

ANALOG AND DIGITAL TRAINER FOR EE/ECE LABORATORY

A SPECIAL PROBLEM REPORT

Presented to

The School of Graduate Studies
Central Philippine University

Jaro, Iloilo City

GRADUATE STUDIES
LIBRARY



In Fulfillment

Of the Requirements for the Degree

Master in Engineering

By

Ramon A. Alguidano, Jr., RECE

July 2003

ABSTRACT

The analog and digital trainer is one of the basic requirements for electronics laboratory. This equipment is used when performing the laboratory experiment in electronics and some laboratory experiment in electrical engineering subject. This analog and digital trainer is composed of two major sections: the analog section and a digital section. The analog section are composed of several circuit for analog signal experiments and design. The digital section are composed of several circuit used in digital logic experiments, design, computer interfacing using Parallel and serial port with little introduction of computer program for interfacing using turbo C, Pascal, Basic, and MATLAB, and digital-to-analog converter and analog-to-digital converter.

The Analog section are composed of the following circuit: two Bank of regulated power supply with fixed voltage output of $\pm 12V$, $5V$ and ± 0 -to- $\pm 30V$ variable regulated power supply. Function generator that will generate sine wave, square wave, triangular waveform, for a maximum swing of $\pm 10V$ with frequency range of $0Hz$ -to- $100kHz$ with addition feature for amplitude modulation techniques. In the digital section are composed of the following circuit and $1k\Omega$, and $100k\Omega$ for the accessories needed.

This analog and digital trainer is design to cater the needs of the EE/ECE laboratory due increasing number of student enrolled in this course. Adding additional feature in order to enhance further the knowledge and capability of the students specifically on complicated circuit design especially in digital logic circuit and computer programming and interfacing. Helping some school here in the Philippines who are interested but not capable of acquiring this from abroad. To the individual who are interested in the development and design of electronic circuit and also to the electronic enthusiast who wants to personalized this trainer.

The trainer is tested at EN204 for the evaluation of the parameters. To conform the specification of the design which include the limitation of the design specifically for minimum and maximum operating conditions. Note: "most of the parameters are base on the specification sheet of the component used" the specifications are provided at appendices for further information and data needed.

The data gathered are shown in appendix D the table for actual measurements at a standard operation at specific temperature and operating condition to be compared to the specifications sheets provided by the component manufacturer expected value.