System Test Plan

For

RF Direction of Arrival System

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TABLE OF CONTENT

1. Introduction

1.1. Purpose

This document is a test plan for the Radio Frequency (RF) Direction of Arrival (DoA) System Testing, produced by the RF DoA Team R. It describes the testing strategy and approach that the DoA testing team will use to verify that the application meets the established requirements needed in the classroom prior to release. Some of the testing for this system includes subsystem testing such as antenna response, antenna switching capabilities, analog to digital signal processing, and computer software computation of angle given a sampled signal.

1.2. Objectives

- Meets the requirements, specifications, and the Competition Rules.
- Supports the intended business functions and achieves the required standards.
- Satisfies the Entrance Criteria for User Acceptance Testing.

2. Functional Scope

The Modules in the scope of testing for the RF DoA System Testing are mentioned as follows.

- Antenna Array Testing
- Antenna Switching Array Testing
- Analog to Digital Signal Testing
- Directional Computational Software Testing
- Visual Display Output Testing
- Product Usability Testing

3. Overall Strategy and Approach

3.1. Testing Strategy

The RF DoA System Testing will include testing of all functionalities that are in the scope (refer to the Functional Scope Section) identified. System testing activities will include the testing of 5GHz signal detection, antenna switching, analog to digital, software signal computations, and screen level validations.

3.2. System Testing Entrance Criteria

In order to start system testing, certain requirements must be met for testing readiness. The readiness can be classified into:

- Requirements have been clearly defined and met.
- Testable code and hardware are available.
- Test cases have been developed and are available to be executed.
- The test environment has been prepared and is available.

3.3. Testing Types

3.3.1. Usability Testing

User interface attributes, cosmetic presentation, and the content will be tested for accuracy and general usability. The goal of Usability Testing is to ensure that the User Interface is comfortable to use and provides the user with consistent and appropriate access and navigation through the functions of the application (e.g., access keys, consistent tab order, readable fonts, etc.)

3.3.2. Functional Testing

The objective of this test is to ensure that each element of the component meets the functional requirements of the business as outlined in the:

- Competition / Functional Requirements
- Competition rules or conditions
- Other functional documents produced during the course of the project i.e. resolution to issues/change requests/feedback

3.4. Suspension Criteria and Resumption Requirements

This section will specify the criteria that will be used to suspend all or a portion of the testing activities on the items associated with this test plan.

3.4.1. Suspension Criteria

Testing will be suspended if the incidents found will not allow further testing of the system/application under-test. If testing is halted, and changes are made to the hardware, software, or database, it is up to the Testing Manager to determine whether the test plan will be re-executed or part of the plan will be re-executed.

3.4.2. Resumption Requirements

Resumption of testing will be possible when the functionality that caused the suspension of testing has been retested successfully.

4. Execution Plan

The execution plan will detail the test cases to be executed. The Execution plan will be put together to ensure that all the requirements are covered. The execution plan will be designed to accommodate some changes if necessary if testing is incomplete on any day. All the test cases of the projects under test in this release are arranged in a logical order depending upon their interdependency.

5. Traceability Matrix & Defect Tracking

5.1. Requirement Testing

Requirement numbers correspond to the SRS documentation and were left unchanged to avoid confusion.

- **Functional Requirements**

3.1.1. The system shall be able to detect a 5GHz signal in the ISM band.
3.1.2. The system shall prevent a signal from being detected by more than one antenna by using copper deflectors.
3.1.3. The system shall be able to receive a signal in the 5GHz range for

interpretation using the antenna array.

3.1.4. The system shall switch between which antenna is currently inputting data into the system.
3.1.5. The system shall filter out noise using the bandpass filter.
3.1.6. The system shall amplify the signal through the LNA.
3.1.7. The system shall process the signal from analog to digital through the SDR.
3.1.8. The system shall analyze the signal through the algorithm ran on the computer.
3.1.9. The system shall determine the DoA of the 5GHz signal.
3.1.10. The system shall display the DoA of the 5GHz signal.
3.1.11. The system shall repeat the process starting from functional requirement 3.1.1 once functional requirements 3.1.9 and 3.1.10 are met.

