



BIRDS Project Newsletter

Issue No. 12 (13 Jan. 2017)

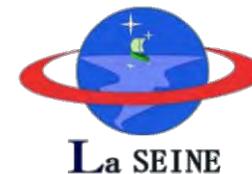


Members of BIRDS-1 and BIRDS-2 Teams (Tobata Campus)

Project website: <http://birds.ele.kyutech.ac.jp/>
All back issues are archived at this website.

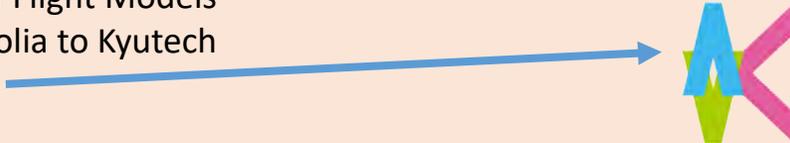
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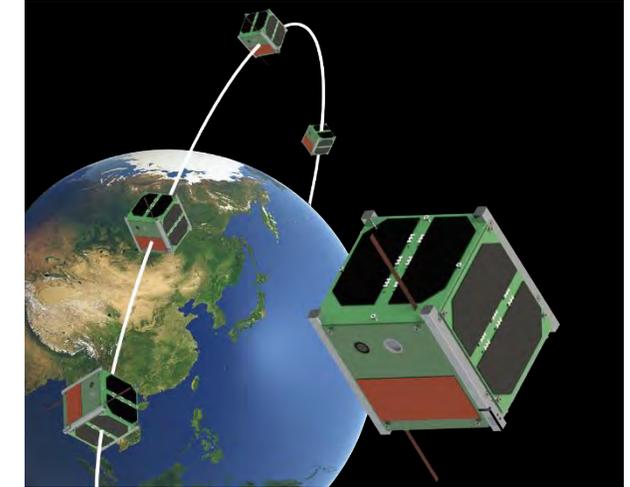
G. Maeda, Tejumola Taiwo, Joven Javier, M. Cho,
Laboratory of Spacecraft Environment Interaction
Engineering (LaSEINE),
Kyushu Institute of Technology,
Kitakyushu, Japan



All back issues of this newsletter can be easily downloaded. Go to here: <http://birds.ele.kyutech.ac.jp/>
At the top, click on the tab called NEWSLETTER. You will get a menu for all back issues.

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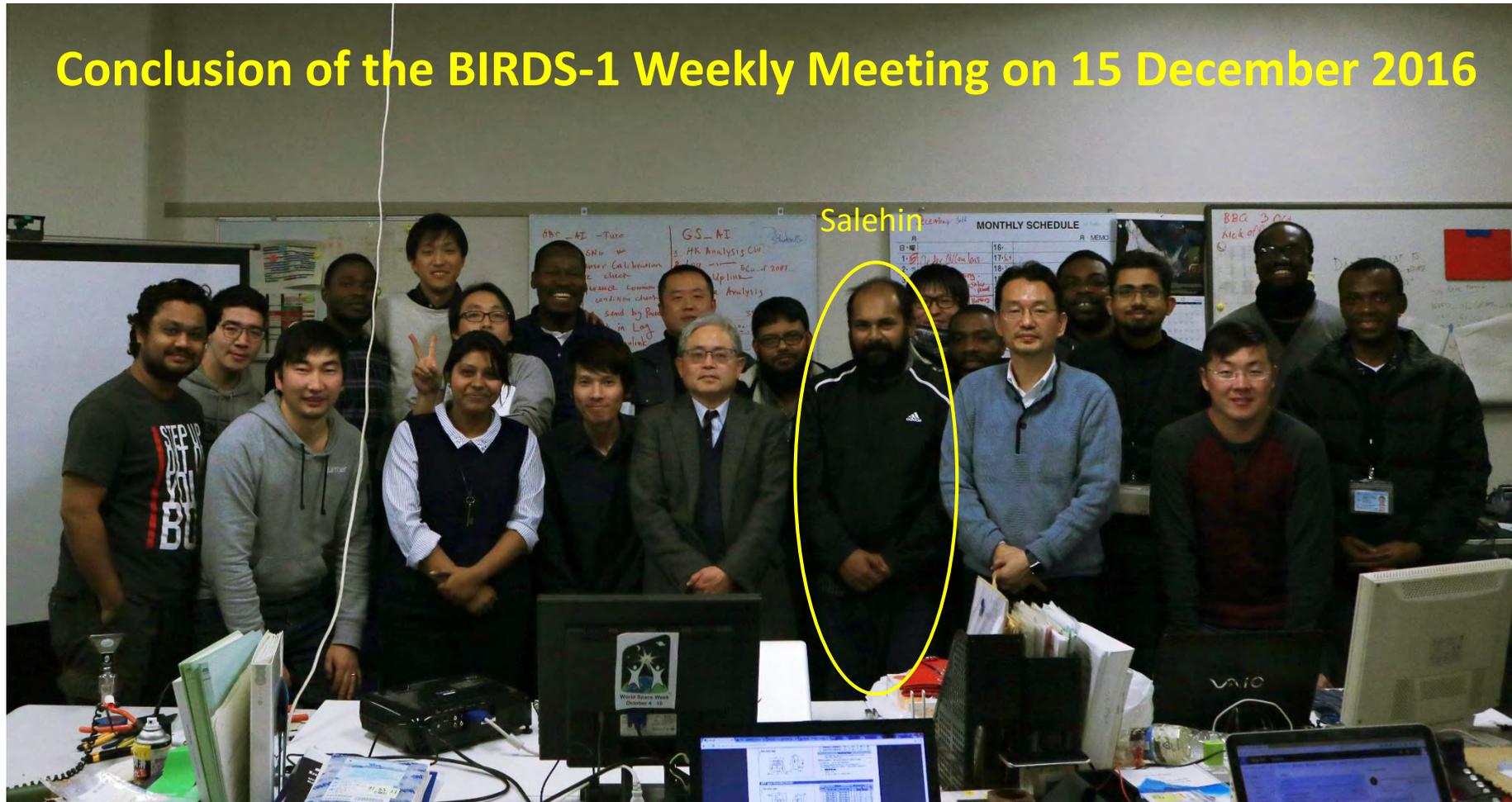
1. Thanks and farewell to Salehin (who helped BIRDS-1 on antenna issues)
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An art design by
Amartuvshin Dagvasumberel
*Department of Applied Science
for Integrated System Engineering*
Asami Laboratory
Graduate School of Engineering
Kyushu Institute of Technology
Kitakyushu, Japan.

