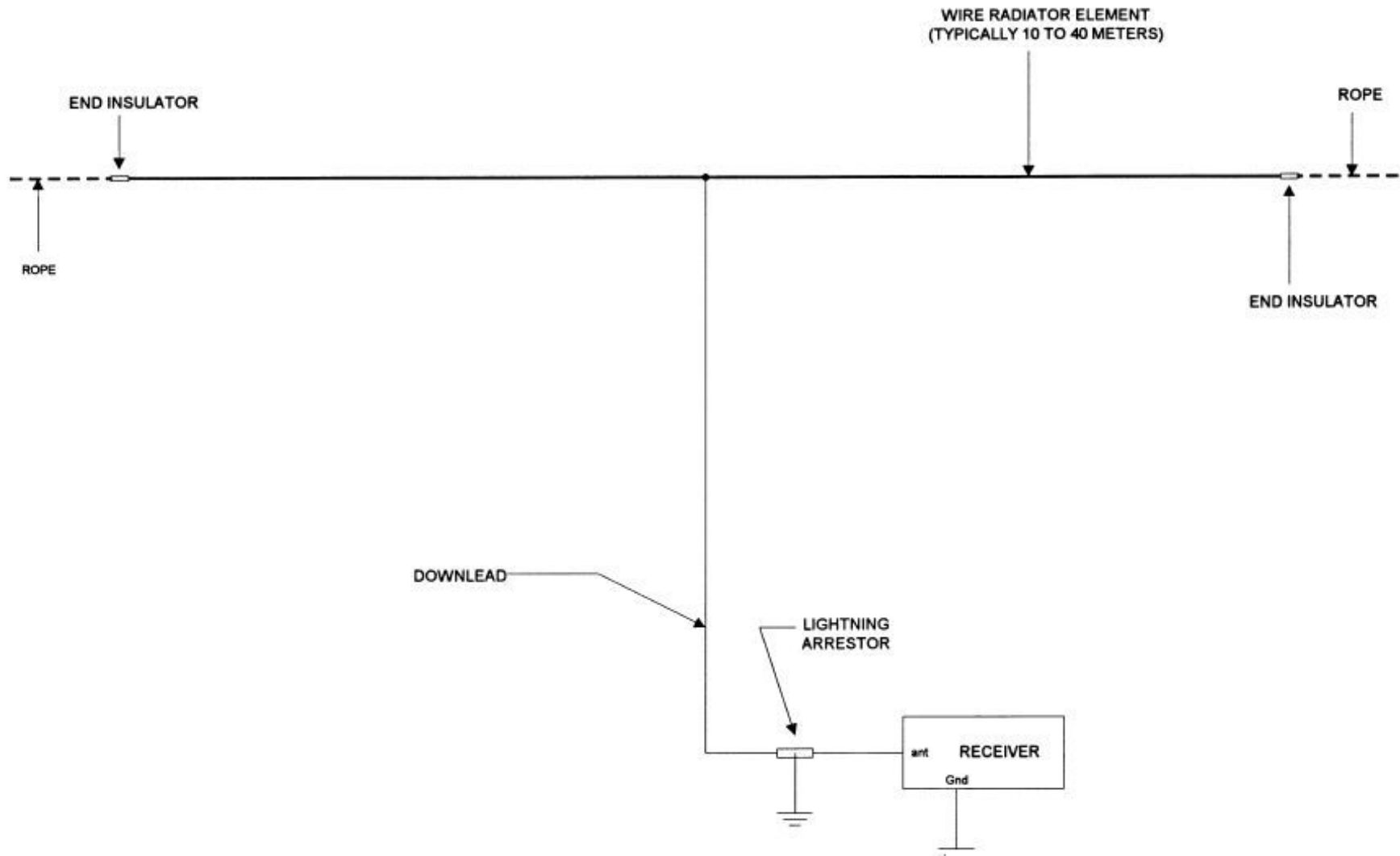


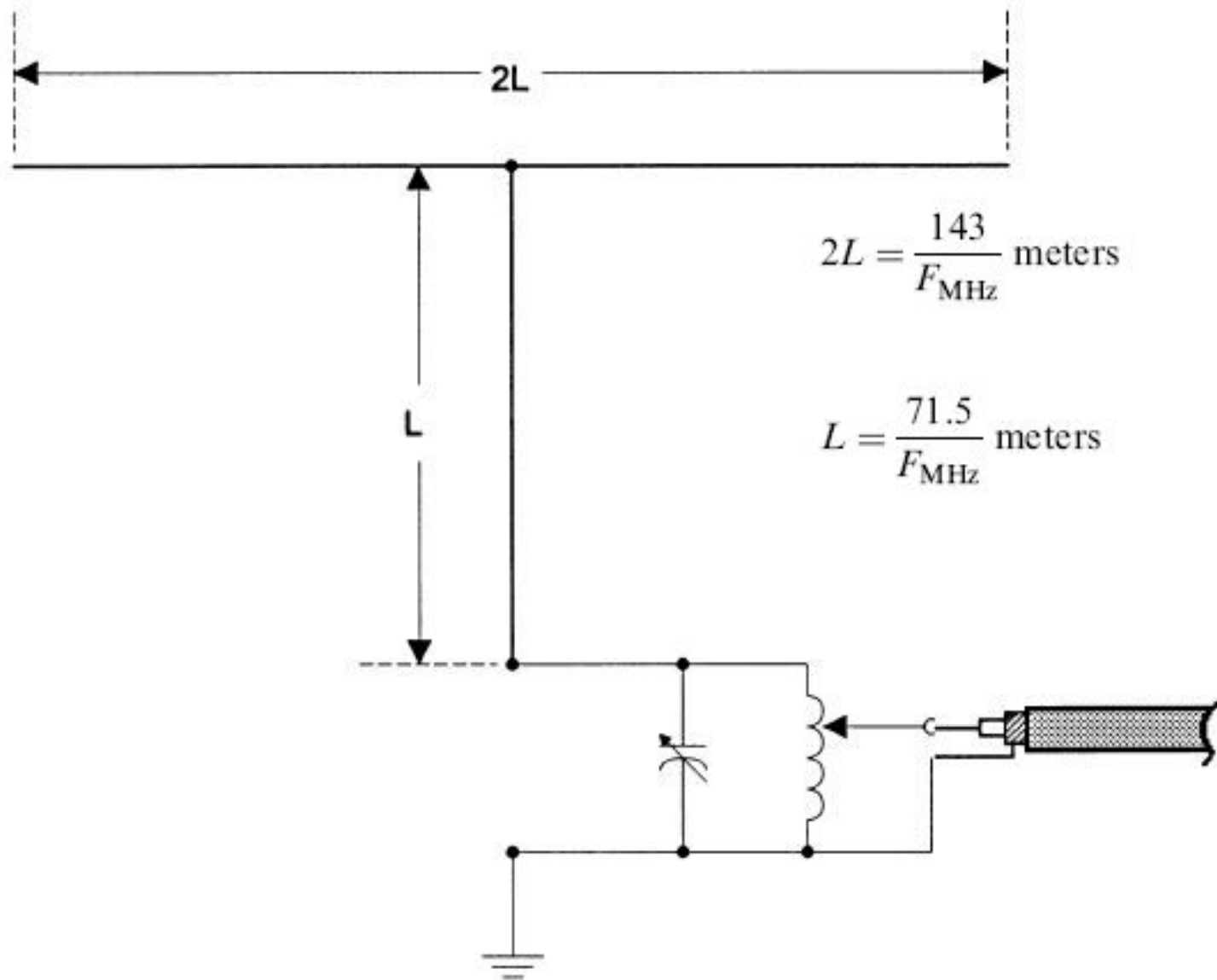
# Wire Antennas for Ham Radio

Julian Rosu, YO3DAC / VA3IUL, <http://www.qsl.net/va3iul>

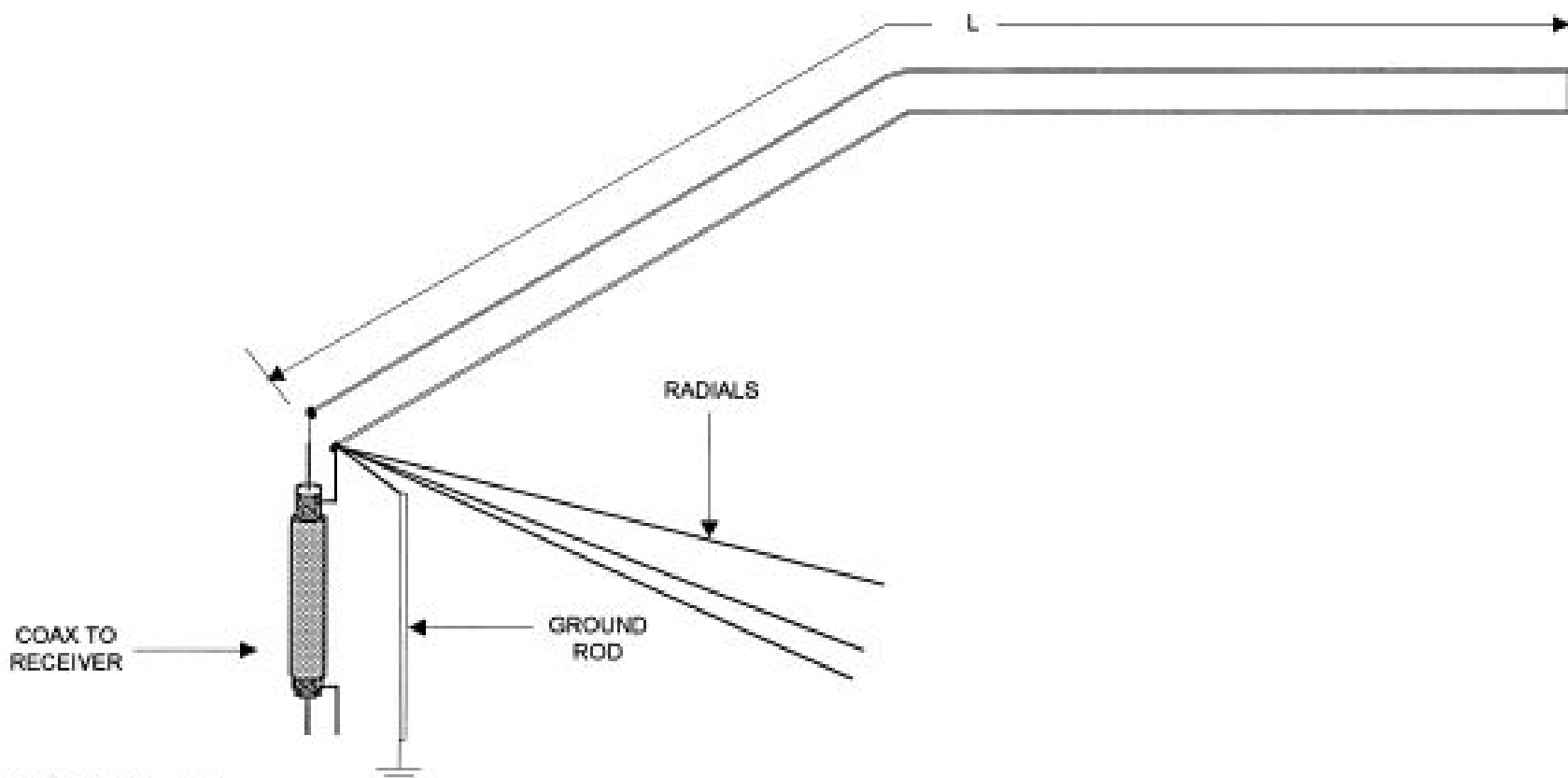
## Tee Antenna



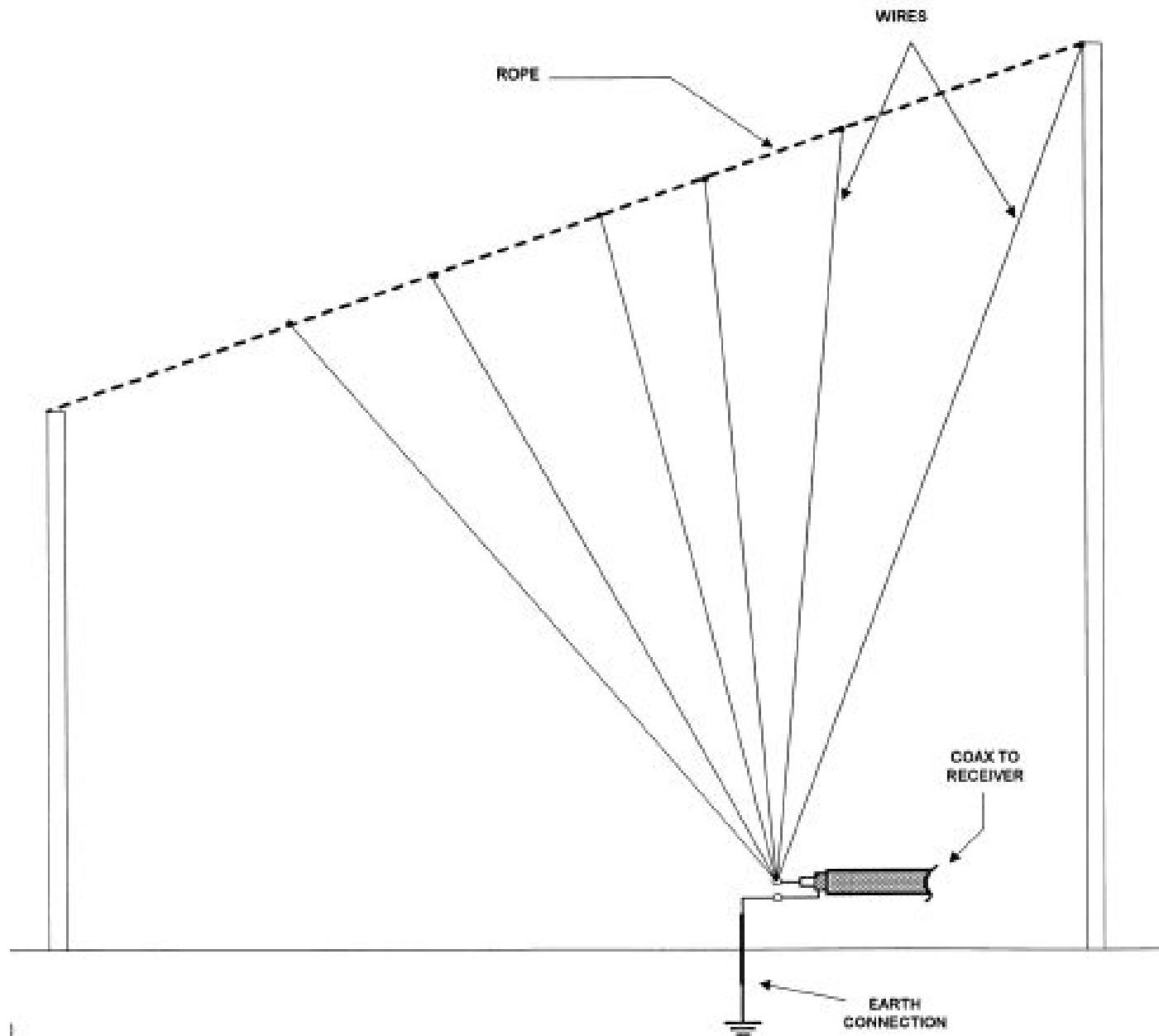
## Half-Lambda Tee Antenna



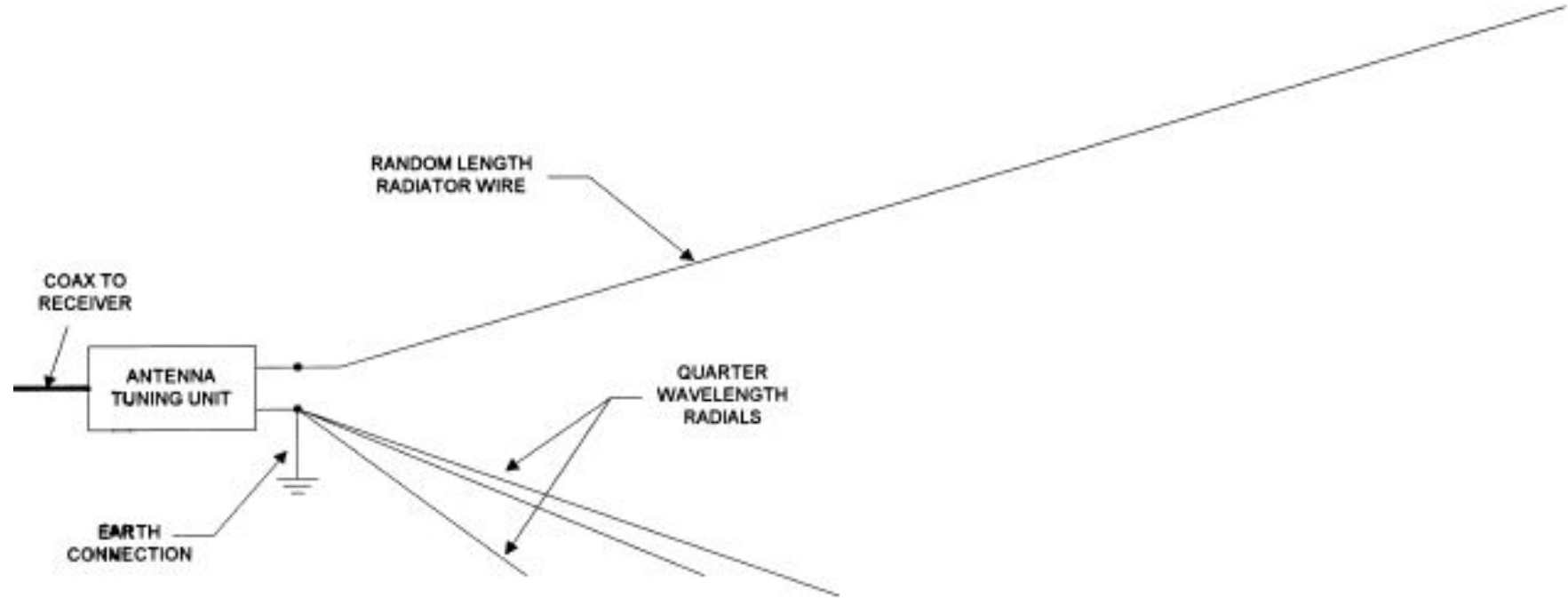
# Twin-Led Marconi Antenna



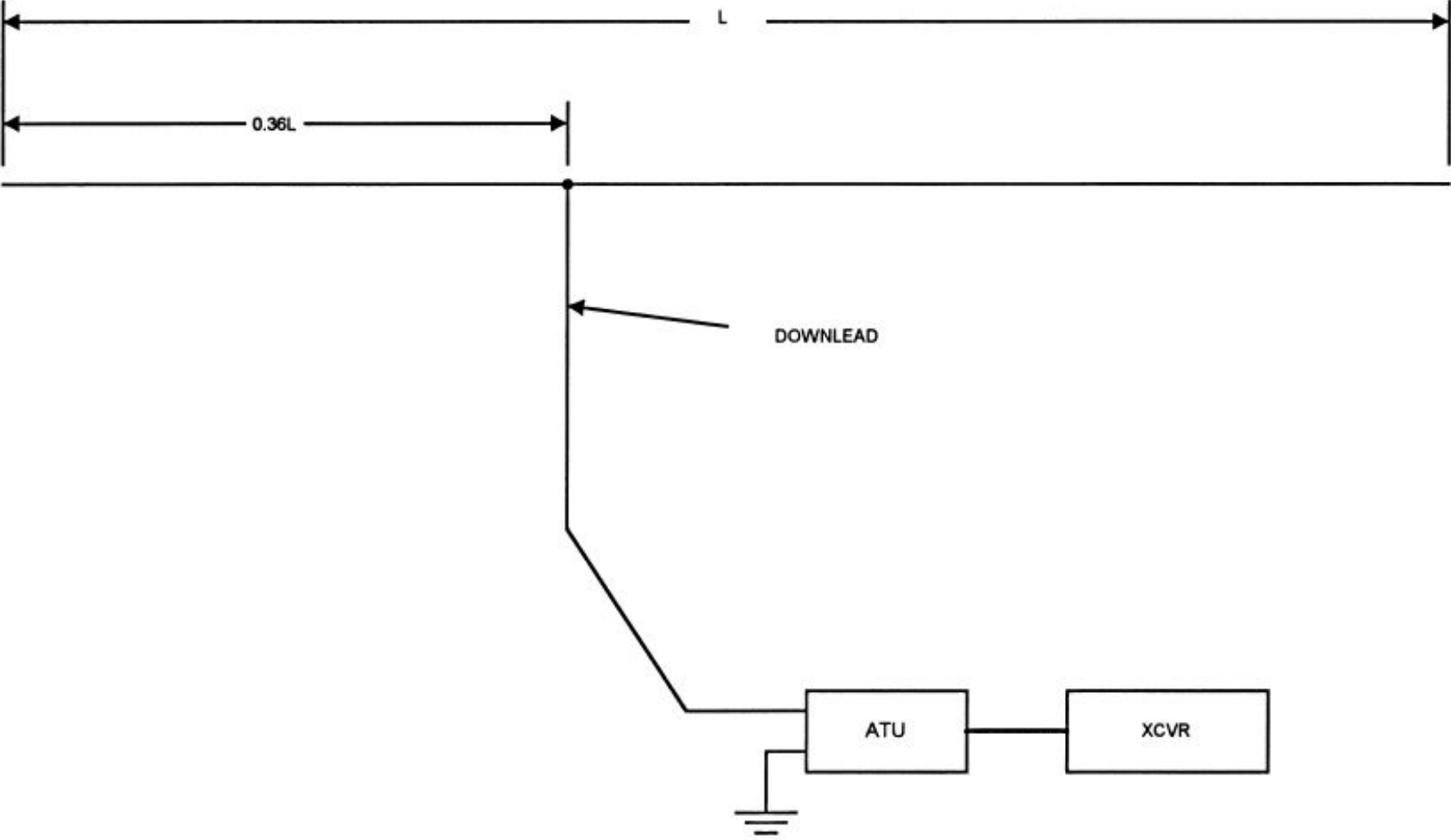
# Swallow-Tail Antenna



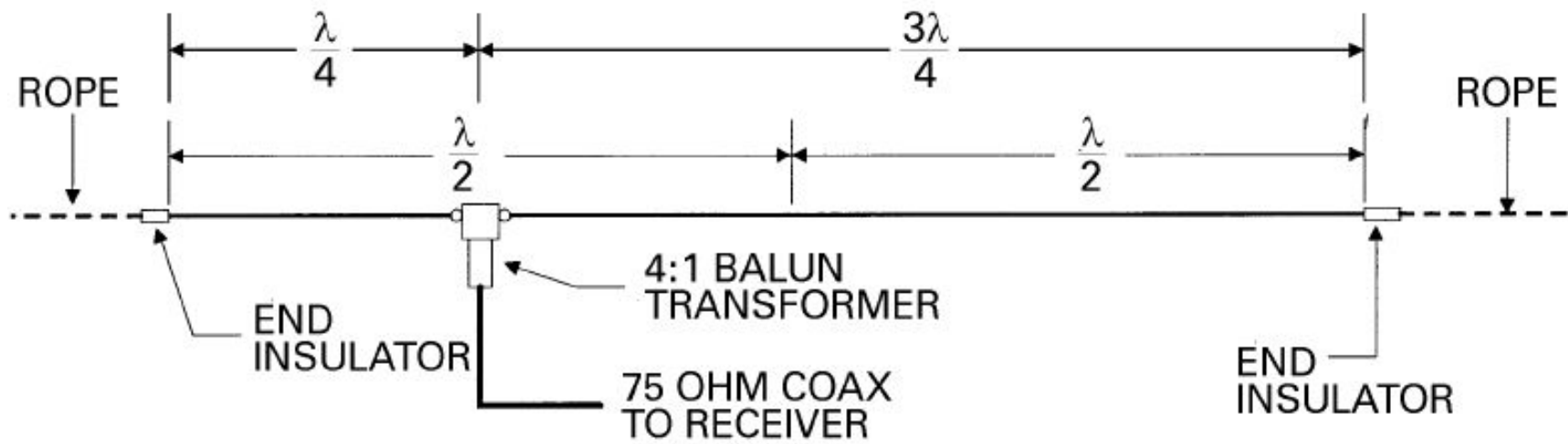
# Random Length Radiator Wire Antenna



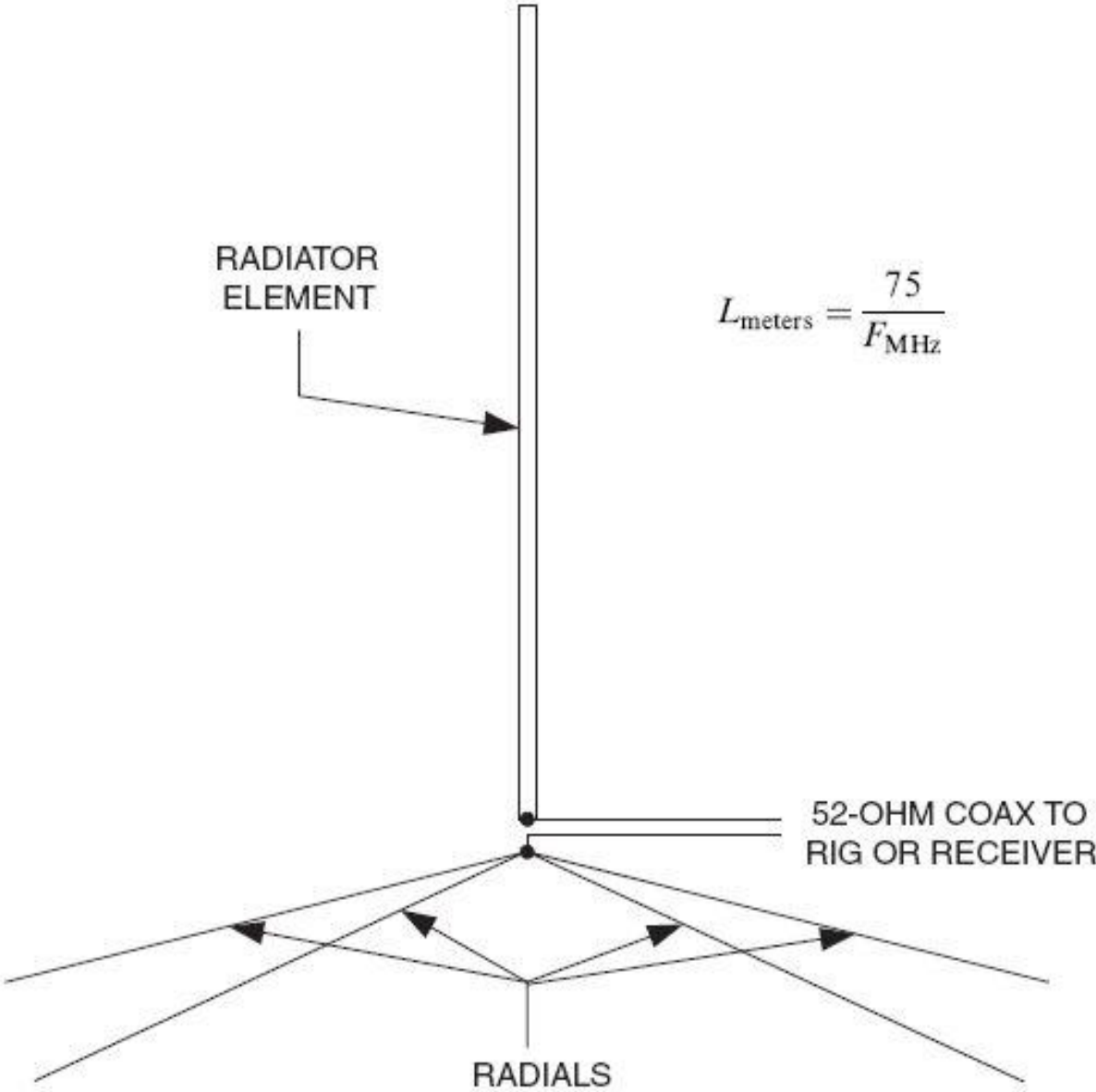
# Windom Antenna



## Windom Antenna - Feed with coax cable

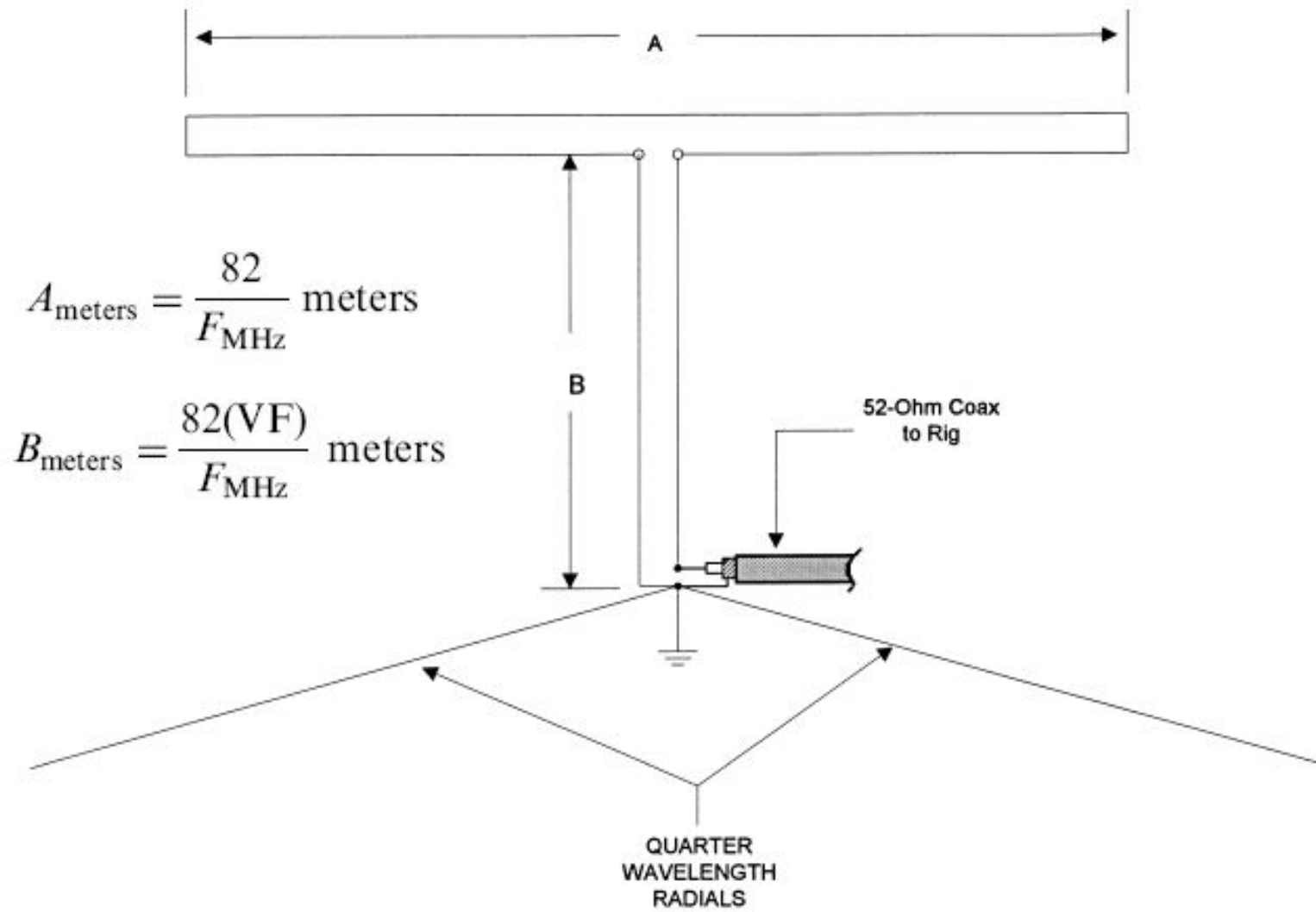


# Quarter Wavelength Vertical Antenna

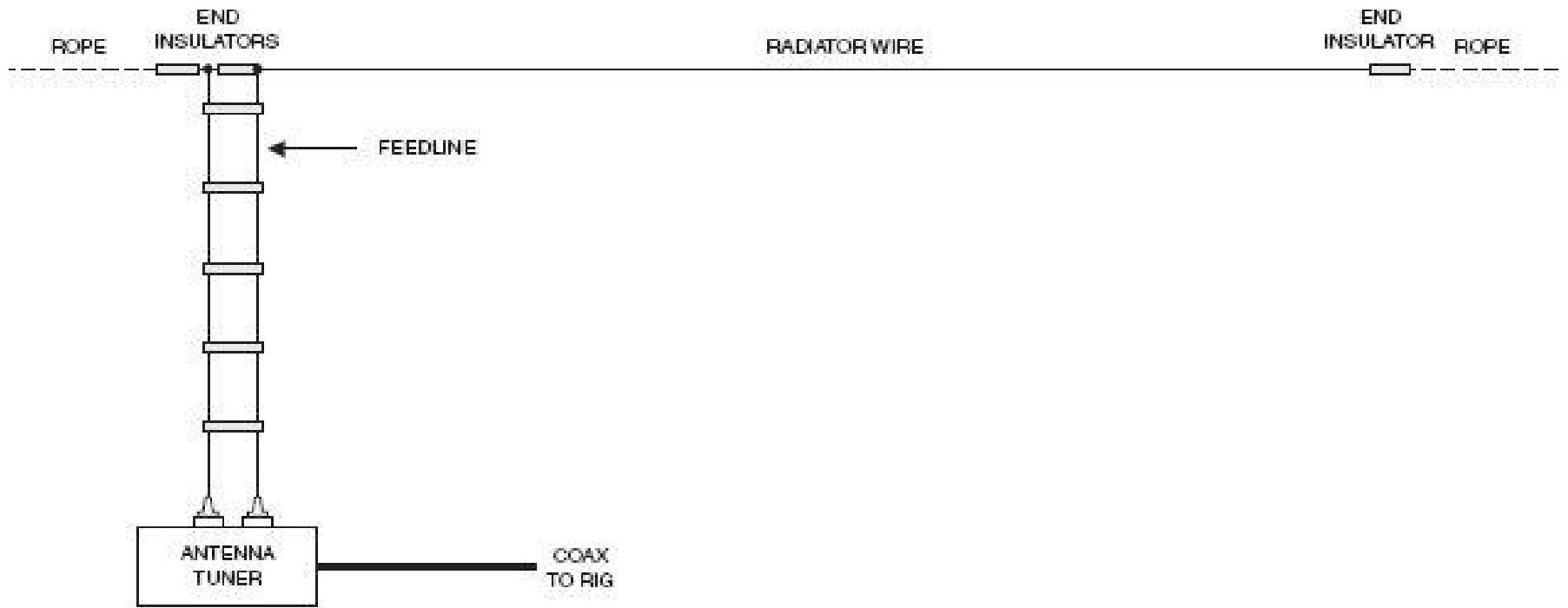




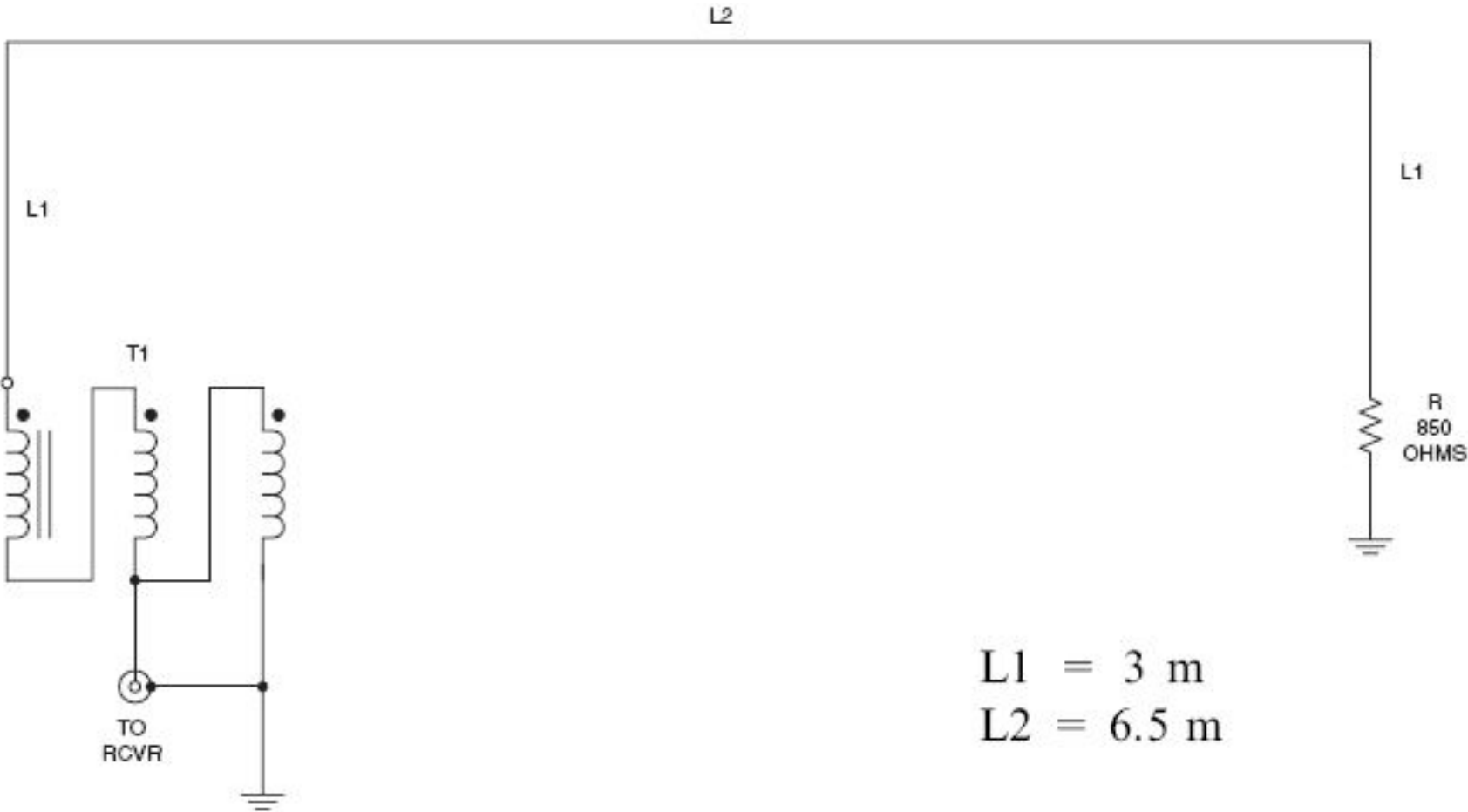
# Folded Marconi Tee Antenna



# Zeppelin Antenna

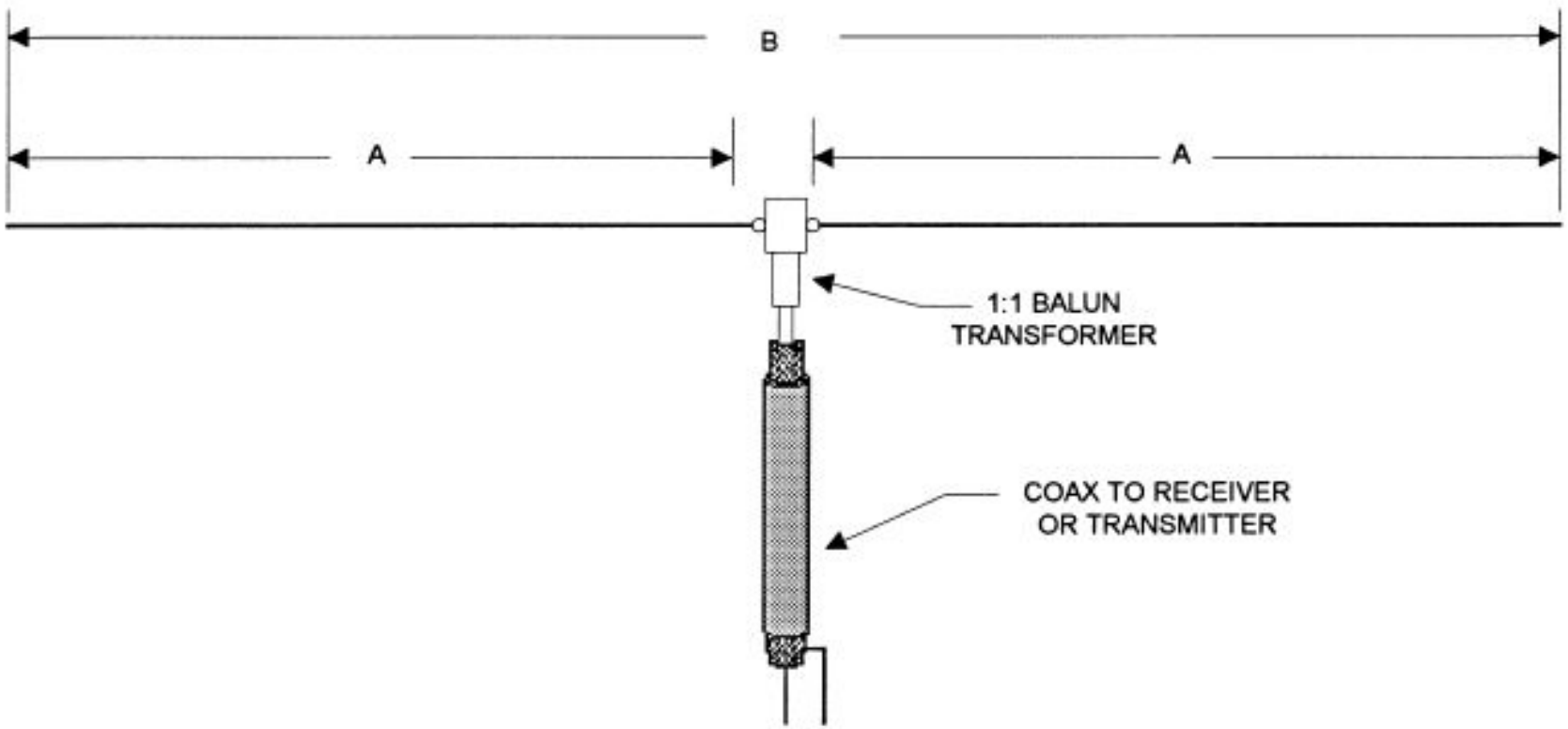


# EWE Antenna

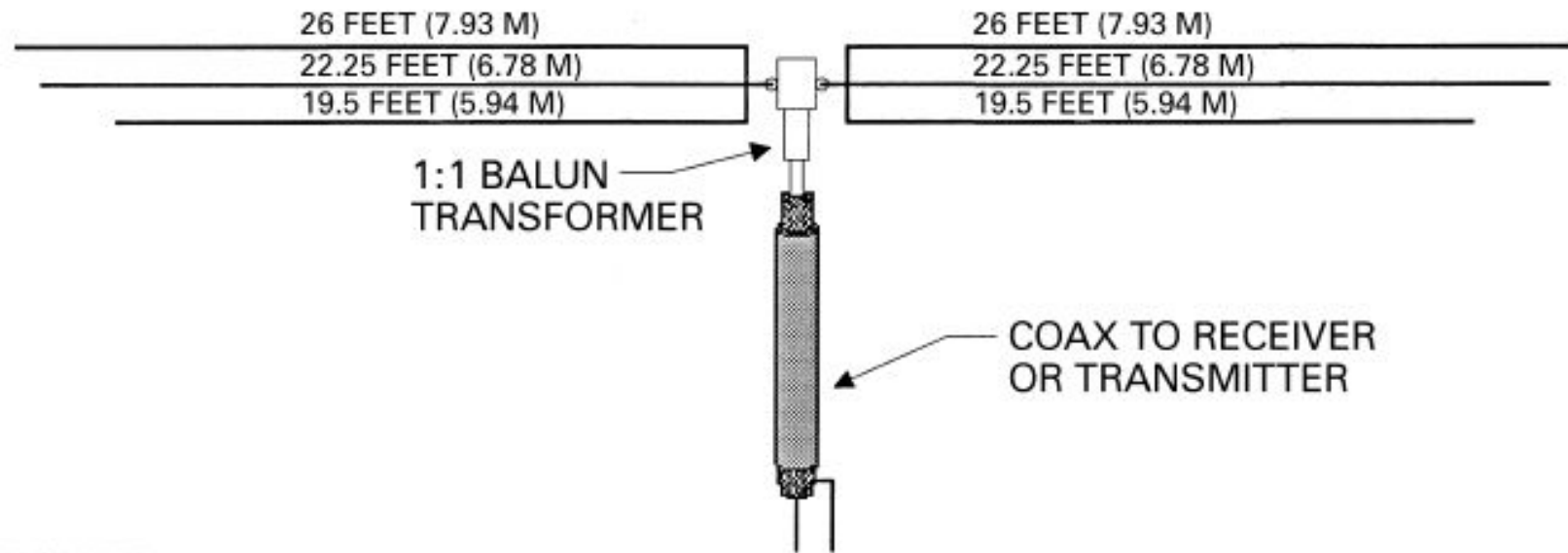


L1 = 3 m  
L2 = 6.5 m

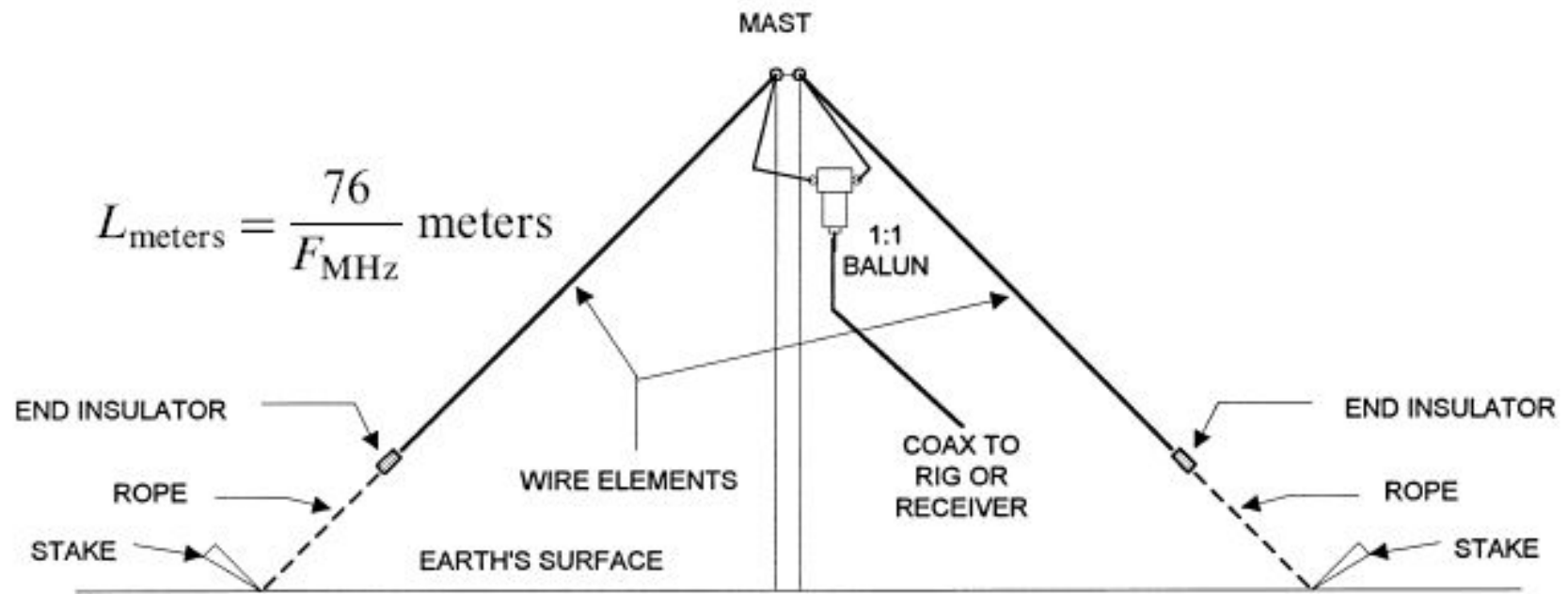
# Dipole Antenna - Balun



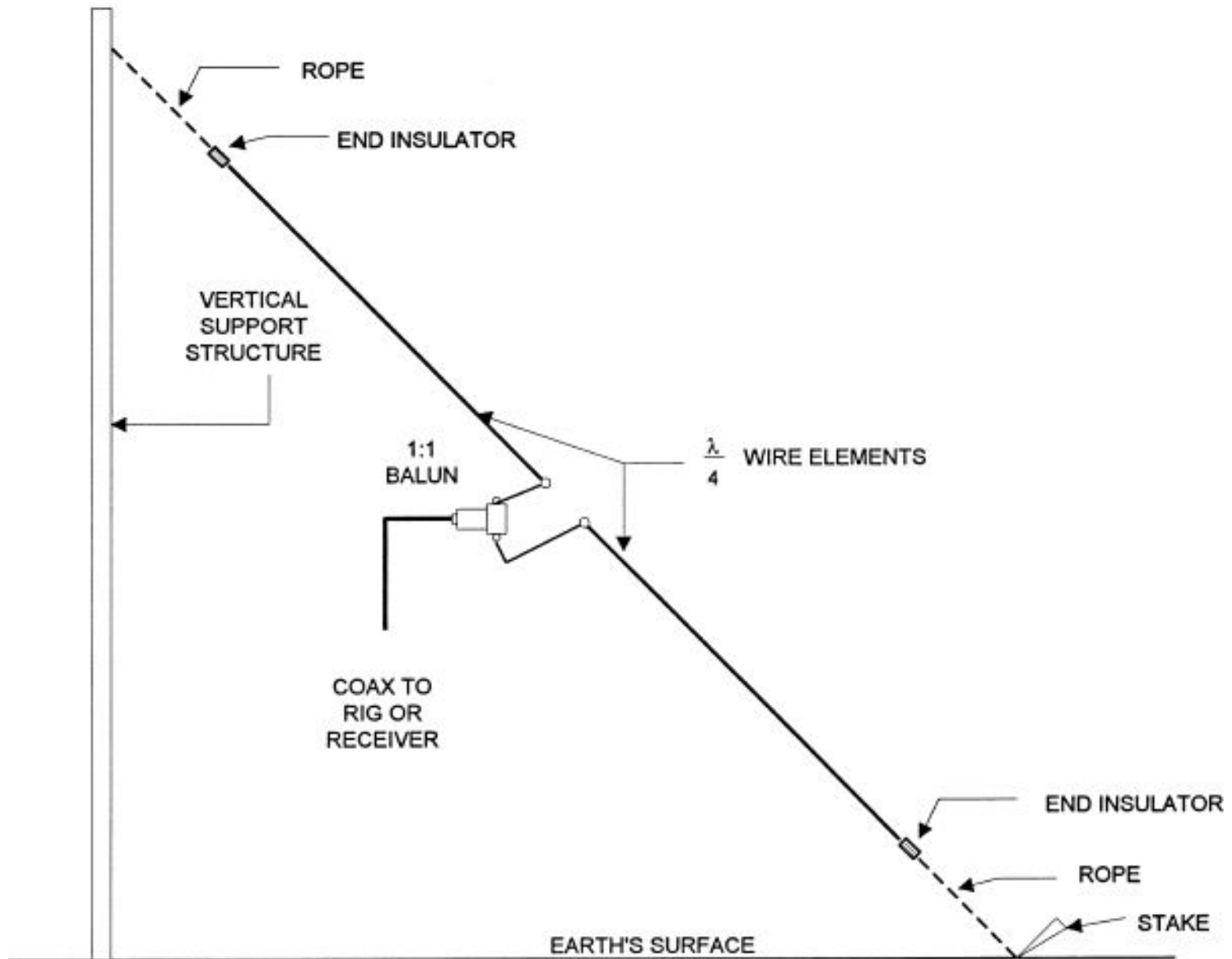
