



# CAARA Newsletter



AN ARRL AFFILIATED CLUB

FEBRUARY ISSUE- 2011

## President's Corner

by Stan-W4HIX

Well another month has flown by. I won a weeklong all-expense-paid trip to Korea in January.

Unfortunately it was work related, so the rest of my life was pretty much on hold. Given that, there's a lot going on at CAARA.



Winter Field Day was a great event. We had more than 20 people come down and either operate or watch. Ruth WW1N actually worked until the wee hours of the night until there were no more contacts. Though the total number of contacts was small, the event was a great success. Hank W4RIG and I served up a bacon and eggs breakfast on Sunday morning to anyone who wandered in, with donations going to the new CAARA scholarship fund. Hank and I have decided that we enjoyed doing it so much, and the folks who ate breakfast seemed to enjoy it, that we would make it a monthly affair. If there are contests going on, then we'll schedule it around the contest—otherwise, stay tuned.

One of good things about serving breakfast is we got the kitchen going again. John WA1JG helped straighten out the kitchen that had turned into a storeroom. The kitchen is now functional, and if anyone wants to sign up to help with some rudimentary remodeling (put up shelving), I'm all ears.

Storage is an issue with the club, but we have to be as active on getting things out of the club and bring them in. Everything that comes in as to judged as keep (and therefore use), sell or discard.

One item I was hoping to complete the natural gas conversion of the club's generator. The conversion is complete, and when Mike K1MB returns, we should have the plumbing complete. With a little

luck, I might run the generator on propane as a test.

As always, there are lots of events coming up. We have a flea market, CW class, Tech-in-a-Day and Field Day (plus more!). Come on down and enjoy the club.

73 de Stan, W4HIX

**Hello to all CAARA Members,**

Coming this Wednesday, February 2nd at 7:30 PM at the clubhouse, we will have a presentataion by guest speaker Phil Temples, K9HI the newly appointed ARRL EMA Section manager.

This will also be broadcast live on the clubs Ustream Internet channel if you can't make it.



Club member Rick Maybury WZ1B will be starting up his morse code class again this upcoming Saturday February 6 th-starting at 9 AM and going until nootime at the Caara Clubhouse on 6 Stanwood Street.The classes will be going at least thru the month of February.

73's

Dean Burgess KB1PGH

CAARA Clerk

**ARISSat-1 Blasts Off**

In addition to delivering fuel, oxygen, food and other supplies, the Progress contains the new AMSAT ARISSat-1 Amateur Radio satellite. Progress is scheduled to dock with the space station on January 30 at 0240 UTC.

ARISSat-1 will be manually jettisoned from the ISS during a spacewalk on February 16. The satellites features a new software defined transponder that will provide simultaneous 2-meter FM, CW, BPSK transmissions, as well as a Mode U/V (70 cm uplink, 2 meter downlink) transponder.

**CAARA Newsletter**  
**Cape Ann Amateur Radio Association**  
*6 Stanwood Street*  
*Gloucester, MA 01930*

CAARA Newsletter is a monthly publication of the Cape Ann Amateur Radio Association (CAARA). It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to CAARA members, and space is available. Material is accepted on a first come, first serve basis. Articles and other materials may be submitted by internet to Jon at k1tp@arrl.net. If possible, material should be in Word format. Material may also be submitted as hard copy to Jon-K1TP or any Club Officer.

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Jon Cunningham-Editor  
K1TP

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## Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the Cingular tower in the Blackburn Industrial Complex in Gloucester Massachusetts. It has an average effective radius of 60 miles, and serves Eastern Massachusetts, Cape Cod, Rhode Island, Southern New Hampshire, and maritime mobile stations. CAARA also operates the W1GLO repeater on 224.900. The W1RK 443.700 repeater with antennas located in Magnolia is owned and operated by club member Ralph Karcher and it too is available for club use.

The Association is one of the few amateur radio clubs that has its own clubhouse. Located at 6 Stanwood Street in Gloucester, it includes a permanent HF station with rotating beam and vertical antenna along with a 2 meter packet station and 2 meter voice and 220 MHz transceivers.

Amateur radio exams are held on the second Sunday of each month at 10:00AM at the CAARA clubhouse. Anyone who is considering a new license or an upgrade, is welcome to test with us. There is no pre-registration necessary. Contact the head of our VE team Bob Quinn if you have any questions about monthly testing.

Monthly member meetings are held on the first wednesday of each month at 7:30 PM except for July and August.

Each Sunday evening at 9:00pm, the club operates a 2 meter net on 145.130. This is an open and informal net which disseminates club news and prepares operators for emergency communications work. All are invited to check into the net as club membership is not a requirement.

## **CAARA Members,**

Last night at the Board of Directors passed a motion to create a CAARA Scholarship committee. This committee has been tasked with creating a policy to give scholarships to local high schools to foster interest in science, technology and amateur radio. The committee will be also be responsible for fund raising for the scholarship fund—no money from the general funds will be used for the scholarship fund. A secondary goal is to help promote CAARA among the school systems and students with a longer term goal of getting more students interested in amateur radio. Depending on the amount of money generated, several scholarships could be given in high schools around Cape Ann. The motion calls for three to five members on the committee. The policy is the first order of business and must be approved by the Board. If you are interested in being on this committee, or donating to the fund (remember, this is tax deductible), or have any questions please let me know. This is another opportunity for CAARA to serve our community.  
73, Stan W4HIX

## **Hello CAARA,**

The CAARA website has been redesigned using the very common blog/content management system software, Wordpress.

Why change what seemingly was a good thing?

