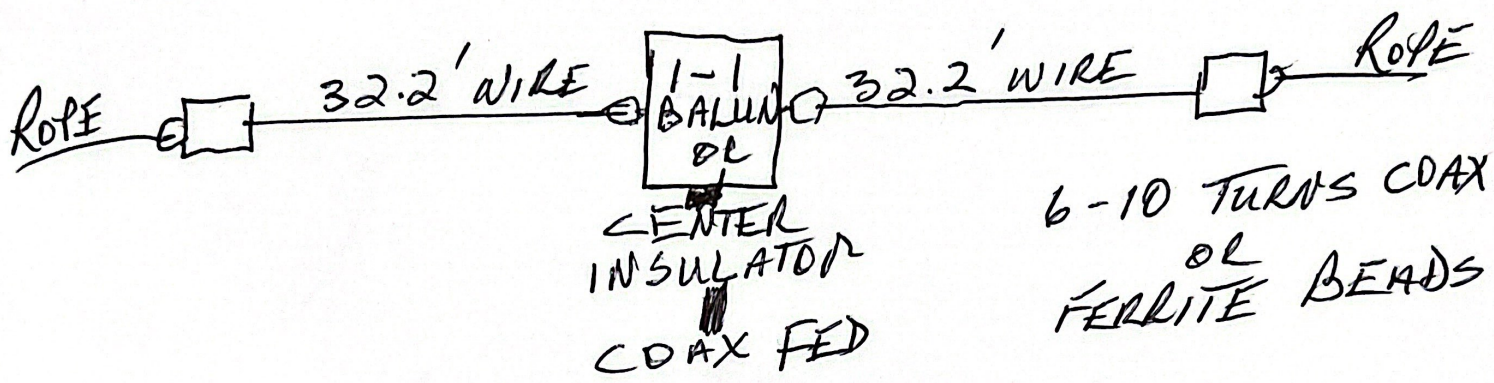


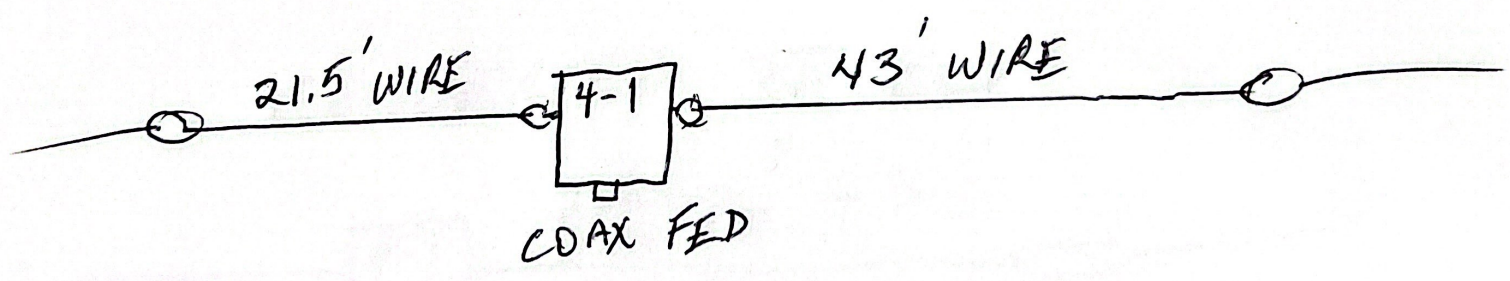
DIPOLE $\frac{1}{2} \lambda$

$$\frac{468}{\text{FMHZ}} = \frac{468}{7.250} = 64.5' \div 2 = 32.2'$$

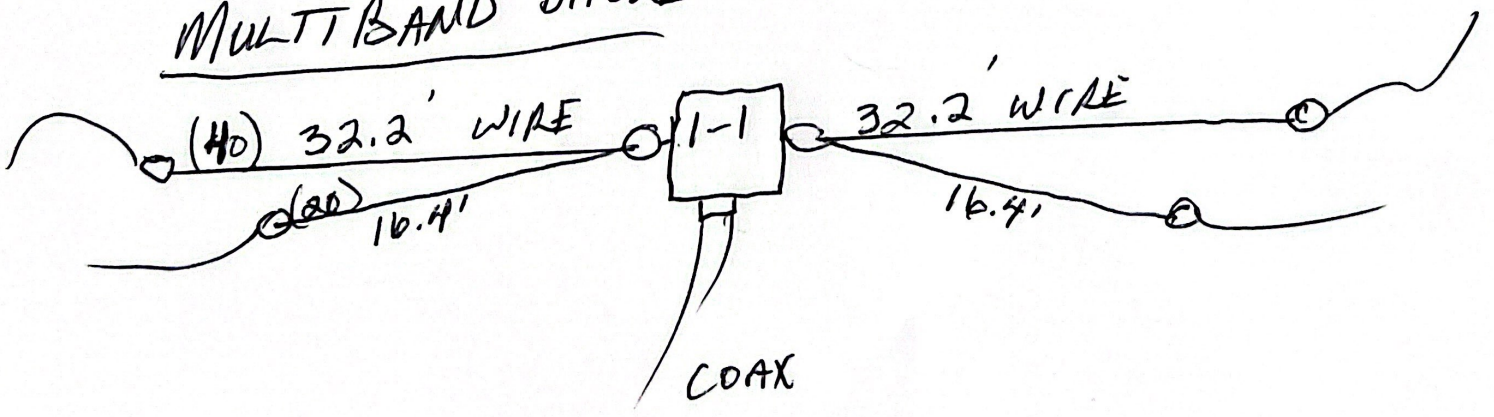


WINDOM OR OCF

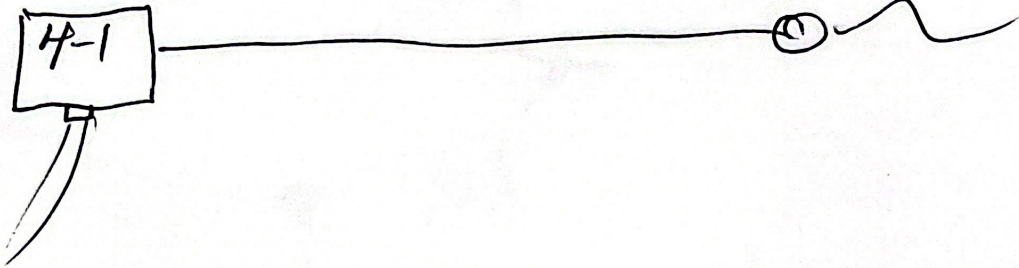
$$\frac{468}{\text{FMHZ}} = \frac{468}{7.250} = 64.5' \div 3 = 21.5'$$



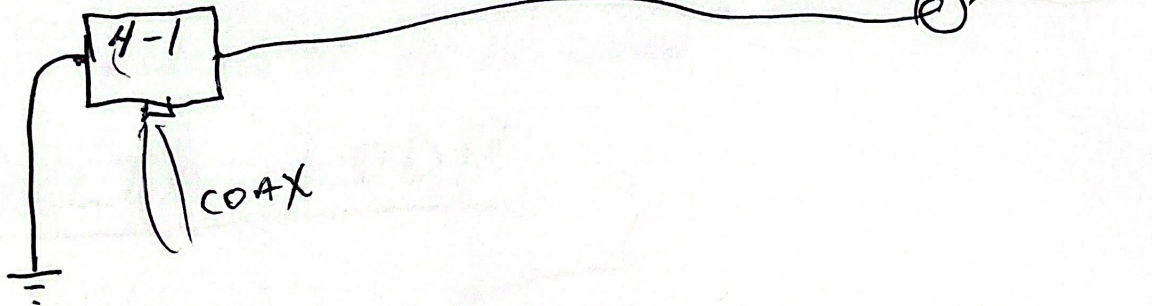
MULTIBAND DIPOLE



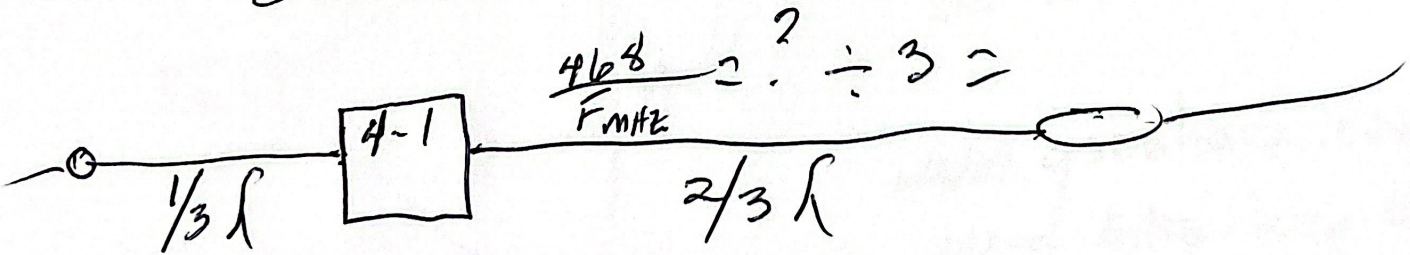
END FED



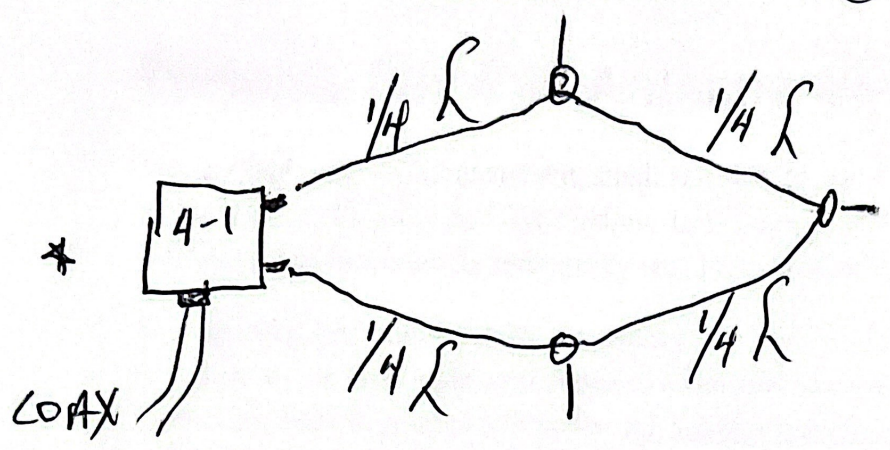
w/COUNTERPOISE



CONVERTED TO OCF



LOOP ANTENNA (FULL WAVE)

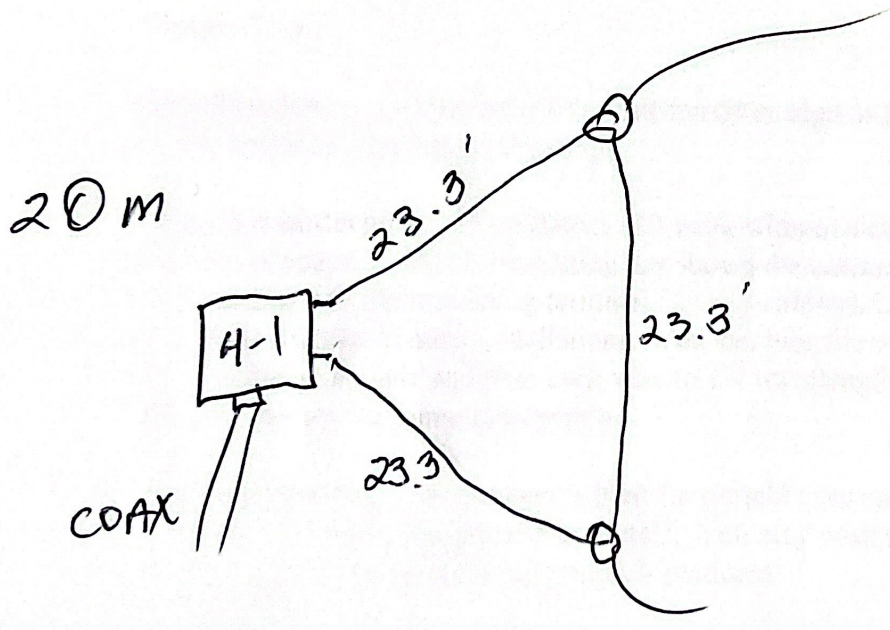


$$\frac{936}{F_{MHz}} = \lambda$$

250'
550'
1600'

