



QRZ NEWS

A PUBLICATION OF THE
SOUTHERN PENNSYLVANIA AMATEUR RADIO
CLUB, INC.

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AN AFFILIATED SPECIAL SERVICE CLUB OF THE ARRL INC.
"Public Service Through Communication"

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JULY-AUGUST-SEPTEMBER 2002

CALLING NAISS, OVER

SPARC -- HAMBRIGHT SCHOOL -- ISS CONTACT



Dan Bursch, Astronaut

On 21 January 2002 SPARC received a telephone inquiry from the Hambright Elementary School in the Penn Manor School District inquiring if the club could be of any assistance to them for a future International Space Station contact with a prior student who was presently part of the crew aboard the ISS Station. The ARRL space representative Rosalie White recommended SPARC to Hambright.

On January 25, 2002 SPARC met with the school's representatives to discuss this possible cooperative event. After a review of the required application process SPARC agreed to assist the school in this project. An eighteen-page application was required to be submitted. We then discovered this contact was a "Crew Request", which means we're on the list.

Next step was to assemble the equipment and support personnel. The main crew consisted of Yogi Bear WB3FQY, Jim Ibaugh AA3C, and Vern Kiehl N3VK. The support crew consisted of Dave Payne N3LOM and Tim Davidson W3PLC. A portable roof tower was acquired to begin assembly of the antenna configurations. Technical advice was welcomed from Randy Shriver, KG3N in Hanover, PA. Randy was the first amateur to contact the ISS Station, and his technical guidance was most welcomed and saved the crew from reinventing the wheel.

The original application indicated using Alinco radios in tandem and Radio Shack units for backup and acquiring an EggBeater antenna for 2 Meters. The school prepared their portion of the application and SPARC completed the technical reports. Unfortunately, ARISS didn't like the configuration, which really had the wheels spinning.



"Hello out there!!"

A pair of 16 element circularly polarized antennas was quickly acquired along with the original EggBeater. Borrowed rotors were set up and failed the testing phase, creating another rush to supplement the rotors. An Azimuth/Elevation rotor was acquired along with two new coaxial cable runs of 110 feet each, and two 110 foot runs of 8 conductor rotor cables were acquired. The next obstacle arrived from ARISS advising the radios were inadequate. Another crisis to be solved.



Screen Test of a lovely lady

We borrowed an Icom IC-821H for the initial radio and supplemented it with another configuration, only to discover we needed tandem radios. We were fortunate to be able to acquire another IC-821H from an E-Bay sale. We now have the hardware available to begin the project.

The antenna configuration was assembled at Ironville inside the building and made to clear the doorway to utilize outside for testing. Now the computer programs need to be coordinated. SPARC used WinOrbit, and contacted the school for additional computers. Hambright supplied three computers with Internet access and gave us carte blanche of the school premises when required to reconfigure the programs.

Ironville now becomes a very busy site with testing being done an average of twelve man-hours per day to conduct various tests. We're feeling petty good by now, it's early April and plans are made to move the equipment on site. The school is alerted to acquire sixteen (16) sandbags to assist in holding this array on the roof. Hambright responds with an electric lift to get this equipment on the roof along with the sandbags and supplied us four maintenance persons to assist. The tower is lifted on location and N3LOM and WB3FQY begin the assembly on roof. Three hours later everything is assembled on roof and hopefully secured. The five cables required operating the antennas and rotors are affixed to the building wall and fed in thru a window, which they configured to accept the cables and keep the building secure.



Future Astronauts

It's test run time and coordination with the school programs. April 5th we begin tests from inside the building. ARISS now comes again and required the students to prepare questions for the big day. These must be sent to the ISS in advance so they have the answers. ARISS and SAREX advise the frequencies and dates need to be kept confidential until the actual day is confirmed. The only person knowing this information is WB3FQY and he isn't talking. The school principal is alerted of two possible dates, which he accepts. Now there are only two people that know the dates and neither is talking. The school staff will not be told until three days before the event.

