



# Azalea Coast Amateur Radio Club



Oct - Dec  
2019 Edition

## ACARC

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(WB3FYR)

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## From The Editor

Well, I guess no one picked up the newsletter when I stopped last year so I'm back...miss me? Both my mom and stepmom beat cancer so far, I'm in my 5<sup>th</sup> year of remission...so why not.

At least for this first issue out of the gates it will be quarterly, with this issue covering October – December. The frequency in which this newsletter gets published all depends on the feedback and help with articles. Yes, I'm still 200 miles away in SC but the internet and email makes that distance so much shorter.

So...I'm asking nicely...pleading on my knees...send me your ideas. Send me your articles for publication (even if it's rough I'll help you clean it up). No skills required – just an interest in keeping your fellow club members informed and educated. Send me photos! Please email to: [W4BIX@arrl.net](mailto:W4BIX@arrl.net)

73!

## Upcoming Important Events

- Oct 15<sup>th</sup>** Monthly club meeting, 7:00 pm
- Nov 19<sup>th</sup>** CFCC North Campus
- Oct 12<sup>th</sup>** VE testing, 10 am @ CFCC North Campus
- Dec 14<sup>th</sup>**
- Nov 16<sup>th</sup>** A Day in the Park, 9:00AM – 1:00PM
- Dec 7<sup>th</sup>** Pearl Harbor Remembrance Day: BB-55
- Every Monday** 2 Meter Rag Chew, 9:00PM  
147.18MHz, +0.600 offset, 88.5 tone  
Norman (KI4YSY) is net control



# Pearl Harbor Day 2019

by Jeff (W4BIX)

Pearl Harbor Day is a date no one will ever (or should ever) forget – December 7<sup>th</sup>. Although never an “official” government holiday it is a day of remembrance of the 1941 attack on our country’s military in the (at the time) Territory of Hawaii.

We mark the event by annually operating as a club on board the USS North Carolina (BB-55) on December 7<sup>th</sup> out of both Radio Central and Radio Two. In our most recent history, we made 108 contacts in 2018 and 127 contacts in 2017 utilizing CW, FT-8 and SSB modes.

The morning begins with the traditional breakfast at the K&W Cafeteria. After that, everyone meets at the battleship to begin the day’s operation. Depending on band conditions we usually operate for 4-6 hours then call it a day. This year, December 7<sup>th</sup> is on a Saturday so I hope for an increase in both participation and contacts. There are no state QSO parties or major contests that should interfere so there should be some shoulder room for us to operate with. Stay tuned for email messages that week prior for reminders and times to meet. Be there...Aloha!





# A Day in the Park

by Linwood (NT4F)

Come spend a day in the park with ham radio!

When: Nov 16<sup>th</sup> (Saturday)

Time: 9:00AM – 1:00PM

Where: Ogden Park, Shelter #2

9 am to 10 am: Hamfest flea market – buy, sell, trade give away

10 am to 12 pm: Fox hunt presentation

12 pm to 1 pm: Food (hot dogs, chips and drinks) and socialize



# Foxhunt Information

By Linwood (NT4F)

## What is fox (transmitter) hunting?

Transmitter hunting is an activity wherein participants use radio direction finding techniques to locate one or more radio transmitters hidden within a designated search area.

## Why should hams be proficient in finding interfering transmissions?

To locate and identify the source of an interference signal whether it be Amateur related or public service

## What does it take to make the search successful?

A hidden transmitter, or fox as it is sometimes called, is used by amateur radio operators for sport. Somebody hides a fox, and participants use different methods to find it. This is for practice for when there is an illegal transmitter nearby. Then the "hams" know what they are doing when tracking it down.

The Fox Transmitter usually transmits a long tone followed by a FCC granted call sign in Morse code. (Mine tx's "NT4F Fox Hunt Beacon Wilmington, NC") (Approximately 30 sec's with 1.5 minute interval between transmissions)

## Foxhunting demo:

<https://www.youtube.com/watch?v=eQSiTqH9Dzw>

## Tools necessary to find the fox:

Easy Ways to "Sniff" Foxes on Two Meters - there is no "standard" two-meter RDF setup for on-foot use by hams in the USA. Every ham who is experienced at it has his or her own idea of what works best in a given situation. Try various methods and see which ones you like most.

<http://www.146970.com/PDFs/TDOA%20Phasenpeiler.pdf>

## Using Directional Antennas

You'll get much more accurate bearings, plus more sensitivity when hunting weak signals, if you use an antenna with forward gain and directivity such as a yagi, cubical quad, or phased array. The technique is simple, just point the antenna toward the horizon and turn your body in a 360-degree circle to find the direction in which the signal is strongest, just as if you were turning a rooftop TV antenna for best picture. When signal strength is greatest, the high-gain antenna is "pointing" toward the signal source. You could remove and carry the 4-element yagi or quad that you normally use for mobile T-hunting, but it's rather large and cumbersome. You don't need that much gain and pattern sharpness --- two or three elements will do nicely.

### Short spaced two element yagi:

<http://www.homingin.com/equipment.html>

A good ready-to-hunt choice for two meters is the 3-element yagi by Bob Miller Enterprises ). Element rods fold along the boom for easy storage and transit. Each antenna is hand-built and tuned for best match by N6ZH.

### VHF antenna manufactured for 121.500 MHz ELT or Amateur Foxhunting on 146.565 MHz:

<http://www.rdfantennas.com>

Another good sniffing antenna is the Shrunken Quad on pages 173-176 of the book *Transmitter Hunting--Radio Direction Finding Simplified (THRDFS)*. It is more compact than a yagi or phased array and is safer because it does not have long pointed elements. It is somewhat tricky to tune and has a narrow bandwidth (about 500 KHz), but it is an excellent choice if most of your hunts are on one frequency such as the southern California coordinated transmitter hunt frequency (146.565 MHz).

Today's favorite home-built two-meter radio-orienting beam among newcomers is the 3-element tape measure antenna. It's a simple project made from a steel measuring tape, PVC

pipe, hose clamps, and a "hairpin" match to the coax. The steel tape measure elements fold gracefully for convenience and safety as you crash through the brush at running speed. You can build this antenna from scratch using parts from your local hardware store.

### 3 element tape measure yagi:

<https://www.youtube.com/watch?v=BmHoQrDfw-0>

Using one of these antennas will get you in the ballpark, and then you can switch to the close-up methods for finding the signal.

### Close-up method

Handie-Talkie Tricks - If you are a typical ham radio operator, all you need to get started quickly and find foxes successfully is your VHF/UHF handi-talkie (HT) or scanner and some simple accessories. The most elementary way is called the "body fade" or "body shield" technique. Hold your HT tight against your chest and turn around slowly, looking for the direction at which your body blocks the signal most effectively (the signal null). At this point, the signal is coming from behind you. Walk in the direction of the null, taking bearings at regular intervals, and observe the signal strength get stronger. The "body fade" null, which is rather shallow to begin with, can be filled in by signal reflections (multipath), nearby objects, etc. When using this method, stay away from large buildings, chain-link fences, metal signs, and the like. If you do not get a good null, move to a clearer location and try again.

When the signal is so strong that you can't find the null, tune 5 or 10 KHz off frequency to put the signal into the skirts of the receiver's IF passband. If your hand-held is dual-band (144/440 MHz) and you are hunting on two meters, try tuning to the much weaker third harmonic of the signal in the 70 cm band while performing the "body shield."

Disconnecting the HT's "rubber duck" antenna will knock down the signal even more. Hearing the signal with antenna off is usually a "You are here!" indicator.

Some foxtailers wrap aluminum foil around their HTs to attenuate the signal even more. If you do this, be sure to put insulating tape over the battery charging terminals on the bottom of the set first. You might damage the radio by shorting these terminals with the foil.

1. When you get close to the signal, it will overwhelm the S-Meter on your radio, making it difficult to ascertain the direction. An attenuator (Show attenuator box) allows you to reduce that signal so you can view the amount of change on your meter as you sweep your antenna around. But you can also hunt for signals without the attenuator:

[https://www.arrl.org/files/file/Technology/tis/info/pdf/May1998\\_Atenuator.pdf](https://www.arrl.org/files/file/Technology/tis/info/pdf/May1998_Atenuator.pdf)

2. Body Fade the signal. Using the duck antenna on your handheld, hold the radio close to your body and physically turn until the signal is strongest. If the signal is strong in all directions, partially unscrew your antenna for more attenuation. Fashioning a shield out of a piece of aluminum foil can also help cut the signal strength as you search.

3. Listen to a harmonic. As you get close, you'll be able to hear the transmitter's 2nd and 3rd harmonic. If the fox is transmitting on 146.55, tune your radio to 293.1 MHz or 439.65 MHz and listen for the signal.

4. Look for clues. The person hiding the fox might be quite crafty; but sometimes there be clues, evidence that someone was there before. These clues might lead you to the hidden transmitter.

The favorite signal reduction device of on-foot foxhunters with beams is an "active," or "offset" attenuator. It converts a strong on-frequency signal into a weaker off-frequency signal, usually from 1 MHz to 5 MHz up or down the dial. To use it, tune your receiver to the offset signal, then adjust the attenuator for the needed attenuation, from 20 dB to 100 dB or more. Signal leakage into

the receiver case is not a problem with this kind of attenuator:

<http://www.homingin.com/joek0ov/offatten.html>  
Offset attenuator

<https://www.youtube.com/watch?v=PxmF23VS61s>  
Offset attenuator projector

Finally, in your fox hunting adventures, please follow the rules of the road. Do you like to see a person driving and texting? Make a rule to only allow two person teams to participate in your club contest. One driving and one operating the equipment. Pull over if need be to keep it safe. It is not a timed event parse' Tread lightly and no trespassing on private property. Ask for permission first.

#### Reference material:

Book: Transmitter Hunting--Radio Direction Finding Simplified (THRDFS).

VHF antenna manufactured for 121.500 Mhz. ELT or Amateur Foxhunting on 146.565 Mhz.  
<http://www.rdfantennas.com>

Offset attenuator

<http://www.homingin.com/joek0ov/offatten.html>

Offset attenuator project

<https://www.youtube.com/watch?v=PxmF23VS61s>

Foxhunting demo

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3 element tape measure Yagi

<https://www.youtube.com/watch?v=BmHoQrDfw-0>

Short spaced two element yagi

<http://www.homingin.com/equipment.html>

[https://www.arrl.org/files/file/Technology/tis/info/pdf/May1998\\_Atenuator.pdf](https://www.arrl.org/files/file/Technology/tis/info/pdf/May1998_Atenuator.pdf)

<http://www.146970.com/PDFs/TDOA%20Phasenpeiler.pdf>

# County Hunting Trip

By Jack (WD4OIN)

County hunters try to work all 3077 counties. It's a great way to see a lot of this beautiful country of ours. Putting out counties from a mobile (car) you see a lot of things when you get away from the interstates. Over the years I have ran every county in NC, SC, GA, FL and VA and a lot of the other counties, about 1100 in total.

On Sep. 11, I left home to join up with a fellow county hunter in Green county. Spent the night with him and the next morning at 6:00am we left on our trip. We had posted our trip on the county hunting forum so we were hoping for a good following. The first day we ran 4 counties in North Carolina and 13 in Virginia and 3 in West Virginia. No problem, they were all on the interstate.

The following day was a slow go! We went straight across WV on state roads and county roads that turned and twisted like a pretzel. The plan was to come up the western edge of WV and KY and Ohio to Pennsylvania. We ran 12 counties in WV, KY and OH but we didn't get to PA. The next day we ran more counties in WV and got to Pittsburg, PA. We ran 15 counties that day.

The next day we ran 14 counties in PA and the following day we ran 8 more counties in PA and 5 of the bottom counties of NY. We have now made the turn for home, ran 4 more in PA, 1 in MD and 10 in VA. The last day we ran 6 more counties in VA before heading down I-95 for home.

Had a great radio trip, put 2535 miles on the car and enjoyed every mile. Made about 1,775 contacts and had 1 flat tire, made 2 bad turns and got lost for a short time.

**Reminder – the club's annual elections will be held at the November meeting!**

# Contest Calendar

From WA7BNM Contest Calendar

October 2019	
IQRP Quarterly Marathon	0800Z, Oct 1 to 2000Z, Oct 7
222 MHz Fall Sprint	1900 local - 2300 local, Oct 1
Phone Fray	0230Z-0300Z, Oct 2
CWops Mini-CWT Test	1300Z-1400Z, Oct 2 and 1900Z-2000Z, Oct 2 and 0300Z-0400Z, Oct 3
UKEICC 80m Contest	2000Z-2100Z, Oct 2
German Telegraphy Contest	0700Z-1000Z, Oct 3
NRAU 10m Activity Contest	1700Z-1800Z, Oct 3 (CW) and 1800Z-1900Z, Oct 3 (SSB) and 1900Z-2000Z, Oct 3 (FM) and 2000Z-2100Z, Oct 3 (Dig)
SARL 80m QSO Party	1700Z-2000Z, Oct 3
SKCC Sprint Europe	1900Z-2100Z, Oct 3
NCCC RTTY Sprint	0145Z-0215Z, Oct 4
NCCC Sprint	0230Z-0300Z, Oct 4
TRC DX Contest	0600Z, Oct 5 to 1800Z, Oct 6
Oceania DX Contest, Phone	0800Z, Oct 5 to 0800Z, Oct 6
Russian WW Digital Contest	1200Z, Oct 5 to 1159Z, Oct 6
YLRL DX/NA YL Contest	1400Z, Oct 5 to 0200Z, Oct 7
IARU Region 1	1400Z, Oct 5 to 1400Z, Oct 6
UHF/Microwaves Contest	
California QSO Party	1600Z, Oct 5 to 2200Z, Oct 6
International HELL-Contest	1600Z-1800Z, Oct 5 (80m) and 0900Z-1100Z, Oct 6 (40m)
FISTS Fall Slow Speed Sprint	1700Z-2100Z, Oct 5
SKCC QSO Party	1800Z, Oct 5 to 1800Z, Oct 6
RSGB DX Contest	0500Z-2300Z, Oct 6
UBA ON Contest, SSB	0600Z-0900Z, Oct 6
Peanut Power QRP Sprint	2200Z-2359Z, Oct 6
RSGB FT4 Contest Series	1900Z-1959Z, Oct 7
ARS Spartan Sprint	0100Z-0300Z, Oct 8
NAQCC CW Sprint	0030Z-0230Z, Oct 9
Phone Fray	0230Z-0300Z, Oct 9
CWops Mini-CWT Test	1300Z-1400Z, Oct 9 and 1900Z-2000Z, Oct 9 and 0300Z-0400Z, Oct 10
432 MHz Fall Sprint	1900 local - 2300 local, Oct 9
10-10 Int. 10-10 Day Sprint	0001Z-2359Z, Oct 10
NCCC RTTY Sprint	0145Z-0215Z, Oct 11
NCCC Sprint	0230Z-0300Z, Oct 11
QRP ARCI Fall QSO Party	0000Z-2359Z, Oct 12
Makrothen RTTY Contest	0000Z-0800Z, Oct 12 and 1600Z-2400Z, Oct 12 and 0800Z-1600Z, Oct 13



Nevada QSO Party	0300Z, Oct 12 to 2100Z, Oct 13
Oceania DX Contest, CW	0800Z, Oct 12 to 0800Z, Oct 13
Microwave Fall Sprint	0800 local - 1400 local, Oct 12
Scandinavian Activity Contest, SSB	1200Z, Oct 12 to 1200Z, Oct 13
SKCC Weekend Sprintathon	1200Z, Oct 12 to 2400Z, Oct 13
Arizona QSO Party	1600Z, Oct 12 to 0600Z, Oct 13 and 1400Z to 2400Z, Oct 13
Pennsylvania QSO Party	1600Z, Oct 12 to 0500Z, Oct 13 and 1300Z-2200Z, Oct 13
FISTS Fall Unlimited Sprint	1700Z-2100Z, Oct 12
South Dakota QSO Party	1800Z, Oct 12 to 1800Z, Oct 13
PODXS 070 Club 160m Great Pumpkin Sprint	2000Z, Oct 12 to 2000Z, Oct 13
UBA ON Contest, CW	0530Z-0800Z, Oct 13
UBA ON Contest, 6m	0800Z-1000Z, Oct 13
4 States QRP Group Second Sunday Sprint	0000Z-0200Z, Oct 14
RSGB 80m Autumn Series, CW	1900Z-2030Z, Oct 14
Phone Fray	0230Z-0300Z, Oct 16
CWops Mini-CWT Test	1300Z-1400Z, Oct 16 and 1900Z-2000Z, Oct 16 and 0300Z-0400Z, Oct 17
AGCW Semi-Automatic Key Evening	1900Z-2030Z, Oct 17
NCCC RTTY Sprint	0145Z-0215Z, Oct 18
NCCC Sprint	0230Z-0300Z, Oct 18
Zombie Shuffle	1600-2400 local, Oct 18
Araucaria World Wide VHF Contest	0000Z, Oct 19 to 1600Z, Oct 20
ARRL EME Contest	0000Z, Oct 19 to 2359Z, Oct 20
JARTS WW RTTY Contest	0000Z, Oct 19 to 2400Z, Oct 20
10-10 Int. Fall Contest, CW	0001Z, Oct 19 to 2359Z, Oct 20
New York QSO Party	1400Z, Oct 19 to 0200Z, Oct 20
Stew Perry Topband Challenge	1500Z, Oct 19 to 1500Z, Oct 20
Worked All Germany Contest	1500Z, Oct 19 to 1459Z, Oct 20
Feld Hell Sprint	2000Z-2359Z, Oct 19
Argentina National 7 MHz Contest	2130Z-2230Z, Oct 19
Asia-Pacific Fall Sprint, CW	0000Z-0200Z, Oct 20
UBA ON Contest, 2m	0700Z-1000Z, Oct 20

Illinois QSO Party	1700Z, Oct 20 to 0100Z, Oct 21
RSGB RoLo CW	1900Z-2030Z, Oct 20
Run for the Bacon QRP Contest	0100Z-0300Z, Oct 21
ARRL School Club Roundup	1300Z, Oct 21 to 2359Z, Oct 25
Telephone Pioneers QSO Party	1800Z-1900Z, Oct 21 (Digital Only) and 1900Z, Oct 21 to 0300Z, Oct 22 (All Modes)
SKCC Sprint	0000Z-0200Z, Oct 23
Phone Fray	0230Z-0300Z, Oct 23
CWops Mini-CWT Test	1300Z-1400Z, Oct 23 and 1900Z-2000Z, Oct 23 and 0300Z-0400Z, Oct 24
RSGB 80m Autumn Series, Data	1900Z-2030Z, Oct 23
NCCC RTTY Sprint	0145Z-0215Z, Oct 25
NCCC Sprint	0230Z-0300Z, Oct 25
CQ Worldwide DX Contest, SSB	0000Z, Oct 26 to 2359Z, Oct 27
Phone Fray	0230Z-0300Z, Oct 30
CWops Mini-CWT Test	1300Z-1400Z, Oct 30 and 1900Z-2000Z, Oct 30 and 0300Z-0400Z, Oct 31
UKEICC 80m Contest	2000Z-2100Z, Oct 30
RSGB 80m Autumn Series, SSB	1900Z-2030Z, Oct 31
<b>November 2019</b>	
NCCC RTTY Sprint	0145Z-0215Z, Nov 1
NCCC Sprint	0230Z-0300Z, Nov 1
Silent Key Memorial Contest	0600Z-0859Z, Nov 1
IPARC Contest, CW	0600Z-1000Z, Nov 2 and 1400Z-1800Z, Nov 2
Ukrainian DX Contest	1200Z, Nov 2 to 1200Z, Nov 3
ARRL Sweepstakes Contest, CW	2100Z, Nov 2 to 0300Z, Nov 4
IPARC Contest, SSB	0600Z-1000Z, Nov 3 and 1400Z-1800Z, Nov 3
EANET Sprint	0800Z-1200Z, Nov 3
High Speed Club CW Contest	0900Z-1100Z, Nov 3 and 1500Z-1700Z, Nov 3
RSGB FT4 Contest Series	2000Z-2059Z, Nov 4
ARS Spartan Sprint	0200Z-0400Z, Nov 5
Phone Fray	0230Z-0300Z, Nov 6
CWops Mini-CWT Test	1300Z-1400Z, Nov 6 and 1900Z-2000Z, Nov 6 and 0300Z-0400Z, Nov 7
UKEICC 80m Contest	2000Z-2100Z, Nov 6
NRAU 10m Activity Contest	1800Z-1900Z, Nov 7 (CW) and 1900Z-2000Z, Nov 7 (SSB) and 2000Z-2100Z, Nov 7 (FM) and 2100Z-2200Z, Nov 7 (Dig)

SKCC Sprint Europe	2000Z-2200Z, Nov 7
NCCC RTTY Sprint	0145Z-0215Z, Nov 8
NCCC Sprint	0230Z-0300Z, Nov 8
WAE DX Contest, RTTY	0000Z, Nov 9 to 2359Z, Nov 10
PODXS 070 Club Triple Play Low Band Sprint	0000Z, Nov 9 to 2359Z, Nov 11
10-10 Int. Fall Contest, Digital	0001Z, Nov 9 to 2359Z, Nov 10
JIDX Phone Contest	0700Z, Nov 9 to 1300Z, Nov 10
SARL VHF/UHF Analogue Contest	1000Z, Nov 9 to 1000Z, Nov 10
OK/OM DX Contest, CW	1200Z, Nov 9 to 1200Z, Nov 10
SKCC Weekend Sprintathon	1200Z, Nov 9 to 2400Z, Nov 10
CQ-WE Contest	1900Z-2300Z, Nov 9 (CW/Digital) and 0100Z-0500Z, Nov 10 (Phone) and 1900Z-2300Z, Nov 10 (Phone) and 0100Z-0500Z, Nov 11 (CW/Digital)
AWA Bruce Kelley 1929 QSO Party	2300Z, Nov 9 to 2300Z, Nov 10 and 2300Z, Nov 16 to 2300Z, Nov 17
North American SSB Sprint Contest	0000Z-0400Z, Nov 10
4 States QRP Group Second Sunday Sprint	0100Z-0300Z, Nov 11
RSGB 80m Autumn Series, Data	2000Z-2130Z, Nov 11
Phone Fray	0230Z-0300Z, Nov 13
CWops Mini-CWT Test	1300Z-1400Z, Nov 13 and 1900Z-2000Z, Nov 13 and 0300Z-0400Z, Nov 14
NCCC RTTY Sprint	0145Z-0215Z, Nov 15
NCCC Sprint	0230Z-0300Z, Nov 15
YO International PSK31 Contest	1600Z-2200Z, Nov 15
ARRL EME Contest	0000Z, Nov 16 to 2359Z, Nov 17
SARL Field Day Contest	1000Z, Nov 16 to 1000Z, Nov 17
LZ DX Contest	1200Z, Nov 16 to 1200Z, Nov 17
All Austrian 160-Meter Contest	1600Z-2359Z, Nov 16
REF 160-Meter Contest	1700Z, Nov 16 to 0100Z, Nov 17
+ Feld Hell Sprint	1900Z-2059Z, Nov 16
RSGB 1.8 MHz Contest	1900Z-2300Z, Nov 16
ARRL Sweepstakes Contest, SSB	2100Z, Nov 16 to 0300Z, Nov 18

Homebrew and Oldtime Equipment Party	1300-1500Z, Nov 17 (40m) and 1500-1700Z, Nov 17 (80m)
Run for the Bacon QRP Contest	0200Z-0400Z, Nov 18
NAQCC CW Sprint	0130Z-0330Z, Nov 19
Phone Fray	0230Z-0300Z, Nov 20
CWops Mini-CWT Test	1300Z-1400Z, Nov 20 and 1900Z-2000Z, Nov 20 and 0300Z-0400Z, Nov 21
RSGB 80m Autumn Series, SSB	2000Z-2130Z, Nov 20
NCCC RTTY Sprint	0145Z-0215Z, Nov 22
NCCC Sprint	0230Z-0300Z, Nov 22
CQ Worldwide DX Contest, CW	0000Z, Nov 23 to 2400Z, Nov 24
SKCC Sprint	0000Z-0200Z, Nov 27
Phone Fray	0230Z-0300Z, Nov 27
CWops Mini-CWT Test	1300Z-1400Z, Nov 27 and 1900Z-2000Z, Nov 27 and 0300Z-0400Z, Nov 28
UKEICC 80m Contest	2000Z-2100Z, Nov 27
RSGB 80m Autumn Series, CW	2000Z-2130Z, Nov 28
NCCC RTTY Sprint	0145Z-0215Z, Nov 29
NCCC Sprint	0230Z-0300Z, Nov 29
Russian WW MultiMode Contest	1200Z, Nov 30 to 1159Z, Dec 1
<b>December 2019</b>	
DARC Christmas Contest	0830Z-1059Z, Dec 1
QRP ARCI Topband Sprint	0000Z-0300Z, Dec 5
ARRL 160-Meter Contest	2200Z, Dec 6 to 1600Z, Dec 8
Wake-Up! QRP Sprint	0600Z-0800Z, Dec 7
TOPS Activity Contest	1600Z, Dec 7 to 1559Z, Dec 8
FT8 Roundup	1800Z, Dec 7 to 2359Z, Dec 8
QRP ARCI Holiday Spirits	2000Z-2300Z, Dec 8
Homebrew Sprint	
PODXS 070 Club Triple Play Low Band Sprint	0000Z, Dec 14 to 2359Z, Dec 16
ARRL 10-Meter Contest	0000Z, Dec 14 to 2400Z, Dec 15
AGB-Party Contest	2100Z-2400Z, Dec 20
OK DX RTTY Contest	0000Z-2400Z, Dec 21
Croatian CW Contest	1400Z, Dec 21 to 1400Z, Dec 22
RAEM Contest	0000Z-1159Z, Dec 22
ARRL Rookie Roundup, CW	1800Z-2359Z, Dec 22
RAC Winter Contest	0000Z-2359Z, Dec 28
Stew Perry Topband Challenge	1500Z, Dec 28 to 1500Z, Dec 29