Mainly, security for my web server. Behind the scenes, monthly I had to remove literally thousands of spam sign-ups and those signups, also produced submissions of content. Before it got out of hand, the submissions were all spam ads for Viagra and other crap. Right now there are over 5,000 submissions in the system that I can't even see because the script times out before they load. I can't even get rid of them. Signing up for the site with your call actually never really got you anything to begin with. Originally it would enable certain people to update the website themselves, but the CMS wasn't even easy to update without knowing some html. It was a failure on many levels. And the last time I used its auto update feature it crashed and burned and I had to hire a php developer to help string it back together to keep it running. It is about 3 years out of date for updates. So, we are finished. And now on to what hundreds of thousands of blogs and web sites are built with, Wordpress. Wordpress seems to be updated almost weekly. One click and it auto updates. I chose a theme from [wordpress.org](http://wordpress.org), and spent last weekend working with it for the first time in my life.

And with some Photoshop work, it is customized. All links are now top center. It is easy to see the content, it is actually very easy to update, and very easy to navigate. I think many times the membership didn't know where things were or what was on the site because it was too busy and cluttered. I have kept 95% of the content and links during the redesign. Some unused pages were deleted. I am looking into an ARRL feed like we had before, but that will be in phase 2. The news and update page is now located right in the site and not on a separate page. The board will be sent information on how to update the news page as well as how to update the calendar. The calendar is now a Google calendar. I want stability and ease of use and Google has done very well with their embedded public calendars.

One thing that I still have to work with Dick Ober on, is the membership-only page. For the moment, that is not active. I am hoping it will be soon. If there is something you need to see that Dick already has in the old area, we will provide a link temporarily to that content off of the new membership-only page.

If you haven't been on the site lately, CAARA is now on Twitter and Facebook. I had a good deal of resistance about those two from some members, but if the club and Amateur Radio is to be brought forth to the younger generation, who are well versed in both of those social entities daily, we must keep up. Members who aren't into communicating with new social media to help Amateur Radio be noticed by a younger generation certainly aren't obligated to use it. Facebook updates are being made by Dean and they mimic what we put on the news site. If you are on Facebook and "like" the CAARA page, you will get those updates right on your wall. If you connect the CAARA page to your SMS updates on your cell phone if you use your phone for more than voice, those updates will come to your cell phone as texts. You can see that for those who live in a world of instant up to date information, this could be valuable to gain information in an emergency or even to find out if the CAARA building was open and accessible during a recent snow storm when the repeater was acting screwy and there was no power. In fact, there was a question asked on there about that exact thing. One Facebook update sent and a public who may have SMS messages turned on, would have gotten the answer immediately to their cell phones. True, Facebook isn't radio, but it is helping keep people informed so they can play the hobby. Check out the

Facebook page either off the front page of the CAARA site or going directly to:

<http://www.facebook.com/group.php?gid=167915513704&v=wall>

Anyone can also post photos on there, start discussions, or post questions on the wall. Facebook is not pushing out anything we have on our own site; rather it is adding global, open, and free access to us as a club. You don't even have to have a Facebook account to see the Facebook wall of information. There is no need to worry about personal information being seen. Just view it. (To post anything you do need an account, but that is only logical.) And millions of others have the ability to see what we are about, even without knowing that there is a CAARA in Gloucester MA. The audience is thousands of times greater than who would ever find caara.net unless they were looking specifically for it.

An example of someone wanting CAARA information from Facebook when amateur radio itself was having trouble getting the word out came during the storm on December 1, 2010:

**Jon Hubbard Is the meeting still on? I heard this is a large scale power failure on Cape Ann...and it seems as if the repeater is in and out....**

December 1, 2010 at 6:38pm · Like · Comment  
The Twitter feed is updated also with timely news which can even turn into emergency notifications if the membership picks up the idea. This is like a Facebook update but is used for short 140 character updates. From a cell phone or web page, a member of authority could throw out a message to be picked up by anyone who either has a twitter account and follows the w1glo account or who checks the CAARA Twitter page ( <http://twitter.com/w1glo> ) or who just looks on our web site itself. From news organizations to the Red Cross and beyond, Twitter is used and is proven to be a valuable current communications tool. Again, any naysayers need not participate. If you aren't looking to get or give immediate information through new media, just ignore it like it doesn't exist. No obligation by any means. To me though, anything that helps with communicating Amateur Radio to the masses in this Internet based world is worth its weight in gold.

I read a good op-ed article on page 96 in the February 2011 QST on the new ways social media can aid Amateur Radio moving into the future. If you haven't read it, take a look. If you don't get QST and are

interested, drop me a note and I will forward you a pdf of the article.

And if you have read this far, thanks for hanging on! :-)  
) Enjoy the new site.

73, Glenn  
CAARA web guy

### **Hello to all CAARA members,**

As part of the recent CAARA website update, our historical club newsletter archives will be available to interested members in the new, soon to be activated, private "Members Only" area of the website. Of course, as in the past, only currently paid up CAARA members will be able to access any content in the "Members Only" area. If you have any comments or questions on this feature or if you would like to suggest any other features you might like to see on the designated website, either public or private, please direct your comments to the Board via the Clerk, Dean Burgess, KB1PGH at [dburg101@aol.com](mailto:dburg101@aol.com) .



### **BRAZILIAN MILITARY PRAISES HAMS IN WAKE OF MASSIVE FLOODS**

Civil Defense forces in Brazil have praised the efforts of a local group of amateur radio enthusiasts. This after the hams helped them co-ordinate the rescue efforts in the first hours after the landslides brought on by flooding.

According to a report on the BBC News website, Lt Col Roberto Robadey said that without the help from the Brazilian ham community that his command couldn't have done anything in those first two days. Robadey said that the ham radio operators took their gear to key points to provide a communication link between rescue groups. Since then, the Brazilian Air Force said it was installing a communication centre in Itaipava, so people could make phone calls and access data in their attempts to track down missing relatives. About 100 soldiers have also been deployed to the Cuiaba valley, which has been cut off since the heaviest downpours in 44 years tore through the mountainous area near Rio de Janeiro. Officials say at least 600 people are known to have died in the floods.

