

Appendix A

Schools wanting a scheduled SAREX radio contact with the astronauts are required to submit a proposal and a SAREX school application to ARRL, 225 Main St., Newington CT 06111.

While only a few schools get scheduled radio contacts per mission, all schools can participate by eavesdropping, or by trying to make a random contact with the astronauts. Teachers can use lessons in this SAREX Guide to accompany their SAREX radio activities. Imagine listening in on the astronauts from your classroom! If you are a school teacher, but are unfamiliar with ham radio, you can still take part in SAREX. Contact ARRL to get a list of your local Amateur Radio clubs to assist you.

If your school is interested in SAREX, you must complete a SAREX school application and write an educational proposal. ARRL collects these for the SAREX Working Group who makes the final selection with the astronauts. All grade levels and type of schools (rural, suburban and particularly urban) are encouraged to apply. For a SAREX school application send a business-sized self-addressed stamped envelope to ARRL, or e-mail your request for an electronic version to: sarex@arrl.org

A proposal must accompany all completed applications. The SAREX Working Group and NASA want to know:

- (1) How will you:
 - (a) integrate this activity into the school curriculum, and
 - (b) involve as many grade levels as you can, participating through essay contests, poster drawing, letter writing, etc.?
- (2) Do you have an experienced group of hams to assist in setting up all necessary Amateur Radio equipment and antennas?
- (3) How will you get as much media coverage as possible?

Schools that have been selected for SAREX scheduled contacts are called by a SAREX coordinator.

NASA requires selections to be made about six months prior to launch. If a school is not chosen, its application is recycled for future missions. Note: Schools typically wait one year or longer.

**How Can I,
a Teacher,
Get Started
in SAREX?**

**How Do I
Apply for a
Scheduled School
Radio Contact?**

**How Will I Know
If My School Is
Selected For a
Contact?**



Appendix B

Space Amateur
Radio Experiment
(SAREX)
Application Form

This application is for: [] SAREX [] MirEX [] No Preference

School Information

1. School name: _____
2. Coordinating teacher: _____
3. School address: _____

4. School city: _____
5. School state: _____
6. School ZIP: _____
7. School country: _____
8. School phone number: _____
9. School FAX number: _____
10. Has the school previously been selected? (YES or NO): _____
11. If YES, which mission? STS: _____

Radio Contact Coordinator

(To be filled out by an Amateur Radio operator)

12. Name: _____
13. Call sign: _____
14. Address: _____
15. City: _____
16. State: _____
17. ZIP: _____
18. Country: _____
19. Work phone number: _____
20. Home phone number: _____
21. FAX number: _____



22. E-mail address: _____

Data About Site of Radio Contact

23. Site of radio contact: _____

24. Radio coordinator during contact: _____

25. Call sign: _____

26. Site phone number: _____

27. Site FAX number: _____

28. Latitude [Use decimal format] (South is negative): _____

29. Longitude [Use decimal format] (West is negative): _____

30. Elevation [Use meters above mean sea-level]: _____

31. Time zone: _____

32. Does your area go to daylight time? (YES or NO): _____

33. Language to be used during contact: _____

34. Are weekends, holidays or nights a problem for your contact?
(YES/NO) _____

Assisting Local Amateur Radio Club
(To be filled out by the Amateur Radio club)

35. Name of amateur radio club: _____

36. Club contact person: _____

37. Contact person's call sign: _____

38. Is this person experienced with satellite operations? (YES or NO): _____



**Space Amateur
Radio Experiment
(SAREX)
Application Form
(continued)**

Station and Equipment Data
(To be used during SAREX Amateur Radio contact)

39. Transceiver to be used (Make/Model): _____
40. Does it have memories? (YES or NO): _____
41. Output power (Watts): _____
42. Frequency range (MHz): _____
43. Station equipped with an RX preamplifier? (YES or NO): _____
44. If YES, manufacturer and model of preamplifier: _____

45. Station equipped with a TX amplifier? (YES or NO): _____
46. If YES, maximum output power of TX amplifier (Watts): _____
47. Is the radio capable of a non-standard split? (YES or NO): _____
48. Antenna Type (VERTICAL, SATELLITE (AZ/EL?), OTHER) [specify]:

49. Antenna gain (dbd or dbi): _____
50. Number of elements: _____
51. Polarization (HORIZONTAL, CIRCULAR, or VERTICAL) _____
52. Antenna equipped with a rotator?
(NONE, AZIMUTH ONLY, or AZ/EL): _____
53. Satellite tracking program available? (YES or NO): _____
54. If YES, name of tracking program: _____
55. Do you have automatic antenna control? (YES or NO): _____
56. VHF packet capability? (YES or NO): _____
57. VHF SSTV capability? (YES or NO): _____
58. Please note any antenna obscuration data: _____



NASA Resources for Educators

NASA's Central Operation of Resources for Educators (CORE) was established for the national and international distribution of NASA-produced educational materials in audiovisual format. Educators can obtain a catalog and an order form by one of the following methods:

- NASA CORE
Lorain County Joint Vocational School
15181 Route 58 South
Oberlin, OH 44074
- Phone (440) 774-1051, Ext. 249 or 293
- Fax (440) 774-2144
- E-mail nasaco@leeca.esu.k12.oh.us
- Home Page: <http://spacelink.nasa.gov/CORE>

To make additional information available to the education community, the NASA Education Division has created the NASA Educator Resource Center (ERC) network. ERCs contain a wealth of information for educators: publications, reference books, slide sets, audio cassettes, videotapes, telelecture programs, computer programs, lesson plans, and teacher guides with activities. Educators may preview, copy, or receive NASA materials at these sites. Because each NASA Field Center has its own areas of expertise, no two ERCs are exactly alike. Phone calls are welcome if you are unable to visit the ERC that serves your geographic area. A list of the centers and the regions they serve includes:

AK, AZ, CA, HI, ID, MT, NV, OR, UT, WA, WY
NASA Educator Resource Center
Mail Stop 253-2
NASA Ames Research Center
Moffett Field, CA 94035-1000
Phone: (650) 604-3574

CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT
NASA Educator Resource Laboratory
Mail Code 130.3
NASA Goddard Space Flight Center
Greenbelt, MD 20771-0001
Phone: (301) 286-8570

CO, KS, NE, NM, ND, OK, SD, TX
JSC Educator Resource Center
Space Center Houston
NASA Johnson Space Center
1601 NASA Road One
Houston, TX 77058-3696
Phone: (281) 483-8696

FL, GA, PR, VI
NASA Educator Resource Laboratory
Mail Code ERL
NASA Kennedy Space Center
Kennedy Space Center, FL 32899-0001
Phone: (407) 867-4090

KY, NC, SC, VA, WV
Virginia Air and Space Museum
NASA Educator Resource Center for
NASA Langley Research Center
600 Settler's Landing Road
Hampton, VA 23669-4033
Phone: (757) 727-0900 x 757

IL, IN, MI, MN, OH, WI
NASA Educator Resource Center
Mail Stop 8-1
NASA Lewis Research Center
21000 Brookpark Road
Cleveland, OH 44135-3191
Phone: (216) 433-2017

AL, AR, IA, LA, MO, TN
U.S. Space and Rocket Center
NASA Educator Resource Center for
NASA Marshall Space Flight Center
P.O. Box 070015
Huntsville, AL 35807-7015
Phone: (205) 544-5812

MS
NASA Educator Resource Center
Building 1200
NASA John C. Stennis Space Center
Stennis Space Center, MS 39529-6000
Phone: (228) 688-3338

NASA Educator Resource Center
JPL Educational Outreach
Mail Stop CS-530
NASA Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109-8099
Phone: (818) 354-6916

CA cities near the center
NASA Educator Resource Center for
NASA Dryden Flight Research Center
45108 N. 3rd Street East
Lancaster, CA 93535
Phone: (805) 948-7347

VA and MD's Eastern Shores
NASA Educator Resource Lab
Education Complex - Visitor Center
Building J-1
NASA Wallops Flight Facility
Wallops Island, VA 23337-5099
Phone: (757) 824-2297/2298

Central Operation
of Resources
for Educators

Educator
Resource Center
Network



Regional Educator Resource Centers

Regional Educator Resource Centers (RERCs) offer more educators access to NASA educational materials. NASA has formed partnerships with universities, museums, and other educational institutions to serve as RERCs in many states. A complete list of RERCs is available through CORE, or electronically via NASA Spacelink at <http://spacelink.nasa.gov>

NASA On-line Resources for Educators

NASA On-line Resources for Educators provide current educational information and instructional resource materials to teachers, faculty, and students. A wide range of information is available, including science, mathematics, engineering, and technology education lesson plans, historical information related to the aeronautics and space program, current status reports on NASA projects, news releases, information on NASA educational programs, useful software, and graphics files. Educators and students can also use NASA resources as learning tools to explore the Internet, accessing information about educational grants, interacting with other schools which are already online, participating in on-line interactive projects, and communicating with NASA scientists, engineers, and other team members to experience the excitement of real NASA projects.

