September 8, 2014

CLTP5

CanSat Leader Training Program 5

Overview and Experience of CLTP 4

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UNISEC University Space Engineering Consortium

CLTP 4

Source: http://cltp.info/cltp4.html

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General Information

- Date: July 22 – August 16, 2013
- Location: Shin Kawasaki (K2) Campus, Keio University, Kawasaki, Kanagawa, Japan

  Seminar House Crosswave Funabashi, Funabashi, Chiba, Japan

  *CanSat Launch Experiment was conducted at Futawa Ground, Nihon University, Funabashi, Japan

Mission of CANSAT

To take video while the CANSAT is descending to the ground

To measure the temperature of the CANSAT

To measure ambient pressure

To trace trajectory

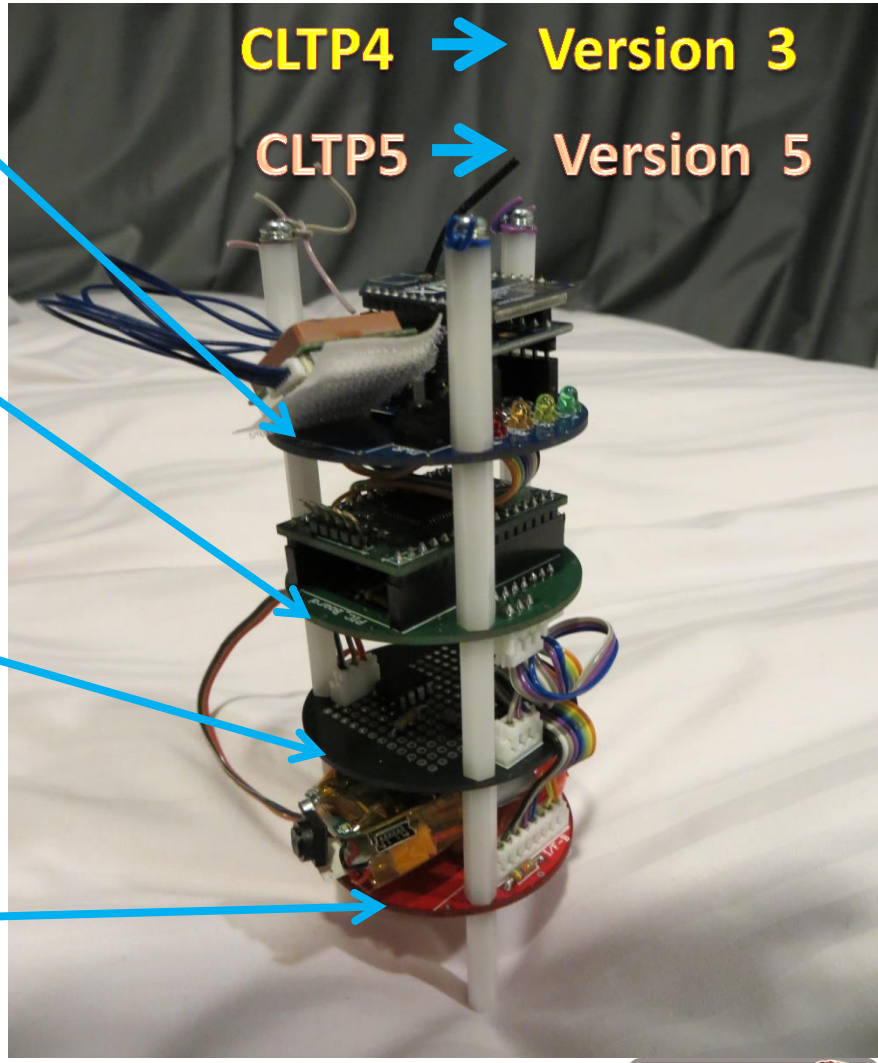
My CANSAT

Top Part: XBee, GPS module, LED, Main switch, Read Jumper

Middle Part: PIC Board, EEPROM memory, Relay Camera etc.

USR Design Part: Temperature, pressure sensor etc.

Bottom Part: Camera, Battery, Separation Jumper etc.



