

## Robot to Pick and Place

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### ABSTRACT

Furthermore, the combination of two professions has greatly aided in making human existence easier and better. So, using both of the aforementioned technologies, a process for designing and implementing a mobile operated mechanica is shown in this work.ROBOT is suggested, which means that the proposed arm will be controlled by a cellular device that links to the robotic arm's receiver. Furthermore, if any key is pressed from the cellular device throughout the course of a call, an indicator indistinguishable from the key pressed is observed at the receiver side.. This tone is referred to as DTMF because it reflects the superimposition of two different frequencies. Furthermore, the DTMF tone is used to control the mechanical Robot. Also, the acquired tone at the receiver is taken into a Arduino using the DTMF decipher module i.e. MT8870. In addition, the decode module unwinds the DTMF signal into its two-bit form before sending the matching number to the microcontroller.. The Arduinois programmed to take an action based on the decoded value. Further, the Arduinoforwards control signals to the motor driver unit to move the arm in forward/backward or multi-directional course.

**Keywords:** Dual tone multi-frequency (DTMF) , GSM (Global System for Mobile

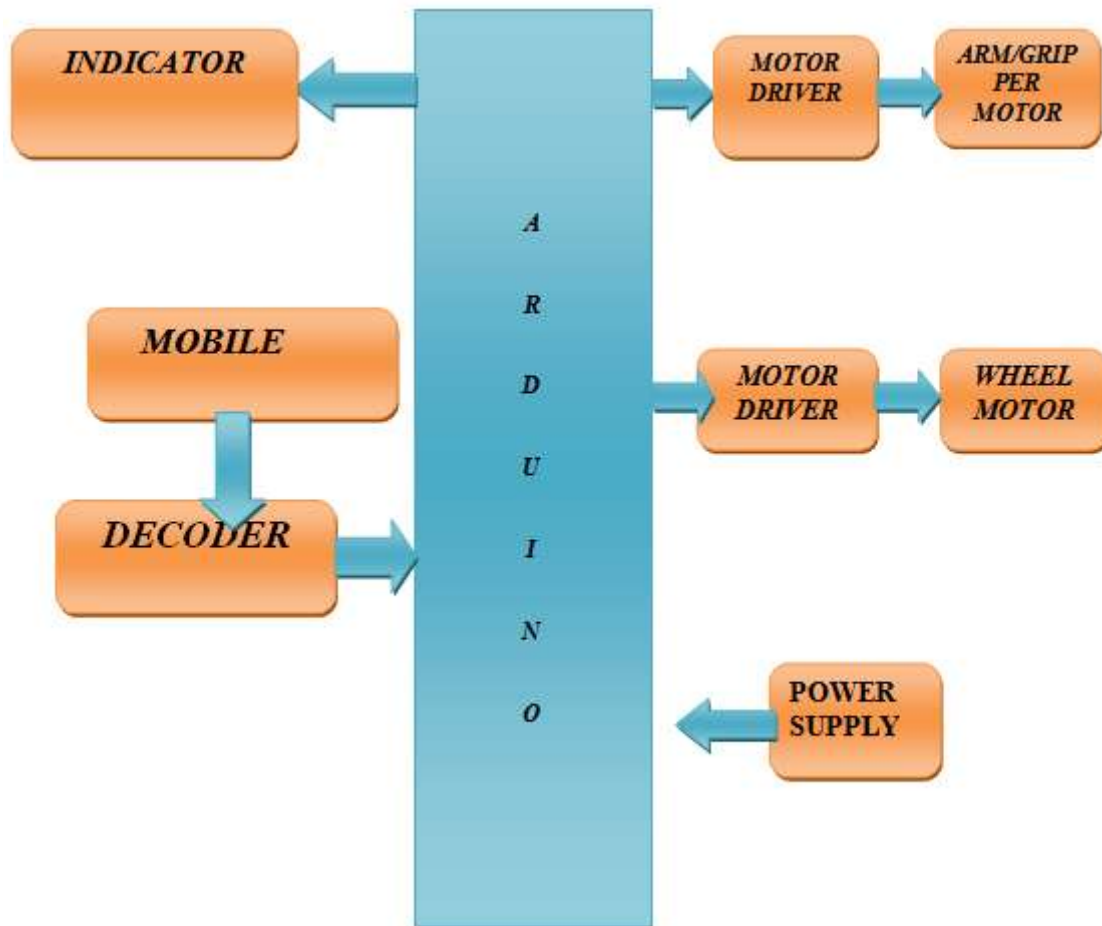
Communications) I .

