PSIP
Maple Leaf Particle Detector

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Edmonton AB T6G 2G7
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June 1, 2011

Revision: 2.00

Payload Title: Maple Leaf Particle Detector

Payload Class: Large

Payload ID: 009

Institution: University of Alberta

Contact Name: Laura Mazzino

Contact E-mail: *mazzino@ualberta.ca*

Submit Data: June 1, 2011

1 Mechanical Specifications

A. Payload total weight: 17.872kg

B. Mechanical Drawing: (see appendix)

C. Hazardous Materials: None

D. Additional Information: None

2 Power Specifications

A. Measured current draw at 30.75 ± 0.01 VDC: (Nominal payload design without the heater, this design was Thermal/Vac tested) 18 ± 2 mAmps
(worst case: with heater included) 188 ± 2 mAmps,

B. *See appendix for power diagram.* EDAC and EPS Connection:

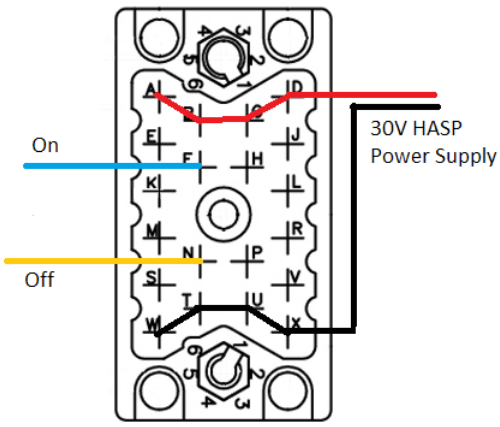


Figure 1: EDAC connector

C. Additional Information: None

3 Downlink Telemetry Specifications

A. Data format: Digital packet.

B. Each second a packet will be send, therefore require 34bytes/second or 272bits/second.

C. Serial data record, the total length is 34 bytes.

Byte	Bits	Type	Description
1-2	16	`uint16_t`	Board ID
3-4	16	`uint16_t`	Packet ID
5-6	16	`uint16_t`	HV1
7-8	16	`uint16_t`	HV2
9-10	16	`uint16_t`	HV3
11-12	16	`uint16_t`	T1
13-14	16	`uint16_t`	T2
15-16	16	`uint16_t`	T3
18-21	32	`uint32_t`	seconds since sys start
22-23	16	`uint16_t`	msecs since last second
24-25	16	`uint16_t`	temperature
26-27	16	`uint16_t`	pressure
28-32	16	3× `uint16_t`	reserved
33-34	16	`uint16_t`	CRC checksum
total 34 bytes.			

Table 1: Data Format

D. Number of analog channels used: None

E. If analog used, what are they used for? N/A

F. Number of discrete lines being used: The two assigned by HASP

G. If discrete lines being used what are they being used for? On/Off

H. Are there any on-board transmitters? N/A

I. Other relevant downlink telemetry information? N/A

4 Uplink Commanding Specifications

A. Command link capability required? No

B. If, so will commands be uplinked in regular intervals: N/A

C. How many commands do you expect to uplink during the flight (n commands per hour): N/A

D. Table of all commands, that you will be uplinking to your payload: N/A

E. Are there any on-board receivers? No

F. Other relevant uplink commanding information? N/A

5 Integration and Logistics

A. Date and Time of your arrival for integration: The student team will arrive on the 31st July, the supervisors will arrive TBD, at Palestine TX. We will be available to integrate at any time assigned by HASP from August 1 to August 5.

B. Approximate amount of time required for integration: 3 hours (2 hour setting up and mounting the detector on the mounting plate, 1 hour for communication and power testing)

C. Integration team leader: Andreas Buttenschön

D. Integration team leader E-mail: *andreas.buttenschoen@ualberta.ca*

E. All integration participants

Name	Nationality*	Email-address
Andreas Buttenschoen	German	andreas.buttenschoen@ualberta.ca
Laura Mazzino	Italian	mazzino@ualberta.ca
Cory Hodgson	Canadian	crhodso@ualberta.ca
Wyatt Johnson	Canadian	wyatt@ualberta.ca
Quinn Farr	Canadian	qfarr@ualberta.ca
Ian Mann	British	imann@ualberta.ca
Jonny Rae	British	Jonathan.Rae@ualberta.ca

Table 2: *Photocopy of passports and additional information available upon request.

