(Autocad ss)

Each leg consists of three parts. The parts were assembled first with servo motors. Each joint had one motor. That’s a total of 18 servo motors. The base had two parts. The lower part was the platform for all the legs. The upper part had the servo horns mounted on it allowing rotational motion to the inner servo of a leg.

Ja ja chobi ase dewar moto parts assembly er

Each joint of the legs provided one degree of freedom. Inner servo (inservo) gave the front and back motion, mid servo (midservo) gave the up-down motion and the outer servo (outservo) gave the inward outward motion for turning left and right. The bot has different functions built for each movement (front, back, left and right). The initial position of each servo was set to be in the middle so that it can get the full access of rotation. The bot doesn’t stay balanced in shut down mode because of its own weight. An initial position function is provided for this purpose, which would keep the bot on a standby position until further command.

Lekha baki nut bolt er size niye ar veroboard er connection niye ar metal sensor er mechanism niye (kemne kaaj kore, koto distance e kaaj kore etc etc)

Power source:

A 3cell lipo battery is used to supply power. A buck module is used to step down supplied voltage from 11V to 5.3V. We also used PC power supply; it ran well for a few servo but when all servos are connected, power supply wasn’t stable. May be the current rating wasn’t suitable or the wires had been used wasn’t suitable enough. Current rating of lipo battery is good and for this project, 10-12A may pass and lipo can handle this much current flow.

For stepping down the voltage, firstly LM2596 buck converter is used. Due to it’s low current rating (3-A) it wasted. Then SBT5333 DC-DC buck converter is used as it can handle 12A of current. For this project, it ran well.

Microcontroller:

Arduino Mega is used for this project. As there are 18 servos, Sonar, Bluetooth module, metal detector is used above 20 digital pins are needed and Mega can provide this much pins. No additional servo driver is needed for choosing Arduino Mega instead of UNO.

Servo:

In this hexapod ant, each leg consists of 3 servos to mimic the motion of an ant. PWM pins of the sevos are connected to digital pin of Arduino Mega. Vcc and Gnd pins are shorted by using veroboard. By using the veroboard and male pin header, number of wires is/are minimized. 5V is to be supplied to the veroboard.

Bluetooth:

HC05 bluetooth module is used to communicate or giving instruction the microcontroller. Tx & Rx pin is connected to the Rx & Tx pin of Arduino Mega. An app is used for giving input.

SONAR:

SONAR sensor is used to get the distance of obstacles infront of the bot. If the bot gets near the obstacle, the bot will move backward. Trig pin of the module is connected to digital pin 7 and echo pin is to digital 6. Vcc and Gnd can be connected to battery or the 5volt power source.

Metal detector:

Metal detector is connected to digital pin 13. RBD-1066 mini metal detector module is used for this project. From the buzzer portion, digitalread was taken. Then an LED is used for indication.