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# The WA7VE

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## FIELD DAY IS SPECIAL!

### FIELD DAY

SeaPac 2013 is now history. I do not know about you but I had a great time!

Now our full focus turns to Field Day. That very special, once-a-year event. Field Day can only truly be experienced by immersion. Coming out for dinner and saying Hi to a couple of people and then moving on is not the same as "being there."

You should consider arriving early and helping with setup. You need to get on the air and/or log for someone else while they run through QSO's. Get involved in preparing and serving a meal. Try staying up all night. Okay perhaps you could sleep a couple of hours in your car, then get right back in there and start at it again. Work the GOTA (Get On The Air) tent and speak with the curious public.

Sunday afternoon seems like it will never end. There is just a certain air of excitement about logging that last QSO and tallying up the points, counting the states worked and the total raw score.

Then there is the inevitable. Someone must be the last one there. Be that person or assist that person and learn how to tear down, pack up and move out.

### FIELD DAY, CONT'D

Be the person that walks the area to be absolutely certain that you leave it like you found it or a little bit cleaner and neater. After being there at the beginning, you will begin to gain an understanding of what Field Day is really all about.

Yes, Dorothy - I understand that different people have different levels of interest and commitment to this hobby we share.

Many of us have heavy commitments to friends, family, jobs and life in general.

The real point here is to enjoy Field Day and take it in at whatever level you can. I bet you will want more involvement next year.

There is not a weekend that goes by that something special does not happen in amateur radio. Even for ham radio fanatics you just cannot do it all. Do what you can. It is a very fulfilling hobby.

Last year we had 58 area hams sign into the site over the weekend. I do not know how many did not find the sign in sheet.

Come and partake of Field Day. You will not regret it.

### OR. REP. WALDEN (W7EQI) LOOKS TO REFORM THE FCC

House Communications and Technology Subcommittee Chairman Greg Walden, (W7EQI) of Oregon has praised interim FCC Chair Mignon Clyburn. He told C-SPAN last weekend he has concerns about Tom Wheeler. Wheeler (Obama's pick for chairman of the regulatory agency).

Senate Commerce Committee Chairman John Rockefeller has said he plans to hold nomination hearings in June for Wheeler who is a former telecommunications industry lobbyist. Walden is concerned about Wheeler's position on some past telecommunications deals. He told C-SPAN the commission should not use its power to approve/deny a merger to exercise market changes it cannot do through the regulatory environment.

Walden has let it be known Commission reform is still on his agenda. While he praised former FCC Chairman Julius Genachowski for some of his moves to modernize the agency he also noted that the FCC needs more checks to keep it on schedule and make sure the it doesn't lose sight of the progress it's made as it transitions to new leadership.

# HAM RADIO ROBOTICS

NASA has been doing some exciting explorations of Mars with robots, currently Opportunity and Curiosity, which are maneuvered on the Martian surface by remote control.

These robots collect and analyze soil samples and relay the results of these distant experiments back to Earth. While students can learn about these experiments in newspapers, scientific journals, on the Internet or TV, wouldn't a more active approach provide a more engaging learning experience? Why not let students experience the same thrills as the NASA scientists and engineers through a simulation that they conduct in their own classrooms?

The basic concept of MAREA uses robotic movement commands that are attached in the text portion of an Automatic Position Reporting System (APRS) packet transmission. The APRS packet with the attached commands is sent from a "mission control" school via the terrestrial APRS network or, when possible, even via the Amateur Radio station on the passing International Space Station (ISS), to a "ground station" school. At the ground station school the command packet is received and the command data is linked by UHF radio to the "Mars" robot for execution.

The MAREA system components consist of:

- the typical 2 meter packet capable ham radio transceiver (or receiver if reception only is desired)
- a computer running a free APRS packet display program, sound card TNC (Terminal Node Controller) and serial loopback software packages
- UHF data link transceivers
- an instructional robot

Read the full ARRL article at

<http://www.arrl.org/marea-ham-radio-robotics>

## 85 YEARS OF TV - REALLY? 85 YEARS??

On February 9, 1928 the Baird Television Development Company (BTDC) achieved the first television transmission between London and Hartsdale, New York. That same year, BTDS also demonstrated the first TV transmission to a ship in mid-Atlantic.

On July 3, 1928 John Logie Baird demonstrated the world's first color transmission, using scanning discs at the transmitting and receiving ends with three spirals of apertures, each spiral with a filter of a different primary color; and three light sources at the receiving end, with a commutator to alternate their illumination. On August 10, 1928 he demonstrated stereoscopic 3-D television.

Read more about John Logie Baird and his achievements at

[http://www.bbc.co.uk/history/historic\\_figures/baird\\_logie.shtml](http://www.bbc.co.uk/history/historic_figures/baird_logie.shtml)

Transatlantic Television in 1928

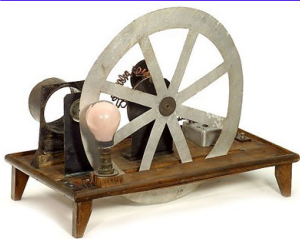
<http://www.bairdtelevision.com/1928.html>

How "Stereoscopic" Television is Shown

<http://www.bairdtelevision.com/stereo.html>



MAREA = The Mars Lander Amateur Radio Robotics Exploration Activity.



## THE DX PAGE

W5JON will be operating as V47JA from his Calypso Bay, St. Kitts, West Indies vacation home from July 9th until August 10th. Listen out for John on 160 through 6 meters using SSB, RTTY and several digital modes. He will also be using his newly issued contest call V49J in the IARU and Islands on the Air contests on SSB. John's wife Cathy, W5HAM, may get on the air occasionally operating as V47HAM. All QSL's go direct or via Logbook of the World to W5JON. PA3A, PD1AEG, PA8AD and PA8AN will be active from Congo September 28th to October 11th as TN5MS. They will be active on H-F Bands. QSL via PA3AWW, either direct, or Logbook of the World.

