Amateur Radio On The ISS

Application & Information Packet

Feb 1, 2020

Dear Director or Educator,

What would your students think if they could converse with an astronaut on the International Space Station (ISS)? We (The Milwaukee Radio Amateur's Club- MRAC) in conjunction with Amateur Radio on the ISS (ARISS) will facilitate this once in a lifetime opportunity for you with technical and information coordination. There is no direct cost to the school for materials. The contact is made from a ground station which MRAC will bring, locate, and operate at your school- typically in your auditorium or gymnasium.

Local media coverage through our club and in partnership with 88.9 FM Radio Milwaukee helps spotlight this project. Depending on the size of the audience, ARISS encourages a few schools to participate in a single contact. MRAC members will be available before and after the contact to discuss design, assembly, testing and assist with any additional outreach.

The program's goal is **to inspire students worldwide, to pursue interests and careers in science, technology, engineering and mathematics (STEM) through Amateur Radio.** Educators who participated in past programs reported that student participation in the ARISS program successfully drove an interest in STEM subjects and STEM careers.

Important Program Information:

- The current application window is open from **Feb 1, 2020 to March 31, 2020**
- The application and review process may take up to 12 months for approval
- Contact is scheduled about 18 to 24 months after the original application is submitted

- A contact lasts approximately **10 minutes** with students asking prepared questions
- The ISS course is projected on a screen along with details about the astronaut
- Student's questions and the received transmission are broadcast over a PA system
- Multiple schools and technical experts participate, giving students team experience
- An ARISS technical mentor will be assigned (when the application is accepted) to coordinate the event between MRAC, the Radio Amateur Satellite corporation (AMSAT), the Amateur Radio Relay League (ARRL) and the National Aeronautics and Space Administration (NASA)

Included in this packet are the documents required to apply. Our club has assembled the necessary station requirements, applications, and technical crew required to successfully facilitate contact and communication between the ISS Astronauts and students. If you are interested in this fantastic program please contact Roger Heindl (MRAC Outreach Coordinator) who will work with you to complete all aspects of the proposal and documents in this packet.

For additional information about ARISS, please visit their website: http://www.ariss.org/

We look forward to working with you, your staff and students. Feel free to contact me if you have any questions about any aspect of this incredible opportunity.

Regards,

Roger Heindl, AC9BT

Outreach Coordinator,
Milwaukee Radio Amateurs' Club
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roger@techlabhq.com

Requirements

(Preliminary & Subject to Change)

1. The next application deadline is **MARCH 31, 2020**.
2. Your school must demonstrate this is a supplement to existing STEM programs.
3. You need an auditorium and AV system available for the audience:
    a. Sound System
    b. Screens (2 preferred, projector or large TVs depending on audience size)
    c. Staff to operate in-house systems and coordinate with MRAC technical personnel
4. The school picks 20-30 students to ask one question each to an astronaut.
5. MRAC sets up equipment on location and confirms readiness 24 hours in advance, preferably with students for learning and team building.
    a. This includes a roof-top temporary antenna installation no further than 400 feet from the stage area.
6. A completed *ARISS application.
7. A completed *Proposal Form.
8. A completed *Equipment Proposal form (MRAC).
9. ALL in attendance for the event, a completed Talent Release form.

Online Resources

1. Please view these sample youtube videos of successful contacts:
    a. https://www.youtube.com/watch?v=JbWUywvZrMw
    b. https://www.youtube.com/watch?v=rmvs6EWlnvA
2. Amateur Radio on the International Space Station (ARISS) website:
    a. http://www.ariss.org
3. Amateur Radio Relay League (ARRL) Resources
    a. http://www.arrl.org/hosting-an-ariss-contact
    b. http://www.arrl.org/preparation-for-an-ariss-contact

*Original Materials (non-PDF format) which can be filled out and modified are available.

Milwaukee Radio Amateurs' Club
P.O. Box 26233, Milwaukee, WI 53226
http://www.w9rh.org/

ARISS News Release **No. 17-11**

Dave Jordan, AA4KN
ARISS PR
aa4kn@amsat.org

International Space Station Astronauts are Calling CQ Students

ARISS-US program education proposal deadline is November 15, 2017

September 18, 2017: The Amateur Radio on the International Space Station (ARISS) program is seeking proposals from U.S. schools, museums, science centers and community youth organizations to host radio contacts with an orbiting crew member aboard the International Space Station (ISS) between July 1 and December 31, 2018.

Each year, ARISS provides tens of thousands of students with opportunities to learn about space technologies and space communications through the exploration of Amateur Radio. The program provides learning opportunities by connecting students to astronauts aboard the International Space Station (ISS) through a partnership between NASA, the American Radio Relay League, the Radio Amateur Satellite Corporation and other Amateur Radio organizations and worldwide space agencies. The program's goal is to inspire students worldwide, to pursue interests and careers in science, technology, engineering and mathematics (STEM) through Amateur Radio.

Educators overwhelmingly report that student participation in the ARISS program inspires an interest in STEM subjects and in STEM careers. Ninety-two percent of educators who have participated in the program have indicated that ARISS provided ideas for encouraging student exploration, discussion, and participation, and 78 percent said that ARISS was effective in stimulating student interest in STEM.

ARISS is looking for organizations that will draw large numbers of participants and integrate the contact into a well-developed education plan. Students can learn about satellite communications, wireless technology, science research conducted on the space station, what it is like to work in space, radio science, and any related STEM subject. Students learn to use Amateur Radio to talk directly to an astronaut and ask their STEM-related questions. ARISS will help educational organizations locate Amateur Radio groups who can assist with equipment for this once-in-a-lifetime opportunity for students.

The **proposal deadline** for 2018 contacts is November 15, 2017. Proposal webinars for guidance and answers to proposal questions will be offered **Sep. 21, 2017, at 7 p.m. EDT** and **Sep. 25, 2017, at 4 p.m. EDT.** Advance registration is necessary. To sign up, go to https://ariss-proposal-webinar-fall-2017.eventbrite.com

For more details such as expectations, proposal guidelines and the proposal form, visit: http://www.ariss.org/hosting-an-ariss-contact-in-the-us.html

About ARISS
Amateur Radio on the International Space Station (ARISS) is a cooperative venture of international amateur radio societies and the space agencies that support the International Space Station (ISS). In the United States, sponsors are the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL), the Center for the Advancement of Science in space (CASIS) and National Aeronautics and Space Administration (NASA). The primary goal of ARISS is to promote exploration of science, technology, engineering, and mathematics (STEM) topics by organizing scheduled contacts via amateur radio between crew members aboard the ISS and students in classrooms or public forms. Before and during these radio contacts, students, educators, parents, and communities learn about space, space technologies, and amateur radio. For more information, see www.ariss.org.

Also join us on Facebook: Amateur Radio on the International Space Station (ARISS)
Follow us on Twitter: ARISS_status

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AMSAT

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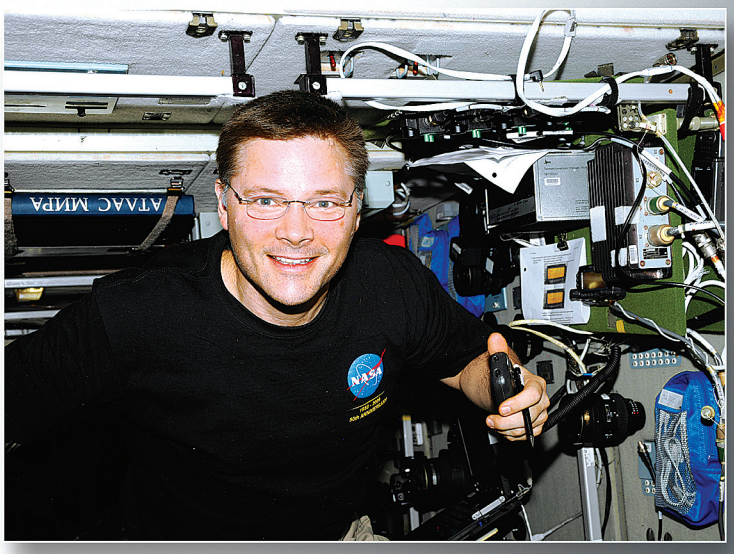
Amateur Radio on the International Space Station

—ARISS

PROPOSAL GUIDE



AMSAT®

ARRL The national association for AMATEUR RADIO®

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Preface

Who Should Use This Guide?

This Proposal Guide is for educators interested in hosting an Amateur Radio on the International Space Station (ARISS) contact in the United States and its territories. Before initiating a proposal, please visit https://www.ariss.org/hosting-an-ariss-contact-in-the-us.html for a complete description of the program.