### I. INTRODUCTION

Traditionally, wirelessly operated robots have relied on circuits, which have limitations in terms of operating range, frequency range, and controlThese restrictions can be solved by using cell phones for robotic controlThese drawbacks can be solved by using cell phones for robotic controlThese restrictions can be solved by using cell phones to operate robotics.

Although robots vary greatly in look and capability, they always include a mechanical, moveable framework that is controlled in some way.Perception, processing, and action are the three phases of robot control.. The pick and place robot in the project is controlled by a mobile phone that makes a call to the robot's mobile phone. If any button is touched during a call, the other end hears a tone termed a "Dual Tone Multiple Frequency" (DTMF) tone that corresponds to the button pressed. Thes are given to the robot.The received tone is processed by the arduino with the help of DTMF decoder IC MT8870. These IC sends a signals to the motor driver IC I293d which drives the forward motion of the motor, reverse, left, right, pick, release, up, down, rotate left, rotate right.

## II. BLOCK DIAGRAM



**Figure 1:** BLOCK DIAGRAM OF PICK AND PLACE ROBO

In this project we are using two mobile phone one for transmitting signal and one for receiving signal. Also we use one DTMF(Dual Tone Multi Frequency) decoder IC, one Arduino, two motor driver IC and 4dc geared motor two motor are 100 RPM used for wheel and two are 60RPM use for hand and up down movement of hand

When we calling the receiving mobile from transmitting mobile then it receives call automatically because it is in the auto answer mode, so no need to answer the call by pressing key.Receiving mobile is attached to the DTMF decoder through 3.5mm audio jack. When we press any key from transmitting mobile then two tones of specified frequency are generated by receiving mobile which are decoded by DTMF decoder

during call in progress.

These decoded 4-bit binary outputs is given to the Arduino input. According to the pressing of key arduino process and gives the output. First we check the password for security purpose because we want to protect and avoid the unwanted access to the robot

Our robot is based on the principle of DTMF technology generated by mobile keypad so we

can control this robot from any where is the coverage of GSM service provider is available; even from other city other country also.According to key press robot moves forward, reverse, left, right or up/down hand or pick and release the object.

### III. IMAGE OF PICK AND PLACE ROBOT



### IV. COMPONENT

Sr. No.	Component Required	Quantity
01	Arduino	01
02	Chassis	01
03	60&100 RPM DC Motor	02+02
04	Gear	03
05	Warm Gear	02
06	Carte Wheel& Robot Wheel	01+02
07	Shaft	01
08	9V Rechargeable Battery	02
09	9V DC Battery	03
10	Capacitor(10uf&30pf)	04
11	Switch	02
12	DTMF Decoder 8870	01
13	Motor Driver IC L293D	02
14	Molex Connector	05
15	Driller bit	02
16	Connector	03
<b>17</b>	<b>TOTAL</b>	<b>=55</b>

### DTMF Decoder IC

The dial tone from the phone line is identified by this DTMF (Dual Tone Multi Frequency) decoder circuit, which decodes the key pushed on the remote telephone. The MT8870DE, a touch tone decoder IC, is utilised to recognise DTMF signals in this application.. It converts the DTMF input to 5 digital outputs To calculate the frequencies of the restricted tones and verify that they correspond to conventional DTMF

frequencies, the M-8870 DTMF (Dual Tone Multi Frequency) decoder IC employs a digital counting advanced. The DTMF tone is a one-way communication system that connects the dialer and the telephone exchange. The touch tone initiator and the tone decoder or detector make up the entire communication system.. For further use, the decoded bits might be connected to a computer or a microcontroller.

### Pin diagram

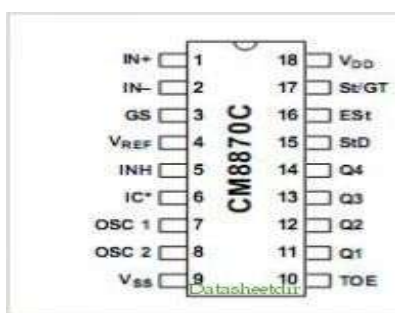


Fig:- 3.2.1 Pin Diagram of DTMF Decoder IC

### DC Motor Driver IC (L293d)

#### L293D Description

The L293D is a common motor driver or motor driver IC that allows a DC motor to rotate in any direction. A 16-pin integrated circuit with two DC motor controllers is the L293D. In either direction at the same time It means that a single L293D IC can operate two DC motors. Integrated circuit for dual H-bridge motor drivers (IC) The

L293d can also operate tiny and quiet large motors; for further information, see the Voltage Specification at the bottom of this page Because voltage must change direction in order to drive a DC motor in either a clockwise or anticlockwise direction, H-bridge ICs are suitable for controlling DC motors.