Types of Flight Test

Balloon test

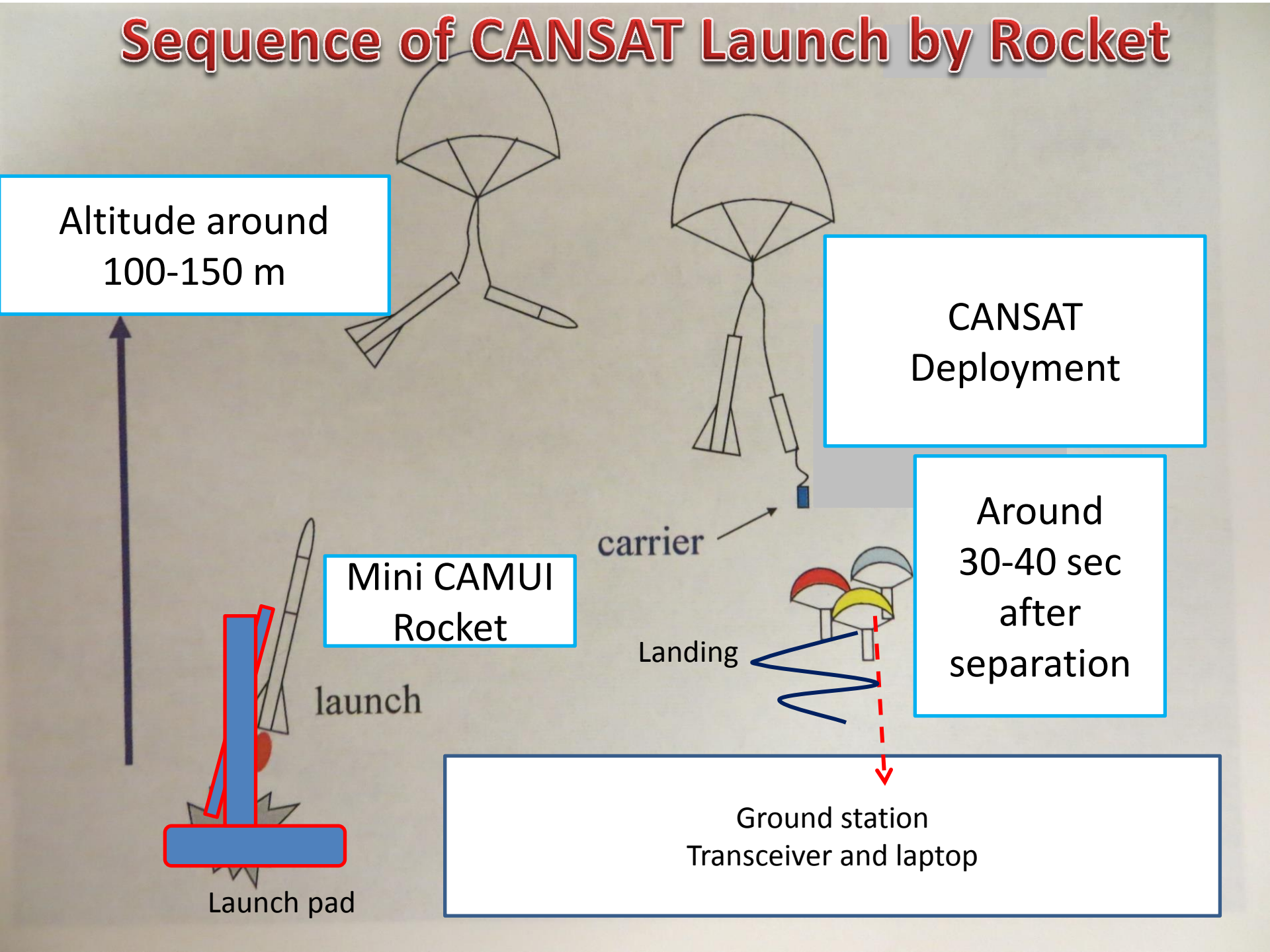
Kite Plane test

Viedo of Mini CAMUI hybrid Rocket lunch in Akabira

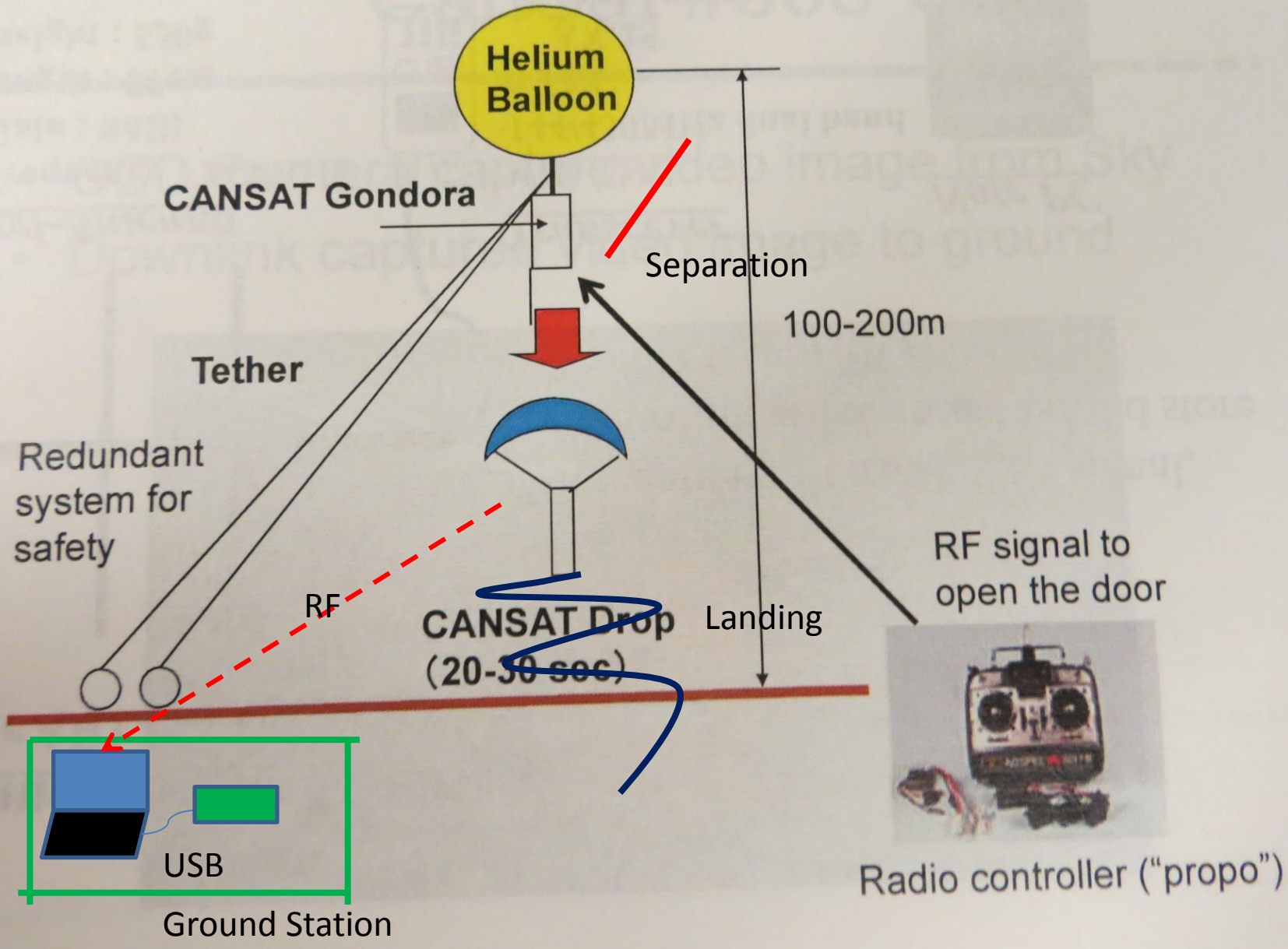
MVI_2518.MOV

Rocket test