F. Define successful integration of your payload. Successful integration is defined as that the payload passes:

- Mechanical fit
- Electrical system
  - Successful turn on.
  - Current lies within expectation
- Successful communication with HASP platform.
- Successful environmental testing
  - Heater (if included) functions properly
- Successful data output, full uncorrupted data packet received.

G. List all integration steps:

- Mechanically mount the payload
- Connect power cable
- Turn on
- Measure current draw
- Connect data/communications cable
- Verify that communications with the platform is working
- Do a count test for the length of the Vacuum test

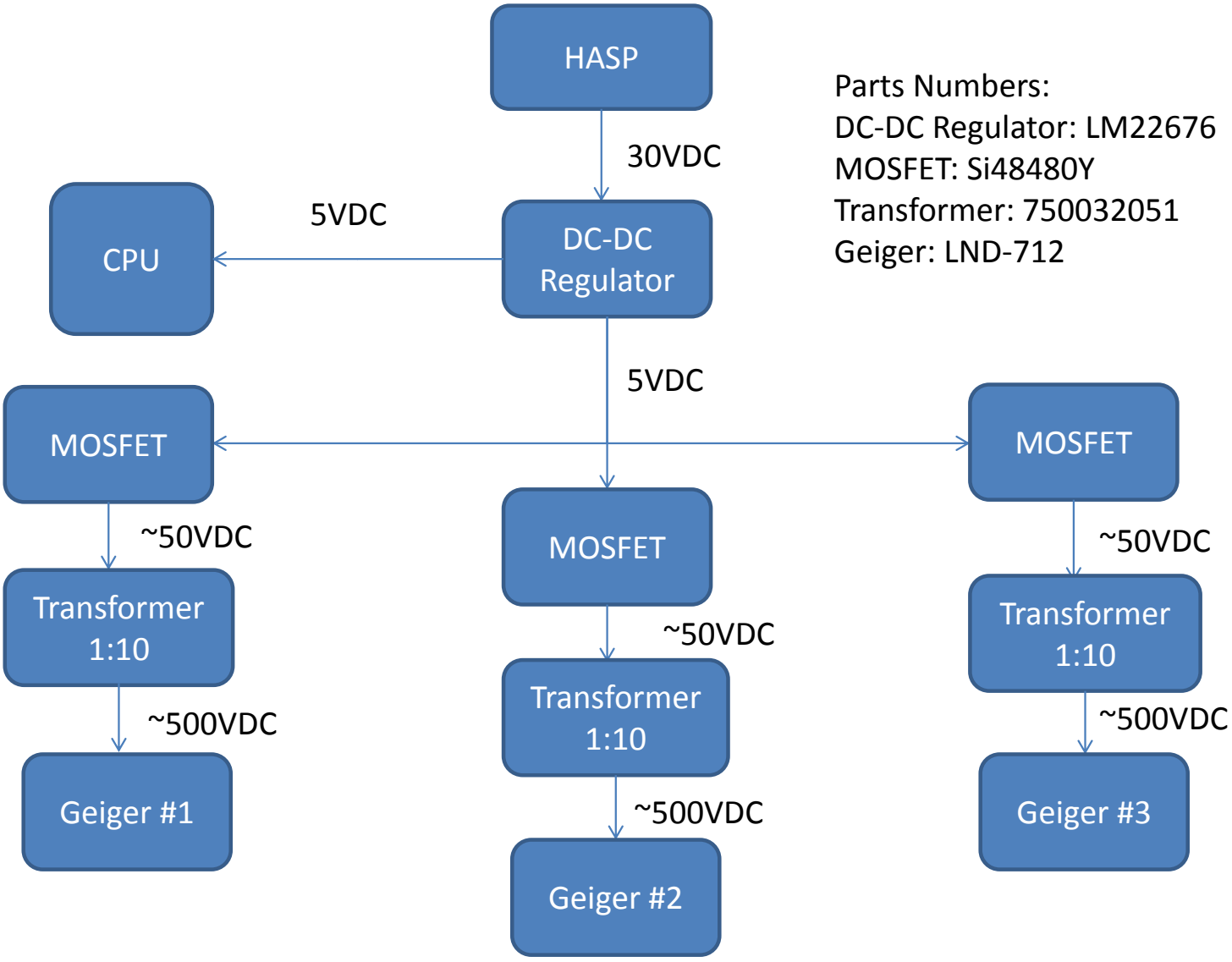
H. List all checks that will be determine a successful integration: All items in point F.

