

**DESIGN AND DEVELOPMENT OF A MICROPROCESSOR-BASED
TELEPHONE CALL MONITORING DEVICE**

Undergraduate Design Project
Submitted to the Faculty of the
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree of
Bachelor of Science in Computer Engineering



00001212

*Design and development of a
microprocessor-based telephone call
620.0042 B14 2004
DP-136*

**EDWIN D. BAGO
RYAN O. DE GUZMAN
MICHAEL T. PERIDO**
October 2004

ABSTRACT

BAGO, EDWIN D., DE GUZMAN, RYAN O., and MICHAEL T. PERIDO.
Design and Development of a Microprocessor-Based Telephone Call Monitoring Device. Undergraduate Design Project. Bachelor of Science in Computer Engineering. Cavite State University, Indang, Cavite. October 2004. Adviser: Mr. Bienvenido C. Sarmiento, Jr.

The design of the Microprocessor-based Telephone Call Monitoring Device was constructed and fabricated at the second floor, Room 202, of the New Engineering Building, Cavite State University. It was tested and evaluated at the Department of Interior and Local Government Office, Indang Municipal Building.

The MC6802 microprocessor was used, which simplified the circuit design. The project was constructed to monitor the outgoing call on landline telephone sets. Monitoring involves recording of information on the calls made. This information includes the number dialed, time and date, and duration of the call. All these were saved in an eight-kilobyte EEPROM, which could store approximately 250 entries. A separate clock module was utilized which composed mainly of a BCD binary counter to produce an exact one second count for accurate timing. Connecting a printer enabled the device to produce a print out of the saved data.

The proponents developed an assembly language program as the control software, which managed the overall performance of the device. The software was embedded on a four-kilobyte EPROM. The project underwent a series of test, which revealed that the designed device was able to perform the monitoring of the calls except that it failed to meet some expected functions due to hardware complexity.

TABLE OF CONTENTS

| | Page |
|---------------------------------------------|------|
| BIOGRAPHICAL DATA | iii |
| ACKNOWLEDGMENT | v |
| LIST OF FIGURES | x |
| LIST OF TABLES | xi |
| LIST OF PLATES | xii |
| ABSTRACT | xiii |
| INTRODUCTION | 1 |
| Importance of the Study | 2 |
| Objectives of the Study | 2 |
| Time and Place of the Study | 3 |
| Scope and Limitation of the Study | 3 |
| Definition of Technical Terms | 5 |
| REVIEW OF RELATED LITERATURE | 8 |
| MATERIALS AND METHODS | 17 |
| Materials | 17 |
| Methods | 18 |
| Design and development of the circuit | 18 |
| Construction of the circuit | 18 |
| Software development | 22 |
| Testing and evaluation | 22 |

| | |
|---------------------------------------------------------------------|----|
| Cost computation | 22 |
| RESULTS AND DISCUSSION | 24 |
| Description and Operation of Telephone Call Monitoring Device | 24 |
| Microprocessor Unit | 29 |
| Software Description | 31 |
| Evaluation | 39 |
| Cost Computation | 41 |
| SUMMARY, CONCLUSION, AND RECOMMENDATION | 49 |
| Summary | 49 |
| Conclusion | 50 |
| Recommendation | 50 |
| BIBLIOGRAPHY | 52 |
| APPENDICES | 53 |
| PROGRAM LISTING | 59 |