HASP Payload Specification and Integration Plan

Payload Title: SORA 3 - Stratospheric Organisms and Radiation Analyzer 3

Payload Class: Large

Payload ID: 9

Institution: University of Houston

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Contact Email: r.masek97@gmail.com

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HASP Payload Specification and Integration Plan

I. MECHANICAL SPECIFICATIONS

A. Measured weight of the payload (not including payload plate):

B.

C. The SORA 3 payload contains a pressurized vessel that will remains at a constant 1 atm throughout the entire flight. The vessel will be hermetically sealed on the surface prior to flight and will remain sealed for the entire duration of the flight. This will not pose any risk to HASP personnel before or after flight.

All dimensions in all drawings are in millimeters [mm].

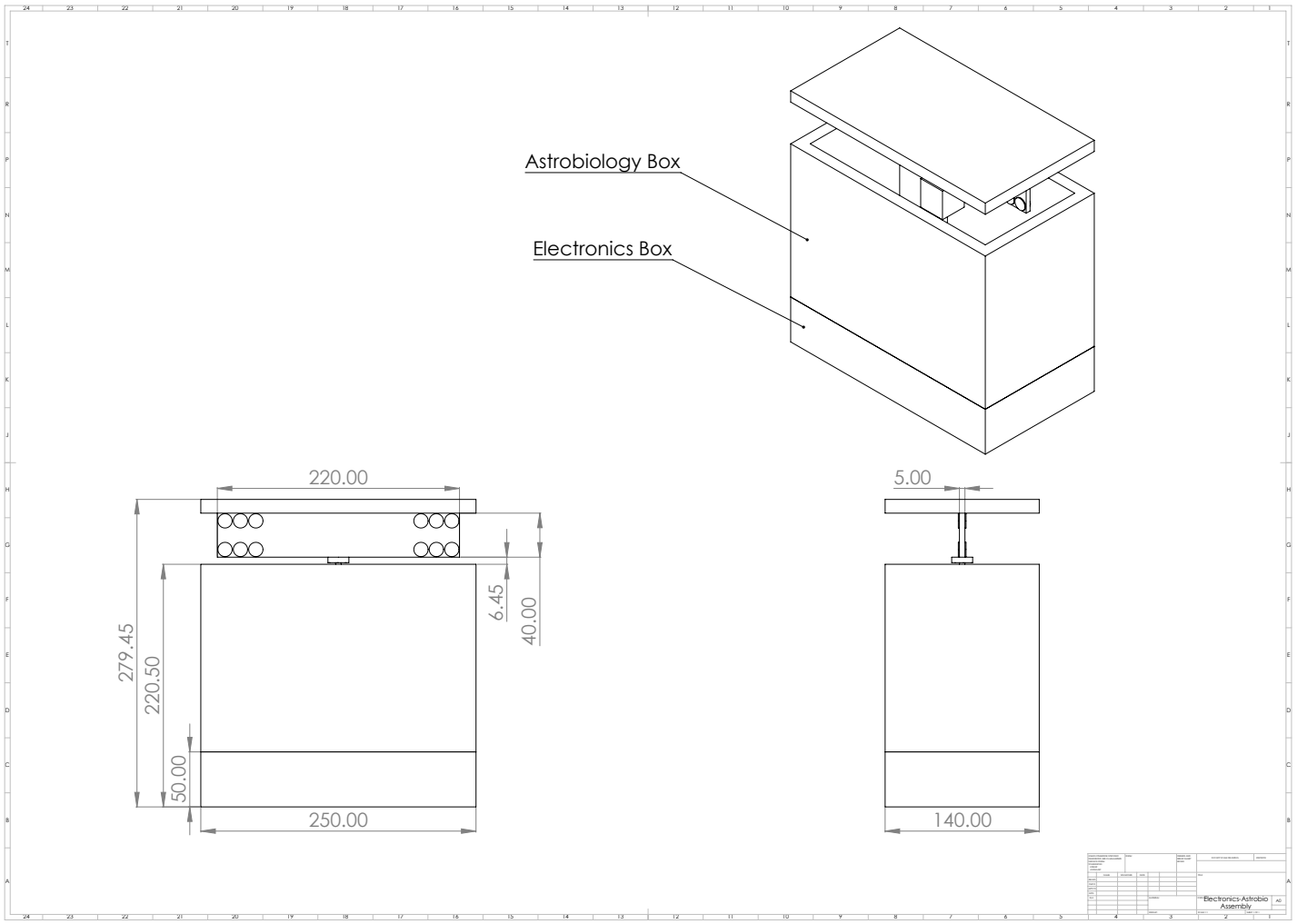

FIG. 1 Drawing of the deployed astrobiology system.

