

Computerized Gate control and Identification System

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Abstract-This paper is a practical design and implementation of an electronic Computerized Gate control and Identification System. It is computer-based Identification System can be used in any types of gates, not only for control but also for identification. Generally in telecommunications, identification, friend or foe (IFF) is an identification system designed for command and control. It enables military and national (civilian-located ATC) interrogation systems to identify aircraft, vehicles or forces as friendly and to determine their bearing and range from the interrogator. Our designed system can operate as stand alone or interfaced with a complete control system for the protecting, monitoring, alarm, guard etc. The system can control and display information of incoming at gate and allow certain preset privilege to each one, or for a group of them. The designed system use control key board or using a remote control and the system respond to the input from the gate comer input by open or not the gate and give certain audio output predetermined for each expected comer, by this way the people inside the building as example or the observers will be able to recognize and distinguish the incoming person by the gate. The designed system can prevent the comer to the gate from access unless the right store code is entered, also it can let the comer access only for certain specific previously determined time, or prevent at certain conditions or stop completely in case of danger. The system is powered by 220V Ac supply available in all building, and also can operate by 12V dc battery. Further, it was demonstrated that the program is used in actual work for the system to the microcontroller type16F84A. The software is preferred for design using software PIC Basic for microcontroller. This Program is a window based Software and friendly user. To enhance the system, different techniques can be employed such as camera day or night, passive infrared detector, flex or pressure sensor, the output from enhanced module is taken via USB port for monitoring purpose and through a relay used as one of the controls to the microcontroller type 16F84A which will result in the required action.

Keywords- IFF; Safety and protection; Gate Control; Signal Processing; Sensors

I. INTRODUCTION

To access the gate you must enter the right password for the key board. Our design covers various methods of prevention to reduce the likelihood of protected area to be accessed. These include physical barriers, which make the effort of entering more difficult by allowing only authorized if the right password contains the correct code which is present in the stored microcontroller. Adding to those chances reduced with various intruders by giving the impression to the unknown comer that she/he is more likely to get caught; including: alarm systems that are triggered if a breaking and entry into the gate occurs and trying to open by force. The circuits were designed to frustrate or slow down the efforts of break through. When we start to speak about the identification systems our mind go toward the military application. The United States and other NATO countries started using a system called Mark XII in the late twentieth century; Britain had not until then implemented an IFF system compatible with that standard, but then developed a program for a compatible system known as successor IFF (SIFF).[1] The systems used in the early twenty-first century by NATO and allied powers use a separate specialized transponder beacon which can operate without radar. They are referred to as cross-band beacon or transponders. But generally IFF is used by both military and civilian aircraft. Modes 1, 2, 4 and 5 are for military use only. Modes 1, 2 and 3/A are collectively known as Selective Identification Feature (SIF) modes. Civilian aircraft use modes 3/A, C and S. Mode C which includes barometric pressure altitude information is often used in conjunction with mode 3/A. Mode S is a new civilian mode developed to replace both mode 3/A and C. [2][3] The above identification system is different from our designed system which can control the allowance in different application like protected ground area, the gates in air port, or it can be used in the water passage like Suez Canal, Panama Canal, Our designed Software is divided into two parts, the 1st part is related to remote board for the control switches, the 2nd part is related to keyboard for the control board, the flow charts for both parts are shown in appendix A, Both parts use programs written in Pic Basic Pro to microcontroller, Section III will discuss applications and limitations for allowance avoidance, section IV will represent the circuit diagram, section V will discuss software used in the design, section IV Shows the complete system design , section I IV is the conclusion.

II. APPLICATIONS and LIMITATIONS for ALLOWANCE AVOIDANCE

a. DISCUSSION RELATED LITERATURE WORK

A Computerized Gate control and Identification System developed by the author was deployed in the real world as a technology to avoid the unknown personal from getting inside the protected area. The technology identifies every comer individually, along with its specific audio indication, enabling the observer inside to know that in real time. The proposed system include a variety of automatic video and audio signal, based on these we can identify , control and protect the assigned area. Also this system can be used in conjunction with a large system or work as standalone system.



Fig.1 Gate control for roads and building [4]

When a person is by the gate, information about him and his identity is critical to make decisions to avoid entering of unknown and dangers. Visual observation and audio are historically used for this purpose. These preventative mechanisms, however, sometimes fail due to time delays, limitations, miscalculations, and display malfunctions and can result a fault. While requirements for our system are to display only very basic information, the data obtained can be integrated with a graphical electronic system or a large display, providing consolidated information on a single display.

b. CONTRIBUTION



Fig.2 Gate control for airports [4]

The system can control the allowance in different application like the gates in air port as shown in fig. 2 such that the passenger from or to certain flights are the only people who have access to certain gate number. Also it can be used in the water passage as shown in fig. 3 like Suez Canal, Panama Canal.



