NASA CT SPACE GRANT CONSORTIUM

HASP (DATA)

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INTRODUCTION

On September 1, 2016, a High Altitude Student Platform (HASP) payload was launched from Fort Sumner, New Mexico with 12 different university student payloads. University of Bridgeport sent a robotic arm to the Near Space (over 120,000 feet) in that payload. The robotic arm has 3 servos and 1 little servo which can move left and right. The aim of the HASP project is to test the servos at very low temperature and near vacuum.
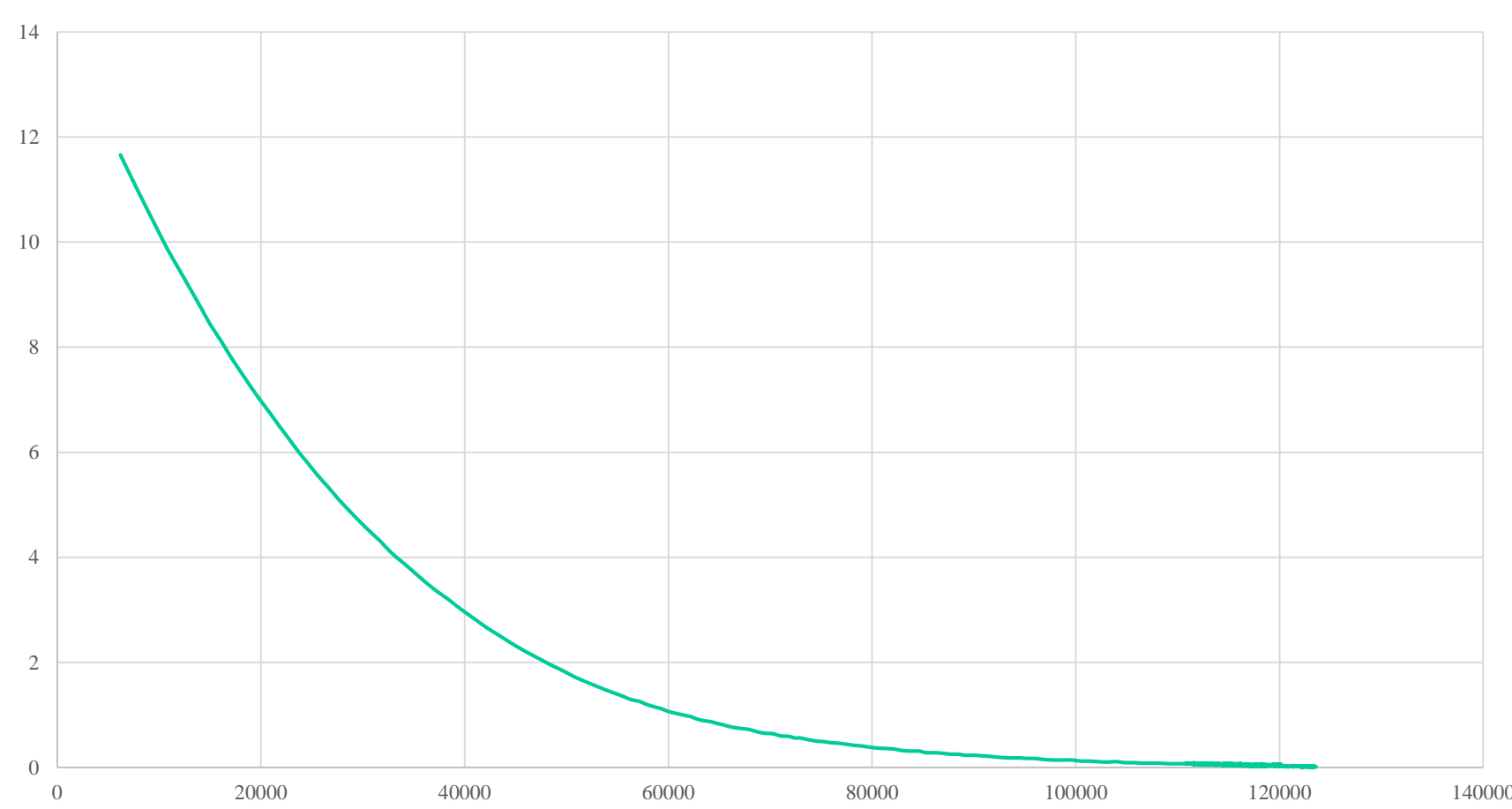
DATA OBTAINED