The SPARC crew shows up at Hambright with a lot of equipment and begins the inside assembly of radios, amplifiers, preamps and reconfigured computers. This is being setup in the schools cafeteria which means at lunch time it gets a little noisy with first through sixth graders getting excited about this event. The school is consulted on having "dry run" days in an attempt to have the students well prepared to ask their question quickly and clearly and not to get "mic fright". The school agrees and we're off and running again.

The SPARC crew is now spending two or three days per week in the school doing various tests and working with the students during their morning assembly period. All is going well and Murphy shows up. A rotor is having a problem and we cannot rotate the antennas. Turns out after investigation that a plug pin is not making a solid contact. N3LOM resolves the problem and we're up and running again.

Excitement at the school is building daily. SPARC approaches the principal and suggests they conduct a contest among the students and have them guess the actual time of the initial contact, stating it by hour,

minute and seconds. SPARC will supply two models, scale of 1:125 of the ISS Station to give to the winners, one male and one female. The school jumps on this and the momentum continues.



“Don’t be scared”

We’re now at April 26 and we’ve expended over 260 man-hours in this project and about \$1600.00 to date. We’re feeling pretty good right now, all the tests have been successful, we’re tracking well on every pass we’ve tried and it’s time to relax until the big day.

Here’s today’s e-mail and Murphy is squirming again. We have not received the equipment for the MSNBC connection and the individual having it in New York isn’t responding. Somehow the AP put out a release yesterday saying we did this on Thursday which has the school jumping also.

ARISS and SAREX are advising the confirmation date will not be confirmed until a 24 to 48 advance notice. The SPARC crew must remain flexible. Rosalie White at ARRL advises we must be aware these projects cause silver hair, unfortunately Yogi doesn’t have much to turn silver let alone much hair.

We’re at 29 April and the decision is made to place the equipment at ground level to accommodate the expected influx of television camera crews. We need tables for this to happen and the school doesn’t have any. A call to Woody Graves at the Fire Company gets us two eight-foot bingo style tables, just what we need. The equipment is moved from “on stage” to the new tables at ground level. Tests are conducted to insure we’re still operational and all is fine.

Time is getting closer, we’re at May 2 for more testing and the bomb hits us. The music teacher has a series of concerts planned for next week in the cafetorium and she’s not about to cooperate in moving it to an alternate date. This means everything in the building needs to be disassembled, moved and stored until after this event. Orchestra and chorus need the area for practice sessions and for their public concert.



Last minute details

Everything is now disassembled, cables, two eight conductor rotor control lines and three coaxial runs need to be rolled carefully and stored away from the main stage area. All electrical lines we installed need to be removed also, what a bummer. The disassembly goes quite well when another bomb hits. We cannot set this up until after the final presentation on Wednesday afternoon after school is dismissed. In the meantime, the modified phone equipment arrives and it doesn’t work with the system in the building.

The need is here to run a separate dedicated telephone cable from the building’s telephone entrance room to the cafetorium and test it prior to the event day. Another request is made that we put the event on the school’s public address system. The PA system is checked and it’s not working the way it should. N3VK begins that project, and we run another line from this system direct to the operations table. The telephone entrance room is on the other side of the building, so the line we install goes outside and over the roof to get to our area. Tests are conducted and we cannot get this unit to work. Assistance is requested from WA3UOE. He advises the problem is the fact the incoming service is analog and the interior building system is digital. We need to find a way to circumvent the digital system, and this additional cable line may be the answer. We now need to find the restricted direct line that’s in the building to do this. We also need to acquire an analog telephone so this works; all of the school telephones are digital and programmed. After about a one-hour trial and miss theory, we get the line we need and now we can test the interface unit, and we’ve acquired our analog telephone.

The interface unit is required if we want direct coverage from MSNBC. The interface configuration is accomplished, N3VK has the cabling for the master PA system tied to the interface, radios are again set up to insure we have everything where it should be. It’s after 1800 hours and we finally feel confident that it will work. The school’s PA system needs adjustment along with its equalizer unit. N3VK gets this task

accomplished. AA3C is busy getting all the computer clocks to synchronize so everyone is on the same page the day of the event. Next is to acquire the school's laptop that will be used for the projection of the WinOrbit program on the big screen the day of the event. AA3C now sets the current Keps and we test again, with success.

