Draft Comments to Delegates
Amateur Radio on the International Space Station
Meeting December 4-7, 2003
Chip Margelli, Vertex Standard

Good Morning.

I speak to you today on behalf of, and bring best regards from, the CEO of Vertex Standard, Mr. Jun Hasegawa, who regrets not being able to attend this momentous meeting himself. He sends greeting to all ARISS Delegates from the entire staff and management of Vertex Standard, the manufacturer of the Yaesu products so many of you undoubtedly use at home.

It is my distinct honor and privilege to attend this meeting for the purpose of announcing a commitment from Vertex Standard for design and provision of the HF/VHF and UHF multi-mode equipment to be flown to the International Space Station.

The Yaesu Model FT-100D has been specified by the Hardware Selection group as the platform to be used by the ISS Astronaut-Operators. This model, as you may know, includes frequency coverage of the HF, 50 MHz, 144 MHz, and 430 MHz Amateur bands, with operational capability on SSB, CW, AM, FM, Packet, and SSB-based Digital modes like SSTV, Pactor, and PSK31. Besides the wide array of frequency and mode selections, the fundamental performance of the FT-100D's RF design, especially in the receiver area, is truly outstanding. When one considers the signal levels that will impinge upon the Phase 2 station, it is clear that the industry-leading dynamic range of the FT-100D will serve the interest, necessity, and convenience of the orbiting operators well.

As you can well imagine, the flight FT-100D will not be an "off the shelf" version. Many hours of engineering time are being donated by our company to configure the FT-100D for the special requirements of space flight. The flight version will be restricted to Amateur Satellite Service frequencies, of course, in firmware. We also are performing special modifications in the area of heat transfer so as not to depend on non-existent convection cooling in the zero-G environment. The power output will be restricted in hardware, to minimize current drain and further ensure minimal heat build-up. And, with the help of Sergej Samburov and the rest of the hardware integration team, special cabling will be prepared so as to ensure plug-and-play compatibility with all station on-board systems.

Completing the integration of the FT-100D into the Service Module's Amateur Station will be a special version of our FC-20 Automatic Antenna Tuner. Because the HF antenna system presents a widely varying impedance, depending on the operating frequency, the flight version of the FC-20 Auto-Tuner will have been re-designed to accommodate this wide impedance range, with a significant margin of safety both in terms of impedance range and RF voltage specification.

Yaesu's interest in assisting the Space Program dates back to the early 1980s, when the initial equipment specifications for Owen Garriott's flight were being drawn up. Our engineers spent countless hours poring over out-gassing and other materials specifications, re-configuring our FT-209RH model for on-orbit use in the U.S. Space Shuttle, and while our equipment ultimately was not selected, we have maintained a high level of interest in this initiative. Over the years, we have provided ground equipment for use at W5RRR and at other locations, many of which have been utilized for contacts between Shuttle and ISS crews and schools around the world. And, of course, we are particularly proud to have been the manufacturer of the FT-290R, belonging to my "radio brother" Valery Agabekov, UA6HZ, that was used for many years on board MIR. . .even if that particular model did not exactly follow a "traditional" path of product flight qualification!

I would like to take this opportunity to salute the delegates to this meeting, as well as all the members of the ARISS Team worldwide, on behalf of Vertex Standard. The provision of Amateur Radio equipment to the International Space Station is so much more than a simple exercise in equipment configuration. Rather, it is a demonstration to the world of the way in which leading-edge technology, furnished through supporting industry members like Kantronics, Kenwood, and our company, is blended with the dedication of volunteers—which we know as "The Ham Spirit"—through a vehicle called Amateur Radio, and our Company feels that this exposure of Amateur Radio to the population at large will be essential in ensuring the long-term viability of the Amateur Service.

Pursuant to the requirements stipulated by the Hardware Selection group, our company will be donating, at this initial stage of our commitment to the International Space Station program, a total of fifteen sets of equipment. These include the actual flight version, flight backup, the ground-based "mirror" versions, plus the crew training and familiarization equipment to be distributed between the working groups in Russia and the United States. And, at such time as the Japanese and European ISS modules are placed into orbit, and more equipment is needed, our Company stands ready to expand our commitment of engineering time and equipment, to ensure many years of reliable and exciting QSOs from the International Space Station.

These meetings have proven valuable in identifying other possible areas of industry support. For example, it was mentioned that there is an ongoing problem providing real-time problem-solving assistance to the crew regarding the Amateur Radio equipment. As it turns out, Yaesu has just introduced a system of Internet linking called WIRES, which would allow creation of a closed-loop network of command and control stations around the world, all linked via the Internet. if a question arises on orbit, a crew member could set their radio to the appropriate frequency, press a single DTMF digit on their Touch Tone pad, and that would page the entire network simultaneously; therefore anyone who wasn't sleeping or at work could respond and, at the very least, take down the information relating to the technical difficulty. This technology also stands to provide a way of telebridging on the fly, in case the crew is late to a schedule for a school contact, so as to extend the contact beyond the visual LOS time.

And Tsuji-san has mentioned the need for a traveling kit for school contacts in Japan, and I will make contact with our people in Japan this next week to see what kind of support might be arranged.

Our objective in offering this support is to facilitate the operations on board the International Space Station, in the hope that the exposure of Amateur Radio to the general public, and especially youths around the world, will contribute significantly to the long-term growth and vitality of the Amateur Service. And it is my personal hope to be able to contribute to the Technical, Hardware Selection, and PR groups on an ongoing basis, in the interest of reducing the workload on all of you.

Thank you for the honor of speaking to you today, and best regards from Mr. Hasegawa and the entire Yaesu Team at Vertex Standard.