About ARISS

What is ARISS?

Amateur Radio on the International Space Station (ARISS) is a cooperative venture of the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL) the ISS U.S. National Laboratory and the National Aeronautics and Space Administration (NASA) in the United States, and other international space agencies and international amateur radio organizations around the world. The primary purpose of ARISS is to organize scheduled contacts via amateur radio between crewmembers aboard the International Space Station (ISS) and classrooms or informal education venues. With the help of experienced amateur radio volunteers from amateur radio clubs and coordination from the ARISS team, the ISS crewmembers speak directly with large group audiences in a variety of public forums such as school assemblies, science centers and museums, Scout camporees, jamborees and space camps, where students, teachers, parents, and communities learn about space, space technologies and amateur radio.

Goals of the ARISS program include:

- Inspire an interest in science, technology, engineering and math (STEM) subjects and in STEM careers among young people
- Provide an educational opportunity for students, teachers and the general public to learn about space exploration, space technologies and amateur radio as preparation for the event

- Provide an opportunity for amateur radio experimentation and evaluation of new technologies
- Provide a contingency communications system for NASA and the ISS crew.
- Provide crew with another means to directly interact with a larger community outside the ISS, including friends and family.

ARISS United States Partners

NASA: NASA provides access to onboard ISS resources, including the on-board crewmembers, supports the launching of hardware, provides educational resources and supports mission planning for ARISS contacts. NASA's Space Communication and Navigation (SCaN) organization sponsors ARISS operations and works with ARISS to ensure the ISS ham radio system supports the astronauts with backup communications in case primary ISS communications is lost.

ISS U.S. National Laboratory (ISS NL): Sponsors ARISS operations and launching our equipment to ISS. ARISS is part of the ISS NL's Space Station Explorers (SSE) program, which enables venues to further expand their educational program with additional ISS related educational opportunities.

AMSAT: AMSAT provides program leadership, technical support, and resource coordination (both US and international) to successfully conduct the ARISS program. AMSAT is responsible for the US development, operation and maintenance of the on-board hardware. AMSAT interacts with the national space agencies to provide expertise and guidance about amateur radio in space. AMSAT provides experienced volunteers who serve as ARISS Technical Mentors, guiding organizations through their technical execution of an ARISS contact.

ARRL: ARRL sponsors an educational outreach program that provides resources for students and teachers to explore radio science and wireless technology and to engage

students in these and other STEM topics. ARRL's ARISS Delegate is part of the ARISS program leadership team and provides program guidance and administrative support.

What is an ARISS Contact?

An ARISS contact is an opportunity for students and educators to interact with the crew aboard the International Space Station (ISS) through a 10-minute question and answer session using amateur radio. ARISS contacts are large-scale, public events and are ideal for a variety of forums such as school assemblies, science centers and museums.

Though the ARISS contact itself is only a 10-minute event, the educational plan leading up to and following the event is much more extensive. Host organizations are expected to plan and execute an effective educational plan over a week, month, semester or school year that engages relevant content areas such as (but not limited to) space exploration, technologies related to space research, space communications and wireless technologies, and amateur radio as a hands-on learning focus. Educational plans focusing on this content will prepare students for a fuller appreciation of the ARISS contact event and can extend to further exploration of the space and radio/wireless technology topics following the actual event.

Why do NASA and the ISS NL support ARISS contacts?

ARISS contacts use the unique experience of human spaceflight to afford audiences the opportunity to learn first-hand from space explorers what it is like to live and work in space. These events are designed to encourage students to study and pursue careers in STEM.

In addition, ARISS provides an opportunity for students, teachers and the public to learn about wireless communications technologies and the capabilities of amateur radio, encouraging students to further explore these technologies.

This Proposal Guide offers information about the process and requirements to host an ARISS contact. You may direct questions or comments to ariss.us.education@gmail.com.

Section 1: Getting Started

Fitting the Opportunity

Is my organization a good fit for this opportunity?

An ARISS contact may be a good fit if your organization:

- Is a formal or informal education institution or organization
- Has the ability to adapt to ARISS date and time changes, understanding the constraints of the planning timeline
- Has flexibility regarding pre- and post- ARISS contact educational activities
- Has the ability to develop a strong ARISS education plan
- Can secure a large student and educator audience
- Can assemble a team to handle the education, media, technical and evaluation components of an ARISS contact
- Has the ability to establish community partnerships, including a partnership with representatives of your local ham radio community

How do I maximize this opportunity?

Think of the ARISS contact as part of a much larger vision. Use the ARISS contact to:

- Bring STEM subjects alive for students through an educational plan that includes investigation of multiple topics dealing with space exploration, space research, space and communications technologies leading up to and following the event
- Enhance or create new partnerships with local businesses and community leaders as well as other educational organizations
- Attract widespread attention of the community and news media to your organization

- Support local education objectives and initiatives

Understanding the ARISS Proposal Process

What do I do first?

The first step is to decide if your organization is a good fit for this opportunity. Read this Proposal Guide thoroughly.

Then what?

If you decide you want to proceed, begin with a proposal containing your education plan. Proposal forms are available at https://www.ariss.org/hosting-an-ariss-contact-in-the-us.html. The ARISS proposal review committee will approve proposals that best meet the program's objectives. Because there are a limited number of contact opportunities, we must be selective. The criteria used to evaluate proposals is described in more detail in Section 2.

Proposals to host an ARISS contact are evaluated and decisions announced during two cycles each year to plan for contacts that will be scheduled 6-12 months into the future. Find the details for the current proposal window at https://www.ariss.org/hosting-an-ariss-contact-in-the-us.html.

The ARISS proposal process is a two-step process.

- Step 1 – Completion and approval of your Education Plan
- Step 2 – Completion and approval of your Equipment Plan

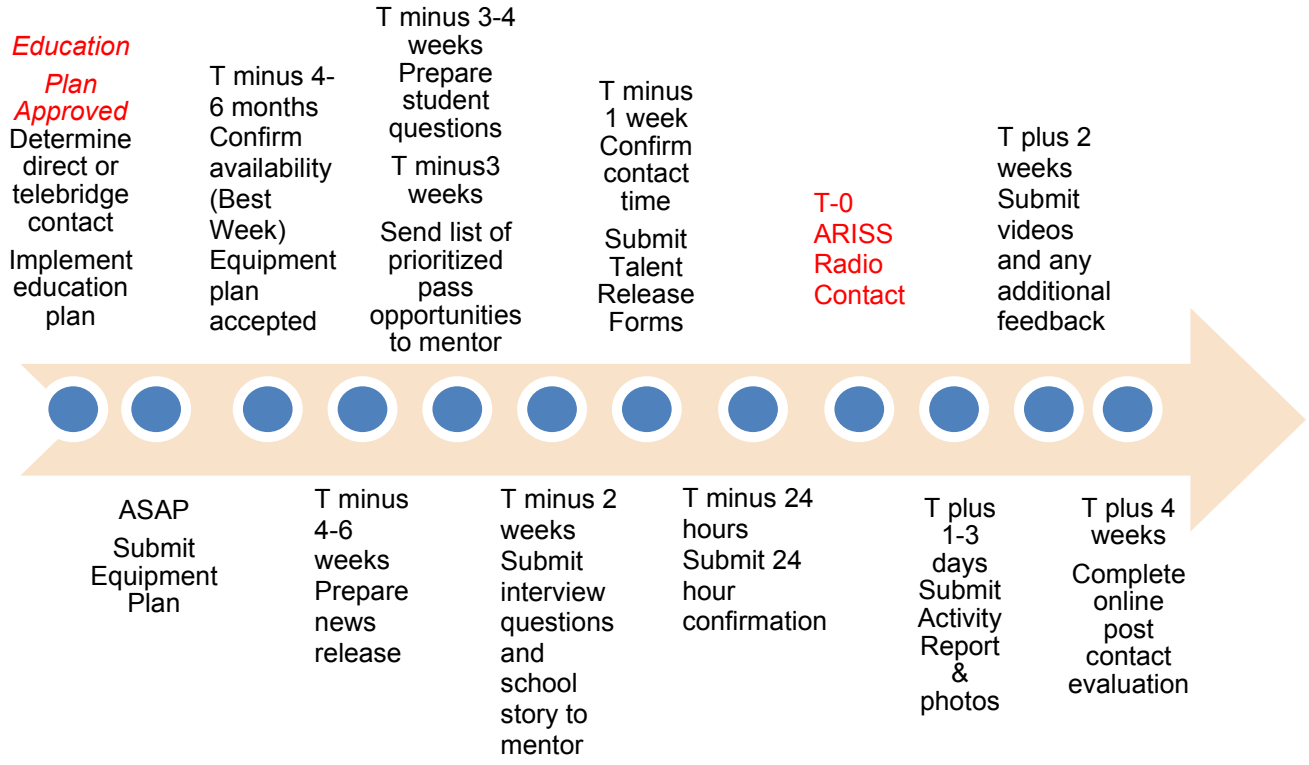
Details about the Education Plan and Equipment Plan appear later in this guide. After approval of both plans, your organization will be entered into the scheduling queue for an ARISS school contact. Bear in mind that your ability to execute your plan and also be available and flexible to respond to scheduling options provided by NASA for the radio contact are very important. Though we try very hard to provide scheduling options that

align with your preferences, due to the nature of the space program nothing can be guaranteed.