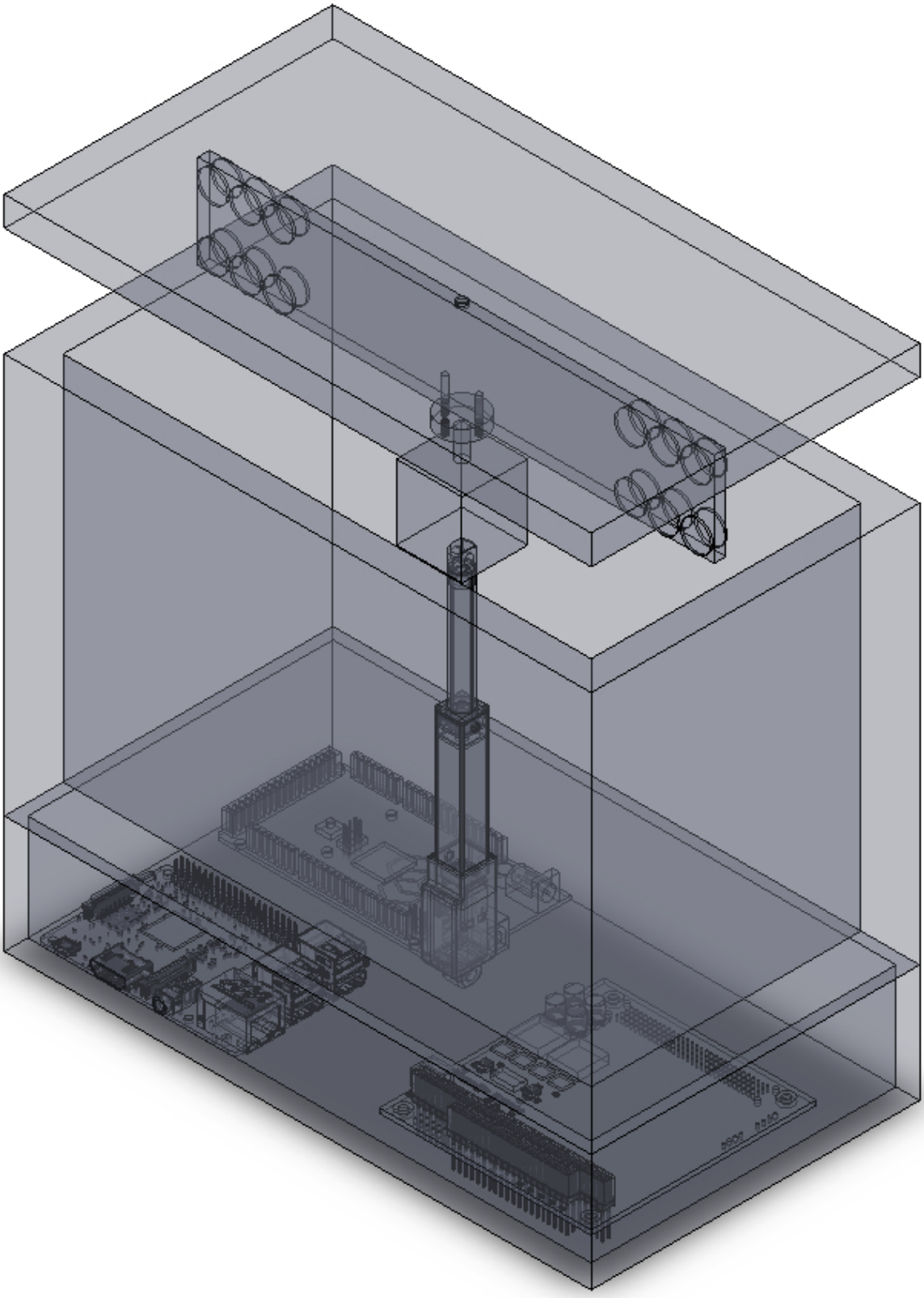

FIG. 2 Isometric, transparent view of the deployed astrobiology and electronics systems. All electronic components can be seen inside.

