






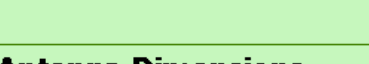




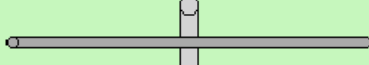







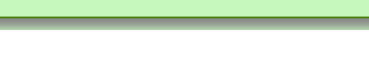

W3FT BARC YAGI FUN 70 cm and 33 cm ver 0.1 draft

920 MHz 33 cm Center for Meshtastic mesh network

Foam Board as structure 24 x 30, conductive copper foil with conductive adhesive 1 inch wide

Antenna Dimensions			US/Imperial	Metric
Cumulative Spacing	Element	Element Length		
Zero	REFL		156.95	
65.17	D.E.		152.4	
89.61	D1		133.86	
148.27	D2		131.61	
218.33	D3		129.39	
299.79	D4		127.37	
391.03	D5		125.62	
488.79	D6		124.12	
591.44	D7		122.83	
698.97	D8		121.7	

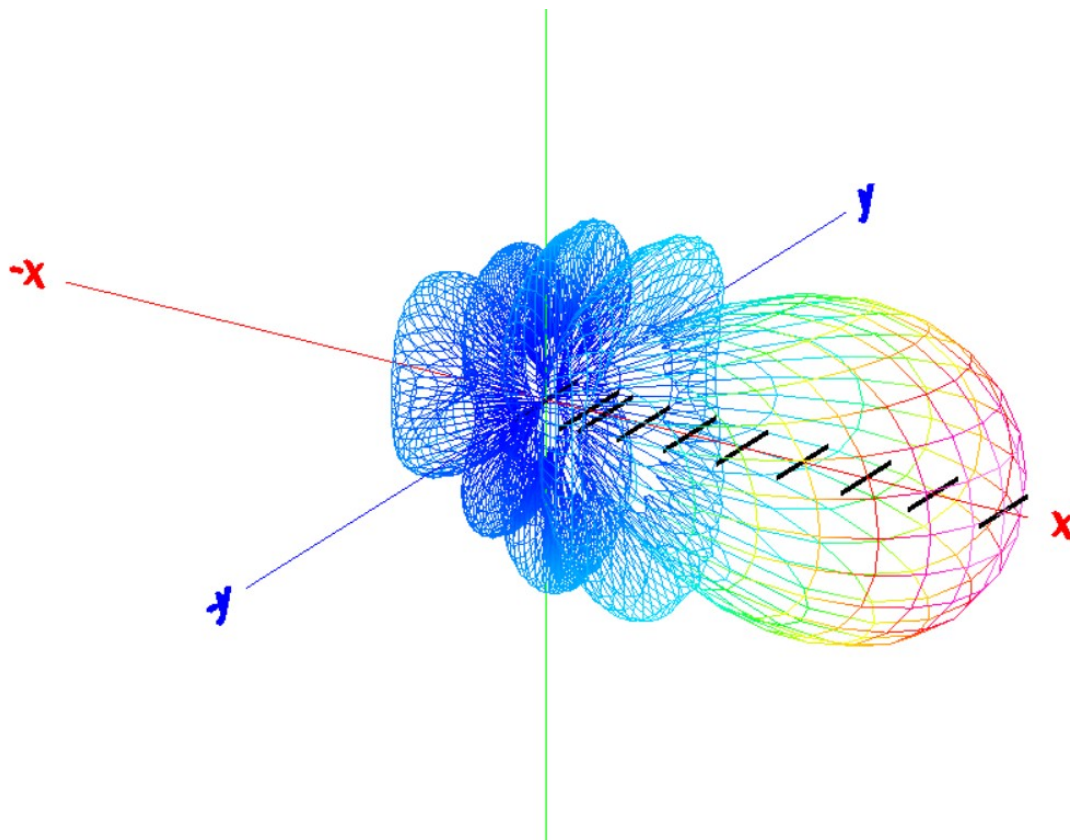
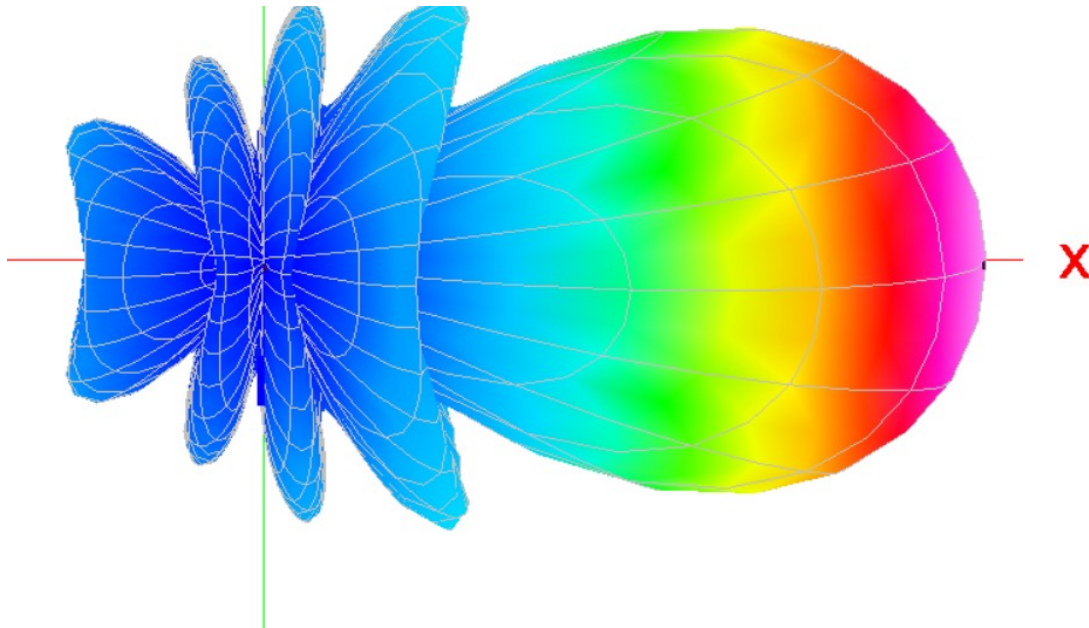
Metric

