War Field Spy Robot With Ultrasonic Metal Detection And Bomb Diffusion System

T. Chandra Sekhar [1], S. Durga Prasad[2]
[1,2] Giet Engineering College, Rajahmundry, India

Abstract- *The aim of the project is designed to build the live human detection and explosive detection with the sharp shooting weapon by using PIR sensor, Arduino and laser. The main objective behind developing this robot is for the surveillance of human activities in the war field or border regions in order to reduce infiltrations from the enemy side. Military people have a huge risk on their lives while entering an unknown territory. The robot will serve as an appropriate machine for the defense sector to reduce the loss of human life and will also prevent illegal activities. It will help all the military people and armed forces to know the condition of the territory before entering it.*

Keywords- Arduino, Laser, Shooting Weapon, Explosive detection, surveillance.

I. INTRODUCTION

❖ **ZIGBEE:** It requires knowledge of the system for the owner to operate zigbee compliant device. It is not secure like wifi based secured system

❖ **GSM:** There is no availability of variety of handsets in CDMA as in case of GSM for customers. They are incompatible with GSM handsets.

❖ **BLUETOOTH:** Bluetooth is a short range wireless data. It sends data relatively slowly. It sends data relatively slowly. Bluetooth security is weak compared to wifi and other wireless data.

II. EXISTING SYSTEM

RF controlled Robot Interesting thing in this project is that it will run without using any microcontroller. Here it will run directly by RF Decoder and Motor Driver.**RFcontrolled robot** is controlled by using four push button placed at transmitter side. Here we only need to push the buttons to control the robot. A transmitting device is used in your hand which also contains a RF Transmitter and a RF Encoder. This transmitter part will transmit command to robot so that it can do the required task like moving forward, reverse, turning left, turning right and stop. All these tasks will perform by using four push buttons that are placed on RF transmitter.

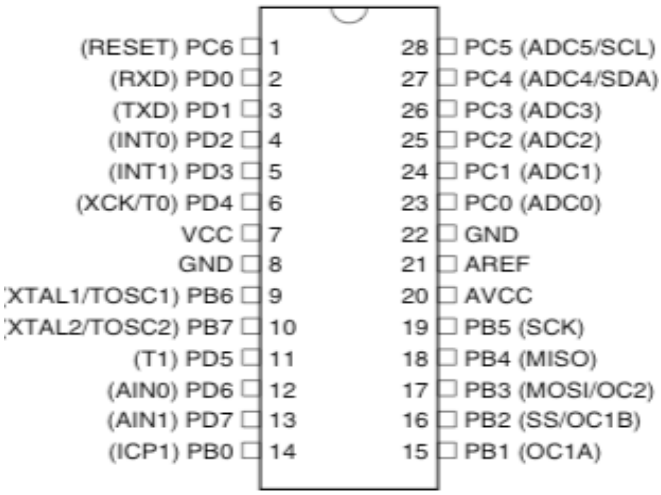
The wireless robot is used in the war field for to detect the live human and explosive materials with the sharp shooting weapon. This can be controlled by the electronic device like mobiles, computer and laptops. In our proposed system will enable the robot by using smart phone. Its operate based on the microcontroller. The user operates the robot via telnet app which is present in the smart phone simultaneously LCD will display elements which are running parallel.

The proposed system accepts the signal, gives command and controls the robot. This will be most useful in war fields because it can reduce death count in war field and it also can detect metal, livinghuman being can use shooting weapon.

After the survey we done on various wireless technology, we have decided to use wifitechnology in our wireless robot .further as we did on microcontrollers and we found that arduino is the advanced technology which is one of the ATMEL family the series of the controller is ATMEG328. The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digitalinput/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, 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 a AC-to-DC adapter or battery to get started.The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. The Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode. The board has the following new features:

➢ 1.0 pinout: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adaptto the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. The second one is a not connected pin that is reserved for future purposes. the reset line drops long enough to reset

the chip. The Arduino software uses this capability to allow you to upload code.



Arduino pin architecture

Programming:

The Arduino Uno can be programmed with the Arduino software (download). Select "Arduino Uno from the **Tools > Board** menu (according to the microcontroller on your board).

The ATmega328 on the Arduino Uno comes pre burned with a boot loader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files).

You can also bypass the boot loader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header; see these instructions for details.

The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available TheATmega16U2/8U2 is loaded with a DFU boot loader, which can be activated by: On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy) and then resetting the 8U2.On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode.