Once your Education Plan is approved (Step 1), an ARISS Technical Mentor will be assigned to work with your ARISS project team to help you develop your Equipment Plan (Step 2). The Technical Mentor is a volunteer amateur radio operator who is very experienced with satellite communications. He or she will help you and your local team of amateur radio operators develop a satisfactory Equipment Plan.

The Planning Timeline

The timeline and table below offer a broad outline of the major action and decision points in the preparation process for an ARISS contact. The Orientation Session and your Technical Mentor will provide details about specific activities and deliverables leading up to and after your contact.



Summary of Proposal and Implementation Process

Submit Education Proposal	By end of open proposal window
Education Plan is evaluated and approved	Within 6-8 weeks after proposal window closes
Attend Orientation Session; receive Technical Mentor /ARISS Educational Ambassador assignment	Within 1 month after Education Plan approval
Determine direct or telebridge contact and submit Equipment Plan	As soon as possible, usually within 2 months after Education Plan is approved
Begin implementing Education Plan and prepare for Contact	Concurrent with submission of Equipment Plan
Equipment Plan is approved; you are added to ARISS scheduling queue	
Learn the week of the scheduled contact: Confirm availability	4-6 months prior to contact
Learn the possible dates and times during the assigned week of the contact: Prioritize options	3 weeks prior to contact
Prepare student interview questions	3-4 weeks prior to contact
Submit student interview questions and story to Technical Mentor. Submit Talent Release forms	2-3 weeks prior to contact
Confirm final date and time of contact as determined by NASA	1 week prior to contact – notification of final date and time is determined by NASA an is beyond our control
Submit Activity Report and photos	1 – 3 days after contact
Submit any additional photos or videos	1 – 2 weeks after contact
Complete online post-contact evaluation	4 weeks after contact

Section 2: The Educational Component

Creating an ARISS Education Plan

What is an ARISS education plan?

An ARISS education plan describes how the host organization will utilize the ARISS contact to enrich STEM learning activities, support local education objectives and the goals of the ARISS program. The plan should describe how the pre- and post-contact activities tie into the 10-minute live contact with the ISS crewmembers.

How can you integrate this activity into the school curriculum?

- Match activities with state and/or national educational standards
- Use an interdisciplinary approach to lesson development
- Utilize cross-functional teaching teams
- Engage multiple grade level participation
- Broadcast on school's LAN, CCTV or PA system, website and social media
- Partner with local science-oriented organizations, such as museums, clubs, and industry
- Use year or semester-long space themes

What are some examples of classroom activities that can engage learning in preparation for the ARISS contact?

Here are some suggestions for classroom activities that can enrich the ARISS experience:

- Visit NASA web pages to find what research projects on the ISS the students find exciting
- Develop student projects related to a research project in the ISS National Lab

- Have students write a proposal for a research project they could like to conduct as an astronaut or a project for a space satellite
- Learn about other NASA space projects such as the Mars Lander Curiosity, Cassini, Voyager, the Hubble Space Telescope, the James Webb Space Telescope
- Research the ISS communications systems
- Investigate the many uses of the radio spectrum and how it is managed
- Establish an amateur radio club
- Practice amateur radio operation protocols
- Broadcast a daily space fact over the PA system
- Explore careers related to space exploration and space technologies
- Learn about satellite orbits and orbital mechanics
- Build a simple antenna (some are cardboard and copper strips!) for satellite communications
- Involve students in the set up and operation of the ground station for the contact
- Find out when the ISS will orbit over your town and watch it pass overhead
- Invite guest speakers who work in science and technology fields
- Investigate radio science fundamentals – see ideas in the Addendum
- Investigate electronics fundamentals – see ideas in the Addendum
- Use satellite-tracking software to track orbits

The Addendum to this Guide provides references with ideas for these and other activities you could include in your Education Plan. Students should investigate research projects the astronauts are doing and students may want to read astronaut biographies.

Elements of a Strong Education Plan

What are some tips to completing a strong education proposal?

- Brainstorm creative ways to maximize the ARISS contact reach and experience

for students.

- Determine your educational objectives and plan a comprehensive educational program of which the ARISS contact is only one component.
- Incorporate partnerships that have a lasting impact on the community.
- Integrate NASA Education and amateur radio content with educational activities (links to a variety of NASA and ARRL resources are provided in this guide).
- Include an outline of the STEM activities and topics appropriate to the grade level of your students you will engage as part of the learning and preparation for the ISS contact.
- Describe how you will select the interview questions and students who will conduct the interview with the crewmember.
- Establish an evaluation plan that will help you determine whether you are accomplishing your objectives and the goals of the ARISS program.
- Keep date flexibility in mind. ARISS contact dates are driven by ISS mission requirements and are tentative due to the nature of human spaceflight.
- Proofread your proposal to make sure the information is complete and relevant.

The more advance preparation you make with educational plans, the more learning and value the ARISS event will have for students. Preference will be given to plans that demonstrate careful thought and appropriate integration of STEM topics at student grade levels.

Evaluation of the Education Plan

Who will evaluate your plan?

Representatives from each of the US ARISS partners confer twice each year to review proposals submitted during the two proposal windows. Decisions on education proposals will be announced by email to your main point of contact no later than 6-8 weeks following the close of the proposal window.

How will the education plan be evaluated?

Evaluation will weigh heavily on how well your proposal addresses the following questions:

- **Education**
  - How does the education plan support and build upon your school's/organization's curricular objectives?
  - Does the plan advance (enhance) the students' engagement in science, technology, engineering and mathematics (STEM)?
  - Does the education plan include STEM and amateur radio hands-on activities such as building simple kits or listening to ham satellite contacts—things related to amateur radio? See ideas in the Addendum.
  - Does the education plan include hands-on activities from NASA and ISS NL resources and space station-related content? See ideas in the Addendum.
  - Is the plan developed to extend over a period of time to increase and extend the impact of the ARISS contact for students in your audience?
  - Does the plan describe the student groups/grades that will be part of the education plan? What are the demographics of this group? What student groups/grades and other audiences will be part of the audience for the contact event?
  - Have all educational organizations that are described as plan participants been involved in developing the plan and are they committed to carrying it out?

- **Logistics**
  - Does the proposal demonstrate flexibility should an ARISS radio contact shift dates and/or times?
  - Does the proposal provide a clear overview of the contact including location that accommodates a large number of students, audience,

transportation (if needed), and technology (audio/video/Internet and radio station)?

- **Outreach**
  - Does the proposal include a detailed news media/outreach plan beyond simply posting to the school's web site and social media accounts?
  - Does the proposal include plans to involve the community in the ARISS radio contact and/or education plan?
  - Does the plan include how photographs and videos will be captured by semi-professional and professional photographers and videographers, and parental permissions collected?

Section 3: The Technical Component

Understanding Amateur Radio Technology

How are ARISS contacts performed?

An amateur radio contact with the space station is a line of sight contact between an amateur radio ground station and the amateur radio station on board the ISS. Your interview with the astronaut will utilize either a ground station at your location for a direct contact, or a ground station at another remote location for a telebridge contact.

- A **DIRECT** radio link between an amateur radio station set up in your venue and the amateur station onboard the ISS. Direct contacts are timed such that the ISS is passing over your location.
- A **TELEBRIDGE**, in which an ARISS amateur radio ground station, located somewhere in the world, establishes the radio link with the ISS. Voice communications between your students and the ground station travel over traditional telephone lines.

Preparing for an Amateur Radio Contact

How do I prepare for an amateur radio contact?

Preparation is different for direct and telebridge contacts.

