



# *FY2020 Antarctic Long Duration Ballooning Campaign*



Campaign Update

Balloon Program Office  
Andrew Hynous  
Mission Operations  
Manager

12 December 2019

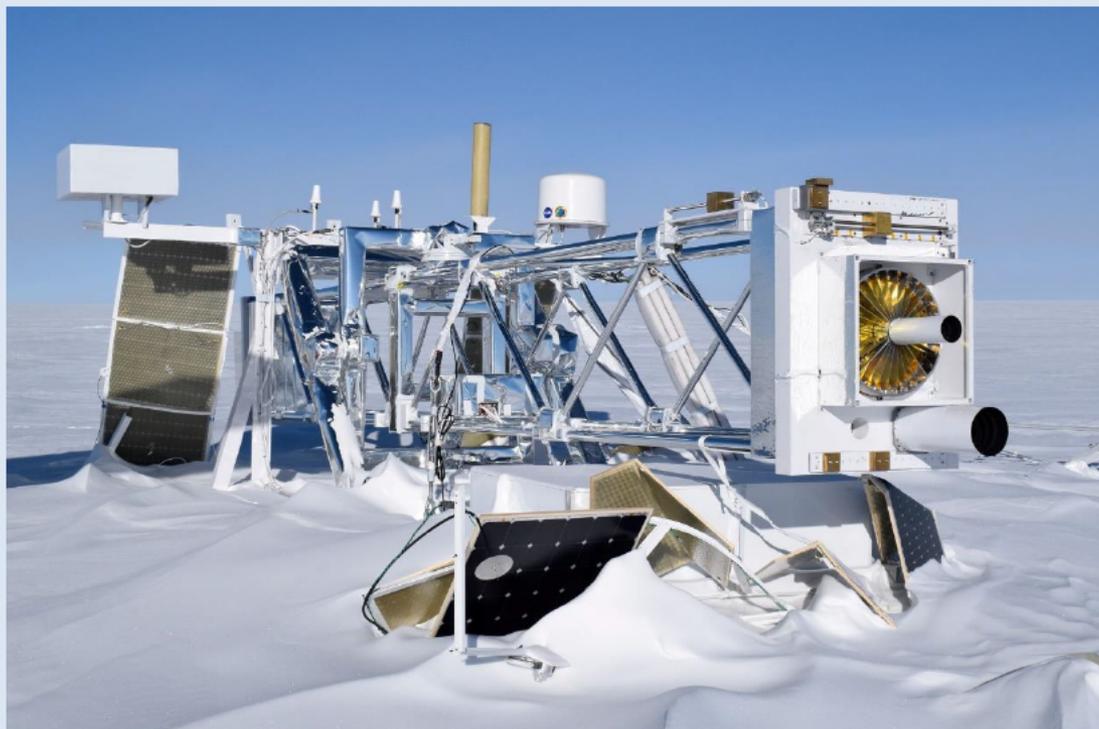


# FY20 Campaign Schedule



Mission	Discipline	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Fort Sumner, New Mexico</b>		<b>Fall '19</b>											
Toon/JPL-Remote/Bailey/VATech/GLO	Upper Atmosphere	◆ Success											
Kogut/GSFC/PIPER	IR-Submillimeter	◆ Success											
Young/SwRI/THAI-SPICE (Hand Launch)	UV/Visible	◆ Success											
Tang/JPL/RECKTANGLE (Hand Launch)	IR-Submillimeter	◆ Success											
Livesey/JPL/SWITCH (Hand Launch)	IIP/Upper Atmosphere	◆ Successful Ground Test											
<b>McMurdo, Antarctica</b>		<b>Winter '19</b>											
Rauch/WUSTL/SuperTIGER	Cosmic Ray/Particle			◆									
Devlin/UPENN/BLASTPOL	Gamma Ray/X-Ray			◆									
Salter/CSBF/TRAVALB	Test Flight			◆	◆								
<b>Wanaka, New Zealand</b>		<b>Spring '20</b>											
SPB Test/Boggs/UCSD/COSI	Test Flight/COSI (PB)							◆					
Salter/CSBF/TRAVALA	Test Flight						◆	◆					
<b>Palestine, Texas</b>		<b>Summer '20</b>											
Kogut/GSFC/BOBCAT	IR-Submillimeter									◆			
Kogut/GSFC/PIPER	IR-Submillimeter										◆		
<b>Fort Sumner, New Mexico</b>		<b>Fall '20</b>											
Kogut/GSFC/BOBCAT	IR-Submillimeter												◆
Field/CSBF/LDB Test Flight	Test Flight												◆
Young/SwRI/THAI-SPICE	UV/Visible												◆
Walker/Large Balloon Reflector	IR-Submillimeter												◆
Guzik/LSU/HASP	Student Flight Project												◆
Kogut/GSFC/PIPER	IR-Submillimeter												◆
Toon/JPL-Remote/Bailey/VATech/GLO	Upper Atmosphere												◆





Recovery team is currently waiting at the South Pole for air transport to become available. The fuel airdrop has been completed and is currently being repositioned for use.

Once flights are available, the recovery team will be given 1 hour allotments per trip to the X-Calibur site to conduct recovery operations.

Five flights are manifested and will be scheduled by NSF / ASC depending on plane and pilot availability.



