EMERGENCY AUTOMATIC SIGNALING SYSTEM

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***Abstract*—The effective use of wireless technology and high speed micro controller to provide smooth and clear flow of traffic for ambulance to reach the destination on time has been used in this paper. This is achieved by using RF transmitter at the ambulance and RF receiver at the traffic system i.e., traffic signal. The signal from the ambulance is sent to traffic system which after detecting it sends it to PIC micro controller which controls the traffic light. If an ambulance is detected the signal goes green and if it is not detected the light goes red, normally the regular routine continues between green, yellow and red lights.**

Keywords —RF transmitter, RF receiver, PIC microcontroller, Traffic systems.

I. INTRODUCTION

In India it is difficult to maintain and control the roads, traffic and congestion. The migration of population from rural to urban and sub-urban areas makes the condition even more critical [1]. As a result of this the number of road accidents also increased to a great extent. The non-lane based Indian traffic makes it difficult for the ambulance to reach the destination on time [2].This in turn has an adverse effect on the economy of our country as well as the loss of lives. So problem given above will become worst in the future. As a result, emergency vehicles such as ambulances get stuck in traffic signal and waste their valuable time and golden hour. High priority must be given to human lives in the ambulance which is travelling through a traffic signal.

Emergency Automatic Signaling System aims to identify the ambulance and to give green signal to the traffic light in a traffic jam

II. MONITORING SYSTEM

Ambulance Signaling Block Diagram

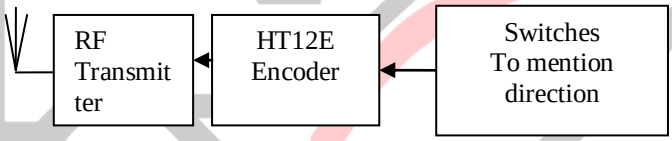

Figure1 Ambulance Side

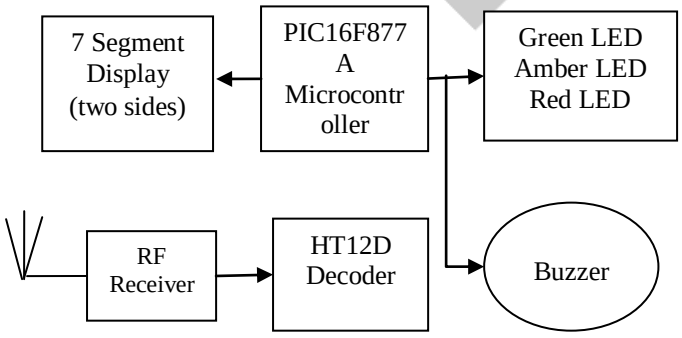

Figure 2 Signal Side

The above mentioned Emergency Automatic Signaling System is being used in two way roads. Under the normal condition in the two way roads, the LEDs will change simultaneously.

When the ambulance driver reaches near the signal and if he finds that the signal is not cleared, he has to press the **"PASS"** button. As soon as he presses the **"PASS"** button, the signal in the ambulance side will change to green even it was in the red state. At this time the green signal on the other side of the road will go to red.

After crossing the signal the ambulance driver must press "**RESUME"** button for the signal to run in normal condition. The signal from the ambulance is passed through the RF transmitter as shown in figure 1 and the receiver receives the signal using RF receiver, decodes the value and takes the decision based on the condition as shown in figure 2. The decision making is implemented using PIC16F877A Microcontroller. The buzzer is used to make an alert sound when the signal is getting changed.

The encoder and decoder circuits are shown in figure 3. At the transmitter side the encoder receives the signal from the driver and converts it to a form suitable for transmission. Similarly on the traffic system side the receiver receives the signal and decodes to a form suitable for the PIC microcontroller to make a decision of changing the signal lights.

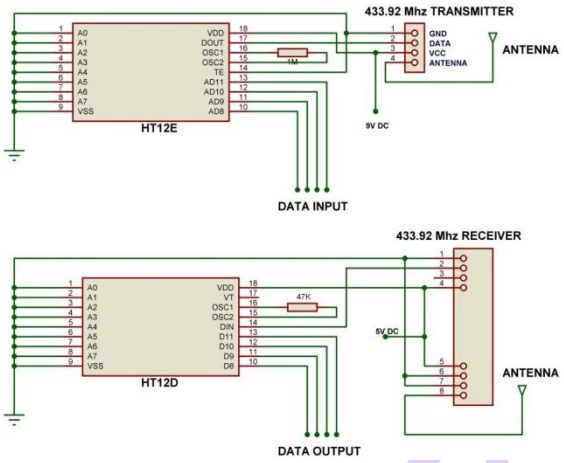

Figure 3 Encoder and Decoder circuit

III. CONTROLLING UNIT

A.PIC16F877AMicrocontroller

The PIC family was redesigned to use one of the other things that the fledgling company was good at, i.e. EPROM. The CMOS technology and erasable EPROM program memory the PIC family, as we know it, was born. These microcontrollerseries are RISC-based processors, which use the Harvard3 architecture; therefore the microcontroller has a program memory data bus and a data memory bus.

Separating the program and data memory, allows instructions to be sized differently than the 8-bit wide data word. This separation means that the instruction words can be ideally sized for the special CPU application. This is necessary since RISC architectures require that instructions have the source and destination operands be encoded within the instruction. The PIC opcodes for the mid-range processors are 14-bits wide, and the 14-bit wide program bus fetches an instruction in a single cycle. There are 35 single word instructions. A two-stage pipeline overlaps fetch and execution of instructions.

IV. CASE STUDY

When city traffic halts ambulances, lives caught in a bind: Travel speed in the city crawls to 15kmph during rush hours, making it difficult for ambulances to negotiate traffic jams.

BANGALORE: Six months ago, a two-year-old girl was being rushed in an ambulance from Mysore Road to Manipal Hospital on Old Airport Road. The child was suffering from low BP and struggling to breathe. It took more than two-and-a-half hours to cover the 15-km stretch, owing to traffic snarls. When she finally reached the hospital, she was declared 'brought dead'.

Figure 4 Case Study

V. CONCLUSION AND FUTURE SCOPE

This system uses human for pressing the button to indicate the ambulance arrival in a signal.This work can be further developed without human intervention by using sound sensors, in which the sensors in the traffic system ie., signal which sense the siren sound of the ambulance and changes the signal lights accordingly. This work can be further improved for example, in 4 roads or 3 roads junction if more than one ambulance arrives at the junction from different sides then first priority can be given to the ambulance which is present in the road with lesser congestion and so on. Otherwise the ambulance which is reaching the junction first can be given first priority.

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