ZL2JU is currently active from Rarotonga in the South Cook Islands as E51JJU. He is operational on most of the High Frequency bands but no exact schedule of operating times is mentioned. QSL via home call.

OO9O will be on the air portable LX from Luxembourg from June 17th to the 20th. He plans to focus on 30 meter CW and PSK. QSL via home call, or electronically using eQSL or Logbook of the World.

Five operators will be active using the call will be active from Ustica Island from July 24th to the 29th signing IE9 stroke IK6JRI. They also plan to take part in the RSGB sponsored Islands on the Air contest that takes place during their stay. If you make contact please QSL via IK6JRI

Lastly, G0MGX is currently working in Qatar and has obtained a permit to operate stroke A7. He says to listen out for him during evenings and some weekends primarily using RTTY and JT65. He adds that the Qatar Amateur Radio Society has made him feel very welcome and that he is very grateful to them for the support and help they have given to him. He adds that he has provided the ARRL with the necessary documents of licensing for all his call signs and uploads to Logbook of the World regularly. QSL as directed on the air

After many months of careful planning, the XR0ZR team is pleased and proud to announce preparations for a multi-national DXpedition to Robinson Crusoe Island in the Juan Fernandez Archipelago (CE0Z), using the callsign XR0ZR. It is our privilege to activate this entity during the period November 8–20th, 2013.

The Juan Fernández Islands (Spanish: Archipiélago Juan Fernández) are a sparsely inhabited island group reliant on tourism and fishing in the South Pacific Ocean, situated about 600 kilometers off the coast of Chile, and is composed of three main volcanic islands; Robinson Crusoe Island, Alejandro Selkirk Island and Santa Clara Island. On the Club-Log's most wanted DXCC list, Juan Fernandez (CE0Z) ranks as #35 on the most wanted list for all amateur radio operators, #23 on the most wanted list for Asia, #27 on the most needed list for CW operations, and #18 on the most needed list for Digital Operations.

The Team is meeting in Santiago, Chile, and will depart by a chartered aircraft on November 7th. The Team expects to become active on November 8th. The main goal of this DXpedition is to work every amateur radio operator who needs Juan Fernandez, (CE0Z) for a new DXCC country. In addition, we will be active on all bands and modes from 1.8 MHz to 50 MHz with special attention to be made to accommodate distant stations during periods when propagation permits. We are planning to have 4 stations running simultaneously and hope to make thousand contacts worldwide. We are kindly seeking Club and Individual Sponsors to help us defray the costs of carrying out this important DXpedition.

Thank you for your assistance in helping make this a world class DXpedition.

You can follow us on:

Facebook : <https://www.facebook.com/groups/xr0zr/>

Website : <http://www.juanfernandez2013.com>

Twitter : @xr0zr

## EVEN MORE DX

JA9LSZ is reported as being currently active from Nepal as 9N7SZ. His operation is on the High Frequency bands only. If you work him please QSL to JA9LSZ.

According to SQ8X posting on the FT5XM Web page the group hopes to set sail for Amsterdam Island on January 15, 2014 and arrive on the 24th. Landing operations will begin as soon as the sea conditions and weather allow. Once the team is ashore, they will have 18 days to set up, conduct the DXpedition, and tear down for departure. You can follow developments at [www.amsterdamdx.org](http://www.amsterdamdx.org)

Members of the Dutch Society of Radio Amateurs will be active as 9H25 from Qawra, Malta between May 20th and June 4th. This in celebration of the groups 25th Holiday DXpedition to that nation. Operations will be on 80 through 6 meters using CW and SSB. QSL via PI4KGL



## DX GROUP ATTEMPTING TO ARRANGE OPERATION FROM NORTH KOREA

A well known group of DX'ers say that they are working to obtain permission to operate from North Korea which is the most wanted DXCC entity in the world. The Intrepid-DX Group, in partnership with the World-Wide DX Group says that for the past four years that they have been working with professionals in the business and tourism industries who are actively doing business in North Korea.

In a widely circulated press statement the organizations note that they have prepared a comprehensive, multi-faceted proposal, which has been delivered to the North Korean officials via their emissary located in China. Several members of the combined groups leadership and advisory team have made multiple visits to the region and are advising the overall groups accordingly.

The DXers say that they are using the same techniques that were successful in opening up Kurdistan, the South Sudan and Yemen to DXpedition activity. They add that they are leveraging their ideas and contacts towards the goal of a major DXpedition over a four week period from within the North Korea border. As we go to press, no date for such an operation has even been speculated.

What a catch that will be!



A patrolled outpost on the demilitarized zone, the 155-mile buffer between North and South Korea.

## HOW ABOUT SOME MORE DX?

UA4WHX is currently operational portable CP1 from Bolivia. You will find him on the various HF bands. QSL via UA4WHX.

ZL2AGY will be active from Rarotonga Island from May 9 to the 29th as E51FOC and E51AGY. QSL either via his home call.

F4CZU will be on the air from Gozo Island through May 18th as 9H3ZU. He will be active on most HF Bands. QSL via F4CZU

Lastly, HA0NAR will be operational from Viti Levu Island, Fiji Islands in October 2013 as 3D2AR. Listen out for him on all of the High Frequency bands. QSL via his home call

The battle for the International Lighthouse and Lightship Weekend leadership, held in August, is tied between Australia and Germany with 40 registrations each, out of more than 220 from 30 nations around the world. The USA has 23, England 18, Argentina 12, Ireland and Scotland 9, Canada, Netherlands and Sweden on 8, Portugal and Puerto Rico 4, while Finland, Poland, Northern Ireland and New Zealand each has 3. They are followed by Belgium, Denmark, Cuba, Malaysia, South Africa, Sri Lanka, Ukraine and Wales on 3, and single entries from Curacao, Chile, France, Honduras, Italy and Spain.

