

Bot Spec

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Drive System

- **Power** (4.5 V 80-800mA)
- **Output:** Rotation (Max 120 RPM)
- **Functionality:** Provides mobility
- **Performance:**
 - 90 deg (+- 5 deg) turn
 - 25 in (+- 5 in) / 20 seconds in a straight line
- **Acceptable dimensions (length, width, and height) and weight:**
 - Wheel 11g x4 (60x60x8mm)
 - Motor 19g x2 (36.5x20x27.4mm)

Power

- **Input:** 9V[Arduino] + 1.5V [Motor] + Control Signal
- **Output:** (4.5 V 80-800mA) [Motor] + (7-12V) [Arduino]
- **Functionality:** Provides power to systems that require it
- **Performance:** (4.5 V 80-800mA) [Motor] + (7-12V) [Arduino] for 90 seconds atleast
- **Parameters:**
 - 9V 17.5x26.5x48.5mm
 - 1.5V 50x13x13mm

Communication – Emission (Speaker), Reception (Microphone), Human Interaction

Emission

- **Input:** Control Signal and Power (.5 W)
- **Output:** pulses at 18.75 kHz
- **Functionality:** Outputs messages in the form of pulses
- **Performance:** 200, 300, 400, 500 ms pulse (+- 50ms)
- **Parameters:**
 - Speaker 3.8x20x20mm

Reception

- **Input:** Power and Pulse at 18.75kHz
- **Output:** The decoded message
- **Functionality:** Receives pulses at determined frequency and decodes it
- **Performance:** Differentiate between 200, 300, 400, and 500ms
- **Parameters:**
 - Microphone: 9.7x9.7x4.5mm

Human Interaction

Brake Lights, Turn signals, Headlights, Horn, LED etc. . .

- **Input:** Control Signal
- **Output:** Appropriate feedback for humans (brake lights illuminate when breaking, etc. . .)
- **Functionality:** Provides feedback to human onlookers as to what action is being taken by the bot
- **Parameters:**
 - Speaker:
 - * 0.1 W (0.89 V)
 - * 15x15x5.7mm

Sensor – Magnetic Field, Accelerometer, Light Sensor

Hall Sensor (Collision Prevention)

- **Input:** Magnetic Field + Power
- **Output:** Voltage proportional to magnetic field strength
- **Functionality:** Detect magnetic (Pedestrians)
- **Performance:** Must output a strong enough signal before hitting pedestrian
- **Parameters:**
 - 1.5x4.1x17.05mm

Collision Detection

- **Input:** Collision + Power
- **Output:** Binary signal designating a collision
- **Functionality:** Signals bot to collision
- **Performance:** Minimize false positives and misses

Light Sensor

- **Input:** Light + Power
- **Output:** Light + Voltage
- **Functionality:** Path Following + Bot Collision Detection
- **Performance:** Must differentiate between black blue yellow and red. Must avoid collision with bot.
- **Parameters:**
 - 35x5.8x5.8mm

Microcontroller

- **Input:** (7-12V DC)
- **Output:** Control Signals for various systems
- **Functionality:** Runs all logic and code from running autonomously

Miscellaneous

- **Cost:** \$17,599
- **Weight:** ~3 lbs.
- **Size:** ~10 in. x 10 in. x 10 in.