

RCA AMATEUR RADIO CLUB

APRIL, 2011

MONTHLY NEWSLETTER

INDIANAPOLIS, IN

THE NEXT MEETING OF THE RCA AMATEUR RADIO CLUB WILL BE
TUESDAY, APRIL 12TH, 6:30 PM AT [G.T. SOUTH'S](#),
5711 E. 71ST STREET, INDIANAPOLIS, IN

RCA ARC NEWS

SUMMARY OF THE MARCH MEETING -- At the March meeting, K9RU reported we have re-installed a preamp at the 21st & Meridian repeater receive site (something we've been going to do for a couple of years). Ivy Tech will be taking over ownership of that building but we don't expect that to effect our receive site. Field Day and the Indy Hamfest were again discussed. Our Club voted to again sponsor prizes for the QSL contest and Homebrew contest. Dave, N9KZJ, reminded everyone of the upcoming O'Dark 30 Swapfest coming up on April 16. The location is the American Legion Post in Speedway, across Georgetown Rd. from the Track. Dave also reminded us about the WW2IND operation on Memorial Day and the Museum Ships event.

The Indianapolis Radio Club is chartering a bus to the Dayton Hamvention again this year. This is "to the door service" at the Hamvention on Saturday, May 21. The bus will park at Hara Arena so you will have access to it. Tickets are \$35. Contact Jay Willever, K9LJW for tickets.

INDIANA QSO PARTY IS COMING UP -- Don't forget the Indiana QSO Party starting at 1600 Z on Saturday May 7, lasting for 12 hours. Website is <http://www.hdxcc.org/inqp/>
New for 2011 is a Multi-operator, multi-transmitter class... perfect for clubs to try out their Field Day setup with all the signals they can muster.

Also.... mobiles, portables and rovers the County Hunter contest has moved to a different weekend this year... so why not operate in Indiana on May 7? Post plans for your counties now!!! There are only 92 Indiana counties so don't delay. Stations planning to operate from Indiana can post plans on the INQP reflector (sign up from the website) or send them to KJ9C@arrl.net. --Mel KJ9C

THE IRC "Oh-Dark-30" TAILGATE SWAP MEET -- "Oh Dark 30" Indianapolis Radio Club Tailgate Swap meet, the 2nd year Date: 16 April 2011 Sat Times: 0630 am to 11:00 am "RAIN or SHINE" event. Location: Speedway IN American Legion Post 500..1926 N Georgetown Rd.(west side of the 500 Race Track) West side of street half way between 16th & 30th street on Georgetown Rd. There is no charge for setup or parking. Donuts & coffee at 06:30 AM while they last! Lunch will be served at 11AM ! There will be a 50/50 Blind Draw Donation.

HAMFESTS, OPERATING EVENTS & TESTING

Apr 16	IRC's "O'Dark 30 Swapfest" - Georgetown Road (Across from Speedway Track)
Apr 16	North Central Indiana Hamfest, Peru, IN http://www.nci-hamfest.net
May 7 - 8	Indiana QSO Party
May 20 - 21	Dayton Hamvention
Jun 11	South Bend Hamfest, South Bend, IN http://w9ab.org
June 25 - 26	Field Day
July 9	Indy Hamfest, Camp Sertoma, Indianapolis http://www.indyhamfest.com

All dates, unless otherwise stated, are UTC. See the ARRL Contest Branch page, <http://www.arrl.org/contest-update-issues>, the WA7BNM Contest Calendar, <http://www.hornucopia.com/contestcal/> and the ARRL Special Event Stations page, <http://www.arrl.org/special-event-stations> for more info. See ARRL training page for test sessions: http://www.arrl.org/exam_sessions/search

MIKE KOSS, W9SU SK – MARCH 28, 2011

Mike Koss, W9SU passed away March 28 at the age of 58. He was first licensed in 1968 as WB9BPG while in high school. Mike dreamed big and nothing seemed to be impossible. Mike had worked at Radisco, and owned VanSickle, IES, and then ICE.

