

# HABET Missions Pre-2006



## Introduction

This document is still a work in progress. Please check back for updates.

### PLEASE NOTE

In the fall of 2010, we began moving to a new web server. Because of this, some links to photos and data are currently broken. We are aware of this, and as soon as we are fully setup in our new server we will make sure those links get fixed.

This document contains information and links to photos and data from HABET Flights before 2006. In 2006 the SSCL obtained a new Chief Engineer (Matthew Nelson) that implemented a series of changes to how Missions were classified and categorized. In addition, the SSCL moved to a new webserver and to a CMS based system instead of a simple HTML system that had been used in the past.

For the most part, this document is a copy and paste from the old HTML files that were used. Photos that are in digital format were then uploaded to our new Gallery for easy linking and browsing. Any Data files have now been uploaded to our new website and can be found there. Post 2006 flights will be listed both on our Wiki site and our main site and are listed by Mission, with each Mission having multiple flights possible.

The flights are listed in order of their flight number. This does not mean they are listed in chronological order.

Although every attempt has been made to preserve our history of HABET, there are some flight information that is missing due to one reason or another.



# Table of Contents

I. **HABET Missions Pre-2006**

i. [Introduction](#)

II. **Table of Contents**

III. **HABET L-21**

i. [Mission Objectives](#)

ii. [Outcome](#)

iii. [Personnel](#)

iv. [Flight Information](#)

v. [Data](#)

IV. **HABET L-24**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

V. **HABET L-26**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

VI. **HABET L-27**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

VII. **HABET L-28**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

VIII. **HABET L-33**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

IX. **HABET L-34**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

X. **HABET L-35**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

XI. **HABET L-44**

i. [Mission Objectives](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personal](#)

v. [Flight Information](#)

vi. [Data](#)

XII. **HABET L-46**

i. [Mission Objective](#)

ii. [Status](#)

iii. [Outcome](#)

iv. [Personnel](#)

v. [Flight Information](#)

vi. [Data](#)

# HABET L-21

HABET L-21 flew on October 19th, 1998  
HABET L-21 was the first high-flying mission using the new LSB-1.

## Mission Objectives

- Team training.
- Test LSB-1.
- Test flight prediction and automation software.
- Refine operations plan.

## Outcome

HABET mission L21 was a success. All operations were generally a success, with spacecraft tracking and recovery proceeding without problem. The flight and prediction software proved functional, but areas for improvement were revealed. Due to loss of the first balloon, without the payload, a new method for attaching the balloon to the payload was devised.

## Personnel

Mission Manager	Mike Cook
Principal Investigator	Jooho Lee
Launch Director	Bill Byrd
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	Adam Cupp Wook Kim Jon Ryan
Flight Team	Tom Below
Recovery Team	Bruce Tsai Mike Meiners

Terry Carlson  
Bill Byrd

### Flight Information

Launch date	October 10, 1998
Launch time	9:40 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	2 hours, 43 mins.
Landing site	Lat 42° 18'N Lon 92° 44'W
Burst altitude	93,068 ft
Ground distance traveled	
Loss of signal (GPS)	666 meters
Ground wind speed at launch	6 knots at 140°
Temperature at launch	10 ° C
Dew point at launch	8 ° C
Pressure at launch	30.10 "Hg
Cloud cover at launch	Clear
Visibility at launch	5 miles, mist
Bus	LSB-1
Payload	Camera, visible film, timed operation.
Total lift	16 lbs
Net lift	9.25 lbs
Stack weight	6.75 lbs

## **Data**

[L-21 Plot in Excel](#)

[L-21 Raw data](#)

[L-21 Graph](#)

## HABET L-24

HABET L-24 flew on February 6, 1999.

### Mission Objectives

- Team training
- Obtain accurate flight path information using differential GPS
- Integrate external power down/reset
- Test improved Flight Team automation software
- Test LSB uplink capability

### Status

1/28/99	Scheduled to fly February 6, 1999. MRR will be at 6:30 PM, February 4.
2/5/99	After MRR, L24 is a Go! FRR will be at 6:30 PM, February 5.
2/5/99	After FRR, L24 is aGo! Launch will be at 8:00 AM, February 6.
2/6/99	L24 launched at 8:20 AM, February 6. Spacecraft landed in a tree. Recovery options currently under consideration.
2/7/99	Spacecraft fell over night. Now recovered.

