

# A VHF AND UHF STEALTH ANTENNA SYSTEM FOR THOSE WHO LIVE IN HOA'S



(AND IF YOU LIKE YOUR SATELLITE SERVICE YOU CAN KEEP YOUR SATELLITE SERVICE)

By N5CEY

30 April 2016

**March 2016 issue of QST had the  
following article:**

**“An Efficient 2 Meter Antenna Disguised as a TV  
Satellite Dish”.**

**Pages 37 and 38**

**By John Portune, W6NBC**

**I give all credit for this seminar to Mr. Portune.**

**I simply followed his instructions and it  
worked very well.**

**I also carried through with a 440 mhz version.**

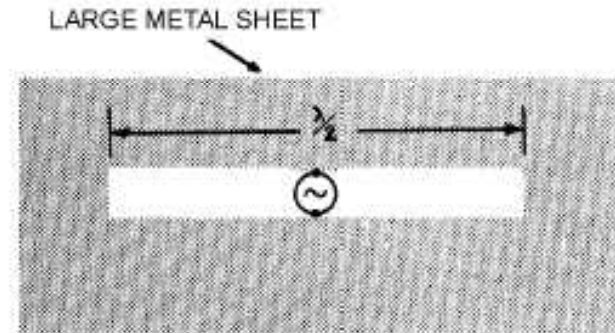
# A bit about Slot Antennas

- **What is a slot antenna? A *slot antenna* consists of a metal surface, usually a flat plate, with a hole or *slot* cut out.**
- **Where are slot antennas commonly used? Slot antennas are very commonly used on commercial and military aircraft because they can be easily molded into the structure of the aircraft. Also used in cell phone towers at microwave frequencies**
- **What frequencies are slot antennas commonly used at? Typically, slot antennas are used at 300 Mhz and above.**

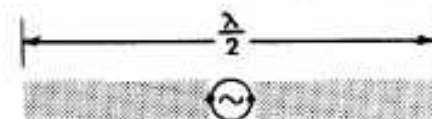
# Some typical slot antennas



Look Familiar?



SLOT ANTENNA



COMPLIMENTARY DIPOLE

FI03018

Comparison with dipole

# The Sacrificial Lamb

Provided by N5RGV



**28" Dish Network dish in pretty fair condition**

# Dish as received

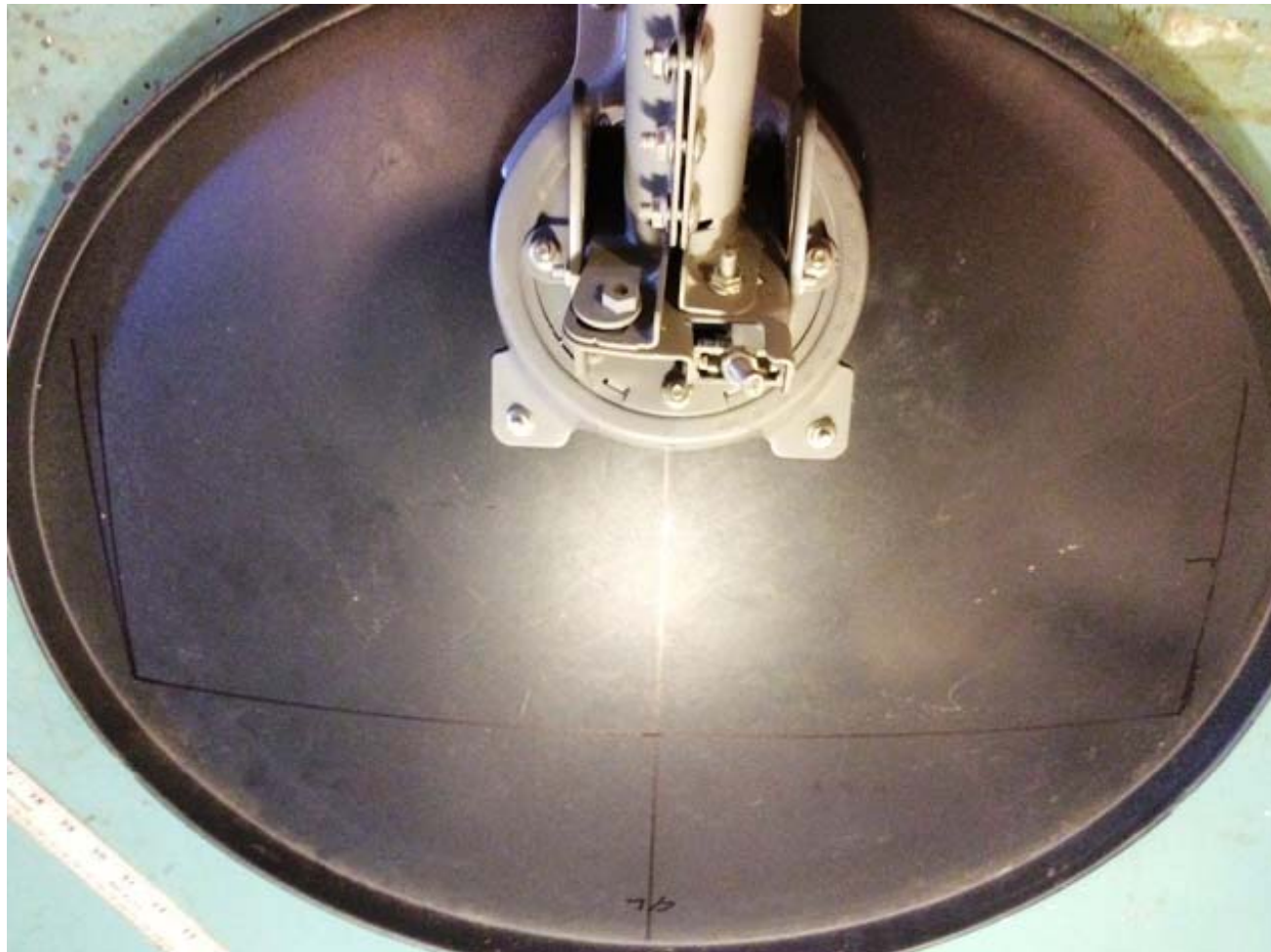
Cleaned out all the roaches!