I. Any other LSU personnel support needed? Michael Stewart and Gregory Guzik.

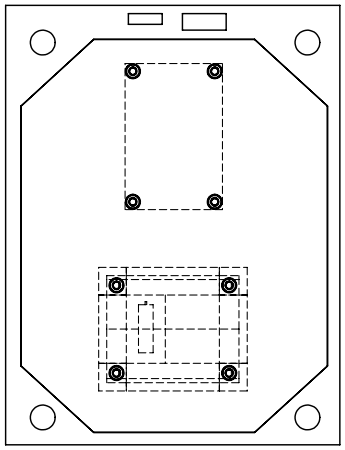
- Introduction to the facility
- Familiarization with the gondola and the interface
- Answering Q&A if any arise

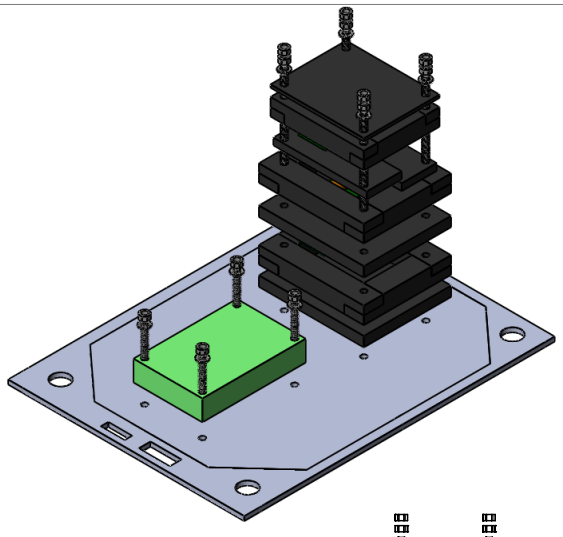
J. list any LSU supplied equipment required for integration? None required.

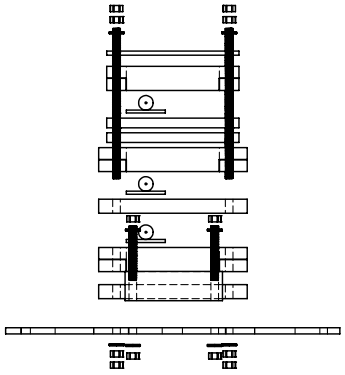
Appendix

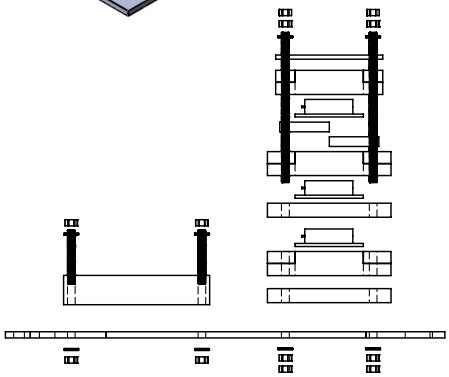


Parts Numbers:
DC-DC Regulator: LM22676
MOSFET: Si48480Y
Transformer: 750032051
Geiger: LND-712









(1:6 Scale)

NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN MM
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

MATERIAL --

FINISH --

DO NOT SCALE DRAWING

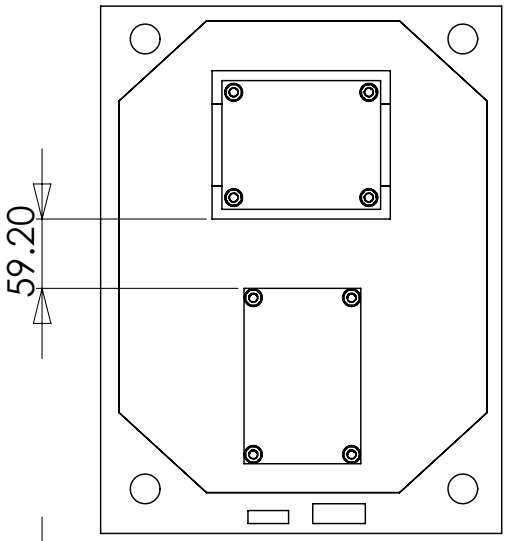
	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

