

American Institute of Aeronautics and Aeronautics – IIT Student Branch

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High Altitude Student Payload (HASP)

AIAA-IIT HASP Project Description:

Scarlet Hawk III is going to be AIAA-IIT fourth near space satellite. This is a NASA Columbia Scientific Balloon Facility affiliated project and it comprises around **20 graduate and undergraduate students** from more than 6 different fields and 3 different departments. This project is independently managed by students and welcomes every major and every field.

The idea for this year is to have two experiments on board: one biological scientific experiment and a communication system for a one-liter satellite our student organization is planning on having on orbit by 2017. Additionally, we will consider the feasibility of implement an improved version of last year's independent power system.

This project is aimed for the summer of 2015 (the final date is yet to be assigned). Our final prototype has to be ready on **July 2015**, when we should perform the final test at Columbia Scientific Balloon Facility (in Palestine, Texas).

As you will be able to see, the main components we are budgeting for this time are for the structure of the payload. Aluminum was chosen as the main material to use for the frame and structure of the payload. The reason for us choosing this type of aluminum is that it allows satisfying the minimum shock, thermal and conductivity requirements for a low cost.

We are building a communication system, managed mainly by Arduino microprocessors and some sensors recording environmental measures (temperature, humidity and pressure). The system will also record pictures.

Assignments:

Communications:

- Sensor communication (Arduino): obtains data from each sensor
- Data management(Arduino): collect all data, store into the SD card
- Serial communication(Arduino):
 - Encode data

- Send through serial port
- Data retrieve (Computer):
 - Receive data
 - Decode data
 - Display data

Control/monitoring system:

- Look for best method for our system.
- Possible measure to be monitoring:
- For the electrical system: current and voltage
- For the payload: temperature, pressure, humidity

Structure

- Look for the best materials for the payload (in terms of isolation, weight, strength, temperature, resistance and dimensions).
- Decide the size and the type of structure. Preliminary design.
- Decide the assembling method of the components to the structure.

Estimated Costs:

Estimated Costs for some of the Payloads structure materials:

Item	Price	Quantity	Product Specifications
Aluminum Flat 6061 Sheet	\$414.05	1	Dimensions: 1ft x 8ft Thickness: 1/2 in
Fiber-reinforced plastic	\$39.60	1	2" Square Edge - 4' x 10' ST2X4X8

Estimated Cost for part of the electronic system:

Item	Price	Quantity	Product Specifications
Diodes	\$1.99	10	Rectifier Diodes NTE572 1000V 6 Amp General Purpose Rectifier

Other estimated expenses:

Item	Price	Quantity	Product Specifications
Glass Block Sealant	\$38.97	1	4 Pack 10.3 fl. oz. Glass Block Sealant, non-corrosive, 17-minutes tooling time

Total: \$512.52

Appendix A: Photographs of Items requested in Budget

Aluminum Flat 6061 Sheet

Supplier: Metal depots www.metaldepots.com




The screenshot displays the Metals Depot Shopping Cart interface. On the left is a navigation menu with categories like Angle, Channel, Beams, Flat Bar, Round Bar, Square Bar, Pipe, Square Tube, Rectangle Tube, Round Tube, Diamond Plate, Plate, Sheet, Expanded Sheet, Perforated Sheet, Bar Grating, Safety Grating, Specialty Metals, and Metals Depot® Gear. The main content area shows a progress bar with steps: 1. Shopping Cart (active), 2. Checkout, 3. Order Review, and 4. Finished. Below the progress bar is the title 'Metals Depot® Shopping Cart' and logos for VeriSign, MasterCard, VISA, AMEX, and PayPal. There are links for Save, Print, and Email. A table lists the cart items:

Stock Number	Item Description	Size	Status	Price Each	Totals
F41124	1-1/2 X 4 6061 Aluminum Flat	8 Ft.	In Stock	\$406.00	\$406.00
Sub-Total:					\$406.00
Shipping:					\$8.05
Total:					* \$414.05





Below the table, there are fields for '60616', 'United States', and 'School / University'. A shipping options dropdown is set to 'UPS 3-Day Select' for \$8.05. A yellow banner offers to 'Add FREE MetalsDepot® Catalog to cart?' with a 'Discount Code' field and an 'Apply' button. A notice states: 'Notice: Due to current market conditions, prices are subject to change without notice. * - Orders in KY are subject to a 6% sales tax.' At the bottom are buttons for 'Empty Cart', 'Continue Shopping', and 'Check Out'.

Fiber Reinforced Plastic

Supplier: www.frpshop.com



[Credit Application](#)

	FRP Panel - Bright White 4' x 10'	\$39.20	<input type="text" value="1"/>	Add to Cart
	FRP Panel - Bright White 4' x 12'	\$47.04	<input type="text" value="1"/>	Add to Cart
Smooth White				
	FRP Panel - Smooth White 4' x 8'	\$39.68	<input type="text" value="1"/>	Add to Cart
	FRP Panel - Smooth White 4' x 10'	\$49.60	<input type="text" value="1"/>	Add to Cart
Almond				
	FRP Panel - Almond 4' x 8'	\$32.00	<input type="text" value="1"/>	Add to Cart
	FRP Panel - Almond 4' x 9'	\$36.00	<input type="text" value="1"/>	Add to Cart
	FRP Panel - Almond 4' x 10'	\$40.00	<input type="text" value="1"/>	Add to Cart
Silver (Light Taupe)				
	FRP Panel - Silver 4' x 8'	\$32.00	<input type="text" value="1"/>	Add to Cart
	FRP Panel - Silver 4' x 9'	\$36.00	<input type="text" value="1"/>	Add to Cart

Glass Block Sealant

Supplier: homedepot

Home > Building Materials > Concrete, Cement & Masonry > Glass Blocks & Accessories > Mounting Accessories

Pittsburgh Corning | Model # 102133 | Internet # 100318675

Glass Block Sealant (4-Pack)

★★★★★ (3) [Write a Review](#) [Questions & Answers \(4\)](#)



\$38.96 / case



Ship to Home **FREE** with \$45 Order
Estimated Arrival: FEB 6 - FEB 10



Ship to Store **FREE**
Available for Pick Up: FEB 9 - FEB 12

1

ADD TO CART

SAVE TO MY LIST

OR **Buy now with PayPal**

Item cannot be shipped to the following state(s): AK, GU, HI, PR, VI

 **PRODUCT SOLD ONLINE ONLY**

Rectifier Diode

Supplier: Radioshack

DIY > COMPONENTS & PARTS > DIODES & RECTIFIERS > NTE5812 - RECTIFIER-100PRV 6A

PRINT  [Share](#)

Model: NTE5812 | Catalog #: 55052265

NTE5812 - RECTIFIER-100PRV 6A

★★★★★ (0.0) [Write a Review](#)

\$1.99

In Stock (ONLINE ONLY)

1

ADD TO CART



FREE SHIPPING OVER \$25

[SEND TO A FRIEND](#)