

# WCARC Beacons On 33cm & 23cm

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# Why We Have Beacons

- Signal Source to test our equipment including antennas
- Direction Reference for rovers and rotators
- Propagation Indicator for weak signal work
- Telemetry (embedded data)
- Experimentation

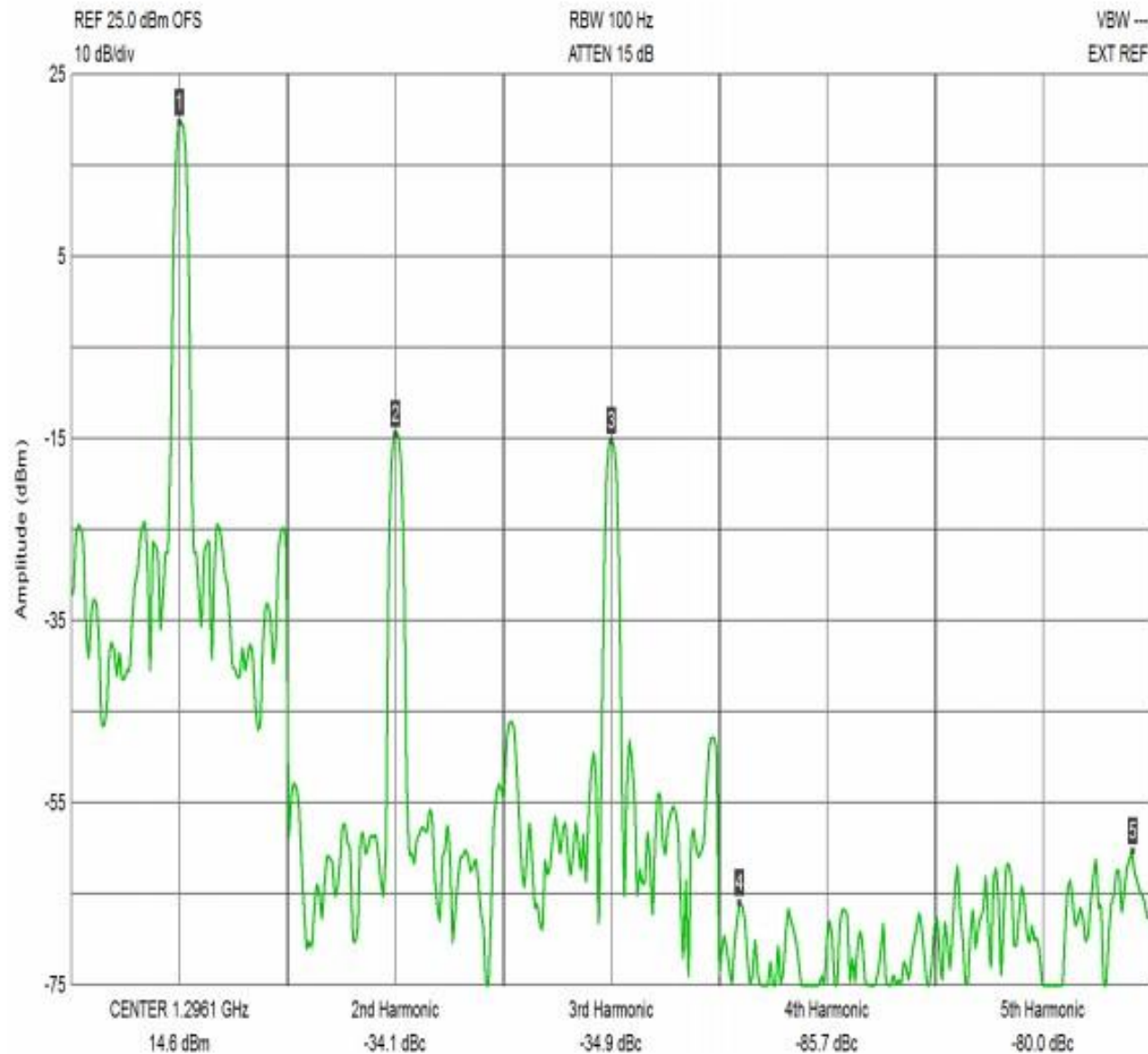
# Characteristics of Beacons

- On High Ground (to be heard)
- Often low RF power output
- Reliable
  - Robust
  - Emergency Powered
- Consistent with Other Beacons
- Identifiable
  - Unique Signature
  - Location Indicator
- Well Documented