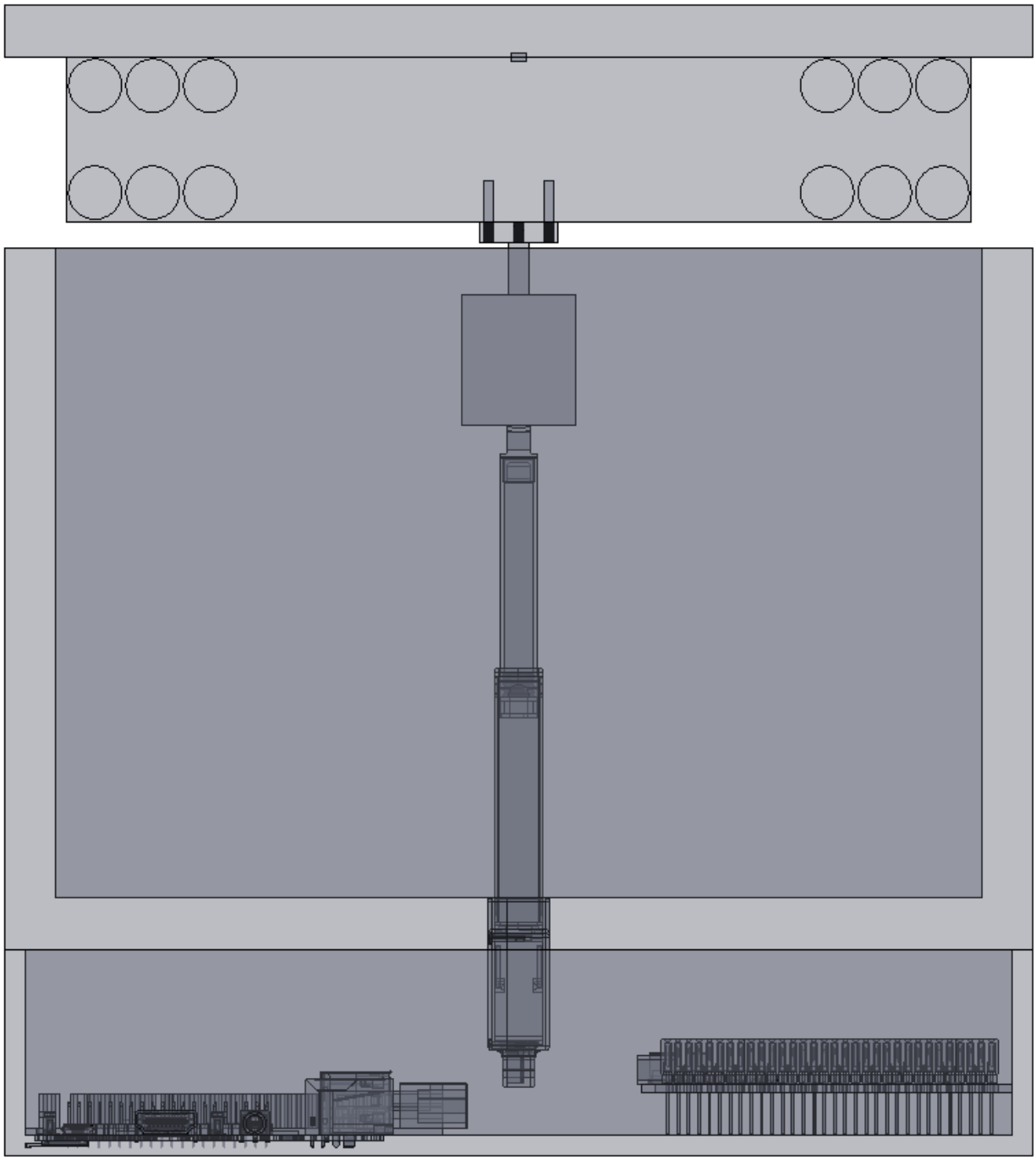

FIG. 3 Transparent Side view of the astrobiology and electronics box.