* OR FEED WITH 50Ω COAX WITH AN IMPEDANCE-MATCHING TRANSFORMER MADE FROM A QUARTER WAVE SECTION OF 75Ω COAX

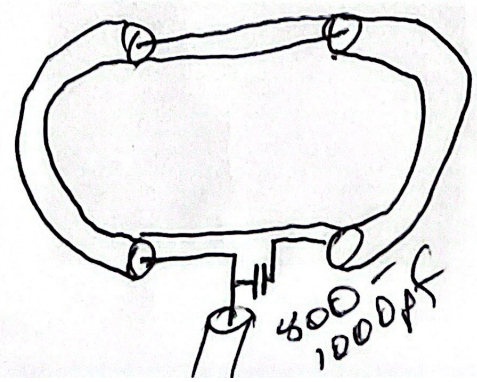
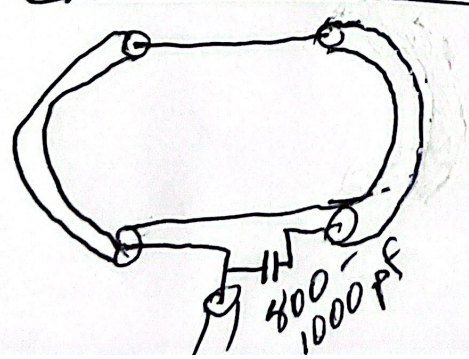
DELTA LOOP



FEED POINT CAN BE MOVED AROUND

www.qsoshack.com/20m-delta-loop-hf-antenna/

HOME BUILD (WHICH WORKS?)



1. MADE USING COAX

Portable End-Fed Antenna 40-6 meters

This end-fed antenna is convenient, small and easy to set up for portable use. Great for your FT-817D, KX2, KX3, and other QRP radios. It will handle 100w PEP of power, so it's also perfect with typical transceivers for emergency use, Field Day, or in locations with antenna restrictions.

The matching unit contains a trifilar wound, 9:1 UNUN (unbalanced to unbalanced) transformer that matches the high input impedance of an end fed antenna into the range where most antenna tuners can produce good performance. An antenna tuner is needed-- many built-in radio autotuners and external tuners will work .

The end fed antenna works well in several configurations including horizontal, sloper, and vertical configurations. Hang the insulator end from a tree limb or pole and attach the coax to the SO-239 connector. No counterpoise wire or ground is required, but it is suggested for best performance.

Covers 40-6m, including WARC bands. Lower bands can be added by extending wire length. It also makes a great shortwave antenna as well. Antenna is ready to use out of the box.

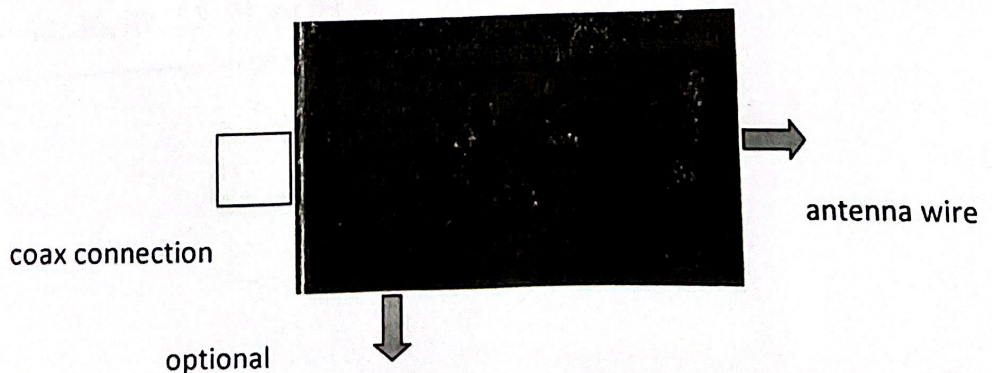
Setup Tips:

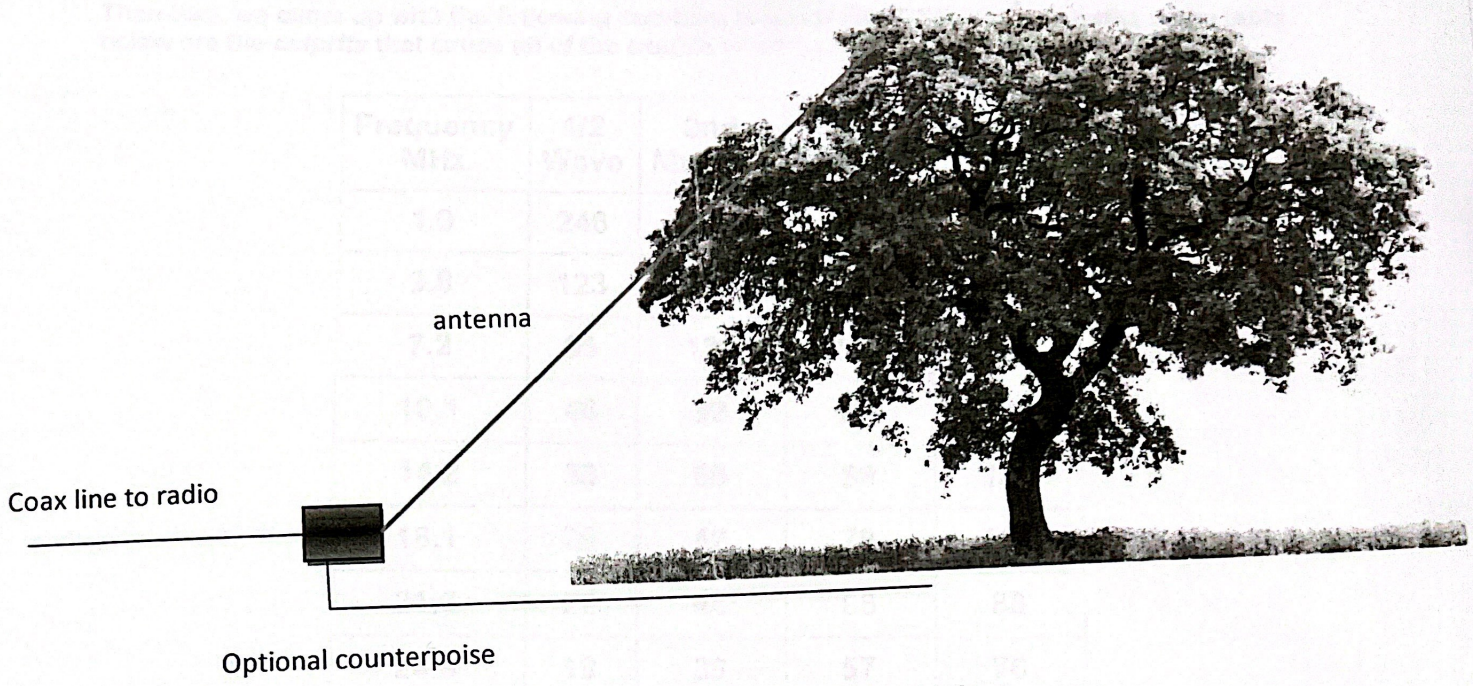
Height matters. Get the end of the antenna up as high as practical. The radiator wire connects to the terminal with the red marking.

Using a counterpoise. The antenna will work without a counterpoise if 16 or more feet of coax cable is connected. However, testing has shown the antenna works better with a counterpoise wire--connect to the remaining terminal (green marking). Using a 30 ft. piece of wire run along the ground works in most installations. You can tune the counterpoise for specific bands. Some use 4-conductor cable and trim each wire to 1/4 wavelength for the bands they use. Remember, 40/15m can use the same counterpoise.

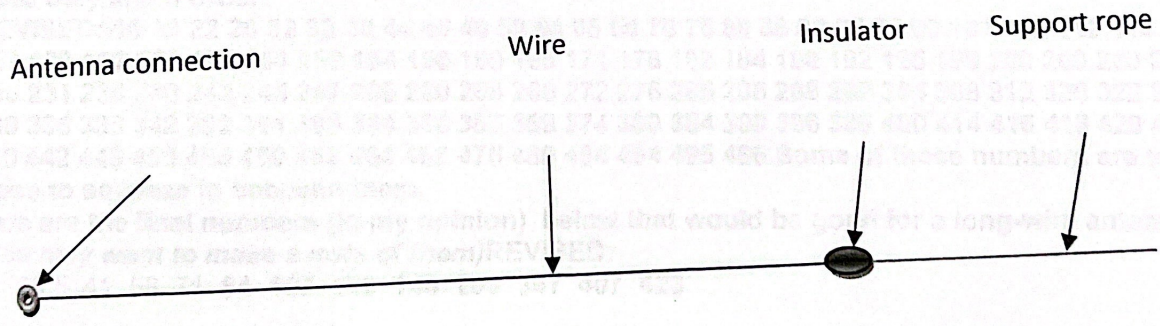
Weatherproofing. The antenna is built for portable use and occasional use outdoors. Stainless hardware is used on the antenna terminals. You may wish to do additional weatherproofing if the antenna will be used for long periods outdoors.

Do I really need a tuner? Yes. To cover multiple bands, a tuner is needed between the antenna and the radio.





Antenna in sloper configuration



“Magic” Wire Lengths: This antenna comes with a 30 ft. wire antenna, but other lengths will work as well—longer lengths will tune to 80 meters. Remember, the 9:1 balun is doing the conversion of impedance from about 450-700 ohms down to 50 ohms. The antenna cannot be an actual ¼ wavelength on any ham band, so 8, 16, 32 and 66 ft. lengths are ruled out. Feel free to try these lengths: 30, 36, 49, 53, 71, or 84 ft.

The table below represents half wave lengths and multiples that you DO NOT WANT TO USE! You have to stay away from a half wavelength on any frequency. Therefore, we came up with the following numbers to avoid (IN FEET): These lengths in the table below are the *culprits* that cause all of the trouble when using random lengths.

