



THE FRANKFORD RADIO CLUB NEWSLETTER

PROFICIENCY THROUGH COMPETITION

CALENDAR

February 2003:

- 8-9 CQ RTTY WPX Test
- 11 FRC Meeting, KofP, 8 PM**
- 9 NA Sprint, CW
- 15-16 ARRL CW DX Test**
- 20 T.I.T.S. Meeting, Noon**
- 21-23 CQ 160 Meter contest, SSB
- 25 Remy Meeting B**

March 2003:

- 1-2 ARRL SSB DX Test**
- 9 NA Sprint, RTTY
- 11 FRC Meeting, KofP, 8 PM**
- 15-16 Russian DX Test
- 20 T.I.T.S. Meeting, Noon**
- 25 Remy Meeting B**
- 29-30 CQ WPX Test, SSB

April 2003:

- 11-13 Japan Int. DX Test, CW
- 19-20 YU DX Test
- 26-27 Helvetia Contest

CHANGES

FRC new Web site location

www.gofrc.org

IT'S SHOWTIME!!!

February and early March bring the **ARRL DX Contests**. This year's dates are:

CW: February 15-16

SSB: March 1-2

To keep peace in your household, please remember that the ARRL CW Test begins on *Valentine's Day* evening.



FRC Contest DXpeditions



CW

K3TEJ will be active as **6Y0T**.
 K2NG K2TW NO2R will be at **PJ4G**
 N2ED will operate **V26G**

SSB

WE3C and KQ3V will be on as **VP5A**
 W3CF and crew will operate as **V26DX**.



Work 'em everywhere

Spot 'em everywhere

President's Column

THANK YOU!!!!!!!



As the ARRL contests near I would like to take this opportunity to thank all the guys who have been supportive over the last two years. Dale **N3BNA**, your Vice President, has been an invaluable friend and confidant. John **K3ZV**, one of the newer guys has done an outstanding job as Secretary. John brings a new zeal to the job and I thank him for going the extra mile. Dan **K2QM**, the **FRC** Treasurer has brought new ideas and cost savings to the position. We can now use credit cards to contribute to the **FRC** coffers thereby saving money on postage.

Please give these guys the warm "thank you" they deserve.

The Committee Chairs are next. Dave **N3RD** continues as Packet Guru as he has for years. He and Bob **K2UT** have worked hard to get the new internet nodes going and thereby easing the load on the RF nodes. The result is a more robust system and much faster spots. Nick **K3NL**, has worked at bringing the repeater system up to snuff. New things are just around the corner that will allow us to link repeaters with other DX /Contest oriented repeaters thereby allowing **FRC**ers in the fringes to be able to work thru 147.27. Alex **W2OX** has been another strong voice and confidant. You know Alex always has **FRC** in mind and provides whatever support he can. Bill **K3ANS**, volunteered to become Membership Chair and did an outstanding job trying to bring new scores into **FRC**. Chas **K3WW**, has retired from previous duties to become the Royal Statistician or keeper of the **FRC** record and scores. After 52 contests last year one wonders where he finds the time. Chas also reminds me of the little things that I might otherwise over look. Norm **W3IZ**, put together a fine awards program and insured trophies and certificates to the deserving. Joe, **KQ3F**, has provided a fantastic newsletter to help keep us all informed.

Other folks who contributed to the daily business of **FRC** are listed below in no particular order: **W3BGN**, **N2WKS**, **N2TK**, **W3PP**, **W2GD**, **N3ED**, & **KQ2M**. These are the section leaders who are contacts in the outskirts and provide the interested rookie guidance and direction.

THANK YOU ALL FOR YOUR SERVICE TO FRC!

Three things fill the current agenda. First, the ARRL DX Contests this month. We need everyone to give their best shot for the next two tests. We have a really good chance of winning if we put our shoulder to the grindstone. Second are **FRC** elections. The nominating committee is **K3NL**, **N3AD**, and **W3EA**. Now is the time to contact these guys and volunteer for **FRC** service. If called by these guys consider it an honor to be asked and give it your consideration. This is the chance to put your mark on **FRC** history. Third is the upcoming fund drive. If I recall, it costs over 40 dollars a man for newsletter, awards, and other **FRC** costs. We have been as frugal as possible over the last two years and we depend on voluntary contributions to keep the club rolling merrily along. Available contribution media includes cash, check, money order, or credit card. Please be as generous as you can.

See you all from V26DX in ARRL Phone.

73, Doug W3CF

(Ed. Note: And thank YOU, Doug!)

Meeting Info

Main Monthly Meeting

On Tuesday, February 11, the main **FRC** monthly meeting will be held at the Fire-house in King of Prussia. The meeting will start at 8:00 with food and drink available prior to the start. The Fire House is located at 170 Allendale Road in King of Prussia, Pa. 19406. If you're coming up the expressway you exit at 202N and go to the third light (McDonalds on right corner) and **TURN LEFT** onto Allendale Road. The fire-house is 1.5 blocks on the right. Enter driveway and **SLOWLY** go to the rear of the station. If you see **COSTCO** you've gone too far.



T.I.T.S. meeting

NOTE: New Location!!!

The Trexlertown International Transmitting Society has a new meeting place. It's the Pied Piper / 76 House, located just down the road from the old location. Location is on the South-west corner of 222 and Route 100 at the traffic light. The meeting will be on Thursday, February 20 at 12:00 noon.



Rexy Meeting B

The Rexy's **FRC** Meeting B meets after the main **FRC** meeting on the second Tuesday of each month, and at about 8 PM on the fourth Tuesday of each month.



Kenwood TS-950SDX. Includes: two 500hz CW filters/remote voice&CW keypad/original box & manual. \$1900 +shipping. Also, Icom IC-746 includes two 500hz CW filters/1.8mhz ssb filter/original box & manual. \$950 + shipping.

Contact Rick **K300** rsaeger@fast.net 610-863-4971 before 9:00pm

Score Correction

ARRL 10-Meter Contest

Call	QSOs	Mult	Score	Class
WB2BHC	221	153	109,548	SO Mixed HP



Initial user's report: The SteppIR Yagi By Jim Jarvis, N2EA

Shortly after my tower came down at the beginning of October 2002, I started looking around for a way to replace the log periodic and 40m beam. The folks at FluidMotion introduced the SteppIR yagi just prior to Dayton last year. I spent a fair amount of time talking with Mike, K7IR at the show, and was encouraged by their approach to the design.

The actual elements are Beryllium Copper strips, with punched holes. They're sprocket driven and mounted on a spool, which is driven by a stepper motor. These elements move to programmed lengths within fiberglass tubes, and operate over the 20 through 6 meter bands.

After considerable thought, I was reminded that "you can't go back"...so I decided to try something new. One of the things driving me to experiment with this yagi is that I'd contemplated the design over 10 years ago, but didn't have time or resources to do the development. A 3 element stepper motor driven yagi was installed on my tower about 4 weeks later, just ahead of some serious Vermont weather.

Assembly of the antenna took 2 hours. It's amazingly simple. Mount 3 motor housings on the 16' boom, at the marked positions. Attach 4 wire control cables to a central terminal strip at the boom to mast mount. Pull out six telescoping fiberglass element 'poles', and tape the seams with epoxy tape. Install on tower.

The element poles are nicely epoxy coated, with no fiberglass to damage fingers. They're almost 18' long, and clean enough that my wife Peggy could assemble them across the living room furniture. I assembled the motors and boom in the foyer at the same time. The elements are an attractive green color, which prompted my wife to comment, "not only is it clean, it's not too ugly!"

The next day, I carried the boom out to my ab621 military mast, and dropped it on top. I had purchased the quick disconnect fixtures, which are rubber pipe clamps. The fiberglass tubes simply slide into the motor housings, and one tightens the pipe clamps. It took longer to run the control cable to the shack than it did to assemble the antenna on the tower.

The AB621 mil-mast was in its lowered position, and there is a ladder to walk up while carrying the antenna. In a normal tower situation, the SteppIR has a "boomslide" as an installation option. This allows you to assemble individual elements from the tower, while sliding the boom back and forth. When all three elements are on the boom, one transfers the load to the boom to mast mount, and removes the boomslide assembly. This option was slick enough that I bought it, even though I didn't need it.

Tuning: There is none. It's programmable, and remotely controlled. Bye-bye to tweaking antennas. All I had to do is push up the tower to 70', push a button, and pour in the RF.

This review is somewhat flawed, in that I haven't had a functional rotor since the tower came down. The neat thing is, the SteppIR allows you to flip the antenna sense by 180 degrees from the control box. So my yagi is aimed at SE, and I can flip it to point to EU, or put it in the 'bidirectional' mode. As a result, I wasn't feeling overly pressured to send the rotor to Yaesu for repair. At this writing, the rotor is working, but the cable is lost under 5' of snow in the yard. So if I want to work JA, I have to run to the base of the tower and use the Armstrong wrench.

There is also a bi-directional mode, so it's possible to chat with guys in EU and the Southeast at the same time. In fact, this has proven useful on 20 several times. In competitive situations, this seems like an opportunity to let folks off the back of the antenna know you're there.

The 3 el SteppIR has a half-power beamwidth of +/- 35 degrees. Gain and front to back are spec'd realistically, and are validated with empirical data vs. a SteppIR dipole. The 70 degree beamwidth is appropriate for an antenna with this gain and f/b. It's about right, aimed at Europe or South.

Initial user's report: The SteppIR Yagi (continued)

3 element yagi field test data (from the manual)

Band	gain	front/rear	half power angle
20	4.9dBd	42dB	+/- 34
17	5.5dBd	44dB	+/- 32
15	5.7dBd	44dB	+/- 29
12	6.2dBd	16.5dB	+/- 28
10	6.3dBd	15dB	+/-29
6	2.9dBd	4 dB	+/- 25

It is clear from this table that the antenna designs implemented in the microcontroller code favor matching and f/b. The antenna is basically quite efficient, but with fixed element spacings, the pattern comes apart as the boom becomes long with respect to wavelength. I was quite impressed with the pattern on 20, 17 and 15. On 10 meters, propagation provides the f/b ratio anyway, so the compromised pattern is no great loss.

The antenna has three operating modes, Ham Band, General Coverage, and Setup. In the ham mode, there are pre-programmed frequencies for each ham band. 20, 15, 10 and 6 meters each have three preset frequencies, while 12 and 17 meters have a single frequency each. If you have the optional radio interface, General Coverage allows the antenna to track the radio's frequency, every 50 KHz. The radio interface is a \$60 option, which is well worth it, in my opinion. Setup is self explanatory, and has a variety of modes.

One setup mode permits defining your own antenna. I haven't felt the need or had the time to try it. Other modes permit 'calibration', which fully extends and fully retracts the element tapes, to make sure the motor controller and motors are sync'd up. Another mode retracts the elements.

In the Vermont climate (-18F, as I write, and today's high was -2F), and with big trees, I keep the elements retracted when not in use. If a tree branch should fall through the antenna, it will cost about 30 bucks per fiberglass tube to replace. Element strips can be replaced for a modest cost as well, but the motor housings have to be sent back to the factory for rebuild.

Ok, so it was easy to assemble, went up quickly, and didn't require tuning; does it work? Short form answer: YES. The f/b ratio is astounding, for a short boom antenna. In addition, it's clearly quite efficient. Because my situation doesn't allow having multiple antennas up for comparison, it's impossible to be quantitative. My Carolina Windom is the only common denominator, and the comparison is purely subjective.

Optimally spaced 3-element single band yagis on similar boom lengths can undoubtedly equal or outperform the SteppIR, if you only compare within the sweet spot of the traditional yagi. Try this at the edges of the VSWR, GAIN, or F/B curves, and the SteppIR will likely prevail. Stagger tune a yagi, to broaden the vswr bandwidth, to get both phone and CW, and the SteppIR will pretty surely outperform.

In my view, no multiband, trapped yagi on similar boom lengths will beat it. Same for log periodics. I've had a KT34A, Cushcraft 2010 and Tennadyne T8 log periodics, A3, A4, and A3WARC. As far as I can discern, there is no performance penalty for the SteppIR's flexibility. My intuitive belief is that I'm easily 10dB louder with the new beam.

Multiple single-banders on a common boom, like the Benchers, Force 12 and Optibeams should be able to outperform the SteppIR, within their sweet spots. Most of these have longer booms. The smaller Force 12, which only has two active elements on 20, is questionable.

On six meters, there is an optional 4th element. If you install the passive 4th element, however, you lose the opportunity to flip the sense of the antenna by 180 degrees on that band. I have not tested it on 6, largely because I've missed the

Initial user's report: The SteppIR Yagi (continued)

tropo season.

The antenna is suitably quick to tune. They spec 1.17 MHz/sec., which means that it takes about 15 seconds to go from 20 to 10 meters. Seems like forever, if you're running 20, and jump to 10 for a multiplier, though. Clearly, in an SO2R or multi situation, this can't be the only antenna.

One of the interesting aspects of this antenna is that you can break it down, and transport it to an expedition in a hard-sided golf case. The fiberglass elements telescope down to a 4' section. You can also buy a dipole, or 2-element beam, and add to it as your budget permits.

Nothing's perfect: A glitch in the radio-interfaced general coverage mode was that the antenna would go to 13.6 MHz, whenever you switched off to 30 meters or below. When I pointed out the problem to Mike Mertel, K7IR, they changed the code, and promptly sent me a new microcontroller. (I assume this has been cut into production, but you should ask.)

There were two reasons for noticing this. First, I jump around a lot, and I wanted the antenna to stay where I had left it, if I went to 40 to work a multiplier, for example. Secondly, there was a noise output from the stepper motors, which I could hear on my window. On some bands, it was loud enough to obscure weak signals. Grounding the controller case reduced this problem to tolerable levels. Reasonable coax and control cable routing will probably eliminate it.

Stepper motors are driven by pulses, and the rising and falling edges of those pulses are rich with RF harmonics. Reasonable effort has been made to control RFI, and there is no noise heard on the SteppIR itself.

The antenna went up in a blizzard, and I decided to route the coax and control cables down the nearest guy, rather than have to delay installation and make up another 100' of coax. That guy runs directly below the window, and in the same plane. Since the window was due to be moved, it didn't concern me at the time. Any such work will have to wait until the snow melts. One needs snowshoes to go out in the antenna field at this point. ☺

The SteppIR's programmer says they're using a single chip microcontroller from Atmel. There are no off-chip memory busses, so no high speed signals coming off the chip. Programming is stored in onboard eeprom. The manual for the antenna does not provide a circuit diagram of the controller box, or a logic diagram for the device.

In summary, the 3 element SteppIR yagi seems to be a good performer. Specifications are pretty much in line with performance, and are consistent with respect to forward gain and half-power beamwidth. RFI issues with stepper motors are to be expected, and I've been pretty casual about cable routing and grounding.

WINA has a stack of two SteppIR's, at 35 and 70', using a Stackmaster to phase them. When I spoke with him, in November, he had yet to try the stack in a contest. I'm seriously looking at a pair, although that may wait until my new location. My sidemount is all ready to go.

SteppIR is evaluating designs for a new antenna, covering 40 and 30 meters as well as 20-10. They're both looking at a Moxon Rectangle design, and a loaded conventional design. The idea is to provide 2 elements on 30 and 40, on the same boom as the existing antenna. (Or a lengthened version of it.) One design challenge is the size of the existing motor housing. It limits the largest element tape. The molded motor housings are expensive. Don't expect to see this at Dayton this year. They're being careful not to overpromise.

In closing, the workmanship on this antenna was superb. Assembly was a snap. There was no tuning. It truly WAS plug and play. And it plays well. The SteppIR is a bit pricey: \$1079 for the basic antenna, with the boomslide adding \$70 and the radio interface \$60. If you buy 12 conductor control cable from them, it comes with an installed db25 for the control box connection. The SteppIR weighs in at 42 lbs, projects 6.0 sq. ft. wind surface, and is rated for 100mph. Turning radius is 19.7'. You can find full details on the SteppIR at www.steppir.com.

PacketCluster Update

The K2TD PacketCluster node will soon need a new home, as the tower that supports the 2m and link antennas is coming down. Charlie, **K2BU**, has hosted this node for a number of years, and now it is time to find a new host. With the availability of *FREE* DX Spider software to replace the ancient (but still very functional) PacketCluster, combined with the proliferation of DSL and cable modem full time connections to the internet, new possibilities are opened for us. No longer must we consider how the node will link via UHF backbones into the existing system. The backbone is the internet, meaning that all the node needs is a 2m radio/antenna/TNC. In fact, the K2TD node could conceivably be replaced by multiple DX Spider nodes, distributed around the general area currently being served by the K2TD (aka K2BU) high 2m antenna. DX Spider runs on throw away computers, and is so simple to set up, it could be done in 15 minutes. The computer just essentially plugs into your home network router.

So, without going into any more gory details, here are the basic options:

1. Find a new home for the existing equipment at K2TD, and link into K2UT on 450 Mhz, just as is done now.
2. Install one or more DX Spider nodes, linked into K2UT via the internet. These nodes can be a combination of 2m, 450, whatever.
3. Both 1 and 2 above.
4. Do nothing (not preferred).

FRC's goal is to continue to provide 2 Meter access to the DX Cluster for the indefinite future. We hope that the replacement node or nodes will provide 2m coverage equal to (or even better than) what we currently have. *Keep in mind that all the info about Spiders, DSL, routers, cable modems, etc. is aimed at the potential host for a node that links into the FRC's network via the internet.* Many FRCers already have 24/7 internet access, and this makes hosting a DX Spider node extremely easy. It comes to mind that this discussion applies equally well to other regions of FRC who are at the fringes of access via UHF backbone links. Again, the ability to link the node in via the internet opens up the possibilities of expanding our cluster into the fringes, without the hassle of multi-hop UHF backbones, which cost lots of money to install.

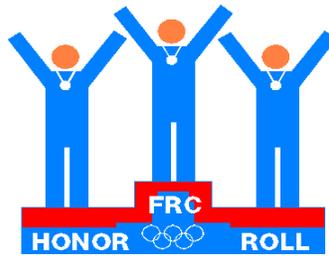
Those affected by retirement of the existing K2TD node should consider the options and have some discussions amongst yourselves to determine what you feel is the best approach. There are several guys who can answer just about any question about this issue:

Bob, **K2UT**
John, **K3ZV**
Dave, **N3RD**

Finally, thanks to Charlie, **K2BU**, for hosting the node.

I'd be happy to answer any and all questions.

73 - *Dave N3RD*



FEBRUARY **CONDUCTED by N2SS** **2003**

WARC BANDS

30 Meters	17 Meters	12 Meters
K2FL...326	K2FL...333	K2FL...324
N2TK.....324	N2TK.....331	N2TK...324
N2LT.....309	N2LT.....329	N2LT.....316
W3BGN...293	K2JLA...328	W3BGN...304
K2RW.....290	W3CF...323	K2RW.....296
W8FJ.....284	K2RW...320	N2SS.....293
W2YC.....273	W3BGN...318	K2JLA...284
K2PS.....272	N2SS.....312	W3SOH...265
WA2VYA...263	K2PS.....289	K2PS.....262
N2SS.....261	WA2VYA...288	WA2VYA...261
K2JLA...237	W2YC...286	W2YC...258
W3SOH...223	W8FJ...286	WT3W...246
K3II...222	W3SOH...266	KS3F...232
W2LE...205	WT3W...259	W8FJ...222
KS3F...178	N1RK...241	N1RK...210
K2BU...175	W3OV...234	KQ3F...199
AA2WN...164	K3II...233	K3II...195
WT3W...151	KQ3F...232	W3CF...192
W3OV...150	KS3F...215	W2YR...181
KQ3F...141	W2LE...196	K2NJ...162
W2YR...124	W2YR...194	W2LE...161
K2JF...111	K2JF...168	W3OV...160
AB2E...104	NA2U...155	NA2U...138
NA2U...103	K2NJ...145	K2JF...135
K2NJ...97	K3ND...110	WT3P...127
K3PP...68	WT3P...106	AB2E...72
N2VW...67	AA2WN...102	K3PP...53
K2WJ...28	K3GYS...83	K3GYS...30
W3CF...27	AB2E...80	N2VW...25
N1RK...16	N2VW...63	AA2WN...19
N2MT...15	K3PP...60	K2WJ...17
K3GYS...8	K2WJ...40	N2MT...6
KB3FEE...1	N2MT...26	KB3FEE...3

Still looking for that undisputed
KING OF WARC

6 METER DXCC

N2LT.....102	K3OO.....52
K2NJ.....95	N2SS.....50
K2JF.....94	W2YR.....41
AA1K.....93	K3PP.....30
K2PS.....80	WT3P.....39
WA2VYA...75	K2RW.....36
N1RK.....57	W2YC.....9

160 Meters

W3BGN289	WT3W 125
AA1K279	K2PS 101
K2BU.....260	K2RW 92
WT3Q.....248	W2YR 80
N2LT239	N2VW 74
N2TK.....238	NA2U 73
K3NW228	N2SS 72
K3SX210	W3CF 69
W8FJ192	K3NL 62
K3JYG170	K2NJ 59
K3NZ170	K3PP 59
NO2R170	KQ3F 41
W3OV163	N1RK 40
N3RS156	KB3FEE.....38
W2YC150	K2JLA 35
K3II149	W2LE.....27
K3NM.....146	AA2WN 25
WA2VYA...144	K2JF 20
K2FL135	N2MT 14
K3ND133	K3GYS 12
KS3F129	W3SOH.....12
.....	K2WJ 3

W3BGN continues as the undisputed
Top of Top Band.

Digital

W2UP.....332	W3CF..... 100
N2LT326	W2LE..... 81
K2PS.....266	K2JF..... 57
W3SB245	WA2VYA... 50
K2RW231	N1RK..... 42
K2NJ.....221	N2SS..... 42
W2YC.....197	N2MR..... 28
AA2WN.....162	KQ3F..... 23
WT3W151	K3GYS 15
WT3P.....133	K2WJ..... 12
K3PP.....123	W8FJ..... 12
W2YR.....122	N2VW..... 7

MOBILE DX

W2YC274	K3GYS 143
AA1K251	AA2WN 131
N2SS.....234	WT3Q 107
N2MR.....190	KB3FEE..... 48
K2JF150	K3PP..... 46
.....	W2YR..... 21

1.5K Club

K2FL.....1704	N3RD.....1400
W3BGN1691	K2NJ.....1383
N2TK.....1683	WT3W1361
N2LT.....1658	W3SOH1378
W2UP1637	K2JF1350
K2RW.....1591	AA2WN.....1295
W8FJ1577	NA2U1295
N3RS.....1564	N1RK.....1272
K2BU1550	N2VW1240
K2PS.....1502	WT3Q.....1162
N2SS1502	K2WJ.....1161
W2YC1494	W2YR.....1125
K3ND1488	W2LE1115
NO2R1480	K3PP.....1110
WA2VYA...1429	K3NM.....1107
K2JLA1428	W3CF1077
KQ3F.....1412	WT3P.....1009
KS3F1407	N2MT719
.....	KB3FEE231

Islands On The Air

K2FL.....938	KS3F.....319
K2JLA854	N2VW250
W3SOH762	W2YR.....226
N2SS732	K2WJ.....223
W8FJ530	WT3W203
W2YC520	W3CF200
N1RK492	K3GYS156
W2YC456	KB3FEE23

Rules for FRC Honor Roll Listings.
Provide me with your total IOTAs worked, or countries (including deleted) worked for: WARC Bands, 160 Meters, Digital modes, Mobile, 6 Meters or your total for 80,40,20, 15 and 10 for 1.5K Club. Countries do not count until HQ Awards Committee takes action and announces a start date for a new country.



THE FRANKFORD RADIO CLUB NEWSLETTER

P. O. Box 431 Albury, PA 18011-0431



Affiliated Club

In This Issue

ARRL Contest Info

Meeting Info

Report on the SteppIR yagi

PacketCluster Update

AND MORE!

**Deadline for March issue:
Sunday, February 23**

The Frankford Radio Club

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President, W3CF , Doug Priest.....	215-361-9989
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Packet, N3RD , Dave Hawes	610-935-2684
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Awards, W3IZ , Norm Fusaro	215-795-0390
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Newsletter & Roster

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Repeater

2 meters, 147.27/147.87
Output PL tone, 114.8

Home Page

www.frc-contest.org

Meetings

Meetings are held on the 2nd Tuesday of each month (Sep through May) at 8 PM at the Philadelphia College of Pharmacy and Science, 43rd and Kingsessing Street, Philadelphia. Summer meetings are held at member homes (one Saturday/ Sunday per month).

Packet Cluster Contest/DX System

144.910	N2MT
144.930	W3FRC
145.650	K2TD
144.950	KD3CN
145.530	K3WW
145.530	AA1K
145.530	K2SG
145.570	WT3Q
145.570	K2TW
145.590	N2NT
144.950	K3GYS
145.710	W3EA
145.730	N2BIM
147.495	W3MM
145.670	W3PP
441.050	W3MM
445.525	K3GYS
445.525	W3EA
445.850	N3BNA
..TBA	N3ED