PCARA Update

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April seed – May bloom

Just when you think that it can't get any busier, it does!

On Sunday April 7, 2019 we had our regularly scheduled Membership Meeting at New York Presbyterian/Hudson Valley Hospital. The meeting was well attended by 13 members including some faces we hadn't seen in a while.

Among topics discussed was planning for 2019 ARRL Field Day. This year Field Day is on the weekend of June 22 - 23, and PCARA will be participating from Walter Panas High School at 300 Croton Avenue in Cortlandt Manor, NY. We're going to try something different this year. In order to share the workload, set up will be divided into several parts, each of which will be managed by a specific team. For example, maybe a team for erecting antennas, another for power and distribution, one for setting up the computer network, one for setting up the radios, and finally one for infrastructure such as tents, tables, and chairs. I just want to know who's going to be responsible for the coffee and doughnuts! In order to help organize for this new format, there will be three planning sessions, the first on April 27th at 6:00 p.m. at Turco's in Yorktown Heights, NY. The following two sessions will be advertised on the PCARA website, the PCARA Yahoo! Groups page, and the PCARA Facebook page.

Also at the meeting, a member brought in a flyer from the Yorktown Rehabilitation and Nursing Center (YRNC) advertising their "Yorktown Health & Garden Spring Fest 2019" on June 8, 2019. The center was looking for local groups to sponsor an event/activity, or volunteer to help. Members present at the meeting thought it would be a great idea for PCARA to get involved and maybe set up a tent and table with informational material about Amateur Radio and PCARA. As a result an email was sent to YNRC asking if we could participate. Twenty minutes later we received our answer, they would love us to participate! So keep Saturday June 8, 2019 free! More information to follow... stay tuned.

The PCARA Breakfast on Saturday April 20, 2019 at Turco's had 11 members in attendance. The weather was overcast and rainy and everyone was keeping a close watch on the forecast because the PCARA UHF Simplex Challenge was scheduled to take place at 1:00 p.m. that afternoon. Karl N2KZ mentioned that there had been an incredible number of hits on the PCARA Facebook page in response to the posting about the challenge. Although the rain had stopped by 12 noon, Karl learned from the NYS Park Police that Perkins Drive which leads to the summit of Bear Mountain would remain closed for all day. As a result, the PCARA UHF Simplex Challenge was rescheduled to Saturday April 27, 2019 at 1:00 p.m.

Field Day antenna construction at the April Antenna Workshop. *[Report page 9.]*

On Sunday April 21, PCARA provided parking assistance for the Church of the Holy Spirit Easter Mass. Parking was choreographed and coordinated courtesy of David KD2EVI, Al K2DMV and Malcolm NM9J, with capacity crowds. Thank you! *Continued p 2* ⇨

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PCARA has taken a table at the Orange County Amateur Radio Club (OCARC) Spring Hamfest in Middletown, NY on Sunday April 28, 2019. Members are invited to bring along any items they may wish to sell. Doors open at 8:30 a.m. with setup beginning at 7:00 a.m.

Please mark your calendars with these upcoming events:

- Saturday April 27, 2019: Rescheduled PCARA Simplex Challenge, 1:00 p.m. on 446.000 MHz. Check-in on the 146.670 MHz repeater at 12:50 p.m.
- Sunday May 5, 2019: Mount Beacon Amateur Radio Club (MBARC) Spring Hamfest, 8:00 am.
- Saturday May 11, 2019: PCARA Foxhunt, 3:00 p.m. at Beach Shopping Center, Peekskill. Check-in at 2:30 p.m.
- Saturday May 18, 2019: PCARA Breakfast, 9:00 am at Turco's in Yorktown Heights.
- Saturday May 18, 2019: PCARA VE Test Session, 11:00 am at John C. Hart Memorial Library in Shrub Oak, NY.
- Saturday May 25, 2019: Bergen Amateur Radio Association (BARA) Spring Hamfest.
- Saturday June 8, 2019: Yorktown Health & Garden Fest 2019, Yorktown Rehabilitation and Nursing Center, 2300 Catherine Street, Cortlandt Manor, NY.
- June 22 - 23, 2019: 2019 ARRL Field Day, Walter Panas High School, 300 Croton Avenue, Cortlandt Manor, NY.

Our next regularly scheduled Membership Meeting is on Sunday May 5, 2019 at 3:00 p.m., at NewYork–Presbyterian / Hudson Valley Hospital in Cortlandt Manor, NY. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

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Net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater on Thursdays at 8:00 p.m.

Join net control Karl, N2KZ for news and neighborly information.

NY QSO Party results

The New York State QSO Party took place on Saturday October 20, 2018. Peekskill/Cortlandt Amateur Radio Association's entry was hosted by Joe, WA2MCR from his home station, using 100W and wire antennas. Operators included Joe himself, Charles N2SO, Greg KB2CQE and NM9J. For details of the club entry, see the November 2018 issue of *PCARA Update*.

Joe WA2MCR and Charles N2SO take part in the 2018 New York QSO Party.

Operating with club call W2NYW from Westchester County - WES, PCARA claimed the following score:

Year	QSOs	Points	Multiplier	Claimed total
2018	392	564	73	41,172

There was some concern at the time over the calculations used by the N3FJP contest software. Full, corrected results for 2018 were published on April 25th on the NYQP web site http://nyqp.org/wordpress/. Quoting the official report: "MULTI-OP – 13 different NY stations decided to enter the multi-op categories in order to maximize their fun. These stations spread out over the different categories, but the MULTI-ONE MIXED was the most competitive with **W2NYW** beating out NJ1F for the top spot."

Multi-One Low Mixed (NY State)

Station	QSOs	Mults	Score	Counties	Locn
W2NYW	370	68	36,040	32	WES
NJ1F	250	69	30,981	34	SAR
W2ORC	273	64	22,464	29	ORL
W2GT	127	48	10,608	25	CAY

This means that PCARA has won one of two plaques that the club sponsors — NY Multi-One Low Power. The other plaque sponsored by the club — Non-NY SSB Low Power — was won by AB1EP (ME) with 71 QSOs, 30 multipliers, and a score of 2,130.

Joe volunteered his station score for the combined entry of the Hudson Valley Contesters and DXers (HVCDX), of which he is a member. This contribution raised the combined club score from 15 members of HVCDX to 588,415 points, taking top prize of 'New York Club High Score'.

Adventures in DXing

- N2KZ

Bring Back Weather Radio

The radio voice for essential emergency information serving the New York City metropolitan area has been completely off the air since November 2017. NOAA All-Hazards Radio KWO-35 on 162.55 MHz has been muted due to an incessant radio interference problem. Problems began as early as 2013. When will it return to the air?

Over a thousand similar stations warn the public nationwide as "your single source for comprehensive weather and emergency information broadcasting warning and post-event information for all types of hazards — including natural (such as earthquakes and avalanches,) environmental (such as chemical releases and oil spills,) and public safety (such as AMBER alerts or 911 telephone outages.)" Why is New York City without this service? Well, *it's complicated.*

Do you remember being in radio school or studying for your amateur radio licenses? If you recall, signal mixing is a very basic concept that allows miraculous technologies like superheterodyne receiver designs to produce great results. Take any frequency and mix it with (for example) 455 kHz and you could hear an elegantly processed signal with little re-tuning. But...if you are not careful, mixing can also work against you!

Mixing Against Us

Consider this dilemma: NOAA Weather Radio in New York City is assigned **162.550 MHz** as an operating frequency. Just 5.75 MHz *below* is the International Distress, Safety and Calling Frequency for maritime use (VHF Channel 16) at 156.800 MHz. Exactly 5.75 MHz *above* NOAA's 162.550 MHz frequency is 168.3 MHz known for use by the FBI with P25 digital encoding (very similar to amateur radio's DMR format.)

NOAA's KWO-35 had been on the air 24/7 with a powerful 750 watt transmitter located in Manhattan. When the FBI used its own powerful transmitters, their signal combined with NOAA's broadcast producing a 'product' 5.75 MHz below 162.550 MHz effectively and involuntarily jamming the maritime distress frequency on 156.800 MHz. What was created was the radio equivalent of utter chaos!

Adding to the misery is the inability to compromise. NOAA's KWO35 has been using 162.550 MHz for maritime and weather broadcasts going back almost sixty years to about 1960! The NOAA All-Hazards Radio system now has 1,023 stations on the air nationwide using seven VHF frequencies. With so many stations sharing only seven channels, it would be very difficult to move dominant KWO35 to another frequency without an enormous juggle of other NOAA stations from hundreds of miles around.

Marine channel 16 at 156.800 MHz is a standard emergency and distress frequency used literally and universally around the world. Don't expect that frequency to change any time soon! It might as well be carved into stone as the place to go when you are in trouble!

Beware of Big Signals

I have long personal experience with the attributes of governmental use of RF spectrum. Back in the 1980s, I would often cover major events such as political conventions or follow campaign trails or debates. Broadcasters do not like excitement and last minute problems. It might take long hours, days, weeks or even months to plan out complex coverage to be seen nationwide.

The Society of Broadcast Engineers (SBE) is one of several groups that provides careful and calculated frequency coordination for all things broadcast including sports and political events, election nights, disaster coverage and you name it! All the planning in the world is all well and fine, but governmental frequency users can be insistent and dominant with very little prior notice. No matter how much you plan for co-existence, be prepared to conform and adapt when necessary!

I remember on many more than one occasion feeling confident that a myriad of broadcasters' wireless operations were peacefully cooperating. Just a day or hours before the start of an event, a major repeater would be deployed (and rightfully so) by governmental entities like the Secret Service. You always retain your utmost respect for them and quickly improvise a solution amongst yourselves. Fast phone calls and impromptu meetings with your peers may be the most anxious moments during an entire event. The bottom line: You modify your frequency use and get it done!

KWO35 broadcasts are an interesting case: What do you do when you have a clash of frequencies that are all governmental in nature? The priorities become obvious quickly. Emergency frequencies always have first priority. Rest assured... Marine channel 16 is not going anywhere! NOAA Weather Radio versus the FBI? Guess who wins! It is no wonder why KWO35 was sacrificed to silence to quickly end this annoying problem. Where do we go from here?

Is There Hope?

Some attempts at resolve have been tried. Relocating the NOAA transmitter was pursued for a few

months. It was difficult to secure a location that would continue KWO35's dominant signal strength *and* cure the debilitating mixing problem. Other experiments included operating with much lower power or during limited hours. NOAA even tried broadcasting only when an actual event occurred with little success. There was no joy.

The last known Public Information Statement regarding KWO35 was issued on November 28, 2017. I can only wonder if the search for a new transmitter site has been completely abandoned. In the interim, NOAA suggests visiting their web site at weather.gov/okx or their Facebook and Twitter pages at NWSNewYorkNY.

Without NOAA All Hazards Radio in the New York City metropolitan area, millions of people are truly in the dark and unprotected. It seems so ironic that the largest city in the country continues without Weatheradio coverage. Imagine the uproar that would ensue if a NOAA weather station went off the air in an area continually threatened by tornadoes or dangerous flooding.

Public Information Statement
National Weather Service New York NY
1025 AM EST Tue Nov 28 2017

...Public Information Statement...

...THE NOAA WEATHER RADIO NYC TRANSMITTER WILL BE OUT OF SERVICE FOR AN EXTENDED PERIOD OF TIME STARTING THIS AFTERNOON...

The NOAA Weather Radio transmitter that serves the NYC metropolitan area will be out of service for an extended period of time starting this afternoon.

This station is KWO35 broadcasting on a frequency of 162.550 MHz on 750 watts.

This outage is required to re-locate the NYC NOAA Weather Radio transmitter. We are in the process of identifying possible new locations for the transmitter. Once a new site is identified, we will begin system testing to assure the transmitter and the associated signal is performing at an optimal level. This process will take several months.

During this period, local NWS observations, forecasts, and data for the NYC metropolitan area can be found on:

The web at: http://www.weather.gov/okx

Facebook at:
https://www.facebook.com/NWSNewYorkNY

Twitter at: https://twitter.com/NWSNewYorkNY

If you have any comments or questions, please contact Susan Buchanan, NWS Acting Director of Public Affairs at susan.buchanan@noaa.gov or 301-427-9000.

Voice recordings of NWS weather information for the NYC metropolitan area will continue at 631-924-0517.

We will provide updates on the status of the NYC NOAA Weather Radio Transmitter through Public Information Statements when more information becomes available.

Public statement on KWO35 published by NWS New York Nov 28, 2017.

It is difficult for those affected to adapt to the situation we are left with. Here in the lower Hudson Valley we may be able to receive NOAA broadcasts from WXL-37 Highland, New York on 162.475 MHz or WWH-33 in Cornwall, Connecticut on 162.500 MHz. You can approximate and postulate what may be coming your way, but you will never hear an alert targeted for your precise location. It has been 17 months or more since KWO35 was silenced. Isn't it time for a resolve?

As Old As The Clouds Above

The saga of KWO35 began almost 60 years ago. In 1960, the precursor of NOAA, The United States Weather Bureau, began broadcasting in New York and Chicago using transmitters previously used for aviation weather and condition reports. 162.550 MHz became the place for immediate and up-to-the-minute weather reports from a most authoritative source!

Ten years later in 1970, KHB-47 in Hartford went on the air on 163.275 MHz. Marine channel 21B 161.650 MHz and Channel 83B 161.775 MHz were also used by early weather broadcast stations. My Yaesu FT-1900R 2 meter mobile transceiver includes these three channels still used by Environment Canada to this day. American weather broadcasts were originally allocated to three frequencies: 162.400, 162.475 and the original 162.550 MHz. Only when no further expansion could be handled were four more frequencies welcomed into use: 162.425, 162.450, 162.500 and 162.525 MHz.

In 1971, tone signal actuation was introduced allowing weather stations to activate alarms to listeners equipped with matching tone decoders. In the early 1980s, the system became much more useful and accurate in delivery with the unveiling of the S.A.M.E system. Specific Area Message Encoding now gave NOAA the capability of notifying very specific counties with customized alerts for their immediate surrounds. It wasn't until 1997 that the S.A.M.E. system was fully rolled-out to the entire nation. Now, in the year 2019, S.A.M.E. can not work in New York City because there

is no transmitter to carry the alerts to the public!

More Than Weather?

Weatheradios do not necessarily need to be used for NOAA reception. I understand amateurs have modified these inexpensive handhelds to monitor 2 meter amateur transmissions and even public service frequencies.

Years ago, (around 1980) I was called upon to modify Weatheradios to receive over-the-air NASA Select audio when covering some of the first Space Shuttle missions broadcast from Mission Control in Clear Lake City, Texas. NASA Select audio was transmitted on around 173 MHz. A change of a crystal or a slight re-tuning of a Weatheradio cube would bring it right in! *Weatheradio™* (as one word) was/is a trademark of Radio Shack — a Tandy Company — although it became a commonplace reference enough to use it to describe other manufacturer's versions.

A trio of Realistic Weatheradios from Radio Shack.

The 1990s also saw the re-branding from Weatheradio to All-Hazards Radio now including all natural disasters, industrial dangers and national emergencies. Another historical moment of note: The introduction of computer generated voices reading the reports on the air. In February 1999, Digital Equipment Corporations' NWR2000 computer system began reading weather reports instead of real human beings. Early attempts were difficult to listen to but the technology has matured in the past two decades. Would you believe that there are now 1023 NOAA stations on the air?

Will It Return?

Is there a solution to KWO35's fate? We cannot account for the inner workings of government, complex budgets and agency priorities and preferences. It would be so nice if we could help! Good housekeeping at transmitter sites can go a long way to correct relentless problems. Cleaning up old hardware and cabling and insuring good connections is essential. It is easy to create an unintentional diode detector! Proper installation of combiners and notch filters can also help.

Remind yourself how useful a station like KWO35 can be. AM, FM and TV broadcasters all depend on NOAA alerts of severe weather and other travesties and are compelled to listen for alerts by federal regulations. Without a local weather station on the air, how can that be done? Westchester and Putnam counties have seen several instances of tornadoes in recent years. No one can forget Hurricane Sandy and similar storms. Who knows what the future will bring? We need this technology. Can it be restored soon? Write to your legislators and request renewal of this facility. It is about time!

P.S. – the latest word on KWO35 from NWS' Director of Public Affairs Susan Buchanan, dated 4/26/19 states that…

"We do not have an update yet, but are hopeful we'll be able to announce something soon. We have been waiting for GSA to complete the legal process of getting a lease agreement in place with the new location for our transmitter."

Keep your eyes to the skies and always be aware of the weather! Until next month, 73s and dit dit from N2KZ 'The Old Goat'

V.E. Test Session

PCARA's next Volunteer Examiner (V.E.) Test Session takes place on Saturday May 18, 11:00 a.m. at the John C. Hart Memorial Library, 1130 E Main St., Shrub Oak, NY. The cost for candidates is $15.00 per exam or retest.

Photo-ID is required, plus SSN if unlicensed. All candidates are advised to contact Mike W2IG before the session using e-mail address: w2igg 'at' yahoo.com.

Note: This could be your last chance to be tested on the current 'General' question pool, which is only valid until June 30, 2019. On July 1 a new Question Pool for the General examination comes into effect.

John C. Hart Memorial Library, Shrub Oak.

AM broadcast band loop antenna — N2CKD

Reception of the U.S. AM broadcast band (530 – 1700 kHz, 10 kHz spacing) can be improved by use of an external **magnetic loop antenna**. Outside the U.S.A. the AM broadcast band is also known as medium wave (**MW**) or the medium frequency (**MF**) broadcast band.

Most portable AM radios have an internal antenna called a loopstick or ferrite rod, consisting of multiple turns of thin, insulated copper wire wound around a rod of ferrite material. [For more on ferrite materials see "Essential$_2$ cores", *PCARA Update,* March 2016 –*Ed.*]

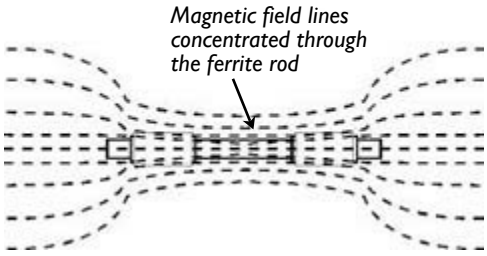
Loopstick or ferrite rod antenna for MF radio reception consists of a coil of enameled copper wire wound around a cylindrical rod of ferrite material.

An incoming MF radio signal can be picked up by the AM radio's internal loopstick antenna. This is sufficient for reception of high-power, local AM radio station transmissions. However weak, distant stations are more difficult to hear due to insufficient signal pick-up, local noise and interference from strong local signals. An external loop antenna can help improve reception of signals from those more distant stations.

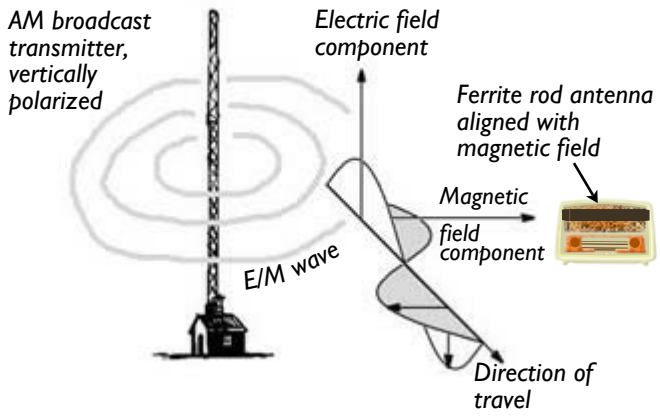
Medium frequencies travel mostly by ground wave during the day, but during the night, propagation improves due to reflection of radio waves by the ionosphere (sky wave). A DX listener interested in receiving distant AM signals can either use a MF loop antenna or connect an external long wire antenna to improve radio reception. AM broadcast signals are vertically polarized, so the magnetic field lines are horizontal.

Find your direction

The MF loopstick antenna is a directional antenna which behaves somewhat like a half-wave dipole. The design takes advantage of the high permeability of the ferrite rod material which concentrates the magnetic component of the incoming electromagnetic wave. Since the antenna only uses the magnetic field of the incoming radio signal, it operates best when the magnetic lines of force arrive in line with the ferrite rod. This corresponds with the rod being horizontal and at right angles to the direction to the transmitter.



In a loopstick antenna the ferrite material concentrates magnetic field through the wire coil(s), which have been wound around the ferrite rod.



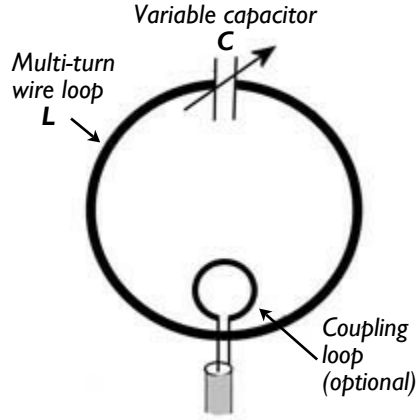
*Polarization of an electromagnetic wave is in the same direction as the **electric** field, which is vertical in the case of most AM broadcasts. Alignment of a receiver's ferrite rod antenna for maximum signal should be in line with the **magnetic** field component — which is **horizontal** in this case and at right angles to the direction to the transmitter.*

The loopstick antenna has another position where signal strength is at a minimum, when the ferrite rod is aligned with the direction to the transmitter.

By turning the radio through 180° you will notice the signal strength increases from minimum to maximum (audio volume increases). The minimum signal point, received from either end of the rod, is referred to as a **null**, which is useful to find the direction of an incoming signal. The null point can also help minimize a strong local signal so that weaker stations can be heard, either on the same frequency or on adjacent frequencies.

External loop theory

The MF loop antenna consists of a loop of wire (acting as an inductance *L*) in parallel with a variable capacitor to form an LC circuit. This circuit is tuned or peaked by adjusting the variable capacitor to resonate at the radio's selected frequency. At resonance the received signal strength will be at maximum.



Loop antenna consists of one or more turns of wire resonated with a variable capacitor.

Resonant frequency $f = \frac{1}{2\pi\sqrt{LC}}$

where f = frequency in hertz, L = inductance in henrys, C = capacitance in farads.

The inductance of the loop can be calculated from Wheeler's formula for a single layer air-core solenoid, which states that:

$$L = \frac{N^2 \times r^2}{9r + 10h} \text{ (approximately)}$$

where L = inductance in microhenrys, N = number of turns of wire, r = radius of coil in inches, h = height of coil in inches.

The performance of the MF loop antenna depends on the physical size, the number of turns, (determining the loop inductance per Wheeler's formula) and the variable capacitance value which determines the frequency where the loop will resonate. The larger the loop size, the more signal will be captured. The maximum and minimum values of the variable capacitor combined with the inductance of the loop will determine the frequency range to which the circuit will tune.

AM radios with a variable tuning capacitor commonly use a value of 20 – 365 pF per section, so a suitable capacitor could be salvaged from an old, discarded radio. If you substitute a different value capacitor, you will need to experiment with increasing or decreasing the number of turns of the external loop — or increasing total capacitance by connecting an additional capacitor gang in parallel.

Air-spaced two-gang variable capacitor as used in older broadcast receivers.

There are two ways to connect the MF loop antenna to the radio. One way is to simply place the external loop near the receiver so it magnetically couples to the radio's internal loopstick antenna. The other way is to wind one-to-two turns of wire around the external loop to form a coupling coil then connect this coil to the antenna/ground input connections of the radio. You can peak or null the received signal by rotating the loop and radio. A Lazy Susan turntable can be used to rotate radio and loop.

Practical summary

I decided to build an MF loop from a spool of 50 feet of wire that was given to me by Jay, NE2Q (thanks Jay), using a 3-gang air-spaced variable capacitor from my junk box. I wound the 50 foot spool of wire randomly around a shoe box then taped it to form a rectangular loop approximately 8"× 11". I soldered the wire ends to the variable capacitor then hot-glued the wire loop to a discarded 8½" × 11" photo frame to hold the loop in place. I tried out the loop antenna by placing it near an AM radio and tuned around the broadcast band. I was quite pleased to hear improved signal reception as a result of the peaks and nulls.

Parts List:

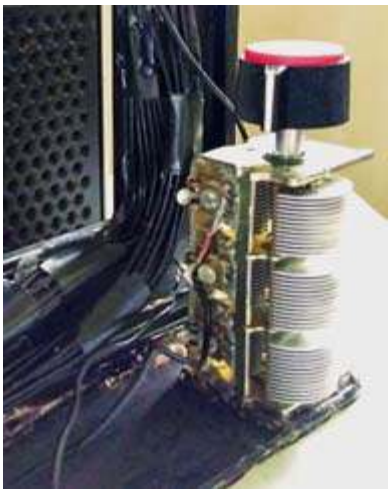
- Approximately 50 feet of 20 AWG insulated copper wire.
- Variable capacitor, preferably 365 pF. (Experiment with other values. Mine was 500 pF).
- Old photo frame 8½"× 11" or larger (A larger sized photo frame may perform better).
- Thin plywood (4" × 11" × ¼") to form a base, glue to one side of the photo frame.
- Hot-melt adhesive and glue gun.

Step-by-step construction

1. Wind the 50 foot length of wire into a loop the same size as the photo frame that you will use. I wound my loop using a cardboard shoe box as a guide. Once the wire loop is formed use vinyl electrical tape every few inches to hold the loop in place.

50 feet of insulated wire and three-gang variable capacitor. [N2CKD pic.]

2. Remove insulation from the ends of the wire loop and prepare for soldering to the variable capacitor. The variable capacitor has solder lugs for connection to the rotor (rotating plates) and stator (stationary plates). If you are planning to connect an external ground to the loop, this should be wired to the rotor side of the capacitor. An optional external antenna (e.g. 20 feet of wire) can be connected to the stator.



Detail of MF loop antenna showing wire soldered to variable capacitor. [N2CKD pic.]

3. Solder the wire loop ends to the capacitor lugs as explained above.
4. Cut to size a 4" × 11" piece of plywood to make a base to mount the photo frame.
5. Hot glue one side of the photo frame to the wooden base so the frame stands upright.
6. Hot-glue the wire loop to the photo frame.
7. Fix the variable capacitor to the wooden base.

View of Lovji's completed antenna with wire loop hot-melt glued to the photo frame and variable capacitor mounted lower right on the wooden base.

Tuning the loop

The external MF loop is adjusted by first placing it near a portable AM radio. Tune the radio to a station on the AM broadcast band, then adjust the loop's variable capacitor to achieve maximum signal strength. At this point the external loop is at resonance and coupling additional RF energy to the radio's internal antenna. Maximum received signal will be in the **plane** of the external loop, when standing upright — and **broadside** to the radio's internal rod antenna. [The internal ferrite rod is usually, though not always, aligned with the longer side of the radio –*Ed*.] The signal null points will be off the ends of the rod. By rotating the external antenna and radio through 180° you can go from maximum to minimum signal, based on audio volume or S/N.

Place the loop antenna near to a portable AM radio receiver. [N2CKD pic.]

If you do not hear a marked difference in signal strength as you adjust the variable capacitor, you may need to increase inductance by adding more turns of wire or increase maximum capacitance, for example by connecting an additional gang of the variable capacitor.

Hints and observations

I optimized tuning by first pointing the radio receiver's end toward the transmitter to obtain a station null point (minimum audio volume) then placed the external loop near the radio and adjusted the variable capacitor for maximum volume. For example to tune 1130 kHz (Bloomberg Radio, WBBR, Meadowlands NJ) I pointed the end of the receiver roughly SSW then adjusted the loop capacitor for the loudest audio volume signal.

Framed! Lovji demonstrates his external loop antenna design at PCARA's April 7 meeting.

The loop as constructed only tuned between 600 kHz – 1300 kHz with best signals around 770 – 1130 kHz.

The variable capacitor plates are at minimum capacitance when fully open, corresponding to the highest resonant frequency e.g. 1350 – 1750 kHz. When the plates are fully closed, they are at maximum capacitance, corresponding to the lowest frequency, 600 kHz. To change frequency range, the capacitor value or number of loop turns would need to be modified. Using 100 feet of wire or increasing the capacitance did not improve performance of my loop.

Useful references

1. https://www.instructables.com/id/Medium-Wave-AM-broadcast-band-resonant-loop-antenn/
2. http://www.mwcircle.org/mw_loop_tuned.htm
3. http://www.mwcircle.org/mw_intro.htm - 'An Introduction to Long Distance Medium Wave Listening' by Steve Whitt (UK) & Paul Ormandy (New Zealand)
4. "Signals and Systems for Dummies" by Mark Wickert ISBN: 978-1-118-47581-2 Paperback, June 2013

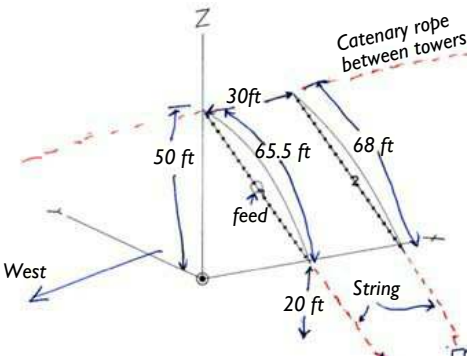
- 73, de Lovji, N2CKD

Antenna Workshop

On Tuesday April 2, PCARA held its 2019 Antenna Workshop at the Town of Cortlandt Community/CUE Room in Cortlandt Town Center. Lou KD2ITZ had arranged for a short presentation on Antenna Modeling followed by a practical session featuring assembly of a wire antenna. Twelve members and friends arrived at the CUE Room by 7:15 p.m., including David K2WPM who brought along some very welcome refreshments.

In *PCARA Update* for June 2018, Lou pointed out that the most contacts on ARRL Field Day were scored on 40 meters and suggested some new antennas for the event. One suggestion was a two-element 40 meter wire beam described by Andrew N2CN in the June 2018 issue of *QST*. A 66 foot driven element and 70 foot reflector are supported by two 18 foot spars, held in place by cross braces made of Dacron rope. Unfortunately, finding suitable materials for the 18 foot spars proved difficult, so one of Lou's other suggestions was chosen instead.

Jay NE2Q had described a two-element beam antenna for 40 meters which could be supported at one end by a catenary rope strung between light towers.



2-element sloping wire antenna for 40 meters designed by Jay, NE2Q.

The other end of the antenna would be lower, supported by ropes running to smaller poles out in the sports field. Jay had modeled this antenna over ground using EZNEC+ and predicted a maximum gain of 7.7 dBi at 40° elevation.

The presentation on Antenna Modeling by NM9J described the free software "MMANA-GAL Basic" which can be downloaded from https://hamsoft.ca/ . A sequence of PowerPoint slides demonstrated the steps needed to model a simple 40 meter dipole in free space, and the antenna pattern typical of a half-wave dipole.

(The PowerPoint presentation has been shared on PCARA's Yahoo! Group.)

The presentation then switched to a live demonstration of MMANA-GAL software, modeling the performance of the two-element sloping beam antenna designed by Jay, NE2Q. With the antenna positioned over "real ground" at the height suggested by Jay, gain was calculated as 7.67 dBi at an elevation of 40°. These results are very close to those obtained by Jay using EZNEC+. Minimum SWR for a 50Ω feed impedance was 1.05:1 at a frequency of 7.115 MHz.

NM9J makes a point during the Antenna Modeling presentation. [N2CKD pic.]

With Jay's antenna design displayed on the large screen, attention moved to the practical aspect of building a wire antenna for Field Day. The driven element length is 65.5 feet while the reflector is 68 feet long. Fortunately, the Cortlandt Community/CUE Room is just long enough to accommodate these lengths. Joe WA2MCR had brought supplies to construct the antenna along with a suitably long tape measure. Hard drawn copper wire was soon laid out across the floor, then cut to length and terminated with insulators.

David K2WPM and David KD2EVI measure wire lengths in the CUE Room.

Attachment of the coaxial cable was temporarily postponed as the RG-58 type cable supplied by Joe had an aluminum foil shield which proved very difficult to remove.

Three weeks later, a Budwig center insulator with SO-239 was fitted to the driven element. With a coaxial cable attached, Joe then strung the 2-element antenna in his yard, checking SWR first with an MFJ-259 analyzer, then using his HF transceiver. Lowest SWR reading was 1·3:1 at 7125 kHz.

- NM9J

Joe WA2MCR checks SWR of the 2-element 40 meter beam.

Jay Albano N1NRP SK

Members will no doubt remember when Jay N1NRP from Danbury, CT visited PCARA to join in our activities, frequently accompanied by Marlon KC1EHW and other members of the Candlewood Amateur Radio Association (CARA). Jay and Marlon achieved first place in the PCARA Foxhunt of September 2017, then returned to play the role of Fox in the May 2018 event.

Sadly we now hear that Jay passed in mid-April, 2019. Here is a short extract from his obituary.

Jay V. Albano, age 60, of Danbury, CT passed away on Tuesday, April 16, 2019. Jay was born December 29, 1958 to the late Barbara (Michinko) and James Albano in Danbury, CT. Jay was well known for his big heart and caring nature. He loved and was loved by his family and friends dearly. His light-hearted energy gave him the unique ability to brighten any room he entered. He created cherished memories during the quality time he spent with his wife, daughters and family members, as they meant everything to him.

Those who knew Jay, knew how much he loved his co-workers and amateur radio fraternity. He had unfaltering pride in the work that he did and established one-of-a-kind relationships with his colleagues. N1NRP was an outstanding ambassador of good will worldwide. Thank you to CARA for providing a second home to him. As the Vice President of the club, Jay always made astounding contributions and always had the future of the club in his best interest. He stayed in touch with all the HAM radio members on his way to and from work, while also organizing and participating in fox hunts and field days. He found tremendous joy for all of his friendships, with a special thank you to Marlon for continually going above and beyond for Jay.

Jay N1NRP and Marlon KC1EHW at PCARA's Sept 2017 foxhunt. [N2KZ pic.]

In lieu of flowers, Jay's family asks that donations and contributions be made to The ALS Association, PO Box 37022, Boone, IA 50037-0022. Fond memories and expressions of sympathy may be shared at www.thegreenfuneralhome.com for the Albano family.

Published in Danbury *News Times* Apr 17-18, 2019.

Link to full obituary:
https://www.legacy.com/obituaries/newstimes/obituary.aspx?n=jay-v-albano&pid=192422155&fhid=14080

Newsletter archive

Another new URL

The archive of *PCARA Update* newsletters was recently moved to a new location, **http://nm9j.com/pcara/newslett.htm**. Here's why.

A little history

Starting in March 2000, early editions of the *PCARA Update* were distributed on paper by snail mail. From the December 2001 issue, the newsletter was produced as an Adobe **.PDF** file and distributed electronically through e-mail.


PCARA Update

Emergency Preparedness

License Plates

Update goes electronic

Tech class begins

License changes?

PCARA Update for December 2001, the first issue to be distributed electronically as a PDF.

Copies of the newsletter have also been made available over the Internet. From 2004 to 2015, the PDF files were housed at: http://home.computer.net/~pcara/newslett.htm .

In 2015 LANline Communications (http://www.lanline.com/) announced that they would no longer be allowed to employ the domain name "computer.net". As a result, the newsletter archive was moved to: http://home.lanline.com/~pcara/newslett.htm .

Latest move

LANline Communications announced in March 2019 that as of April 1, 2019 they were discontinuing all Personal Websites hosted at home.lanline.com. The archive of PCARA newsletters had to be moved once again. The new address is now: **http://nm9j.com/pcara/newslett.htm** .

If you have trouble remembering this URL, you can still reach it by visiting the PCARA web site http://pcara.org/ then following the link in the left margin to "PCARA Update (newsletter)". The new address for the archive is also available on the last page of this May 2019 issue of the newsletter.

If you search online for articles within *PCARA Update*, be aware that many search engines are still returning results from the *previous* location of the archive. Make a note of the issue's year/month then move over to the new location of the *Update* archive.

- NM9J

High-fiber diet – part II

In the April 2019 issue of *PCARA Update*, "High fiber diet" described how contractors for Cablevision/ Optimum were stringing multi-strand figure-8 fiber optic cable along local streets. This was part of a move by Cablevision's new owner, Altice USA, away from its current hybrid fiber cable (HFC) network toward 100% fiber-to-the-home (FTTH), capable of gigabit-per-second Internet speeds. There has been further progress during April.

They're back

Three weeks after the initial visit in mid-March, contractors returned for further work on the fiber-optic cable that had been strung along local streets. The first step was for the Texas-registered bucket truck to pull sufficient free cable from the far end of the street — where it had been temporarily coiled up — to allow a loop of cable to reach the ground alongside selected utility poles.

Two Optimum contractors make a loop of fiber-optic cable available at ground level alongside selected utility poles.

Cable loop is split open and inserted into a plastic closure.

A third worker on foot then split the cable open and coiled the fiber strands inside a black, molded optical fiber closure. He confirmed that this was the point from which individual fiber drops would be provided for each household taking high speed service from Optimum.

The closure was identified as a **3M™ Fiber Closure BPEO Size 0**. (BPEO is a French abbreviation for *Boîtier de Protection d'Épissures Opticale*, or 'optical splice protection case'.) This closure is designed for Fiber-to-the Home customer connections and is small enough for installation in manholes, on buildings or on utility poles. There are two large ports for the multistrand fiber cable to enter and exit, two smaller ports for additional multi-strand cables to branch off and **twelve** single ports for smaller drop cables to go to individual customer premises. Up to four splice trays can be fitted inside the closure, allowing fusion splices or mechanical splices to be installed and held in place.

Close-up of 3M BPEO fiber closure with two splice trays inside, ready for connecting drop cables to the premises.

3M fiber closure being labeled prior to installation high in the air. Unspliced fiber strands are looped around the inside of the closure before they continue down the street.

The fiber closure nearest my location was temporarily taped to the utility pole. Next day, Optimum's contractors returned with their bucket truck and mounted the terminal high in the air, on the cable com-

3M BPEO closure suspended high in the air on cable company steel wire. Yellow sleeve identifies Altice fiber optic cable.

pany's steel strand (messenger wire). The loop of figure-8 fiber-optic cable that previously reached down to the ground was suspended in the air from the same steel strand, using nylon ties.

Cable into and out of BPEO closure is suspended in the air.

This pattern was repeated every 3-to-5 utility poles down the street, with the far end of the cable terminated in a PLP® Coyote® In-Line Closure. 3M BPEO-type closures have also been observed hanging in the adjacent streets.

Rush hour return

One week later the Optimum contractors were back with their bucket truck working their way down Route 202, this time making connection between the fiber-optic cable that runs down each street and a second fiber cable, already strung along Route 202.

Bucket truck returns to connect each side-street to the fiber optic cable running down Route 202.

A rectangular closure that had been connected and assembled at the side of the road was being strand mounted alongside the other Optimum cables. The box was identified as a Commscope® OFDC-C12. OFDC stands for Outdoor Fiber Distribution Closure — this particular model is a fiber optic splice/patch terminal with two preinstalled 48-fiber splice trays and capacity for 12 SC/APC adapters for pre-connectorized drop cables.

Commscope® OFDC-C12 distribution closure.

Commscope fiber distribution closure. Covers are open to show drop cable entry and splice tray.

Additional closures spotted on Route 202 have been of the OFDC type as well as a PLP Coyote Dome Closure for optical splices.

PLP Coyote Dome Closure.

When Altice/Optimum offers 1 gigabit/sec service, the fiber optic drop to each house will need to be suspended in the air and terminated inside the nearest Fiber Closure where it will be connected or spliced to one of the existing fiber strands. As mentioned in the April issue, the optical fiber is single mode with preferred connector type **SC/APC** (Standard Connector / Angled Physical Contact). The connector is color-coded **green** to indicate the 8° angle of the polished connector.

SC/APC green connector has 8° angled contact to prevent reflections traveling back down the fiber.

What of the fiber future?

An interesting question — will Altice/Optimum eventually abandon their hybrid fiber/coaxial cable network in the same way that Verizon has abandoned its legacy twisted-pair copper in favor of FiOS? At present, the Optimum coaxial cable network relies on bidirectional amplifiers and WiFi nodes that are powered through the

Bidirectional amplifier powered from coaxial cable extends the cable's range.

same cable that carries the RF signals. This is accomplished by injecting low-voltage AC onto the inner conductor of the coaxial cable.

Cisco 1552C wireless access point — as used for Optimum WiFi — is also powered from the coaxial cable.

In the event of a power outage, the pole-mounted CATV power supply has a battery-powered UPS to maintain low-voltage AC on the coaxial cable. During a *prolonged* power outage that might exhaust the batteries, the cable company has to provide an alternative power source, for example from a small Honda generator.

Alpha Group outdoor pole-mount power system enclosure.

The new "PON" passive optical networks for fiber-to-the-home are devoid of *any* active components. As a result there are no power requirements along the length of the network, apart from the OLT (Optical Line Terminal) at the service provider's office and the ONT (optical network terminals) within the fiber gateway at each home. So how will those WiFi nodes be powered if the coaxial cable is abandoned?

- NM9J

Church parade

PCARA had once again been asked by Kathy, XYL of N2LJO, to provide parking support for the 10:00 a.m. mid-morning Mass taking place on **Easter Sunday** at the Church of the Holy Spirit on Route 202.

At 9:00 a.m. on Sunday April 21, PCARA volunteers began arriving at the entrance to the Church. The 8:00 a.m. mass had only just ended and despite the early hour, the parking lot was quite full and busy with departing vehicles.

Fr. John provided a short briefing about the upcoming 10:00 a.m. Mass. Cones and barriers were already laid out near the church. Parking on the grass above the upper lot would be allowed, but safety cones there were still awaiting distribution.

PCARA's three volunteers — Al K2DMV, David KD2EVI and NM9J were all present by 9:15 a.m. We spread ourselves out with Al overlooking the entrance plus lower parking lot, NM9J watching over the turning circle plus adjacent middle lot while David supervised the upper lot and parking on the grass. Co-ordination went well on 146.565 MHz FM simplex, with good radio coverage across the entire area. Heavy traffic began arriving around 9:30 a.m. By 9:45 a.m. the lower lot had filled, closely followed by the middle and upper lots so that David had to begin parking on the grass.

David KD2EVI supervises vehicles at the upper lot.

As the 10:00 a.m. service began, Al reported that the lower grassy area was now full, with several cars double- and triple-parked. A few vehicles were still arriving and the church itself was completely full. Several visitors left the building saying they could no longer bear the large number of people inside.

With our limited numbers this year, a few vehicles evaded the keen eye of the volunteers and parked in positions that would certainly impede departing traffic when the service was over.

Al K2DMV points out several tightly-parked vehicles on the lower grassy area.

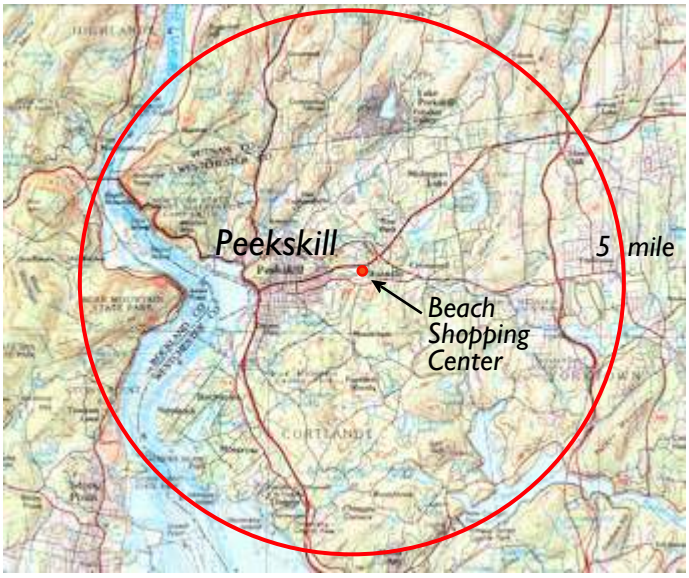
By now, arriving vehicles had slowed to a trickle, so we walked down to the entrance and concluded operations. Thanks again to everyone who came to assist.

- NM9J

PCARA Foxhunt Rules

Saturday May 11, 2019

1. Transmission: FM simplex on 146.565 MHz, horizontally polarized.
2. Transmissions start at 3:00 p.m. for 5 minutes, followed by 5 minutes off. Second transmission commences at 3:10 p.m. 3 minutes on, 7 minutes off. The fox will not move during this time. This cycle repeats at 10 minute intervals until the last transmission ends at 4:30 p.m. when the fox will announce its location.
3. The opening transmission will include a time check for watch synchronization.
4. All contestants who wish to be eligible for a prize must book in at the **Beach Shopping Center parking lot***, in Peekskill before the start. Contestants will count as one team if more than one person occupies a car. (i.e. if three in a car, they don't get first, second and third prize.)
   * on the far west side of the Shopping Center, near Jo-Ann/CVS.
5. No contestant is allowed to move his/her car until the end of the first transmission, so take your time with the first bearing and make it a good one. The transmission will be audible from the start without a super-sensitive receiver.
6. Radio silence will be maintained by all contestants on all frequencies from the first to the last transmission.
7. No excess mileage penalty will be incurred but all contestants are reminded at all times to stay within the law and observe speed limits, parking restrictions etc.
8. The fox will be hidden not more than 5 miles from the start. The location of the fox will not be on property which is inaccessible by car.
9. Upon a contestant finding the fox, please do not shout or in any way give the location away to other contestants. Report your name/callsign to the fox and retire to the place of refreshment immediately. This will ensure that other contestants do not discover the fox because a group of people is hanging around nearby. It is requested that you maintain radio silence even though the fox has been found and the fact that you have found the fox should not be revealed to anyone until the place of refreshment has been reached.



The fox will be hidden within 5 miles (red circle) of the starting point at the Beach Shopping Center.

10. The first competitor to locate the fox and positively identify him/her will be presented with a certificate. This competitor will be invited to assume the role of fox for the next foxhunt event.
11. Competitors should convene from 4:30 p.m. at the place of refreshment, which will be announced on-air by the fox.

Rules adapted from Bury Radio Society Fox Hunt – Malcolm, NM9J

Peekskill / Cortlandt Amateur Radio Association

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Newsletter contributions are always very welcome!
Archive: http://nm9j.com/pcara/newslett.htm

PCARA Information

PCARA is a **Non-Profit Community Service Organization**. PCARA meetings take place the first Sunday of each month* at 3:00 p.m. in Dining Room B of NewYork-Presbyterian/Hudson Valley Hospital, Rt. 202, Cortlandt Manor, NY 10567. Drive round behind the main hospital building and enter from the rear (look for the oxygen tanks). Talk-in is available on the 146.67 repeater. *Apart from holidays and July/August break.

PCARA Repeaters

W2NYW: 146.67 MHz -0.6, PL 156.7Hz
KB2CQE: 449.925MHz -5.0, PL 179.9Hz
N2CBH: 448.725MHz -5.0, PL 107.2Hz

PCARA Calendar

Sun May 5: PCARA meeting, NewYork-Presbyterian /Hudson Valley Hospital, 3:00 p.m.
Sat May 11: PCARA Foxhunt, 2:30 p.m. for 3:00 p.m. start from Beach Shopping Center, Peekskill.
Sat May 18: PCARA Breakfast, Turco's, Yorktown Hts. 9:00 a.m.
Sat May 18: PCARA V.E. Test Session, John C. Hart Memorial Library, Shrub Oak, 11:00 a.m.

Hamfests

Sun Apr 28: Orange County ARC Spring Hamfest, 2 Wes Warren Dr., Middletown, NY. 8:30 a.m. ***PCARA Club table***.
Sun May 5: Mt Beacon ARC Hamfest, 83 Red Schoolhouse Road Fishkill, NY. 8:00 a.m.
Sat May 18: Southern Berkshire ARC Hamfest, Goshen CT Fairgrounds, 8:00 a.m.
Sat May 25: Bergen ARA Spring Hamfest, Westwood Regional HS, 701 Ridgewood Rd, Township of Washington, NJ. 8:00 a.m.

VE Test Sessions

May 5: Mt Beacon Hamfest, 83 Red Schoolhouse Rd, Fishkill, NY. 9:00 a.m. Contact Andrew W2BOS (845) 462-7539.
May 9: WECA, Westchester Co Fire Trg Center, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.
May 17: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Contact Joseph J. DeLorenzo (845) 534-3146.
May 18: PCARA, John C. Hart Memorial Library, Shrub Oak. 11:00 a.m. Contact Michael Dvorozniak W2IG, (914) 488-9196.
May 19: Yonkers ARC, Yonkers OEM, 789 Saw Mill River Rd, Yonkers NY. 11:30 a.m. Pre-reg. John WB2AUL, (914) 969-6548.
May 20: Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.

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