**The full BBC story on this ham radio first responder effort in Brazil is on-line at [Read the full BBC News story at tinyurl.com/BrazilRescue](http://Read%20the%20full%20BBC%20News%20story%20at%20tinyurl.com/BrazilRescue)**



This photo was sent to me by Jim- W1DDX. Can you identify this Cape Ann radio personality? He was quite a character!



Dean, KB1PGH, in his shack with the no-code family cat.

## A Look at the Icom 7000 by Dean Burgess KB1PGH

Last year I decided to make the commitment to work Buddipole portable due to my horrible S-9 level electrical RF issues that I have at my home QTH due to the surrounding power lines and other industry so I started shopping around for an HF rig. I also wanted something similar to the FT 857 that I once had because that was a decent all-around rig that included 6 meters, VHF and UHF. Well last fall I attended the ARRL Boxboro Convention and they had all of the major HF Rig vendors there. I walked by the Icom booth and started looking around and the Icom 7000 caught my eye and I was hooked. I picked up a flyer and got home that night and went on E-Ham.net and looked at all the reviews which were very positive. I then went on Youtube and looked at some of the videos made by other Icom 7000 users and what hooked me was a video of a demonstration of the DSP and noiseblanker capabilities and that was the clincher. I have to admit we live in a great age if where one can look at reviews and video demo's on the internet before you leap and plunk down a lot of cash for a radio. Well that following Monday morning I pulled the trigger and called the local candy store (Ham Radio Outlet) up in New Hampshire. Like the saying goes-what does "Ham" mean-"Have another Mastercard?" The next day the big brown box from UPS was on my front doorstep. I hooked the IC 7000 and away I went. It's great that HRO has free shipping on anything over \$100.00 by the way.

The first thing one notices on the Icom 7000 is the full color 2.5 inch TFT display. It is crystal clear and everything is easily read. This display can be made bigger by hooking up to the composite video jack in the back of the radio. I went onto 20 MTR's and per usual I had that S-9 buzzing noise level in the background. I turned on the digital noiseblanker and it was gone! I couldn't believe it! The Icom 7000 noise blanker blows away the Yaesu FT 857 one. The Icom 7000 is an advanced radio. It uses two IF level DSP chips in the AGC loop. It looks like Icom is using the very same IF DSP in the top of the line IC 7800. I am very impressed with the audio quality of IF DSP. It blows the AF level DSP of the Yaesu FT 857 out of the water! The great thing about the 7000's DSP is that you do not need to buy any optional



filters. Basically it is like a software defined radio where you can adjust the size of the passband up to 41 Times or move the passband wherever you want to eliminate interference. You can even go as far as selecting a soft or sharp filter setting. The Icom 7000 also has digital noise reduction which really takes the static out of the equation and the DNR is fully adjustable. The Icom 7000 also has two manual digital notch filters as well as an Automatic notch filter which both apply 70 db of rejection. The notch width is also fully adjustable from wide to narrow. I will say that this radio has superior tools for the receive end of HF. There's no excuse not to be able to pull a signal out of the mud with the IF Level DSP in the AGC loop, IF level noise reduction, IF digital noise blanker and IF level dual notch filters. The 7000 has a pre-amp for HF signal which works well with very little overload or distortion and carries a 20 db attenuator. The Icom 7000 also has a Direct Digital Synthesizer unit which helps in the circuit to noise ratio in receive and transmit. I can see where CW operators would love the receive flexibility of the IC 7000. Rick Maybury-are you listening?

On the transmit side of things the SSB transmit bandwidth is also DSP controlled and the low and high passbands are fully adjustable. The IC 7000 also has a High Stability Crystal Unit Master Oscillator which can come in handy for transmitting digital signals in a mobile or portable environment where the outdoor temperature fluctuates. The HM 151 microphone is fully functional and gives you complete remote control of the different settings and memories in a mobile environment. Some early users of the 7000 have reported low

transmit audio and modulation due to the mike. I did not seem to have this problem when I operated portable with the 7000 last summer. There is a modification which is available by Bob Nagy, AB5N where he changes the mike element and capacitor and adds foam and weight into the mike case. I myself did send my microphone out for this modification. I figured it couldn't hurt and if I rather would have great sounding audio and modulation that drives the IC 7000 to it's peak performance and to get as many of those 100 watts the Icom 7000 puts out on HF as possible. The 7000 also has a real low distortion speech compressor driven by the IF DSP. Some radios like the Yaesu FT 857 have speech processors which are just another mike gain. The compressor works well at adding extra audio "Punch" during DX-ing and is fully adjustable. I had nothing but great audio reports during my portable dxing which is good since the HM 151 microphone is actually designed to work in a mobile environment and be a noise cancelling mike. That's why maybe some had the low audio issues with the first run IC 7000's. Icom is now having China manufacture the mikes. I will report back when I get a chance. to use my modded mike during this summer. For contesting the IC 7000 has a digital voice recorder where you can record your callsign and you can even record incoming transmissions! The IC 7000 even has a fixed and sweeping band scope! This is in part because I think Icom morphed some of the software from their IC 756 PRO 3 into the 7000. To be honest the scope does work but it sucks the audio away and mutes it so using it full time drives on nuts. The meter is so small that it is tough to see the minute changes to see other signals. The IC 7000 also has a built in RTTY Demodulator which actually works where you can see the text on the screen! The IC 7800 has the same thing so maybe the 7000 has the same software in parts.