Total mission time = 18hrs 26 min
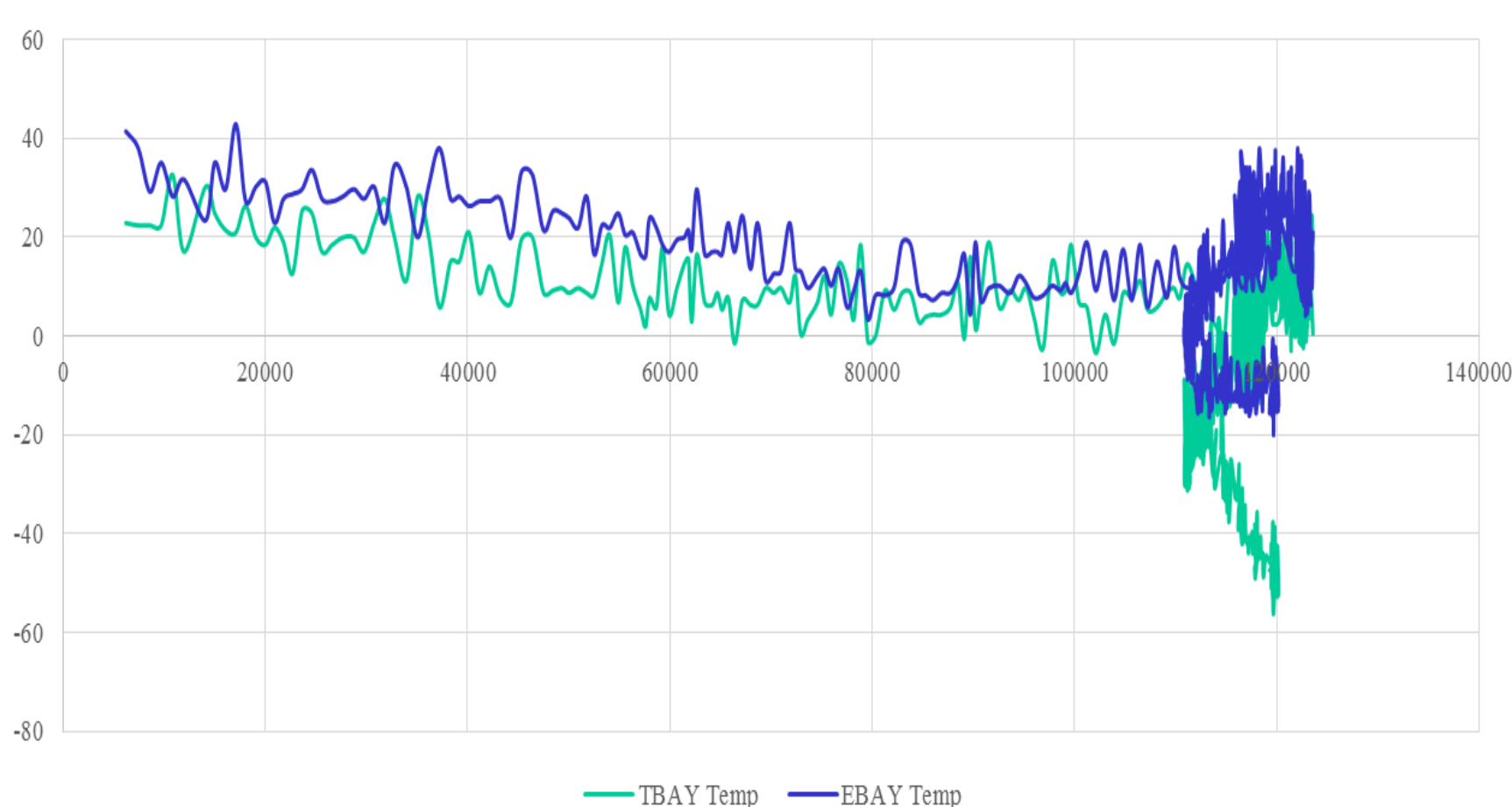Maximum Altitude Reached = 120566ft

