HASP Monthly Status Report

Report Month:	June 2023
Submitted by:	Wookwon Lee
Submit Date:	6/30/2023
Institution:	Gannon University
Payload Number:	2023-12
Payload Name:	UHF-Band Video-Streaming Payload

I) Activities During Previous Month:

a) Payload construction – All subsystems are placed on the payload plate except for a UHF amplifier:
   - Cameras #1, #2, and #3 to Raspberry Pi 4
   - Camera #4 to Raspberry Pi 3
   - Raspberry Pi 3 for command and control and one HD video (camera #4)
   - Raspberry PI 4 for HD videos from 3 cameras (~10 Mbps data rate)
   - i5 computer – host computer for UHF modulator for apsc3 video packets
   - DTA 2115B (our UHF modulator for apsc3 video transmission)
   - Two DC-DC converters (small and large EDACs, respectively)
   - A network switch to multiplex video packets from two Raspberry Pis
   - Four temperature sensors installed
     - Temp 0 - ambient / base plate
     - Temp 1 - DC/DC converter (for the i5)
     - Temp 2 - Power amplifier
     - Temp 3 - ambient / payload wall
   - a rubber duck 446 MHz antenna (1 foot long)
   - TTL to RS 232 converter for down link data and uplink commands

b) Heat sinks and thermal tape/pads are placed to all necessary subsystems for heat dissipation by conduction

c) Tests for 446 MHz wireless transmission were conducted in the lab with omni directional antennas on both end. For now, the received signal strength (RSS) is not as desired for range test; will need a final link budget analysis and remediation at the Tx and/or Rx side(s).

d) A 10 dBi yagi antenna for 400-470MHz frequency band is ordered (arriving on June 30th) – we plan to use our own Yagi antenna for range test on HASP for our future use of our system for non-HASP flights; an Yagi antenna available at CSBF, Ft. Sumner, is still an option as a backup.

II) Issues Encountered:

- UHF amplifier was damaged once again and new one for UHF frequency range was ordered and delivered for integration test in the lab.
- For now, 446 MHz received signal strength (RSS) is not as desired for range test; will need more measurements at the Tx antenna output (using a wireless probe), a final link budget analysis, and remediation at the Tx and/or Rx side(s).
- Debating if we need to put a LNA at the Rx, subject to the test/analysis mentioned above.

III) Milestones Achieved:

- Completed Final PSIP and security clearance Excel sheet for Ft. Sumner.

IV) Plans for Coming Month:

1) Integrating a front-end power amplifier and testing
2) Construct the receiver (Yagi antenna + DTA2131 + Lenovo M90n portable computer + portable monitor)

V) Other Comments or Questions for HASP Management:

- None at the moment.

VI) Team Composition and Organization:

Fill in text as necessary plus update table below.

Name [(i)]	Start Date	End Date	Role	Student Status	Race[(ii)]	Ethnicity[(iii)]	Gender [(i)]	Disabled
Wookwon Lee	1/9/23	Present	Faculty Advisor	Faculty	Asian	Non-Hispanic	Male	No
Nicholas Conklin	1/9/23	Present	Faculty Co-Advisor	Faculty	White	Non-Hispanic	Male	No
Andrew Snowdy	1/9/23	Present	Project Lead	Undergraduate	White	Non-Hispanic	Male	No
Kalkidan Lakew	1/9/23	Present	Video operation & integration	Undergraduate	Black	Non-Hispanic	Female	No
Hannah Jacobs	1/9/23	Present	UHF front-end electronics	Undergraduate	White	Non-Hispanic	Female	No
Zoey McClain	1/9/23	Present	Video operation & integration	Undergraduate	White	Non-Hispanic	Female	No
Sara Jones	1/9/23	Present	UHF modulator operation & testing	Undergraduate	White	Non-Hispanic	Female	No
John (Jack) White	1/9/23	Present	i5 CPU integration	Undergraduate	White	Non-Hispanic	Male	No
Zachary Dickinson	2/8/23	Present	R-Pi & Thermal control	Undergraduate	White	Non-Hispanic	Male	No
Damien Chu	3/20/23	Present	R-Pi & Thermal control	Undergraduate	Asian	Non-Hispanic	Male	No

i. Current NASA guidance requires information from up to date legal documentation (for instance, Driver's License, Passport)

ii. Accepted options include African-American/Black, Asian, American Indian/Alaskan Native, Native Hawaiian, Pacific Islander, White

iii. Accepted options are Hispanic on Non-Hispanic.