We now get some break time until Wednesday, but in the meantime we visit the Rag Shop and acquire some table covering material so the operations table looks presentable. We also advise the principal that SPARC will be presenting each of the students asking questions of Dan Bursch, a certificate declaring them as a *Space Communicator* for the day of the event.



“Testing, testing”

It's now May 6 and ARISS advises of frequency changes for the uplinks. The downlink will remain as usual, 145.800. ARISS gives us three frequencies, primary, backup and alternate. This was created because of the last several days; unknown amateurs have been attempting to contact the ISS on its packet frequency using voice. We're also advised these frequencies do not go to public domain, nor do they want to hear any frequency numbers during the contact, we can only use their channel number code to the ISS.

May 8th arrives, late afternoon; the school's concert is in session, so we wait for its conclusion before we can begin reassembling the systems. The Hambright Orchestra and Chorus is pretty good for elementary students, so we enjoyed the program, it took the edge off this rush that we're all beginning to feel. We finally get access to the area and the setup begins. It's 1900 hours; the systems are up, tested and operational. We secure the room and await the big day.



NAISS, this is WB3FQY

May 9th, *The Big Day*. Its 0730 arrival time at Hambright. All equipment is turned on and we're ready, except for the new Keps. The school laptop and projection unit arrives and is placed accordingly, WinOrbit is activated and so far all is well. The school district technical crew begins to arrive; they're going to videotape this event. Shawn Beard and Charlie Reisinger begin their setup.

We've planned on doing “dry runs” this morning with the students as last preparation for the big event.

The dam just broke with the entrance of the news media and equipment tripods, cameras and cables, and everyone wants something. Here it comes, WGAL-TV 8 truck and personnel, which will also simulcast to WGET-AM radio, NBC affiliate, WHTM-TV 27 personnel, ABC affiliate, WFMZ-TV 69 personnel covering Berks County and Reading, PA. CBS affiliate, WPMT-TV 43 York, the FOX network, Lancaster Intelligencer Journal and the Lancaster New Era newspapers, the Advertiser/Merchandise personnel. We have cables and equipment coming from everywhere, the stage area is full of media personnel with other cameras and lights, and it's beginning to get near panic time. SPARC has several persons taking our own videos and still digital photos, flashes everywhere and time is getting close.



The Space Team, Yogi, Vern, Dave, Jim
(Absent, Tim, W3PLC)

We had everyone settled we thought, then the individual interviews begin to come, time is getting short, students need their practice runs, morning breakfast is winding down in the room, tables need to be removed, floor cleaned, and the students are getting ready to come down from their classrooms. Finally we have a chance to have the students make their practice run, and that creates more media involvement, but all goes well. We were able to do the exercise twice.

It's now 1055 and the teachers, student teachers and the students begin to enter. The noise and excitement is getting loud, so loud we cannot hear the telephone direct line ringing from MSNBC.

Being alerted that it was ringing, we advised them it was noisy and loud and they gave us their instructions. We had to leave the phone off the hook for this to work. We advised the students they are now live on MSNBC and they need to be quiet, for at least twelve minutes, and that got a groan.

It's now 1115 EDST. We announce to everyone, watch the WinOrbit on the master screen, when the bottom bar turns "red", it means that Hambright is now in the "footprint" of the ISS and they now must be very quiet. AA3C advises "one minute". WB3FQY advises everyone if this doesn't work in one minute, remember who said that, pointing to Jim.

The bar turns "red" and Yogi says: "NA1SS, THIS IS WB3FQY AT HAMBRIGHT ELEMENTARY SCHOOL CALLING, OVER". It seemed like an hour, but six seconds later, at 15:22:48 UTC /11:22:48 EDST, we heard "GOOD MORNING HAMBRIGHT" from Astronaut Dan Bursch on board the ISS. *You had to see these students' faces to appreciate what really just happened.*

Yogi acknowledged the contact their questions, and Dan his answers. We were able to get before we had loss of signal.