Antenna Dimensions			US/Imperial	Metric
Cumulative Spacing	Element	Element Length		
Zero	REFL		6-11/64"	
2-9/16"	D.E.		6"	
3-17/32"	D1		5-17/64"	
5-27/32"	D2		5-3/16"	
8-19/32"	D3		5-3/32"	
11-51/64"	D4		5-1/64"	
15-25/64"	D5		4-61/64"	
19-1/4"	D6		4-57/64"	
23-9/32"	D7		4-53/64"	
27-33/64"	D8		4-51/64"	

US/inches

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Cursor Az angle = 0, Ev angle = 0, $G = 13.9$ dBi



Freespace

Tuning SWR

Gamma Match

- **Function:** It serves a triple purpose: it provides impedance transformation, cancels the inductive reactance of the antenna element at the feed point, and helps transition from an unbalanced feedline to a balanced element.
- **Mechanism:** It consists of a smaller rod (gamma rod) that runs parallel to a portion of the main driven element. A shorting strap and a series capacitor (often variable for tuning) are adjusted to achieve an optimal match to the 50 ohm feedline.
- **Advantage:** It allows the main antenna element to be grounded directly to a metallic support boom, simplifying construction.
- **Disadvantage:** It introduces structural asymmetry, which can slightly distort the radiation pattern and may require an additional balun to prevent common-mode current (RF on the coax shield).

