March 2004 ARISS Meetings
Attendee List---March 25-27

Frank Bauer, KA3HDO	ARISS Chairman, AMSAT-NA, US ARISS delegate
Gaston Bertels, ON4WF	ARISS Vice Chairman, UBA, Europe ARISS delegate
Rosalie White, K1STO	ARISS Secretary-Treasurer, ARRL, US ARISS delegate
Masanobu Tsuji, JH2PRZ	JAMSAT, Japan ARISS delegate
Robin Haighton, VE3FRH	AMSAT-NA, Canada ARISS delegate
Ken Pulfer, VE3PU RAC	RAC, Canada ARISS delegate
Keigo Komuro, JA1KAB	JARL, Japan ARISS delegate
Sergej Samburov, RV3DR	Russia ARISS delegate
Miles Mann, WF1F	MAREX Team
Mike Miller, KA5SMA	Chairman & US mbr, Project Use and Selection Committee
Lou McFadin, W5DID	Chairman & US mbr, Hardware Committee
Carlos Eavis, G0AKI	RSGB, Europe ARISS team
Jim Heck, G3WGM	AMSAT-UK
Graham Shirville, G3VZV	AMSAT-UK
Jorge Matias CT1GQU	Europe ARISS team
Wayne Nakata, N1WPN	MAREX team
Kenneth Ransom, N5VHO	US ARISS team, liaison to Johnson Space Center
Mark Steiner, K3MS	US ARISS team, deputy to Frank Bauer
Olga Frumkin	Interpreter
Karen Tadevosyan, RA3APW	Russia-AMSAT
Manfred Lugert, DL5FAB	Europe ARISS team
Joerg Hahn, DL3LUM	DARC, Europe ARISS delegate
Christophe Mercier	Europe ARISS team
Scott Stevens, N3ASA	US ARISS team, PR Committee
Peter Kofler, IN3GHZ	Europe ARISS team, ARISS mentor
Andras Gschwindt, HA5WH	Europe ARISS team
Csaba Szombathy, HA5MRC	Europe ARISS team
Danny Orban, ON4AOD	Europe ARISS team

ARISS Technical Meeting - March 25, 2004

A quick welcome was given by Frank Bauer and all participants introduced themselves.

Thanks goes to Joerg, Manfred and Gaston for all of the work they performed in setting up this event, and being our hosts for our multiple-day meetings.

<u>Technical Discussion</u>

Phase I:
Packet is not hooked up to the computer, so it gets filled up quickly, and shuts off. The two-person crew continues to be too busy handling Station functions to support ARISS maintenance and repair. And we are a secondary payload, not a primary one, so many items that need to be modified or optimized via parameter changes are not being

accomplished. The use of a computer is still unclear. We believe we have a computer available to us, but we need a power supply for it. There was considerable discussion on whether we need two computers (one in the FGB, and one in the Service Module). No consensus was arrived at on this topic.

Headsets – only 1 is up there. The second one got brought down in error. One headset extension cable was working intermittently – it could be the push-to-talk – so we asked for it to be brought down. By accident, the US crew support group got the headset down instead of the extension cable. This issue is being worked. Crew support wants the headset and cable by March 31 for launching on 14-P -- we may not be able to meet that deadline, but will send it as soon as possible so it can go up as soon as possible, probably on 15P. The extra extension cable is occasionally used in series with the other extension so the FGB ham station can be operated from the Service Module near a window. The ISS Program Office does not want cables through hatches on a permanent basis (safety issue in case of emergency), but crew members can temporarily move between one module (FGB) and another (Service Module) with the headset on.

SSTV – with just two crew members, and because every ounce of mass on *Progress* rockets is critical, NASA suggested we wait for a *Progress* that's near the time when shuttles fly again (when there will be 3 crew members). There won't be time for the crew to install and test SSTV before then. They've been too busy keeping all "ISS systems running and still have not even completed validation testing of the on-orbit Phase II hardware.

We don't have out-gassing tests done on the SSTV items. Funding is now in hand for three tests (SSTV, Yaesu tuner and a third test). The US Team has been told the SSTV off-gassing test is getting put on the schedule. As was stated above, we don't have a power supply for the computer that may be used for the SSTV system. Just before the shuttles return to flight (March '05) we hope to ship the SSTV system – including the hardware and the software. This will probably be on flight 16P. Bill McArthur and/or Sergej Krikalev would be good to have do the SSTV installation and check-out. Bill's medical issues are resolved.