Fig.3 Gate control for canals [4]

There are several steps involved in identification upgrade. The crypto-computers have to be keyed and the keys have to be managed and somebody has to understand the entire systems requirement, this will be the controller, and has to be able to execute it. So, it is not just the technology that can do this job. The core of the ID system is the crypto-computer, which is inserted in the system, A key is something that says the crypto-algorithm is supposed to look like this today, this tomorrow and this the next day. The changes made to the key are classified. The UN allowed will be trying to go through, but the key changes make this difficult and almost impossible. If the keys are not changed constantly, somebody will manage to break the codes eventually. If not allowed get the code, they can make themselves look like a friend. If you increase the difficulty for the code and changes, it will be difficult to get in; it is like the secret crypto weapon of the IFF. It can go to other visitor or allowed for certain time, but the core part about this is the code key. The controller for the system manages the keys, so if it provides an code capability to a non-allowed people, ships, car, airplanes or others according to application and wants them to go through with the allowed, the controller distribute the code, everyone keys up exactly the same way, so we all now look like friends, If in the next situation is changed, and if the non-allowed is no longer required to be allowed, we just don't give the code to them. They just don't get the keys anymore. The combat ID system would then be rendered useless. [1]

III. The CIRCUIT DIAGRAM

The designed system is shown in Fig. 7 as a connection diagram, and in Fig.8 as a real realization for electronic system which can be tested by technique used in ref [5]. This designed unit consists of 2 main units; the 1st main unit is the electronic unit as shown in the left part of Fig.7 which contains 4 subunits, the 12 voltage transformer with a rectifier, Control board for remote switches, another 12 volt transformer with rectifier and key board control board. The 2nd main unit is shown in Fig.7 right part contains key board and the locker under control. Fig.4 represent the component lay out for the keyboard control board. Fig.5 represents PCB for multi user remote switches; Fig.6 represents the circuit diagram for multi user control switches

