Team Aeneous Swarm Bot Specification

Functionalities

- Drive subsystem **(Delivery Date: February 12th)**
    - Have two synchronized motors turn forward and backward to move wheels.
    - Perform tight 90 and 180 degree left and right turn.
    - Come to a complete stop when directed.
    - Move at constant speed for 20 seconds.
    - Able to maneuver around obstacles (pedestrians and blocks).
- Path-Following subsystem **(Delivery Date: February 28th)**
    - Detect blue, red, and yellow paths using a photodiode, phototransistor, or photoresistor.
    - Able to search until colored path is found.
- Collision detection subsystem **(Delivery Date: March 12th)**
    - Detect magnetic field using Hall sensor.
    - Detect walls, other robots, and blocks.
    - Send information about environment to Arduino and decide how much time until collision at current speed.
- Communication subsystem **(Delivery Date: March 28th)**
    - Send and receive AM signals as 200, 300, 400, and 500 ms unit step functions.
    - Uses 18.5 kHz carrier signal.
    - Position microphone and speaker correctly to receive and send messages taking consideration of the 60 degree wave cone of the speakers
- Power subsystem **(Delivery Date: April 1st)**
    - Provide power to Arduino and all other electrical subsystems.
- Logic/Microprocessor subsystem **(Delivery Date: April 9th)**
    - Receive signals from drive, communication, path-following, and collision detection subsystems.
    - Make decisions on how to interpret incoming signals, move bot, send communications, and control lights and horn.
- Human Interaction subsystem **(Delivery Date: April 9th)**
    - Able to flash LEDs
        - Red, blue, and yellow LEDs corresponding to path color
        - Headlights: 2 white (on front of robot)
        - Brake lights: 2 red (on back of robot)
        - Turn signals: 4 yellow
        - Communication: red
        - Start: green
        - Pedestrian detection: green
    - Able to beep horn when necessary.

Manufacturing Hours: TBD Cost: $26.31/hr
Engineer Hours: TBD Cost: $42.19/hr
Manager Hours: TBD Cost: $66.11/hr

Specification	Value	Tolerance (+/-)	Unit
Bot dimensions	6 x 6 x 8	2	inches
Weight	3	1	pounds
Battery Life	6	0.6	hours
Precision Speed	1.5	0.25	inches/sec
Turning Radius	TBD	TBD	inches
Max impact survival speed	TBD	TBD	inches/sec

Part	Quantity	Individual Cost (USD)	Total Cost (USD)
9V Energizer Battery	2	1.35	2.70
HAL115 Hall Effect Sensor	1	2.5	2.50
Pololu 120 to 1 Motor	2	5.75	11.50
Blue LED	1	0.29	0.29
Red LED	4	0.46	1.84
Yellow LED	5	0.16	0.80
Green LED	2	0.49	0.98
White LED	2	0.49	0.98
SP-1504 Speaker	1	1.87	1.87
CLS0201MA-L152 Speaker	1	3.87	3.87
Arduino Mega 2560 Board	1	13.99	13.99
CMA-4544PF-W Microphone	1	0.70	0.70
BPV22NF Photodiode	1	0.54	0.54
Wheels	2	TBD	TBD
Miscellaneous	TBD	TBD	TBD
Final Parts Cost	----------	----------	42.56 + TBD