### Outcome

Flight prediction did not work as expected, resulting in a flight virtually over Cedar Rapids airport. The recovery team experienced significant packet loss throughout the flight, and the flight team experienced significant loss near the end of the flight. The cause of this is being looked into, and possible solutions will be

investigated. Reception from the pin-hole camera over the first few thousand feet was good, although the spacecraft experienced more spin than we had hoped for. It does not appear that we obtained differential GPS lock during the flight. In the future, we will be doing our own on-the-ground correction for this. The uplink system did not function. This is being investigated. Although we experienced several problems with this flight, the launch did go without a hitch, and flight tracking and recovery was successful.

### Personnel

Mission Manager	Mike Cook
Principle Investigator	Arthur Vickers
Launch Director	Adam Cupp
Flight Director	Tom Below
Recovery Director	Mike Meiners
Launch Team	Jon Ryan Wook Kim Nick Mohr
Flight Team	Arthur Vickers Bruce Tsai
Recovery Team	Bill Byrd Wook Kim

### Flight Information

Launch date	February 6, 1999
Launch time	8:20 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	1 hour 40 mins
Landing site	Ely, Iowa Lat 41° 51'N Lon 91° 35'W
Burst altitude	60,500 ft



Ground distance traveled	104 miles
Loss of signal (GPS)	`
Ground wind speed at launch	1 kt
Temperature at launch	
Dew point at launch	
Pressure at launch	
Cloud cover at launch	Clear
Visibility at launch	Excelent
Bus	LSB-1
Payload	Differential GPS
Total lift	22 lbs
Net lift	15.25 lbs
Stack weight	6.75 lbs

## **Data**

[L-24 Raw data](#)  
[Pictures and Videos](#)

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# **HABET L-26**

HABET L26 flew on April 24, 1999.

## Mission Objectives

- Team training.
- Test cutdown system using timer.
- Fly new turnstile antenna for main transmitter.
- Further evaluation of flight prediction software.
- Test anti-spin device.

- Re-test LSB uplink capability

## Status

3/3/99	MMR will be held 3/4/99 6:30pm, in the SSOL.
3/4/99	Mission postponed due to hardware problems. New date to be set.
4/21/99	MRR held. Mission is a Go!
4/23/99	FRR held. Mission is a Go!
4/24/99	HABET L26 launched at 7:50am.

## Outcome

Cutdown worked as expected, with cutdown occurring at 27,000 feet. Uplink from SSOL also worked as expected, indicating that we are ready to test the cutdown as triggered by an uplink command.

Flight prediction software shows some previously unseen bugs that need to be fixed, but tracking was accurate enough to facilitate easy recovery.

Turnstile antenna could not be attached to the spacecraft enclosure in such a way that the HABET manager was happy to fly it. It was therefore removed from the mission.

The antenna team needs to work on a new design for attaching the antenna.

The anti-spin device seemed to have some effect on reducing spin, but more tests are required to verify this.

## Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)
Launch Director	Adam Cupp
Flight Director	Tom Below
Recovery Director	Mike Meiners

Launch Team	Khan Haroon Bill Byrd Wook Kim
Flight Team	Arthur Vickers Mark Anderson
Recovery Team	Bill Byrd Bruce Tsai

## Flight Information

Launch date	April 24, 1999
Launch time	7:50 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	63 minutes
Landing site	Rhodes, IA Lat 41° 57'N Lon 93° 12'W
Burst altitude	27,000 feet
Ground distance traveled	16 miles.
Loss of signal (GPS)	1600 feet above sea level
Ground wind speed at launch	2 knots
Temperature at launch	20 °C
Dew point at launch	-1 °C
Pressure at launch	30 inches Hg
Cloud cover at launch	Partly cloudy
Visibility at launch	Very good.
Bus	LSB-1
Payload	Cutdown system Anti-Spin device
Total lift	20 lbs
Net lift	9 lbs
Stack weight	11 lbs

# Data

[L-26 Raw Data](#)  
[L-26 Pictures and videos](#)

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## HABET L-27

HABET L27 flew on June 17, 1999.

### Mission Objectives

- Team training.
- Test cutdown system commanded from ground.
- Test launch release device.
- Further evaluation of flight prediction software.

### Status

6/1699	MRR held at 12:00pm. Mission is a Go!
6/17/99	FRR held at 8:00am. Mission is a Go!
6/17/99	HABET L27 launched at 10:23am.

