

**2m-70cm**

**Satellite Dish**

**SLOT Antenna**



*Wondered ....*

**Could I hide  
my 2-meter base  
antenna in a  
TV satellite dish?**

**My CC&R committee  
couldn't  
make me take it down**

FCC: 47 C.F.R. Section 1.4000, 1996,  
prohibits restrictions... satellite dishes less  
than one meter (39 in.) in diameter...

But wouldn't the  
**Don't fight the metal,**  
metal in a TV dish  
**cut a slot antenna**  
compromise  
**in the reflector**  
a 2-meter antenna?

# An Efficient 2 Meter Antenna Disguised as a TV Satellite Dish

**This vertically polarized horizontal slot antenna, cut into the reflector of a TV dish, might be the ultimate stealth antenna.**

John Portune, W6NBC

I've long wondered if it would be practical to hide an efficient 2 meter base-station antenna in a TV satellite dish. My homeowners covenants, conditions, and restrictions (CC&R) committee couldn't force me to take it down.<sup>1</sup> But would all the metal in the TV dish compromise a 2 meter antenna? Finally, it struck me: don't fight the metal, take advantage of it, by cutting a half-wavelength long slot antenna into the TV dish reflector.

A slot antenna is a narrow rectangular opening in a large conductive surface, such as a TV satellite dish. Slot antennas are familiar in the commercial radio world. They're common in TV broadcasting, the skin of aircraft, and in radar, microwave, and cell phone applications. This TV dish (see Figure 1) slot is the complement to a dipole. It is also a great way to learn about slot antennas.



Figure 1 — Note the low visibility of the slot in my modified satellite TV dish.

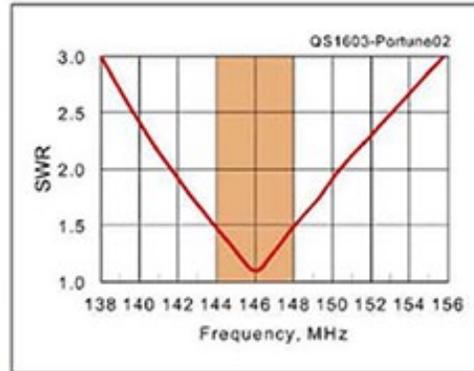
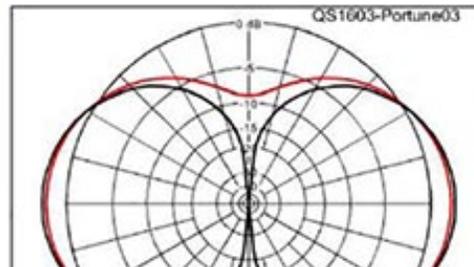


Figure 2 — Bandwidth of a single-saw-blade-cut TV dish slot antenna.



## Slot Antennas For Ham Radio

John Portune W6NBC

24 in.



DIRECTV

7.5 in.

7.5 in.



