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.
### 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): ___
### Station and Equipment Data
(To be used during SAREX Amateur Radio contact)

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>39. Transceiver to be used (Make/Model):</td>
<td></td>
</tr>
<tr>
<td>40. Does it have memories? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>41. Output power (Watts):</td>
<td></td>
</tr>
<tr>
<td>42. Frequency range (MHz):</td>
<td></td>
</tr>
<tr>
<td>43. Station equipped with an RX preamplifier? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>44. If YES, manufacturer and model of preamplifier:</td>
<td></td>
</tr>
<tr>
<td>45. Station equipped with a TX amplifier? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>46. If YES, maximum output power of TX amplifier (Watts):</td>
<td></td>
</tr>
<tr>
<td>47. Is the radio capable of a non-standard split? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>48. Antenna Type (VERTICAL, SATELLITE (AZ/EL?), OTHER) [specify]:</td>
<td></td>
</tr>
<tr>
<td>49. Antenna gain (dbd or dbi):</td>
<td></td>
</tr>
<tr>
<td>50. Number of elements:</td>
<td></td>
</tr>
<tr>
<td>51. Polarization (HORIZONTAL, CIRCULAR, or VERTICAL):</td>
<td></td>
</tr>
<tr>
<td>52. Antenna equipped with a rotator? (NONE, AZIMUTH ONLY, or AZ/EL):</td>
<td></td>
</tr>
<tr>
<td>53. Satellite tracking program available? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>54. If YES, name of tracking program:</td>
<td></td>
</tr>
<tr>
<td>55. Do you have automatic antenna control? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>56. VHF packet capability? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>57. VHF SSTV capability? (YES or NO):</td>
<td></td>
</tr>
<tr>
<td>58. Please note any antenna obscuration data:</td>
<td></td>
</tr>
</tbody>
</table>
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
- NASA Ames Research Center
  Moffett Field, CA 94035-1000
  Phone: (650) 604-3574
- NASA Goddard Space Flight Center
  Greenbelt, MD 20771-0001
  Phone: (301) 286-8570
- NASA Johnson Space Center
  1601 NASA Road One
  Houston, TX 77058-3696
  Phone: (281) 483-8696
- NASA Kennedy Space Center
  Mail Stop 8-1
  Kennedy Space Center, FL 32899-0001
  Phone: (407) 867-4090
- NASA Lewis Research Center
  Mail Stop 21-1
  Cleveland, OH 44135-3191
  Phone: (216) 433-2017

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.

<table>
<thead>
<tr>
<th>Educator Resource Center</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK, AZ, CA, HI, ID, MT, NV, OR, UT, WA, WY</td>
<td>NASA Educator Resource Center Mail Code 130.3 NASA Educator Resource Laboratory 1601 NASA Road One Houston, TX 77058-3696 Phone: (281) 483-8696</td>
</tr>
<tr>
<td>CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT</td>
<td>NASA Goddard Space Flight Center Greenbelt, MD 20771-0001 Phone: (301) 286-8570</td>
</tr>
<tr>
<td>CO, KS, NE, NM, ND, OK, SD, TX</td>
<td>NASA Johnson Space Center 1601 NASA Road One Houston, TX 77058-3696 Phone: (281) 483-8696</td>
</tr>
<tr>
<td>FL, GA, PR, VI</td>
<td>NASA Kennedy Space Center Mail Code ERL 32899-0001 Phone: (407) 877-8907</td>
</tr>
<tr>
<td>KY, NC, SC, VA, WV</td>
<td>NASA Lewis Research Center Mail Stop 21-1 21000 Brookpark Road Cleveland, OH 44135-3191 Phone: (216) 433-2017</td>
</tr>
<tr>
<td>AL, AR, IA, LA, MO, TN</td>
<td>NASA Educator Resource Center Mail Stop 253-2 NASA Ames Research Center Moffett Field, CA 94035-1000 Phone: (650) 604-3574</td>
</tr>
<tr>
<td>MS</td>
<td>NASA Educator Resource Center Building 1200 NASA John C. Stennis Space Center 45108 N. 3rd Street East Lancaster, CA 93535 Phone: (205) 948-7300</td>
</tr>
<tr>
<td>CA cities near the center</td>
<td>NASA Educator Resource Center for NASA Dryden Flight Research Center 4800 Oak Grove Drive Paso Robles, CA 93446-5099 Phone: (805) 948-7400</td>
</tr>
<tr>
<td>VA and MD's Eastern Shores</td>
<td>NASA Educator Resource Center for NASA Wallops Flight Facility Wallops Island, VA 23337-3099 Phone: (757) 824-2297/2298</td>
</tr>
</tbody>
</table>
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 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 (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

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

“How to Access NASA’s Education Materials and Services”
EP-1996-11-345-HQ
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.

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

Please take a moment to respond to the statements and questions below. You will then be asked to enter your data at the appropriate prompt.

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

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

3. How valuable do you consider this 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
   - Hands-On Activities
   - Integration into Existing Curricula
   - Interdisciplinary Activity
   - Other: Please specify: ____________________________________________

7. How can we make this educator guide more effective for you?
   - Please specify: ____________________________________________
   - ____________________________________________

8. What features of this educator guide did you find particularly helpful?
   - Please specify: ____________________________________________
   - ____________________________________________

9. How can we make this educator guide more effective for you?
   - Please specify: ____________________________________________
   - ____________________________________________

10. 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
    - Team Activities
    - Lecture
    - Other: Please specify:__________________________________________

11. Additional comments:
    - ____________________________________________
    - ____________________________________________

To today's date: ____________________________________________