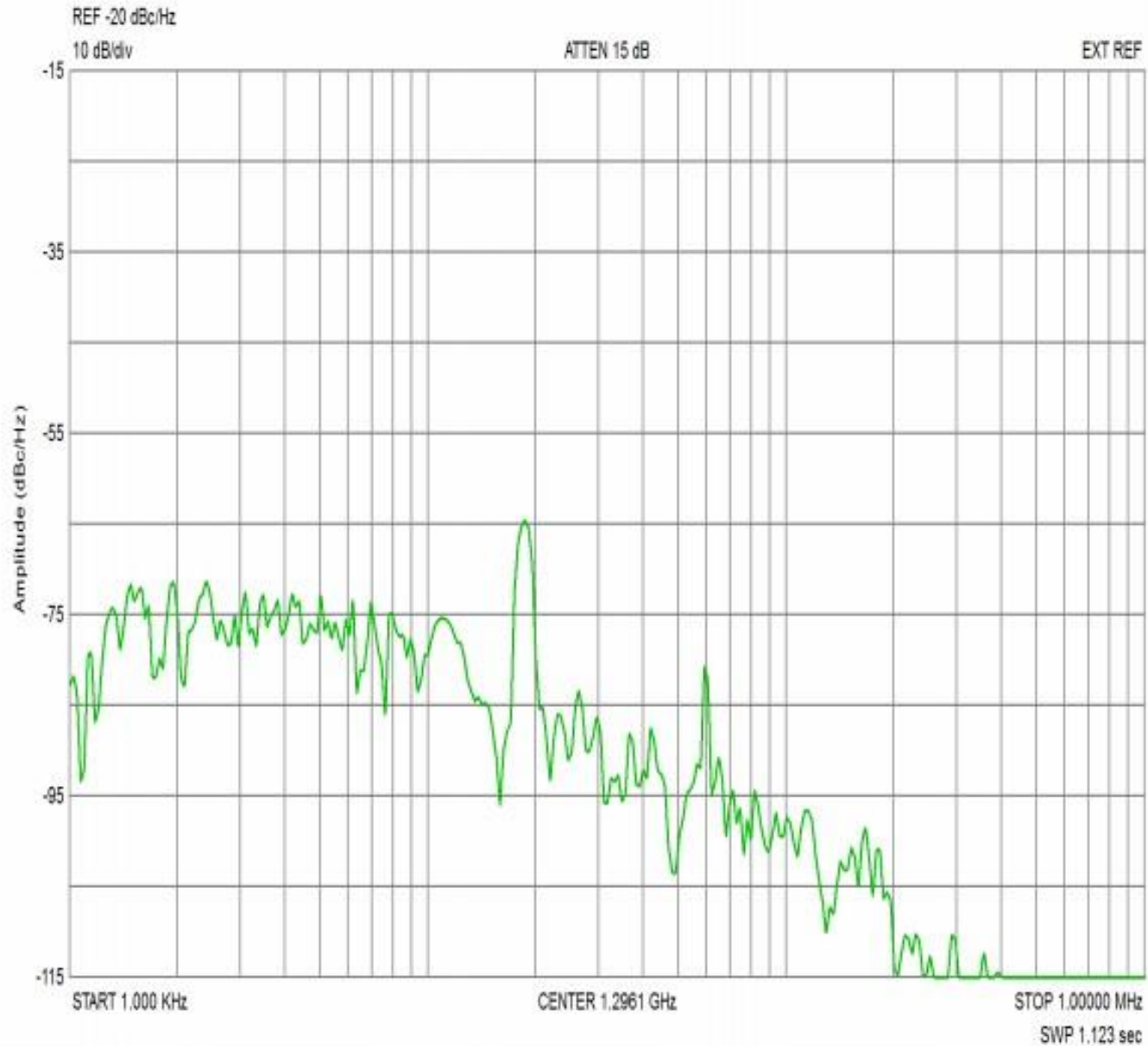
# WCARC Beacons

- Complete modules with keyer, rf module and filtering, custom made and tested by Bruce Shurtz W7BAS for \$130. See <http://www.signalblox.com/Synthesizers.html>
- Keyer code is W7BAS hack of KD7TS work, w/ permission
- Programmable 90 Mhz - 1300 Mhz
- Excellent Phase Noise
- On-Board High Stability TCXO w input for user Ref Osc. 2-26 Mhz (GPS, Rubidium, OXCO etc...)
- +5 to +10 dbm output
- Low-Pass Filtering on output (nice harmonics if filter removed)
- Very small 2" x 2" PCB
- Excellent osc replacement for W1GHZ, DEMI Transverters
- Phase Noise, Power & Harmonic Plots emailed w every unit
- Power requirements 8-20VDC @ 50ma