Registrations and countries numbers are only at the half-way mark, but they are ahead of this time last year, things are really starting to heat up. To register a lighthouse, lightship or marine beacon on August the 17th and 18th of August online, visit the dedicated website [www.illw.net](http://www.illw.net)

Andy, M0HLT, is expected to be active as VP8DOH possibly for 2 years. Andy, who is a regular contributor to Tony's 10-metre Band Report, is now based on the Falklands as an electrician. Activity will be limited between his work commitments. Operations will be SSB only and mainly on the higher HF bands, preferring 10 meters when conditions allow but will try 20 meters and above. QSL via eQSL only or LoTW

## WFF ACTIVITIES

DL-FF 092 - Niederlausitzer Landruecken, DL0LSW/p will operate from there for the IARU-R1 CW Fieldday. QSL via bureau and LotW.

FFF 031 - Nationalpark "Brenne", FFF 032 - Nationalreservat "Bois des Roches", FFF 033 - Naturreservat "Cherine", Vincent/HB9EVJ, Alex/HB9ICJ, and Eric/HB9IAB plan an activation of these areas as F/HB9HI/p between the 2nd and 8th of June. FF-031 on the 8th, -032 on the 4th or 5th, 033 on the 6th or 7th. QRV in CW and SSB. QSL via HB9HI (d/B).

HAFF-028 - Lazberci Biosphere Reservat, Bela/HA9SU and Lali/HA9CM hope to get this area on the air on June 1, success will depend on weather conditions though, as bad weather will prevent entry into the reserve. QSL via h/c (d/B).

## REPEATER LOSS!

Ruidoso News in New Mexico reports that the removal of ham radio repeaters from a tower worries emergency service personnel.

Tony Davis, president of White Mountain Search and Rescue, said he learned late Wednesday that the tower on Buck Mountain holding the amateur radio repeater that is owned and maintained by Rick Sohl of Southwestern Wireless, also a member of Sierra Blanca Amateur Radio Club, was sold to American Tower Corporation.

"Despite attempts by Rick to negotiate an arrangement, American Tower has decided to terminate ham use of the tower, effective

(Friday)," Davis said. "There are other towers there, but they are largely occupied."

The lack of backup communications could have serious implications for public safety in Lincoln County, Davis said.

Read the story at

[http://www.ruidosonews.com/ruidoso-ruidoso\\_news/ci\\_23215653/removal-ham-radio-equipment-from-tower-worries-emergency](http://www.ruidosonews.com/ruidoso-ruidoso_news/ci_23215653/removal-ham-radio-equipment-from-tower-worries-emergency)

This should be a concern for all amateur radio operators not just area repeater owners.

Large companies such as American Tower buying up repeater sites and kicking out

all ham gear is not good for EMCOMM.

Please consider writing a letter to the executives of the company.

Corporate Headquarters  
JAMES D. TAICLET, JR.  
Chairman, President and  
Chief Executive Officer

TOM BARTLETT  
Executive Vice President  
and Chief Financial Officer  
116 Huntington Avenue,  
11th Floor  
Boston, MA 02116  
Tel: 617-375-7500  
Fax: 617-375-7575

Media Relations  
Matt Peterson  
Tel: 617-375-7500  
Fax: 617-375-7575  
[media.relations@americantower.com](mailto:media.relations@americantower.com)



## HEATHKIT AGAIN, REALLY?

After the apparent final demise of the Heathkit Company last year hams on several websites are reporting that they were surprised to learn of a new consumer survey from whomever now owns the company name.

The lengthy on-line survey asks responders to relate what is important to them, their kit-building interests, their thoughts about the many vintage Heathkits and their interest if any in amateur radio.

It also requests thoughts and ideas about Heathkit while offering the opportunity to sign up to join a mailing list.

The opening page instructions note that Customer privacy is very important to them. As such that they do not release personally identifying customer information outside our company as explained in it's Privacy Policy. As such, those responding to the survey can choose which questions that they wish to answer.

You can find more on-line at [tinyurl.com/new-heathkit-survey](http://tinyurl.com/new-heathkit-survey).

## AURORA BOREALIS - IN NEBRASKA?

The other night, Northern Lights spilled across the Canadian border and descended into the contiguous United States as far south as Colorado and Nebraska. The display was caused by the unexpected arrival of an interplanetary shock wave on May 31st. Check <http://spaceweather.com> for pictures of the display and the odds of a repeat performance tonight.

DID YOU MISS THE STORM? Next time get a wake-up call. Aurora and solar flare alerts are available from <http://spaceweathertext.com> (text) and <http://spaceweatherphone.com> (voice).

Earth's magnetic field is calming down as of June 1st following nearly 15 hours of non-stop geomagnetic storming. The storminess was caused by the arrival of an interplanetary shock wave on May 31st (1618 UT). The source of the shock is unknown. Current speculation focuses on a co-rotating interaction region (CIR) - that is, a shock-like transition zone between high- and low-speed solar wind streams. Whatever it was, the impact ignited some beautiful auroras. More storms could be in the offing tonight as the solar wind continues to blow faster than 600 km/s.

"Last night, I drove to Crater Lake National Park to photograph the Milky Way rising above the rim," reports Oregon photographer Brad Goldpaint. "I was staring upward towards a clear night sky when suddenly, without much warning, the aurora borealis began erupting in front of me." "With adrenaline pumping, I raced to the edge of the caldera, set up a time-lapse sequence, and watched northern lights dance until sunrise," he continues. "The moon rose around 2 AM and blanketed the surrounding landscape with a faint glow, adding depth and texture to the shot."



