



# IJIRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

e-ISSN: 2319-8753 | p-ISSN: 2320-6710



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 7, July 2021

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 7.569



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# War Field Multipurpose Robot Discarding Explosive through Wireless Controlled Method

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**ABSTRACT:** Nowadays bomb disposal and diffusing has become a very critical and hazardous method to human's life, In order to overcome the problem a concept based on wireless bomb disposal robot is proposed. The bomb is disposed using the robot which will be controlled through the wireless control module. The control module consists of a android app and the actual Robot consists of the receiver module. The receiver module i.e., Bluetooth is interfaced with an 8051-microcontroller board. The Robot functions according to the input given via the transmitter. The control module a wireless video receiver which receives video signal from the wireless camera.

**KEYWORDS:** Gas sensor, RF Module, Metal Detecting Sensor, IP Camera, Video Monitoring, 8051MicroController

## I. INTRODUCTION

For many years, humans have been the core motivation for the development of robot system. It surely had many challenges and limitations with the robotic researches that had taken place thus far. Many efforts have been taken for the development of robots to be used as a replacement for humans to do tasks that are a bit critical and risky to human life who have been constantly exposed to methods like bomb disposing, machine cuttings, etc. Our basic idea is to provide a robot that can be used for bomb diffusion and disposal where it can be controlled from a distance by a bomb disposal expert so that the bomb is carried by the robotic arm by the robot and disposed at a place which is out of the danger zone, away from human population. The robot that we are going to make is a both command-and-control robot. Commands are taken from the user in the form of control signal and performs the required action.

## II. PROPOSED METHOD

### 3.1.1 Bluetooth Module HC-05:

This Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for the transparent wireless serial connection setup. It also provides switching mode between devices. The Bluetooth module has two devices i) master device ii) slave device. One device connects to the master while the other device connects to the slave. Bluetooth module HC-05 consists of six pins. The six pins are Key, 5V, GND, Tx, Rx, Status in order to have proper communication, the master device must be connected to the slave. Once the pairing is done between two devices, the device will ask to enter the password. The password will be either 0000 or 1234. Enter the password and both the devices will be connected to each other

### 3.1.2 Draw Backs of Existing Method:

- Manual power is required
- Zigbee and RF are short distances

The main technology used here for serial communication with the robot is the RF technology. RF technology can be used to share data between two devices considering the range between two devices. The rf receiver module will be connected with the robot and the commands to the robot will be given through the rf transmitter module.

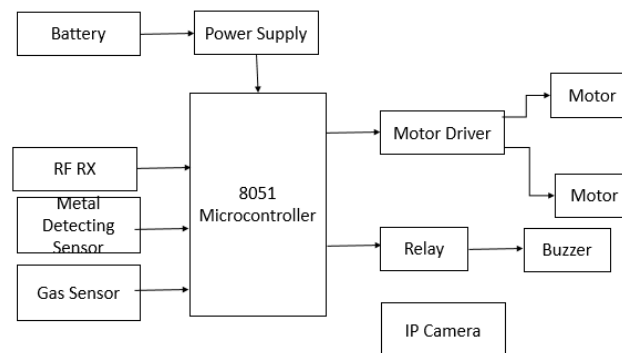
The robot is contained with 8051 series microcontrollers for desired operation and is generally used for spying purposes. The transmitting module consist of the push buttons that send the commands to the receiving module for controlling the movement of robot either to right, left, forward, downward. The receiving module of the robot consists of two motors which are interfaced with the 8051 series of microcontroller to control its movement via motor driver IC.

### Block Diagram:

#### For Transmitter



#### For Receiver:



### Hardware Requirements:

#### Metal Detector:

A **metal detector** is an instrument that detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground. They often consist of a handheld unit with a sensor probe which can be swept over the ground or other objects. If the sensor comes near a piece of metal this is indicated by a changing tone in earphones, or a needle moving on an indicator. Usually the device gives some indication of distance; the closer the metal is, the higher the tone in the earphone or the higher the needle goes.



Fig. Metal Detector

#### MQ2 Sensor:

In current technology scenario, monitoring of gases produced is very important. From home appliances such as air conditioners to electric chimneys and safety systems at industries monitoring of gases is very crucial. Gas sensors are very important part of such systems. Small like a nose, gas sensors spontaneously react to the gas present, thus keeping the system updated about any alterations that occur in the concentration of molecules at gaseous state.

Gas sensors are available in wide specifications depending on the sensitivity levels, type of gas to be sensed, physical dimensions and numerous other factors. This Insight covers a methane gas sensor that can sense gases such as ammonia which might get produced from methane. When a gas interacts with this sensor, it is first ionized into its constituents and is then adsorbed by the sensing element. This adsorption creates a potential difference on the element which is conveyed to the processor unit through output pins in form of current.