Funny Orange Coax

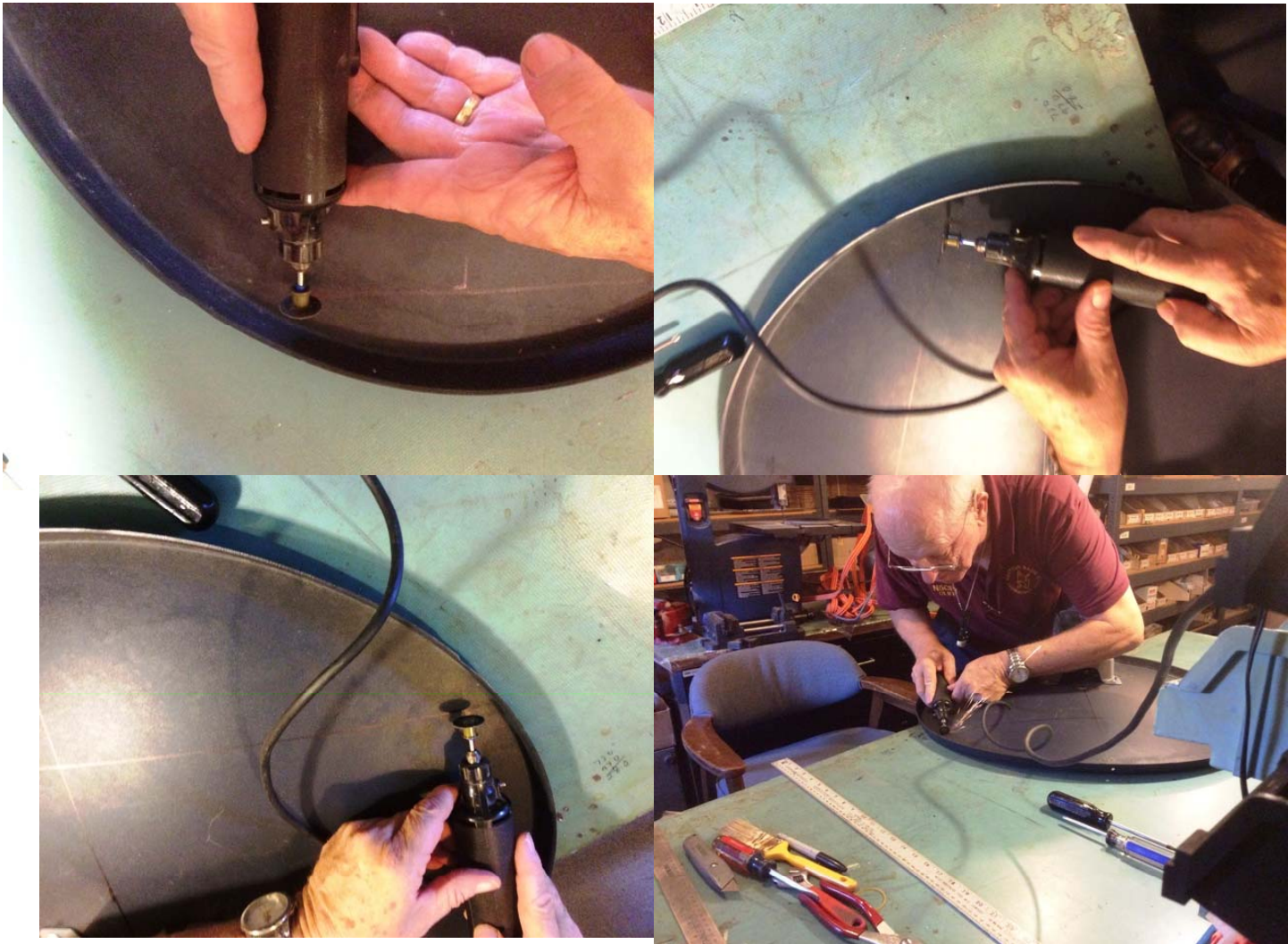


**Laying out the slot, 24" long and 7.5" tails**



**DESIGN FREQUENCY: 146.00 MHZ**

**USING A DREMEL CUTOFF WHEEL TO MAKE CORNER CUTS FOR SABER SAW  
INSERTION**