Mike purchased the land and the houses on Gale Street in 1986 for the W87PAX Pan Am Games Special Event Station and it was a big success. In 2004 it became the location for the W9IMS Indianapolis Motor Speedway Special Event Station. The station and antenna systems have evolved over the years and are very impressive.

Mike was always promoting the hobby and willing to help anyone who asked. When Thomson was moving from Sherman Drive to Carmel and we needed a new location for the '88 repeater. He offered us space and the use of his towers. The repeater remains there today. --Jim K9RU

YAESU, ICOM AND KENWOOD ISSUE STATEMENTS REGARDING EFFECTS OF EARTHQUAKE ON OPERATIONS

In a letter to the Amateur Radio community, Vertex Standard Chief Executive Officer and President Jun Hasegawa expressed his "sincere appreciation to all of you for your kind words and thoughts about us" after the devastating 8.9 earthquake. Vertex Standard is the parent company of Yaesu. All Vertex Standard employees and their families are safe and unhurt, Hasegawa said, but the company has not been able to reach many of their dealers and subcontractors who are located on the coast area: "We just hope that they are alive." Hasegawa said that a Vertex Standard factory in Fukushima was damaged in the earthquake. Even though the factory is not located near the coast and the damage was minimal, he said that Vertex Standard has decided to "disable the operation at this moment." Saying that they are working very hard to get the factory back to its normal operation, Hasegawa said that "it may take one to two weeks to restart operation in the Fukushima factory. I would like to ask for your understanding and cooperation at this time."

According to a press release, no one from ICOM is known to be injured. No damage has been reported at ICOM's headquarters in Osaka, or at either of their two main factories in Wakayama; both Osaka and Wakayama are located far south of the most severely affected areas. The branch offices in Tokyo and Sendai, however, did suffer some minor damage. "Most of ICOM's facilities and systems are ready to get back to normal business, but supplier logistics, commuting issues and future power disruptions will affect our company," the press release said. "It is too soon to tell how big an impact the earthquake and its aftermath will have on ICOM. We appreciate your interest and concern."

"Thankfully, our staff in Japan is safe due to earthquake preparedness and the special construction of our buildings," said Kenwood USA President Junji Kobayashi on [the Kenwood website](#). "Power outages and interruption of mass transit have kept most of Kenwood's staff at home since the earthquake; however, we expect the infrastructure to improve in the coming week and our operations to fully resume accordingly. We appreciate the concern for our employees expressed by all those who have contacted us." Kenwood's primary office facilities in Yokohama and Hachioji were not damaged,

due to their proximity further south and west of the quake's epicenter. Since Kenwood's primary manufacturing facilities are in Malaysia, electronics production is unaffected. –ARRL Letter

ARISSAT-1 OPERATIONS POSSIBLE 11-13 APRIL UTC

The ARISSat-1 satellite, presently still inside the ISS, will be turned on and use an external antenna from the afternoon of 11 April UTC through the morning of 13 April to celebrate the 50th anniversary of Yuri Gagarin's first manned space flight. More specific times will be announced as they become available.

AMSAT will support this event and issue certificates to those stations reporting reception of the ARISSat-1 signals. Roscosmos has announced that the satellite will be deployed into orbit during the next EVA in July of this year.

The release of a development version of the BPSK/CW decoding software next week. Schedule specifics of the 12 April operation transmissions are not available yet. These will be posted on the AMSAT and ARISSat1 web sites and in ANS when available.

The transmissions on the 12th will see ARISSat-1 in low power mode, this means 40-60 secs on, 2 minutes off. It should be a challenge to find and tune the CW signal then decode some BPSK data during the short on times. This mode was developed to be used when the batteries are low or the satellite is in eclipse. During this even data and information will be collected to improve the BPSK demodulating, decoding and display software.

Those with the FUNcube Dongle and SDR-IQ and variants are encouraged to record the wideband transmissions to help us better understand the signals and improve the ground station software.