You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an external programmer (overwriting the DFU boot loader). See this user-contributed tutorial for more information.

III. AUTOMATIC (SOFTWARE) RESET

Rather than requiring a physical press of the reset button before an upload, the Arduino Uno is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 Nano farad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino software uses this capability to allow you to upload code by simply pressing the upload button in the Arduino environment. This means that the bootloader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload. This setup has other implications.

When the Uno is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half second or so, the bootloader is running on the Uno. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened. If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data. The Uno contains a trace that can be cut to disable the auto-reset. The pads on either side of the trace can be soldered together to re-enable it. It's labeled "RESET-EN". You may also be able to disable the auto-reset by connecting a 110 ohm resistor from 5V to the reset line; see this forum thread for details.

USB Over current Protection:

The Arduino Uno has a resettable poly fuse that protects your computer's USB ports from shorts and overcurrent. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.

IV. PHYSICAL CHARACTERISTICS

The maximum length and width of the Uno PCB are 2.7 and 2.1 inches respectively, with the USB connector and power jack extending beyond the former dimension. Four screw holes allow the board to be attached to a surface or case. Note that the distance between digital pins 7 and 8 is 160 mil (0.16"), not an even multiple of the 100 mil spacing of the other pins.

VIN:

The input voltage to the Arduino board when it's using an external power (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

5V:

This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.

3V3:

A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

GND:

Ground pins.

Memory:

The ATmega328 has 32 KB (with 0.5 KB used for the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

Input and Output:

Each of the 14 digital pins on the Uno can be used as an input or output, using pin Mode(), digital Write(), and digital Read() functions. They operate at 5 volts. Each pin can provide or receive maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kohms. In addition, some pins have specialized functions:

Serial (0 (RX) and 1 (TX)):

Used to receive (RX) and transmit (TX) TTL serialdata. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip.

External Interrupts (2 and 3):

These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attach Interrupt () function for details.

PWM (3, 5, 6, 9, 10, and 11):

Provide 8-bit PWM output with the analogWrite () function.

SPI (10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK)):

These pins support SPI communication using the SPI library.

LED (13):

There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off. The Uno has 6 analog inputs, labeled A0 through A5, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the analog Reference () function. Additionally, some pins have specialized functionality:

TWI (A4 or SDA pin and A5 or SCL pin):

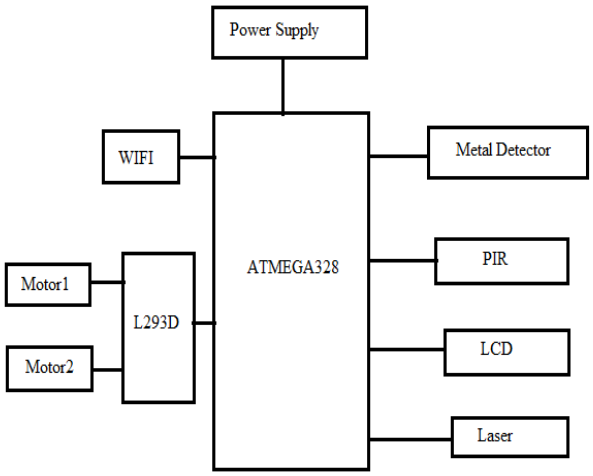
Support TWI communication using the Wire library. There are a couple of other pins on the board:

AREF:

Reference voltage for the analog inputs. Used with analog Reference ().

Reset:

Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board. See also the mapping between Arduino pins and ATmega328 ports. The mapping for the Atmega8, 168, and 328 is identical.



Schematic representation of project hardware

set voltage. The regulators can be selected for operation with load currents from hundreds of mill amperes to tens of amperes, corresponding to power ratings from mille watts to tens of watts.A fixed three-terminal voltage regulator has an unregulated dc input voltage, Vi, applied to one input terminal, a regulated dc output voltage, Vo, from a second terminal, with the third terminal connected to ground.

The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79

regulators provide fixed negative regulated voltages from 5 to 24 volts.

For ICs, microcontroller, LCD --------- 5 volts

For alarm circuit, op-amp, relay circuits ---------- 12 volts

IC 7805:

7805 is an integrated three-terminal positive fixed linear voltage regulator. It supports an input voltage of 10 volts to 35 volts and output voltage of 5 volts. It has a current rating of 1 amp although lower current models are available. Its output voltage is fixed at 5.0V. The 7805 also has a built-in current limiter as a safety feature. 7805 is manufactured by many companies, including National Semiconductors and Fairchild Semiconductors.

