North Fulton Amateur Radio League NFARL eNEWS

August 2019

Over 40 Years Promoting
Service | Friendship | Education | Fun

www.nfarl.org

SPECIAL SERVICE CLUB

Join Us for the Islands QSO Party and Summer Picnic!

NFARL is sponsoring a radio day at Lake Lanier with fun for the whole family! You can choose to operate or just come for fellowship and fun, for one hour or for the whole day.

NFARL will hold a W/VE Islands QSO Party and Summer Picnic at Mary Alice Park, 1700 Mary Alice Park Rd, Cumming, GA 30041 on **August 24, 2019**. Activities will start around 8:00AM and wrap up by 9:00PM. There is a $5 fee to enter the park.

Island QSO Party Event Chairman Terry Joyner, W4YBV, has set our island location to Mary Alice Island, GA028L. Jim Paine, N4SEC, will be the captain of our digital station, Jim Stafford, W4QO, will be captain of our CW station and Terry will captain our 20/40-M SSB station. We are looking for operators for 15M, 10M and 6M bands and loggers.

The bands should be hot with a lot of contests on the air on the 24th: Hawaii QSO Party, Kansas QSO Party, Ohio QSO Party, ALARA Contest, CVADX Contest, and the 50MHz Fall Sprint.

Please plan to join your fellow club members on Saturday August 24th while we celebrate NFARL, great friends, the sport of amateur radio and SUMMER! We would love to see you there.

RSVP for QSO Party to Terry:

Please let Terry know by email (w4ybv@yahoo.com) if you are coming to the QSO Party, what time you are coming, what you can bring, and if you need a ride. We would like a few members to come up early at 6:00 AM to help set up radios and antennas. Terry will reward volunteers with freshly-cooked sausage and Jim Paine will bring biscuits.

RSVP for Picnic to Bob:

RSVP to Bob Hensey, K4VBM@nfarl.org for the picnic by Wednesday 8/21

Lunch is scheduled for noon until no one is hungry!
The club is furnishing hamburgers, hot dogs, buns, chips, soft drinks, and bottled water. If you wish to bring steaks, chicken or whatever suits your taste and your schedule, you are welcome to do so. We'll be ready for you with plenty of hot grill space!

2019 NFARL Scholarship Winner / Alex Kemp, WD4BDQ

Alexandra "Alex" Kemp, WD4BDQ, is a member of NFARL and the 2019 recipient of the NFARL scholarship. Alex recently graduated with distinction earning a 4.0 in her Master of Science in Aeronautics from Embry-Riddle Aeronautical University. This fall, Alex has accepted a PhD research internship in human factors with Honeywell Aerospace in Phoenix, Arizona. She will work in the advanced flight deck systems lab and focusing on how new technologies impact pilots in flight. In Spring 2020, Alex plans to attend Purdue University to begin her PhD in Aviation Human Factors.
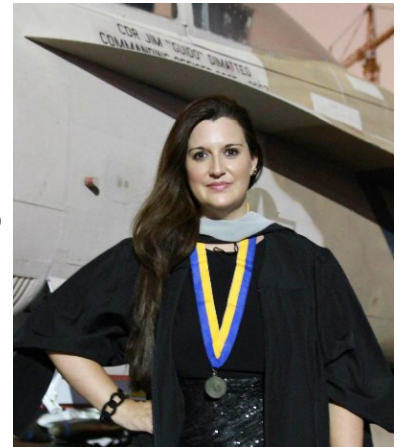
As a 3rd generation ham, Alex received her grandfathers' call sign when she became a technician in 2015 and in 2017, she received her general license. Alex ventured into ham radio because of her love for spaceflight. Her father Stephen "Steve" Kemp (WB4CVB) told her about many of the endless capabilities that amateur radio can do, including talking to the International Space Station.

Happy I Sold my Yaesu FT-817 / Brian Cleary, K4BBL

The Yaesu FT817 and FT818 family of radios have been the go-to portable, low power, HF radio for over a decade. First launched in 2001, the FT 817 was compact, rugged, and worked on HF, VHF and UHF. The internal battery made it perfect for ultra-portable operations. The popularity and long track record of this family of radios means there are plenty of mods and 3rd party accessories for it. I'm sure many of you have or currently own one of these iconic radios. But it is 2019, and there are more options than ever, dare I say better options?

As a newer ham, I was drawn to the idea of a shack-in-a-box for under $700. I read only good things about the radio, so I pulled the trigger and bought a new FT-817nd from HRO. I used the radio in parks, on mountains and even at the house. It served me well. I don't mind the QRP struggle, but there were a few things I wished my radio had. A better battery and internal antenna tuner topped my wish list. If I wanted to use the radio for more than an hour at 5 watts, I needed to lug an external battery pack along. If I wanted to use a multi-band antenna, that meant having a tuner in the bag as well. The weight started to add up. I started looking for alternatives. I ended up selling my FT-817nd and I hope the new owner has as much fun with it as I did.

Enter the Xeigu X-5105. This is a modern, software defined radio with a fantastic looking spec sheet. It has a much better internal battery, an internal tuner with SWR graphing and multiple filters. The radio has a large, bright display and even an internal mic. There did seem to be some areas for concern, like the fact the radio is manufactured in China and sold through MFJ. This isn't a partnership that screams top quality and best in class customer service. I decided to roll the dice on that one. I also considered the lack of VHF and UHF but a compact HT solves that problem. I said "ni hao" to my new portable.

The X-5105 is impressive. My first SSB contact was to Slovenia. I really appreciate the internal battery which lasts longer than I can sit on a park bench or rock. The screen is super clear even in bright conditions and the internal antenna tuner is very robust. The real time, SWR curve is super helpful when I use my mag loop antenna as I can get the tuning just right. The audio reports I get back are all positive and the filtering helps pull those stations in. Since it's a SDR, I have updated the firmware twice and look forward to new updates offering new features and or improved performance.

If you're looking for a replacement or new portable HF rig, don't overlook the Xeigu! Keep an eye on my YouTube channel to see upcoming videos featuring the Xeigu in action.

NFARL "Junior" or Youth in Action or NFARL Makers? / *Jim Stafford, W4QO*

By whatever name, it's a new thing for NFARL. Having a special "get together" for our younger members or guests before every NFARL meeting. Here's the idea… before the meeting, in that period from 7:00 to 7:30 PM, youth from 8 to 18 will gather together not just to meet one another but to have a small activity – just for them! Yes, it's only a short time but while all those grown-ups are shaking hands, exchanging ideas, covering last minute business, our younger folks will be doing or learning of something about electronics, science, and even ham radio.

The sky's the limit and it doesn't take long to come up with tons of ideas. Here are some examples:

- **Tesla Coil**
- **Build a kit**
- **Design antenna**
- **Magnetism**
- **Antenna Analyzer**
- **Maker Faire**
- **QSLing**

- **VOM use/safety**
- **Design a game**
- **Echolink**
- **Build Capacitor/Coil**
- **Repeater use**
- **Science Expo**
- **VHF contests**

- **Soldering**
- **Arduino**
- **ARES**
- **CW**
- **Maker Space**
- **Batteries**
- **Storm Watch**

There are likely many more you could add. We'll need some help from some experienced hams along the way but there is little doubt that our club meetings could be more "fun" for our younger crowd. So bring your family members between ages 8 and 18 to the meetings and we'll have some activity for them.

If you have some expertise or want to help out, let me know. Just send an email to: junior@w4qo.com and put HELP in the title. We can make this a good thing. Also, send along your ideas for other perhaps more important things to do for this group to do.

BRING A YOUNGSTER TO THE NEXT NFARL MEETING at 7PM and help them be a part of this activity!

July 2M Fox Hunt

Just prior to the July club meeting, Tim Lemmon, WK4U, put together a quick fox hunt in the area around the Alpharetta Adult Activity Center. The fox was hidden and transmitting in the FM mode on **146.565 MHz.**

A number of club members brought their radios & antennas and located the hidden fox!

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!
  Check NFARES.org for more information.

- **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
  Location: Slope's BBQ, 34 East Crossville Road, Roswell, GA 30075
  Meet with your fellow club members every Wednesday!

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

- **Every Saturday — Royal Order of the Olde Geezers Breakfast** - 9 AM
  Location: Reveille Café, 2960 Shallowford Road, Marietta, GA 30066   You don't need to be old or a geezer to join this breakfast get-together, everyone is welcome!

- **Second Tuesday — NFARES Meeting** - September 10, 2019, 7:00 PM - 9:00 PM
  Location: Fellowship Bible Church, 480 W. Crossville Road, Roswell, GA 30075
  Check NFARES.org for more information.

- **Second Saturday – VE Testing** - September 14, 2019, 10:00 AM
  Location: Alpharetta Adult Activity Center at North Park
  13450 Cogburn Road, Alpharetta, GA 30004
  NFARL provides amateur (ham) radio test sessions on the second Saturday of each month. All exam modules are offered at all sessions. Walk-ins are welcome, no appointment is necessary. Please check our website for more information.

- **Third Tuesday — NFARL Club Meeting - August 20, 2019, 7:30 PM**
  Pre-meeting social begins at 7:00 PM
  New youth gathering from 7:00 PM—7:30 PM!
  Location: Alpharetta Adult Activity Center at North Park
  13450 Cogburn Road, Alpharetta, GA   30004
  August's meeting will include a double-feature:
  ◊ "The Other End of the Pile-up: Our Story in Curacao", by Audrey McElroy, KM4BUN, and family
  ◊ "Some Thoughts on Amateur Satellites: Use & Future", by Dr. John Kludt, K4SQC

- **Fourth Tuesday – NFARL Executive Team Meeting -** August 27, 2019, 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.

- **Islands QSO Party and Summer Picnic — August 24, 2019 8 AM—10 PM** rain or shine! Mary Alice Park on Lake Lanier. RSVP for the picnic (held at Noon) by Wednesday August 21 by emailing Bob Hensey, k4vbm@nfarl.org. More details here.

Ham Radio and Wife-Carrying Contest / *Wes Lamboley, W3WL*

Sometimes ham radio is just too fantastic to be explained. Such an event occurred at the recent IEEE Symposium on Antennas and Propagation, attended by over 1,400 people from 23 countries.

NFARL hosted a booth to promote our hobby. We designed the booth to try and get people's attention and then engage them in conversation to find out what their interests were and then find a potential related fit in ham radio. Our booth consisted of lots of catchy signage, a Geochron displaying interesting stuff about our planet, controls for remote operation of ham radio stations via the Internet, and a World War II vintage teletype machine.

Ray Bailey (N4GYN), Jim Kaufman (W4IU), Eric Eveleigh (KN4VRW), David Beniost (AG4ZR), Chuck Catledge (AE4CW)

The idea for the teletype came from Martha Muir, W4MSA, local idea maven, and the teletype machine itself was courtesy of Steve Garrison, N4TTY. The machine had an interface to the Internet allowing it to pick up and print information such as Reuter's News Service. It made the usual teletype noises and motions all the while with the aroma of warm 3-in-1 oil gently wafting in the background. The machine did its job very well, attracting many folks to the booth, claiming they had never seen a teletype before much less heard and smelled one in operation!

NFARL member Gary Bush, W6GB, struck up a conversation with a guy from Finland, a fellow ham as well, and they were talking about an antenna design the guy was working on – a full-sized cross-polarized 20 meter beam on a 150 foot tower. About then, the teletype started doing its thing with a Reuter's news item about the most recent Finnish Wife-carrying Contest. They read the article and the guy from Finland puffed-up mightily and proclaimed "Oh yes – we do that in Finland many times!" and then both he and Gary stared in disbelief at the teletype and wondered how it knew to print that article at just that time! See Wikipedia and this article for the rest of the story!

The booth was a joy to be a part of and we met many very interesting folks from around the world. Those whom thought ham radio was dead found out much differently! Their main interest seemed to focus on all the VHF/UHF spectrum we have license to operate in, and we ran out of the ARRL spectrum charts. There was also keen interest in amateur satellite programs.

Our VEC Team also licensed 11 new hams as well. Initially we did not know that we could give the tests to non-US citizens, but it turns out that it is done all the time. There is now a big plan to offer US licenses at the next IEEE meeting in Montréal next year.

If you have not followed the last two links by now, please do be sure to go back and check them out. You will be amazed!

Replacement LCD Display for Kenwood TM-V7A / Bob Hensey K4VBM

This is about my own adventure creating a replacement LCD display for one of my Kenwood TM-V7A dual band mobile radios. I am not a hardware guy by training (software was my thing), but some of my hobbies have forced me to learn electronics on my own and this story has greatly increased my knowledge of electronics through somewhat painful mistakes and simple lack of knowledge. But I keep telling myself: "It's fun"! The actual time for this project from start to finish was many months, but a lot of that time was waiting for parts to arrive from overseas. I have tried to relate the actual events in correct time order as best I can remember in spite of my Very Bad Memory.

The Kenwood TM-V7A

First some background: My first radios were second-hand which I bought as a new Technician class license holder from the son of a ham that had had a serious stroke and could no longer operate – a Kenwood TS-870 HF radio and a Kenwood TM-V7A dual band mobile radio. The TM-V7A introduced me to repeaters and the TS-870 introduced me to the exciting world of HF, and they both introduced me to antenna construction and antenna tuning.

I liked the TM-V7A so much, I later bought another used one on eBay at a good price that had a failing LCD display, but I had found an article on the internet where a foreign ham described his own journey in 2008-9 to create a replacement LCD display for his own TM-V7A so I figured maybe I could do that same thing someday and minimally I would have a spare radio if the original died for some reason. Some years passed.

Fast forward to the present – I now have time to attempt the project. Here is another document I found on the internet with very helpful information about the project. I purchased the LCD display, a proto board, a number of components, a usbsap programmer, and then waited for everything to arrive. The cost was low and I was game for some fun.

Once everything arrived (the stuff from China took forever), I decided that my first objective would be to program the ATmega8 microcontroller with the pre-compiled hex code provided. This was harder than I ever could have believed. I chose to purchase a USB serial programmer on eBay instead of building the parallel programmer in the documentation. First problem, the ZIF socket board provided with the programmer did NOT accept the smaller ATmega8-16U DIP. So, I ended up buying another smaller version ZIF socket board that would work with my programmer and had to wait more weeks for that to show up.

USBasp programmer with ZIF boards

Once it did, then I needed to choose programming software to use. WOW – so many choices. The Ponyprog software mentioned in the documentation didn't work with my new usbasp programmer – I eventually settled on AVRdude version 6.3, which is a command line program with no GUI. I tried a lot of software, and many programs didn't work with the usbasp programmer that I had purchased and many of the other free versions were too crippled or just were not easy to use. Even getting AVRdude to work wasn't easy. I actually figured out how to program the chip after hunting for and finding and loading generic windows drivers for the usbasp programmer and reading through the AVRdude documentation and looking at the examples.

After much trial and error, the command turned out to be:

avrdude -c usbasp -p m8 -P usb -U flash:w:"C:\avrdude-6.3-mingw32 \TMV7_V106.HEX":a

-p was the part and '**m8**' was for an ATmega8. **–P** says the port is via USB. **–c** is the type of programmer which in my case was a usbasp. All that just to put program code into a microcontroller's flash memory.

Next it was time to fire up the soldering iron, and plan out a layout for the proto board. I don't have a lot of experience doing that, so after some thought and staging various configurations what I ended up with works OK but could be improved. Here is a picture of the proto board held in the neat board holder I saw others using during the NFARL Kit-Building Techfest event. I get so many good ideas from you other hams with more experience.


The proto board
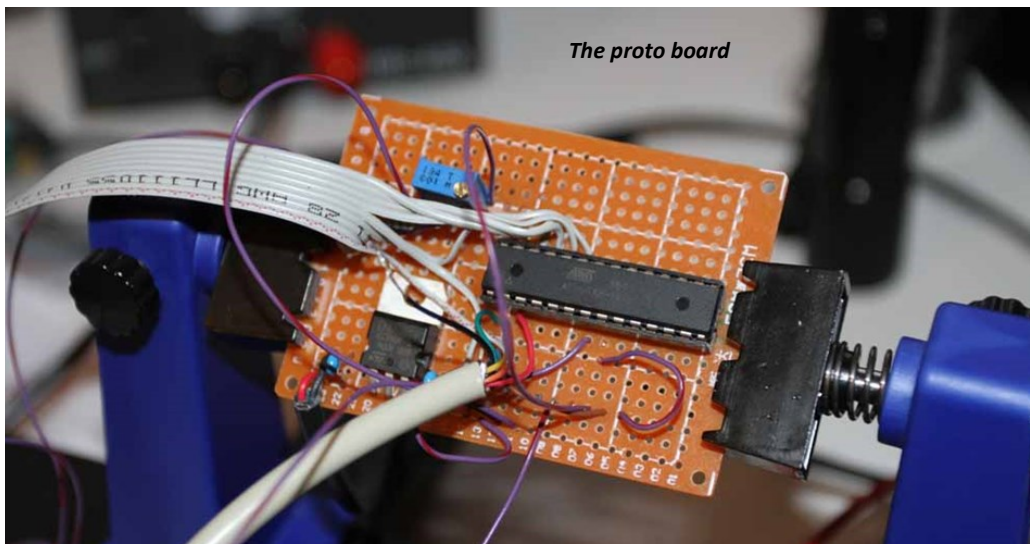
The ATmega8 chip is socketed so I can pull it and re-program it. The power (12V) comes in at the lower left (barely can be seen black cable with red and black wires) and hits the power regulator (bent over so the board will fit easier into the project box with the LCD) to become a usable 5V. The bottom row was designated voltage and the third row from the bottom was designated ground. You just need two capacitors - on either side of the regulator (blue), and a resistor to the ATmega8 reset pin. The rest was mostly just connecting pins on the ATmega8 to pins on the LCD, and for that I used a piece of old IDE cable. Well, there was also the trimmer pot to control the brightness of the LCD. My first mess-up was not using local wires to connect all the grounds on the LCD which caused me to use some extra single wires in addition to the piece of IDE cable to bring all the grounds back to the proto board. Another change from the original instructions/design was that I decided to turn on the LCD back light – two more wires from the LCD to the proto board 5V and ground, not shown on the original schematic provided. Scary thing – I changed the original design. I guess hams are supposed to do that.

I still needed to make the cable to go to the data port on the radio (the beige cable in the picture above), but I wanted to see if the LCD would work, so it was time for the moment of truth – connect up to a 12V power supply and turn it on. After all that time, stripping wire ends, placing components, and soldering/de-soldering/soldering. Yes, de-solder braid is your friend. I hooked the power wire to the supply and turned on the switch. Well of course it didn't work, and that age old fear of "Did I let the smoke out of the chips and LCD?" immediately hit me like a brick. Got to find out what happened.

Time for some trouble-shooting. I checked the schematic and matched up to what I had created.
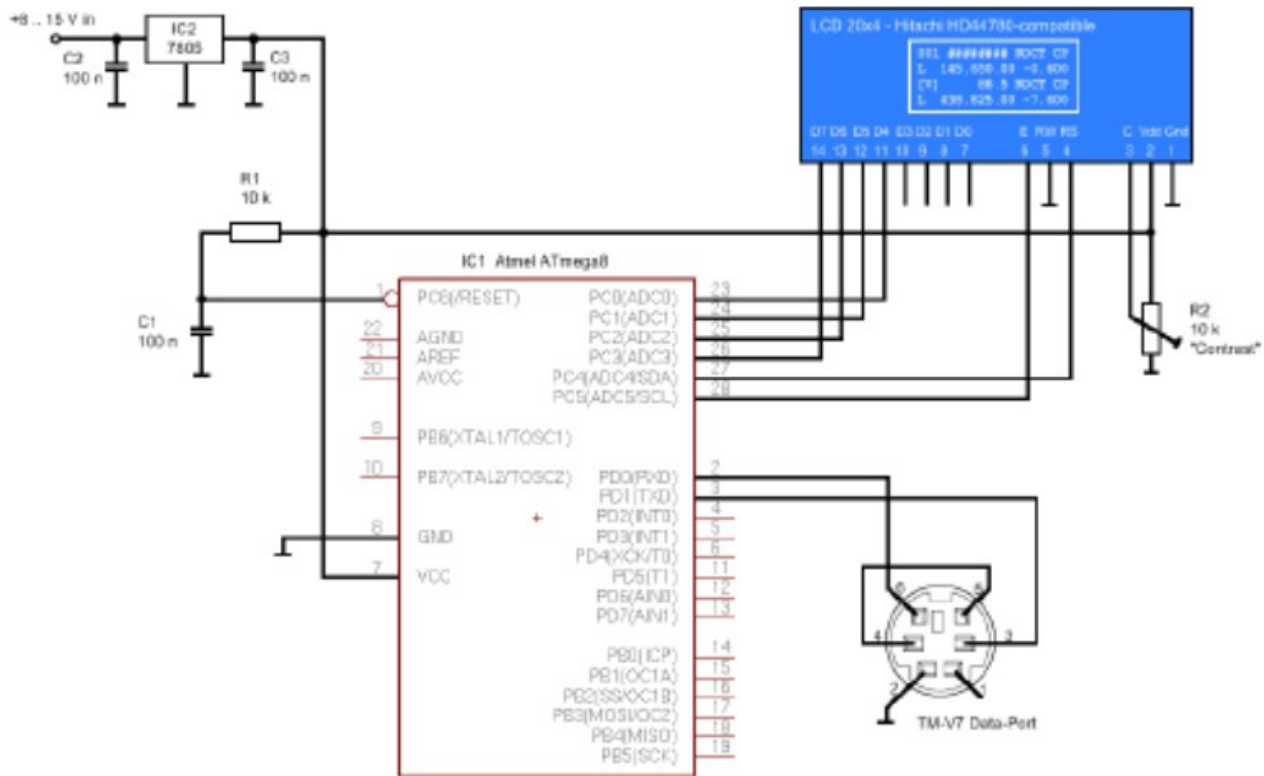
Oops – I got two wires crossed from the LCD to the ATmega8 (one of the data lines and ground LOL). If you get in a hurry, you make mistakes. Note that you need to print out a real 28-pinout diagram for an ATmega8 so you know which pins are which, because the schematic above does not show them in the correct order. After the swap, I tested again. Well dang, no joy! OK trouble-shoot some more - duh – I wired the brightness pot wrong. I mixed up the wiper with one of the ends. To fix this, I destroyed the first pot trying to remove it to move it, so I used another fresh trim pot in a new spot on the proto board and removed the remains of the old one (always buy spares when a rookie, so yes I bought two LCDs but they were only $6 each, and buying ten of something instead of one can give a nice per part discount, and I am a rookie, and maybe I am foolish enough to try more projects in the future). Applied power, and something good finally! The LCD backlight lights up, but nothing else. Check again. OK, biggest DUH - I forgot to run a wire from pin 8 of the ATmega8 to ground. It just ain't gonna run no program like that.

After hooking up yet another wire, I applied power and got this:

ATmega8 talking to LCD

Replacement LCD Display (continued - 4)

Yay! Smile. Celebrate a bit. Now some serious progress has been made. The ATmega8 is running the program and talking to the LCD! I didn't let the smoke out (at least not yet)! But that is NOT the end of this story. If you are still reading and not died from laughter, there is more.

The final step is to make the cable that connects from the proto board to the radio. The radio data port needs a 6-pin mini-DIN male connector. Those are extremely hard to solder, but I used a piece of standard USB cable and actually managed to get it done without melting and disturbing the lay-out of the pins or shorting anything. I even got the cover back over everything. I got the cable soldered to the proto board. But when I tried to plug the cable into the radio, it WOULD NOT go into the narrow hole. I sanded down the plastic sleeve cover of the connector, and it still wouldn't go in. This is where many people go insane or end up incarcerated. But not me (at least not yet)!

I ordered two different types to male 6-pin mini-DIN cables hoping I can cut in half and use a half to do the job, hoping these narrow-looking molded connectors in the pictures will fit into the re-cessed radio data port. The cables finally arrive. It plugs easily into the radio – WHEW! I cut one cable in half, and use my multi-meter to figure out what color wire goes to which pin and write it down. I wire the cable end to the proto board and short the two pins that need that. I plug into the radio, turn it all on, and still NOT talking to the radio. I spend countless hours troubleshooting and everything circuit-wise is correct. Failure is not an option, but I have my hammer ready in case I can no longer stand the pressure.

After a break, I decide to take the time to read all the documentation that I have again, and found two sentences that brought me hope.

"Please note: A few users have reported that their freshly built external display does not work and only shows "Transceiver: unknown" instead. Please double check and ensure that you have set the right fuses when programming the ATmega 8 because it runs from internal 1 MHz clock source out of the box which leads to wrong serial line speeds with this software. The controller must run from internal oscillator @ 8 MHz to set up correct communications with the transceiver.

Smack forehead – I need to also program the ATmega8 "fuses". How could I have forgotten something that I have never done before yet needs to be done? The "fuses" are just options that you turn on or off to control how the microcontroller acts and operates. Well, how hard can that be (VERY it turns out)?

So, this AVR programming rookie figures out what the values of the low and high byte fuses need to be. I am giddy now, and decide to try a GUI front end to AVRdude, called AVRDUDESS. It has a very confusing GUI, and I end up writing the wrong values to the fuses and now I can no longer talk to the ATmega8 via the programmer. I "bricked" it as they say. You don't learn if you don't make mistakes. Now a good rookie buys more than one component for just this possible bad outcome, and I have done that because I know I will make newbie mistakes.

I go get another fresh ATmega8, and pop it into the programmer. AVRDUDESS is history for me – no more new stuff – stick with what has worked before. Back to the trusty command line AVRdude that has already worked for me. I translate the fuse bytes into hexadecimal values, and run the AVRdude commands to write the fuses after careful reading of the documentation. After writing them, I try to read the fuses, and AGAIN I can no longer talk to the ATmega8 – yes, I bricked the second one!

Replacement LCD Display (continued - 5)

I put yet another fresh ATmega8 in the programmer. I try the same AVRdude command, with the same result (anyone could have told me that would happen) – yes, I bricked the third one too! Amazing what frustration makes you do!

Time to slow down as I only have two more ATmega8 chips left (five Chinese versions for the price of a single US version – seemed like a good idea at the time). I pore over the output in the AVR-dude window and see the default values of both fuses which were read prior to being programming and they looked dissimilar to the values that I had computed as I only needed to change two fuses from the supposed defaults for the chip. It is time for some more internet research.

I found this cool page on the internet and silly me had the fuse byte bit order backwards. This web page allowed me to turn on and off fuses and see what the correct hexadecimal value should be without having to think (at this point, a good thing for me). Turns out the high byte fuses were fine using the defaults, and low byte fuses needed to be set to 0xe4. Here is the magic command that made it happen: **avrdude -c usbasp -p m8 -P usb -U lfuse:w:0xe4:m** Basically, in my mistake using the wrong hex value, I turned off the fuse that allows the chip to be programmed by a serial programmer.

Time to put this newest chip into the socket and see what happens. With every expectation of complete and utter success, I power up everything, and it STILL CANNOT TALK TO THE RADIO. I cannot describe the sadness and frustration. After another break/cool-down, I go online to the original documentation that I had printed out a while ago and carefully read again. And I found something NEW:

"Update: It seems different batches of ATmega8 controllers have a quite wide variation on internal clock accuracy. At least OM Philippe, F1IQE, had troubles getting to work the communication between the TM-V7 and the display, most likely due to inaccurately generated baud rates using the internal clock. The display finally could be brought up by him using an 8 MHz XTAL and two 22 pF caps on pin 9 and 10 (XTAL1 and XTAL2). The fuses must be set to external XTAL clock source in this case:

Fuses: CKOPT = 1 ; CKSEL3..0 = 1111 ; SUT1..0 = 11 (meaning all unprogrammed).

If you use a cheap programmer providing no external clock to the ATmega8 being programmed you might not be able to read/program the device anymore after changing the fuses to external XTAL clock source. In this case I'd recommend modifying your programmer with an external XTAL (4..8 MHz will do) and two 22 pF caps, enabling you to program devices with either clock sources."

Leave it to me to buy some of these Chinese ATmega8's with the imprecise internal clock and make my life difficult. Well, yes, the price was too good to be true, but I needed extras for mistakes. Time to order some 8 MHz crystals and see if I can finally finish this project (I already had some 22 pF caps). Amazing the junk you accumulate once you start fiddling around with electronics. Well, yes, I could just order an expensive US part hoping its internal clock would be more friendly to me and be done with it, but this has become a true saga and the challenge to make the Chinese chips work has been accepted as a "duel to the death"!

The Digikey package arrives. I pull the ATmega8 to re-program the low fuses to 0xff so that the new external oscillator will be used instead of the internal clock. I add the oscillator and two 22pF caps to the circuit. See the additional circuit schematic below.
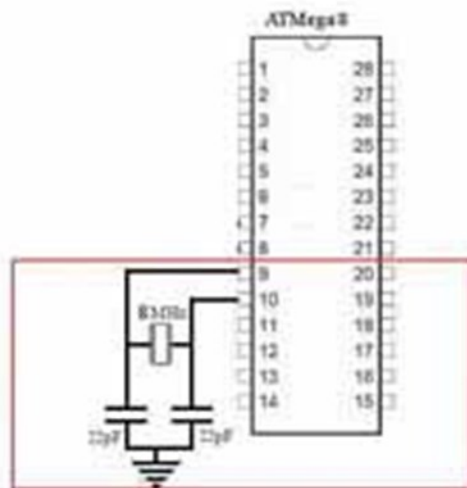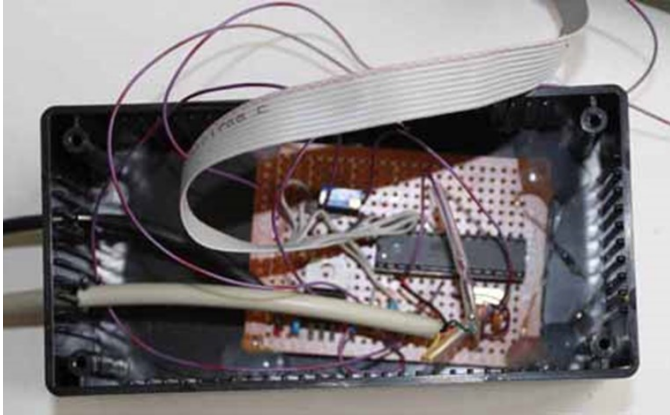

Oscillator circuit add-on

Here is the magic command that made it happen: **avrdude -c usbasp -p m8 -P usb -U lfuse:w:0xff:m** Time to put the ATmega8 back in the socket and see what happens.

The picture says it all! Wish you could have seen the big smile on my face.
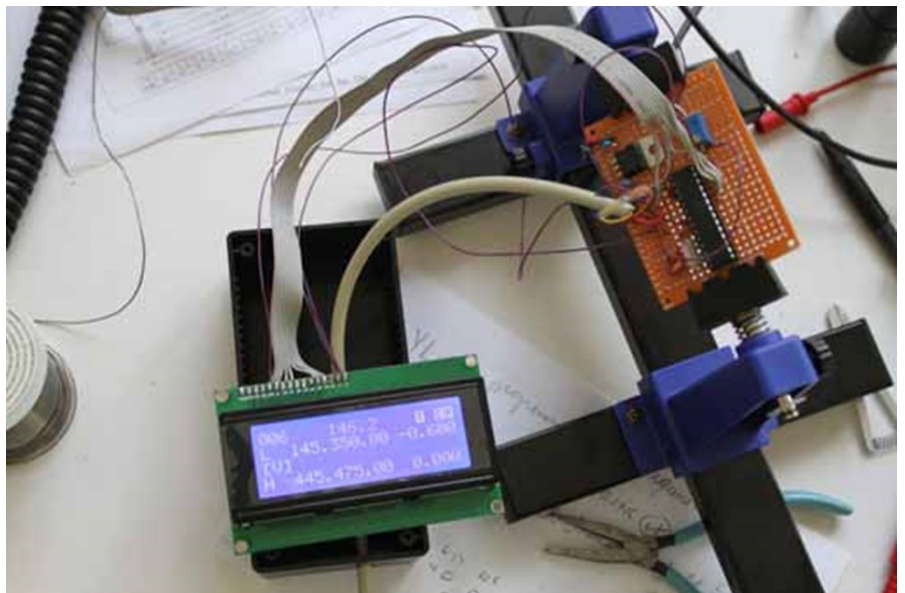
*It's working!
(Anakin Skywalker)*

Replacement LCD Display (continued - 7)

Proto board in project box

Time to pack everything into the project box and do something to make my wrong-size hole look better. And might as well hook up the power cable internally in the radio instead of running it to external power as then the display will only come on when the radio is powered up.

First I hot glued the proto board to the bottom of the project box.

Next stuff all the wires in the box and get the LCD sitting recessed in the top.

LCD in project box

Power from MIC jack pin 2

Next, figure out how to nicely get the power cable into the radio and soldered to the right places. The original instructions recommended using pin 2 of the microphone jack. I couldn't easily find any other nice accessible spot to take power from, so pin 2 from the back of the mic jack it was. I soldered ground to one of the ground springs for the cover.

Finally, get everything inside and the covers back on with a zip tie for strain relief.

Power cable exit with strain relief

Put the last cover back and, and do a final test:

Going to find some black silicone and fill in the slits around the LCD display caused by my too big hole. I will also put some Velcro tabs to hold the new display in place (3M Dual Lock TB3550 works really great for that and note you need to let the adhesive cure for 24 hours before you start using it).

Now I can say that it was a fun electronics project, and that I learned a whole lot (funny how a Very Bad Memory can forget all the bad parts)! I may use this radio now for chasing satellites!

NOTE: I found out that a HV programmer like the STK500 can recover the "bricked" ATmega8 chips. I verified this with a borrowed Atmel STK500 (now I have three more chips to mess up again).

My replacement display

I would like to summarize some key learnings from this project:

- Don't be afraid to tackle a hard project that has stuff you haven't done before – you will learn many new things in the process – stretch yourself

- The internet has a lot of information and can be very helpful – use it wisely, Padawan

- Don't give up too easily – the best learning is from making mistakes, learning to troubleshoot them, and finding solutions to them which develops your own creativity

- When you get frustrated, put it aside and take a break

- It is OK to buy stuff from overseas – just be aware that the quality may not always be what you expect

- Fellow hams are a great source of information, ideas, and helpful tips

I know this article was somewhat long and "co-infagulated" [see Wes Lamboley, W3WL, for definition!], but I hope you enjoyed it and maybe learned something useful. I would love to hear about some of your own projects.

73,

Extra Extra! / From the Extra Class Question Pool

New info for Technicians and Generals and a refresher for Extra Class Licensees!

**E5B03—What happens to the phase angle of a reactance when it is converted to a susceptance?**

A) It is unchanged

B) The sign is reversed

C) It is shifted by 90 degrees

D) The susceptance phase angle is the inverse of the reactance phase angle

See answer on the last page!

Contest Corner

- **8/18/19   Rookie Roundup—RTTY** — In this contest, newly-licensed operators ("Rookies") in North America are encouraged to exchange information with as many other stations as possible on 80, 40, 20, 15, and 10M. Experienced operators ("Non-Rookies") are encouraged to participate and help Rookies, either on the air or in person.

- **8/24/19 to 8/25/19   Kansas QSO Party** and **Ohio QSO Party**

- **8/31/19 to 9/8/19** Happy 150th! **Hiram Percy Maxim Birthday Celebration**. N3FJP has developed free software for this special event.

-

- **9/1/19 to 9/2/19   Tennessee QSO Party**

- **9/7/19 to 9/8/19   Nebraska QSO Party**

- **9/14/19 to 9/15/19   Alabama QSO Party** and **Texas QSO Party**

- **9/14/19 to 9/16/19   September VHF** — Work as many stations in as many different 2x1 Maidenhead gridsquares as possible using frequencies above 50 MHz.

Some State QSO Parties:
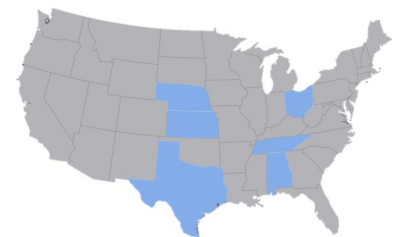
Chasing Satellites for Rookies

In July, NFARL launched **Chasing Satellites for Rookies**. There were three parts to the activity:

1. A [study guide](#) from Bob Hensey, K4VBM, to help familiarize you with the ins and outs of making satellite contacts that you can digest at your own pace
    *   Download the ZIP file and decompress it to create a folder named '**Chasing Satellites For Rookies**'
    *   Inside that folder will be another folder named (**Microsoft PowerPoint Viewer and security update**) which contains the installer for the free version of Microsoft's PowerPoint Viewer (PowerPointViewer.exe) along with the latest security patches (ppviewersp2010-kb2687456-fullfile-x86-en-us.exe) for the same (if you don't have Microsoft Office or some other suitable program already on your computer to view a PowerPoint presentation file).
    *   The main PowerPoint presentation file is named: ***Chasing Satellites.ppt***
    *   The presentation contains some embedded videos, and explains how satellite contacts work, the basic equipment necessary, preparation steps, and how to make a satellite contact.

2. After viewing the Study Guide, hams were encouraged to bring questions to the [Monday night TechTalk net,](#) and if possible even find/make/acquire the basic equipment to use. TechTalk is held every Monday night from 8:30 to 9:30 PM on the 145.470 repeater.

3. A **Satellites in the Park** day held Saturday August 10 in North Park near the Alpharetta Adult Activity Center

Satellites in the Park! / Bob Hensey, K4VBM

It was a hot day, but the crowd was prepared, the satellites passed over, some contacts were made, new antennas were assembled, some neat equipment was displayed, and I think everyone who showed up enjoyed the fun!

Daryl Young, K4RGK, and Lori Young, K4UPI, brought their mobile satellite station, and Daryl operated out of his van – I know he made at least one contact.

Johnny Kludt, K4SQC, was busy answering questions, helping assemble new antennas, and even was able to make some contacts. Very Bad Memory, K4VBM, tried praying but still didn't make a contact!

Satellites in the Park (continued)

Eddie Thompson, AE4TQ, brought his set-up that featured a home-made actuator/positioner, Brian Cleary, K4BBL, was busy making a video for his YouTube channel, and Barbara Carlson, KN4HER, brought her home-made tape measure antenna.

Eddie Thompson and Brian Cleary

Barbara Carlson

Thanks to Scott Banks and Terry Joyner for photographing the event. You can view all the pictures on the nfarl.org website at http://nfarl.us/PhotoAlbum/gallery/2019-activities/satellites-in-the-park/

Thanks to everyone who attended, and helped make this a successful activity for everyone.

Stay connected with NFARL by signing up for our email reflector on Groups.io

How About those Old Magazines? / Jim Stafford, W4QO

I've mentioned before that I have in my shack the club's collection of old QSTs going back to 1920, the small sized ones, and they are available to "check out". You might also want to come by and just browse just as you might at a real library. I find them fascinating but Walt Woron, WØRON, might say it's because I have been a ham that long and those are my original subscriptions! I also have in my personal library a number of old magazines and books if you want to drop by and take a look.

In case you are not aware, you can go to the American Radio History website and find archives of a huge number of radio and engineering magazines, but not QST. I enjoy those old Electronics Illustrated mags, for example. You will also find Popular Electronics, which is one that I read religiously when I was in high school and how I discovered ham radio. I was able to acquire a number of bound volumes of PopTronics (as we called it) covering years – 1957 thru 1963.

While browsing the December 1958 volume I came across a most interesting recurring column called "Among the Novice Hams". To my amazement, there was a photo of the station of our own club member – Tom Koch, W4UOC, who at the time was KNØPDI! And here's the thing, I'm sure I saw that picture in 1958 as a junior in high school and a new ham myself – KN9MAF. Little did I know that I would one day meet Tom and consider him a friend to me and all hams in the Atlanta area. Tom, as you probably know, was the Emergency Coordinator for North Fulton for several years.

Tom Koch, KNØPDI, uses this picture of his station as his QSL card.

WØPDH	Charles L. Gillespie, 505 Chestnut Street, Neligh,	Nebr.
KNØPDH	Lee R. Carr, 307 S. Okoboji Av., Milford,	Iowa
WØPDI	Vinton H. Wight, 3803 Krug Av., Omaha,	Nebr.
KØPDI	Thomas E. Koch, 1819 First Av. S., Denison,	Iowa
WØPDJ	Ferd E. Kuehn, 601 S. Lincoln Av., Hastings,	Nebr.
KNØPDJ	George W. Hall, P. O. Box 69, Osceola,	Iowa
KNØPDK	Emil F. Kopetka, Bloomfield,	Nebr.

So I thought I'd check an old callbook. The closest I could find was Spring 1959 and there on page 453 I found Tom's callbook entry for KØPDI, he must have had his general license by then (I was still a novice).

There are a number of sites where you can peruse old callbooks but the one I check first is this page on Archive.org. Not every callbook is found there but there is a good representation of old ones. Another one that has some good info is WØIS website.

If you have been a ham as long as me, you too would enjoy looking through my trove of old magazines. Oh, the ads! Yes, straight keys? $1.50 in 1950!

Ohm's law states that the current through a conductor between two points is directly proportional to the voltage across the two points where:

- **I is the current** through the conductor in units of amperes
- **V is the voltage** measured across the conductor in units of volts
- **R is the resistance** of the conductor in units of ohms

Use this image to remember the calculations!
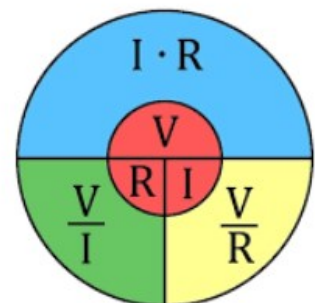
Review of 20/24-Pin ATX Benchtop Board Computer PC Power Supply Breakout Adapter Module | *Bob Hensey K4VBM*

I saw this item somewhere (ham reflector post or TechNet,) and decided it was worth getting one and trying it out. Since retiring, I have had more time to learn electronic stuff which has always fascinated me, but I was the software guy. This is the module that I bought: 24 Pins ATX Benchtop Board Computer PC Power Supply Breakout Adapter Module

If you have a spare ATX PC power supply lying around, this seemed like a great and inexpensive idea to turn that spare power supply into a benchtop power supply. I bought it on eBay from a Chinese seller (I have no relationship with that seller nor am I being compensated) for a wallet-busting $7.21 free shipping. I am still a learning electronics rookie, and this stuff is a learning experience for me. This was the item description:

> The benchtop power board kit was created to provide quick access to the typical voltages needed when developing physical computing projects (embedded systems). After assembling the kit you'll have access to four different voltages (3.3V, 5V, 12V and -12V) each with their own replaceable 5A fuse. Each power rail has a corresponding ground connection; all of the power rails are brought out to a binding post. The benchtop power board should be powered by a standard computer power supply with an ATX connector. With power light and power switch. 24 pins ATX computer power sockets, compatible with 20 pins plug. 4pcs copper cylinder holders design. Size: Approx. 12.8 x 4.8cm / 5.03 x 1.88 inch

Of course, it took a long time to arrive but I was not in a hurry and patience gives you lower cost. It finally did come, and I decided to test it out with the results described in this review below.

It came with some nuts and stand-offs so that it could stand up away from the work surface and be mounted if you wanted as there are threaded holes in the bottom of the stand-offs. My initial impression was that I didn't like the exposed parts and the danger presented, but putting in an enclosure would take serious modification due to its design.

The fuses are supposedly 5A, 5mm x 20mm glass fuses, and you may need to pick up some more of different values as a computer power supply potentially has different minimum and maximum amp ratings for each of the supply values of 3.3V, 5V, 12V, and -12V that can exceed or be less than 5 amps (in my case, -12V was 0.8A, 5V and 3.3V was 24A, and 12V was 22A).

I could exceed the -12V max amps and the 5A fuse would not blow. If I wanted to draw more than 5 amps for any of 5V, 3.3V, or 12V using that supply, in theory I could, but the fuse would blow at 5A preventing me from doing so.


Example label from the 24-pin supply I used to test

Review (continued)

A very serious defect in my opinion was that even though binding posts look like they will take banana plugs, standard size banana plugs DO NOT FIT TIGHTLY – it is a very loose fit and could cause problems in use. There is also no hole in the binding post shaft for inserting a wire end and then screw down to clamp. Very poor binding posts to say the least. The good news is that you can unscrew the two nuts underneath the board and the binding post is easily removed, which means you can replace easily with better binding posts at your own cost and leisure.

I hooked up my 24-pin computer supply and made sure it was powered on. Then I powered on the board via its own switch. The LED glowed blue which was a good sign.   I hooked by DVM to each supply port and read the following values: 3.325V, 4.95V, 11.85V, and -11.80V for the 24-pin computer supply. It works!
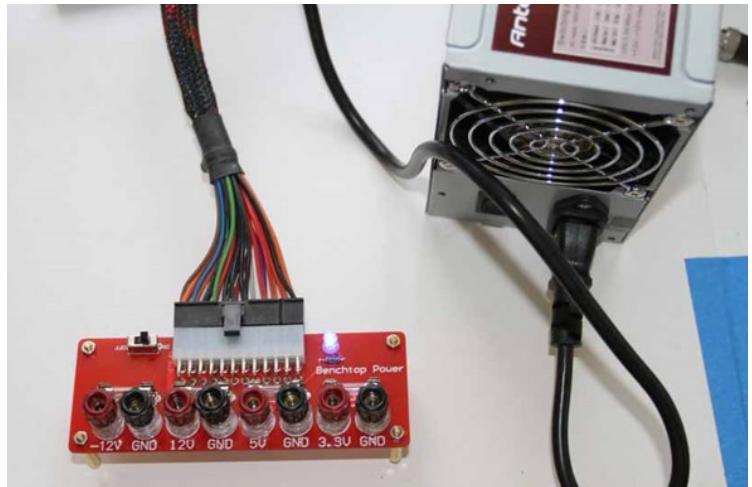
Next, I hooked up my older 20-pin comput-er power supply. Right away I noticed that the connector on the board locking tab did not extend far enough to the side for the 20 -pin plug to latch. The plug is keyed, and you can only plug in the 20-pin plug all the way to the left as seen in the picture below. Since the locking tab does not engage, you will need to be careful not to tug on the 20-pin supply cord or it could come loose. The measured voltage values were (I didn't think more pictures were necessary): 3.328V, 5.12V, 11.90V, and -11.12V.

NOTE: the voltage values read are determined by the computer power supply used and not the board.

In summary, the product works for both 24-pin and 20-pin computer power supplies as adver-tised, but has some drawbacks/defects that you should be aware of such as the poor binding posts, 5A fuse rating, and lack of a locking tab for a 20-pin supply plug. For the cost, it is a workable solution that you can improve on with some added cost.

I hope this review is of use to all you electronics tinkerers out there. 73!

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Frequency—Description	P.L. Tone	Location
145.470 (-) EchoLink Node 560686 NF4GA-R	100 Hz	Morgan Falls
147.060 (+) Primary ARES Repeater	100 Hz	Roswell Water Tower
* 224.620 (-) Joint Venture with MATPARC	100 Hz	TBD
443.150 (+)	100 Hz	Roswell Water Tower
444.475 (+)	100 Hz	Morgan Falls
* 927.0125 (-)	146.2 Hz	TBD

Currently off the air

Club Callsigns: NF4GA and K4JJ

Extra Extra answer: B (question E5B03)

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