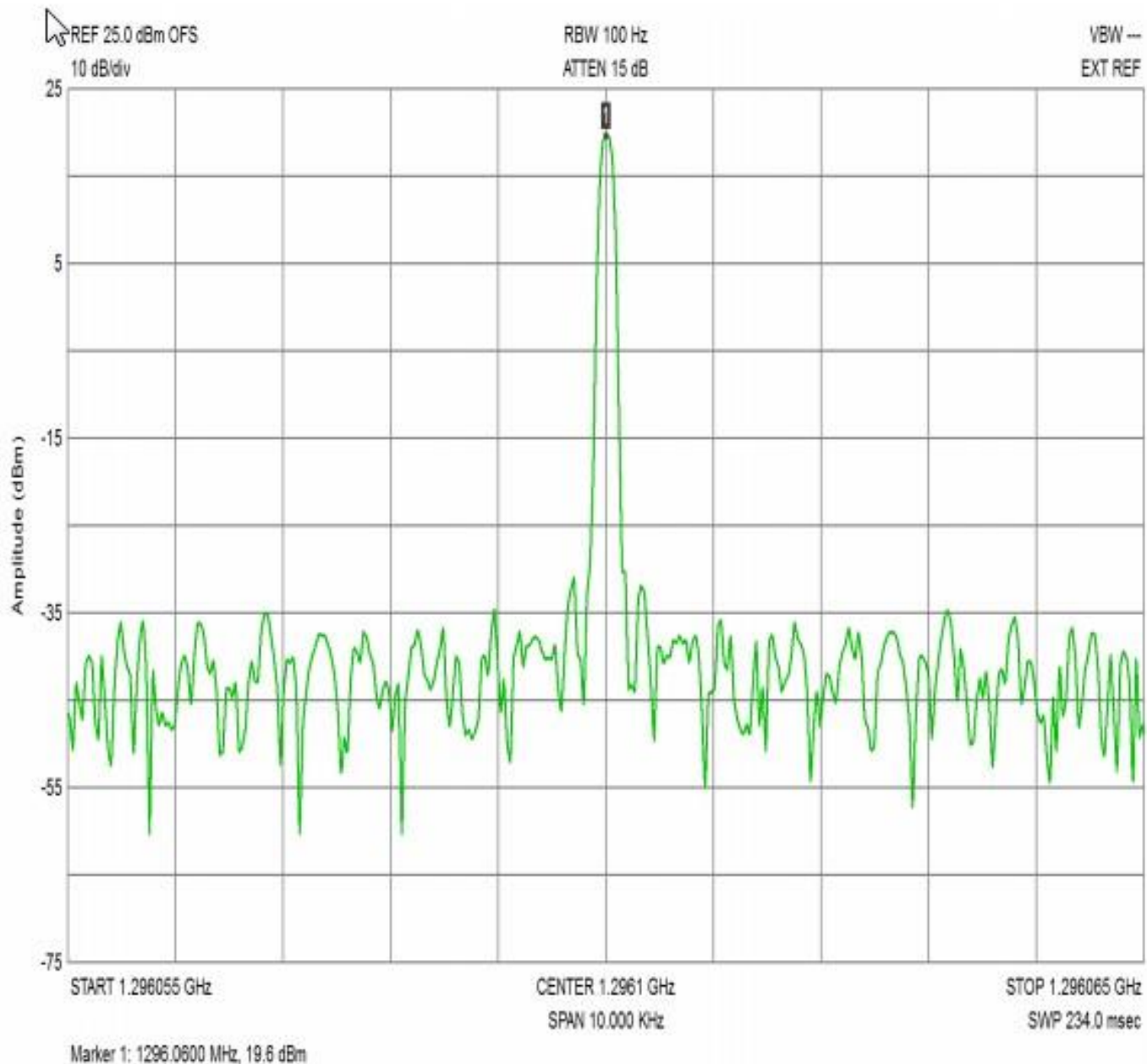
# 1296.060 Module Harmonics



# 1296.060 Module Phase Noise



# 1296.060 Module Power Out

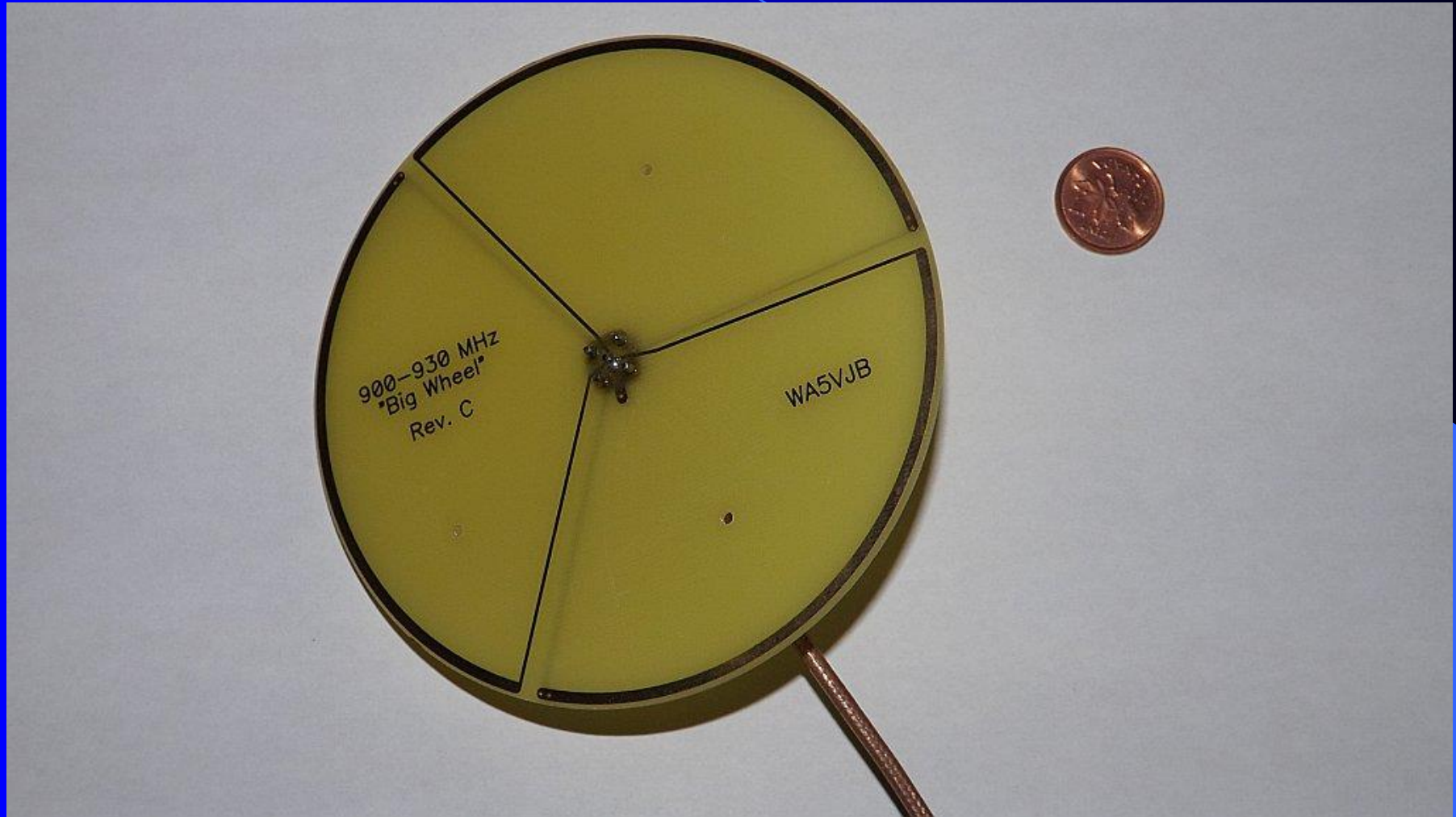


# Big Wheel Antennas

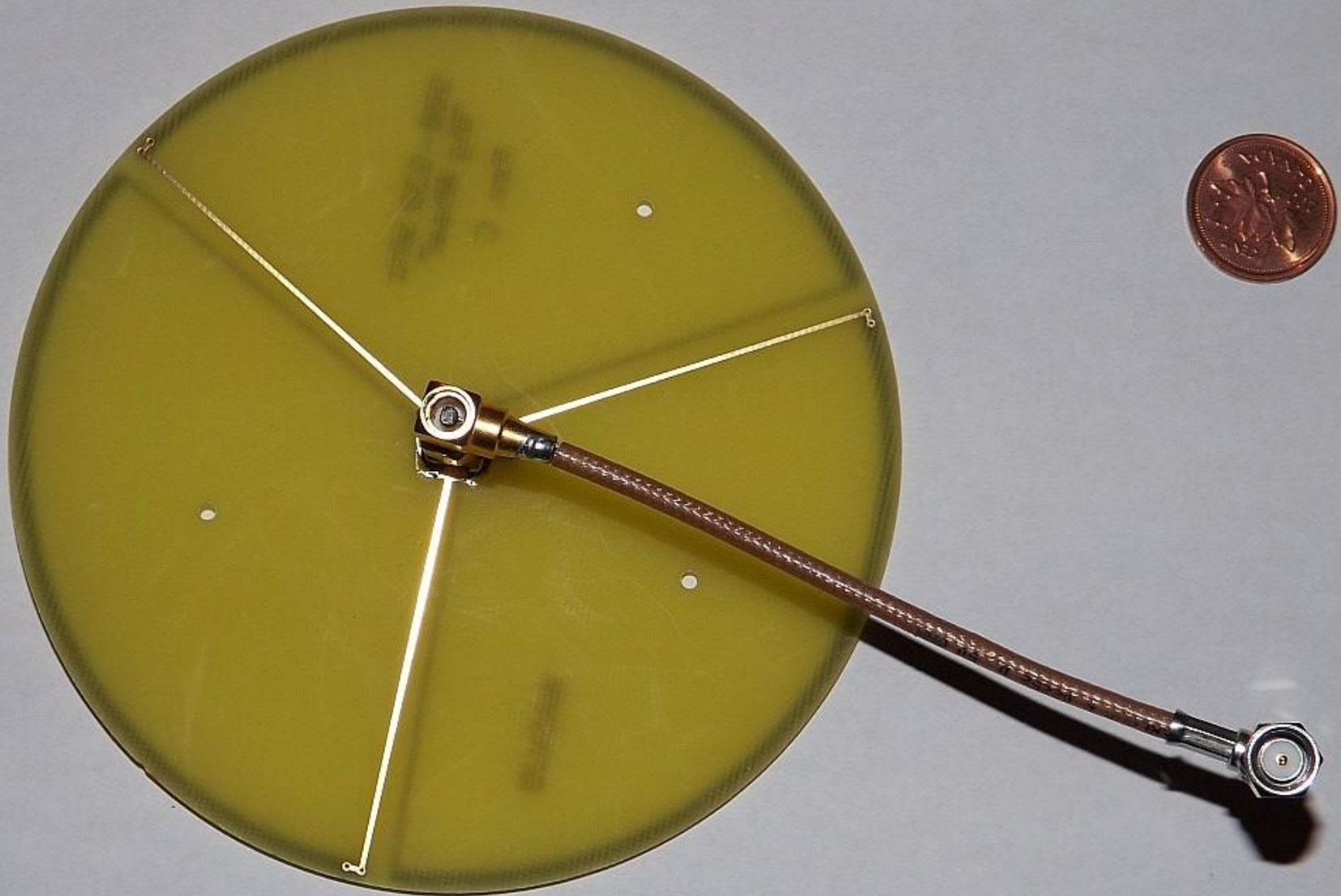
- Called the Big Wheel, or clover leaf antenna because of its shape
- Consists of 3 full wave loops fed in parallel. A single big wheel has a gain of roughly 2-3dBd. Phasing 2 big wheels mounted one above the other will result in a gain (in the horizontal plane) of about 5dBd. This is similar to a small Yagi, but in a full 360 degree pattern.
- See Roger Lapthorn's (G3XBM) QRP site at <https://sites.google.com/site/g3xbmqrp3/antennas/bigwheel>



