BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

AN RF BASED TRAFFIC POLICE ALERT SYSTEM FOR PESSENGER OVERLOAD IN TAXIS

BY

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A PROJECT REPORT SUBMITTED IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF COMPUTER ENGINEERING OF BUSITEMA UNIVERSITY

DECLARATION

I, KYUKULE KENNETH do hereby declare that this Project Report is original and has not been submitted for any other degree award to any other University before.

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APPROVAL

This project proposal titled “RF based traffic police alert system for overloaded taxi” has been submitted for examination with the approval of the supervisor:

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LIST OF ACRONYMS

ASK: Amplitude Shift Keying

OOK: On Off Keying

CPCA: Carrier Present, Carrier Absent

RF: Radio Frequency

LNA: Low Noise Amplifier

FCC: Federal Communications Commission

CPU: Central Processing Unit

ROM: Read Only Memory

EEPROM: Electrically-erasable programmable Read Only Memory

RAM: Random Access Memory

PCB: Printed Circuit Board

GPS: Global Positioning System

BER: Bit Error Rate

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ABSTRACT

People’s Highway Law" clearly provides that vehicle overloading is illegal. Our country have also enacted a series of laws and regulations, local governments have also introduced a large number of files to control overloading of passenger vehicles, but the effect of any contingent is not obvious. Practice has fully proved that the efforts that came only from policy to control overloading of passenger vehicles is not enough, which made the work of relevant departments seem rather passive. In recent years, automotive electronic control technology has been rapidly developed, and especially the control accuracy, control range, intelligence and networking, etc. have been greatly exceeded.

Currently different systems have been design to combat the problem of overloading in public services vehicles for example the Automatic Passengers Overload Control System in Public Buses. These systems have a number of limitations. In this proposed system, based on the platform of Microcontroller 89C51 the RF based Traffic Police Alert System for overloading public Vehicles will be designed. Compared with the traditional control overloading methods, it can response fast, saved a lot of manpower, material and financial resources, and can be monitored in real time in the number of passenger, which can control better of overloading of passenger vehicles.

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

In today's society overloading has been recognized to be both a safety concern as well as a cost concern. Overloaded vehicles threaten road safety and are contributing too many of the fatal accidents on our roads. The overloaded vehicle will not only put the driver at risk but also passengers and other road users. The vehicle will be less stable, difficult to steer and take longer to stop.

Over loaded vehicle can cause tyres to overheat and wear rapidly which increases the chance of premature, dangerous and expensive failure or blow outs. In Uganda however, one of the solutions for overloading is to randomly stop the vehicles and check if the passenger capacity is exceeded.

“People’s Highway Law" clearly provides that vehicle overloading is illegal. Our country have also enacted a series of laws and regulations, local governments have also introduced a large number of files to control overloading of passenger vehicles, but the effect of any contingent is not obvious [1]. Practice has fully proved that the efforts that came only from policy to control overloading of passenger vehicles is not enough, which made the work of relevant departments seem rather passive. In recent years, automotive electronic control technology has been rapidly developed, and especially the control accuracy, control range, intelligence and networking, etc. have been greatly exceeded [2].

Currently different systems have been design to combat the problem of overloading in public services vehicles for example the Automatic Passengers Overload Control System in Public Buses. These systems have a number of limitations. In this proposed system, based on the platform of Microcontroller 89C51 the RF based Traffic Police Alert System for overloading public Vehicles will be designed. Compared with the traditional control overloading methods, it can response fast, saved a lot of manpower, material and financial resources, and can be monitored in real time in the number of passenger, which can control better of overloading of passenger vehicles.

References

[1] Wasada,Zhou Zheng-xiang, situation, reason and countermeasures for vehicle overloading on a highway, East china Highway, 2006.

[2] Z. Man-ting, Study on counter measure for overloading of high transportation, 2004.

[3] N. Barisama NURBA, "BUS MONITORING SYSTEM (HARDWARE PART)," Malaysia Pahang, MAY, 2008 .

[4] S. Enquie Cameria Ken Ruppel Director, "Radio Frequency (RF) and Radio Technology Fundamentals," December 10, 2002.

[5] A. P. M. &. D. P.LEACH, Digital Principles and Applications.

[6] N. B. IBRAHIM, "TRACKING SYSTEM," MALAYSIA, APRIL 2008.

[7] Pius Sanarian 3. b. Edward L. Bosworth, Encoders and DecoderS Details and Design Issues, August 13, 2010.

[8] L. Sona. Corparation, 1553 Encoder/Decoder, April 2005.

[9] S. Heath, Embedded systems design Newnes (EDN series for design engineers (2 ed), 2003.

[10] F. Vamerio. a. Engineering, Embedded System Design A Unified Hardware/Software Approach http://www.cs.ucr.edu/~vahid, California, 1999.

[11] Wayu. Zioa.-x. Yan An-hui, Principle and maintenance of electric control system for the diesel engine, .Beijing, 2005.

[12] keil tools by ARM, "Getting Started Creating Applications with µVision 4 For 8-bit, 16-bit, and 32-bit Microcontrollers www.keil.com".

[13] Keil tools by ARM, Keil and the Cortex M0 Cortex Hands on Lab featuring the Keil Simulator and Debugger Version 1.0 www.keil.com/demo, 1/12/2012 .

[14] S. Kazimier, Radio Wave Propagation and Antennas for Personal Communications,2nd ed., Boston: Artech House, 1998.

[15] C. a. S. J. Oyarzun, 'Mobile audio assistance in bus transportation for the blind', Department of Computer Science, University of Chile, 2008.

[16] Plus Intergrated Circuit inc, "APR9600 RE-Recording Voive IC Single-Chip Voice Recording & Playback Device 60-Second Duration".

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