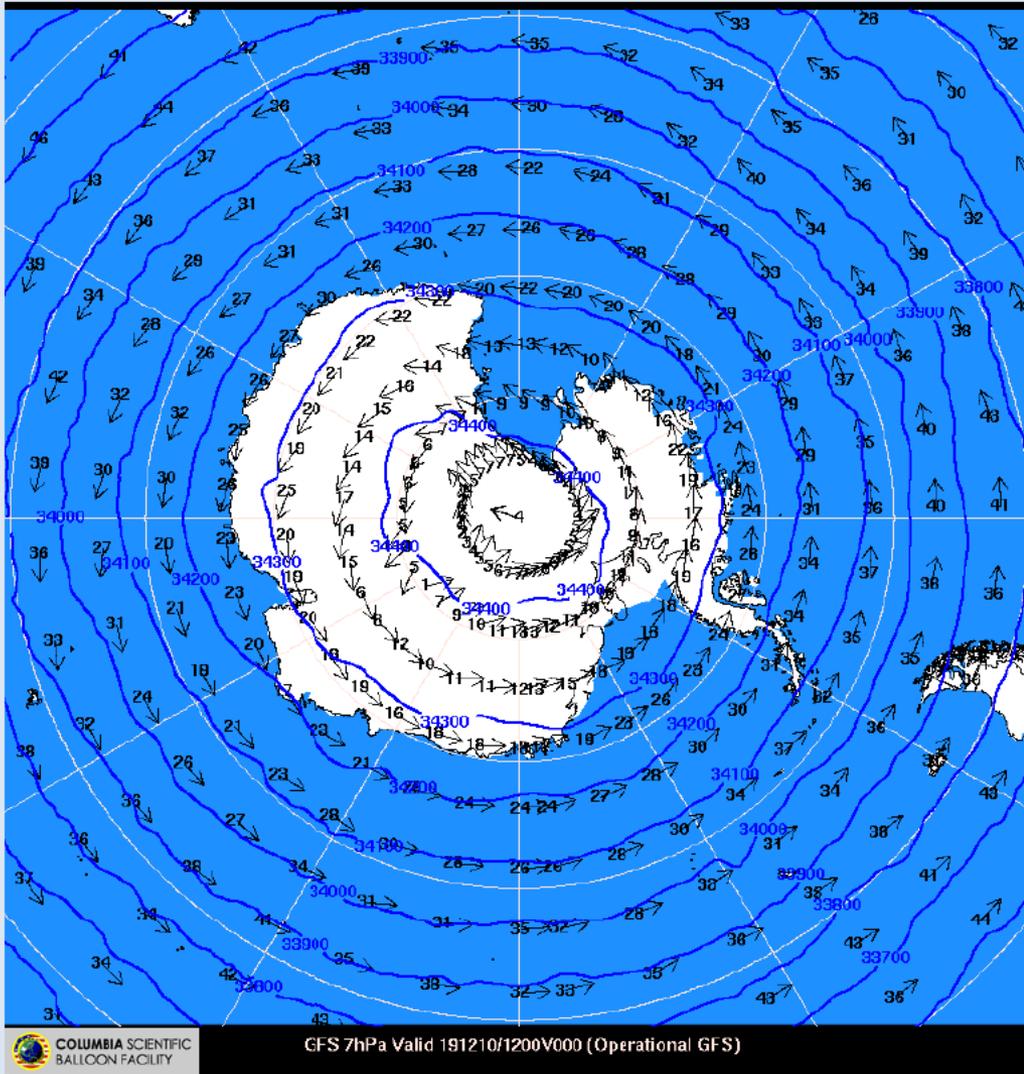
# *Helium Compressor*



The certified pressure relief valves and gauges were received and installed here in McMurdo Station.

There is a second helium compressor that is a back up if the primary is rendered non-functional.

The valve and gauge kit will be swapped to the secondary compressor if needed.