*Slimline*





**Slot**

**A reader's version**

# **What is a Slot Antenna**

**Mystery to many  
hams**

# Never Popular in Ham Radio

1938

Mainstay of  
TV VHF  
Broadcasting



Stealth

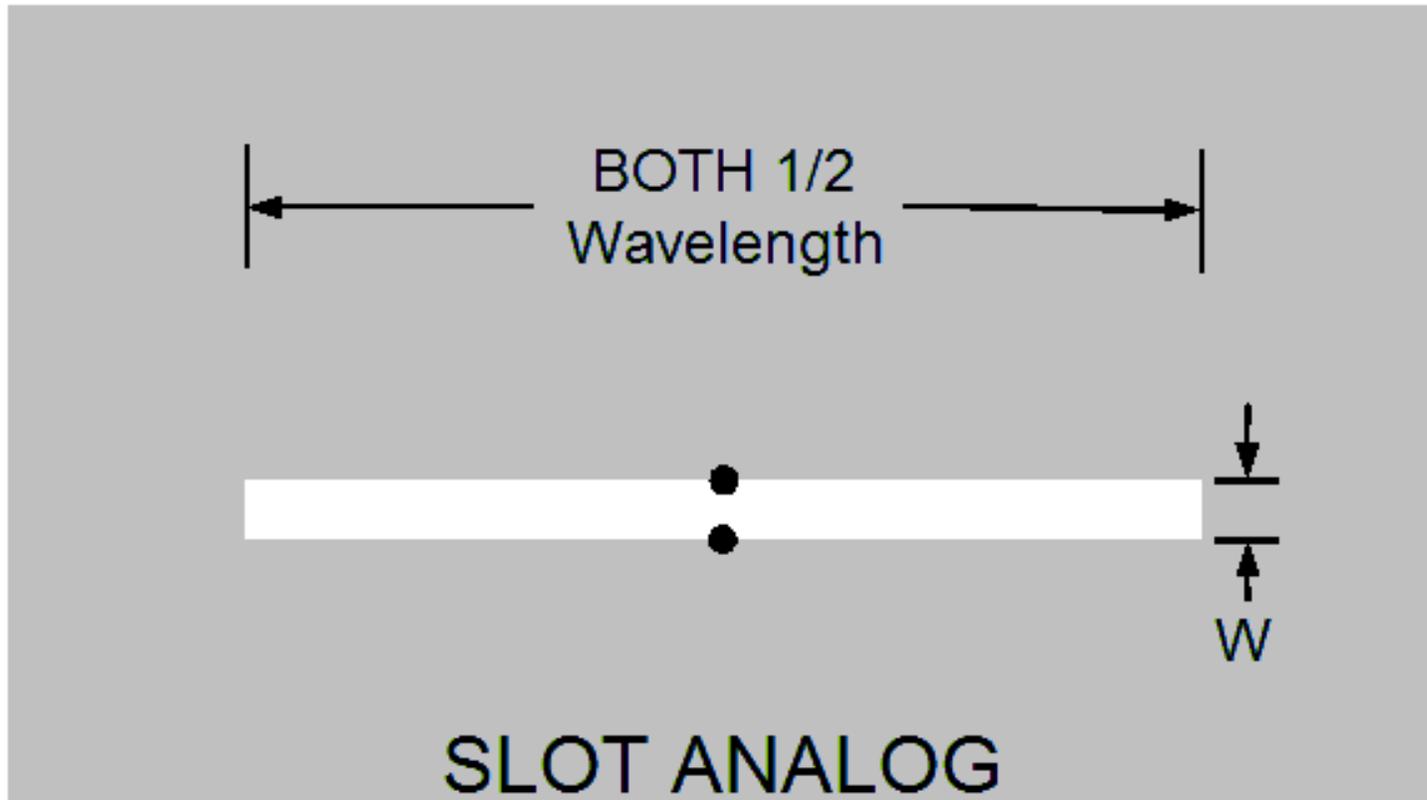


Aviation



I can't believe  
you're still using  
rabbit ears

**W6NBC**



# Common Explanation

# **A Slot is Like a Dipole**

**Same Gain**

**Roughly 2.1 dBi, Free Space**

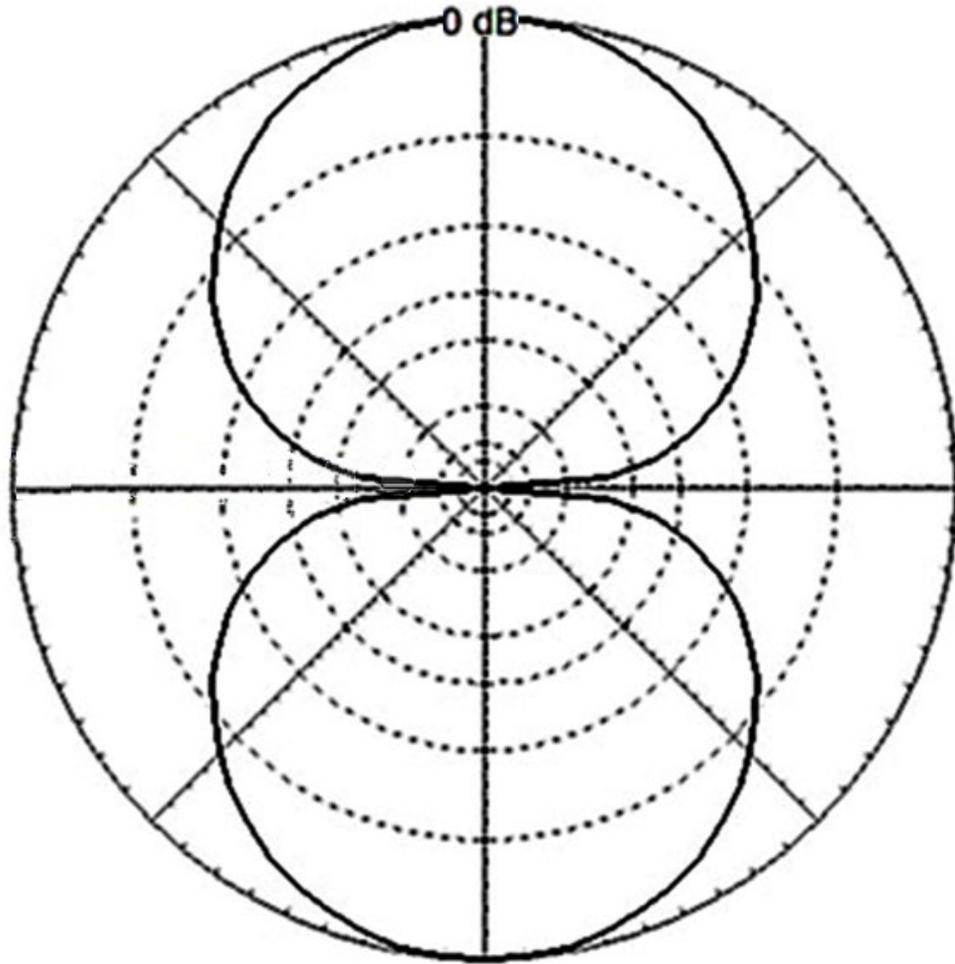
**Similar Bandwidth**

**Width of slot or wires**

# **A Slot is Like a Dipole**

**Same Directivity**

**Classic dipole donut  
(in Free Space)**



# **Pattern of Horizontal Dipole and Slot**

**Difference -- Dipole**

**Polarization is 90° Rotated**

**Horizontal slot – vertically  
polarized**

**Ideal for dish slot**

# Another Difference

Impedances are Reversed

DIPOLE – low middle -- high ends

SLOT – high middle -- low end

Fed near either end

# A Further Difference

- Dipole – series fed
- Slot – shunt fed



**I Wanted  
to "grok"**

**Slots**

# Discovery

- **Slot width not critical**
- **Plane width not critical**
  - **Skeleton Slot -- Hentenna**
  - **Double Inverted Delta Slot**

# Biggest Discovery

- How a **hole** in a metal plane can transmit?



