Manager's Project Contract of Deliverables
Corp_5
Manager: [redacted]
Date: 5/29/2012

Tasks:

I. Manufacture the Hinge Tilt Adjustment subsystem
   a. Fabricate and assemble constitutive parts including
      i. Turnbuckle
      ii. Hinge plates
      iii. Tabs
      iv. Gussets
   b. Integrate and test the Hinge with the existing system
      i. Attach the Hinge tool bar via direct interface or using arm bar
      ii. Attach the trencher assembly to the Hinge using existing methods
      iii. Use the turnbuckle to articulate the Hinge and maintain a level cutting depth

II. Manufacture the Residue Shedding subsystem
   a. Fabricate and assemble constitutive parts including
      i. Trencher nose
      ii. Scrapers
   b. Integrate and test the R.S. subsystem with the existing system
      i. Attach the scrapers to an existing Yetter coulter assembly
      ii. Build and attach a simplified "test" trencher (using modified trencher) assembly and attach it to said coulter assembly
      iii. Run the test trencher in heavy wheat residue at various cutting depths and speeds

Measures of Performance: Aside from completion of the above tasks, performance can be measured by how well the complete subsystems, and therefore the system, meet the requirements set in the critical design phase.

Interfacing Plan: Physically the complete subsystems will interface with the system as stated in the Tasks section above. More detail for interfaces can be found in the critical design report. The completed subsystem will also require operation instructions for safe use by all potential operators.

Delivery Date: All tasks must be completed and tested by the end of the summer semester (July 27, 2012).

[redacted]
Sponsor's Signature

[redacted]
Manager's Signature

Technical Advisor's Signature

Corporation 13

Auburn University

MECH 4250

Dr. David Beale

25 January 2016

AFRL Challenge

Managers Promised Contract of Deliverables

This contract, effective as of 25 January 2016, is made and entered into by Dr. David Beale and Corporation 13 in Auburn, Alabama.

Corporation 13 shall deliver a product which meets the requirements agreed upon between Dr. David Beale and Corporation 13 which are derived from desired requirements of the AFRL Challenge. The requirements are as follows:

1. System must be safe to use
2. System shall be capable of being installed on existing aircraft
3. System shall carry at least one user with a weight of up to 450 pounds
4. Descent shall be possible from 90 feet
5. Descent shall occur at a desired rate of at least seven feet per second
6. System shall be compact and light
7. System shall reduce friction to users' hands
8. System shall be easy to use

This contract shall be completed and delivered on or before the week of 18 April 2016.

Dr. David Beale - Overlord

DLB

Morgan Pelt – Manager

Caleb Clemons - Manager

Report Requirements: Complete CAD, BoM, test data, FBDs

The report must document iterative design improvement and the logic of each succeeding improvement based on test data, followed by interpretation of data, and then FBD analysis as a basis for next design iteration.

thermal for gloves

for both GLOVES AND DEVICE !

Manager Project Contract of Deliverable

Team: ME Senior Design ADACS
Student Name: [redacted]
Date: 5/23/14

Task: The following project deliverables shall be completed by the ME Senior Design team Summer 14 semester within Adams software:

1. Complete aerodynamic torque model by developing a function which calculates satellite projected area onto a plane orthogonal to velocity vector.
2. Controls
   - **2.1.** Develop actuator control equations. Magnetorquer functions dependent on error quaternion.
   - **2.2.** Simulation and determination of acceptable control gain range. Simulations use fixed magnetic field vector and constant density.
3. Simulate noise in sensor signal. Determine acceptable range for sensor noise with current satellite parameters.
4. Develop Adams tutorial. Document design methods utilized by ME Senior Design team in Adams.

Measure of Performance (MOP): Deliverable is successful if:

1. Disturbance torque applied to satellite is dependent upon:
   a) atmospheric density
   b) satellite area projected onto plane orthogonal to velocity vector
   c) satellite orientation (point of application of drag force)
   d) drag coefficient
   e) satellite velocity

and changes in real time during simulation.

2.1. Torques produced by actuators are real-time functions of error quaternion and angular velocities multiplied by their respective control gains.

2.2. Range defines control gains which provide attitude control to within 10 degrees of desired quaternion.

3. Determine range for sensor error margin with 10 degree control still accomplished.

4. Following engineers can reproduce Adams model and understand Adams software. Control design progress made by the ME Senior Design team is preserved.

Delivery Date: 7/25/2014

[redacted]	[redacted]	Will McGinnis
Student's Signature (Required)	Manager's Signature (Required)	Technical Advisor's Signature (Optional)

Manager's Project Contract of Deliverables

Date: 6/2/2015 Corp Number/Name: [redacted]

Contract Title: Fiber Damage Detection Machine

Task: Our task is to create a machine that detects fiber damage locations on passing composite fiber tow and is able to analyze and display relevant data.

This machine will be able to pull the fiber at varying angles and take up speeds. The data is collected by two cameras, one recording the fiber before coming off the carrier and the other after coming off the carrier, and a load cell that measures tension. The load cell will be located on a pulley connected to the angle assembly and is between the feed carrier and take up bobbin. The cameras will take images of the passing fiber; these images will then be run through a MATLAB program and be able to count and measure protruding fibers. The program will also display an error percentage of a fiber damage image versus a base undamaged fiber image. The fibers on the tow will be agitated by an air nozzle connected to a vacuum system. At multiple points during the tow's path, loose fibers will be vacuumed from the tow and be collected in a filter. This filter can then be weighed to find the mass lost from the damage along the fiber. The data from the cameras will be sent to a server or host computer for storage and further analysis through MATLAB. The data recorded, not including the MATLAB results, can be displayed on a GUI.

The GUI can also control the speed of the take up motor and the angle the tow is being pulled of the carrier. The GUI will be controlled by a BeagleBone Black board, which also controls the cameras. The BeagleBone Black will be running OpenCV to manage the image capture of the cameras. The capture speed of the cameras will increase when the speed of the motor increases. The BeagleBone Black will also communicate with an Arduino board to manage the speed of the motors. All the electronics will be contained in a power box located on the outside of the machine, with the GUI on the front of the box.

Measure of Performance (MOP): Success of this deliverable is whether the machine can be built and functions correctly by the chosen delivery date. The machine should be able to process the taken images and provide an error percentage, a damage count, and an average length of the fibers. These numbers can be related to a tension measurement and a mass loss measurement taken from loose fibers.

Interfacing Plan: This task will be divided between the group by assigning a member to each system of the machine:

- Luke – Motor Control
- Ryan – GUI
- BK – Vacuum System
- Gabe – Computer Vision/Image Analysis
- Tony – Computer Vision/Image Capture

The electronics will be able to communicate between each other by Arduino boards for the motors and a BeagleBone Black board for the cameras. The GUI will be able to control motor speed and the position of the angle assembly.

My deliverable will be completed by: July 29th, 2015

Student's Signature/Date (required)	**Manager's Signature/Date (required)**	**Technical Advisor's Signature/Date (optional)**