

**Multidisciplinary Senior Design
Project Readiness Package**

Project Title:	Avionics Testing Laboratory Automation System (ATLAS)
Project Number: (assigned by MSD)	P18319
Primary Customer: (provide name, phone number, and email)	Lockheed Martin RMS Owego
Sponsor(s): (provide name, phone number, email, and amount of support)	Lockheed Martin RMS Owego
Preferred Start Term:	Fall 2017
Faculty Champion: (provide name and email)	Technical mentor or individual who has a particular interest in the project
Other Support:	
Project Guide: (assigned by MSD)	

Prepared By

Date

Received By

Date

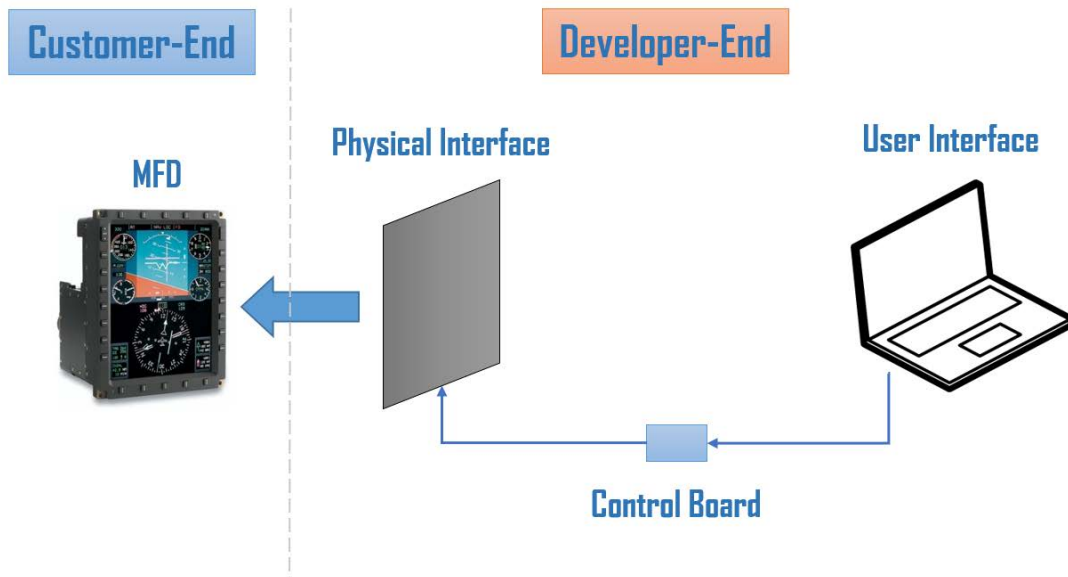
Project Information

*** Overview:**

The goal of Avionics Testing Laboratory Automation System (ATLAS) is to enhance the automated testing capabilities in the avionics labs at Lockheed Martin RMS Owego. The RIT team is to develop a programmable physical interface that can simulate human inputs (keypress and touchscreen) on a Multi-Function Display (MFD) through a scalable, detachable device.

Our short term goals of the project would be to create a proof of concept to ensure this is feasible. We would need to learn if the device is capable of soft touching a glass screen plus having the ability to press a hard key both with the ability to not damage the equipment during the “touch” action.

Our long term goals would be to create a device where the “touch” instrument can handle both soft and hard touches and is designed in a way to do multi “touch” in the future.



*** Preliminary Customer Requirements (CR):**

C R	Requirement Description
1	Automated – system can perform a set of pre-defined tasks without human interference.
2	Universal – system can be used on multiple flight displays by swapping out 1 or 2 components and changing software parameters within the graphical user interface (GUI).
3	Scalable – system can be expanded to work on 2 displays or a larger display with minimal changes to the design (length of rails, longer cables, new mount, etc.).

4	Reliable – system can perform different tasks correctly, in a repeatable manner and function from any orientation from 180 degrees (ceiling mounted) to 0 degrees (table mounted)
5	Efficient – system can perform tasks at a speed close to or faster than a human operator.
6	Can operate both physical buttons and touchscreen flight displays.
7	User-friendly – the graphical user interface shall be intuitive and easy to use.
8	Offline – system must be able to operate without internet access.

*** Preliminary Engineering Requirements (ER):**

ER	Source (CR)	Metric	Specification
1	1	Number of hours of automated operation	X hour
2	2	Number of components needed to change	10 components
3	3	Minimum touch area	6"x9"
4	3	Maximum touch area	30"x30"
5	4	Number of mistakes per hour of operation	0.05 mistakes
6	5	Number of keypresses per minute	90 KPM

*** Constraints:**

- Cannot cause physical damage to the hardware under test during operation.
- Weight of physical device cannot be more than 10 lbs.

*** Project Deliverables:**

Minimum requirements:

- All design documents (e.g., concepts, analysis, detailed drawings/schematics, BOM, test results)
- Working prototype
- Technical paper
- Poster
- All teams finishing during the spring term are expected to participate in ImagineRIT

Additional required deliverables:

- TBD

† Budget Information:

TBD

*** Intellectual Property:**

All students on the team will sign a standard Student Course Project Intellectual Property and Non-Disclosure Agreement. This agreement assigns the rights to the team's project work to the sponsor, and describes the process whereby the project sponsor can reveal proprietary information to the team. The faculty coach will sign a standard Faculty Course Project Non-Disclosure Agreement which describes the same process for revealing proprietary information.

Project Resources

† Required Resources (besides student staffing):

Based on current design we do not foresee the need for specialized equipment or labs.

Faculty Possible US Only based on Export Licensing	Initial/ date
Environment	Initial/ date
Equipment	Initial/ date
Materials	Initial/ date
Other	Initial/ date

† Anticipated Staffing By Discipline:

Indicate the requested staffing for each discipline, along with a brief explanation of the associated activities. “Other” includes students from any department on campus besides those explicitly listed. For example, we have done projects with students from Industrial Design, Business, Software Engineering, Civil Engineering Technology, and Information Technology. **If you have recruited students to work on this project (including student-initiated projects), include their names here.**

Dept.	# Req.	Expected Activities
BME		
CE	3	Software to operate the device through a control board for manual and automated operations using motors, actuators, and sensors. Graphical User Interface (GUI) on a computer for user inputs.
EE	1	Electrical power, wiring, and schematics designs of the system.
ISE		
ME	2	Hardware design, construction, and assembly of the system and mounts. Pre-assigned member: Harvick Tang
Other		