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IN-PERSON CLUB MEETING SET FOR MAY!

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The new ZeroBeat Newsletter, the official publication of the Montgomery Amateur Radio Club published on the first day of each month. Contents: Articles about new products - antennas - techniques and ideas – items for sale – humor - announcements and upcoming events – letters to the editor – articles about old products – profiles of club members – event pictures.

The ZeroBeat wants your contributions! Email articles to me at CASKYWARN@GMAIL.COM in Microsoft Word format or plain text. Comments and letters to the editor are welcome!

Zero Beat

Report on the Lowndes POTA Activation

Otto Arnoscht N4UZZ

POTA is Parks On The Air, a nationwide program where hams go to parks and make contacts. You need to make 10 contacts from a park location to “activate” that location. On the POTA website park activators and park hunters coordinate, announce their activations, and review the statistics of activations for each park.

The Lowndes WMA north of Whitehall is a POTA (K-3697) that had never been activated and presented a desirable target. John, KJ6MTJ, Scott, KS4TAC, and Otto, N4UZZ, made the trek to this wildlife management area to activate this POTA on cw and SSB.



We set up in a field at a good distance from woods to increase safety from moccasins, wild hogs, alligators, and turkey hunters. Fortunately, we did not encounter any of these hazards. What we did encounter, though, was a stiff wind at 25 to 35 mph. We first set up a canopy but took it down because it was in danger of being blown over. Then we set up a small tripod with a 17-foot mast for a VHF/UHF antenna to get on

the 84 repeater. It was promptly blown over. Then we set up the big mast, a 40-foot Spiderbeam fiberglass mast that was used to hold up an endfed antenna in inverted-V formation. It blew over. So we erected the spiderbeam mast again, but this time secured it on a big MFJ tripod. That worked.

We had two Icom IC-7300 radios and quickly realized that even if they operated on different bands, they interfered with each other severely. One factor was that the antennas and the radios were not physically separated. But that was no problem. We simply took turns, with N4UZZ starting on 40m in cw. After we got the requisite 10 contacts in cw, Scott KS4TAC took over with the phone operation and called CQ. After almost two hours of calling CQ, Scott got only two contacts despite us spotting him on the clusters.



At 11:00 AM we called it a day, packed up, and drove home. All in all, it was a great experience. We learned a lot about portable setups, and we were successful in activating the POTA location. We are looking forward to more POTA outings and expanding our efforts to some SOTA (Summits On The Air) locations.

Zero Beat

Amateur Radio Limbo – How Low can You Go?

Rick Vachon, W3VAC

A. K. A. Get Started in Weak Signal Propagation Reporting (WSPR)

How efficient is your antenna system really?

A great way to test it and find out is by running a WSPR mode beacon. WSPR is a non-QSO mode. It is a low power beacon you set up and report who you hear to a web site. Other stations around the world will also report if they hear you. Anybody can receive and report but you must be a licensed Amateur Operator to transmit on the bands that you are authorized.

What bands?

There are frequencies on almost every amateur band. From 2190m (136 KHz) to 23cm (1.2965 GHz). A complete list can be found on the WSPRNET website but most of these are already in WSJT-X by default. This means any Amateur Operator has access to a band to transmit and run in this mode.

Equipment needed

Pretty much any HF radio that you can interface with a computer will work. Modern SDR based radios make it very easy to run digital modes and since the computer controls the input to be transmitted, you can control the output power. My Yaesu FT-DX101D will only adjust power down to 5 watts minimum. From there I use a combination of the digital input level control on the radio, the speaker volume on the computer (the USB Codec soundcard control), and the transmit power slider in WSJT-X to lower my transmitted signal level to 2 (ish) mW. Many portable HF rigs will also allow you to dial down to QRP levels directly.

A Wattmeter that has a fairly low range is a must (in my humble opinion). Many WSPR beacons run 10, 5, 1 watts and many meters will get that low. For lower levels, there are a number of



QRP wattmeter kits available for not too much money and they look fairly simple. I have a very nice Telepost LP-100A which claims better than 5% (3% typical) down to 1 watt. I posed the question of QRP levels to the Groups.IO site for the meter and the inventor answered back that I should see 5% or better down to 100mW and below that it could get erratic. I decided to build my own milliwatt meter. Taking a DC voltage reading from a dummy load seemed to be the most accurate and efficient way to measure down to the 1 to 2 milliwatt range. So a schottky diode, a couple of capacitors and some resistors later, I have a meter.

The scale I stole from the internet but I calibrated it on this scale using my LP-100A to 100mW and the two higher scales track very well so I believe it is pretty close on. Here is what I am calling 2mW (on the 100 mW scale). The rest you already have, a computer, software (I recommend WSJT-X), and an antenna. Once you get your power level set, start sending!

Zero Beat

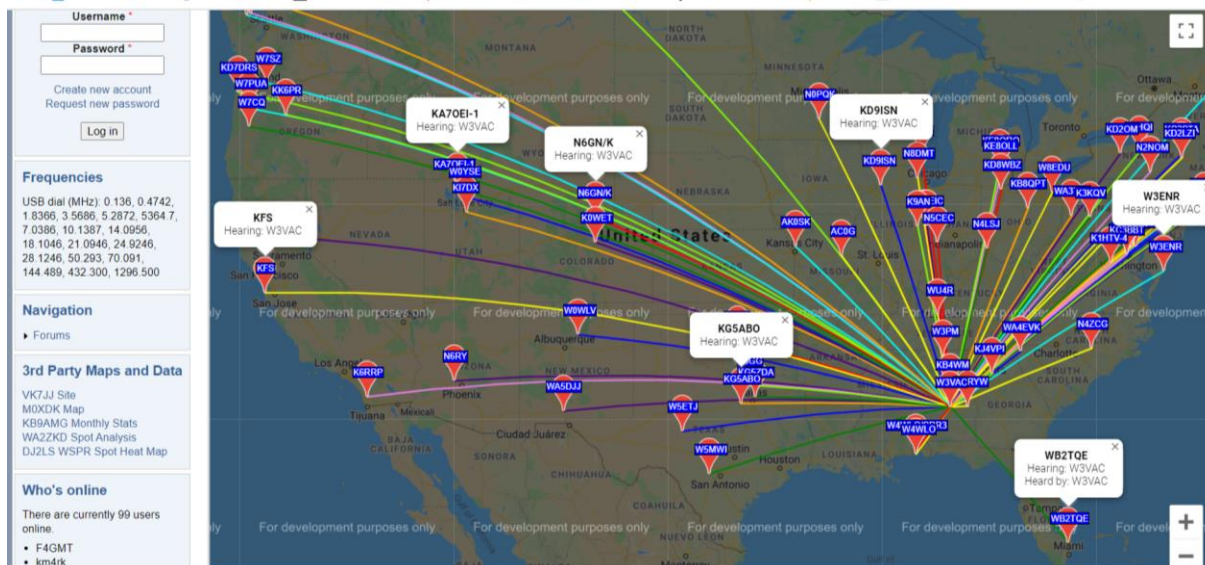
Get Started

Here is where I broke a million miles per watt. 2054 miles from my grid EM62 (Millbrook, AL) to grid CM87 (San Francisco, CA). 2054 miles divided by .002 watts = 1,027,000 miles per watt.

2021-03-06	10:40	W3VAC	3.570067	-22	0	EM62tm	+3	0.002	KK1D	FN31	1544	959	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-21	0	EM62tm	+3	0.002	N3SB	FM19mk	1143	710	WSPR-2
2021-03-06	10:40	W3VAC	3.570034	-23	0	EM62tm	+3	0.002	WS3W	FM19ng	1137	706	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-22	0	EM62tm	+3	0.002	K1HTV-4	FM18ap	1021	634	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-29	0	EM62tm	+3	0.002	W4RYW	EM72gn	86	53	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-26	0	EM62tm	+3	0.002	N2NOM	FN22bg	1424	885	WSPR-2
2021-03-06	10:40	W3VAC	3.570038	-26	0	EM62tm	+3	0.002	KD9ISN	EN41xr	1074	667	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-18	0	EM62tm	+3	0.002	W4WLO	EM50vj	293	182	WSPR-2
2021-03-06	10:40	W3VAC	3.570033	-25	0	EM62tm	+3	0.002	W3ENR	FM28jh	1198	744	WSPR-2
2021-03-06	10:40	W3VAC	3.570035	-30	0	EM62tm	+3	0.002	KFS	CM87tj	3305	2054	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-25	0	EM62tm	+3	0.002	N6GN/K	DN701l	1883	1170	WSPR-2
2021-03-06	10:40	W3VAC	3.570036	-23	0	EM62tm	+3	0.002	K9AN	EN50wc	858	533	WSPR-2
2021-03-06	10:40	W3VAC	3.570037	-14	0	EM62tm	+3	0.002	W4WLO/SDR3	EM50vo	275	171	WSPR-2
2021-03-06	10:40	W3VAC	3.570035	-24	0	EM62tm	+3	0.002	WA2TP	FN301u	1504	935	WSPR-2
2021-03-06	10:40	W3VAC	3.570035	-23	0	EM62tm	+3	0.002	W3PM	EM64or	249	155	WSPR-2
2021-03-06	10:40	W3VAC	3.570034	-26	0	EM62tm	+3	0.002	KA7OEI-1	DN31uo	2499	1553	WSPR-2
2021-03-06	10:40	W3VAC	3.570035	-29	0	EM62tm	+3	0.002	KC3BBT	FM18kx	1100	684	WSPR-2
2021-03-06	10:40	W3VAC	3.570044	-31	0	EM62tm	+3	0.002	W2GNN	FN20qh	1360	845	WSPR-2

See the results of your beacon at WSPRNet. Here is a screen shot from there showing all stations that I heard and who heard me. This shows you not only the directionality of my transmitting antenna but also where it is receiving from.

<http://wspnet.org/drupal/wspnet/map>



Good Luck and 73!
W3VAC, Rick

Zero Beat

A Practical Inverted L

Rick Vachon, W3VAC

or,

Random does not Really Mean Random

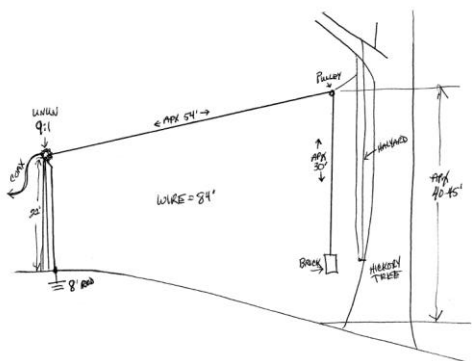
In my mind, I separate end fed antennas into two different types, half wave and random. The inverted L can be either. Like every choice, both have advantages and disadvantages. The main advantage to the random wire is that it can be used on several bands, which is why I prefer it, I like the flexibility. They both behave very differently at the feed point so it is important that you keep in mind the differences before you cut a wire.

A half wave antenna has a feed point impedance (Z) of a couple of thousand, to several thousand ohms. This means you would use an unun with a ratio of 49:1. For example, a 2450 ohms feed point Z divided by 49:1 unun = 50 ohms, a perfect match. A feed point Z of 6000 ohms divided by 49 = 122.4 ohms. Not a perfect match but close to a 2.5:1 SWR which is within the range of most built-in tuners. If cut for a specific half wave, no tuner would be needed, the main advantage to an end fed half wave.

A "random" length antenna can have several hundreds of ohms at the feed point. For example, a feed point of 450 ohms, divided by a 9:1 unun = 50 ohms. A 900 ohm feed point Z divided by a 9:1 unun = 100 ohms. A 2:1 match and again, within the reach of most built in tuners. Both of the above examples are dealing with rough overall impedance and do not separate reactance from real resistance. A vector analyzer will show much more difference between the two across different bands, but for general principals and planning, rough calculations have shown to be sufficient for me.

So to keep a "random" wire random, we have to avoid half wavelengths and multiples of half wavelengths. This means that random is not really random. I have found several internet sites that discuss end fed long wire antennas and I have experimented with good results using several of these lengths that avoid half wavelengths: 29, 35.5, 41, 58, 71, 84, 107, 119, 148, 203, 347, 407, and 423 feet. I run a 148' and a 133' EFLW as well as the 84' Inverted L.

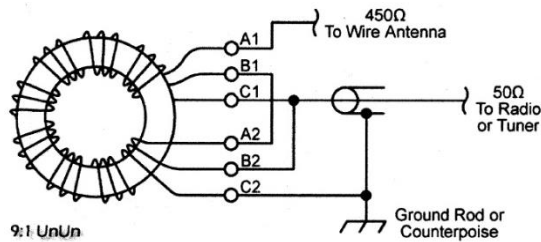
My version of the inverted L uses surplus military field phone wire which I bought on line for about \$40 for a half kilometer (1640 feet, \$0.024 a foot) delivered. My version of the inverted L is a little different in that the feed point is high with the vertical element trailing, where



traditionally it should start low and have the vertical element first. The unun is supported by a halyard on a push up pole on the side of my house. I have several coils of coax at the feed point to act as a common mode choke (not shown) which serves to keep RF out of the shack (something EFLWs are known for). The wire runs through a pulley supported by a tree and has a brick counter weight. The pulley and weight system is so that the mast will not rip from the house if limbs or trees should fall across the wire, which happened during the spate of hurricanes last year. Tree fell, hit wire, brick went up, no damage!

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The unun: I made it using an FT-140-43 toroid and 18 AWG magnet wire.



Below are my SWR readings showing the SWR for the antenna un-tuned, with just the unun and then with the ATU in the radio, then with the manual tuner. The Tuner Set numbers are the presets for my Tucker T-3000 manual tuner (Vectronics HFT1500).

EXT 84' INVERTED L, 9:1 UnUn, *230 deg

Band	F/MHz	Un	Tuned	ATU-SWR	Tuner Set/ SWR
160m	1.840	2.60		7-12-8 2.00	
160m	1.900	2.73		7.5-42-8	2.20
80m	3.573	2.92	1.10	4-213-3	2.00
80m	3.965	2.54	1.10	4-247-3.25	1.60
60m	5.3585	6.50		5.25-299-2.25	1.00
40m	7.074	2.70	1.00	2.5-325-4.5	1.00
40m	7.180	2.52	1.00	3.25-330-4	1.00
30m	10.136	1.58	1.00	4.5-367-3	1.30
20m	14.074	2.28	1.01	3.5-378-3.25	1.00
20m	14.300	2.15	1.00	3.5-381-3	1.00
17m	18.100	2.59	1.10	3.5-384-4	1.00
15m	21.074	1.55	1.00	3.5-396-3.5	1.00
12m	24.915	3.00	1.10	2.25-396-9.25	1.00
10m	28.074	2.98	1.00	2.25-392-5.5	1.00
10m	28.500	2.62	1.00	2.25-388-6	1.00
10m	29.000	2.65	1.00	2.25-381-2.75	1.00
10m	29.500	2.30	1.00	2.25-390-1.5	1.00
6m	51.000	1.91	1.10	2.75-381-.075	1.00
6m	52.000	4.56	1.10	2.75-405-0.75	1.00

As you can see, it's not usable at all for 160 meters and not very good for 80m FT8. From the high end of 80m up though, I have an antenna that is usable for most of the HF bands as well as 6 meters.

For Winter Field Day, I set up a similar antenna at 58' length of 18 AWG speaker wire and a 9:1 unun kit I bought for \$25 and found it very usable from 40m up to 6m.

I find that the inverted L, that I treat as an end fed random wire, is a highly versatile, simple to make, inexpensive antenna and I have used it for literally thousands of digital contacts all over the world. The horizontal and vertical elements combined seem to give me a pretty fair take off angle for hitting most of the US as well as Europe and South America. The Pacific is tougher to hit with any regularity but I have numerous contacts in Japan and several in Australia and New Zealand. I have hit the Middle East about three times (Palestine, Israel and Kuwait) and have yet to hit India, but I'm working on it.

73, W3VAC

Zero Beat

Club Happenings for April 2021

At the last board meeting there was agreement that we will have in-person club meetings starting in May 2021. We feel that by May all persons who have concerns about Covid will have had the opportunity to be vaccinated. In addition, the meeting facility will provide ample space for social distancing. Masks will be optional.

Meeting place: due to the continued closing of the Red Cross building, we will meet at the Scottish Rite Temple which is on the same parking lot as the Alcazar Shrine Temple where we hold our hamfest. When you drive up to the Alcazar Shrine Temple, the Scottish Rite building is to the right.

The Lunchbunch meeting schedule:

April 7, 2021	Pizza Perfect, 428 Coliseum Blvd, Montgomery, AL 36109 meet at 11:30 AM
April 14, 2021	TO BE DETERMINED at 11:00 AM
April 21, 2021	Sommer's Place, 7972 Vaughn Road meet at 11:30 AM CT
April 28, 2021	Gail's Down the Street Café, 2741 Zelda Road, meet at 11:30 AM CT

To join the Lunchbunch email list and get weekly reminders and announcements, send an email to me at CASKYWARN@GMAIL.COM and we will send you an invitation.

From time to time members will gather at Vicki's Lunch Van for the best burgers in town. Those announcements are usually made on the club email list.

Skywarn Training Net	meets every Thursday 7:00 PM CT on 146.84 W4AP
Club Breakfast	remains canceled until further notice
Club Meeting	April 19, 2021 on the air on 146.84 W4AP
CAVEC Testing	remains canceled until further notice
ARRL-VE Testing	remains canceled until further notice

We have an active facebook page where members post pictures of equipment and make announcements about events. The facebook page is at: <https://www.facebook.com/groups/1412939275643917/> ask for approval to join.

Club Membership Renewal

Yes, we are accepting membership renewals for 2021. They are overdue, but we take all comers and welcome any renewals. We need your membership to keep up our efforts to maintain several repeaters in the area and to have Field Day and the Hamfest as well as many other events and activities. To renew your membership go to W4AP.ORG, then click on [Enter Website] then click on "About Us" which brings up a drop-down list and click on "Join MARC." In the center of the page you will find a link to the renewal form and instructions. You can pay via paypal by sending money to Treasurer@W4AP.COM

FT1 Beta Released!

*To Revolutionize Amateur Radio!
Up to 700 Complete QSOs in a Cycle!
Cycle Shortened to 1 Second!*

April 1, 2021: Special beta Release of FT1

A research team has taken Joe Taylor's ideas to the next level and has issued a beta release of the new revolutionary digital communications program FT1. The team of Clifford Irving, Rosie Ruiz, and Robert Richter (now working on a cold fusion project in Argentina) have developed FT1, a new and accelerated version of FT4.

The features of the program:

- A cycle is now 1 second, with four complete transmit-receive packets of 248 ms each.
- In each cycle the entire band (up to 1 MHz) is received, skimmed, and processed.
- All operations are automated. Operator intervention is not possible.
- Up to 700 QSOs can be completed within one second.
- Deep decoding results in 100% decoding at -38db, far below the noise floor of most amateur radio equipment

Comments from beta testers:

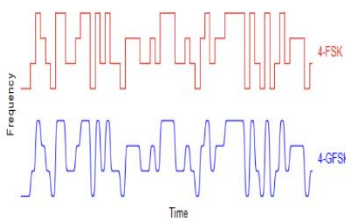
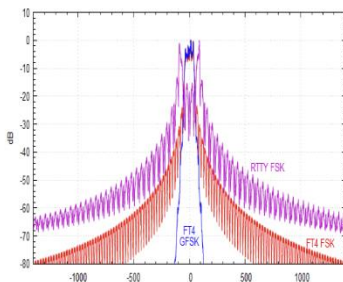


Fig 2 — Example of the encoded (red) and smoothed (blue) frequency sequences for part of an FT message.



“The implications of this new technology are mind boggling, “DXCC in five minutes, LOTW crashing from all the uploads.”
Bob Sherwood NC0B

“Surprised a regular computer can handle this.”
Milton Reselle K1BT

“This is the ultimate fusion of ham radio and high-speed data technology.”
Mark Ebersole, W7AFD

“I know some contest cw operators that are just as fast as this.”
Barry Coldwater III, KN7XX

“This thing really starts cooking with a 2 kW amplifier!”
Randy Morgee, K5KW (often heard on 7.200 mHz)

Download locations must remain confidential at this time. We can give you the location and you can download the beta release FT1_beta_0.02.exe . Just post an inquiry on our members-only MARC facebook page.