Frequency MHz	1/2 Wave	2nd Multiple	3rd Multiple	4th Multiple
1.9	246	492	738	984
3.8	123	246	369	492
7.2	65	130	195	260
10.1	46	92	138	184
14.2	33	66	99	132
18.1	26	52	78	104
21.3	22	44	66	88
24.9	19	38	57	76
28.5	16	32	48	64

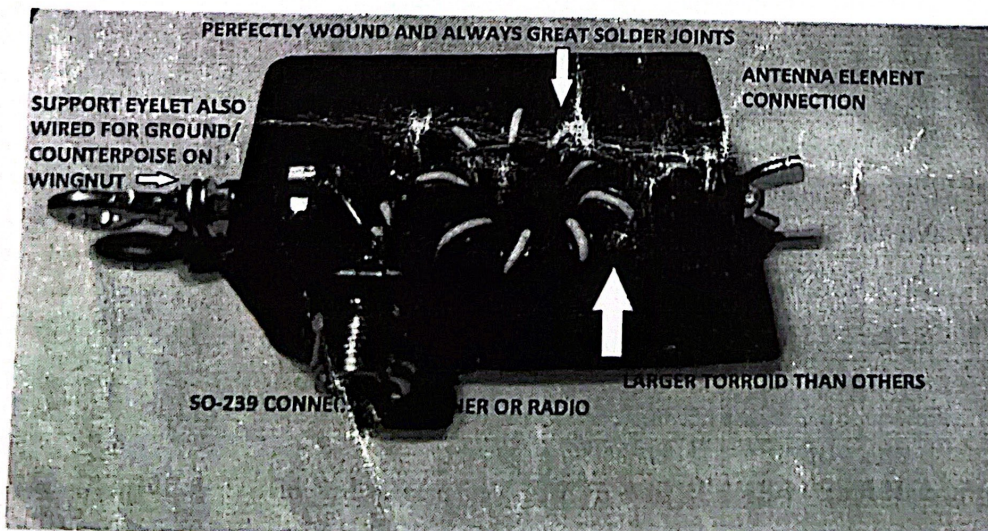
So those are the numbers above that we have to stay as far away from as possible when building a long-wire antenna.

Here they are in order:

REVISED: 16 19 22 26 32 33 38 44 46 48 52 64 65 66 76 78 80 88 92 95 96 99 104 110 112 114 123 123 130 132 133 138 144 152 154 156 160 165 171 176 182 184 190 192 195 198 208 209 220 224 228 236 231 234 240 242 246 247 256 260 264 266 272 276 285 286 288 297 304 308 312 320 322 323 325 330 336 338 342 352 361 363 364 366 368 369 374 380 384 390 396 399 400 414 416 418 429 432 437 440 442 448 455 456 460 462 464 468 475 480 484 494 495 496. Some of these numbers are too close to squeeze in between them.

Here are the final numbers (in my opinion) below that would be good for a long-wire antenna: (You may want to make a note of them) REVISED:

29 35.5 41 58 71 84 107 119 148 203 347 407 423

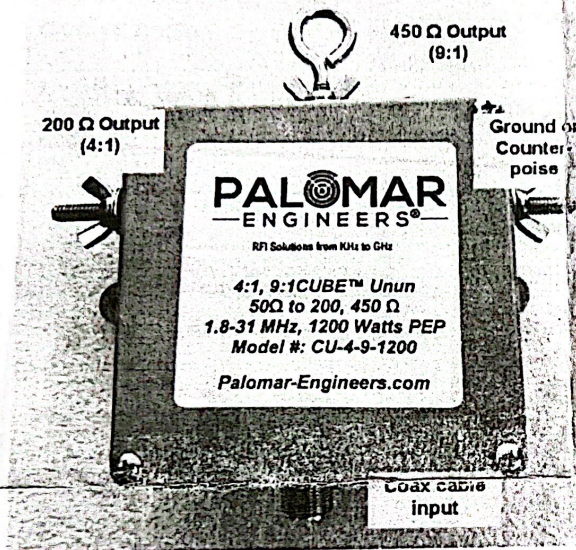


PALOMAR ENGINEERS®

RFI Solutions from KHz to GHz

1200 Watt 4:1/9:1
CUBE Unun™

Model CU-4-9-1200



Model CU-4-9-1200 is a 4:1 and a 9:1 voltage unun housed in a NEMA enclosure box (4" x 4" x 2") with one top stud for 4:1 and another top stud for 9:1 outputs, each capable of input power levels up to 1200 watts PEP when used with a matched load. The 4:1 ratio takes 50 ohms input and matches to 200 ohms output and the 9:1 ratio takes 50 ohm input and matches to 450 ohms output between 1-61 MHz under 1.5 SWR under matched load conditions.

A great multipurpose unun for 31' fiberglass verticals, end fed non-resonant antennas, traveling wave verticals, etc. Multi-core, Ruthroff style unun with side ground terminal for adding counterpoise or radials as an option. Now you don't need two ununs – just pick the output ratio that best matches your antenna tuner! **Only ONE ratio can be used at a time. Choose wither the 4:1 (left side terminal) and ground OR the 9:1 (top eyebolt terminal) and ground.**

The Unun provides multiple taps for impedance conversions of:

- 50 to 450 (9:1) – for end fed long wires, traveling wave antennas
- 50 to 200 (4:1) – for ¼ wave vertical folded dipoles, OCF verticals

USE

This unun is designed to convert unbalanced coax to an unbalanced antenna feed point such as vertical antennas, low impedance end fed antennas, traveling wave antennas, etc.

Attach the feedline to the SO-239 coax connector and a ground to the side ground post (which is internally connected to the coax connector shield). Connect the antenna radiating element to either the "4" side terminal for 200 to 50 ohm matching or the "9"

Phone: 760-747-3343 Email: Sales@Palomar-Engineers.com

www.Palomar-Engineers.com

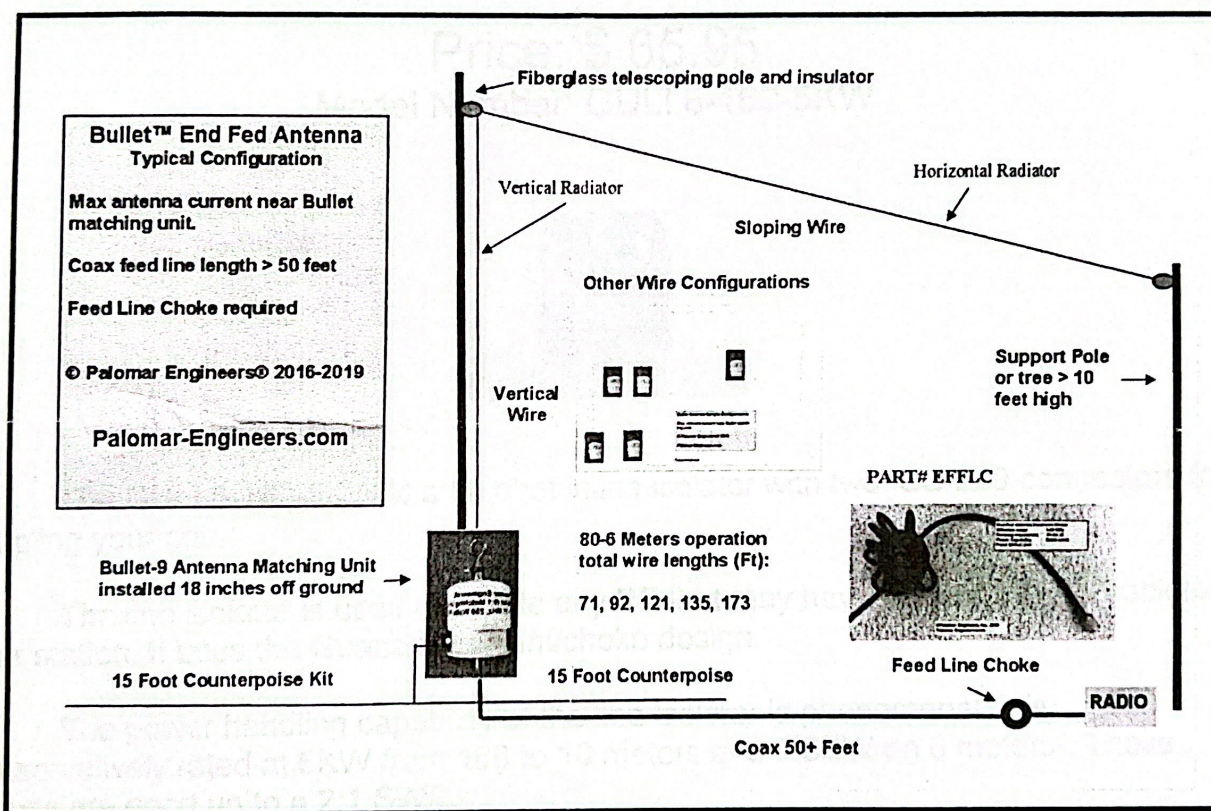
Providing Quality Ham Radio Products Since 1965

We Ship Worldwide

top terminal for 450 ohm matching. Depending on the frequency of operation, a single antenna may be used for 80-10 meters, but different matching terminals may be needed for a particular band. (All bands won't use the "4" or the "9" – some may require the "4" and some the "9" and some neither as the antenna feed point may be near 50 ohms).

The CU-4-9-1200 is a matching transformer and NOT a common mode choke/line isolator. For best results, use a 1:1 common mode choke or coax noise filter at the radio end of the coax to keep transmitted RFI from getting into the radio and also to reduce receive noise

A typical setup is similar to our Bullet™ end fed antenna system shown below:



Phone: 760-747-3343 Email: Sales@Palomar-Engineers.com

www.Palomar-Engineers.com

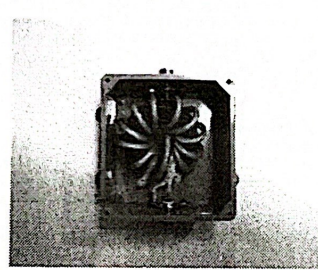
Providing Quality Ham Radio Products Since 1965

We Ship Worldwide

Hy Power Antenna Company

**50 Ohm Current / Choke Balun
5 KW 160 to 10 Meters
3 KW 6 Meters
All Stainless Steel Hardware**

Price: \$ 65.95
Model Number: GULI 6-160-5KW



The GULI 6-160-5KW is a 50 ohm inline isolator with two SO 239 connectors for coupling your coax.

The line isolator is used to isolate any RF that may have worked its way back to your station. It uses the Guanella current/choke design.

The power handling capability of the line isolator is phenomenal, it is conservatively rated at 5KW from 160 to 10 meters and 3.5KW on 6 meters . These ratings are good up to a 2:1 SWR.

The MIL SPEC transmission line used to make the isolator uses: silver clad copper center conductor, silver covered shield, solid teflon dielectric, 1900 rms voltage rating and a temperature range from -55 to +200 degrees centigrade.

If you are using a transmatch, connect the line isolator to the input (station side) of your transmatch. Do not place it on the antenna side of the transmatch. Most transmatches use a 4:1 voltage balun and that does not offer adequate choking. An RF choke, or line isolator is needed between the transmatch and your station. The GULI 6-160-5KW fits these needs.