Miles will work further on the SSTV software – first there needs to be a software review by the US Team in April to validate what pieces need changes. The changes are mostly for making it easier for the crew to use, and for some of Sergej's requirements and concerns. For instance, when the photo folder is opened, nothing shows while the photos are being processed, and the operator thinks nothing is happening or that the wrong folder was opened. A face-to-face meeting should be held to ensure that all the requirements for flight and flight operations have been met. During this ESTEC trip, a final list of requirements will be written down. We need to have software ready three months before launch. We need to prepare installation procedures, too.

Phase II:
The D-700 and cables have been launched. Lou displayed the antenna switch assembly that was launched and the RF cables that have not been launched. The antenna switch

enables the Glisser system to be easily switched on for EVAs. The ISS Ham radio system shuts down during EVAs. All items are required to be labeled for specific uses.

Speakers –Sergej says the crew wants a portable speaker so we need a 2.5-m length cable. Or they can use headsets, but would need a splitter. We could purchase splitters rather than custom-build them.

Yaesu FT-100 Modifications – Karen will make the FT-100 modifications to get the hardware ready for flight; he works with Yaesu. Some of the modifications include replacing the Yaesu-provided tuner cable with a new cable with molded mini-DIN connectors and Teflon wire. The team will determine who does what jobs for the connectors and cables. The US will pursue with the safety team, Lou's method of using a special covering for the Yaesu-provided tuner cable, and the Russians will pursue flight approval of the molded connectors and Teflon wire.

Protocols for delivering the Russian connectors need to be in place before we build the power switching assemblies. Kenneth will work this action.

Columbus module—Gaston said work is done with ESA engineers. The patch antennas will be affixed to panels on the nadir of the module. Because of dimensions, VHF wouldn't be okay, but UHF and L and S band would be okay. Patches would be fiberglass, affixed to an aluminum frame, with coax for the feedline – installed before launch. Feedthroughs are being installed, for coax runs. ARISS would deliver short coax cables, RF connectors, and patches (two for each feedthrough in case something would impact and ruin one), and they would be for UHF, L and S band. Funding is an issue – 100,000 Euros are needed for this. ESA (Manned Space Microgravity in the Netherlands) would cover half of this amount; Gaston is looking for the rest. The ESA astronaut corps and ESA are positive. ESA has agreed to sign off on the project as soon as we have the funding – when the General Director for Columbus sees Gaston, he asks if we have the money. The money covers feedthroughs, coax cables, employee time, certification, but not the antennas. ARISS is designing and building the antennas. Gaston and Rodrigo have written letters asking for donations from the government, education agencies, ham radio societies, etc. Manfred will look into German Aerospace Agency funding for educational outreach. Rosalie suggested writing to Mark Shuttleworth about a donation. Gaston met with a Belgian ESA satellite education person, and they are thinking about ARISS. The money has to be there in the next few months. The module was supposed to be finished in mid-2004, but the delay in flying shuttles has helped us by pushing back the due date for the money. Dani Orban will present the antenna design, the gain and antenna pattern later at this meeting. The efforts for *Columbus* have been an outstanding initiative by the European team.

Open items:

Computer: According to Mike Foale, our primary issue is the lack of a power supply. A power supply is being built in Russia; it converts 28 volts to 80 volts, and it will convert to other voltages. It is like the power supplies that are on board now. We will need a

special cable for a power supply to go to the computer. Kenneth Ransom has the action to understand what we have on-board, and how we can best get a dedicated computer for our system.

The computer (A-22) brought up by Shuttleworth would work better for slow scan than some of the other computers on-board. So we might want to get access to the A-22.

Network Operations—There was a lengthy discussion on whether our computer should be hooked to the network. If we don't, we won't have easy access to several resources on the network. The primary items that we will not have are pictures that were captured by the ISS cameras and Keps to support our future orbit prediction programs. Without the network we would need to port pictures over to our computer by hand using a CD, disk or memory stick. We need the network to automatically update Keps instead of sending a file for the crew to do the updates manually if we want them to have an ISS Ham orbit prediction program. If we don't use the network, we are more on our own.

