

ALL NATIONS UNIVERSITY COLLEGE
SPACE SCIENCE TECHNOLOGY LABORATORY
(ANUC-SSTL)

Ground Station Development and Setup

By:

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09/06/2016

GROUND STATION INFORMATION (QTH)

- Name: All Nations University College
- CALL SIGN : 9G2-AA
- Latitude : $6^{\circ} 6^{\prime} 33.87\text{N}$
- Longitude : $0^{\circ} 18^{\prime} 7.41\text{W}$
- Grid Location : 1J96UC
- Altitude about sea level 162m

Contact:

www.anuc.edu.gh

P. O. Box KF 1908, E/R,Koforidua,Ghana.

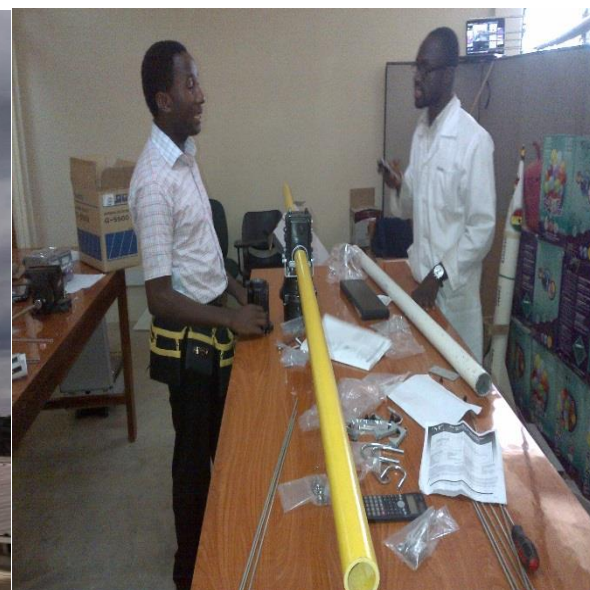


Equipment procurement and Mast Installation

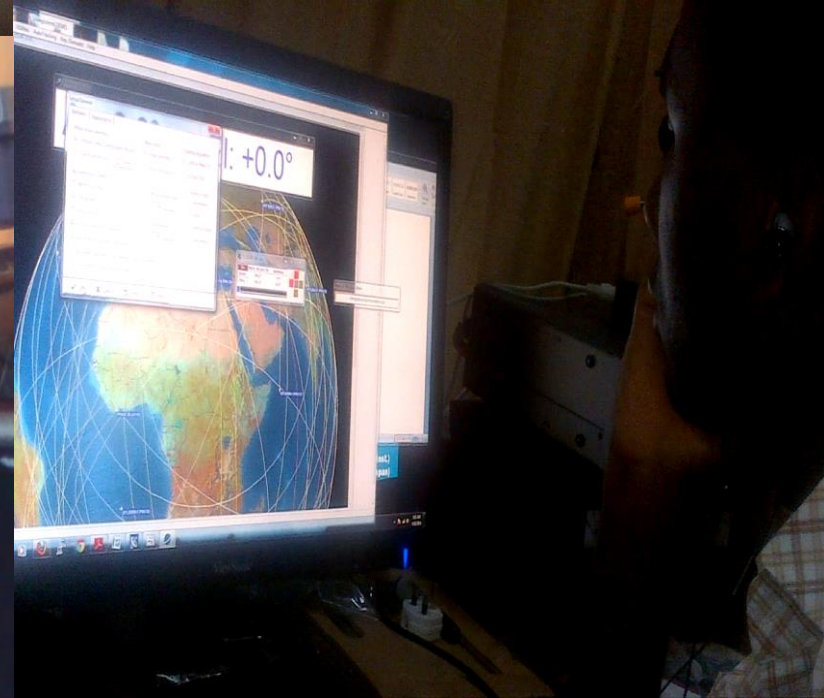


Project commenced July 2013. In the picture is Mr Bonsu-ANUCSSTL team member taking delivery of ground station equipment from the port.

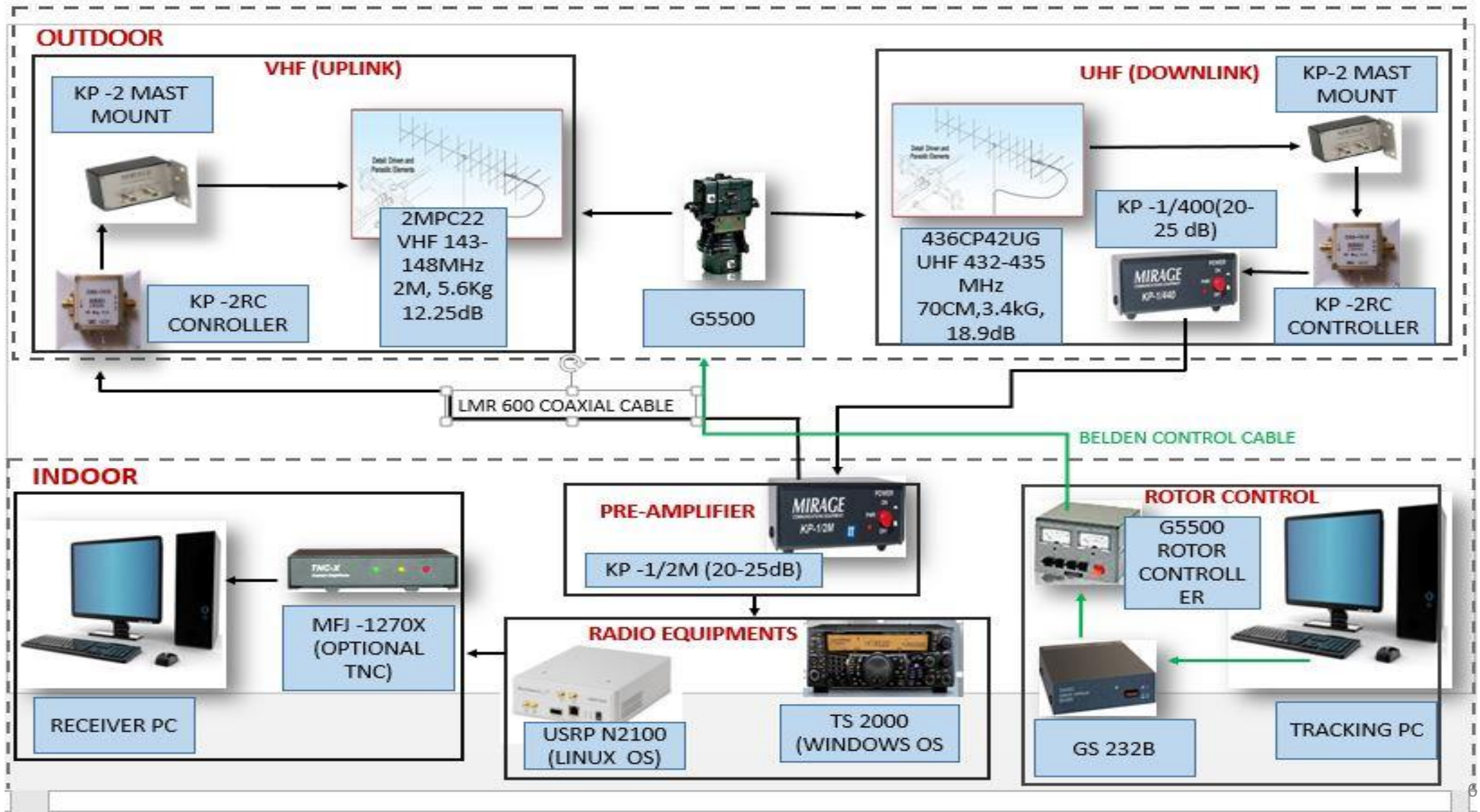
DEVELOPMENT PHASES (EQUIPMENT INSTALLATIONS)



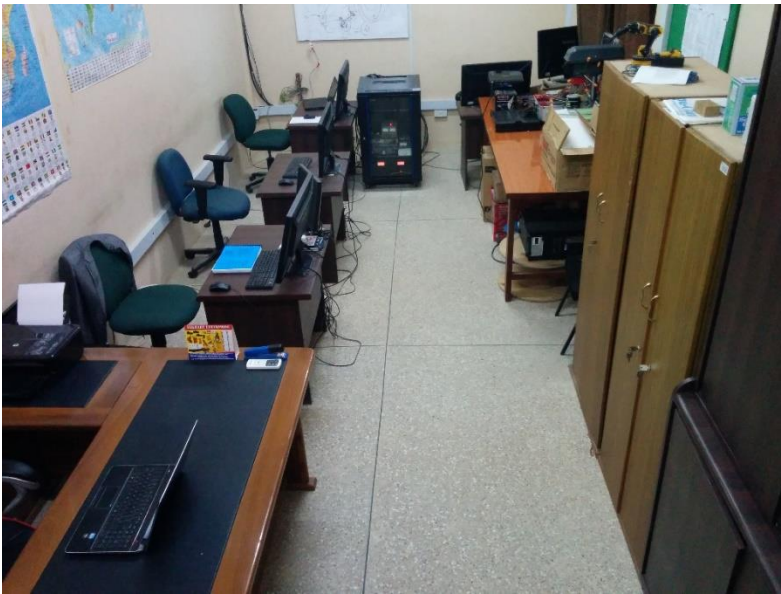
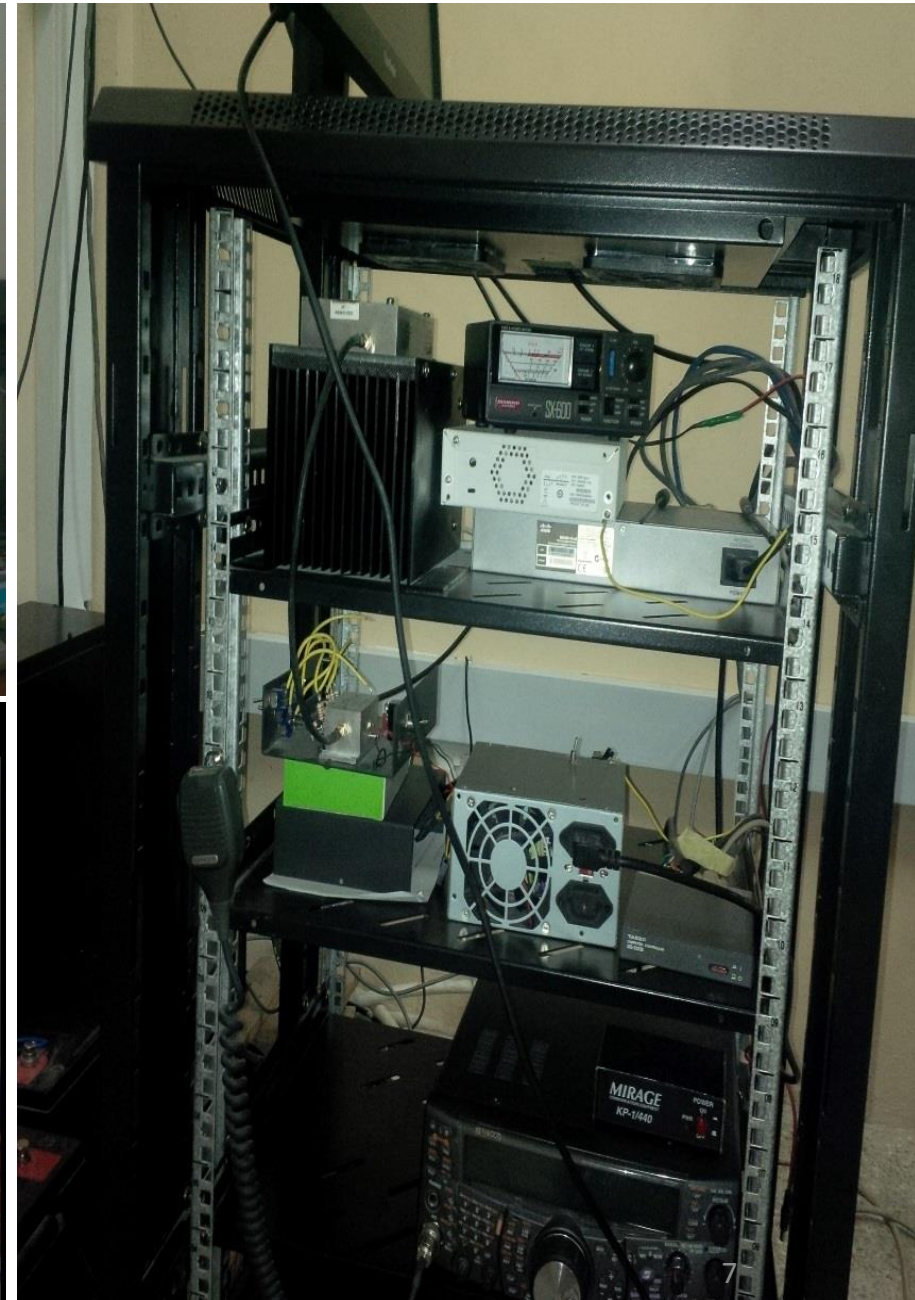
Testing and Troubleshooting Phase



GROUND STATIONS BLOCK DIAGRAM OVERVIEW

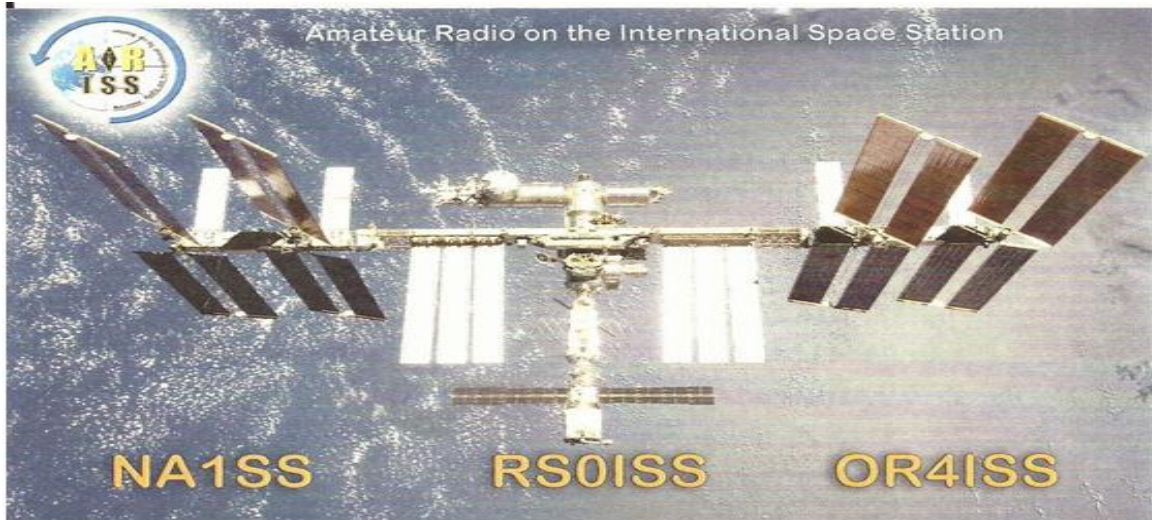


INDOOR INSTALLATIONS



GS-Operation and Achievements

QSL CARDS RECEIVED



The International Space Station (ISS) is sponsored by **Canada, Japan, Russia, the USA and many nations in Europe**. ISS crews hail from these and other nations. Major hardware elements are:

- Zarya, Zvezda, Pirs, research modules Poisk and MRM-1 Rassvet built by Russia
- Science lab Destiny, Unity, Quest, Harmony and Tranquility modules provided by the US
- Canadian Mobile Servicing System, a 55-foot mobile robotic arm used for assembly and maintenance
- Columbus module, a science laboratory provided by ESA
- Kibo module, a science laboratory provided by Japan.

ISS crews and visitors often use their Amateur Radio station, first set up in Zarya and then Zvezda, to talk with school students to aid in their education, plus chat with fellow radio amateurs around the world. The ARISS Team continually works to extend ISS Amateur Radio station capability with new operation modes and, more recently, equipment placement in the Columbus module.

To **9G2AA**

From	Day	Month	Year	UTC	MHz
<input type="checkbox"/> NA1ISS	18	18	20.14	12h38	145.800
<input checked="" type="checkbox"/> RS0ISS				12h34	
<input type="checkbox"/> OR4ISS	20				

Mode: Voice Packet SSTV APRS Repeater SWL

FIRST ISS QSL CARD RECEIVED FROM AMATEUR RADIO ON INTERNATIONAL SPACE STATION (ARISS)

JO1ZJQ Grow in space. **SPROUT**

Downlink Frequency 437.525MHz
Nihon University
College of Science and Technology
Department of Aerospace Engineering
Miyazaki Laboratory

To Radio **9G2AA**

Date	Day: 18, Month: 12, Year: 2014, UTC: 12h38, JST: 12h34
Mode	CW
Frequency	Center: 437.525 MHz

SPECIFICATION

Name: SPROUT sPace Research On Unique Technology
Size: 20cm cube
Weight: 7.1kg

Launch date: 24/05/2014
Launch vehicle: H-IIA Rocket-F24
Launch site: TNSC(Tanegashima Space Center), Japan
MHI(Mitsubishi Heavy Industries, Ltd.),
JAXA(Japan Aerospace Exploration Agency)

Orbit: Sun-synchronous, Inclination 97.9degrees,
Perigee 654km, Apogee 652km

Nihon University Ground Station Location:
Latitude: +35.725° Longitude: +140.057°
Altitude: about 50m

Thank you for receiving signals from SPROUT. Your continued support will be greatly appreciated.

Issuance No. _____

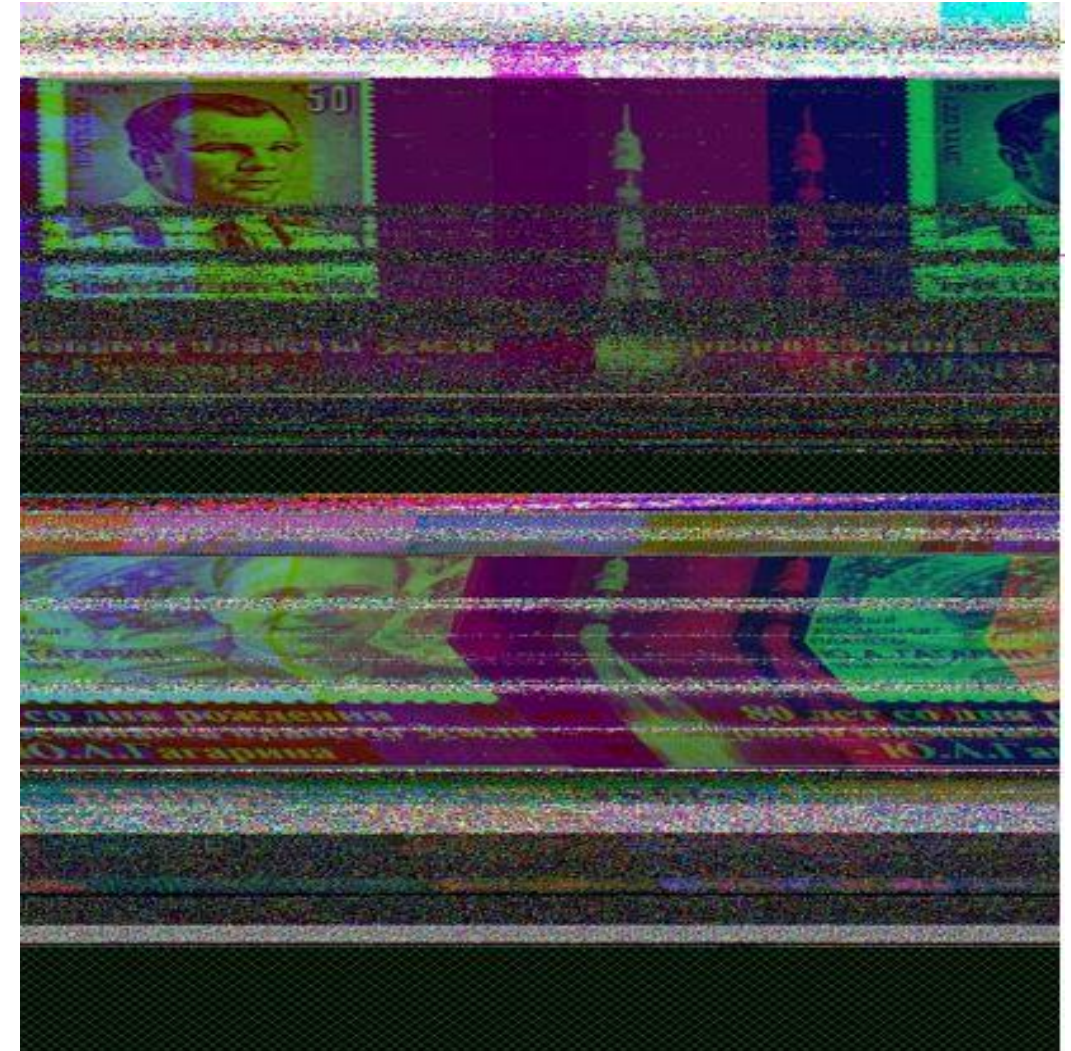
SPROUT Project Team
Miyazaki Laboratory
Department of Aerospace Engineering
College of Science and Technology
Nihon University, Japan
URL: <http://forth.aero.cst.nihon-u.ac.jp/sprout>
E-Mail: sprout_contacts@forth.aero.cst.nihon-u.ac.jp

QSL CARD RECEIVED FROM SPROUT SATELLITE (Nihon University-Tokyo)

RECEPTION OF STTV IMAGE FROM ISS



Team in a shot on a day of tracking and receiving satellite beacons.
(17/6/2014) -First day of tracking and receiving satellite beacons.



Decoded SSTV image of the Russian Cosmonaut (Mikhail Kornienko)
received from the ISS on the 18th and 20th of December, 2014.

Tracked and Received Horyu-4 Beacons

- ANUC-GS received CW beacon signal on the 29th April 2016, at 6:42 UTC during HORYU-IV pass
- ANUC-GS team successfully decoded the Housekeeping (HK) data and sent to Kyutech GS team.
- This HK data is to enable Kyutech GS team to know the status and health of HORYU-IV when is orbiting the West-Africa Region.
- ANUC-GS is part of the BIRDS GS network

Arc Event Generator and Investigation Satellite
HORYU-IV -AEGIS-



Solar Panel picture taken in space.

To Radio

Date	Time
Day/Month/Year 29 / 04 / 2016	6:42 : (UTC) : (JST)
Band	Mode
<input checked="" type="checkbox"/> 437.375MHz <input type="checkbox"/> 2400.3MHz	<input checked="" type="checkbox"/> CW <input type="checkbox"/> PSK <input type="checkbox"/> BPSK <input type="checkbox"/> Digi-Singer

Specification

- ◆ Name: HORYU-IV -AEGIS-
Arc Event Generator and Investigation Satellite
- ◆ Call Sign: JG6YBW
- ◆ Size: 450*420*430[mm], Weight: 10kg
- ◆ Orbit: Altitude 571km, inclination 31deg
- ◆ Launcher: H2A rocket
- ◆ Launch Date: 17 Feb 2016
- ◆ Kyutech GS Location:
Latitude 33°53'33.6"N
Longitude 130°50'25.1"E

URL: <http://kitnet.ole.kyutech.ac.jp/horyu4WEB/horyu4.html>

 **Kyutech** HORYU-IV Project
Kyutech Institute of Technology

That you do it!

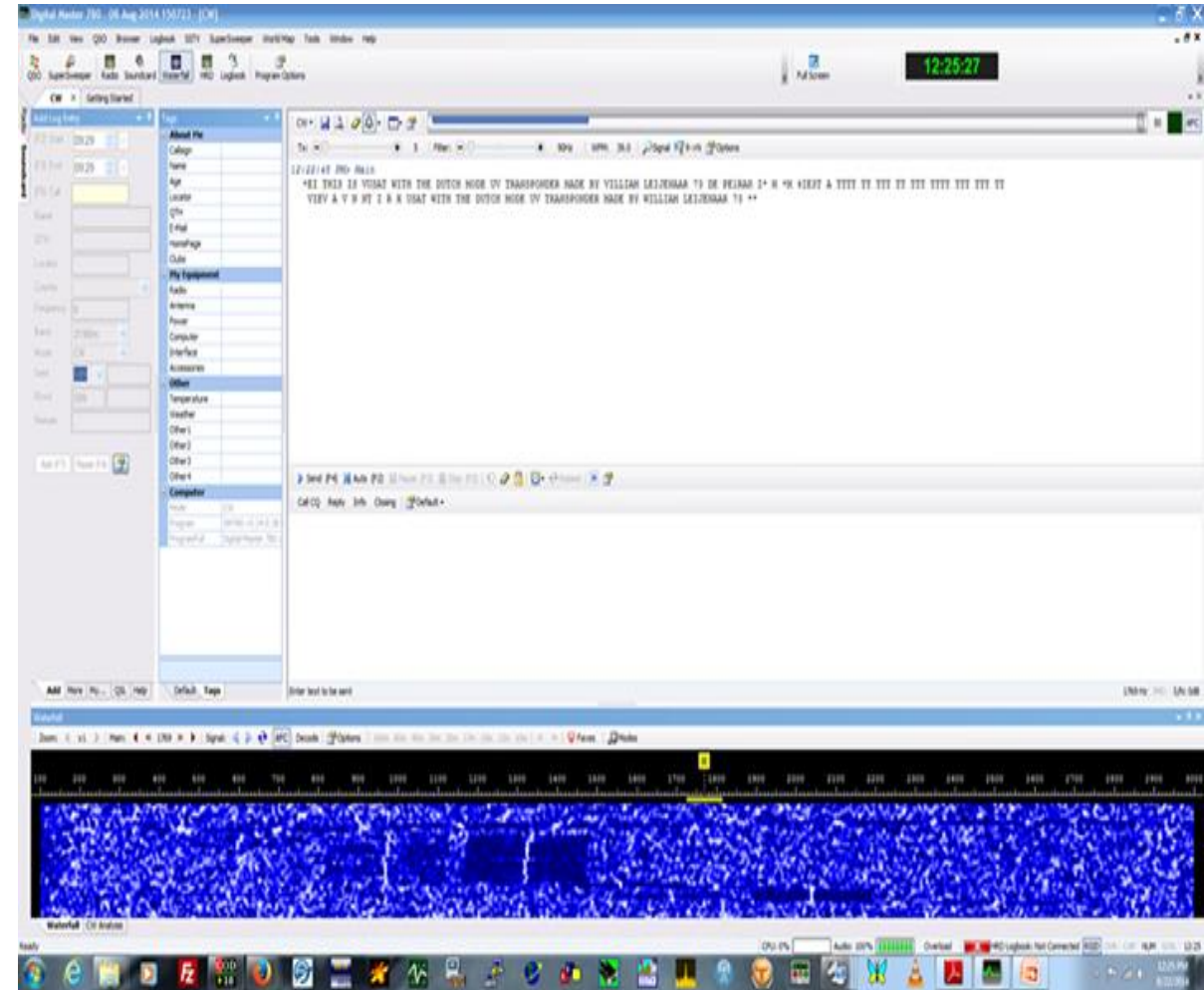


Received QSL Card from Kyutech Team

And was officially signed by the HORYU-IV Principal Investigator,
Prof Mengu Cho

Signal reception and tracking of other Satellites Include:

- JUGNU by a team of students and faculty at IIT Kanpur and ISRO (Indian Space Research Organization).
- RS-22,CO 55,CO 57,Prism and et el.
- AO-7 on the VHF 145.97Mhz. Communication type was "Voice“ (19/8/14)
- CO-57 and SRMSAT on the 18/8/14 @ 6:22pm on the UHF band 437MHz
- TISAT, a CubeSat designed by the University of Applied Sciences of Southern Switzerland.



VUSAT also called OSCAR-52 is an Indian/Dutch satellite in Low Earth Orbit.