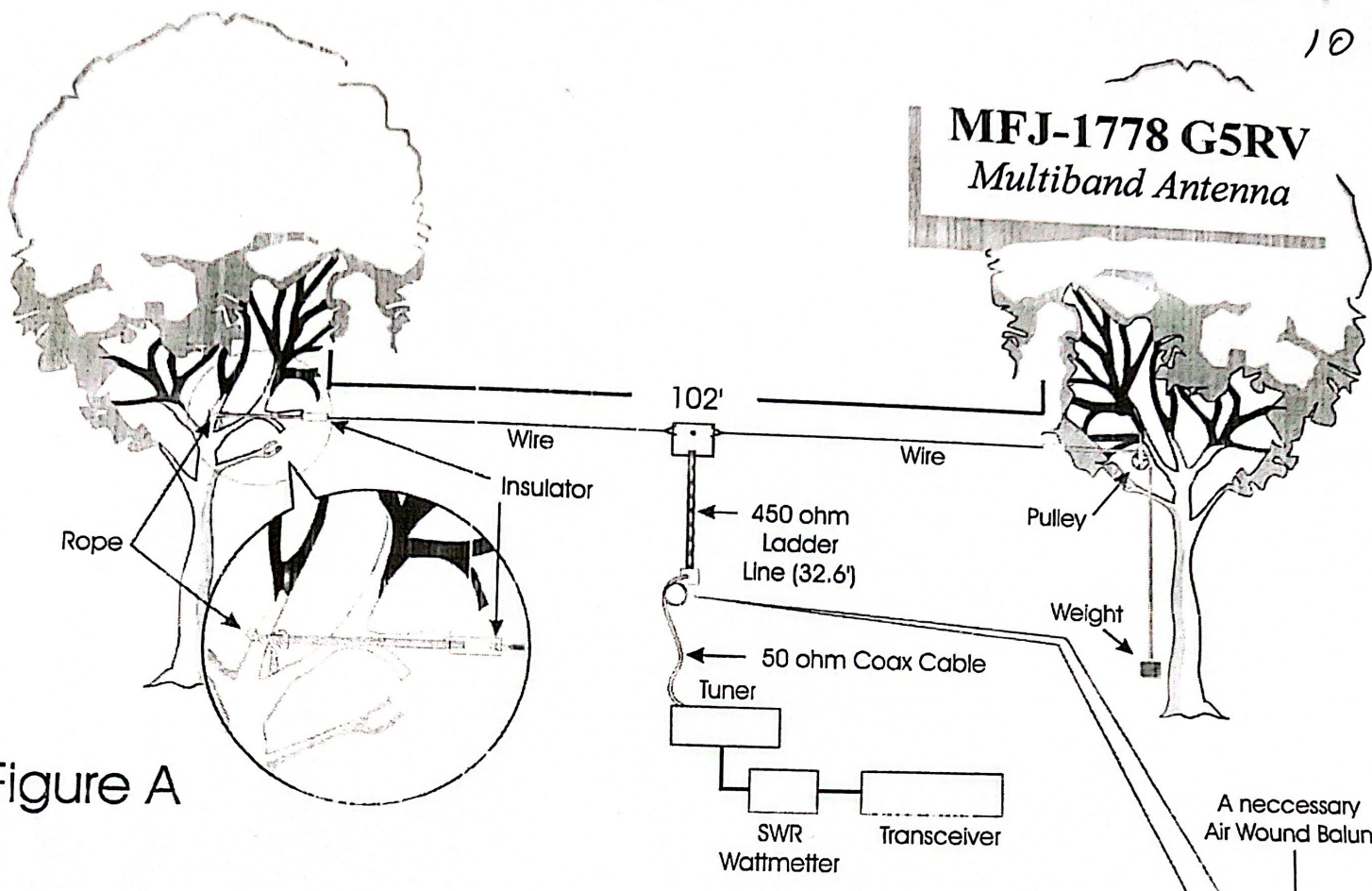


Figure A

NOTE:
Tuner, Wattmeter, and Transceiver shown in drawings should be located indoors

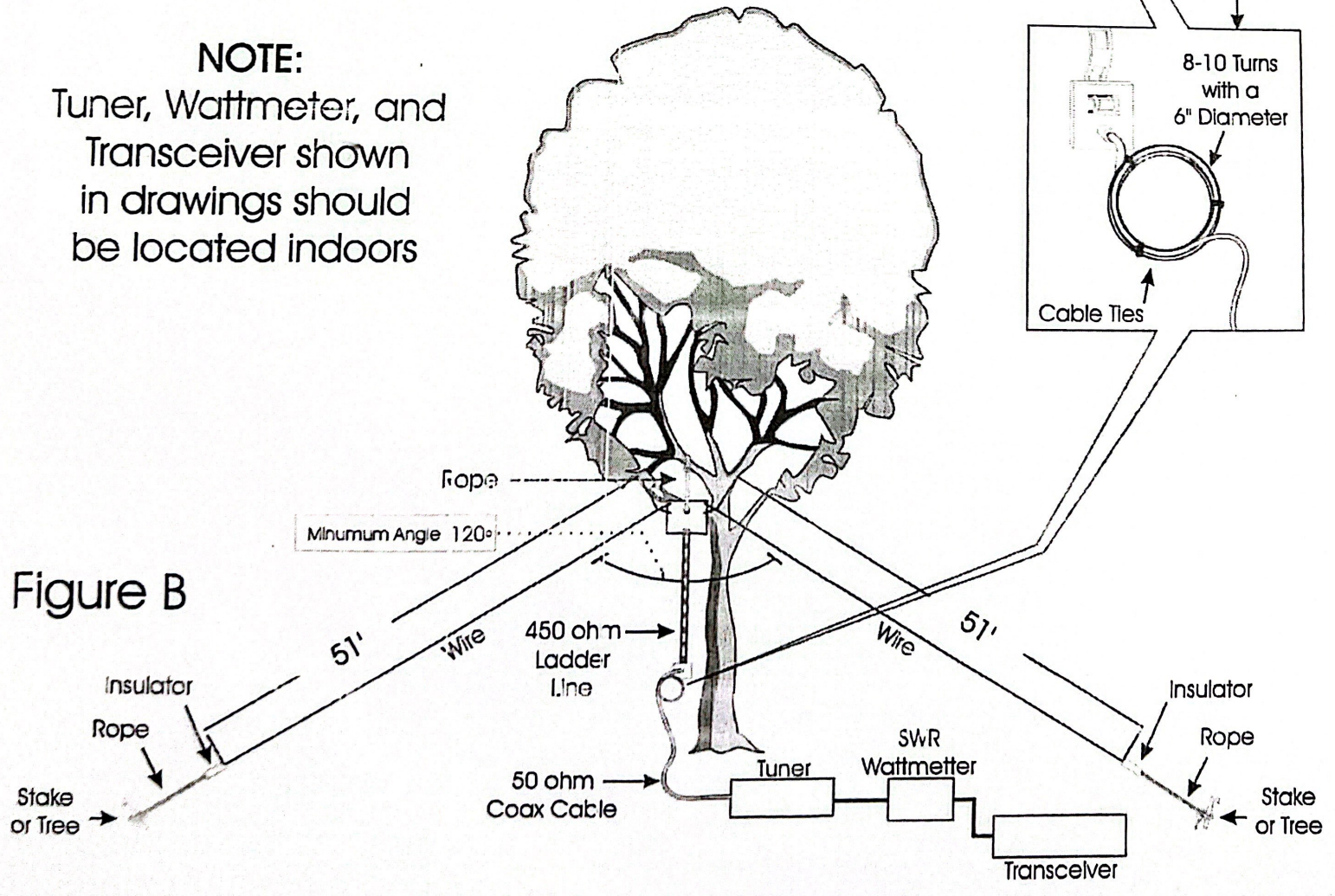
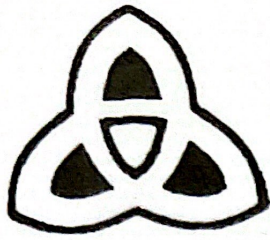


Figure B



OPEK®

HIGH PERFORMANCE HF/VHF/UHF 8-BAND $(1/4\lambda)$ +2-BAND $(5/8\lambda)$ MOBILE COMMUNICATION ANTENNA

MODEL : HVT-400B

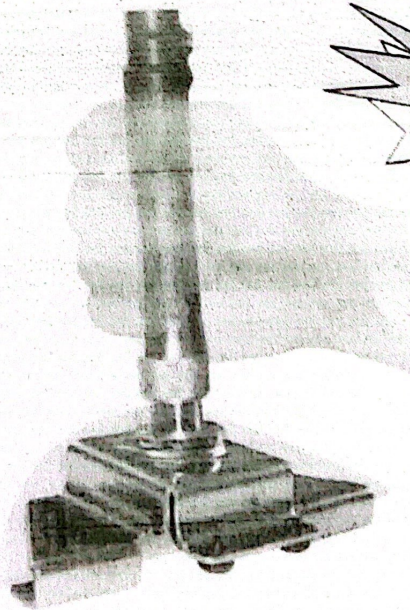
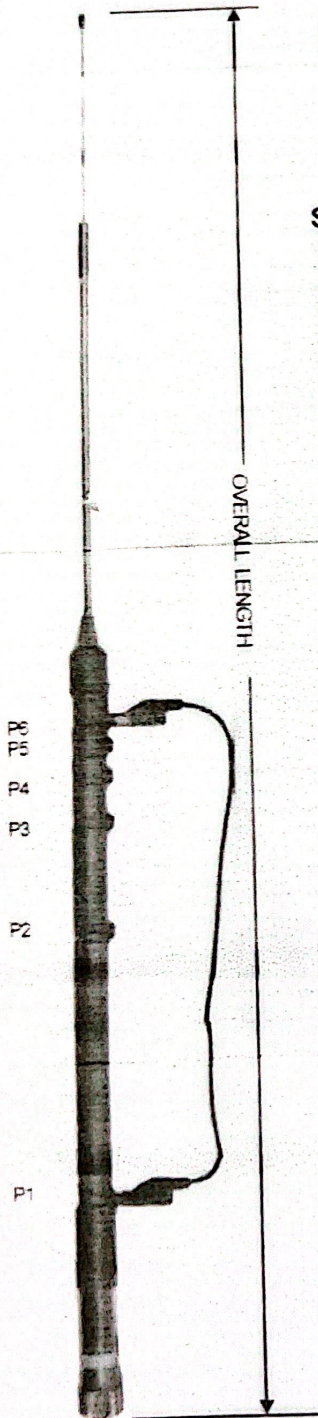
Specifications

FREQUENCY RANGE:	3.75MHz(80M) / 7.15MHz(40M) / 14.2MHz(20M) / 21.2MHz(15M) / 29MHz(10M) / 52MHz(6M) / 145MHz(2M) / 435MHz(70cm) / AIR BAND(118-136 MHz)
V.S.W.R. :	LOW V.S.W.R.
POLARIZATION :	VERTICAL
IMPEDANCE :	50 OHMS
POWER CAPACITY :	120 WATTS
CONNECTOR :	UHF MALE (PL-259)

∴ USE JUMPER LEAD TO CHANGE FREQUENCY BAND ∴

* IN ORDER TO GET THE BEST PERFORMANCE (LOWEST V.S.W.R.),
TRUNK LIP MOUNT IS RECOMMENDED (USING OPEK AM-203, AM-204,
AM-205 or AM-210 TRUNK LIP MOUNTS)

* MAKE SURE TO HANDLE THE CHROME BRASS BASE ONLY WHEN
INSTALLING or DISMANTLING THE HVT-400B ANTENNA. (PLEASE REFER
TO THE PICTURE BELOW.) IT MAY CAUSE SHIFT OF SHORT CIRCUIT,
OPEN CIRCUIT or EVEN DAMAGE THE ANTENNA IF HANDLED ANY PART
OF THE LOADING COIL WHEN INSTALLING or DISMANTLING THE
ANTENNA.



