

AMATEUR RADIO TRANSMITTER HUNTS

Presented by Tom Davis – KB7HTA

Transmitter Hunt History

- ▣ The earliest foxhunts used vacuum tube technology to locate hidden signals. By the 1930s, Amateur Radio Relay League (ARRL) conventions featured on-foot hunts using basic gear like galena crystals to "sniff" out signals.
- ▣ Following World War II, European nations developed radio direction finding into a sport to enhance military and civilian navigation skills. This, known as Amateur Radio Direction Finding (ARDF), served as a civil defense application during the Cold War.

Transmitter Hunt History

- ▣ In the latter half of the 20th century, mobile T-hunting became popular among hams, using vehicles to track hidden transmitters. These hunts tested their construction skills for building RDF gear and tracking abilities.
- ▣ Today, transmitter hunting is a global sport with annual world championships. It includes "ARDF," which combines radio direction finding with orienteering (running through woods to find transmitters), and vehicle-based "T-hunting" that can span hundreds of miles.

Las Vegas Valley History

- ▣ Earl, WB6AMT started conducting T-Hunts in the valley before 2016 and continued doing so until his passing in 2023. A document detailing many of these hunts is available at kb7hta.com/t-hunts.

Las Vegas Valley History

- ▣ My first T-Hunt was March 10, 2018.



Las Vegas Valley History

- ▣ Andy, KJ7RFN, has conducted several hunts in the past in an effort to get hams interested once more.
- ▣ In October of 2025, Ron, KJ7PAQ conducted the first T-Hunt in a long time, which was a smashing success with over 13 hams in attendance.

Currently

- ▣ **Las Vegas Transmitter Hunters** get together on the 3rd Saturday of every month at a local park for a non-sponsored transmitter hunt (T-Hunt). The T-Hunts are conducted alternately by Ron, KJ7PAQ and Tom, KB7HTA. The entire T-Hunt takes place at a park and other than driving to and from the park; there is no driving involved, everything is accomplished on foot. Additional information can be found at kb7hta.com/t-hunt

Transmitter Hiding Zones



Planning a T-Hunt

- ▣ Find a Park in Your Zone



Make a Map

- ▣ Using Google Maps and Photoshop - Publish



Day of the Hunt

- ▣ Prepare Signup/Time Sheet
- ▣ Acquire Doughnuts and Coffee
- ▣ Go to the Park's Starting Point
- ▣ Hide the Transmitters (Foxes)
- ▣ At 8:30 am Sign-in, Socialize and Wait for Start
- ▣ Start Hunt and Record the Start Time
- ▣ Hunters Return Proof of Finds & Record Time
- ▣ Announce the Winners
- ▣ Post the Results and Photos Online

Results

TRANSMITTER HUNT 10-18-25 POLICE MEMORIAL PARK

START TIME 9:04AM

RESULTS

CALL SIGN	NAME	POSITION	TIME BACK	NOTES
KM7AKK	DAN NOVAK	1	9:25	
K7FYI	RICK LAUTENBACH	2	9:16	
K1ZCR	BILL TYNING	3	9:25	
K7XMD	MATT CREGAR	4	9:19	
KJ7GLG	MIKE HUBSKY	5	9:33	
KC0NMZ	CHRIS JAYNE	6		
KG7NEP	LARRY SPURGEON	7		
N0GIH	DENIS EATON	8		
K7OSW	AL PISTRITTO	9		
KK70UG	JAMES BERENDS			
KJ7YZZ	RICH MCCARRON			
KB7HTA	TOM DAVIS			
K4BL	VERN BROOKS			

Transmitter Used

- ▣ Micro Fox 50 manufactured by Byonics
- ▣ RF Output: 0.05 – 50 mw
- ▣ Range 1 – 5+ miles
- ▣ Frequency 144 – 148 MHz
- ▣ Chargeable LiPo Battery
- ▣ SMA Antenna Connector
- ▣ User Defined CW ID
- ▣ Web Based Config Tool



Micro Fox 50 Configuration

Some Windows users have reported difficulty updating the firmware. Enabling the Safe Mode at speed 1 may help.

