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We accept:

A touch of *Class*, the **J-POLE**

By Glynn E. "Buck" Rogers Sr *(65 years as K4ABT)*

Between the articles by the late Lew McCoy W1ICP *and* myself*, the J-POLE, Windom, and ZEPP should be around "forever."*

The J-POLE has been around since the early days of HAM Radio, and is a direct descendant of the "ZEPP." Like the ZEPP, the J-POLE is a spin-off, or a modified WINDOM for VHF. One of the first articles I wrote about the J-Pole was in HRC magazine in 1958. Since 1958, I've written several j-pole articles in other HAM Radio publications.

Here, my references are to the early, 1923 *(version)* Windom (Article by Loren G. Windom September 1929, QST magazine) . If you look at the feed of the early Windom that was fed with a single wire, you may soon see the similarity between the Windom, ZEPP, and the J-Pole.

For now, let's look at some of the features of our J-Pole, whether for; 140-150 mHz, or 430-450 mHz

- the J-Pole is easy to erect
- the J-Pole needs no radials
- the J-Pole has low angle radiation
- the J-POLE has greater bandwidth.
- the J-Pole has greater immunity to terrestrial noise
- the J-Pole is great for local nets or distant repeaters
- the J-Pole has more gain than most Ground Planes
- the J-Pole is more durable than most Ground Planes
- the J-Pole meets most "stealth" antenna restriction agreements
- the J-Pole has less static-charge noise, and static-charge build-up.

In the mid-fifties, and early sixties, ridged copper was difficult to find, and even if we were fortunate enough to locate ridged copper, the cost was prohibitive. Most of our VHF (don't even think about UHF) operating was AM (for the late model HAM, "Amplitude Modulation"), and on two meters, operating was centered around 144 MHz. We either opt'd for a bamboo spreader cubical quad, or folded "zepp," as we called it in those days (now-a-days, called a "J-Pole.")

Another variation to this antenna construction was to use electrical thin-wall conduit or "EMT." EMT actually means "electrical metallic thin-wall" but somehow early acronyms had a way of getting turned around, or inverted, . . . or perverted.. hi.

Using metal EMT instead of copper, we learned to use the brazing rods and torch to fabricate our "folded (zepp) Jay." In any case, we were able to make the J-Pole happen. For VHF, the *J-Pole* became the antenna of choice, just as the *Windom* took its place as the antenna of choice for the lower (HF) bands. As a matter of interest, look close at both the J-pole and the Windom, and you might find a close resemblance and maybe even some relationships in the off-center method used to feed each of them.

I've heard of J-poles stacked, collinearized, and some with weird fitted, 1955 Ford fender-skirts. Depending on who's telling the story, they might have more gain than a yagi on a helicopter at 1200 feet, or they won't reach a hand-held across the backyard. I try to make it a personal point to stay out of these CB University fences. You can put a "mini-skirt" on it, you can even place a "tutu" on the J-Pole, but the truth is, it remains a Jpole.

As a personal observation throughout my 64 years as a HAM; **Mistakes**, **Experience**, and **Knowledge** has given this ole HAM the **Wisdom** *to know the difference*. **Don't try to build a Windom for two meters,** ***and for heavens sake, DO NOT attempt building a J-Pole for seventy-five (75) meters.*** As they say, "do the math;" Just the long, vertical section of a 75 meter J-pole would near 200 feet.

TO THE POINT OF OUR SUBJECT:

I've had many requests for a ready-made J-pole design that will enable the Amateur Radio user to print the image from a web page and go directly to the construction table and build a J-Pole antenna for their HAM Radio station.

On this page you will find many illustrations I've drawn to help you understand the manner in which a J Pole is built. Fabrication can sometimes be a problem for the apartment dweller, or the HAM with limited facilities for this kind of project.

For these reasons, you may wish to purchase the "direct fed Jpole" ready to install. We offer this BUXCOMM J POL in two versions;

A VARIATION ON A THEME:

Let's look first at *FIGURE 1a;* This is the overview and profile of the J-Pole we will be working with. There are two different bands we will be building the J-Pole antennas for. NO, we will not build a two band antenna on one mast. I've been there, done that.. and it is an exercise in futility.

For openers, I would like to show you that all J-poles are not created equal. By that statement; I mean, we will modify our construction techniques a bit and apply a variation to the theme. Notice in the exploded view at *FIGURE 1b,* I've deviated from the usual RF feedtechnique that we normally use to attach our coaxial cable to the J-pole.

Where we usually attach the shield and center conductor to the tuning stub and the driven element with aero-seal (hose) clamps, here we've made a slight change in the design by exchanging the elbow for a tee. Below the short (1/4 wave tuning stub) section, we (carefully) soldered an SO-239 (Chassi-mount) coax (female) connector.

But notice that we must first attach a piece of ***number 12 or 14*** insulated, copper wire to the SO-239. The length of this wire depends on the spacing between the stub and *(Fig 1A "D")* long section of our antenna.

If the antenna is for six meters, the wire length will need to be about, 10 to 12 inches long. If our antenna is for two meters, the wire length will be less than 8 inches overall.

I am careful when I (Benz-O-Matic torch) solder the SO-239 to the copper tee, since I don't want to heat the SO-239 to the point the solder on the wire melts and I have to begin the process again.

Shown above ↕ are our direct feed J-Poles.

