

STEP UP OF A DC VOLTAGE

by

ANDREAS SOPHOCLEOUS

Project Report

submitted to

**the Department of Electrical Engineering
of the Higher Technical Institute
Nicosia, Cyprus**

in partial satisfaction of the award

of diploma of

TECHNICIAN ENGINEER

in

ELECTRICAL ENGINEERING

**Project Supervisor: Mr. M. KASSINOPOULOS
Lecturer in electrical engineering, HTI**

JUNE 1991



ACKNOWLEDGEMENTS

I would like to express my thanks to my projet supervisor Mr. M. Kassinopoulo, for his guidance and assistance during the design and construction period of this Projet.

I also express appreciation to my cousin Agathi Karaoli as well as to Costas Theophanides for their help during the typing of the prject.

ABSTRACT

This project deals with the Step up of a D.C. Voltage.

The requirements of this project are:

1. To study various circuits of D.C. voltage supplies.
2. To design, construct and test a D.C. to D.C. voltage converter.
(12v to 165v).

TABLE OF CONTENTS

| | PAGE |
|---|-----------|
| Acknowledgements | |
| Abstract | |
| Introduction | |
| CHAPTER 1: POWER SUPPLY UNIT | 1 |
| 1.0 Introduction | 2 |
| 1.1 Transformer | 2 |
| 1.2 Full wave rectifier | 3 |
| 1.2.1 Full wave bridge rectifier | 4 |
| 1.3 Capacitor filter | 5 |
| CHAPTER 2: INVERTER CIRCUIT | 7 |
| 2.0 Introduction | 8 |
| 2.1 Single phase inverters & devices used | 8 |
| 2.1.1 Fixed voltage three-terminal regulator | 8 |
| 2.1.2 555 timer | 11 |
| 2.1.3 7473 J-K Flip-Flop | 13 |
| 2.1.4 Bipolar transistors | 14 |
| CHAPTER 3: BLOCK DIAGRAM OF THE SYSTEM | 22 |
| 3.0 Block diagram | 23 |
| 3.1.1 Expanation | 23 |

| | |
|--|-----------|
| CHAPTER 4: DESIGN & CIRCUIT DIAGRAM | 25 |
| 4.0 Introduction | 26 |
| 4.1 Inverter operation | 26 |
| 4.2 Rectifier operation | 27 |
| 4.3 Final circuit | 27 |
| 4.4 Construction of PCB | 28 |
| | |
| CHAPTER 5: TESTING AND PERFORMANCE | 31 |
| 5.0 Testing | 32 |
| 5.0.1 Test points | 32 |
| | |
| CHAPTER 6: CONCLUSIONS AND SUGGESTIONS | 35 |
| 6.0 Conclusions | 36 |
| 6.1 Suggestions | 36 |
| | |
| APPENDICES | |
| | |
| APPENDIX 1: REFERENCES | |
| | |
| APPENDIX 2: DATA SHEET | |
| | |
| APPENDIX 3: COMPONENTS LIST | |