# Communication Tip of the Month

## Feeling cut off?

Do you ever wonder why you get cut off and interrupted in meetings, while other people's opinions are sought out time and again?

Two sure fire ways to get marginalized is to ramble on without a clear point or attach a sidecar of downer emotions to your thoughts. In the business setting, energy goes more towards clamping down on "ramblers" or "tension producers" rather than giving them more air time.

Look at the meetings you attend and notice who tends to get more "welcomed floor time". My guess is that they talk in a relatively normal, conversational tone, keep their thoughts focused and to the point, and leave people in the room feeling safe.

Consider this. If you frequently get cut off before you've made your point, sketch out your thoughts briefly on your notepad before you speak to the group. Just a few words outlining your key thoughts is sufficient. Then, when you get your chance to speak, do it in a thoughtful yet assertive manner.

If you have a tendency to add emotional tension, then you might be detracting from your message. Emotions that tend to get shut down in meetings include exasperated whining, indignant attitudes, sarcastic complaints, and angry challenges. Dial down the expression of your emotions, aim for a more conversational tone and use words to convey your emotions instead.

"I am losing energy because there are no solutions emerging that people can agree upon. Could we rank order the three best possibilities available to us?"

"I need to be honest with everyone here, this topic is really hitting me where I live and I can feel my frustration level rising. I don't think my thoughts are getting a fair hearing. Could we spend a few minutes more exploring this idea before we move on?"



*Patti Lind*

[www.pattilind.com](http://www.pattilind.com)



## NUGGETS FOR NEWBIES

I know for you old hands this is remedial stuff but we have had questions from rookies who would appreciate a review of how the amateur radio call sign system works in the USA.

All U.S. amateur radio call signs contain one or two prefix letters beginning with K, N, W, AA-AL, KA- KZ, NA-NZ or WA-WZ. By agreement, these prefix letters are allocated to the United States by the International Telecommunication Union (ITU.)

### THE CALL SIGN NUMERAL:

This digit is always a single numeral, 0 (zero) through 9 which usually indicates a geographical area within the continental (lower 48 contiguous) United States. For initially issued call signs, the mailing address of the licensee determines the numeral. Area digits (also between 0 and 9) of ham stations outside of the contiguous U.S. are arbitrarily assigned by the FCC. For example; the area digit for American Samoa is the number 8.

The regions and numerals in a U.S. amateur station call sign are: (States are indicated as two letter state postal codes. The regions and call sign digits are the same for Regions 1 through 9.)

For stations located within the continental United States:

- 1 -- CT, ME, MA, NH, RI and VT
- 2 -- NJ and NY
- 3 -- DE, DC, MD and PA
- 4 -- AL, FL, GA, KY, NC, SC, TN and VA
- 5 -- AR, LA, MS, NM, OK and TX
- 6 -- CA
- 7 -- AZ, ID, MT, NV, OR, UT, WA and WY
- 8 -- MI, OH and WV
- 9 -- IL, IN and WI
- 0 -- CO, IA, KS, MN, MI, NE, MO, ND and SD

For stations outside of the continental (contiguous) 48 United States.

Alaska - Any numeral 1 through 0, zero. (KL9KAA-KL9KHZ is reserved for assignment to U.S. personnel stationed in Korea.)

Caribbean (Atlantic) Insular area. - The numeral 1 indicates Navassa Island; 2 indicates Virgin Islands; 3 or 4 indicates Commonwealth of Puerto Rico except Desecheo Island; and 5 indicates Desecheo Island.

Hawaii and Pacific Insular areas. - The numeral 1 indicates Baker or Howland Island; 2 indicates Guam; 3 indicates Johnston Island; 4 indicates Midway Island; 5 indicates Palmyra or Jarvis Island; 5 followed by suffix letter K indicates Kingman Reef; 6 or 7 indicates Hawaii except Kure Island; 7 followed by the letter K indicates Kure Island; 8 indicates American Samoa; 9 indicates Wake, Wilkes, or Peale Island; and 0 indicates the Commonwealth of Northern Mariana Islands.

**Article continues on the last page.**



## HAMS RESCUED VIA HAM RADIO

Two hams have been rescued from a flooded campground thanks to their hobby. Sunday morning, May 19th at about 4:40 AM Eric Heaton (KF4LJN), and Henry Miller (N4VG), were awakened by a flooding situation at Lake Chinabee in Munford, Alabama east of Birmingham. The two had been camping when Miller noticed water getting into his tent.

Miller and Heaton moved their cars several times to stay above the flooding line. They soon realized that the only road out of the area was submerged in two to three feet of water and impassable. So Miller made contact with a ham in Talladega, Alabama, over the Mt. Cheaha 147.69 repeater. That ham in turn notified authorities of the two trapped hams.

The Cleburne County Sheriff's Rescue Squad was dispatched and both Heaton and Miller were soon brought to safety by boat. There was very poor cell phone coverage in the area but thanks to ham radio everyone is safe.

## ETON ZONE GUARD RECEIVER

Eton Corporation has a new product that may well be of interest to hams involved in emergency response operations or those who live in regions where getting accurate emergency alerts are a necessity.



Called the ZoneGuard, it is a portable battery-powered AM/FM radio that receives NOAA weather and Specific Area Message Encoding or S.A.M.E. local emergency messages. The ZoneGuard radio will also flash an internal 3 level High-visibility color alert light bar and emit warning sounds when local warning messages are activated. On top of that, it is also programmable so multiple geographic areas can be programmed into it for emergency message reception. Best of all is the price for this little gem at under \$40 street and available where most consumer electronics are sold.