A **direct** contact will give your students an opportunity to use an amateur radio station at your location to speak with astronauts. It will also provide a first-hand opportunity to see an amateur radio station and learn how the radio system works. It will more clearly show the students the physics of spaceflight and orbits as the radio station will be tracking the position of the ISS with its antennas as the ISS flies overhead of your school. For direct contacts, local amateur radio operators or clubs work with the host organization to set up radio station equipment and antennas that provide a clear line of sight to the projected path of the space station.

If you are unable to arrange a direct contact, a **telebridge** contact can also be a rewarding experience for students and your community. ARISS amateur radio telebridge ground stations enable ISS radio contacts with organizations that are unable to support a direct contact. This may be due to the ISS not passing over the school's location except during the night or passing over at an elevation that is too low for a good radio contact, or other technical concerns. In a telebridge contact, one of the ARISS amateur radio telebridge ground stations around the world establishes the radio link with the crew member using the ISS amateur radio station.

For either direct or telebridge contacts, your local amateur radio operators, your ARISS Technical Mentor and the ARRL's education resources can provide training with amateur radio operations and educational resources you can use to explore radio science and communications technologies with your students.

It is important to reach out to your local ham radio community as you prepare your Education Plan. Discuss your educational objectives and your plan with them to determine their ability to support you with the expertise, equipment needs and

instructional support for learning activities related to amateur radio. Get their commitment of support.

If you have trouble identifying a local ham radio club to support your efforts, contact the ARISS team at ariss.us.education@gmail.com for assistance.

What equipment do I need to have in place for a direct contact?
Local amateur radio operators or clubs in your community can work with your organization to set up the necessary radios and antennas for a direct contact.

Briefly, for direct contacts, antennas are configured to provide a clear line of sight to the projected path of the ISS. Typically, this means the antennas are on the roof where the fewest obstructions are located. Because the ISS is 240 miles above Earth and traveling at 17,500 miles per hour, it will cross the sky from horizon to horizon in about 10 minutes. This path defines the communications footprint. During this time, the beam antennas must track horizontally (azimuth) and vertically (elevation). Due to the motion of the ISS, the radio frequency must also be corrected for the Doppler shift. By doing the Doppler shift correction, the audio clarity will be maintained as clearly as possible.

The recommendations for the ground station to support a direct contact are considerably more robust than needed for a casual point-to-point radio contact. Because the scheduled contact is a one-time event involving a large audience, every effort is taken to configure a ground station that will offer the maximum communications window possible within the constraints of orbital mechanics and line of sight considerations, and to provide redundancy in the event of unexpected equipment failure.

If you are considering a direct contact, please review the current ARISS Ground Station Recommendations with your local amateur radio team. Find current recommendations at: https://www.ariss.org/uploads/1/9/6/8/19681527/ariss_ground_station.pdf.

What equipment do I need to have in place for a telebridge contact?

Two separate, dedicated telephone lines are required for telebridge contacts. The first telephone line serves as the direct communications line. The second telephone line (which can be a cell phone) serves as a backup in case there are any failures or technical issues with the first telephone line. Discuss recommendations for a suitable telebridge configuration with your Technical Mentor.

Can other people listen in on the contact?

Other schools, institutions, and radio amateurs are encouraged to listen in on contacts. There is a standard downlink frequency for the events. If listeners happen to be in the ISS footprint, they can hear portions of the ARISS contact. Listeners can only hear the crew member answers, not student questions, which are communicated on a separate frequency. The ARISS team shares the students' questions ahead of time so listeners in the ISS footprint or on the Web can follow along. Many host organizations stream the entire interview online to make it available to students who are not at the event site.

The Equipment Plan

What is involved with the Equipment Plan?

After your Education Plan has been approved, you must decide whether your contact will be executed direct, with a ground station on site, or by telebridge. You must develop an Equipment Plan that provides the information necessary to be sure you will be able to support the contact method you have chosen. Your Technical Mentor will assist you and your local ham radio team to help you work through the considerations. You will be expected to provide the information requested on the ARISS Equipment Plan Form. You can download the form at https://www.ariss.org/hosting-an-ariss-contact-in-the-us.html. Your Equipment Plan must be completed and submitted as soon as possible after your Education Plan has been approved, usually within ~~3~~ 2 months after approval. Your contact with the ISS will not be submitted for scheduling until your Equipment Plan is reviewed and accepted by the ARISS management team.

Section 4: The Media/Outreach Component

What is a media/outreach/promotion plan?

A media/outreach/promotion plan is an overview of how the host organization plans to communicate information about the amateur radio interview and surrounding educational activities out to your community. The plan should describe plans for both internal and external promotion to your community's media outlets.

Some strategies to consider:

First promote within your school/organization

What you are attempting to achieve is a program that will pull together all of the students, teachers, school staff, and much of your community in a single unified goal…a personal interview with a crew member on the ISS **using amateur radio** via ARISS that has stimulated students' interest in science, technology, math and engineering (STEM).

It is very important to garner support from your organization's administrators, principals, and superintendents. They can also offer services in obtaining media attention.

Parents

Remember to include parents and parent groups in your plans. Not only do they help encourage students to complete their part of the ARISS educational activities, but they can play a role in having the media see the importance of the event to the community.

Parents may be given the assignment of recording events (audio, video, note-taking, photographs) as they unfold. Parents can get quotes from students and teachers about the learning activities leading up to the ARISS contact and the impact on their outlook, and about ARISS and amateur radio. Enlist the help of parents and their students in distributing programs for the ARISS contact day, and in seating VIPs and the media.

Business Leaders and Community VIPs

Business leaders and local VIPs can offer help in a variety of ways. For some it might mean offers of various media exposure, printing of invitations, t-shirts for students, or simply demonstrating support for the students. Create and distribute special invitations to local VIPs.

Other Schools and Educational Groups

Invite neighboring schools to listen in to the radio contact from a remote location. Even better, invite them to attend your educational activities and ARISS contact. Provide a special seating area for them.

Involve Students

- Students can be selected to write articles describing their learning activities and ideas about ARISS and amateur radio for the school paper, local paper and other media.
- Create programs to be distributed on the day of the event to all who attend. These become great keepsakes. They can also help to communicate some details about the event.
- Work with students so that they will be prepared to speak to the media after the ARISS amateur radio contact. Prior practice doing this can be helpful for students so that they talk about educational activities and ARISS.
- Select students for specific responsibilities such as publicity, artwork, production of event programs and invitations.
- Select students for the responsibility of recording all of the school's activities and lessons, including the day of the contact.

How do we involve local news media?

You will want to make sure that you inform your local news organizations about your upcoming interview with the ISS; go beyond just posting to the school or group's website and social media. You will need to notify them in advance about the planned event and keep them informed as you have more details about the date and time the contact will occur. It is important to designate someone within your organization as the point of contact with media to make sure that accurate and timely information is provided. You might consider inviting the media to tour your school before the ARISS contact to see what students have been learning. Be sure to emphasize the educational impact of the opportunity.

- Send news releases to newspapers, TV stations, radio stations once the date of the contact is known. Get a sample press release at https://www.ariss.org/hosting-an-ariss-contact-in-the-us.html and customize it for your venue.
- Ensure you have collected the required permission forms from anyone participating in the ARISS contact who will be interviewed, recorded, or photographed. You'll find a release form you can download and print at https://www.ariss.org/uploads/1/9/6/8/19681527/talent_release-1.22.10.pdf
- Send links for newspaper articles, television stories and other website stories to your ARISS Technical Mentor so we can communicate the story about your event to the organizations that fund ARISS.
- Send photos and scanned release forms for students photographed to ariss.us.education@gmail.com.

Addendum: Resources for Education

Accessing NASA and ISS NL Resources

What kinds of NASA educational resources are available from NASA?

NASA produces a variety of resources for educators and students. These resources include websites, printed materials, student programs and professional development opportunities. The NASA Education resources listed below will help with writing the proposal and the creation of activities.

NASA Education Home Page
https://www.nasa.gov/offices/education/about/index.html

This site is a gateway to all NASA Education programs/services for educators and students. Search for resources by subject, grade level, topic, and type. There are educator guides, posters and multimedia with information on space that you will find useful in planning student activities. An example of higher level lessons is: https://www.nasa.gov/audience/foreducators/exploringmath/precalculus/Prob_EarthHearMeNow_detail.html

ISS NL Space Station Ambassadors
https://www.spacestationexplorers.org/ambassadors/

Educators can study the ISS U.S. NATIONAL web pages to learn about Space Station Explorers, free educational resources, and the perks of becoming a Space Station Ambassador.

Space Place
https://spaceplace.nasa.gov/

NASA and partners Jet Propulsion Laboratory, California Institute of Technology, ITEEA (International Technology and Engineering Education Association) have developed this website with activities and resources for elementary students and educators.