# More corner notches



**Where's your safety glasses???**

**DREMELS are your friend!**

# Cutting the slot



**USE A SHARP, METAL CUTTING SABER SAW BLADE AND TAKE YOUR TIME**

# Checking Dimensions



**24" LONG AND THE "TAILS" ARE 7.5" LONG**

# Slot cut, Dish is unstable (physically)



**Very Unstable!**

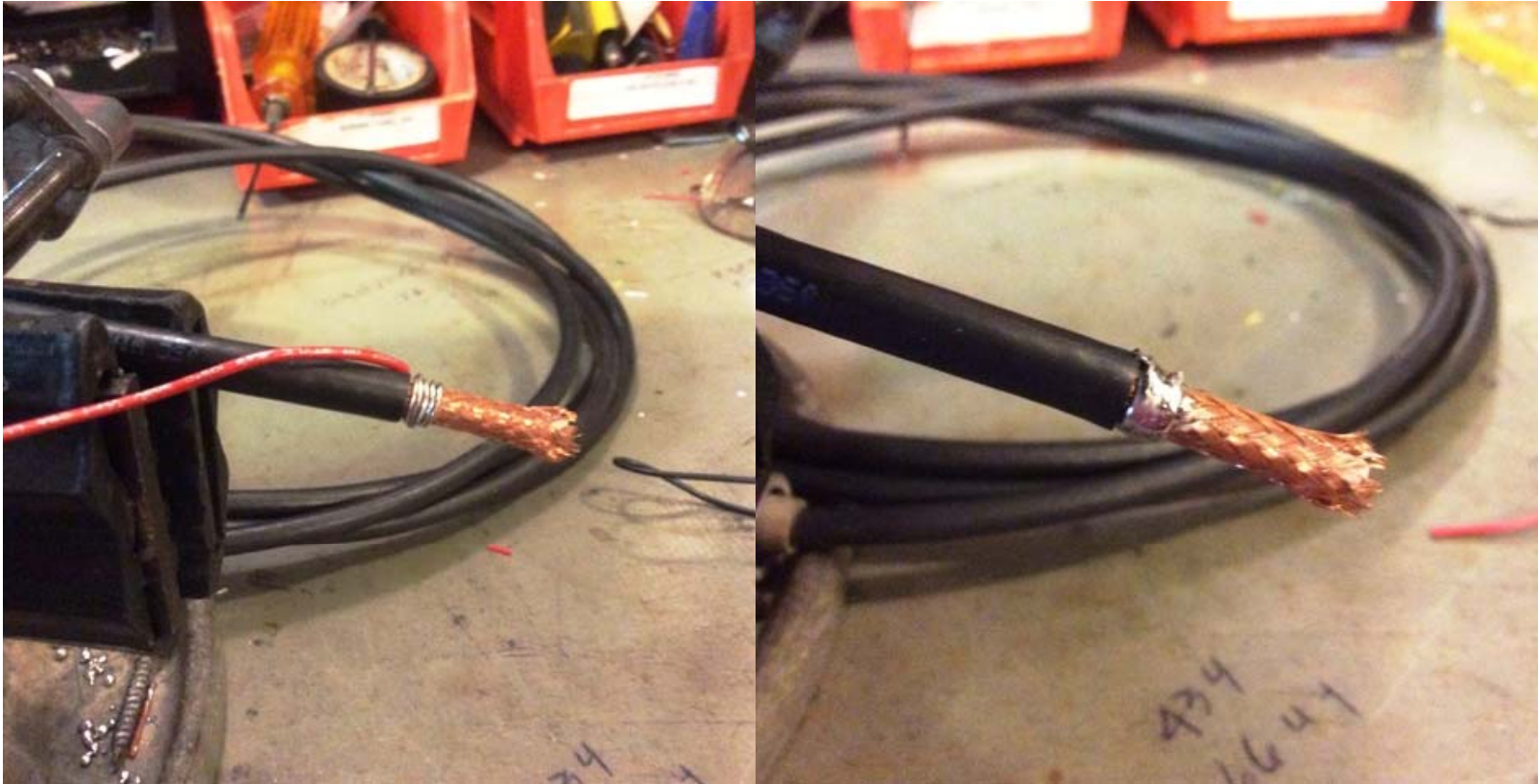


# Aha! 5 minute Epoxy!

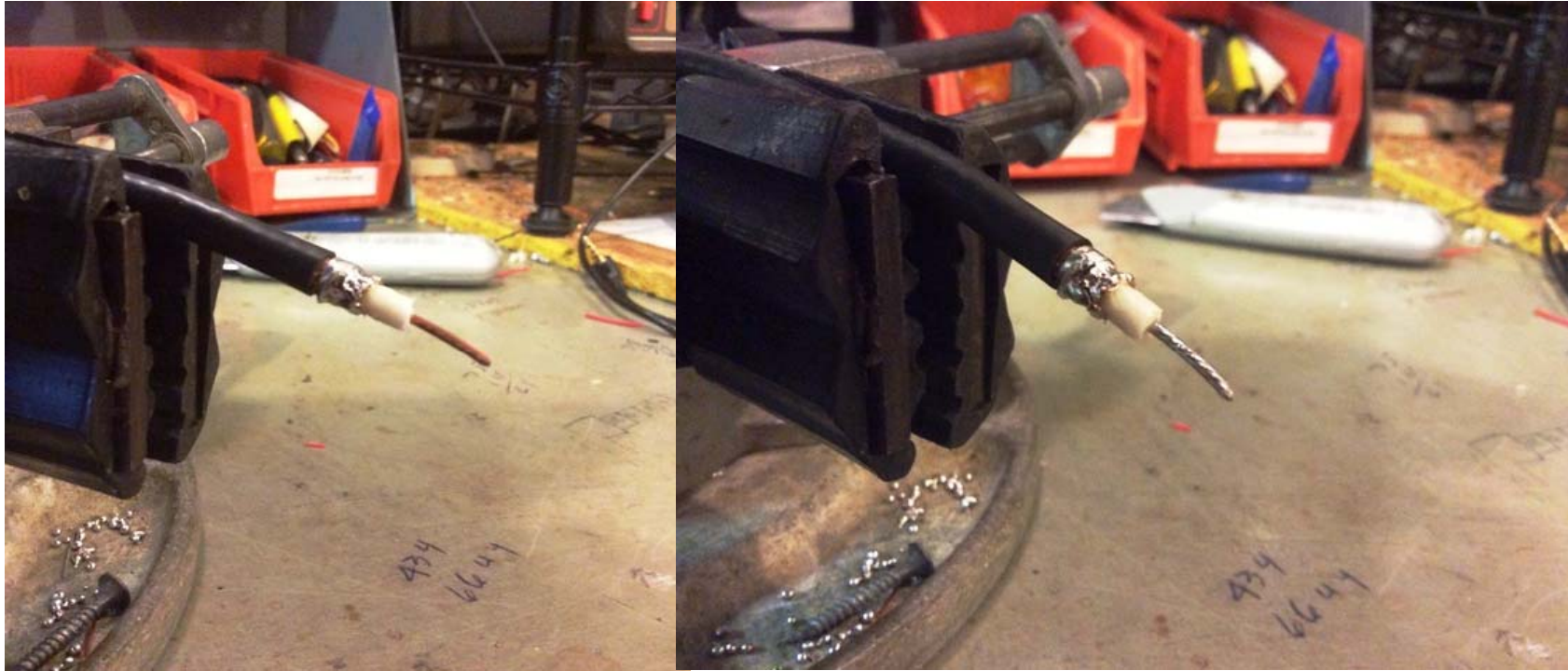


Taped across the slot on the front side and epoxied across the slot on the back. Allowed the epoxy to cure over night. Really tightened things up!