1. Thanks and farewell to Salehin (who helped BIRDS-1 on antenna issues)

Conclusion of the BIRDS-1 Weekly Meeting on 15 December 2016



The engineering activities by Salehin during his stay are described in **Issue No. 11** of this newsletter --- see **Section 5, Issue No. 11**, pages 10-11; it was written by Salehin.

Below: Pics from Section 5 of Issue No. 11.



2. BIRDS-1 and BIRDS-2 mentioned during Joint Session of SEU-WG and ST-WG of recent APRSAF (in Manila)

SEU=Space Environment Utilization

ST=Space Technology

At the right is page 23 of 29 of the final report by SEUWG.

AV-3, BIRDS-1, BIRDS-2, and DIWATA-1 are mentioned here.



SEU-WG & ST-WG JOINT SESSION

“LAUNCH AND EXPERIMENT OPPORTUNITIES”

Attended by more than 100 participants from 17 country/region, 36 organizations

- Introduction of Kibo exposed facility system for the development and testing of new materials
 - J-SSOD and ExHAM
- Microsat Development project and framework
 - AOBA-Velox III (Singapore and Japan), BIRDS-1 (Japan, Ghana, Mongolia, Nigeria, and Bangladesh), and BIRDS-2 (Bhutan and Philippines)
 - DIWATA-1 (Philippines and Japan)
- Towards new mission, new opportunities
 - Small satellite development and deployment mission in Indonesia and Malaysia
 - Development of a Spaceport in Northern Australia
 - ISRO's Small satellite platforms and Launch Opportunities



**23RD
APRSAF**

ASIA-PACIFIC REGIONAL
SPACE AGENCY FORUM
PHILIPPINES

3. BIRDS-2 Team celebrates 109th National Day of Bhutan

Photos of Section 3 were taken by Asst. Professors Kim and Maeda.



Yeshey Kiran Asst.Prof. Maeda Adrian Prof. Cho Cheki Azami Joven Asst.Prof. Kim

Syazana and her husband arrived later.



Date and Time:
17 Dec. 2016,
About noon to
13:30.

Location:
Cho Lab Seminar
Room of the 4th
floor of
Building S-2 of
Tobata Campus,
Kyutech.

Continued on the next two pages.

Prof. Cho lights the candle for this occasion.



Spicy hot meat dish by Cheki



“Butter lamps are a common feature in Buddhist temples and monasteries throughout the Himalayas. A lighted butter lamp represents the illumination of wisdom and helps to focus the mind and aid meditation.”



From
The **Bhutan Canada** Foundation

<https://bhutancanada.org/bhutan-photo-of-the-week-butter-lamps/>



Dishes by Yeshey





Before eating lunch, Kiran delivers a PowerPoint presentation about Bhutan – interesting stuff.



We enjoyed a great lunch.



Yeshey explains the dishes to Prof. Cho.



4. BIRDS students Bonsu and Ibukun present at “SAES_2016” symposium



This Japan-Malaysia university-based engineering symposium took place on the Tobata Campus of Kyutech on the wintry weekend of 17 December. Around 95 students (70% women) flew in from UPM to participate.



During the banquet, Prof. Oie (President of Kyutech) chats with Ibukun, our BIRDS satellite engineer of Nigeria.