# Multiband Dipole Antenna



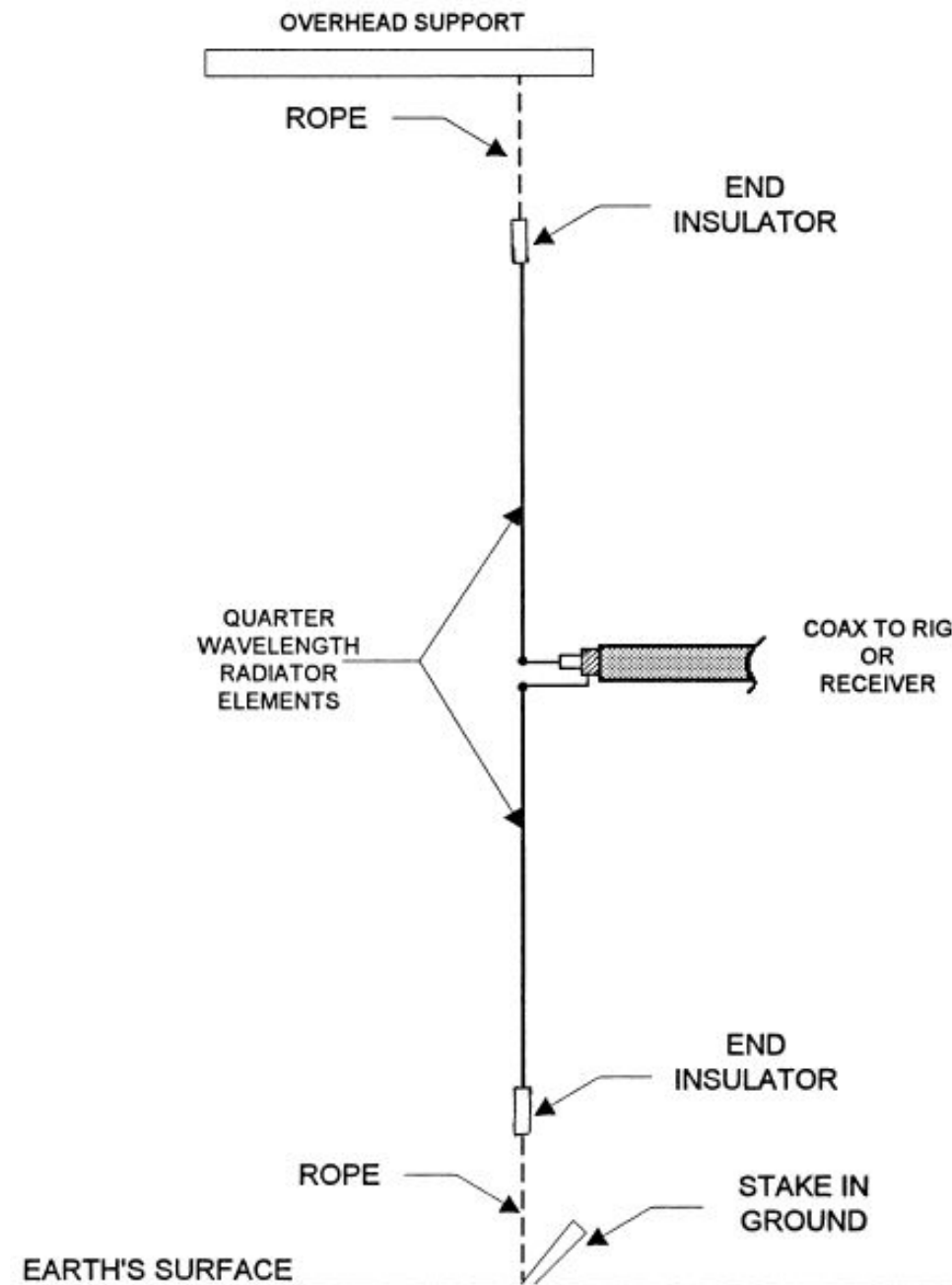
## Inverted-Vee Antenna



# Sloping Dipole Antenna

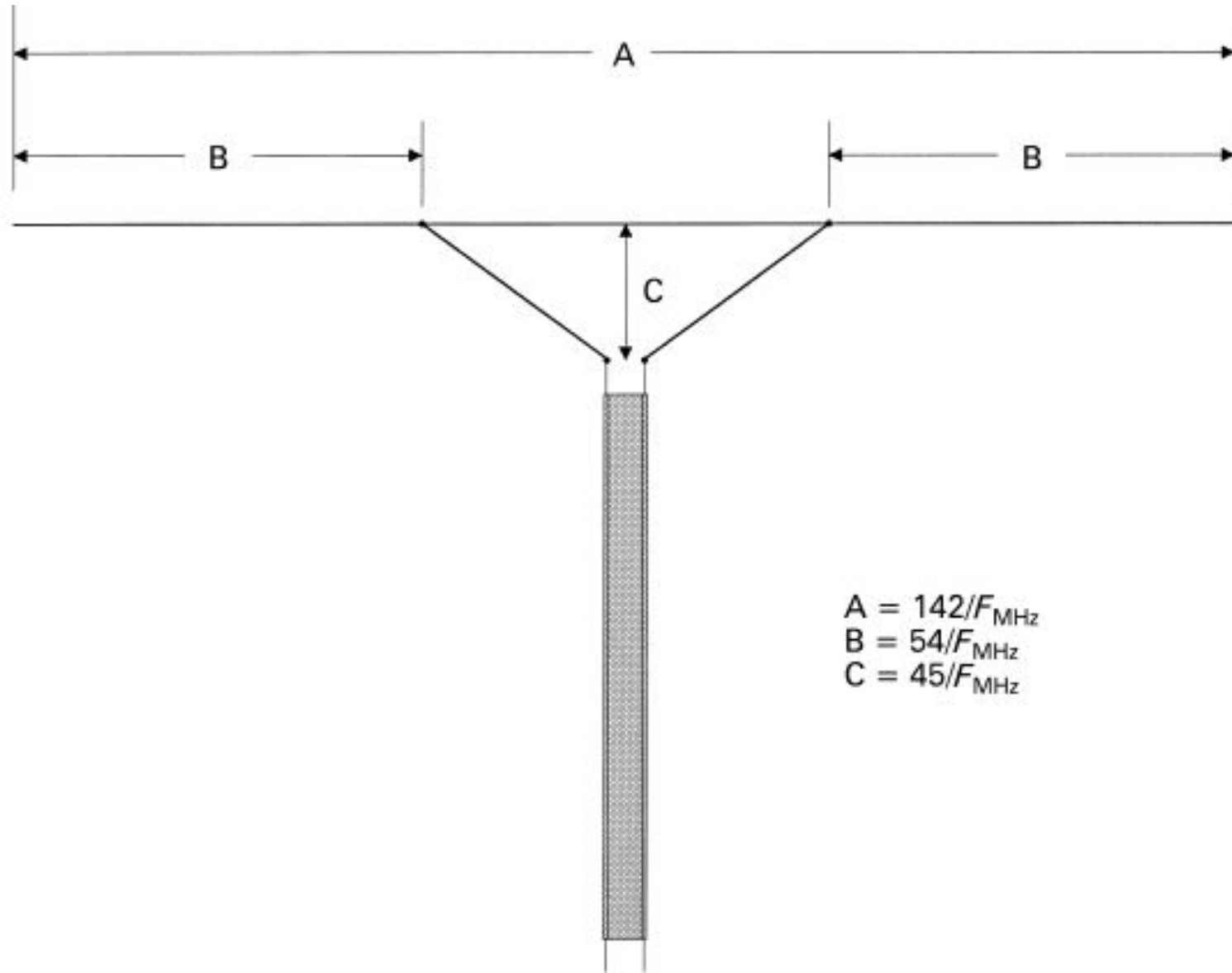


# Vertical Dipole

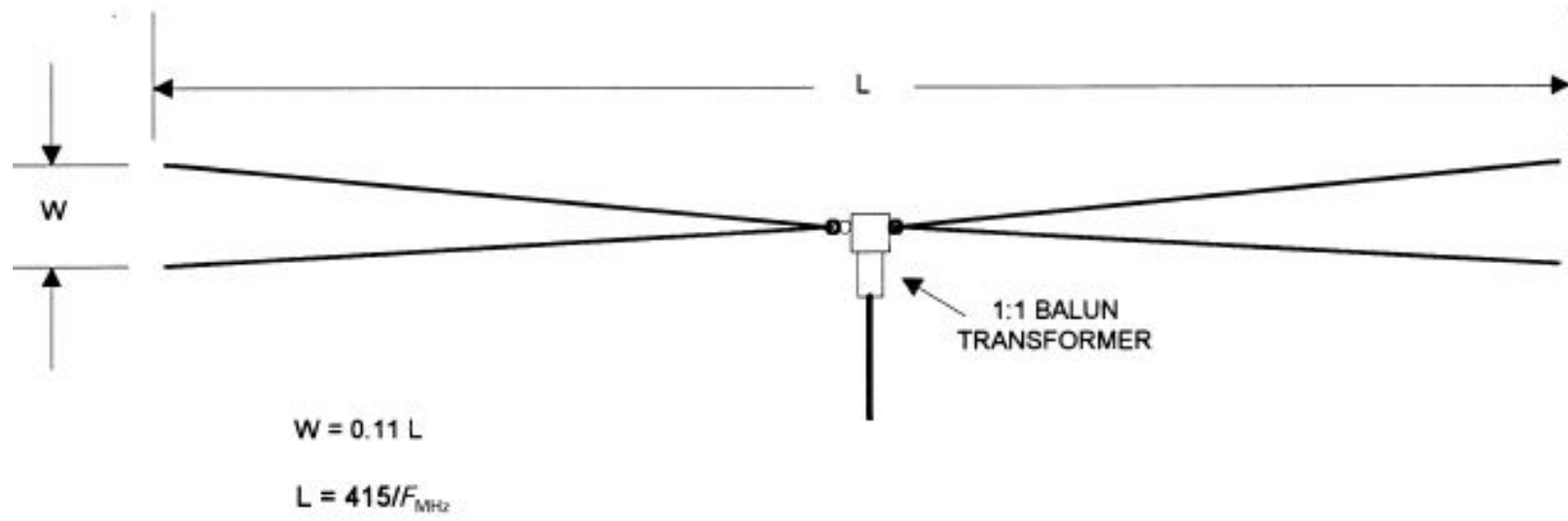




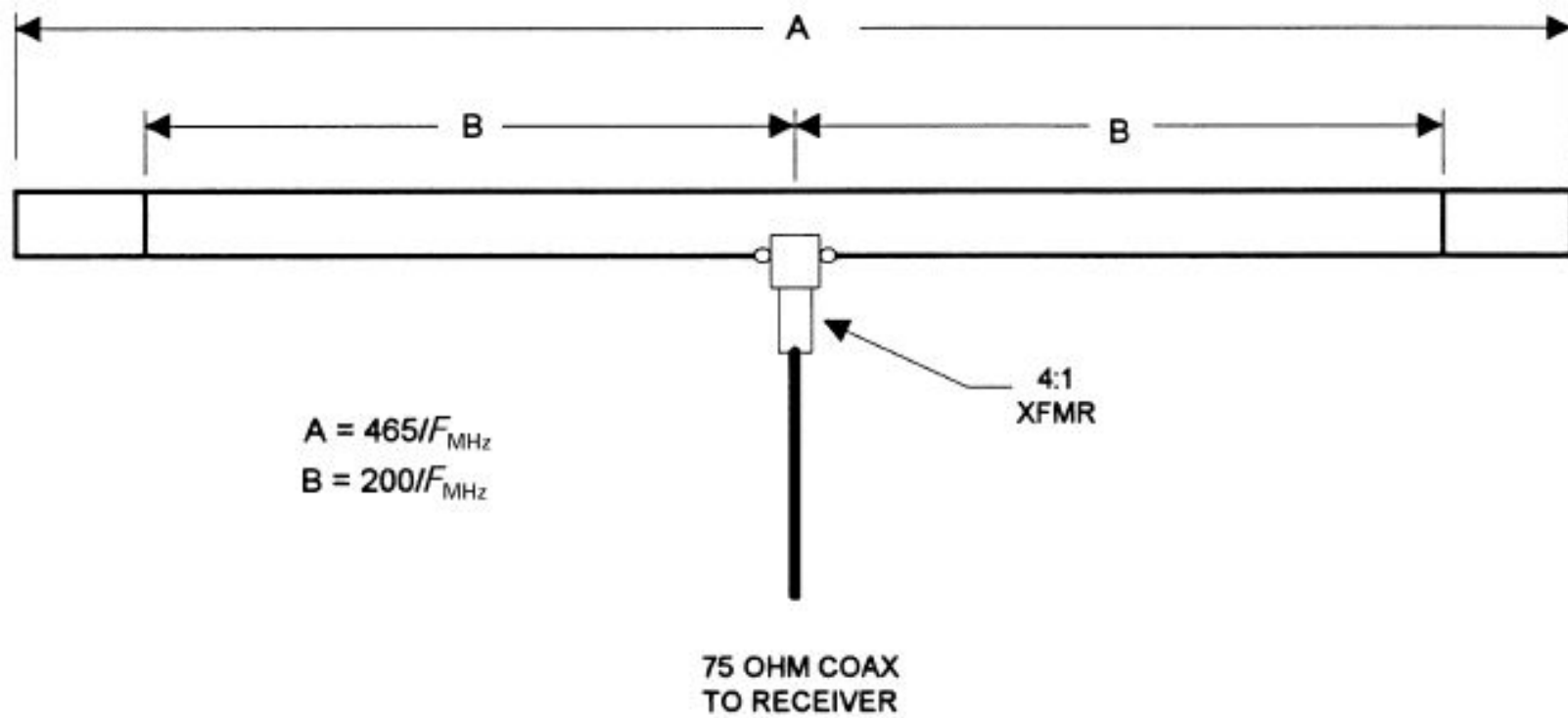
## Delta Fed Dipole Antenna



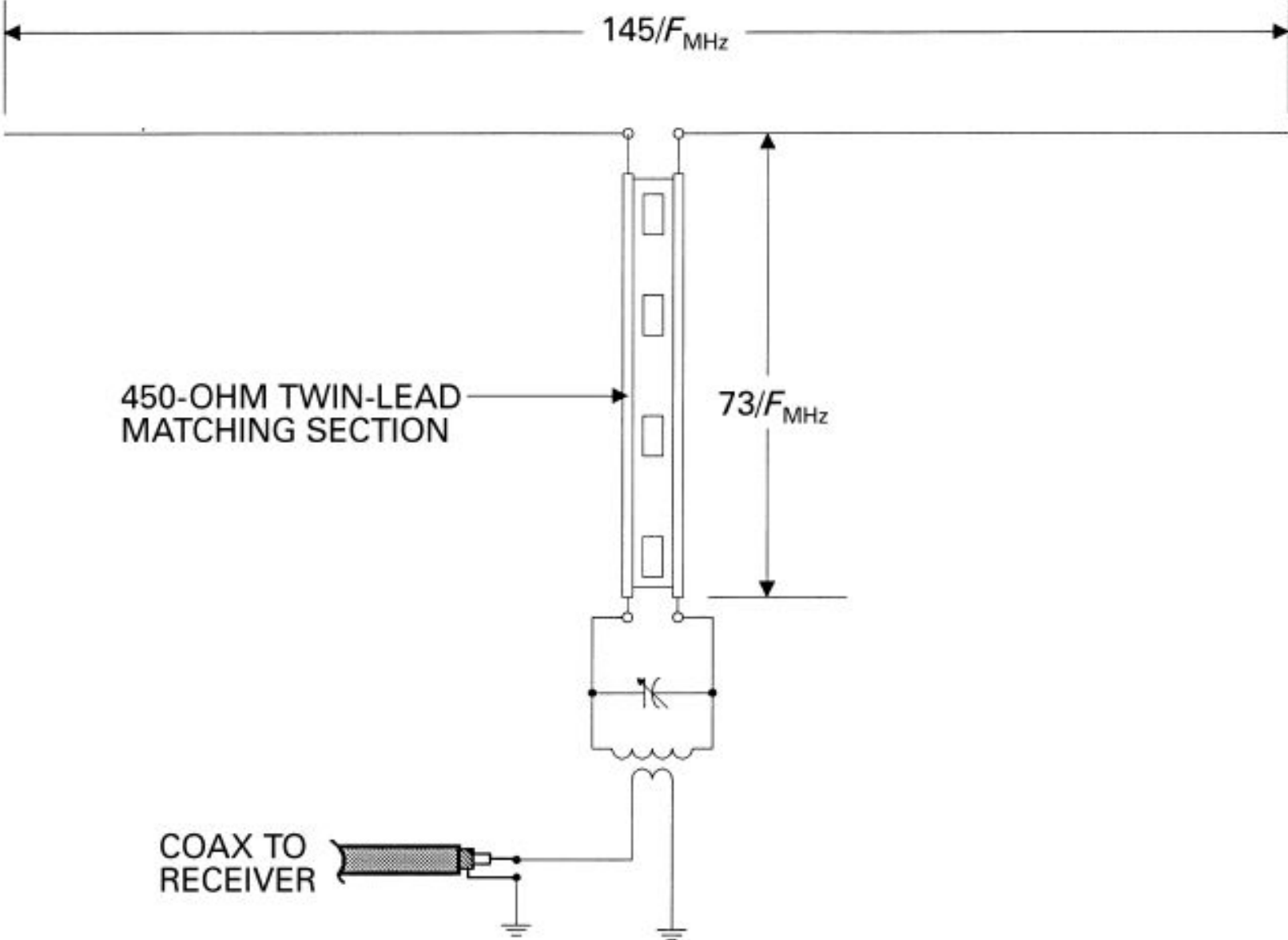
# Bow-Tie Dipole Antenna



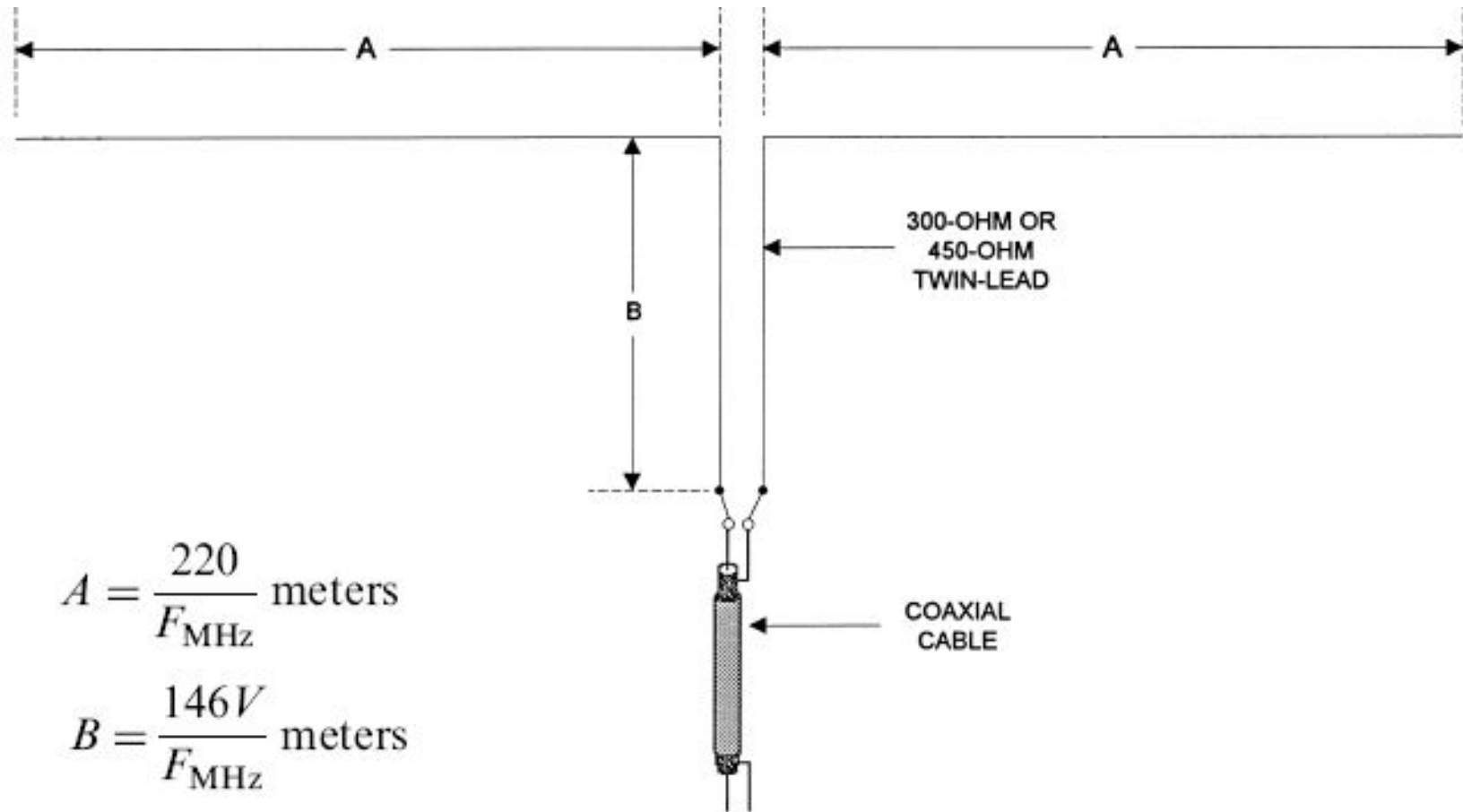
## Bow-Tie Dipole Antenna



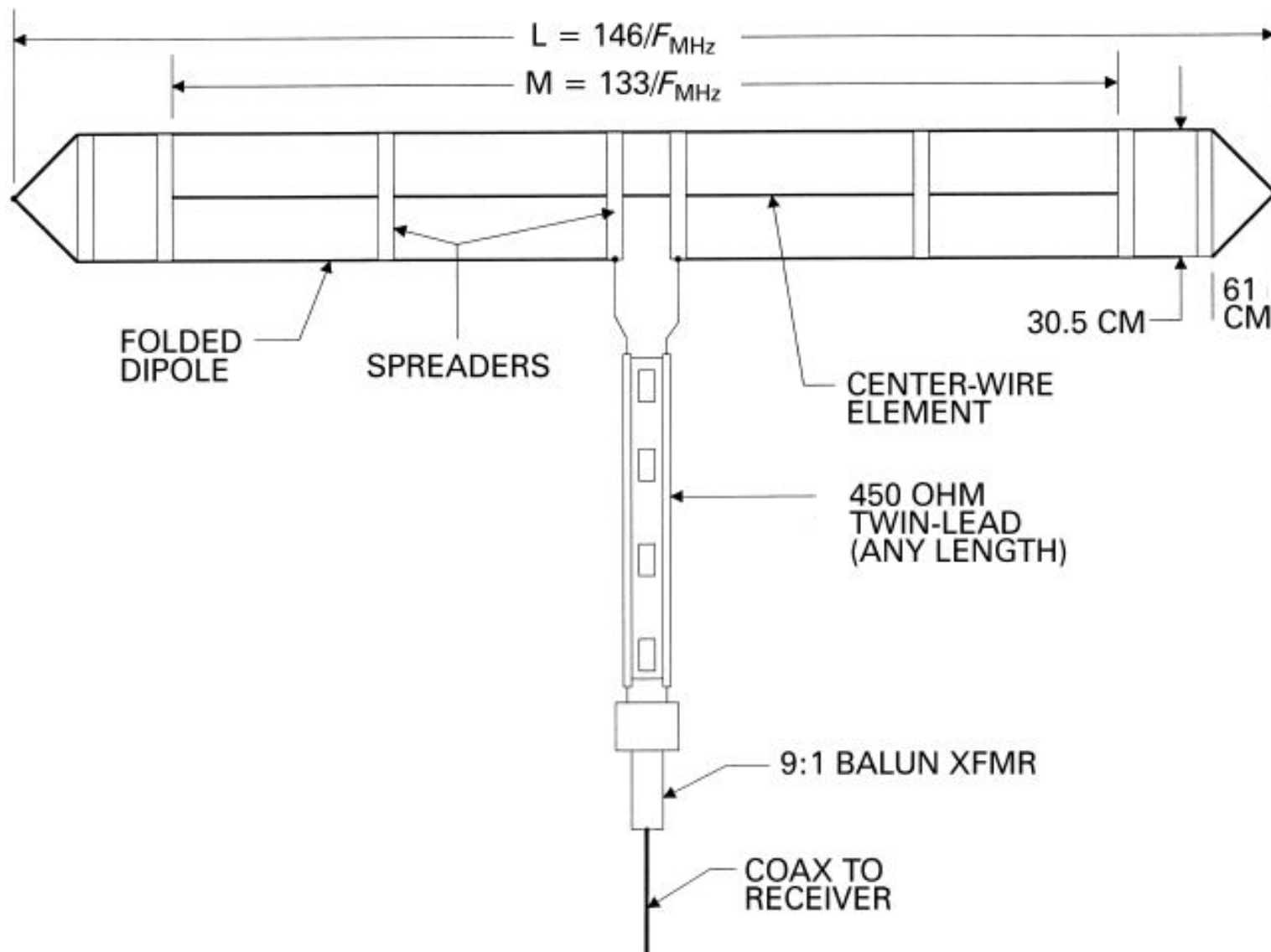
# Multiband Tuned Doublet Antenna



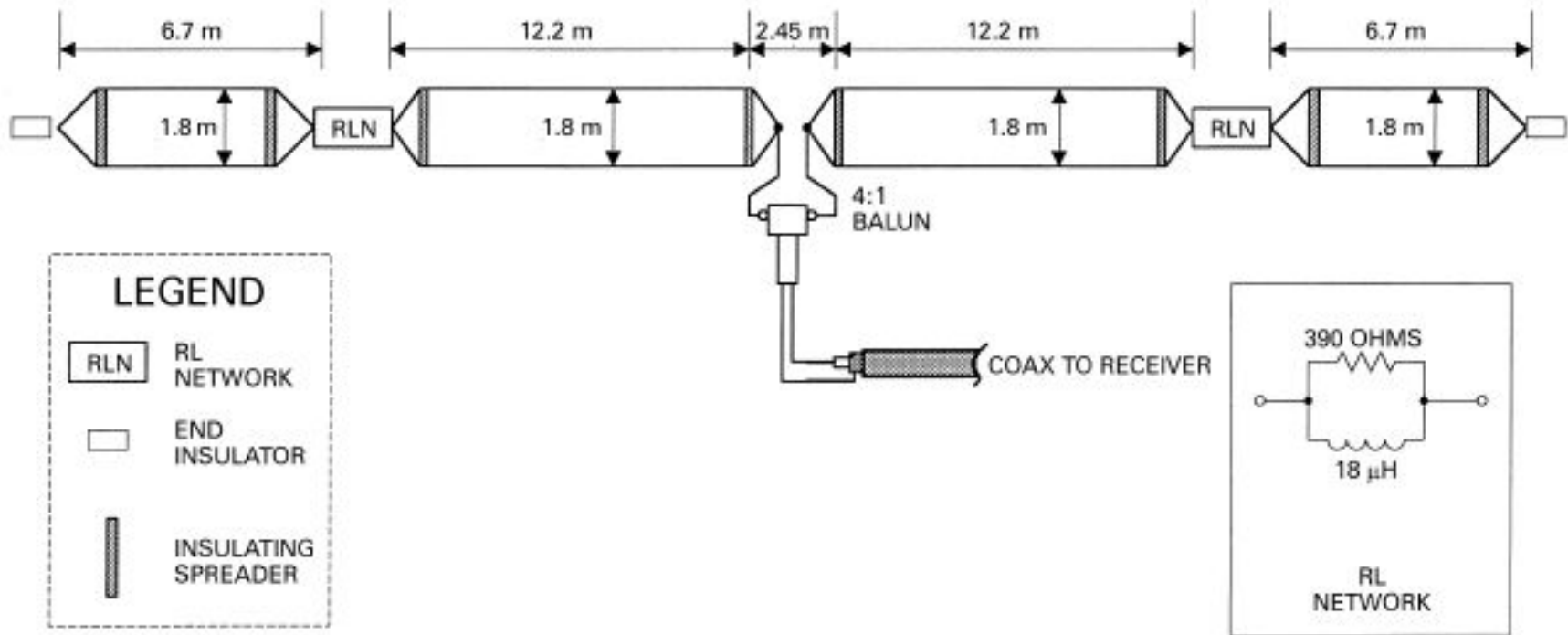
## G5RV Antenna



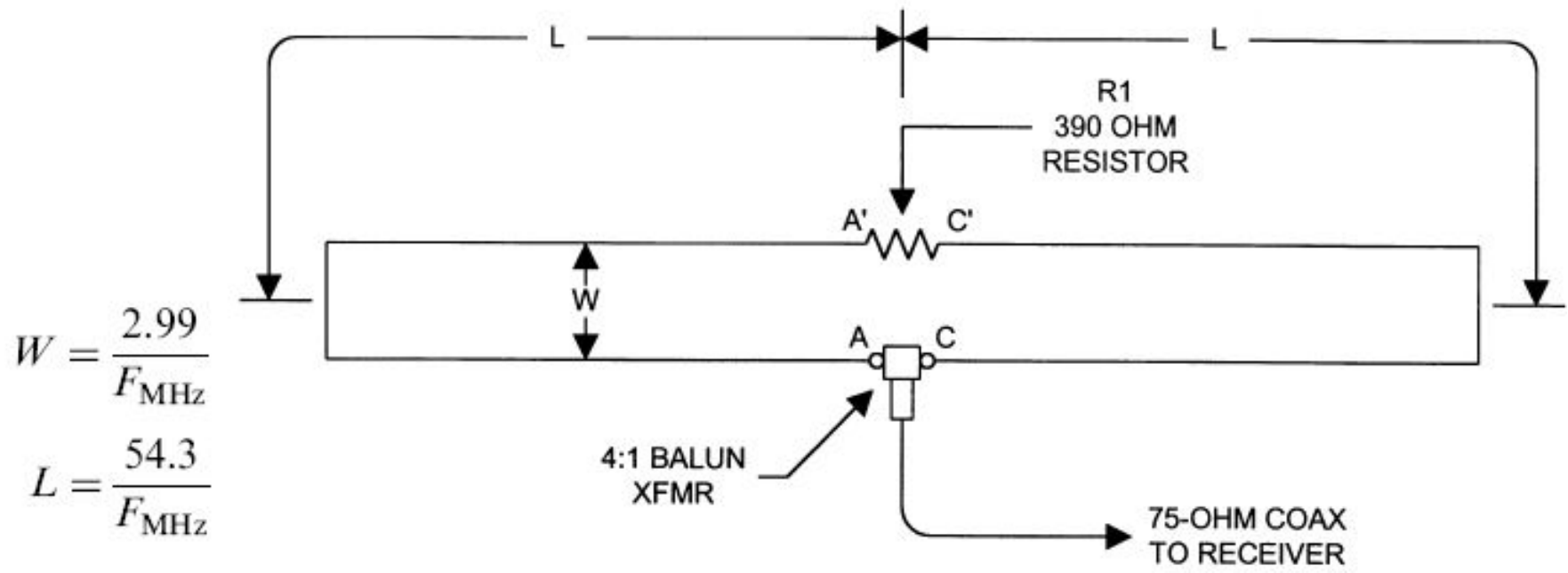
# Wideband Dipole Antenna



# Wideband Dipole for Receiving

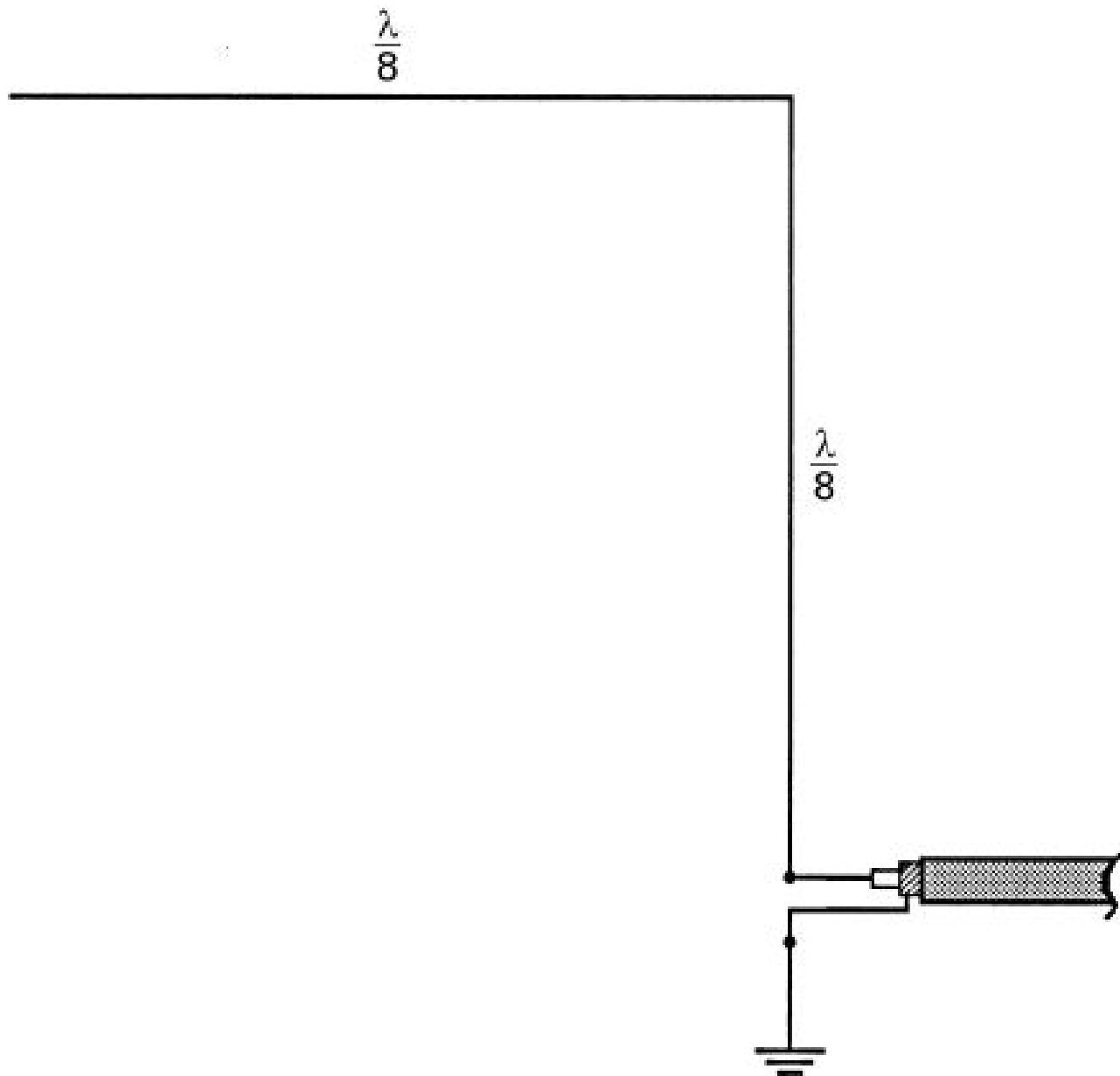


## Tilted Folded Dipole Antenna

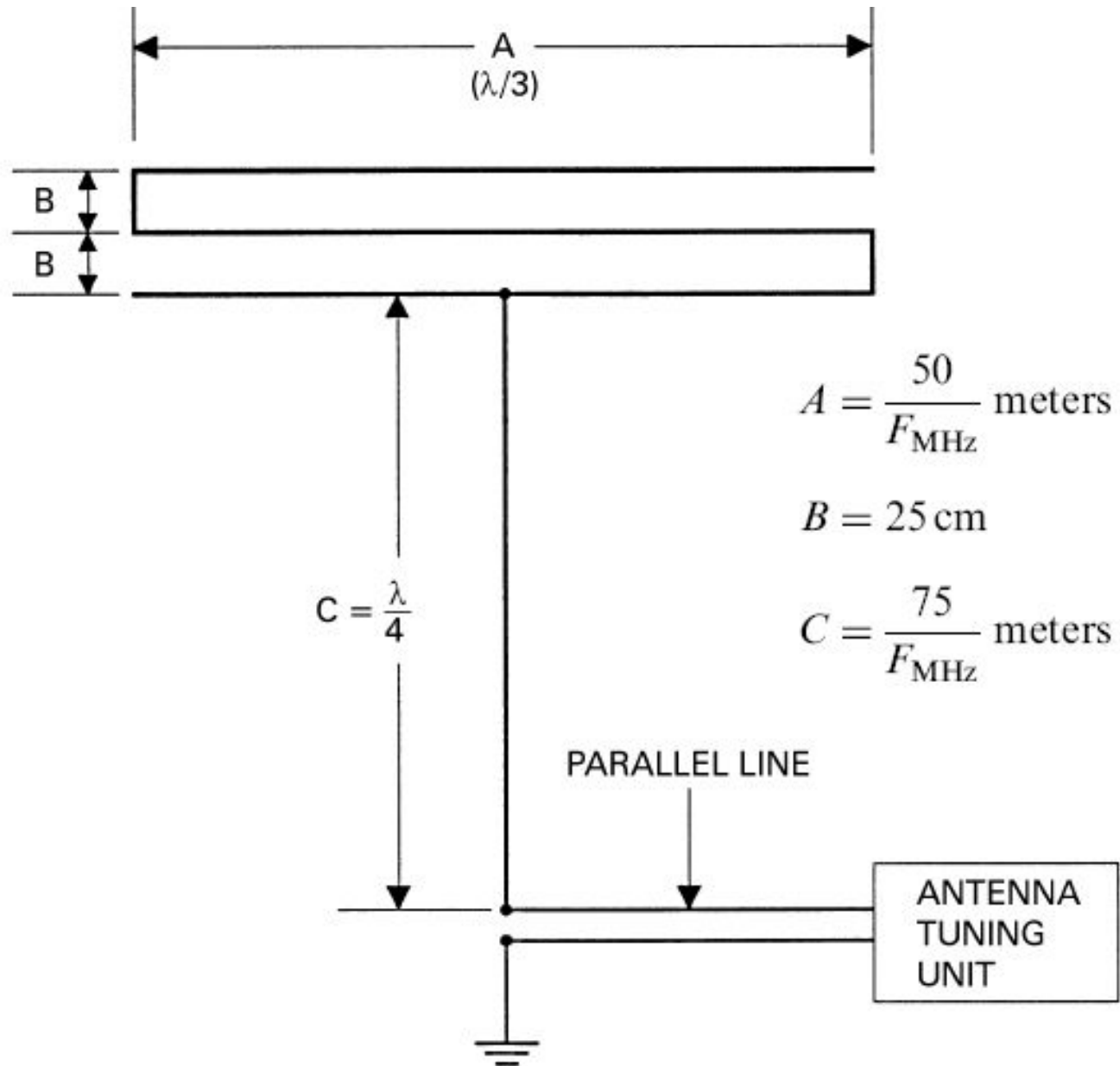




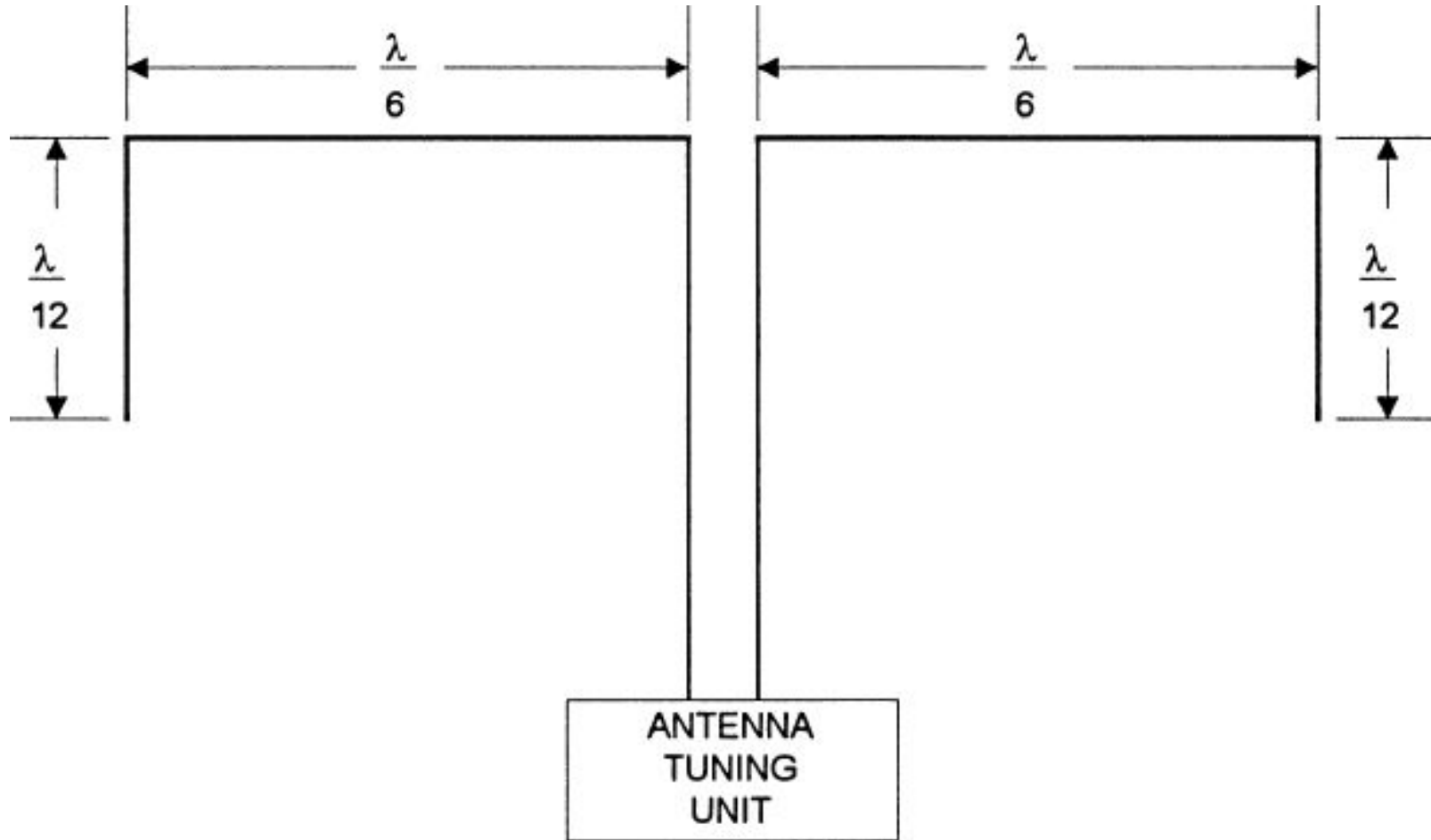
# Right Angle Marconi Antenna



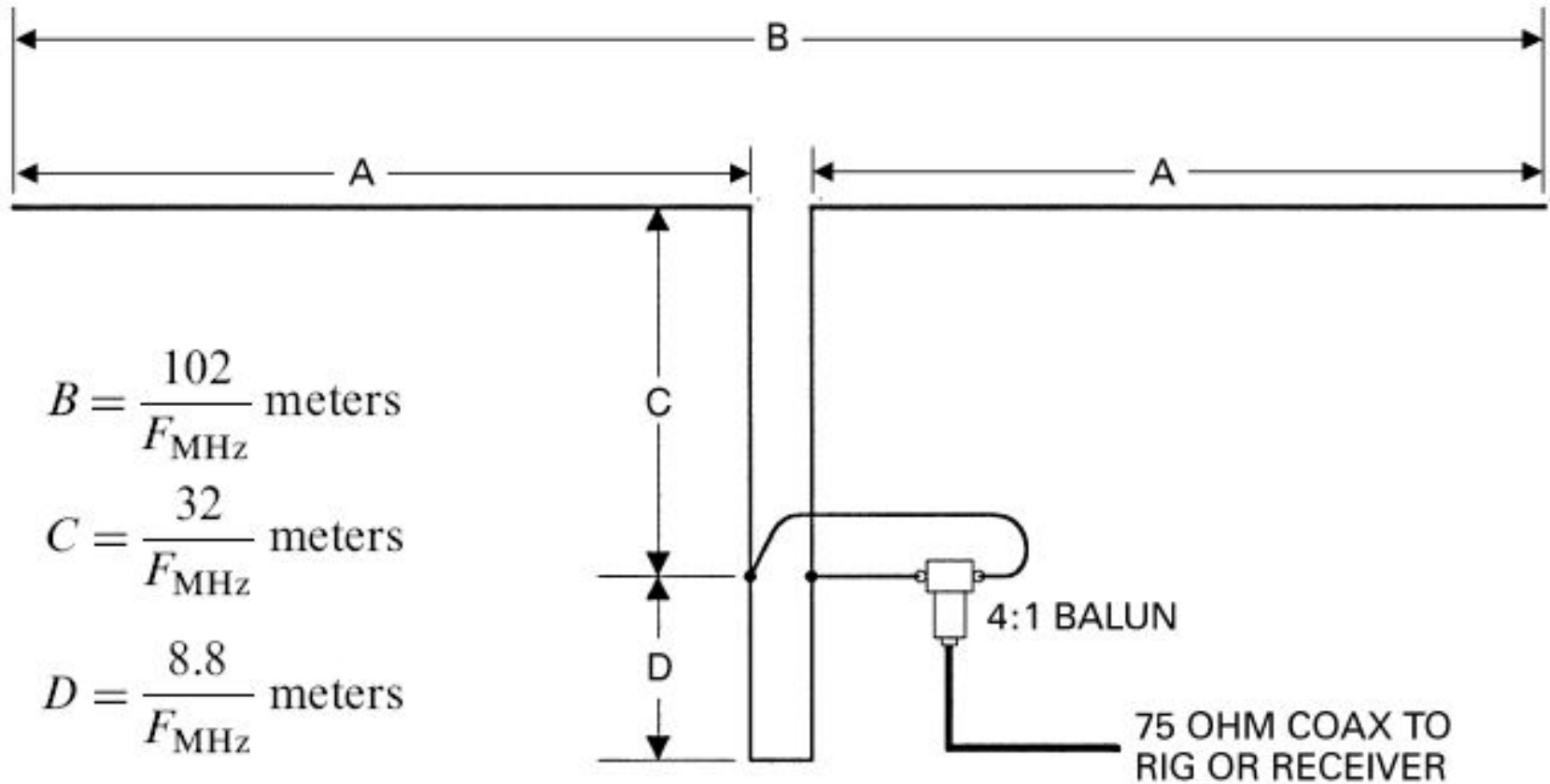
## Linearly Loaded Tee Antenna



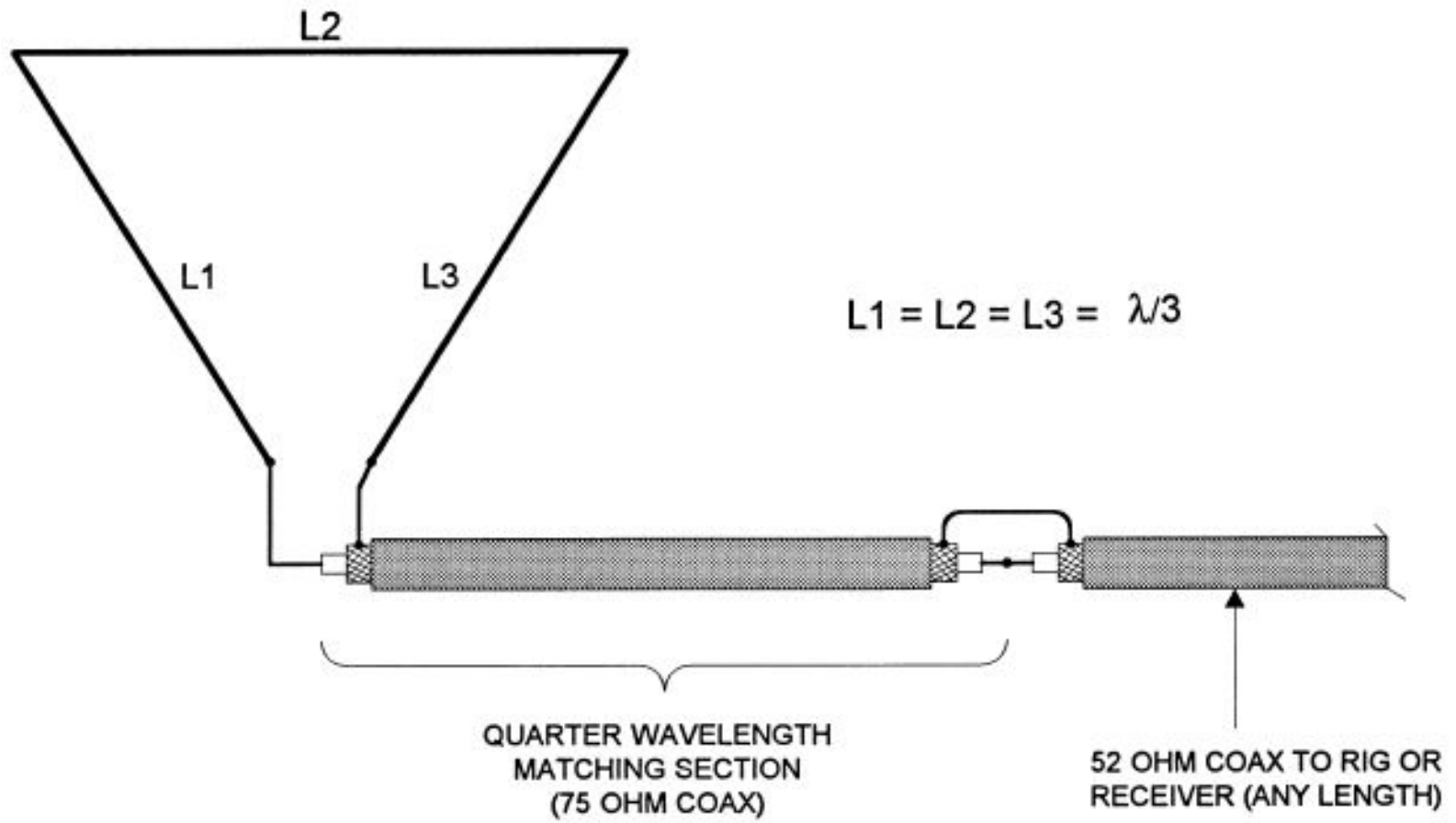
## Reduced Size Dipole Antenna



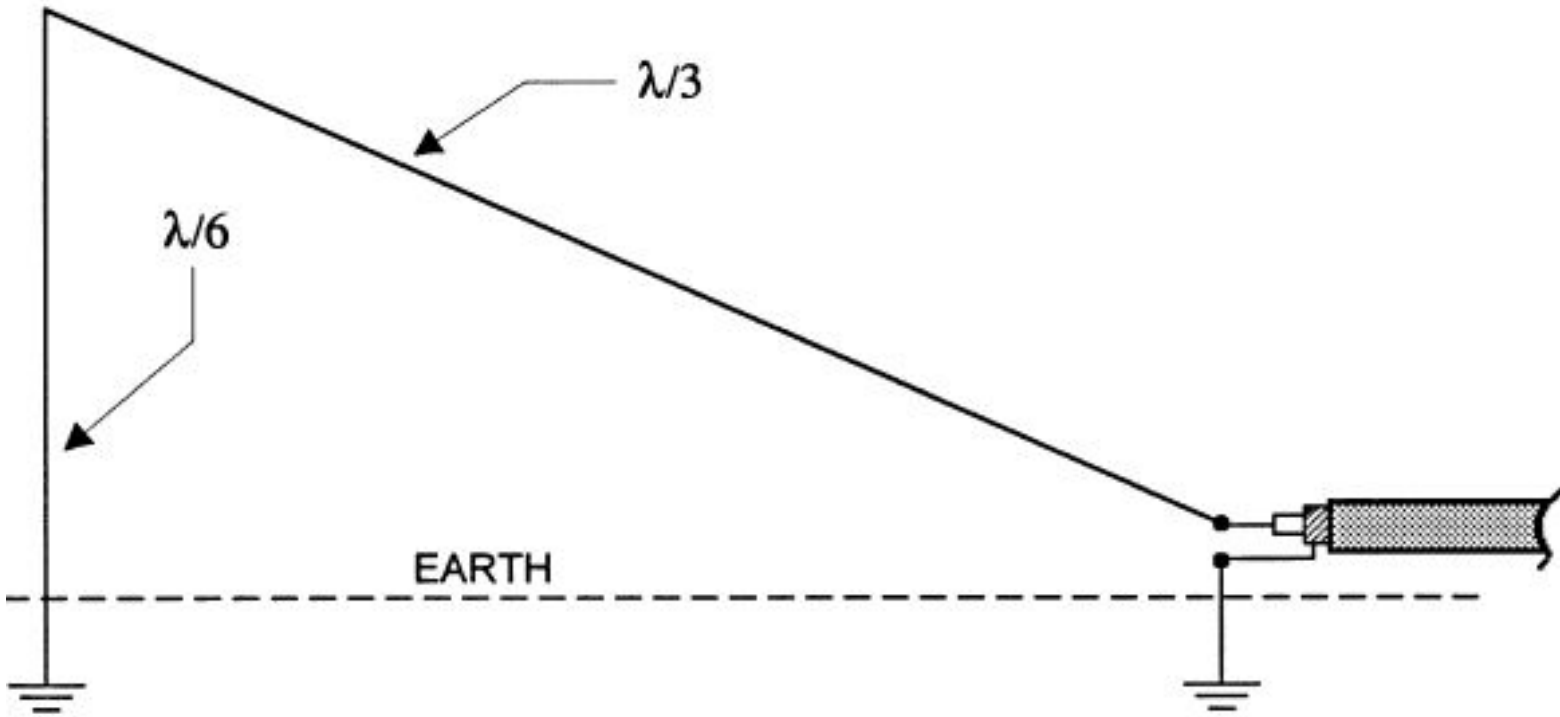