The 7000 also has a built in cooling fan, 500 memory channels, CW full break in, CW pitch adjustable and CW Receive Reverse. The meter on the TFT screen displays power, ALC, SWR and compressor all at the same time so that helps as well. You can also see the interior temp of the radio on the display as well. Overall I am very please with IC 7000. I wish I could use the radio more but I'll have to wait until the spring. At least I get to use it on 2 meters and 440 and so far so good. I've had good luck as well using the IC 7000 on 100 watts on the 6 Meter "Magic Band". Like the saying goes "You get what you pay for". The Yaesu 857D that I had goes for about \$ 800.00 and the IC 7000 is selling now at HRO for \$1,199.95 with a remote kit thrown in for free . What a difference paying the extra money to get that extra performance. This is a top of the line rig for portable and mobile HF use with the bonus of VHF and UHF thrown in. There are some small issues though like with all radios. The IC 7000 needs space to keep cool. Some early owners had issues with overheating of the radio- I think that they crammed it into a really small place where it couldn't breathe. I had no such heat issues with mine. The radio does get a bit toasty after long term use but the interior fan does turn on automatically. The other issue with early radios was with low audio and modulation due to the HM 151 microphone- not the radio itself. Those issues were solved with the AB5N mike mod which I recommend having done to achieve full transmit audio potential of the IC 7000. The radio was released in 2006 so I think any early bugs have lone been worked out.

I say take a look at the Icom 7000. For a small portable and mobile rig you can't go wrong. Even as a all around base station you get a high quality radio. Of course it's not a super high end contest rig like the Icom 7800 but for casual dxing and ragchewing why spend the \$12.500 price tag of the IC 7800? You can find out more information on the IC 7000 by going onto Icom's website at [www.icomamerica.com](http://www.icomamerica.com) .



The club's emergency generator has now been converted to work on natural and propane gas, as well as regular gas. This will greatly expand our ability to provide emergency power and lighting to the CAARA clubhouse in case of a power outage. This will help us provide better emergency back up communications to the Cape Ann Area. Club President Stan Stone W4HIX installed the new regulator and carburetor attachment and Mike Burke K1MB will soon install a new outdoor gas line attachment to the clubhouse so we can run the generator without having to get and store gasoline on the property. The club has also purchased emergency battery back up lighting for the interior of the clubhouse. The new exit lighting will soon be installed so Dick Macpherson WB1W won't almost fall down the stairs when the power goes out and he is on the second floor like what happened the last time the power went out.





## 2011 ARRL FIELD DAY IS COMING !!!!

Are you getting sick and tired of all the cold and snow? Well it's time to think of warm summer weather and ham radio in the field ! The dates are set for this years ARRL Field day and it will be on Saturday June 25 th and Sunday June 26 th. CAARA will once again be participating in field day so mark that weekend down in your calendar and join us. Stay tuned for all the updates as we get closer. Here's a picture of Rick Maybury WZ1B and Paul Mcdonough W1PLM racking up the points in the CW tent.



## LD-1B Software Defined Radio

**Pete Goodman, N19N**, has produced videos showing how his **LD-1B Software Defined Radio** can be used to receive PSK-31 and Digital Radio broadcasts.

Using an LD-1B and Winrad to receive and decode PSK-3

A video demonstration which shows how to use an SDR front end (Lazy Dog Engineering LD-1B was used), Winrad, Virtual Audio Cable and PSK-31 software (DM-780 was used in the demo) to receive PSK-31. This setup should work equally well for any other "soundcard" mode.

[http://www.youtube.com/watch?feature=player\\_embedded&v=KzAFaxIV8rs](http://www.youtube.com/watch?feature=player_embedded&v=KzAFaxIV8rs)

## **Below is last month questions and answers were all again directly from the 1976 License Manual.....by Dick-WB1W**

### **1. *What is a dummy antenna? How can it be of use to amateur operators?* (Advanced Class question)**

A dummy antenna is a device which has the same electrical-circuit characteristics as a real antenna, but which dissipates all the power supplied to it without radiating any. Typically it is a large resistor of 50 to 75 ohms, of a size sufficient to handle the transmitter's power output safely; to increase the power dissipation capability the resistor may be immersed in an oil bath. It is of use to amateur operators in tuning and adjusting transmitters without causing interference to radio communications.

### **2. *What is a dipole antenna?* (Novice Class question)**

A dipole is an antenna to which the signal is applied at the midpoint. The most common dipole is one half wave in length.

### **3. *Compare the characteristics of a horizontal half-wave dipole with those of a quarter-wave ground plane antenna?* (General Class question)**

Vertical ground-plane antennas, not exceeding 5/8-wavelength, radiate a vertically polarized omnidirectional signal at low angles of radiation. They require an image ground system (radials) in order to be effective. A horizontal dipole does not require an image ground system (radials) in order to be effective. A horizontal dipole does not require an artificial ground system, and radiates a bidirectional, horizontally polarized signal if erected one half wavelength or more above ground. The closer it is to ground, the higher the angle of radiation, the less pronounced its directivity, and the lower its impedance.

### **4. *What constitutes a parasitic antenna element?* (Extra Class question)**

A parasitic element is one receiving power from a driven element by coupling through the electromagnetic field, rather than receiving power directly from the transmitter through a transmission line. It is usually similar in construction to a driven element and is placed parallel to it at a distance which may be as much as one-half wavelength, but is generally less than one-quarter wavelength. It is usually tuned, by adjusting its length or by other convenient means, so that the phase relationship between the current induced in it and the current flowing in the driven element, in conjunction with the element spacing, will give a desired directive pattern for the system as a whole.