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1.	3.1.1	a. Turn on Raspberry Pi 4 b. Run Program	System will be able to detect a 5GHz signal in the ISM band	Pass	
2	3.1.2	a. Turn on Raspberry Pi 4 b. Run Program	System will prevent a signal from being detected by more than one antenna by using copper deflectors.	Pass	
3	3.1.3	a. Turn on Raspberry Pi 4 b. Run Program	System will be able to receive a signal in the 5GHz range for interpretation using the antenna array.	Pass	

4	3.1.4	a. Turn on Raspberry Pi 4 b. Run Program	System will switch between which antenna is currently inputting data into the system.	Pass	
5	3.1.5	a. Turn on Raspberry Pi 4 b. Run Program	System will filter out noise using the bandpass filter	Pass	
6	3.1.6	a. Turn on Raspberry Pi 4 b. Run Program	System will amplify the signal through the LNA.	Pass	
7	3.1.7	a. Turn on Raspberry Pi 4 b. Run Program	System will process the signal from analog to digital through the SDR.	Pass	
8	3.1.8	a. Turn on Raspberry Pi 4 b. Run Program	System will analyze the signal through the algorithm ran on the computer.	Pass	
9	3.1.9	a. Turn on Raspberry Pi 4 b. Run Program	System will determine the DoA of the 5GHz signal	Pass	

10	3.1.10	a. Turn on Raspberry Pi 4 b. Run Program	System will display the DoA of the 5GHz signal	Pass	
11	3.1.11	a. Turn on Raspberry Pi 4 b. Run Program	System will repeat the process starting from functional requirement 3.1.1 once functional requirements 3.1.9 and 3.1.10 are met.	Pass	

- **Hardware Interface Requirements**
  - 3.2.1. The system shall turn on when a switch is flipped to the ON position
  - 3.2.2. The system shall turn off when a switch is flipped to the OFF position
  - 3.2.3. The testing hardware shall be coordinated by a single-board computer.
  - 3.2.4. The testing hardware shall consist of the following:
    - 3.2.4.1. Software Defined Radio (HackRF One)
    - 3.2.4.2. Whip Antenna
  - 3.2.5. The Raspberry Pi shall be running on a computer running Python.
  - 3.2.6. The Raspberry Pi shall consist of:
    - 3.2.6.1. Broadcom BCM2837b0, Cortex-A53(ARMv8) 64-bit SoC at 1.4GHz
    - 3.2.6.2. 1GB LPDDR2 SDRAM
    - 3.2.6.3. Gigabit Ethernet over USB 2.0
    - 3.2.6.4. Extended 40-pin GPIO header
    - 3.2.6.5. Full-size HDMI
    - 3.2.6.6. 4 USB 2.0 ports
    - 3.2.6.7. DSI display port
    - 3.2.6.8. 4-pole stereo output and composite video port
    - 3.2.6.9. Micro SD port
    - 3.2.6.10. 5V/2.5A DC power input
    - 3.2.6.11. Power-over-Ethernet (PoE)
  - 3.2.7. The antenna shall consist of the following:
    - 3.2.7.1. The antenna shall be made out of a conductive material, in this case, copper.

3.2.8. The system shall have a SPDT switch PCB consisting of the following:
 3.2.8.1. SKY13351-278LF RF Switch
 3.2.8.2. 50 ohm SMA connectors
 3.2.8.3. 5GHz matched transmission lines
3.2.9. The system shall have two SP4T switch PCBs consisting of the following:
 3.2.9.1. E4244A-Z RF Switch
 3.2.9.2. 50 ohm SMA connectors
 3.2.8.3. 5GHz matched transmission lines

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.2.1	a. Flip the switch up	The system will turn on		Not added to the system
2	3.2.2	a. Flip the switch up. b. Wait until the system turns on. c. Flip the switch down.	The system should turn on and then turn off completely.		Not added to the system
3	3.2.3	a. System is connected to the Raspberry Pi.	The system will be connected to the Raspberry Pi by several different connections.	Pass	
4	3.2.4.1	a. Connect SDR to the testing platform USB input. b. Detect the device on the platform.	The platform will detect and connect to the device.	Pass	