MADE IN TAIWAN
Ver 20090318

FREQUENCY CHART

80M BAND (3.5-4 MHz) (JUMPER LEAD IS NOT NEEDED)					
Freq (MHz)	3.5	3.625	3.75	3.875	4
LENGTH (mm)	1760	1635	1510	1395	1300
40M BAND (7-7.3 MHz) (JUMPER LEAD P1 TO P2)					
Freq (MHz)	7	7.075	7.15	7.225	7.3
LENGTH (mm)	1760	1760	1715	1665	1620
20M BAND (14-14.35 MHz) (JUMPER LEAD P1 TO P3)					
Freq (MHz)	14	14.075	14.15	14.25	14.35
LENGTH (mm)	1735	1735	1695	1695	1655
15M BAND (21-21.45 MHz) (JUMPER LEAD P1 TO P4)					
Freq (MHz)	21	21.1	21.2	21.325	21.45
LENGTH (mm)	1850	1850	1850	1850	1850
10M BAND (28-29.7 MHz) (JUMPER LEAD P1 TO P5)					
Freq (MHz)	28	28.15	28.3	29	29.7
LENGTH (mm)	1800	1800	1760	1715	1675
6M BAND (50-54 MHz) (JUMPER LEAD P1 TO P6)					
Freq (MHz)	50	50.1	51.4	52.7	54
LENGTH (mm)	1475	1475	1410	1375	1355
2M BAND (144-148 MHz) (JUMPER LEAD P1 TO P6)					
Freq (MHz)	144	146	148		
LENGTH (mm)	1420	1420	1400		
70cm BAND (420-450 MHz) (JUMPER LEAD P1 TO P6)					
Freq (MHz)	420	430	440	450	
LENGTH (mm)	1440	1410	1365	1355	
AIR BAND (118-136 MHz) (JUMPER LEAD P1 TO P6)					
Freq (MHz)	118	127	136		
LENGTH (mm)	1760	1620	1510		

SIGMA EURO-COMM Ltd

SE HF X-80 INSTRUCTION SHEET

Thank you for purchasing the SE HF X-80 VERTICAL, this instruction sheet should help you get the best from your new antenna.
The SE HF X-80 consists of a 6 m aluminium vertical radiating section and an UNUN transformer used to lower the high impedances found at the feedpoint of the vertical to the 50 Ohms that is required by your transceiver.

Specifications:

- Type End fed vertical antenna
- Frequency TX/ 3.5 – 52MHz (with ATU)
RX/ 1.8 – 55MHz (with ATU)
- Max power 400 Watts PEP
- Impedance 50 Ohms
- Connector SO-239
- Height 6 m

Assembly and mounting:

Before you install your antenna, select the most available open site away from power lines and telephone lines. The antenna can be mounted at ground level or at height so giving you many options for installation.

Mount the antenna using the u bolt or other attachment.

Assemble aluminium elements using jubilee clamps, leaving 11cm in each section and secure.

At the top of the base cradle place the three nuts and bolts into the black moulding and secure.

Attach the PL-259 plug on the 50 Ohm feeder coax to SO-239 socket on the UNUN.

We recommend that you should always earth at the tuner point rather than at the transformer for best performance and safety. If you wish to ground the antenna, attach adequate wire to the base cradle. For permanent installation it would be prudent to seal the jubilee clamps with amalgamating tape or similar to prolong the life and quality of the antenna.

Pack contents:

- 6x Aluminium poles.
- 1x base cradle + Unun transformer.
- 5x Jubilee clamps.
- 1x Base bolt.
- 3x Top molding nuts and bolts.
- 2x U-Clamps + washers and nuts.
- 1x Top cap (red)

Please note:

This antenna is for amateur radio and broadband receiving use. Do not use other than for the purpose of antenna.

Please use the antenna within the standard specifications described in this manual. Failure to do this may cause heat and break down of the transformer unit.

**Warning: High RF Voltages are present on the element when transmitting.
DO NOT TOUCH.**

SE HF X-80 DATA SHEET

The Sigma Euro-Comm Ltd SE HF X-80 is an end fed aluminum vertical antenna, capable of allowing the user to work 80 metres through to 6 meters bands using an ATU, also not requiring any counterpoise and can be fed using coax cable. The antenna should be ideally metal pole mounted at ground level or elevated depending on the user's personal requirements. The power rating is for intermittent amateur (400W CW or 400W SSB) use and not for AM broadcast or constant carrier data modes. The antenna comes complete with all fixings and fixtures and full installation guide.

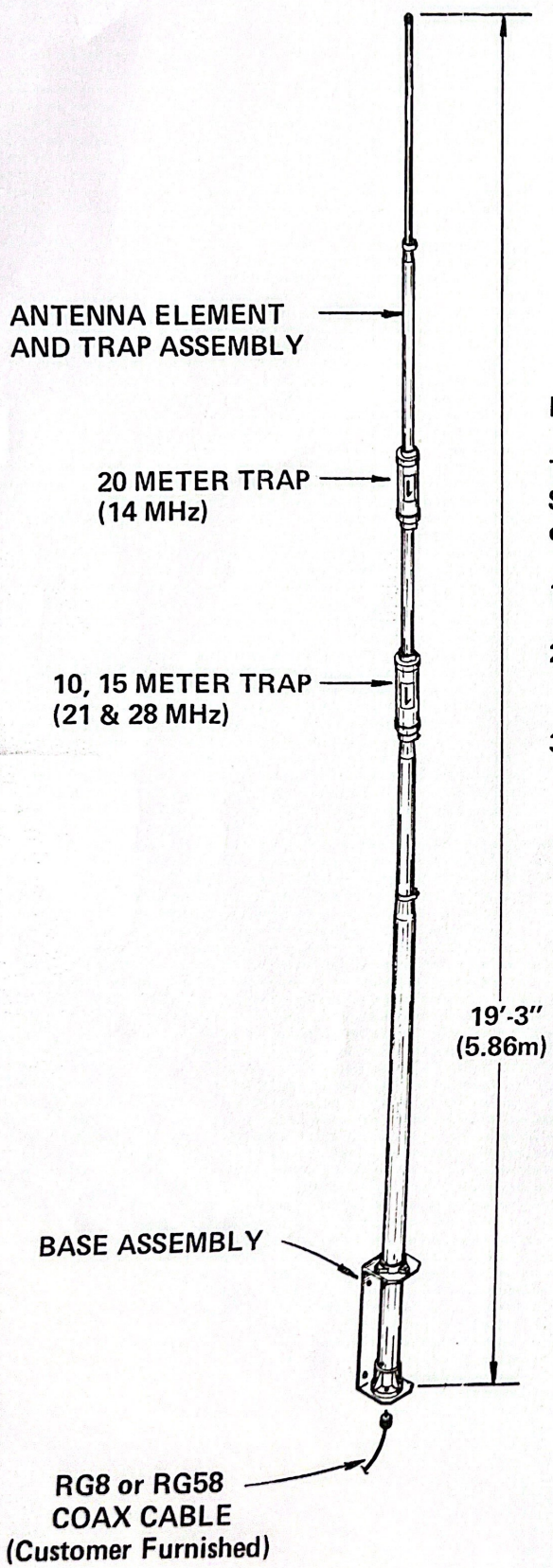
How it works: The antenna is fed using 50 Ohm coax via a SO-239 socket at the base of the unit. A 6:1 UNUN transformer is located in an IP65 weather sealed box at the bottom of the 6 meter telescopic aluminium element. The transformer reduces the impedance at the feed point to a more acceptable level making the antenna much more efficient and allowing proper and easy tuning via an external ATU and most automatic ATU's found in most modern radios.

The antenna can be grounded if the user experiences excessive local static noise, but as the UNUN is DC grounded: grounding will not affect the tuning ratios.

The Highlighted bands in the chart below will require a manual ATU, the others an internal ATU.

Frequency	VSWR
3.5 MHz 80 m	with Manual ATU 1.1
7 MHz 40 m	with ATU 1.1
10 MHz 30 m	with ATU 1.1
14 MHz 20 m	with ATU 1.1
18 MHz 17 m	with Manual ATU 1.1
21 MHz 15 m	with ATU 1.1
24 MHz 12 m	Manual ATU 1.1
28 MHz 10 m	with ATU 1.1
50 MHz 6 m	with Manual ATU 1.1

Please use a good quality 50 Ohm coax, RG-213 or Mini 8 are probably the best choice.



BASIC ASSEMBLY PROCEDURE:

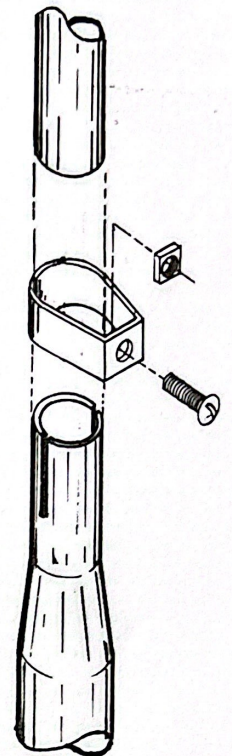
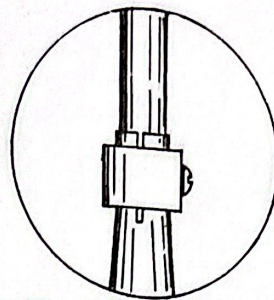
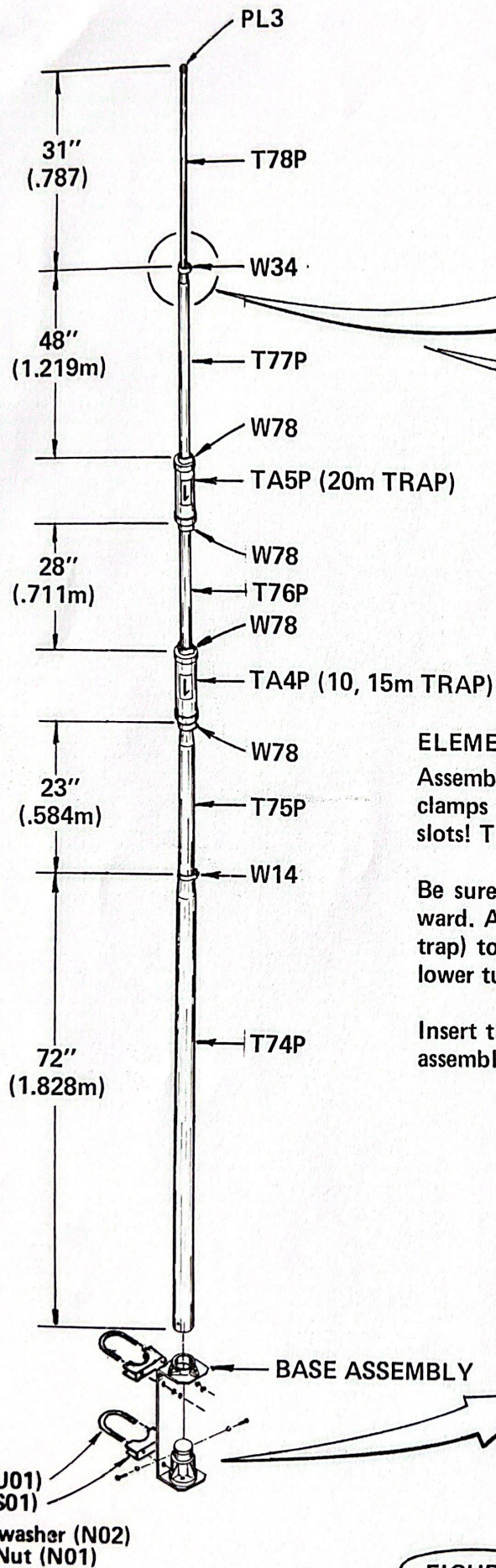
This figure shows what the antenna should look like when assembled. Specific assembly details are shown on following pages. Your basic order of assembly should be:

1. Assemble the base assembly as shown in Figure 2 with the hardware provided.
2. Next, assemble the elements and install the two traps as shown in Figure 3 with the clamps and screws provided. Pay careful attention to the assembly dimensions noted in the figure.
3. Insert the completed element and trap assembly into the base assembly and secure with the machine screws and lockwashers furnished.

