



Pioneer Amateur Radio Association



P.O. Box 330
Glennville, WV 26351

ParaPhrase



President corner . . .

It has been awhile since I have found time to create a new newsletter. It is good to be doing so. As for me, I am still working at Preston Memorial Hospital in Kingwood and living near Fairmont. I am having a great time working HF on both the digital FT8 mode and county hunting. As for the club we met on April 20th at the Holt House (Historical Society Building) in Glennville. We have a room upstairs where we can set-up our own station. Steve AB8CR supplied a Ten-Tec Scout HF, 2-meter rig and a power supply. We took a few minutes, hooking them up and listened on HF with a make shift antenna. We need to come up with a dipole that we can mount permantly. Hope to see you at the next meeting. 73'

Ed N8OYY



Upcoming Events

- May 5th - TCARC Hamfest - Ripley, WV
- May 17-19th - Dayton Hamvention - Xenia, OH
- June 1st - West PA ARRL Convention - Prospect, PA
- July 1st - Somerset County PA Hamfest - Somerset, PA
- August 10th - Tri-State ARA Hamfest - Huntington, WV
- August 23rd - WV State ARRL Convention - Weston, WV
- September 1st - PA State ARRL Convention - Uniontown, PA
- September 8th - Butler County ARA Swapfest - Butler, PA
- October 12th - Parkersburg/Wood Hamfest - Mineral Wells, WV

Local VHF repeaters

- 145.29 WB8WV (91.5) - Glennville
- 145.45 N8LGY (107.2) - Grantsville
- 145.39 N8MIN (No pl) - Weston
- 146.655 K8VE (123) - Flatwoods
- 146.85 K8VE (103.5) - Buckhannon
- +147.030 N8ZAR (103.5) - Buckhannon
- +147.06 W8OO (103.5) - Crawford
- +147.300 WV8RAG (107.2) - Pennsboro

Pioneer Amateur Radio Association Meeting - April 20, 2019

Members present: Eugene Allen KG8KQ, Bert Brook WA3GSO, Jerry Helmick KD8BAZ, Ed Messenger N8OYY & Steve Ostaff AB8CR

No treasurers report was presented due to Edsel being absent.

This meeting was informal due to the number of members who attended. Ed Messenger mentioned that he the 5.29 repeater needs some attention, he will get with Eric KD8JPE to take a look at it real soon. He also said he is making progress to find a tower to install the 146.82 repeater and hope to have it on the air in the next few months.

Steve said that he has talked with the Historical Society about us using the building for meetings. He is working with them to determine if we will need to make a donation to do so. He hopes to know more before the next meeting. Otherwise no club business was done.

There seems to be some interest in getting together for Field Day this year. Ed mentioned that he will be tied up this year because he has been asked to be the Field Day Chairman for the Central WV club in Clarksburg. He mentioned that everyone are more then welcome to join in there. The plans is to setup at Liberty High School.

There was ideas discussed on what we would like to do for the future of the club for meetings and the like. No descissions were made. Steve provided a tour of the Holt House and found a room upstairs that was suitable to setup a station for our use. He provided a power supply and two rigs to experiment with.

With no further business, the group disbanded around noon.

Ed Messenger, N8OYY
President

WV HF Nets

WV Fone Net—3.810—6 PM Daily

WV Training Net—3.810—11:45 AM Daily

WV Early CW Net—3.567—7 PM Daily

WV Late CW Net—3.567—10 PM Daily

Club Officers:

President: Ed Messenger

Vice President:: Steve Ostaff AB8CR

Treasurer: Edsel De Wees KC8GAV

Secretary:



SPURIOUS SIGNALS

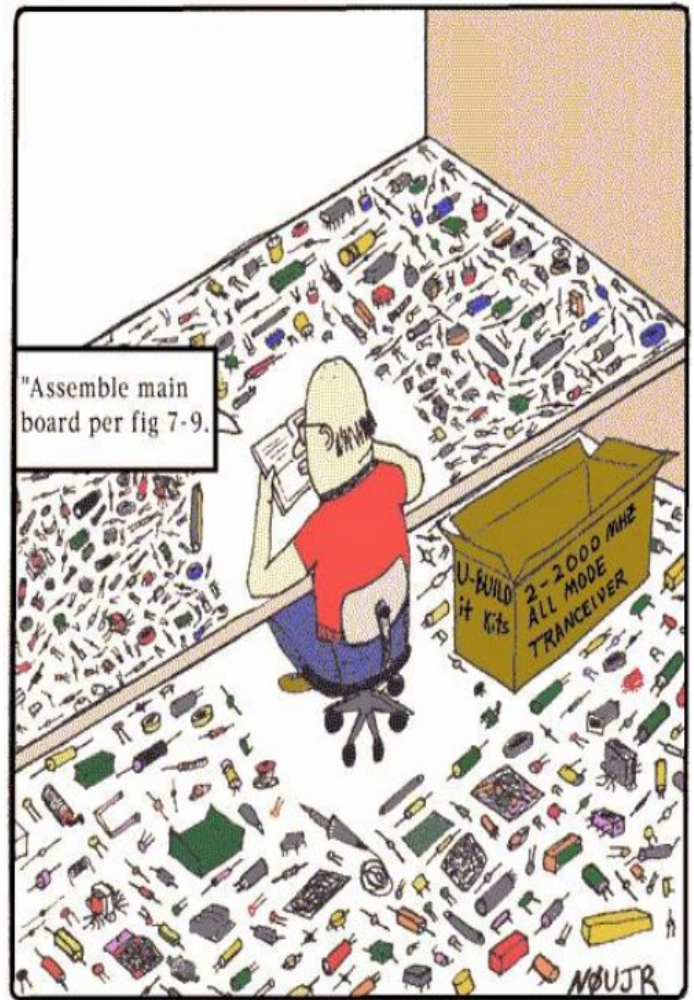
By Jason Togyer W3MCK
spuriouscomic.blogspot.com



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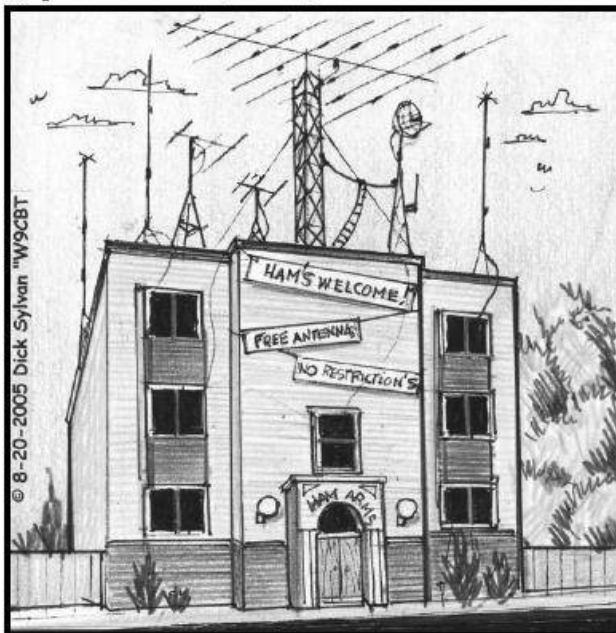


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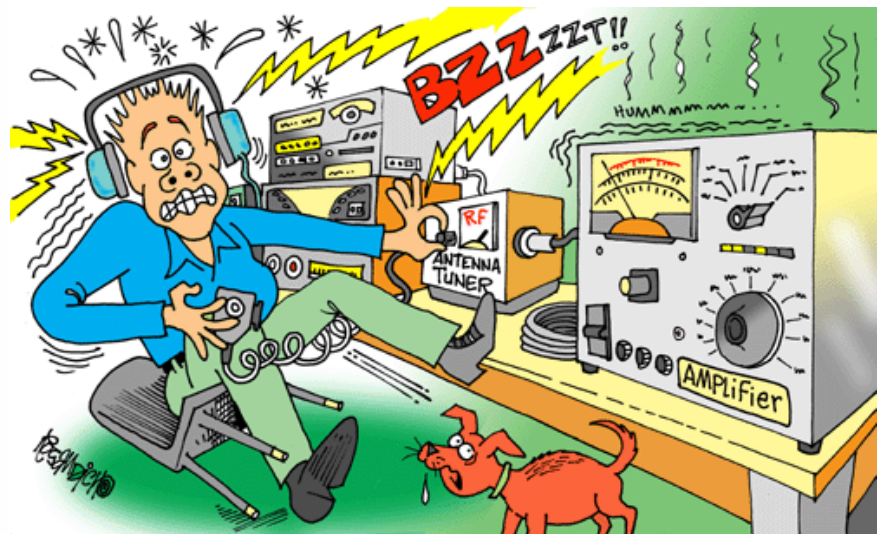


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"Looking For an Apartment Where You Can Put Up an Antenna? — Dream On!"



HOMING IN

BY JOE MOELL,* KØOV

ARDF in the Appalachians and a New Tool for 2-Meter Foxhunting

“It’s the lusty month of May,” proclaimed love-struck Richard Burton as King Arthur in the musical “Camelot.” May is also a prime month for hidden transmitter hunts and for CQ’s World Wide Foxhunting Weekend¹. Will your local ham club have a mobile T-hunt, an on-foot foxhunt, or both?

What makes a venue ideal for on-foot transmitter hunts? Your club can have lots of fun finding foxes in a city park, if there are plenty of bushes, shrubs, and other features where they can be concealed. As a general rule, the less landscaping, the better.

It takes a wilderness area of one thousand acres or more to meet the requirements for a full-scale competition under the international rules for Amateur Radio Direction Finding (ARDF), also called foxhunting and radio-orienteeing. Heavily wooded sites with clear running spaces between the trees are best. There should be some trails, but competitors need to be able to go cross-country as well. That gives them many route choices, including “tunnelling the corridors” to minimize ups and downs.

Sites with some hills are OK, adding challenging reflections to VHF bearings, but steep and rugged mountain terrain isn’t suitable. For fairness, the site should not have been used for ARDF competition or practice for at least two years. Above all, an up-to-date map, drafted to International Orienteering Federation (IOF) standards, is a must.

You aren’t likely to find large wooded sites in Nebraska or Kansas. Some other states have promising forests but they are not IOF-mapped. Fortunately, there are numerous locations in our country that fit the bill. For instance, the forests of North Carolina are ideal. So in 2019, for the third time, the Tar Heel State will play host to the ARDF championships of the U.S.

This year, our national championships are being combined with those of International Amateur Radio Union (IARU) Region 2, which encompasses North and South America. Backwoods Orienteering Klub (BOK), which claims to make the best O-maps in the world, will supply updated course maps for all of the championship courses.

The IARU establishes rules for ARDF competitions. The object is always to find as many of the required transmitters as possible in the shortest time and then navigate to the finish line, using only one’s own direction-finding equipment plus a compass and the provided map. Scoring is first by number of required transmitters found and second by elapsed time. Competitors are divided into six age categories for males and five for females, with medals awarded to winners in each category.

The 2019 championship courses are being designed by Illia Ivanko of Krasnyi Lyman, Ukraine. Illia is an amazing runner and radio-orienteer, winning numerous gold medals in the last three USA ARDF Championships. Often his all-fox times were the best of the entire field of competitors.



Ruth Bromer, WB4QZG, and Joseph Huberman, K5JGH, are the primary organizers of the 19th USA and 10th IARU Region 2 ARDF Championships. They have been frequent members of ARDF Team USA at the World Championships. (Photo by Joe Moell, KØOV)

This year’s Meet Director is Joseph Huberman, K5JGH, who is President of BOK. His wife, Ruth Bromer, WB4QZG, is Registrar. She is handling the computer work, which includes online registrations, order of starts, electronic scoring, and results tabulations.

It was 2006 when our national championships were in North Carolina for the first time. Classic courses were in the 5,600-acre William B. Umstead State Park near Raleigh-Durham airport. Then in 2013, the courses were 65 miles to the west in the 5,025-acre Blkhead Wilderness Area of the Uwharrie National Forest, just south of Asheboro. This year’s championship events plus several practice sessions will take place in various parks and forests within a 30-minute drive of downtown Raleigh. There is a list of potential venues in the BOK website².

The BOK hosts are preparing a full nine days of ARDF fun, starting on Saturday, July 28 with an equipment-checking session. Next day will be practice of foxing and sprint. Foxing is an 80-meter event that helps ARDF enthusiasts to improve their orienteeing skills. At the start, they receive a map marked with circles for at least 10 transmitters, plus the start and finish beacon locations.

The very low power foxing transmitters are in or very close to the circles as marked on the maps. Competitors navigate close to transmitter by means of the map and then complete the final approach by radio direction finding. Foxing transmitters are very small and are usually concealed in trees, often without a flag. As in all other events, the designated transmitter numbers to be found by competitors in each category are announced in advance.

In the sprint, as in all other competitions except foxing, there are no markings for the transmitters on the maps. The sprint has twice as many transmitters as a classic event, but the course is much shorter. The first group of five transmit-

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ters are all on one frequency, transmitting for 12 seconds each in a 60-second cycle. After finding the ones required by category in that group, competitors find the required ones in a second group of five on a different frequency, then they head for the finish line.

Monday will feature an 80-meter short course and a training session in ARDF for the blind. It was the Croatians who first developed a special set of ARDF rules for unsighted and low-sighted persons and made them part of the ARDF World Championships in that country in 2010. A championship blind ARDF course has five transmitters in a flat grassy area such as a soccer field. They are on the 80-meter band, which is more suitable than 2 meters because receiver/antenna sets are smaller and signal reflections are usually non-existent.

Blind competitors take on the course one at a time and are timed individually. When the start signal is given, fox #1 is already on the air and the competitor heads out to find it. There is an eight-foot (2.5 m) radius circle in chalk or tape around the vertical transmitting antenna. Stepping into this circle constitutes a "find."

On Tuesday morning will be a practice two-meter course. Wednesday will be a day of rest, sightseeing, and equipment check. This will be arrival day for those who do not participate in any practice sessions. A competitor meeting is planned for the evening to review rules and safety in the woods.

The first championship event, foxoring, will be on Thursday, August 1. Friday begins with the sprint championship, followed by the blind ARDF championships, a model event for equipment testing, and a competitor meeting. The blind

ARDF event is open to anyone, but sighted persons must wear a blindfold.

The two-meter classic event is on Saturday morning, followed by an awards banquet in the evening with medals for foxoring, sprint, and 2-meter classic. On Sunday morning is the 80-meter classic competition, followed immediately by awards presentation and departure in the afternoon.

USA's national championships are open, meaning that competitors visiting from other countries are welcome. These visitors compete for individual medals in an overall division that includes everyone. Previous Region 2 championships have drawn participants from numerous countries including Australia, China, Czech, England, Germany, Japan, Russia, Sweden, and Ukraine. There is a growing ARDF movement in Canada, and that country is expected to field a team to compete for the Region 2 medals. Of course, the majority of the participants will be from the United States.

The organizers report that a group of about 50 middle- and high-school students from China are planning to attend and compete. Students, instructors, and coaches from Guangzhou No. 2 High School in Guangdong province were visitors to the IARU Region 2 ARDF Championships in 2015 and 2017.

Competitors and visitors are expected to provide their own lodging during their stay. This is customary at most American classic orienteering and ARDF events. Those who need transportation to and from the airport or the event site should contact the organizers at the time of registration. Everyone is encouraged to stay at the event hotel when it is announced. This makes it easier to arrange for ride-sharing and it facili-



Dennis Schwendtner, WB6OBB, of Santa Barbara, California (far left) took fourth place in the category for men over age 50 at the First ARDF World Championships for the Blind at Opalija, Croatia in September 2010. An ARDF competition for the blind will be part of this year's USA and IARU Region 2 ARDF Championships in North Carolina. (Photo by Marvin Johnston, KE6HTS)



The new FoxRex 144 ARDF set has a measuring-tape Yagi for 2 meters and a sensitive AM receiver that is full of "bells and whistles." (Photo by Joe Moell, KØOV)

tates socializing. It is likely that groups will get together for supper each evening at local restaurants.

USA's ARDF Championships are open to anyone of any age who can safely navigate the woods with handheld radio gear for several kilometers. These championships will be a full-format practice for those who hope to compete in ARDF internationally. For beginners, this will be an excellent introduction to how this sport is played worldwide. Don't worry if you are inexperienced at radio-orienteering, as this is a chance to learn from experts. Most will be licensed hams, but a license is not a requirement.

Registration for the USA Championships will open soon at the BOK website. More information about the history, equipment, and techniques of ARDF is at my "Homing In" website. I hope to see you there.

A New High-Tech ARDF Set for 2 Meters

Most radio-orienteers start out on 2 meters using a three-element, direction-finding Yagi with elements that are made from a steel measuring tape or another flexible material. These antennas are easy to construct³ and work with any hand-talkie or scanner if you add an offset type RF attenuator⁴ to knock down the signal as you approach a fox trail transmitter.

Using the Yagi is a simple matter of aiming it for the strongest signal, much like aiming an outdoor TV antenna toward the station's tower. After a few hunts, some foxtailers "graduate" to a special ARDF receiver with tone-pitch signal strength indication and automatic attenuation.

For years, the favorite advanced receiver has been Sniffer4 by Bryan Ackerly, VK3YNG, of Melbourne, Australia, which covers the full American 2-meter band and the VHF aircraft band. Separate detectors for AM and FM signals are built in. Signal strength is indicated by the pitch of an audio tone. The higher the pitch, the stronger the signal. There is also a built-

in autoranging attenuator with nine steps, as displayed on a single-digit readout.

With the tone-pitch signal strength indication in one ear and audio in the other on stereo headphones, you can keep your eyes on where you're walking as you travel toward the target. Sniffer4 is available from VK3YNG in Australia⁵. It is also imported by Bob Miller, N6ZHZ, in La Verne, California⁶.

The newest plug-and-play two-meter ARDF set on the market is by far the most feature-rich. It comes from Rig Expert Ukraine Ltd., a company best known for advanced antenna analyzers and digital mode interfaces. The FoxRex 144 is based on a design by Dr. Nicolas Roethe, DF1FO. Nick and his wife Brigitte have been frequent visiting competitors at the USA and IARU Region 2 Championships. It seems that



In a classic ARDF competition, the FoxRex 144 LCD display shows the frequency memory number, transmitter number, transmission time remaining, signal strength, and an estimate of distance to the transmitter. (Photo by Joe Moell, KØOV)



Nick Roethe, DF1FO, is the designer of numerous ARDF receivers. His most sophisticated 2-meter design is the basis for the Rig Expert FoxRex 144. (Photo by Joe Moell, KØOV)



Oleg Shuman, UT5UML, is the engineer for Rig Expert in Ukraine who adapted the DF1FO 2-meter ARDF set design into the FoxRex 144. (Photo by Joe Moell, KØOV)

every time they come to the U.S., Nick has built a new and better ARDF set.

Nick has documented his 2- and 80-meter ARDF equipment projects on the Web⁷. Some of his work is in English, but most is in German. Thanks to Google Translate, you can learn about his projects in the language of your choice.

Over the years, Nick has sold boards and circuit components for his projects. That became too time-consuming, so he stopped sales in 2011. Now with his premier 80- and 2-meter designs licensed for production from Rig Expert, he has more time to enjoy experimenting and competing.

Just as with the FoxRex 3500 set for 80 meters⁸, Rig Expert has done an excellent job of packaging Nick's design. The complete set weighs only 19 ounces but is very rugged. The internal lithium polymer battery is rated for 30 hours of operation on a charge.

FoxRex 144 comes with Beats ear

buds, a carrying case, and a 12-volt battery charger that works on 120 or 240 VAC. There's no need for an on-off switch. Plugging in the headphones turns on the power. It also starts a timer that keeps track of the fox number and the transmission time remaining. Accidentally disconnecting the headset won't reset the timer because the control knob must also be pushed and held to turn off power. If you forget and just unplug the headphone after the hunt, the set will turn off automatically after a few minutes.

The manual encourages new users to head right to the forest with a transmitter to "play with your receiver" to learn how it works. You will learn a lot that way, but you might miss some useful new features. So I suggest reading through the 26-page manual first⁹.

As you move through the woods on a classic ARDF event, the LCD display shows which transmitter is on and how many seconds remain in the current

transmission. It also shows the estimated distance to the transmitter. A warning tone sounds shortly before each fox goes off. For foxing or a multi-fox hunt such as the one at the Dayton Hamvention¹⁰, where the foxes are not on a timed cycle, the display shows time from the start, frequency number, and estimated distance.

Before the hunt, you can customize the unit with the main menu and rotary encoder, entering up to 12 frequency memories, transmitter power for distance estimation, and so forth.

As a transmitter is approached, the automatic attenuator steps up and the distance-to-transmitter display updates. An additional low-pitched proximity tone sounds as you get very close to the transmitter. The attenuator can be reset to zero at any time by moving the momentary toggle switch to the ATT position.

Classic ARDF events use two frequencies, one for the foxes and one for the finish line beacon. Sprint events have four frequencies, two for foxes and two for beacons. With this set, there is no need to tune up and down the band. Switching among up to 12 preset frequencies is a simple matter of pushing and turning the encoder knob.

FoxRex 144 is available from Rig Expert Canada¹⁰ and sells for \$490 U.S. As the supply pipeline fills, expect it to be sold by stateside Rig Expert distributors including DX Engineering and Ham Radio Outlet.

Any Downsides?

In Europe, the 2-meter band is 144-146 MHz and ARDF transmitters send tone-modulated AM by rule. By contrast, the Region 2 (Western Hemisphere) allocation for 2 meters is 144-148 MHz and FM is the preferred voice mode, not AM. From the factory, the unit is set to tune 144-146 MHz. To get the full 144-148 MHz range, go to the Setup menu and carefully follow the instructions in the manual.

At the factory, FoxRex 144 is set for peak sensitivity at 144.500 MHz. The input filters do not track, so I was concerned about weak signal performance above 146 MHz. However, in my tests the unit met the claimed sensitivity specification over the entire Region 2 band.

Since 2008, U.S. and IARU Region 2 ARDF championships have used AM transmitters or 2 meters to accommodate visitors from other IARU regions and to be in conformance with rules of the ARDF World Championships. But most local clubs use handi-talkies or other FM transmitters such as PicCon¹¹.

The receiver is single-conversion with

DITS and DAHS

The **A B C**'s of Morse Code Operating

BY ED TOBIAS, KR3E

This small but solid guide is the perfect read for those interested in learning or improving CW operating techniques!

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The Red Fox 144 microtransmitter is suitable for training, testing, and foxoring. One is included with the FoxRex 144. (Photo by Joe Moell, KØOV)



a 10.7 MHz IF frequency. Selectivity is 46 kHz at -40 dB, which is considerably wider than most 2-meter AM receivers. The filter slopes are more shallow than in receivers with typical 455-kHz filters, so they do an acceptable job of demodulating FM signals by "slope detection." FM audio is somewhat noisy because there is no quieting as would be the case with a true FM demodulator.

The measuring-tape Yagi has elements that are doubled for half their lengths from the boom for ruggedness and to prevent "flapping" in the wind or when running at high speed. A compass is mounted to the boom, halfway between the director and driven element. DF1FO points out that the elements can become magnetized and affect the compass operation. Demagnetizing them can be easily done with the primary winding of an old transformer, as explained on Nick's website¹².

Included with the FoxRex 144 is a Red Fox 144 foxoring transmitter. This 1-3/8-inch diameter circuit board puts out

about three microwatts into wires that can be spread to form a dipole. Power comes from a CR2032 lithium coin cell that will last for about 100 hours.

This little transmitter is fine for testing and training in a backyard or small park, but it should not be connected to a larger antenna or RF amplifier. Its operating frequency of 144.002 MHz is in the CW-only portion of the 2-meter band and there is no callsign ID. There are also spurs from the internal 48 MHz oscillator that are 8 to 22 dB below the 2-meter signal. So use Red Fox only with the supplied wire antennas, to keep the radiated power on all frequencies within the limits of FCC Part 15.

What's your favorite RDF setup for on-foot foxhunting on 2 meters? Your comments are always welcome, as are stories and photos of foxhunts in your locality. I am eager to receive your reports from the CQ Worldwide Foxhunting Weekend on May 11-12. Happy hunting.

Notes

1. www.homingin.com/joek0ov/nfw
2. <https://li.yuurl.com/y5ces8yf>
3. http://theleggios.net/wb2hol/projects/df/lape_bm.htm
4. www.homingin.com/joek0ov/offalten
5. www.foxhunt.com.au
6. www.rdfantennas.com/products/mk4-sniffer
7. www.df1fo.de/ndexeng.html
8. Reviewed in "Homing In" for August 2017
9. <https://li.yuurl.com/y35qj74>
10. <https://li.yuurl.com/y59ougdg>
11. www.byonics.com/plccon
12. www.df1fo.de/DOC/FoxRex144Inside.doc