Sequence of CANSAT Launch by Rocket



CanSat Deployment using Helium Balloon

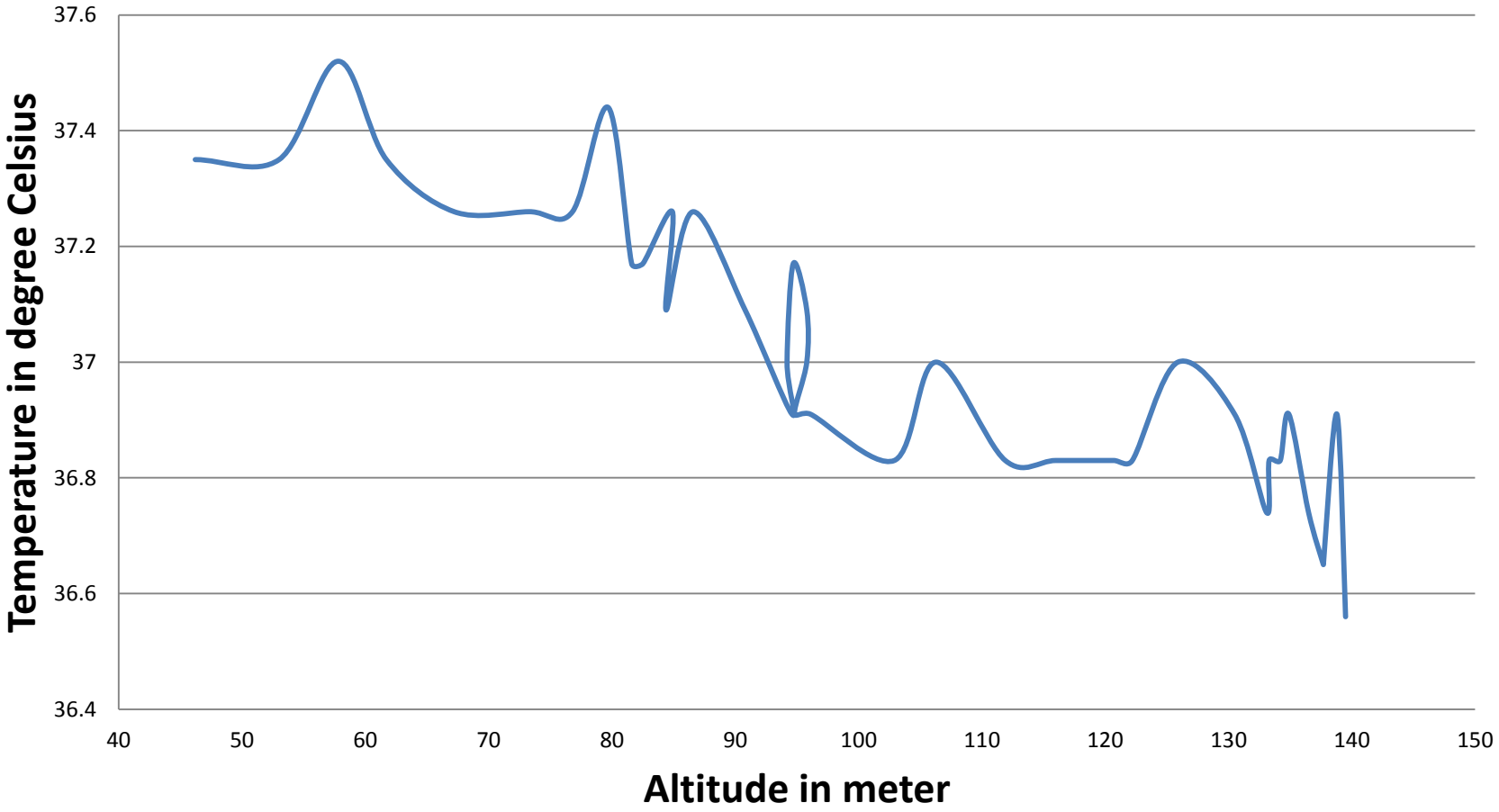


Available data from Balloon test

1. GPS data such as date time, latitude, longitude, altitude etc.