FIGURE 1

DRAWN E.T.W.
APPROVED [Signature]

WV-1A



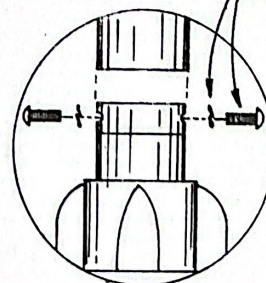
ELEMENT ASSEMBLY:

Assemble your WV-1A as shown. Be sure to center the tubing clamps over the tube slots. Do not place the screws over the slots! Tighten all screws securely.

Be sure traps are located correctly and arrows point downward. All dimensions are made from the top of one tube (or trap) to the top of the other tube with the exception of the lower tube (T74P) which is fixed at 72".

Insert the completed element and trap assembly into the base assembly and secure with the hardware as shown.

10-24 x 1/2" Machine Screw (S21)
No. 10 Lockwasher (N12)



2" U-Bolt (U01)
2" Saddle (S01)
5/16" Lockwasher (N02)
5/16" Hex Nut (N01)

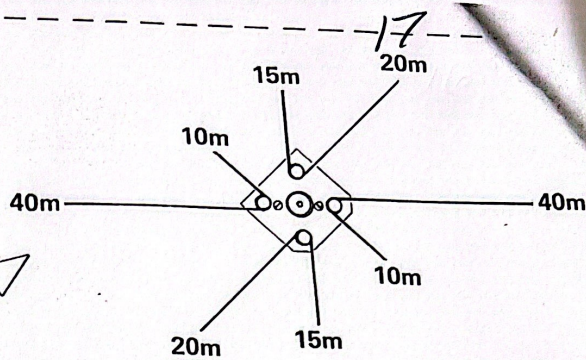
FIGURE 3

DRAWN E.T.W.
APPROVED [Signature]

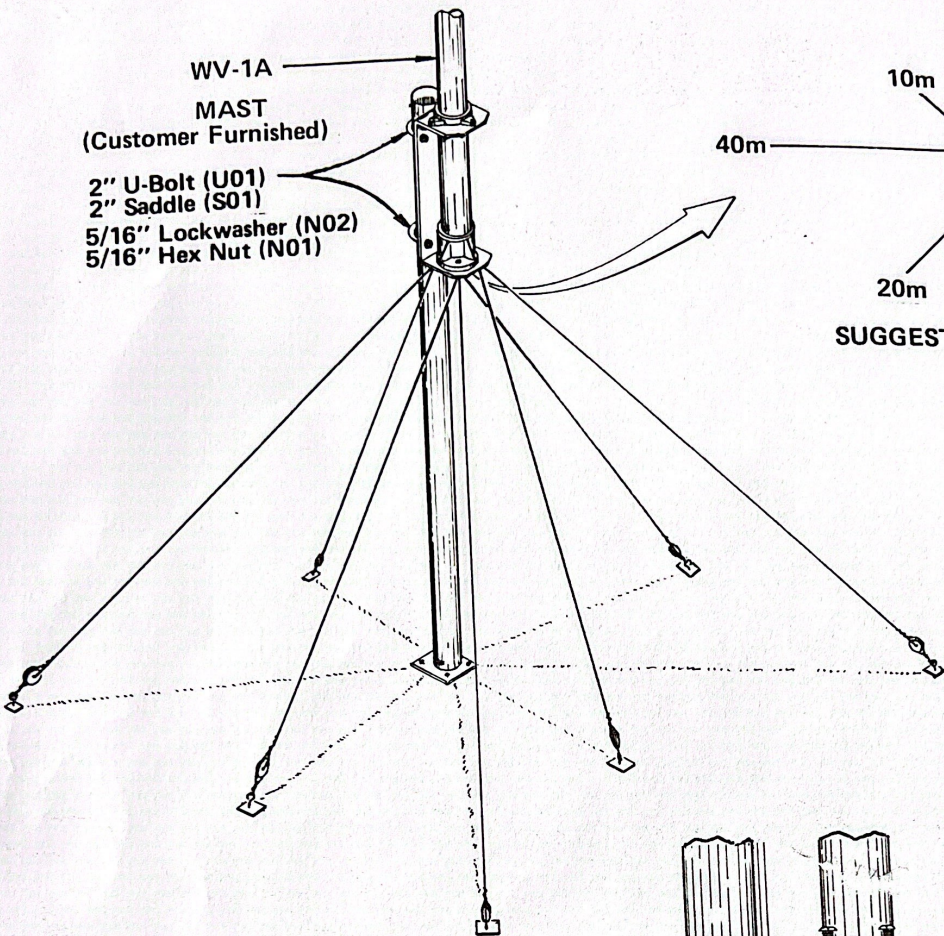
WV-1A

WV-1A
 MAST
 (Customer Furnished)

2" U-Bolt (U01)
 2" Saddle (S01)
 5/16" Lockwasher (N02)
 5/16" Hex Nut (N01)



SUGGESTED RADIAL PATTERN



GR-1 RADIAL KIT ASSEMBLY:

Using the copper wire furnished, cut two pieces 45' long (for the 10m and 40m radials) and two pieces 30' long (for the 15m and 20m radials). Attach an egg insulator to one end of the 45' length of wire and measure 34' 9" and wrap one turn around screw in base assembly and secure with hardware as shown. Measure 8' 8" from screw and attach another egg insulator. This forms the first 40m and 10m radials. Repeat this process for the other radials using the dimensions noted in the table. Arrange the eight radials in the pattern suggested above.

RADIAL WIRE LENGTHS
 (Screw-to-Insulator)

7MHz (40m)	..	34'9"	(10.6m)
14MHz (20m)	..	17'4"	(5.28m)
21MHz (15m)	..	11'7"	(3.53m)
28MHz (10m)	...	8'8"	(2.64m)

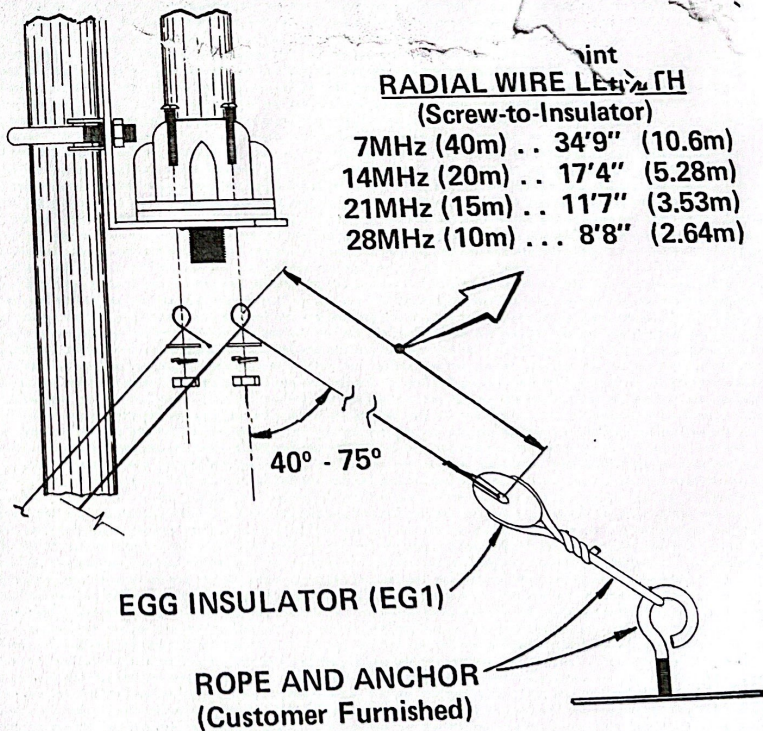


FIGURE 5

DRAWN ERW.
 APPROVED WT

GR-1
WV-1A

**MOSLEY
TRAP MASTER
MODEL MINI-32-A**

Assembly Instructions

18
Version

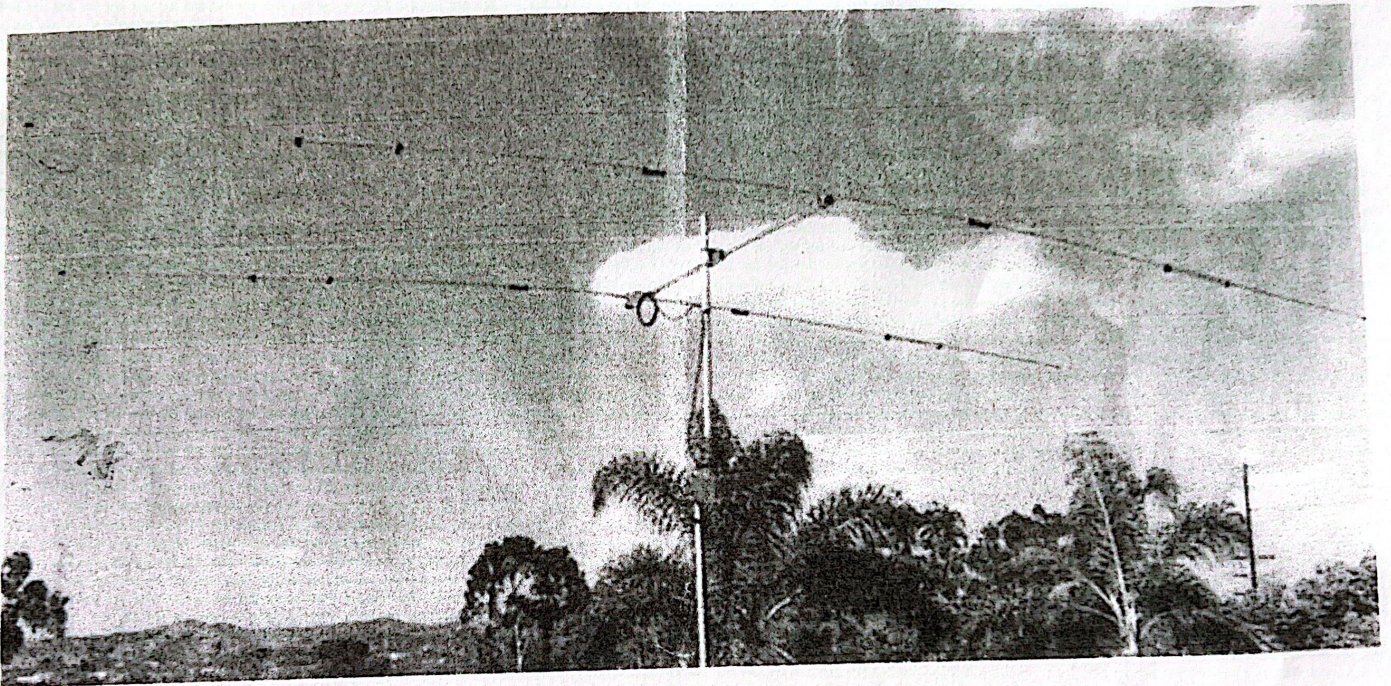
2015.2

For assistance with assembly contact:
Mosley Electronics, Inc. Technical Support

636-583-8595

antenna@mosley-electronics.com

www.mosley-electronics.com



SERIAL #

#574049

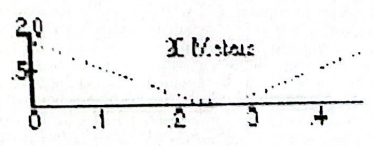
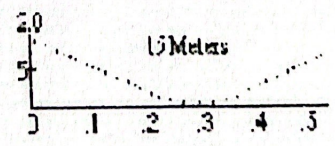
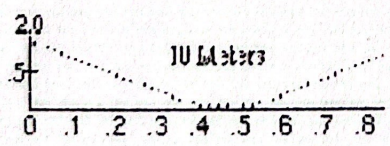
The high performance of your MOSLEY Antenna can only be achieved if the antenna is assembled in accordance with the instructions supplied. Substitution of materials or modification of design will materially lessen this performance.