### Outcome

The launch release mechanism worked without a hitch, resulting in an extremely smooth and well-controlled launch. Command was received by the spacecraft and the cutdown activated correctly and burned through the line. However, the line then became tangled so that the spacecraft did not fall away from the balloon freely. Therefore, the spacecraft travelled to burst altitude before returning to ground. Flight tracking and prediction worked flawlessly so that the recovery team were able to video record the spacecraft returning to earth.

## Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)
Launch Director	Adam Cupp
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	Adam Westphal Bill Byrd Jason Clark
Flight Team	John Britton
Recovery Team	Adam Westphal Bill Byrd

## Flight Information

Launch date	June 17, 1999
Launch time	10:23 am
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	2 hours 31 minutes
Landing site	Bussey, Iowa Lat 41° 12'N Lon 92° 53'W
Burst altitude	84,000 feet
Ground distance traveled	70 miles.
Loss of signal (GPS)	35,000 feet
Ground wind speed at launch	3 knots
Temperature at launch	15 °C
Dew point at launch	10 °C
Pressure at launch	30.32 inches Hg
Cloud cover at launch	Clear
Visibility at launch	Very good.

Bus	LSB-1
Payload	Command cutdown system.
Total lift	11 lbs
Net lift	4 lbs
Stack weight	7 lbs

## Data

[L-27 Raw Data](#)  
[L-27 Photos and videos](#)

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## HABET L-28

HABET L28 flew 9/23/99

### Mission Objectives

- Test capability to transmit multiple distinct commands to spacecraft.
- Test altitude-activated trigger mechanism.
- Test new cutdown device designed to reduce possibility of lines becoming tangled following burn-through.

### Status

7/20/99	Technology development of the multiple command and altitude activator capabilities is currently underway.
9/21/99 11AM	MRR Mission is Go for Launch
9/23/99 10AM	FRR Mission is Go for Launch
9/23/99 2:30	Launch

PM

### Outcome

Spacecraft was launched at 2:30 PM without any problems. Cutdown was being tested for 15,000 ft, however cutdown failed and the Balloon and payload flew to burst altitude. Recovery Team successfully found the Spacecraft, tracking of the spacecraft had no errors.

### Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)
Launch Director	Bill Byrd
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	Tracy Wulf Bohaboj Jason Clark Scott Taylor Michael Tribuno
Flight Team	John Blattel-Britton Eric Hauber
Recovery Team	Nate Adam Katie Blummer

### Flight Information

Launch date	9/23/99
Launch time	2:30 PM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	2 hours 30 minutes
Landing site	Lat 41° 37'N Lon 92° 20'W

Burst altitude	84,930 ft
Ground distance traveled	74 miles
Loss of signal (GPS)	none
Ground wind speed at launch	N/A
Temperature at launch	N/A
Dew point at launch	N/A
Pressure at launch	N/A
Cloud cover at launch	Partly Cloudy
Visibility at launch	N/A
Bus	LSB-1
Payload	Altitude-activator Multiple command system Cutdown device
Total lift	10.25 lbs
Net lift	3.25 lbs
Stack weight	7 lbs

## Data

[L-28 Raw Data](#)  
[L-28 Excel Data](#)  
[L-28 Photos and Videos](#)

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## HABET L-33

HABET L33 flew 10/4/99

### Mission Objectives

- Test capability to transmit multiple



distinct commands to spacecraft.

- Test altitude-activated trigger mechanism.
- Test multiple cutdown device

### Status

9/30/99	MRR
10/1/99	FRR
10/4/99 9:39AM	Launch

### Outcome

Spacecraft launched normally. Gained altitude till approximately 15,000 feet. At 15,000 feet the balloon was cut free and the spacecraft descended to the ground.

### Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)
Launch Director	Bill Byrd
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	Katie Blummer Nate Adam
Flight Team	Jason Clark
Recovery Team	Eric Hauber Natasha Jo Krentz Adam Cupp

## Flight Information

Launch date	10/04/99
Launch time	9:39 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	35 minutes
Landing site	5.3 Miles SSW of Nevada, IA
Burst altitude	approximately 15,000 feet
Ground distance traveled	23 miles
Ground wind speed at launch	N/A
Temperature at launch	N/A
Dew point at launch	N/A
Pressure at launch	N/A
Cloud cover at launch	Partly Cloudy
Visibility at launch	N/A
Bus	LSB-1
Payload	Altitude-activator Multiple command system Multiple Cutdown device
Total lift	12 lbs
Net lift	5 lbs
Stack weight	7 lbs

## Data

[L-33 Raw Data](#)  
[L-33 Excel Data](#)  
[L-33 Photos and videos](#)

