BLUETOOTH CONTROLLED ROBOT
Overview

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Introduction

• Build a robot which can receive commands via bluetooth and work accordingly.
• Develop an android app which allows the user to sends commands via bluetooth.
• Commands received by bluetooth modem connected to Arduino UNO.
• Arduino controls motor which allow the movement of robot.
Block Diagram

RECEIVER

Motor 1
Motor 2

Motor Driver

ARDUINO UNO

Bluetooth Module

TRANSMITTER

Android Application Device

Bluetooth

Power supply

To all stages
Hardware requirements

- Arduino Uno
- Bluetooth Module HC-05
- DC Motor Driver L293D
- DC Motor
- Power Supply
Arduino UNO

- Microcontroller board based on the ATmega328P.
- 14 digital input/output pins (of which 6 can be used as PWM outputs)
- 6 analog inputs.
- 16 MHz quartz crystal
- A power jack
- Connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.
The board...

- LED
- 14 digital inputs/outputs (6 PWM outputs)
- Power indicator
- Reset button
- USB connection
- 16 MHz clock
- Voltage regulator
- AC/DC adapter jack
- DC voltage supply (IN/OUT)
- 6 analog inputs
Bluetooth Module (HC-05)

- For the communication between mobile phone and microcontroller Bluetooth module (HC-05) is used.
- Low Power 1.8V Operation, 1.8 to 3.6V I/O.
- Serial port Bluetooth module have a Bluetooth 2.0+EDR (enhanced data rate), 3Mbps modulation with complete 2.4GHZ radio transceiver and baseband.
- Using Bluetooth profile and android platform architecture different type of Bluetooth applications can be developed.
DC Motor Driver (L293D)

- L293D has quadruple high current half-H drivers.
- Wide Supply-Voltage Range: 4.5 V to 36 V
- High-Noise-Immunity Inputs
- Output Current 600mA Per Channel
- Peak Output Current 1.2A Per Channel.
Circuit Diagram
DC Motor

- 10 to 200RPM 12V DC motors with Gearbox
- 6mm shaft diameter with internal hole
- No-Load Current=60mA(max)
- Load Current=300mA(max)
Power Supply

230 V AC
50 Hz

12V step down transformer

Bridge rectifier

DC in

Filter (470μf)

5v Regulator

INPUT
GROUND
OUTPUT

5V DC

Diagram:

Transformer 12-0V
Bridge Rectifier (+12V)
Voltage Regulator

220V AC
0-12V

1N4007
1N4007
1N4007

470μF
10μF

LED-Red

R40 330Ω

GND 20

(+5V) 40
Android

- Android is an open-source operating system which means that any manufacturer can use it in their phones free of charge.
- It was built to be truly open.
- Android is built on the open Linux Kernel. Furthermore, it utilizes a custom JAVA virtual machine.
Android Application on Mobile Phones

• An android app is meant for phones with an android based operating systems. They can be downloaded from the android app Market which is pre-loaded on every android phone.
• Blue control APP and Bluetooth Spp APP are some examples.
Android Application Operated Bluetooth

- The Android platform includes support for the Bluetooth network stack, which allows a device to wirelessly exchange data with other Bluetooth devices.
- The application framework provides access to the Bluetooth functionality through the Android Bluetooth APIs.
Android Application

BlueStick
Software Used..

- Arduino IDE
- Eclipse Android SDK (Software Development Kit)

Programming Languages Used..

- Embedded C/C++
- Java & XML
Advantages

• It is feasible to implement bluetooth communication between smart phone and microcontroller.
• The development of apps for Android in Android SDK is easy and free of cost.
Applications

• It can be used in various industries where human intervention is not desired.
• It can be used to develop robot with military applications.
• It provides more application based on Android operating system.
• With tremendous smart phone in markets, it is bound to have many more applications in near future.
Future Work

• We can interface sensors to this robot so that it can monitor some parameters.
• We can add wireless camera to this robot.
References

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Questions????
THANK YOU