ASSEMBLY INSTRUCTIONS FOR
MOSLEY MODEL MINI-32-A

Specifications

Frequency, MHz	28, 21, 14	
Power Rating, watts CW	500	
Power Rating, watts SSB	1000	
Power Rating, AM/FM	250	
Power Rating, RTTY/AMTOR	250	
VSWR at frequency	1.0/1 to 2.0/1	
Forward Gain, dBd 10 meters	5.1	
Forward Gain, dBd 15 meters	4.5	
Forward Gain, dBd 20 meters	3.3	
Front-to-Back Ratio, dB 10 meters	17 (avg.)	
Front-to-Back Ratio, dB 15 meters	17 (avg.)	
Front-to-Back Ratio, dB 20 meters	17 (avg.)	
Boom Length	6 ft	1.83 m
Maximum Element Length	19.6875 ft	6 m
Turning Radius	10.29 ft	3.14 m
Mast Size hardware (equipped)	1.5 in	3.81 cm
Assembled weight	9.5 lbs	4.31 kg
Wind Surface Area	2.5 sq ft	0.232 sq m
Wind Load, EIA Standard 80 MPH	38 lbs	17.24 kg
Warranty	2	
Recommended Coax	Belden RG-8 / RG-213	
Options (E-mail for details.)	Add 12 & 17 Meters	

Average SWR Curves



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Union, Missouri 63084
Phone 636-583-8595 • Fax 636-583-0890
www.mosley-electronics.com

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TELEX COMMUNICATIONS, INC.
9600 ALDRICH AVE. SO. MINNEAPOLIS, MN 55420 U.S.A.

82075

INSTRUCTION MANUAL

ORDER NO. 388S TH3MK3-S THUNDERBIRD 3-Element, Ham Antenna

PN 801819

General Description

The Hy-Gain TH3MK3-S is a three element tri-band beam antenna designed for operation on 10, 15 and 20 meters. Multi-banding is accomplished through the use of Hy-Gain's all Hy-Q traps. The antenna is designed to fit a 1 5/8" (41 mm) O.D. mast and can be rotated with a heavy duty TV rotator. All mounting and assembly hardware is high strength stainless steel except for 7 large bolts used in the boom to mast bracket.

Specifications

Electrical

Input impedance	50 ohms
Gain	8 dB minimum
Front-to-back ratio	25 dB
Maximum power input	1 kw AM
VSWR (at resonance)	less than 1.5:1
Lightning protection	DC ground

Mechanical

Boom Length	14 ft. (426.7 cm)
Boom diameter	2 in. (51 mm)
Longest element	27 ft. (823.7 cm)
Maximum wind survival	100 mph (160.93 kmph)
Net weight	36 lbs. (16.3 kg)
Accepts mast	1 1/4" to 2 1/2" O.D. (32 mm - 64 mm)
Wind surface area	5.10 sq. ft. (0.474 m ²)
Wind load at 80 mph	131 lbs. (59.42 kg)
Turning radius	15.7 ft. (4.8 m)

FOR OUR OVERSEAS CUSTOMERS: The United States uses English units of measurement. Please see the last page of this manual for assistance in identifying the hardware and components supplied with this product.

Preparation of Assembly

The antenna site should be free of large buildings, metal objects or powerlines.

WARNING

When installing your system, take extreme care to avoid any contact with overhead powerlines. Failure to exercise this care could result in serious or fatal injury.

There are two methods of installing the TH3MK3-S at the top of your tower.

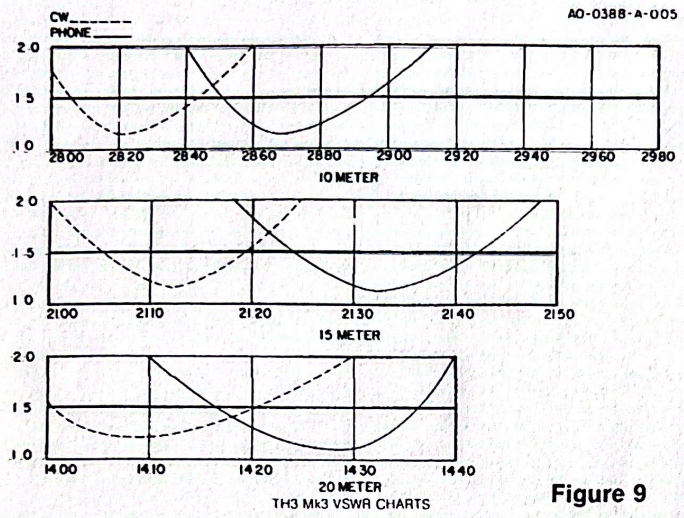
Method 1 — Completely assemble the antenna on the ground then hoist it into position using a block and tackle as shown in Figure 1.

Method 2 — Assemble the antenna on the ground in halves, then hoist each half up the tower and assemble in the boom-to-mast bracket on the tower as shown in Figure 2.

All tubing supplied with the TH3MK3-S telescopes together. Make all measurements as accurately as possible using the given dimensions to gain optimum results from your antenna.

Transmission Modes

Determine which mode of transmission you will use—either phone or continuous wave (CW). Dimensions for both are shown, but only one mode must be used throughout the assembly of the antenna. Trying to use phone dimensions on one band and CW dimensions on another band will give less than optimum results on both. The typical VSWR charts shown in Figure 9 will help you to decide which mode is best for your use.



VSWR CURVES

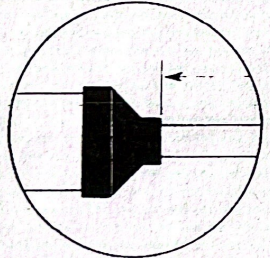
These VSWR curves are typical for this antenna mounted 70 feet above the ground, horizontally polarized. Similar curves can be expected for this antenna mounted between 30 and 100 feet above the ground. **DO NOT TRY TO TUNE THIS ANTENNA FOR LOW VSWR AT GROUND LEVEL.**

Figure 9

NOTE: The following steps cover assembly of only one side of the antenna. They will have to be done first for one side and then repeated for the other side.

Assembly of the Reflector

AO-0388-A-016



Dimensions Measured as Shown
Detail

Check to see that all the element-to-boom brackets will lie horizontal when the antenna is mounted on your mast. Do this by observing the position of the element with respect to the boom-to-mast bracket. Make any adjustments necessary, keeping the center of the bracket 2 5/8" from the tip of the boom then tighten the anchor screws securely.

Select the R1 section of tubing (1 1/4" x 48", 121.9 cm long, item 4). Slip a 1 1/2" compression clamp onto the R1 section. Refer to Figure 8. Select the R2 section (1 1/8" x 48", 121.7 cm long, item 7). Slip the unswaged (untapered) end of the R2 section into the R1 section and measure dimensions B for your mode of transmission (phone or CW) as shown in Figure 10 then tighten the compression clamp slightly.

CAUTION

There are two kinds of 15-meter traps. Part No. 878694 is a parasitic trap that is used in the Reflector and Director. Part No. 878637 is for use on the Driven Element.

AO-0388-C-017

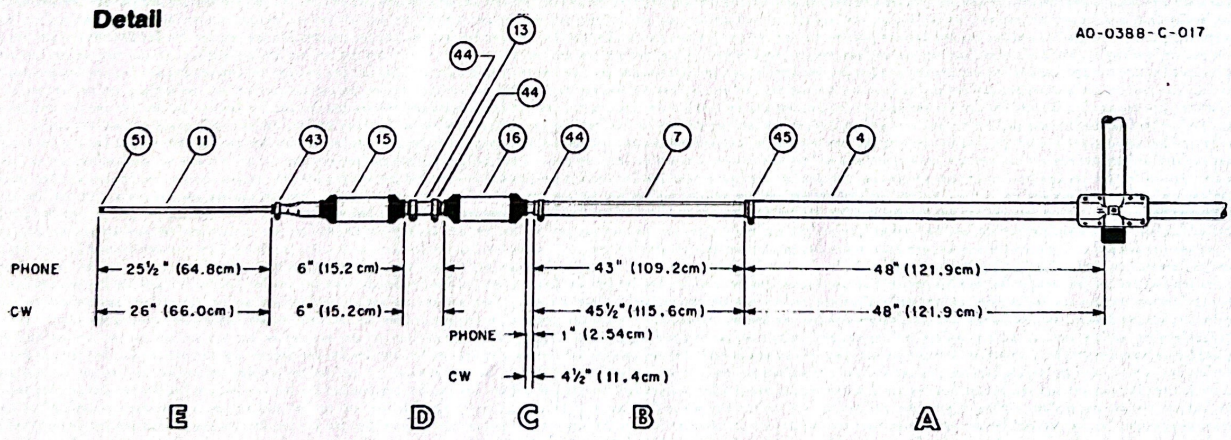


Figure 10 Reflector

NOTE: Install all the traps with drain holes on bottom and make sure the part number end is toward the boom.

Slip a 1/2" compression clamp over the swaged end of the 15-meter trap.

Select the D4 section (7/16" x 28", 71.1 cm long, item 11) and slip it into the swaged end of the 15-meter trap. Measure dimension O for your mode of transmission as shown in Figure 12 and then tighten the compression clamp lightly.

Insert the Director Element into the bracket assembled on the boom. Tighten the screws to hold the element securely but *do not tighten the anchor screws* (item 25) at this time.