## Doublet Dipole Antenna



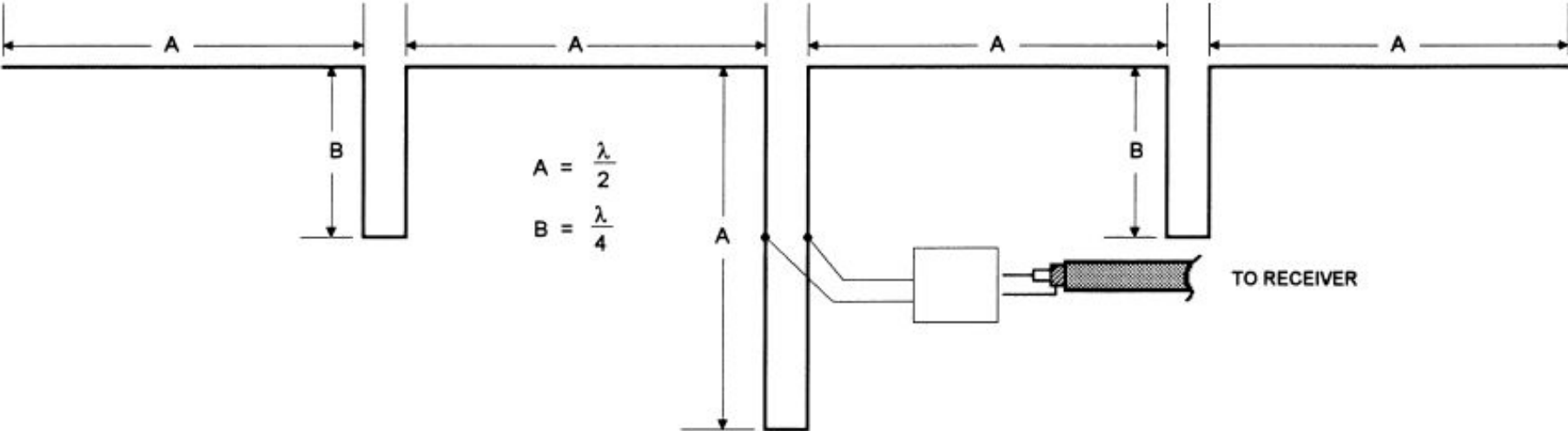
## Delta Loop Antenna



## Half Delta Loop Antenna

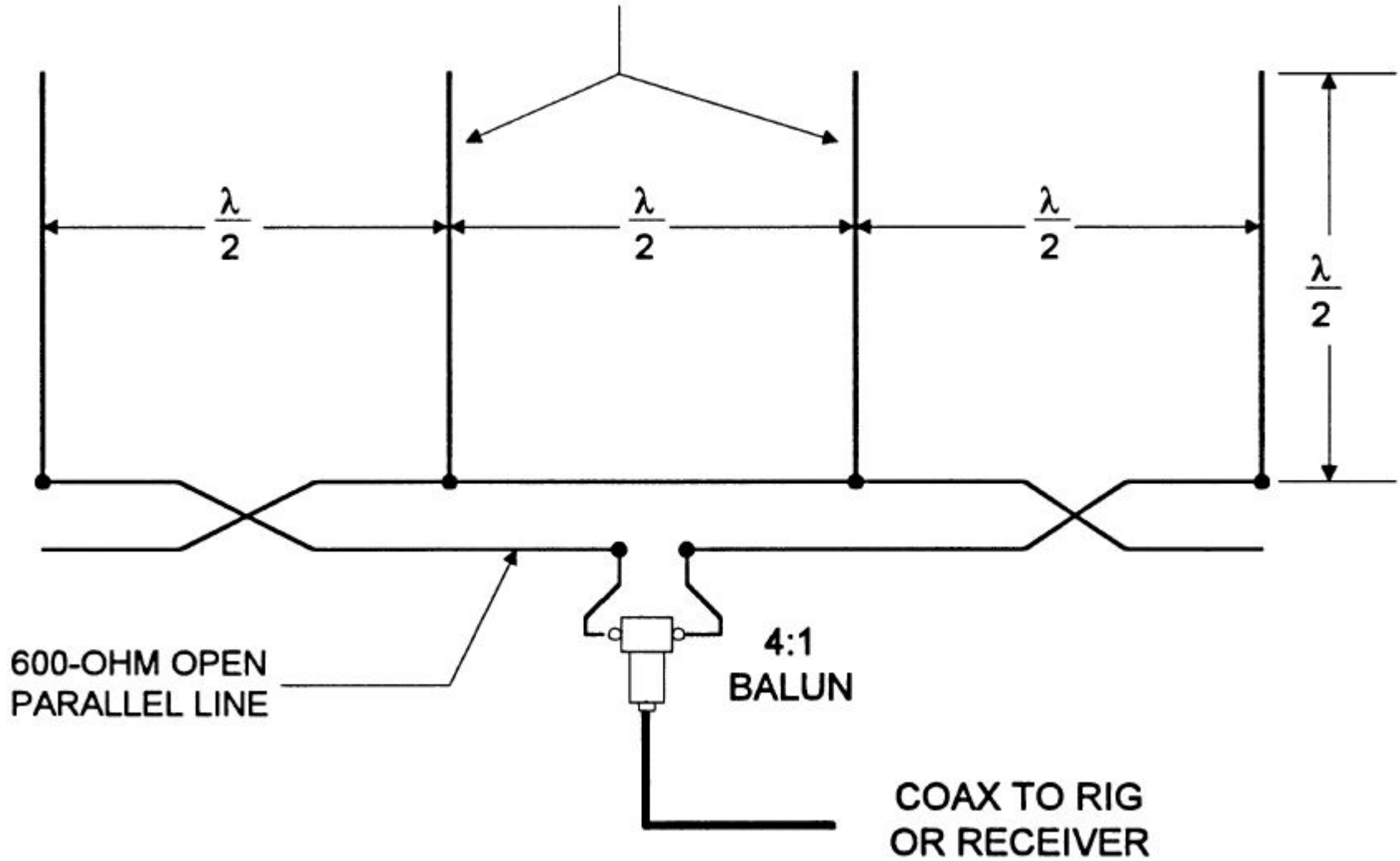


# Collinear Franklin Antenna



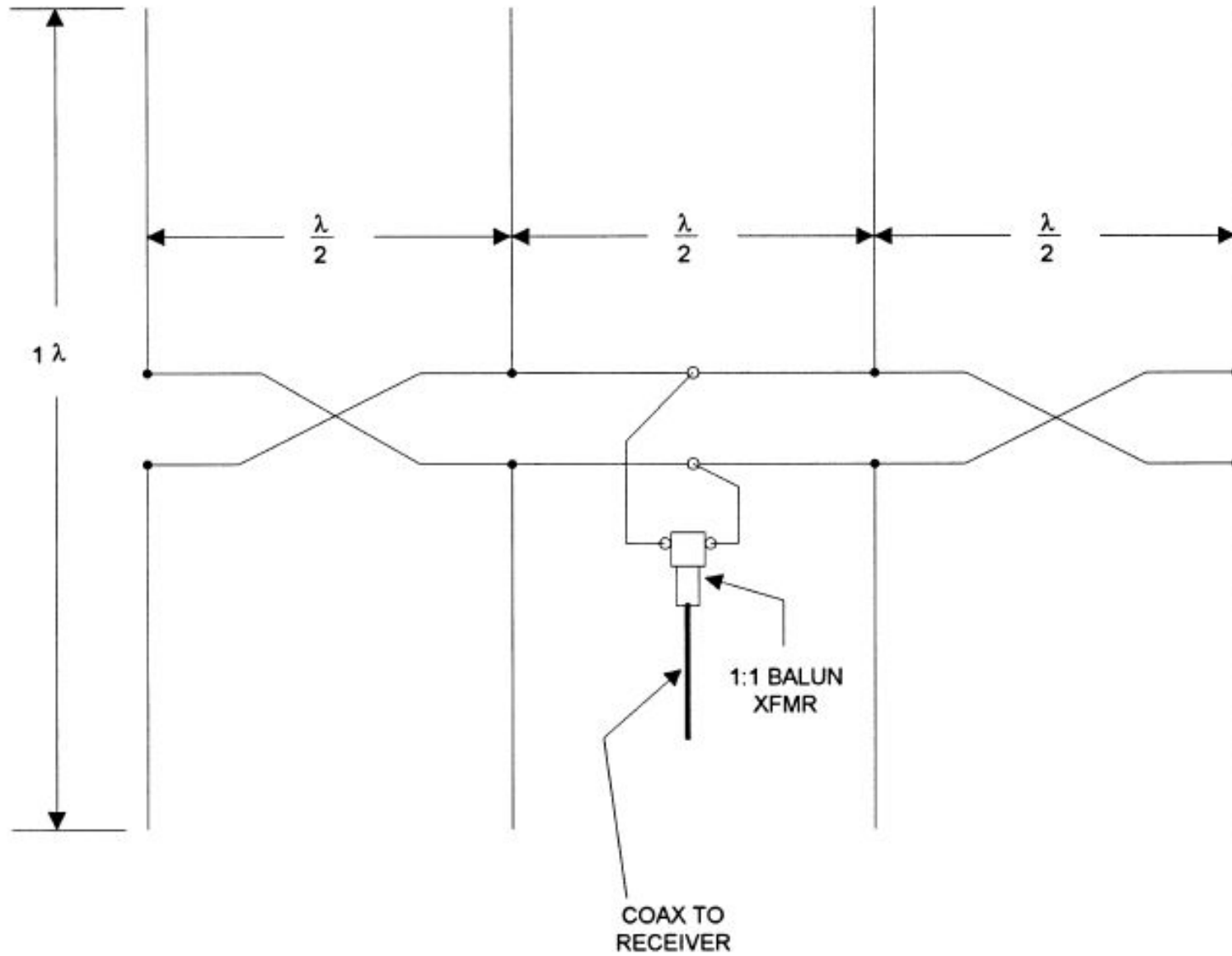
# Four Element Broadside Antenna

HALF-WAVELENGTH  
VERTICAL ELEMENTS (4)

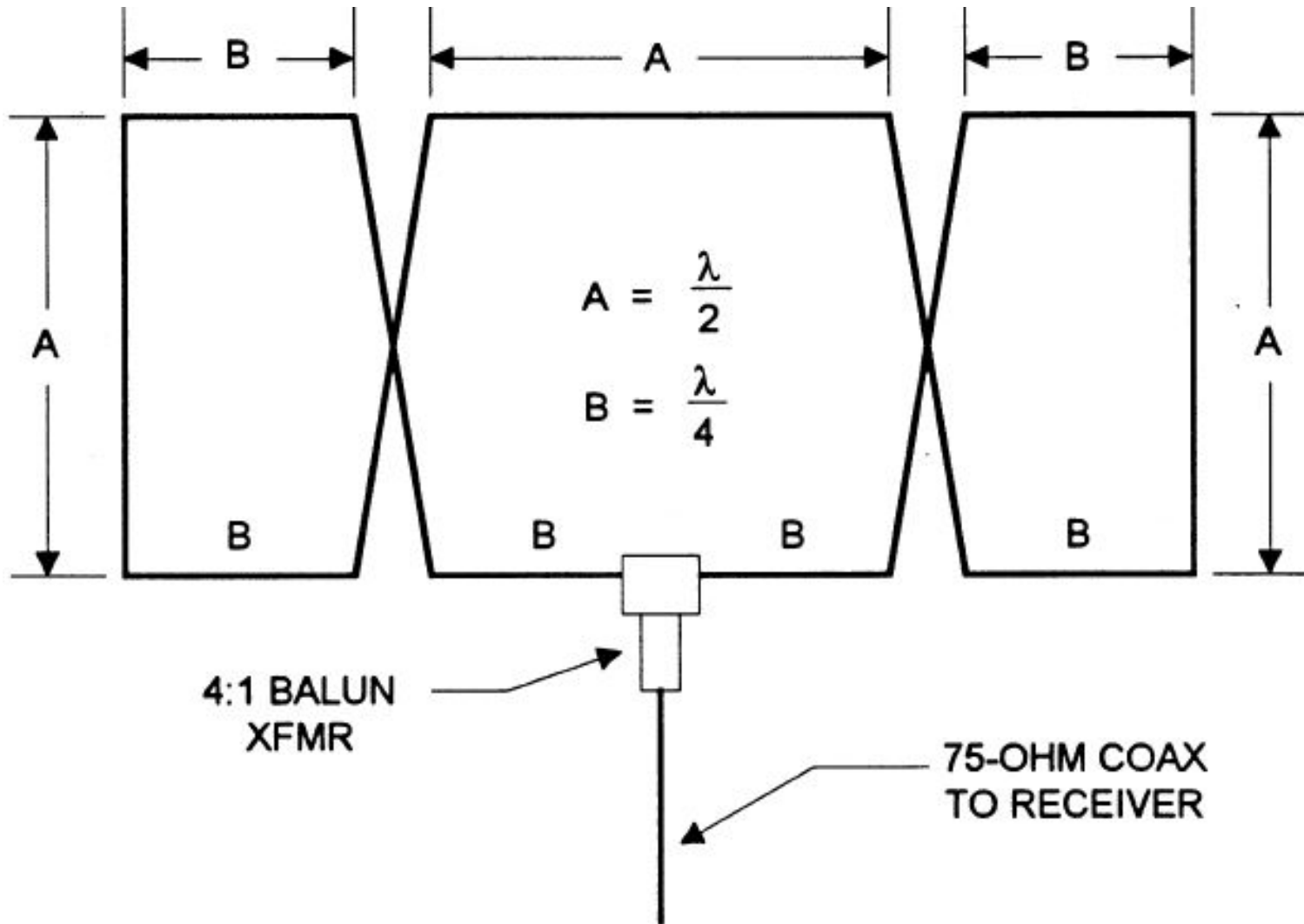




# The Lazy-H Array Antenna

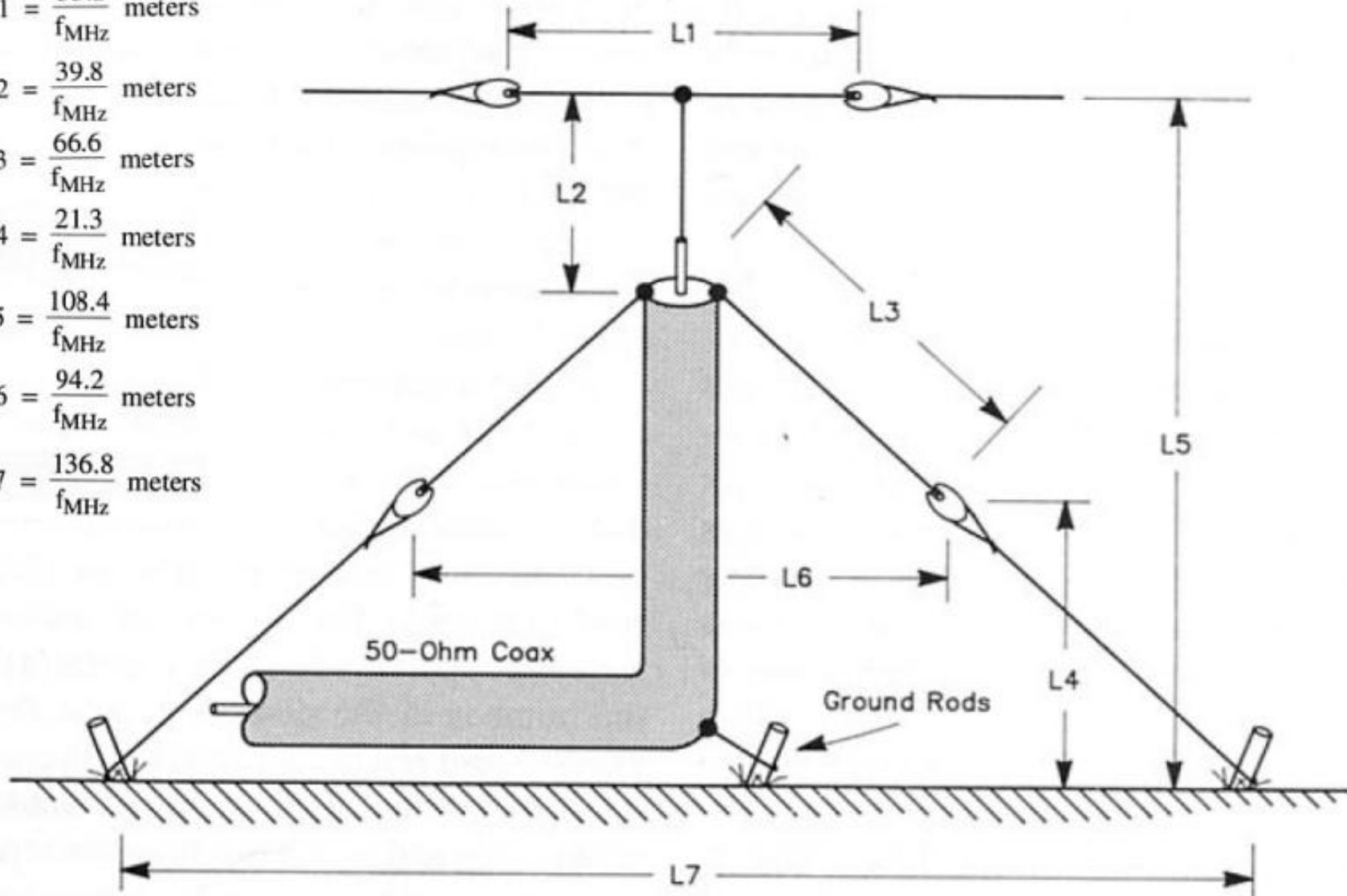


## Sterba Curtain Array Antenna

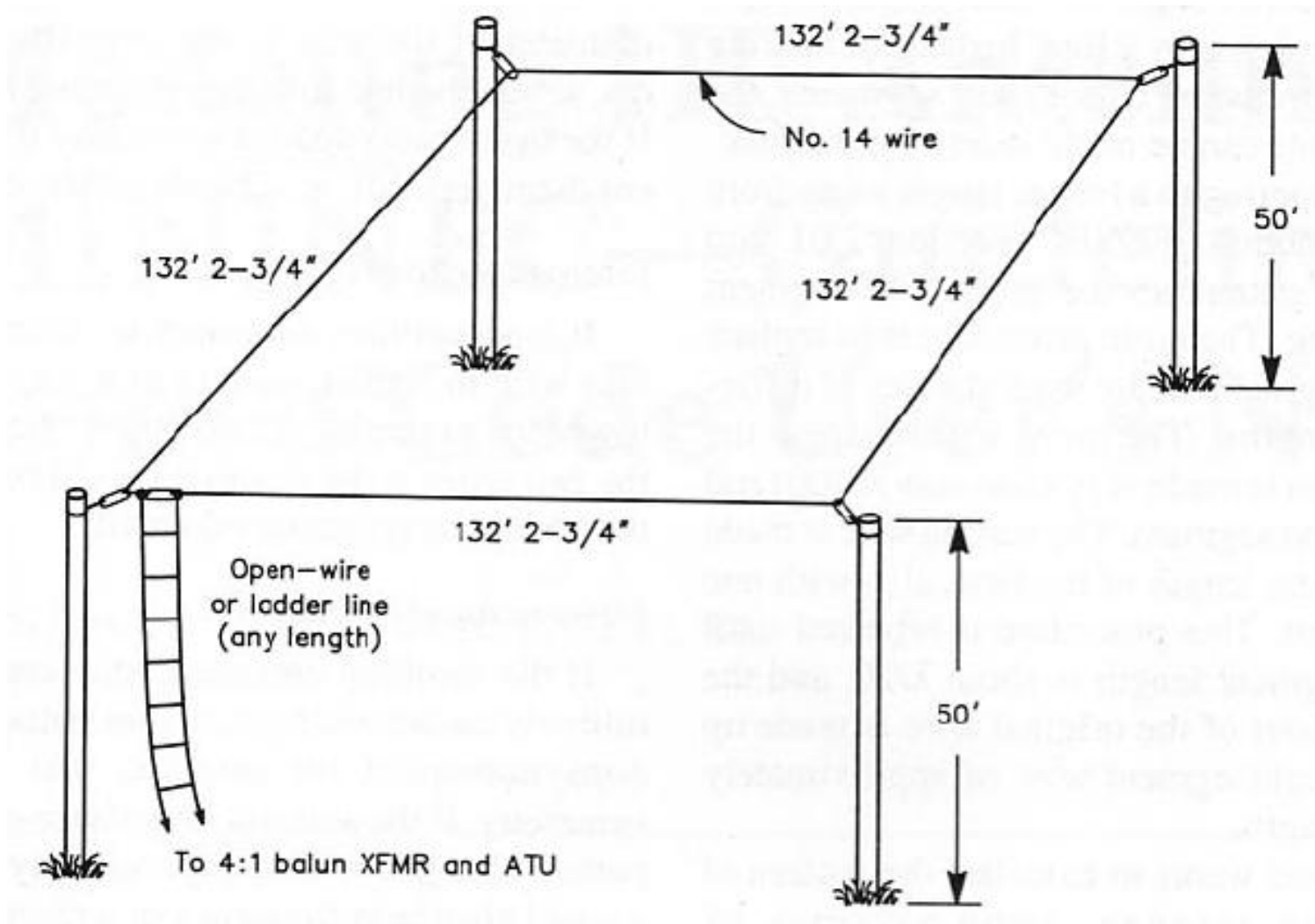


## T-L DX Antenna

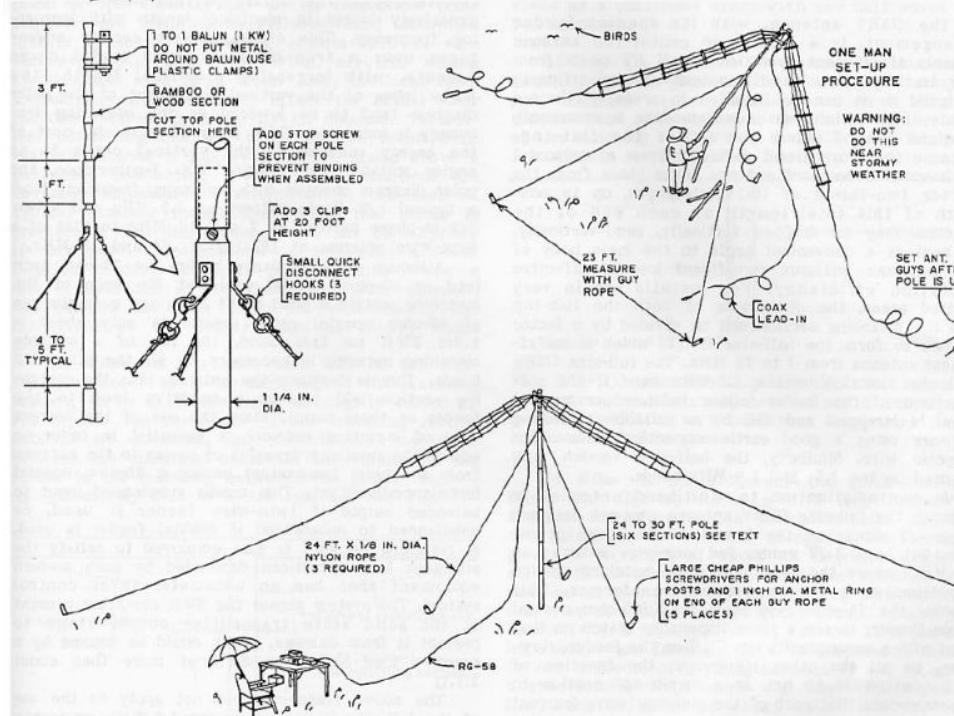
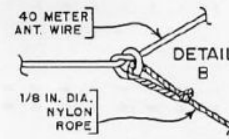
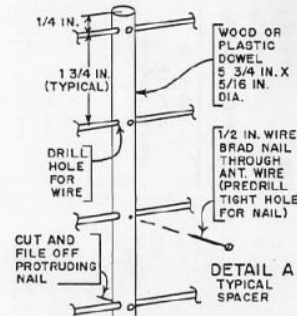
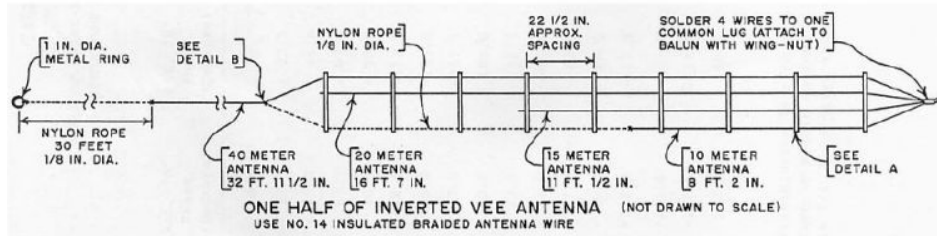
$$L1 = \frac{53.2}{f_{\text{MHz}}} \text{ meters}$$
$$L2 = \frac{39.8}{f_{\text{MHz}}} \text{ meters}$$
$$L3 = \frac{66.6}{f_{\text{MHz}}} \text{ meters}$$
$$L4 = \frac{21.3}{f_{\text{MHz}}} \text{ meters}$$
$$L5 = \frac{108.4}{f_{\text{MHz}}} \text{ meters}$$
$$L6 = \frac{94.2}{f_{\text{MHz}}} \text{ meters}$$
$$L7 = \frac{136.8}{f_{\text{MHz}}} \text{ meters}$$