While using the network minimizes crew time, it adds more rules for us to follow. There are great concerns regarding viruses, especially on the network

If we use NASA tracking programs that are on other ISS computers (and are already on the network), that will resolve a significant need for crew intervention because Keps for these programs are already updated periodically by the space agencies, making less work for the crew. If we get our own orbit prediction software approved, we are better off in some ways, plus we'd have redundancy. But we'd have to train the crew, and also, we'd be totally on our own regarding keeping this prediction software current. Conclusion: we should work to include whatever capabilities we require in the ISS Orbit Prediction Software that is already on-board (it may take no modifications), so that the crew can get AOS and LOS information, but the crew should not have to do any work to update the Keps on it. Frank summarized this as follows:

First ideal-- we will utilize the space station network and software resources to support our orbit prediction requirements. Second ideal-- we will operate our system without network capability, but if it becomes relatively simple to get on the network, we will learn what is needed to meet the station network security requirements and pursue getting on it.

Project Selection & Use Committee (PS&U)
The PS&U committee reviews proposals for Amateur Radio projects for deployment onboard the ISS. The committee recommends the acceptance or non-acceptance of those projects to the international delegates. The committee has a list of questions that must be addressed by the group proposing a project, and the committee bases its decision on the answers.

The committee is currently looking at these projects.
* Shadow Experiment
* ISS ATV (Graham Shirville)

* CDATV Project (Miles)
* SpaceCam 2 Project (Miles)
* Linking ISS to the Internet
* Ionospheric research project
* antennas for the *Columbus* module

A significant problem was reiterated to the team in attendance. Once ARISS approves a project, and it is built and onboard, we still need space agency approval for crew time for training and on-orbit for QSOs, installation and maintenance. All attendees were reminded to minimize crew interaction and make systems as autonomous as possible to ensure that their projects will be installed and utilized. Sergej suggests we call projects a scientific educational outreach experiment. He thinks we can get more crew time if our projects are scientific educational outreach experiments. ESA has many scientific projects proposed, but ESA is happy to see and support educational outreach projects.

Shadow Experiment – Sergej Samburov
We have to get the plasma portion of this project certified before it can fly. The Russians want to propose a cold experiment and a hot one. The cold experiment is just the time text sent by a beacon through the packet system. The hot experiment includes the plasma pulse – ARISS isn't responsible for this. Hams who participate in the experiment would get certificates. No *Progress* vehicle has been identified yet to launch the project; it may take a few years for this. ARISS would be responsible for the software to provide the signal for the time segment through packet. We could go through the SSTV computer clock. Bob Bruninga might have some ideas utilizing APRS. The 10-minute experiment will be done 5-10 times in a 6-month period.
See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/PS&UPresentations/2_projectke1.pdf

The Shadow team is asking for clearly expressed support by ARISS of the project, assistance in notification of the Amateur Radio community, and any other help for success. The PS&U members will develop a recommendation for the ARISS delegates.

ISS ATV – Miles Mann
Miles proposal is for compressed digital ATV using an ICOM high speed digital transceiver. It uses much less bandwidth than analog FM video. He proposed the use of the L-band uplink. However, the ITU only allows downlinking on 1.2 Ghz, so S band might be considered. The software will need funding. ICOM has said their radio is and isn't open protocol, so we have to find out their final plans on this, and we'd have to decide whether we want to be involved if it isn't open protocol.
See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/PS&UPresentations/4_CDATVISSproposal2.pdf

Concept for an External Payload: a Digital ATV Transponder & Beacon – Graham Shirville

External payloads are desirable for ARISS -- ARISS might want to consider a standard enclosure for external payloads. Graham proposed a digital 13 cm downlink and an analog FM 23 cm uplink. Existing, inexpensive FM equipment is easier for amateurs than DATV, and they can generate more power on the ground than will be possible on the ISS. The better signal-to-noise ratio of the digital downlink will be balanced on the uplink by more ERP. Receiving DATV by amateurs will be easy due to available of standard satellite receivers. We should look into Earthkam and see how we might partner with them. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/PS&UPresentations/3_a18atviss.pdf

Digital SSTV : SpaceCam2 – Miles Mann
Software is available for this, but major updates would be needed, and it would require funding to do the updates. No hardware changes would be required to our existing system, but we'd need a Laptop such as Mark Shuttleworth's computer, and we couldn't use the existing on-board IBM A-21 computer.
See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/PS&UPresentations/5_SpaceCam2StatusESA1.pdf