Less we forget, the radio also carries a Red Cross identification brand on it and a portion of sales profits goes to that organization.

## VO-52 COMPLETES 8 YEARS IN ORBIT



VU2WMY reports that AMSAT-India's VO-52 hamsat completed 8 years on-orbit on Sunday, May 5th. He notes that the overall health of the satellites parameters are excellent and that AMSAT-India hopes that transponders on-board VO-52 will continue to render services for many more years to come. He also notes that during the time it has been in space that VO-52 has proven to be a valuable communications asset for the amateur radio community.

## VANITY CALL PRICE HIKE

The FCC is seeking a small Vanity Call Sign fee increase. They released a Notice of Proposed Rulemaking (NPRM) on May 23, seeking to raise the fee for Amateur Radio vanity call signs by 20 cents. Currently, a vanity call sign costs \$15 and is good for 10 years. The new fee, if approved, will go up to \$15.20 for 10 years.

The FCC is authorized by the Communications Act of 1934, as amended to collect vanity call sign fees to recover the costs associated with that program. The NPRM can be found in PDF format at:  
[http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2013/db0523/FCC-13-74A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0523/FCC-13-74A1.pdf)

The vanity call sign fee has fluctuated over the 15 years of the current program -- from a low of \$11.70 in 2007 to a high of \$70 (as first proposed in the FCC's 1994 Report and Order). The FCC said it anticipates some 14,300 Amateur Radio vanity call sign "payment units," or applications, during the next fiscal year, collecting \$217,360 in fees from the program.

The vanity call sign regulatory when applying for a new vanity renewing a vanity call sign. call signs issued prior to 1993 to pay the vanity call sign regulatory fees until 1996. Such sign holders do not appear as FCC Amateur Radio database.

Amateur Radio licensees may within 90 days of their license radio amateurs must have an FRN) before filing any Commission. Applicants can to the Universal Licensing System on the "New Users: Register" your Social Security Number to



fee is payable not only call sign, but also upon Those holding vanity are exempt from having latory fee at renewal, as FCC to collect regula-"heritage" vanity call vanity licensees in the

file for renewal only expiration date. All FCC Registration Num-application with the obtain an FRN by going tem (ULS) and clicking link. You must supply obtain an FRN.

The ARRL VEC will process vanity call sign holders for a modest fee. The service is available to ARRL members and non-members, although League members pay less. Routine, non-vanity renewals continue to be free of charge for ARRL members.

Trustees of club stations with vanity call signs may renew either via the ULS or through a Club Station Call Sign Administrator, such as the ARRL VEC.

Visit the "Call Sign Renewals or Changes" web page at <http://www.arrl.org/call-sign-renewals-or-changes> for complete instructions on how to have the ARRL renew your license for you or for how to do it yourself.

License application and renewal information and links to the required forms are available on the FCC License Renewals web page at:  
<http://www.arrl.org/renewals>.

See the FCC's forms page at:  
<http://www.fcc.gov/forms> also offers the required forms.

## SELF HEALING CHIPS A REALITY

Indestructible electronics are a step closer to reality thanks to engineers at the California Institute of Technology who have developed what they are calling self-healing IC's.

The team from the High-Speed Integrated Circuits laboratory in Caltech's Division of Engineering and Applied Science repeatedly blasted tiny power amplifiers with a high-power laser, vaporizing many of their components. They then watched the chips develop their own work-arounds in less than a second.

The new integrated circuits are so small that 76 of them, including the amplifier and everything needed to heal it, can fit on a single penny. The amplifiers developed by the team use on-chip sensors that monitor temperature, current, voltage, and power. These sensors send the information to a custom application-specific integrated circuit or ASIC which is a central processor on the same chip that functions as the system's brain. The ASIC evaluates the information it receives from the sensors about the amplifier's performance, decides what adjustments need to be made to the system's actuators, and makes those changes. The unit was designed to get to the optimum state for all actuators in any situation without outside intervention.

The benefits of this approach go beyond overcoming severe damage. Because of the self sensing, these amplifiers used about half as much power as those without the self-healing capability, and performance was more predictable and reproducible.

In addition to working around damage to parts of the circuits, the amplifier's self-healing can repair static variations due to differences across components and long-term aging problems that arise over time as use changes the internal properties of the system. It can also handle short-term variations caused by changes in load, temperature and differences in supply voltage.

Since chips such as these are useful for next-generation communications, imaging, sensing, and radar applications, showing successful self-healing here should mean that it also can be done in less cutting-edge electronic systems such as cell phones and perhaps someday even in ham radio gear.

## GUYANA IOTA - WELL....MAYBE



Christian (F5UII), may be active as FY/F5UII from the radio club station FY5KE in Kourou City between June 5-14th. Activity will be on the HF bands on SSB. He suggests to look for him during the weekday mornings about 1000-1100z and after 2100z. He may possibly be operating during the weekend of June 8th & 9th, Christian will try be active from Royale Islands (SA-020) with a multiband wire antenna which will allow him to be active on 80-10 meters SSB. This activity is not yet certain.

For more details and updates, visit:

<http://www.f5uui.net/en>

Christian also has a Twitter account: <https://twitter.com/f5uui>

## NEW BATTERY MANAGES WIND & SOLAR

The National Accelerator Laboratory and Stanford University are developing a low-cost, long-life battery that could cost-effectively store and discharge excess energy generated by wind and solar power sources.

Today's electrical grid cannot tolerate the large and sudden power fluctuations caused by wide swings in sunlight and wind, adding to the difficulties in harnessing these alternate sources of energy. But the SLAC National Accelerator Laboratory and Stanford University are developing a low-cost, long-life battery that could manage these changes and enable a larger role for wind and power in the nation's energy supply. Solar and wind combined now contribute nearly 20% of the grid's available electricity.