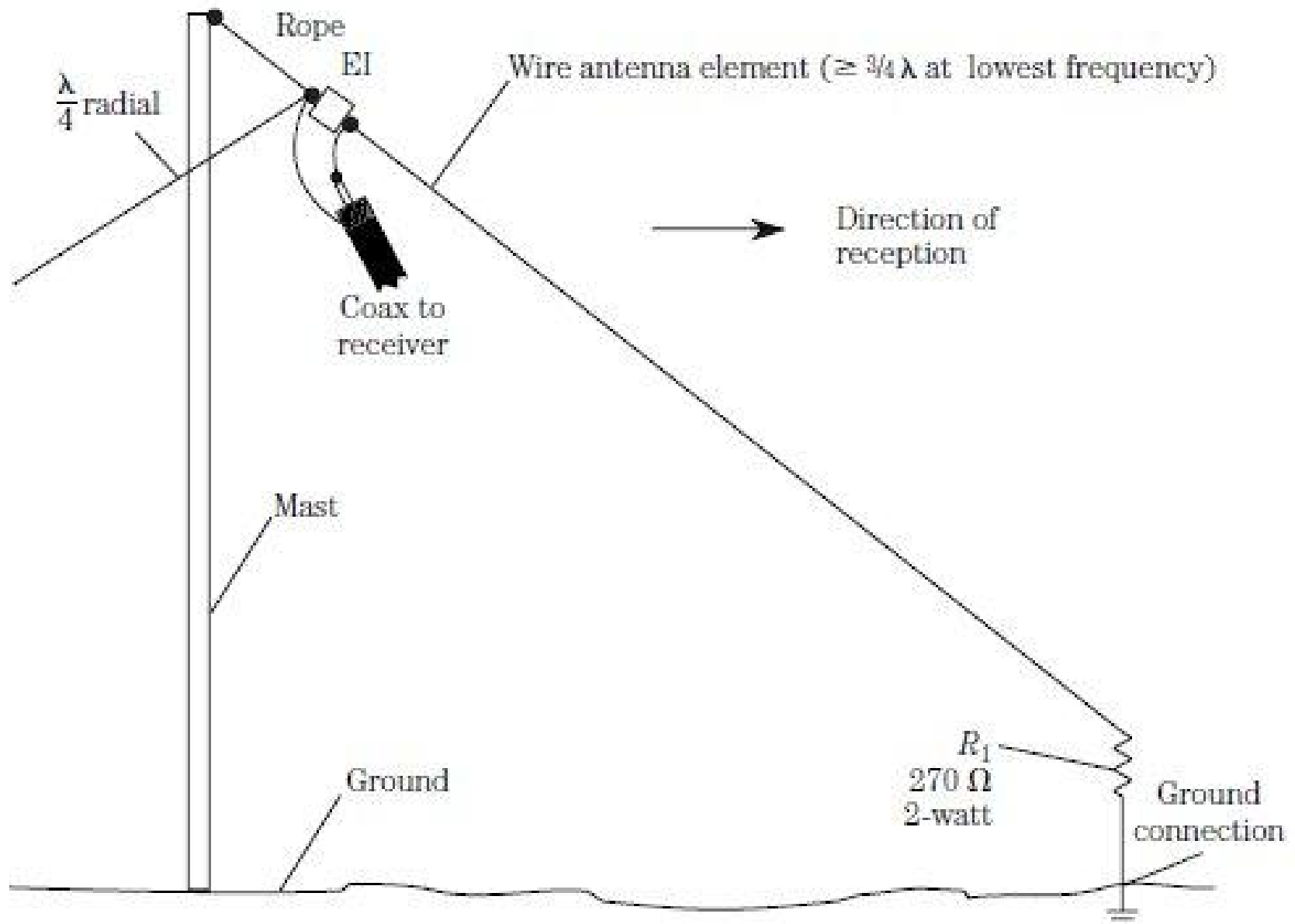
## 1.9 MHz Full-wave Loop Antenna



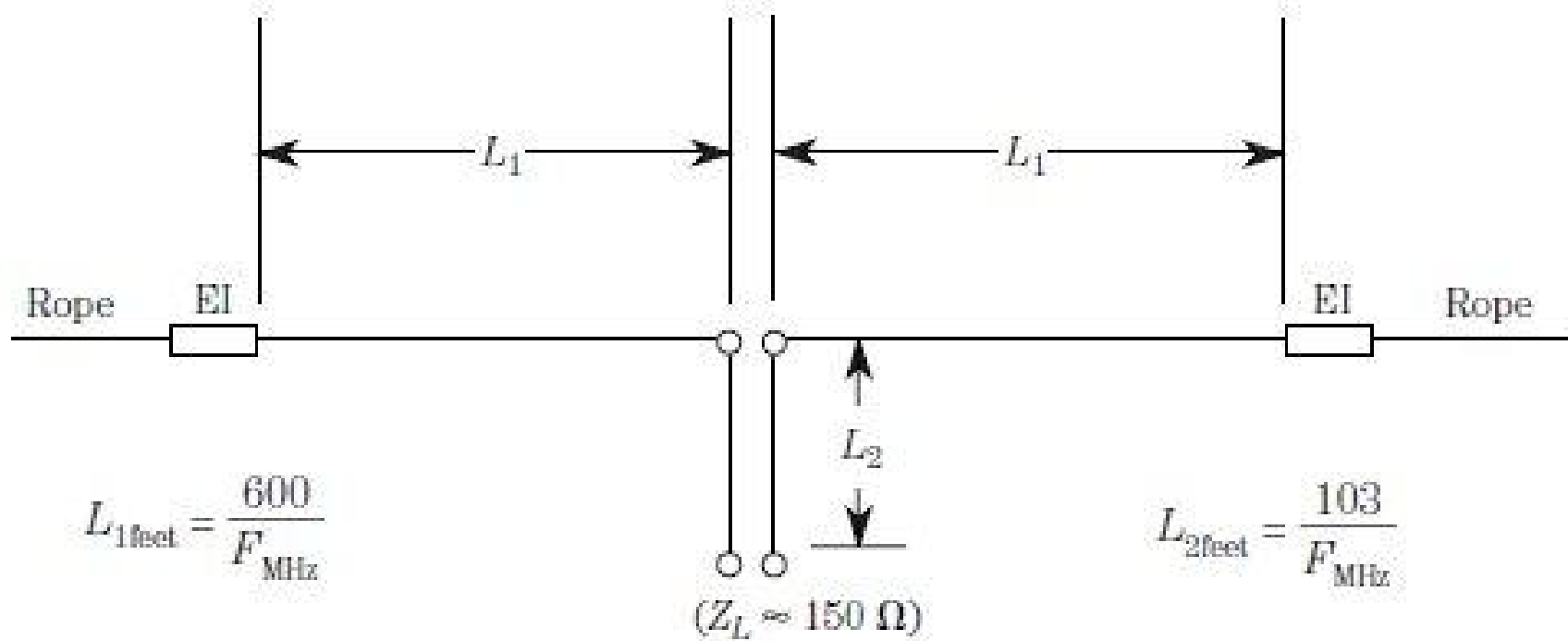
# Multi-Band Portable Antenna



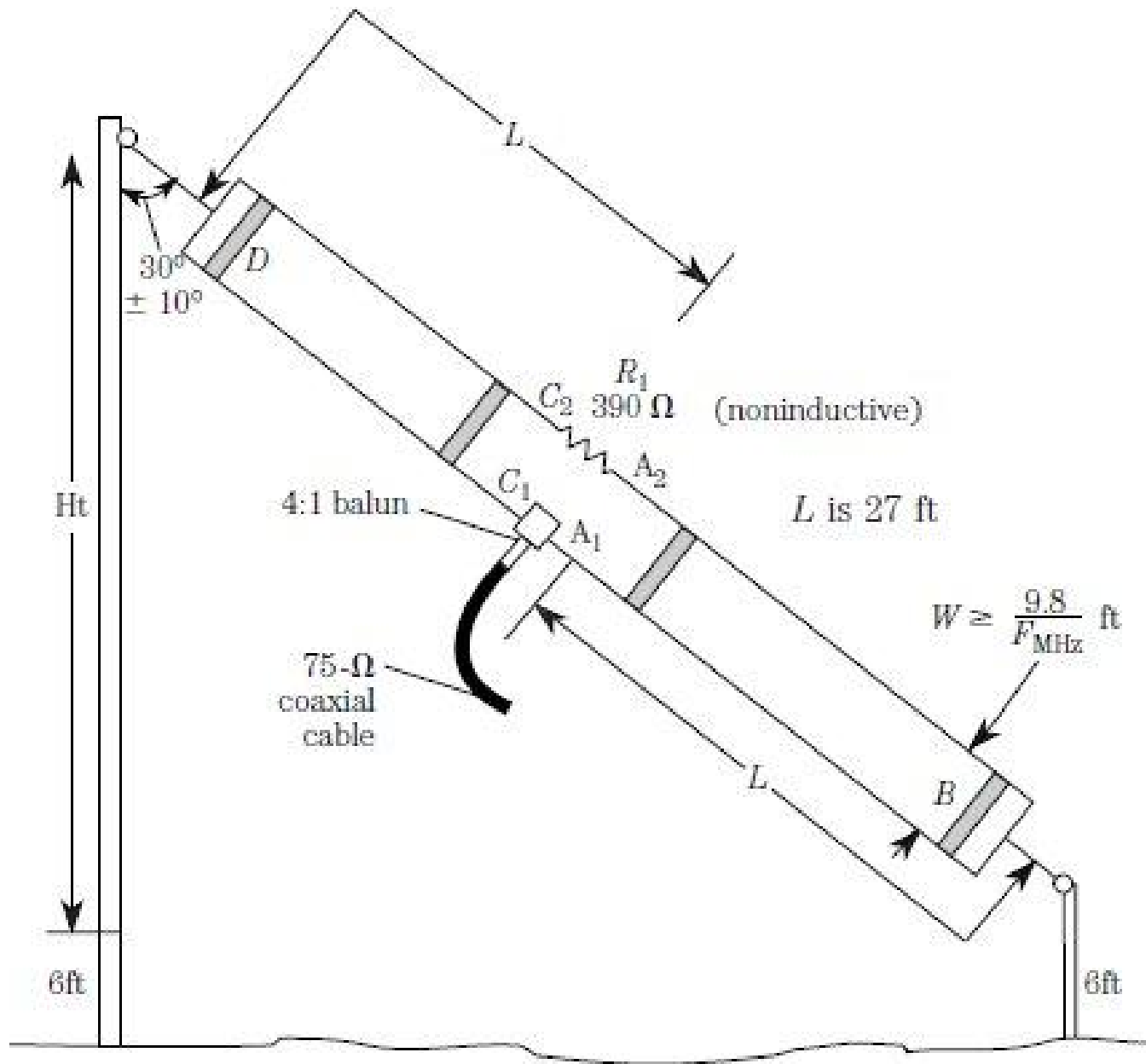
## Terminated Sloper Antenna



## Double Extended Zepp Antenna

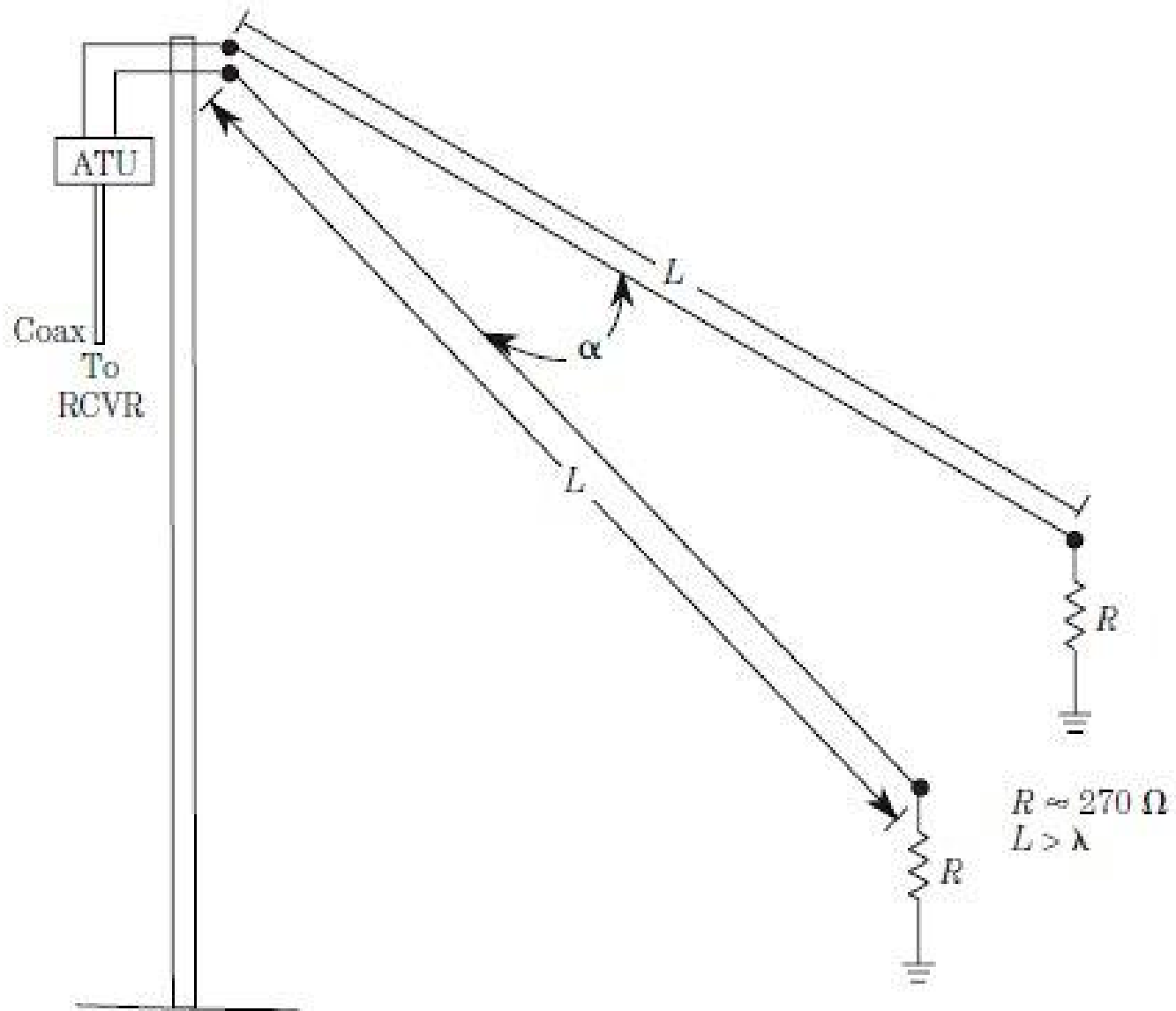


# TCFTFD Dipole Antenna

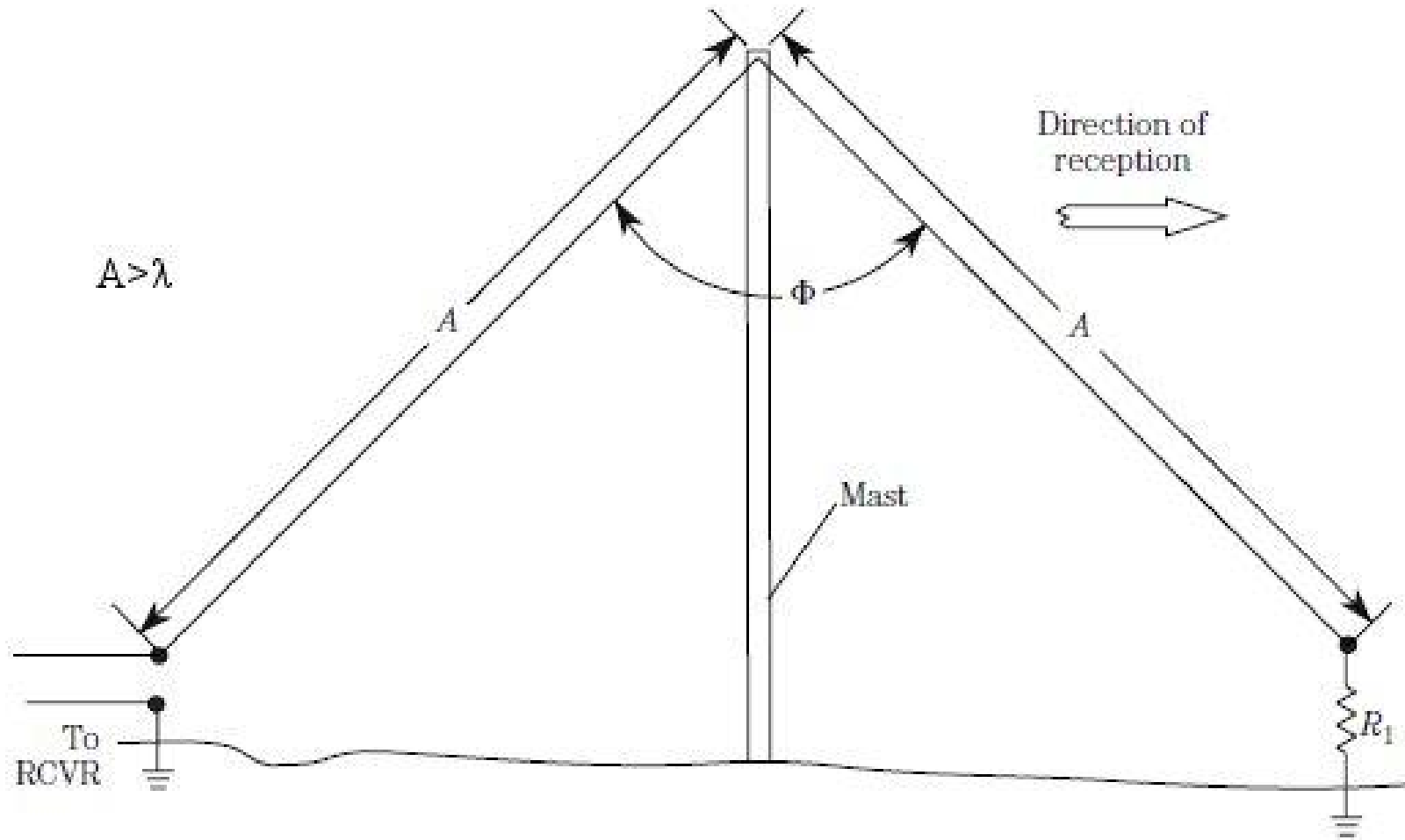




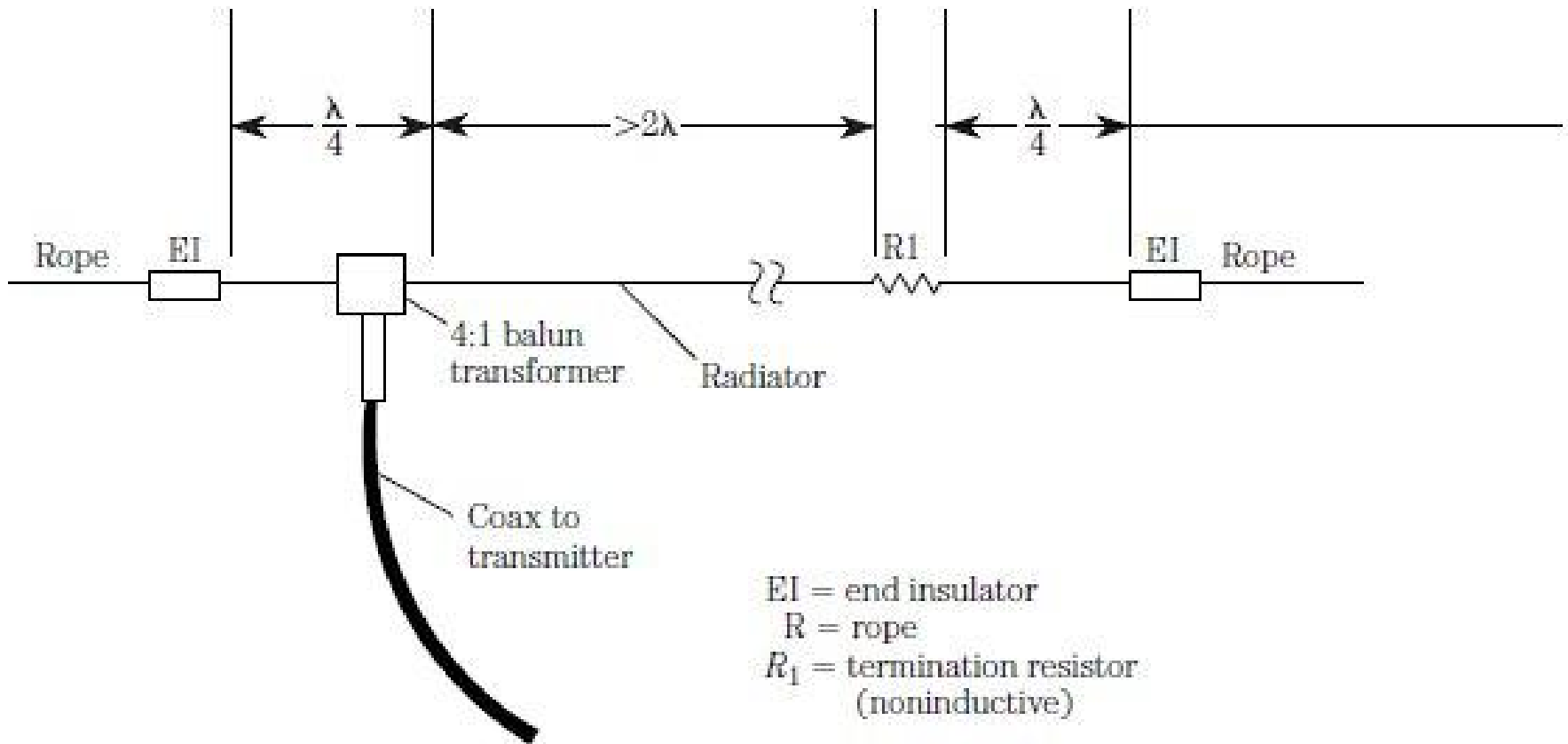
## Vee-Sloper Antenna



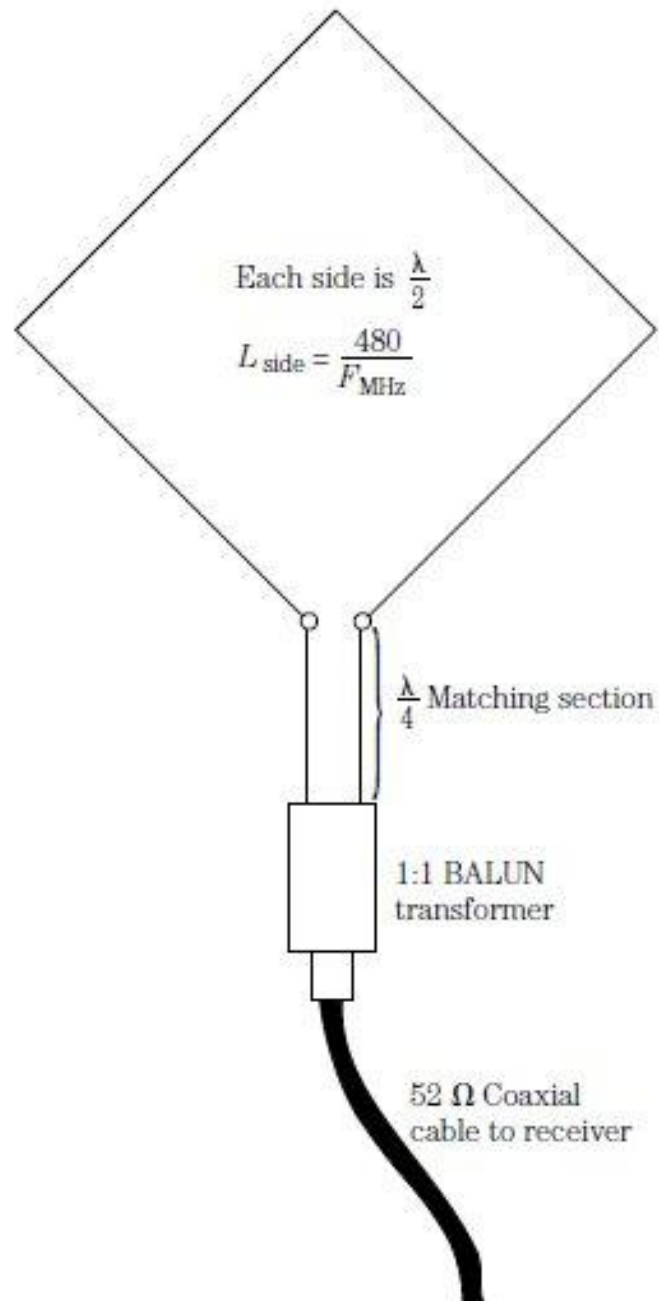
## Rhombic Inverted-Vee Antenna



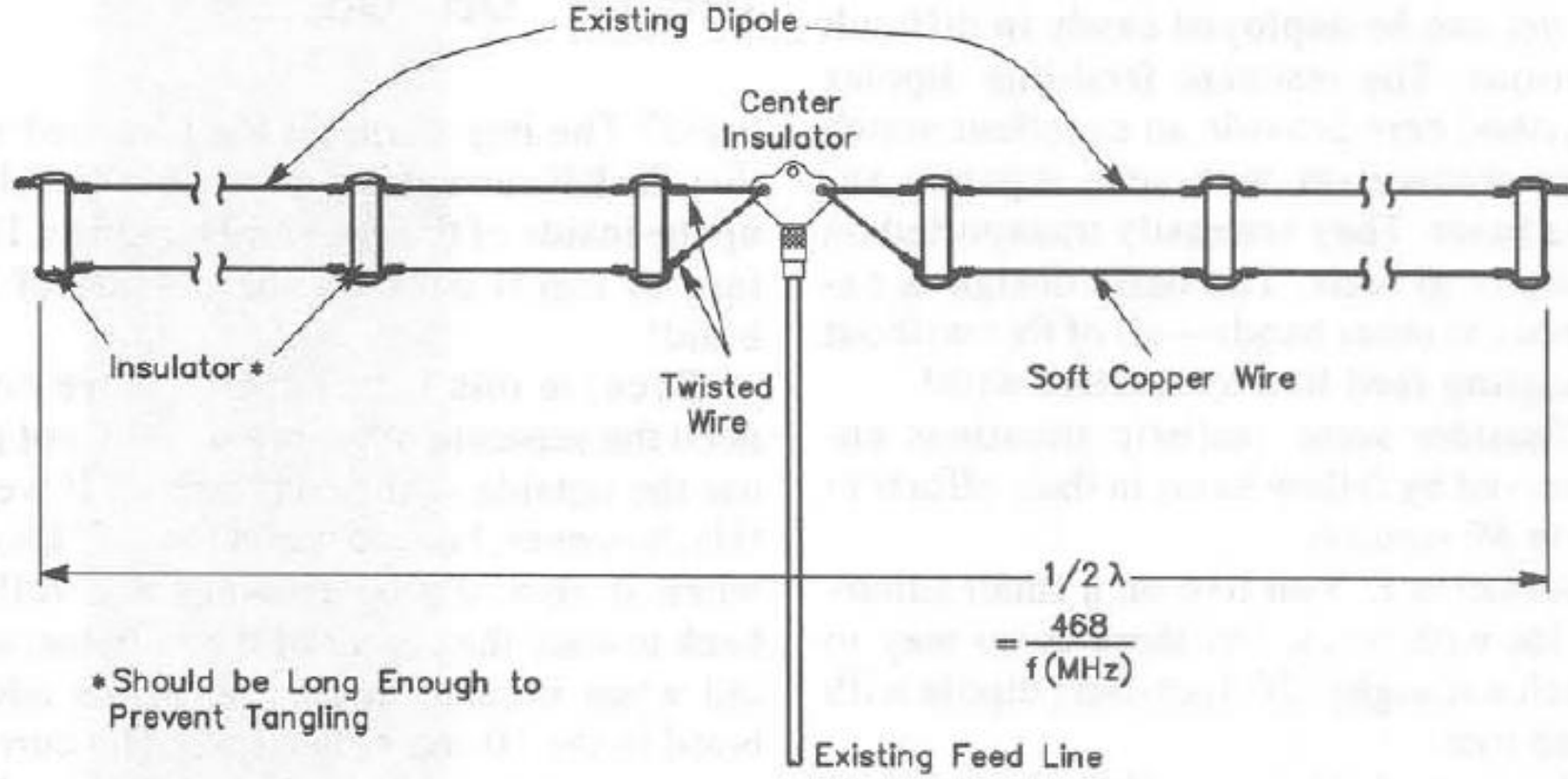
## Counterpoise Longwire



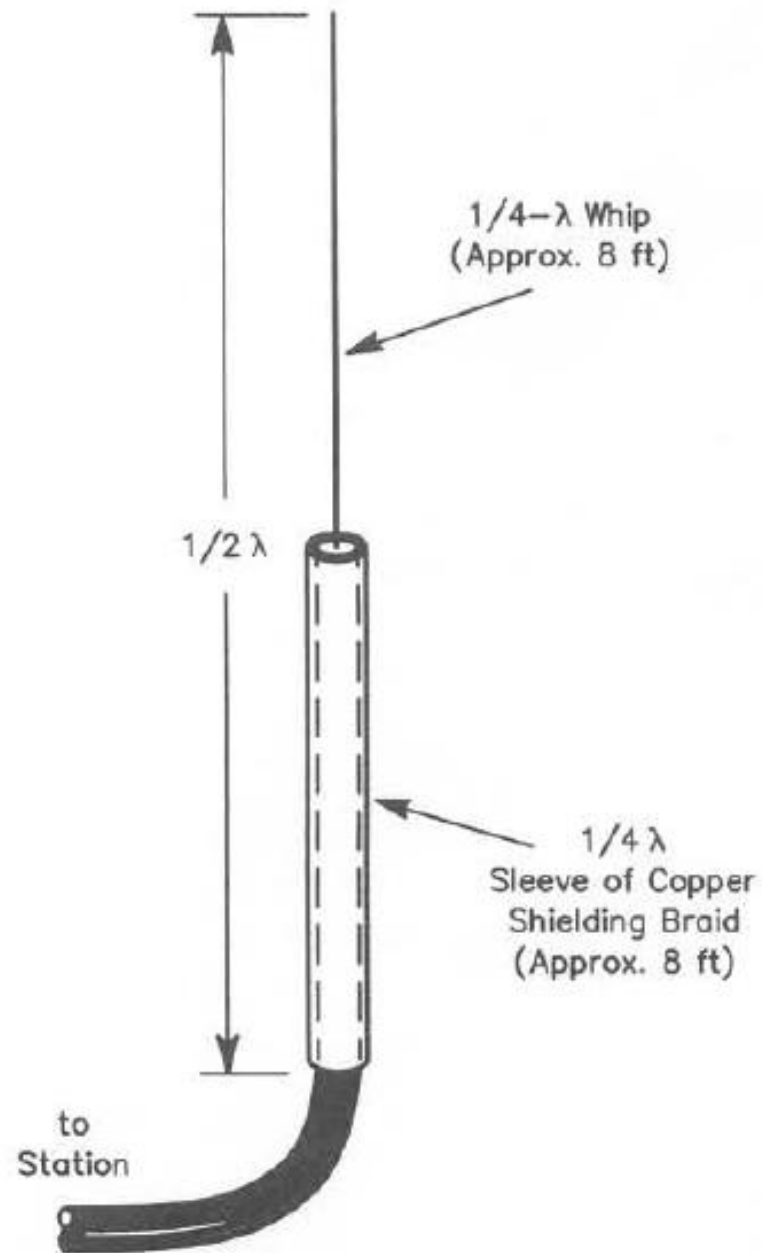
# Bisquare Loop Antenna



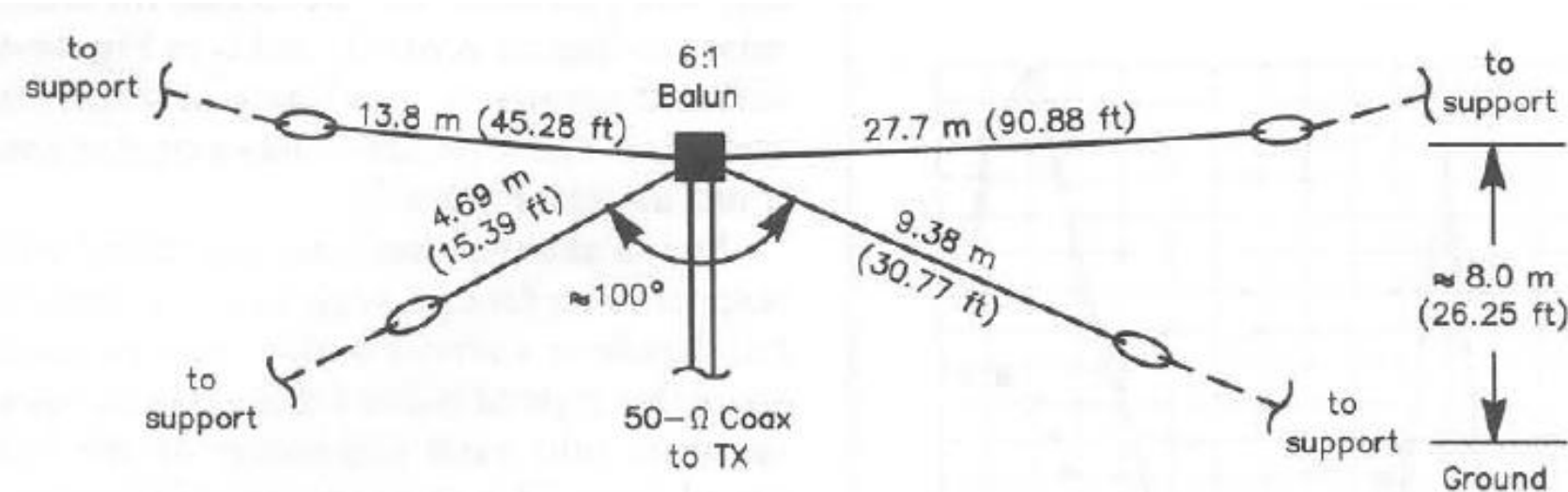
## Piggyback Antenna for 10m



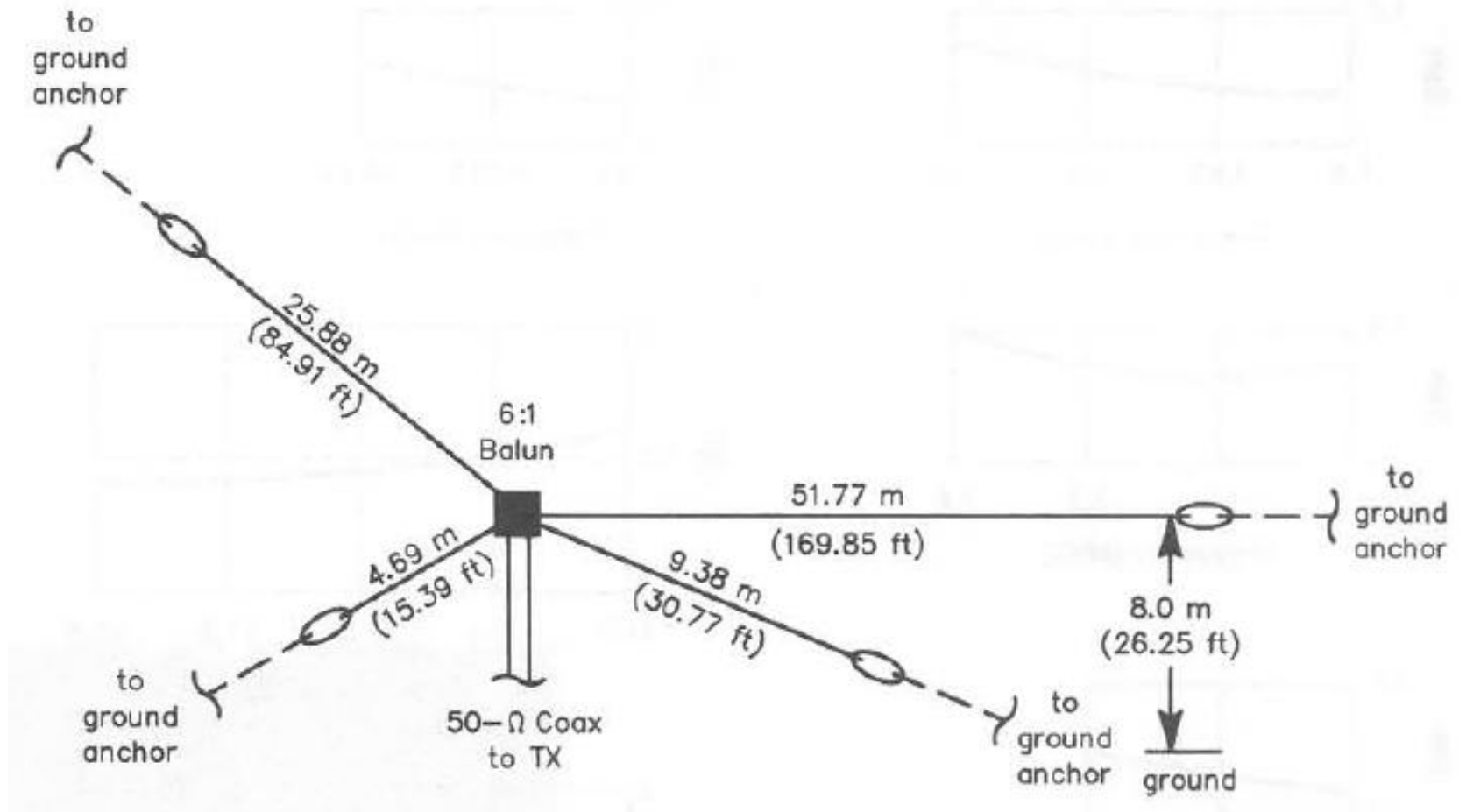
## Vertical Sleeve Antenna for 10m



# Double Windom Antenna

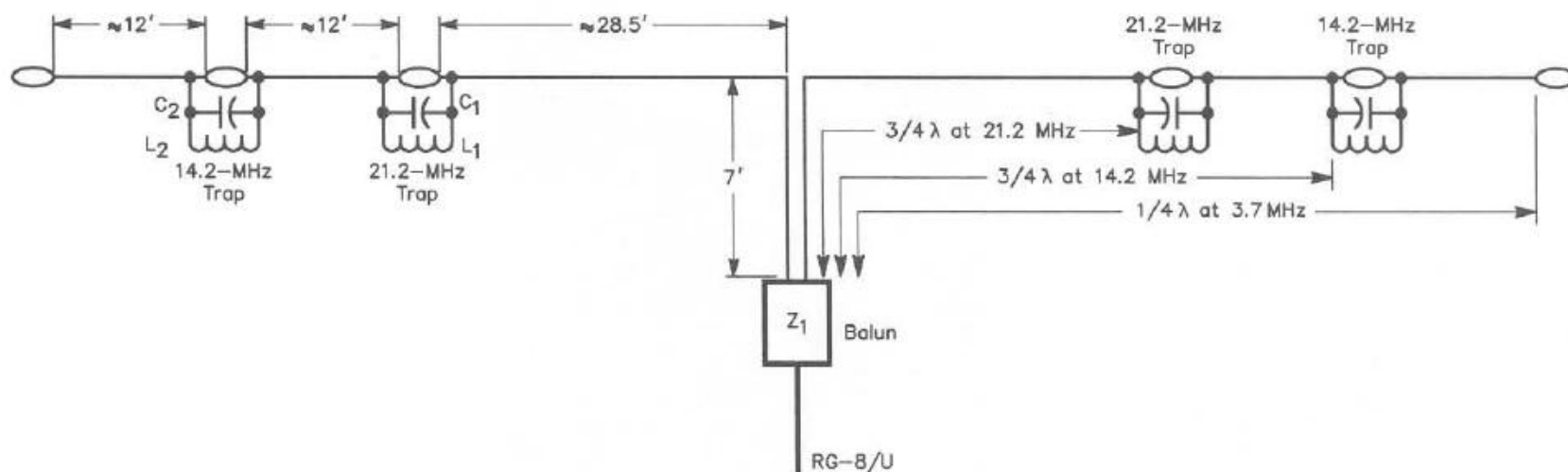


## Double Windom for 9 Bands





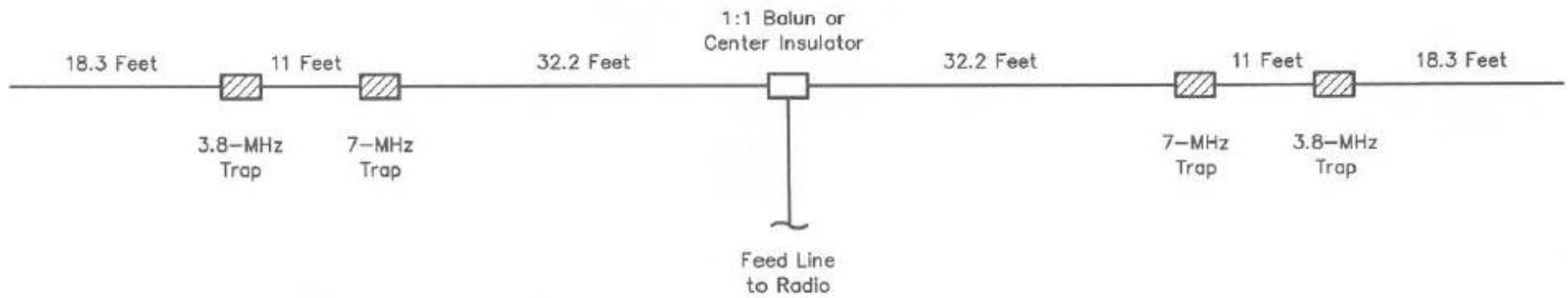
## Collinear Trap Antenna



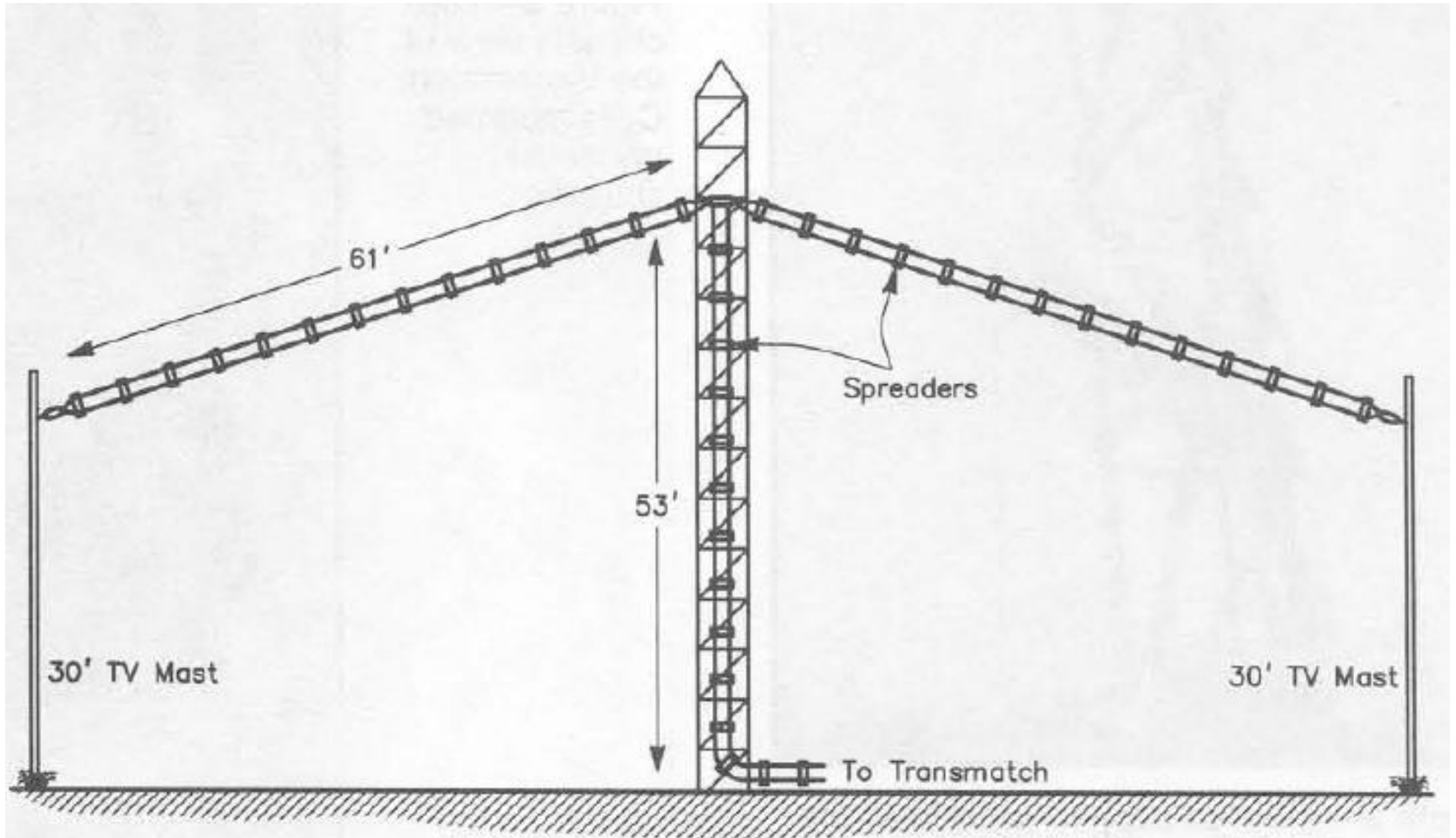
C1, C2—25-pf. 6000-volt disk ceramic. See text.  
 L<sub>1</sub>—Approx. 2  $\mu$ H—4<sup>3</sup>/<sub>4</sub> turns No. 18, 2<sup>1</sup>/<sub>4</sub>-inches diam., <sup>3</sup>/<sub>8</sub> inch long, or 5 turns No. 18, 2-inch diam., 16 tpi. See text.