Information on where to send the recordings will be available on the AMSAT and ARISSat1 Web sites. --Gould, WA4SXM

AMSAT website <http://www.amsat.org>

ARISSat1 website <http://www.arissat1.org/>

HAMS HELP WHEN PHONES FAIL AT SOUTHERN CALIFORNIA HOSPITAL

When nurses and other caregivers picked up their phones at Children's Hospital of Orange County (CHOC) in California in the early morning on March 21, there was no dial tone. A power surge caused the central processor in the hospital's phone switch to fail. Following established procedures, the Lead Operator at the CHOC switchboard immediately activated the Hospital Disaster Support Communications System (HDSCS), using an off-switch tie-line to reach April Moell, WA6OPS, head of this ARES® group that specializes in helping hospitals when their communications fail.

Moell established a 2 meter net and initiated a call-out of HDSCS members via telephone and pager. Ken Simpson, W6KOS, and Clay Stearns, KE6TZR, soon arrived at the hospital to help establish a link with the outside world. Soon, more operators were at the hospital to communicate for its most important units, including the emergency department, neonatal intensive care, pediatric intensive care and the pharmacy.

She then contacted the supervisor at Orange County Communications to report the outage and to provide her telephone number for incoming calls to CHOC. This resulted in Moell receiving several

urgent messages for the hospital, including one regarding the transport of a young patient coming in for an appendectomy. Message handling continued through the morning, with some of the first-to-arrive operators being relieved by other HDSCS members when they had to leave for work or other commitments.

By 10:45 AM, some phones were working, but spare parts were on their way from a supplier. HDSCS continued to provide unit-to-unit and hospital-to-community messaging as needed, including coordination of patient treatments and a request for blood. At 1:02 PM, the repair crew announced that the phone system was back to normal, except for some voicemail functions. HDSCS members remained on station for 30 more minutes, as they always do to insure that phone systems are stable before securing.

This is the 31st year of HDSCS service to medical facilities in Orange County and the 114th activation to provide communications support when telephones have failed or overloaded. The reasons for HDSCS involvement have ranged from equipment failure, to cut cables, to natural disasters such as earthquakes, floods and wildfires. Each member has their own go-kit that is ready to take to any of the 36 supported hospitals to establish communications. The HDSCS is familiar with CHOC because the group has participated in drills and communications emergencies there before, including an external phone outage that lasted 22 hours in August 2006 when a construction accident severed fiber optic cables. –ARRL Letter

ARRL FILES *PETITION, REQUEST FOR TEMPORARY WAIVER* WITH FCC REGARDING VHF VOICE AND DATA EMISSIONS

On Tuesday, March 15, the ARRL filed a *Petition for Rulemaking* and a *Request for Temporary Waiver* to authorize the use of single-time-slot Time Division Multiple Access (TDMA) emissions in the amateur bands at and above 50 MHz, wherever multiple-time-slot TDMA is authorized. (See below for copies of these two documents.)

The ARRL -- which called its *Petition* “very narrow in scope” -- seeks to facilitate the use of and experimentation by radio amateurs with existing narrowband spectrum-efficient digital voice and data technology. “Such technology is now in regular and increasing use in the private land mobile radio services, but its use in the Amateur Radio Service is now apparently unintentionally precluded by two specific Commission rules,” the ARRL’s *Petition* stated.

The *Petition* asks the FCC to allow those amateurs who are presently using a Motorola narrowband (12.5 kHz) digital land mobile system -- commercially marketed as [MotoTRBO](#) -- to be used legally. Because of some restrictions in the Part 97 rules, the TDMA repeaters (which are multiple-time-slot devices) are legal, but the mobiles and portables are not because the emissions used (single-time-slot TDMA) are not authorized anywhere, due to the emission designator.

The legality of the use of these systems, however, was drawn into question only recently. The ARRL called it “urgent to allow these existing systems to continue to operate and to allow the sponsors of them to avoid losing their investment in them.” Therefore, contemporaneously with its *Petition*, the ARRL submitted a *Request for Temporary Waiver* of the same rules sought to be modified in the *Petition*. This would, if granted, permit these systems to continue to operate (on a non-interference basis), while the *Petition* is under review and subject to its outcome.