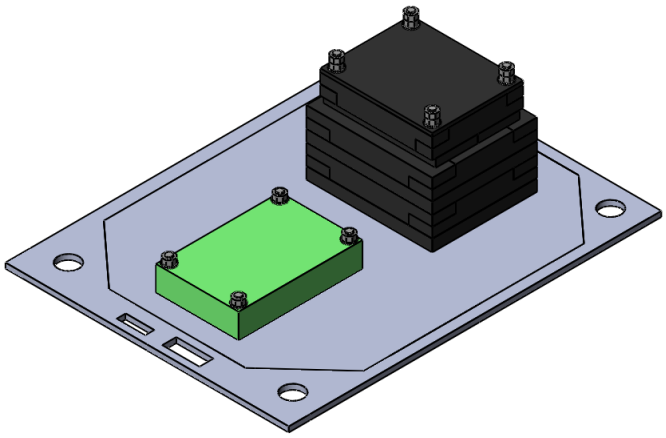
Drawn By:
Wyatt Johnson

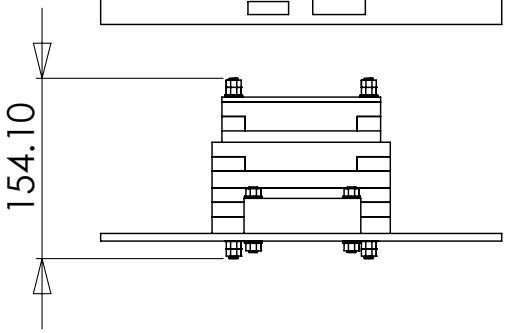
Cosmic Canucks

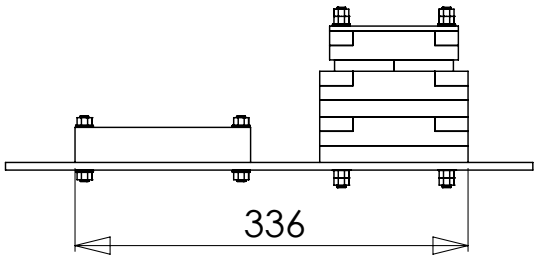
Main Integration Exploded

SIZE	DWG. NO.	REV.
A	1 of 4	
SCALE:1:10	WEIGHT:	SHEET 1 OF 4









(1:5 Scale)

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		DIMENSIONS ARE IN MM TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	Drawn By: Wyatt Johnson		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

Cosmic Canucks

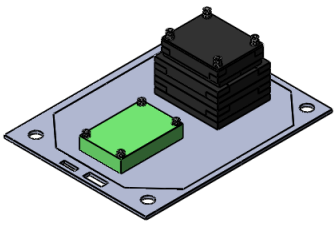
TITLE:

Main-Integration

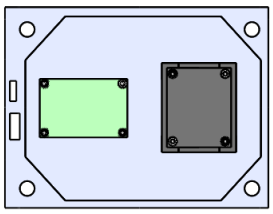
SIZE	DWG. NO.	REV
A	2 of 4	

SCALE: 1:10 | WEIGHT: | SHEET 2 OF 4

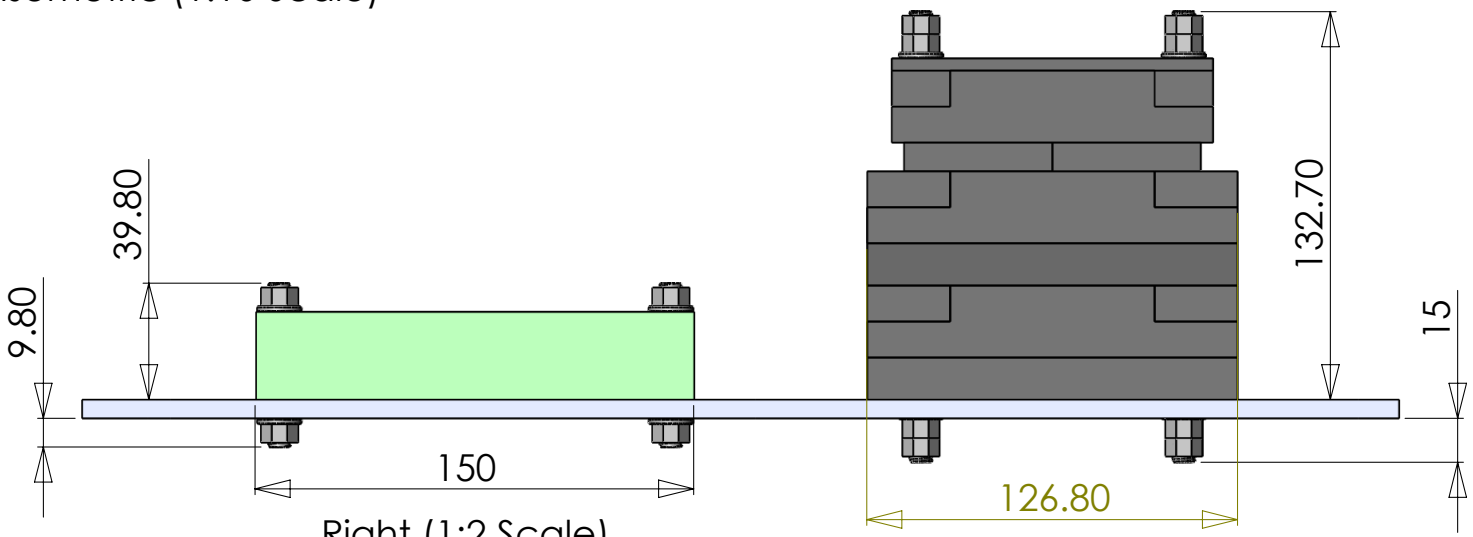
5 4 3 2 1



Isometric (1:10 Scale)



Bottom (1:10 Scale)



Right (1:2 Scale)

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			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	Drawn By: Wyatt Johnson		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

Cosmic Canucks

TITLE:

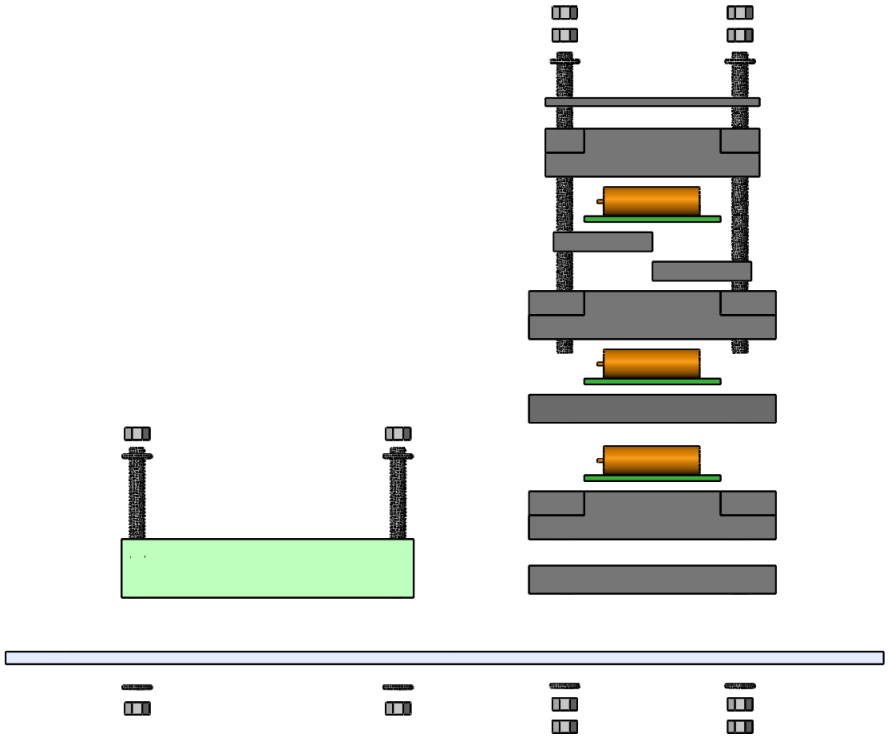
Main-Integration

SIZE	DWG. NO.	REV
A	3 of 4	

SCALE: 1:10	WEIGHT:	SHEET 3 OF 4

5 4 3 2 1

Right
(1:3 Scale)



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		DIMENSIONS ARE IN MM TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	Drawn By: Wyatt Johnson		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

Cosmic Canucks

TITLE:
Main-Integration Exploded

SIZE	DWG. NO.	REV
A	4 of 4	

SCALE: 1:10 | WEIGHT: | SHEET 4 OF 4

5 4 3 2 1