A successful event, SPARC Certificates to each of the presented one to Principal Peart Elementary School.

The winners of the ISS models the female winner missed the time

This event could not have cooperation of personnel at Penn and Hambright, consisting of Kevin Peart, Charles Reisinger, John Toomey, Bill White, Steve Harnish, Shelby Testerman, Shawn Beard, and the enthusiastic students at Hambright.

A special acknowledgement to our ARISS mentor, Kerry Banke N6IZW in LaMesa, California, and technical advisor Randy Schriver KG3N from Hanover, PA.

SPARC thanks Kevin Peart and the teachers for their untiring cooperation. This school is one to be very proud of, from the instructors to the students and support personnel. This is quality education at its finest.

Hambright will leave a lasting memory for the SPARC personnel. (WB3FQY)



and the students began responded quickly with twelve questions asked

then presented the students, and also for the Hambright

were announced, and by only two seconds.

happened without the Manor School District

LETTERHEAD WITH YOUR ADDRESS

Rep. _____

United States House of Representatives

Washington, DC 20515

Dear Rep. _____

I urge you to co-sponsor H.R. 4720, the "Amateur Radio Emergency Communications Consistency Act," sponsored by Rep. Steve Israel. The bill would alleviate a problem facing many federally licensed Amateur Radio operators living within development communities who are subject to unreasonable restrictions or outright prohibitions regarding the installation of external antennas.

Under current law, the FCC applies a policy that instructs states and localities that they must reasonably accommodate Amateur Radio antenna. The policy, however, fails to address situations affecting private land-use groups. Rep. Israel's bill would ensure consistent application of these regulations.

This legislation seeks to insure that Amateur Radio operators are available for emergency communications in all sections of the country, regardless of whether they live in a development, such as a retirement community, or townhouse subdivision. Restrictions against antennas render Amateur Radio operators unable to utilize their licenses, which in turn may ultimately hinder their emergency communication role during times of disaster or national crisis.

Amateur radio provides a vital public safety communications service to the public at no cost to taxpayers. I hope you will join Rep. Israel in co-sponsoring his bill.

I look forward to hearing from you as you consider this important legislation.

Sincerely,

TESTING ELEMENTS

As part of the FCC's 1998 Regulatory Review, the FCC issued a *Notice of Proposed Rulemaking* on August 10, 1998 seeking to restructure the U.S. Amateur Service. This eventually led to a multitude of changes when the FCC issued the *Report and Order* in WT Docket No.98-143 on Dec. 30, 1999.

One of the items that the FCC sought information on in the NPRM was the future preparation and content of the various written examinations. There were five different question pools at the time (Novice, Technician, General, Advanced and Extra.)

The *Report and Order* restructuring the service into three license classes (from six) was effective April 15, 2001. The Tech Plus Class was eliminated and the Novice and Advanced Class were "grand-fathered"

...that is, they could be renewed and modified indefinitely but no new Novice and Advanced Class licenses would be issued. .

It was necessary to condense the five written exam question pools into three: Technician (Element 2), General (Element 3) and Extra Class (Element 4.) The national database of multiple-choice questions and answers are developed by the National Conference of VECs "Question Pool Committee" (QPC) and are periodically updated so that all publishers and applicants have access to current materials.

The QPC had to do a rush job in preparing the initial three pools since they had to be ready in less than 3 months so they could be distributed to VE teams for use after April 15, 2000. Basically the

I. QPC combined questions from the existing Novice and Technician pools for the new Element 2, left the general Class pool pretty much as it was, and incorporated questions from the existing Advanced and Extra Class pools into the new Element 4.

The FCC asked in NPRM whether the examination topics should continue to be mandated by the Commission. At the time, the written examination for each license class specified ten general topics and a specific number of exam questions that had to be asked from each topic.

Noting that the "written examinations have been prepared and administered under the VE system for over a decade" the FCC asked in the NPRM whether the required number of questions from each general topic should continue to be established by rule.