The use of TDMA digital emissions in certain frequency bands in the Amateur Service is on the increase, the ARRL noted. There are numerous narrowband UHF repeater facilities now operating that use multiple slot TDMA repeaters and single slot TDMA handheld digital transceivers, principally in the 70 cm band. These systems have been installed primarily in the western part of the US and in the New York City area, but also in several midwestern states. –ARRL Letter

FCC ADOPTS SPREAD SPECTRUM RULES CHANGES

In a *Report and Order* adopted February 22 and released March 4, 2011, the Federal Communications Commission has eliminated the requirement that amateur stations transmitting Spread Spectrum use Automatic Power Control (APC) to reduce transmitter power. At the same time, the Commission has reduced the maximum power of a Spread Spectrum emission from 100 to 10 W PEP.

The *R&O* explains the Commission's actions this way: "We believe that these rules changes will (1) encourage individuals who can contribute to the advancement of the radio art to more fully utilize SS technologies in experimentation, and (2) balance the interests of all users in mixed-mode and mixed-service frequency bands until sharing protocols are sufficiently developed to avoid interference."

The ARRL filed a *Petition for Rulemaking* back in March 2006 asking that the APC requirement be eliminated. Since it was first imposed in 1999, the ARRL's *Petition* observed, the APC requirement has "been impractical of compliance; unnecessary in order to protect other Amateur Radio operations or the operation of any licensed radio service sharing certain Amateur Radio allocations; and it has served as an unintended, but effective deterrent to Spread Spectrum experimentation in the Amateur Service." While it did not propose the power reduction in its petition, in later comments the ARRL conceded that it has not been demonstrated that the proposed power limit would pose a substantial obstacle to SS experimentation, and stated that "it is willing to accept the restriction presently, subject to revisiting the matter after some reasonable experience is gained."

ARRL Chief Executive Officer David Sumner, K1ZZ, commented: "We are pleased that this relatively minor matter finally has been resolved. We hope that as soon as the amended rules become effective, amateur experimenters will take advantage of the greater flexibility that has been afforded to them."

The changes to Sections 97.311 and 97.313 of the Commission's Rules will be effective 30 days after the *R&O* is published in the *Federal Register*. –ARRL Letter

NIST TO CONDUCT TIME AND FREQUENCY USER SURVEY

The National Institute of Standards and Technology's (NIST) Time and Frequency Division is conducting a [survey](#) to learn more about its users, seeking to determine how the agency can make its services more useful in the future. NIST services include [WWV](#), [WWVH](#) and [WWVB](#), which provide reference time and frequency signals via radio. The NIST also provides the Internet Time Service -- which provides accurate time synchronization to computer systems -- and several other services to offer accurate time information via telephone or web pages. Radio amateurs are encouraged to complete the survey.

"If you use any of these services, we want to hear from you," said WWVH Electronic Technician Dean Takamatsu. "The survey should take just a few minutes to complete and your input will be greatly appreciated."

WWV and WWVB in Fort Collins, Colorado, along with WWVH on Kauai, Hawaii, broadcast continuous time and frequency information to millions of listeners worldwide. Information broadcast includes time announcements, standard time intervals, standard frequencies, UT1 time corrections, a BCD time code, geophysical alerts, marine storm warnings and Global Positioning System status reports. –ARRL Letter

NCVEC DELETES QUESTION FROM AMATEUR EXTRA QUESTION POOL

Due to the [FCC revising the rules concerning Spread Spectrum](#), the Question Pool Committee of the National Council of Volunteer Examiner Coordinators (NCVEC) has decided to delete a question from the Amateur Extra class question pool. According to QPC Chairman Rol Anders, K3RA, when the Spread Spectrum rule change goes into effect, the answer to question E1F13 in the Amateur Extra class question pool will no longer be correct.

