



RICHMOND AMATEUR RADIO CLUB

3531 Richmond Street, Richmond, BC, V7E 2W2

NEWS RELEASE

FOR IMMEDIATE RELEASE

Talking to International Space Station Involves Seven Months of Preparation for Today's Seven-Minute Contact.

Richmond, B.C. (March 13, 2014 – 0800h) – In about two hours from now, the Richmond Amateur Radio Club (RARC) will enable students at H.J. Cambie Secondary School to start making radio contact with Commander Koichi Wakata as the International Space Station appears over the West-northwest horizon at approximately 10:08 am. The up to seven minutes of contact when the ISS orbits over Richmond, BC is a culmination of more than half a year of planning after RARC was approached by Cambie Secondary science teacher, Karen Ibbott, to partner in an application to the Amateur Radio on the International Space Station (ARISS) program that organizes radio contact between astronauts on the ISS and educational institutions.

After receiving a “confirmed tentative” date for early 2014, RARC members spent the latter part of 2013 making preparations for the day of contact. The tedious planning process involved working with Brian Jackson, ARISS Mentor for Canada, in putting together the necessary equipment to enable students to chat with astronauts on the ISS. “Our experienced club members are used to DXing (making long distance radio contacts) with radio Amateurs as far away as Europe and Japan, but going after moving targets like the ISS in outer space require different skill sets and equipment,” says Kishore Nair, leader of the club’s ARISS Ground Support Team and long time member. Another club technical expert and also a long time member, Charles Cohen, comments that, “The project is the largest undertaking in scope for the club and the most technically challenging ever.”

The key challenge is tracking the ISS as it orbits overhead and keeping the directional antenna locked on the moving satellite in order to establish radio contact. The tracking system comprises of ISS orbit information that is downloaded into a computer and then processed through an interface to drive a mechanical rotator that guides the antenna to follow the “bird” across the sky. Once line of sight is established between the ISS and the antenna, radio contact can take place at a determined VHF frequency. Another technical challenge in the process is applying the orbit data to adjust the Doppler shift of the transmitted signals so that the change in radio frequency does not distort the sound of the audio.

The radio system is designed according to requirements by the ARISS program and comprises of two radio stations, one primary and the other as back up, each with an independent radio, antenna, computer and tracking software. Each radio station is also backed up by another computer, in case the main one crashes. The antenna for the primary station is a directional Yagi design to focus the transmission of radio waves while the ISS is being tracked. The antenna for the backup station is an omni-directional design, called an eggbeater because it looks like one, which is less efficient but a lot simpler to operate because no tracking system is involved. A power generator is also available on standby.

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Acquisition of the technical equipment for the ARISS project, primarily the antennas and the ISS tracking components, involved pooling the resources of many club members. The 8-foot Yagi directional antenna was assembled from a mail-order kit. The backup eggbeater antenna was a member's homemade project built with materials from a hardware store. Members with extraordinary technical background and experience created other necessary parts from circuit board components to antenna guidance assemblies. The antenna rotator was on loan for the duration of the project from a member while companies in the community provided useful goods in-kind such as Icom Canada lending the primary radio for the event.

The ability to contact the ISS with equipment put together by a group of like-minded space enthusiasts and radio hobbyists demonstrates what is so compelling about such a project. Not only can Amateur radio provide the ability for students to chat with astronauts on a space station, but the hobby is the only one that permits a non-government organization (an Amateur radio club) to contact personnel on a spacecraft.

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About RARC - The Richmond Amateur Radio Club is a registered BC Society to promote the interests of Amateur Radio, assist in the provision of communication services in the event of an emergency, and provide radio communications for public service events as requested. RARC is a member of Emergency Management BC and supporter of Emergency Social Services with the City of Richmond. Club programs are partially funded by grants from the City of Richmond and the Province of British Columbia.

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Additional information about RARC can be found
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