As a result, energy storage systems are needed to level the peaks and valleys of this "intermittent" power, storing excess energy and discharging it when input drops. "Flow" batteries offer promise for intermittent storage because it's relatively simple to scale their tanks, pumps, and pipes to the sizes needed to handle large energy capacities.

Today's flow batteries pump two different kinds of liquids through an interaction chamber where dissolved molecules undergo chemical reactions that store or give up energy. The chamber contains a membrane that only allows ions not involved in reactions to pass between the liquids while physically separating the active ions. The researchers say that this design has two major drawbacks: the high cost of liquids containing rare minerals such as vanadium (especially in the huge quantities needed for grid storage) and the membrane itself, which also is very expensive and requires frequent maintenance. Instead, the researchers offer a simplified and less expensive design that is a good fit for large-scale production.

The new design uses only a single stream of molecules and does not require a membrane at all. Its molecules mostly consist of the relatively inexpensive elements lithium and sulfur, which interact with a piece of lithium metal coated with a barrier that permits electronics to pass without degrading the metal. When discharging, the molecules, called lithium polysulfides, absorb lithium ions. When charging, they lose the lithium ions back into the liquid. The entire molecular stream is dissolved in an organic solvent that doesn't have the corrosion issues of water-based flow batteries.

Researchers said that the battery retained excellent energy-storage performance through more than 2000 charges and discharges in initial lab tests, equal to more than five and a half years of daily cycles. They demonstrated their concept with a miniature system using simple glassware. Adding a lithium-polysulfide solution to the flask immediately produces electricity that lights an LED.

Yi Cui, a Stanford associate professor of materials science and engineering and a member of the Stanford Institute for Materials and Energy Sciences, held a lab demonstration of his group's new lithium-polysulfide flow battery contained in a simple flask. The design could serve as a model for a low-cost, long-life battery that enables solar and wind energy to become major suppliers to the electrical grid.

A utility version of the battery would be scaled up to store many megawatt-hours of energy. The next step is for the researchers to make a laboratory-scale system to optimize its energy storage process and identify potential engineering issues. They also expect to start discussions with potential hosts for a full-scale field-demonstration unit project.

Stanford University [www.stanford.edu](http://www.stanford.edu) SLAC National Accelerator Laboratory [www.slac.stanford.edu/](http://www.slac.stanford.edu/)

## KITS - BENDING COMPONENT LEADS

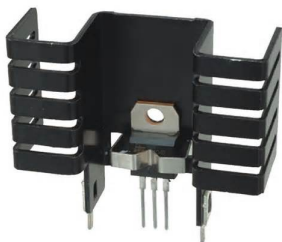
I was talking to Scott (WA7SS) at Hams and Eggs about the installation of some Shottky diodes at one of our repeater sites and it occurred to me that many hams that do not have any history of working in hi-tech manufacturing would have no idea what we were talking about. TO20 this and TO20 that. So I located this article to share. I think it will be helpful for new kit builders. Building something and have it fail to soon after is disappointing and stultifying to your hobby interest. This is an engineering story that has application for those of us that are interested in building ham radio kits. Read and learn about what goes wrong and why, my friends.

A while back, my presence was requested at a good customer in the business of building motor drives. They had an application where the TO220 parts were bent over the top of the PCB, front of the package facing down, such that the tabs could be affixed to a heatsink. They had several devices symmetrically arranged in a rectangle. The heatsink clamped over all of them uniformly. The screws that applied the holding force clamped through the PCB. They had all of the applicable anti rotational hardware, Belleville washers and a silicon pad to insulate the various tabs. Torque settings used and holding force were ample. Mechanically it was well done. But the story didn't make sense. A larger product, done the same way never had any failures. With this smaller product the failures occurred in the field after several months of use. The waveforms looked textbook. No ringing, no overshoot, no gate oscillation. The device was well within its range of operation under worst-case overload conditions. The thermals were fantastic, very low temperature rise. Yet there were unexplained failures hundreds of hours into operation.

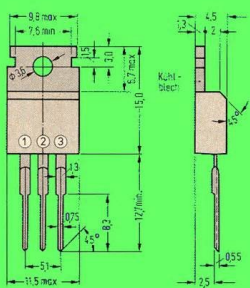
After gathering up all of this information and looking at various waveforms we began talking about the PCB's....and I noticed something odd. The lead bends were inconsistent and not at right angles, as though the parts were set in the board and hand formed. That struck me as odd. There had been a mention made of switching from one contract manufacturer to another. I inquired how the leads were formed prior.....perhaps a secondary operation....a set of progressive dies or a custom brake. They said that the old parts were in fact repeatably machine formed. The new parts were not.

And here's where things get troublesome. If the leads are held near the package with a brake, a die set, a pair of pliers, jig, whatever, the stress from the bend is never transmitted to the package. If the package isn't stressed, the likelihood of failures at several hundred hours drops back almost nil. BUT, when the leads are simply bent over by hand, with no support near the package, that stress terminates at the plastic mold compound. Initially that may not be a problem, but depending on the severity of the bend, it may cause micro cracks around the leads. The most susceptible leads are the gate and source. You will recall on larger packaged devices that the drain terminal protrudes from the tab which is mechanically fixed to that large metal tab. The source lead is not fixed. It is connected to the die with bond wires and held captive by the plastic molding compound. The gate lead is held in similar fashion by the molding compound, and attached to the die with a much finer, usually single bond wire.