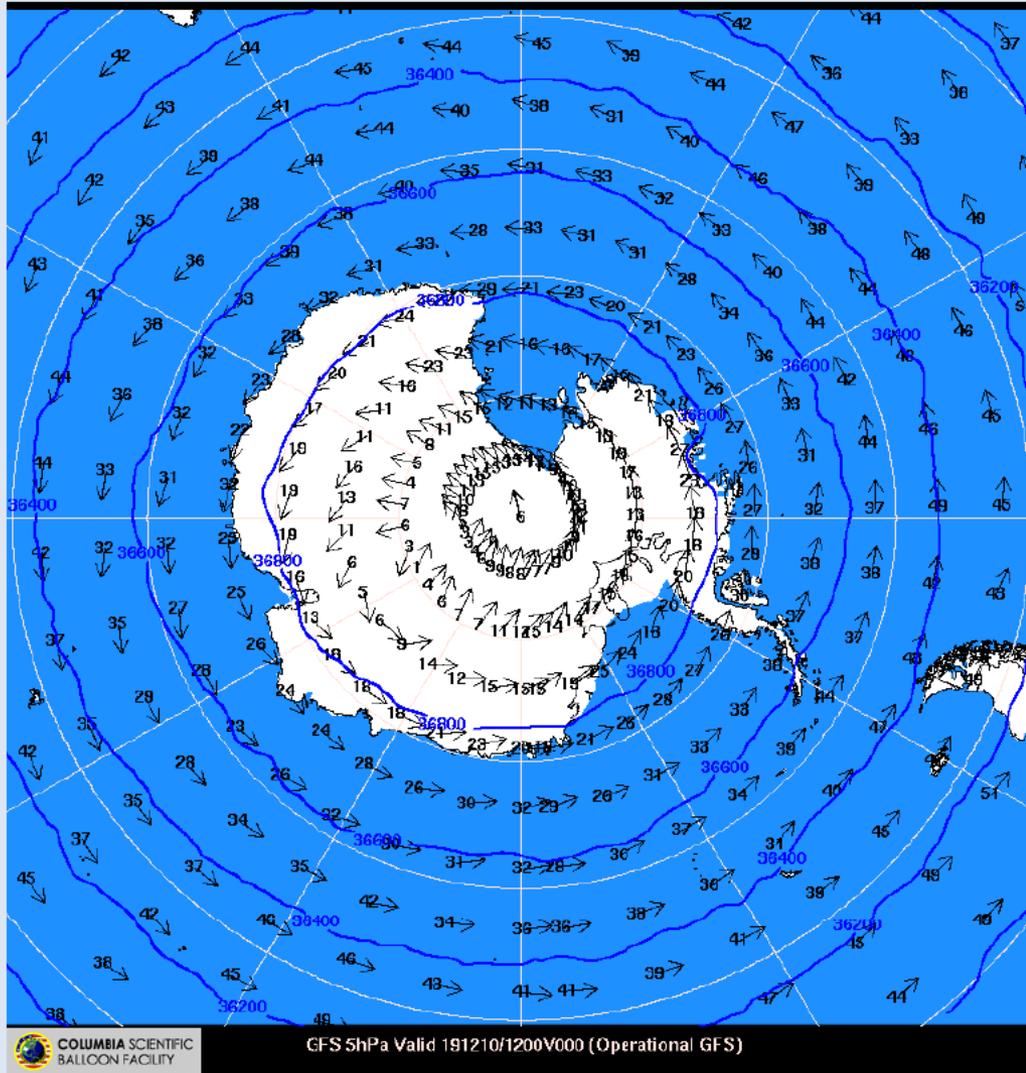


Circulation set up over Antarctica about 27 November 2019.

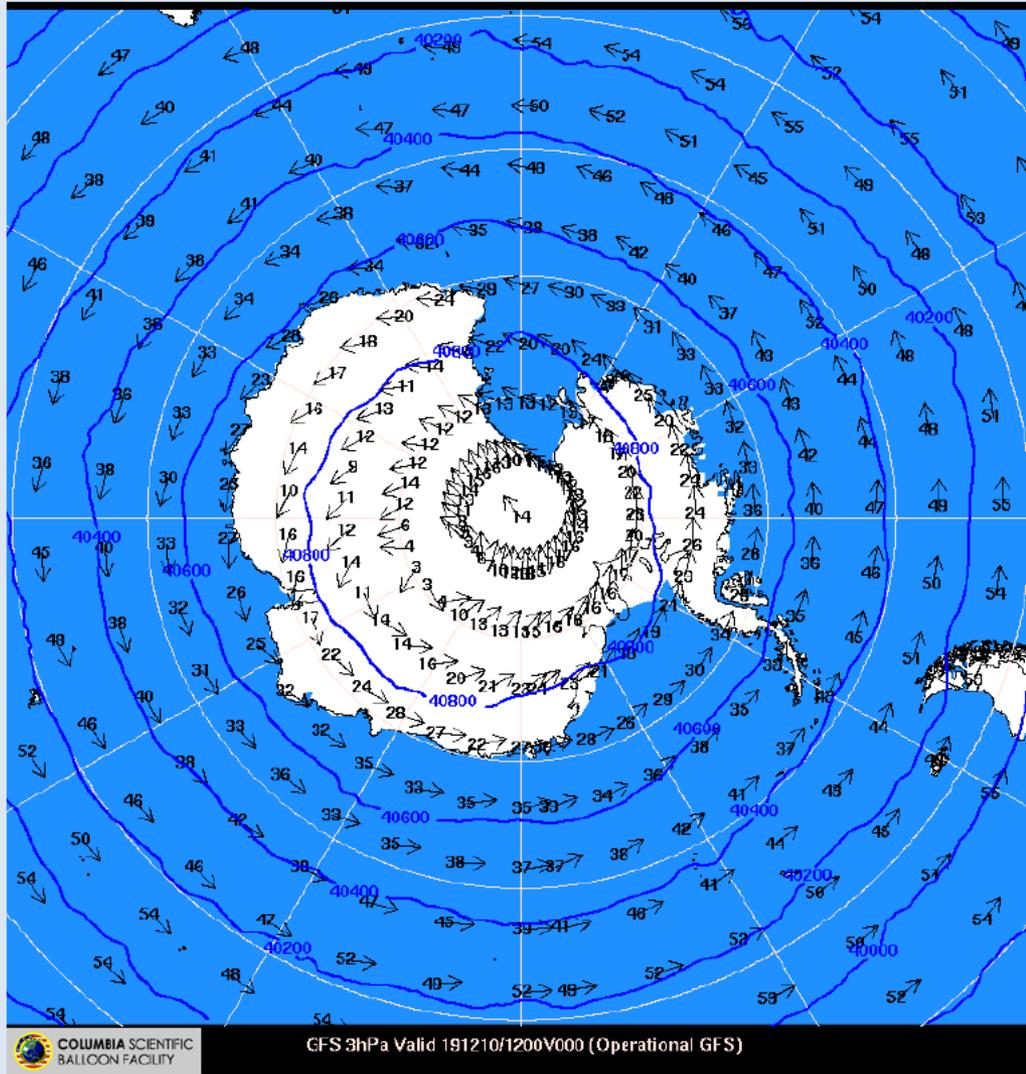
Since the nominal campaign readiness date of 27 November, there have been approximately 4 missed opportunities for show days due to delays in personnel and cargo.