Access these resources through the NASA Education Home Page:
<http://www.hq.nasa.gov/education>

NASA Television

NASA Television (NTV) is the Agency's distribution system for live and taped programs. It offers the public a front-row seat for launches and missions, as well as informational and educational programming, historical documentaries, and updates on the latest developments in aeronautics and space science. NTV is transmitted on the GE-2 satellite, Transponder 9C at 85 degrees West longitude, vertical polarization, with a frequency of 3880 megahertz, and audio of 6.8 megahertz.

Apart from live mission coverage, regular NASA Television programming includes a Video File from noon to 1:00 pm, a NASA Gallery File from 1:00 to 2:00 pm, and an Education File from 2:00 to 3:00 pm (all times Eastern). This sequence is repeated at 3:00 pm, 6:00 pm, and 9:00 pm, Monday through Friday. The NTV Education File features programming for teachers and students on science, mathematics, and technology. NASA Television programming may be videotaped for later use.

For more information on NASA Television, contact:

NASA Headquarters, Code P-2, NASA TV, Washington, DC 20546-0001
Phone: (202) 358-3572

NTV Home Page: <http://www.hq.nasa.gov/ntv.html>

"How to Access NASA's Education Materials and Services"

EP-1996-11-345-HQ

This brochure serves as a guide to accessing a variety of NASA materials and services for educators. Copies are available through the ERC network, or electronically via NASA Spacelink. NASA Spacelink can be accessed at the following address: <http://spacelink.nasa.gov>



Amateur Radio in Space

A Teacher's Guide with Activities in Science, Mathematics, and Technology

EDUCATOR REPLY CARD

To achieve America's goals in Educational Excellence, it is NASA's mission to develop supplementary instructional materials and curricula in science, mathematics, geography, and technology. NASA seeks to involve the educational community in the development and improvement of these materials. Your evaluation and suggestions are vital to continually improving NASA educational materials.

Please take a moment to respond to the statements and questions below. You can submit your response through the Internet or by mail. Send your reply to the following Internet address:

http://ednet.gsfc.nasa.gov/edcats/teacher_guide

You will then be asked to enter your data at the appropriate prompt.

Otherwise, please return the reply card by mail. Thank you.

1. With what grades did you use the educator guide?

Number of Teachers/Faculty:

_____ K-4 _____ 5-8 _____ 9-12 _____ Community College
College/University - _____ Undergraduate _____ Graduate

Number of Students:

_____ K-4 _____ 5-8 _____ 9-12 _____ Community College
College/University - _____ Undergraduate _____ Graduate

Number of Others:

_____ Administrators/Staff _____ Parents _____ Professional Groups
_____ General Public _____ Civic Groups _____ Other

2. What is your home 5- or 9-digit zip code? _____ — _____

3. This is a valuable educator guide?

Strongly Agree Agree Neutral Disagree Strongly Disagree

4. I expect to apply what I learned in this educator guide.

Strongly Agree Agree Neutral Disagree Strongly Disagree

5. What kind of recommendation would you make to someone who asks about this educator guide?

Excellent Good Average Poor Very Poor

6. How did you use this educator guide?

Background Information Critical Thinking Tasks
 Demonstrate NASA Materials Demonstration
 Group Discussions Hands-On Activities
 Integration Into Existing Curricula Interdisciplinary Activity
 Lecture Science and Mathematics
 Team Activities Standards Integration
 Other: Please specify: _____

7. Where did you learn about this educator guide?

NASA Educator Resource Center
 NASA Central Operation of Resources for Educators (CORE)
 Institution/School System
 Fellow Educator
 Workshop/Conference
 Other: Please specify: _____

8. What features of this educator guide did you find particularly helpful?

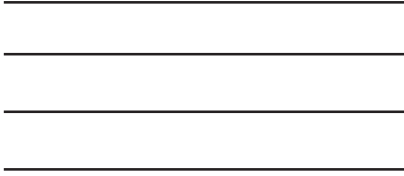
9. How can we make this educator guide more effective for you?

10. Additional comments:

Today's Date: _____

EG-1998-03-114-HQ

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**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
EDUCATION DIVISION
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