### DISCRETE COMPONENTS USED

#### Resistor



Fig: 3.4.1 Resistor

Resistor is a passive electrical component with two terminals that implements electrical resistance as a circuit element. Resistors are used in electrical circuits to limit current flow, modify signal, divide voltages, and bias, among other things. active components, and terminate transmission lines High-power resistors, capable of dissipating several watts of electrical power as heat, might be useful. Motor controllers, power

distribution systems, and generator test loads are all examples of applications. The resistance of fixed resistors varies only minimally with temperature, time, or operating voltage. Variable resistors can be used to change the behaviour of circuit components (for example, a volume control). as heat, light, humidity, force, or chemical activity detecting devices.

## Capacitors



A ceramic capacitor is a fixed-value capacitor in which the dielectric is made of ceramic material. It consists of two or more alternating ceramic layers and an electrode layer composed of metal. The electrical behaviour and hence uses of ceramic materials are determined by their composition. Ceramic capacitors are divided into two application classes:

- Class 1 ceramic capacitors provide excellent stability and low losses for resonant circuit applications, whereas

- Class 2 ceramic capacitors provide high volumetric efficiency for buffer, applications using by-pass and coupling. Ceramic capacitors, particularly the multilayer type (MLCC), are the most widely made and utilised capacitors in electronic equipment, with over one trillion (10<sup>12</sup>) units created annually.

## LED



When an electric current flows through a light-emitting diode (LED), it generates visible light. Although the light is not especially strong, it is monochromatic, occurring at a single wavelength in most LEDs. An LED's output can range from red

(at a wavelength of about 700 nanometers) to blue-violet (at a wavelength of about 400 nanometers in diameter). Infrared-emitting diodes (IREDs) are LEDs that emit infrared (IR) light (830 nanometers or longer) (IRED).

## Dc Geared Motor



A DC Geared motor is any of a class of rotary electrical machines that converts direct current electrical power into mechanical power. The most popular kinds rely on magnetic fields to create forces. Nearly all types of DC geared motors

have some internal mechanism, either electromechanical or electrical; to alter the direction of current flow in a portion of the system on a regular basis in part of the motor.

## Gripper Motor



The gripper module is a cutting-edge robotic arm that may be utilised in a variety of 'pick and place' robots. It is powered by a DC motor (9 to 12V DC). Jaw Open & Close Action is caused

by a change in the rotation direction of the DC Motor. The DC motor may be readily controlled using a DPDT switch (manual mode) or any microcontroller in conjunction with the L293D

Motor Driver module..

### Receiver and Transmitter Mobile



orm combines functionality with a clean, uncomplicated modern aesthetic. A stylish touch is added by the sparse and basic bar shape with eye-catching colour contrast border. Better grip is

provided by the scalloped surface back design. Its slim and compact proportions make it simple to grasp and carry, while also giving a pleasant, comfortable grip.