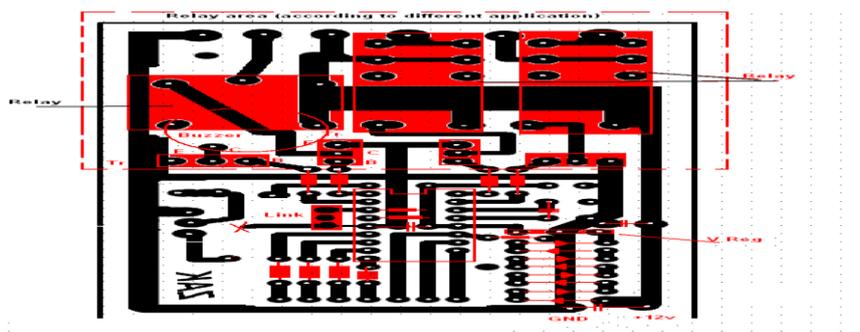


Fig. 4 components layout

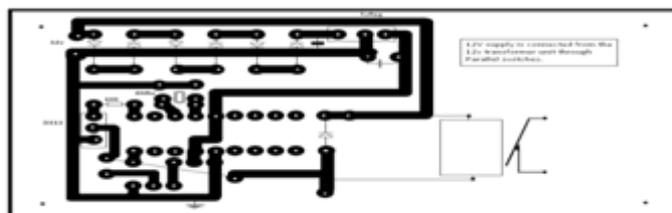


Fig.5 PCB for Multi user remote switches

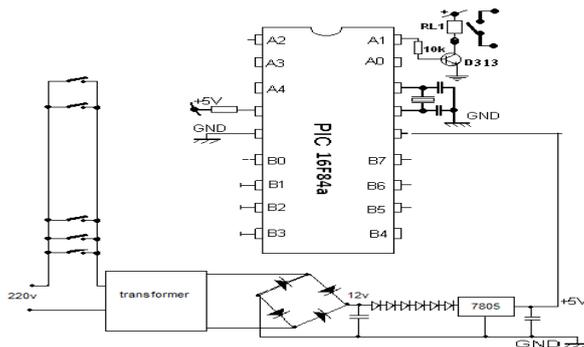


Fig.6 circuit diagram for Multi user control switches

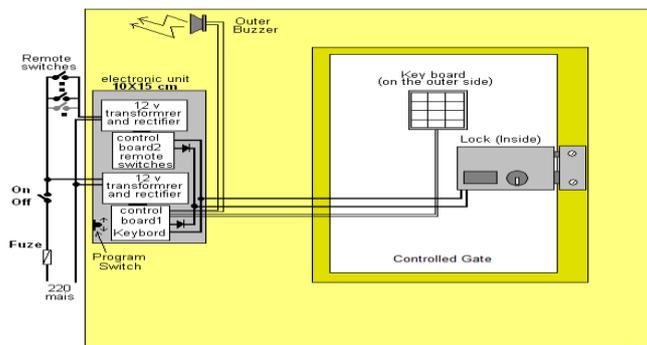


Fig.7 Block diagram for a complete system

IV. SOFTWARE USED IN THE DESIGN

Our designed SW is divided into two parts, the 1st part is related to remote board for the control switches, the 2nd part is related to keyboard for the control board. Both parts use programs written in PIC Basic Pro [6] to 16F84a microcontroller [7]. The control for the locker for predetermined preset period of time under condition that the circuit is energized (in our case 800 m.sec) after that time it will shut down., The second part is responsible about keyboard control that will execute the opening order locally using the keyboard for predetermined period of time and give different identified audio messages at the control station related to different allowed .Both programs are available under request.

V. The COMPLETE SYSTEM DESIGN



Fig. 8 represents the complete designed electronic unit



Fig. 9 represents one of the real installations of the system

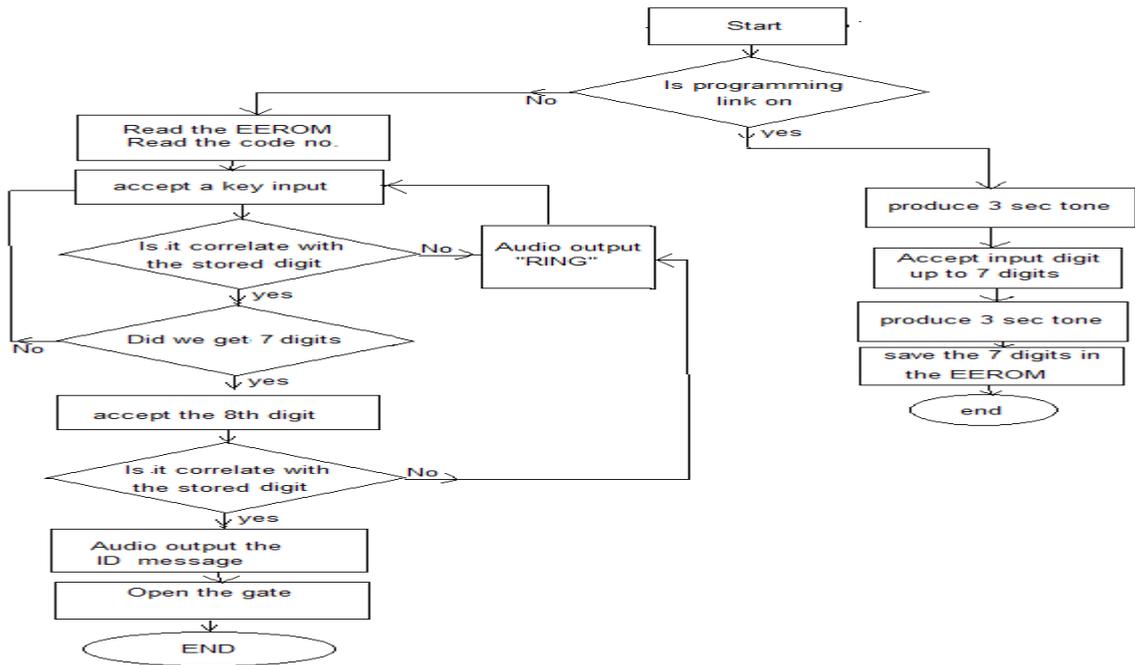
VI. CONCLUSIONS

In this design, a Computerized Gate control and Identification System was developed by the author as a technology to avoid the unknown personal, ship aircraft, etc according to the application from getting inside the protected area. The technology identifies every comer individually or a group, along with its preset specific indication, enabling the controller or the observer inside the controlled area to know that in real time, we were able to find the countermeasure for most different ways to prevent non allowed from passing, and the designed system can be used not only as standalone but also to be integrated to large system. Circuits were designed to prevent, frustrate or slow down the efforts of trying to get through, Moreover; it can send SOS message at certain conditions [8]. Design allows straightforward programming interface to the system that simplify the task of integration into different user environment and large systems. System provide high quality, cost effective solution backed by open architecture design and the user who program his system and can be used for a wide variety of application. The system proved high level of security, protection, cheap and can be used to more complex designs according to requirements. It can be used in wide scale in commercial as protection and alarm system for any application. Further, a new and systematic design was presented in this paper using microprocessors.

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Flow chart for key board of control board



Flow chart for remote switches board