L<sub>2</sub>—Approx. 5  $\mu$ H.—8 turns No. 18, 2<sup>1</sup>/<sub>4</sub>-inch dia., <sup>5</sup>/<sub>8</sub> inch long, or 9 turns No. 18, 2-inch diam. 16 tpi. See text.  
 Z<sub>1</sub>—1 to 1 balun.

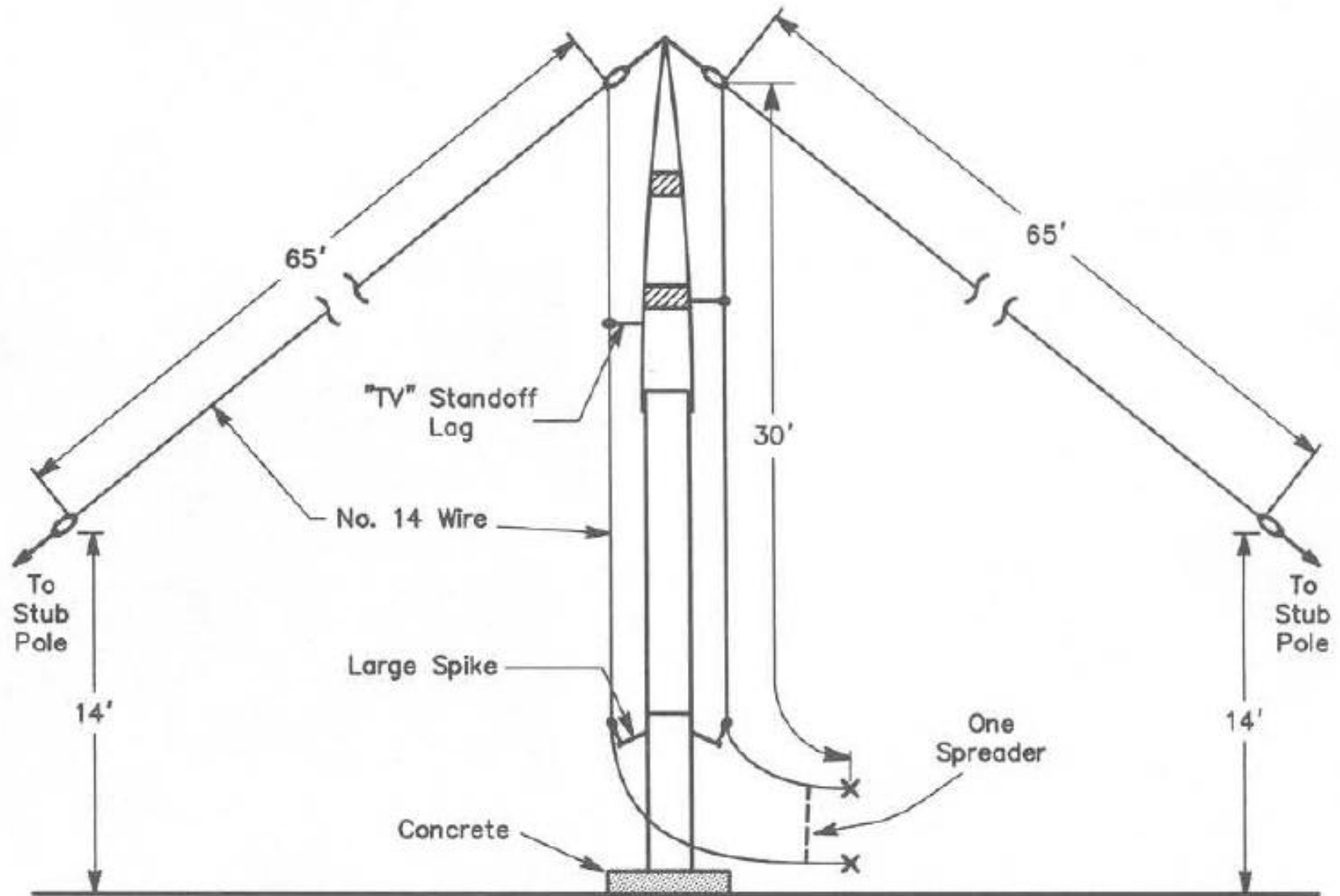
## Short Dipole Antenna for 40m - 80m - 160m



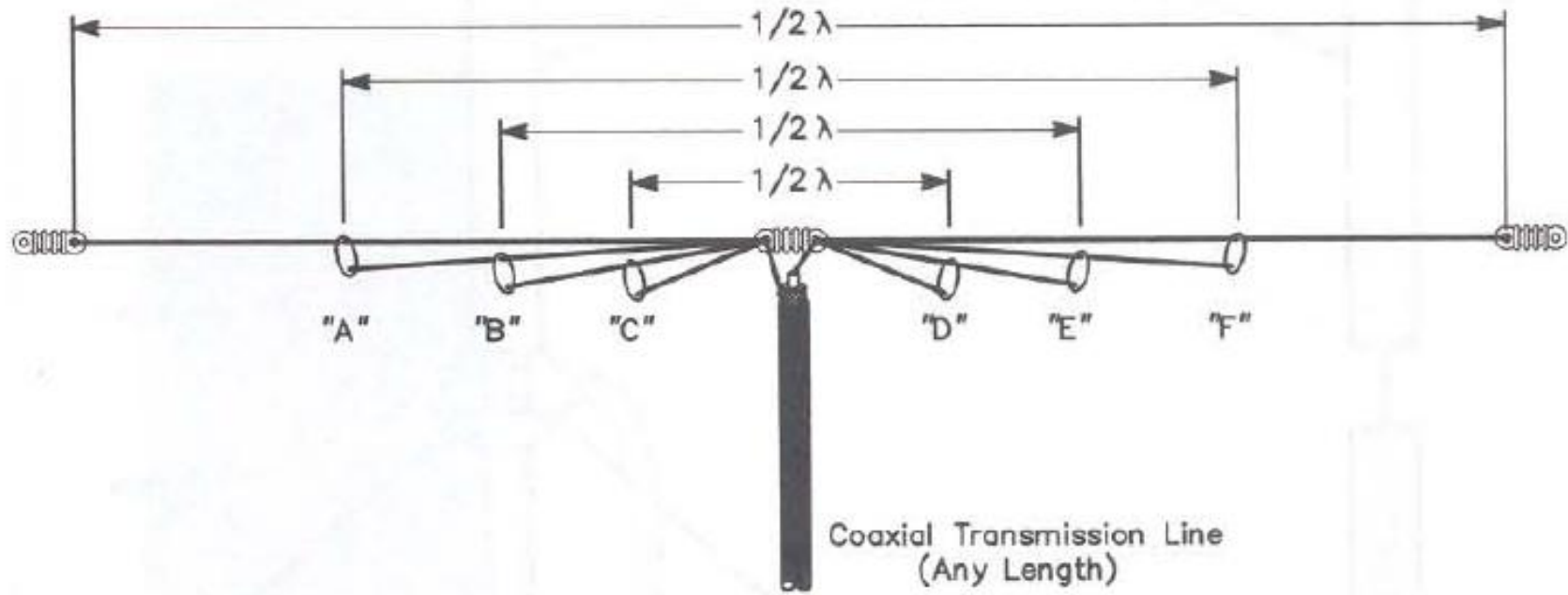
## Center Fed-Zepp Antenna for 80m - 40m



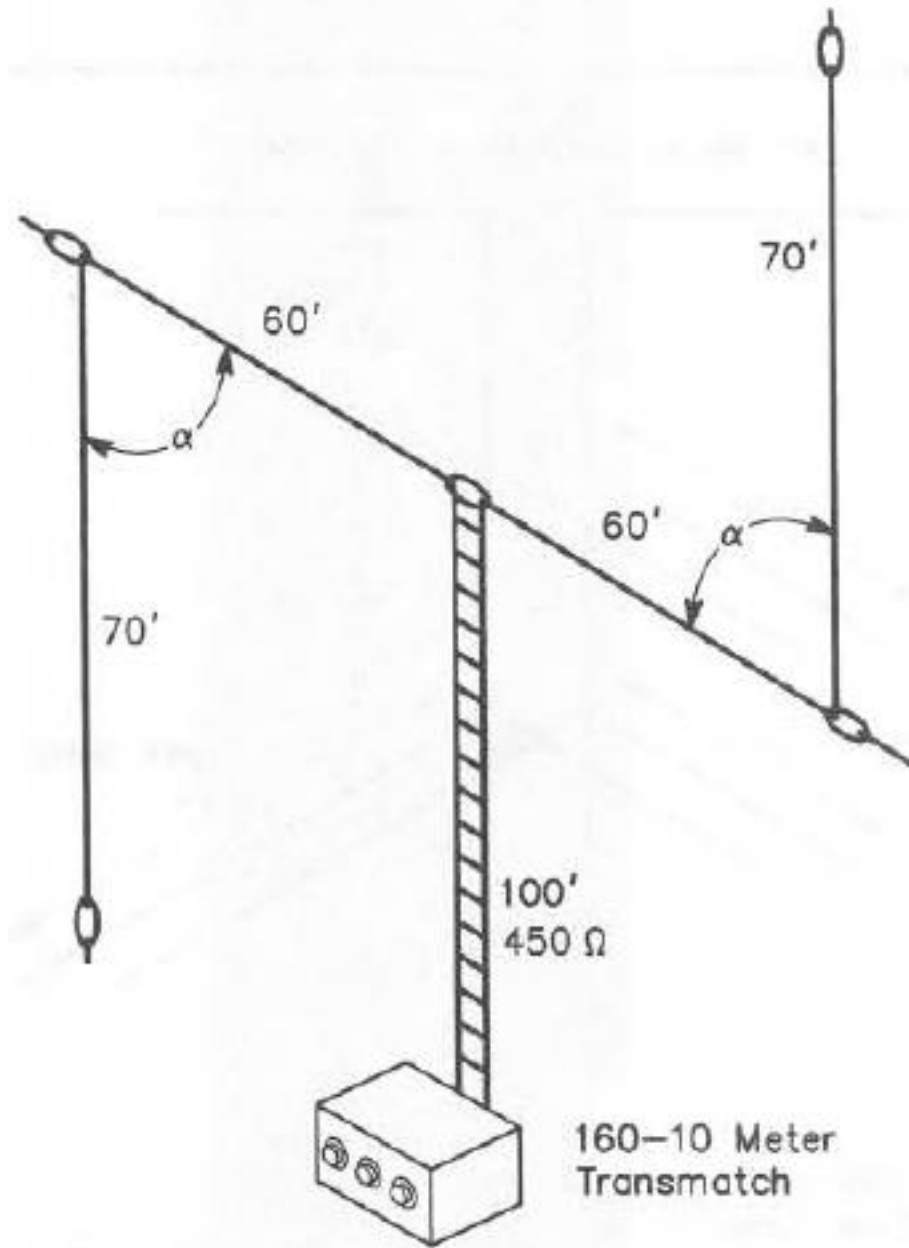
# All-Bands Antenna



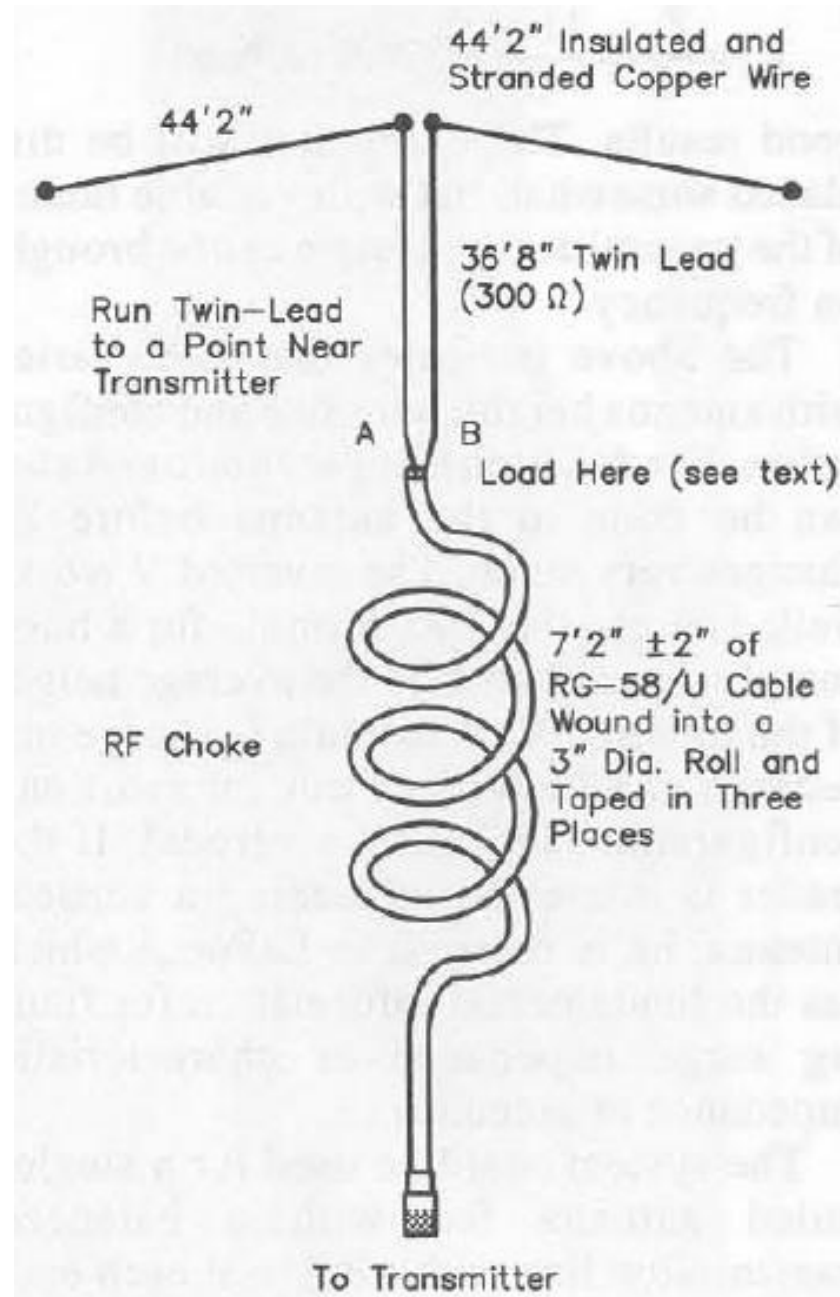
## All-Bands Dipole Antenna



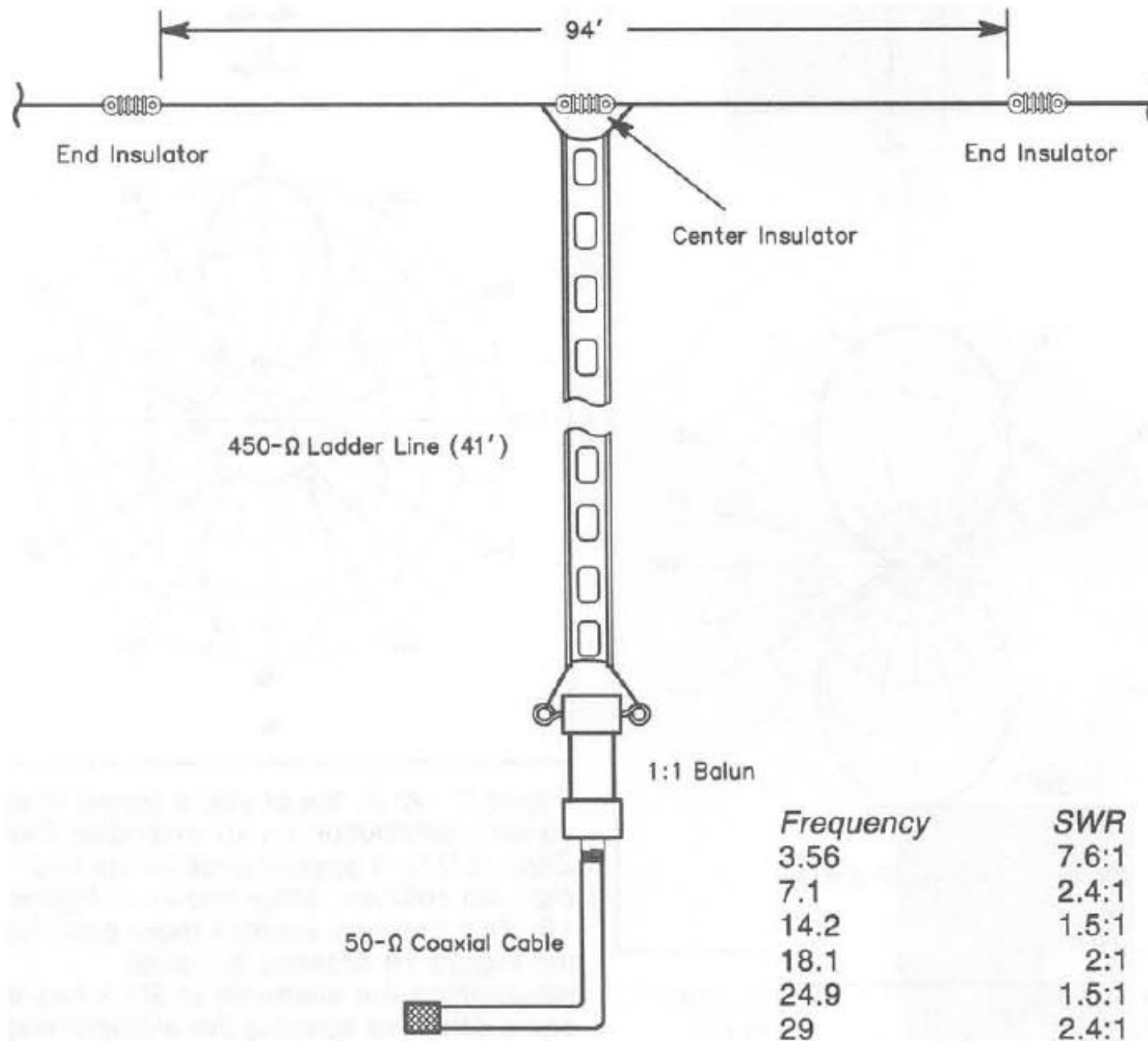
## Multiband Z Antenna



## Multiband Dipole Antenna

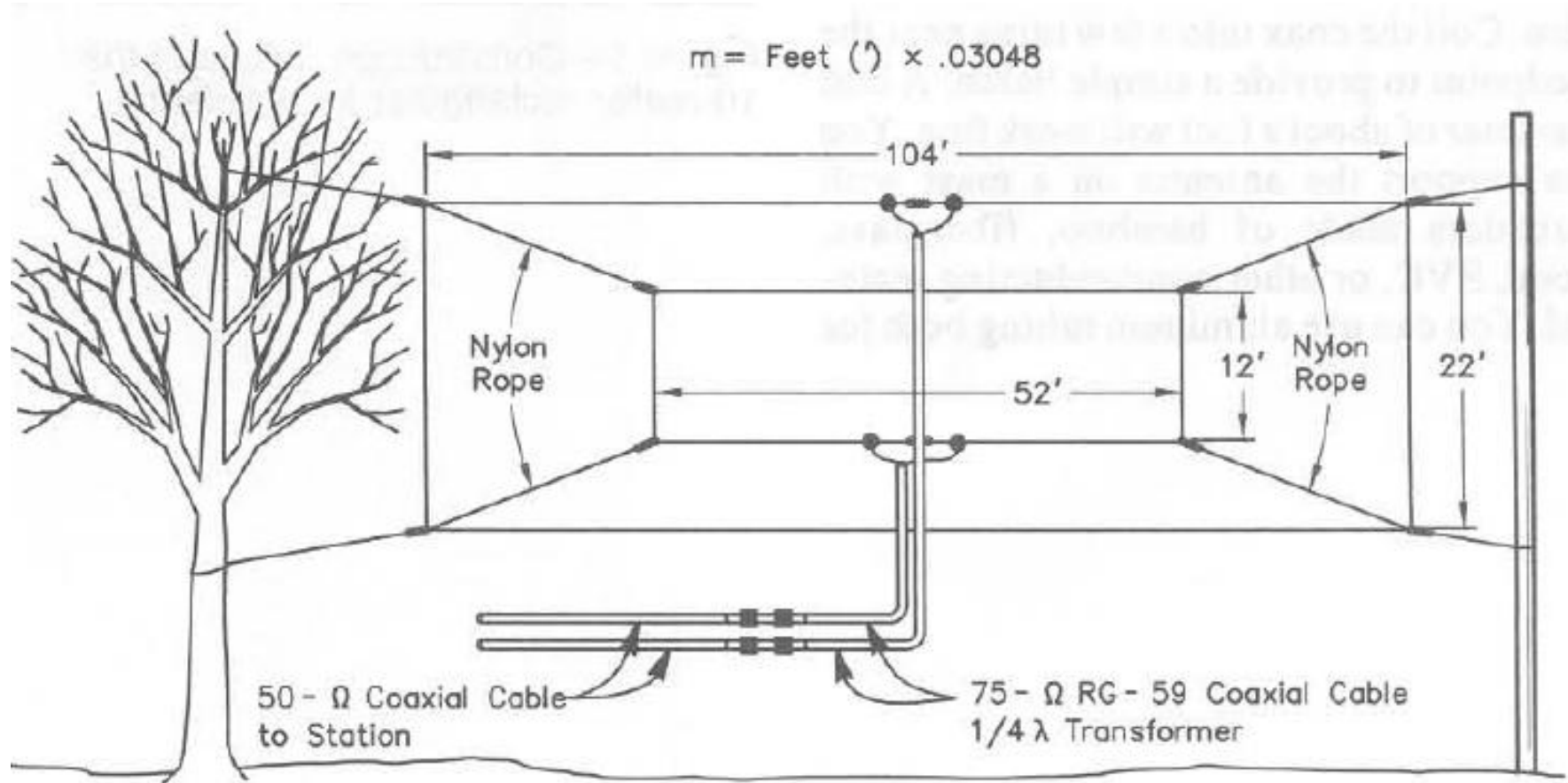


## Five-Bands No-Tuner Antenna

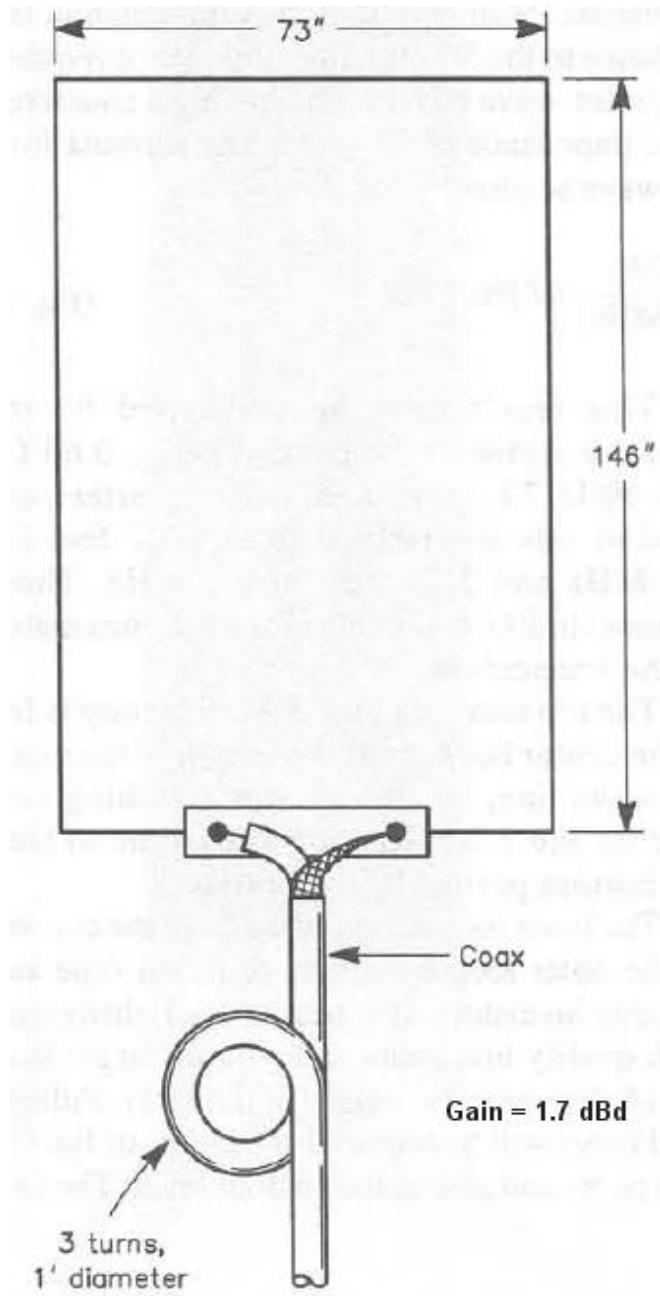




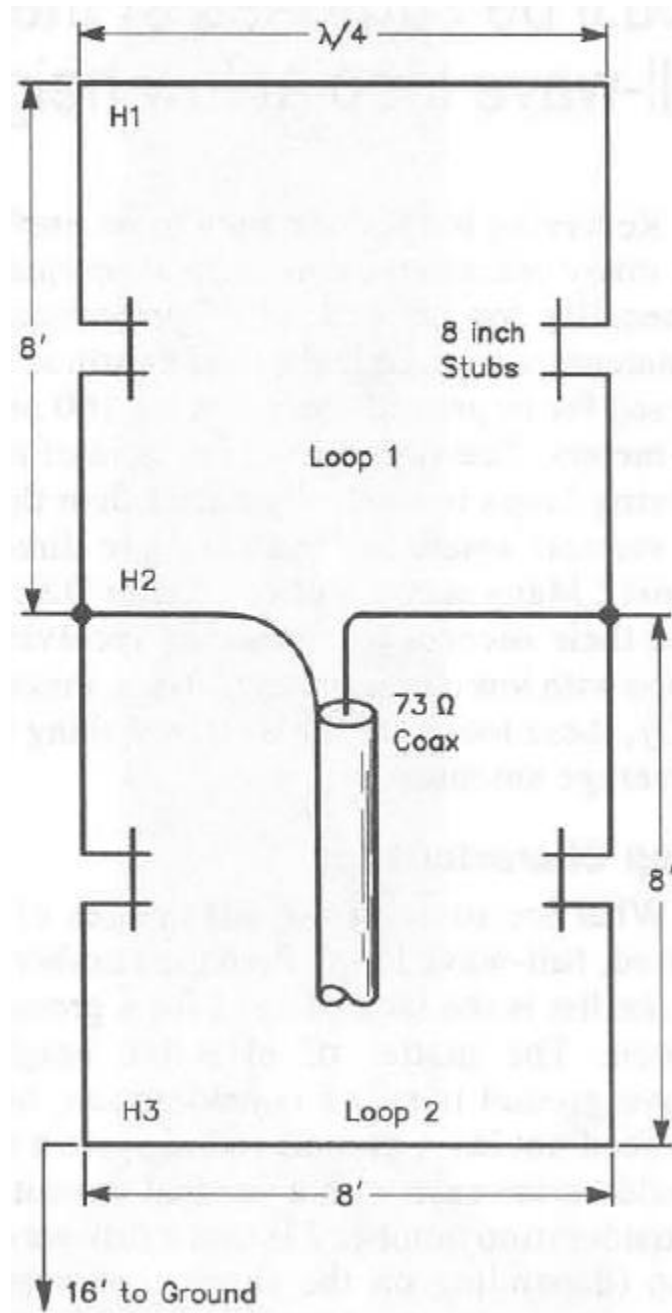
## Dual-band Full-wave Loop Antenna for 80m-40m



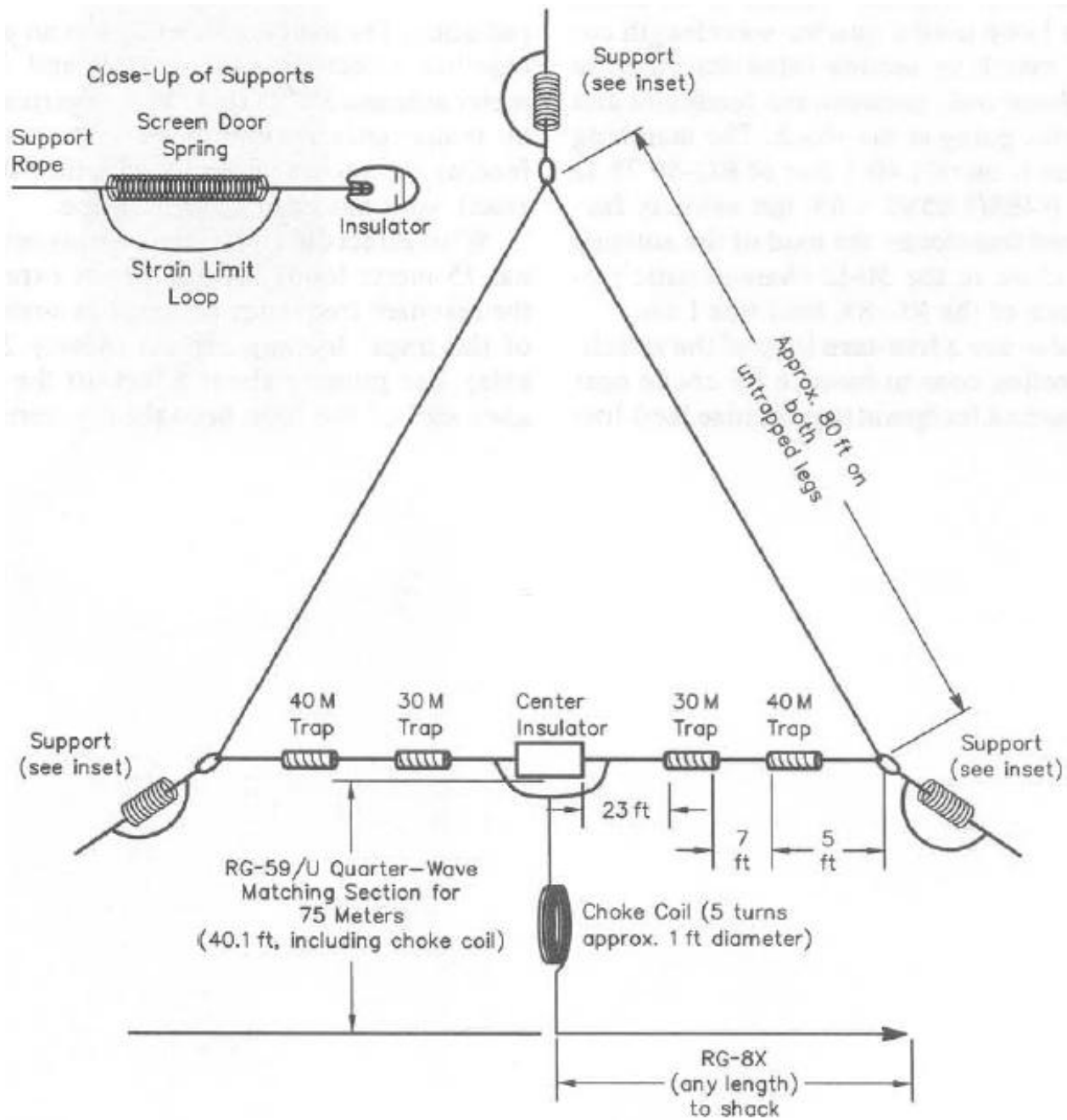
# Loop Antenna for 10m



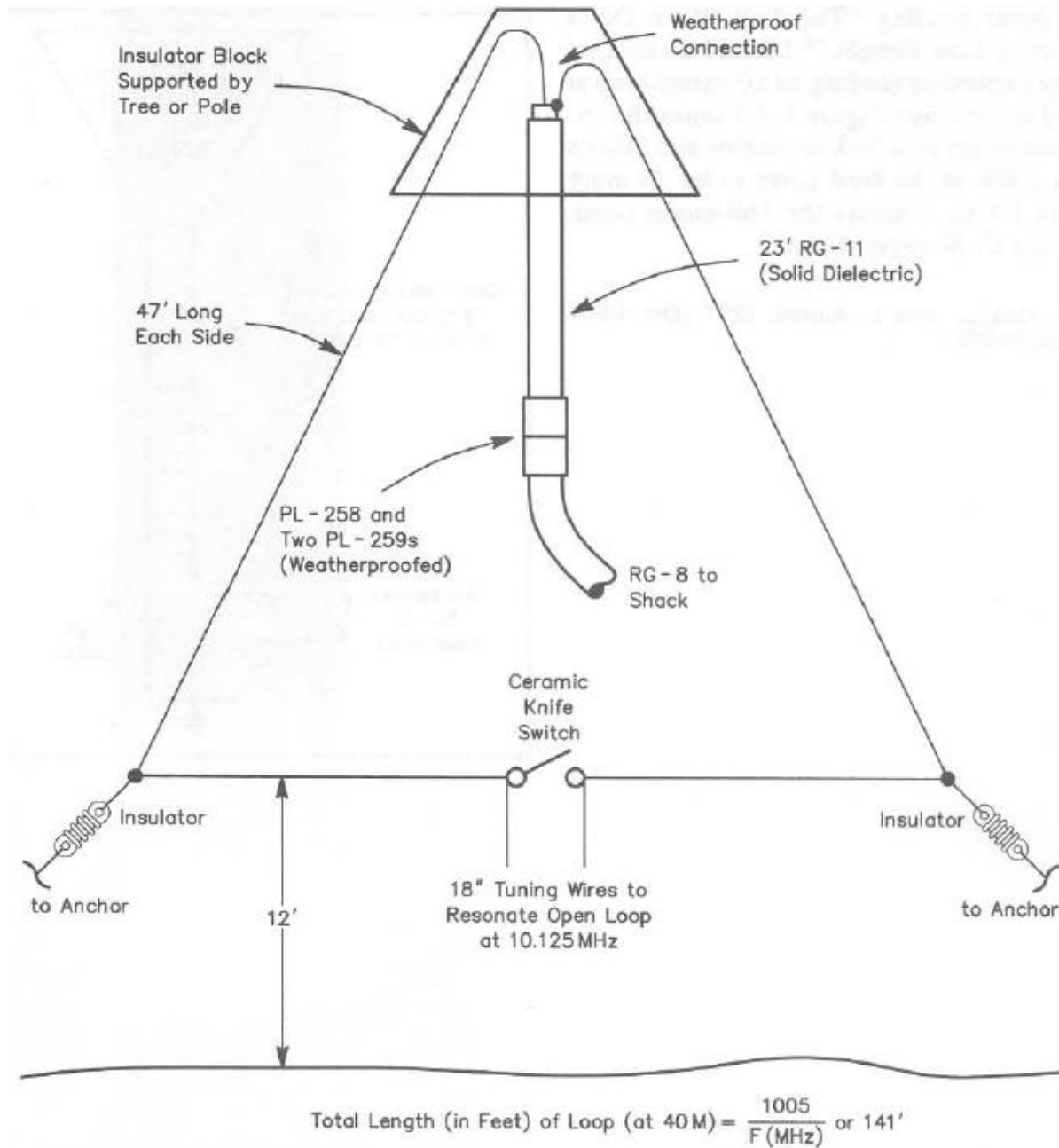
# Lazy Quad Antenna for 10m



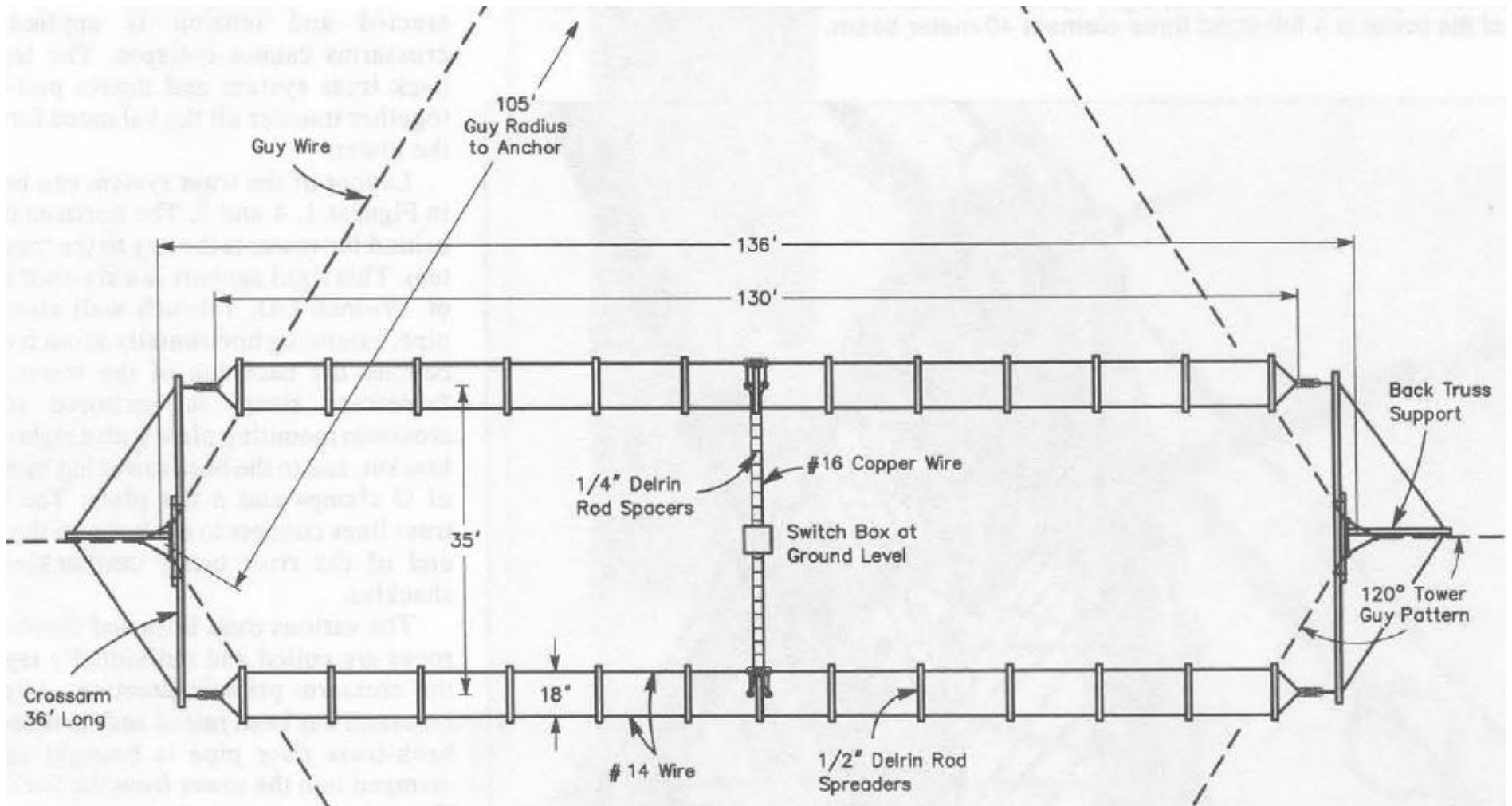
# Tri-band Delta Loop Antenna for 80m - 40m - 30m