**FEED POINT** **HORIZONTALLY POLARIZED**

ONE WAVELENGTH WIRE (QUAD) LOOP

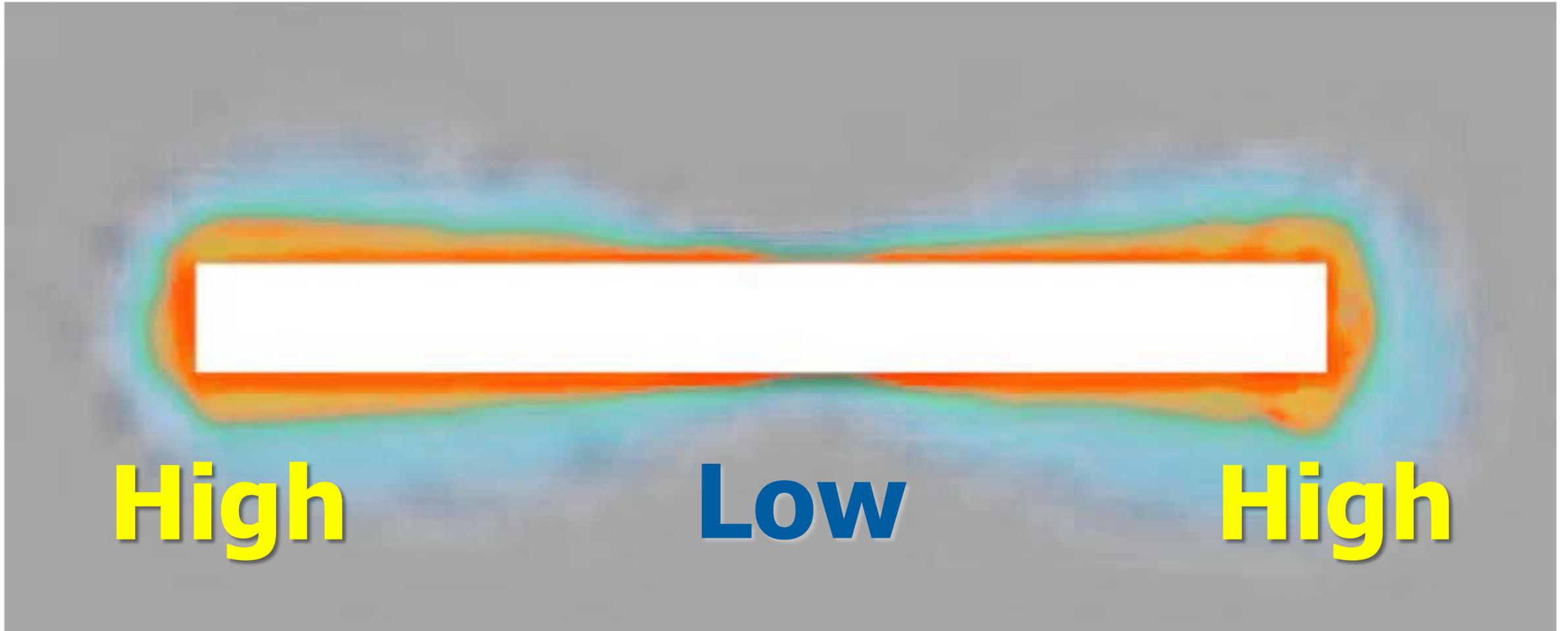


FOLDED DIPOLE



HALF WAVELENGTH SLOT ANTENNA

# Current Around a Slot Antenna



# TV Dish Slot Construction

24 in.