Linking the ISS (Using Ham Radio) Over the Internet – Scott Lindsey-Stevens
There are several methods for this to consider – Echolink (a ham license is needed to listen to these transmissions), IRLP (people don't need a ham license – third parties can listen in via scanners). No funding is needed initially for these. No crew training is needed for this, although they'd have to understand that school QSOs could be longer. In some regions, kids would be bored because they already do this type of thing. Kids not interested in ham radio, but interested in computers, might be pulled into ham radio. ARISS asks: What is the objective of this project? It might be used with schools waiting for QSOs – they could listen and learn. We have to ensure that the kids understand that this mode uses Amateur Radio.
See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/PS&UPresentations/6_ISSLink Lindsey-Stevens.pdf

Thursday's meeting ended at 1718 local time.

ARISS-I International Meeting

March 26, 2004
ESTEC – Noordwijk, Holland

The meeting was started at 9:30. A welcome was given by Frank Bauer and Gaston Bertels. Introductions were done by everyone. Frank provided a testament in memory of Roy Neal, K6DUE, and his knowledge and guidance to ARISS, helping us get ARISS established, accepted, and make it a reality. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/02_Roy_Slide.pdf

Thomas Kieselbach and Pam Mountjoy were also remembered for their great assistance in ARISS activity. Rosalie asked that everyone check the attendee list to ensure their name, call sign and email address is correct. Manfred announced our schedule for a tour of parts of ESTEC.

Gaston moved that we approve the minutes of the last meeting, and the delegates did so.

The report for the European ARISS region was given by Gaston, who began by saying ARISS-Europe is a working group of Europeans. ARISS-Europe has an elected board with Gaston as Chairman. Danny Orban, ON4AOD, is Technical Director – he will give a report on the *Columbus* module. Joerg Hahn and Christophe Mercier are Technical Counselors, and Peter Kofler, IN3JHZ, is a School Mentor along with Gaston. School QSOs in Europe have been very successful, and there have been two already in 2004. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/03_ARISSEuropeReport.pdf

Gaston has worked quite hard to get ARISS accepted as a worthwhile program by the European Space Agency (ESA). Having Frank DeWinne take an interest in ARISS helped Gaston, who went to the ministry of education. Gaston was invited to DeWinne's de-briefing, and it was there that Gaston sold ARISS to ESA, the scientists that DeWinne worked with, and education officials. Just recently, the ESA education office asked to offer the ARISS program a statement of understanding between the two organizations. In principal, there are two ESA astronauts on-orbit each year – so twice per year, a joint ARISS/ESA national program could be organized that involves all primary schools in a member state. Frank and Rosalie will take the request to NASA HQ in Washington DC, since ARISS is co-sponsored by NASA.

Ken Pulfer, VE3PU, presented the report for the Canadian ARISS region. He began by remembering achievements Roy Neal made toward progress on ARISS. Ken then discussed how we have changed, and there are many new faces successfully helping with ARISS work. Canadians have done a lot of ARISS PR to hams, to schoolteachers and students, and to the general public. Canada would like to see its older schools get scheduled. Ken hopes to further foster interest by the hams at the University of Toronto in ARISS hardware work, and he wishes to develop greater interest in ARISS by the general Canadian ham. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/04_CanadaReportPulfer.pdf

Frank gave the report for the ARISS team in the USA. Rather than being a progress report, Frank's discussion covered the substantial re-organization of the team to better serve the program. ARISS recalls the many things Carolynn Conley did, and now, Kenneth Ransom has taken her place. Frank displayed a graph showing the US team, and their ARISS duties. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/05_USTeamReportBauer.pdf

Sergej provided a report for the ARISS Russia team, which consists of him plus a few volunteers. He thanked Karen for joining the team, and hopes more volunteers can be found. Karen's background covers many things including development of packet hardware; Sergej feels Karen will be a great help. Sergej said, "The crew likes the table we built and launched, and uses it for computers. The table has an extra shelf for future equipment, and was installed in December." The FT-100 and cables (to be finished by the US) for the antenna switches may be launched on a fall *Progress* flight. Sergej's group is working on an official operations manual for the crew. He has several school applications; the next crew wants more notice for scheduling schools.