In March 2011, the FCC -- acting upon a 2006 *Petition for Rulemaking* filed by the ARRL -- eliminated the requirement that amateur stations transmitting Spread Spectrum use Automatic Power Control (APC) to reduce transmitter power. At the same time, the Commission reduced the maximum power of a Spread Spectrum emission from 100 to 10 W PEP.

Anders encouraged those who administer Amateur Radio license exams to remove question E1F13 as soon as possible, but advised that it must be removed when the rules change goes into effect. The changes to Sections 97.311 and 97.313 of the Commission's Rules will be effective 30 days after the [Report and Order](#) is published in the *Federal Register*. The current Amateur Extra class question pool is effective through June 30, 2012. --ARRL Letter

SO JUST HOW MUCH FASTER ARE COMPUTERS TODAY?

I purchased my first computer, an Apple][+, in 1983. I paid US\$2,000 for it. At the time, it was a high-end PC (the term personal computer was just then coming into use) with two 5.25" floppy drives, a 6502 microprocessor, and 48 kBytes of RAM. There was no hard drive. I wrote everything in assembly language, including a complete set of floating point math routines. I developed my own format for single precision floating point numbers. After I had completed the project, I discovered that my custom format had actually turned out to be identical to the standard IEEE floating point format! So now I know why a floating point number has its exponent represented in something called "excess binary" rather than regular binary or two's compliment... I had figured it out the hard way. (This allows a true zero to have a zero exponent, which is less than the exponent of any non-zero number, among other reasons.)

My second computer was a Commodore 64, again about US\$2,000. I did not get a floppy drive because it was bulky and expensive. The computer had an extraordinary full 64 Kbytes of RAM. With some changes in the memory map, like different IO locations, I would assemble the software on my Apple and then just copy the binary over to the Commodore using an RS-232 serial link, for which I wrote the drivers on both ends myself. To ship software to customers, I recorded it on to an audio cassette tape.

I have fond memories of those days, and many late nights, slaving away on the computer as I wrote an antenna analysis program. However, I never did a matrix solve on those first two computers. That would wait for my third computer, which I acquired in 1985. One of the first IBM-PCs, it also cost about US\$2,000, and it also had two floppy drives and no hard drive. There was a whopping 640 Kbytes of RAM, and it ran at the blazing speed of 4.77 MHz. (That's right, MHz, not GHz!) In 1985, this was an incredible speed. After all, that was at a higher frequency than my first amateur radio contact, 3.726 MHz.

I also splurged for a US\$50 copy of Borland Turbo Pascal, so I could turn out software a little faster. It was nice to not have to buy Microsoft's US\$400 equivalent because I was a graduate student, with a mortgage, a wife, and a new baby. Expenses were very carefully considered back then.

I was working on my dissertation on the Method of Moments under Prof. Roger Harrington, who first fully described and unified the technique. As part of the Method of Moments, we must invert a matrix. The algorithm usually used is called LU (for "Lower-Upper") decomposition. The first IBM-PCs used the Intel 8088 microprocessor. It had a 16-bit internal data bus, but was 8 bits externally, thus reducing cost. For speeding up math operations, I had also purchased the optional 8087 co-processor. It was a separate chip (today the co-processor and CPU are on the same chip). While mathematical operations are being performed in the 8087, the address of the next operands can be calculated in the 8088. So I wrote the inner loop of the LU decomposition routine in assembly language for maximum speed.

Flash back to the late 1960s and early 1970s. Roger Harrington is placing the Method of Moments into its modern, unified form. However, some of his attempts to publish are met with skepticism by reviewers. One reviewer comment, which Prof. Harrington told me about, went something like this, "All your work on numerical electromagnetics is useless because it has been proven that it is impossible to invert even a 100×100 matrix... because the magnetic tape would wear out going back and forth." Very funny today, but back then it was probably a true statement. It is just that the reviewer did not anticipate that things might change in the future. We should all be careful we do not make similar mistakes today when we review papers.