SEIC students mingle with the students of UPM

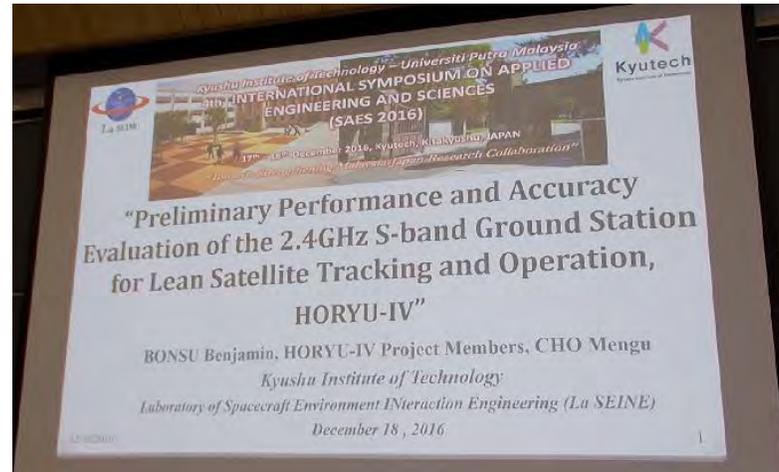
Symposium Banquet of 17 Dec 2016

Continued on the next page



15-minute oral presentations by Ibukun and Bonsu on 18th December 2016 as indicated by the SAES_2016 Program

Ibukun Adebolu	JOINT GLOBAL MULTI-NATION BIRDS Project: An Overview
B. Bonsu	Preliminary Performance and Accuracy Evaluation for the 2.4GHz S-band Ground Station for Lean Satellite Tracking and Operation



Handsome SEIC fellows pose for this shot.

Great job gentlemen !



5. BIRDS-1 engaged in assembly of Flight Models

Photos from Ibukun's SAES_2016 oral presentation Power Point file.



All these photos were taken in the BIRDS-1 clean room. Note that each country team has its own work bench.



6. TV film crew comes from Mongolia to Kyutech

For a TV documentary



During the week of 19 December 2016, a film crew (shown at the left) from NUM (National University of Mongolia) and MNB (Mongolian National Broadcaster) came to Kyutech to shoot material for a MNB documentary about BIRDS-1, LaSEINE, SEIC, Kyutech, and various aspects of Kitakyushu. Their primary host was Prof. Kikuchi of Kyutech. This crew interviewed Prof. Cho on the BIRDS-1 Project and on LaSEINE.

From left to right:

- 1) Mrs. TSevegsuren PUREVSUREN - Staff, Department of research and innovation, NUM
- 2) Mr. Tsogoo GANKHUU, Producer, Mongolian National Broadcaster
- 3) Mrs. Sayo Tsukinari, Secretary, LaSEINE, Kyutech, Japan
- 4) Mrs. Shuurai MENDBAYAR - Head of International affairs, NUM
- 5) Mrs. Osor OTGONJARGAL - Journalist, Mongolian National Broadcaster



7. Explanation of Kyutech's logo

国立大学法人

九州工業大学

Kyushu Institute of Technology

シンボルマーク

制作コンセプト



2009年創立100周年の節目に、学内公募によりシンボルマークを制定しました。原作者は、工学部建設社会工学科4年(当時)の澤野大地氏。澤野氏の原案を、プロデザイナーがモディファイしました。



これからの未来、これからの100年
「動作・活動」=Action

Action



今までの歴史、今までの100年
「価値・値打ち・評価」=Value

Value



未来と歴史を1本にボルトのモチーフでつなぎとめて、全体として1本の太い棒にしています。置かれた大学方針を表しています。



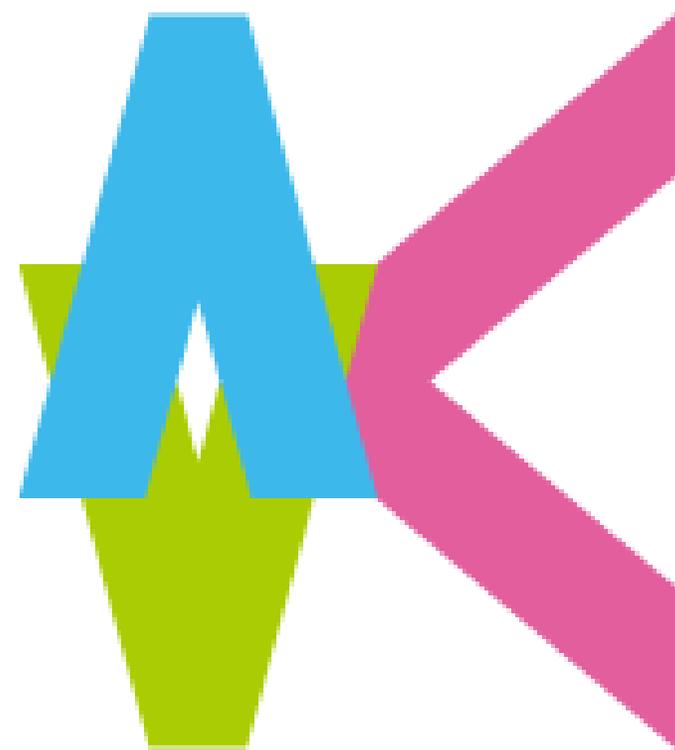
学生の飛躍感や、社会・世界へ飛び出していく元気のよいイメージ。上記と組み合わせて、九州工業大学の頭文字「K」の形になります。