## **This month's questions:**

- 1. What is the principle of an electrolytic capacitor? Why are they widely used in amateur equipment?**
- 2. What are inductive and capacitive reactance? How are their phase angles related?**
- 3. Draw the schematic symbol of a resistor, a capacitor, an inductor, a transformer, a choke?**
- 4. How do resistors combine in parallel and in series? Capacitors? Inductors?**

**So let's add a couple of problems related to the above.**

- A. If you have five capacitors, each 5uF, connected in series what is the equivalent capacitance?
- B. You find another 5uF capacitor and add it in parallel with the above five in series what's the new capacitance of the circuit?
- C. You go to a ham flea and buy two boxes with three terminals. Each box has three terminals on the outside (A, B, & C). You measure the resistance across each terminal and find that resistance of both boxes measure the same resistance. So being the good ham that we all are the first thing you do is open the box. The first box has three resistors connected in a Delta configuration. The resistors are marked as follows:  $R_{AB} = 200$  ohms ;  $R_{BC} = 400$  ohms; and  $R_{AC} = 600$  ohms.

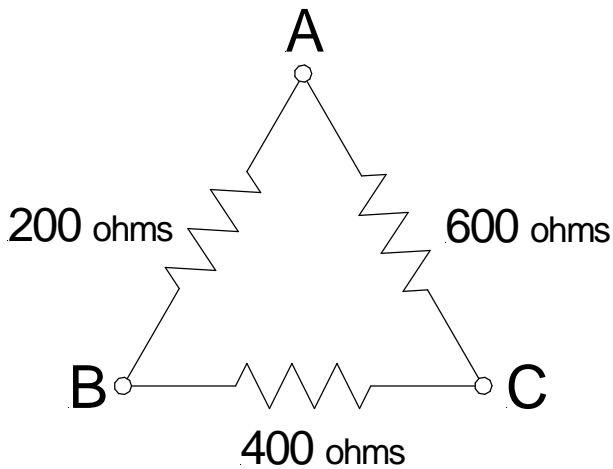
What resistance did you measure across each terminal?

A to B = ?      B to C = ?      A to C = ?

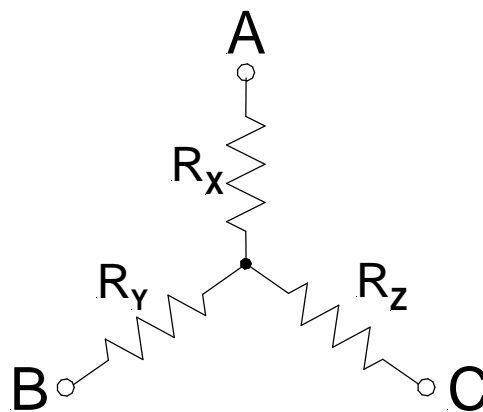
So now you open up the second box and find it also has three resistors but the resistors are not marked. In addition, these resistors are connected in a Wye configuration.

What is the resistance of each resistor in this second box?

$R_X = ?$  ohms       $R_Y = ?$  ohms       $R_Z = ?$  ohms.



First Box



Second Box

## Cell-phone to fly in space

Researchers at the University of Surrey and Surrey Satellite Technology Limited (SSTL) have developed 'STRaND-1', a satellite containing a smartphone payload that will be launched into orbit around the Earth later this year.

STRaND-1 (Surrey Training, Research and Nanosatellite Demonstrator) is being developed by the Surrey team to demonstrate the advanced capabilities of a satellite built quickly using advanced commercial off-the-shelf components.

STRaND-1's lead researcher Dr Chris Bridges explained why a smartphone made an ideal satellite payload "Smartphones pack lots of components – such as sensors, video cameras, GPS systems and Wi-Fi radios – that are technologically advanced but a fraction of the size, weight and cost of components used in existing satellite systems. And because many smartphones also run on free operating systems that lend themselves to online software developers, the creators of applications ('apps') for smartphones could feasibly develop apps for satellites," he said.

Smartphones aren't designed to go into space, so in addition to extensive ground testing prior to launch there will be an in-orbit test campaign to put the phone through its paces. A powerful computer built at the SSC will test the vital statistics of the phone once in space. The computer will check which components of the phone are operating normally and when components malfunction in orbit for recovery. Images and messages from the phone will be sent back to Earth via a radio system. Once all the tests are complete, the micro computer will be switched off and the smartphone will be used to operate parts of the satellite.

"If a smartphone can be proved to work in space, it opens up lots of new technologies to a multitude of people and companies for space who usually can't afford it. It's a real game-changer for the industry," Dr Bridges added.

A smartphone avionics suite is one of many technological advances packed into this 4 kg nanosatellite. To precisely point and manoeuvre, the satellite also incorporates advanced guidance, navigation and control systems including miniature reaction wheels, and a GPS receiver, as well as innovative pulse plasma thrusters to propel it through space.

## Echoes of Apollo - call for student investigators and adult engineering mentors

**Pat Barthelow, AA6EG** of the Echoes of Apollo Project (the folks who brought us the 70cm Arecibo EME activity) is working with kids on the *Google Science Fair*.

The students and adult mentors have devised a simple experiment to measure the distance to the moon using MoonBounce.

Pat has several EME stations committed and is looking for more technical support. He is also looking for additional young Co-Primary Investigators (Age 13-18) to participate.

Time is of the essence. Reply directly to:

[apolloeme@gmail.com](mailto:apolloeme@gmail.com)

Pat says the students will develop the experiment, lead, analyze.

Adults are needed to nurture, guide, mentor with these goals in mind:

- + Key a CW transmission or alternatively, send an audio impulse via microphone to EME TX.
- + Starting the time clock on the impulse transmission whether Audio "Clack" or CW key.
- + Recording for Science Fair presentation, using Multimedia video/audio equipment in the Moon bounce Station.
- + Stopping the clock when the audio/RF does RT to moon (~2.5 Seconds) and returns, and is demodulated by Moon bounce RX and presented at Audio speaker terminals.
- + Pre-measure station delays in TX and RX to develop a constant for internal equipment delays.
- + Measuring the EME interval as closely as possible, with simple equipment, say, to milliseconds. Probably take the Multimedia video/audio to a Video editor, to measure delay, digitally.
- + Compare distance to the moon in the NASA, or US Naval Observatory databases for their actual distance to moon, at the moment of the experiment.
- + Student analyzes for errors, error sources, discusses return signal distortion, due to doppler, Libration, pulse stretching, due to spherical moon, etc.
- + Student suggests follow up experiment, to minimize measurement errors, or assuming more sophisticated equipment became available.