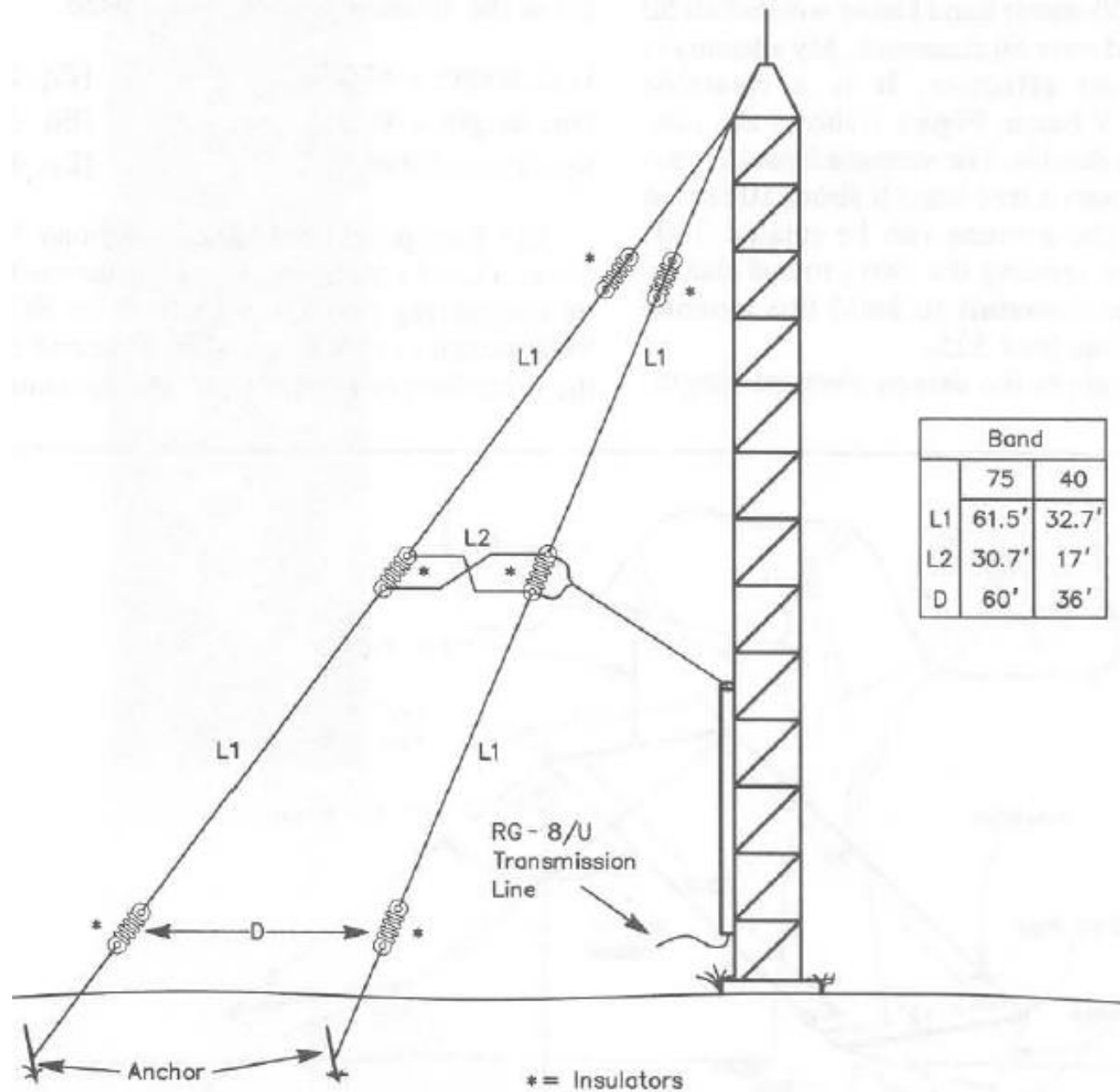
## Dual-band Loop Antenna for 30m - 40m



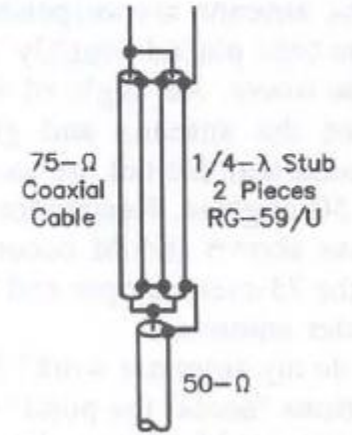
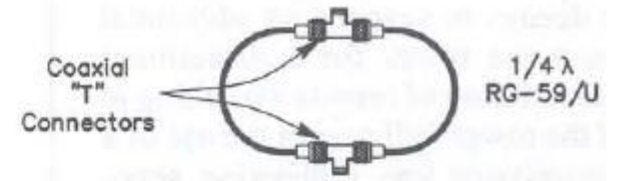
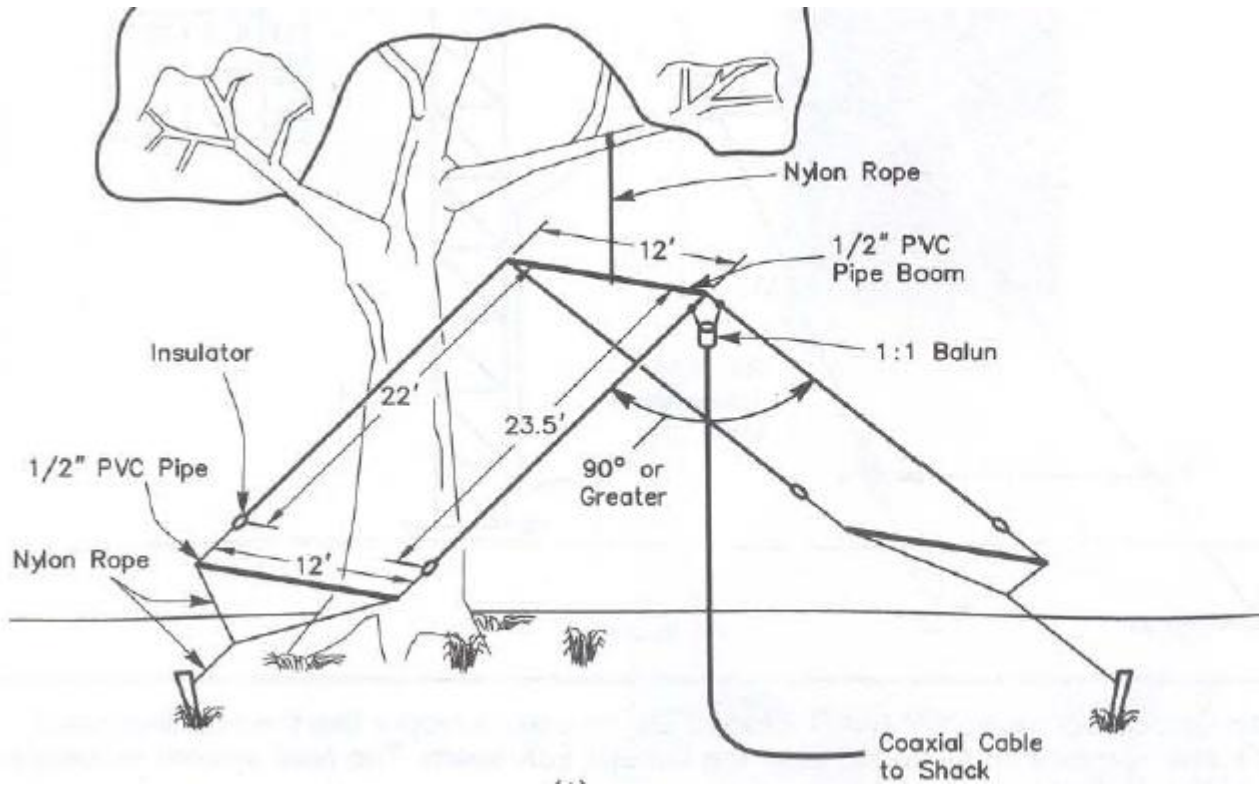
## Wire-Beam Antenna for 80m



# Dual-Band Sloper Antenna

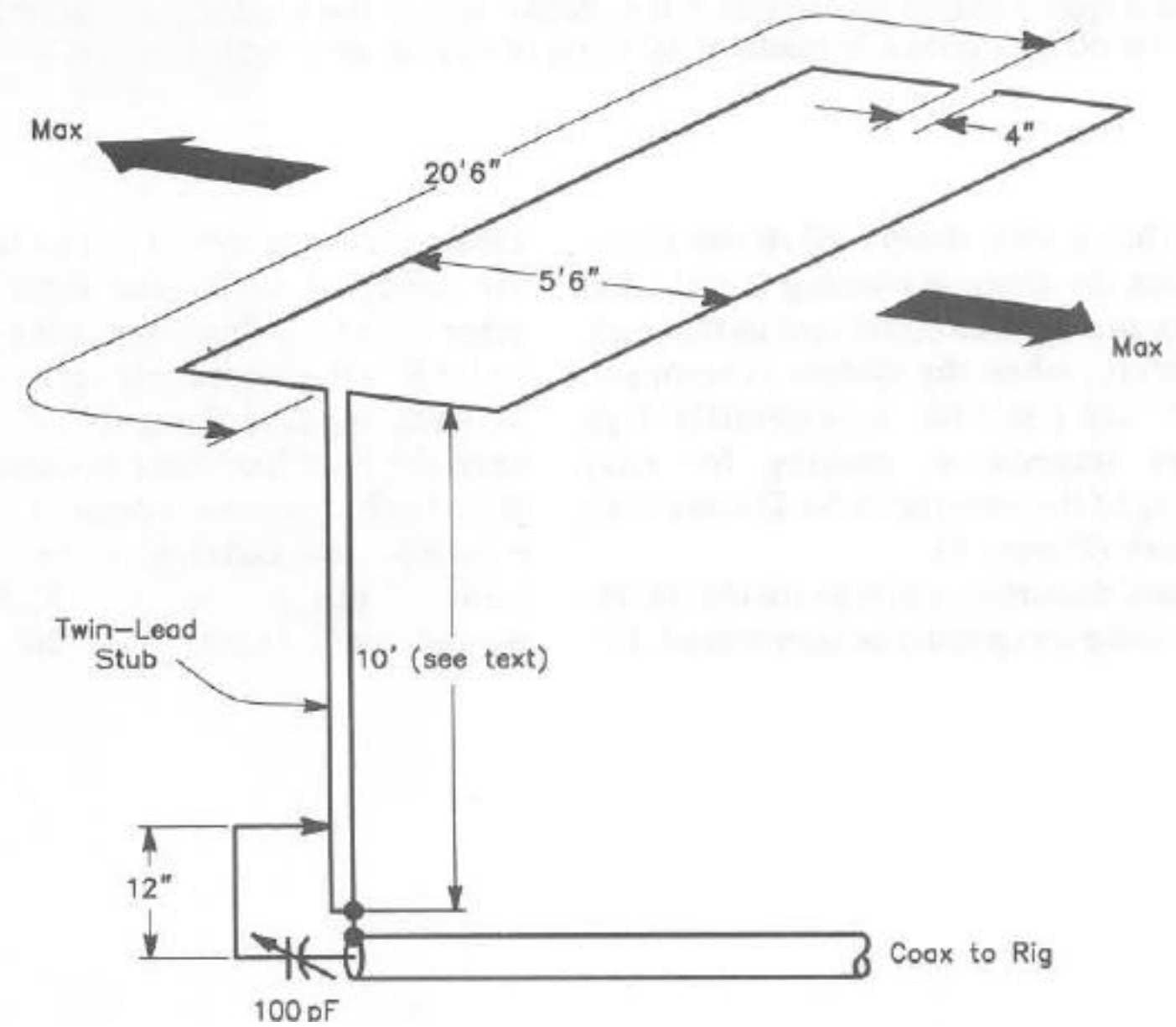


# Inverted-V Beam Antenna for 30m

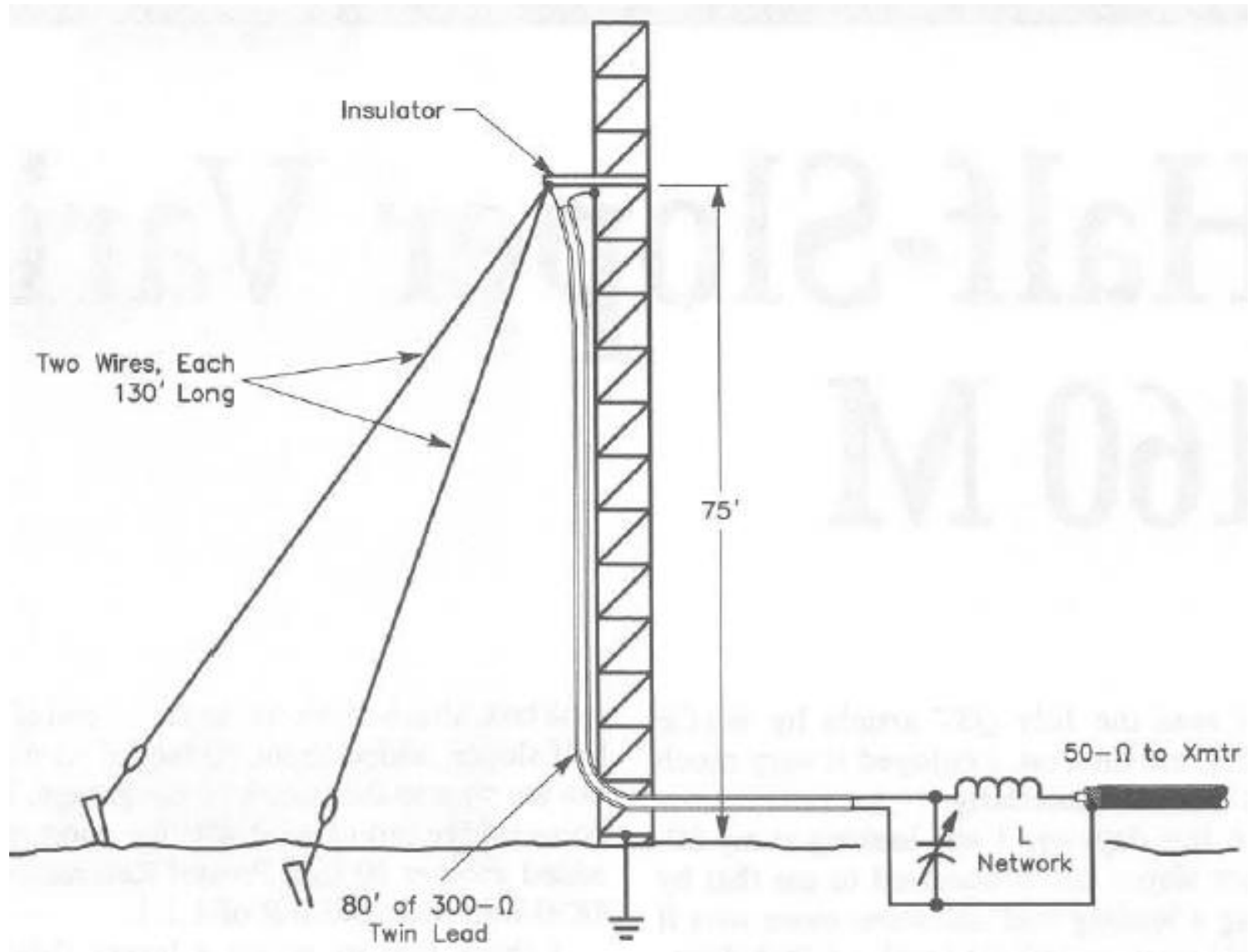




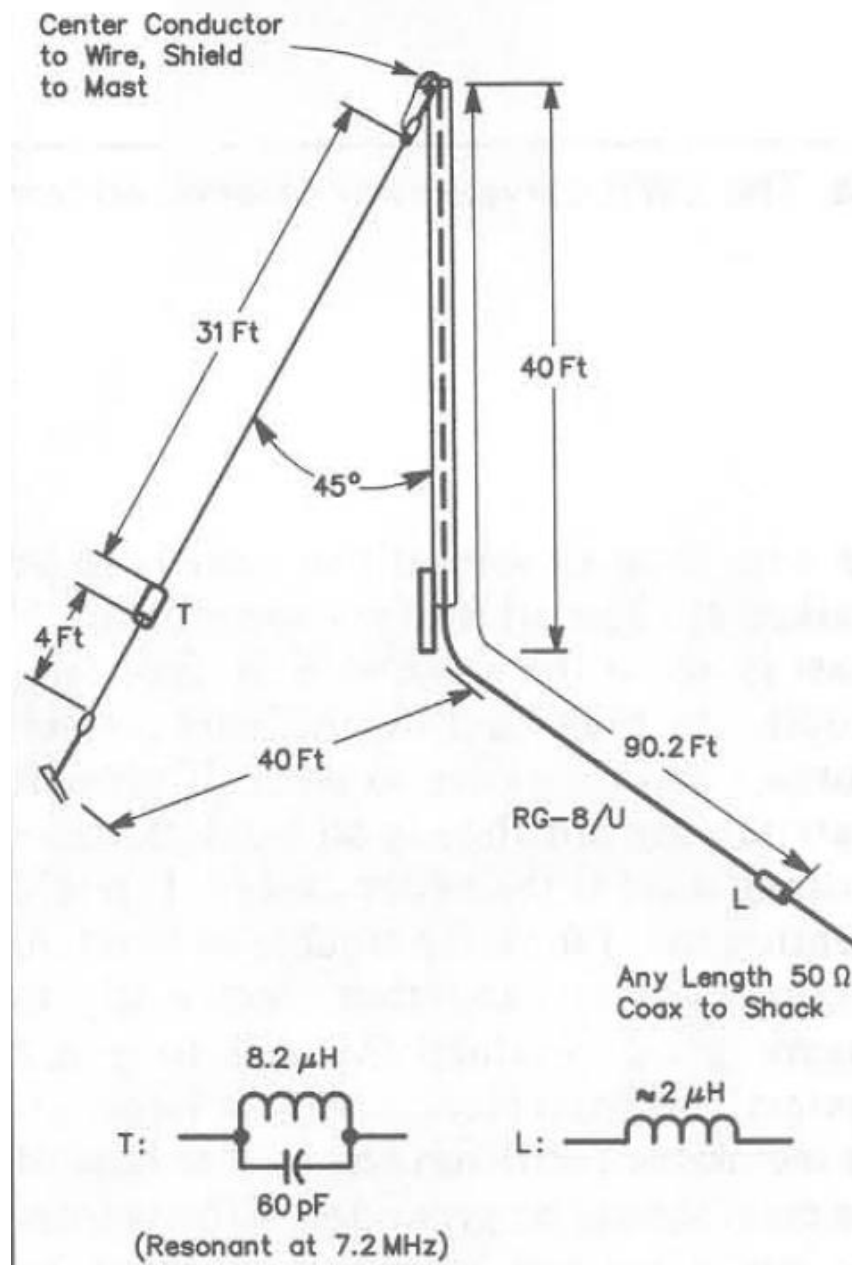
# ZL-Special Beam Antenna for 15m



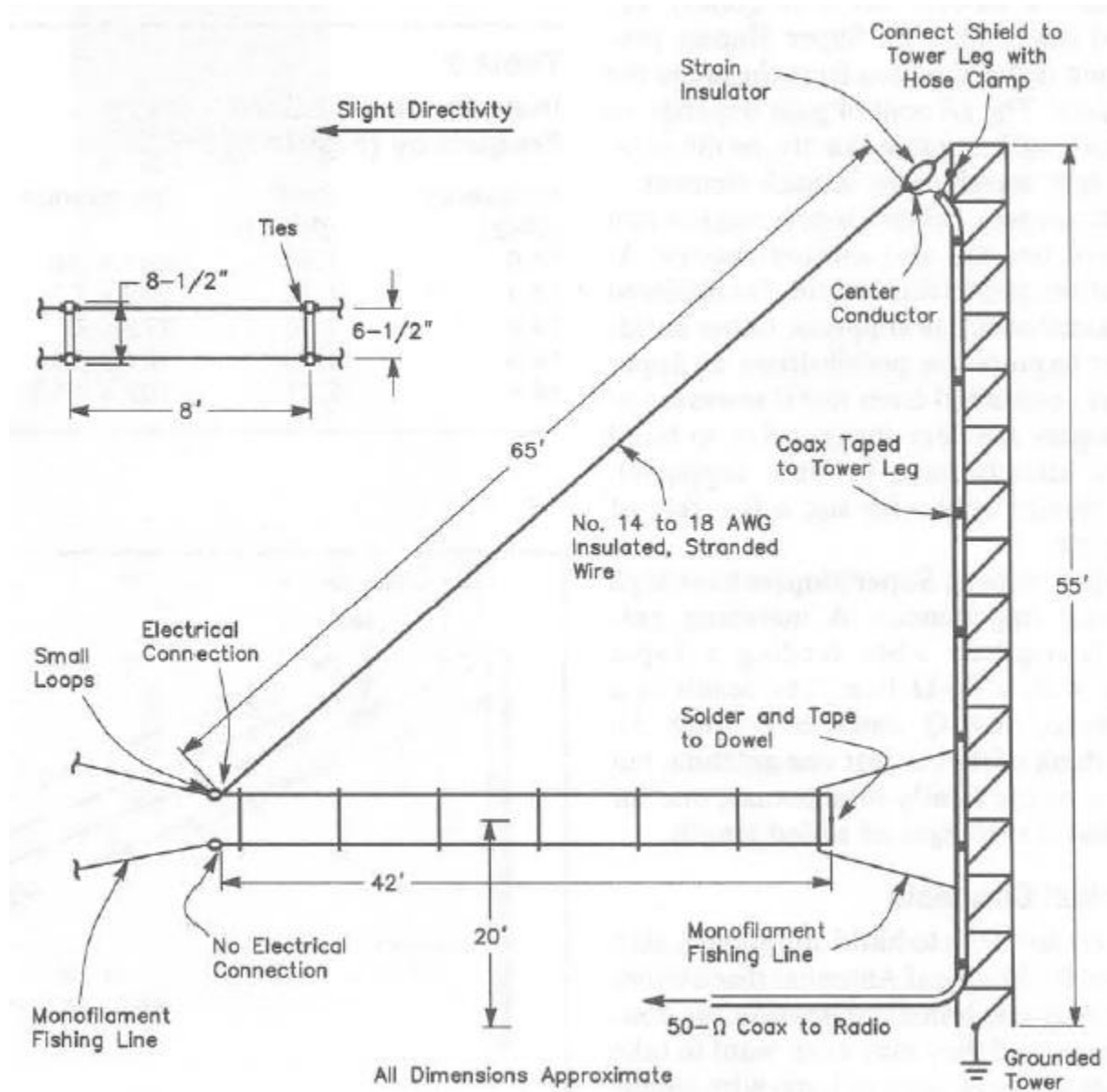
## Half-Sloper Antenna for 160m



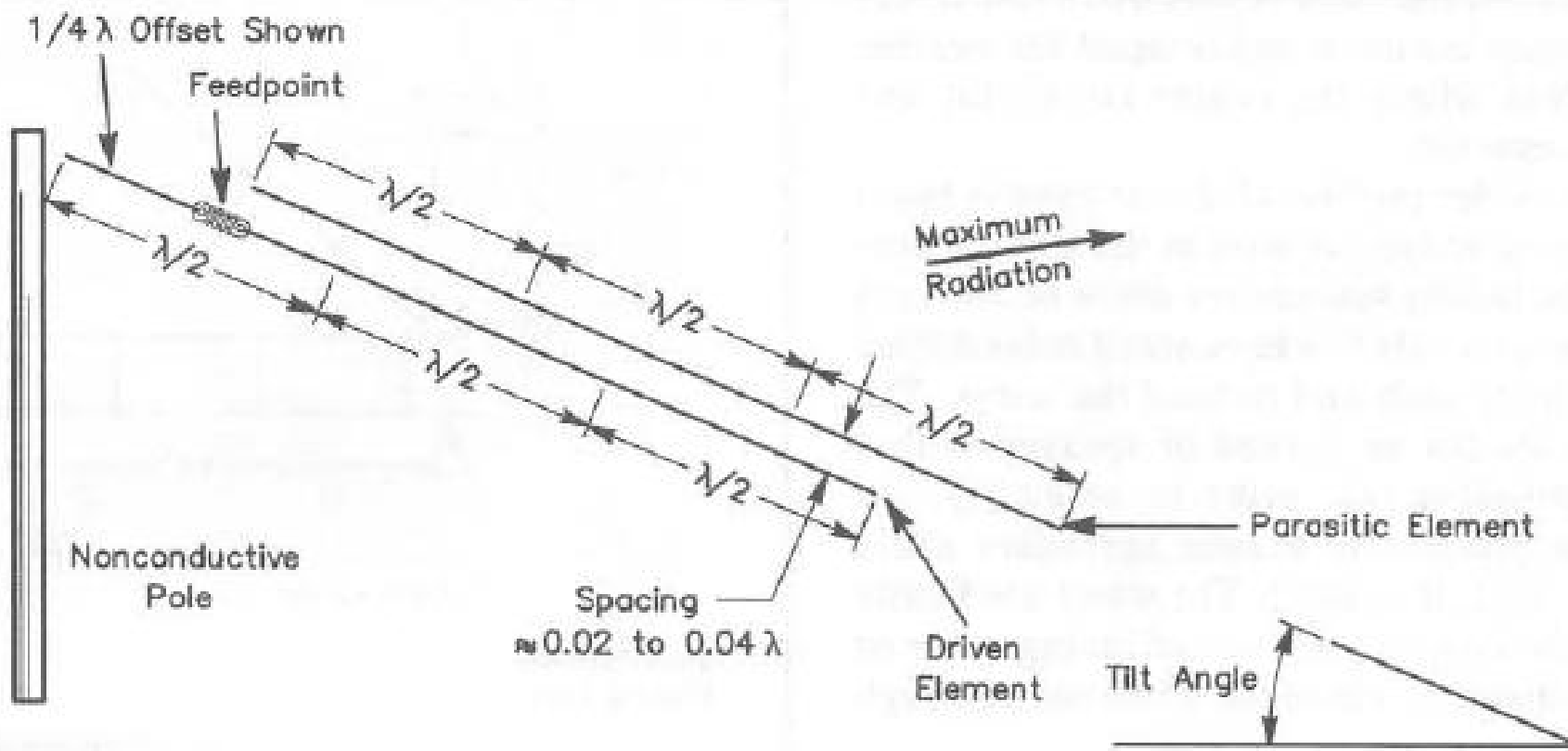
## Two-Bands Half Sloper for 80m - 40m



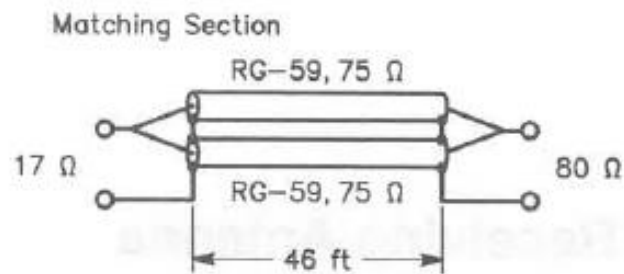
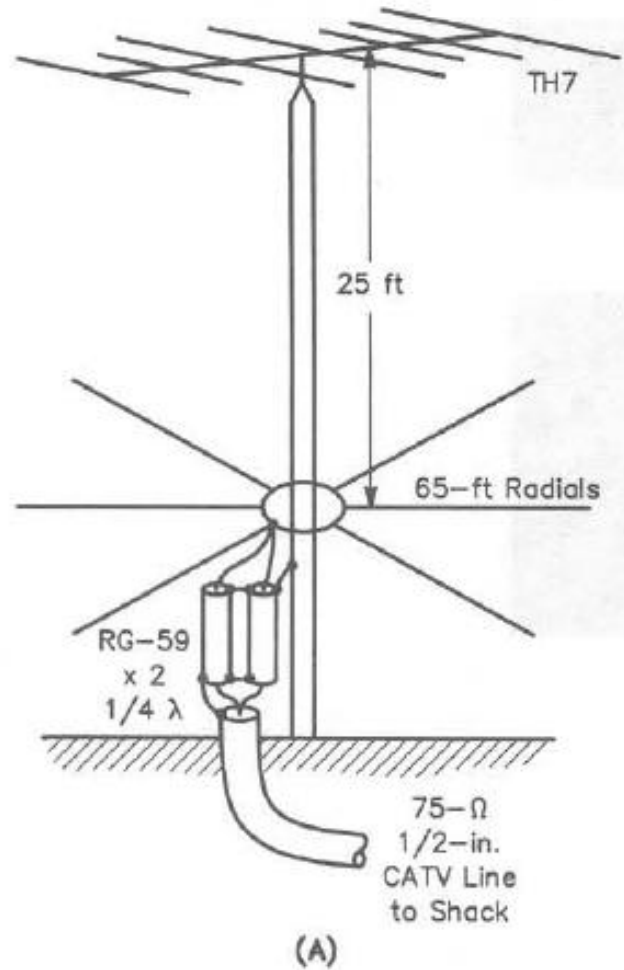
# Linear Loaded Sloper Antenna for 160m



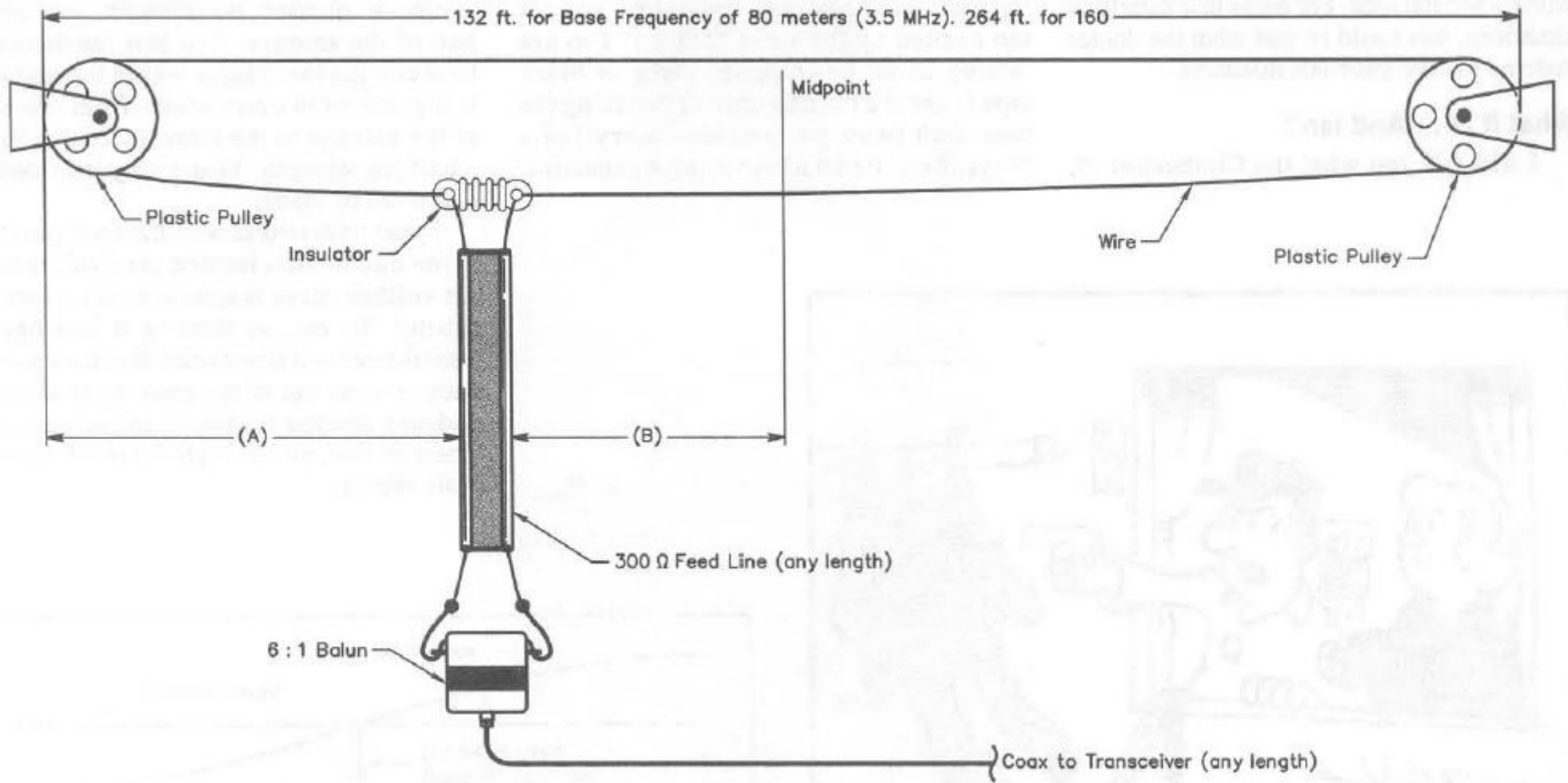
## Super-Sloper Antenna



# Tower Pole as a Vertical Antenna for 80m



# Clothesline Antenna



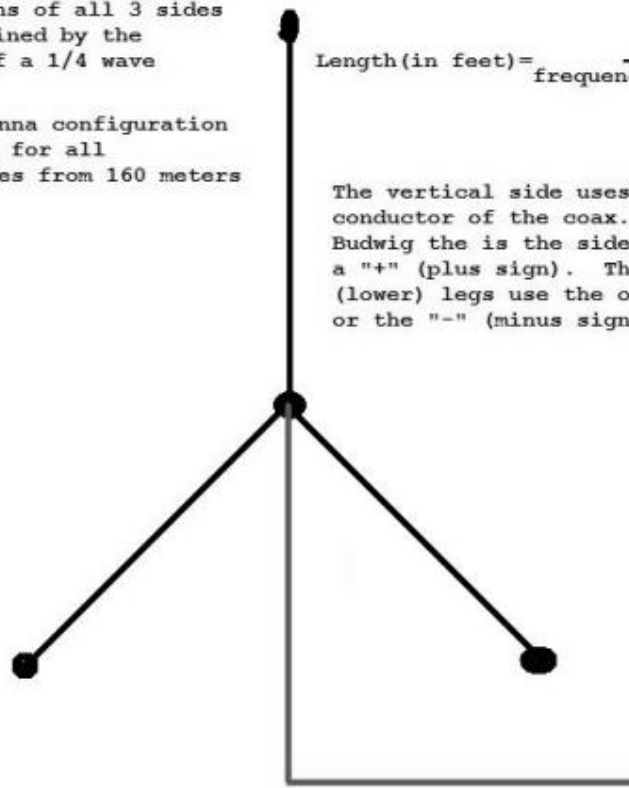
# Wire Ground-Plane Antenna

The lengths of all 3 sides is determined by the formula of a 1/4 wave antenna

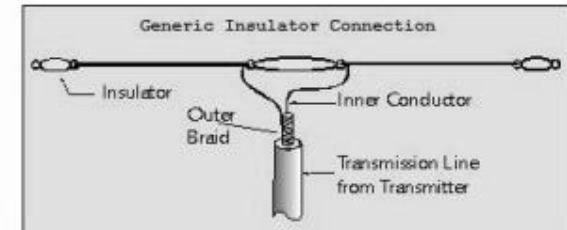
This antenna configuration will work for all frequencies from 160 meters to VHF.

$$\text{Length (in feet)} = \frac{234}{\text{frequency in MHz}}$$

The vertical side uses the inner conductor of the coax. On the Budwig the is the side the shows a "+" (plus sign). The outer (lower) legs use the outer braid or the "-" (minus sign).