Kyutech



A(ction) V(alue) K(yutech)の頭文字をユニットにしフレッシュで斬新なイメージのカラー使用で未来へ羽ばたいていく学生やこれからをリードしていく大学を表現しました。

In 2009, when Kyutech celebrated the 100th anniversary of its founding, it held a logo competition. The winning design came from a 4th year undergraduate student, 澤野大地氏.



8. Filming TV in Kitakyushu



Newsletter “Kitakyushu Bridges” by the City of Kitakyushu
<http://www.city.kitakyushu.lg.jp/english/e20100007.html>



Kitakyushu Supports a Thai Television Series!

Since the establishment of the Kitakyushu Film Commission in 1989, Kitakyushu has been branching out to television, film and media sectors by assisting various forms of support for film, drama and commercial makers such as providing shooting locations in the city. In total, more than 190 movies and television series have been supported by the commission and Kitakyushu, and the city is gaining publicity both home and abroad for being a well-known filming spot.

In September 2015, it was announced that “Devil Lover”, part of a new genre of romantic science-fiction, will be airing nationwide in Thailand from October and that the T.V. series was shot mainly in Kitakyushu, with around 120 local residents volunteering as unpaid extras. The filming took place for 11 days, spanning 30 filming locations, including the Hiraodai Limestone Plateau (a natural rock formation) and Kokura Castle.

Pitchaya Nitipaisankul (a.k.a. Golf), the protagonist and the producer of the drama commented that the appeal of the diverse range of locations convinced the creators to select Kitakyushu as the main shooting location at the press conference. Subsequently, Golf was appointed as Kitakyushu’s Cultural Ambassador to Thailand, where he will help to promote better mutual relations between Kitakyushu and Thailand.

Mayor Kitahashi also joined the production team at the press release which took place at the Japanese ambassador’s residence in Bangkok. During the interview, the mayor praised the local residents’ enthusiastic cooperation and also stated his anticipation of the training camp site to be provided by Kitakyushu for the Thai Olympic team for the upcoming 2020 Summer Olympics in Tokyo. The city also hopes to trigger a tourism boost from the increased media exposure.



One of the filming locations for the drama

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PHONE:+81-93-582-2146 FAX:+81-93-582-2176

Newly Updated! URL: http://www.city.kitakyushu.lg.jp/pcp_portal/ (in English, Chinese, Korean)

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Published 2016/3/15



9. BIRD-2 MDR (Mission Definition Review) – 9AM to 12:45, 28 Dec. 2016

Mission Definition Review (MDR)

[from Wikipedia]

“The MDR examines the proposed requirements, the mission architecture, and the flow down to all functional elements of the mission to ensure that the overall concept is complete, feasible, and consistent with available resources.”



Azami
(Malaysia)



Thanks to Jesus and Dima for participating in this MDR



Yeshey
(Bhutan)



Syazana
(Malaysia)



Adrian
(Philippines)



Held in the Cho Lab Seminar Room

*BIRDS-2 MDR, continued
from the previous page.*

The BIRDS-2 Team pose
for group photo after
the MDR.

Dr Amelia Greig (in the
center, wearing green)
was a guest participant
of this MDR.



Members of the BIRDS-2 Team on 28 December 2016

10. Celebration of BIRDS-2 MDR completion, and the completion of Year 2016

On the evening of Wednesday, 28 Dec 2016, members of BIRDS 1 and 2 gathered to celebrate the completion of BIRDS-2 MDR, and also the completion of Year 2016.

We had a party see the next page.



Prof. Cho encourages the troops





BIRDS End-of-2016 Party



11. New Year Greetings from the BIRDS-1 Team (in the assembly clean room)

The photo at the right is from Taiwo's Facebook.



The BIRDS-1 team has worked throughout the winter break – except for 01 January 2017, which was deemed a day of rest.

Heavy work schedule resumed on 02 January 2017 at 10:00 AM (vibration testing).

 **Tejumola Taiwo** shared Joint Global Multi Nation Birds - BIRDS project's photo — with Erdenebaatar Dashdondog and 11 others at  Kyushu Institute of Technology.
21 hrs · Kitakyushu-shi · 

Happy new year from all of us #Japan #Ghana #Mongolia #Nigeria #Bangladesh



Joint Global Multi Nation Birds - BIRDS project 🎉 celebrating New Year's Eve with Tejumola Taiwo and 13 others.
January 1, 2016 ·  · 

HAPPY NEW YEAR from the BIRDS Team! 😊 😊

This paper, highly relevant to the BIRDS Project and to its goals, will soon be published in the Transactions of JSASS, *The Japan Society for Aeronautical and Space Sciences*. Only the abstract is shown here at the right.