Masanobu gave an account for the ARISS Japan team, including an article he displayed from *CQ* ham radio magazine about an ARISS Japanese school QSO. Besides getting an arrangement set up for ARISS to get the Kenwood and the Yaesu Vertex-Standard equipment, the Japan team got special call signs for the schools, with the suffix ISS. Masanobu and Keigo thanked volunteers including Satoshi, Jay and Fumio. Satoshi has a good association with the government, and has helped with frequency matters, particularly ARISS' use of frequencies on the 2-meter band. Frank thanked the Japan delegation and Satoshi in particular for their work on this matter.

During the lunch break, the Project Selection & Use Committee met, as did some members of the PR Committee.

Ken presented a report on the PR Committee, and started with how the logo has been widely used and is known, but we should think about whether we want to have a policy that it is to be used only on a white background. Our Web sites are doing well, and are in different languages. For some PR areas we're doing well, but some areas need work. Ken passed out a brochure that could be modified for different audiences (teachers, hams, general public, space agencies) and for different countries. Frank has some presentations that people can modify for use. The internationals need to know a point of contact for forwarding their news stories. Ken asked the Russian representatives about a Russian Web site, and asked the Japanese representatives if there is someone updating their site. Ken proposed to the delegates that Scott Lindsey-Stevens join the PR Committee, and he was unanimously elected. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/06_PRCommitteeReportKPulferARISS4.pdf

Frank reported on the Roy Neal Commemorative Event. After some initial problems (due to the crew not being available), the event was activated by the ISS crew, and we began receiving QSL cards plus messages of thanks for the program. Participants -- 85 people in the US took part, 40 in Europe took part plus a few in the other countries. A special certificate will be given to Sergej to try to have flown on the ISS, and pictures taken for publicity purposes. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/07_K6DUECommemorativeBauer.pdf

Rosalie gave a report on QSL cards, listing how many were in stock in each ARISS region. Each region probably has enough to continue through the rest of the year. It was suggested that in a few days, the ARISS team should begin submitting ideas for design changes. In summer 2004, the ARISS officers will set up a timeline for changing the card before going to a printer. For our October ARISS meeting, each ARISS region will re-check the QSL card supply. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/08_ARISSQSLrptWhite.pdf
Ken provided information about third party traffic issues prior to, and after, the WRC-03 conference in Geneva when international Amateur Radio regulations were reviewed. The new provision says Amateur stations may be used for transmitting international communications on behalf of third parties only in the case of an emergency or disaster relief. But more importantly, the new provision says an administration may determine the applicability of this provision to amateur stations under its jurisdiction. Thus, each country's administration can define what is a communication on behalf of a third party, and with whom the stations under its jurisdiction may exchange such communications. If the other station's administration permits the same communication, then the communication may be exchanged internationally. This eliminates the former requirement for bilateral agreements between the countries concerned, which often took years to negotiate and approve, and allows each administration to unilaterally permit educational communications to take place internationally. ARISS needs for the FCC and the Russian telecommunications agency to give some verbiage for us. This is important because for Increment 11, the US astronaut will probably not have a license. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/09_3partyKPulfer.pdf

Hardware Status

Frank began this report by showing planned capabilities for the Phase 2 station. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/10_HardwareStatusBauerSamburov.pdf Sergej pointed to the graphic, showing where the ham equipment resides. With the long extension cables, crew members can even use the toilet while on the air – the fans are loud enough that you wouldn't hear the flush, says Sergej! The HF antenna is 2.5 meters long. For WA3, the ground controllers noticed something moving during a Progress docking. It was discovered that during the EVA the crew left a cloth tiewrap on the antenna. In the most recent EVA, Sasha Kaleri removed the cloth, which is good.

For Progress 15P or 16P, late 2004, we hope to deliver the Yaesu FT-100D system, the SSTV hardware and software, and the Phase l headset and extension cable.

For early 2005, or when the shuttles return to flight, we hope to deliver MISSE-5/ PCSAT2 as an external payload.

Joint operations will be in the FGB and the Service Module. For the antennas: WA1 is for the Kenwood, WA2 is for the Ericsson 70 cm, WA3 is for the Yaesu FT-100 2m/70cm., and WA4 is for HF with the Yaesu FT-100.

The Kenwood D-700 supports voice, crossband 2m/70cm repeater, APRS, 1200-baud packet, emergency mode, and 9600 baud packet. We've checked out voice and 1200-baud packet only. The ARISS team simplified this complex radio for ease of operation by the crew. It was a tremendous international effort with significant participation by the Russian, US and Japanese manufacturers teams.