DIRECTV

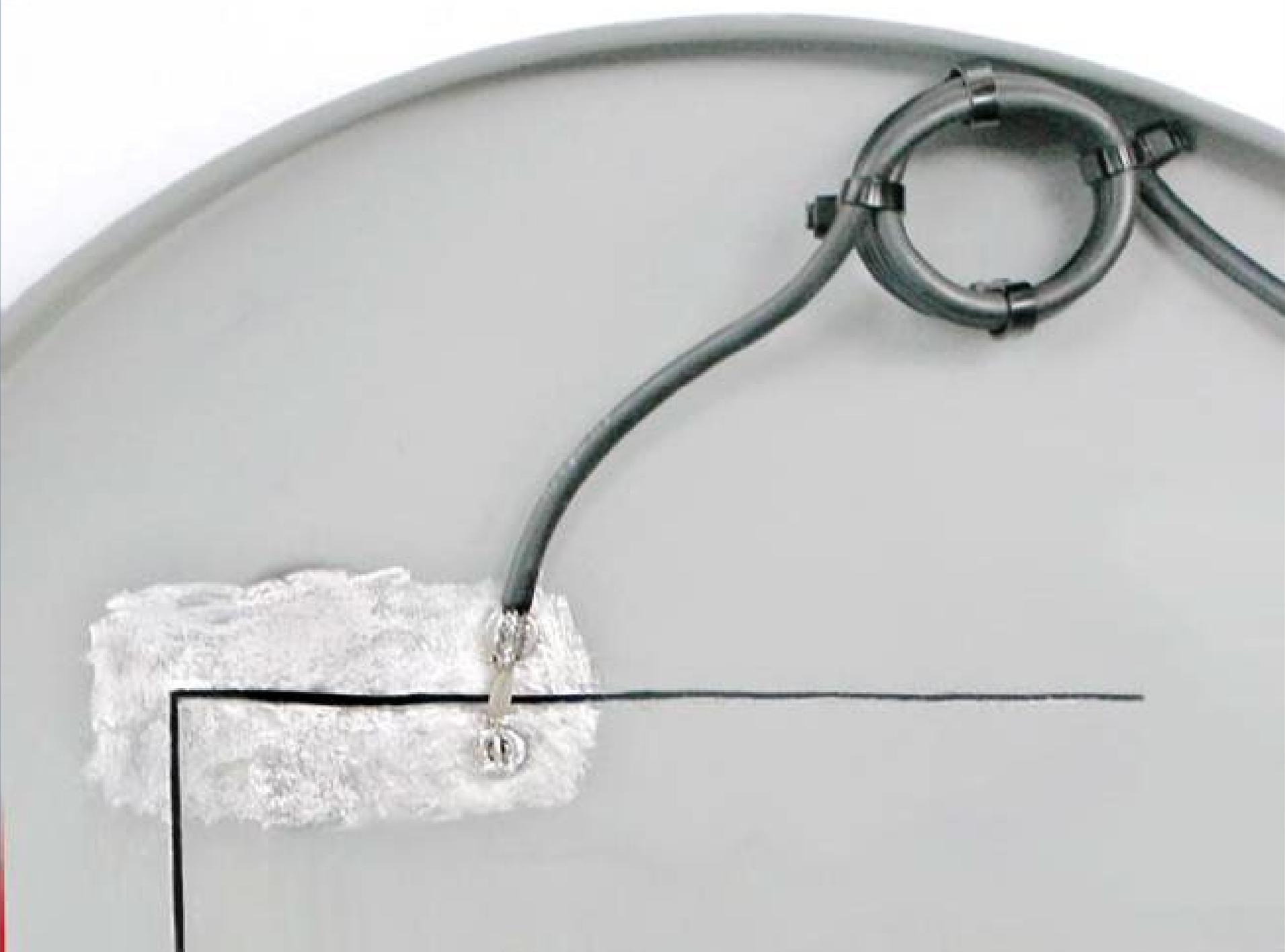
7.5 in.

7.5 in.