The FCC said in the *Report and Order* that "the VECs hat! consistently shown since 1986 their ability to maintain the question pools." The Part 97 Rules were amended "...to require that the Technician Class and General Class written examination elements consist of thirty five questions each, and that the Amateur Extra Class written examination element consist of fifty technically oriented questions, including questions about administering amateur radio operator license examinations."

The FCC additionally agreed "that the Question Pool Committee has a better ability to insure that the question pools reflect current technology than we do by specifying general topics in our Rules..." and that the QPC "...is capable of both specifying topic..." and organizing questions by topic "

The VECs said in their comments that it is not necessary for licensees to understand electronics and other technical subjects in order to properly operate commercially-manufactured equipment. They recommended that the Commission eliminate the mandated ten topics and that the "...Question Pool Committee determine the topics and questions that are appropriate as part of the process of reviewing and revising the various question pools." . The ARRL disagreed, however, and said they wanted "...some version of the syllabus to remain in the Rules."

Now that the Question Pool Committee has adequate time to do a more thorough job of revising the pools, a new syllabus has been developed for the Element 2 (Technician) Question Pool. It still contains ten different topics, but they have been completely over-hauled. Follows is a breakdown of the previous outline and the new one:

Ten topics and questions currently in effect are:

(1) FCC rules, 9 questions; (2) Operating procedures, 6 questions; (3) Radio propagation, 3 questions; (4) Amateur radio practices, 4 questions; (5) Electrical principles, 3 questions; (6) Circuit components, 2 questions; (7) Practical circuits, 2 questions; (8) Signals and emissions, 2 questions; (9) Antennas and feed lines, 2 questions; and (10) Radiofrequency safety, 3 questions. (Total: 35 questions)

Ten proposed topics in new Element 2 syllabus are:

(1) FCC rules, 5 questions; (2) Methods of communication, 2 questions; (3) Radio Phenomena, 2 questions; (4). Station licensee duties, 3 questions; (5) Control operator duties, 3 questions; (6) Good operating practices, 3 questions; (7) Basic communications electronics, 3 questions; (8) Good engineering practice, 6 questions; (9) Special operations, 2 exam questions, and (10) Electrical, antenna structure and RF safety, 6 questions. (Total: 35 questions.)

Request for comments on proposed syllabus

On April 4th, Scotty Neustadter, Chairman of the ~ VECs Question Pool Committee released the following proposed Element 2 (Technician written exam) syllabus out for public comments.

Comments on the following syllabus should be directed to each of the following four Q.C. members: Scotty Neustadter, W4VWV w4ww@arrl.net Bart Jahnke, W9JJ vec@arrl.org. Fred Maia, w5yi@w5yi.org John Johnston, W3BE <Johnston.John1@worldnet.att.net>

The public comment period closes on May 9, 2002.

SUBELEMENT T1 -FCC Rules - [5 Exam Questions --5 Groups]

T1 A Definition and purpose of Amateur Radio Service, Amateur-Satellite Service and Radio Amateur Civil Emergency Service in places where the FCC regulates these services and elsewhere; Communications Act, Part 97 and FCC regulation of the amateur services: Penalties for unlicensed operation and for violating FCC rules; Prohibited transmissions.

T1 B International aspect of Amateur Radio; ITU Regions, International and domestic spectrum allocation; Spectrum sharing; International communications: reciprocal operation.

T1 C All about license grants: Station and operator license grant structure including responsibilities, basic differences: Privileges of the various operator license classes; General eligibility; License grant term; Modifying and renewing license grant; Grace period.

T1 D .Qualifying for a license: Purpose of examination: Examination -elements: Upgrading operator license class; Element credit; Provision for physical disabilities.

T1 E Amateur station call sign systems including Sequential, Vanity and Special Event, ITU Prefix; Call sign formats.

SUBELEMENT T2 --Methods of Communication - T2 Exam Questions --2 Groups]

T2A How Radio Works: Electromagnetic spectrum; Magnetic/Electric Fields: Nature of Radio Waves; Wavelength; Frequency; Velocity: AC Sine wave/Hertz.