Joerg asked if the six digi-talkers could be used now. Sergej is offering the power supplies needed for this. Discussion on this topic will continue.

At 4:00 PM the meeting broke for a tour of the ESA test facilities.

Saturday, March 27 9:15AM

Miles gave a report on Space Cam. There is a wish list for improving the software, but Miles isn't sure there is time to ready all of them. Lou said a few of the things on the list are really needed – such as when selecting user folders, it creates thumbnails, but the user can't tell the computer is selecting folders. Some of the other changes would be nice but aren't so much a priority. Lou said we need to prioritize the list of improvements for importance, and concentrate on the most important ones first. See: http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/13_SpaceCam2StatusESA1.pdf

Phase 2 Hardware

Lou and Sergej started this report with the development status of Phase 2. There are a number of open items being worked on. Karen will be helping with some of the work. The tuner needs testing for out-gassing and other certification issues – this is the USA's responsibility. Testing of the FT-100 is the responsibility of the Russians. The power switching assembly needs certification.

The SSTV hardware is built, and it needs one more certification check plus the out-gassing test. A new item is the speaker cable (Y-cable for listening on stereo speakers). If we don't get a suitable computer, we also need a computer power supply. Sergej is building one – a 28VDC > 22 VDC unit. We would like a dedicated small Web-camera instead of collecting photos on several ISS cameras; this would minimize crew operation.

Another open item is the HF antenna. Lou stated that it has no ground, and it is believed that it is installed on fiberglass. There was substantial discussion on this. Frank stated that this is not an issue until we determine that it is through on-orbit testing. Several agreed that there is probably sufficient metal under the antenna to serve as an adequate ground plane. It was agreed to set up a technical sub-committee to discuss simulated and

on-orbit testing before deciding on a final approach. The system may be fine as-is. Or there may be some modifications required. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/11_OnboardHWstatus3-04R1.pdf

PC-SAT2
Lou gave Bob Bruninga's presentation on PCSAT2 – Synergy in the Amateur Satellite Service. This experiment is built in a suitcase that is half filled with a solar cell experiment. The suitcase will be an external payload on one of the solar arrays or possibly near an airlock. The experiment is being done through the Naval Academy in partnership with the DOD and ARISS. Frank and Ron Parise attended some of the flight review meetings. A typical student user station is a handheld radio. The system has APRS packet on 70 cm, PSK-31, optional voice repeater capability, and optional packet up/down on 145.825. Bob got permission from the ARISS delegates last December to continue work on this project. It is on hold until the shuttles are flying again. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/12_ARISS-PCSAT2Bruninga.pdf

ARISS Digi-talker
Joerg spoke on the status of the digi-talker, a voice memory unit that stores 3-minute messages. It can be connected to an ISS transceiver, and a message from the ISS crew could be spread to school students worldwide with little work from the crew. There are 6 units already built by Thomas Kieselbach, and funded by the German Aerospace Group. The units were tested, but the power requirements were higher than what the phase 1 system could provide. Now with the D-700, the digi-talkers will probably work fine. All that is needed are cables. Lou asked for a schematic and a unit, and he will build a cable. He will take a unit to test for out-gassing. The Project Selection & Use Committee will move forward with this project at an accelerated pace to get a positive recommendation to the delegates.

ARISS Educational Outreach / School Selection Committee
Rosalie reported on the work of the ARISS Educational Outreach / School Selection Committee. The results of the NASA fiscal year annual report for 2003 showed that 41 of the 43 schools having QSOs in 2003 submitted evaluation forms. These forms are partly what determine annual funding to ARISS from NASA. Students participating during the 41 QSOs totaled 13,586. Another 650 listened from other schools or facilities, and 890 teachers participated. Frank asked Gaston to ensure that the two Spanish schools filled out their forms for next year's report, since so many students were involved. We also ask that ESA fill out a form for outreach schools that listened in, and individuals listening via the Web streaming files. Rosalie handed out the new NASA lithograph and brochures on Amateur Radio for youth. Now that ISS hardware is more varied, the group discussed how schools can do more than just a Q&A for their QSO if they wish. The US has many schools that have been waiting since 2001, and Canada also has two like this. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/14_ARISSedrptWhite.pdf

General Ops
Kenneth presented a report on general operations. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/15_GeneralOpsKRansom.pdf

Crew Training
Mark spoke about training of crew members and taxi astronauts on the use of the equipment. The committee prepares cue cards and on-orbit manuals for how the equipment works. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/16_ARISS2003TrainingTaylorandSteiner.pdf

Crew Licensing
Kenneth talked about how we got Mike Fincke trained quickly for Expedition 9. Kenneth related that Dan Tani, the Expedition 11 US backup, is licensed. Bill McArthur is a ham for the Expedition 12 crew, and Suni Williams, KD5PLD, is scheduled for Expedition 12, depending on when the Shuttle start flying again. Clayton Anderson is licensed, and is the Expedition 12 US backup.