QUESTION: For an analog RX to audio output, what would be the best way be to measure the internal propagation delay in an [Analog, Digital] receiver, from the time of arrival of the RF at the Antenna connector to demodulated output [Analog, Digital] at the speaker, or computer screen.

For analog receivers, is the internal RX propagation delay, in order of: microseconds? Milliseconds? For Digital receivers?

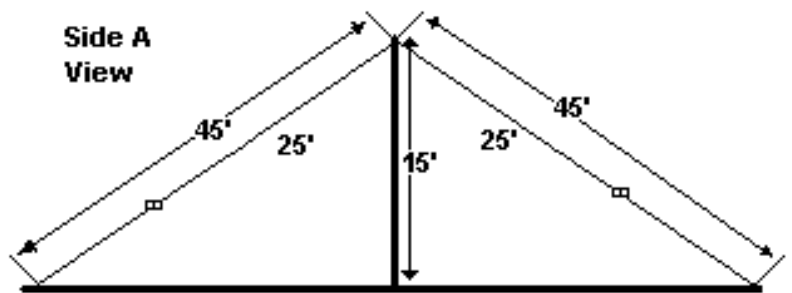
Best Regards,  
*Pat Barthelow*

## Build Your Own AS-2259 Type NVIS Antenna

<http://home.centurytel.net/w9wis/NVIS.html>

### Parts List

- 3 ea 1.5" PVC pipes 5' long
- 2 ea 1.5" PVC coupling
- 2 ea 1.5" PVC cap
- 4 ea egg type insulators
- 3 ea brass round head screws (#6-32 x 1/2")
- 2 ea brass round head screw (#6-32 x 1")
- 6 ea brass hex nuts(#6-32)
- 4 ea flat brass washers (#6)
- 4 ea lock washers (#6)
- 1 ea SO-239 chassis connector with solder pot center pin
- 1 ea SO-239 coax crimp on type
- 4 ea stakes
- 1 ea round metal stake 3/4" dia. x 18" long
- 4 ea heavy solder lugs to fit brass screws (you could use crimp lugs)
- 4 ea Plexiglas pieces, 1" X 3", hole drilled through each end
- ~150' copper antenna wire (braided/woven type like Davis Flex-weave works best)
- ~60' nylon rope (Parachute type cord works great and is inexpensive)
- ~17' RG-58 (coax for center mast feedline)



Drill a PVC Cap to accept SO-239 (7/8") and 4ea #6 screws, lock washers and nuts.

Make sure to center the SO-239 in the hole before drilling the 4 screw holes. Lock washers go under the nuts. 3 screws are 1/2" and the other is 1".



Cut off the head of a 1" #6 brass screw and solder it in the center post of SO-239

Cut antenna wires to length plus a little.

Fit one end of each wire with solder lugs.

Fit the other with the egg insulators and parachute cord or other nonconductive rope that serves as guy ropes on the ends of the 4 elements. Two guy ropes should be at least 7.5' long for the 38' antenna wires and 20.5' long for the 25' antenna wires.

Locate the 4 Plexiglas pieces and drill 3/8" holes on each end. Slip the guy rope through one hole and tie it to the other. See picture on last page if you have trouble visualizing this... These pieces allow you to pull the Plexiglas piece up the guy to shorten it and adjust the tension of each guy. The total length of each element, wire and guy, is about 45'.

Drill hole in center of second end cap (3/4") and run round steel 18" x 3/4" diameter rod through the center. I purchased the rod at Menard's Home Center and it would also be available at Home Depot, Lowes or similar home centers. This is the bottom section and the center stake helps when setting up the antenna.

Drill a 3/4" hole near the bottom of one end of one of the 5' pieces of PVC pipe. After drilling the hole run one end of 17' of RG-58 coax through the pipe and out the hole. Crimp a SO-239 on this end. Crimp a PL-259 on the other end. The long end is run through the pipes before erecting the antenna as a coax feed. Alternately you can just run a long piece of coax to the top but I thought this was quicker and easier. I leave the coax in the bottom section and feed to the connector in the top when I assemble the antenna. You may find it easier to leave the coax in a coil and feed from the top through the bottom.

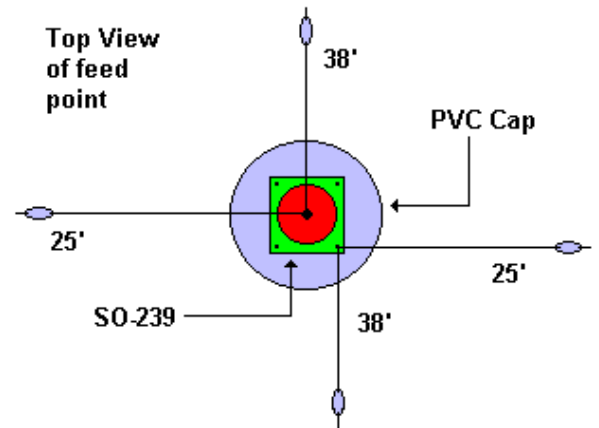


Install pipe coupling to one end of the pipe as seen above. Install a coupling to the remaining pipe as well. The couplings need not be glued... in fact I didn't glue any of the caps or couplings and they seem sturdy enough for the purposes of the support mast.

Put the top cap with SO-239 on top of what will be the top section of PVC pipe. Attach wire elements to the top cap as shown in the drawings, also illustrated below...