These two leads are susceptible to microcracking around where the lead goes into the plastic package when the bends aren't properly supported. But that's not all. Usually the bend is supposed to be a right angle. That allows some mechanical compliance for any mismatch between the devices, heatsink and pcb in the plane parallel to the PCB. When the leads are just forced over, there is no right angle bend, rather a gradual radius. With this, the compliance that was needed is altogether gone. So the initial stress from the bend gets pounded with every thermal cycle. After enough cycles, the microcracks are large enough to allow contaminant ingress, at which point device failure is imminent.



TO - 220 B



# AMATEUR RADIO WORLD CASTLES AWARD

WCA - ON-1909/NM285 on air June 9th 2013

June 9th 2013: ON6GX/P Castel-farm Upignac - Ref.: BCA NM-285 - WCA ON-01909 ON6GX/P - Club UBA of Gembloux will be active on 2013, June 9th from Castel-farm Upignac in Upigny (Eghezée) from 06:00-10:00 UTC mainly on 7 Mhz - Reference Belgian Castel Award NM-285 - World Castels Award ON-01909 [www.on6gx.be](http://www.on6gx.be)

## \$15K FINE FOR ILLEGAL XMITTER IN OREGON

Following up on a complaint from a local broadcaster in 2011, the Portland office of the Enforcement Bureau traced the signal on 97.9 MHz in Prineville, Ore. to the residence of Joshua McMurchie's. A police officer accompanied the FCC agent to the address where the FCC agent inspected the station and issued McMurchie a Notice of Unlicensed Operation.

Following another complaint in 2012, an agent again T-hunted the source of the signal to McMurchie's residence and found a transmitter there. The commission said that McMurchie admitted operating the station and offered to surrender the transmitter. Last July, FCC issued McMurchie a Notice of Apparent Liability in the amount of \$15000 raising by \$500 it from the base amount of \$10,000 because the unlicensed transmissions continued even after McMurchie was ordered to cease operation.

But in its May 9th release the FCC says that McMurchie never answered the original Notice of Apparent Liability. Based on that and the evidence before it the agency has now issued a Forfeiture Order for \$15,000 giving him 30 days to pay or the case may be referred to the Justice Department for collection. Maybe now he will pay attention to that Registered Mail from the FCC.

## HAM-TV FROM THE ISS

Frequencies have been announced for the new Ham Radio Digital TV transmitter that will transmit from the ISS in the amateur radio 2400 MHz band. The main mission of HamTV is to perform school contacts between the astronauts onboard ISS and the scholarship, not only by voice, but also by unidirectional video from the ISS to the ground within ARISS program.

In addition to the existing VHF radio amateur station, ISS will host a S-Band video transmitting station. This new equipment can broadcast images from the ISS during the school contacts or other pre-recorded video images up to 24 hours a day to allow ground stations tuning. It is planned to transmit DVB-S signals on 2.4GHz at either 1.3Mpsps or 2.3Mpsps with 10 watts of RF from the ISS Columbus module. The IARU Amateur Satellite Frequency Coordination Panel have announced coordinated frequencies of 2422.0 MHz and 2437.0 MHz. HamTV on Facebook at: <https://www.facebook.com/Hamtvproject>

It is understood that the HamTV equipment will be carried to the ISS on the HTV 4 spacecraft currently planned to launch in August.

## MOOSE HIGH ON POT



My ten year old great granddaughter came to visit me the other day. I was sitting at the kitchen table planning out an antenna installation. She asked me what I was doing. My reply was "I am doing some math, dear." She replied "I HATE MATH!" I told her I know how you feel. I used to feel that way too, but once I knew I needed math to do something interesting, it made the prospect of doing the math just a bit easier. She seemed intrigued and asked what are you figuring out? I said I was calculating the hypotenuse of a right triangle. She squealed a HIGH – POT – MOOSE? How did the moose get high on pot? I did not know kids her age knew about pot so I explained.

The hypotenuse is the long side of a right triangle. I was installing a 40 feet fiber glass antenna mast. The lower 20 feet were to be hose clamped to an existing 20 feet TV antenna mast that was left on the house after the antenna was taken down. No guy ropes were needed on that section.

The upper 20 feet of fiberglass mast needed guy ropes every 4 feet and I needed to know how much expensive DacRope to order. I explained to her that did not want to order too little of the specialized rope and be unable to finish the job once I started. I also did not want to have a lot left over because I would not need it and I might not have enough money left to buy her an ice cream if I spent too much money on rope. She looked me in the eye and very seriously said "No...No... we can't have that." Knowing she now had a dog in the fight so to speak, I smiled and said let me draw out the math problem for you. Drawing it out makes it much more interesting.

I sketched a picture like the one below. Here is the house with the antenna mast on the right side. That is the "a" variable. We know how high the mast will be. It will be 40 feet high. She and I then went out and measured the width of the house. That is the "b" variable in the drawing of the right triangle. That measurement was 66 feet on the tape measure. I asked her if we were having fun yet and she said "YEP." Perhaps math isn't so bad after all? "Nope" she replied.

What we needed to calculate was the unknown length of the hypotenuse. That would be the length of each of the five guy ropes. If you are detail oriented you will note that there would actually be 5 different hypotenuses. One for each of the five guy rope sections set four feet apart on the mast. We fudged and just determined the longest one and cut the other ropes to match. We get a lot of wind in central Oklahoma and I wanted as much guying as possible. 3 ropes at 5 guying points. Now let's break out our Droid phone with an algebraic calculator and go to work.

I did not reveal to her that it had been so long since college math that I had to locate the formula to calculate the hypotenuse of a right triangle on the internet. I also did not tell her about Pythagoras. She thinks I am a genius. That will be OUR little secret okay?

