International Journal of Engineering Research & Management Technology ISSN: 2348-4039

March-2017 Volume- 4, Issue-2

Email: editor@ijermt.org www.ijermt.org

DESIGN AND IMPLEMENTATION OF CELL PHONE CONTROLLED PICK AND PLACE ROBOT

Harsh Narayan Dixit
UG student
SRM University NCR Campus
Modinagar

Umashankar Gupta
UG student
SRM University NCR Campus
Modinagar

Harish Goyal
UG student
SRM University NCR Campus
Modinagar

Mr Saptarshi Gupta
Assistant Professor
SRM University NCR Campus
Modinagar

ABSTRACT: Mankind has always strived to give life like qualities to its artifacts in an attempt to find substitutes for himself to carry out his orders and also to work in a hostile environment. The popular concept of a robot is of a machine that looks and works like a human being. The industry is moving from current state of automation to Robotization, to increase productivity and to deliver uniform quality. One type of robot commonly used in industry is a robotic manipulator or simply a robotic arm known as pick and place robot. There was also a need for a robot to work in hazardous conditions and war zones, and reach places those are out of reach of humans, hence pick and place robot can be of great use, it is an autonomous robot which can reach far and wide and has a wirelessly controlled robotic arm, which can be of great use for a number of applications. In this paper pick and place robot is been designed which performs its operation by Cell phone application and PIC microcontroller.

1. INTRODUCTION

Robotics is the branch of engineering science and Technology related to robots, and their design, manufacture, application, and structural disposition. Robotics is related to electronics, mechanics, and software. Robotics research today is focused on developing systems that exhibit modularity, flexibility, redundancy, fault-tolerance, a general and extensible software environment and and seamless connectivity to other machines. The automation is playing important role to save human efforts in most of the regular and frequently carried works. One of the major and most commonly performed works is picking and placing from source to destination.

Present day industry is increasingly turning towards computer-based automation mainly due to the need for increased productivity and delivery of end products with uniform quality.

The pick and place robot is a microcontroller based mechatronic system that picks the object from source location and places at desired location, and for controlling the robot Bluetooth based application is been developed.

2. SYSTEM OVERVIEW

Main Components Required are- Microcontroller -Pic16F876A, 4 servo motors,1 dc motor for arm movements, 2 DC motors for Ground Movement, Bluetooth Module for movement control, IC 7805 and motor driving IC L293D,power supply transistors, resistors and capacitors.