Leroy Chiao is studying for his license, but John Phillips probably won't get licensed, and Kenneth is checking on Jeff Williams' interest (he is US backup for Expedition 12). For John Phillips, who goes up with Sergej Krikalev, we will have 3rd party issues and we should look into the WRC-03 changes in order to make the best of this situation. Rosalie will talk with ARRL General Counsel Chris Imlay. Frank will work with Sergej in an effort to get 3rd party permission from the Russian ministry of communication. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/17_LicensingKRansom.pdf

Project Selection and Use Committee
Mike Miller spoke on the results of the committee meeting held yesterday, and decisions made for approving proposals to recommend to the ARISS delegates. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/18_PS&USummary2.pdf

The committee recommends the Shadow project with the provision that the project is approved by the appropriate authorities in the sponsoring country, and that the sponsors need to clarify the packet timing requirements. Also, Robin suggested that any liability for violations would be the responsibility of the sponsoring country. The delegates voted unanimously to approve the project.

Mike covered Graham's proposal for a 13 cm downlink digital ATV transponder and beacon device, and a 23 cm uplink using digital encoding – one or more on-board cameras with a graphic overlay acting as a test card. Mike also covered Miles' proposal to install an easy-to-use CDATV (Compressed Digital Amateur Radio TV) camera with a graphic overlay acting as a test card. Joerg Hahn reminded the team that the French

delegation proposed an ATV proposal at a previous ARISS Meeting at ESA ESTEC. The PS&U committee proposed recommendations, and these are in the committee's report.

The delegates approved the idea of having ATV on ISS, with the following recommendations:
* ensure frequency compliance per ITU rules
* investigate the possibility of deploying via the Express Pallet
* design changes to protect from direct sun exposure to the optics due to unplanned attitudes of the ISS
* use a non-proprietary, open-source protocol
* combine the Amateur TV projects (UK, French, US)
* complete a link budget study to determine the technical feasibility, and
* present responses to the PS&UC and then a presentation would be given at the October 2004 ARISS meeting.

Further, the delegates requested that a single point of contact coordinate the trade studies and lead the proposal development effort for ATV on ISS. The delegates recommend that Graham Shirville be that point of contact.

Mike continued with ISS via the Internet – EchoLink, IRLP (high-quality streaming video), etc -- see Scott's presentation. The committee recommended that:
the initiator should:
* consult with the international partners
* perform some engineering tests to validate the pros and cons of the various systems
* resubmit to the committee when test results are available
* participate in teleconferences with PS&UC prior to the October 2004 ARISS meeting

The delegates concurred with the committee's recommendations, and voted to accept them.

The delegates said it was important that the Project Selection & Use Committee have proposals in hand from initiators at least a month prior to ARISS Meetings in order for committee members to make recommendations at least one month ahead of the meeting. If proposals come in late, these won't be considered by the delegates until the next ARISS meeting. The PS&UC should generate a list of projects they are going to recommend before the meeting with the proposed recommendations to the delegates several weeks (two minimum) prior to the ARISS meeting.

Ionospheric Topside Sounding Experiment
Csaba provided some information via his presentation sponsored by the Budapest State University of Technology and Economics, Faculty of Electrical Engineering's Space Research Group. The proposal stated that most sounders are ground-based, so it would be interesting to have an experiment from space. Such an experiment would improve hams' models of propagation for HF, and help with propagation predictions. The digital data (signal level, frequency and time) to be downlinked to Earth from the ISS for this

experiment would be helpful to Amateur Radio operators, scientists and professionals. Rohde & Schwarz offered an HF receiver, and will provide flying equipment at no charge, and will perform the shock and vibration tests. A public test opportunity is at http://webradio.ha5mrc.hu and email for corresponding is szombathy@mht.bme.hu and gschwindt@mht.bme.hu After some discussion, it became clear that the proposers expected a very high downlink capability (>>1Mbps) which is currently beyond the capabilities of ISS Ham. They expected to use some of the ISS downlink resources, which are also beyond the scope of the ARISS program.

