Automated Retractable Billboard with Radio Frequency Control

A Research Proposed to the Faculty of Engineering

De La Salle University – Dasmariñas

In Partial Fulfillment of the Requirements

for the Degree Bachelor of Science in

Electronics and Communications Engineering

BONIFACIO, Romain Gabriel E.
CONDA, Andre Rafael S.
MORALES, Arvin Jay G.
SABIO, Jose Luis R.
ECE 52

March 2010

Table of Contents

| Acknowledgement | | 4 |
|------------------------------|---------------------------------------|----|
| Chapter 1: The Problem and | Background of the study | 2 |
| Introduction | | 2 |
| Background of the Study | | 3 |
| Statement of the Problem | | 6 |
| Conceptual Framework | | 7 |
| Significance of the Study | | 8 |
| Scope and Limitation | | 10 |
| Definition of Terms | | 11 |
| Chapter 2: Review of Related | d Literature <mark>and</mark> Studies | 12 |
| Conceptual Literature | | 12 |
| Review of Related Studies | | 17 |
| Synthesis | | 19 |
| Chapter 3: Research Method | is and Procedures | 20 |
| Data Gathering and Procedu | ires | 21 |
| Assembly and Construction | | 22 |
| Theory of Operation | , | 23 |
| PCB Design | | 24 |
| PCB Layout | | 25 |
| Schematic Diagram | | 26 |

| Chapter 4: Results and Discussion | 28 |
|---|----|
| Research Project Discussion | 28 |
| Project Structure | 30 |
| User Manual | 36 |
| Data and Results | 37 |
| Mode of Operation | 38 |
| Survey | 39 |
| Discussion of Results | 42 |
| Chapter 5: Summary of Findings, Conclusion and Recommendation | 45 |
| Summary | 45 |
| Conclusion | 47 |
| Recommendation | 48 |
| Bibliography | 49 |
| Appendices | 50 |
| Appendix A | 51 |
| Appendix B | 57 |
| Appendix C | 60 |

List of Tables

Table 4.1: Speed Sample Test

Table 4.2: Average wind velocity

Table 4.3: Automatic Operation

Table 4.4: Manual Operation

Table 4.5: Acceptability Test

Table 4.6: Reliability Test

Table 4.7: Functionality Test

Table 4.8: Typhoon Signal and its corresponding Wind Speed

Shall be

List of Figures

Figure 1.1: The Research Paradigm

Figure 2.1: Roll up Door

Figure 3.1: Theory of Operation of Automated Retractable Billboard with RF Control

Figure 3.2: PCB Design of the Circuit

Figure 3.3: PCB Layout of the Circuit

Figure 3.4: Schematic Diagram of the Circuit

Figure 3.5: Rolling Down of the Billboard at wind threshold

Figure 3.6: Rolling Up of the Billboard after the delay

Figure 4.1: Picture of the Anemometer used

Figure 4.2: Photo of the Microcontroller Circuit

Figure 4.3: Photo of the RF module and the Remote

Figure 4.4: Label of the Remote

West L be

Abstract

Title:

Automated Retractable Billboard with Radio Frequency

Control

Researchers:

Bonifacio, Romain Gabriel E.

Conda, Andre Rafael S.

Morales, Arvin Jay G.

Sabio, Jose Luis R.

Adviser:

Engr. Emmanuel T. Longares

School:

De La Salle University - Dasmariñas

Pages:

61 Pages

School Year:

2009 - 2010

Degree:

That be

BS Electronics and Communications Engineering

Billboard is one of the best ways to advertise one's product. It can be easily seen by people walking or driving along the road. The reason of this research is to minimize the hazards that these billboards can do. The reason of which is the enormous size of it. Typhoons or strong gust of wind can bring down these big billboards and can damage one's property or take away one's life.

This research lessens the possibility of any billboard to be destroyed by strong winds and save the property or one's life to harm. It can be manually operation using Radio Frequency Control or can be automatically detect the wind velocity using an Anemometer.