# Beacon Antenna t – 903MHz



# Beacon Antenna b – 903MHz



# 33cm or 903MHz Beacon

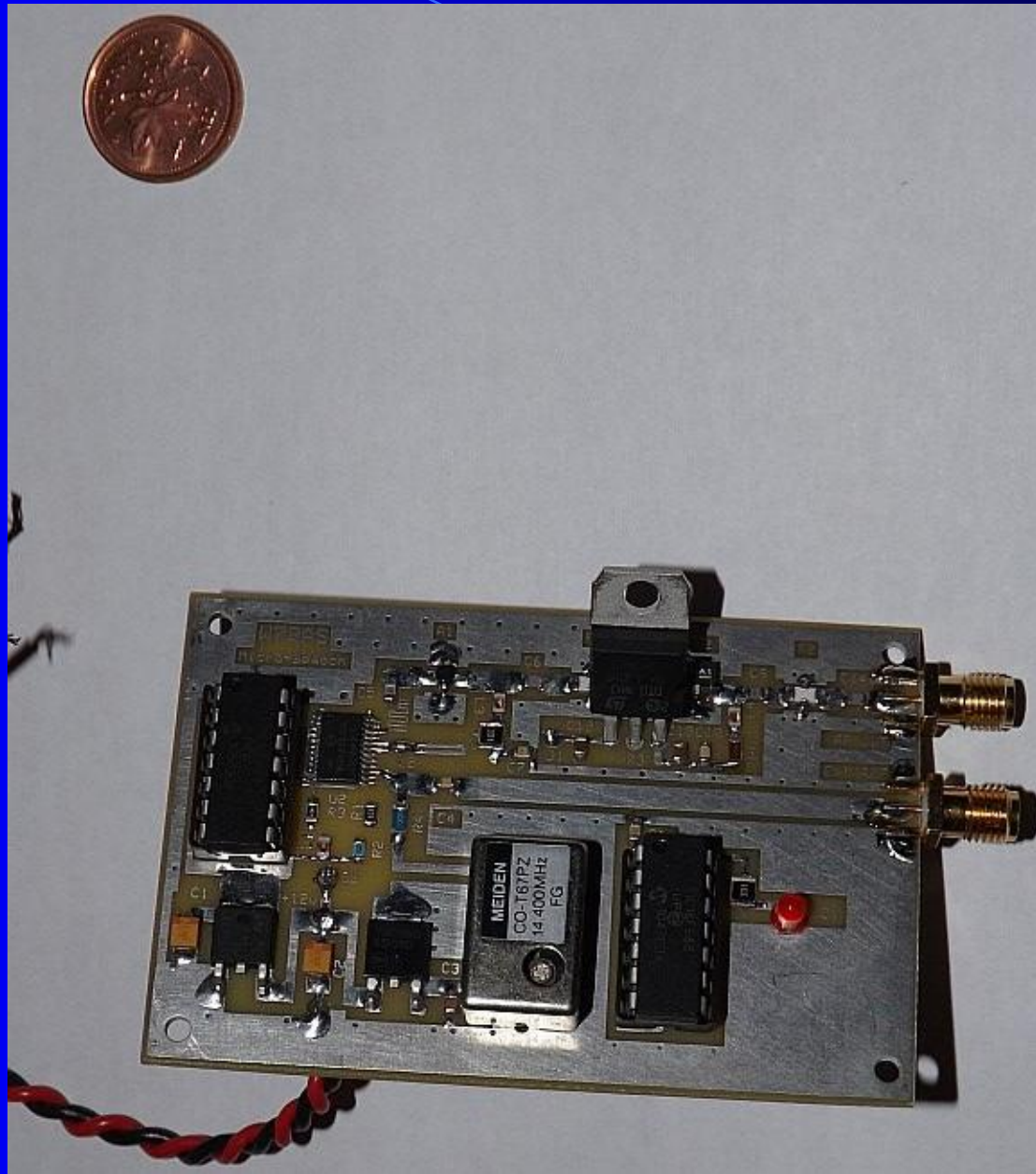
- Frequency is 903.360MHz
- Power is 100mw
- Elevation is approximately 170' AGL
- Transmission Mode is CW:VVV DE VE3WCC IN FN25DJ
- Antenna is a horizontally polarized miniature Big Wheel plated circuit board antenna by Kent Britain (WA5VJB) see <http://www.wa5vjb.com/>
- Antenna gain is about 2 dBd horizontal omni
- Activated March 2013