NEON (NASA Educators Online Network)
http://neon.intronetworks.com/#
Subscribe to this newsletter for information about opportunities resources and professional development opportunities.

International Space Station (ISS) Home Page
http://www.nasa.gov/mission_pages/station/main/index.html
This site serves as the main homepage for the ISS. You can find the latest news on missions, ISS activities and resources.

NASA Space Communication and Navigation (SCaN) Home Page
http://www.nasa.gov/directorates/heo/scan/#.VCwZ5T_AbaJ
This site serves as the main homepage for SCaN, the NASA organization responsible for NASA's communications with satellites, including ISS.
https://www.nasa.gov/directorates/heo/scan/communications/outreach/students/txt_kidszone.html
The SCaN pages enable students to learn how NASA communicates with its satellites and ISS through SCaN radio and laser communications systems and includes NASA communication and navigation educational activities.

What other NASA resources are available?
There are a variety of other NASA resources that host organizations could utilize in preparing for an ARISS contact.

Astronaut Appearance Requests
http://www.nasa.gov/about/speakers/astronautappearances.html#.VCsBhvldUnc
NASA astronauts appear before a variety of groups to inform the general public about the U.S. Space program. Requests must be submitted far in advance. There is a cost involved for the host, and appearances are very limited.

Astronaut and Cosmonaut Biographies
https://www.nasa.gov/astronauts/biographies/active)
The astronaut biography homepage provides information on the members of space flight crews and candidates for future missions in NASA's space flight programs.

NASAcast
http://www.nasa.gov/multimedia/podcasting/
Subscribe to NASA's omnibus podcast for the latest mission news, features and the "This Week @ NASA" report.

NASA Television
http://www.nasa.gov/multimedia/nasatv/
NASA TV is a resource designed to provide real-time coverage of NASA's activities and missions. NASA TV features ISS and Space Shuttle mission coverage, live special events, amateur radio contacts, electronic field trips, aviation and space news and historical NASA footage.

Science at NASA
http://science.nasa.gov/
Find out the latest headline science news happening at NASA. Subscribe to *NASA Science News*, an electronic newsletter, to learn about new findings and developments in space research. This is a great way to get students tuned in to space research activities.

Accessing Amateur Radio and ARRL Education Resources

What kinds of amateur radio resources are available from ARRL?
ARRL's Education & Technology Program (ETP) offers resources to teachers and schools, and professional development opportunities and grants related to radio.

ARRL Education & Technology Program Curriculum Guide

http://www.arrl.org/curriculum-guide

Many ideas in this curriculum guide can intrigue your students.

ARRL ETP, Using the ETP Lesson Library

http://www.arrl.org/lesson-ideas-and-learning-activities

Lessons that you may wish to try are in this library.

Preparation for an ARISS Contact

http://www.arrl.org/preparation-for-an-ariss-contact

Resources collected on this web page will generate ideas for your education plan. You'll find resources here for learning about satellite communications, radio science, electronics and space travel and exploration and some sample education plans developed by other schools.

Education & Technology Program

http://www.arrl.org/etp-classroom-resources

Resources are available for educators to use to help their students understand wireless communications, radio waves, the electromagnetic spectrum, wave forms and modulation, satellite communications, orbits, and Keplerian elements, to name just a few of the concepts discussed.

Teachers Institute on Wireless Technology

http://www.arrl.org/teachers-institute-on-wireless-technology

This Institute offers *expenses paid* professional development opportunities each summer that provide hands-on training for educators to learn about basic electronics, wireless communications, micro-controllers, programming fundamentals and robotics and offers resources for classroom instruction. Attending the Teachers Institute is a great way to prepare for an ISS contact through the ARISS program.

Listen to or Watch ARISS Contacts

http://www.arrl.org/listen-to-watch-ariss-contacts

This web page provides audio and video recordings of ARISS contacts that will give educators a good idea of how the contacts are conducted and the kind of conversations that develop between students and astronauts. A search on YouTube will produce additional video recordings of ARISS contacts.

Using Amateur Radio in the Classroom

http://www.arrl.org/amateur-radio-in-the-classroom

This web page provides information on using amateur radio in the classroom as an effective way to teach both fact and theory. Amateur radio can be used to engage students in a variety of subjects. Visit the web page at www.arrl.org/curriculum-connections-and-benchmarks for ideas about how amateur radio subject content can align with state and national learning objectives.

Amateur Radio on the International Space Station (ARISS)

School Application Form
For an Organized Radio Contact with the International Space Station

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Please read instructions before filling out the application.

SECTION A

ALL QUESTIONS IN THIS SECTION MUST BE ANSWERED.

For a direct contact, fill out questions A1 to A15 and B1 to B7. For a telebridge contact, fill out questions A1 to A15.

Note: Please enter your country code and city code as part of the telephone number for any voice, fax, or cellular phone.

(A1.) Date of application:

(A2.) School
Name:
Address:
City:
State, province, territory, mail district:
Zip or postal code:
Country:
Phone #:
Fax #:
E-mail address:
School Web site address:
Normal school hours:
Brief description of the school and the amateur radio school club (if there is one):

(A3.) Principal
Name:
School phone #:
School fax #:
School e-mail address:
Pager #:
Home phone #
Home fax #:
Cellular phone #:
Home e-mail address:
Home address:
Home city:
Home state, province, territory, mail district:
Home zip or postal code:
Home country:

(A4.) Coordinating teacher
Name:
Grade level/subject taught:
School phone #:
School fax #:
School e-mail address:
Pager #:
Home phone #:
Home fax #:
Cellular phone #:
Home e-mail address:
Home address:
Home city:
Home state, province, territory, mail district:
Home zip or postal code:
Home country:

(A5.) Public relations contact
Name:
Work phone #:
Work fax #:
Work e-mail address:
Pager #:
Home phone #:
Home fax #:
Cellular phone #:
Home e-mail address:
Home address:
Home city:
Home state, province, territory, mail district:
Home zip or postal code:
Home country:

(A6.) Has the school previously been selected for a shuttle, Mir, or ISS contact?
(YES or NO):
If YES, which mission?
STS: or Astronaut on Mir or ISS:
Date of contact:

Did the school have a complete contact? If no, please explain why not.

(A7.) Language requested: English is the language that is normally used on the ISS. It is possible that other languages may be used. If another language is requested, please indicate the desired language.

(A8.) Are weekends, holidays or nights a problem for your contact? (YES/NO)
Please forward the school calendar for the year. To aid the contact planners, provide dates for major holidays, or other known problem dates. Be as descriptive as possible. (i.e. school starts the third week of August, holiday is the fourth Thursday of the month, etc.)

(A9.) Attach the school's educational proposal to this application before submitting.

The educational proposal should include answers to these questions:
How will you:
a) integrate this activity into the school curriculum?
b) involve as many grade levels as you can, with participation through essay contests, planning a Mars outpost, learning to track the ISS, learning about basic circuit boards, poster drawing, letter writing, etc.?
c) obtain as much media coverage as possible?

(A10.) Contact site phone #:

(A11.) Contact site cellular phone #:

(A12.) Contact site fax #:

(A13.). Contact site time zone:
When does your area go to Daylight Saving Time?

(A14.) Hours before or after UTC (Coordinated Universal Time):

(A15.) Assisting local amateur radio club
(To be filled out by the amateur radio club if one is providing assistance)
Name of amateur radio club:
Club contact person: Contact
person's call sign: Contact
person's home phone #: Contact
person's work phone #: Contact
person's pager #: Contact
person's e-mail address:
Is the club experienced with satellite operations? (YES or NO):
National amateur radio organization (if club is affiliated with a national amateur radio organization such as the ARRL):

AUTHORIZATION AND USE OF PERSONAL INFORMATION

In compliance with privacy laws on the detention and the processing of personal information, the applicants are invited to complete and sign the present authorization statement and e-mail it, duly scanned, to the ARISS School Selection Manager.

S chool's Name and Ci t y :

Principal

The undersigned, duly authorized to represent the school (or youth organization), gives permission to the ARISS organization for the processing and use of data related to and needed for the setting up of an educative ARISS radio contact, provided care be taken that the data will not be made available to other parties, accordingly to the applicable law.

Moreover, the undersigned gives permission to the ARISS organization for publishing the school's ARISS related educational project on the ARISS website, provided no personal data be made available, except the school's address, e-mail and phone number.

Date :

Name and Signature :

Participants

Accordingly to the applicable law, the undersigned give permission to the ARISS organization for the processing and use of their personal data related to and needed for the setting up of an educative ARISS radio contact, provided care be taken that the data will not be made available to other parties.