Automatic updates of stratospheric winds will be set up by 12 December 2019.

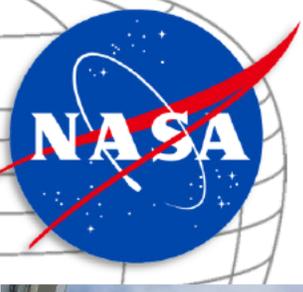
7 mbar winds in circular pattern with wind speeds up to 25-30 knots over Antarctica.



5 mbar winds in circular pattern with wind speeds up to 20-25 knots over Antarctica.



3 mbar winds in circular pattern with wind speeds also up to 20-25 knots over Antarctica.



## Balloon Program Office

**FY20 Antarctic LDB  
Approval to Proceed**

**The Super-Trans Iron  
Galactic Element  
Recorder II**

**12 December 2019**

# The Super-Trans Iron Galactic Element Recorder II (SuperTIGER II)

**Principal Investigator:** Dr. Brian Rauch, Washington Uni. in St. Louis

**Discipline:** Astrophysics / Cosmic Rays, Particle

**Discipline Scientist:** Thomas Hams

**Purpose:** The primary objective is to test the OB-association model of the origin of galactic cosmic rays by measuring the abundances of nuclei heavier than iron. SuperTIGER uses plastic scintillator  $dE/dx$  detectors and Cherenkov counters with differing refractive indices. It consists of two modules, each having approximate dimensions 1.8 meters x 3 meters with height 1 meter mounted side by side.

## Flight Profile:

Balloon: W39.57-2-118

### Weight

- Balloon: 4132 lb.
- Suspended: 5983 lb.
- Ballast: 160 lb.