### POWER SUPPLY BATTERY



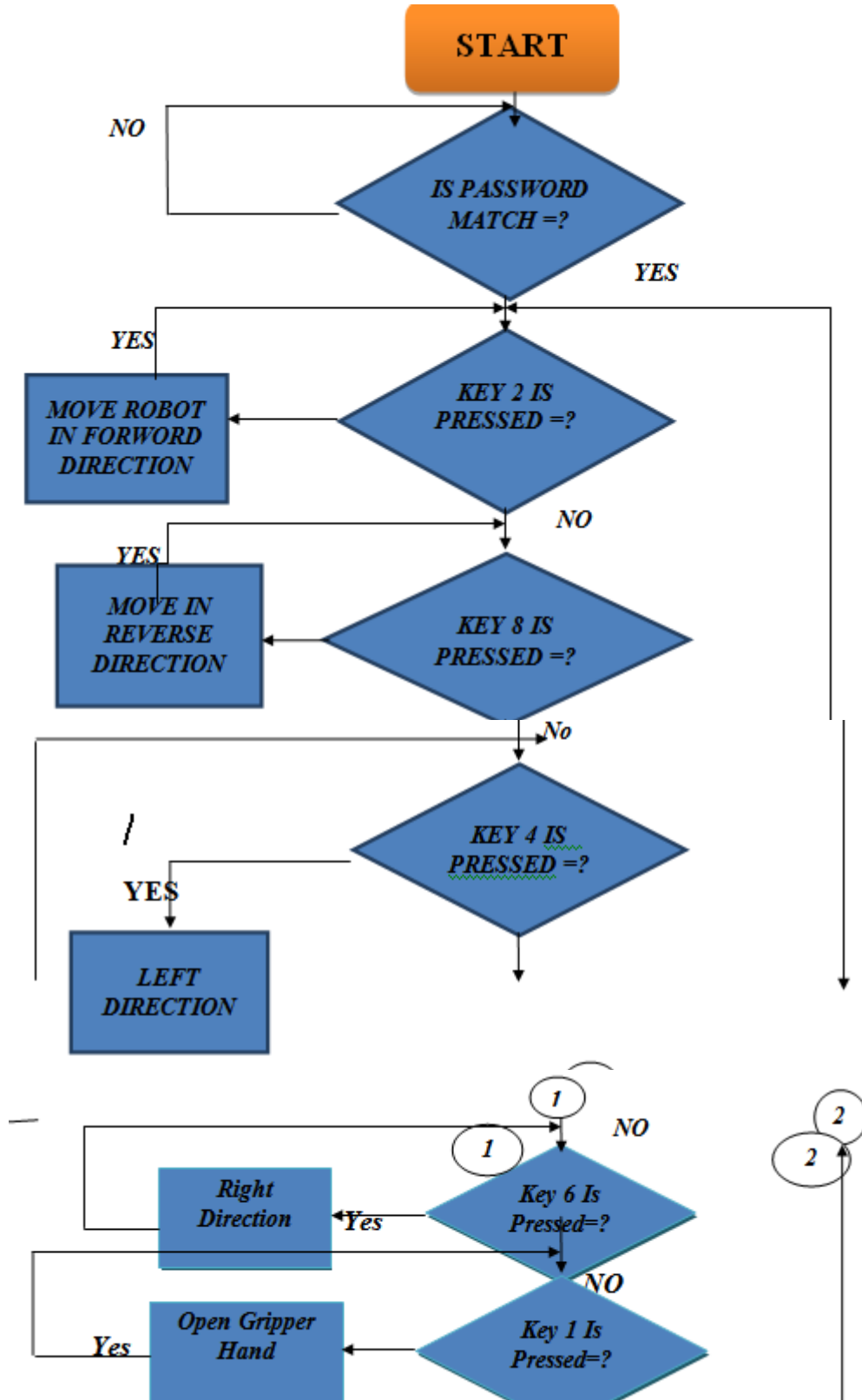
#### Battery

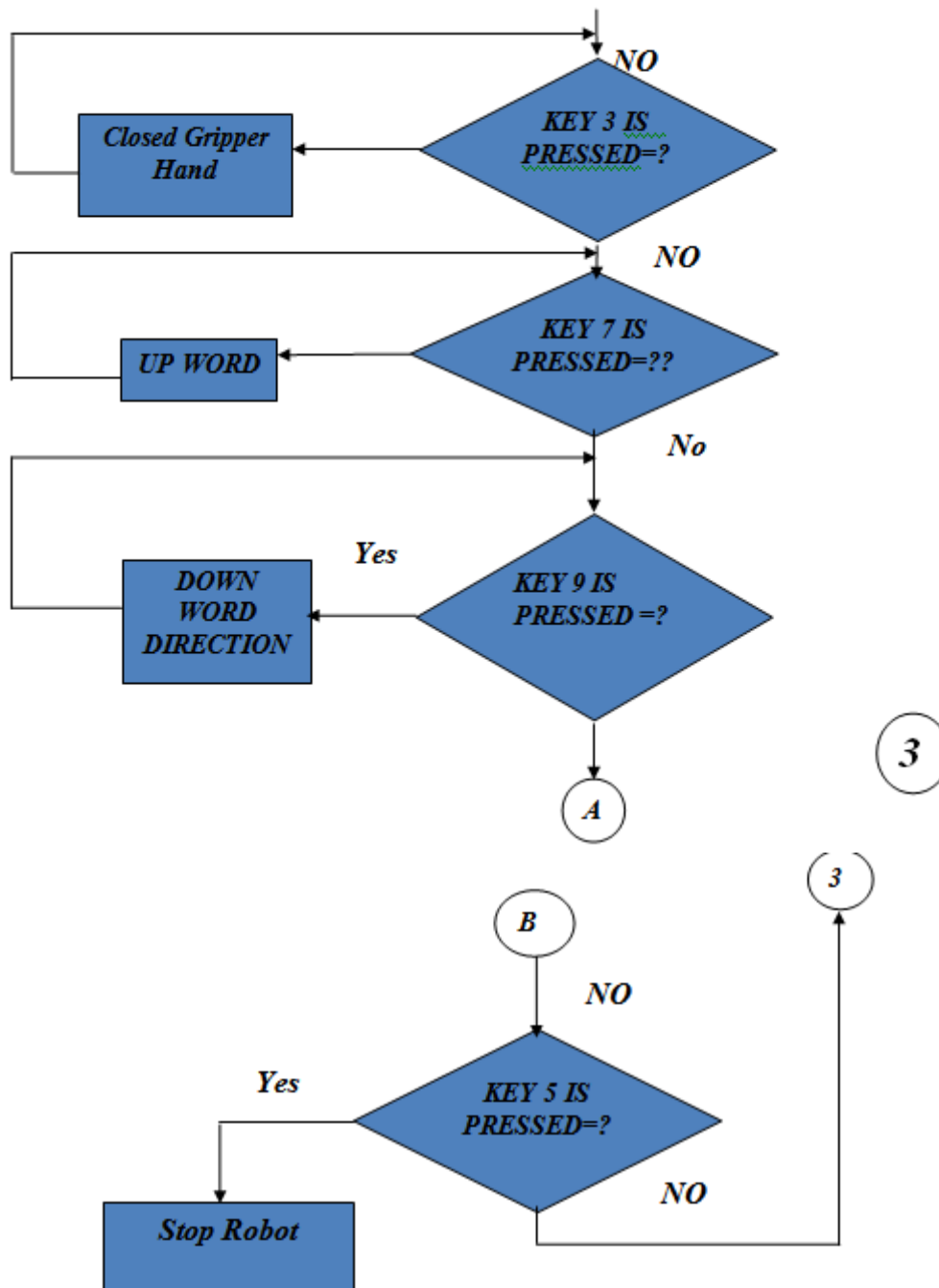
An electric battery is a device made up of one or more electrochemical cells that are linked together to the outside world to power electrical gadgets like flashlights, cellphones, and electric automobiles..The positive terminal of a battery is the cathode, and the negative terminal is the anode while it is delivering electric power. The negative terminal is a source of electrons that will flow and supply energy to an external device when linked to an external circuit. When a battery is linked to an external circuit, electrolytes within the battery can travel as ions, allowing chemical processes to be completed at the terminals and thereby delivering energy to the external circuit.The movement of those ions within the battery causes current to flow out of the battery, allowing work to be done. Historically, the term "battery" referred to a device made up of many cells, but its meaning has expanded to cover devices made up of a single cell as well.