Coordinating Teacher

Date :

Name and Signature :

Public Relations Contact Person

Date :

Name and Signature :

Amateur Radio Operator

Date :

Name and Signature :

SECTION B

ONLY ANSWER THESE QUESTIONS BELOW IF A DIRECT CONTACT BETWEEN THE SCHOOL AND ISS IS REQUESTED

If you are unsure how to answer a question, please ask your ARISS representative for help.

(B1.) Radio contact coordinator
(To be filled out by an amateur radio operator)
Name: Call
sign: Home
address: Home
city:
Home state, province, territory, mail district:
Home zip or postal code:
Home country:
Home phone #:

Pager #:
Cellular phone #:
Home fax #:
Home e-mail address:
Work phone #:
Work fax #:
Work e-mail address:
Experienced with satellite operations? (YES or NO):

DATA ABOUT SITE OF RADIO CONTACT

(B2). Site of radio contact location information:
Latitude [Use decimal format] (Indicate N=North S=South):
Longitude [Use decimal format] (Indicate W=West E=East):
Elevation [Use meters above mean sea level]

Note: For help in converting latitude and longitude to decimal format, see:
Longitude and Latitude.doc

Address:
City:
State, province, territory, mail district:
Country:

(B3.) Radio coordinator during contact:
Name:
Call sign:
Home address:
Home city:
Home state, province, territory, mail district:
Home zip or postal code:
Home country:
Home phone #:
Pager #:
Cellular phone #:
Home fax #:
Home e-mail address:
Work phone #:
Work fax #:
Work e-mail address:
Experienced with satellite operations? (YES or NO):

(B4.) Call sign at contact site:

(B5.) Station and equipment data
(To be used during the ARISS amateur radio contact)

We require 2 complete radio stations at your event site. See: ARISS Contact Requirements document.

Photos of the radio equipment to be used by the school may be required prior to final approval for the radio contact.

Radio Station #1

Transceiver to be used (manufacturer/model):
Does it have memories? (YES or NO): If yes, number of memories:
If yes, is the memory considered tunable like a VFO?
Output Power (Watts):
Frequency range (MHz):
Frequency steps:
Station equipped with an RX preamplifier? (YES or NO):
If YES, manufacturer and model of Preamplifier:
Station equipped with a TX amplifier? (YES or NO):
If YES, manufacturer and model of amplifier:
If YES, maximum output power of TX amplifier (Watts):
Is the radio capable of a non-standard split? (YES or NO):
Antenna type (VERTICAL, SATELLITE (AZ/EL?), OTHER) [specify]:
If commercially built, manufacturer and model:
Antenna gain (dbd or dbi):
Number of elements:
Polarization (HORIZONTAL, CIRCULAR, or VERTICAL)
Antenna equipped with a rotator? (NONE, AZIMUTH ONLY, or AZ/EL):
Satellite tracking program available? (YES or NO):
If YES, name of tracking program:
Do you have Automatic Antenna Control? (YES or NO):
VHF Packet capability? (YES or NO):
VHF SSTV capability? (YES or NO):
Do you have phone patch capabilities?
SWR/Power output meter to be used (manufacturer/model):
Coax cable to be used:

Radio Station #2

Transceiver to be used (make/model):
Does it have memories? (YES or NO): If yes, number of memories:
If yes, is the memory considered tunable like a VFO
Output Power (Watts):
Frequency range (MHz):
Frequency steps:
Station equipped with an RX preamplifier? (YES or NO):
If YES, manufacturer and model of preamplifier:
Station equipped with a TX amplifier? (YES or NO):
If YES, maximum output power of TX amplifier (Watts):
Is the radio capable of a non-standard split? (YES or NO):
Antenna type (VERTICAL, SATELLITE (AZ/EL?), OTHER) [specify]:
If commercially built, manufacturer and model:
Antenna gain (dbd or dbi):
Number of elements:
Polarization (HORIZONTAL, CIRCULAR, or VERTICAL)

Antenna equipped with a rotator? (NONE, AZIMUTH ONLY, or AZ/EL):
Satellite tracking program available? (YES or NO):
If YES, name of tracking program:
Do you have Automatic Antenna Control? (YES or NO):
VHF Packet capability? (YES or NO):
VHF SSTV capability? (YES or NO):
Do you have phone patch capabilities?
SWR/Power output meter to be used (manufacturer/model):
Coax cable to be used:

(B6.). Please note any antenna obscuration data for the site of the radio contact:

Azimuth degrees	Elevation degrees
0 (North)	
45	
90 (East)	
135	
180 (South)	
225	
270 (West)	
315	
360 (North)	

For example:

Azimuth degrees	Elevation degrees
0 to 50	0
50 to 90	15
90 to 100	30
100 to 140	5
140 to 280	10
280 to 360	5

(B7.) Do you plan to do a live re-transmission or webcast? If a live re-transmission, how and on what frequency and mode? If a webcast, what is the Web site address?

School Letterhead or use ARRL Logo Letterhead

Contact: [LOCAL CONTACT's NAME]
[LOCAL CONTACT's TITLE, if any}
[EMAIL]
[AREA CODE & PHONE]

FOR IMMEDIATE RELEASE

LOCAL STUDENTS TO TALK TO ASTRONAUTS ON INTERNATIONAL SPACE STATION

Amateur Radio connects kids, crew as ISS orbits overhead

[DATE]

Students at [NAME OF SCHOOL] at [ADDRESS] in [CITY, STATE] will talk with astronauts on the International Space Station via Amateur Radio at [LOCAL TIME} on [DAY, DATE]. This activity is part of the ARISS (Amateur Radio on the International Space Station) Program, which promotes learning opportunities as part of the STEM (Science, Technology, Education and Math) initiative.

[Describe students and teachers who have been preparing for the event. Describe some of the activities/topics they have been studying to prepare.]

[Describe how the contact will happen: Direct? Telebridge? Which astronaut will be interviewed?]

[Describe the local Amateur Radio community that will be supporting the Amateur Radio contact with equipment and any other support such as training students, providing instruction on radio communications.]

Background information to include:

What is ARISS?

ARISS is a joint venture by NASA, the Center for the Advancement of Science in Space (CASIS), the American Radio Relay League (ARRL), and the Radio Amateur Satellite Corporation (AMSAT) to facilitate communication via Amateur Radio between astronauts aboard the International Space Station and schools and communities around the world. ARISS programs excite and motivate students in a one-of-a-kind presentation and exchange.

ARISS program goals are:

- Inspiring an interest in STEM (Science, Technology, Engineering and Math) subjects and in STEM careers among young people.
- Providing an educational opportunity for students, teachers, and the general public for learning about wireless technology and radio science through Amateur Radio.

- Providing an educational opportunity for students, teachers, and the general public for learning about space exploration, space technologies and satellite communications.

What is Amateur Radio?

Amateur, or "Ham," Radio, is a popular service and hobby in which federally licensed participants operate communications equipment. There are over 700,000 licensed amateurs and nearly 2,300 ARRL-affiliated Amateur Radio clubs in the United States. Hams talk to each other across town, around the world, and even into space without the need for normal communications infrastructure, such as cell phone networks or the Internet. Amateur Radio is regularly used during natural disasters to help local emergency and served agencies (such as the Red Cross, Salvation Army, and state and local governments) respond when normal communications methods are disrupted. The Amateur Radio community is a great source of electronics experimentation, public service, and fun.

More information on the ARISS program can be found at **www.ariss.org**.
More information on Amateur Radio can be found at **www.arrl.org/what-is-ham-radio**.

#####

Talent Authorization and Release

I hereby grant to the space agencies (ESA, NASA, JAXA, CSA, and the Russian Space Agency) and others acting on their behalf, the right to record my person and voice using audio, photographic, video, or other such techniques: to include my name, likeness, voice and biographical material in connection with these recordings; to use, reproduce, distribute, and exhibit such recordings in any and all media throughout the world without limitation; and to authorize others to do so, for any purpose which the space agencies and those acting pursuant to their authority, deem appropriate.

I hereby waive all rights of any nature in such recording(s) and the exhibition thereof. It is understood that this grant is provided at no cost to the Government and that no compensation of any kind shall be due or expected.

