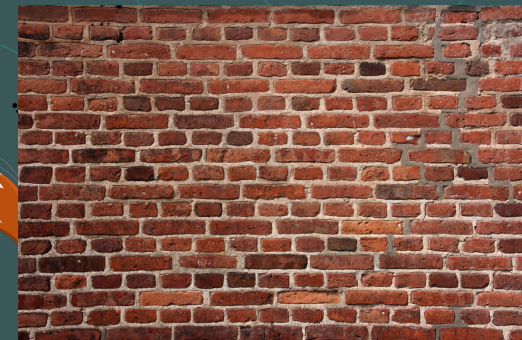


Welcome

Agenda

- 9:00-9:55 – Simple VHF DF Presentation
- 9:55-10:00 – Wake Everyone Up
- 10:00-12:00 – Antenna Workshop / Mini-Hunt
(it's all kind of casual at this point)



Simple VHF Direction Finding



Stolen from: **Gary Wilson, K2GW**

Updated by: **Glen Johnstone, NK1N**

A vertical strip on the left side of the slide shows a topographic map of a coastline. A yellow path is drawn along the coast, and a red location marker is visible. The map is partially obscured by the text.

Simple Requirements

- Simple Knowledge of VHF Propagation
- Simple Methodical Patient Approach
- Simple Land Navigation Skills
- Simple DF Skills
- Simple Tools
- Simple Radio Equipment



VHF Propagation

- Straight Line, but ...
- Multipath
- Masked by Terrain and Conductive Objects

A vertical strip on the left side of the slide shows a portion of a topographic map with contour lines and a yellow path. The rest of the slide has a dark teal background with faint, light blue contour lines.

Methodical Approach

- Keep a Log
- Develop a plan
- Plot Bearings on Map
- Use Terrain to Your Advantage
- Work the Right Angles (timed events)



Land Navigation Skills

- Know How to Read a Topographic Map
- Know How to Use a Compass
- Know How to Adjust for Declination
- Know How to Plot a Bearing



Initial DF Skills

- Signal Strength Monitoring – Turn Off Squelch
- Omnidirectional Fade and Peak Plotting
- Portable/Mobile Directional Antennas
 - Yagi
 - Phased $\frac{1}{4}$ Waves
 - Cubical Quad

A vertical strip on the left side of the slide shows a topographic map with contour lines, a yellow road, and a yellow path. The map is partially cut off on the left edge.

Mobile DF Hints

- Use a county roadmap to plan travel before leaving a stop.
- Stops should be a half mile apart.
- Take three bearings at each stop.
- Each bearing from the apex of fifty foot triangle
- If all three at a stop don't agree, this stop is affected by multi path reflections.
- Alternate: Are front and back peaks 180 deg. apart?



Close in DF Skills

- All Directions Show Full Scale
- Attenuation!
- Cheap Attenuators
 - Body Shield Null
 - Junk Antenna
 - No Antenna
 - Tuning Off Frequency
 - Gap Attenuator
 - Third Harmonic on 440



Tools to make it easier

- Team (Driver, DF'er, Plotter/Navigator)*
- Compass with Declination Adjustment
- Reverse-Rose Compass
- Topographic Maps

* Don't get lost **alone**...

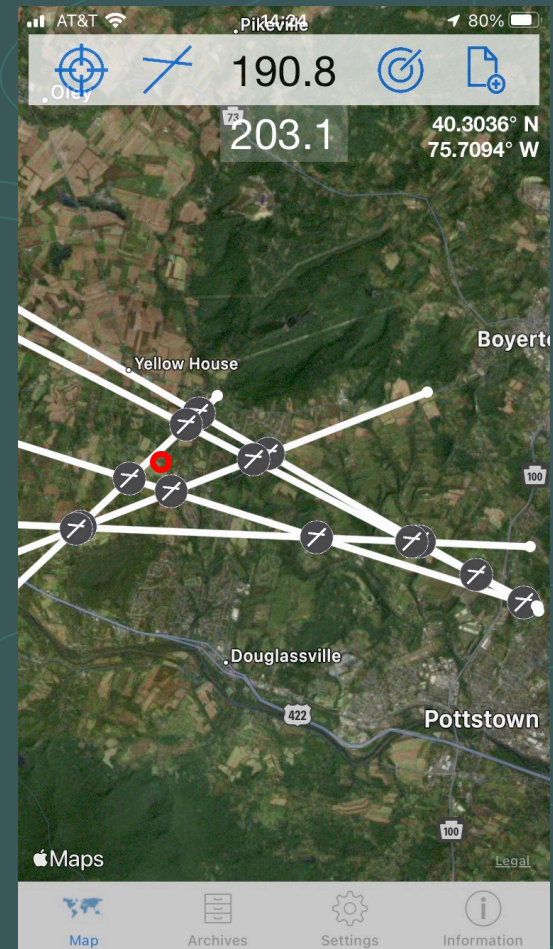
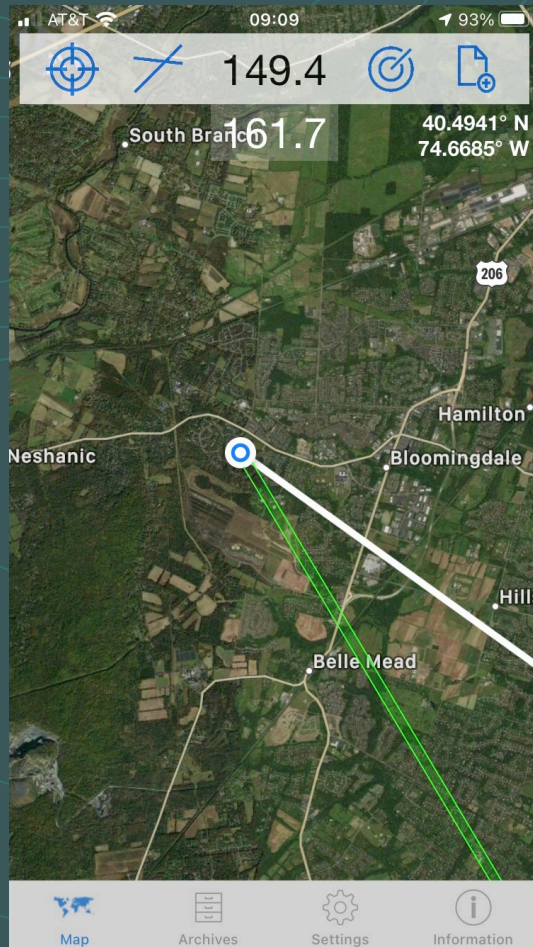
Reverse-Rose Compass