*Slimline*

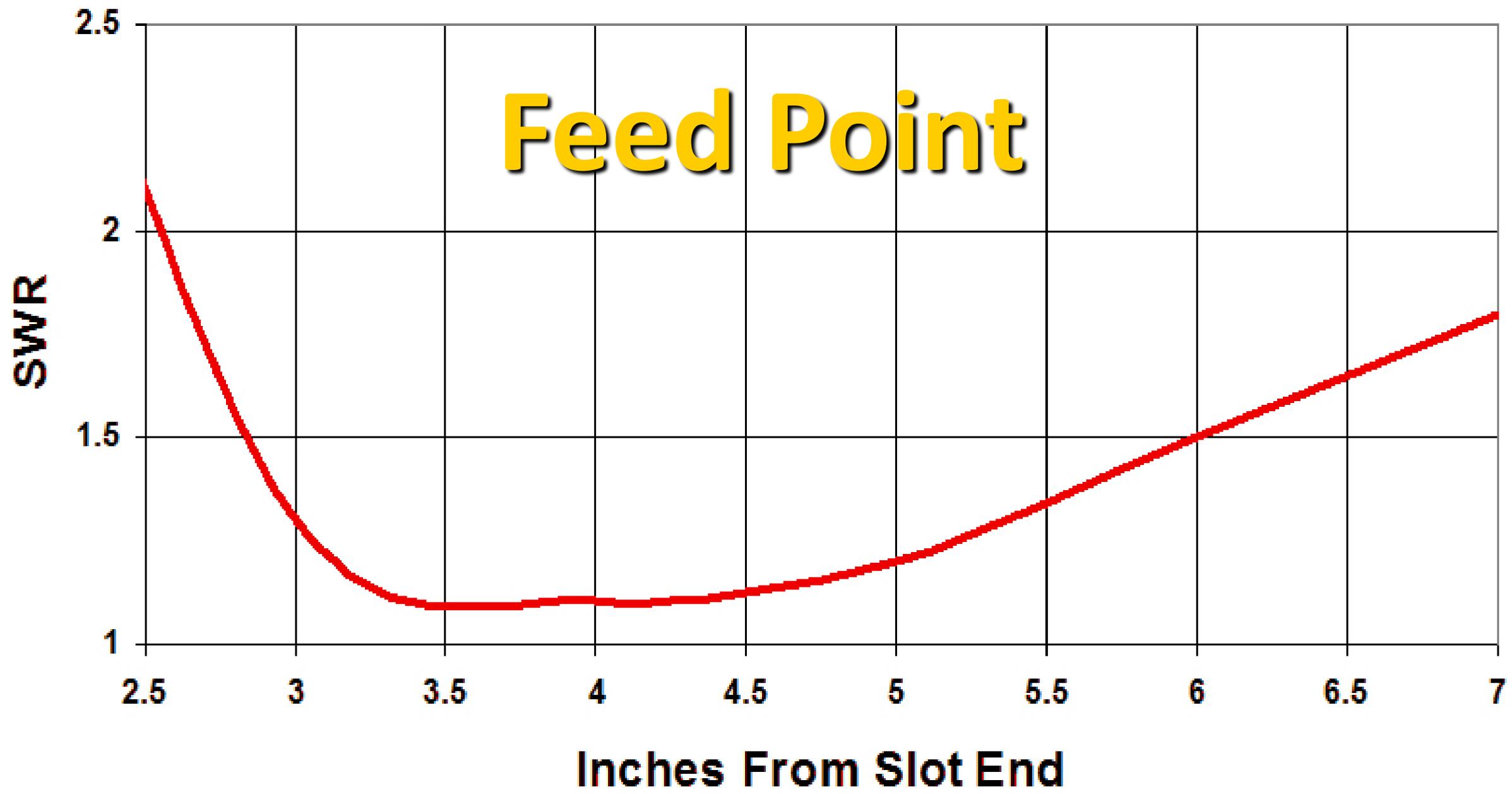
39 in. total

**Feed**





# Feed Point



**Replace with drill and tap**



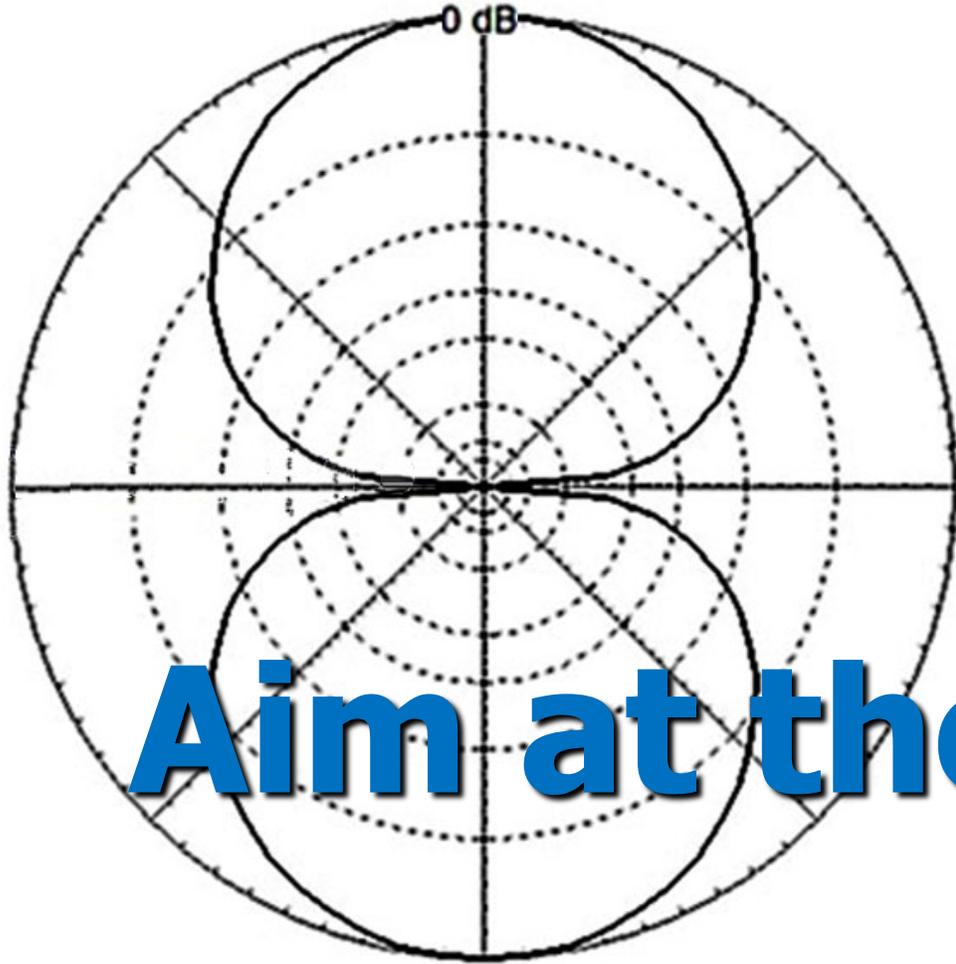
**Tuning  
Paint Okay**

**1:1  
current  
balun**



**LNB  
Assembly**

**Non-  
resonant**



**Aim at the repeater**

**But aim high, as if you're  
Receiving satellite TV**

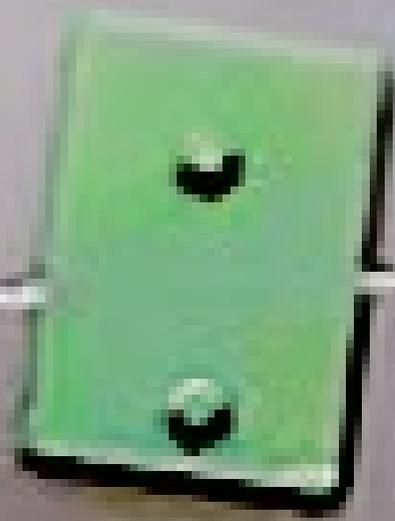
# 2-meters & 70cm

- On 3<sup>rd</sup> harmonic – pattern?
- Okay to cut 2 slots
- AI6MS Marcell Stieber
- Diplexer, stubs, two feeds



# Brace on Back

- **Nylon bar stock**
- **Plastic handle**
- **Roughly 1-2 in. long**
- **6-32 screws**



# Leave Slot Open

- **No dielectric**
- **No Tape or Filler**
- **Okay to paint the cut edges**

# One Dish for Both?

- **Impractical**
- **2m TX, TV front end**
- **Slot vs TV directivity**



**“I’m coming to  
you through my  
TV satellite dish.”**



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gmail.com](mailto:w6nbcmail@gmail.com)  
[w6nbc.com](http://w6nbc.com)

**DØGGY**



*"That's all Folks!"*