Paper Session III-C - A SAREX Case Study- Getting Teachers Interested in Amateur Radio and Space Education

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A SAREX Case Study
- getting teachers interested in amateur radio and space education

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SAREX, the Shuttle Amateur Radio Experiment, is flown primarily as part of NASA’s education program. Any school or educational group can submit a proposal for a prescheduled SAREX contact. It’s hoped that schools will get interested in the space program and amateur radio, and make these activities part of the normal curriculum. Sometimes a SAREX contact is incredibly exciting, but forgotten soon after the shuttle mission is over. But in many cases SAREX does leave a lasting impression on the students and teachers. Co-author Joan Freeman is a teacher at South Seminole Middle School in Casselberry Florida. Three years ago she watched television and read the newspaper to find out about the space program. Now she uses amateur radio every day in her class and completed a SAREX educational contact with the shuttle during the STS-65 mission. This paper will show what has been done, and suggestions for how to increase awareness about ham radio, SAREX, and the shuttle program in schools.

SAREX, the Shuttle Amateur Radio EXperiment, is one of the most enjoyable ways of getting students involved in ham radio and the space program. It has flown on the shuttle over a dozen times and has become one of the most popular shuttle experiments.

Three years ago co-author Joan Freeman was a typical middle school teacher, with little special interest in amateur radio or the space program. Another local teacher, Joe Laughlin KC4VBY, got her interested in SAREX and an upcoming
school contact. During the STS-45 shuttle mission in March 1992 a handful of central Florida schools were linked together via an amateur radio repeater which retransmitted the shuttle’s SAREX audio to all of the participating schools. Lyman High School was the primary contact point. A student at Lyman got to ask a question to shuttle astronaut Brian Duffy N5WQW. The next student from Ventura Elementary got to ask a question, followed by students from Galaxy Middle, Trinity Prep, and Rock Lake Middle Schools. Unfortunately time ran out before South Seminole Middle School, Joan’s school, got to ask their question.

Linking several schools together on a net had many advantages - most significantly getting many more schools involved than with a typical contact, but was much more difficult logistically - in addition to being frustrating for schools which didn’t get the opportunity to talk to the astronaut in space.

Still, preparing for the contact got Joan excited. Of all of the teachers involved in the STS-45 SAREX contact, Joan decided to get her amateur radio license and uses amateur radio in regular day-to-day classes. Her classroom includes many radios, donated by local hams, and a computer donated by a local business. In addition Joan runs an education net on the local repeater. Eleven schools in three counties, ranging from elementary through high school level participate in classes during the net. But the most frustrating part for Joan was not getting to talk to an astronaut in space. So Joan decided to put in her own application. It took two years before an appropriate opportunity came up. South Seminole Middle School got selected for the STS-65 mission as one of commander Bob Cabana KC5VBH’s many school contacts.

The contact was scheduled for July 13th at 10:09 am EDT at a mission elapsed time of 4 days 21 hours and 15 minutes. Most of the hams involved with the Lyman contact a couple of years earlier donated their time and expertise to making Joan’s contact a success, including Joe Singer N4IPV, Ed Cox W0RAO, and John Rothert KC4IYO.

Everything went smoothly, with Joan acting as the control operator for the contact. Appropriately the first student to get to ask a question was one who had earned his ham license in Joan’s class. Eight students got to ask questions to Bob Cabana. There was additional time available and three of the adults also asked questions. As a bonus benefit Joan got special permission to visit the Kennedy Space Center and got to see Bob Cabana up close.

All together the contact lasted just six minutes, but the experience will last a lifetime. “Something to tell my grandkids about” as one student told a local reporter.

There is no fee for an educational group to participate in a SAREX contact, but it does require a lot of effort by a couple of dedicated people. Most importantly
there is no requirement for the school to actually have anybody with amateur radio experience. The SAREX team will gladly put you in contact with an amateur radio operator in your area with the proper experience and hardware to help you out. Contact the ARRL's educational department and ask for a SAREX application. This is a simple two-page form with basic information on the school, its location, and the available amateur radio equipment. Fill out the form with the school and send it in. The backlog of schools is slowly disappearing and hopefully you won't have as much of a wait as South Seminole Middle School did before its contact.

