



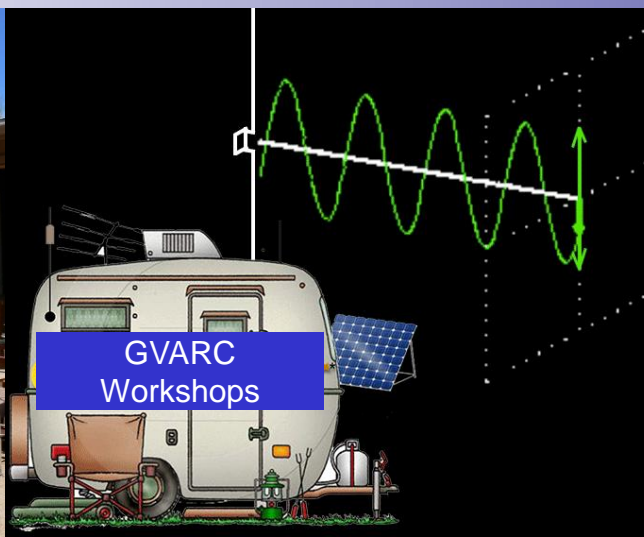
Why Some Hams
like to Winter in
Southern Arizona

George N0RCL
Today after No Bird
SnowBird Net



GVARC Hands On Workshops

Ed Toal	N9MW	Committee Chair
Ron Phillips	AA7RP	Vertical/Flag Pole Antenna
Tom Lang	K7VOA	Vertical/Flag Pole Antenna
Bruce Tewksbury	K3BAT	Magnetic Loop Antenna
Roger Johnson	K5IP	Magnetic Loop Antenna
John Lynn	KL7CY	Magnetic Loop Antenna
Ed Toal	N9MW	Direction Finding (DF) Antenna





Overview



- Hands On Workshop Goals
- Vertical/Flag Pole Presentation (Ron AA7RP)
 - Where We're at and What's Next
- Magnetic Loop Presentation (Bruce K3BAT)
 - Where We're at and What's Next
- Direction Finding (DF) Antenna Presentation (Ed N9MW)
 - Where We're at and What's Next
- Future Hands On Workshops
- How You Can Get Involved
- Questions and Comments



Vertical/Flag Pole Antenna (Ron AA7RP)



Ron's Flag Pole Installation



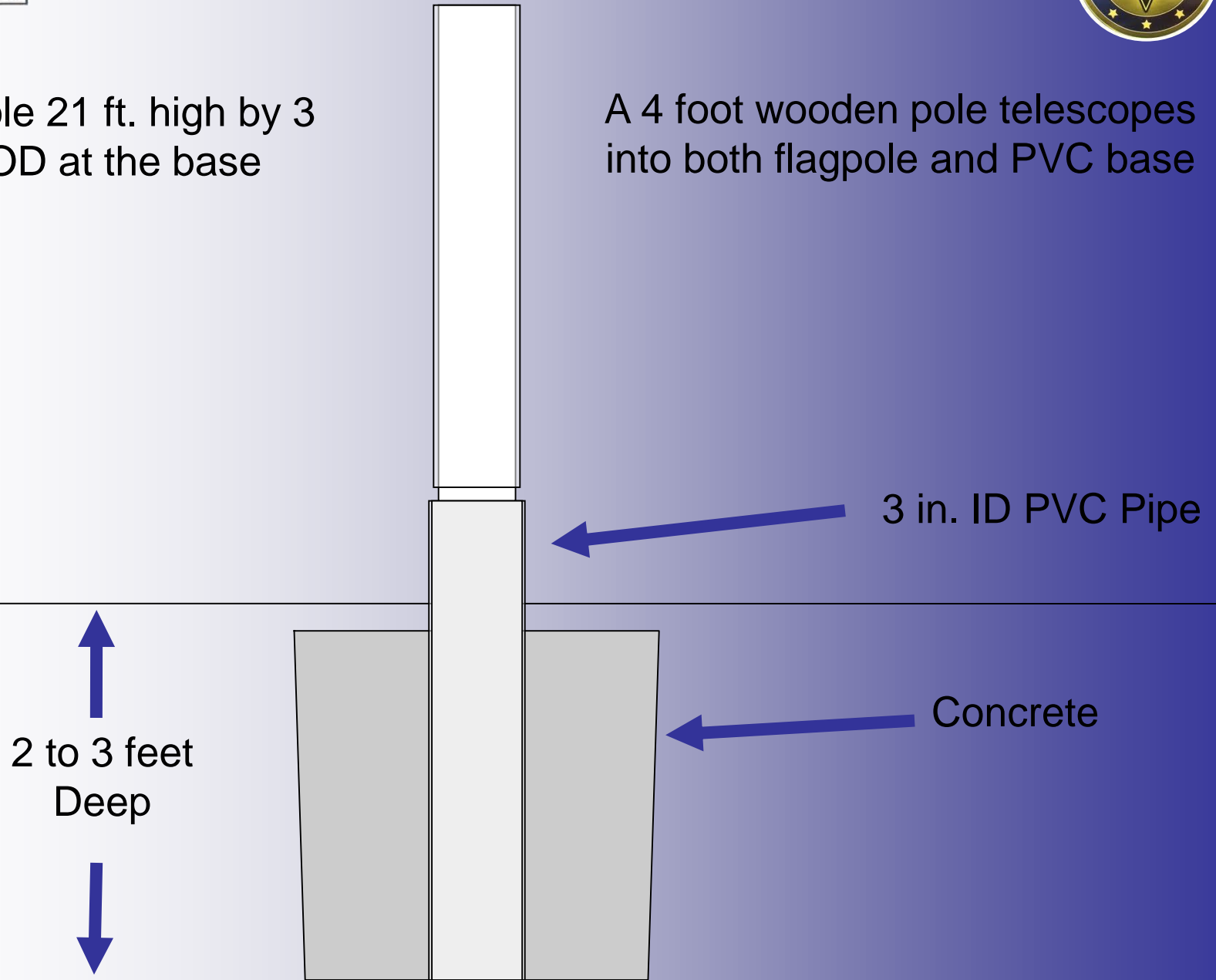


Ron's Flag Pole Installation Diagram



Flagpole 21 ft. high by 3 in. OD at the base

A 4 foot wooden pole telescopes into both flagpole and PVC base



3 in. ID PVC Pipe

2 to 3 feet
Deep

Concrete

Tom's Flag Pole Installation (Tom K7VOA)



No tuner at the base,
instead it's fed through a 1:1
balun



Tom's Flag Pole Installation Diagram



Flagpole 21 ft. high by
3 in. OD at the base

3 ft.

The flagpole telescopes into
a length of PVC pipe

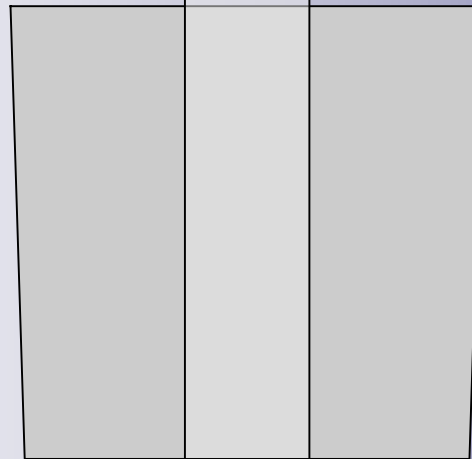
3 in. ID PVC Pipe

Wire from balun
attaches to flagpole
through hole in PVC

Bolt through PVC Pipe

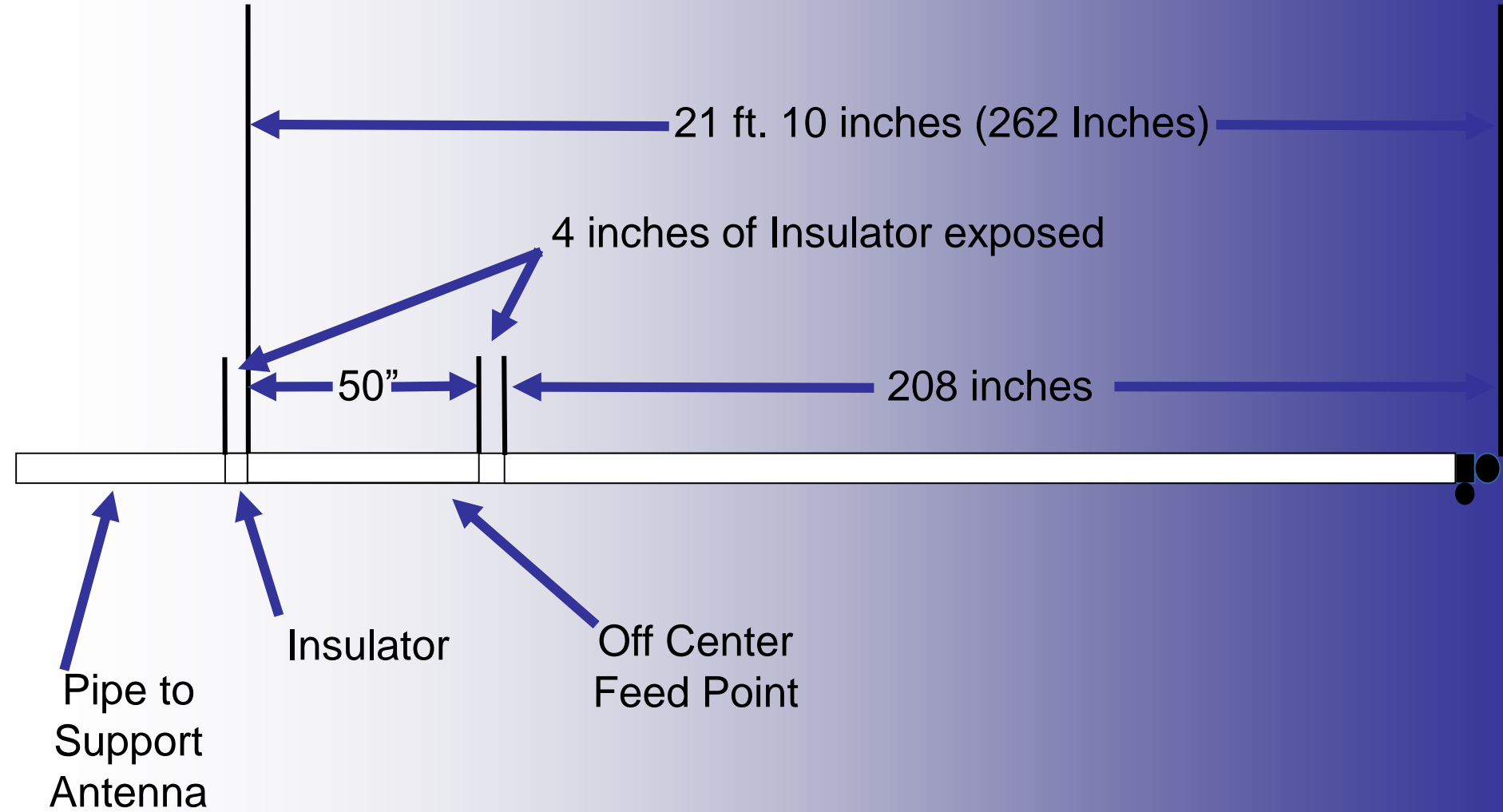
2 to 3 feet
Deep

Concrete

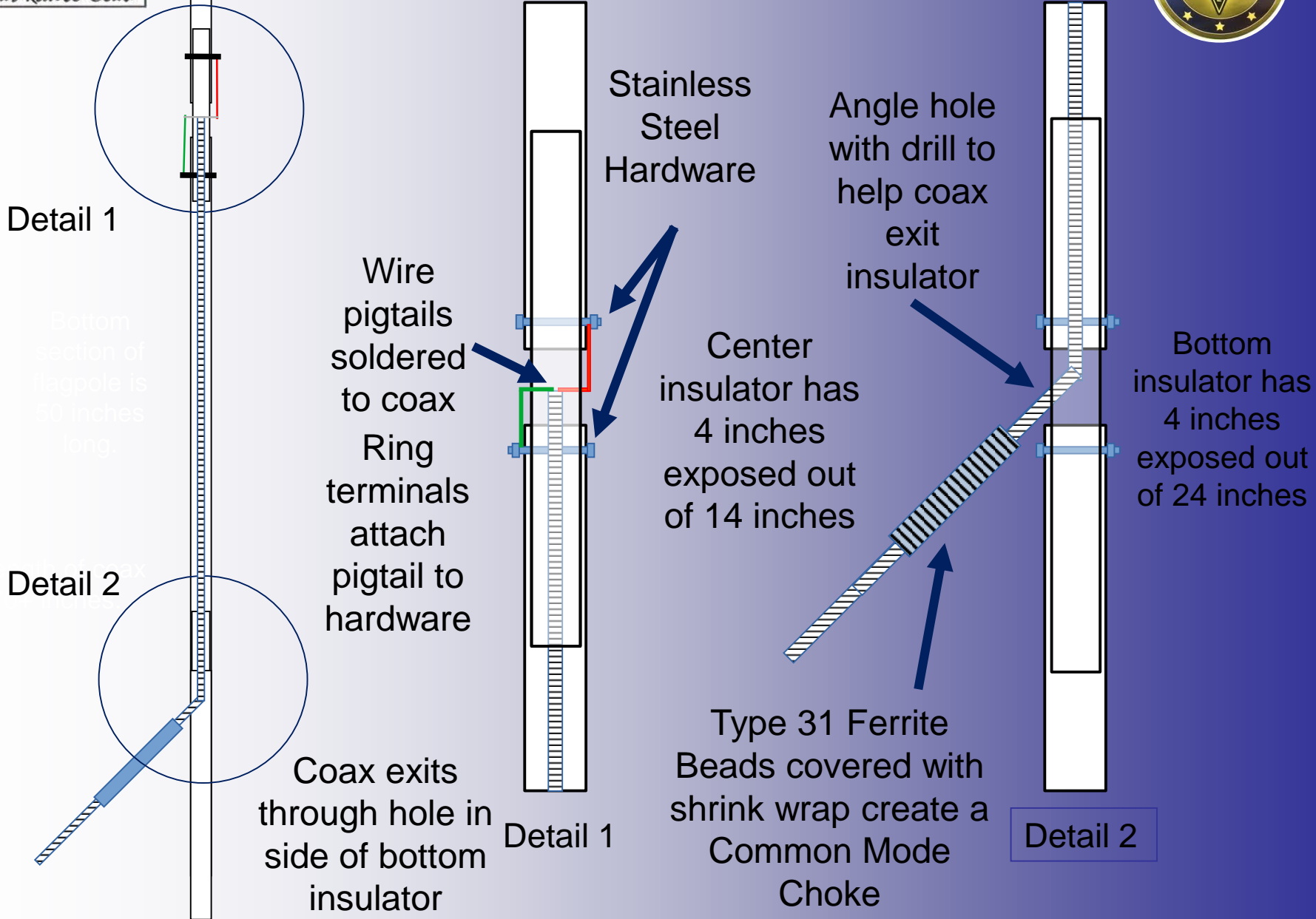




Off Center Feed (OCF) Flag Pole Diagram



OCF Flag Pole Diagram (Cont)



Magnetic Loop Antenna Bruce (K3BAT)





Why a Magnetic Loop Antenna?



1. Transition from Rural to Suburbia

- a. Smaller Lot Size with HOA Restrictions
- b. High RF Noise Levels

2. Vertical Antenna **Cons**

- a. Known for High RF Noise and Can Require Extensive Ground Radials
- b. Can be Very Unsightly (HOA Targets)

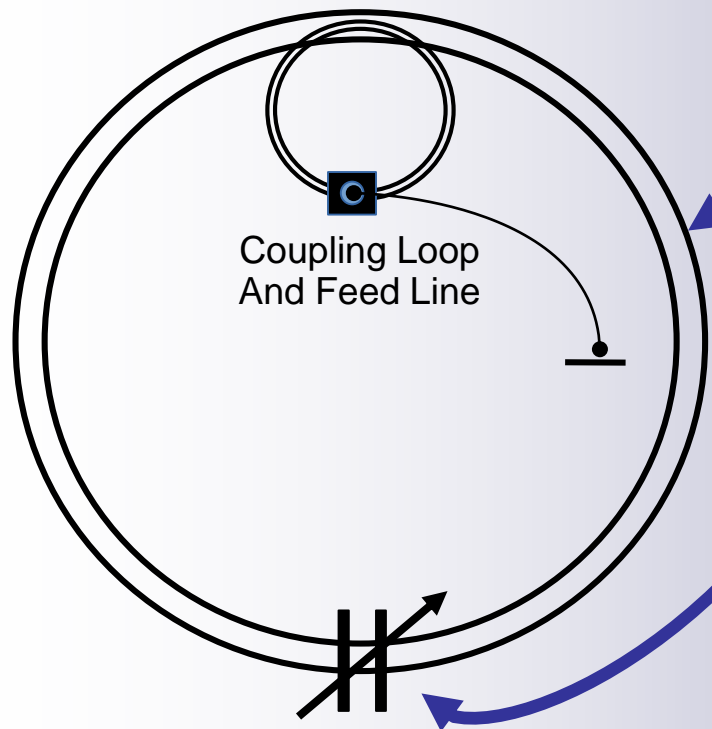
3. Magnetic Loop Antenna Pros and Cons

- (**Pro**) Small Footprint (3'-6') and Low RF Noise (can null noise source)
- (**Pro**) Great Performance with proper construction/location
- (**Pro**) No Ground Radials Required
- (**Con**) Narrow Bandwidth: 20-10 Meters 35-80 Khz (40 and 80 Worse)
- (**Con**) Bad Rap from Poor Designs and Construction
- (**Con**) Many Loops Can Only Support QRP

Magnetic Loop Project Goals

1. Usable at 100 Watt Level – 500 Watt Ultimate Goal
2. Single Band for Simplified Tuning
3. Remote Tuning Without Extra Wires

Mag Loop Design Challenges



The Loop Itself Must Handle **High Current**

- * 20-25 Amps RF at 100 Watts
- * 40-50 Amps RF at 500 Watts

The Tune Capacitor Must Handle **High Current and Very High Voltage**

- * 20-25 Amps RF at 100 Watts
- * 40-50 Amps RF at 500 Watts
PLUS
- * **5000 Volts** RF at 100 Watts
- * **14000 Volts** RF at 500 Watts

Magnetic Loop Construction



Coupling Loop and Line Feed

7/8th Dia Helix Hard Line Supports High Current,
Bigger is Better.

Large Butter Fly Capacitor: 15,000 Volt
Breakdown

John Lynn
KL7CY
Roger Johnson
K5IP



Working Loop
Frame Support



John, Roger, and Bruce Stand Ready for a Photo
Op...Where's Ed?

Magnetic Loop Motor Drive and Remote Control





20 Meter Performance Testing



1. Great Signal Reports Both DX and Ground Effect
 - a. Costa Rica, WA, and WI (SDRs show comparable Propagation to Vert w/Power)
 - b. Southern AZ performance as good as Verticals w/Power

2. A/B Test vs. Gap Titan DX (Loop at 100 Watts – Gap at 500 Watts)
 - a. Xmit Reports < 1 S Unit From Gap, Receive 1 S Below Gap
 - b. Loop Noise Level 5 Units < Gap (Much better copy)

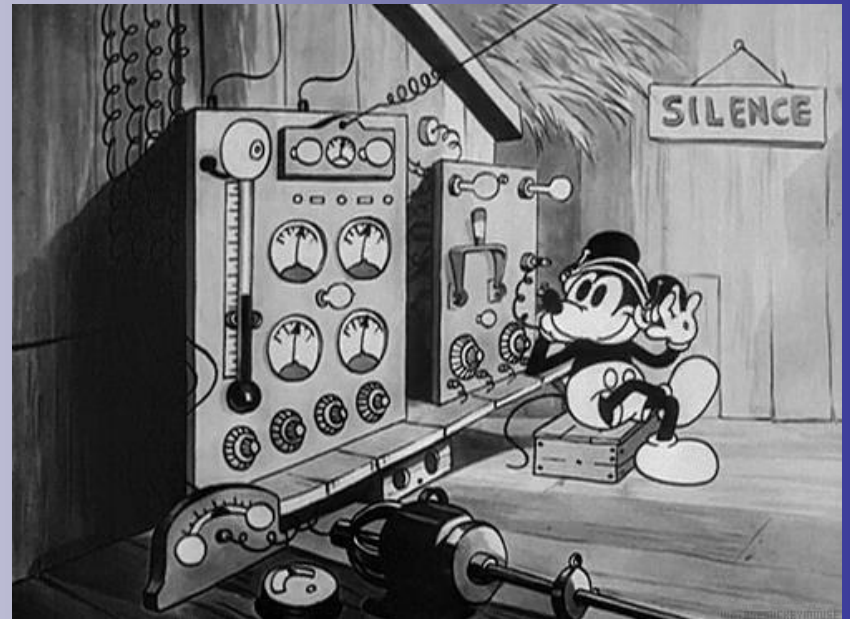
3. Loop has performed well from 30 Watts to 500 Watts

4. Some Commercially Available Magnetic Loop Options
 - a. MFJ-1786 (10-30M @ 150 Watts) **\$450**
 - b. MFJ-1788 (7-21M @ 150 Watts) **\$500**
 - c. Ciro Mazzoin MZZ-MIDI (3.5-7.9M @ 300W & 8-14.5M @ 800W) **\$2478**
 - d. Ciro Mazzoin MZZ-MIDI (6.6-21.9M @ 450W & 22-30M @ 1000W) **\$2098**

Direction Finding (DF) Antenna (Ed N9MW)



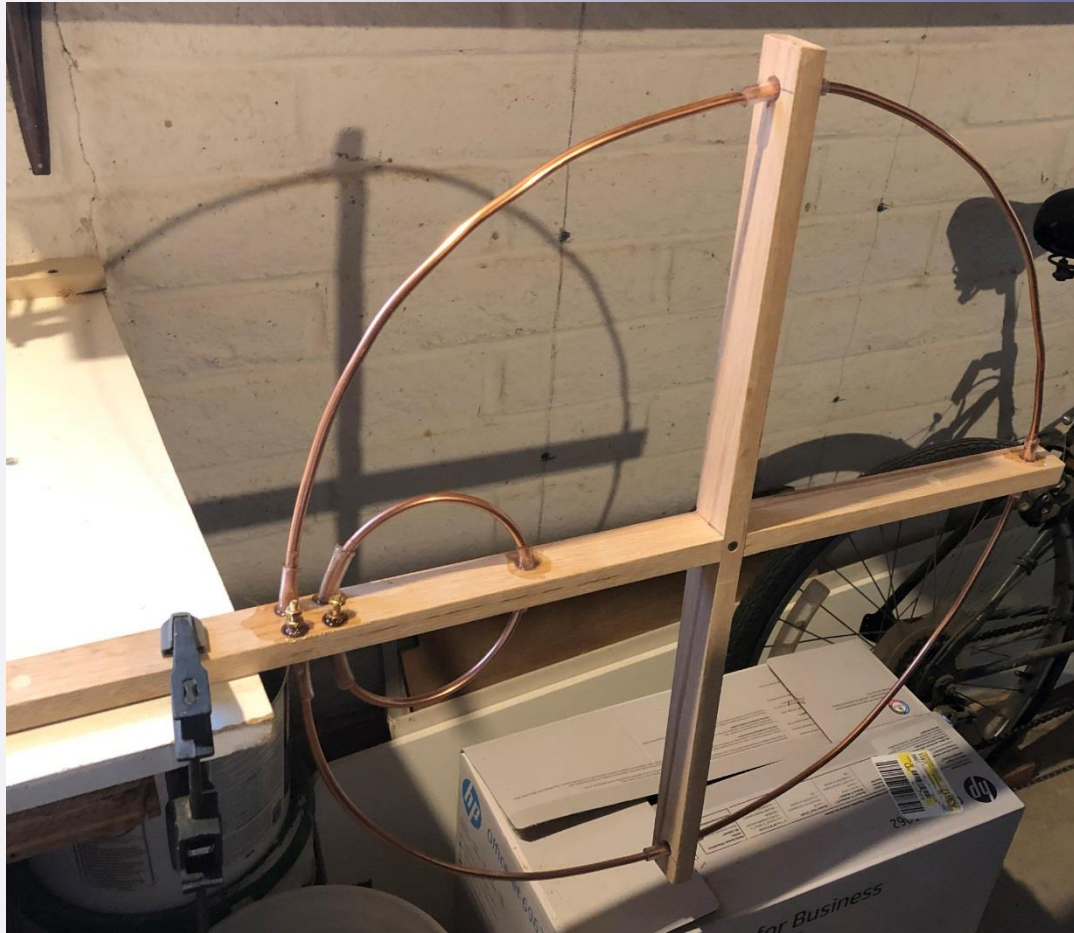
Ah....Here's Ed N9MW, during his early years!



DF Antenna (Ed N9MW)



DF Antenna Construction



DF Antenna (Ed N9MW)



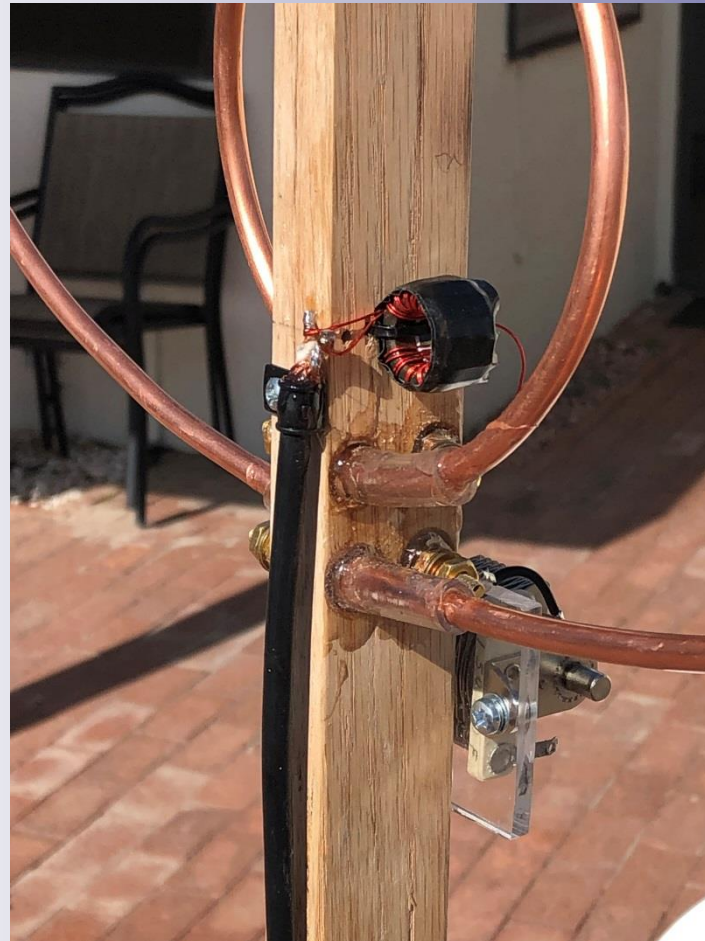
DF Antenna Capacitors



DF Antenna (Ed N9MW)



DF Antenna Feed Line



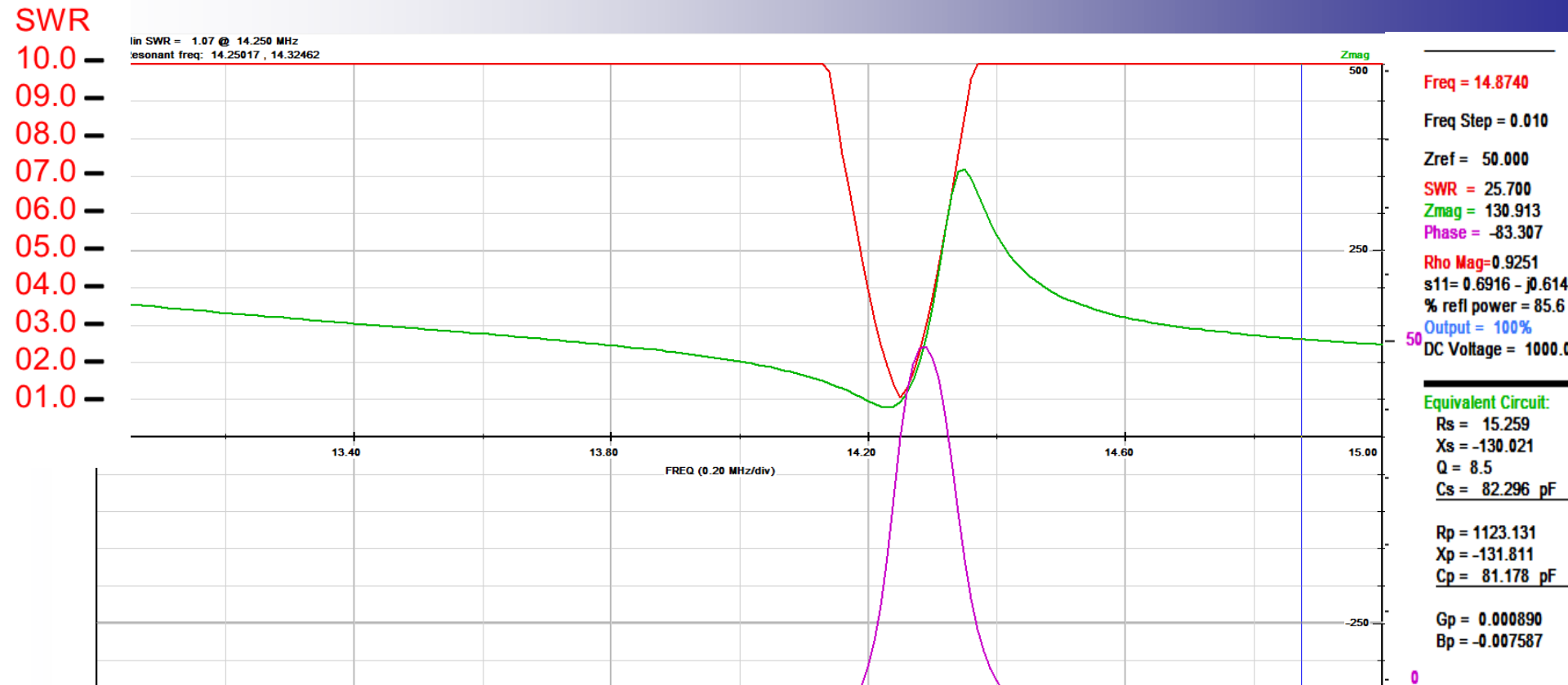
DF Antenna (Ed N9MW)



DF Antenna Interface with HDSDR



- Customized GVARC site survey tools and expertise
 - DF Antenna Coupling Loop and Leveraging HDSDR
 - Aim Chart Antenna Analysis
- Other Thoughts From Ed



Future Workshops (Ed N9MW)



What Next? Fox Hunt Late Fall? ...Your Thoughts?



They can run...but they can't hide!



Who Let the Hams Out! Whoo...Whoo...Whoo?



GVARC Hams! Are you ready for a Fox Hunt?



How You Can Get Involved Comments/Questions/Discussion



Ed N9MW (608) 279-5545 Committee Chair/Direction Finding Antenna

Ron AA7RP (520) 784-8595 Vertical/Flag Pole Antenna

Bruce K3BAT (520) 625-9170 Magnetic Loop Antenna



How You Can Get Involved Thanks for Engaging





GVARC Hands On Workshops Q&A with Workshop Team



Ed Toal

N9MW

Committee Chair

Ron Phillips

AA7RP

Vertical/Flag Pole Antenna

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