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## HABET L-34

HABET L34 flew 10/18/99

## Mission Objectives

- Test capability to transmit multiple distinct commands to spacecraft.
- Test altitude-activated trigger mechanism.
- Test multiple cutdown design for the release of multiple balloons. (Testing electronics only, no multiple balloons)

## Status

10/18/99      Launch  
8:31AM

## Outcome

The spacecraft was launched on time at 8:31 AM on Monday, October 18th, 1999. Attempts to cut down the balloon at 15,000 ft failed, due to failure to activate multiple cutdown device before takeoff. At about 18,000 ft contact with the spacecraft was lost, and was not regained until the spacecraft descended once again through about 18,000 ft. Due to the failure of the cutdown switch, the spacecraft proceeded much farther than the anticipated landing sight, over 100 miles away from launch site. The spacecraft was successfully recovered east of Waterloo, IA.

## Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)

Launch Director	Bill Byrd
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	Katie Blummer Nate Adam
Flight Team	Jason Clark
Recovery Team	Eric Hauber Natasha Jo Krentz Adam Cupp

## Flight Information

Launch date	10/18/99
Launch time	8:31 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	2 hours 15 minutes
Landing site	Lat 42° 29'N Lon 91° 38'W
Burst altitude	unknown (about 92,000 ft)
Ground distance traveled	109 miles
Loss of signal (GPS)	GPS lost at 18,000 ft ascent
Ground wind speed at launch	N/A
Temperature at launch	N/A
Dew point at launch	N/A
Pressure at launch	N/A
Cloud cover at launch	Partly Cloudy
Visibility at launch	N/A
Bus	LSB-1
Payload	Altitude-activator Multiple command system Multiple Cutdown device
Total lift	12 lbs
Net lift	5 lbs

Stack weight

7 lbs

## Data

[L-34 Data](#)  
[L-34 Photos and Video](#)

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# HABET L-35

HABET L35 flew November 1, 1999

## Mission Objectives

- Test capability to transmit multiple distinct commands to spacecraft.
- Test altitude-activated trigger mechanism.
- Test multiple cutdown design for the release of multiple balloons. (Testing electronics only, no multiple balloons)

## Status

11/1/99 8:05 AM Launch

## Outcome

The Spacecraft was successfully launched at around 8:05 AM Monday, November 1, 1999. The balloon flew a short flight to the cut-off altitude of 15,000 ft where the cutdown was successful. Recovery team was able to obtain video recording of L35 dropping down to the earth. The Recovery team was able to

locate and recover the spacecraft.  
There were no losses of GPS during this flight, and the hardware systems being tested were successful.

#### Personnel

Mission Manager	Mike Cook
Principle Investigator	Terry Carlson (HABET Engineering)
Launch Director	Bill Byrd
Flight Director	Arthur Vickers
Recovery Director	Mike Cook
Launch Team	
Flight Team	Tracy Wulf Bohaboj
Recovery Team	Natasha Jo Krentz Recovery Team

#### Flight Information

Launch date	11/1/99
Launch time	8:05 AM
Launch site	Outdoor Classroom, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	40 mins
Landing site	Lat 42° 3'N Lon 93° 18'W
Burst altitude	cutdown at 15,000 ft
Ground distance traveled	19 miles
Loss of signal (GPS)	none
Ground wind speed at launch	N/A
Temperature at launch	N/A
Dew point at launch	N/A
Pressure at launch	N/A
Cloud cover at launch	Sunny

Visibility at launch	N/A
Bus	LSB-1
Payload	Altitude-activator Multiple command system Multiple Cutdown device
Total lift	12 lbs
Net lift	5 lbs
Stack weight	7 lbs

### Data

[L-35 Raw data](#)

[L-35 Excel data](#)

[L-35 Video and pictures](#)

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## HABET L-44

HABET L44 was flown Wed. Nov. 15, 2000

### Mission Objectives

- Reinforce Team Training for Current Rotation
- Gather Public Relations Photographs of High Altitude (Near Space)

### Status

10/10/00	Mission Put Ahead of H43
10/14/00	MRR is GO for launch on 10/15/00
10/15/00	FRR is GO for launch Spacecraft Launched

### Outcome

L44 was launched at at 8:10 AM CST on 11/15/00. The objective of reinforcing team training for 265x was completed, as many students of 265x participated with the launch. However the goal of obtaining high altitude pictures failed.