The sponsors were asked to give the committee more details and determine how they could support their experiment with our existing ISS Ham resources before further consideration will be done. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/21_Presentation_BUTE.pdf

News about the Columbus *module*
Danny spoke about the *Columbus* module. RF feed-throughs are now on *Columbus*! This allows for 8 antennas, but it is proposed we use 4 single or dual-band patches. What was suggested is dual band 70/23, dual band 23/13, dual band 70/13, and one other. The antenna is an L profile, and it is aluminum with a patch on top. Gaston still has to work the funding issues if this is to become a reality. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/22_ColumbusARISS_040326a.pdf

High Speed Packet Capability
Karen presented a talk on behalf of AMSAT-Russia on improving high speed packet capability. He asks what kind of system we would like, and asks that we suggest applications and technical requirements. Ideas include orbital data and picture over memory flash to server, high speed transport link "ground-ISS" and applications over link and/or independent applications, migration from analog to digital, and so on. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/20_PacketandRussiaPresentationRA3APW.pdf

Express Pallet (Expedite the Processing of Experiments to Space Station)
Mark Steiner talked about the Express Pallet that fits on the truss (these projects would not be pressurized), and he provided some specifications that are likely to change. Such projects would share space with other experiments, so we would have to be good neighbors with RFI, etc. A more comprehensive report will be available in October. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/19_Express_PalletSteiner.pdf

Funding
Robin reported on his requirement to answering to the AMSAT-NA board about expenses AMSAT covers for ARISS, and listed what has been spent from 1998 through 2003. He mentioned that ARRL spends a large amount of money, too, as does NASA, and ESA contributes also. But he asked about other ham radio societies' contributions.

It is true that other ham societies' volunteers to ARISS usually pay much of their own travel costs to meetings. Robin asked that we put this topic on the agenda for the October 2004 meeting in order to get thoughts from the other societies. He feels ARISS should develop a budget in order to assist with this issue. Some of AMSAT-NA's major costs include travel expenses for ARISS meetings, and travel to do hardware testing, and costs for building hardware plus cables, boxes and so on. On the other side of the coin, what we have for Amateur Radio on the ISS is phenomenal for the costs we must pay.

NASA's New Exploration Initiative to the Moon, Mars and Beyond
Frank reassured us that there is no question that the shuttles will fly again. The current prediction is that will happen in March 2005; Frank thinks a little longer. NASA is now looking at architecture and funding for exploring space – the moon, Mars and beyond. Space Station will be finished by 2010 using the space shuttle, which would then be mothballed at that time. The NASA Education Office has asked us to look at the role ARISS might play in the initiative for moon/Mars/and beyond. So from an ARISS perspective, we will want to focus on, and strategize about, and endorse this new initiative. We should think about things such as a payload for going to Mars. A repeater on the moon. A Mars telecom satellite. Remote control of ATV – although there are long path issues. Hamsats at the Moon-Earth libration point. And so on. Our space agencies are going to Mars now, so it's natural we should think about it, and do initial planning, now. Rosalie mentioned that we could start with targeting our educational materials on exploration beyond the ISS. We will have further discussions on this topic at our October meeting. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/23_ExplorationInitiativeBauer.pdf

Fall 2004 Meeting Plans & Meeting Closure
Our next meeting will be October 10-13 in Arlington, VA, following the AMSAT-NA Meeting (Oct 8-10). This enables us to present information to AMSAT members, and possibly get more ARISS volunteers and support. We plan to tour the new Udvar-Hazy Air & Space Museum at Dulles. See:
http://www.amsat.org/amsat/ariss/Meetings/ESTEC2004/Presentations/24_FutureMeetingPlansBauer.pdf

The team should think about how often to meet, and give suggestions for the 2005 meeting, possibly April-May or later (maybe June), or October-November. Ken will be at IARU meetings in April-May. Joerg says ESA might host the meeting in Italy. We might also go to Russia. Karen was going to look into this.

The meeting closed at 6:10 PM with comments from Frank about how well we work as a team, and from all of the ARISS delegates on our progress. We've had a good year!

Respectfully submitted,
Rosalie White, K1STO
ARISS Secretary-Treasurer