

# Houston, We Have Amateur Radio!



Mission Control Room for the International Space Station. ARISS contacts are officially placed in the ISS schedule by the OPSPLAN Mission Controllers. Graphics showing the ISS orbital position and attitude, critical command and telemetry data, as well as countdown clocks to upcoming critical events can be seen on the screens in the front of the control room. During high activity periods there is normally one controller at each of the 15 console positions, each supporting a specific technical discipline of ISS operations.



Kenneth Ransom, N5VHO, ISS Ham Radio Project Coordinator, demonstrates the Kenwood dual-band TM-D700 144/440 MHz Amateur Radio transceiver mounted against the wall in the Russian Service Module mockup, the same area that it is located in the ISS. NASA engineers will also be installing an Ericsson Radio system in the Columbus Module (ESA) training mockups at JSC similar to the actual ISS installation. There is no chair for the operator. In micro gravity, the astronaut/radio operator floats next to the radio.

In March, I visited the Johnson Space Center in Houston, Texas, I was there to discuss the ARISS (Amateur Radio on the International Space Station) program with some of the folks from NASA. The ARISS program is a joint venture between the ARRL, NASA, AMSAT (The Radio Amateur Satellite Corporation) and other international space agencies. The ARISS program schedules Amateur Radio contacts between ISS astronauts and cosmonauts and schools. More than 600 ARISS QSOs have been conducted to date.

*Johnson Space Center is comm central for ARISS and the shuttle missions that first brought hams into space.*

**Harold Kramer, WJ1B**



Another shot of the dual-band radio mounted on the wall of the ISS. This is the transceiver head; the rest of the transceiver is to the right out of view. The blue cards on the wall are fuse locations marked in both Russian and English. The manual is attached to the wall to the right of the radio. The Russian segment of the ISS runs on 28 V dc and the US segment runs on 120 V dc. The Kenwood

radio in orbit uses a Russian power supply to step the voltage down from 28 V to 13.6 V. The station in the mockup is functional. For test purposes, NASA hams often make contacts with local schools from inside the mockup. NASA hams have also used IRLP from this location to contact schools in other parts of the US, Canada and Europe.



The mockup of the Russian Zarya (Sunrise) Module, also known by the technical term Functional Cargo Block or the Russian acronym FGB, as seen from the forward vestibule looking aft. When walking between modules, you have to duck your head a lot and be careful where you place your feet. It's tight quarters!

If you look closely, you can see the dual band 144/440 antenna mounted on the ISS mockup. (Antenna attached to the Service Module; the bracket is located on the top rear of this module.) The bracket is specially fabricated for this application. The coax is mounted along the outside of the ISS. Special cable is used with a covering that protects it from damage due to exposure to the harshness of space. The service module has dedicated RF feeds through specific feed points. The cable is attached there, fastened with real wire ties and then is tied to various handles and protruding structures along the outside of the ISS where the antenna is mounted.



Incoming Club President John J. Maca, AB5SS, Information Technology Team Lead & ISS Chief Information Officer with WJ1B at W5RRR, the Johnson Space Center Amateur Radio Club. The station is located at the Gilruth complex at the JSC. The old club building was demolished about 4 years ago and there is a brand new facility in the same location. There are about 30 members in the club ([www.w5rrr.org/](http://www.w5rrr.org/)).



From the left standing next to an ISS module are Astronaut Don Pettit, KD5MDT; Kenneth Ransom, N5VHO, and Mark Severance, N5XWF, ISS National Laboratory Education Projects Manager. Kenneth and Mark manage the ARISS program for NASA. Don made 12 school contacts and some general QSOs during his time on orbit as part of the Expedition 6 crew from November 2002-April 2003. He will be returning to the ISS as part of the Expedition 30 crew in November 2011.



A communications panel in the Columbus module of the ISS. These are used for both internal communications within the spacecraft and for radio communications with the ground controllers. These are familiar looking controls to radio operators: XMIT Mode, VOX, VOL and PTT. A ham would feel right at home.



The satellite antenna tower at the Johnson Space Center Amateur Radio Club, W5RRR. It is equipped with M<sup>2</sup> circular polarized satellite antennas.

*Thanks to Kenneth Ransom, N5VHO, for his assistance with this article.*  
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