5	3.2.4.2	a. Connect whip antenna to SDR through FMA connector.	The SDR must be securely connected to the whip antenna.	Pass	
6	3.2.5	a. Open software installed list	Python will be listed as installed software	Pass	
7	3.2.6.1	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
8	3.2.6.2	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
9	3.2.6.3	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
10	3.2.6.4	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
11	3.2.6.5	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
12	3.2.6.6	a. Check for listed feature on the product.	Feature is a part of the Raspberry	Pass	

			Pi.		
13	3.2.6.7	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
14	3.2.6.8	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
15	3.2.6.9	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
16	3.2.6.10	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
17	3.2.6.11	a. Check for listed feature on the product.	Feature is a part of the Raspberry Pi.	Pass	
18	3.2.7.1	a. Check for listed feature on the product.	Feature is a part of the Antenna array	Pass	
19	3.2.8.	a. Check for listed feature on the product.	Feature is a part of the SPDT switch PCB	Pass	
20	3.2.8.1	a. Check for listed feature on the product.	Feature is a part of the SPDT	Pass	

			switch PCB		
21	3.2.8.2	a. Check for listed feature on the product.	Feature is a part of the SPDT switch PCB	Pass	
22	3.2.8.3	a. Check for listed feature on the product.	Feature is a part of the SPDT switch PCB.	Pass	
23	3.2.9.	a. Check for listed feature on the product.	Feature is a part of the SP4T switch PCB	Pass	
24	3.2.9.1	a. Check for listed feature on the product.	Feature is a part of the SP4T switch PCB	Pass	
25	3.2.9.2	a. Check for listed feature on the product.	Feature is a part of the SP4T switch PCB	Pass	
26	3.2.9.3	a. Check for listed feature on the product.	Feature is a part of the SP4T switch PCB	Pass	

- **Software Interface Requirements**
    - 3.3.1. The system shall use GNU Radio to display 5GHz signals.
    - 3.3.2. The system shall use GNU Radio to print signal readings to a file.
    - 3.3.3. The system shall use GNU Radio to process the signal received by the SDR.

3.3.4. The computer shall be running Windows or Linux operating systems.
3.3.5. The system shall create a digital sample of the signal received.
3.3.6. The system shall display the direction of the signal.
3.3.7. The Raspberry Pi shall run Python to run all systems in tandem.
3.3.8. The system shall use Python to calculate the location of the signal.

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.3.1	a. Open GNU Radio. b. Connect SDR and antenna. c. Run program	Display of the 5GHz signal will display	Pass	
2	3.3.2	a. Open GNU Radio. b. Connect SDR and antenna. c. Run program	The file will populate with complex binary numbers as program is running.	Pass	
3	3.3.3	a. Open GNU Radio. b. Connect SDR and antenna. c. Run Program	Program should run without error if SDR signal is received.	Pass	
4	3.3.4	a. Turn on Raspberry Pi 4	The operating system should be Windows or Linux	Pass	
5	3.3.5	a. Turn on Raspberry Pi 4 b.Open GNU	The program will	Pass	

		Radio. c. Connect SDR and antenna. d. Run Program	show the signals being received by the antenna.		
6	3.3.6	a. Turn on Raspberry Pi 4 b. Run Program	The program will display a GUI	Pass	
7	3.3.7	a. Turn on Raspberry Pi 4 b. Run Program	The entire system shall run in tandem.	Pass	
8	3.3.8	a. Turn on Raspberry Pi 4 b. Run Program	If the display GUI shows up then the direction calculati on works.	Pass	

- **Physical Environment Requirements**
  - 3.4.1. The system shall operate outdoors during clear weather conditions
  - 3.4.2. The system shall operate indoors without interruption from other signals

Test No.	Requiremen t	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.4.1	a. Take the entire system outside in clear weather. b. Run system	The system should work without any issues as its	Pass	

			intended purpose		
2	3.4.2	a. Run the system inside	The system should work without any issues as its intended purpose	Pass	

- **User and Human Factors Requirements**
  - 3.5.1. The system setup shall be understood by non-specialists
  - 3.5.2. The system procedure shall be understandable for non-specialists
  - 3.5.3. The system instructions shall provide detailed, step-by-step instructions for teaching purposes.
  - 3.5.4. The user shall be able to turn the system on with a switch.
  - 3.5.5. The user shall be able to turn the system off with a switch.
  - 3.5.6. The user shall be able to see the direction of the signal displayed on the screen.
  - 3.5.7. The user shall be able to easily transport the system from one place to another.
  - 3.5.8. The user shall be of at least high school age to understand and operate the system.