It's important to include all of the information specified - especially your school's location. The easiest way to get an accurate latitude / longitude for your location is to use a surveyor's map, or find a boater with a Global Positioning Receiver.

While amateur radio classes at the school are not a prerequisite for getting selected for a SAREX contact it is highly desirable to have some kind of an active amateur radio and space education program. SAREX is not designed as a stunt to generate a bunch of publicity for the contacts without any actual learning.

NASA's education department will be glad to provide generic materials on the shuttle and its activities. Unfortunately the SAREX information sheet is badly out of date, but it still has some good information.

The most important thing to remember is SAREX, like the shuttle program, is much more than just astronauts - it's people. The astronauts certainly have the most visibility and most envious jobs within NASA, but SAREX exists because of many different people performing different roles, including the JSC amateur radio club volunteers who prepare the hardware and train the astronauts, the ARRL and AMSAT folks who handle the paperwork and information distribution, and most importantly the hams and teachers at the schools who interact directly with the students.

For teachers SAREX is an amazing activity. Milken Foundation National Educator Award winner Philip Downes completed a SAREX contact on the STS-60 mission in February 1994. He's a fifth grade teacher at the James H. Bean School in Augusta Maine and called his contact "The highlight of my professional career."

Many months after you put in your application you will get a tentative flight assignment. This can easily change depending on the mission's requirements, changes to the crew's flight plan, and other factors. But it gives you a date to plan towards, and tells you that you've made it to the top of the pile.

Contact your local NASA education office. If you don't know which NASA center serves your region then ask the ARRL educational representative. The
Johnson Space center’s public affairs and education office is also an excellent source for information. Another excellent source, if you have a computer with a modem is to call NASA Marshall’s Spacelink BBS at 205-895-0028. Spacelink will include press kits, astronaut biographies, and even scanned versions of the crew logo for the mission.

If you don’t ask - you don’t get. There is plenty of public information available for each mission, including press kits, crew biographies, descriptions of the mission’s primary payloads, etc. etc. The NASA education office should be able to provide lithos of the ham astronauts, and the official crew photo. There are also commercial firms where you can purchase patches and pins with the crew logo. In addition the JSC Amateur Radio Club, WSRRR, has SAREX patches available for sale for $5. The proceeds go towards the SAREX operating fund.

Lessons learned:

Based on several SAREX contacts here’s some recommendations we’d like to pass on to everybody planning a contact:

Keep asking NASA education for materials - if you don’t ask - you don’t get. If you just send in a letter to NASA asking for materials it usually goes to a special ‘fan mail’ area where it’s processed, and occasionally you’ll get a reply. But if you call the education office and speak to a specialist and explain that you’re involved with a SAREX contact there will be much more information available to you.

When you get your flight assignment get all of the information you can on that flight, its objectives, and other information. The Goddard Spaceflight Center’s ham club WA3NAN coordinates the school contacts and they will be glad to get you the specifics on your particular mission.

If you don’t get NASA Select in your school make arrangements to get it temporarily at least for your mission. NASA Select is a publicly available satellite transponder (Spacenet 2 69 degrees West channel 9) which provides full-time coverage of shuttle missions. In between missions important press conferences and other events are broadcast. Around two weeks before each mission there are a series of press conferences where the mission’s details are explained. If you can get copies of these press conferences they are excellent teaching materials.

One of the best ways to get NASA Select is to contact a local dealer which sells satellite dishes. Convince the dealer it would be excellent publicity for the dealer to loan the school a dish for the duration of the mission, and promise that advertising literature will be made available to anybody interested. Alternately
you may be able to convince a local cable company to provide the NASA Select signal.

If you can’t get live NASA Select at the school arrange for it to be taped. Hopefully you can find somebody in your area who has access to NASA Select, possibly somebody who has a home satellite dish. If a satellite dish dealer isn’t willing to loan the school a dish, perhaps it might be possible to make arrangements to videotape important activities at the dealership showroom? The best system is to videotape all of the press conferences and each day’s mission highlights. If you can’t get the schedule for the press conferences when they first air, the preflight press conferences are replayed on the day before the planned launch.