Fig. MQ2 Sensor

#### DC Motor:

A machine that converts D.C power into mechanical power is known as a d.c. motor. Its operation is based on the principle that when a current carrying conductor is placed in a magnetic field, the conductor experiences a mechanical force. The direction of this force is given by Fleming's left hand rule and magnitude is given by;

$$F = BIl \text{ newton's}$$

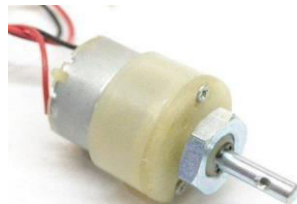


Fig. DC Motor

#### Web Camera:

A webcam is a **video camera** that feeds or **streams** an image or video in real time to or through a **computer** to a **computer network**, such as the **Internet**. Webcams are typically small cameras that sit on a desk, attach to a user's monitor, or are built into the hardware. Webcams can be used during a video chat session involving two or more people, with conversations that include live audio and video. For example, **Apple's iSight** camera, which is built into

Apple laptops, iMacs and a number of iPhones, can be used for video chat sessions, using the Messages instant messaging program. Webcam software enables users to record a video or stream the video on the Internet. As video streaming over the Internet requires much bandwidth, such streams usually use compressed formats. The maximum resolution of a webcam is also lower than most handheld video cameras, as higher resolutions would be reduced during transmission. The lower resolution enables webcams to be relatively inexpensive compared to most video cameras, but the effect is adequate for video chat sessions.



Fig. Web Camera

#### Buzzer:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play.



Fig. Buzzer

#### Block Diagram For 8051 Microcontroller:

It is 8-bit microcontroller, means MC 8051 can Read, Write and Process 8 bit data. This is mostly used microcontroller in the robotics, home appliances like mp3 player, washing machines, electronic iron and industries. Mostly used blocks in the architecture of 8051 are as follows:



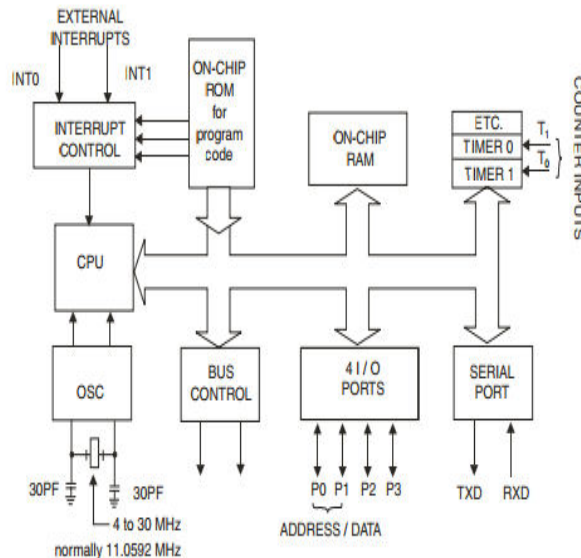


Fig. 1.2 8051 architecture

Fig. 8051 Block Diagram

#### Features Of 8051:

Feature	Quantity
ROM	4k bytes
RAM	128 bytes
Timer	2
I/O pins	32A
Serial port	1
Interrupt sources	6

#### Architecture For 8051 MC:

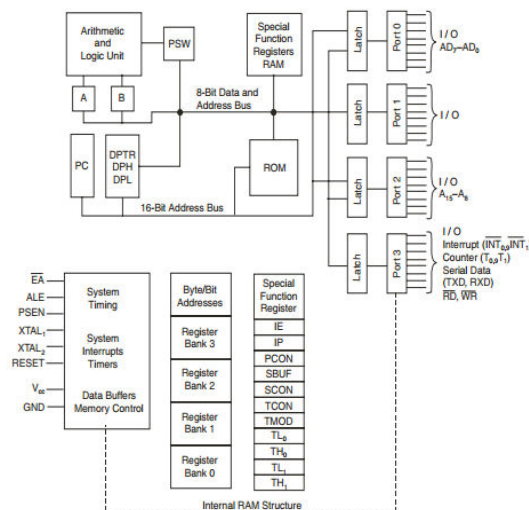


Fig. Architecture of 8051

**Psw Register Formate:**

Commonly known as the PSW register, this is a vital SFR in the functioning of micro controller. This register reflects the status of the operation that is being carried out in the processor. The picture below shows PSW register and the way register banks are selected using PSW register bits – RS1 and RS0. PSW register is both bit and byte addressable. The physical address of PSW starts from D0H. The individual bits are then accessed using D1, D2 ... D7. The various individual bits are explained below.