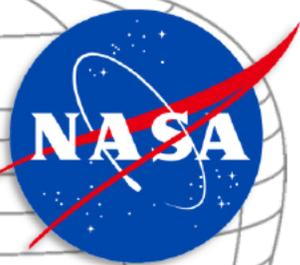
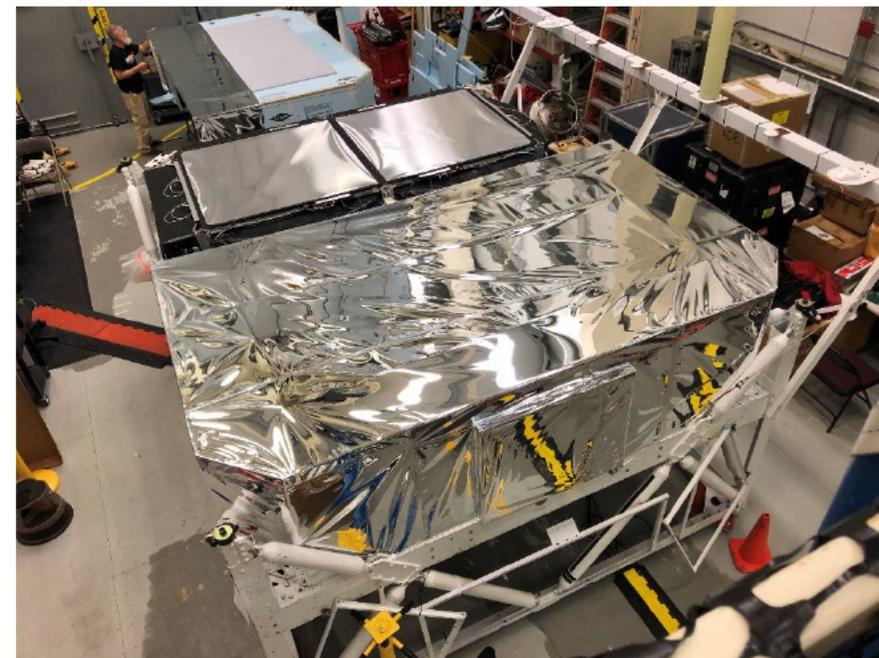
LSI: 1781 psi

### Altitude

- Desired: 125 kft.
- Minimum: 105 kft.

### Duration

- Desired: 60 Days
- Minimum: 1 Rotation  
or 8 Days





### HOW TO USE THIS FORM:

This form is completed by the Project or Mission Manager for SSOPD managed activities where SSOPD is the lead NASA organization authorizing flight and/or where safety related concerns are higher than routine activities. The form is not required for SSOPD-developed systems or activities where SSOPD is not responsible for safety of flight (i.e. CubeSats, engineering development, subsystem deliveries). An "X" in the "Complete" column indicates the respective line item is complete. A date in the "Date" column indicates the estimated completion date of the respective line item. Details of waivers granted are documented in the space provided and/or attachments may be inserted. The submitter's signature indicates a readiness status for the respective items identified and a request to proceed. The completed form is presented for review and approval at the Approval to Proceed (ATP) meeting. Contingencies approved in order to proceed should be documented in the space provided and signed off by the submitting Office Chief or their designee when the status is updated. The signed form is maintained by the submitting office. Approval signatures of supporting offices are obtained as applicable. SSOPD may include or exclude activities from the ATP at their discretion.

Date:	Project Number:	Project/Mission Name:	PM/MM Name:	<b>Reset Form</b>
12/12/19	820-LMPP-1904	SuperTIGER	Andrew Hynous	

Managing Office:	Platform:	Scope of Authorization:	Operations Location:	Flight Number(s):
Balloon Program Office	Balloon	Specific Mission	LDB, McMurdo Station, Antarctica	To Be Assigned

