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Electrical and Computer Engineering 304
Junior Design Project

Test Plan
Draft 1

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Section 1: Design Requirements

1. Automatically detect patrons that are up to 10 feet away
2. Shall track the distance of the approaching individual and display it for the visitor and the user
3. Will alert both the approaching individual and the user that the visitor is in violation
4. The system will direct the patron to be 6 feet away
5. The system will utilize a display for the approaching party to show their distance from the desk
6. The system will employ another display for the desk attendant that details the distance of the current patron
7. The desk attendant display will also show the minimum two distances of the patrons over a time-period

Section 2: Verification Plan

Requirement Number	System Requirement	Verification Method	Details
1	Automatically detect patrons that are up to 10 feet away	Demonstration	Have an individual or an object come within various distances up to 10 feet of the device and have the device demonstrate that this is detected
2	Track the distance of the approaching individual and display it for the visitor and the user	Test	Move an object at pre-measured distances and compare this to what the device detects them at
3	Alert both the approaching individual and the user that the visitor is in violation	Test	Move an object to a premeasured distance of 5 feet 11 inches and observe if the device detects this violation
4	Direct the patron to be 6 feet away	Demonstration	When an object is within 6 feet, light up an LED
5	Utilize a display for the approaching party to show their distance from the device	Demonstration	Component demonstrated in Req. 2 test
6	Display for the desk attendant that will display the distance of the patron	Demonstration	Component demonstrated in Req. 2 test
7	Display for the desk attendant that will display the minimum two distances of the patrons over a time-period	Demonstration	Component demonstrated in Req. 2 test

Section 3: System Test Plan

Summary

This test plan will detail how the device will be evaluated to determine if the build meets the design requirements. This test plan verifies that the sensors are working properly in conjunction with the ECU and will not be examining any other components of the build.

Sensor Subsystem

The system will consist of one sensor, a sonar device, that will detect whether a patron is approaching and from this data send information to various displays and turn an LED on or off.

Test 1: Track the distance of the approaching patron

This test will determine whether the device can detect an approaching person and the accuracy of their distance. A person will approach the device and come within 10 feet. Then the person will approach closer, stopping at various pre-determined distances. These distances will be compared to the ones recorded on the device.

The device will pass this test if it accurately measures all distances between 5 inches of the actual value. The device fails this test otherwise.

Test 2: Alerting the parties when the visitor is in violation

This test will examine whether the device can detect that the approaching person is violating the distance guideline. A person will approach the device from a distance greater than 6 feet, then come closer than 6 feet. The device should light up an LED informing of the violation.

The device will pass this test if it detects a violation during each test as any failure in this build ruins the goal of the product. Failure of this test will be given if not.

Section 4: System Demonstration Plan

Summary

The purpose of the system demonstration plan is to exhibit the functionalities and requirements of the device.

Demonstration 1: Detect when a person is 10 feet away

Have a person approach the device farther than 10 feet away then come into 10 feet of the device. The device should present that it has detected the patron.

Demonstration 2: Displaying the distance of the approaching patron

Have a person approach the device and momentarily stop at pre-measured distances. These distances will be compared to the readings displayed on the visitor's and user's separate displays. Both displays should display the same distances.

Demonstration 3: Display the minimum two distances of interactions for the user

A person will approach the device three times, all of which being of different distances. The desk attendant's display should read the two minimum distances of those approaches.

Section 5: Block Diagram