Signed:_____

Printed Name:_____

Name of School:_____

If a minor, signature of parent or guardian:

_____

Date:_____

Talent_Release.rtf
Updated: 22 January 2010
13:15 UTC

Amateur Radio on the International Space Station (ARISS)
Contact Proposal

The ARISS-US program opens proposal windows for applicants from the United States twice each year in order to accept proposals for contacts to be scheduled 6-12 months in the future. You'll find information about the current or next proposal window at http://www.ariss.org/submit-a-contact-proposal.html. Proposal Webinars will be offered prior to the submission deadline in order for you to ask questions about the program. Please check http://www.ariss.org/ for updated dates and times.

Privacy Policy:
The information you provide will be used by ARISS member organizations only for its intended purpose. Submitting information is strictly voluntary. By doing so, you are giving ARISS your permission to use the information for the intended purpose. If you do not want to give ARISS permission to use your information, simply do not provide it. However, not providing certain information may result in ARISS's inability to provide you with the information or services you desire.

Discrimination Policy:
The ARISS program does not discriminate on the basis of race, color, national origin, sex, disability, or age.

Directions:
Please read the ARISS Proposal Guide and then fill out this proposal form to the best of your ability. You'll find the proposal guide at:
https://www.ariss.org/uploads/1/1/1/6/111680627/2019-09-12-ariss_proposal_guide_for_publication_v2.pdf

Save your completed proposal form as a Microsoft Word document **using this file naming convention**: "Organization_Name_YYYY-MM-DD_ARISS Proposal.docx" and email it to ariss.us.education@gmail.com along with your Letters of Commitment (see Section 5). If you have any questions or comments, please email.

This proposal is being submitted for the Contact Window of
January 1, 2021 – June 30, 2021

This proposal is due to ARISS by March 31, 2020
at 11:59 PM Pacific Time.

Section 1: Contact Information

Lead Host Organization	Organization Name: Address: City, State, Zip Code: Web site: Telephone:
Lead Host Organization **Chief Administrator** (principal, director, president, etc.) *Will receive copies of certain key ARISS correspondence*	Name: Title/Role: Address: City, State, Zip Code: Work Telephone: Email:
Lead Host Organization **Main Point of Contact** (usually the person completing this proposal) *Must be authorized to represent the Lead Host Organization and will be responsible for submitting an ARISS Activity Report after the contact which requires information about the student and audience participation in the radio contact event and related educational activities*	Name: Title/Role: Address: City, State, Zip Code: Work Telephone: Mobile: Email:
Technical Point of Contact *Will coordinate audio/video/Internet technology for the event*	Name: Title/Role: Address: City, State, Zip Code: Work Telephone: Mobile: Email:
Media Coordinator *Will coordinate publicity, outreach to local media—not just postings on school or group web sites and social media-- and be responsible for obtaining ARISS Talent Releases and high-resolution photos and any other media documentation of the educational activities and ISS interview to provide to the ARISS program*	Name: Title/Role: Address: City, State, Zip Code: Work Telephone: Mobile: Email:

Partner Organization **Main Point of Contact** *(if applicable)* *Main contact from another school or educational organization in partnership to host the ARISS contact. Example: a science museum partnering with a local school that will provide the students who will be participating.*	Organization Name: Contact Name: Title/Role: Address: City, State, Zip Code: Daytime Telephone: Mobile: Email:
Local Amateur Radio Club **Main Point of Contact** *If identified at time of proposal; this person will coordinate support being provided by local amateur radio community*	Name and Call Sign: Address: City, State, Zip Code: Daytime Telephone: Mobile: Email:
Additional Point of Contact *(optional)* *Anyone else from the educational community or ham radio community who will be involved in leading the execution of this proposed plan*	Name: Address: City, State, Zip Code: Daytime Telephone: Mobile: Email:
Have you attended the ARRL Teacher Institute (TI)? Would you like more information?	__ Yes: Date _____ __ No __ Please send more information about ARRL TI to this email address: _____
How did you hear about the ARISS program?	
Names of organizations/persons submitting commitment letters	

Section 2: Scheduling Considerations for ARISS Contact

1. If your organization is selected for an ARISS contact, are there any dates during the proposed cycle that your organization cannot support? **Type the weeks, days of week, times of day that you cannot support below.** List all vacation days, school holidays, testing days, etc. Additionally, providing a school or facility calendar may be helpful. *Please note that the more flexible your organization, the more likely we will be able to schedule a contact.*

2. Please provide any preferred time for the event to be held. If you are planning around a specific event occurring on a specific day(s) or week(s), state that clearly.

3. Please provide your time zone.

4. At this point do you have a preference for a Direct or a Telebridge configuration for your contact? For example, there may be known constraints at your location or constraints related to a specific event on a particular day and time that would make a Direct Contact difficult to schedule and would indicate a Telebridge Contact would be your best choice. If you have already determined your preference, please indicate that here. If you don't have a preference, please indicate "either." If you don't yet know how to assess your preference without further guidance, please indicate "unsure" (delete those choices below that do not apply). **Note:** *Due to the nature of the program, we cannot guarantee a particular request.*

Prefer Direct Contact
Prefer Telebridge Contact
Either
Unsure

Section 3: Education Plan

For the following items, please include as much detail and information as you feel is appropriate within the prescribed word limits. We will not review information that exceeds the prescribed response limit. NOTE: Microsoft Word allows you to select a section of text and perform a Word Count using the Tools menu (versions differ between Mac OS and Windows environments).

1a. Our school/organization is (delete those choices below that do not apply):

Urban
Rural
Suburban

Public school
Charter school
Private school
Parochial school
Museum
Library
Other organization type (please explain)

1 b. Describe the student population (demographics) that will be engaged in your education plan and the audience that will be present for the ARISS radio contact event. If students from another school/organization are to be involved in your education plan and/or in the audience for the radio contact, include demographics of that student population, as well. Include these demographic descriptors: age level, education level, ethnicity and native languages, % receiving reduced price lunch, % of socio-economically disadvantaged. If you have previously hosted an ARISS contact, describe how you will reach a different audience with this new proposal. Also include roughly how many people you are expecting will be physically present at the contact. *Limit 250 words.*

1 c. Describe your school/organization's purpose and its educational objectives/mission statement. *Limit 250 words.*

2. Explain why your organization wants to host an ARISS radio contact and how an ARISS radio contact will enhance the educational objectives of your organization. Specifically, describe how your organization will use the ARISS radio contact to support local STEM (Science, Technology, Engineering, and Math) goals and objectives. *Limit of 350 words.*

3. Describe any community partnerships that will be part of the ARISS radio contact and surrounding activities. Specifically, list any local amateur radio organizations that will be supporting your contact and/or that will be involved in your educational plan, as well as any other educational organizations or other community resources that will be involved in carrying out your educational plan. Describe how these organizations have committed to be part of or will support your educational plan. **Note:** Be sure to name the point of contact for these organizations in Section 1 and obtain Letters of Commitment from the named organizations to accompany your proposal as requested in Section 5. *Limit of 350 words.*

4 a. Describe your year-long STEM curricular topics and some of the hands-on preparatory learning activities to be engaged with students at different grade levels leading up to and after the radio contact with the ISS. Review the resources listed in the Addendum to the Proposal Guide and describe how you plan to incorporate NASA and amateur radio content and some of these or other education resources into your education plan. *Limit of 1200 words*

4. b. Describe activities planned for the weeks and days leading up to and after the ARISS radio contact. *Limit 500 words.*

4 c. Describe how the radio contact interview questions will be developed and how you will select the students who will ask the questions of the ISS crewmember. *Limit of 350 words.*

5. Describe how you will organize your proposed ARISS radio contact, including the location, transportation details (if needed), and how you will have the supporting technology (audio/video/Internet) in place. *Note*: You will provide details about the radio station equipment supporting your contact in your Equipment Plan. That information is not needed here. *Limit of 350 words*.

6. Provide information on your organization's plan to secure your target audience in case there is a shift in dates and/or times (i.e. a "Plan B"). Consider this scenario*: Four days before the date that has been scheduled for your contact, an ISS event occurs that means the contact will not be possible at the time previously scheduled. You are offered an alternate contact time a week later. How will you adjust and work to get all students, parents, media on site? Limit of 250 words.*

7. Describe your organization's plans to evaluate the educational and STEM impact of the ARISS radio contact on students. How will you determine if the event has influenced the students' learning, and/or their new attitudes

toward future studies and learning and amateur radio, and/or students' new thoughts about STEM careers? *Limit of 350 words.*

Section 4: Media Plan

Describe your media/promotion plan to engage your community through contacting the news media. (Please refer to the suggestions in the Proposal Guide.) Be specific. *Limit of 350 words*.

Section 5: Letters of Commitment

Provide signed Letters of Commitment from **each participating organization named in your education plan**; include **signatures of lead administrators of all organizations including your own**. (see Section 1). All letters are to be addressed to ARISS-US Education Committee, scanned and submitted electronically together with this proposal via email to ariss.us.education@gmail.com.