2. temperature.
3. pressure.

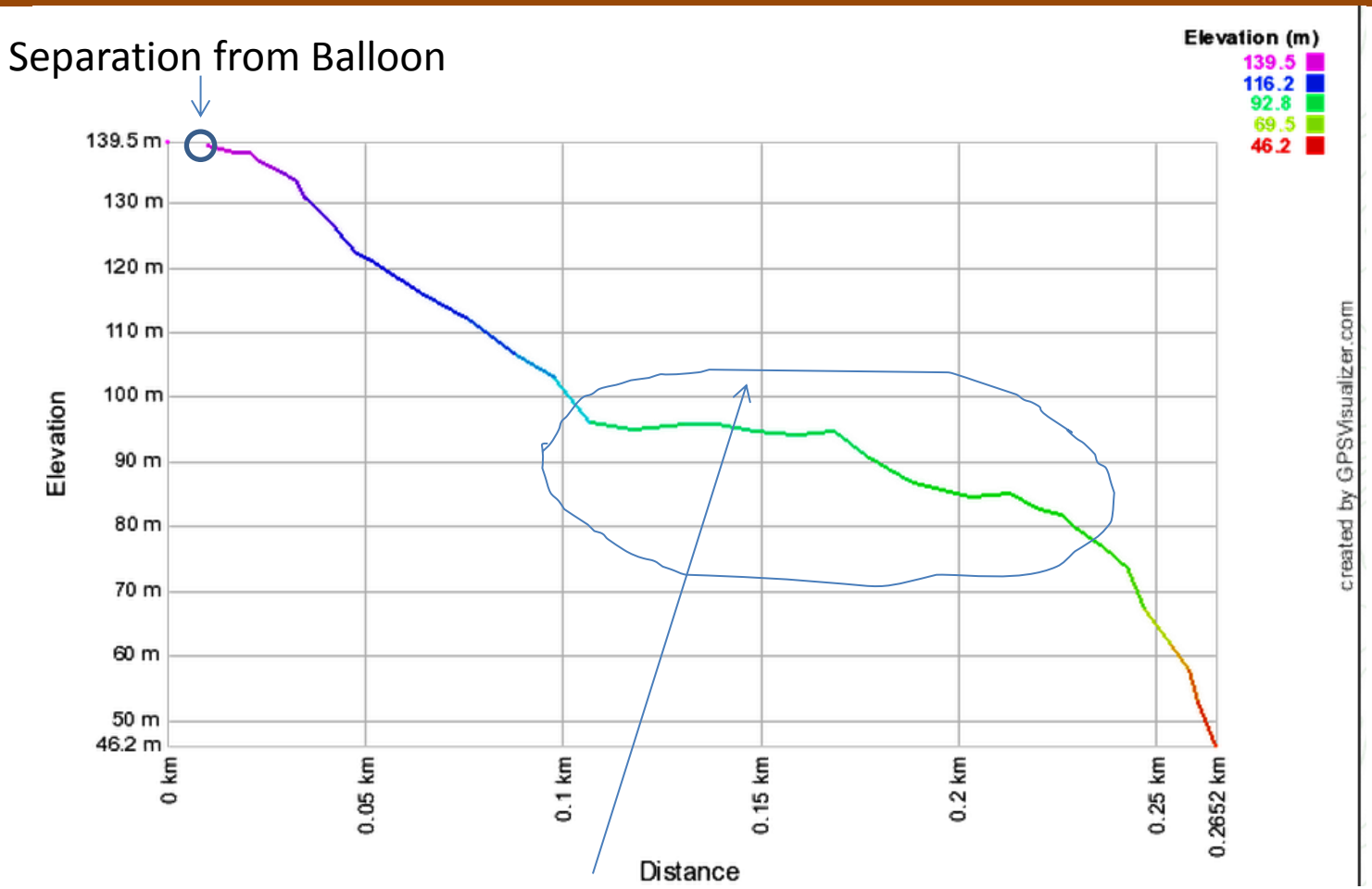
All these data of CANSAT were obtained after separation from Balloon by transmission.

Change in temperature with altitude



Track of lost CANSAT by GPS visualizer during Balloon Experiment

Elevation profile for Balloon Test



From this graph I think that it took long time to drop of altitude in between 100 m to 80 m because of strong wind flowing at that moment