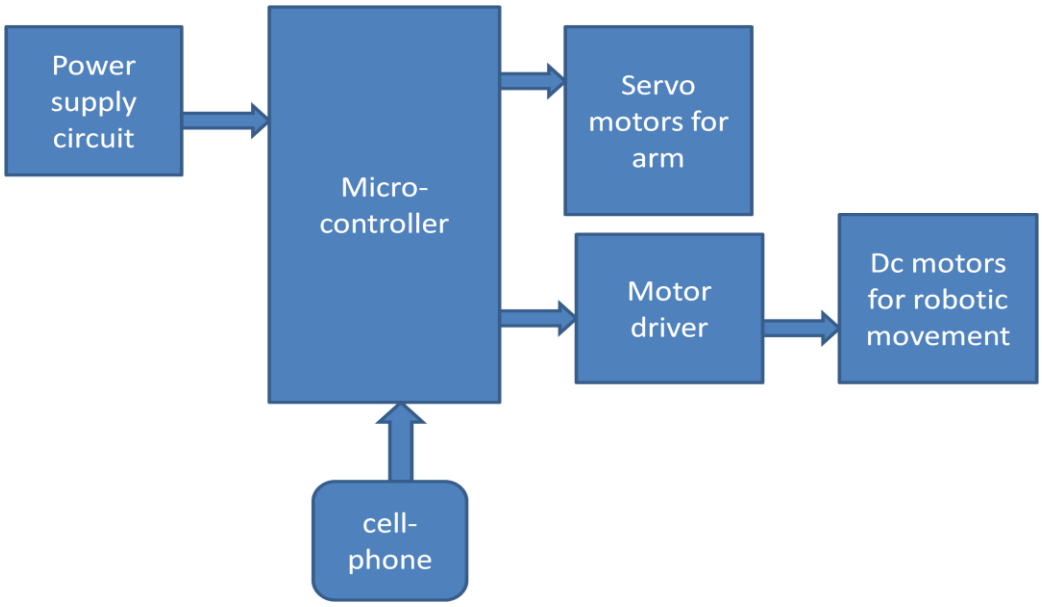

Fig 1:-Block Diagram of Cell Phone Controlled Pick And Place Robot

Features of the project are that two motors are used for ground movement of the robot in forward, backward and side movements, 4 servo motors are used for movement of the jaw in up and down direction and opening and closing of the jaws.

Circuit Diagrams are as follows-

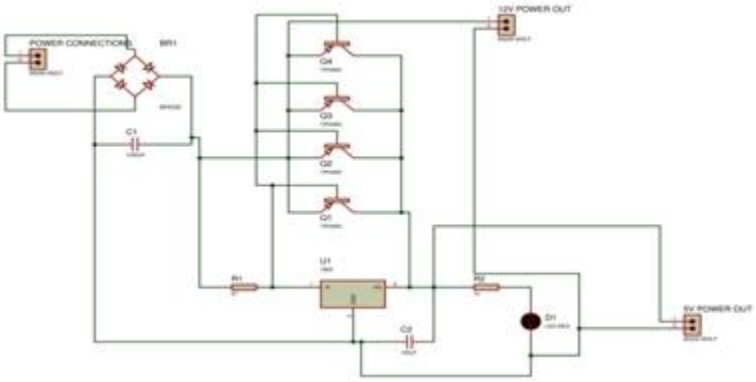

Fig 2: Power Supply Circuit

This is the circuit that is used to provide power supply to the main circuit, Transistors are used to provide the necessary current as the number of motors used here are more in number(4 servo and 3 DC motors). IC7805 is used here as a voltage regulator, to provide the necessary voltage to the PIC microcontroller.

Main circuit is as follows-

Here crystal oscillator is used to provide clock to the circuit, Microcontroller PIC16F876A controls the movements of servo motors for movement of the arm, Microcontroller also sends signal to the motor driving IC L293D for the movement of the robotic vehicle in various directions. Another motor driving IC is

used at the base of the arm to control its movements. Bluetooth Module is used for communication with the cell phone to wirelessly control the robot.