II. POWER SPECIFICATIONS

A. Expected nominal current draw at 30 VDC is 1810 mA. Max current draw will be 2120 mA.

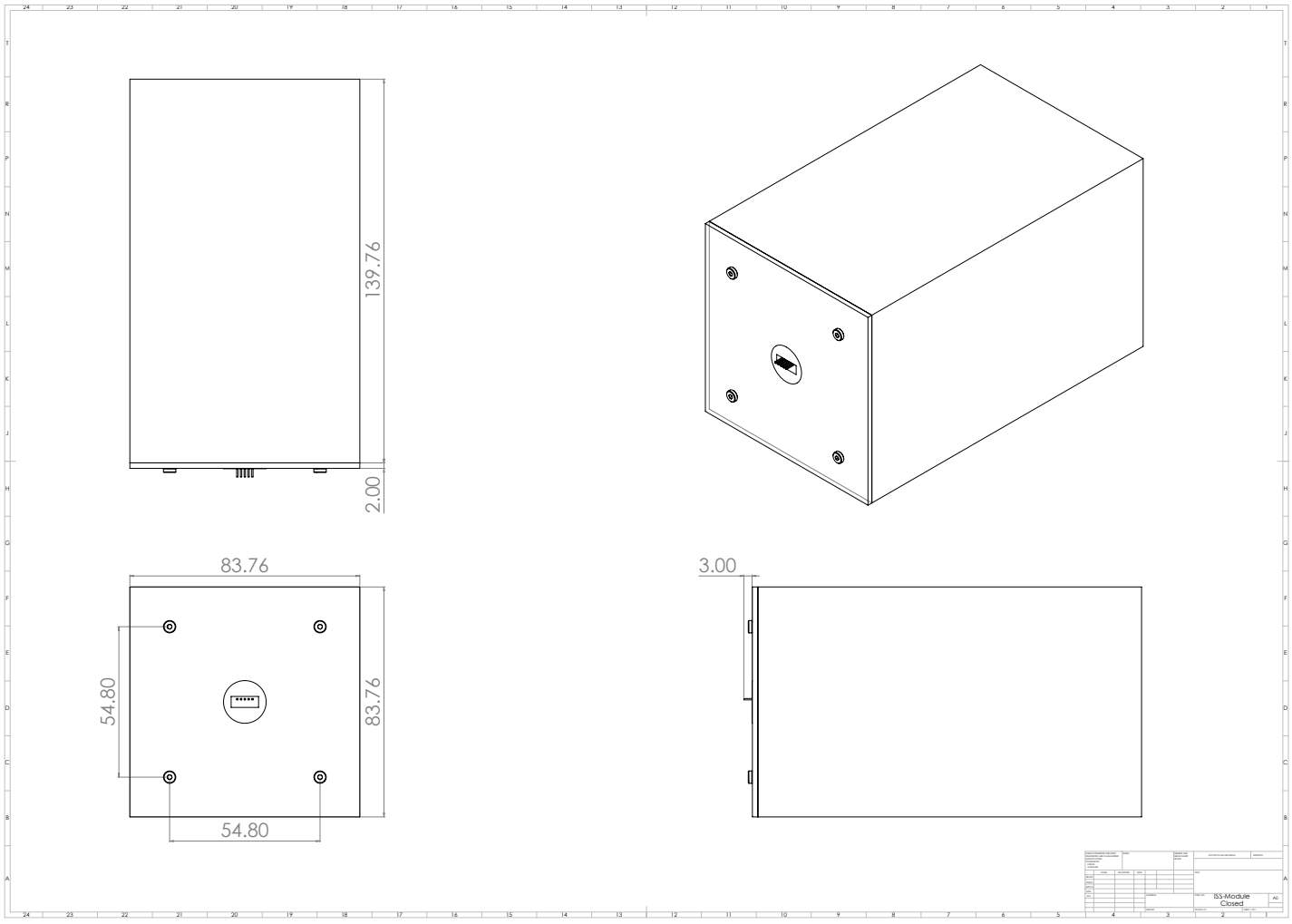

FIG. 4 Drawing of the closed ISS module.