#### V. ALGORITHM

1. Start
2. Check Pass Configure Input & Output Port.
3. Check Password.
4. Check For Key Press.
5. If Key 1 Is Pressed Then The Released The Object.
6. If Key 2 Is Pressed Then Move Forward..
7. If Key 3 Is Pressed Then Pick The Object.
8. If Key 4 Is Press Then Move In Left Side.
9. If Key 5 Is Press Then Stop All Robot Action.
10. If Key 6 Is Pressed Then Move In Right Side.
11. If Key 7 Is Press Then Robot Arm Move Upward Direction.
12. If Key 8 Is Press Then Robot Moves Backward Direction.
13. If Key 9 Is Press Then Robot Arm Moves Downward Direction.
14. Back To Step 4.
15. End

VI. FLOW CHART





### VII. ADVANTAGES

- Working range is rather large.
- More control buttons are available.
- Robust control.
- No interference with other controllers.
- Low cost.
- Easy operation.
- Reduced human efforts.

### VIII. APPLICATIONS AND FUTURE SCOPE

As already mentioned that robotics have greater application in military and rather in all walks of life. Examples being the unmanned aerial vehicles, capturing an militants, spying and rescuing people. Quite a few nations are contemplating to make utilization of these vehicles in case of any catastrophes & natural calamity. Also, these automated vehicles will also be helpful



to reach and access places where human reach and presence is not possible under the circumstances.

Our attempts to create a low-cost integrated system for pick-and-place robot development have so far resulted in the iterative creation of a tried and true hardware platform. The software stack was created with localization in mind.

### IX. CONCLUSION

In this implementation, an electro-mechanical Robot controlled via cellular phone has been developed that makes a call to the cell phone attached to the Robot. During the duration of the call, if any key is pushed, a tone mapped to the key pushed is acquired at the receiver side. The utilisation of wireless technologies, such as GSM and DTMF in this case, eliminates the need for a cabled medium in this remotely driven electro-mechanical Robot. Further, work can still be done to enhance the strength and capacity of this framework. Cell phone that makes a call to cellular phone attached to the base of the mechanical arm provides remote access and As a result, there will be no need to create receiving and transmitting devices in the future, and it will also be free of problems related to RF communication and its reach ability. Furthermore, this approach might be highly beneficial in the collecting of data from human-related domains outreach, which has been one of the prime causes of rise in research activities in this domain.

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