Gap

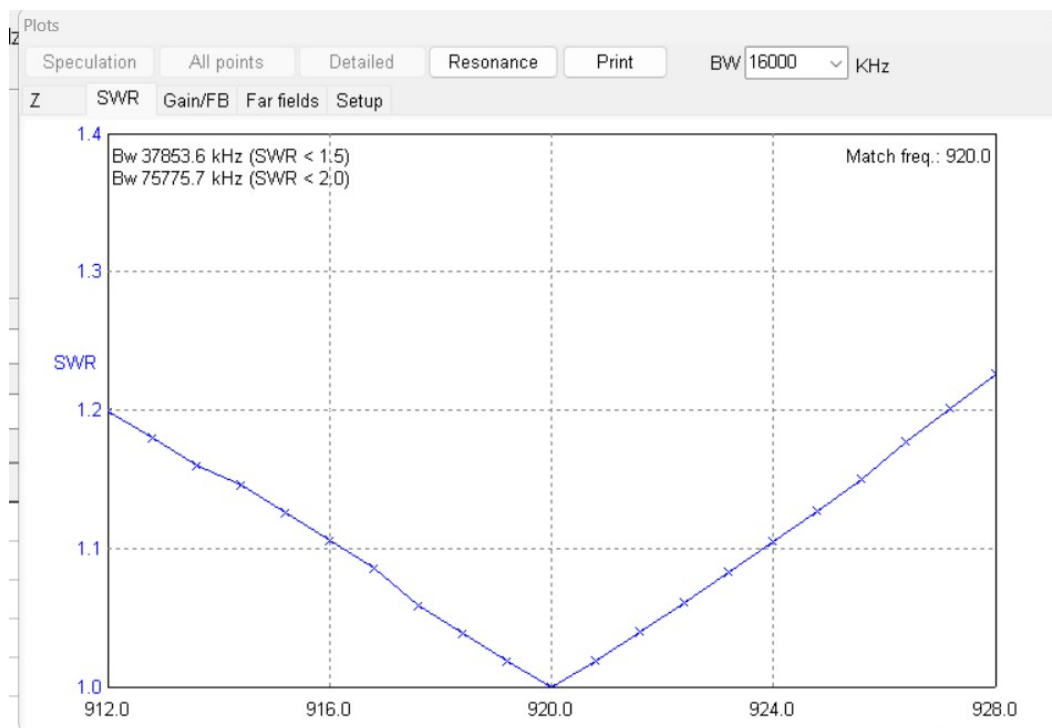
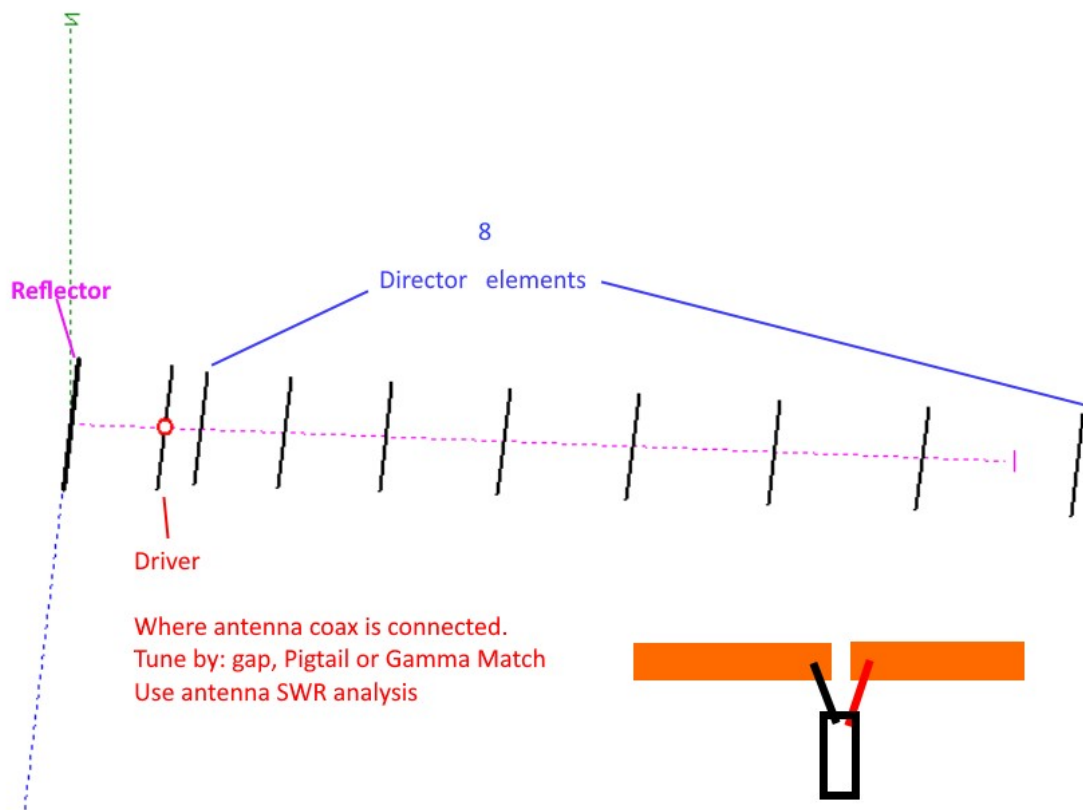
- **Function:** This gap is the feed point for the antenna. The length of the gap can influence the impedance and radiation pattern.
- **Connection:** For a balanced feedline (like ladder line), the two conductors connect directly to each side of the gap. For an unbalanced feedline (coax), a balun is typically used to transition to the balanced feed point and prevent the coax shield from radiating.

