

The Link

Newsletter of the Durham FM Association

November 2019



Next Meeting is Tuesday, November 5th, 6pm, at Bullock's BBQ.



President's Corner

Making Things Happen

A part of our hobby is figuring out how to make things work with the available resources. Whether that is making contacts on a compromise antenna in an apartment, pulling a signal out of a noisy channel, or replacing a faulty connector in the field, who among us isn't excited when we figure out the solution to our problem.

Running a club isn't that different than operating a radio. Sometimes things come up that need to be addressed before the contact can be completed. Jimmy Dixon, KF4KHU, recently had to take some time away from his vice-presidential duties to focus on some health issues. Fortunately, I've been able to use my vice-president experience from last year to fill in for him while he's been away.

What does this have to do with all of you? There is another issue, that I need your help in solving. For 45 years, the club has been organizing **DurHamFest**. A steady stream of volunteers has made this happen like clockwork, but this year the problem is that no one has volunteered to lead the effort. Without anyone to organize the hamfest, it will not happen. What is your solution to this problem? Can someone in the club take it on? Perhaps relying on one person is the wrong solution this year and we should instead form a committee to organize the fest. Let's solve this problem!

73,
Jack

Program Info

John Green, KX4P, has prepared a Power-Point presentation on his rebuild of a 1980 Collins KWM-380. He shows why and how this project materialized. There are even some movie clips showing the repaired radio operating SSB and CW. John has put a lot of effort into creating this very interesting presentation. You don't want to miss this one!



THE DFMA NEEDS YOU !

Opinion by NC4CD

The Durham FM Association will be 49 years old in January 2020. DFMA has been very successful over all these years. A great part of this success is due to the members who provide their skills, time, and expertise to the activities of the club. The club has a major advantage over many ham clubs in that it is financially sound. Many clubs have to “pass the hat” when anything is needed. DFMA currently has 114 paid members and the only time we pass the hat is for charities at the Christmas party.

With all of this good news, there are several things that are currently needed that cannot be ordered from Amazon. I will list a few of them.

1. **DurHamFest.** Jack Hill, KM4MBG, served as **DurHamFest** Chairman for several years and has done a great job. DFMA has had the **DurHamFest** every year since the early 70's. Since we just elected Jack to serve as DFMA President, we now need a new **DurHamFest** Chairman. So far, no one has volunteered. We would welcome several members who would serve as the **DurHamFest** “Committee”. If no one steps up and volunteers, the decision might have to be made to discontinue the **DurHamFest**. It is not a critical part of DFMA's income stream; it is more of a public service to the ham community ... and it's a lot of fun!
2. **Mobile Communications Unit (MCU).** Years ago, the DFMA purchased a vehicle to serve as a mobile communications unit. It can be used to provide emergency communications, hamfest talk-in and advertising, and general promotion of amateur radio. Over those years, management and maintenance of the MCU has been provided by Wilson - W4BOH, Lowell – KK4PH, Dan – KR4UB, and others. Lowell served as MCU Chairman for a number of years but he has now retired and has moved to Harrisonburg, Virginia. Lowell also provided his software expertise in the programming of the club's repeater controllers. He can still help with the controllers remotely over the internet but changing the oil in the MCU is a different story. Now DFMA needs a volunteer to be in charge of the MCU. Surely we have someone in the club with skills in vehicle maintenance to volunteer for this.
3. **AUXCOMM.** Shawn Conner - K4CTD joined DFMA and, with his interest in emergency communications, volunteered to be in charge of our activities with AUXCOMM (formerly known as ARES). Meetings are held once a month on the 4th Tuesday at the Durham EOC. Participation in AUXCOMM by DFMA members has declined in recent months. If we want to be an active participant in the emergency communications activities in Durham County, Shawn needs more DFMA members to be involved with AUXCOMM.
4. **6 METER REPEATER.** Bob Milback, formerly K4WCV – now K4VO, has donated his 6 meter repeater to the DFMA. We are currently trying to decide which of our towers would be the best home for it. We are also looking for members who would like to be involved in the move of this repeater to its new home. I have not seen it yet but I understand the cabinet is large and the 6 meter duplexer is even bigger!! Floor space of 2' x 4' will be required. This amount of floor space is available at TV Hill but certainly not at Hillsborough.

5. PROGRAMS. Jimmy Dixon – KF4KHU is DFMA Vice President. One of his responsibilities is getting programs for our meetings. I am sure that Jimmy would appreciate suggestions or volunteers for programs. Our programs have been great and are the reason that many hams come to the meetings each month.

6. THE LINK. Martin Brody – KA5JUJ has been doing an excellent job with the DFMA **Link** newsletter. I am sure that Martin would welcome articles from our members.

7. LICENSE CLASSES. Please allow me to use this forum to make a suggestion which is personally important to me: DFMA should hold classes for Technician, General, and Extra class licenses each year. I am not sure what the average age for DFMA members and hams in general is, but the number is increasing every year. We need to keep the hobby growing.

8. REPEATERS. DFMA was founded as a repeater club in 1971. DFMA owns its tower at Hillsborough (along with an income from the cellular companies using the tower) and has access to 18 other towers in the area. We have repeaters (and APRS equipment) at Hillsborough, TV Hill, Red Mountain, Hillsborough Gibbs Lane and the VA Hospital. The repeaters are on 147.225, 145.45, 224.26, 444.1, 444.45, 443.275 and 443.1375 MHz. Very few ham clubs have this kind of availability of tower sites. What we need most now is more people talking on the repeaters. Some members check into the Possum Trot net every morning. Some check into the Thursday night DFMA net. A few check into the club's DMR repeater on Sunday evenings on our Hillsborough DMR repeater. A few check into a 6 meter net. What I don't personally hear is random or regular conversations between hams. Of all of our repeaters, the busiest one throughout the day is the 224.26 repeater which is linked to a network of 220 MHz. repeaters in Virginia, Oklahoma, Pennsylvania, and other states. The Hillsborough 147.225 was once known as "The Friendly Repeater". Now it might be called "The Lonely Repeater". So, stop surfing the web and talking on your cell phone and talk on the DFMA repeaters !

Charles Durst, NC4CD

DFMA Member Gets a Promotion

One of DFMA's newer members, Adam Caudill, WX4WNC, works in the IT Department of Avalara, a sales tax software company. If you have been to a Durham Bulls game at the DBAP, you have seen Avalara's offices out in right field of the DBAP.

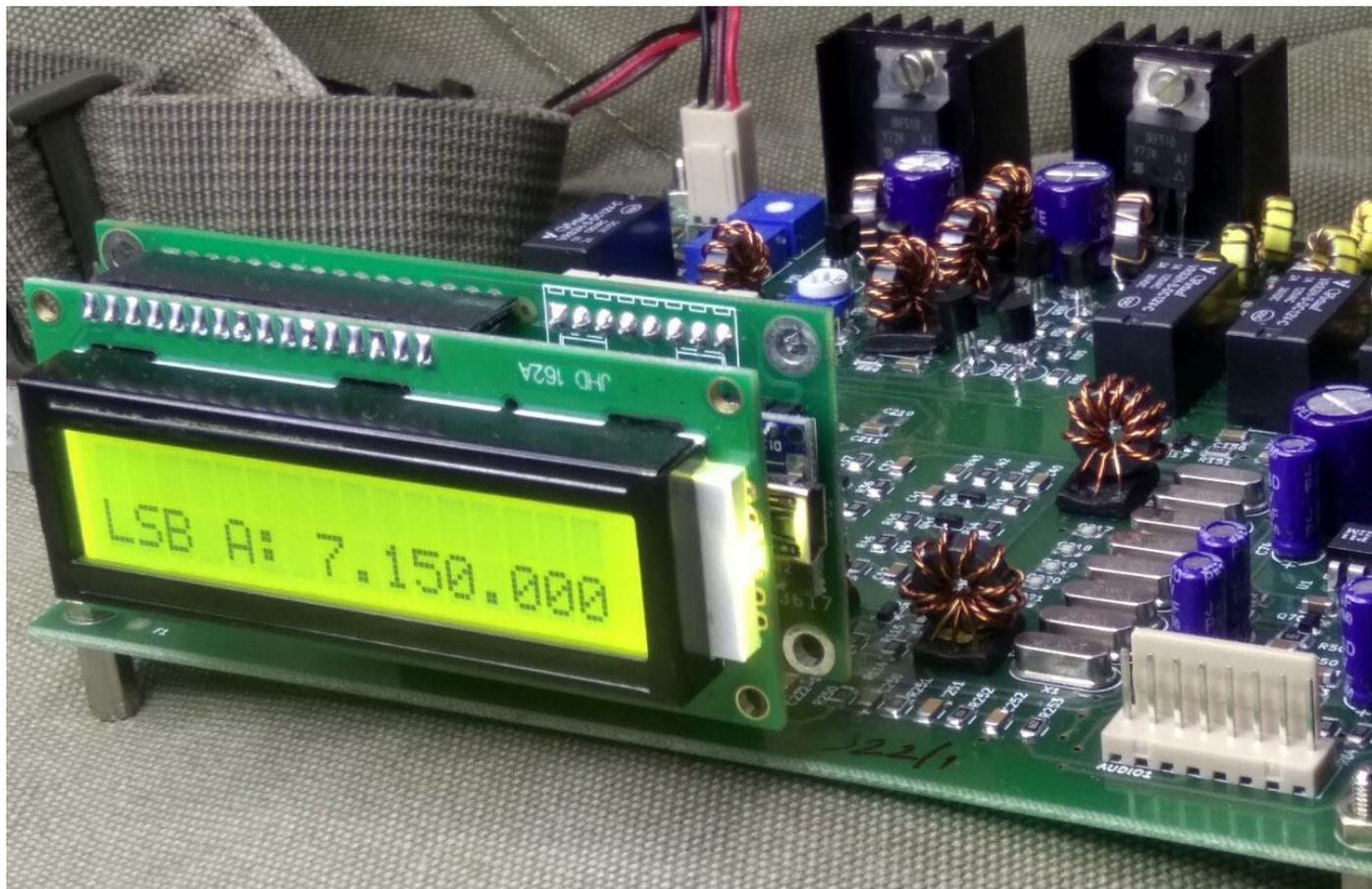
Before coming to Durham, Adam worked for Verizon Wireless in western North Carolina. In addition to Adam's interest in amateur radio, he is interested in weather, therefore the call sign "WX 4 WNC – weather for western North Carolina".

Adam was beginning to work with the digital and IT parts of our repeater system. We were working on a back-up system to switch to Verizon Wireless cellular for IRLP and DMR repeater operation when the CenturyLink DSL failed.

In September, I got good news and bad news from Adam. The good news ... he got a promotion at Avalara. The bad news ... the new job is in Seattle. So in late September, Adam and his XYL moved to Seattle. At some point we may be able to chat with Adam over our DMR repeater at Hillsborough.

Good luck with the new job and the new QTH Adam!

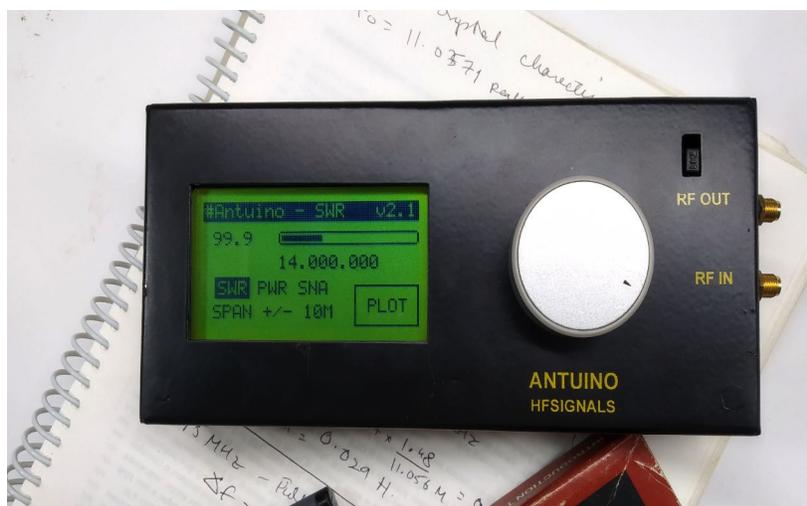
73 de NC4CD



ANTUINO

A compact Radio Lab for Antennas, Radio circuits

Antuino is an accurate instrument that can be used in the field to measure SWR, field strength, modulation, etc. In the lab, it can be used to sweep filters, measure gain, distortion, frequency response, etc. It works up to 150 Mhz. On the third harmonic, it is usable on the 435 Mhz band as well (with reduced sensitivity).



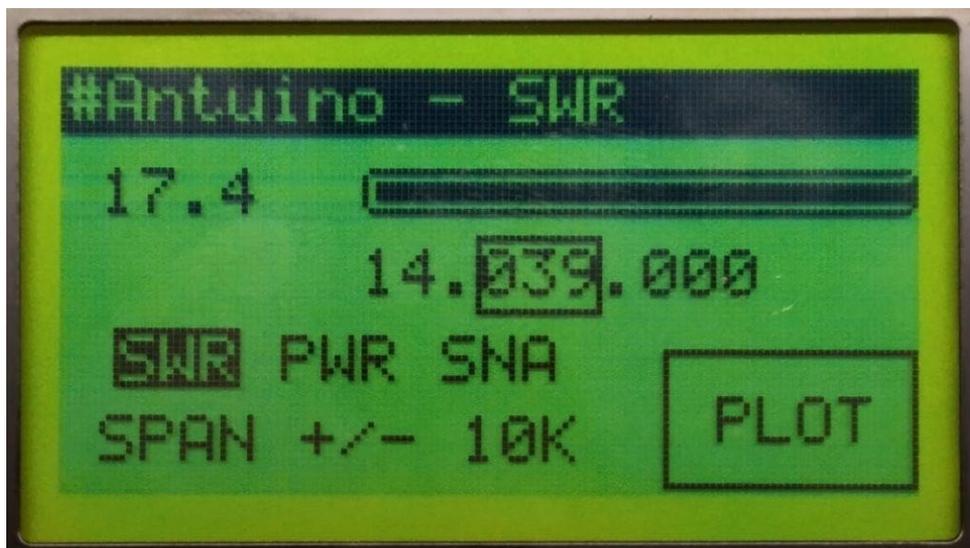
The Antuino, unlike simpler instruments is based on a superhet architecture that measures the response of the antenna or circuit at exactly the tuned frequency. It is based on Analog Devices' Logarithmic Amplifier, the AD8307 to provide accuracy of 1db in your measurements. It is tuned with a crystal locked PLL based on Si5351 oscillator chip.

Note: The Antuino distributed at FDIM 2019 has sub-optimal performance, it can be improved by simple modifications. Read <http://www.hfsignals.com/index.php/2>

What can it do?

1. **SWR** The Antuino measures the SWR of the antenna with a narrowly tuned receiver. A simpler resistive bridge with a diode detector will pick up an stray RF like local broadcast, a nearby ham radio operator or harmonics to give a false reading. The Antuino uses dual crystal filters to provide very accurate SWR at the actual frequency of measurement.
2. **Field Strength Meter** Attach a small piece of wire (small whip) to your Antuino's RF IN port. Now, monitor the field strength of a transmitting antenna! It allows for quick and dirty measurement of front-to-back ratios, nulls and general Apples to Oranges comparisons of different antennas.
3. **Cable Loss** Connect the RF cable between the RF IN and RF Out ports. Set Antuino to SNA mode and set to the frequency. Read the power level.
4. **RF Cable velocity** Connect a short piece of wire between the RF IN and RF OUT ports. Solder A length of the cable under test at the junction. Choose SNA mode and plot the frequency response. A dip will give you an accurate reading of which frequency is a quarter-wave length of the cable's length.
5. **Modulation meter** The Antuino can pick up signals as low as -90 dbm in power mode. A small whip antenna connected to the Antuino will allow you to monitor your own signals. Tune up and down the frequency of your transmitter to measure the splatter from distortion.
6. **Signal Source** The RF out port of the Antuino acts as a signal source (though with square waves). You can accurately tune it to any frequency from 10 Khz to 150 Mhz.
7. **Frequency Response** By feeding the signal from RF-OUT into a device/circuit under test and measuring the response at the RF-IN port, you can effectively measure the circuit response at any frequency. Click on PLOT to see the frequenc response.
8. **Plot!** By clicking on the PLOT button, you can plot the frequency response of your amplifier or filter. It is a little spectrum analyzer with a tracking generator.
9. **Hackable** The entire Antuino circuit and the software are placed under GPL license on <https://github.com/afarhan/antuinov2.1>
10. **Battery operated** Power your Antuino from 6 AA cells. With the low power monochrome display, your batteries will last a long time. The current consumption is 90 mA. A set of batteries will last hours of operation. But switch it off when not in use.

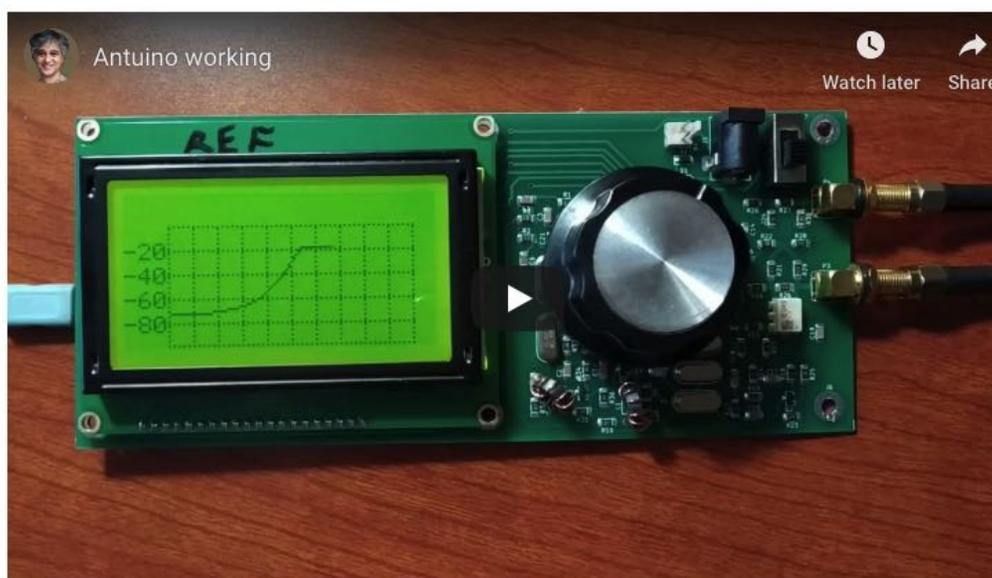
The Display



- The top line shows the current mode of operation (It is measuring SWR in the above picture).
- The second line is a meter and read-out. It is showing SWR of 17.4 as the Antuino is not connected to any antenna
- The third line shows the current frequency at which the readings are shown
- The fourth line is a choice of modes : SWR, Power meter, Scalar Network Analyzer. At the moment it is in SWR mode
- Below that is the span control where you control how large the plot is.

How to use it

There are a number of fields that can be changed. A rectangle shows which field you are on (in the picture above, we are on kilohertz field).



- To get to from one field to another you just turn the knob
- To select a field, press the knob
- To change a selected field, turn the knob to the correct value, press it again to save it.

Calibration

- Disconnect everything from both the connectors.
- Keep the encoder pressed and switch it on, this puts it in calibration mode.
- **Frequency calibration** – Choose Freq Calibrate from the menu and turn the knob until the RF-OUT (as monitored on a frequency counter) is exactly at 10 MHz. Press the tuning knob to save the frequency calibration.
- **Return Loss Calibration** – Choose Return Loss from the calibration menu. Confirm that the RF-IN port is not connected to anything. Press OK to start the return loss calibration. Wait for it to complete the calibration process.
- Switch off and switch on again.

Hacking the Software

The software is available from <https://github.com/afarhan/antuinov2.1>

Many have had difficulty in finding the correct GLCD library used. [You can download it here](#)

JARSFEST 2019

Sunday, November 17th
American Legion Complex
605 N. Wall Street
Benson, NC

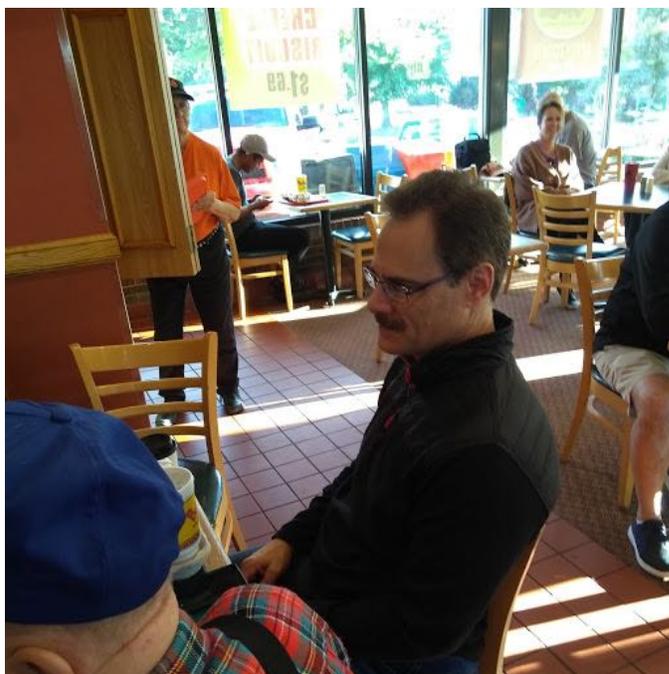
If you didn't receive their flyer in the mail and want to know more, go to <http://www.jars.net>

Hams are mostly familiar with the dozens of Q-codes in our hobby, but probably not many know the meaning of the name of our ARRL magazine ... **QST**

QST (OCLC 1623841) is a magazine for **amateur radio** enthusiasts, published by the American **Radio** Relay League (ARRL). It is a membership journal that is included with membership in the ARRL. ... The magazine name is derived from the **radio** Q signal meaning "**calling all stations**", and its first issue was dated December 1915.

Here is your editor's contact info for contributions to the Link

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A few of the Saturday morning crowd at Bojangles in Hillsborough. Lots of ham talk and show and tell, as well as solving global, societal and local problems. Come join us!

Minutes of Last Club Meeting

Durham FM Association (DFMA)

DFMA Meeting – 10/01/2019 – Charlie, NC4CD filling in for Dan, KR4UB

Location: Bullock's Bar-B-Cue, Durham

Attending: KA4AVM, Sue; WB4YYY, Jim; WA2ROC, Dick; W4PEL, Pete; WA4AHR, Dewey; N2XZF, Paul; KV4ZR, Loren; WA4UJM, Wally; W4SAR, Dave; KD4YJZ, Karen; KA5JUJ, Martin; KM4MBG, Jack; N8BR, Bill; KN4SVO, John; NC4CD, Charlie; W4BOH, Wilson; KF4PAB, Lenore; KE4HIH, Rhett; KE4QOZ, Joanna; KK4BPH, Michael; KB7ZGU, Thaddeus; KF4NTC, Bob; KU4GC, Dee; KN4PTU, Charles; KW4KZ, Chuck; KJ4VWG, Sam; Guest: Eric Monson

A total of 27 attending, with 26 of them currently licensed hams.

President - Jack, KM4MBG called the meeting to order starting with introductions, officer's reports and announcements.

REPORTS

Vice President – Jimmy, KF4KHU absent.

Treasurer – Lenore, KF4PAB provided the treasurer's report. There are 114 members with dues current.

Secretary – Filling in for Dan, KR4UB; Charlie, NC4CD recorded the minutes of the meeting.

Repeater Manager – Charlie, NC4CD reported that Bob, K4WCV, has offered to donate his 6 meter repeater to the DFMA so that its antenna could be on a taller tower site to give better coverage on 6 meters. We are looking for members who are willing to provide time for installation and maintenance of this repeater.

AuxComm EC – Shawn, K4CTD absent.

Field Day & VE Coordinator - Dave, W4SAR reported that the next VE session will be Saturday, October 12 at the Efland Baha'i Center. We are waiting on the December issue of QST for the results of Field Day. That issue comes out in early November.

DurHamFest Chairperson (position open) - Jack reported that we still need for someone to volunteer to be Chairman of the Durhamfest. We would also welcome 2 or 3 members that would volunteer to be co-chairmen. There are things that need to be done now for the Durhamfest if we are going to have the event in 2020.

Presentation of the DMFA "Lid" Award - The DFMA LID was last presented by Jack, KM4MBG to Jimmy, KF4KHU for his generous gift to the club of the new Optoma projector and, for his IT work to upgrade and maintain the DFMA website.

Announcements:

- Wilson, W4BOH, reported that the OCRA Christmas party will have "better food" this year. Dinner will be catered by Hope Valley Diner and prime rib was mentioned.

- Attendance at AUXCOMM monthly meetings has been declining. Only 3 showed up for the last session. Meetings are on the 4th Tuesday at 7pm at the Durham EOC on Broad Street in Durham.

Door Prizes - Door prizes were won by Erin (the official DFMA flashlight), Lenore (magnetic pick-up tool), and Rhett (socket adapters).

Program: The program was given by Eric Monson, PhD. Eric is with the Duke Libraries Center for Data and Visualization Sciences. His topic was “The Unlikely Librarian’s Guide to Multi-Spectral Imaging”. To summarize a subject that sounds very technical and complex, they are analyzing very old documents and scrolls with photography, different light sources, and different filters, and then using computers to analyze gigabytes of data to determine the age and text of these very old documents. Many of the members related to this topic through experiences in their own careers.

At the conclusion of the program, the meeting was adjourned.