T2B Frequency privileges granted to Technician class operators; Amateur service bands; Audio and Radio frequency: Unmodulated RF carrier; Emission types and designators: Modulation principles; AM/FM/Single sideband/upper-lower, international Morse code (CW), RTTY, packet radio and data emission types; Full quieting..

SUBELEMENT T3 -Radio Phenomena - [2 Exam Questions -2 Groups]

TJA How a radio signal travels; Atmosphere/troposphere/ionosphere and ionized layers; Skip distance; Ground (surface)/sky (space) waves; Single/multihop;

Path; Ionospheric absorption; Refraction; Line of sight.

T3B HF vs. VHF vs. UHF characteristics; Types of VHF/UHF propagation; Daylight and seasonal variations; Tropospheric ducting; Maximum usable frequency (MUF); Sunspots and sunspot Cycle, Characteristics of different bands..

SUBELEMENT T4 --Station Licensee Duties - [3 Exam Questions --3 Groups]

T 4A Correct name and mailing address on station license grant; Places from where station is authorized to transmit; Selecting station location; Antenna structure location; Stations installed aboard ship or aircraft.

T 4B Designation of control operator; FCC presumption of control operator; Physical control of station apparatus; Control point; Immediate station control; Protecting against unauthorized transmissions; Station records; FCC Inspection; Restricted-operation.

T 4C Providing public service; emergency and disaster communications; Distress calling; Emergency drills and communications; Purpose of RACES..

SUBELEMENT T5 --Control Operator Duties - [3 Exam Questions --3 Groups]

TSA Determining operating privileges, Where control operator must be situated while station is locally or remotely controlled; operating other amateur stations.

TSB Band selection; Selecting a transmitting channel; Transmitter power standards; Interference to stations providing emergency communications; Station identification requirements; Observing frequency boundaries.

TSC Authorized transmissions, Prohibited practices; Third party communications; Retransmitting radio signals; Participation in message forwarding system; One way communications.

SUBELEMENT T6 -Good Operating Practices

[3 Exam Questions-- 3 Groups]

- **T6A** Calling another station; Calling CQ; Sending messages; Typical amateur service radio contacts; Proper language; Courtesy and respect for others; Popular Q-signals; Signal reception reports; Phonetic alphabet for voice operations; Coordinated Universal Time (UTC)c

T6B Occupied bandwidth for emission types; Mandated and voluntary band plans.

T6C TVI and RFI reduction and elimination, Band/low/High pass filter, Out of band harmonic Signals, Spurious Emissions, Grounding, Telephone Interference, Shielding, Receiver Over- load.

SUBELEMENT T7 -Basic Communications Electronics - [3 Exam Questions --3 Groups]

T7 A Fundamentals of electricity; AC/DC power; units and definitions of current, voltage, resistance, inductance, capacitance and impedance; Rectification; Ohm's Law principle (simple math); Decibel; Metric system and prefixes (e.g, pico, nano, micro, milli, deci, centi, kilo, mega, giga).

T7B Analog vs. digital communications; Audio/RF signal; Oscillator; Bandwidth; Amplification.

T7C Concepts of Resistance/resistor; Capacitor/capacitance; Inductor/Inductance; Conductor/Insulator; Diode; Transistor; semiconductor devices; Step up/step down transformer; Filter; Resistor Color Code system; Electrical functions of and schematic symbols of resistors, switches, fuses, batteries, inductors, capacitors, antennas, grounds and polarity; Construction of variable and fixed inductors and

capacitors; Factors affecting inductance and capacitance..

SUBELEMENT TS -Good Engineering Practice - [6 Exam Questions -6 Groups]

TSA Basic amateur station apparatus; Choice of apparatus for desired communications; Setting up station; Constructing and modifying amateur station apparatus; Station layout for CW, SSB, FM, Packet and other popular modes

T8B How transmitters work; Operation and tuning; VFO; Transceiver; Dummy load; Power supply; Amplifier; Stability; Micro- phone gain; FM deviation; Block diagrams of typical stations.

