Automatic Gun Firing System, In Army For Border Security

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Abstract- *Sensor Based Automatic Gun targeting System for Border Area is an automated gun target and firing system if found an object within a range of sensors. The project is primarily based on arduino and wired transmitter and receiving units using RS485.The Project is required because till today, border is protected by Iron Spike wires, and a watch tower containing a person continuously flashing the light over the border area day and night. Those persons are fully responsible for any intrusion. This project will not fully remove the responsibility from their soldiers, but shares the maximum responsibility and will reduce human mistakes on the border. The master slave will sense any living objects inside the range and confirms manually is it unwanted objects or not and provide the location to slave, in response, arduino generates the code on the site and send to the watch tower where the receiver receives the code, provides code to arduino, interprets the location of the object corresponding to received code, activates targeting system, at last firing system.*

Keywords- Arduino 2560, Arduino 328, RS485.

I. INTRODUCTION

In past centuries communicating a message usually required someone to go to the destination, bringing the message. Thus, the term "communication" often implied the ability to transport people and supplies. A place under siege was one that lost communication in both senses. The association between transport and messaging declined in recent centuries.

The first military communications involved the use of runners or the sending and receiving of simple signals (sometimes encoded to be unrecognizable) [1]. The first distinctive uses of military communications were called "signals". Modern units specializing in these tactics are usually designated as "signal corps". The Roman system of military communication (curses publics or curses vehicular is) is an early example of this. Later, the terms "signals" and "signaler" became words referring to a highly-distinct military occupation dealing with general communications methods (similar to those in civil use) rather than with weapons.

By using this new concept our soldier on border are more secure from any type of attack. And they are getting inform all about what happing on border from any unknown objects and group of living objects.

By using serial port a chances of communication hacking by enemy or terrorist will not be successes. Because serial port is totally wired it only provides a communication between master and slave.

II. METHODS AND MATERIAL

1) *A.Proposed Methodology*

The proposed methodology is consist of mainly microcontroller ,ULN, Relays and various sensors for measuring the various parameters like ; if the water level across the bridge exceeds the red line then water level sensor which is interfaced with microcontroller senses it[6]. Due to overloading, ageing and climatic changes strength of material reduces and it leads to vibration in bridges at this instant vibration sensor which is interfaced with microcontroller senses those vibrations. Due to internal structural damages shape of the bridge is slightly inclined or bends over .This bending parameter sensed by flex sensor which is interfaced with microcontroller. All the signals from these sensors will get signal conditioned and the according to programming the data will get send to the controller through the Wi-Fi module. And according to signals the controller will take his actions.
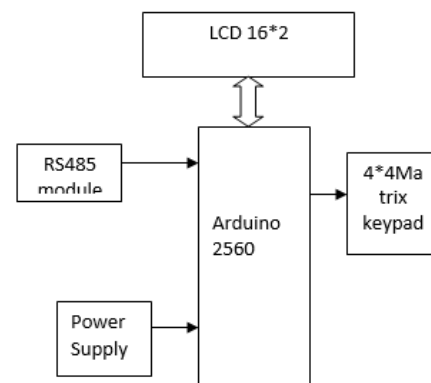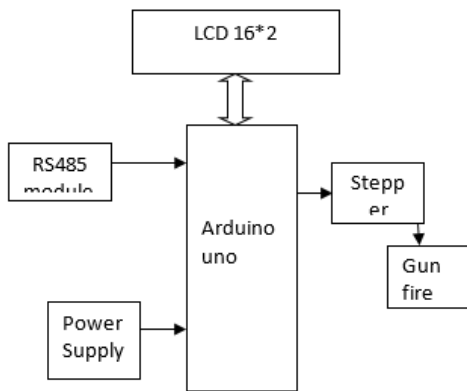

Fig 1: Block Diagram of Master side

Fig 2: Block Diagram of Slave side

B.Working

This project will not fully remove the responsible from soldier. But shared the maximum responsibility and will reduce human mistakes on the border.