Pigtail

"Pigtail" describes a common construction technique in a gamma match system for connecting the coaxial cable shield.

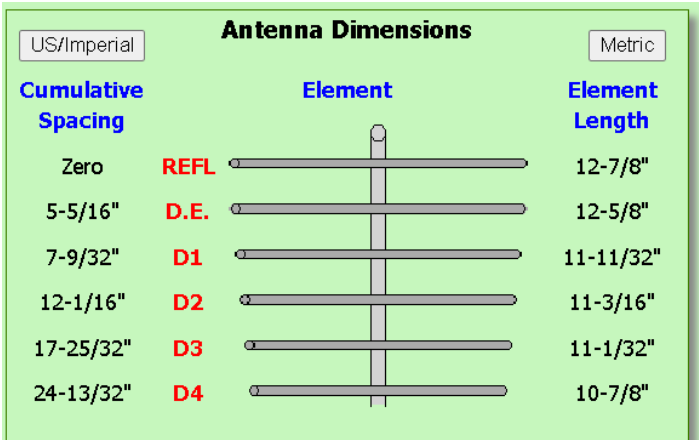
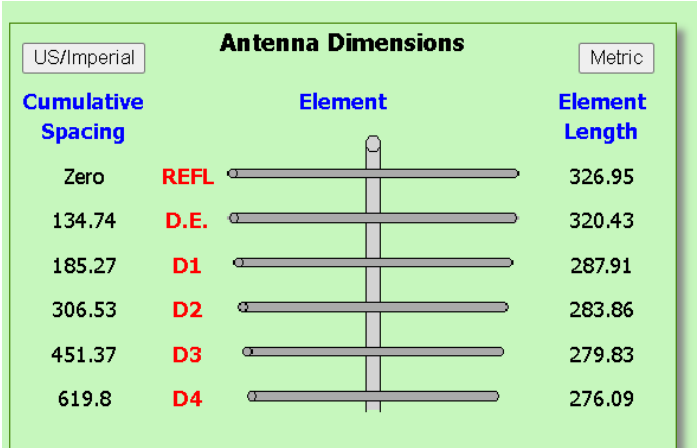
- **Function:** The braid (shield) of the coaxial cable is connected to the center of the main driven element (or the metallic boom to which it is attached). This connection is sometimes made using a short length of wire or the braid itself, which is referred to as a "pigtail".
- **Mechanism:** At the center of a half-wave antenna, the RF voltage is close to zero, making it an appropriate place to connect the ground (shield) of the coax.