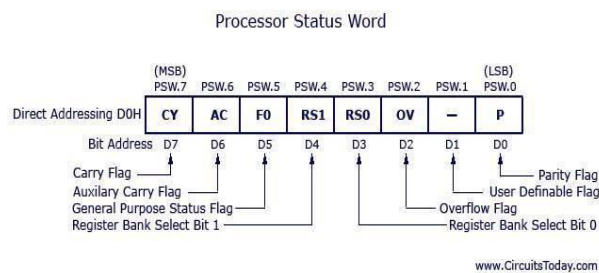


Fig: PSW register format

The program status word (PSW) register is an 8-bit register. It is also referred to as the flag register. Although the PSW register is 8 bits wide, only 6 bits of it are used by the 8051. The two unused bits are user-definable flags. Four of the flags are called conditional flags, meaning that they indicate some conditions that result after an instruction is executed. These four are CY (carry), AC (auxiliary carry), P (parity), and OV (overflow). As seen from below figure, the bits PSW.3 and PSW.4 are designated as RS0 and RS1 as register selection bit, respectively, and are used to change the bank registers. The PSW.5 and PSW.1 bits are general-purpose status flag bits and can be used by the programmer for any purpose. In other words, they are user definable. See below Figure for the bits of the PSW register.

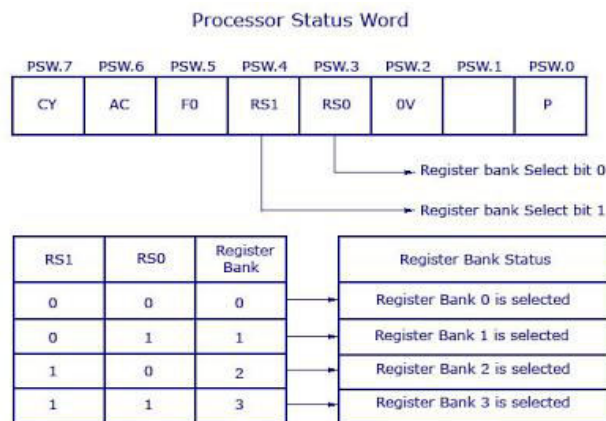


Fig: Processor status word

Instruction that effects flags of PSW:

Instruction	Flag			Instruction	Flag		
	C	OV	AC		C	OV	AC
ADD	X	X	X	CLR C	0		
ADDC	X	X	X	CPL C	X		
SUBB	X	X	X	ANL C,bit	X		
MUL	0	X		ANL C,bit	X		
DIV	0	X		ORL C,bit	X		
DA	X			ORL C,bit	X		
RRC	X			MOV C,bit	X		
RLC	X			CJNE	X		
SETB C	1						

### Software Requirements:

#### Micro-Keil:

The  $\mu$ Vision IDE from Keil joins venture administration, make offices, source code altering, system investigating, and finish recreation in one effective environment. The  $\mu$ Vision advancement stage is anything but difficult to-utilize and helping you rapidly make inserted programs that work. The  $\mu$ Vision editorial manager and debugger are coordinated in a solitary application that gives a consistent inserted venture advancement environment.

8051 microcontroller can be programmed in two languages

- Assembly language
- C language

8051 microcontroller popular development IDE is MCU 8051 IDE and  $\mu$ Vision to develop code.

Keil  $\mu$ Vision IDE consists,

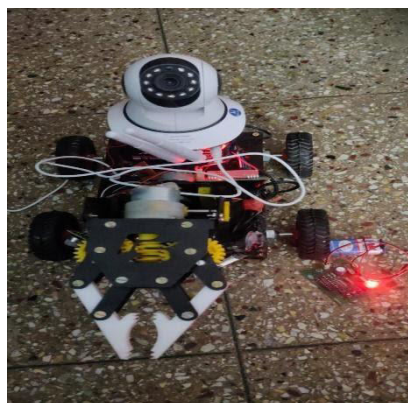
- C Compiler - C51.Exe
- Assembler - A51.Exe
- Linker/Locator - BL51.Exe
- Librarian - LIB51.Exe
- Hex Converter - OH51.Exe

### III. CONCLUSION

Disposing a bomb is quite a challenging job to military & law enforcement agency worldwide and that's why bomb disposal robot demand will increase day by day. This prototype has few limitations in design, dexterity, DOF can enhance the chance to implement in real life application.

We have presented architecture, an implementation, and a demonstration of the INTELLIGENCE SPY ROBOT WITH WIRELESS NIGHT VISION CAMERA USING RF Communication, based on embedded systems and some applicable software programs that can monitor the surroundings. We can install the receiver section at any place and can navigate the robot in all directions easily. This will be help to use the human resources more effectively and efficiently.

### Prototype Models



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- Fig: Prototype Model



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