T8C How receivers work, operation and tuning, including block diagrams: Super-heterodyne including Intermediate frequency; Reception; Demodulation or Detection; Sensitivity; Selectivity; Frequency standards: Squelch and audio gain (volume) control.

T8D How antennas work; Radiation principles; Basic construction; Half wave dipole length vs. frequency; Polarization; Directivity;

.ERP; Directional/non-directional antennas; Multiband antennas; Antenna gain; Resonant frequency; Loading coil; Antenna switch; Electrical vs. physical length; Radiation pattern; Transmatch.

T8E How transmission lines work; Standing waves/SWR/SWR-meter; Impedance matching; Types of transmission lines; Feed point; Coaxial cable; Balun.

T8F Voltmeter/ammeter/ohmmeter/multi/S-meter, peak reading and RF watt meter; Building/modifying equipment; Soldering; Mini- mum tools needed for building kits; Making measurements; Test instruments..

SUBELEMENT T9 -Special Operations - [2 Exam Questions --2 Groups]

T9A How an FM Repeater Works; Repeater operating procedures; Available frequencies; Input/output frequency separation; Repeater ID requirements; Simplex operation; Coordination; Time out; Open/closed repeater; Responsibility for interference.

T9B Auxiliary, beacon, satellite, space, EME communications; Radio control of models; Autopatch; Slow scan television; Telecommand; CTCSS tone access; Duplex/crossband operation.

SUBELEMENT TO -Electrical. Antenna Structure and RF Safety Practices - [6 Exam Questions -6 Groups]

TOA Sources of electrical danger in amateur stations: lethal volt- ages, high current sources, fire; avoiding electrical shock; Station wiring; Wiring a three wire

electrical plug; Need for main power switch; Safety interlock switch; Open/short circuit; Fuses; Station grounding.

TOB Lightning protection; Antenna structure installation safety; Tower climbing Safety; Safety belt/hard hat, safety glasses; Antenna structure limitations.

TOC Definition of RF radiation; Procedures for RF environmental safety; Definitions and guidelines.

TOD Radiofrequency exposure standards; Near/far field, Field strength; Compliance distance; Controlled/Uncontrolled environment.

TOE RF Biological effects and potential hazards; Radiation exposure limits; OET Bulletin 65: MPE (Maximum permissible exposure).

TOF Routine station evaluation. (WB3FQY)

PRODUCTS AND OBJECTS TO GAIN INTELLIGENCE.

The two-year-old Auto-ID Center at *MIT (Massachu- setts Institute of Technology)* is working on an global System of tracking goods using low-cost radio-frequency identification tags linked to an Internet-like infrastructure..

The automatic ID project has \$9 million in research funding from a consortium of big companies and govern- ment agencies including Pepsi, Johnson & Johnson, the U.S. Dept. of Defense, Procter & Gamble, Wal-Mart; International Paper, UPS, Kraft Foods, The Gillette Company ...and dozens of others. Motorola and Intel are involved from a hardware standpoint. The objective of the system is to link products, Businesses, and consumers into a massive interactive real time network. The project's director is a Procter & Gamble executive who has been reassigned to MIT.

Toward that end, the Auto-ID Center is developing ...smart tag" technology for embedding intelligence, identity, and Internet connectivity into everyday objects that will revolutionize how we make, buy, and use products. The technology is based on RFID tags which can be read from 5 feet away. Each chip has its own tiny antenna and broadcasts on an unlicensed frequency.

MIT envisions that within a decade, UPC is will give way to the ePC, Electronic Product Code. UPC (Universal Product Codes) are those bar codes currently printed on consumer products. EPC's are a 96-bit code of numbers embedded into a "smart" chip and attached to various products and objects. Auto-

ID technology has the capability to identify more than 268 million manufacturers, each with more than one million individual products.

It is predicted that within ten years nearly every consumer item will sport a tiny Microchip that continually broadcasts its existence to radio-frequency readers at loading docks, store shelves, entrances, security stations and parking lots just about everywhere.

Radio chips are not new. They are widely used to tag livestock, keep track of rail cars, in toll-tag machines on highways ..even to purchase gas at ExxonMobil's ..1 *SpeedPass* wireless gas pumps.