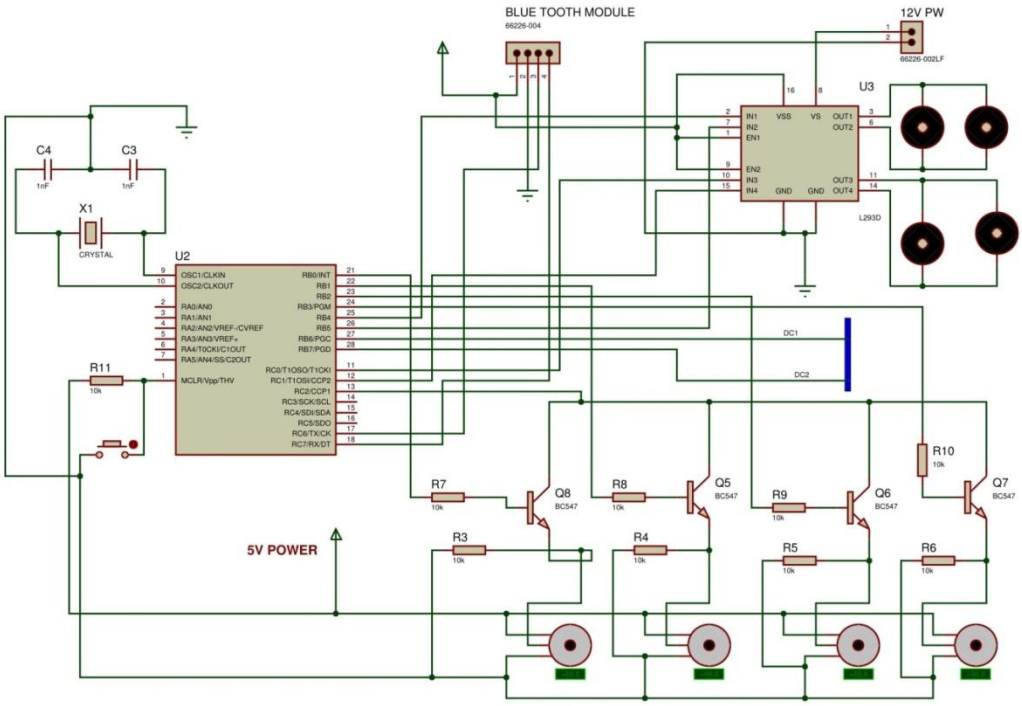

Fig 3.1:- Circuit Diagram of Cell Phone Controlled Pick and Place Robot

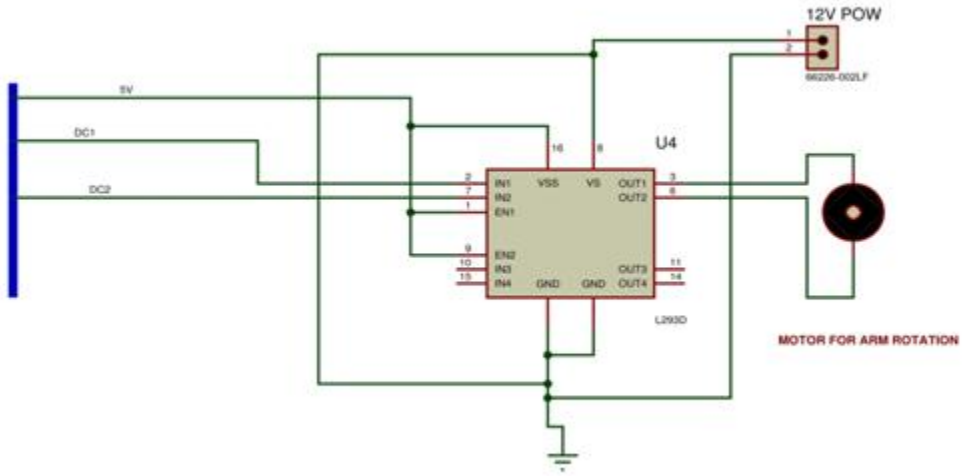

Fig 3.2:- Circuit Diagram of Cell Phone Controlled Pick and Place Robot

3. APPLICATIONS

The robot has a number of uses like military applications in a war zone for example to pull out casualties and to transport objects like weapons and equipments and reaching places out of human reach. There are a number of Industrial applications in automation industry for reducing human effort due to its

wireless, simple and controlled design. These robots will be popular among business owners who require speedy and precise automation applications and material handling systems

4. RESULTS OBTAINED

Robotic arm can be moved freely up and down with jaw opening and closing to facilitate picking and placement of objects. Robotic vehicle can also perform motion and the whole arrangement was controlled wirelessly.

5. CONCLUSION

Thus implementation of cell phone controlled pick and place robot is been done by using a Bluetooth based application which is used to facilitate the movement of the robotic vehicle and robotic arm to pick and place objects. The Robot works in all environments and it overcomes the drawbacks of restricted movements.

6. FUTURE WORK

In future the pick and place robot must be designed in such a way that it is not restricted to particular objects and android application must be designed in such a way that it is capable to capture more articulated objects and complex background.

7. REFERENCES

1. N. Firthous Begum , P. Vignesh " Design and Implementation of Pick and Place Robot with Wireless Charging Application " IJSR , ISSN (Online),2013
2. RK Mittal and IJ Nagarath, “Robotics and Control” BITS Pilani, 2003
3. Ratheesh Rajan ,“Foundation Studies for an Alternate Approach to Motion Planning of Dynamic Systems” M.S.E., the University of Texas at Austin, 2001
4. KangGeon Kim, Ji-Yong Lee and Bum-Jae You, “Providing Services Using Network-Based Humanoids in a Home Environment” IEEE Transactions on Consumer Electronics, Vol. 57, No. 4.,2011