Safe Mode

v0.5 ▾

Update MF-50 Firmware

[Release Notes](#)

Current Version:

tone speed:

tone duration:

loop time:

initial delay:

tx freq:

morse message:

morse speed:

morse tone:

tone sequence:

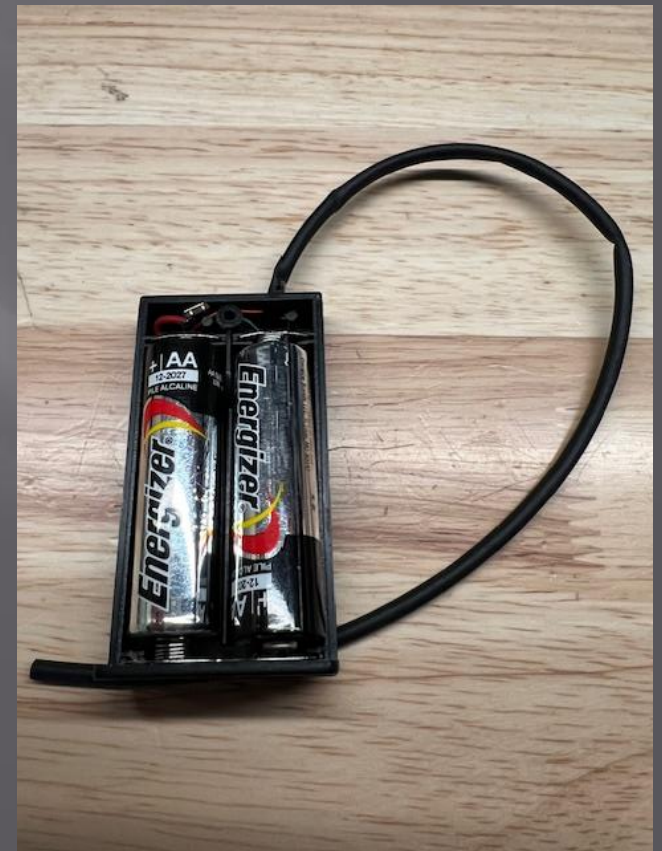
power:

send battery:

level	RF output	current	level	RF output	current
0	0 mW	7 mA			
1	0.05 mW	20 mA	15	9.5 mW	40 mA
2	0.19 mW	21 mA	20	16.2 mW	47 mA
4	0.72 mW	24 mA	30	33.1 mW	60 mA
7	2.2 mW	29 mA	40	46.8 mW	70 mA
10	4.4 mW	33 mA	50	53.7 mW	76 mA

Transmitter Used

- ▣ Simple carrier transmitter (Xtal Oscillator)
- ▣ Output Estimated at ~ 5 mw
- ▣ Tuned Wire Antenna
- ▣ Two Alkaline AA Batteries



Transmitter Power vs Distance

Power Level	Typical Range	Best For
1mW	Up to ¼ mile	Final stage of multi-transmitter hunts
15mW	Detectable from ~12 miles	Walking hunts in parks
100mW	City-wide coverage	Mobile vehicle hunts
1W	Multi-city coverage	Large area hunts

Hidden Transmitter (Fox)



Finding the Fox

- ▣ Antenna
- ▣ Attenuator (Optional)
- ▣ The frequencies we use are 146.565 (T0), 146.575 (T1), 146.585 (T2) and 146.595 (T3) MHZ.
- ▣ Interpret the Signal

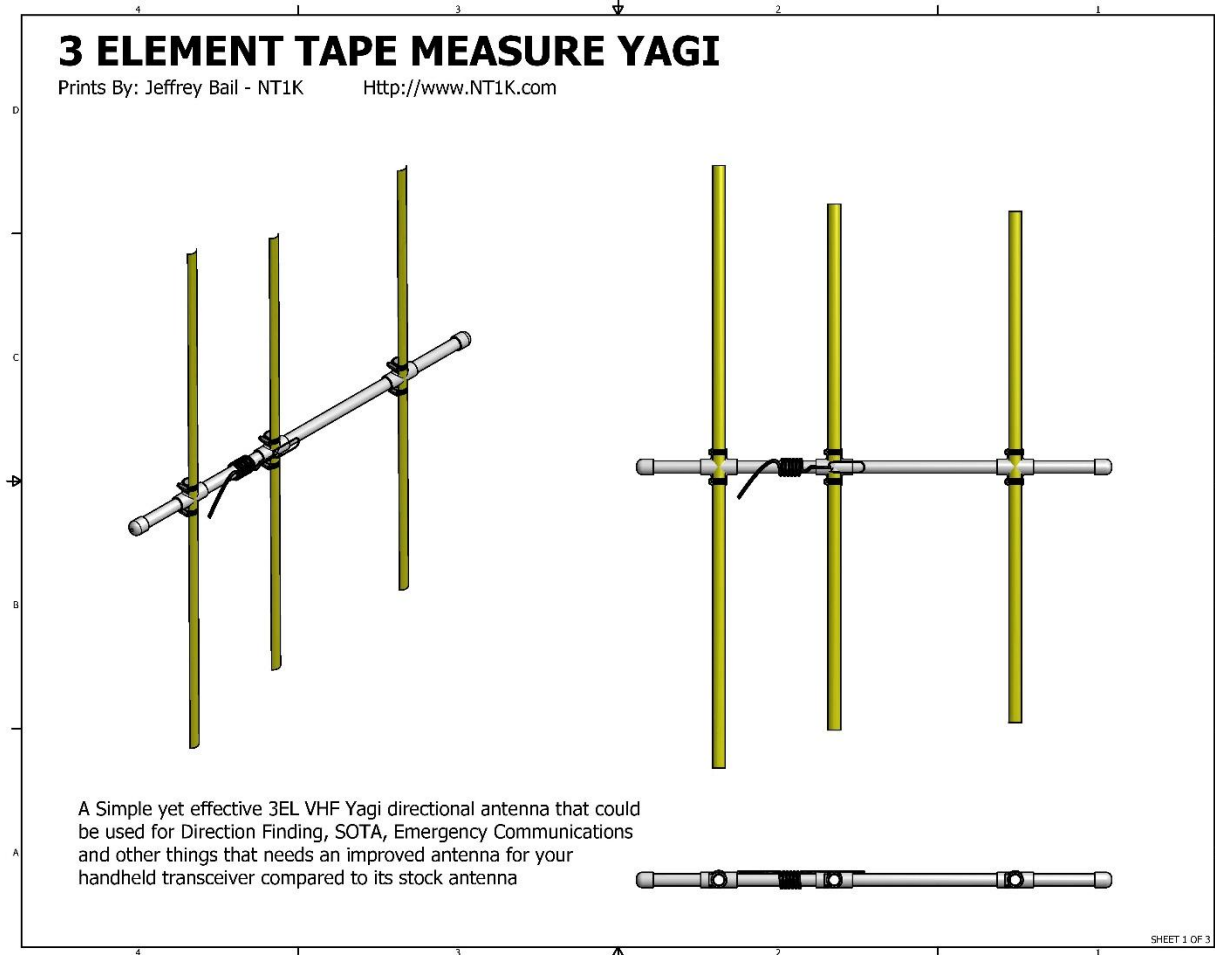
2m Yagi Antenna



2m Tape Measure Yagi Antenna

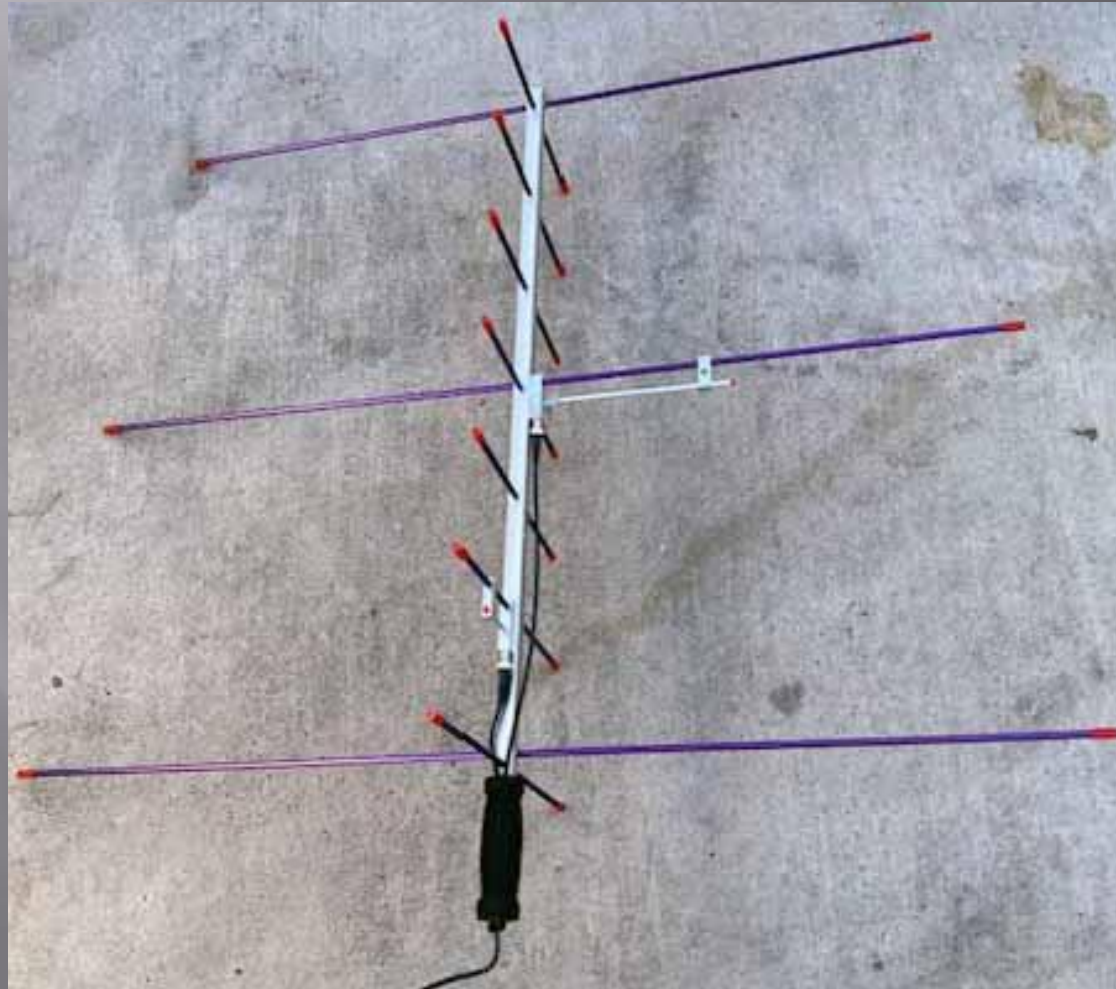
3 ELEMENT TAPE MEASURE YAGI

Prints By: Jeffrey Bail - NT1K [Http://www.NT1K.com](http://www.NT1K.com)



A Simple yet effective 3EL VHF Yagi directional antenna that could be used for Direction Finding, SOTA, Emergency Communications and other things that needs an improved antenna for your handheld transceiver compared to its stock antenna

2m/70cm Yagi Antenna



Loop Antenna



Paper Clip Antenna



Why Use Attenuators

- ▣ When you're closing in on the fox you may find the signals to be strong enough you can no longer find a peak or null with your antenna. Sometimes the signal is so strong that the RF will leak straight into the radio, connections and other equipment making the antenna useless. Solutions follow:
 - Step attenuator
 - Offset attenuator
 - Smaller antennas, foil or 3rd harmonic techniques

HP Step Attenuator



Homebrew Step Attenuator

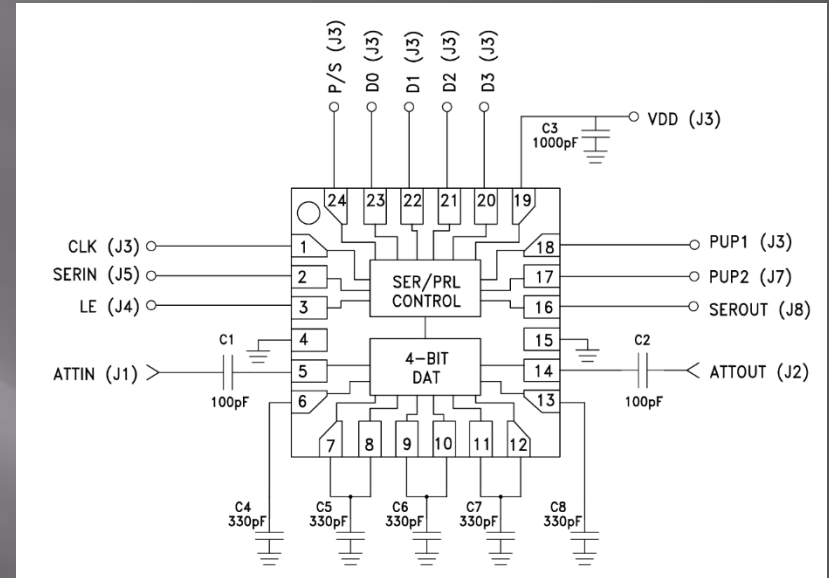
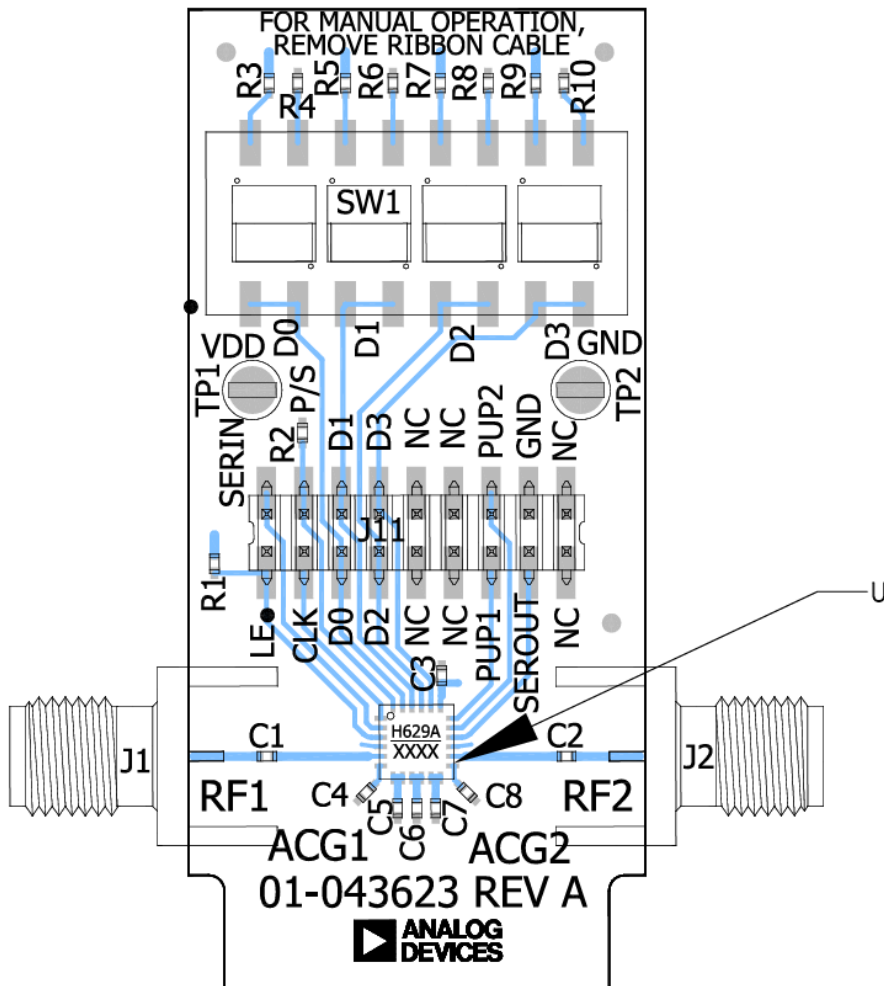


DAVID GEORGE RICHARDS

Homebrew Step Attenuator



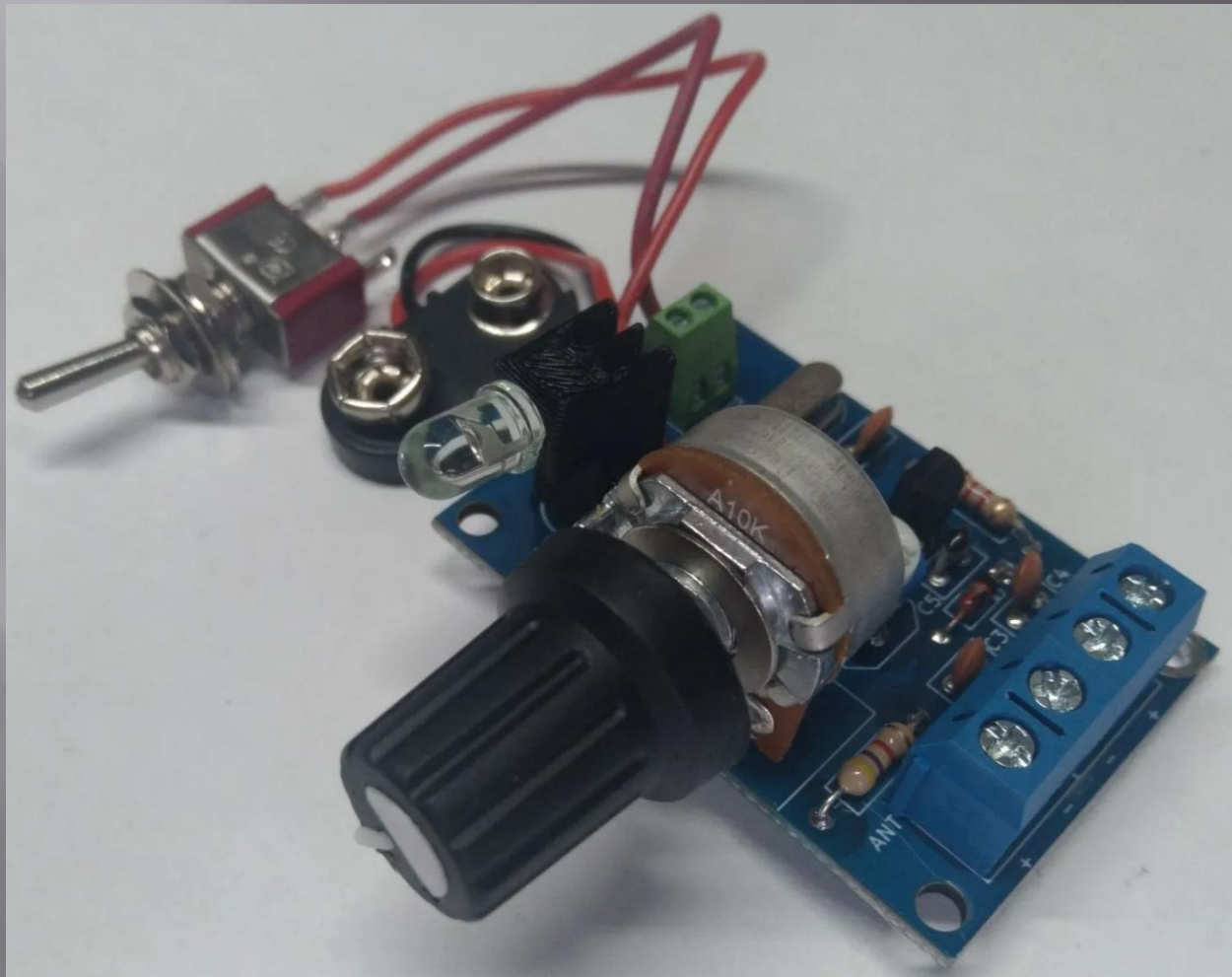
Digital Attenuator (HMC629)



Control Voltage Input				Attenuation State
D3	D2	D1	D0	
High	High	High	High	Reference I.L.
High	High	High	Low	3 dB
High	High	Low	High	6 dB
High	Low	High	High	12 dB
Low	High	High	High	24 dB

Any combination of the above states will provide an attenuation approximately equal to the sum of the bits selected.

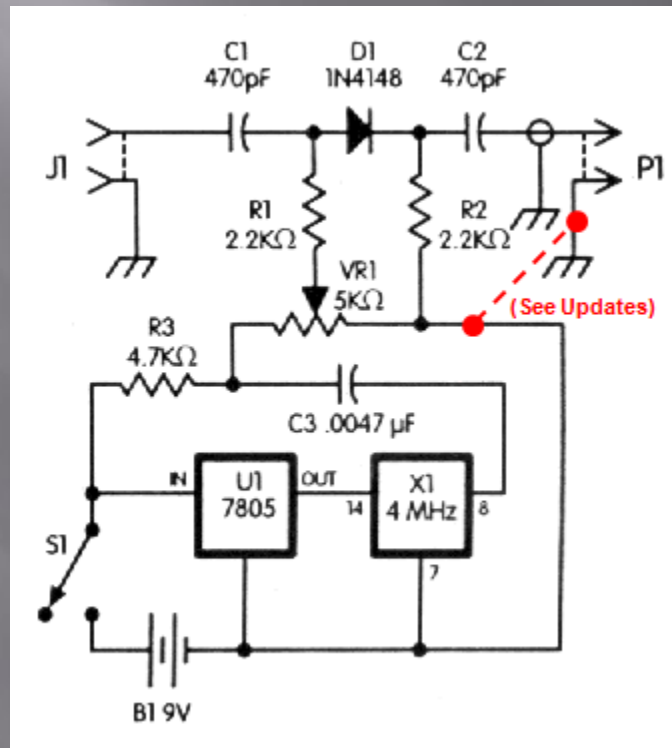
Offset Attenuator



Offset Attenuator

- ▣ The circuit consists of a small RF generator, in this case 4MHz, which will mix with the incoming fox signal (such as 146.565MHz - T0) and produce new signals at plus and minus the fox signal (142.565 Mhz & 150.565 Mhz).
- ▣ A potentiometer on the board changes the injection level of the RF generator which in turn attenuates the incoming mixed signal to your radio to a level where tracking can continue.
- ▣ [Instructional Video](#) [K0OV Attenuator](#)

Offset Attenuator



Dual Band HT Receiver



Portable Receiver



SDR Receiver



Interperting the Signal

- ▣ Digital S Meter
- ▣ Analog S Meter
- ▣ Sound Level
- ▣ Computer Analysis

Putting It All Together

- ▣ Use an HT & set it to the transmitter's frequency
Ex: 146.565 MHz 3rd harmonic 439.695 MHz
- ▣ Use body shielding and signal nulling
 1. Hold the HT (low gain antenna) tight against your chest (aluminum foil helps)
 2. Rotate your body slowly 360°
 3. Note where the signal becomes the weakest (null)
 4. The "Fox" is located directly behind you.
 5. Move a good distance in the direction of the "Fox" and repeat until you get close to the transmitter
 6. Change to the 3rd harmonic or detune 5 KHz

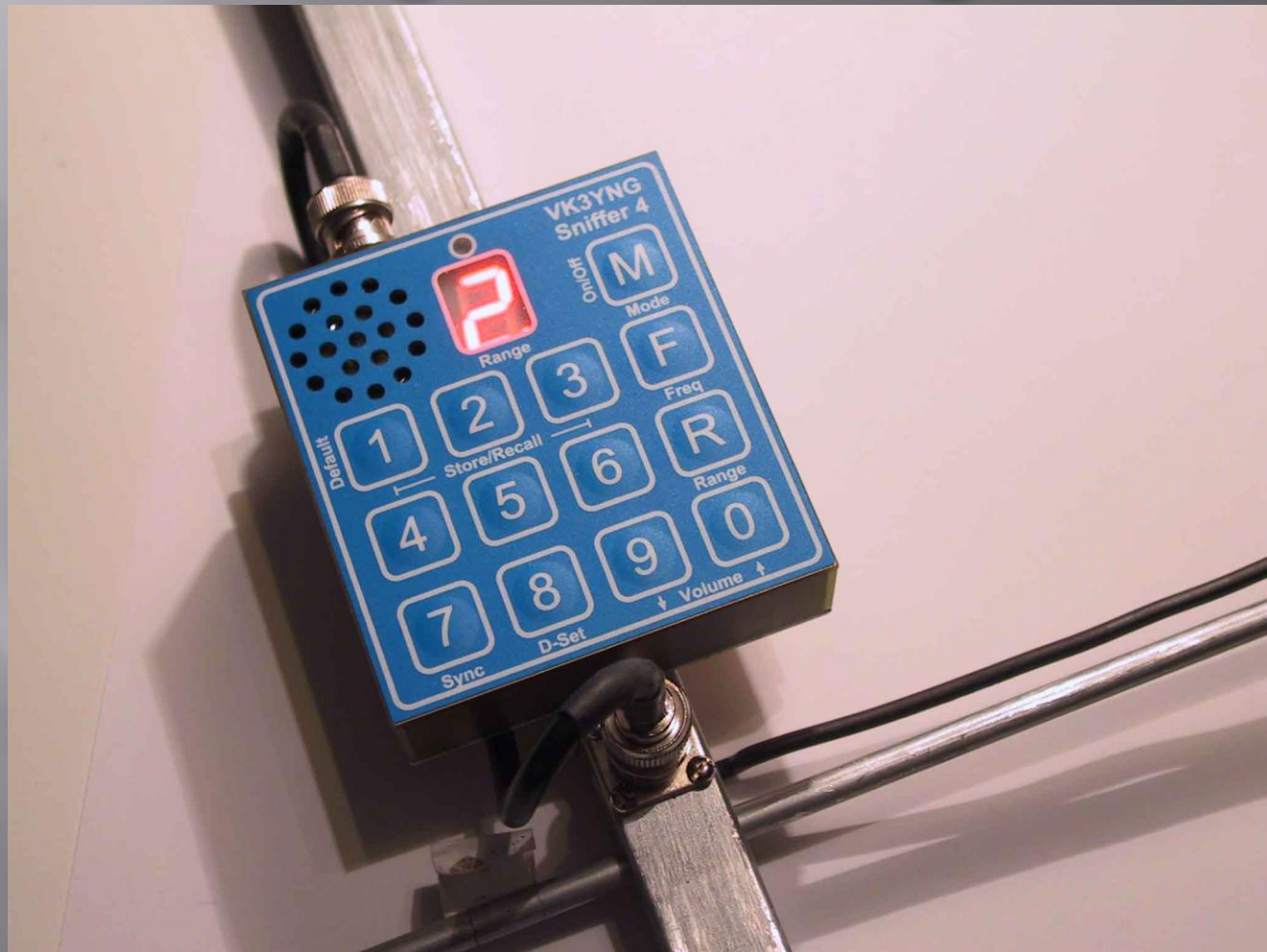
Putting It All Together - WN9ANF



Putting It All Together

- ▣ IC-705 Transceiver
- ▣ Loop Antenna
- ▣ Attenuator
- ▣ Battery
- ▣ Vest

Putting It All Together



VK3YNG MK4 Fox Hunt Sniffer

Putting It All Together

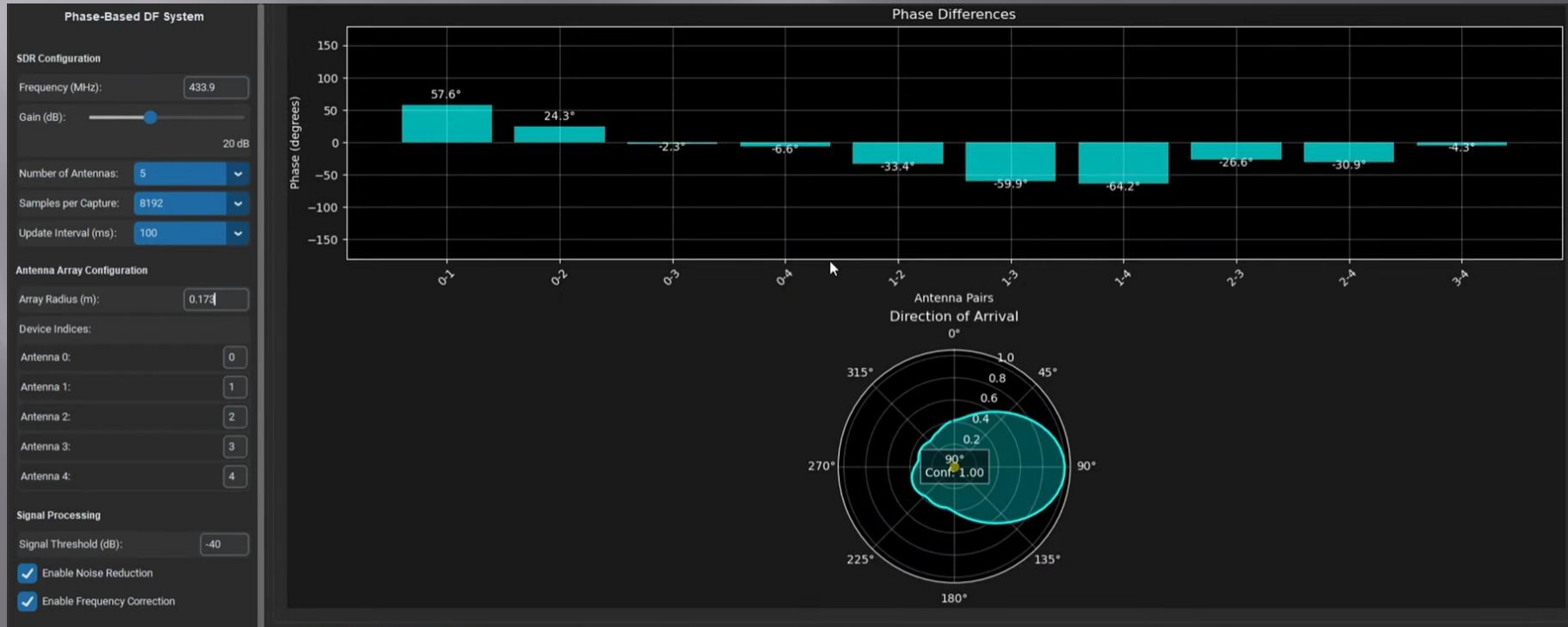
- ▣ The VK3YNG Foxhunt Sniffer is a specially designed synthesized VHF direction finding receiver covering 120MHz and 144MHz bands.
- ▣ The receiver is designed for quickly finding the direction of beacons or hidden transmitters. Anything from distant weak signals to very close "sniffing" of transmitters running many watts of output power can be pinpointed accurately without suffering "overload" problems that plague other designs. Full auto-ranging operation allows the operator to quickly and intuitively locate the source of a signal without twiddling knobs or watching meters.

Putting It All Together - Phased



Putting It All Together

- ❑ Multiple SDR Receivers, Antennas, Etc.
- ❑ Computer/Software to Do the Work –
- ❑ Build Your Own -- Phase Modeling Software



Summary

- ▣ The next T-Hunt will be hosted by Ron, KJ7PAQ on March 21, 2026 at Centennial Hills Park. The start time will be 9 am with doughnuts and coffee starting at 8:30 am.
- ▣ Comments by T-Hunters in the audience.
- ▣ Questions