### Readiness Elements for Approval to Proceed with Operations

<i>Project Management/Range</i>	<i>N/A</i>	<i>Complete</i>	<i>Date</i>	<i>Documentation - continued</i>	<i>N/A</i>	<i>Complete</i>	<i>Date</i>
Funding/Agreements in place for Operations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/01/19	Mishap/Contingency Plan Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11/20/19
Lessons Learned Reviewed for applicability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/06/19	Surveillance/Recovery Plan Approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Environmental Determination/REC complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	05/14/19	Portal Documentation is up to date	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
ITAR/Export Control Approval Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
International Overflight Agreements in Place	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<i>Off-Site/Remote Readiness Elements</i>			
Diplomatic Clearances Approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Off Site Deployment Requirements Met	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11/06/19
Top Risks Identified & Reviewed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/06/19	Host Range Briefings Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Frequencies Authorized	<input type="checkbox"/>	<input checked="" type="checkbox"/>	07/19/19	On Site Equipment Certified and Personnel in place	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/04/19
Payload/Flight Support Systems Integrated/Tested	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/11/19	On Host Range Schedule	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ground Support Systems Integrated & Tested	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/04/19	Host Clearance/Hazard Areas Communicated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Dress Rehearsal Complete/on Range Schedule	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Interim Response Team Established	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/06/19	<i>Balloon Readiness Elements</i>			
Aircraft and/or UAS support approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Structural Certification Complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/11/19
Applicable NOTAMS/Notice to Mariners issued	<input checked="" type="checkbox"/>	<input type="checkbox"/>	To be Filed	Mission Manager Procedure Complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/04/19
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Table Top Exercises Completed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/06/19
<i>Reviews</i>				Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Requirements/Initiation Conference Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<i>Sounding Rocket Readiness Elements</i>			
Internal Office Reviews Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>		SRPO Authorization Memo to Proceed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Flight Readiness Review Complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/11/19	Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Launch Readiness Review Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<i>Aircraft Readiness Elements</i>			
Mission Readiness Review Complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/04/19	Type: Other - Dynamic Ventures, Inc.			
Range Readiness Review Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Airworthiness Safety Review Board Approval	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
All Prior Review Action Items are closed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/06/19	Instrument Safety/Security Plan Approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Aircrew/QNC/Pilots Flight Safety Briefing Scheduled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<i>Safety</i>				Airworthiness Test Flights Scheduled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Risk Analysis Report/Hazard Analysis Completed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	03/08/16	Airworthiness Test Flight Test Plan Signed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Hazardous Operating Procedures Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11/14/19	Airworthiness Certificate/Determination Letter Signed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ground Safety Plan Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11/14/19	MORAP Review Memo Signed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Flight Safety Plan Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/31/19	CAS IAOP Review Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Equivalent Level of Safety (ELS) Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11/05/18	Traffic Management Plan signed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Security Procedures/Warning Areas Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/31/19	Flight Req. Approved/Project on Operations Schedule	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Laser Approval Obtained	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<i>Documentation</i>				Airfield/Hangar Safety Briefing Complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Portfolio Project Plan Annex Approved	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12/11/19	Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Mission/Operations Directive Approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<i>Additional</i>			
					<i>N/A</i>	<i>Complete</i>	<i>Date</i>



Mission/Campaign Plan Approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Other: Operator Training and Certification Complete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>12/04/19</b>
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**Requestors:** Describe any duty time restrictions/constraints, Project Waivers and/or Equivalent Level of Safety (ELS) safety determinations and/or provide attachments. Include a description of preventative actions taken to date and any future actions planned.

**820-EXCEP-2019-03 EXCEPTION REQUEST OF NASA DUTY TIME REQUIREMENTS; Exception granted to support launch operations from Ft. Sumner, NM., signed 18 July 2019**

**BPO-2018-ELS-01; BPO MRSO for Antarctica Campaigns, signed 5 November 2018**

**BPO-2018-ELS-02; Antarctica Viewing Area for Personnel, signed 5 November 2018**

**Define any contingent approval dispositions that permits the Project Office to proceed with the operation:**

Submitter:

Signature:

**Based on the completion of Operational Planning Activities reflected above, concurrence is documented through signatures below. Office signatures are obtained as applicable to the support provided, otherwise "n/a"**

Aircraft Office	Balloon Office	Sounding Rockets Office	Range and Mission Management Office
N/A		N/A	N/A
Special Projects Office	Safety Office	Other (as applicable - otherwise N/A)	
N/A		N/A	

**Authorization to proceed with operations on a contingent basis is at the discretion of the Wallops Flight Facility/SSOPD Director. Based on the preceding information, the Wallops Team is approved to conduct this mission and authorized to proceed.**

Wallops Flight Facility Director/  
SSOPD Director

**To be completed by the Project Manager/Mission Manager if contingencies were approved in order to proceed with operations. If no contingencies documented, this section is not applicable and no signature is necessary**

**Provide a status and/or update of contingencies that were approved in order to proceed with the operation:**

Office Chief or Designee: