ARISS United States Region Report

ARISS International Delegates Meeting

ESA ESTEC, Noordwijk, The Netherlands

3–5 April 2014

# Delegates

Rosalie White, K1STO Represents American Radio Relay League (ARRL)

David Taylor, W8AAS Represents AMSAT-NA

# Key Regional Leaders

Frank Bauer, KA3HDO ARISS International Chair

ARISS-I Educational Outreach/School Selection Committee (chair)

Mark Steiner, K3MS AMSAT-NA Deputy for Human Spaceflight

ARISS-I Project Selection and Use Committee (coordinator)

Rosalie White, K1STO ARISS International Secretary-Treasurer

Debra Johnson, K1DMJ ARRL Education Services Manager

E. Mike McCardel, KC8YLD AMSAT-NA V.P. for Educational Relations

David Taylor, W8AAS US Operations Manager

Lou McFadin, W5DID ARISS-I Project Selection and Use Committee (chair)

David Jordan, AA4KN ARISS-I Public Relations Committee

Kenneth Ransom, N5VHO ARISS-I Operations Committee

NASA ISS Ham Payload Manager

Keith Pugh, W5IU ARISS-I Operations Committee (chair till 30 June 2014, when Steve MacFarlane, VE3TBD, becomes ops coordinator)

# Organization Chart

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# Roles and Responsibilities

All US ARISS teams work toward the fulfillment of ARISS-I goals, as well as regional goals such as the following:

* To inspire an interest in science, technology, engineering, and mathematics (STEM) subjects and in STEM careers among young people, using NASA missions and resources

Here are specific responsibilities for each US team.

## Executive Team

Responsible for leading ARISS activities in the United States, coordinating US activities with those of other ARISS partners, and providing the ARISS-I interface to NASA.

## Operations Team

The US Operations team is responsible for the technical aspects of planning and performing ARISS contacts. This team provides the US representative to the ARISS-I Operations Committee. It also provides people and services to ARISS-I in general, such as ops coordinators, database and web support, pass prediction, and Internet audio distribution.

The following teams are important components of the Operations team.

### Mentor Team

The Mentor team is responsible for guiding technical activities for US contacts.

### Pass Prediction Team

The Pass Prediction team is responsible for generating best weeks predictions and passes for specific contacts, in support of all ARISS contacts world-wide. This team also supports development of the custom software used for these purposes.

### Telebridge Teams

The Telebridge teams are responsible for maintenance and operation of telebridge ground stations within the United States. These stations are:

AH6NM Hawaii

W6SRJ California

K6DUE Maryland

W5RRR Texas (inactive)

## Education Team

The US Education team is subdivided into two parts: school selection and educational outreach. This team works very closely with the NASA Teaching from Space Office.

### School Selection Team

The School Selection team members represent ARRL, AMSAT-NA, and NASA Education. This team is responsible for advertising open proposal windows to the education community, receiving and evaluating proposals, and notifying selected organizations.

### Educational Outreach Team

The Educational Outreach team is responsible for guiding educational activities for US contacts. It assists schools with educational materials and lesson plans, assists the NASA TFS office with orientation webinars, and interfaces with the ARISS-I Education Outreach and School Selection Committee.

## Hardware Team

The Hardware team is responsible for US contributions to the development, maintenance, and troubleshooting of hardware for ARISS projects. It provides the US representative to the ARISS-I Project Selection and Use Committee.

## Crew Licensing Team

The Crew Licensing team is responsible for providing amateur radio license training and license testing for any astronaut desiring it. It also tracks license expirations and assists with renewals.

## Public Relations Team

The Public Relations team is responsible for communicating ARISS activities in the US to the public and to US team members. It provides the US representative to the ARISS-I Public Relations Committee.

## Fundraising Team

The Fundraising team is responsible for generating funding for US hardware, education, and support activities. Funding sources might include grants, donations, and sponsorships.

# Activities since Last Meeting

## US Teams

Since the last ARISS-I face-to-face meeting in October 2011, we have conducted 62 ARISS contacts. In addition, US teams have completed or assisted with these activities.

### Executive Team

* Worked to improve relations with NASA ISS National Lab Education Projects office, despite repeated personnel changes there
* Enhanced communications with the JSC Teaching from Space office by holding monthly project reviews
* Effectively managed the transition of ARISS from Flight Crew Equipment to Educational Payload
* Effectively managed transition of the US portions of ISS to National Lab status
* Proactively ensured ARISS operations were sustained despite funding cuts, loss of hardware safety support (Claire Friedland), and loss of administrative support (Carol Jackson)
* Redistributed ARISS-I administrative roles formerly handled by Carol Jackson
* Frank Bauer returned as US team project lead after a 3-year absence; elected ARISS International Chair in Jan 2013
* Rosalie White was re-elected as ARISS International Secretary-Treasurer in Jan 2013

### Operations Team

* Initiated recruitment and training of new mentors; 2 new mentors and 3 trainees currently
* Instituted procedures, developed supporting documents, and trained mentors for the new US school selection process that began in May 2011
* Modified procedures and volunteer roles to deal with loss of Carol Jackson’s administrative support. This affected submission of talent releases, activity reports, and post-contact reports; scheduling of conference calls; and other tasks.
* Participated in NASA information webinars for US schools that were selected for contacts
* Provided mentoring for 62 US contacts
* Provided telebridge services for 33 contacts world-wide

### Education Team

* Implemented the new US school selection process begun in May 2011. Various modifications were needed along the way, such as a shift in the dates for accepting proposal submissions.
* Participated in NASA-hosted information webinars with US schools shortly after their selection. These webinars explain roles and expectations, and introduce all parties who must cooperate to plan and execute a successful educational event
* Continued to encourage direct contacts over telebridges, both to engage the local ham community and to let students participate first-hand with the radio station
* Partnered with the ARRL Education & Technology Program to develop MAREA, an educational activity that integrates robotics with packet radio and can use the ISS packet station to relay commands between terrestrial robots ([www.arrl.org/marea](http://www.arrl.org/marea))
* Provided special educational support to several high-profile contacts, such as the the ARRL Pacificon ham radio convention

### Hardware Team

* Ericsson VHF—Analyzed low signal levels with original Ericsson VHF radio; prepared and qualified backup Ericsson for launch (manifested on 49P in October 2012)
* Ericsson UHF—Managed use of Ericsson UHF radio for packet operations while VHF radio was being replaced
* Ham Video—analyzed available information on project design; identified potential design enhancements and risk areas; contributed to PS&U recommendations for project modifications
* Ham Beacon—worked with AMSAT-Italia and ARISS-I PS&U to define capabilities for the proposed beacon
* Initiated the re-engagement of the ARISS-I Project Selection and Use Committee

### Crew Licensing Team

* Conducted amateur radio license training and exams for 8 astronauts
* Assisted with license renewals for an additional 8 current and former astronauts

### Publicity Team

* Provided a new US representative to the ARISS-I Public Relations Committee

## Astronaut Support

The following US astronauts have supported ARISS contacts since October 2011:

Michael Fossum, KF5AQC Daniel Burbank, KC5ZSX

Donald Pettit, KD5MDT Joe Acaba, KE5DAR

Sunita Williams, KD5PLB Kevin Ford, KF5GPP

Tom Marshburn, KE5HOC Christopher Cassidy, KF5KDR

Michael Hopkins, KF5LJG

ARISS and the US team thank them and all crewmembers for contributing their time to provide many, many teachable hours in science, technology, math, and engineering for students around the world.

## ARISS Web Site

ARRL provided design work and website hosting to replace the public web site of ARISS (www.ariss.org). The new site features a more modern appearance and easier navigation. In addition to providing new and updated content, the US team joined ARISS Delegates in reviewing the new web site prior to release. ARRL is assisting in maintaining content on the site.

# Future Plans

* Continue to focus on strategic topics that will ensure the future of the ARISS program
* Concentrate on fundraising to support hardware development, travel, and other program costs
* Improve mentor training and support materials
* Find ways to continue focusing on fostering educational outcomes and encouraging teachers to carry on with teaching lessons in STEM fields
* Increase public relations activities and communication within the ARISS team
* Increase the number of US volunteers, including mentors
* Update the ARISS orbit-prediction software
* Train backups for key volunteer positions

# Issues

* All ARISS activities need participation by all ARISS Region teams
* ARISS operations and operational plans require careful legal review so as to protect the ARISS program and our amateur radio licenses
* Some critical processes are potential single-point failures (such as relying on outdated software for orbit prediction and having key volunteers with no trained backup)
* Our volunteer team is over-loaded and some tasks are not receiving adequate or timely attention
* Collaboration and teamwork among ARISS Region teams needs improvement
We have observed a higher occurrence of ARISS Regions' teams working on initiatives within only their own ARISS Region, when the initiative/idea
should have been communicated to the ARISS international delegates and worked through an international team.  International teamwork is crucial for ARISS success, particularly since we are a total volunteer team. Improvements in teamwork will also provide better solutions and eliminate opportunities for radio interference, or people having done double work.  Note that the US team is one of the Regions that need to improve teamwork, too.

# Acronyms

AMSAT-NA Radio Amateur Satellite Corporation, North America

ARISS-I ARISS International working group

ARRL American Radio Relay League

GSFC Goddard Space Flight Center

JSC Johnson Space Center

NASA National Aeronautics and Space Administration

PS&U Project Selection and Use Committee

STEM science, technology, engineering, and math

TFS NASA Teaching from Space

# Participant Comments

Here are some comments from educators who participated in recent ARISS contacts. These comments illustrate the impact ARISS has on students and their education.

Flagler County – Indian Trails Middle School 17 Nov 2012

West Palm Coast, Florida

“The radio contact has also strengthened our ties with the community. From Embry-Riddle Aeronautic al University to the Palm Coast Astronomy Club, which recently donated a telescope to a group of Space club members at ITMS, we look forward to collaborating with our supporters on many future endeavors.”

 – Dana Hausen

Missoula Family YMCA 8 Jan 2013

Missoula, Montana

“Thank you very much for the opportunity to work with you to let the kids actually talk to the astronauts yesterday! I knew it touched something when a boy came up to me at recess while I was winding up the cable to the satellite antennas and excitedly asked me if we were going to set up again tomorrow!”

 – Lance Collister

“Congratulations on your communication with the international space station! Very cool! A friend was having surgery that day and she said her surgery was delayed because the anesthesiologist was at Target Range to watch his child ask a question. She said he came in very excited.”

 – Randa Froebel

South Florida Science Museum/Pine Jog Elementary 30 Oct 2012

West Palm Beach, Florida

By applying for this event and being accepted my students observed how ardently I pursue my passion for participation is Space Exploration. All K-5 classes, our office staff and administration viewed this event. Even though they were disappointed that we lost communication before the other teacher and I asked our questions, I’ve used this as a teachable moment in the challenges of space travel and communication. In addition, I have tweeted my question to the astronauts—modeling that if we want answers, the questions must be pursued—against all odds.

 – Linda Petuch

Bates College Museum of Art 23 April 2013

Lewiston, Maine

"Today was amazing!  Thank you Carl and everyone else who worked on making today possible.  Now I can say I talked to people in space on my birthday!  Today was one for the memory book."

 – Auburn Middle School student

Guilford County Schools 23 April 2013

Greensboro, North Carolina

“As educators, we are excited to provide such a unique opportunity that gives our students the chance to apply concepts they learn in our math, technology and science curriculum. Even after the contact with the International Space Station, we will continue to use amateur radio to enhance our students’ learning, especially in the areas of understanding wireless communication and how we use it for exploration in space.”

 – Tom Niedziela,

 Reading and Math through Technology teacher

Ann Richards School for Young Women Leaders 20 March 2013

Austin, Texas

“The ARISS contact was an experience that truly wowed our entire student body, faculty and administrative team. The girls thought it was one of the best events of this entire school year and loved talking to Commander Hadfield. They were also so ecstatic to see that he had tweeted about our school right after the contact. Our students were inspired by his words and the overall experience.”

 – Monica Martinez