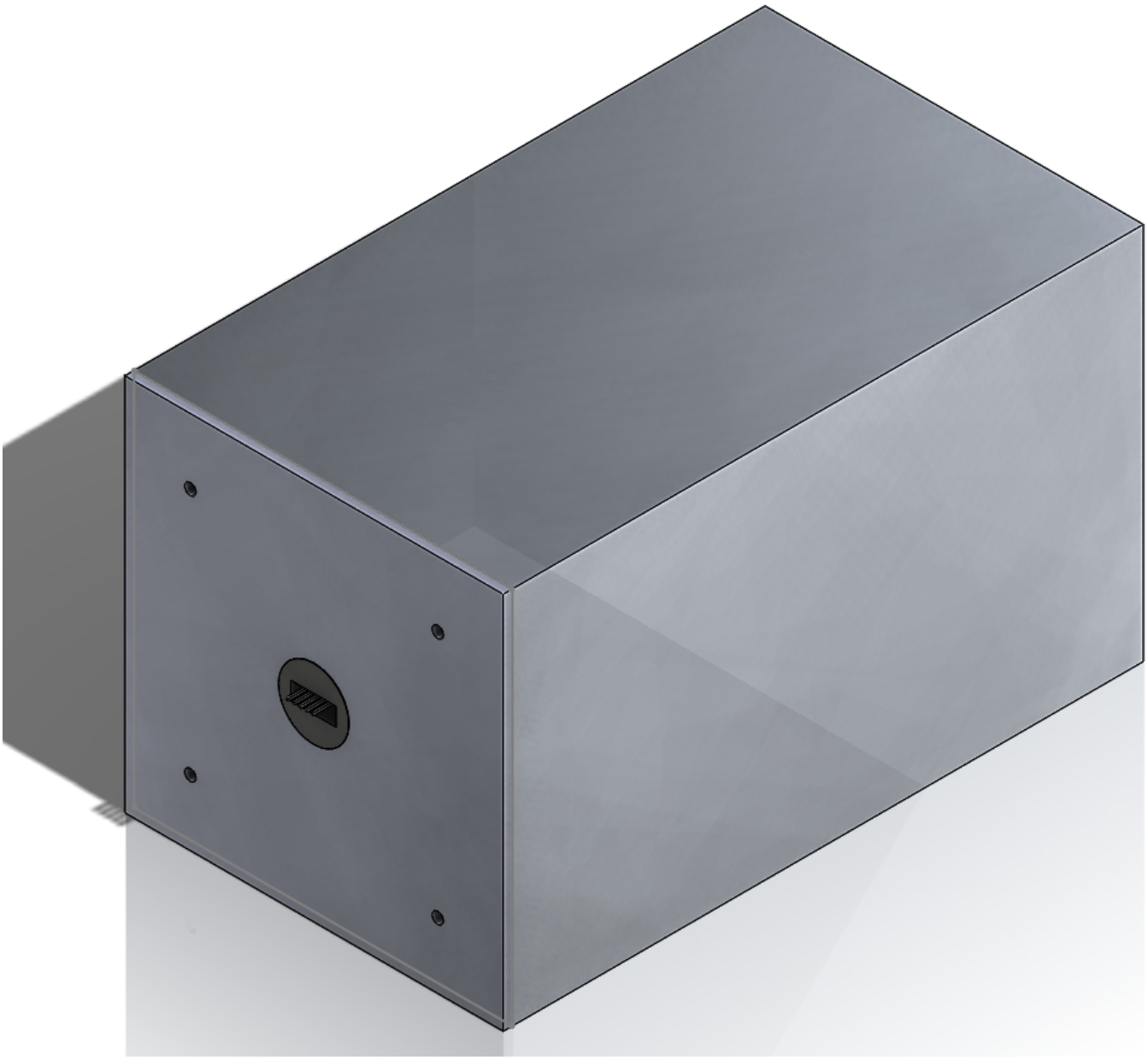

FIG. 5 Isometric view of the closed ISS module.

