2.1: Sketch the waveform	
	3.2.2: Escape	
	3.2.3: Approximate frequency	
	3.2.4: Edge and sync of waveform	
	3.2.5: Freezing the waveform	
	3.2.6: Window of the screen	
	3.2.7; Saving the waveform	
	3.2.8: Loading the waveform	

3.3: Sketching the waveform	
3.3.1: Sync on, negative edge	
3.3.2: Sync on positive edge	
3.3.3: Use of window and finding approximate frequency	
3.3.4: Sketching the waveform	
3.3.5: Peak max and min	
3.4: Calculating approximating frequency	
3.4.1: Processing of inputs	
3.4.2: Way of calculations for approximating frequency	
Chapter 4: Construction	29
4.1:Construction of PCB	
4.2: Placing the electronic materials	
Chapter 5: Testing	33
5.1: Open circuit and short circuit test	
5.2: Checking with other ways the hardware	
5.3: Check the hardware with small programs	
5.4: Hardware and software together	
Conclusions	36
Appendix 1-circuit	37
Appendix 2-software	38
Appendix 3-ICs	42
Appendix 4 Software flowchart	47
References	50