**The HIARC Bulletin**

February 2022 Edition

**The Official Newsletter of the Harris-Intersil Amateur Radio Club**

**Club Meetings:** Second Thursday of each month at Meemaw’s Barbecue on Babcock Street between Palm Bay Road and Port Malabar Road. Supper is at 5:30 PM, business is at 6:30 PM. Prizes at 7:00 PM. Our programs start at 7:15 PM. Meeting ends by 8:00 PM. As some members have allergies, we kindly ask that you refrain from wearing fragrances thanks.

**Club Station:** Building 15, Room 321.  E-mail Butch for access.

**Repeaters:** K4HRS,145.47 Mc, tone 107.2 cycles, elevation 170 feet, Melbourne. Works good, repeater has sensitive receiver and the site is quiet.

**Nets:**

The nets change often. At one point they were:

* HIARC Emergency Net: Sundays 4:00 till 4:30 PM 145.47 MHz repeater
* South Brevard Emergency Net: Thursdays at 7:00 PM. 146.61 or 146.85 MHz repeaters

**HIARC Web Site:** <www.qsl.net/hiarc>. Website administrator; Jim , KC7SSW

**Officers:** President: Francis (“Butch”), WA4AQV

Treasurer: Pat KA4ZEC

Secretary: Open

Repeater Chairman: Clyde KD8AN

Program Chairman: Open

Field Day Chairman: Open

Sunshine Chairman: Open

Club Jester: Ken N8KH

**Annual Membership:**

Annual dues are $12.00. Join at the meeting or send a check to:

HIARC Treasurer

Pat , KA4ZEC

We are on a calendar year dues system with annual dues due in June. Dues are prorated by a dollar a month so if you join in April they are $2.00 to get to June, or you can pay ahead thanks.

Send me your email address to receive the newsletter: francis.parsche@l3harris.com

**Hamfests**

Orlando Hamcation, February 11, 12, 13**.** [www.hamcation.com](http://www.hamcation.com)

**Ham Radio Lunches:**

* Every Friday, 11:00 AM till 1:00 PM or so, Golden Corral on Palm Bay Road in Palm Bay. Around 9 people recently. Talk in on 146.61 Mc repeater.
* Once a month, the Saturday after the PCARS meeting, Sarno Restaurant and Pizzaria, 11:00 AM. Talk in 146.61 repeater. This is at the corner of Sarno Road and Croton Road.

**Our Next Monthly Meeting**

Our next HIARC meeting is Thursday February 10 at 5:30 PM at Meemaws Barbecue. The program will be a show and tell of interference locating antennas by Clyde KD8AN. He is on the interference locating committee over at PCARS.

Looking forward.

Butch WA4AQV

**Orlando Hamcation**

It’s this coming Friday Saturday and Sunday. [www.hamcation.com](http://www.hamcation.com)

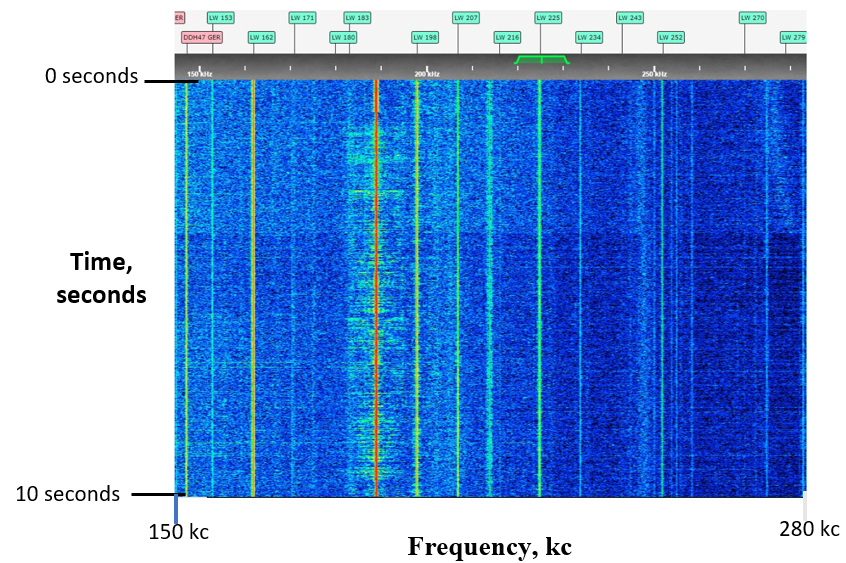
**HF Conditions**

The sun is becoming active, Solar flux is over 130 the past few days The upper HF bands are having some F2 openings at times. Along with the higher solar flux is more variability in conditions. I had to check my rig the other night, figured a tube was loose but the conditions had suddenly faded. Opinions on the this solar cycle have varied widely. Enjoy it.

**How Waterfall Displays Work**

Last month we showed a waterfall display of European Longwave Band reception down in the low frequency range, from a remote receiver site in Europe. Some asked how waterfall displays work. Here is a description.

Waterfall displays are newer forms of spectrum displays for most of us. They use color modulation or “heat mapping” to show signals. Strong signals are red, medium signals are yellow, and background noise is blue. They move continuously from top to bottom so the vertical axis is time, which may be in seconds or otherwise. The horizontal axis is frequency in kilocycles or megacycles, or hertz if you like. Signals are the red and yellow vertical stripes.



**Longwave Broadcast Stations Midday In Europe As Received In Northern Norway**

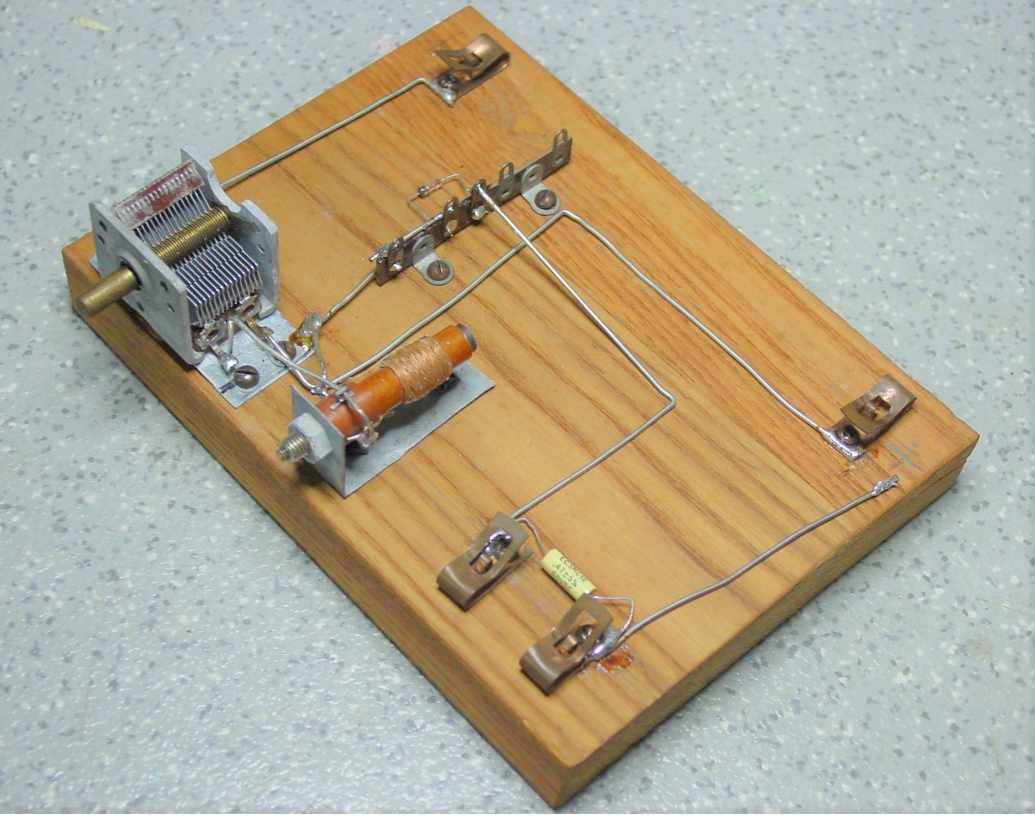
So waterfall displays add the dimension of time to what were snapshots in time on the old spectrum analyzer displays. Waterfall displays could allow you to look all night for a signal and see if it happened on the morning. Morse code dots and dashes will print out vertically on spectrum displays so you can read them visually if the display refreshes fast enough. Waterfall displays are good to spot signals on quiet bands so you do not have to rock the tuning dial back and forth.

In the display figure the carriers of the longwave broadcast stations com through vividly. The sidebands containing the voice and music are do not show up as well. Less spectral energy density as the sideband power is spread out over more kilocycles. In the display shown the BBC Droitwich England transmitter on 198 kc has a good signal. The longwave station in Ireland, RTE RADIO 1 was not on the air at the time of the spectrum snapshot but it sends only one sideband plus the carrier to save power. Once in a while you can hear the European Longwave Stations in Florida, after sunset in the winter at a quiet remote location.

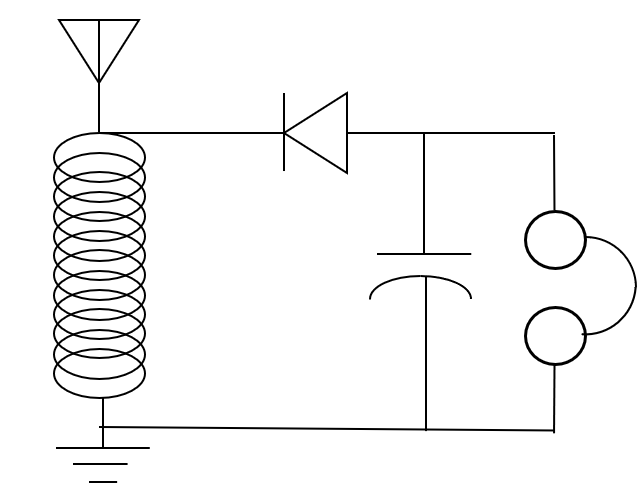
Many longwave listeners are older or expatriates, such as someone from country A in Europe living in country B in Europe and wanting to hear what’s up back home. One example was a person from France listening in a stall in a flea market in England. Some car radios come with a longwave band over there.

**January Program: Crystal sets**

Last month’sHIARC meeting was a program a show and tell of crystal sets. They are still around after 110 years or so. Attached is a recent embodiment:



**WA4AQV Crystal Set**



**Schematic**

This radio uses commercial components including a slug tuned ferrite loopstick inductor. The 1N34A detector diode which is used originally came on the market in 1948, prior to that a tube or catwhisker on galena mineral detector was required. The connectors are fahnstick clips to attach wires. A capacitor near 0.05 uf fills in the mixed RF carrier and sidebands into audio spectrum envelope. The diode has an equivalent series resistance of 1500 ohms or so, so high impedance headphones are best. Some diodes like a litte DC leaked around them with a 20k ohm resistor.

Crystal set sensitivity. The threshold of hearing for those with good hearing is 0.1 microwatts. So a crystal set can be no more sensitive than 0.1 micrwatts. 1 milliwatt is a good listening level in headphones but you need to be close to the transmitter or have a big antenna to get that.

Here is a link budget:



**Link Budget For WMMB AM at 10 miles**

Once in a while you can hear a shortwave radio station on a crystal set. Especially on the 6 MHz shortwave band at night.

The tradition 365 pf air variable capacitor does not tune the whole AM band in crystal sets usually due to the input and output impedances being pot luck. Most people use a random length wire for an antenna so the parallel resonant circuit tuning winds up compensating the antenna reactance.

The crystal set wasn’t around yet at the time of the Titanic Disaster. Phillps used a moving wire magnetic detector known as a “maggie”. Not as good as the crystal detector later to come. The vacuum tube diode did not work as well as the crystal diode as a detector as the vacuum tube did not have a sharp VI characteristic / cutoff necessary to produce mixing action. Diodes are have a sharp conduction voltage near 0.3 volts for the germanium 1N34A. Of course if you have a tube then you could make a grid leak amplifying detector or a regenerative receiver.

Lots of parts to make crystal sets are available these days from the Crystal Set Society at <http://www.midnightscience.com/catalog5.html#part4> and <http://www.midnightscience.com/>

Butch WA4AQV

**3.45 to 3.5 GHz Amateir Radio Band**

SB QST @ ARL $ARLB005  
ARLB005 Amateur Operation in 3.45 - 3.5 GHz Segment Must Cease by  
April 14, 2022  
  
ZCZC AG05  
QST de W1AW    
ARRL Bulletin 5  ARLB005  
From ARRL Headquarters    
Newington CT  January 19, 2022  
To all radio amateurs   
  
SB QST ARL ARLB005  
ARLB005 Amateur Operation in 3.45 - 3.5 GHz Segment Must Cease by  
April 14, 2022  
  
The FCC has established April 14, 2022, as the date by which amateur  
radio transmissions must stop in the upper 3.45 - 3.5 GHz segment of  
the amateur secondary 9-centimeter band. Secondary operations are  
permitted to continue indefinitely in the remainder of the band, 3.3  
- 3.45 GHz, pending future FCC proceedings.  
  
On January 14 the FCC released DA 22-39, which announces the results  
of Auction 110 for the 3.45 - 3.55 GHz band. Release of this notice  
triggered FCC rules adopted last year requiring that amateur radio  
operations between 3.45 GHz and 3.5 GHz cease within 90 days of the  
public notice.  
  
DA 22-39 can be found online at,  
<https://www.fcc.gov/document/fcc-announces-winning-bidders-345-ghz-service-auction/attachment-a>  
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In October 2021, ARRL President Rick Roderick, K5UR, urged Congress  
to direct the FCC to preserve Amateur Radio's secondary use of the 3  
GHz band in a written statement responding to H.R. 5378, the  
Spectrum Innovation Act of 2021, before the US House Commerce  
Communications and Technology Subcommittee.  
  
A chronology of actions responding to amateur access on the 3.5 GHz  
band can be found on the ARRL website at,  
<http://www.arrl.org/3-ghz-band> .  
NNNN  
/EX