North Fulton Amateur Radio League NFARL eNEWS

May 2018

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SPECIAL SERVICE CLUB

MSA ARISS Contact Successful / John Kludt, K4SQC, ARISS Mentor

On Thursday, May 3, 2018 Mill Springs Academy successfully completed an ARISS (Amateur Radio on the International Space Station) contact. The ARISS program sponsored by AMSAT, the ARRL, NASA, CASIS (Center for the Advancement of Science in Space) and space agencies around the world uses Amateur Radio in the 2m band to allow students to talk with an astronaut in orbit on the International Space Station. The ISS is 250 miles up and traveling at 17,500 miles per hour. At that speed and altitude a contact last about ten minutes: the time it takes to move from horizon to horizon.

Schools are selected through a competitive process and Mill Springs Academy in Alpharetta, Georgia was fortunate to be selected. The entire process takes about one year to complete. Martha Muir, W4MSA, a science teacher at Mill Springs lead the educational effort that went into this contact. Martha led the effort to generate over 100 questions. Included were questions from the sister classroom of John Hislop, G7OHO, in Broadstairs, UK. From this pool twenty questions were selected to be asked during the contact.

Daryl Young, K4RGK, was responsible for the technical aspects of the contact. He used the MAST system (Mobile Automated Satellite Tower) owned by the NFARL to get the circularly polarized 2m Yagi in the air. A vertical on a pole was the second antenna. We used two radios for the contact. This being a NASA sponsored program we had a primary and a backup radio system. Antenna rotor control and frequency control of the primary radio were under computer control.

All of this came together at 1547 UTC on the 3rd with a most successful contact. All twenty questions were asked and then answered by astronaut Scott Tingle, KG5NZA. Students asked a couple of extra questions before the signal was lost as the ISS disappeared over the horizon. A recording of the live stream of the contact can be found at http://dcy.us/ariss. *(actual contact with ISS begins at 35:22)*

More details of the event can be found elsewhere in this copy of eNews. Many people were involved and on behalf of the ARISS program I want to thank each and every one of them for their commitment and their ongoing efforts needed to bring this contact to a successful conclusion.

As Bill and Ted would have said, "A most excellent adventure!"

NFARL Upcoming Events and Dates

- **Every Sunday — NFARES net** - 8:30 PM - 147.06 MHz (+) PL 100
  All licensed Hams are welcome, you do not need to be an ARES member!

- **Every Monday — Tech Talk** - 8:30 PM - 145.47 MHz (-) PL 100
  NFARL's flagship technical based "non check-in" net. The net is always better when using the web based chat room but Internet is not required to join the net. Check NFARL Nets website for more information and "how to".

- **Every Wednesday — Hungry Hams Lunch Bunch** - 11:15 AM
  Meet with your fellow club members every Wednesday!
  Slope's BBQ, 34 East Crossville Road, Roswell.

- **Every Thursday — YL OP Net –** 8:00 PM - 9:30 PM 145.47 MHz (-) PL 100
  Check NFARL Nets website for "how to."
  OM's (guys) are welcome to listen in to this YL net.
  Great opportunity to get your YL's on the radio!

- **Every Saturday — Royal Order of the Olde Geezers (ROOG) Lodge No. 1**
  9:00 AM - Reveille Café, 2960 Shallowford Road, Marietta (at Sandy Plains and Shallowford). Everyone is welcome: You don't have to be "old" or a "geezer" to join this breakfast get-together.

- **Second Saturday – VE Testing** - 10:00 AM
  NFARL provides Amateur (Ham) Radio test sessions on the second Saturday of each month - Walk-ins are welcome, no appointment is necessary. All exam modules are offered at all sessions.
  Location: Alpharetta Adult Activity Center at North Park
  13450 Cogburn Road, Alpharetta, GA 30004
  Please check our website for more information.

- **Second Tuesday — NFARES Meeting** - 7:00 PM - 9:00 PM
  Fellowship Bible Church, 480 W. Crossville Road, Roswell.
  Check NFARES.org for more information.

- **Third Tuesday** — **NFARL Club Meeting** - **May 15, 2018**, 7:30 PM.
  Pre-meeting activities begin at 7:00PM.
  Location: Alpharetta Adult Activity Center at North Park
  13450 Cogburn Road, Alpharetta, GA 30004
  Program: "Field Day by the Numbers" by KB4KBS Scott Straw

- **Fourth Tuesday – NFARL Executive Team Meeting**
  May 22, 2018, 7:00 PM
  Location: Arbor Terrace at Crabapple
  12200 Crabapple Road, Alpharetta, GA 30004
  Meetings are open to all NFARL members. Space is available on a first arrival basis. Please contact the President to ensure available space.

Georgia QSO Party
NFARL Participation and Scores at Record Levels !!

Well, so much for the lament of dead bands, as it seemed the lull in the solar cycle was on spring break during the 2018 GQP!! At least this was the case for the stations participating in the "NFARL Challenge" in this year's Georgia QSO Party.

A record number of participants posted scores in the 2018 "NFARL Challenge" and an all time club high score was tallied. This record high score was paced by our all-star rover team, N4N. This team, piloted by W5JR, WK4U and N5ZZ, turned in a final tally of 310,230 points!!

The offer of the "Spell NFARL" certificate in the GQP appears to have been quite a success in generating activity in the contest. NFARL operated 10 special event callsign stations to celebrate the club's 40 plus years of amateur radio service. These stations were:

N4**N** - N4**F** - N4**A** - N4**R** - N4**L**
K4**N** - K4**F** - K4**A** - K4**R** - K4**L**

If you worked 5 of these stations with the suffixes to spell **"NFARL"** using any mix of "N" or "K" prefixes, you are eligible for the coveted "Worked All NFARL" certificate! Please send your details to n4tol@arrl.net for certificate details.

The club would like to recognize Daryl Young, K4RGK for managing the QRZ pages for the special event stations, Bill Cobb, K4YJJ, for maintaining the website info for the GQP, and Jim Stafford, W4QO, for promotion and strategy for the Challenge.

Participants in the "NFARL Challenge" will be recognized at future meetings as scores are processed and category rankings finalized.

John, N4TOL

Radio Island Activation

On Thursday March 22nd club member Terry, W4YBV activated Radio Island, N.C.

Here are a few photos of Terry's activation.

From All of NFARL

Thank You Terry !

Dancing Like Fred Astaire / Martha Muir, W4MSA

If you were to look at the credentials of all the members of NFARL – the colleges they attended, the careers they have or have had, what phenomenal thing or things they enjoy doing with ham radio- no one could help but be impressed. Have you ever seen Fred Astaire dancing? He's always so graceful and so confident. Each step he makes, each twirl or lift he gives his partner, looks effortless, so natural. That ease, that grace, that confidence, that beauty totally hides all the hours of work that went into each performance. The same holds true for all the NFARL hams who helped with the ARISS at Mill Springs Academy. So much work went into that event. It is too easy to overlook all the hours of work and background preparation for that event since it came off so flawlessly. My thanks and appreciation to all the NFARL hams who helped with this ARISS Radio Contact.

Most notably, I'd like to acknowledge and thank Daryl K4RGK and Lori K4UPI. They spent their twentieth wedding anniversary at Mill Springs getting things ready for this ARISS. Daryl nearly assumed a 9 to 5 job at the school on Monday, Tuesday, Wednesday, and nearly Thursday, too. And, oh, yea, Daryl swung by Friday, too. This is on top of all the hours he spent working on things at home, too and the other days Daryl came by the school to meet with the IT and A/V folks or checking to see if he could back the antenna trailer down the sidewalk to the door of the gym.   Come the next HamJam, Daryl will know where everything is.

Lori worked with Daryl to make sure everything would work okay. She manned the backup radio throughout the ARISS all the while hoping we wouldn't need to use her radio, antenna, or skills. All that prior work and preparation hoping it wouldn't be needed? Thank you Lori.

John K4SQC is our ARISS mentor and expert at all things ARISS. He was a mentor to all of us involved in this ARISS. He patiently bit his tongue when the line up of students kept changing after we sent the student list to NASA. He understands the students at MSA do things like that. He came in for a couple of practices involving the students and put them at ease by speaking with them about what to expect. He watched the strange choreography

the students went through to ask their questions in the very non-traditional order for an ARISS. On top of all that, he always deflected the thanks and accolades directed to him to Daryl. Without a doubt, Daryl was in charge of this ARISS but John was always there giving support.

The post-ARISS events were a great hit! What a waste of time and energy if we gather everyone together for a ten minute chat and then dismiss them to go back to their regular classes. Jim W4QO took on the huge task of organizing a series of post ARISS activities that tapped the rich knowledge bank of our NFARL members. Not only were the students enthralled, the adults, in particular, the administration staff who worked in the building directly adjacent to most of the demonstrations ,raved about how exciting those exhibits were and how the NFARL presenters so clearly and enthusiastically explained what was going on at their table. Jim's dream team consisted of Hal K4GG with his Blue Lightning table, Warren KD4Z and Roger N7BU demonstrating Arduinos, Grant KK4PCR, Jim W4QO, and Neil N4FN operating a GOTA HF station, and Pavel AC4PA allowing guests to play a bit tapping out some Morse code. Some of the Mill Springs ham students helped out at these exhibits, too.

Jim also organized a weeklong celebration of this ARISS by arranging for a special event station, call sign N4S, to be operated by students of different grades at Mill Springs all week. Chuck AE4CW, Jim, Neil, and Walt W0RON came in and gave students the opportunity to talk to folks across the country and beyond. They were a special hit with the middle school students. Their principal commented how magically they worked with the students.

Chuck, by the way, quietly operated the antenna for Daryl during the ARISS radio contact, even stepping outside at one point to verify that it was tracking correctly. As we know, Chuck is really great at working with antennas (as well as many other things).

Did you see Mike AD4MC at the ARISS? Even though he was in plain sight, he hides well. Mike was Daryl's right hand man throughout the week leading up to the ARISS helping with the installation and testing of the radio and antenna. He cheerfully played the part of our astronaut in a couple of practices with the students and their questions. During the program, he was running the projector and slides/video. The day before the program, he was up on a ladder putting the black plastic over the windows. After the program, he was helping Daryl pack up the antenna. And and and. The tasks he took on seems nearly endless. All with a smile on his face and seemingly effortless.

NFARL's NFARES group, represented by Grant KK4PCR and Fred KK4JYO, took charge of the parking at this event. Their yellow vests glowed in the bright daylight as they helped our guests find their way around the campus.

Nathan K4NHW was in charge of keeping the live audio and video streams going during the event. Nathan bought his young son Judson Wood in on Wednesday as he and Daryl setup and tested the A/V streaming equipment. The video was live streamed during the ARISS contact and archived later on the web. The audio was live on the 145.470 repeater via it's Echolink node. Shortly after the event, Bill K4YJJ had the photos he had taken organized and posted on the NFARL.org photo page. I had asked him to come in to take photos because I wanted this event to be documented as the NFARL event I thought it would be.

I could go on and on but hopefully I've made my point: the ARISS Radio Contact at Mill Springs Academy earlier this month was, indeed, a grand NFARL event that subtly showcased the great talent and skills of its members. For those who didn't notice, this event, which went off so smoothly, reflects all the work and effort that went in ahead of time.

Just like a Fred Astaire performance, all you saw were the smiles and twirls. Thanks, guys, for all your great dancing on our behalf.

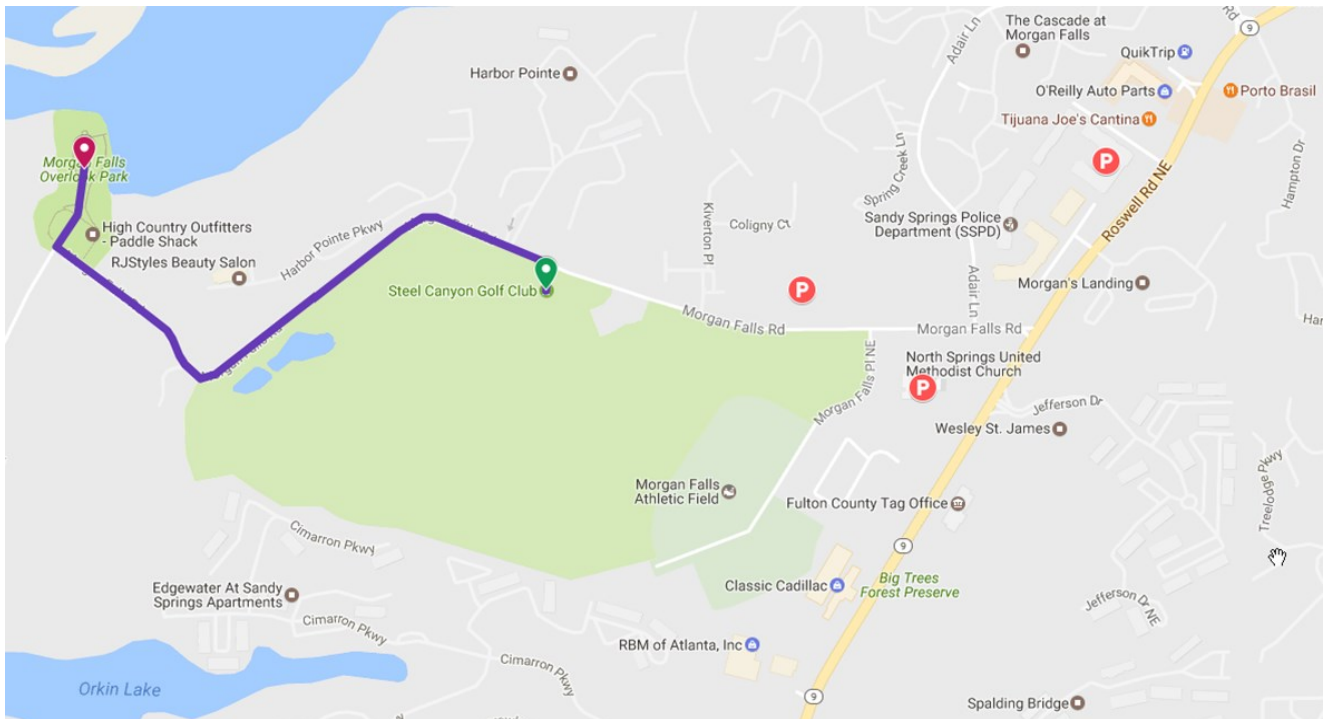# Sandy Springs Lantern Parade
Take it to the River! / Mike Cohen, AD4MC

On Saturday, April 21st, Sandy Springs held it's 3rd annual Lantern Parade. Here's a link to a 3 minute video of the first event. https://www.visitsandysprings.org/lanternparade/ (Scroll down towards the bottom of the linked page to see the video.) In addition to being beautiful and fun, this event is necessarily held when it is very dark.

Sandy Springs Fire Rescue (SSFR) asked NFARES to provide emergency radio communications for this event to help reduce ChatComm radio traffic and the number of 911 calls.   We provided 13 hams; Wayne – KG5WU, Larry - AA4QO, Tim - WK4U, Diane – KN4KSD, Colby – KN4KSE, Brian – N2EYI, Fred – KK4JYO, Mark – KK4VQJ, Jim –KJ4QVT, Steven – KW4HQ, Scott -KM4JXE, Mike B. – KM4TQR, Mike C. – AD4MC.

This was a joint team effort between NFARES and SSFC (Sandy Springs Fire Corps, a volunteer group that provides support for SSFR.) Positioned at the SSFR & SSPD Incident Command tent, Wayne, KG5WU, was our NCS.

If you look over the map, you will see that it should be a trivial task to support this event by radio, since it is only 1-¼ miles long. (Spoiler alert...It wasn't trivial.) The walkers arrived at the

three Parking Areas, P1-P3, went to the Steel Canyon Golf Club area (START = 925' ASL) and later paraded as a group of about 2500 down to Morgan Fall Overlook Park (END = ~800' ASL). That elevation difference of 125' meant that it was going to be a steep ¾ mile climb back to START with kids and lanterns in tow.

Radio signals don't like to pass through hills, so we needed to set up a cross-band repeater at the high point (START) for NCS to reliably contact all the hams.

Did I mention that it was dark? We all wore reflective ARES vests & hats and used flashlights so that we could also act as "guiding lights" for the walkers.   As the walkers started to return to the Parking Areas, we needed to relocate so that we could continue to be with them for communications and as "guiding lights".

We even helped a mom with her 2 year old son find her lost keys in the church parking lot. We had been searching from the park area (Point 1 on the map) all the way back up to the church (P3). (IMHO, that was a 1 in a million find!!) Several of us got big hugs of appreciation and relief from her.

One of the SSFC volunteers wrote "I was really impressed by how professional, focused, and low maintenance the NFARES guys are."

SSFR, Chief Mark Ware thanked us and complimented us for clearly demonstrating that we can provide a useful service for these public events.

We all like to go to these events simply because they are fun, but it sure is good to know that we are recognized by public service officials for providing a useful service for these public events.

Mike, AD4MC

Field Day Primer / *Scott Straw, KB4KBS*

Please make a special effort to attend the May 15th meeting of the North Fulton Amateur Radio League. This will be your chance to learn all about our plans for another superb Field Day. I've spent the last month digging into the archives and researching NFARL's activity over the past several years. I plan to present a fascinating dive into the numbers. I hope to present a convincing argument that we can once again be the winner of the 3A classification and in doing so, set a benchmark for points that will stand for a long time – or at least until we raise it again next year.

Here are some of the numbers that you'll hear: 16,000. 3,000, 1,000, 500, and 2. Come find out what their significance is. Also, bring a pencil because I will need lots of volunteers and there will be so many sign-up sheets, you'll think you're at a silent auction.
We'll also talk about all the fun things we will do including help Scouts BSA members earn their Radio Merit Badge, meet elected officials, tour vehicles from some of the NFARES served agencies, stay up all night, make new friends, and share the joy of our hobby with interested visitors.

Finally, we will talk about food. Since this is the pinnacle event of the year for the club, we want every club member to join us, with their families, for dinner at 6:00 on Saturday night. Come for the food (barbecue & burgers), bring a covered dish vegetable or dessert, then stay for the fellowship.

Its time to get our Field Day on!

Scott, KB4KBS

Tuning Antennas with Qucs / Bob Freeman, KI4SBL

Well, have you ever heard of Qucs? From the Wikipedia page "Qucs (pronounced kju:ks) is an free-software electronics circuit simulator software released under GPL. It gives you the ability to set up a circuit with a graphical user interface and simulate the large-signal, small-signal and noise behavior of the circuit. Pure digital simulations are also supported using VHDL and/or Verilog." In our case, this includes the analysis of RF circuits and the use of transmission lines for impedance matching.
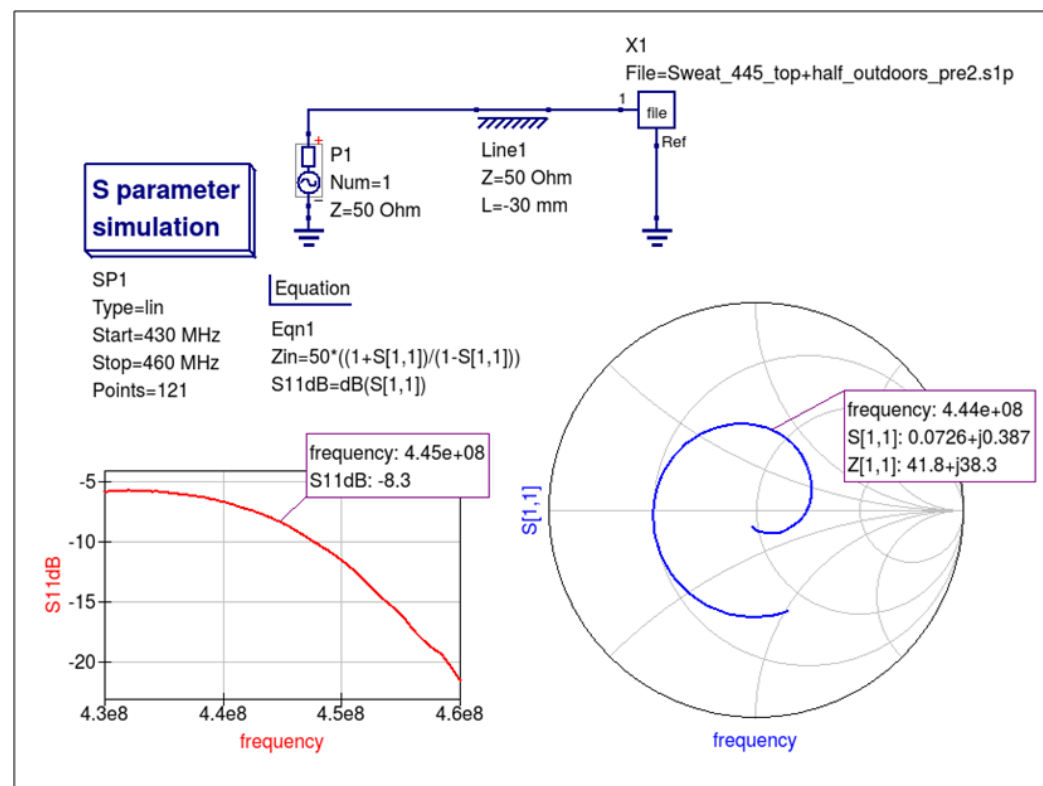
Envision an antenna project that requires the calculation of matching circuits to bring the antenna impedance under control. Two recent projects come to mind. One of these, a 2.4 GHz helix antenna and the other, a 16 element 70 cm folded dipole array with feed network. For the purpose of this article, we'll consider the latter, the dipole array.

Looking at impedance measurements of the array input showed Return Loss values around 8.3 dB. While that is not a terrible number, why throw away the associated 0.7 dB mismatch loss at UHF if we can do better? This is where Qucs comes in -- running a simulation in Qucs provides the means of doing "what if" exercises to evaluate potential options for matching the antenna to 50 ohms without having to build the hardware.

Our project's input impedance data were measured in the form of the S-parameter S11 using a vector network analyzer. The data were saved in Touchstone file format and then imported into the Qucs program as a 1-port S-parameter File component. The following figure illustrates the one port circuit model with measured antenna data. The L=-30mm (i.e. negative 30mm length) transmission line effectively de-embeds the coaxial adapter used to connect to the antenna input from the measured data, thus giving us the "actual" antenna input impedance.

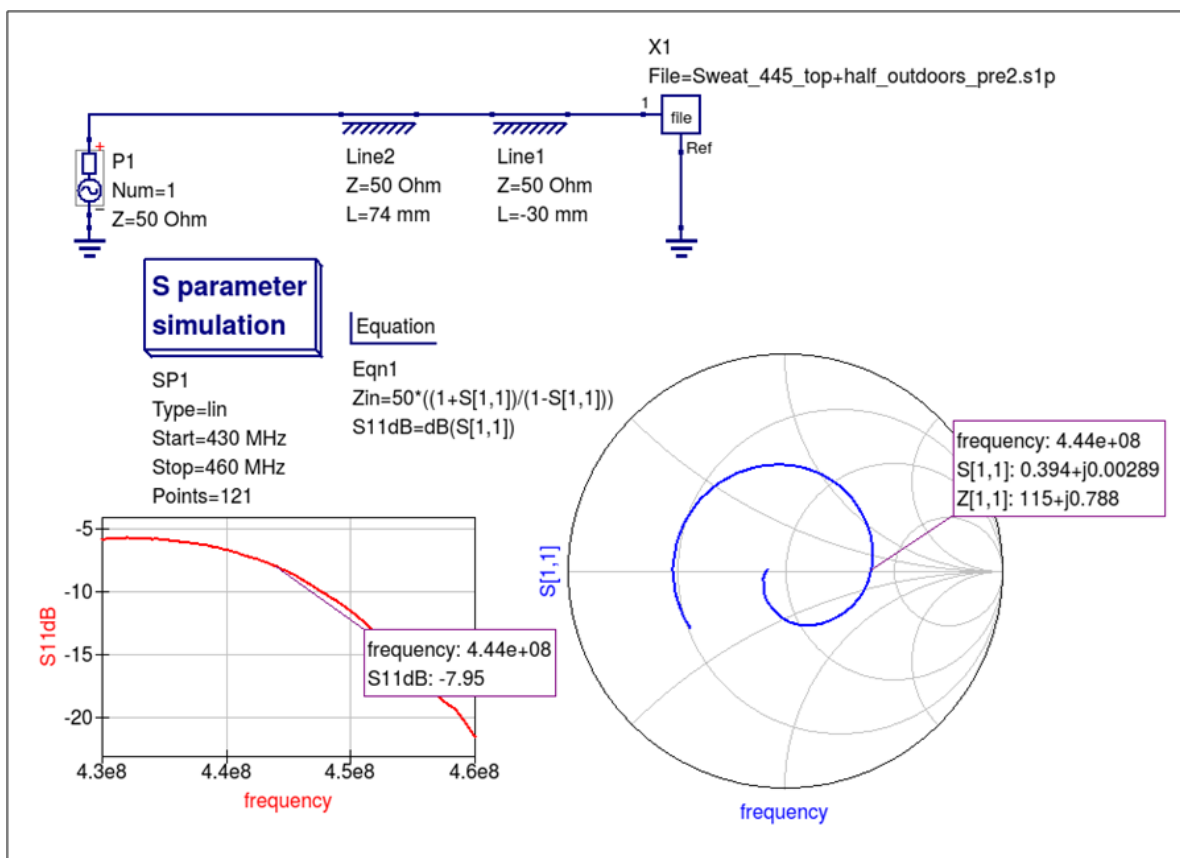Volumes of RF literature show that one method of achieving a narrow band impedance match is to employ a quarter-wave transformer (https://www.microwaves101.com/encyclopedias/quarter-wave-transformers). In the case at hand, the input impedance needs to be rotated clockwise on the Smith Chart by several degrees to place

the response on the Real axis. This is done in Qucs by adding a length of 50 Ohm transmission line and varying the length as needed to place the response on the Real axis; this turns out to be 74 mm of added transmission line in our case, as shown in the figure below.
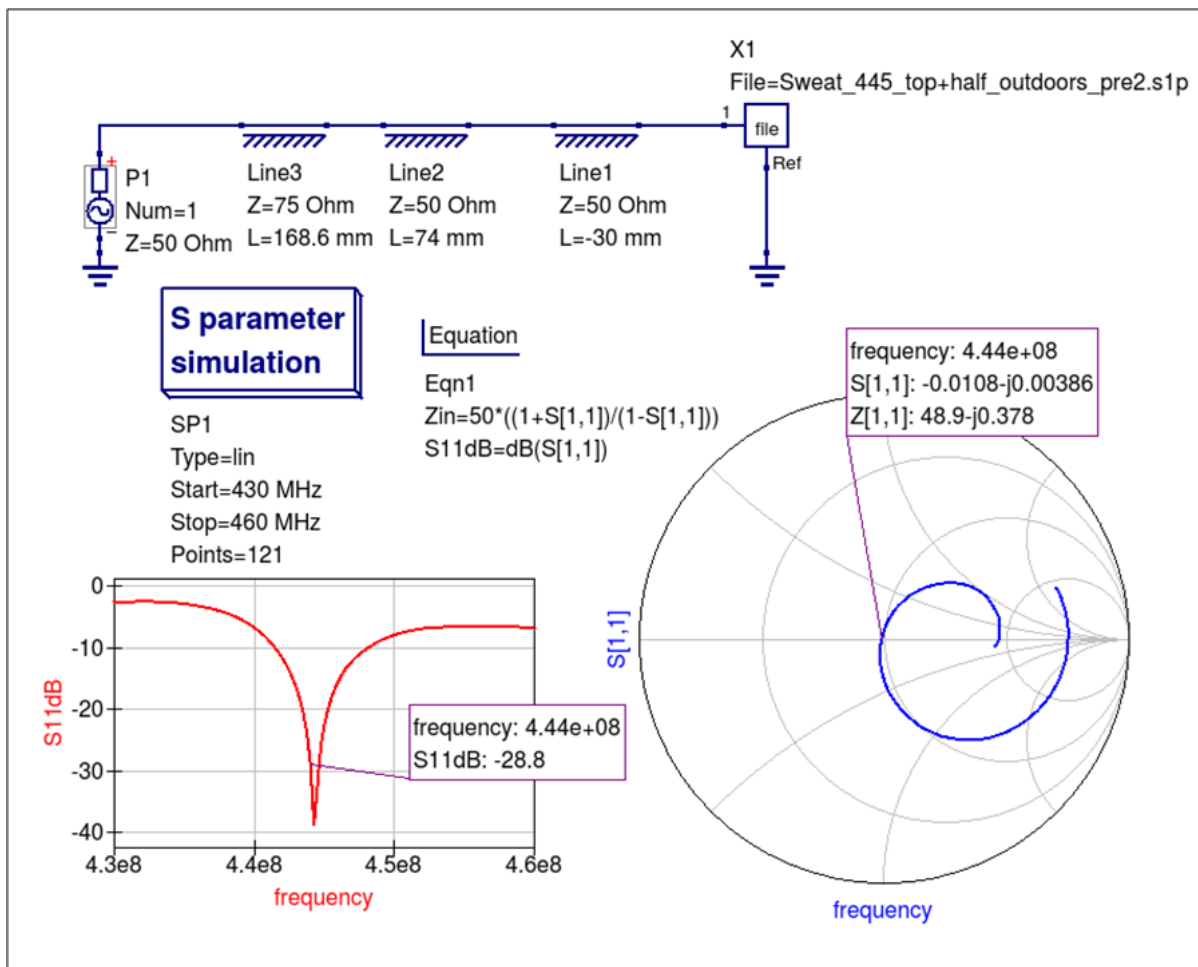

Engineering a quarter-wave transformer requires calculation of a transmission line (coaxial type in our case) with a characteristic impedance that is the geometric mean of the source and load impedances. From the reference above, this is: Z_line= (Z_load * Z_src)^0.5 or S_line= (115 * 50)^0.5 = 75.8 Ohms. How convenient! A length of Andrew LDF4-75A (75 Ohm) Heliax was just purchased from John (N4TOL) at one of our club meetings! But, will it work?

Re-running our Qucs model with the added transmission line will let us know if the 75 Ohm Heliax will work, or not. But, we will need to first calculate the line length at our frequency. Of course, we could grab our trusty hp28S (or borrow W5JR's HP95LX) and calculate a quarter wavelength (in air) – or we can use the tool provided in the Qucs software under Tools>Line Calculation. Enter Er=1, Freq=444.75 MHz, Ang_I=90 (quarter wave), and hit Synthesize to get 168.6 mm. Adding the transmission line to the Qucs model gives the result in the figure on the next page.

All right! Although, we did not have an exact 75.8 Ohm line, and we just threw away the imaginary component of the Z_load without a care, Qucs shows the Return Loss can be improved from about 8dB to 28dB by simply adding a quarter wave length of 75 Ohm line. In other terms, the matching section moved the VSWR from about 2.3:1 to less than 1.1:1 VSWR – that's not too bad!

Design of the actual hardware requires the length of the transformer to be reduced by the

specified propagation velocity of the transmission line. And, the correct length of 50 Ohm line will need to be placed between the antenna input connector and the transformer. These are important physical problems that will have to be addressed for the calculated solution to actually work in the application. But, the Qucs program has provided a means to evaluate a potential solution using the quarter-wave transformer and it can easily be used to evaluate other potential solutions, as well.

In the above example of Qucs use, we have only scratched the surface of the capabilities of the program. Many additional features are included in this free software that are useful for the design and analysis of circuits and systems that we use every day in amateur radio. Consider giving Qucs a try in your next project; the software is available for multiple platforms, including GNU/Linux, Darwin/OS X, FreeBSD, and Windows. It can be downloaded from either github (https://github.com/Qucs/qucs/) or sourceforge: (http://qucs.sourceforge.net/download.html).

Omissions, errors, and questions on the above should be forwarded to the author, please.

ARISS / MSA / NFARL, The Back Story / Mike Cohen, AD4MC

ARISS – Amateur Radio on the International Space Station
MSA – Mill Springs Academy
NFARL – North Fulton Amateur Radio League

On Thursday, May 3rd,, 2018, MSA had its second ARISS contact that was supported by NFARL. The first one was in 2013. These events don't just happen spontaneously. Both times, Martha, W4MSA, took the initiative to apply for MSA be an ARISS/school contact. Both times, John, K4SQC, helped to "guide" AMSAT, NASA and the ARRL in the selection process for MSA. A very belated Thank You goes to John for also creating and setting up the complete satellite radio station for the 2013 ARISS contact.
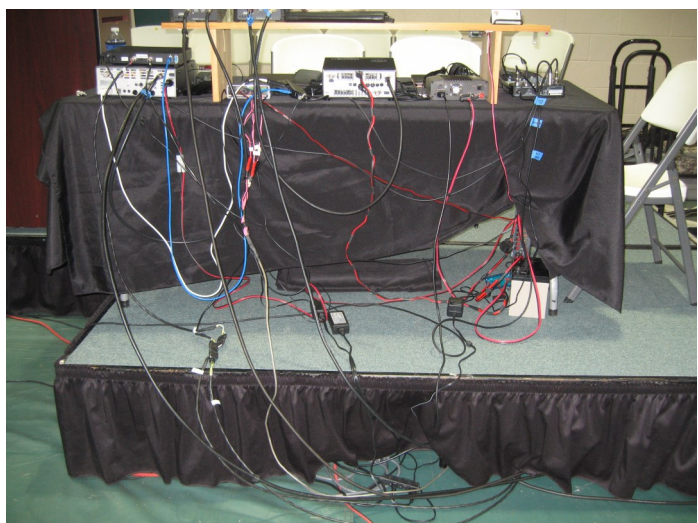
You can read more about this event from our Georgia Section Manager, David Benoist, AG4ZR, at http://www.arrl-ga.org/gomm/GOMM-2018May.pdf.

Bill, K4YJJ, uploaded many pictures for us to enjoy,
http://www.nfarl.org/nfarlPhotoAlbum/gallery/2018-activities/ariss-contact/

That and other articles give you some info on the main story. However, this back story covers the enormous amount of sweat and tears (not aware of any blood) that was required to make this event successful. Once MSA was chosen from the highly competitive selection process, the really hard part began. The actual ARISS contact lasts only about 10 minutes from AOS (Acquisition of Signal) to LOS (Loss of Signal) when the ISS passes above the horizon.

During that short 10 minute window, students got to ask astronaut Scott Tingle, KG5NZA, 21 questions. That precious time slot wouldn't be a good time to be extemporaneous. A pool of over 100 questions was created by MSA students, (including some from school students in England!). Those questions were pared down to about 20. A team of MSA students were "volunteered"/chosen to ask those questions and Martha practiced with them until the questions to astronaut Tingle were polished into a theatrical performance.

OK, so what does it take to make that ham radio contact to the ISS, flying at 17,150 MPH, with its AOS at exactly 11:47 AM Local Time on May 3rd and LOS 10 minutes later? The short answer is a LOT more than a hand held "walkie talkie". Daryl, K4RGK, set up the NFARL trailer and station with his personal equipment, including the antenna system, azimuth/elevation control, 2m/70cm pre-amps, coax, control cables, VHF/UHF radio, metering, computer control of AZ/EL and Doppler shift frequency correction, power supply and power distribution, including battery backup. As required, a

complete 2nd antenna/radio/computer system was also set up as an emergency backup station for the event. Here's a pic to show how Daryl set up his "wireless" satellite radio stations.

And that doesn't include the extras like setting up the PA system so that the audience could hear both the questions from the students and the answers from the astronaut; setting up a large screen and projector for the entire audience to see the ARRL and Ruth, KM4LAO, videos and a tracking program that showed the ISS pass on a world map; and setting up a video recording system with live streaming of the event. Daryl estimated that he had well over 100 hours of preparation time before the final preparations and testing from Monday through the morning of the event on Thursday.   (Yes, a failed coax cable on the tower was discovered and replaced during final testing!) Nothin2it !!

The end result was a spectacularly successful ARISS contact. (Many in the audience, including me, had tears in their eyes when that initial contact was made.)

As a close-up and personal observer, I can report that Martha, W4MSA again initiated this process, John, K4SQC helped us get it approved and then "passed the baton" to Daryl, K4RGK to make it happen. Yes, dozens of hams (K4UPI, W4QO and many more), MSA students and faculty were among the essential team members needed to get so many detailed tasks accomplished, but Martha, W4MSA, John, K4SQC, and Daryl, K4RGK, are the star performers and have each earned an enormous

        BRAVO !!

How I got This Cool Hoodie from Amazon / Pavel Anni, AC4PA
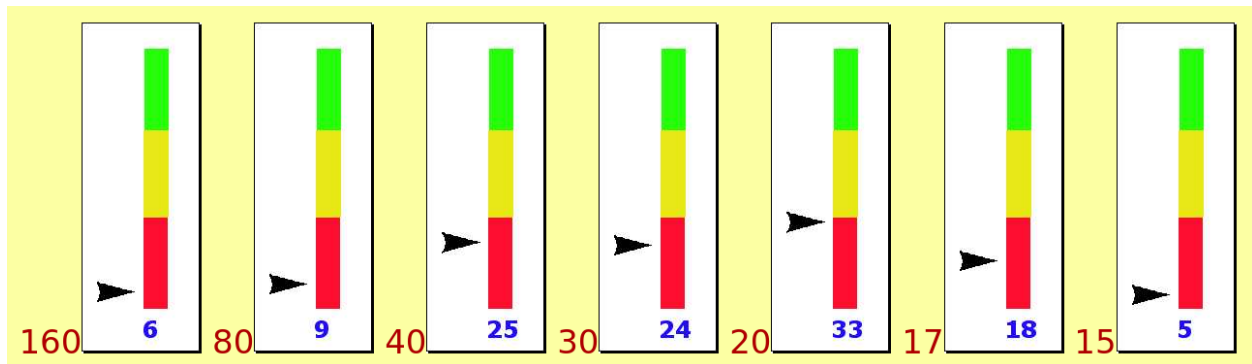
Amazon Alexa and Ham Radio

I started programming for Alexa last summer after I have attended a workshop for developers organized by Amazon. Alexa is very cool by itself (herself?), but being able to program applications was the primary factor in why I became highly interested in learning more.

I have created a couple of example applications and started thinking about developing something real. Naturally, my first thought was about something ham-related. It should be relatively simple (I wasn't ready for a complex project yet), and it should bring real value.

It was one of those weekends when you turn on your rig, scan the bands and hear almost nothing. "Is my tuner in the attic still functioning? Is my antenna up? Did I plug it in the rig?" In other words, the question "Is it just me, or the bands are really that bad?" needed to be answered.

I went to my computer and opened http://bandconditions.com in the browser. Yes, all bands were either dead or almost dead.
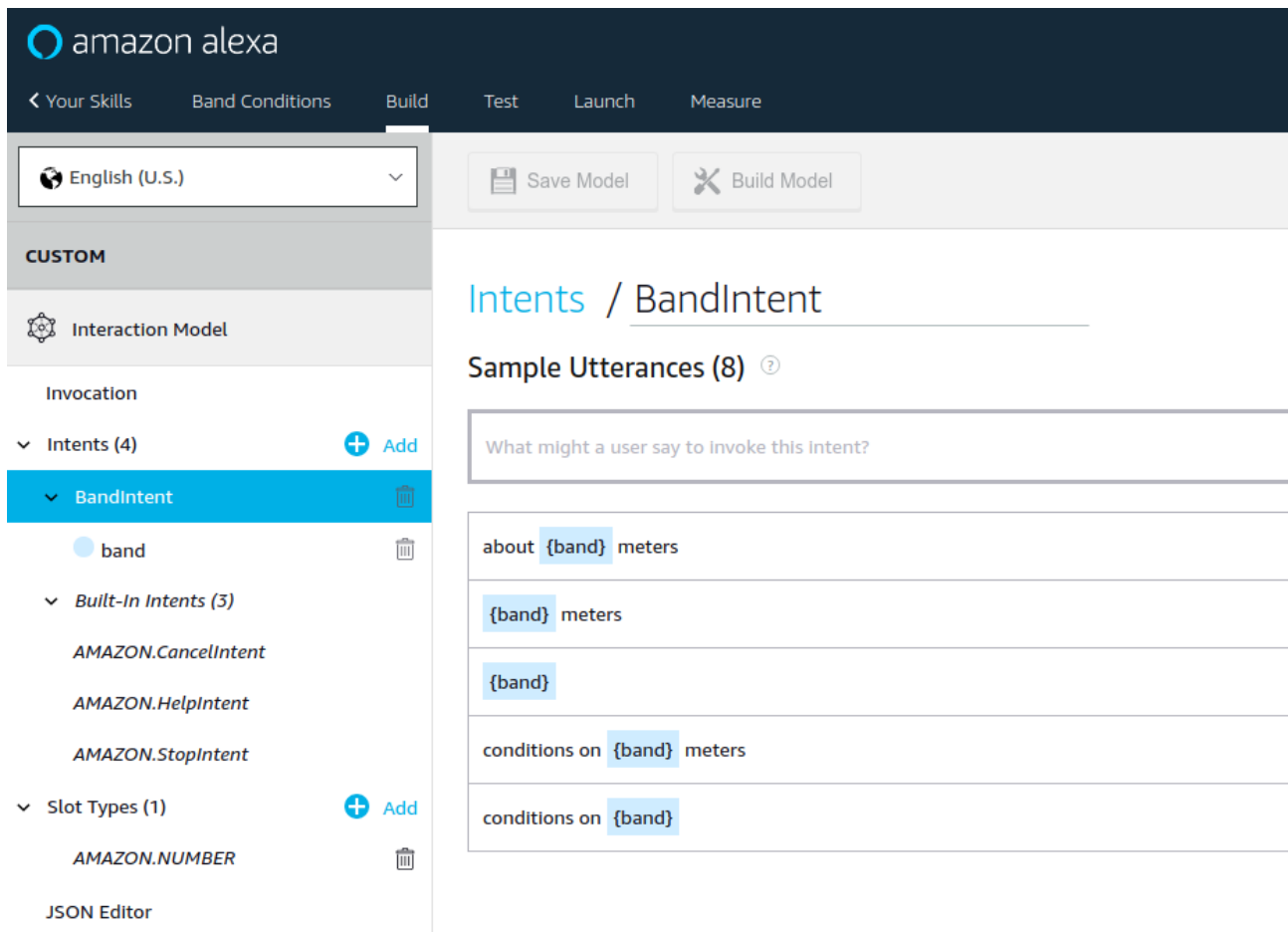

"Wait!" I asked myself. "It's a pretty simple operation, why don't I create an application (or skill, as they call it in the Alexa world) to get this information from the site?" Indeed, it should be very convenient for a busy ham to be able to ask Alexa about the bands instead of opening the browser, typing in the address, etc.

At that time my toolkit for developing Alexa applications was ready to use. I fired up Amazon Developers' Console and started creating the skill. In this case, it was so much simpler than even the example applications. I was going to have just one function: launching the report. It would go to bandconditions.com and pull all the information from there.

For each Alexa skill, you have to create an "invocation name"---the phrase which will be used to start your application and ask questions. In my case it was easy: let's call it "Band Conditions". You would say "Alexa, open Band Conditions" or "start Band Conditions" and Alexa will know which application you are going to use. Then you have to pick the right phrases to call your "intents". This is how Amazon calls Alexa functions. Here is the example of the development portal's screen.

Well, the naming question was solved pretty quickly. Now I had to create a function which would do the work. Most of Alexa examples are written in JavaScript, but for me, Python was more comfortable. I looked around and found a very well designed framework called Flask-Ask. Flask is a well-known Python-based framework for developing web applications. ASK stands for Alexa Skills Kit. One talented developer, named John Wheeler, modified Flask to serve Alexa functions. Hence, Flask-Ask.

After I used Flask-Ask in a couple of previous projects, it was pretty trivial to create a skeleton for this application. In Flask-Ask you have to receive phrases from Alexa (like "open Band Conditions") and specify which functions to call in response to those phrases. The functions should return a string which will then be pronounced by Alexa. So I needed to implement this logic: when you hear "open Band Conditions", go to http://bandconditions.com, pull the front page, parse it, find the numbers that represent each band and transform them into a string which would read "80 meters - 38, 40 meters - 47, etc."
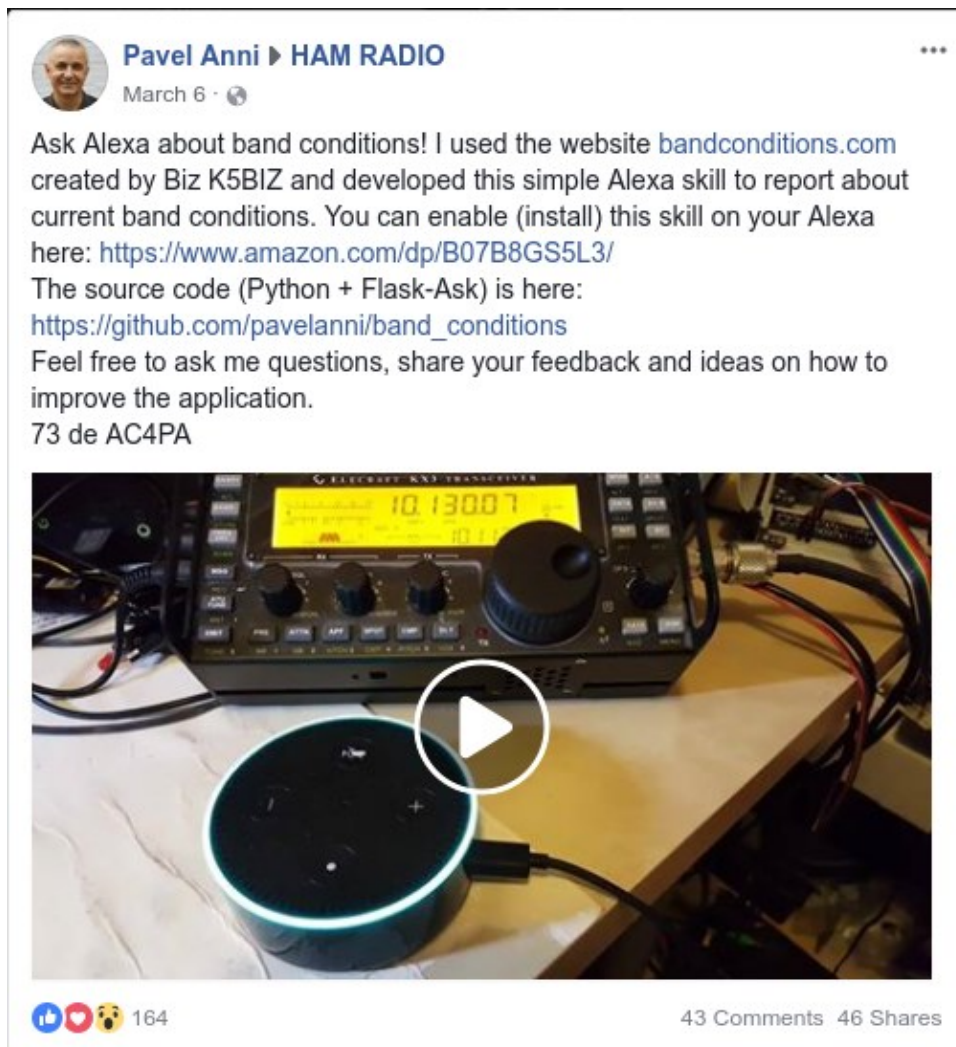
```python
band_conditions.py  ×
43  def get_conditions():
44      conditions = {}
45
46      url = 'http://75.35.171.117/index.htm'
47      r = requests.get(url)
48      p = re.compile('(^\d+).*bandcondx.com/(\d+)\.jpg')
49
50      for s in r.text.split('\r\n'):
51          found = p.search(s)
52          if found:
53              conditions[found.group(1)] = verbalize(int(found.group(2)))
54
55      return conditions
56
57
58  def speak_conditions(band='all'):
59      conditions = get_conditions()
60      bands = ['160', '80', '40', '30', '20', '17', '15']
61      response = 'Band conditions now... '
62
63      if band == 'all':
64          for b in bands:
65              response += f'{b} meter band is {conditions[b]}... '
66      elif band in bands:
67          response += f'{band} meter band is {conditions[band]}... '
68      else:
69          response = 'Wrong band...'
70
71      return response
72
```

It took me about 15 minutes to find the places on the page where those numbers were encoded, pull them and build the string which I should send to Alexa. I tested my first prototype, and it worked! Excited, I filmed the application and emailed the video to the owner of this site, K5BIZ, asking for permission to use his info. He answered with his approval and a suggestion. He said that people don't receive numbers very well, so it's better to convert them into words: great, good, fair, dead. That was easy to implement! In another hour my application was uploaded to Amazon and sent for certification. Next day it was certified and went live!

So what was the deal with the hoodie, you ask? At that time Amazon was running a promotion, trying to motivate developers to create more Alexa skills. They said: if your application gathered more than 100 unique customers in 30 days after publication, you would get a hoodie with the Alexa logo. Time to promote! I went to Facebook and posted my video on a couple of Ham radio communities. Wow! In just a couple of days, I've got the necessary 100 unique customers! It pays off to have a Facebook account, after all! :-)

Currently, the application has around 20 unique customers every day who call two sessions on average. I would hope it gave better band reports to my fellow hams, but it's outside of my control, unfortunately.

I would be happy to share all technical details with those who are interested, and maybe, even convince some of you to start developing for Alexa too. Also, if there is enough interest, I'll be glad to tell you about my next project, where I asked Alexa to turn my antenna. Please don't hesitate to contact me with feedback, questions, and ideas: ac4pa@nfarl.org

Video of the Band Conditions application: https://www.youtube.com/watch?v=5riD7azh0Ew

Video of Alexa turning my antenna (well, antenna model, not a real antenna yet :-)): https://www.youtube.com/watch?v=EuMAzldERhc

Github repository with the code: https://github.com/pavelanni/band_conditions

Amazon page where you can enable the application: https://www.amazon.com/Pavel-Anni-Band-Conditions/dp/B07B8GS5L3/

Pavel, AC4PA

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