At a master circuit board, a soldier having a wide range of binocular with a measuring equipment and area describable map with all detailing. Soldier who is having a master circuit.
First when a suspected object is detected by using a binocular then a soldier is measuring a typicallydistance (which don't have accessible for other people besides Indian army).

Measurements is send to a slave1 or slave2 as per selecting in range of suspected object. Slave 1 or slave 2 received a signal (degree and distance) and with a sec of delay it will be fired at given degree and distance, target is destroy only in few seconds.

Arduino 2560 : The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with AC to DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila[2].

RS485: RS-485, also known as TIA-485(-A), EIA-485, is a standard defining the electrical characteristics of drivers and receivers for use in serial communications systems. Electrical signaling is balanced, and multipoint systems are supported.

Fig 3. Module of RS 485.

The standard is jointly published by the Telecommunications Industry Association and Electronic Industries Alliance (TIA/EIA). Digital communications networks implementing the standard can be used effectively over long distances and in electrically noisy environments [4]. Multiple receivers may be connected to such a network in a linear, multi-drop configuration. These characteristics make such networks useful in industrial environments and similar applications.

LCD: A 2 line by 16 Character LCD is Pictured. Data will work on most 1 line x 16 Character, 1 line x 20 Character, 2 line x 16 Character, 2 line x 20 Character, 4linex 20 Character, 2line x 40 1Character etc. modules compatible with the HD44780 LCD module.
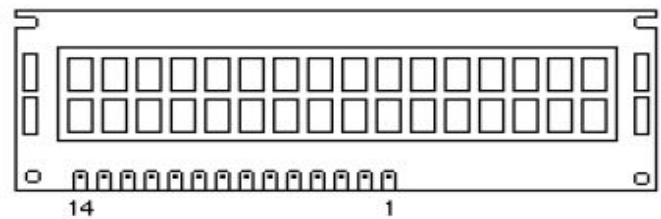

*Fig 4: LCD 16*2*

III. RESULTS AND DECLARATION

This is the working prototype of our developed system.We have also tested our system. The results of the same is shown below.
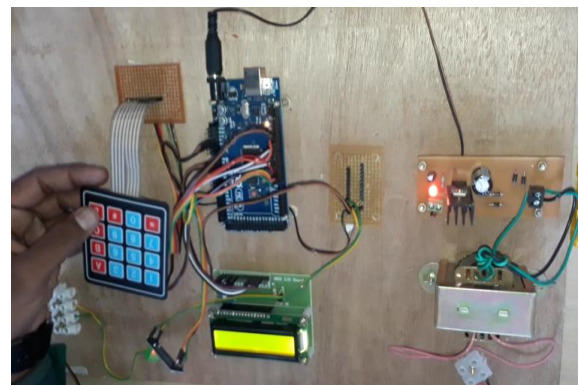

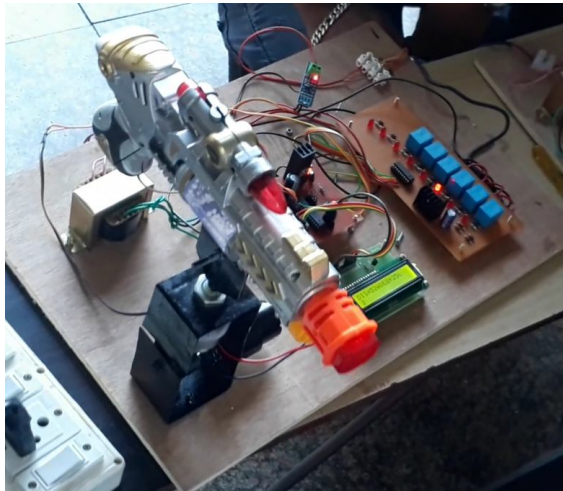*Fig 4. Kit of automatic gun firing system(Master).*

Fig 5. Kit of automatic gun firing system(Slave).

IV. APPLICATIONS

1. In army.
2. At war zone.
3. At boarders.
4. for Secure Communication.

V. CONCLUSION

By implementing the system we get knowledge of the automatic gun firing system in army for border security and also get the knowledge of the programming of the controller (Arduino) here we have also studiedthe PCB designing of the system.

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