# 23cm or 1296MHz Beacon

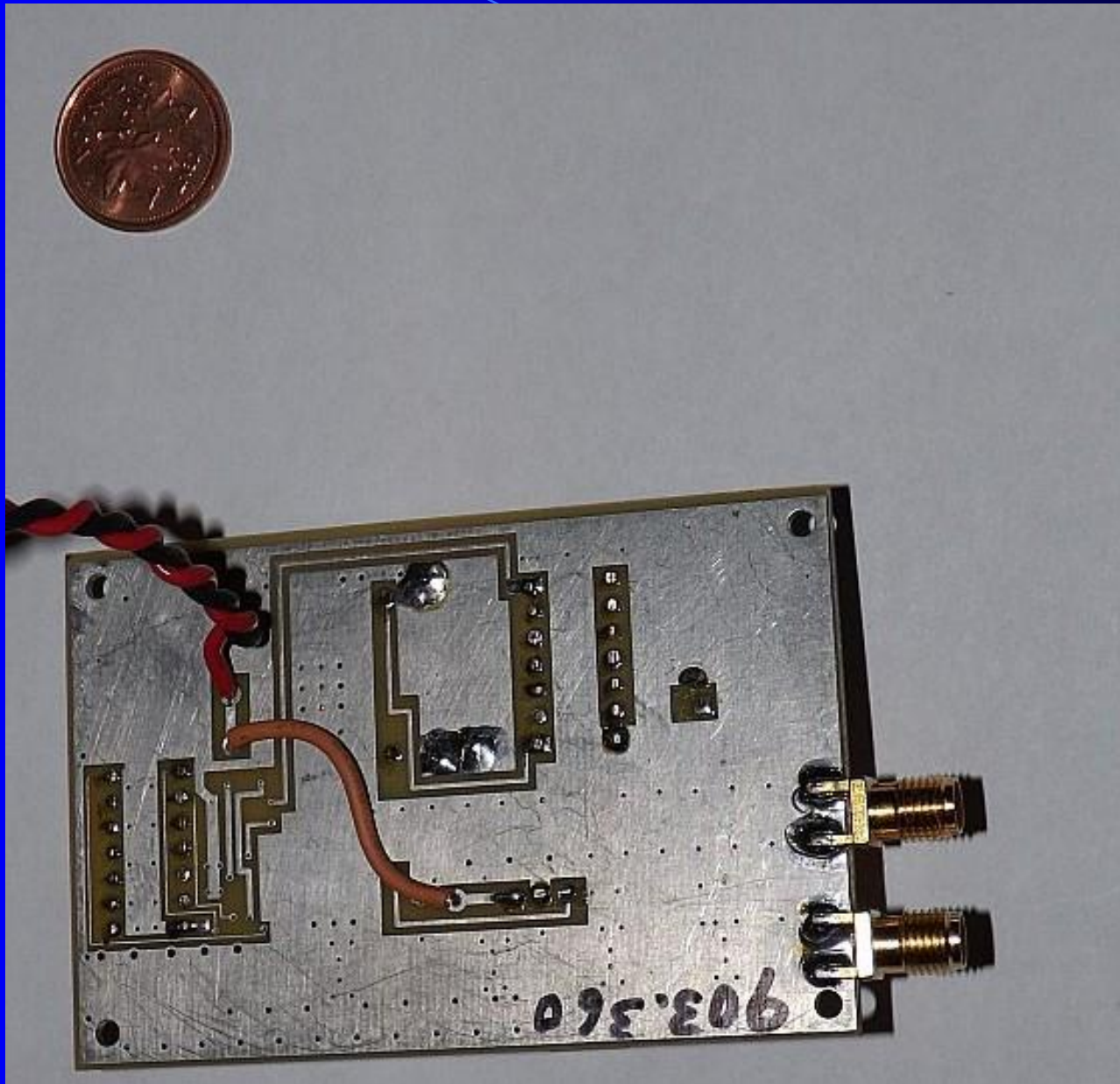
- Frequency is 1296.060MHz
- Power is 100mw
- Elevation is approximately 170' AGL
- Transmission Mode is CW:V V V DE V E 3 W C C I N F N 2 5 D J
- Antenna is a horizontally polarized miniature Big Wheel plated circuit board antenna by Kent Britain (WA5VJB) see <http://www.wa5vjb.com/>
- Antenna gain is about 2 dBd horizontal omni
- Activated March 2013



# Beacon Module t



# Beacon Module b



# More Info

- Both the 903 and 1296 MHz beacons are self contained (except for remote power feed). There is no RF feedline or external antenna.
- Antenna, transmitter and CW encoder are encapsulated in PVC drain pipe
- Suspended on cross-arm attached to D-STAR antenna mast

# How Much Power is Enough?

- These modules are only 100mw. Small solid state PA modules can be added to the package. This adds complexity, filtering requirements and cost.
- I can hear them adequately at my QTH in Cumberland (FN25hm)
- No other reports received to date.
- No official requests for increased power.
- Low activity level on these bands (unfortunately)



# Beacon Encapsulation 1



# Beacon Encapsulation 2



# Beacon Encapsulation 3





# Beacon Cross Arm 1



# Beacon Cross Arm 2





# The View From the Y



73 de  
Rick (VE3CVG)