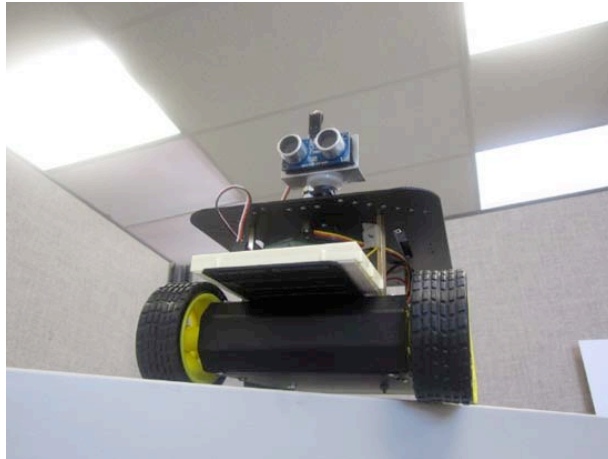


OFFICE J-BOT KIT | JAMECO PART NO. 2140285



Experience Level: Intermediate (requires soldering)
Time Required: 3-5 hours depending on experience

Required tools and parts:

Arduino UNO (**Not Included in Kit**)

11 AA batteries (5 for the motors and 6 for the Arduino, servo and sensor)

Philips screwdriver

Long nose Pliers

Soldering iron and wire

Helping hands

Complete instructions, images, links and videos are available at www.Jameco.com/JBOT

Step 1 - Building the 4 wheel drive platform

Before building the brains, we'll need the basic platform. I found some good videos to help step me through the process of putting together the same 4 wheel drive platform that is included in the J-Bot kit.

After soldering the wires to the motors, I suggest adding a drop of hot glue to the copper clips so the clips do not rip off because they are very fragile. At this point it would be a good idea to label all the cables so you can identify them later. I decided to label them by using regular scotch tape. I labeled the two front motors "FL" and "FR" for front-left and front-right, as well as the back as "BR" and "BL" for back-right and back-left.

Step 2 - Wiring and Mounting Arduino to Platform

To mount the Arduino to the platform, I first put the standoffs on the Arduino to see where I could mount it. I decided to mount the Arduino on the bottom plate because it would require less drilling. I drilled one hole on the platform so I could get all four standoffs connected to the platform.

One of the screws came in contact with one of the headers on the Arduino, so I decided to be safe and insulate the screw with tape. Pull all the wires out from beneath the platform. There should be five cables, four for the motors and one positive battery cable from the switch and the negative cable from the battery pack. Build the Adafruit motor control shield to control the motors on the platform. Be sure you sort out your parts; sometimes the capacitor color will not be the same as the pictures in the instructions. Look at the value of the capacitor, not the color.

The kit includes some headers so you can solder them onto the motor control shield to make it easier to connect the different sensors. The headers that are provided are 8-position. You will need to cut in the

middle of the seventh pin so it will fit onto the motorshield. If you decide not to use the headers, you can solder jumper wires to the board. In this build we will be using pin A0, one grd (ground), and one +5V pin.

Take both sets of wires from the left side (front left and back left) and test them with an AA battery (not included) to make sure they are wired correctly. Both of the wheels should go the same direction. We are wiring the motors in series. Do the same with the right side. After making sure that the motors are wired correctly, put the left side to the terminal labeled M1. Put the right side to terminal M2.

Connect the battery pack cables to the motor shield, attach the standoffs and you will need to solder the plug and the battery holder together. This will provide power to the Arduino Uno. The plug is center positive, so you will need to solder the red cable to center.

Step 3 - Adding the breadboard

I decided to put the breadboard in the front for easy access; so I put the plate on the front side. The breadboard comes with double-sided tape. I left the first row of the plate open in case I want to add other sensors later. Next, slip the servo cable through the top plate and connect it to SER1.

Connect one of the jumpers to pin A0 which is the green cable below. Then connect a jumper cable to ground (yellow) and one to 5 volt (red). On the breadboard connect the power (red cable) to the first row, the ground (yellow cable) to the second row and the signal cable to the first column

Put the header into one end of the extension cable, and put it on the board as shown below. The white cable is the signal, the red cable is power and black cable is the ground.

Step 4 - Adding the PING sensor

We will use the aluminum piece that came with the breadboard to make a holder for the Ping sensor. Put the sensor on the aluminum piece and mark it with a Sharpie. I used regular scissors to cut the aluminum piece. Use the edge of a desk or table to fold the aluminum into a 90 degree angle. I used a small piece of Velcro to stick the sensor to the mount.

Because the aluminum is thin, I used a regular screwdriver to push in a hole in the middle of the mount. I used the circle horn for the servo and attached the mount to it by using the screw provided. I decided to stick the sensor to the mount with Velcro. The servo was attached to the servo hole on the top of the shield by using the standoffs, two screws and two nuts. I attached six AA batteries to the top plate with Velcro in case I want to take the top plate off.

Step 5 - Now time to program!

Arduino software can be downloaded at: www.arduino.cc

First you will need to download the Arduino software. Next download the Arduino Stepper/Servo software library and follow the directions on how to put the library in its respective folder. Next, open the Arduino software and paste the code.

Troubleshooting Guide:

The code will not compile.

1. Make sure the Adafruit motor control library is in its proper folder.
2. Check the code and make sure you copied the complete program.

The IC chips on the Adafruit shield heat up.

1. Check the soldering job. Make sure your soldering is correct on the motor shield.
2. Put a heat sink (P/N 2077335) on the IC. You will need thermal paste (P/N 615312) to put the heat sinks on the IC.

The wheels fall off.

1. Apply a small amount of hot glue to the wheels.