Section 6: Sample Timeline Day of ARISS Radio Contact

Create a sample internal-use schedule that outlines the day of the ARISS radio contact for your staff members. This sample schedule would be used for your internal coordination and planning (transportation of students, audio/video/Internet setup, contacting local media, coordination with amateur radio team, activities, etc.) and is not intended to be the program distributed to the ARISS radio contact audience. For this sample document, assume your ARISS radio contact is scheduled from 11:15 am – 11:25 am. (Note: Your sample schedule is intended to show that you have thought through the contact process. It is not a commitment.) *Limit of 550 words.*

Amateur Radio on the International Space Station (ARISS)
Equipment Plan

Privacy Policy

The information you provide will be used by ARISS member organizations only for its intended purpose. Submitting information is strictly voluntary. By doing so, you are giving ARISS your permission to use the information for the intended purpose. If you do not want to give ARISS permission to use your information, simply do not provide it. However, not providing certain information may result in ARISS's inability to provide you with the information or services you desire.

Directions

The technical team (local amateur radio group and organization's IT representative, with guidance from the ARISS Technical Mentor) should complete this form to the best of their ability. This plan must be submitted to and approved by ARISS before you can be scheduled for an ARISS contact.

Note: ARISS recognizes that circumstances might require changes to this plan during implementation. Your Technical Mentor can approve justifiable changes if they become necessary.

When completed, save this form as a Microsoft Word document with this file naming convention:

YYYY-MM-DD, Organization Name, ARISS Equipment Plan.docx

Submit the completed form to your Technical Mentor, who will review it and forward it to the evaluation team.

Send any questions or comments about this form to ariss.us.education@gmail.com.

General Contact Information

Type of contact requested: ☐ Direct

☐ Telebridge

Contact Site Primary Phone # *Must be a hard-wired (landline) phone*	
Contact Site Backup Phone # *Can be a landline or mobile phone*	
Contact Site Time Zone *UTC is Coordinated Universal Time*	Time Zone Name: Hours before/after UTC:
When is your area on Daylight Saving Time?	

Information for Direct Contact

Complete this section for a direct contact.

Some of the information requested here might not apply to your installation; where appropriate, enter "none" or "NA" (not applicable). You should not interpret these questions as requirements. Refer to the ARISS Ground Station Recommendation and your Technical Mentor for suggested equipment.

Call sign to be used during contact:

Radio Coordinator

Ham Radio Team Lead *Local ham radio operator coordinating the ground station*	Name and call sign: Mailing address: E-mail address: Landline phone #: Mobile phone #:
Briefly describe the team lead's experience with weak-signal satellite operations, if any.	

Contact Site

Location *Address of contact site and brief description (for example, "1st floor auditorium")*	Street: City, State, Zip: Description:
Coordinates *Geographic location of site, for calculating ISS passes. Provide lat/long in decimal degrees (for example, "39.392 N").*	Latitude: Longitude: Elevation (meters above sea level):
Horizon *Note any antenna obscurations (minimum horizon in degrees). For example:* Azimuth (degrees) Elevation (degrees) 0 – 50 0 50 – 90 15 90 – 100 30 100 – 140 5 140 – 280 10 280 – 360 5	Azimuth Elevation

Briefly describe how audio will be distributed during the contact (student/PA microphone to transmitter, receiver audio to PA, and so on).

Radio Station #1 (Primary)

Transceiver

Manufacturer and model:

Number of memories that support non-standard split and 1-kHz resolution:

Output power (watts):

Frequency range (MHz):

Minimum tuning resolution (kHz):

Transmit amplifier

Manufacturer and model:

Maximum output power (watts):

Receive preamplifier

Manufacturer and model:

Location (in station or at antenna):

Antenna

Type (such as single or crossed yagi):

Manufacturer and model:

Gain (specify dBi or dBd):

Number of elements:

Polarization (such as horizontal or right-hand circular; specify if switchable):

Rotator

Type (none, azimuth, az/el):

Manufacturer and model:

Coax

Type:

Approximate length:

Tracking program

Name:

Automatic rotator control (yes/no):

Other station equipment

Power source: (such as UPS or battery):

SWR/output power meter (yes/no):

Packet capability (yes/no):

SSTV receive capability (yes/no):

Radio Station #2 (Backup)

Transceiver

Manufacturer and model:

Number of memories that support non-standard split and 1-kHz resolution:

Output power (watts):

Frequency range (MHz):

Minimum tuning resolution (kHz):

Transmit amplifier

Manufacturer and model:

Maximum output power (watts):

Receive preamplifier

Manufacturer and model:

Location (in station or at antenna):

Antenna

Type (such as vertical or crossed yagi):

Manufacturer and model:

Gain (specify dBi or dBd):

Number of elements:

Polarization (such as vertical or right-hand circular; specify if switchable):

Rotator

Type (none, azimuth, az/el):

Manufacturer and model:

Coax

Type:

Approximate length:

Tracking program

Name:

Automatic rotator control (yes/no):

Other station equipment

Power source: (such as UPS or battery):

SWR/output power meter (yes/no):

Packet capability (yes/no):

SSTV receive capability (yes/no):

Information for Telebridge Contact

Complete this section for a telebridge contact.

Audio Coordinator

Main Audio Point of Contact *Person coordinating the audio arrangements for the contact*	Name: Mailing address: E-mail address: Landline phone #: Mobile phone #:

Audio Information

Type of Phone System *Analog or digital*	
Method of Connecting to Phone Line *Hardware manufacturer and model, etc.*	
Briefly describe how audio will be distributed between the PA system, phone line, and any other connections.	

24 Hour Notice

24 hours before your ARISS contact, verify that you are ready by sending an e-mail to: **ariss-24hrconfirm@amsat.org** **AND** to your ARISS program Technical Mentor.

You will need to include all of the information describe below. Use this template to make sure you include all of the information necessary.

Organizations not adhering to this e-mail request will be deleted as an ARISS scheduled contact!

Please include the following information in the email:

1) Organization name:

2) Confirmation that you are ready for the contact:

3) Time of contact (UTC & Local):

For a **direct** contact, run your tracking program to determine pass time.

For a **telebridge** contact, confirm the teleconference start time.

4) Phone numbers where the contact will take place. Include country code outside USA.
Primary number:

Backup number(s):

5) Verify that primary phone does not have to go through a switchboard OR that the switchboard will have an operator present prior to and during the contact:

For a direct contact:

6) Station operator to make contact:

7) Call sign to be used at school:

8) Call sign to be used by ISS:

9) Transmit frequencies

Primary: MHz

Backup: MHz

For a telebridge contact:

10) Teleconference phone number:

Note: US and Canadian schools will call in. Schools in other regions will be called by the telephone operator.

ARISS Activity Report

Contact #: Contact Date:

Host Organization:

Country: ◯ US ◯ Other, please specify:

If US, complete information below

City:

State: Select One

Zip Code:

Definitions for Participant Count Information

- Direct: A count of participants involved. This includes individuals who are actively engaged in the ARISS contact and/or pre and post activities. Include audience members in this category.
- Indirect: A count of participants in enrichment activities. This includes presence at an event, but not necessarily direct active participation. An example is a large scale public event in which the ARISS contact is one component and many of the participants hear only a small portion of the ARISS contact or simply receive information about ARISS. Presence must be verified by on-site coordinator or facilitator who provides documentation of attendance.

K-4 Educators	Direct:	Indirect:
5-8 Educators	Direct:	Indirect:
9-12 Educators	Direct:	Indirect:
Informal Educators	Direct:	Indirect:
K-4 Students	Direct:	Indirect:
5-8 Students	Direct:	Indirect:
9-12 Students	Direct:	Indirect:
Community College Students	Direct:	Indirect:
Undergraduate Students	Direct:	Indirect:
Graduate Students	Direct:	Indirect:
Pre-Service Teachers	Direct:	Indirect:

Post-Doctoral	Direct:	Indirect:
Community College Faculty	Direct:	Indirect:
College/University Faculty	Direct:	Indirect:
Administrators	Direct:	Indirect:
Civic/Community Members	Direct:	Indirect:
Parents	Direct:	Indirect:
Professionals	Direct:	Indirect:
Other	Direct:	Indirect:

Participating Astronaut:

Type of Contact: Select One

Notes and Highlights:

For US Contacts only:

Additional Participating Schools (if any):
Include name of school, city, state, and zip code

FAQ

(Updated As Needed)

1.