The 7805 will automatically reduce output current if it gets too hot. The last two digits represent the voltage; for instance, the 7812 is a 12-volt regulator. The 78xx series of regulators is designed to work in complement with the 79xx series of negative voltage regulators in systems that provide both positive and negative regulated voltages, since the 78xx series can't regulate negative voltages in such a system.

The 7805 & 78 is one of the most common and well-known of the 78xx series regulators, as it's small component count and medium-power regulated 5V make it useful for powering TTL devices.

The LCD display consists of two lines, 20 characters per line that is interfaced with the PIC16F73.The protocol (handshaking) for the display is as shown in Fig. The display contains two internal byte-wide registers, one for commands (RS=0) and the second for characters to be displayed (RS=1). It also contains a user-programmed RAM area (the character RAM) that can be programmed to generate any desired character that can be formed using a dot matrix. To distinguish between these two data areas, the hex command byte 80 will be used to signify that the display RAM address 00h will be chosen Port1 is used to furnish the command or data type, and ports 3.2 to 3.4 furnish register select and read/write levels.

V. THEORY

A liquid crystal is a material (normally organic for LCDs) that will flow like a liquid but whose molecular structure has some properties normally associated with solids. The Liquid Crystal Display (LCD) is a low power device. The power requirement is typically in the order of microwatts for the LCD. However, an LCD requires an external or internal light source. It is limited to a temperature range of about 0°C to 60°C and lifetime is an area of concern, because LCDs can chemically degrade. There are two major types of LCDs which are:

1. Dynamic-scattering LCDs and
2. Field-effect LCDs

The turn-on and turn-off time is an important consideration in all displays. The response time of LCDs is in the range of 100 to 300ms.The lifetime of LCDs is steadily increasing beyond 10,000+hours limit. Since the color generated by LCD units is dependent on the source of illumination, there is a wide range of color choice.

RS, (REGISTER SELECT):

There are two very important registers inside the LCD. The RS pin is used for their selection as follows. If RS = 0, the instruction command code register is selected, allowing the user to send as command code register is selected, allowing the user to send a command such as clear display, cursor at home, etc. If RS = 1 the data register is selected, allowing the user to send data to be displayed on the LCD.

R/W, (READ/WRITE):

R/W input allows the user to write information to the LCD or read information from it.

- R/W = 1 when reading;
- R/W = 0 when writing.

The enable pin is used by the LCD to latch information presented to its data pins. When data is supplied to data pins, a high - to - low pulse must be applied to this pin in order for the LCD latch in the data pins. This pulse must be a minimum of 450 ns wide.

D0 - D7:

The 8 - bit data pins, D0 - D7, are used to send information to the LCD or read the contents of the LCD's internal registers. To display letters and numbers, send ASCII codes for the letters A - Z, a - z, and numbers 0 - 9 to these pins while RS = 1. When RS = 0 to check the busy flag bit to see if the LCD is ready to receive information. The busy flag is D7 and can be read when R/W = 1 and RS = 0, as follows: if R/W = 1, RS = 0. When D7 =1 (busy flag = 1), the LCD is busy taking care of internal operation and will not accept any new information.

VI. CONCLUSION

The project has the goal of manipulating different parts of the robot to make it react according to our desire. This project using mobile phone for robotic control has wide working ranges. So we took an initiative to design model of spy robot that can be widely used to avoid terror attacks, to

ensure more security at border and high density areas. In such a way construction of this robots will carry nation's name, fame globally.

REFERENCES

[1] P. Saucy and F. Mondana, "Khep on the Web: open access to a mobile robot on the internet," IEEE Robot. Autom. Mag., vol. 7, no. 1, pp. 41–47,Mar. 2000.
[2] R. J. Schalkoff, Pattern Recognition: Statistical, Structural and Neural Approaches. New York: Wiley, 1992.
[3] D. Schulz, W. Burgard, D. Fox, S. Thrun, and A. B. Cremers, "Web interface for Mobile robots in public places," IEEE Robot. Autom. Mag., vol. 7, no. 1, pp. 48–56, Mar. 2000.
[4] http://developer.android.com/
[5] www.engineersgarage.com
[6] http://arduino.cc/.
[7] http://reprapworld.com/software