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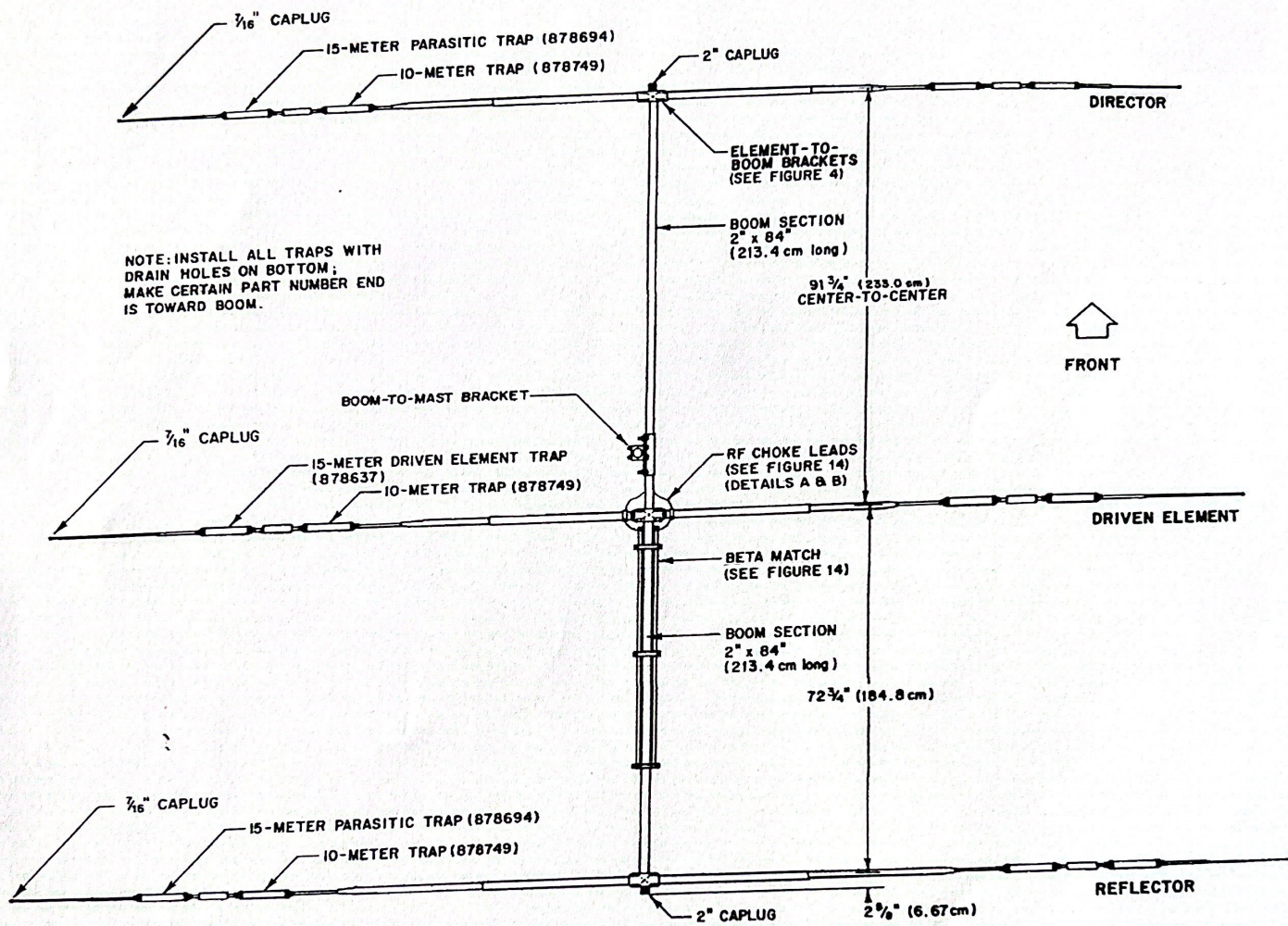
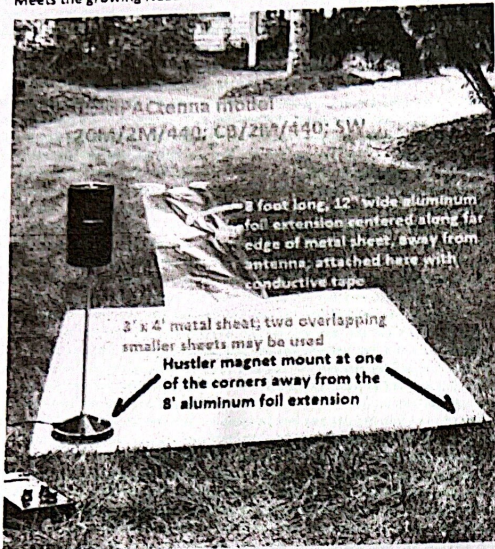


Figure 13. Overall View

Carefully recheck all measurements as shown in Figure 13. The driven element should measure 72 3/4" (184.8 cm) from the center of the reflector element-to-boom bracket to the center of the driven element-to-boom bracket as shown in Figure 13. The director should measure 91 3/4" (233.0 cm) from the center of the driven element-to-boom bracket to the center of the director-to-boom bracket. Make certain that the shorted ends of the trap are pointed towards the boom and the trap drain holes are facing downward. Now tighten all compression clamps and anchor screws securely.

Product Name: COMPACTenna MADE IN THE USA
Only 20" tall - No Antenna Structure Tuning - No Assembly Required - small Ground Plane
Meets the growing NEED for an antenna in Limited Spaces such as HOA's, Condominiums, Apartments

Model: 20M/2M/440

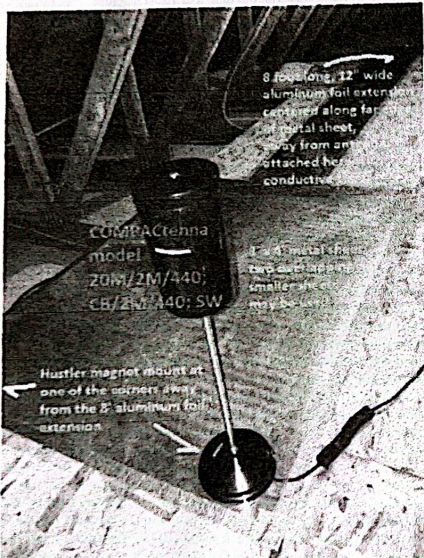


COMPACTenna HF 20" 20 Meters CB Shortwave Receive
Park, Field, Backyard,
Indoor - Floor, Closet, Attic
Ground Plane - Counterpoise, RF beads,
Grounding, Safety measures apply to all Installs



Galvanized steel sheet metal (Roofing flashing sheet) (for magnet mount application)
Through-hole style mounts may be used, as well as on other metal sheeting such as aluminum (Thickness of metal sheeting changes structural integrity, not RF properties substantially)
(Metal sheet/alum foil have capacitive coupling to earth/ground water, creating overall effective ground plane counterpoise with outdoor and indoor, including attic installations)
Metal sheet: at least 3' X 3'
Available in 3' X 4' sheets at home improvement/hardware stores
Option: Two 2' X 3' sheets overlapping in the center
Caution: Edges/corners are sharp
Recommend filing/sanding, rounding of corners, Duct tape all around
Metal sheet may be buried slightly under soil/mulch as long as antenna feedpoint of mount remains above surface

Don't touch any part of antenna structure, ground plane/counterpoise, mounting/support, feedline, grounding, lightning arrestor components/systems nor any other part of installation and related parts/structures while transmitting. See COMPACTenna.com for further information including on installations, operation, etc. Follow local building codes including NEC grounding, lightning, etc. and NFPA guidelines. Follow applicable RF Exposure Regulations. Professional installation recommended. Always check SWR; operate only per transmitter/amplifier specifications.



Attic:

Vehicle:

Antenna Type: Unique Electric/Magnetic Field Diversity Science & Technology Patented Design Patent No. US 9,407,001
With a special design construct of spiraled and cylindrical metal sheeting including 'extended flat monofilar spiral Tesla-like coils', all resistance, inductance and capacitance (matching) is efficiently done by the physical metallic geometric form of the antenna itself, as opposed to internal or external (lossy) components of other designs.
"Magnetic Field Resonator": This built-in resonating matching system is an effectual component of the electromagnetic E & H fields production, resulting in better performance than expected for such a small antenna. With a particularly strong magnetic near field, proximity noise is reduced.
And resulting diverse effective electromagnetic far fields further enhance performance in our RF multipath world of (dynamic) obstructions, mitigating signal drops, reducing flutter, and increasing reliable range.

Broad elevation coordinate signal pattern and elliptical polarization of COMPACTenna provides stabilized signal on diverse pathways.
Maximum Power Rating:
HF: Suppressed Carrier modulation conversational SSB transmission (without speech processing raising average power): 50 watts*
Non-suppressed Carrier modulation types including FT8, AM & FM: 15 watts*
VHF 85 Watts, UHF 50 Watts
Maximum Duty Cycle at max. power rating: Maximum total transmit time of 1 minute in any 2 minute period
*Higher power up to 100 watts is allowable for 3 minutes at the defined duty cycle, then requiring a 15 minute (internal) cool-down period
Maximum Ambient temperature rating 130 degrees Fahrenheit
Hotter conditions such as higher ambient temperature, sun exposure, lesser air flow, etc. decrease duty cycle.
(V)SWR: Nominal <= ~2:1 14.1 - 14.3 MHz, typically tunable with tuner to 14.0 - 14.35 MHz
144 - 148 MHz (2 Meter Band); 420 - 450 MHz (440 Band)
Surrounding metal structures can affect SWR.
Proximity of transmitting antennas to radios can lead to disturbances in SWR measurements, ability of (particularly internal) tuners to function well, audio distortion, as well as (other) feedback/resonance issues.
These issues may be mitigated by:
Increasing separation of radio and antenna, which also results in decreased RF Exposure; Ferrite beads/chokes on coaxial cable/wire leads of radio
Each Antenna quality tested. See www.COMPACTenna.com for further information. [Design and specifications subject to change without notice.]

erving SWR meter snit frequency slightly higher, then lower to determine point of resonance. The point at which minimum reflected power is indicated by SWR meter is the resonant frequency.

2. If resonant frequency is to be lowered, increase dimension "E". If resonant frequency is to be raised, shorten dimension "E". **IMPORTANT:** Make small changes (1/2" or less). Make equal changes on both ends of driven element. Before making adjustment, BE SURE THAT THE INITIAL DIMENSION IS CORRECT.

3. Tune transmitter to 21.35 and repeat step 1. If resonant frequency needs to be changed it is done by changing the position of the tuning piston on the 15 meter end of the frequency-divider. Before any change is made in the adjustment of the 15 meter frequency-divider, it should be considered very carefully and the exact amount of change needed should be carefully noted. If the change is to be only slight (25 to 50 kc) adjust **ONLY** the TRAPS ON THE DRIVEN ELEMENT. If a greater change is necessary, make equal changes of the tuning piston in all the 15 meter traps. See Fig. A below for details of adjustment. Use care in making changes. A 1/16" move of the tuning piston makes a noticeable change in resonant frequency. **IMPORTANT:** Slide the capacitance piston "IN" to raise the frequency. Slide the piston "OUT" to lower the frequency. Mark factory setting with a pencil, and make changes relative to that mark.

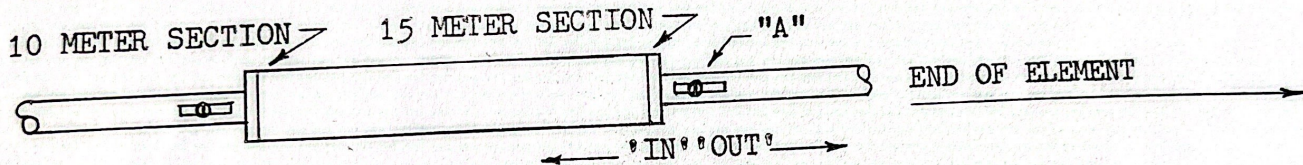


Fig. A

4. Tune transmitter to 14.25 mc and repeat step 1. To lower resonant frequency lengthen dimension "F". To raise resonant frequency, shorten dimension "F". **IMPORTANT:** Make small changes (1/2" or less). Make equal changes on both ends of driven element. Before making adjustment, BE SURE THAT THE INITIAL DIMENSION IS CORRECT.

SWR: The terminal impedance of this antenna is so near 52 ohms on each band that a very satisfactory SWR is obtained, using a single 52 ohm coaxial transmission line. This is true only if the antenna is installed at a reasonable height above ground and buildings, and is not surrounded by trees, powerlines, large structures, etc.

OPERATING CHARACTERISTICS

RESONANCE:

10 meters - - 28.75
 15 meters - - 21.350
 20 meters - - 14.250

FORWARD GAIN:

10 meters - - 8.2 db
 15 meters - - 7.5 db
 20 meters - - 7.0 db

FRONT TO BACK RATIO:

10 meters)
 15 meters) 15 - 18 db
 20 meters)

SWR AT RESONANCE:

10 meters - - 1.10
 15 meters - - Unity
 20 meters - - 1.1

HORNET ANTENNA PRODUCTS COMPANY, P. O. BOX 808, DUNCAN, OKLAHOMA