What is new is RFID tag expansion to groceries, consumer products, all sorts of objects ...and connectivity to the Internet. A microchip company in Morgan Hill, California (Alien Technology) is developing the chips for MIT. Their flat chips, about the size of a grain of sand, are expected to cost about a nickel once in wide distribution. .

Each smart tag is scanned by a wireless radio frequency "reader," which transmits the product's embedded identity code to the Internet. That is where the "real" information on the product is stored. Sun Microsystems is working on the software and servers needed to assemble the chip data into useful databases. That information is then instantaneously communicated back from cyber-space to provide whatever information is needed about that product.

Shoppers will be able, to point their scanner-equipped cell phones or P.DA's (personal digital assistants) at a product and display features on their screens from the manufacturer's web site while they're in the store. Wal-Mart is already testing the system in a Tulsa store. The arrival of the ePC will be greatly hastened if the world's largest retailer commits to the technology.

Alien Technology even has developed an inexpensive grocery store shelf RFID tag whereby the shelf price label can be kept up to date electronically. Theft will be drastically reduced because items will report when they are stolen, their smart tags also serving as a homing device toward their exact location. Benefits to consumers will be equally dramatic. For example, you may never have to read microwave cooking instructions again. The appliance will read the ID tag and set the cooking parameters for you. And the clothes itself will be able to program washing instructions into your washing machine.

At least one luxury designer (Pride of Italy) is already attaching Texas Instruments chips to fashion items in its New York boutique. Clothes brought into dressing rooms by customers activate a video screen showing models wearing the same items and suggest related accessories. RFID tags are even expected to

be implanted into your pet so lost dogs can be immediately identified.

Shopping will no longer involve long, tedious lines at the checkout counter because items are automatically scanned and billed to your pre-selected personal account as you leave the store.

Smart shelves with wireless sensors will tell manufacturers and store employees when a product needs replenishment. It is the ultimate in inventory management ...no hand-counting necessary -the chips handle everything including reordering the goods. Procter & Gamble's goal is to use information provided by the tags to cut its inventory by 40%.

But not everyone especially privacy advocates are excited about automatic data collection and the coming smart tag revolution. While UPC bar codes let companies know what is selling, the new ePC tags will let businesses track products after they have left the store.

They fear that information gleaned from the RFID tags that you may be wearing or carrying will provide a profile that can be specifically linked to a person and used for all sorts of targeted purposes. Your clothes, for example, could indicate your preferences ...even your income level as you walk past a sensor installed in a department store door. The store will know where and when everything was bought and how much was paid.

MIT Auto-ID website is at <www.autoidcenter.org> (WB3FQY)

Field Day June 22-23

This edition of QRZ is prepared early in order to include information about the Annual Field Day operation from Ironville. Tim Headings has already sent information.

Members are needed to help in setting up antennas on Friday evening June 21st at 6 PM until finished.

Work will continue Saturday morning starting at 8:00 AM.

Operation begins at 1400 EDT and continues for a 24 hour period. There will be plenty of opportunities to get in operating time especially during the night hours.

ALERT-ALERT-ALERT

Be suspicious of any e-mail that asks you to forward it to as many people as possible. An e-mail hoax is making the rounds that claims to be a virus alert bulletin. It warns thazt a file name "jdbgmgr.exe" will damage a victim's computer system two weeks after infecting a PC unless sit is deleted. Actually the file is a needed Java software file installed on all Windows PC's.

If deleted, some Java applets and JavaScript will not run. The message generally says "...my address book was infected, which means yours will be also. I have a fix below..." followed by instructions on how to delete the file. The hoax has also been translated in to Spanish, French, Portuguese and Italian.

AND

AT&T Broadband and Comcast Corp. are plannong a \$72 billion merger. The new firm will be name AT&T Comcast Corp. High volume Internet users can expect to pay more if Comcast Corp. succeeds in taking over AT&T Corp's ca ble division. Existing technology already allows ISP.s to keep track on online consumption.
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