



Linear Lines

Trident Amateur Radio Club (TARC) Newsletter
October 2014

TARC Nets:

Every Tuesday, 147.27 MHz PL 123.0

- 7:30 PM CW practice
- 8:00 PM Net

Upcoming Events:

- Dec 1 Board meeting (all welcome)
Dec 10 Contest Club dinner
Contact: Mel W4MEL
Dec 14 **Christmas Party!**
Dec 17 License exam session
Contact: www.veofsc.com



Darrel KB7QVG sets up digital operations at Camp Moultrie, for Jamboree On The Air (JOTA). JOTA is the largest gathering of Scouts worldwide, with 700,000 Scouts, 6000 stations, spanning 150 countries.

For more info: <http://www.k2bsa.net/jota/>

From the Oval Office

Time is really flying by and the holidays quickly approaching. This month we have the club meeting, the monthly club dinner meeting, and ongoing planning for a balloon launch and a club picnic. The club membership is growing by leaps and bounds; we now have 74 members. Just as a reminder, it is time to pay dues. We only have 50% of the members that have paid this year's dues.

This is the time of the year to get all the antenna maintenance done. Then we can work on getting some of those ham shack improvements or new equipment installed. Winter is also a good time to try a new mode, take a shot at making some QRP contacts, or work some of the wintertime contests quickly approaching – even if you only work for a few hours or team up with other hams to work an entire contest. If any members have any ideas, requests to get more info on a particular subject, or help needed, that is what ham radio operators are all about.

73 Steve KE4THX

Christmas Party Plans

The Club Christmas Party will be held at Logan's Steak House in Summerville, on Dec 14 at 7pm.

We will be playing naughty Santa with gifts (~\$10) as usual. A load of fun for all. This is a wonderful opportunity to dress up and take your spouse out.

Contact: Bob NG4R, Michelle KK4WQO

October Birthdays!

- Matt Busta KK4TOW
- Barbara LaMendola KM4FRD
- Dennis Lloyd KV4WM
- Craig Opie KK4RNF

November Birthdays!

- Matt Busta KK4TOW
- Carl Dinger WD4CXW
- Darrel Moser KB7QVG
- Jenny Myers WA4NGV
- Mel Seyle W4MEL

Happy Birthday, all!

From The Treasurer

The club continues to provide a variety of activities for new and old alike. Our radio give-away continues to be very popular. Our **balloon launch** group continues to have a great time splashing through the swamp in search of their payload, however the next launch originally planned for Sunday the 19th has been delayed until favorable weather patterns return.

The **TARC net** is enjoying lots of check-ins and Ron continues to do a fine job as NCS. Be sure to check in every Tuesday night. The **dinner group** continues to be very popular and we usually have a great get together wherever we meet. Our next dinner group meeting will be at Andolina's pizza on Rivers Ave on the 23rd. We always meet at 6:30. The club picnic, originally planned for Saturday the 25th, will be postponed until Spring. It is not too early to be planning for our Christmas party at Logan's Steakhouse on December 14th. Lots of activities for your club and I hope to see you at some of these.

73 Bob NG4R

Long-time Member Takes The Plunge

Congratulations to Barbara LaMendola! Her newly-minted Technician ticket reads **KM4FRD**. Well done!

TARC to Host Special Event Station

On Feb 17 2015 Trident Amateur Radio Club plans to operate a special event station - **N4H** - to celebrate the 151st anniversary of the attack on the USS Housatonic off Sullivan's Island by the **H.L. Hunley** – the first sinking of an enemy ship in battle by a submarine. A QSL certificate will be sent upon receipt of a self addressed envelope and \$1 to defray costs

of printing and handling. Frequencies and times will be published soon.

Here's a link to the *Post and Courier* article covering the last event:

<http://www.postandcourier.com/article/20140206/PC16/140209532>

Bushed Batteries Bounce Better

In the “*Now I've Heard Everything*” department, if you want to test batteries, there's an easier way than swapping them in and out of devices: just **drop them**. Non-rechargeable AA, AAA, C, D, and 9 volt alkaline batteries **will bounce** off of a hard surface if they are dead. A charged battery will make a thumping sound, often staying upright if dropped from a short distance. This is due to chemical changes inside the battery as it loses its charge. Alkaline batteries start life containing a potassium hydroxide electrolyte suspended in a gel-like substance. But as the battery discharges, the gel substance begins to solidify as the electrolyte undergoes chemical transformation. This movement from a semi-liquid state to a hardened state means the battery is able to absorb less and less energy when it hits a hard surface; meaning it bounces higher. In order to test this hypothesis, a group of retired scientists calling themselves the ROMEO (Retired Old Men Eating Out) Club cut open and inspected the insides of batteries--which I don't recommend trying at home.

-- Tom W4DAX

POP QUIZ !! [TECH]

What is probably happening when an ohmmeter, connected across a circuit, initially indicates a low resistance and then shows increasing resistance with time?

- A. The ohmmeter is defective
- B. The circuit contains a large capacitor
- C. The circuit contains a large inductor
- D. The circuit is a relaxation oscillator
- E. This is an AC circuit

PINS Balloon Launch

The Trident Amateur Radio Club will be holding another near space balloon launch very soon. We are waiting for the weather to cooperate. We are waiting for the jet stream to go back up north. With the current Jet Stream pattern the balloon would land somewhere in the Atlantic Ocean and make recovery difficult.

We are holding this launch with the participation of students from the **Palmetto Scholars Academy**, a South Carolina Charter school, on the old Navy Base.

Ms Kellye Voigt, the Math and Science teacher at the school, is the NASA Partner School Liaison and the Program Director for the **Student Spaceflight Experiments Program** for the school. Kellye has attended our last two launches and recoveries, and asked if we could do a launch for her school. This launch is designated the Phoenix In Near Space (PINS) balloon launch

The students in her Mission Development class have developed and built an experiment to test the effects of extreme altitude on the conductivity of metals. They have built the experiment using an Arduino development platform and several lengths of different wires. The Arduino will be programmed to measure the resistance of the wires during the flight into near space and see what effects low atmosphere and altitude would have on their resistance. The school is funding the cost of the launch. (Balloon and Helium).

There are also several students interested in obtaining their Ham tickets.

If you are interested in helping with this project, or just participating in this launch, you can contact Tom W4DAX at wa4dax@hotmail.com or visit tridenthams.org/balloonproject.htm

FCC WiFi Blocking Investigation: Marriott Hotel To Pay \$600K

[Excerpted from *FCC Bulletin*]

Marriott International and Marriott Hotel Services will pay \$600K to resolve a FCC investigation into whether Marriott intentionally interfered with and disabled WiFi networks established by consumers in one of the conference facilities in Nashville, Tennessee, in violation of Section 333 of the Communications Act. The FCC Enforcement Bureau's investigation revealed that Marriott employees had used "containment" features of a Wi-Fi monitoring system at the Gaylord Opryland to prevent individuals from connecting to the Internet via their own personal Wi-Fi networks, while at the same time charging consumers, small businesses, and exhibitors as much as \$1,000 per device to access Marriott's WiFi network.

[Excerpt from FCC Policy www.fcc.gov/jammers]

"Federal law prohibits the operation, marketing, or sale of any type of jamming equipment, including devices that interfere with cellular and Personal Communication Services (PCS), police radar, Global Positioning Systems (GPS), and wireless networking services (Wi-Fi)."

Pop Quiz Part Deux [EXTRA]

What kind of filter would you use to attenuate an interfering carrier signal while receiving an SSB transmission?

- A. A band-pass filter
- B. A notch filter
- C. A Pi-network filter
- D. An all-pass filter
- E. A FRAM filter

Want to see something in Linear Lines?

If there's something you want to see in Linear Lines, please send it to Robert KV4LV <kv4lv@arrl.net> by the second Monday of the month.

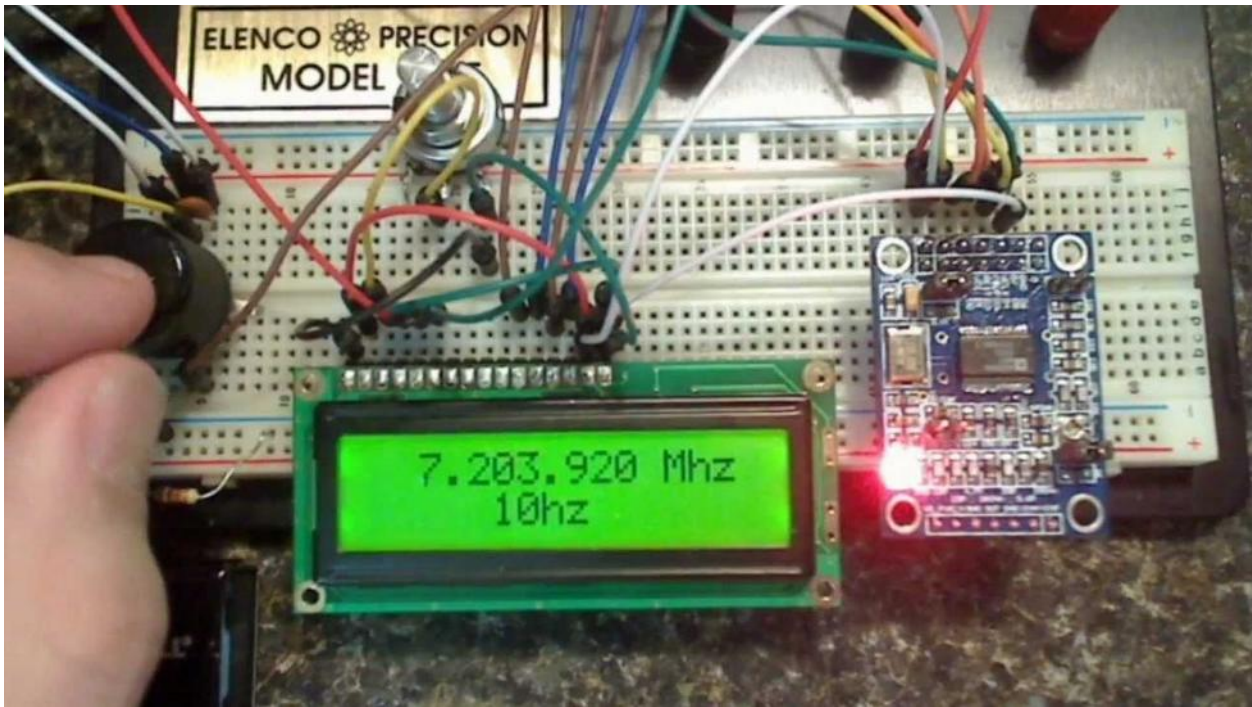
Note: Double Feature in this issue – in addition to Ron's usual “Build This” article, be sure to check the following page for recommended resources for parts and info.

Build this.....

Arduino DDS 7MHZ VFO

By Ron Davis – K4TCP

10/16/2014



The heart of this circuit is the AD9850 chip. This gem is a 0 – 40MHz sine and square wave generator. What's used in the circuit above is a break out board version that is available on eBay for about \$4 - \$8 shipped.



I thought this would be a great addition to a QRP rig or old rig in need of a more modern VFO. With minimal components, a rotary encoder, Arduino Uno R3, LCD display of your choice and the AD9850 break out module one can achieve great results up to 20MHz. From 20MHz to 40MHz the signal gets a bit noisy but is usable.

Here are the relevant datasheets:

AD9850 - http://www.analog.com/static/imported-files/data_sheets/AD9850.pdf

Rotary Encoder - <https://www.sparkfun.com/datasheets/Components/TW-700198.pdf>

16X2 LCD display - <https://www.sparkfun.com/datasheets/LCD/GDM1602K-Extended.pdf>

Links to videos of the working VFO:

<http://www.youtube.com/watch?v=r6nRMikOOmI>

Web article with schematic and sketch links - <http://www.ad7c.com/projects/ad9850-dds-vfo/>

Parts needed:

- 1 – Arduino Uno R3 or equivalent
- 1 – AD9850 DDS Signal Generator Module
- 1 – Rotary encoder (Sparkfun or Adafruit)
- 1 – LCD 16X2 Backlit display w/contrast adj pot.
- 1 – Breadboard
- 1 – Breadboard power supply

Misc hook up wires

FTDI serial board to connect to computer for uploading sketch to ProMini (Not needed if you are using an UNO)

Questions or comments contact:
Ron Davis – K4TCP
Ron.Davis@gmx.us

Ron's URL reference**11/18/2014**

Below is a list of miscellaneous URL and links to various sites I use on occasion. This might be useful to those of you that like to homebrew electronics. This list does not represent endorsement from Trident Amateur Radio Club and we were not paid to provide these links.

Embedded electronics:

SparkFun Electronics	https://www.sparkfun.com/
Adafruit Industries	https://www.adafruit.com/
The Custom Geek	http://thecustomgeek.com/
Modern Device	http://moderndevice.com/
Allspectrum Electronics	http://www.allspectrum.com/store/
Bald Engineer	http://www.baldengineer.com/
Electronic Goldmine	http://www.goldmine-elec-products.com/
Mouser	http://www.mouser.com/
DigiKey	http://www.digikey.com/
AllElectronics	http://www.allelectronics.com/
MPJA Online	http://www.mpja.com/
Jameco	http://www.jameco.com/

RF Parts:

Dan's small parts	http://www.danssmallpartsandkits.net/ (closed until Jan 2015)
RF Parts	http://www.rfparts.com/
Radiometrix	http://www.radiometrix.com/ (home of the HX1)
The Toroid King	http://www.kitsandparts.com/

eBay Stores:

The following eBay stores I have purchased from many times and appear to be trustworthy of your consideration. If you are looking to source some cheap Chinese suppliers I present this list to hopefully eliminate the fear of buying from an unknown source.

anycircuit	(US/Canada based, ships fast, process slightly higher than Chinese sources, good quality)
Czb Electronic	(China based, shipping is 1-2 weeks, low prices, my go to supplier)
Electronics-Salon	(China based, shipping is 1-2 weeks, prices slightly higher, wide selection)
eshop4u05	(China based, shipping is 1-2 weeks, prices slightly higher, wide selection)
IC Touch Store	(China based, shipping is 1-2 weeks, prices slightly higher, good component assortments)
oddWires	(US based, shipping 1 week, robotics/adruino, HAM friendly)
Rf_Cable_Assemblies	(China based, shipping is 1-2 weeks, the go to store for RF connectors)
RadioShack	(US based, fast shipping, way more parts than brick and mortar store)
Thai Shine	(China based, shipping is very fast, large selection of discrete components)

YouTube tutorials:

Afrotechmods	http://www.afrotechmods.com/tutorials/
Derek Molloy	http://derekmolloy.ie/
Human Hard Drive	https://www.youtube.com/user/humanHardDrive
EEVBlog	http://www.eevblog.com/
W2AEW	https://www.youtube.com/user/w2aew

Arduino:

Arduino main site	http://www.arduino.cc/
AVR Freaks	http://www.avrfreaks.net/
GPS Tutorial	http://www.jeremyblum.com/2012/07/16/tutorial-15-for-arduino-gps-tracking/
Arduino I/O	http://tronixstuff.com/2011/08/26/tutorial-maximising-your-arduinos-io-ports/

Baofeng:

Baofeng Tech	http://baofengtech.com/
Baofeng/Pofung	http://www.baofengradio.com/en/
Miklor	http://www.miklor.com/ (Instructions on how to recover a bricked Baofeng)
CHIRP	http://chirp.danplanet.com/projects/chirp/wiki/Home
CHIRP Download Win Installer	http://chirp.danplanet.com/download/0.4.1/chirp-0.4.1-installer.exe

Design:

Ponoko Making system	https://www.ponoko.com
Diptrace PCB desing	http://diptrace.com/
Fritzing	http://fritzing.org/home/ (Great design app)

This list is not an all-inclusive list but it's a good start for beginners in the embedded electronics world. Please feel free to add to this list by sending updates to:

Ron K4TCP – ron.davis@gmx.us