My IBM-PC had sufficient memory to store a 100×100 matrix. It took about one hour to invert. Prof. Harrington was pleased.

When I first published my work with Method of Moments, I was likewise told by a respected microwave engineer that all this numerical electromagnetics was ivory tower academic stuff, completely useless to the practicing microwave engineer. At the time, he was right. A 100×100 matrix was about the largest that we could handle. One hundred subsections is not big enough to do any more than a couple simple discontinuities. At this time, I also had to make the decision to continue on to commercialization or drop the idea and get on with life.

It was discouraging. Matrix solve is an N^3 process. That means we would need a computer eight times faster to do 200 subsections in one hour, as we would need to invert a 200×200 matrix. Would we ever see a computer with, my gosh... a 40 MHz clock rate? Maybe in five years? Maybe ten? How about maybe never.

In spite of the gloomy prospects, I decided to go on with commercialization. Gradually, computers got faster. We started making sales. We could move into office space, hire employees. The past quarter century has turned out to be an incredible ride.

So how much faster are computers today? Late in 2010, my son built a liquid-cooled dual hexa-core computer with 24 GBytes of RAM. It has two hard drives... and no floppy drives! The cost is about US\$3,000. I can now invert a $100,000 \times 100,000$ matrix in just under three hours.

Given that matrix solve is an N^3 operation, this means that hardware and software today, as applied to the same matrix solve technique, is now over 300,000,000 times faster than in 1985. Who would have ever guessed? Not in my wildest dreams. Today is a wonderful time to be involved in the field of applied numerical electromagnetics. –RFGlobalnet, Dr. James C. Rautio of Sonnet Software, Inc..

SERIOUS HAZARD OF COMMON 6 PIN DC POWER CONNECTOR ON HAM TRANSCEIVERS BY VK1OD



Many amateur transceivers use a Molex type 6 pin power connector in a 3 x 2 array of pins. These connectors are used on many Icom, Kenwood, and Alinco radios, and possibly some other brands.

At least some proprietary AC power supplies for these transceivers use pins 3 and 6 of the connector for control of the AC power supply and they may have AC line voltage present on one of those pins even when the power supply's power switch is off.

An example is the Kenwood PS-30, where pin 3 is connected to unswitched AC line voltage.

Though these power connectors are polarized, the scheme used does not effectively prevent incorrect engagement of plug and socket. It is quite easy to incorrectly engage one row of pins of the plug and socket when the plug is rotated 180 degrees from the correct alignment. If this is done, the AC line voltage is applied to the +12VDC line of the transceiver, whilst the power supply -12VDC lead is applied to the transceiver ground even if the power supply's switch is OFF.

The results of such a connection are high voltage and fault current, which are likely to be catastrophic to the transceiver, but of more importance, could result in a transceiver chassis that is at AC line potential if the ground connection is not made or fails before a protective device operates, giving rise to a serious risk of personal injury or death.

All amateurs should review their use of AC power supplies with these transceivers to determine if this hazard exists in their station. The work around is to never insert the DC power plug from an AC power supply into one of these transceivers unless the AC line cord is removed from the mains power outlet.

It is a good idea to modify the power supplies to disconnect the AC control wires from the transceiver cable. Such modifications may void any warranty. If you are not competent, you should seek the assistance of a competent person. Use this information entirely at your own risk. –VK1OD, Canadian Amateur Radio Bulletin

SHORTS

RESPECTED JOURNAL PUBLISHES EXPLANATION FOR LOW SUNSPOTS - An article in the March 3 issue of the journal *Nature* purports to explain the extended sunspot minimum from 2008-2010. According to one of the authors, Piet Martens, the last time a sunspot minimum lasted twice as long as usual was around 1913 and before that, 1810. Although solar activity has increased recently, scientists have been puzzled by the lack of sunspots from 2008-2010. This quiet period had prevented the ionosphere from supporting much of the long-range higher frequency HF Amateur Radio communication that had been expected during the past few years. Read more [here](#). –ARRL Letter

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