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.5.1	a. Provide user all components of the system b. Have user describe the system setup	The user can interpret the system setup with little to no difficulty.	Pass	
2	3.5.2	a. Provide user with procedure manual b. Have users read	The user can understand and	Pass	

		procedures and implement procedure.	implemen t the procedure with little to no difficulty.		
3	3.5.3	a. Provide system instructions to user in this case a teacher b. Provide a Heuristic Evaluation of instruction manual.	Heuristic evaluation should have a high score of understan dability.	Pass	
4	3.5.4	a. Have the user locate the switch on the system. b. Have user flip switch on	Users will be able to locate the switch easily and flip the switch on with no confusion.		Not added to the system.
5	3.5.5	a. Have the user locate the switch on the system. b. Have user flip switch off	Users will be able to locate the switch easily and flip the switch off with no confusion.		Not added to the system.
6	3.5.6	a. Have the user turn the system on. b. Ask users to locate the display screen on the system. c. Ask users what they see on the display screen.	The user will describe seeing the direction of the signal displayed on the screen.	Pass	

7	3.5.7	a. Have the user pick up the system. b. Have the user move the system from location A to location B.	The user will be able to pick up and move the system with little to no difficulty.	Pass	
8	3.5.8	a. Have users fill out demographic forms.	The user will be of highschoo l age or a highschoo l teacher. To continue user testing.	Pass	

- **Documentation Requirements**
  - 3.6.1. The documentation shall be understandable to those of at least a high school level of education
  - 3.6.2. The documentation shall give a brief overview of the system.
  - 3.6.3. The documentation shall describe all system features.
  - 3.6.4. The documentation shall list all contingencies regarding the system.
  - 3.6.5. The documentation shall state all test cases that have been tested and not tested.
  - 3.6.6. The documentation shall state if test cases have passed or failed.
  - 3.6.7. The documentation shall list all parties involved in the system.
  - 3.6.8. The documentation shall describe the software interfaces.
  - 3.6.9. The documentation shall describe the hardware interfaces.
  - 3.6.10. The documentation shall state all functional and non-functional requirements.
  - 3.6.11. The documentation shall instruct the user on how to use the system.

Test No.	Requiremen t	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.6.1	No inputs or actions needed	High school reading level.	Pass	

2	3.6.2	No inputs or actions needed	Brief overview of the system	Pass	
3	3.6.3	No inputs or actions needed	Describe all system features	Pass	
4	3.6.4	No inputs or actions needed	List all contingencies regarding the system.	Pass	
5	3.6.5	No inputs or actions needed	State all test cases that have been tested and not tested	Pass	
6	3.6.6	No inputs or actions needed	State if test cases have passed or failed.	Pass	
7	3.6.7	No inputs or actions needed	List all parties involved in the system.	Pass	
8	3.6.8	No inputs or actions needed	Describe the software interfaces.	Pass	
9	3.6.9	No inputs or actions needed	Describe the hardware	Pass	

			interfaces		
10	3.6.10	No inputs or actions needed	State all functional and nonfunctional requirements.	Pass	
11	3.6.11	No inputs or actions needed	Instruct the user on how to use the system.	Pass	

- **Data Requirements**
  - 3.7.1. The system shall collect the signal characteristics and save them for reference.

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.7.1		System will collect the signal characteristics and save them for reference		Not added to the system

- **Resource Requirements**
  - 3.8.1. The system shall require components that can be purchased from vendors only
  - 3.8.2. The price of components to build the system shall be less than or equal to $1,500

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.8.1	No actions		Pass	

		required			
2	3.8.2	No actions required	System should be less than $1,500	Pass	

- **Quality Assurance Requirements**
  3.9.1. The system shall not exceed 20 lbs

Test No.	Requirement	Inputs/Action	Expected Output	Test Result	Test Comments
1	3.9.1	a. Place the system on a weight scale.	The weight shall be below 20 lbs	Pass	