High altitude pictures failed because the balloon burst at a relatively low altitude never topping even 60,000 ft. Upon looking at film of launch later, it was seen that there was a weak point in the balloon, probably a defect from the factory, that most likely led to the early burst.

L44 was also the first test of the mobile flight team, after finding some problems in the given plans, the hardware and software seemed to function okay for the mission.

The spacecraft landed just east of Vinton, and the Recovery Team was there after about 10-15 minutes after the landing. Spacecraft landed in an open field and was easily recovered.

## Personal

Mission Manager	Mike Cook
Principle Investigator	Habet Public Relations
Launch Director	Adam Cupp
Flight Director (Mobile Flight Team)	Eric Hauber
Recovery Director	Bill Byrd
Launch Team	Thomas M. Kent 5th Aaron Harris Mike Feller
Flight Team	Adam Cupp Sean O'Neil Jason Skretta
Recovery Team	Danny Byrd Jason Walton

## Flight Information

Launch date	11/15/00
Launch time	8:10 AM CST
Launch site	Clyde Williams Field, ISU Campus



	Lat 42° 2'N Lon 93° 40'W
Flight duration	1 Hour and 48 Minutes
Landing site	Farm Field in Eastern Iowa Lat 42° 13'N Lon 91° 58'W
Ground distance traveled	88.6 Miles WNW of Launch Site
Loss of signal (GPS)	
Ground wind speed at launch	3 knots from the South
Temperature at launch	32 Degrees F
Dew point at launch	
Pressure at launch	
Cloud cover at launch	small cirrus clouds mostly sunny
Visibility at launch	Clear
Bus	LSB-1
Payload	Pinhole camera (facing down) Cameras Facing Out Altitude Activated Switch
Total lift	15 lb
Net lift	4.5 lb
Stack weight	10.5 lb

### Data

[L-44 Raw data](#)

[L-44 Excel Data](#)

[L-44 photos and videos](#)

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## HABET L-46

HABET L46 flew Thursday, March 1, 2001 at 0800 CST

### Mission Objective

- Reinforce Team Training for Current Rotation
- Gather Public Relations Photographs of High Altitude (Near Space)
- Verify Altitude switch from L44

## Status

1/16/2001	Mission Personal Assigned
2/1/2001	MRR was GO for Launch
2/1/2001	Mission Postponed due to hardware failure
2/27/2001	MRR was GO for Launch
2/28/2001	FRR was GO for Launch
3/1/2001	Launch at 0800 CST

## Outcome

L46 launched at 8:00 AM on Thursday, March 1, 2001. The spacecraft cleanly cleared the ground at almost exactly 8:00 AM. The balloon and spacecraft rapidly ascended upward due to the large amount of lift given to the balloon. GPS lock was lost briefly in the higher altitudes, most likely due to the rapid ascent once again. Radio communication was never lost, and the recovery team was directed within one mile of the actual landing zone.

The balloon burst at exactly 90,000 ft, then began its descent towards Earth. After bursting, the Altitude Activated Switch triggered the camera to begin taking photos. The spacecraft was recovered in a corn field just east of the small Iowa town of Lincoln. The mission was deemed a success, and the photographs from altitude can be seen [here](#).

## Personnel

Mission Manager	Eric Hauber
Principle Investigator	Habet Public Relations/ 265x
Launch Director	Tracy Bohaboj
Flight Director	Tom Kent

Recovery Director	Katie Blummer
Launch Team	Joe Pederson Adam Cupp
Flight Team	Jenny Bodem Dan Kult
Recovery Team	Mike Cook Danny Byrd

## Flight Information

Launch date	3/1/2001
Launch time	0800 CST
Launch site	Clyde Williams Field, ISU Campus Lat 42° 2'N Lon 93° 40'W
Flight duration	2 hours and 16 mins
Landing site	1 Mile east of Lincoln, IA Lat 42° 15'N Lon 92° 41'W
Ground distance traveled	56.2 miles
Loss of signal (GPS)	
Ground wind speed at launch	3 mph out of SE
Temperature at launch	15 Degrees F
Dew point at launch	
Pressure at launch	
Cloud cover at launch	Broken Clouds
Visibility at launch	10 miles
Bus	LSB-1
Payload	Pinhole camera (facing out) Camera Facing Outwards Altitude Activated Switch
Total lift	20
Net lift	11.5
Stack weight	8.5

## Data

[L-46 Raw data](#)

[L-46 Excel Data](#)  
[L-46 photos and videos](#)

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