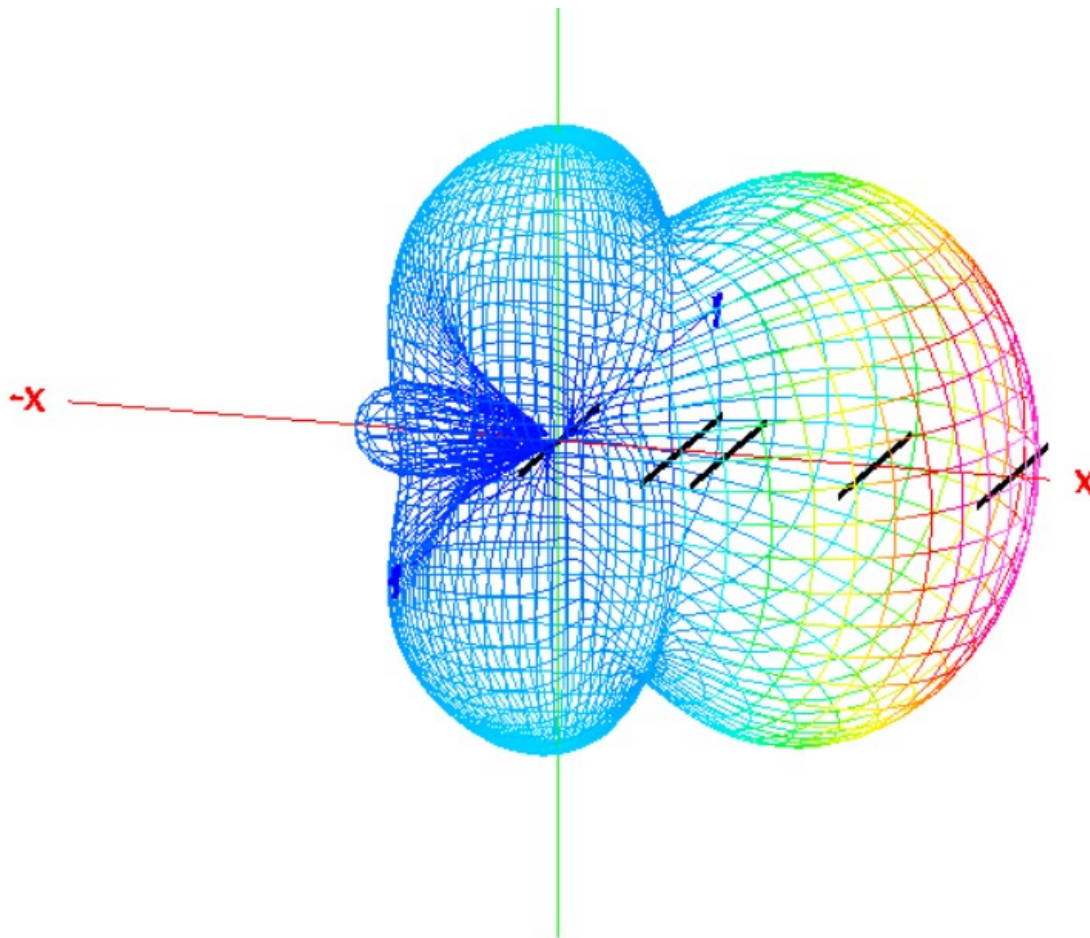
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70 cm design and gap is less than <0.9mm - SWR





Cheap 70 cm build for GMRS, 70 cm

1. Use design tools to center the frequency
2. Poster foam board (not waterproof)
3. Copper conductive foil with conductive adhesive (can cut fingers!!) 1 inch
4. Solder & paste flux for coax connection
5. Razor blade or Scissors (CUT!!!)
6. Solder Iron (HOT!!!)

Fabricate: Need Antenna analyzer, multi meter

1. layout a center line
2. cut each element to exact dimensions
3. Fold element in half
4. remove the protective backing at the middle to start to lay down the element
5. - the driver – for the gap - TIP make this a bit longer, after placement, cut a gap, then adjust the gap size by antenna analyzer . Use wire clips to attach to the drive to adjust the fine tuning.
6. Clean the foil Iso Prop 91% where the wire will connect. Add paste flux, then add a bit of solder. Clean the coax wire Iso Prop, Paste flux and tin the wire. Solder coax to the Driver
7. Make a contact.

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Foil Yagi 33 cm 920 MHz



Foil Yagi 70 cm