Contact all of the local press in your area ahead of time, about a week or so before the mission. Include newspapers, television stations, radio, etc. Tell them about your contact and when it’s scheduled. Don’t be shy to ask for the news director, or somebody you’ve seen on the air who does stories in your local area. It doesn’t hurt to have a prewritten press release which you can fax or mail to each of the media. After launch call back with the planned time and date for the contact based on the actual mission elapsed time. While you’re going to be extremely busy the day before the contact getting everything together it wouldn’t hurt to call again with a reminder. Other good people to invite include local VIPs, like the school’s principal, school board members, and even local politicians - anybody who would like to see how hams and teachers are working together to help educate students.

The day before the contact make arrangements for several different people to record each of the day’s newscasts. Have at least two people record each of the local television stations to make sure you don’t accidentally miss getting copies of yourself on the air. It wouldn’t hurt to monitor CNN either. We’ve heard a rumor that our contact during the STS-65 mission was covered on CNN, but still haven’t been able to get a copy of it on tape.

Set up a computer running a satellite tracking program with accurate kep’s ahead of time. A large television set with NASA Select certainly helps. There’s no guarantee, but if the shuttle’s facing the right direction and the video channels are not in use for other purposes you may actually see video from the flight deck of the shuttle of the astronaut using the ham transceiver talking to you!

Make a list of the students names, in the order they will ask questions ahead of time. Also include the names of the hams and teachers involved and the astronaut’s name and call sign. Give this to the press immediately after the contact. This will make it easier for the press to spell everybody’s name correctly.
Make audio and high-quality video recordings of the contact. Start your recorders by the time the shuttle goes above the horizon. If possible hook up a tape recorder directly to your rig for the best quality audio. Alternately have the tape recorder on the same table as the radio, but not where its mike will pick up noise from fans or other interference.

Assign specific people, not directly involved with the contact, the responsibility of videotaping the event and taking photographs. Good choices would be other hams or teachers.

Make sure that your radio’s controls are well protected to prevent somebody from accidentally shutting it off or turning it off frequency.

Do *NOT* let the press take over the contact. I remember one case where a local radio reporter wanted to be the one to ask the astronaut a question!

Most importantly - do NOT let the press bug the students until AFTER the contact is completed. The students will be extremely nervous, it’s a high stress situation and you don’t want the extra distractions. Afterwards make the students, teachers, and key hams available for interviews. Explain everything in simple terms - not ham jargon. A good rule of being interviewed on TV is to talk directly to the reporter as if he/she was an intelligent 12-year-old. Do not talk down to the audience, but explain everything in simple terms. For the Lyman contact one of the TV reports claimed that our computer with the satellite tracking program was connected directly to the Goddard Spaceflight Center!

Make sure you pick up copies of the next day’s newspapers with your story. For our contact we were told that the “Orlando Sentinel” was going to put the story on the front page of the Local/State section, but it turned out that we appeared on the front page of the main section instead!

The SAREX team, especially the JSC and Goddard amateur radio clubs, and ARRL love to get feedback on how everything worked out, and what kind of coverage you received. Videotapes, audio tapes and newspaper clippings are always appreciated. But when you send copies of the audio tapes - please cue them to the right point just before the contact starts. The JSC club listened to our tape during their meeting, but only heard the preparations ahead of time because the tape was rewound!

One thing every school group would like to do is get the astronaut to visit the school after the mission has been completed. After each mission the astronauts perform many public relations functions, visiting the NASA benefits the local community by get students interested in science and education - there really is a purpose for all of those classes which students have been sleeping through. For the amateur radio community there are many tangible benefits. A SAREX
contact is a high visibility project which shows how amateur radio benefits the public at large. On a more personal level participating in a SAREX contact is an excellent way to help out in your local community. If you've helped at least one student choose to stay in school instead of dropping out, or gave a nudge to a student interested in a technical career then it's worth the effort.
For more information on SAREX school contacts:

Amateur Radio Relay League
attn.: Education Activities Department
225 Main St.
Newington, CT 06111
(203)-666-1541

For satellite tracking programs for a variety of microcomputers:

AMSAT
850 Sligo Ave.
Silver Spring, MD 20910-4703
301-589-6062

For information on the schedule of upcoming SAREX missions and astronaut activities:

NASA Headquarters
attn: Educational Activities
mail stop: FE
Washington, DC 20546
(202)-358-1977