5.2. Traceability Matrix

Requirement No.	Requirement Description	Test Cases	Status	Pass/Fail	Comments
3.1.1	The system shall be able to detect a 5GHz signal in the ISM band.	1	Tested/Done	Pass	
3.1.2	The system shall prevent a signal from being detected by more than one antenna by using copper deflectors.	1	Tested/Done	Pass	
3.1.3	The system shall be able to receive a	1	Tested/Done	Pass	

	signal in the 5GHz range for interpretation using the antenna array.				
3.1.4	The system shall switch between which antenna is currently inputting data into the system.	1	Tested/Done	Pass	
3.1.5	The system shall filter out noise using the bandpass filter.	1	Tested/Done	Pass	
3.1.6	The system shall amplify the signal through the LNA.	1	Tested/Done	Pass	
3.1.7	The system shall process the signal from analog to digital through the SDR	1	Tested/Done	Pass	
3.1.8	The system shall analyze the signal through the algorithm ran on the computer.	1	Tested/Done	Pass	
3.1.9	The system shall determine the	1	Tested/Done	Pass	

	DoA of the 5GHz signal.				
3.1.10	The system shall display the DoA of the 5GHz signal.	1	Tested/Done	Pass	
3.1.11	The system shall repeat the process starting from functional requirement 3.1.1 once functional requirements 3.1.9 and 3.1.10 are met.	1	Tested/Done	Pass	
3.2.1	The system shall turn off when a switch is flipped to the ON position	1	Not Tested		
3.2.2	The system shall turn off when a switch is flipped to the OFF position	1	Not Tested		
3.2.3	The testing hardware shall be coordinated by a single-board computer.	1	Tested/Done	Pass	
3.2.4.1	The testing hardware shall consist	1	Tested/Done	Pass	

	of the following: Software Defined Radio (HackRF One)				
3.2.4.2	The testing hardware shall consist of the following: Whip Antenna	1	Tested/Done	Pass	
3.2.5	The Raspberry Pi shall be running on a computer running Python.	1	Tested/Done	Pass	
3.2.6.1	The Raspberry Pi shall consist of: Broadcom BCM2837b0, Cortex-A53(ARMv8) 64-bit SoC at 1.4GHz	1	Tested/Done	Pass	
3.2.6.2	The Raspberry Pi shall consist of: 1GB LPDDR2 SDRAM	1	Tested/Done	Pass	
3.2.6.3	The Raspberry Pi shall consist of: Gigabit Ethernet over USB 2.0	1	Tested/Done	Pass	

3.2.6.4	The Raspberry Pi shall consist of: Extended 40-pin GPIO header	1	Tested/Done	Pass	
3.2.6.5	The Raspberry Pi shall consist of: Full-size HDMI	1	Tested/Done	Pass	
3.2.6.6	The Raspberry Pi shall consist of: 4 USB 2.0 ports	1	Tested/Done	Pass	
3.2.6.7	The Raspberry Pi shall consist of: DSI display port	1	Tested/Done	Pass	
3.2.6.8	The Raspberry Pi shall consist of: 4-pole stereo output and composite video port	1	Tested/Done	Pass	
3.2.6.9	The Raspberry Pi shall consist of: Micro SD port	1	Tested/Done	Pass	
3.2.6.10	The Raspberry Pi shall consist of: 5V/2.5A DC power input	1	Tested/Done	Pass	
3.2.6.11	The	1	Tested/Done	Pass	

	Raspberry Pi shall consist of: Power-over-Ethernet (PoE)				
3.2.7.1.	The antenna shall be made out of a conductive material, in this case, copper.	1	Tested/Done	Pass	
3.2.8	The system shall have a SPDT switch PCB consisting of the following:	1	Tested/Done	Pass	
3.2.8.1.	SKY13351-278LF RF Switch	1	Tested/Done	Pass	
3.2.8.2	50 ohm SMA connectors	1	Tested/Done	Pass	
3.2.8.3.	5GHz matched transmission lines	1	Tested/Done	Pass	
3.2.9	The system shall have two SP4T switch PCBs consisting of the following:	1	Tested/Done	Pass	
3.2.9.1	E4244A-Z RF Switch	1	Tested/Done	Pass	
3.2.9.2	50 ohm SMA connectors	1	Tested/Done	Pass	
3.2.9.3	5GHz	1	Tested/Done	Pass	