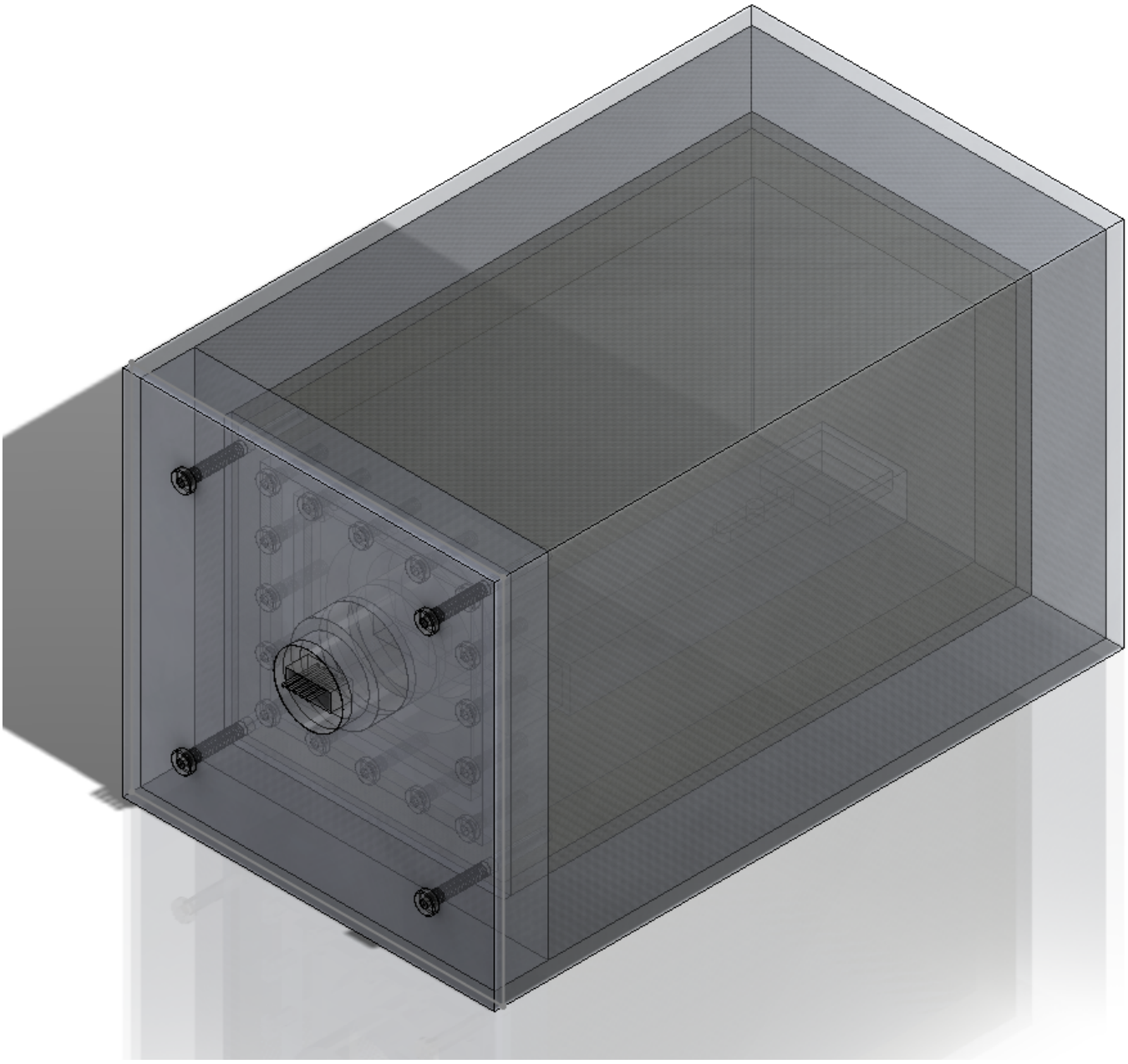

FIG. 6 Isometric, transparent view of the closed ISS module.