- Attach to Antenna
- Line Up North (Antenna's Peak or Null)
- Red Pointer Gives Direct Bearing



Compass set for 13° W Declination

Sigtrax



Radio equipment to make it easier

- Headphones / Earbuds
- Directional Antenna
 - Yagi
 - Cubical Quad
 - Loop Antenna
- Time Difference Of Arrival Antenna Array
- Doppler Arrays
- Attenuator



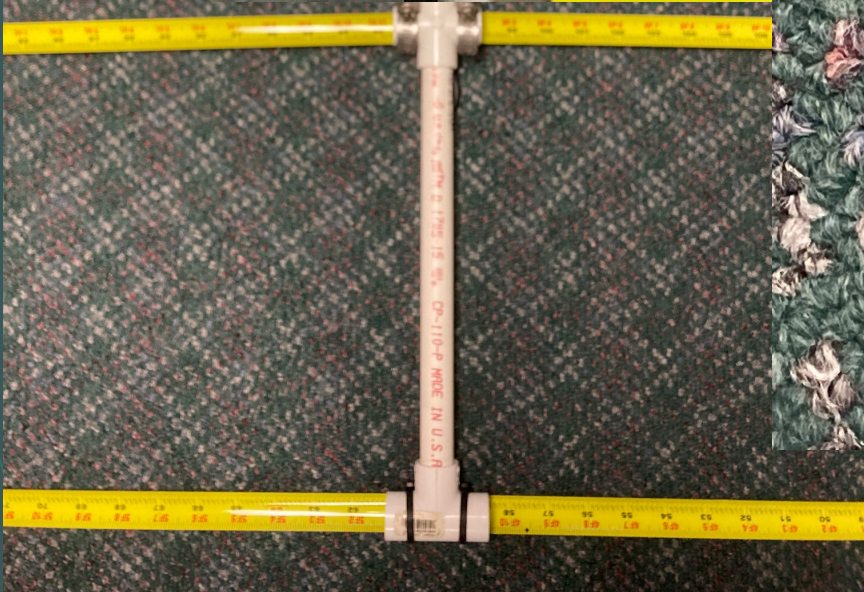
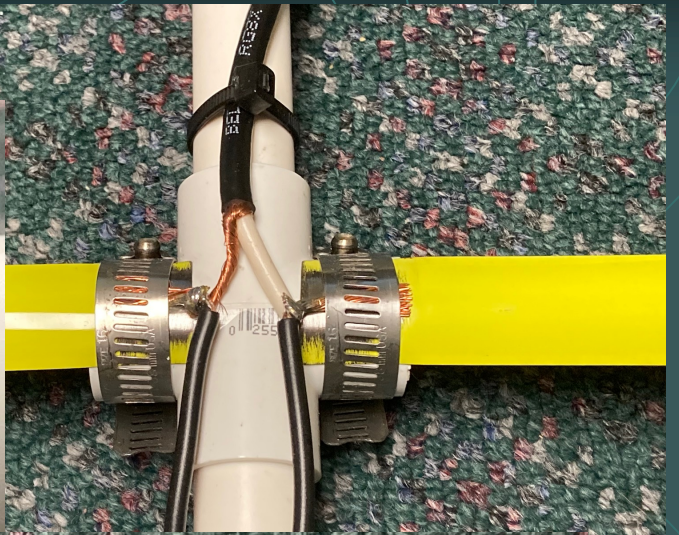
Glen – NK1N

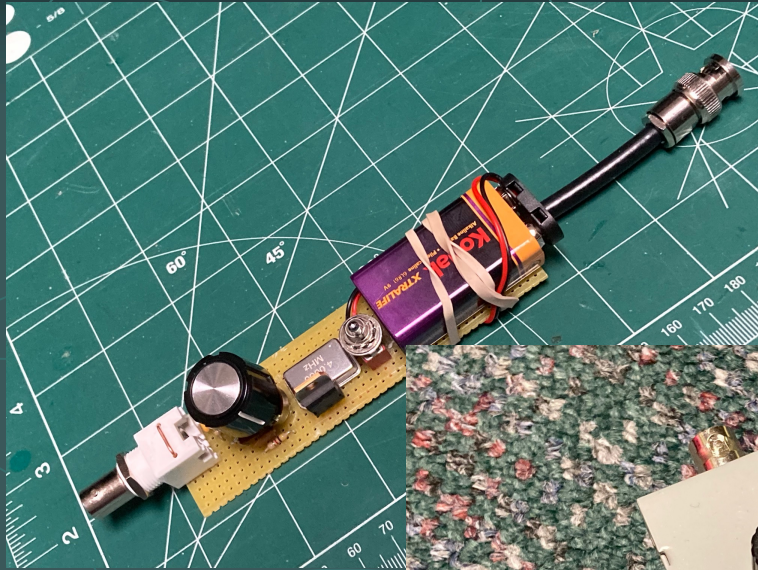


Jim - K3CHJ

Gary – K2GW







K00V Offset
Attenuator
(NK1N Copy)



Arrow Offset
Attenuator



VK3YNG MK4

A vertical strip on the left side of the slide shows a topographic map of a coastline. A yellow vertical line runs down the left edge of the map, and a red dashed line runs parallel to it, slightly to the right. The map shows contour lines and a road network.

Practice Techniques at Home

- Use Known Transmitters such as:
 - NWR Transmitters
 - Repeater outputs
 - Repeater inputs



Events

- IARU International RDF Competitions
- Club Events
 - Mobile Fox Hunts
 - Casual On-Foot Fox Hunts
 - IARU-Style Fox Hunts

IARU RDF Events

- Orienteering event on foot
- On 2 and 80 Meters
- Multiple transmitters.
- Fastest time wins





How a DVRA Mobile Foxhunt Works

- Huntmaster hides fox within Mercer County
- All Hunters meet at start point – currently Chapin School
- Odometers are recorded or zeroed
- Safety Frequency is announced - Usually the DVRA 2m repeater
- Fox is turned on at start time
- Teams hunt for the transmitter and note mileage when they find it
- Lowest Mileage “wins”
- Everyone meets at restaurant to share in fun at end - even if they didn't find it

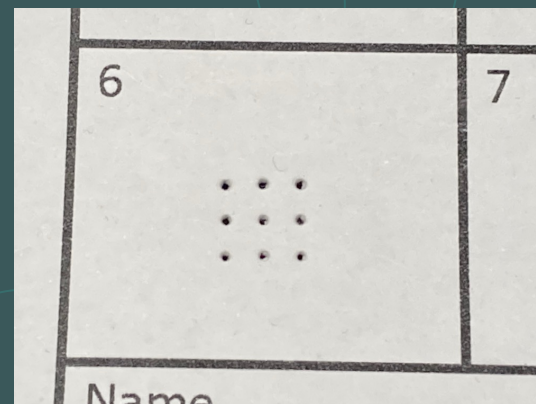
How a DVRA IARU-Style Hunt Works

- Follows the Classic 2m Format (more or less)
- Multiple foxes hidden within 1.5 km (1 mi) radius of starting point
- Foxen use same frequency with different ids (MOE, MOI, MOS, etc.) and are time multiplexed
- All Hunters meet at start point (MCP) and receive Control Card
- Safety Frequency is announced - Usually the W2MER repeater
- Teams start at intervals based on number of transmitters
- When a fox is found, team punches the Control Card
- Return to the start when all foxes are found
- Lowest elapsed time “wins”

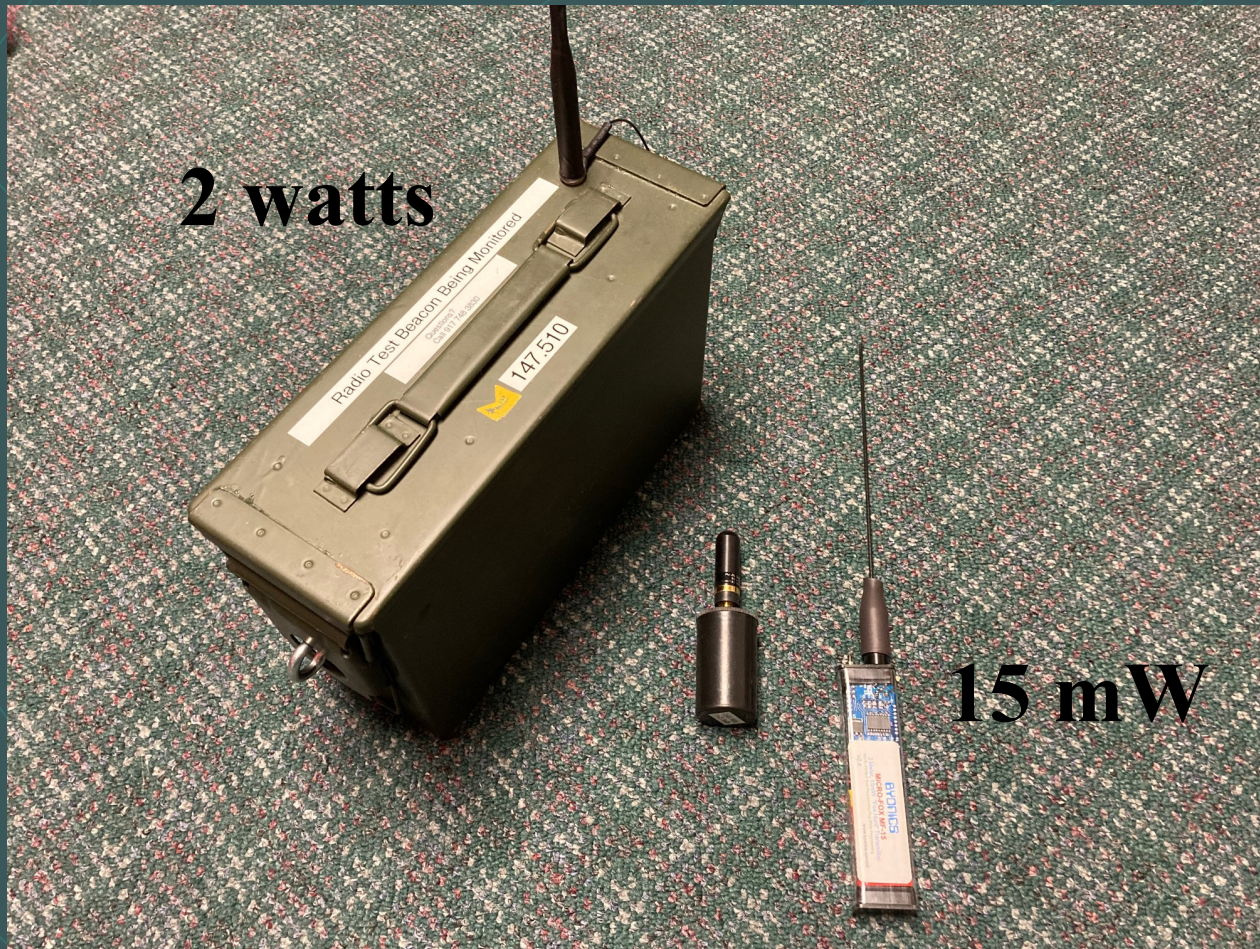
What's a Control Card?

1	2	3	4	5
6	7	8	9	10
Name		Team		Date
 W2ZQ	Finish Time		Delaware Valley Radio Association Fox Hunt Control Card	
	Start Time			
	Elapsed Time			

Fox~: 146.565 — Finish~: 147.510 — Safety~: 147.105+ (123.0Hz)



A Skulk of Foxen



Inside...

TYT MD-UV380

Byonics PicCon



Radio Battery
5000 mAH

Controller Battery
1300 mAH



What Else?

Bi-Monthly DVRA Foxhunts

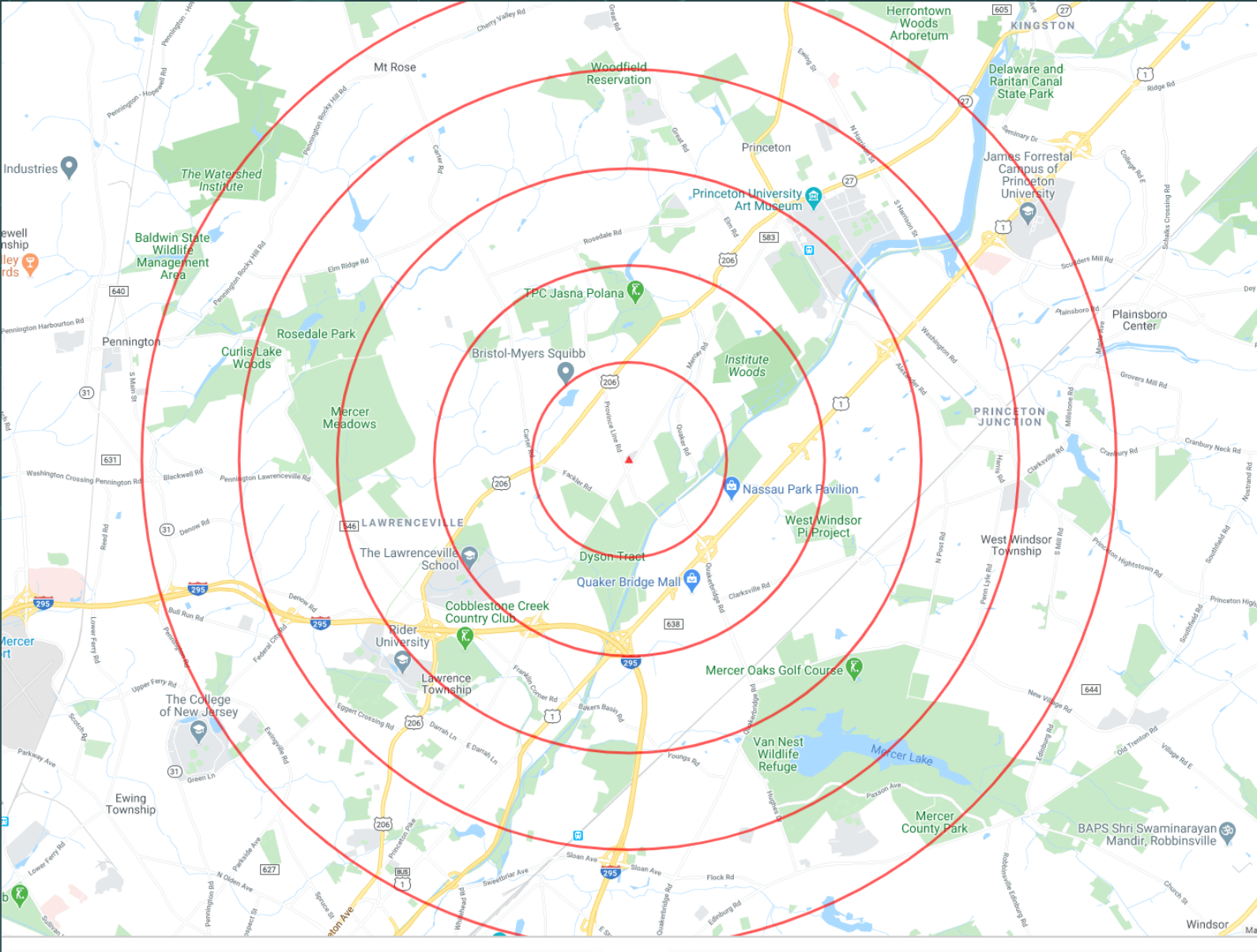
For 2023 - First Saturdays – Even Months

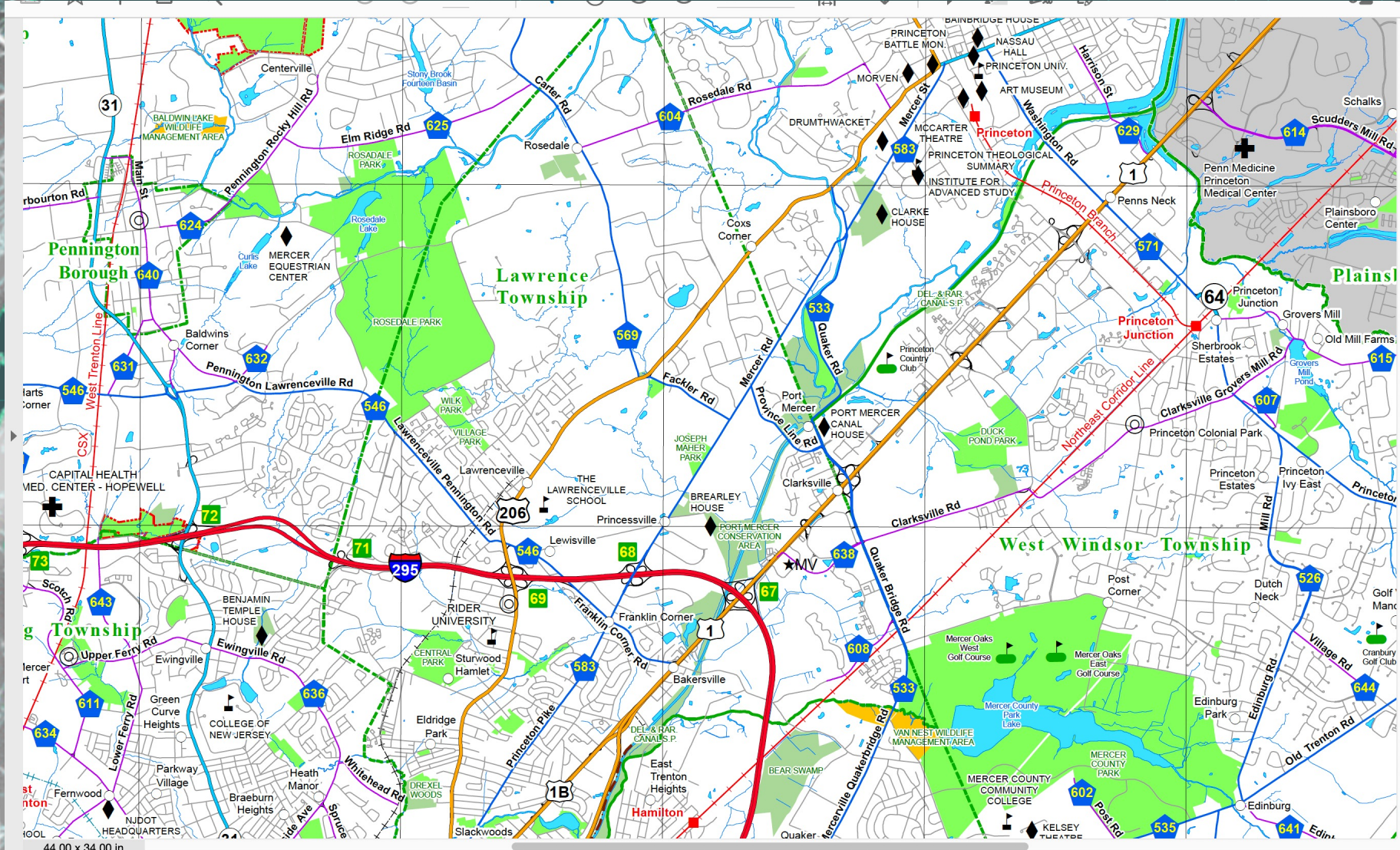
Start at 9 AM

End by 11 or 12

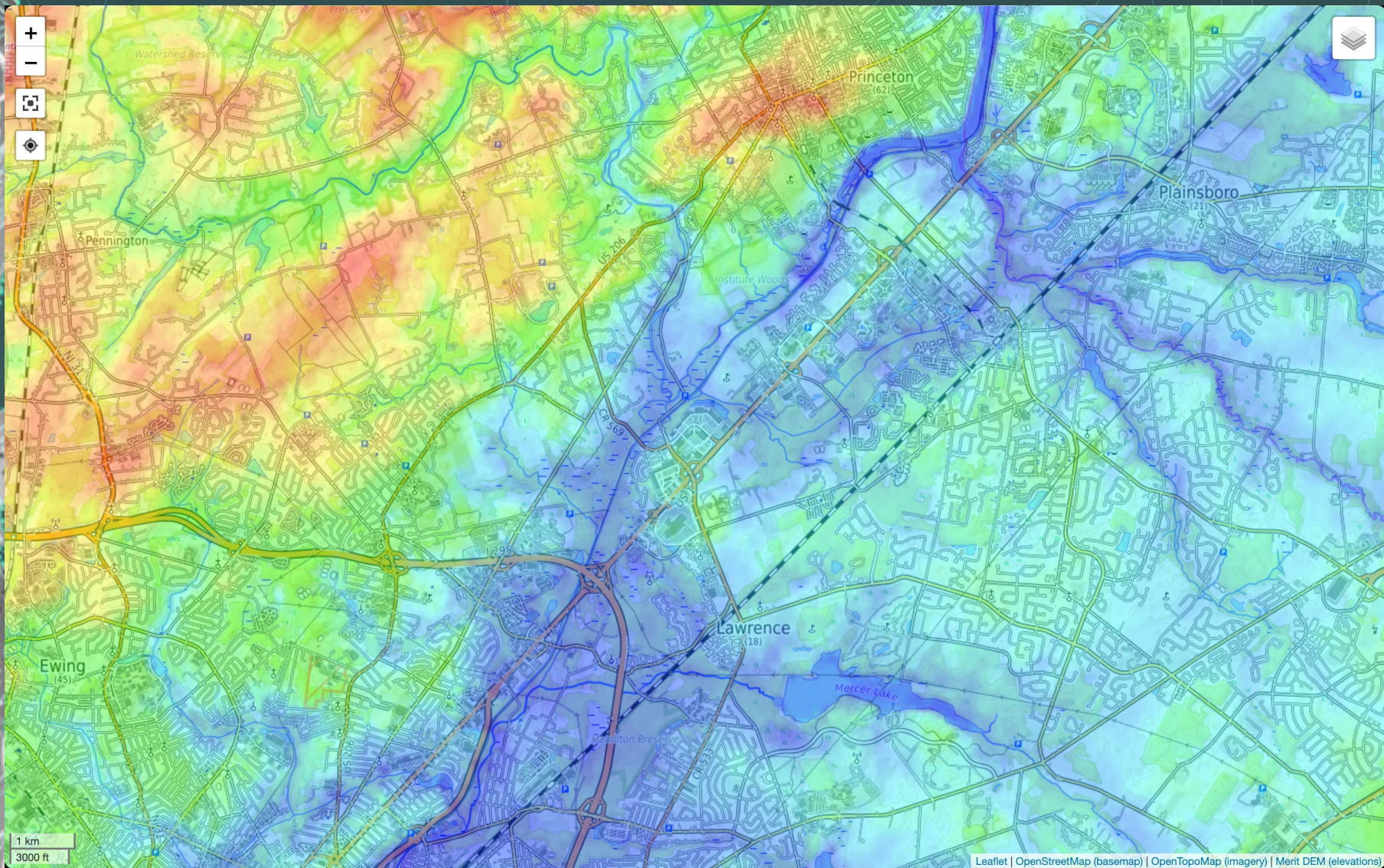
No Experience Needed

No Amateur Radio License Needed

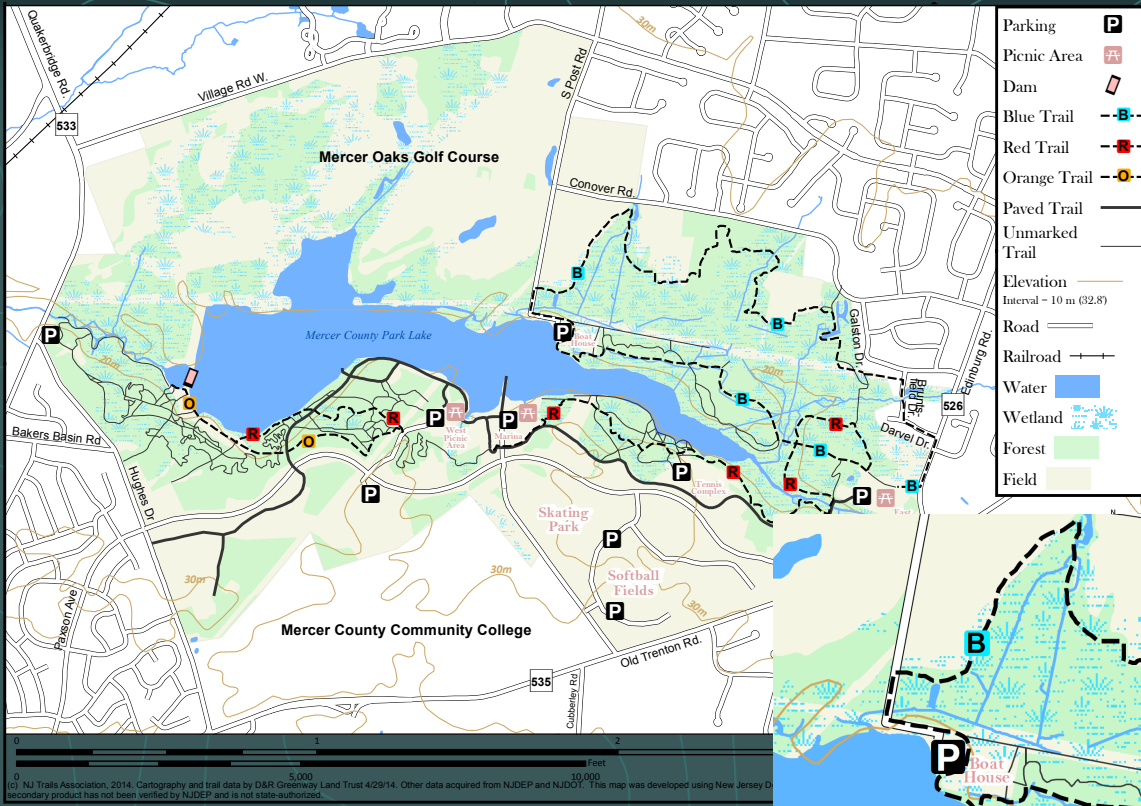




<https://www.state.nj.us/transportation/refdata/gis/maps/mercer.pdf>

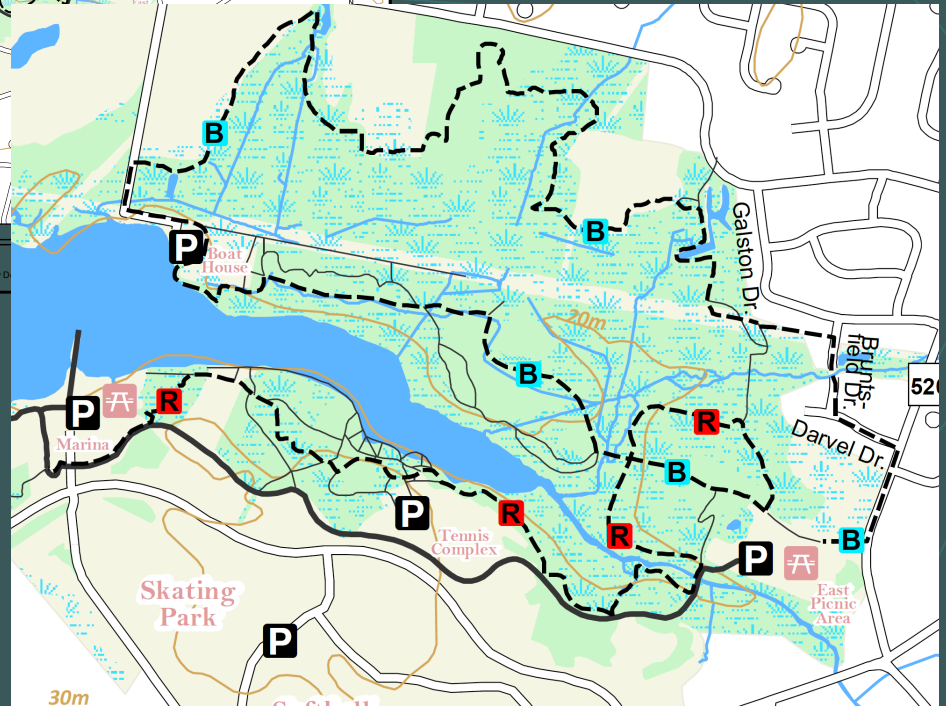


<https://en-us.topographic-map.com/maps/aocz/Mercer-County/>



Parking	P
Picnic Area	PA
Dam	
Blue Trail	B
Red Trail	R
Orange Trail	O
Paved Trail	
Unmarked Trail	
Elevation	
Interval - 10 m (32.8)	
Road	
Railroad	
Water	
Wetland	
Forest	
Field	

0 1 2 Feet
 0 5,000 10,000
 © NJ Trails Association, 2014. Cartography and trail data by D&R Greenway Land Trust 4/29/14. Other data acquired from NJDEP and NJDOT. This map was developed using New Jersey D secondary product has not been verified by NJDEP and is not state-authorized.



<https://njtrails.org/trail/mercer-county-park/>

On The Web

● <http://www.homingin.com>



The screenshot shows the homepage of the Homing In website. The browser address bar displays "Not Secure - homingin.com". The page title is "Homing In" in green, with the subtitle "The Art and Science of Radio Direction Finding (RDF)". Below the title is a graphic with the words "HOMING IN" in yellow, overlaid on a 3D scene of a radio antenna and a computer monitor. A caption below the graphic reads: "Provided by Joe Moell, ham radio callsign KØOV. (That's K-zero-O-V)". A navigation menu includes links for "Mobile T-Hunting", "ARDF/Radio-Q", "CQWWFW", "Local Events", "Wildlife Tracking", "Projects", "Site Map", "About", "News", "Results", "Foxboxes", "FAQs", "Book", "Articles", "Mail Lists", "Links", "Search", and "Contact". A notice states: "This site is frames-free. If you are seeing this page displayed inside a frame of another Web site, [CLICK HERE TO BREAK FREE](#) and display this site full-screen on your computer. If you came by link from another site and the images on this page are not being displayed, [CLICK HERE](#)." Below this is a "Click for Complete Site Directory" link. The "Latest RDF News Headlines" section contains three items: 1) "Results and photos of the on-foot radio foxhunting session on Saturday, May 8, 2021 at Hillcrest Park in Fullerton" with an ARDF logo. 2) "The 24th annual CQ Worldwide Foxhunting Weekend (CQ WW FW) was May 8-9, 2021" with a CQ WW FW logo. 3) "Have you tried transmitter hunting on the six-meter band?" with a transmitter hunting logo. A fourth item, "The February 2021 issue of CQ Amateur Radio Magazine", is partially visible at the bottom.



Thank you for your kind attention

Questions?



Today's Foxes

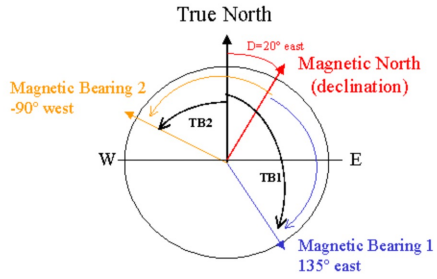
Little Fox – 15 mw – 146.400

Big Fox – 1 watt – 147.510

Bonus Fox – 15 mw – 147.470

Typical 80m Fox and Receiver

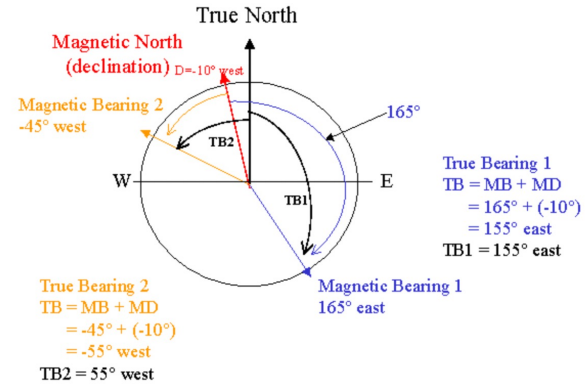




True Bearing is equal to the magnetic bearing plus the magnetic declination so long as degrees west are negative.
 $TB = MB + MD$

True Bearing 2
 $TB = MB + MD$
 $= -90^\circ + 20^\circ$
 $= -70^\circ$ west

True Bearing 1
 $TB = MB + MD$
 $= 135^\circ + 20^\circ$
 $= 155^\circ$ east



True Bearing 1
 $TB = MB + MD$
 $= 165^\circ + (-10^\circ)$
 $= 155^\circ$ east
 $TB1 = 155^\circ$ east

True Bearing 2
 $TB = MB + MD$
 $= -45^\circ + (-10^\circ)$
 $= -55^\circ$ west
 $TB2 = 55^\circ$ west