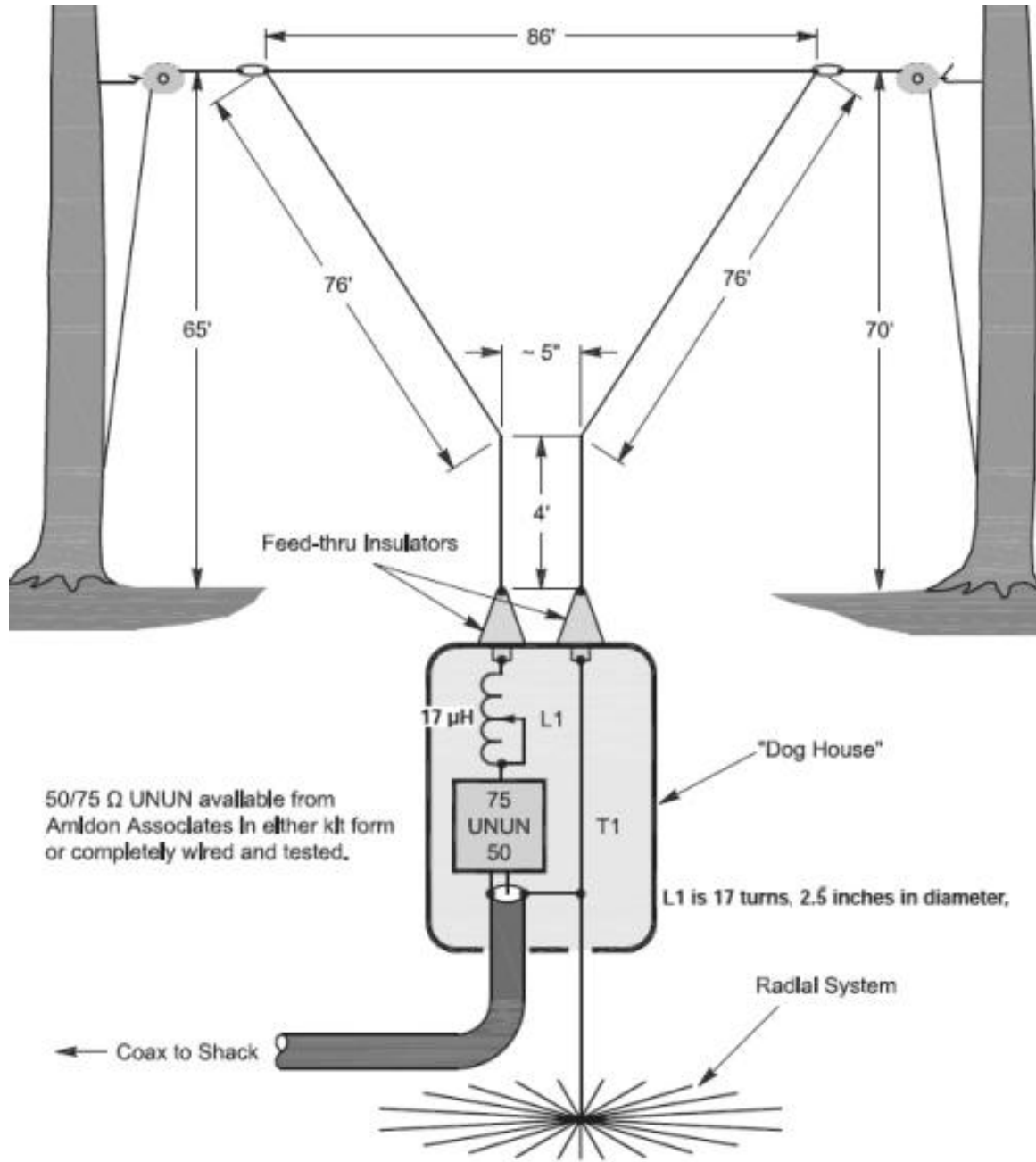


SO-239 Chassis mount, 4 hole

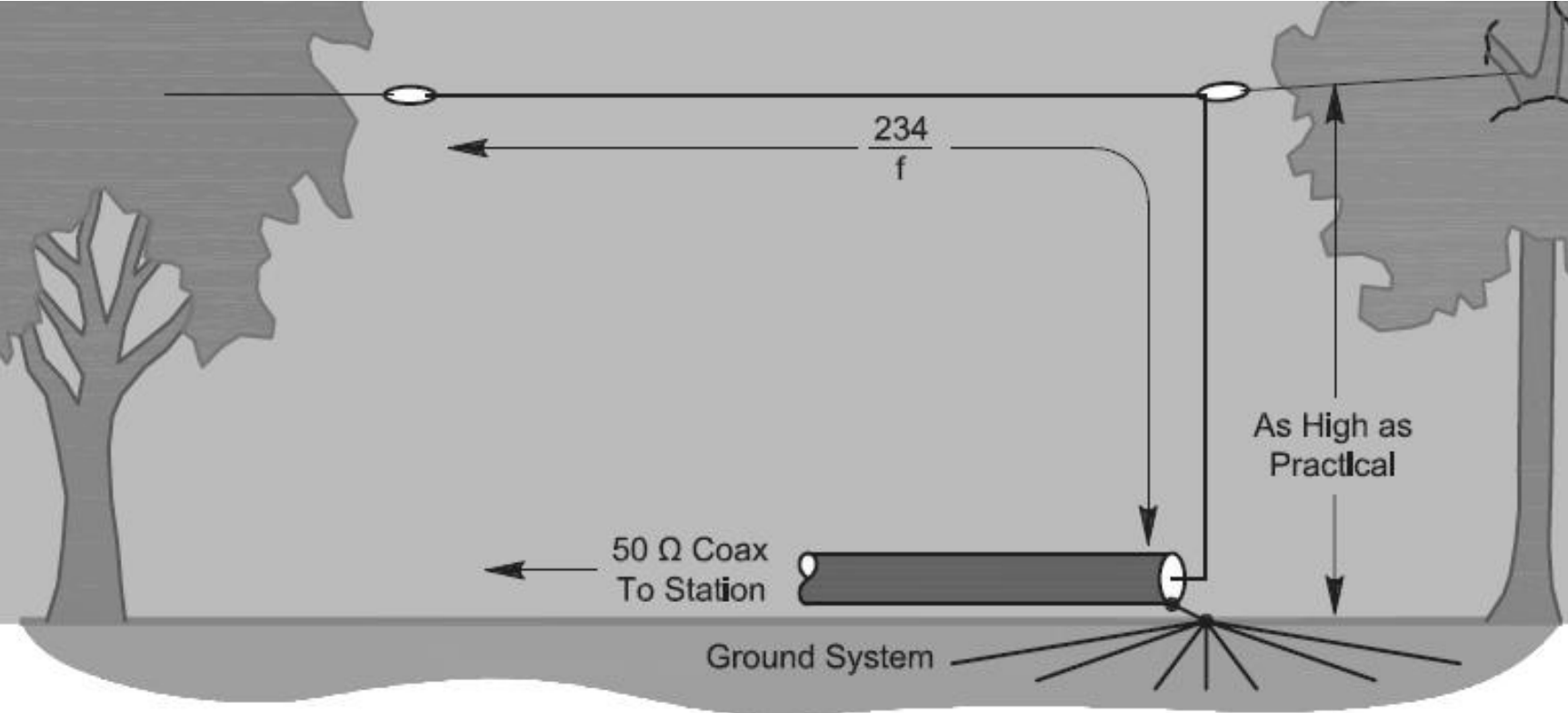




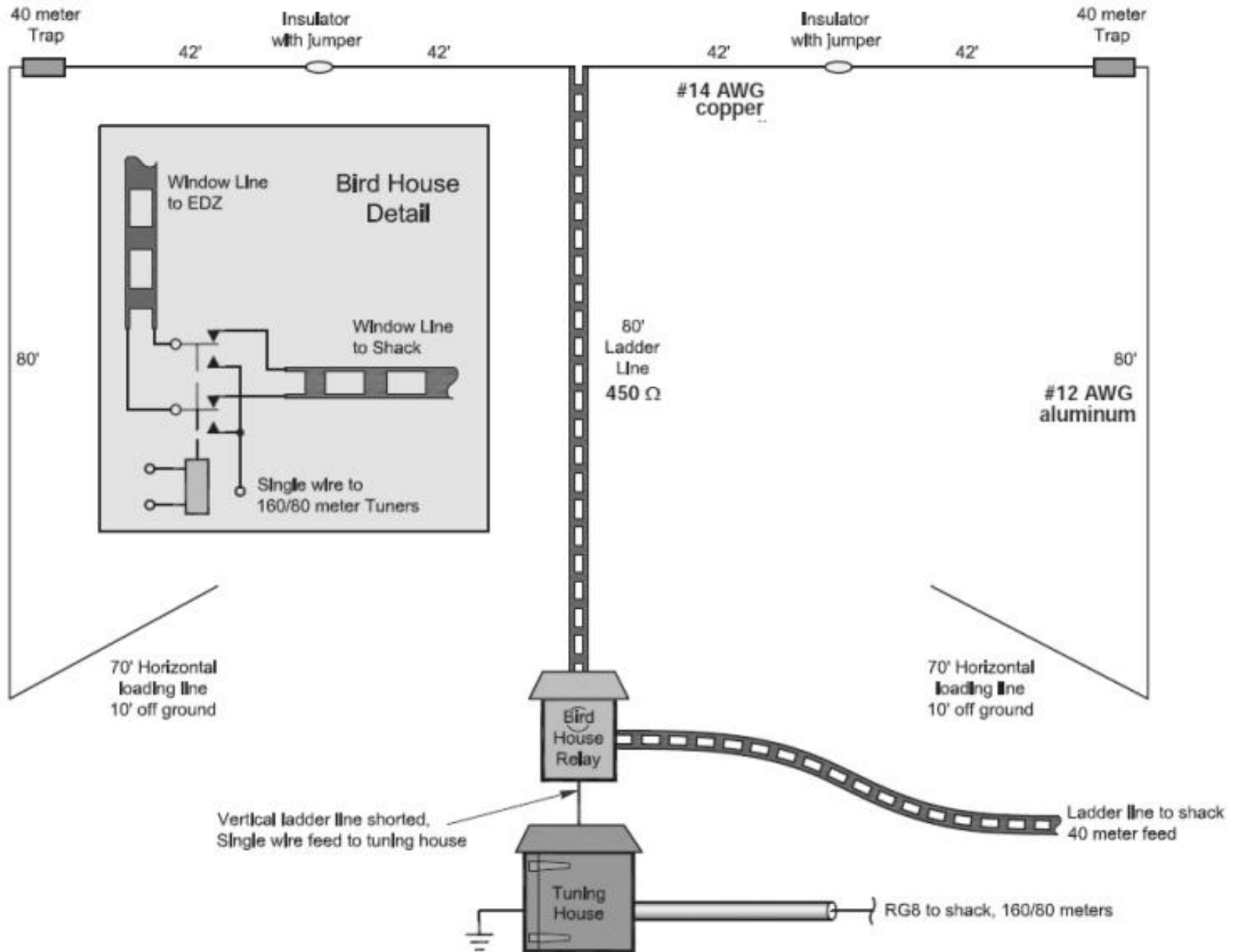
# Inverted Delta Loop for 160m



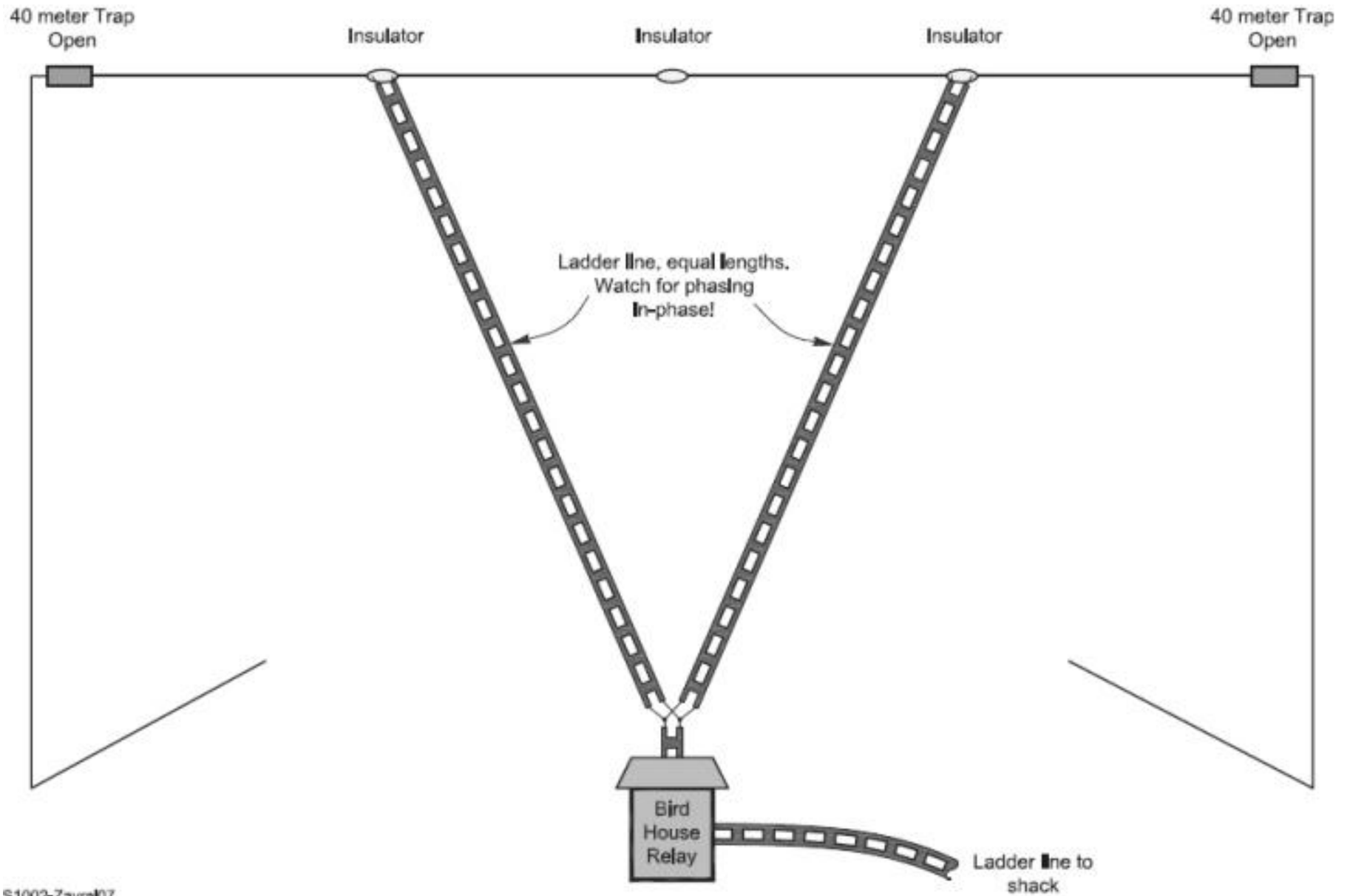
# Inverted-L Antenna for 160m



# Curtain Zepp Antenna for 160m, 80m, 40m

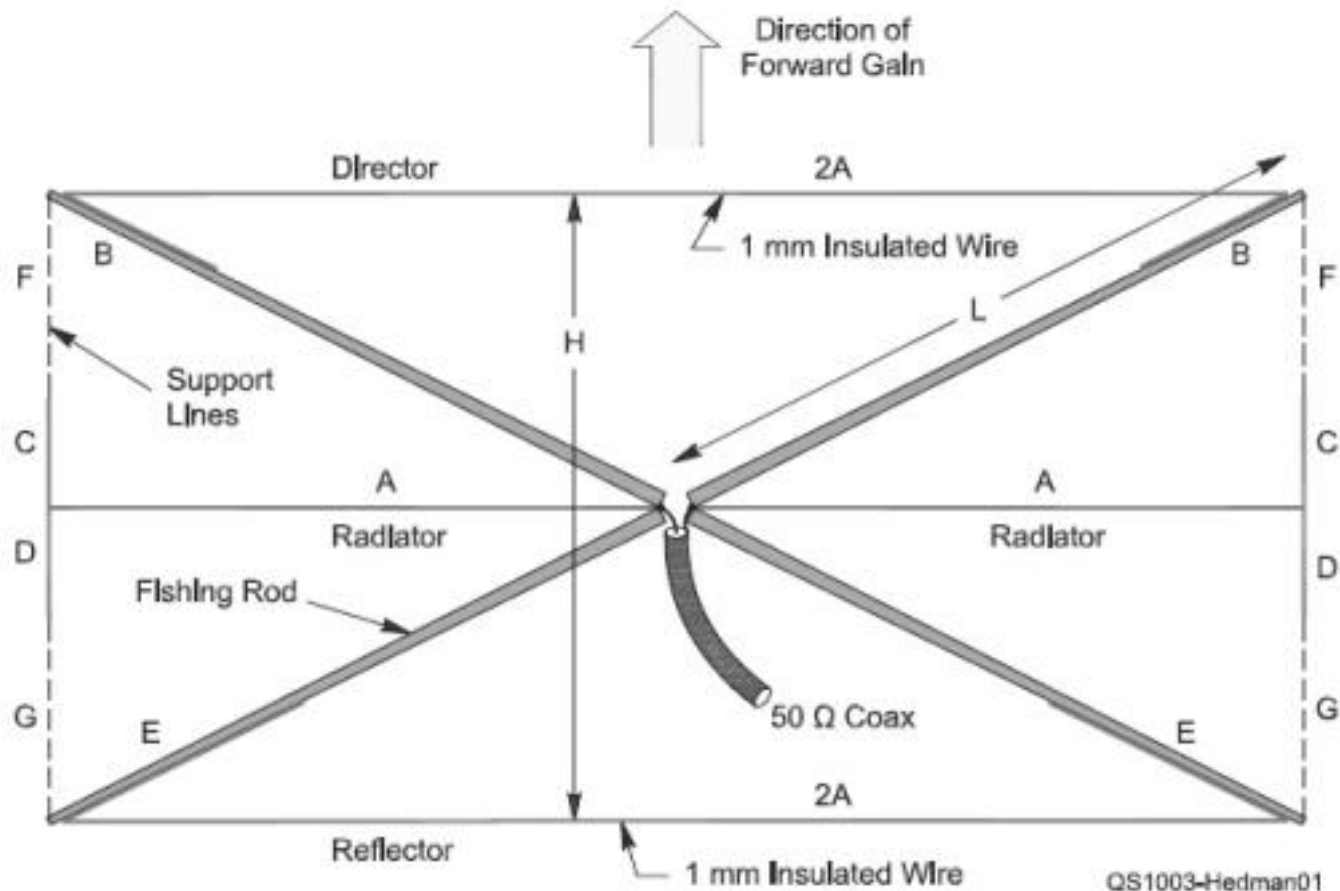


# Curtain Zepp Antenna for 40m, 30m, 20m



S1002-Zavre07

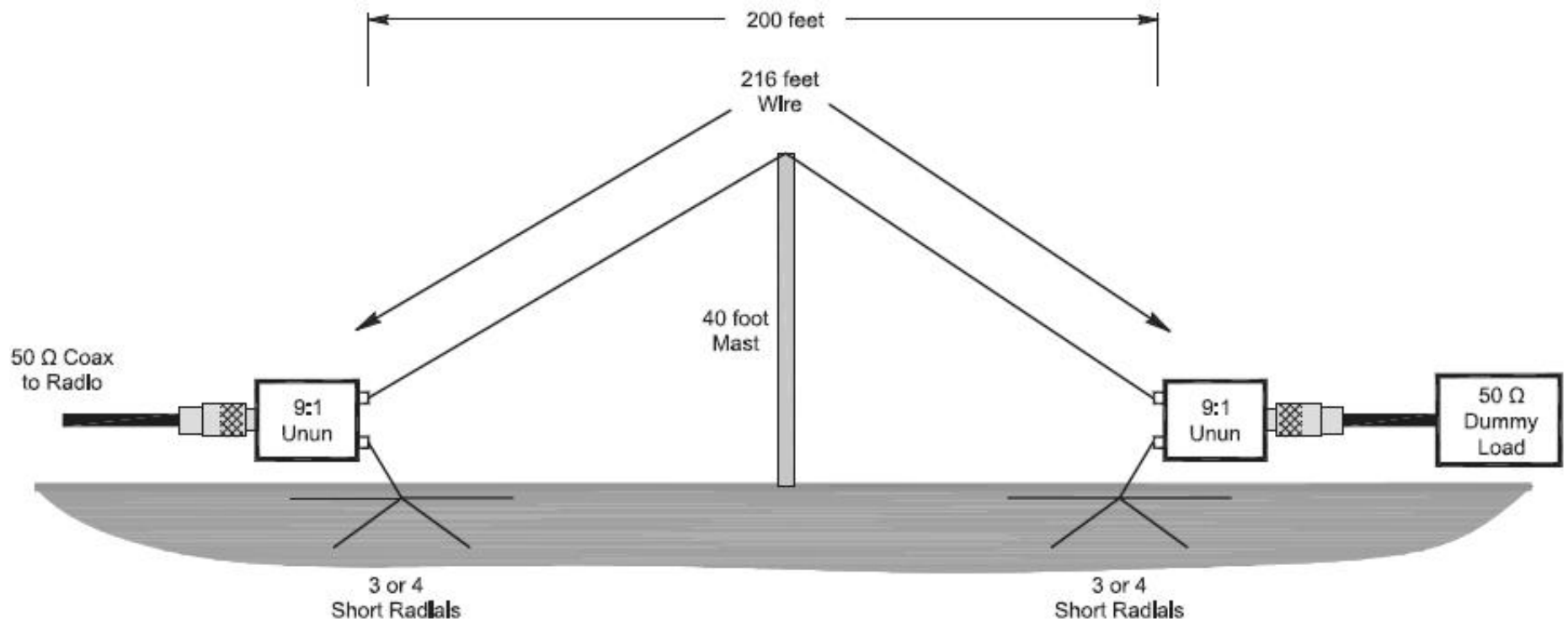
## Mini-Horse Yagi Antenna



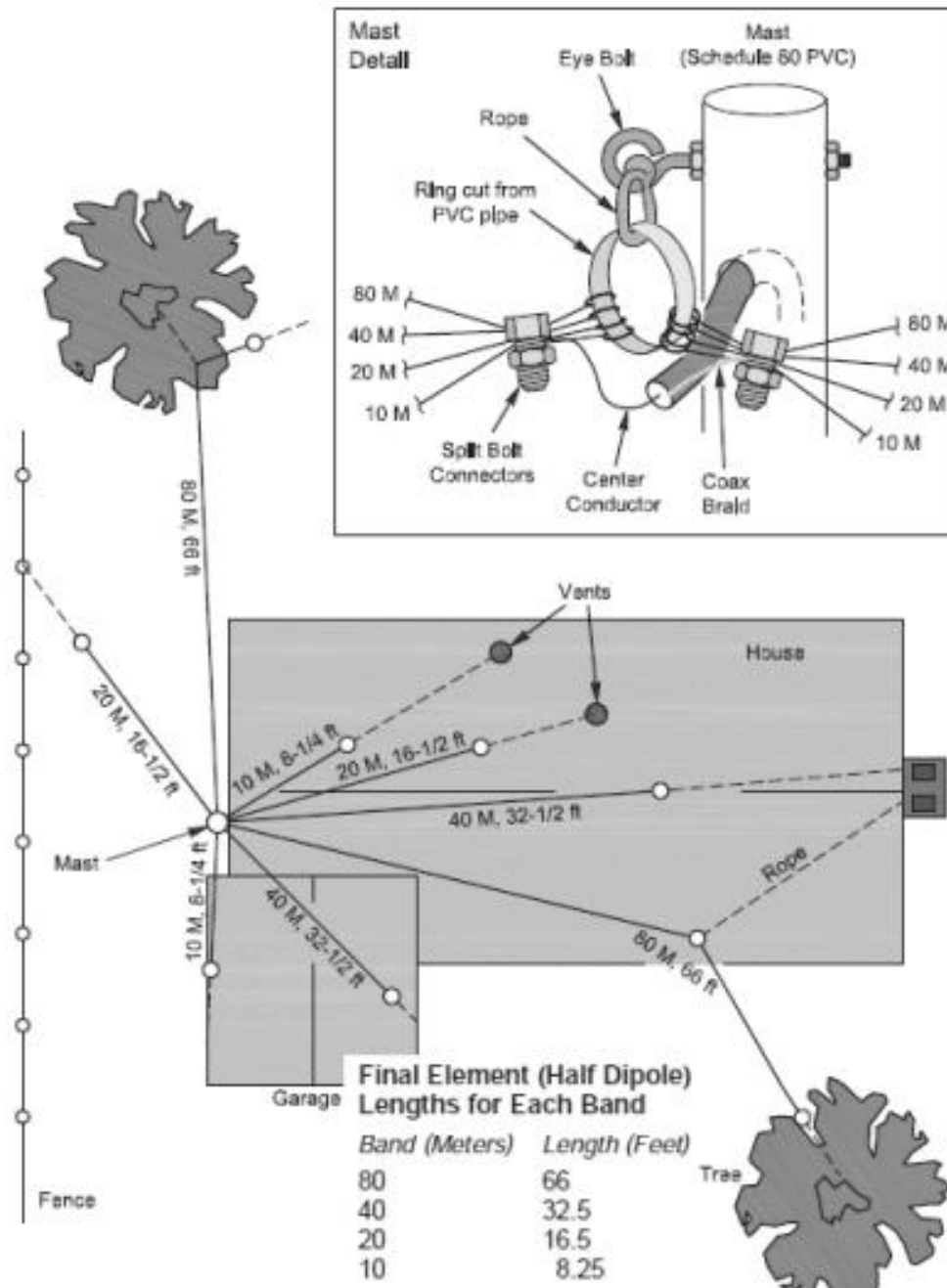
QS1003-Hedman01

MHz	A	B	C	D	E	F	G	H	L
144	1' 2.2"	0' 4.7"	0' 3.5"	0' 1.8"	0' 7.1"	0' 4.7"	0' 6.5"	1' 4.5"	1' 4.3"
28	5' 11.6"	1' 10.8"	1' 6.9"	0' 9.4"	2' 11.8"	1' 10.8"	2' 8.3"	6' 11.4"	6' 11.0"
21	7' 11.6"	2' 6.3"	2' 1.2"	1' 0.6"	3' 11.6"	2' 6.3"	3' 6.9"	9' 3.0"	9' 2.6"
14	11' 11.3"	3' 9.7"	3' 1.8"	1' 6.9"	5' 11.2"	3' 9.7"	5' 4.6"	13' 10.9"	13' 9.7"
7.1	23' 10.5"	7' 7.3"	6' 3.6"	3' 1.8"	11' 10.5"	7' 7.3"	10' 9.1"	27' 9.8"	27' 7.4"

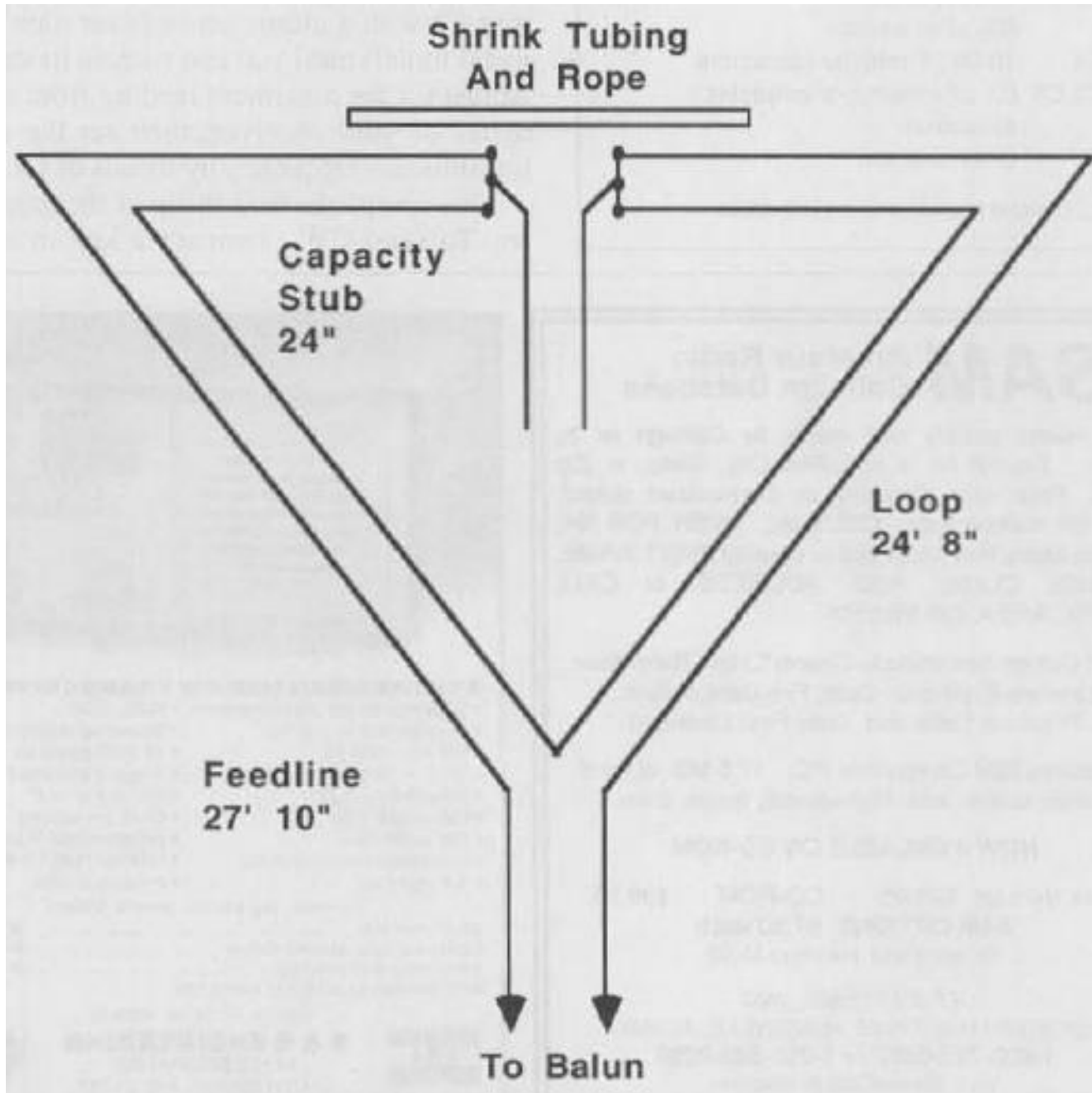
## Half-Rhombic Directive Antenna for 20m to 6m



## Fan-Dipole Antenna for 80m through 6m

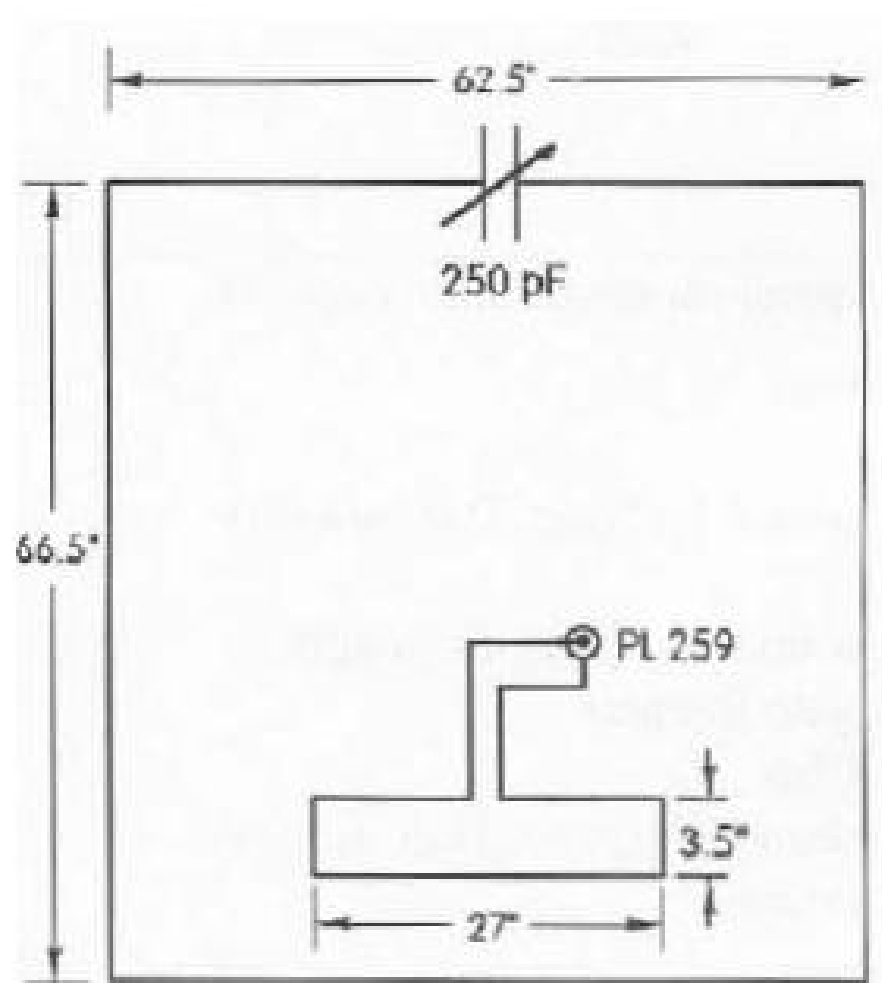
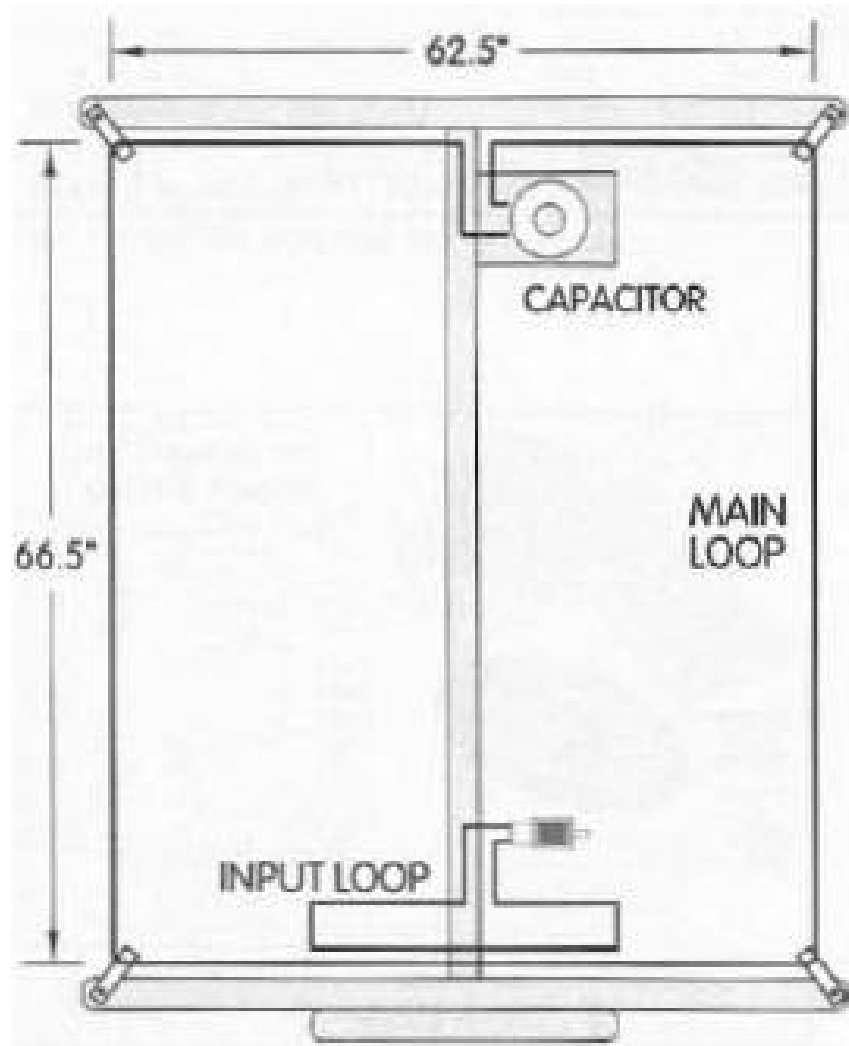


## Capacity Tuned Folded Loop Ant for 20m

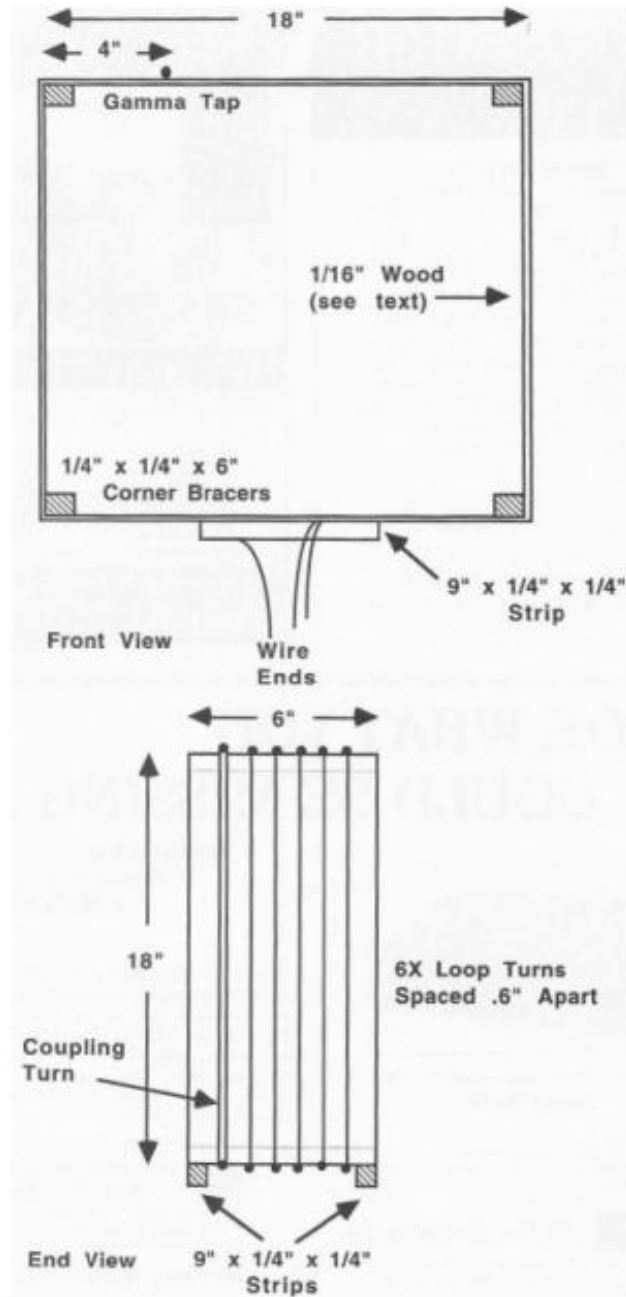




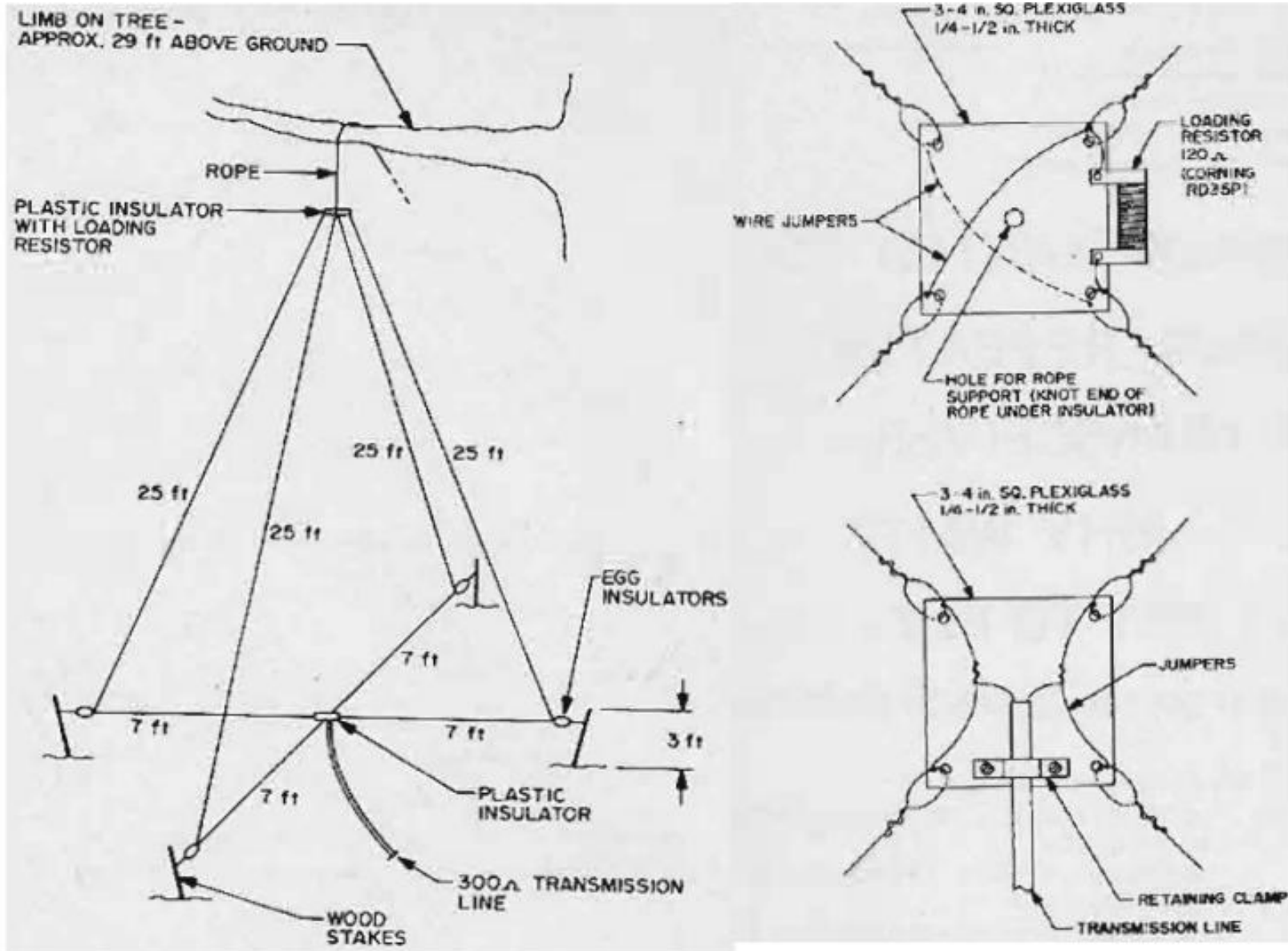
## Indoor Loop Antenna for 80m to 30m



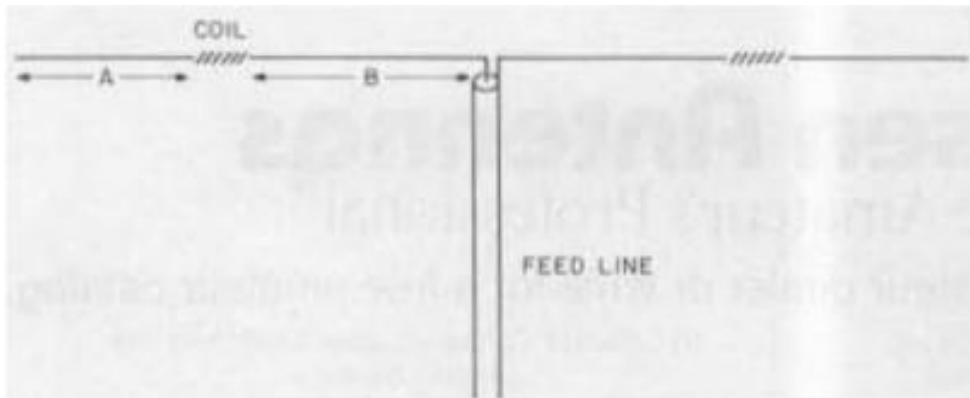
# Indoor Loop Antenna for 80m



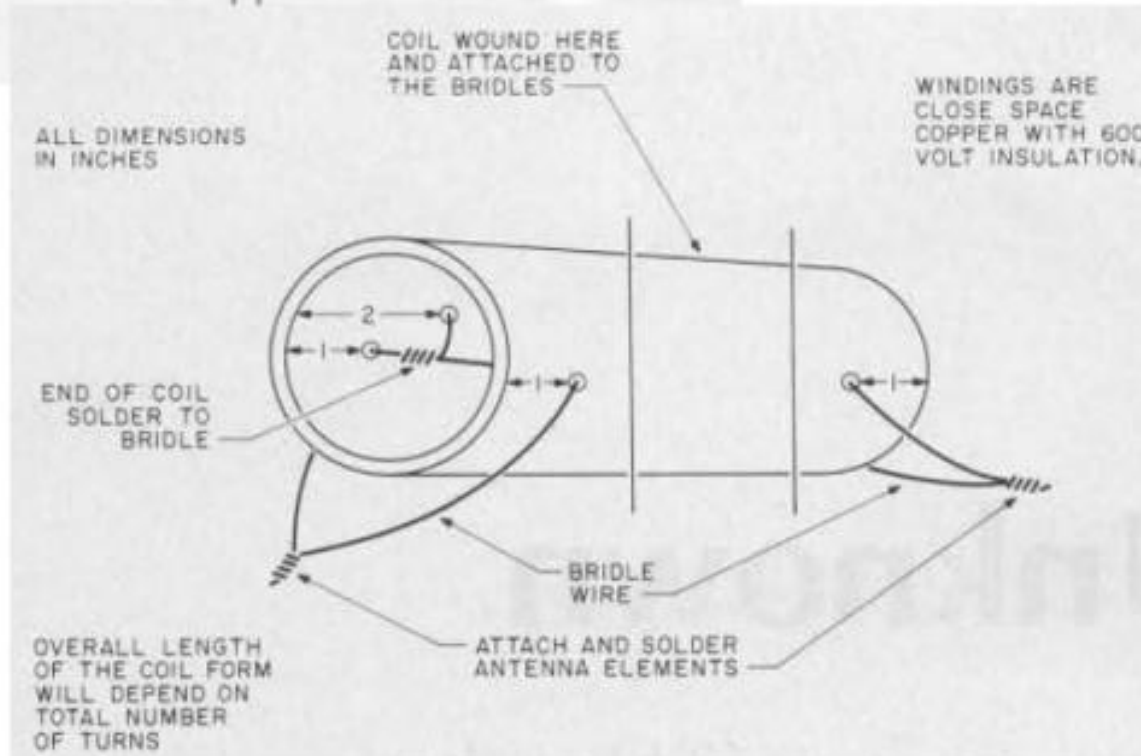
## Double-Delta Antenna for 80 and 40m



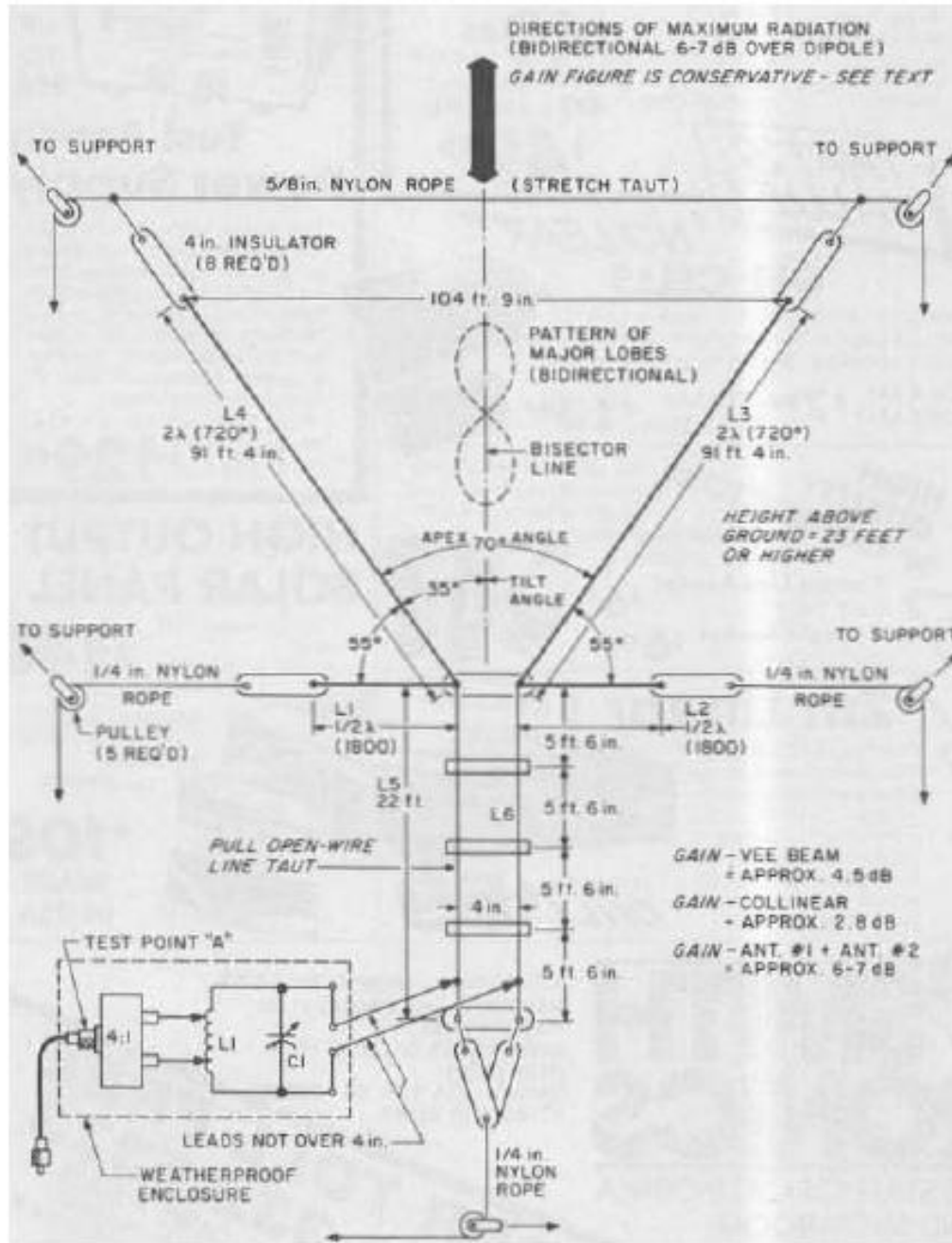
## Inductance Loaded Shortened Dipole for 160m



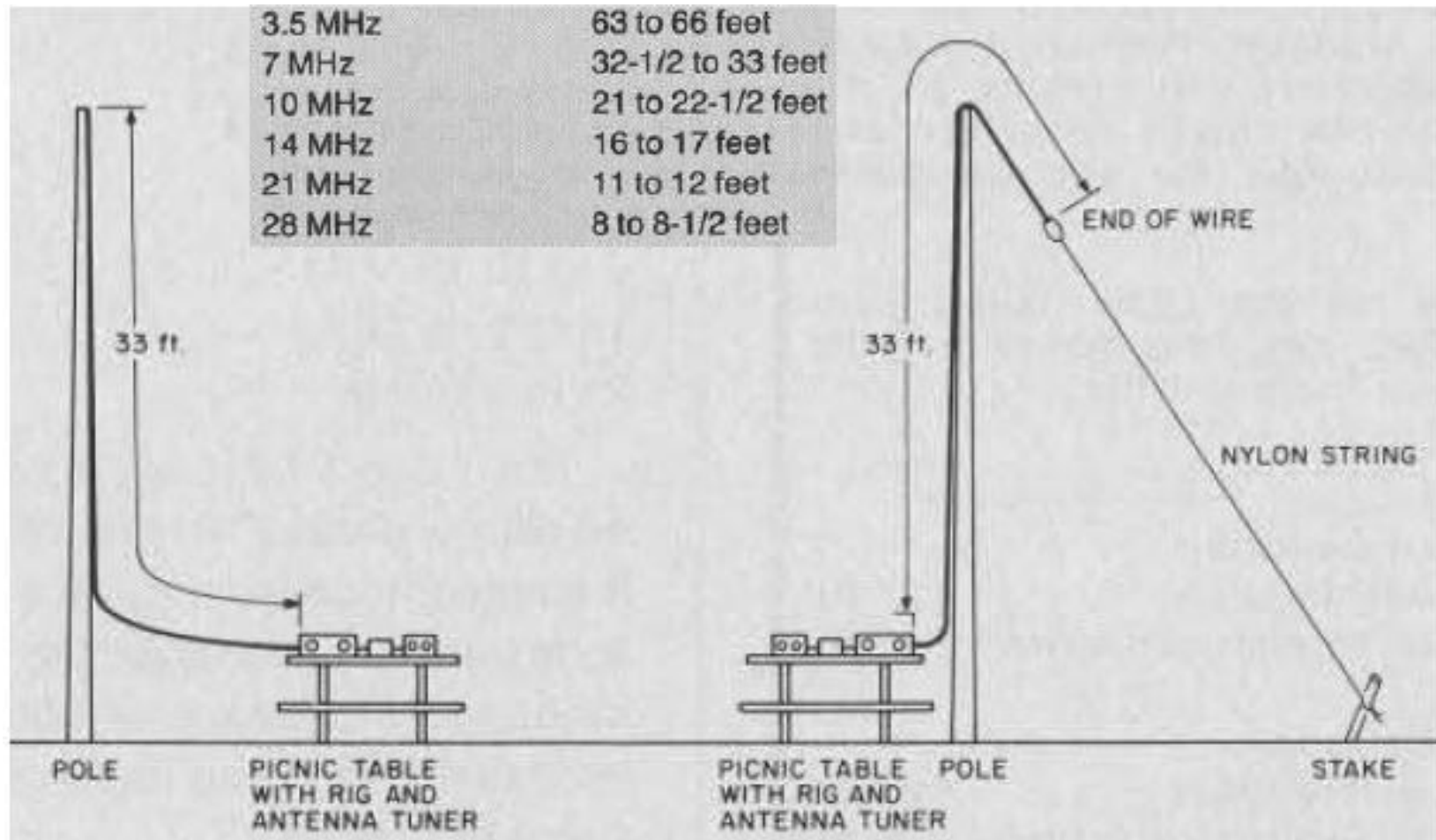
Overall Length (ft.)	Element A Length	Number Of Coil Turns	Element B Length
246.3	full-size antenna		
221.3	66.5	10	44.3
197.1	59.1	20	39.4
172.4	51.7	33	34.5
147.8	44.3	48	29.6
123.2	36.9	65	24.6
98.5	29.6	86	19.7