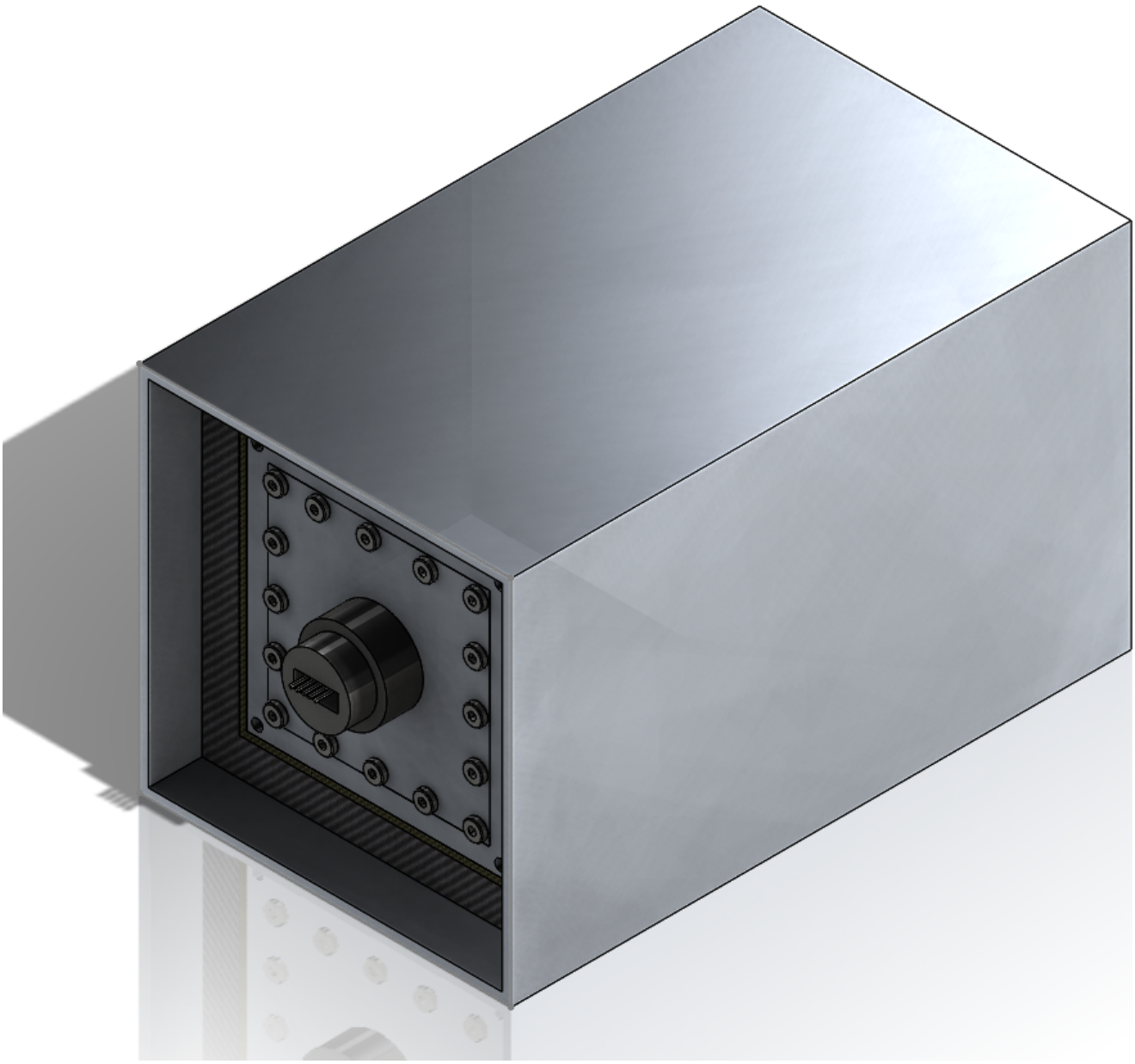

FIG. 7 Isometric view of the ISS showing the casing of the pressurized inner container.

