Shuttle Amateur Radio EXperiment (SAREX)

Astronaut Nancy Jane Currie (bottom left photo) proudly displays the call sign of her Amateur Radio license, KC5OZX. She spoke with students around the globe using an Amateur Radio station aboard the Space Shuttle Discovery in July 1995. The project is called the Shuttle Amateur Radio EXperiment, or SAREX. (Top left photo) Astronauts Jay Apt, N5QWL (left), and Linda Godwin, N5RAW (right), show off the SAREX radio and headset used to make ham radio contacts with schools during their 11-day shuttle flight in April 1994.

SAREX provides students with the unique opportunity to talk by radio with astronauts in the shuttle while they orbit the Earth traveling 17,000 miles per hour. With the help of Amateur Radio operators on the ground, students can attempt to contact the astronauts by voice, packet (computer) radio, or television, depending on the equipment the shuttle takes into space. Astronauts who are licensed ham radio operators participate in SAREX during their free time on missions. They make ham radio contacts with students around the world, exciting them about space, science, and technology. The astronauts also contact their family and friends, and individual ham radio operators. When students make radio contact with the astronauts, they may ask questions about the experiments being conducted on the mission and what it is like living in space. Classes track the shuttle's orbit using computer software, and "eavesdrop" on shuttle communications. When astronauts are asleep, a robot computer Amateur Radio station aboard the shuttle is programmed to makes contact with hams around the world, automatically.

The center picture shows a launch of Space Shuttle Columbia. Amateur Radio has been a regular payload on the shuttles since mission STS-9 in November 1983, when Owen Garriot, call sign W5LFL, carried a hand-held ham radio aboard Columbia.

The bottom right photo shows SAREX participants from the Clear Creek Independent School District of Houston, TX. Challenger Middle School students in Huntsville, AL are shown in the top right photo. The schools made successful radio contacts with astronauts during missions STS-37 and STS-47.

Interested schools and teachers can easily introduce SAREX into their schools by contacting the American Radio Relay League (ARRL) for a list of local ham radio clubs willing to help. These clubs may also assist schools to submit applications to ARRL for scheduled radio contacts with astronauts on future shuttle flights.

In the future, Amateur Radio may be used on the International Space Station for education and recreation.

For the Classroom

1. Amateur Radio operators provide public service, and advance the art of radio communications. Research the Amateur Radio Service. Describe some of the activities that ham operators can do on-the-air once they earn a license.
2. Draw a chart of the electromagnetic spectrum covering 100 KHz (kilohertz) to 1000 MHz (megahertz). Label the MF, HF, VHF, and UHF portions of the spectrum on your diagram. Locate on your chart at least eight radio services such as your favorite AM and FM commercial broadcast stations, CB, television, Amateur Radio, and police.
3. Use a short-wave radio to listen to the astronauts. Members of the Goddard Amateur Radio Club (Greenbelt, MD) re-transmit live, shuttle air-to-ground audio over ham radio frequencies from their club station, WA3NAN. To listen-in during a shuttle mission, tune to Amateur Radio high frequency (HF) bands at 3.86, 7.185, 14.295, 21.395, and 28.65 megahertz (MHz).
4. Submit an application to ARRL for your school to be selected to make a radio contact with the astronauts on a future Shuttle mission.
5. Explore the SAREX World Wide Web page:

   http://www.arrl.org/sarex/

Get Your Own Ham Radio License

Anyone can be a ham—no matter what age, sex, or physical ability. Contact ARRL to find a local Amateur Radio club. Have a volunteer visit your classroom to setup and demonstrate an Amateur Radio station. For free information on getting started in Amateur Radio write ARRL at:

American Radio Relay League (ARRL)
Educational Activities Department (EAD)
225 Main Street
Newington, CT 06111-1494
Phone (860) 594-0301 • FAX (860) 594-0259
Internet: sarex@arrl.org

SAREX Insignia

On the upper portion of the insignia are three SAREX payload sponsors: the American Radio Relay League (ARRL), the Radio Amateur Satellite Corporation (AMSAT), and NASA. On the lower half of the patch is the Space Shuttle orbiting Earth with the SAREX payload.

National Aeronautics and
Space Administration

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