Drive the section with the bottom cap and spike into the ground. Assemble the other two sections together and then hoist onto the lower section. This is MUCH easier with two people but with practice you can assemble it yourself. Just be careful in case it falls over.

Extend the wires as in the diagrams and attach the guy ropes to the stakes. The stakes should be located 42.5' from the center mast of the antenna so the wire elements form crossed dipole-like antenna sections. Thread the Plexiglas pieces onto the guy ropes. Snug up the guy ropes to straighten the antenna mast using the Plexiglas pieces you made earlier—they make it easy to adjust the guys. Check out the photos which follow and you'll get a better idea of



how to make the Plexiglas guy tensioners. I bought power cord holders at a home center to wrap the wire and guys on and labeled each (38 or 25)... they were 2/\$1 so it was really a deal. Using these for guy and antenna wire storage really helps things stay neat when I break down the antenna and store it in its bag. The antenna works NVIS mode from about 3.5 to 11 MHz. It's generally necessary to use a tuner with this type of antenna, then it's useful from 2 - 30 MHz. However, the high bands are not NVIS. If you build this antenna let me know how it works for you. I use a LDG Z-11 auto tuner with my Argonaut V and it works great!



## Cabin Fever And Ham Radio

By J. Pallazola, WB1CHJ

It has been a long cold snow covered winter. One thing about ham radio, it keeps me from going off the deep end with cabin fever. I wish band conditions were better. There was a time when December to mid March the DX bands would be jumping. In March of 2010, I cleared the dust off my two meter gear and got back into ham radio. Ten years ago. I would go on two 15 meter nets and one 20 meter net just about everyday. All three nets are not on anymore. Since I've been back on the air, I haven't done much talking, I mostly keep my ears open and my trap shut! I keep hoping to hear a country I don't have. I haven't heard any DX stations I had

QSO with in the past.. A ham in Texas remembered me. He thought I was a silent key.

The other day, I pulled out an old bag of QSL cards and went over all the countries I have confirmed. I opened another bag and much to my surprise, I found, I'm 4 states away from Working All States. The last Stateside QSL card confirmation was in February 1996. I never paid much attention to my stateside contacts. The WAS award would look great on the wall next to my DXCC award. I purchased a IC-7000. I hope I can live long enough to find out everything that Icom can do. I will say more on that at another time. 73

## **ARISSat-1 arrives at the International**

### **Space Station**

On January 28 at 0132 UTC, a Soyuz rocket lifted off from Kazakhstan carrying the Russian Progress M-09M cargo vehicle to orbit headed for the International Space Station (ISS).

While the primary cargo of the Progress vehicle is fuel, oxygen, food and other supplies, the Progress also contains AMSAT's **ARISSat-1** Amateur Radio satellite.

Progress docked with the space station just two days after launch, on January 30 at 0239 UTC.

Currently ARISSat-1 is planned to be manually deployed from the ISS by Russian cosmonauts Dmitry Kondratyev and Oleg Skripochka during a spacewalk on February 16.

ARISSat-1/RadioSkaf V will have simultaneous 2m FM, CW, BPSK and transponder transmissions. These multiple transmissions are created by a new software defined transponder (SDX) board.

Features provided by the SDX include:

- The FM transmissions with cycle between a voice ID, select telemetry values, 24 international greeting messages in 15 languages and live SSTV images.
- The CW transmissions will be callsign ID, select telemetry, and callsigns of people actively involved with the ARISS program.
- The BPSK transmissions will feature a new 1kBPSK protocol developed by Phil Karn, KA9Q to be readable in low signal level conditions. The BPSK data will alternate between telemetry and Kursk experiment data.  
Free ground station soundcard demodulator and display software will be available before deployment for multiple platforms.
- There also is a 16kHz wide amateur radio U/V transponder between the BPSK and FM signals.
- The Kursk experiment will be sampling the amount of vacuum each day for 90 minutes and sending down data to map the vacuum change as the satellite slowly spirals into the atmosphere.

## **ND9M/VQ9JC Maritime Mobile satellite**

### **operations planned**

**Jim, ND9M/VQ9JC** plans to operate the amateur radio satellites from his merchant marine ship presently enroute from Diego Garcia (grid MI62) to Charleston, SC (FM03) via the Pacific Ocean.

Jim says he has an FT897D and an FT817ND with an Arrow-2 antenna. He plans to be active from quite a few wet grids along the way. His ocean route will take him through grid fields include MI, NI, OI, OJ, PJ, PK, QK (24 hours at Guam), QL, RL, RM, AM, BM, CM. and DM.

Jim's job is seven days a week for four months straight and he will not generally be available during the normal daytime working hours so operating opportunities during these times cannot be predicted.

The majority of passes he can be on will be in the late afternoon and early evening, so AO51, FO29, and AO7 Mode B will be the focus. Early morning AO7 passes will occasionally be available. Operating during late evening passes will be likely once the ship crosses the International Date line and enters the eastern Pacific. Jim's portable satellite station will be setup on the ship's helicopter deck.

The ship will be off the coast of southern California by the end of February and should be there for about 10 days before resuming the voyage towards Charleston via the Panama Canal, then northward around Cuba towards Jacksonville (EM90) for another stop at the end of March.

The voyage will finish in April in Charleston, SC. Jim says he has applied for an IARP permit for Panama so that, barring unforeseen regulations, he will be able to operate whatever passes occur as the ship transits the Canal.

E-mail contact for Jim is via james.t.clary.civ <at>msc.navy.mil.

He plans to post regular updates on his trip's progress to the AMSAT-BB.

## **NASA's Nanosatellite Heard by Hams**

When a NASA nanosatellite — NanoSail-D — ejected unexpectedly on January 17 from the Fast Affordable Scientific and Technology Satellite (FASTSAT), the agency called upon Amateur Radio operators to help track it. NASA asked radio amateurs to listen on 437.270 MHz for the signal and verify that NanoSail-



D was operating. NASA received almost 470 telemetry packets from 11 countries.