Altitude vs Outside Temp
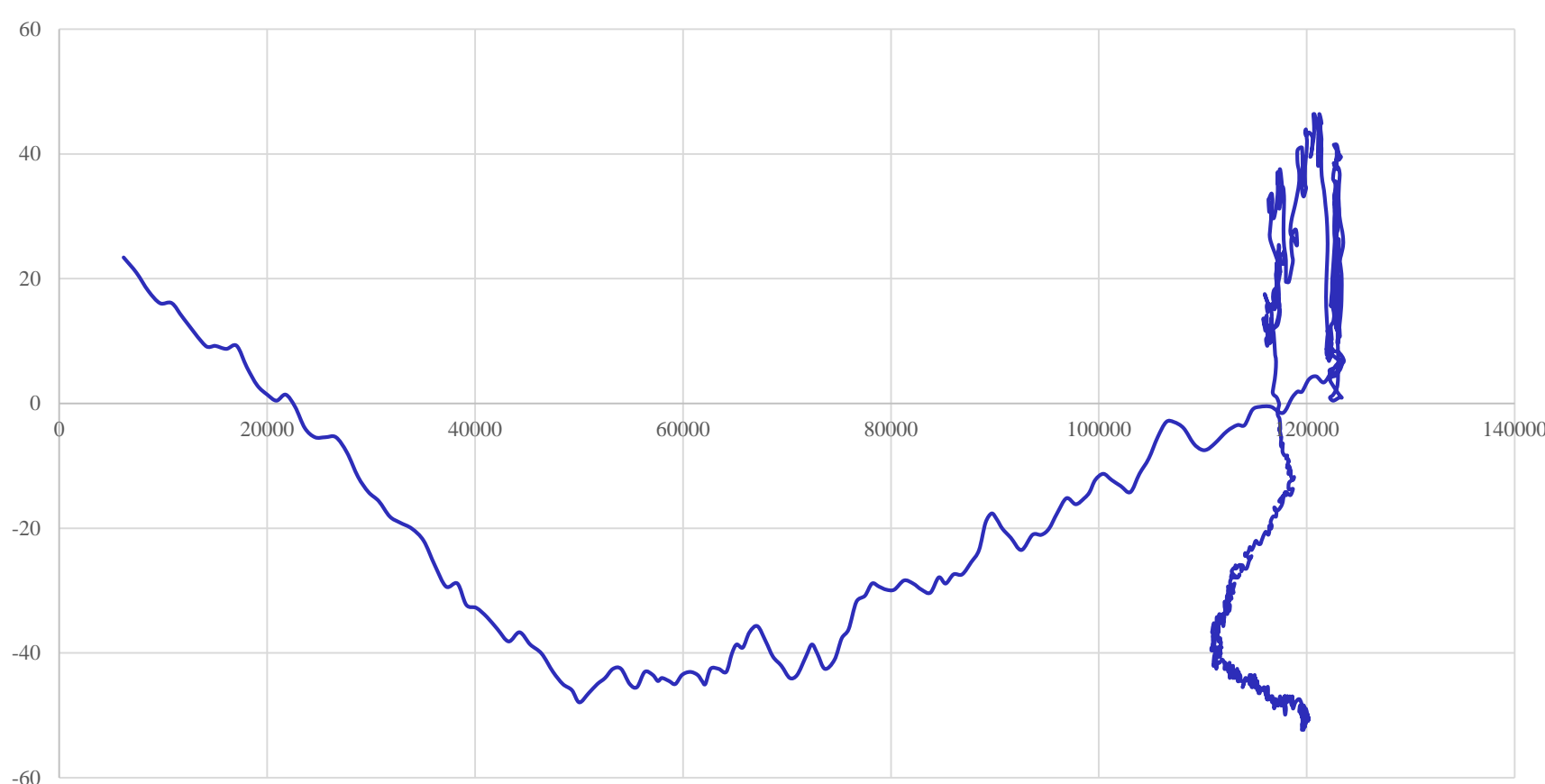
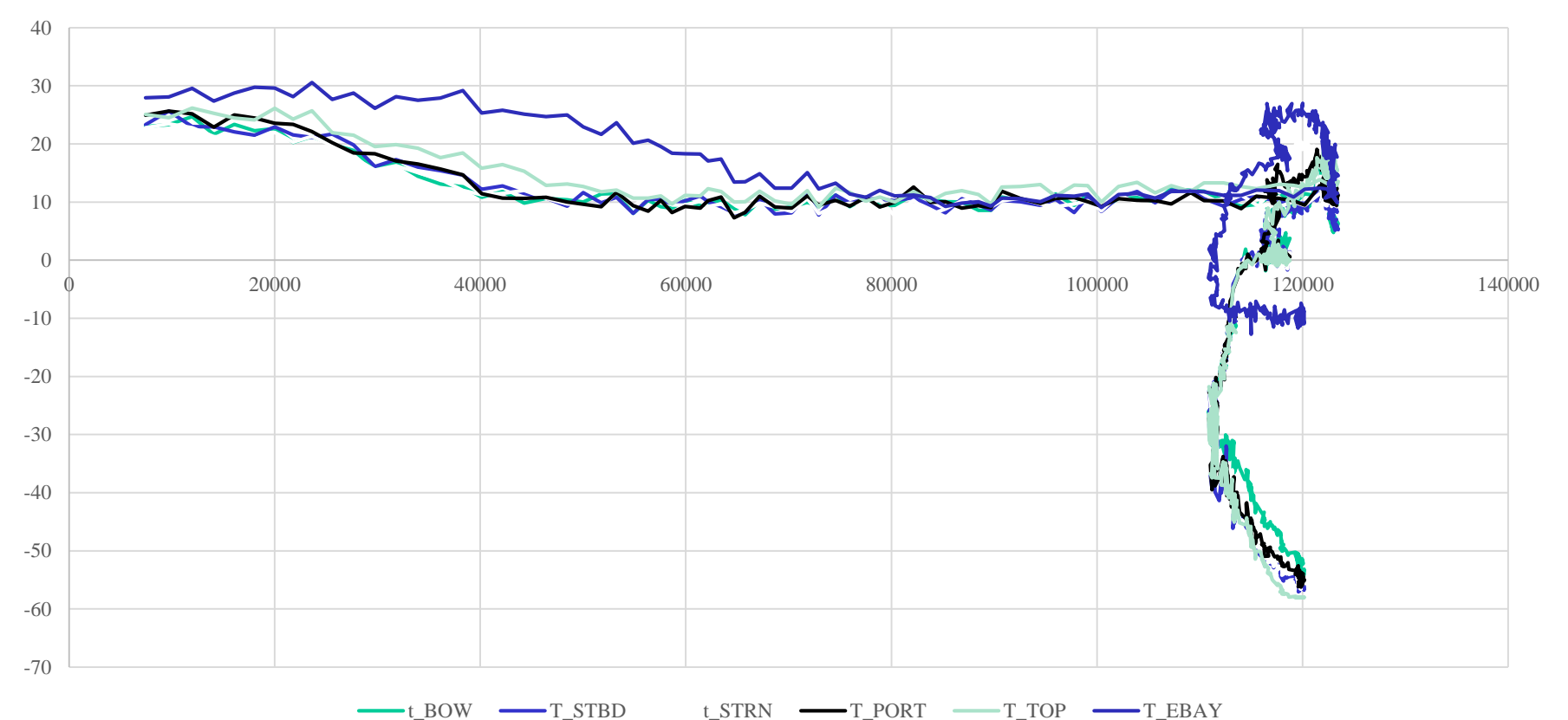—OUTSIDE Temp