"a" squared + "b" squared = "c" squared

"a" is 40 feet squared or 1600 feet

"b" is 66 feet squared or 4356 feet

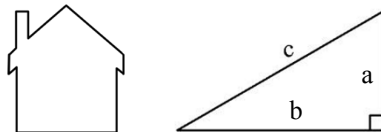
"a" + "b" equals 5956 feet

The square root of 5956 feet is 77.175 feet

That is the longest hypotenuse. Multiply by 15 and we will need about 1158 of rope. It looks like we will have some rope left over on a 1200' roll, but enough money left for some ice cream.

OR

$$c = \sqrt{a^2 + b^2}$$



What was the point of all this? It was to teach a 10 year old child that math can be useful. Even though her school teacher may not take the time to explain how she will use math in the future her great grandpa will. Perhaps she will be a future ham or engineer? You never know. It all starts with a love of problem solving. We started down that path today.



# 5 COMMON MISTAKES OF PS INTEGRATION

Commercial AC-DC power supplies from a reputable manufacturer often are taken for granted when used as basic drop-in, no-headache components. Making some basic mistakes, however, can inadvertently transform the power supply into a source of problems in the field. Here are the five most common issues, which can be circumvented rather easily.

## **Inadequate Air Cooling**

Inadequate cooling becomes a major problem-maker when integrating a power supply into a repeater cabinet. Power supplies generate heat, and how that heat is handled affects performance and reliability. First, consider the cooling air passed over the supply, whether forced air by fans or by convection airflow. Where is the air coming from? Is it initially pre-heated by passing over hot ICs, transistors and coils before being used to cool the supply? If so, it's the cooling effectiveness of the air drops off significantly whether or not the power-supply manufacturer's airflow requirements are met. Second, obstructions in the cooling path (such as dirty air filters) greatly impede airflow. When the airflow stalls, the fans actually speed up, but they push virtually no air. Ensuring maximum air flow requires careful planning of component placement, air-path layout, and inlet and exhaust routing and sizing, and maintenance planning. I have also seen dirty air infiltrate the fans bearings and destroy the fan. Keep that air clean!

## **Incorrect Supply Sizing**

An undersized supply's output may become erratic or struggles to provide more current than its rated value. Some power supplies have a safety feature that will cause the power supply to restart when encountering an overload condition. This will result in unexpected power cycling of the system driven by the power supply. Power supplies that lack an over-power safety feature may become damaged under an overload condition. Implementing an oversized supply will not really solve the problem, though. Aside from unnecessary material cost, it will result in inefficient operation, generating extra heat to dissipate and increasing operating costs. Most power supplies operate at their peak efficiency when supplying 80% to 95% of their rated output, so the supply size should be selected accordingly.

## **Voltage Drop From Cables**

Significant losses can result from resistance in conducting lines or circuitry between the power supply and the load. One foot of #10 AWG has resistance of about 1 mΩ. While this may not seem like much, it's important to remember Ohm's Law ( $V = I \times R$ ).

Calculating for Ohm's Law reveals a drop that can put the delivered voltage at the load outside of the tolerance (both the high side and return wires must be included). Several possible solutions include altering the nominal output voltage to be a little higher at the supply or reducing the wire length. Select the proper gauge wire.

Cabling-related problems are easily avoided with good design practices: twist supply and return lines to minimize EMI. Dress and strain-relieve them properly. Cables that move may eventually come in contact with other installed components, and flexing due to ordinary vibration can lead to tiny cracks in the copper itself, potentially developing into intermittent or open circuits.

## **Open-Frame Supply Issues**

Open-frame supplies have exposed components on their underside. The key is to ensure that they don't touch the enclosure or chassis—standoffs will provide adequate clearance in this case.

Also, there should be enough space to avoid possible interference caused by any motion and minute flexing of the system during normal use. A basic understanding of agency requirements when integrating a power supply doesn't hurt either.

## **Using Multiple Supplies**

When supplies are connected in parallel, recognizing the difference between current sharing and redundancy becomes essential. In current sharing, failure of a single supply means there may not be enough capacity. In redundant and N+1 designs, a single-supply failure is invisible to the load because there's enough excess capacity to carry the entire load.

**Article continues on the last page.**

**WA7VE**

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**Trustee - Hal Denison (WA7FIV)**



Our membership meetings are held at 5:00 PM on the second Saturday of each month at the Seaside campus of Clatsop Community College. We will be upstairs. The Board meeting begins at 4:30 PM. All are welcome.

Please visit our website for updates and information.

## NUGGETS FOR NEWBIES, CONT'D

### THE CALL SIGN SUFFIX:

The suffix can be one, two or three alphabet letters. Single-letter suffixes are all letters A through Z. Two-letter combinations are all between AA and ZZ. Three letter combinations are AAA through ZZZ. Some letter combinations are not used such as common Q-signals (example: QST), distress symbols (like SOS) and certain other combinations. The letter X also may not be the first of three suffix letters in Group D (two-by-three) call sign. By law, those suffixes go to Experimental rather than Amateur radio stations.

When all call signs within a block have been assigned, the next assignment is made from the next consecutive block within a group. When all blocks assigned to a group have been allocated, call signs from the next lower group are assigned. This system is known as the Sequential Amateur Station Call Sign System.

## 5 COMMON PS MISTAKES, CONT'D

Current sharing refers to two or more supplies used in parallel to deliver more current than a single supply's rated output. The total output of the shared supplies is necessary to meet the load requirement. Some supplies are inherently designed to support this configuration, while others need a small "sharing" interface to equalize per-supply loading. Multiple small supplies are often chosen when the physical system layout lacks room for a single large supply, when heat sources must be dispersed, or if the initial supply turned out to be undersized for the final design.

In contrast, redundancy or N+1 occurs when multiple supplies are wired so that they share the load. If one supply is lost, the remaining supplies have enough aggregate capacity to support the entire load without any "switchover" lag when the operating supplies pick up the total load. Some supplies are designed for this capability, while others need additional circuitry.