Date	UTC time	latitude	longitude	altitude
2013/8/12	3:22:36 AM	35.74212	140.0112	139.5
2013/8/12	3:22:42 AM	35.74211	140.0112	8.5
2013/8/12	3:22:44 AM	35.74205	140.0112	138.8
2013/8/12	3:22:46 AM	35.74201	140.0111	137.7
2013/8/12	3:22:48 AM	35.74199	140.0111	137.7
2013/8/12	3:22:50 AM	35.74197	140.0111	136.5
2013/8/12	3:22:52 AM	35.74194	140.011	134.9
2013/8/12	3:22:54 AM	35.74193	140.011	134.2
2013/8/12	3:22:56 AM	35.74192	140.011	133.3
2013/8/12	3:22:58 AM	35.74192	140.011	133.1
2013/8/12	3:23:00 AM	35.7419	140.011	130.5
2013/8/12	3:23:02 AM	35.74188	140.0109	125.9
2013/8/12	3:23:04 AM	35.74186	140.0108	122.2
2013/8/12	3:23:06 AM	35.74184	140.0108	120.7
2013/8/12	3:23:08 AM	35.74176	140.0107	116
2013/8/12	3:23:10 AM	35.74169	140.0106	111.9
2013/8/12	3:23:12 AM	35.74165	140.0105	106.3
2013/8/12	3:23:14 AM	35.74162	140.0104	102.9
2013/8/12	3:23:16 AM	35.74159	140.0103	96.1
2013/8/12	3:23:18 AM	35.74158	140.0102	94.6
2013/8/12	3:23:20 AM	35.74158	140.01	95.8
2013/8/12	3:23:22 AM	35.74158	140.01	95.8
2013/8/12	3:23:24 AM	35.74154	140.0099	94.7
2013/8/12	3:23:26 AM	35.74149	140.0098	94.2
2013/8/12	3:23:28 AM	35.74146	140.0097	94.6
2013/8/12	3:23:30 AM	35.74143	140.0096	90.8
2013/8/12	3:23:32 AM	35.74144	140.0095	86.6
2013/8/12	3:23:34 AM	35.74144	140.0093	84.4
2013/8/12	3:23:36 AM	35.74143	140.0092	84.9
2013/8/12	3:23:38 AM	35.74142	140.0091	82.5
2013/8/12	3:23:40 AM	35.74141	140.009	81.6
2013/8/12	3:23:42 AM	35.7414	140.009	79.7
2013/8/12	3:23:44 AM	35.74135	140.0089	76.8
2013/8/12	3:23:46 AM	35.74132	140.0089	73.3
2013/8/12	3:23:48 AM	35.74131	140.0088	67.2
2013/8/12	3:23:50 AM	35.74128	140.0088	61.7
2013/8/12	3:23:52 AM	35.74127	140.0087	57.8
2013/8/12	3:23:54 AM	35.74126	140.0087	53
2013/8/12	3:23:56 AM	35.74123	140.0087	46.2

From this table we can see total flight time after separation was 1 minute 20 sec. This flying time was greater than we expected.

Communication is lost after it dropped on the ground.

Reasons of losing CANSAT in Balloon test

1. Lack of experience. Since It was our first experiment with CANSAT around 100 -150 m altitude.
2. Ignore the strong wind and not taking the counter measures.
3. Insufficient area for that experiment.

Rocket Experiment

New CANSAT was made after losing first CANSAT.

Mission for New CANSAT:

1. To take video
2. to measure temperature
3. to receive GPS data

Data Received from Rocket Experiment by Ground Station

130814_1443.asc - Notepad

File Edit Format View Help

```
Start video recording.
 Video recording is going on.
Temp: 0.09
$GPRMC,064415.856,A,3544.4698,N,14000.6590,E,026.1,233.7,140813,,,A*62
$GPGGA,0644,14000.6461,E,015.8,$GPGGA,064418.856,3544.4663,N,14000.6461,E,1,07,1.7,99.5,M,35.9,M,,0000*62
Temp: 0.00
Temp: 0.09
Temp: 0.00
Temp: 0.09
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Temp: 54.85
```

17:08
2013/08/15

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Training Program

Track of CanSat movement of Rocket experiment

Reasons of Failure in Rocket test

Inadequate time for accomplishing all kinds of test.

Such as

1. Vibration test
2. Shock test
3. Impact test and so on.

Lessons Learned from the Flight Tests

- Imagine every single thing that could happen.
- Ensure all tests before going to final experiment.
- Do not ignore any little confusion of total experiment.
- To consult many things with an experienced person.

Suggestion for CLTP5 Participants

- To imagine all viable occurrences, possibility of incidence in the time of experiment.
- To ensure all kinds of test, if it possible do a few drop tests from building before Paper Rocket Test.
- To be prepared for substitute or back up plans.

Finally, "Think yourself as a leader of this Project and make instantaneous decision to tussle and intercept any kinds of obstacle."

Conclusion

"We learn from our **accomplished** mission,
We also learn a lot from our **abortive** mission."

I wish you all a successful, fruitful training whatever the mission is **abortive** or **accomplished**.

Have a wonderful time in our beautiful campus of Hokkaido University.

Autumn

Winter


Thank you all
on behalf of
CLTP4 Participants