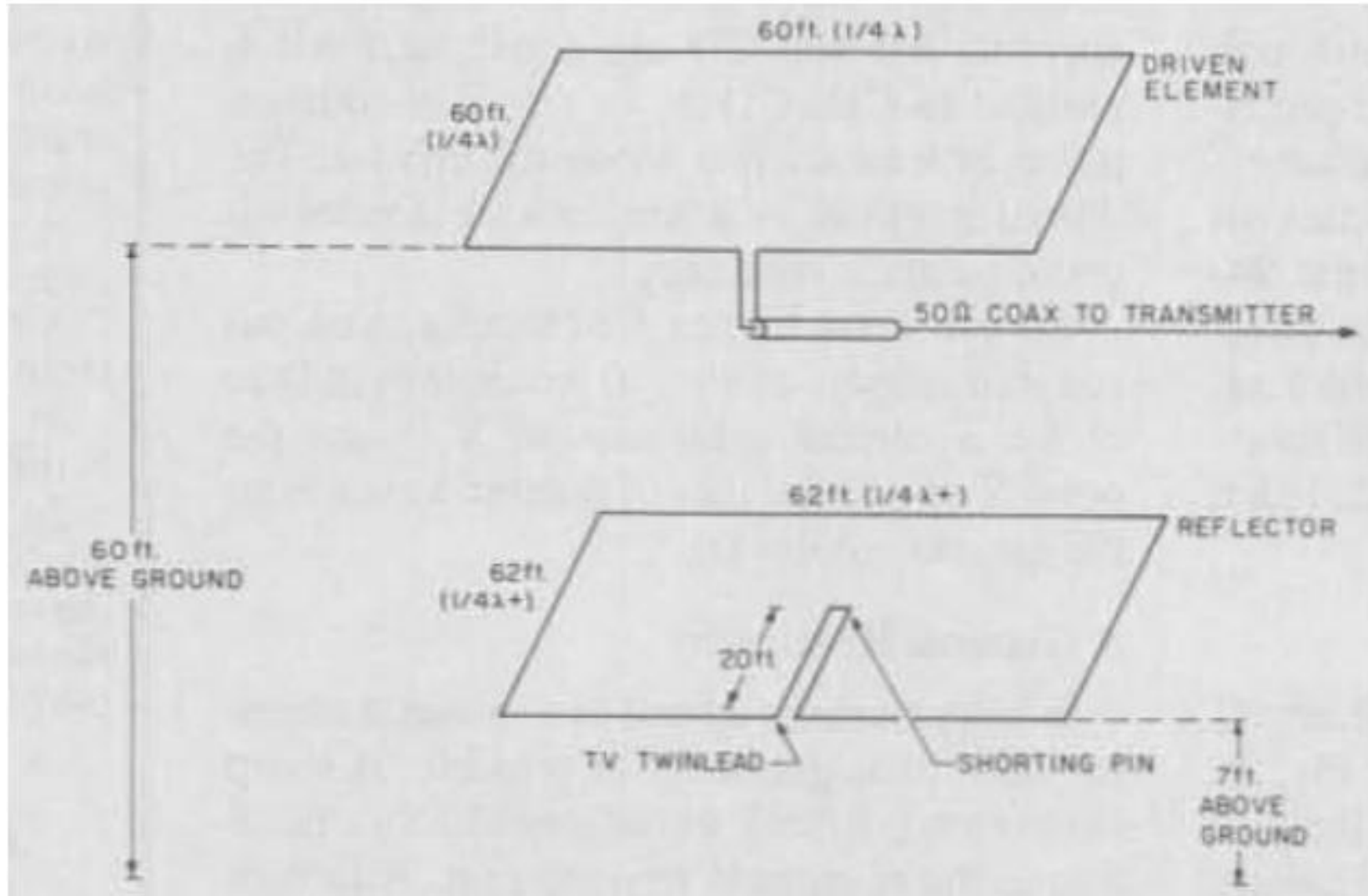
# V-Beam Antenna for 15m



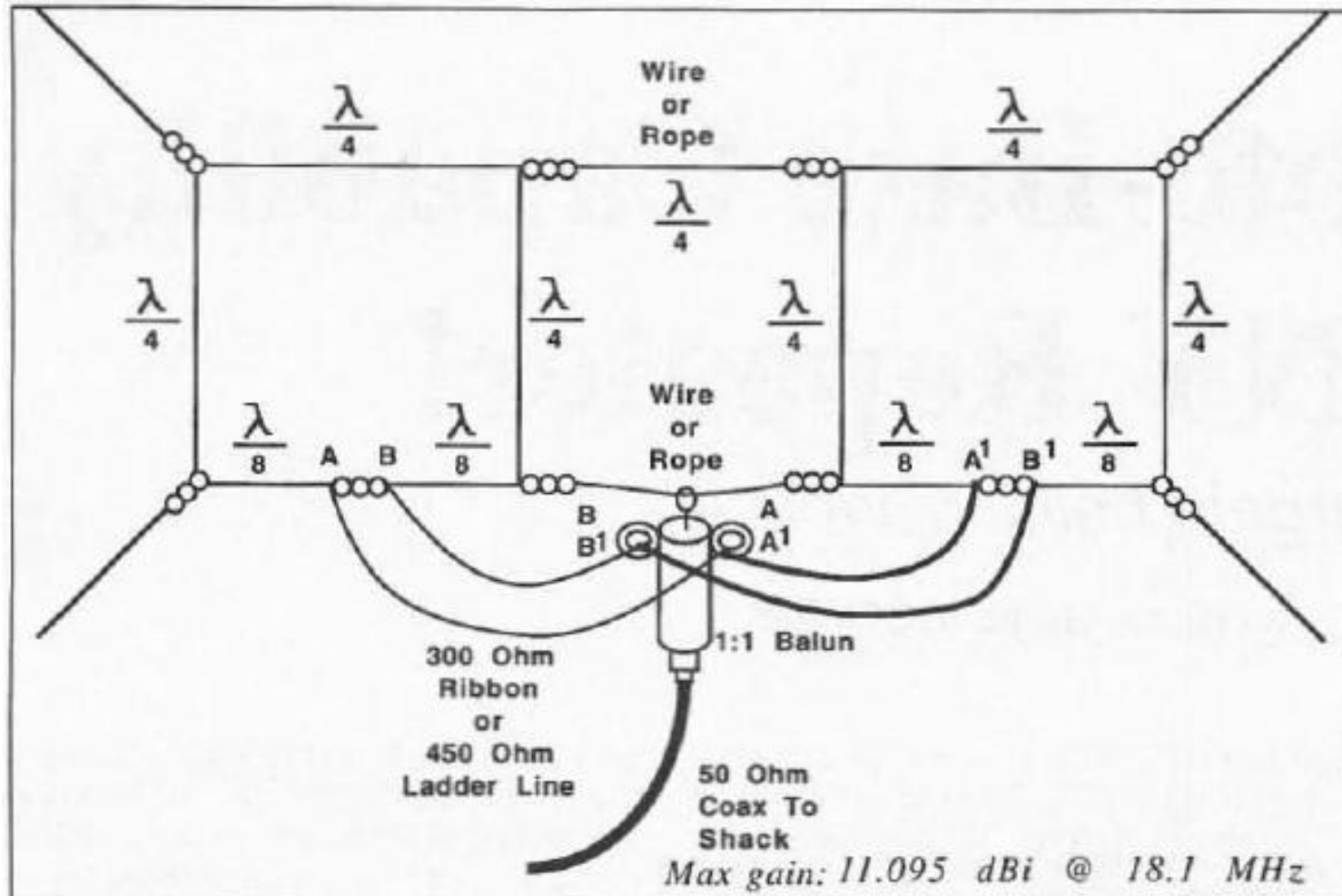
## Picnic Vertical Wire Antenna



# Laid-Back Quad Antenna for 80m



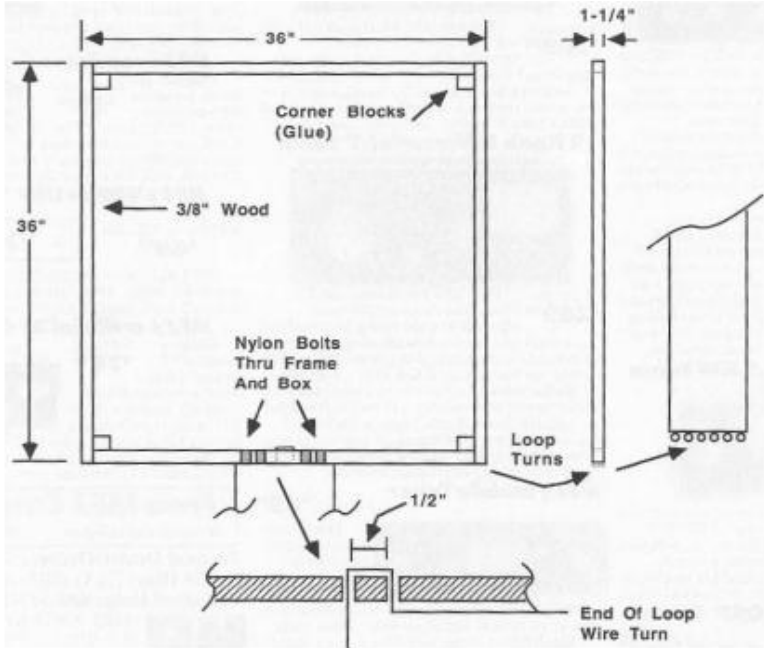
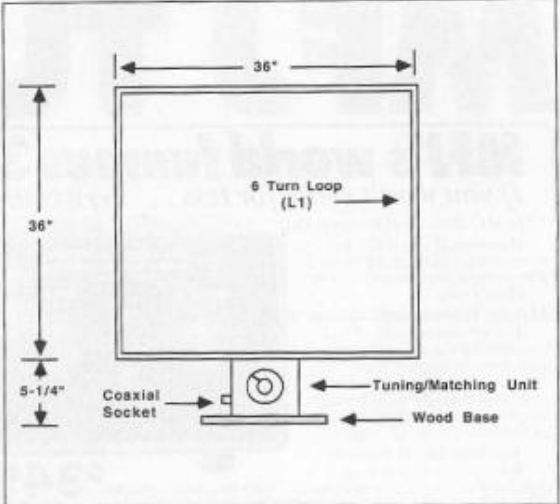
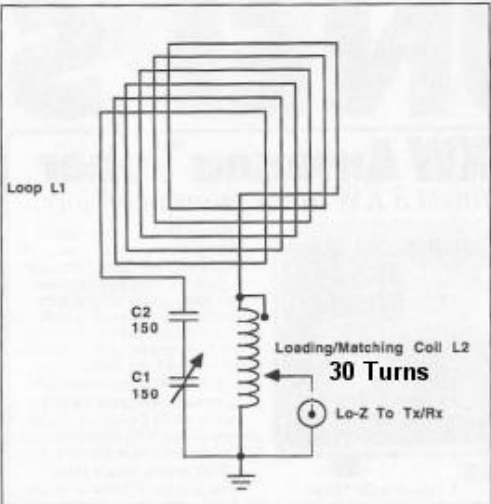
## Phased Loop Antenna



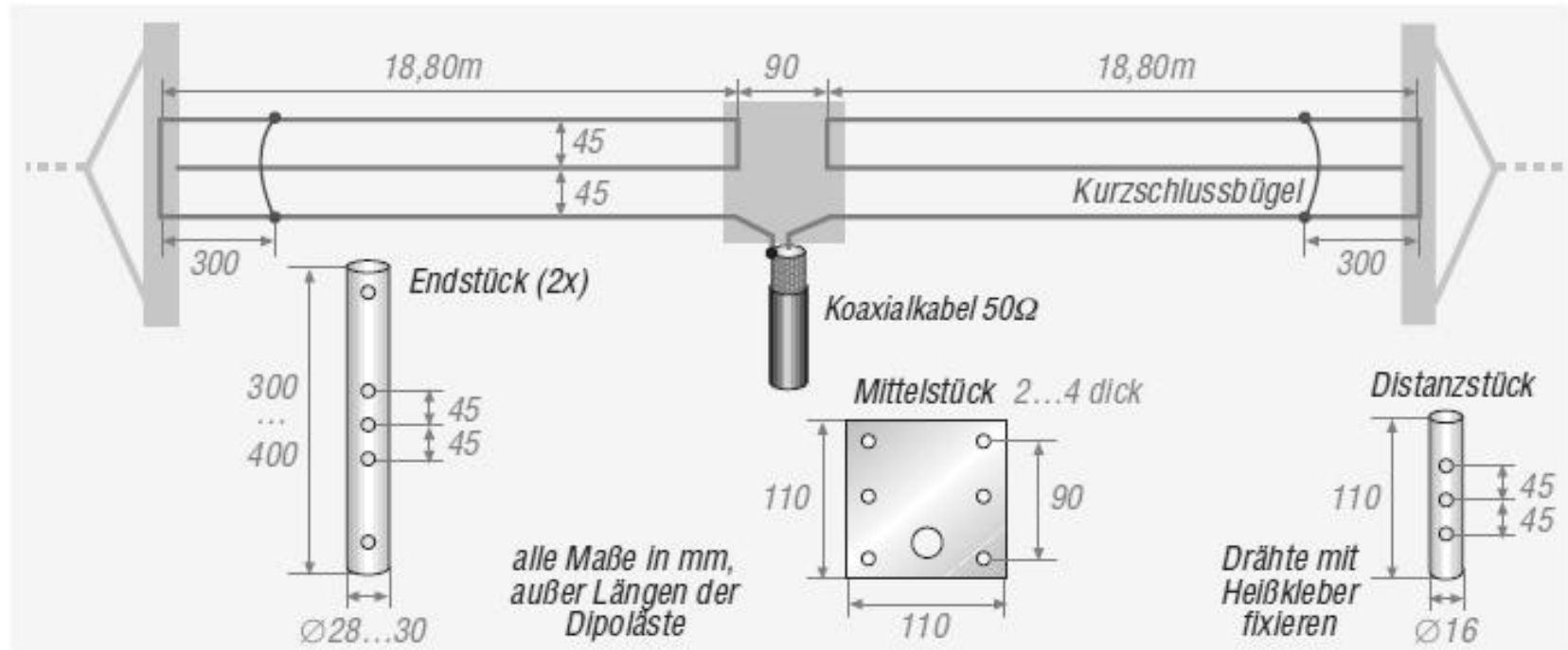
	$\lambda/4$	$\lambda/8$	300 $\Omega$ Ribbon	450 $\Omega$ Ladderline
40m	34.9 ft.	17.5 ft.	53.3 ft.	62.2 ft.
20m	17.6 ft.	8.8 ft.	27.0 ft.	31.2 ft.
17m	13.9 ft.	6.9 ft.	21.2 ft.	25.2 ft.
15m	11.8 ft.	5.9 ft.	18.1 ft.	21.97 ft.
10m	8.67 ft.	4.33 ft.	13.2 ft.	15.33 ft.



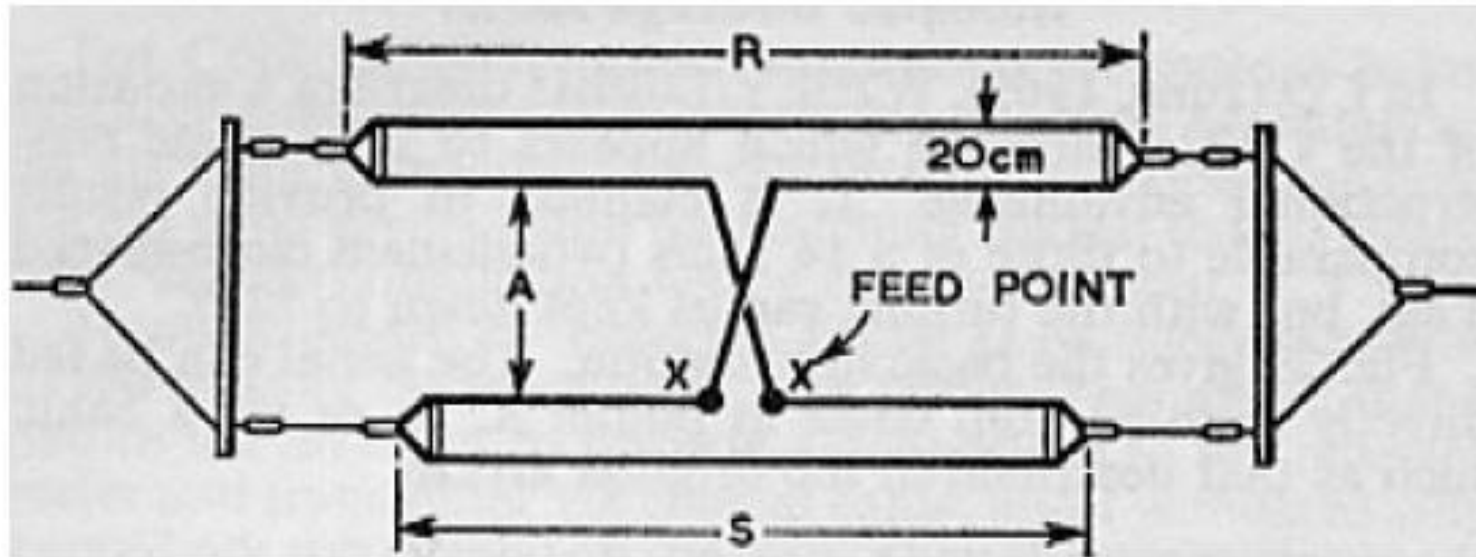
# TX Loop Antenna for 160m



## Morgain-Dipole Antenna for 160m and 80m

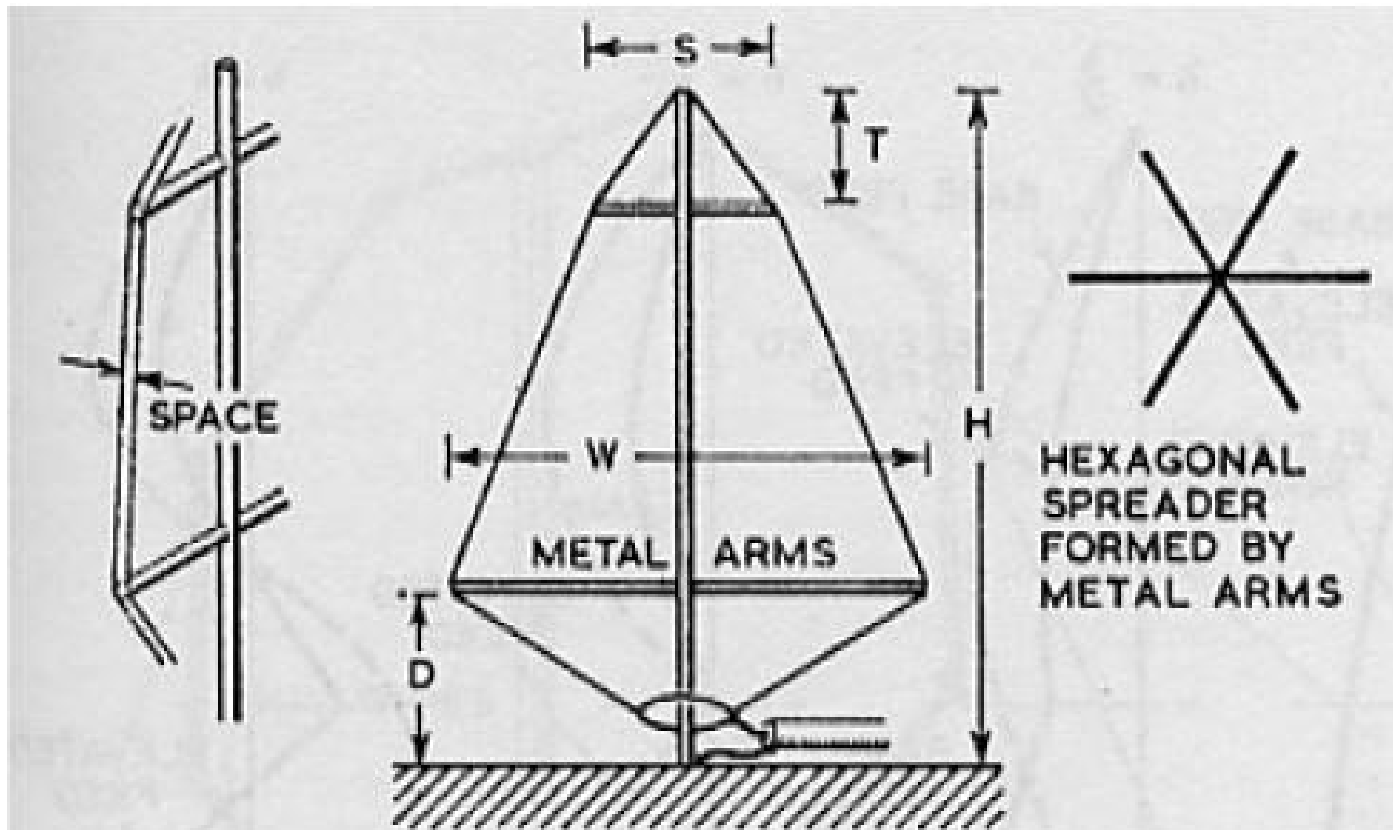


## ZL-Special for 20m, 15m, 10m



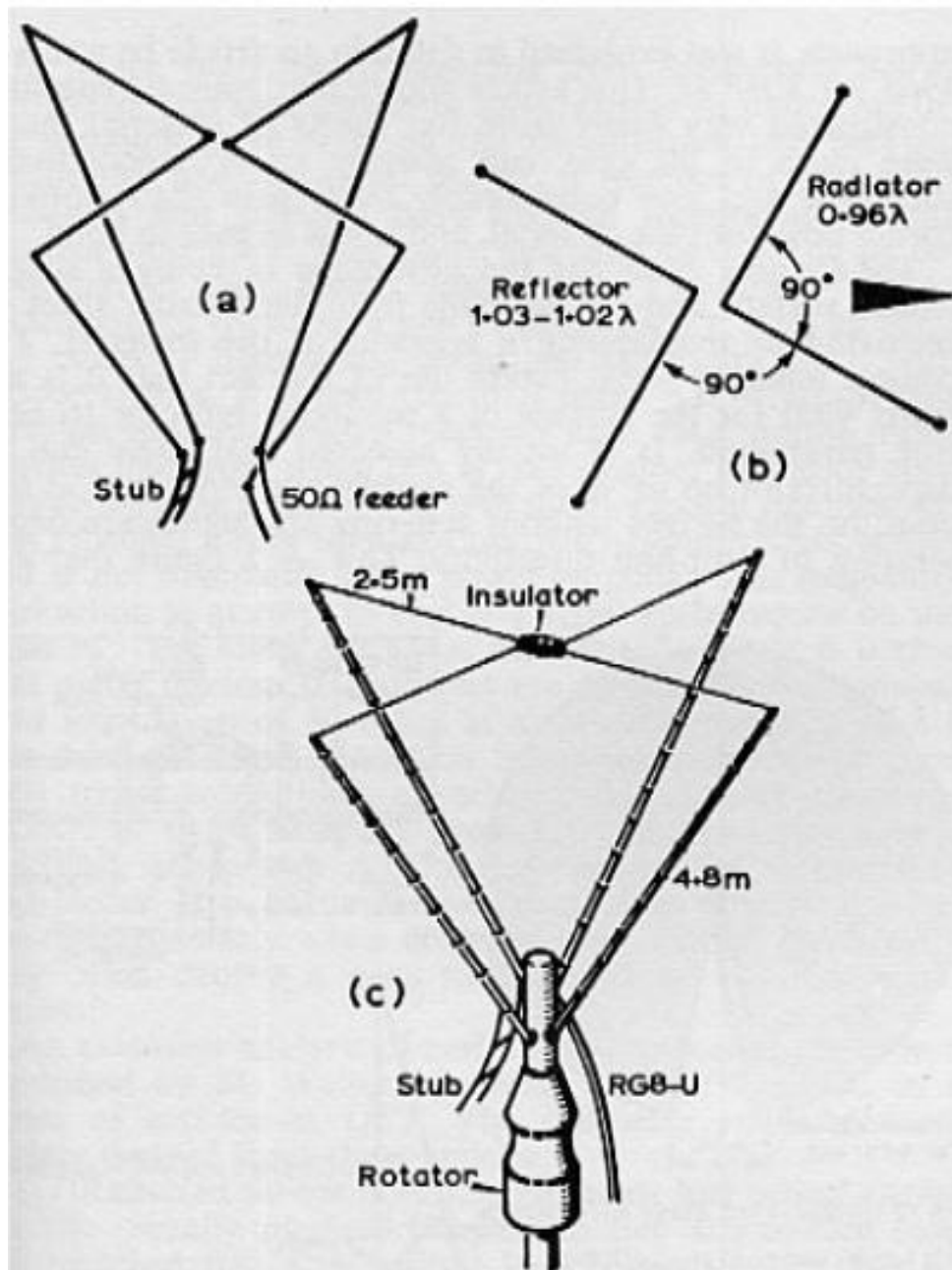
	<b>S</b>	<b>R</b>	<b>A</b>	<b>A</b>
<b>28 Mc/s</b>	5.09m	5.39m	1.29m	$\frac{1}{10}\lambda$
	4.17m	4.42m	1.06m	$\frac{1}{10}\lambda$
<b>21 Mc/s</b>	6.85m	7.24m	1.72m	$\frac{1}{10}\lambda$
	5.62m	5.94m	1.41m	$\frac{1}{10}\lambda$
<b>14 Mc/s</b>	10.30m	10.85m	2.58m	$\frac{1}{10}\lambda$
	8.45m	8.90m	2.12m	$\frac{1}{10}\lambda$

## Biconical Antenna

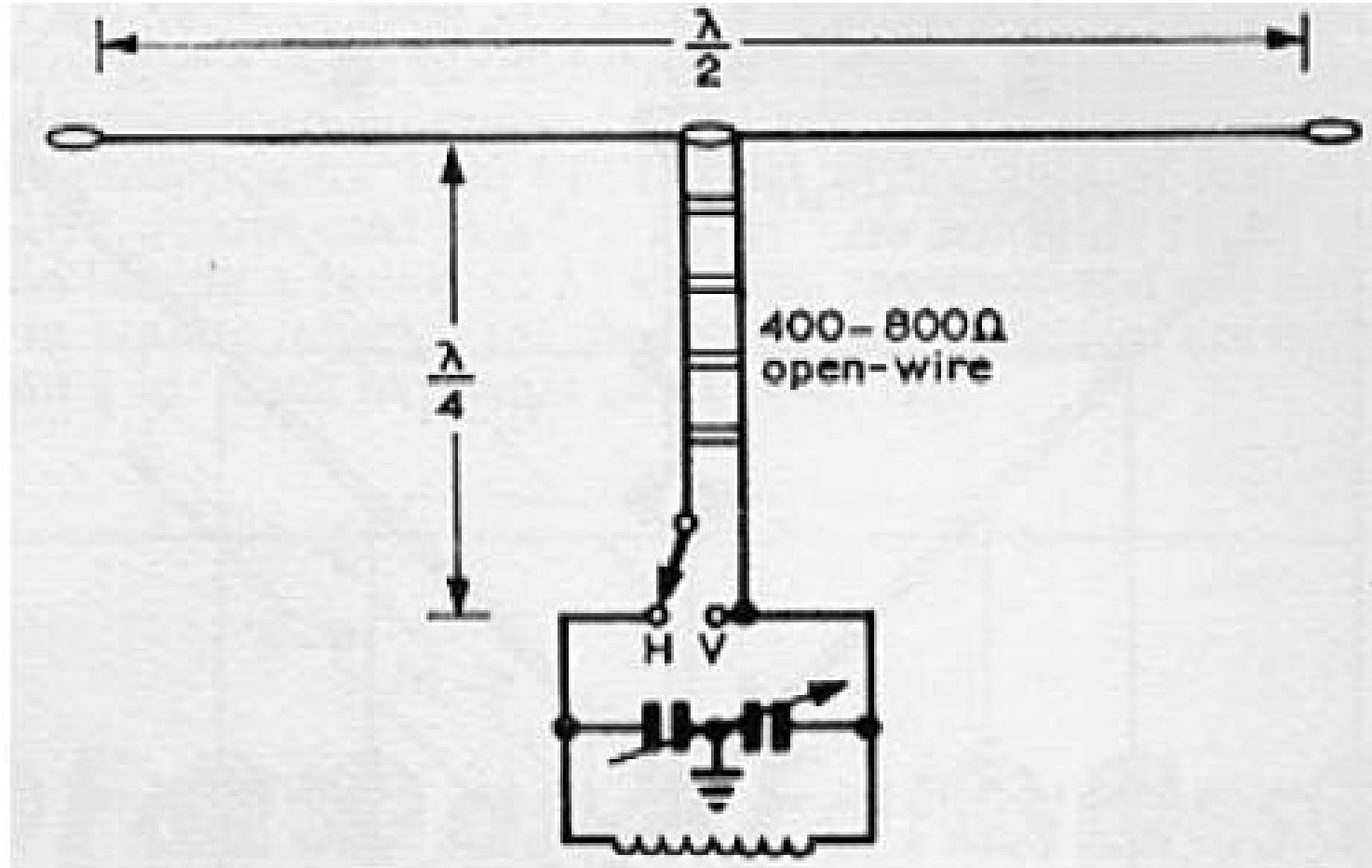


	H	W	D	T	S	SPACE	WIRE
3.5 - 15 Mc/s	43'	17'-8"	16'-10"	2'-2"	5'-10"	3"	NR 8
7 - 28 Mc/s	23'	9'-6"	9'	12"	3'-2"	2"	NR 10
14 - 56 Mc/s	12'	5'	4'-9"	8"	1'-8"	1"	NR 12

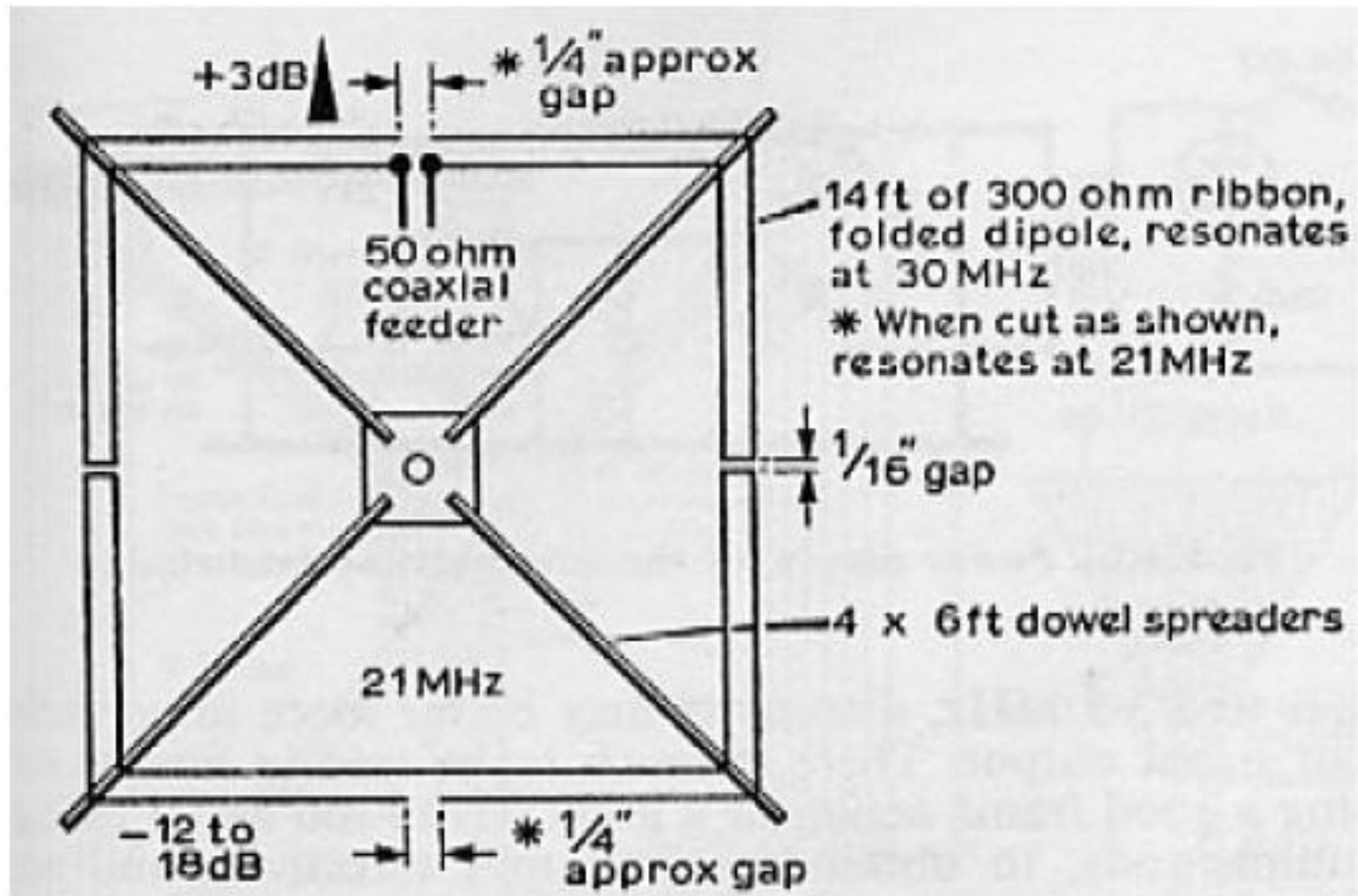
## Directive Delta-Birdcage Antenna for 20m to 10m



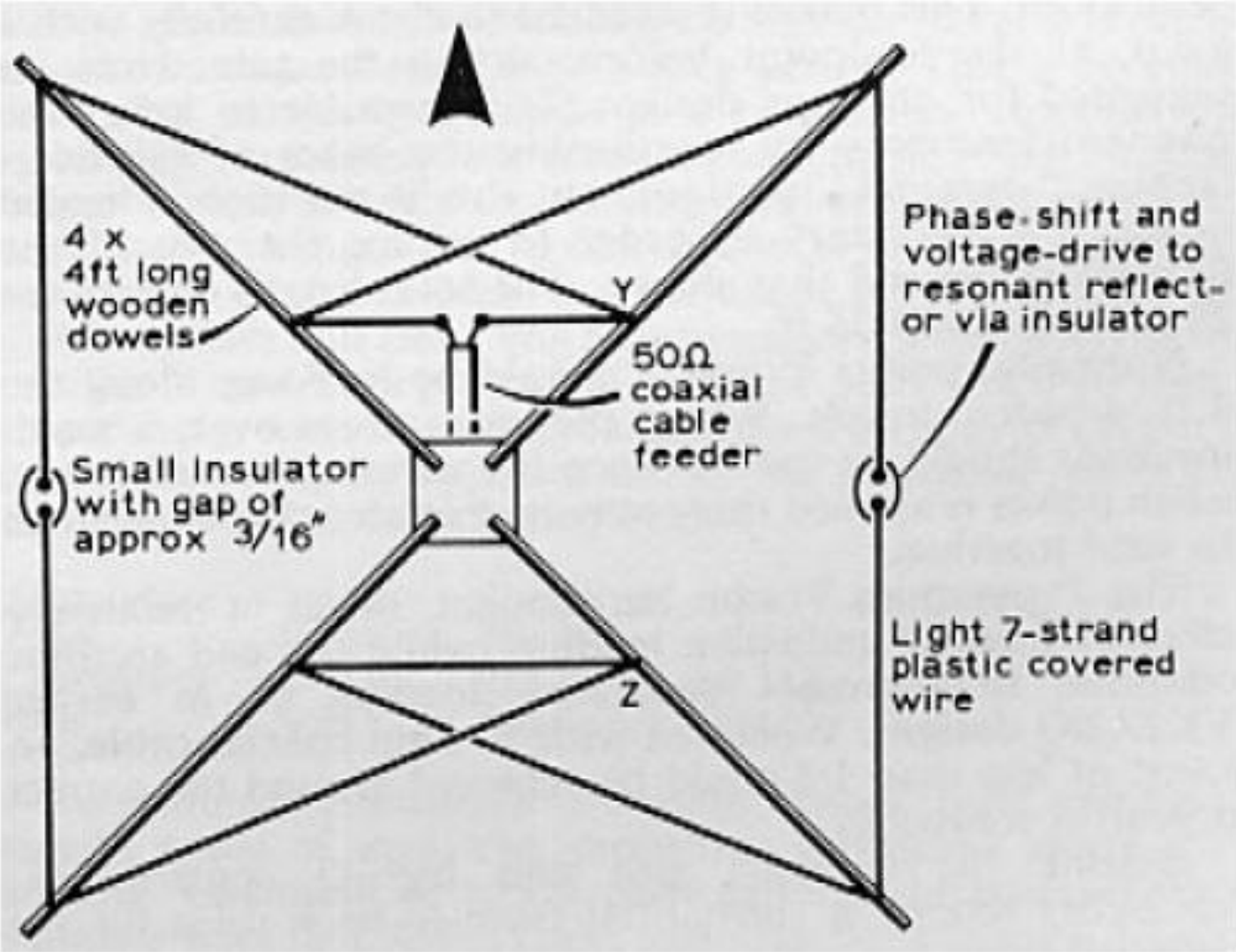
## Dual Polarization Antenna for 80m and 40m



## Directive 300ohms-Ribbon Folded Dipole for 15m

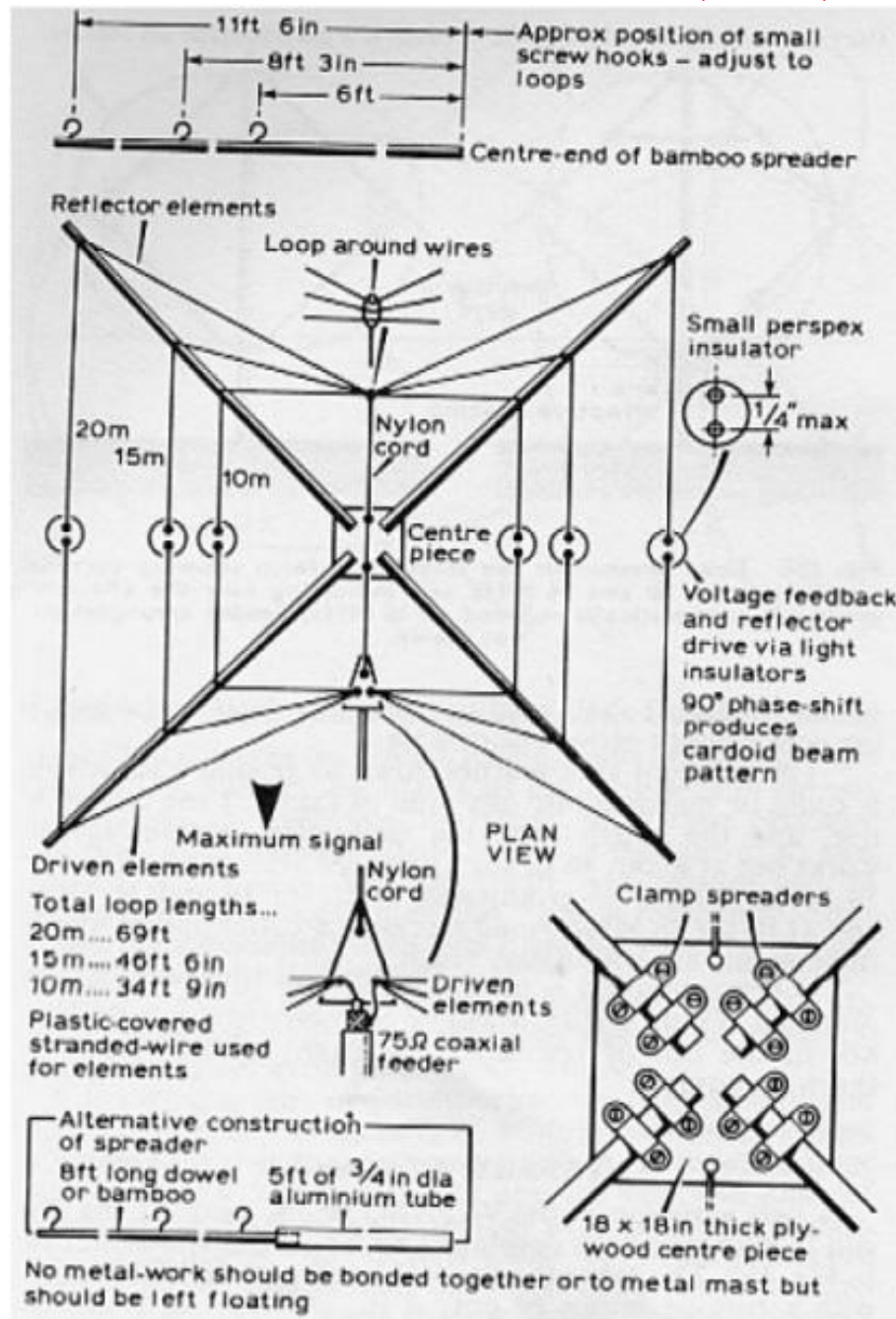


# Miniature Directive Antenna for 10m

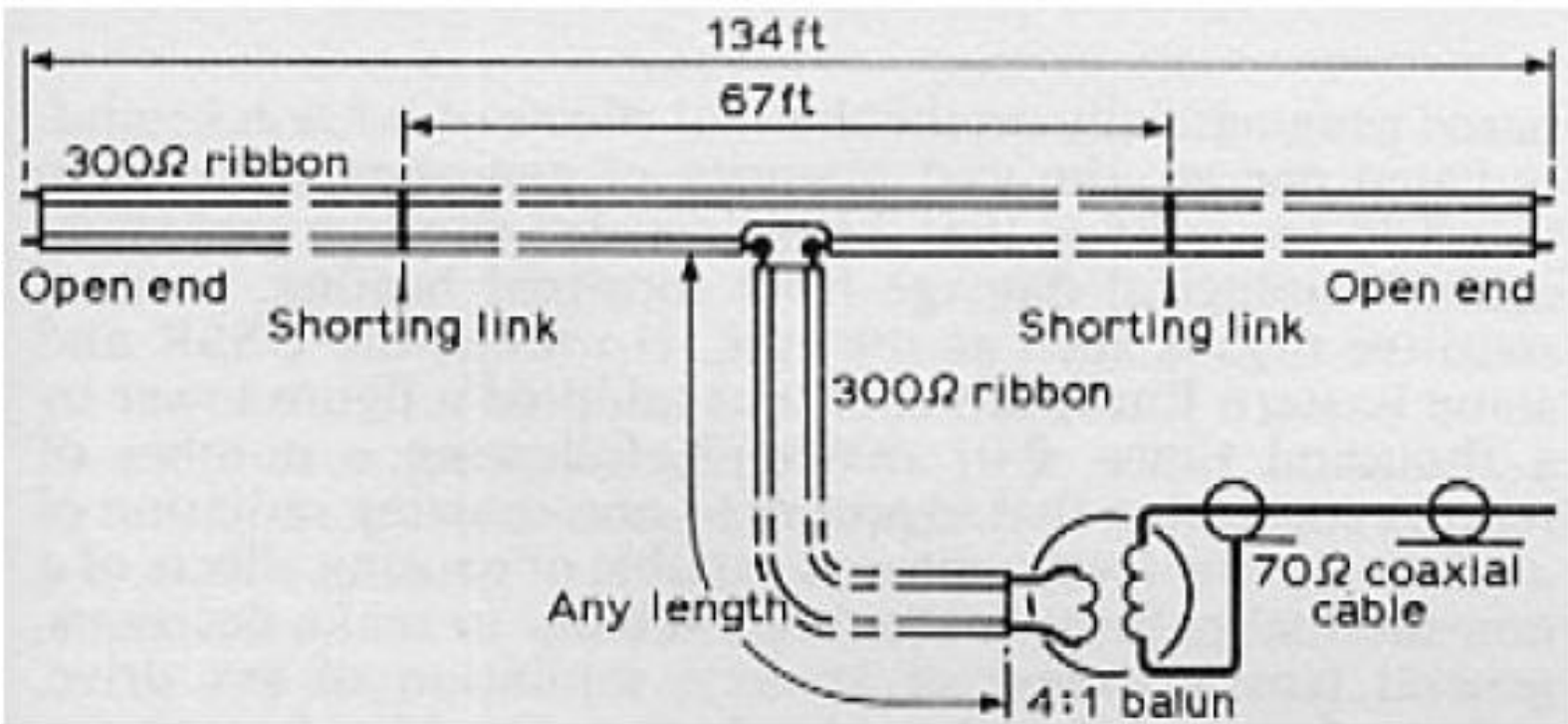




# Tri-Band Beam Antenna for 20m, 15m, 10m



## 300ohm-Ribbon Dual Band Dipole



*References:*

*Antenna Toolkit - J. Carr*

*Practical Antenna Handbook - J. Carr*

*More Antenna Classics - C. Hutchinson*

*Amateur Radio Techniques - P. Hawker*

*ARRL Antenna Handbook 1990-2007*

*ARRL Handbook 1990-2009*

*ARRL Antenna Compendium*

*73 Magazine 1970-2002*

*Funkamateur Magazine 1990-2011*