	matched transmission lines				
3.3.1	The system shall use GNU Radio to display 5GHz signals.	1	Tested/Done	Pass	
3.3.2	The system shall use GNU Radio to print signal readings to a file.	1	Tested/Done	Pass	
3.3.3	The system shall use GNU Radio to process the signal received by the SDR.	1	Tested/Done	Pass	
3.3.4	The computer shall be running Windows or Linux operating systems.	1	Tested/Done	Pass	
3.3.5	The system shall create a digital sample of the signal received.	1	Tested/Done	Pass	
3.3.6	The system shall display the direction of the signal.	1	Tested/Done	Pass	
3.3.7	The Raspberry Pi shall run	1	Tested/Done	Pass	

	Python to run all systems in tandem.				
3.3.8	The system shall use Python to calculate the location of the signal.	1	Tested/Done	Pass	
3.4.1	The system shall operate outdoors during clear weather conditions	1	Tested/Done	Pass	
3.4.2	The system shall operate indoors without interruption from other signals	1	Tested/Done	Pass	
3.5.1	The system setup shall be understood by non-specialist s	1	Tested/Done	Pass	
3.5.2	The system procedure shall be understandabl e for non-specialist s	1	Tested/Done	Pass	
3.5.3	The system instructions shall provide detailed, step-by-step instructions	1	Tested/Done	Pass	

	for teaching purposes.				
3.5.4	The user shall be able to turn the system on with a switch.	1	Not Tested		
3.5.5	The user shall be able to turn the system off with a switch.	1	Not Tested		
3.5.6	The user shall be able to see the direction of the signal displayed on the screen.	1	Tested/Done	Pass	
3.5.7	The user shall be able to easily transport the system from one place to another.	1	Tested/Done	Pass	
3.5.8	The user shall be of at least high school age to understand and operate the system.	1	Tested/Done	Pass	
3.6.1	The documentatio n shall be understandabl e to those of at least a high school level of education	1	Tested/Done	Pass	
3.6.2	The documentatio	1	Tested/Done	Pass	

	n shall give a brief overview of the system.				
3.6.3	The documentation shall describe all system features.	1	Tested/Done	Pass	
3.6.4	The documentation shall list all contingencies regarding the system.	1	Tested/Done	Pass	
3.6.5	The documentation shall state all test cases that have been tested and not tested.	1	Tested/Done	Pass	
3.6.6	The documentation shall state if test cases have passed or failed.	1	Tested/Done	Pass	
3.6.7	The documentation shall list all parties involved in the system.	1	Tested/Done	Pass	
3.6.8	The documentation shall describe the software interfaces.	1	Tested/Done	Pass	

3.6.9	The documentation shall describe the hardware interfaces.	1	Tested/Done	Pass	
3.6.10	The documentation shall state all functional and non-functional requirements.	1	Tested/Done	Pass	
3.6.11	The documentation shall instruct the user on how to use the system.	1	Tested/Done	Pass	
3.7.1	The system shall collect the signal characteristics and save them for reference.	1	Not Tetsed		
3.8.1	The system shall require components that can be purchased from vendors only	1	Tested/Done	Pass	
3.8.2	The price of components to build the system shall be less than or equal to $1,500	1	Tested/Done	Pass	

3.9.1	The system shall not exceed x lbs	1	Not Tested		

6. Environment

6.1. Antenna Environment

The System Testing Environment for the initial antenna testing will be the anechoic chamber in the MicaPlex.

The antenna will be mounted inside the chamber and each antenna will be tested.

6.2. Overall System Environment

The System Testing Environment for the overall system will be the RF lab in the Lehman building

7. Assumptions

These test plan assumptions outline the expectations that will be had while performing system tests.

- All signals used for testing the device will be user-generated and controlled by the testing team.
- The system will operate by on/off switching capabilities and will not require user input for operation.
- If a sub-system in the sequence fails the testing criteria, the following systems in the test sequence will be delayed until the sub-system can be verified.
    - The system will be tested in order of subsystems, starting with the received signal at antennas and ending with user display output of direction.

8. Risks and Contingencies

- Waiting for components to arrive could potentially delay the start of assembly.
- Exporting collected data from Airspy could potentially cause the team to take a different approach to get signal data.