Altitude vs Pressure(PSI)

HEATERS

Altitude vs TBAY and EBAY Temperature

—TBAY Temp   —EBAY Temp

HEATERS (CONTINUATION)

When the heaters are on

Altitude vs Temperature (Heaters On)

—t_BOW   —T_STBD   t_STRN   —T_PORT   —T_TOP   —T_EBAY

Heaters maximum power draw:

Test Bay Heater BOW	7	Watts
Test Bay Heater STERN	7	Watts
Test Bay Heater PORT	7	Watts
Test Bay Heater STARBOARD	7	Watts
Test Bay Heater CEILING	8	Watts
Electronics Bay Heater	13	Watts

TOTAL HEATER POWER 49   Watts

COMMAND DATA FORMAT

Byte1-Byte2	Command
00	Turn DC Power OFF
11	Turn DC Power ON
22	STOP Tests and Assume Standby State
33	Give Hardware Reset to Arduino in Test Bay
44	Start Testing (Exits Diagnostic Mode)
55	Resume Temperature Profile
66	Execute Bench Diagnostics (interactive, with terminal connected to serial port)
77	Execute Flight Line test
88	Launch (to activate processing if Launch was not automatically detected)
99	Request Status
AA	Set TBay Temperature to 35°C
BB	Set TBay Temperature to 10°C
CC	Set TBay Temperature to 0°C
DD	Set TBay Temperature to -10°C
EE	Set TBay Temperature to -20°C
FF	Set TBay Temperature to -30°C
GG	Set TBay Temperature to -40°C
HH	Set TBay Temperature to -50°C
II	Turn EBay Heaters off completely
JJ	Set EBay Temperature to 35°C
KK	Set EBay Temperature to 10°C
LL	Set EBay Temperature to -10°C
MM	Set Fail Code for Servo 1
NN	Set Fail Code for Servo 2
PP	Set Fail Code for Servo 3
QQ	Set Fail Code for Servo 4
RR	Set Fail Code for Servo 5
SS	Set Fail Code for Servo 6
TT	Set Fail Code for Servo 7
UU	Clear all Fail Codes
VV	Execute Servo Test once and report
WW	Establish Baseline for all Servos (saves Servo Data to be compared against tests)
XX	Discover Servo Limits and use but do not save
YY	Start Logging data to SD card (default)
ZZ	Stop Logging data onto SD card and close logfile
aa	Clear and reinitialize logfile
bb	Print Baseline Servo data to Serial Port (Ground Bench command only)
cc	Turn off EBay Heater Completely
dd	Unassigned

CONCLUSION

In this project data was collected every 12 minutes. These data were helpful for us to review the functions of our servos placed onto HASP. We also collected the data about the pressure, and temperature at various altitudes. This results will help our UB Team to continue our future robotic monkey project.