After publication, this newsletter will provide info on how you can access it because the contents are quite fascinating.

12. Paper to be published soon: *Classification of Countries Worldwide according to Satellite Activity Level*, by J.Polansky and M.Cho

Classification of Countries Worldwide according to Satellite Activity Level

By John POLANSKY¹⁾ and Mengu CHO¹⁾

¹⁾Laboratory of Spacecraft Environment Interaction Engineering, Kyushu Institute of Technology, Kitakyushu, Japan

(Received June 21st, 2015)

Emerging countries worldwide can benefit technologically, economically, and socially from domestic space-related activities. However, limited resources and lack of know-how prevent many non-space faring nations from initiating space projects, much less building sustainable space or satellite programs. New opportunities exist to overcome these barriers. The number of small satellites launched in the last three years has increased by an order of magnitude, and the market of satellites less than 50kg is projected to grow from \$700M USD in 2014 to ~\$2B USD by 2019. This paper gives an overview of space-related activities in various emerging countries and categorizes countries in nine regions worldwide according to level of satellite activity.

Key Words: Capacity Building, Lean Satellite, Small Satellites, Emerging Countries, Space Market



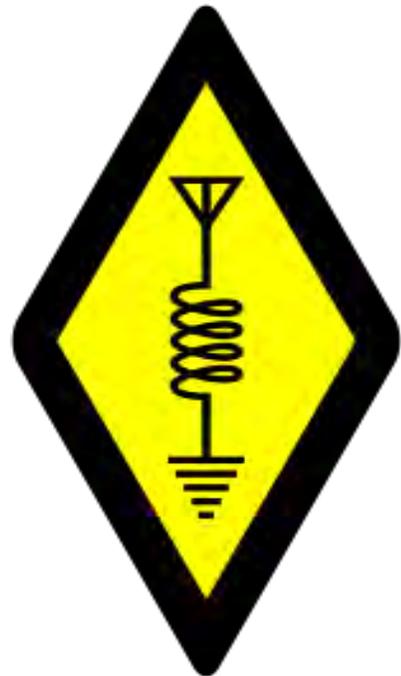
To communicate with BIRDS satellites you must have a valid radio operator's license

Article (the next four pages) prepared by:
Kiran Kumar Pradhan (Bhutan/BIRDS-2)
with support from Apiwat Jirawattanaphol (Thailand/BIRDS-1)

8 January 2017

Amateur Radio (Ham Radio)

Amateur radio (also called ham radio) describes the use of radio frequency spectrum for purposes of non-commercial exchange of messages, experimentation, self-training, private recreation, and emergency communication.



Amateur Radio logo

International Telecommunications Union (ITU) establishes the Amateur Radio services:

- International Telecommunications Regulations (ITR)
- Frequency allocation



ITU logo

National governments are responsible for:

- Operational procedures (Parameters)
- Call sign allocation
- Licenses (operators/stations)



Traditional amateur radio set



Modern amateur radio set

BIRDS Project

JG6YBW

KyuTech Ground Station call sign

BIRDS CubeSats operate in Amateur Radio frequencies:

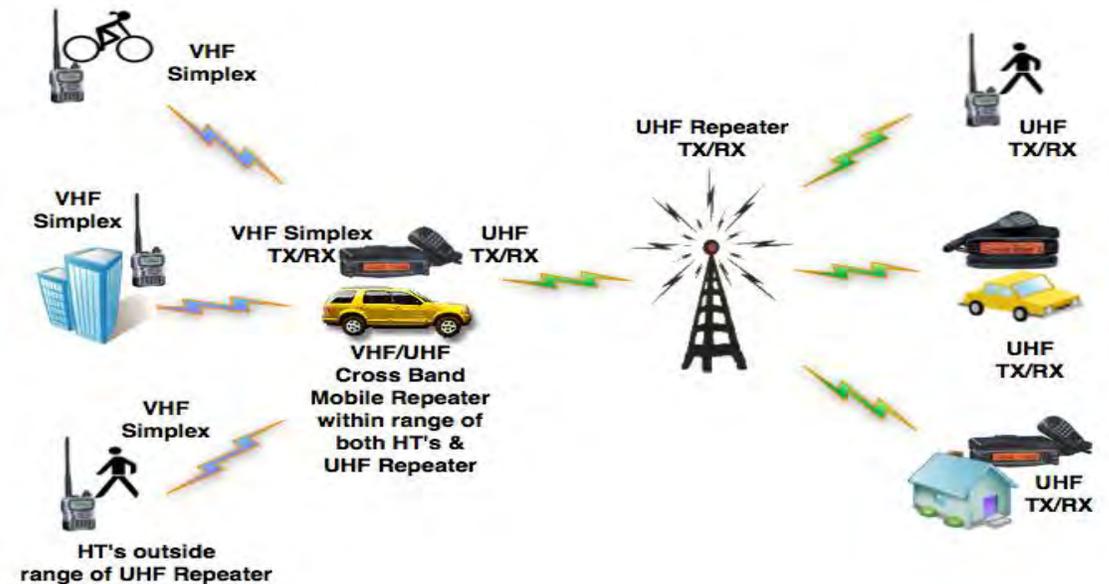
- Downlink in **UHF Band**
- Uplink in the **VHF band**.

Thus, for BIRDS project,

- Each member needs an operator license
- all the Ground stations communicating with the BIRDS satellites need a station license.



BIRDS Project logo



Amateur radio communication diagram

Licensing

Responsibility of National Government/Regulator of a country.

For operation in a foreign country, obtain license from that foreign country through one of the following means:

1. Conversion of license if reciprocity agreement exists between the two nations.
2. If there is no reciprocity agreement then undertake the exam.



Sample call sign

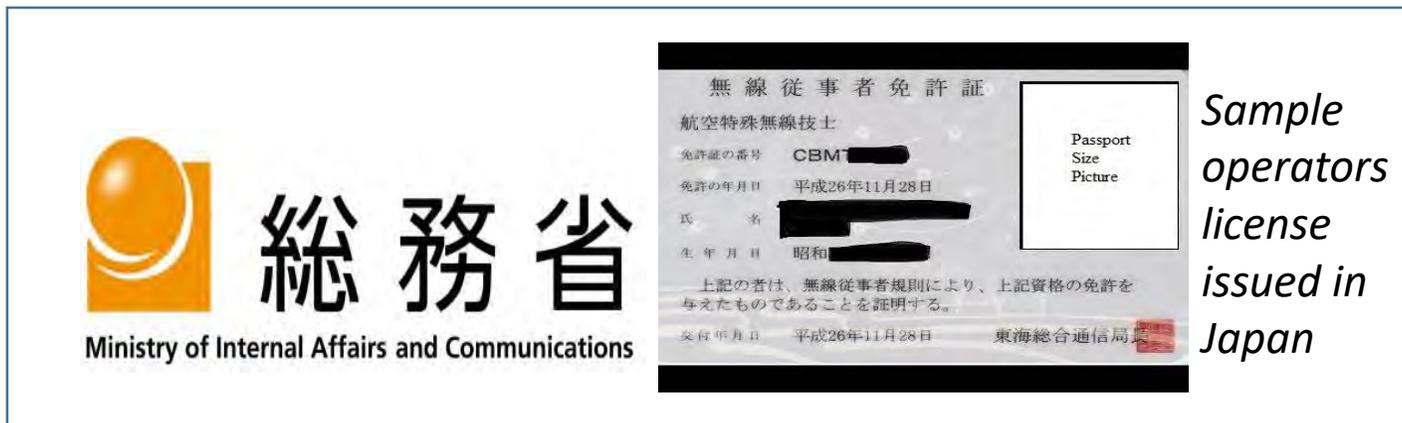


Sample station license

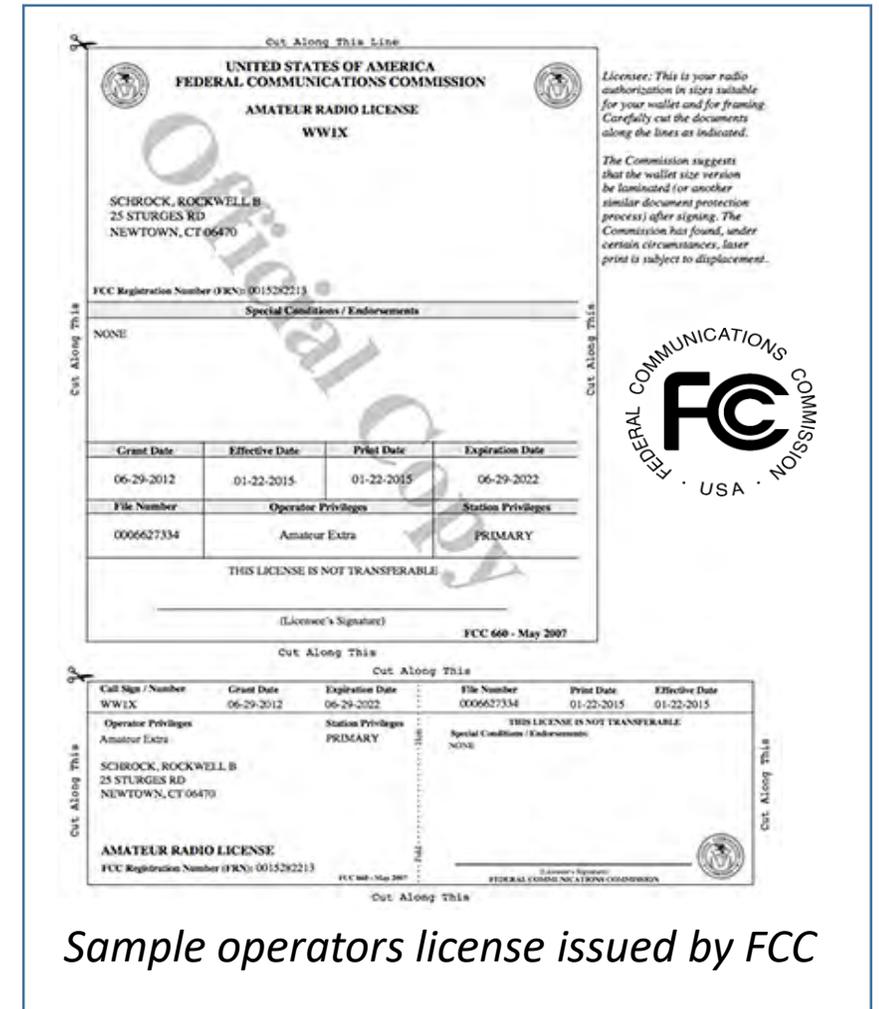
Licensing - BIRDS

All BIRDS members need to obtain valid operators license.

- Japanese members take Japanese exams
- Foreign participants take English-based USA exam coordinated by Federal Communications Commission (FCC).
 - The license obtained is then converted to Japanese license
- All the ground stations in each of the participating nations has to be registered with respective regulators with a valid call sign assigned to stations.
- License reciprocity exists between Japan and USA.



Sample operators license issued in Japan



Sample operators license issued by FCC

End of article by Kiran.

14. Ground Station (GS) of UiTM --- a status report



UiTM Ground Station

Universiti Teknologi MARA (UiTM)

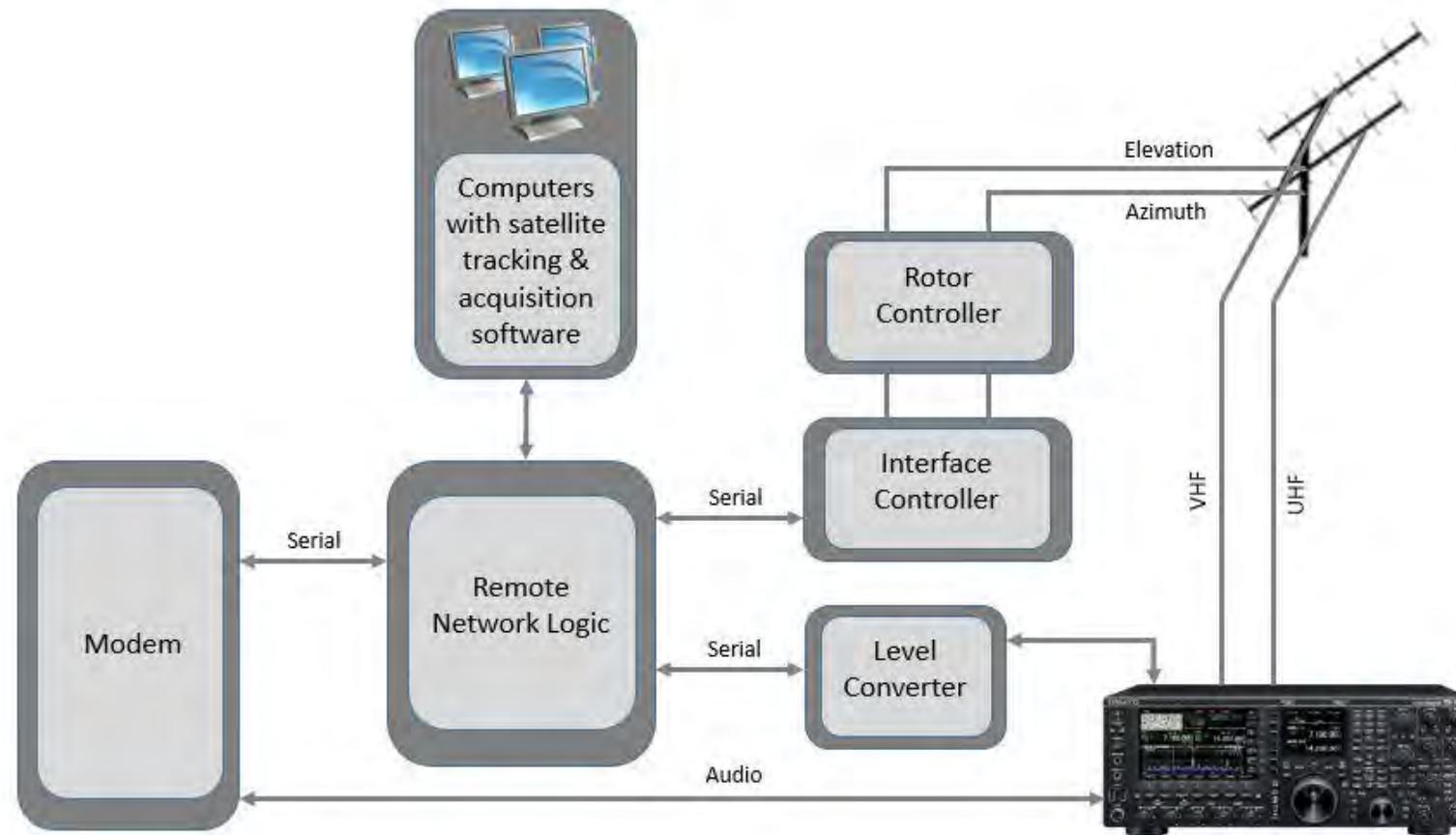
Shah Alam, Selangor, MALAYSIA

Status report by Azami of BIRDS-2 Team on 6 January 2017

UiTM Ground Station Parameters

Components	Details
Transceiver	ICOM 9100
Antenna	2x Yagi-Uda antennas (UHF & VHF)
Rotator	YAESU G-5500 (Az-El rotator)
Terminal Node Controller	KAM-XL
Antenna Frequency	UHF (430-438 MHz), VHF (144-148 MHz)
Data Rate	45-9600 bps
Station Call Sign	<i>In Progress</i>
Altitude (above sea level)	Very roughly 100 m
Latitude	3 04'23.30" N
Longitude	101 29'50.51" E
Installation Goal	2017

UiTM Ground Station Block Diagram Overview



The UiTM Ground Station Team



Location where the antennas will be installed – Dr Huda

Taken on 17 December 2016



Dr Norsuzila, Dr Huzaimy, Dr Idnin, Hasif (not in the photo: Dr Huda and Dr Tarmizi)

Taken on 3 January 2017

15. Thermal Test Plan for BIRDS-1 Flight Models – the plan was drafted by Nakamura-san

Introduction

The thermal vacuum tests of the five Flight Models of BIRDS-1 satellites demonstrate the ability of the satellite to meet qualification requirements under vacuum conditions and temperature extremes which simulate those predicted for flight plus a design margin, and to withstand the thermal stressing environment of the satellite thermal vacuum acceptance test plus a qualification margin on temperature range and number of cycles.

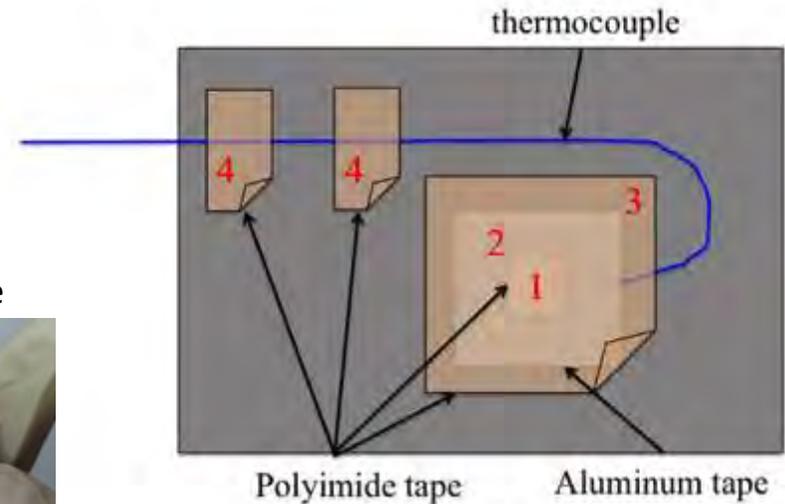
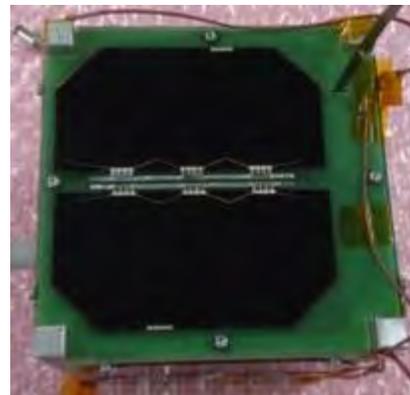
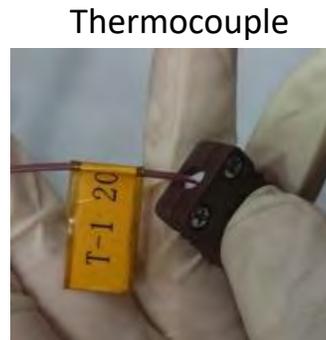
Purpose

Overall test description

- Verify the satellite temperature under the worst conditions
- Verify the satellite functionality under the orbit environment conditions
- Verify the operation of the thermal monitor and control system

Contents	2017
Setting	09 Jan
Vacuuming	10 Jan
Starting TV test	11 Jan
Finish TV test	11 Jan
Removing satellites from chamber	12 Jan

The test schedule (per the plan)



To perform thermal testing, thermocouples are attached to several points inside of the flight model. Then the entire satellite is placed in a test chamber, and taken through cycling of temperatures.

END OF ISSUE NO. 12