The NanoSail-D beacon sent an AX.25 packet every 10 seconds; the packet contained data about the spacecraft's systems operation. Listen here for a recording of the nanosatellite's beacon, made by Hank Hamoen, PA3GUO, on January 21.

Once the NanoSail-D team received confirmation that the nanosatellite did indeed eject, NanoSail-D principal investigator Dean Alhorn quickly enlisted Alan Sieg, WB5RMG, and Stan Sims, N4PMF, to try to pick up NanoSail-D's radio beacon. Both hams work at the Marshall Space Flight Center in Huntsville, Alabama.

"The timing could not have been better," Sieg said.

"NanoSail-D was going to track right over Huntsville, and the chance to be the first ones to hear and decode the signal was irresistible." Right before 2300 UTC on January 17, they heard a faint signal. As the spacecraft soared overhead, the signal grew stronger and the operators were able to decode the first packet:

NanoSail-D was alive and well. "You could have scraped Dean off the ceiling. He was bouncing around like a new father," Sieg recalled.

According to NASA, the nanosatellite was last heard at 1354 UTC on January 21. Telemetry indicates that the sail deployed on schedule and the satellite is now believed to be out of power, which NASA said was to be expected. NASA is now asking for visual tracking and sighting reports of NanoSail-D, which is about 650 km above the Earth. According to the agency, when the nanosatellite's sail reflects off the Sun, it could be up to 10 times as bright as the planet Venus — especially later in the mission when the sail descends to lower orbits. You can track NanoSail-D on the web or on your smart phone. NASA estimates that NanoSail-D will remain in low Earth orbit (LEO) between 70 and 120 days, depending on atmospheric conditions.

### **BRAINWAVE CONTROL IS COMING**

And finally this week, get ready to control your, TV set, your stereo and maybe even your ham radio station with only your mind. That's what you may be able to do with brain waves if the technology developed by a company called PLX Devices proves out. No it's not science fiction as we hear in this report:

—

According to its website, the XWave from PXL Devices is the first consumer product priced under

\$100 which can sense and detect human brainwaves, interpret them and connect it to everyday technology.

PLX Devices founder and CEO is Paul Lowchareonkul. He recently told the U.K. Daily Mail that it was only a matter of time before products like the XWave entered the mainstream. Lowchareonkul says that the human brain is the most powerful, complex thing in the universe, and for the first time, we're able to harness its amazing power and connect it to everyday technology.

Lowchareonkul says that with the development of 3rd party applications or apps, the potential for innovation is limitless. At the moment, PLX is only offering apps that interact with the XWave for Apple mobile devices like the iPhone, iPad and iPod touch. There are four apps currently available that interact with the XWave. These include a basic set-up app; an app that allows you to upload your song list and sync your brainwaves with any song in your library; a "Tug of Mind" app and a meditation app. In the future, PLX says on its website that you will be able to control and float objects in video games by simply thinking about it, or train your mind to focus and relax on command.

### **RADIO LAW: ROCKEFELLER REINTRODUCES INTEROPERABLE RADIO BILL TO SENATE**

Senate Commerce Chairman Jay Rockefeller, of West Virginia has reintroduced legislation that would re-allocate a chunk of spectrum to public safety officials. This, for the creation of a national broadband interoperable network.

Rockefeller said the bill mirrors the measure he offered last Congress. One that would re-allocate the so-called D-block of spectrum to public safety officials instead of auctioning it off to commercial bidders as the Federal Communications Commission has proposed.

Rockefeller noted that with the upcoming 10th anniversary of the September 11, 2001, al-Quida terrorist attacks on the United States, Congress needs to take the steps necessary to implement a recommendation by the commission that investigated those attacks. That being to create a national broadband interoperable public safety network. He said that such a network is needed to assist first responders to better communicate during emergencies.

# WINTER FIELD DAY



Dirk Vanlightenberg N1PSF and John Graves WA1JG working the phone station on the 20 meter beam in the background while Rick Maybury WZ1B works CW on the 40 meter dipole. Rick and Ruth-WW1N below.



Bill Canty W1OKD and new CAARA member Henry DuPuis K1HRD working on the Yaesu FT 857D PSK 31 Station while Hank W4RIG looks on.



Dan-K1DJK and John-W1HUB

Here's some pix of Winter Field Day for the Newsletter. We had a smashing good time with over 22 members showing up for operations and support! Quite a good turnout and I was surprised by the collective enthusiasm of all who appeared. Kudos go to Ruth WW1N for standing duty for the full 24hrs of the contest! Stan and Hank joined forces and cooked an outstanding breakfast for all with eggs, toast, bacon, potatoes, OJ, coffee and plenty of good chat besides. The bands, on the other hand, didn't offer near as much and were fluke at best. That seemed to be the consensus too from all whom we asked on the air. We play digital using HRD & DM-780 as well as CW & Fone. In all honestly we didn't make very many contacts despite a great effort and not many on-air persons seemed to know of or were involved in the contest itself! WFD seems to be becoming a mostly Fone contest but those involved were very enthusiastic. We worked one team who was actually outdoors in the freezing weather in an ice-house on a frozen lake in Diluth, Mn. They were having fun and putting out a nice signal on 20m when we worked them "Whiskey ZERO Long Winter Underwear (W0LWU) was reporting temps in single digits but their tent was cozy and warm They really know how to handle frigid temps...we were quite happy to be home and inside.

Briggs



Ron-WB1EAZ, Ken-KA1OH, and Ruth- WW1N

Dirk-N1PSF and John-WA1JG



Marianne-KB1TEO and Ruth-WW1N