# Preparing the Coax Feed (RG-8X)



# Preparing the Coax Feed(cont.)





# Attaching the feedline



**Feed point is 0.05 wavelength from the end.  
Use  $(936/F) \cdot .6$  for distance in inches.**

**Game time! Check it out!**



**Oh Crap! That's nowhere near right!**

**You can shorten the slot with aluminum tape!**



**But not enough in this case!**

# Success!

(got rid of the Epoxy, it was acting like a capacitor!)



**Took about an hour to grind all that darned epoxy off!  
Had to add a support to keep it stable**

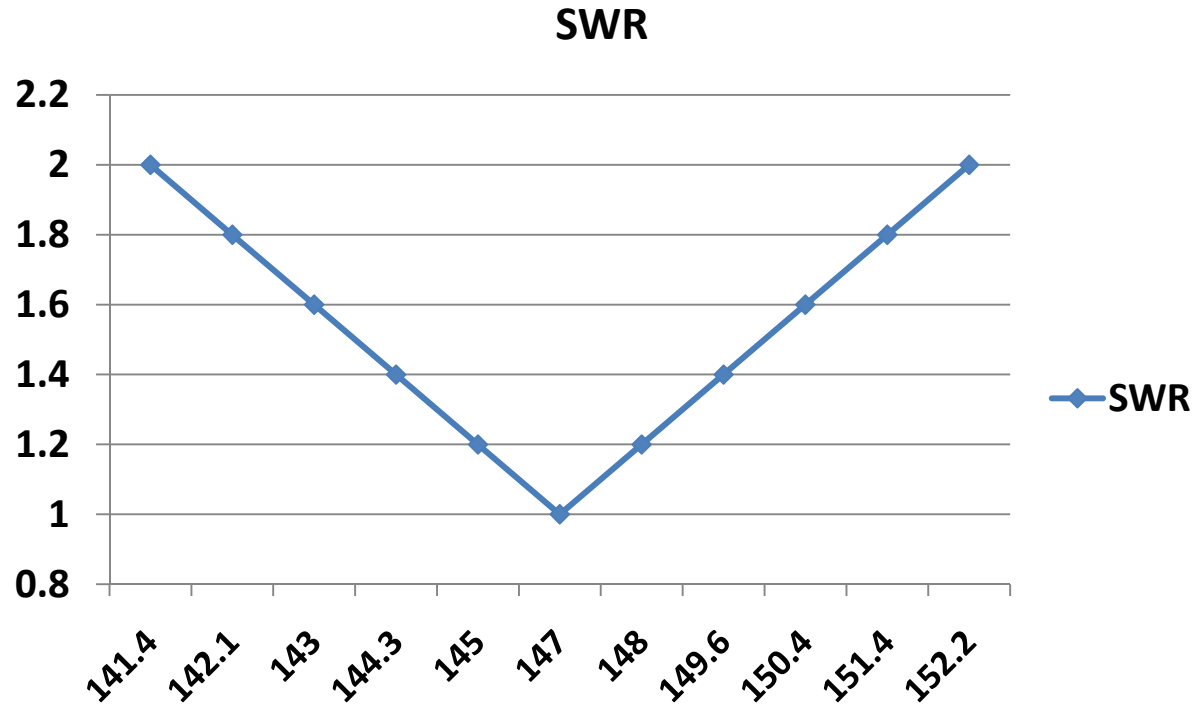
# 2:1 SWR points



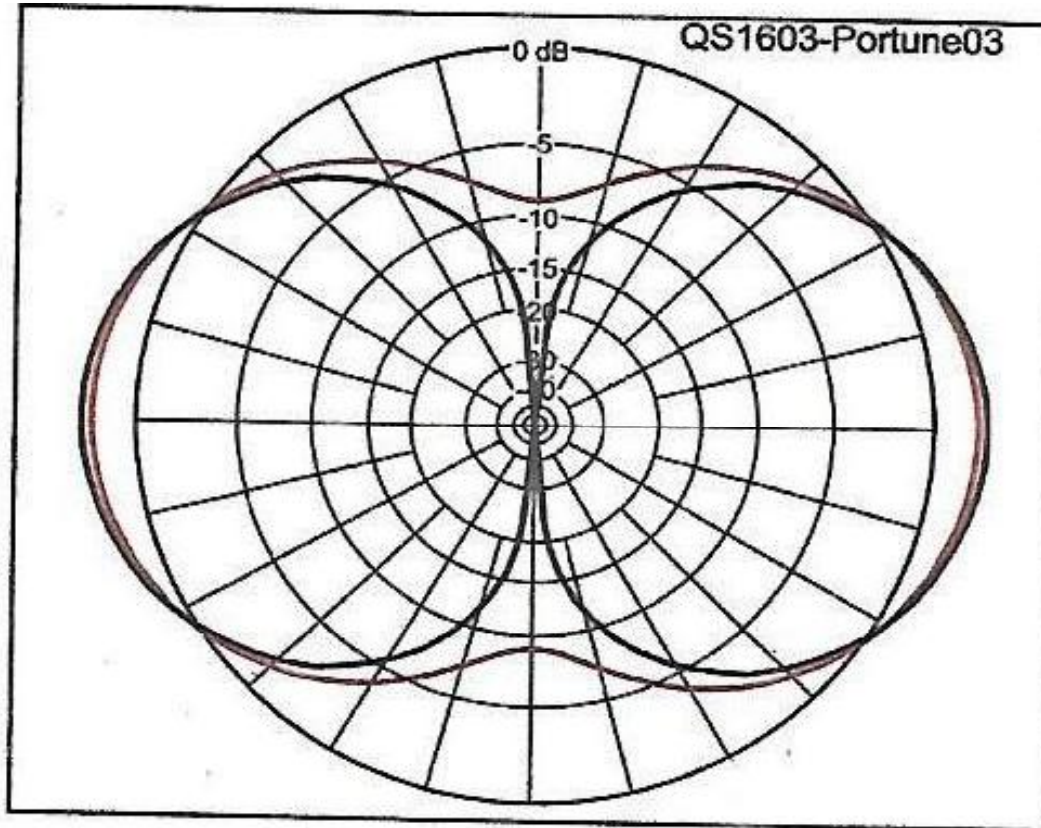
**Bandwidth is 10 MHz wide at 2:1 SWR**

# SWR PLOT

FREQ	SWR
141.36	2
142.1	1.8
143.01	1.6
144.27	1.4
145.01	1.2
147	1
148.04	1.2
149.56	1.4
150.42	1.6
151.43	1.8
152.24	2



# Radiation Pattern



**Figure 3** — Elevation radiation patterns for a vertical wire simulation of the bent slot (red) and a straight slot (black). The peak gains are 1.9 dBi and 2.1 dBi, respectively.

# FINISHED 2 METER ANTENNA





# 440 MHZ DISH



# Rear View, 440 Mhz



# Feed Line attachment



**Feed point is 0.05 wavelength from the end.  
Use  $(936/F)*.6$  for distance in inches.**



**444.875 SWR**



**449.875 SWR**



# Conclusion and Notes

- Slot antennas are vertically polarized when the slot is horizontal.
- Use  $(468/F)*12$  to determine the length of the slot in inches
- Feed point is 0.05 wavelength from the end. Use  $(936/F)*.6$  for distance in inches
- The slot only needs to be the width of the saber saw blade thickness
- 2 meter slot antennas need a minimum dish size of 28 inches
- 440 mhz slot antennas need a minimum dish size of 16 inches
- The slot antennas exhibit very good bandwidth i.e. the 2 meter antenna is 10mhz wide at 2:1 SWR points.

# Conclusion and notes (cont.)

- **Don't throw that old Dish Network antenna away, someone in an HOA can use it for either 2 meters or 440.**
- **Raw materials are very inexpensive, and many times free**
- **They have about 2dbi gain, nothing to crow about, but better than nothing.**
- **You can make a slot antenna out of any flat surface that is large enough to "fit" the slot. A large cookie sheet for example would work well (but look kind of funny).**
- **Thanks for coming, it was fun and educational building these antennas.**
- **Final Surprise Ending: All three of these antennas are going to be raffled off today so be sure to check your tickets!**