FIG. 8

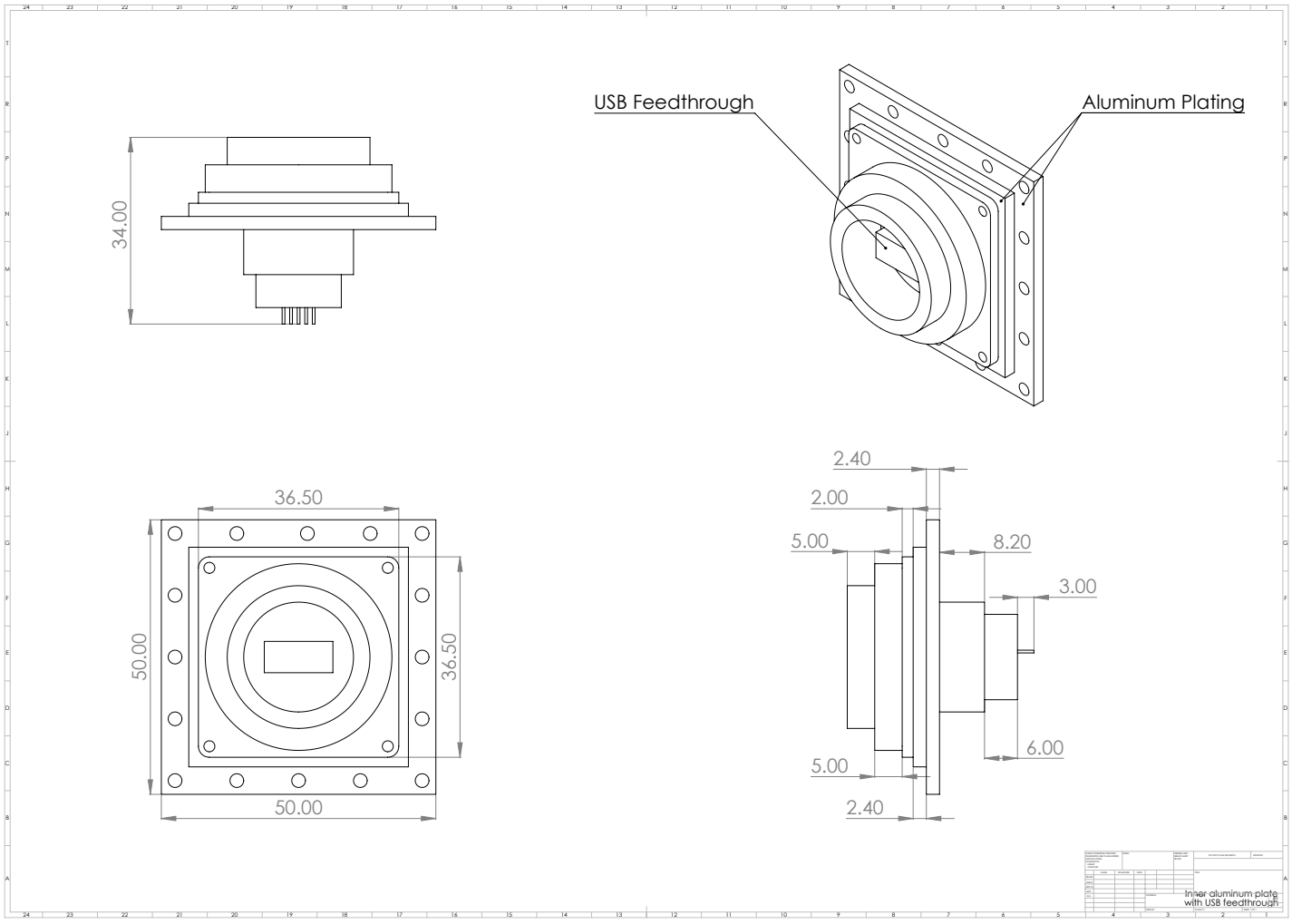

FIG. 9 Removable aluminum plate to contain the atmosphere within the ISS module.

III. DOWNLINK TELEMETRY SPECIFICATIONS

A. Serial data downlink format: **Packetized**

B. Approximate serial downlink rate (in bits per second) is 500 bit/s.

C. Specify your serial data record including record length and information contained in each record byte. This can be seen in Table **??**.

D. No analog channels needed.

E. Number of discrete lines used:
4 lines. Pins F, N, H, and P.

F. If discrete lines are being used what are they being used for?
F - activate astrobiology system, N - deactivate astrobiology system, H - power on SOCRATES, P - power down SOCRATES.

G. No on-board transmitters.

H. Other relevant downlink telemetry information?
This concludes our payload's downlink communication.

TABLE I Serial record for the SORA 3 payload.

Description	Byte Number
start_packet	0
RPI Temp	1 - 4
MiniPIX-0 Temp	5 - 8
MiniPIX-1 Temp	9 - 12
ISS Temp	13 - 16
ISS Pressure	17 - 20
Ambient Pressure	21 - 24
Solar cells w/ accessories	24 - 120
Timestamp	121 - 124
end_packet	125
Total	**125**

IV. UPLINK COMMANDING SPECIFICATIONS

A. Command uplink capability required: Yes

B. If so, will commands be uplinked in regular intervals: Yes

C. How many commands do you expect to uplink during the flight (can be an absolute number or a rate, i.e. n commands per hour): Ideally, we will send no commands the entire flight. If we need to send commands, we will likely send a maximum of 4 throughout the entire flight.

D. Provide a table of all of the commands that you will be uplinking to your payload: See Table **??**

E. Are there any on-board receivers? No on-board transmitters.

F. Other relevant uplink commanding information.

TABLE II

Command	Command Byte 1	Command Byte 2
Activate astrobiology system	0x01	Not used
Deactivate astrobiology system	0x02	Not used
Power up SOCRATES	0x03	Not used
Power down SOCRATES	0x04	Not used

HASP Payload Specification and Integration Plan

V. INTEGRATION AND LOGISTICS

A. Date and Time of your arrival for integration:

B. Approximate amount of time required for integration:

C. Name of the integration team leader: Reed B. Masek

D. Email address of the integration team leader: r.masek97@gmail.com

E. List ALL integration participants (first and last names) who will be present for integration with their email addresses:

F. A successful integration of the SORA payload will include the following:

G. List all expected integration steps:

- Mechanical System:

  i. Ensure SORA properly fits and successfully attaches to the HASP platform.

- Electrical System:

  i. Successful power up, check all health status lights power on.

H Communications System:

(a) Successful communication with and downlink to the HASP platform.

- Environmental System Check:

(a) Thermal and vacuum tests completed successfully for each system.

- List all checks that will determine a successful integration:

- List any additional LSU personnel support needed for a successful integration other than directly related to the HASP integration (i.e. lifting, moving equipment, hotel information/arrangements, any special delivery needs...): None

- List any LSU supplied equipment that may be needed for a successful integration: None

- All dimensions drawings and circuit diagrams updated above.