For 2 meters (145.000 to 146.000 MHz) the EXACT dimensions are:

A = 58 inches overall (Long, driven element).
B = 19.5 Inches
C = 2 Inches
D = 1.8 Inches (space)

For 6 meters (50.500 to 51.500 MHz) the EXACT dimensions are:

A = 166-3/4 inches overall (long, driven element).
B = 58-3/4 inches (short, tuning stub).
C = 5.5 Inches
D = 5 inches

USE BUX "VBALUN" withJ-Poles *1 kw VHF* Balun, BUX VBALUN $19.95

> CLICK HERE for on-line CATALOG

Hi-Q, toroid design, wound with teflon covered, silver wire. For VHF beams and J-Pole matching applications, and construction

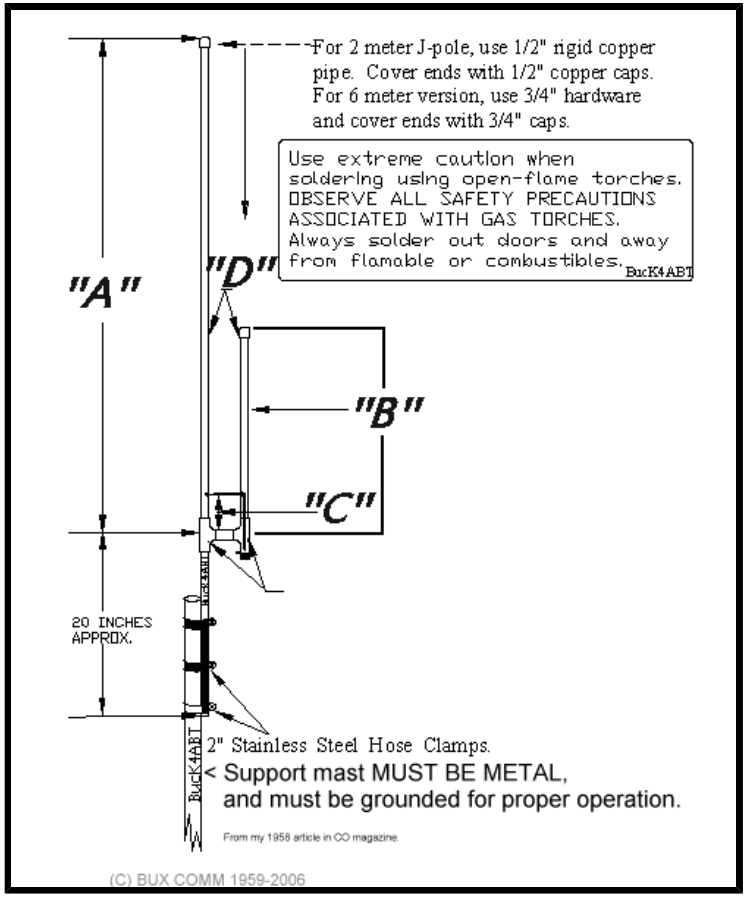
For 2 meter J-pole, use 1/2" rigid copper pipe. Cover ends with 1/2" copper caps. For 6 meter version, use 3/4" hardware and cover ends with 3/4" caps.
Use extreme caution when soldering using open-flame torches. OBSERVE ALL SAFETY PRECAUTIONS ASSOCIATED WITH GAS TORCHES. Always solder out doors and away from flamable or combustibles.
BucK4ABT
"A"
"D"
"B"
"C"
20 INCHES APPROX.
BucK4ABT
2" Stainless Steel Hose Clamps.
< Support mast MUST BE METAL, and must be grounded for proper operation.
From my 1958 article in CQ magazine.
(C) BUX COMM 1959-2006

FIGURE 1a

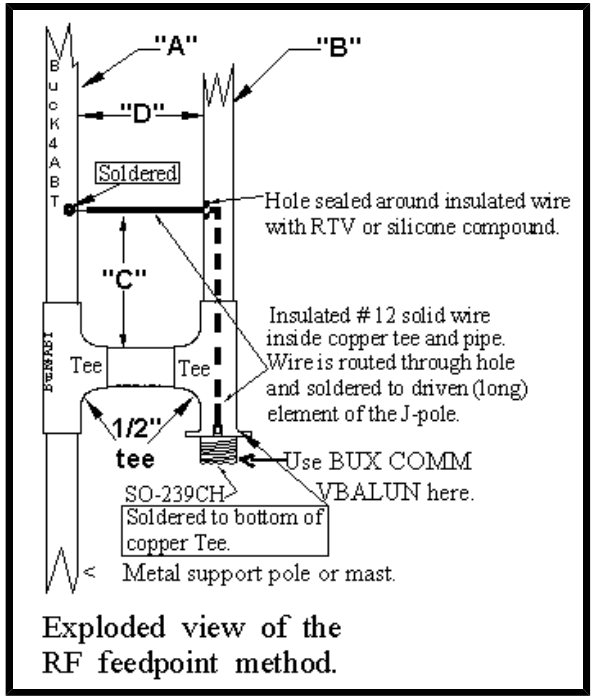

Figure 1b

SAVE TIME BY USING THE HANDY J-Pole CALCULATOR BELOW.
NOTE: Coax center conductor attaches to the "Long section" feed point.
Shield attaches to the short section feed point.

USE BUX "VBALUN" withJ-Poles *1 kw VHF* Balun, BUX VBALUN $19.95

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Hi-Q, toroid design, wound with teflon covered, silver wire. For VHF beams and J-P ole matching applications, and construction

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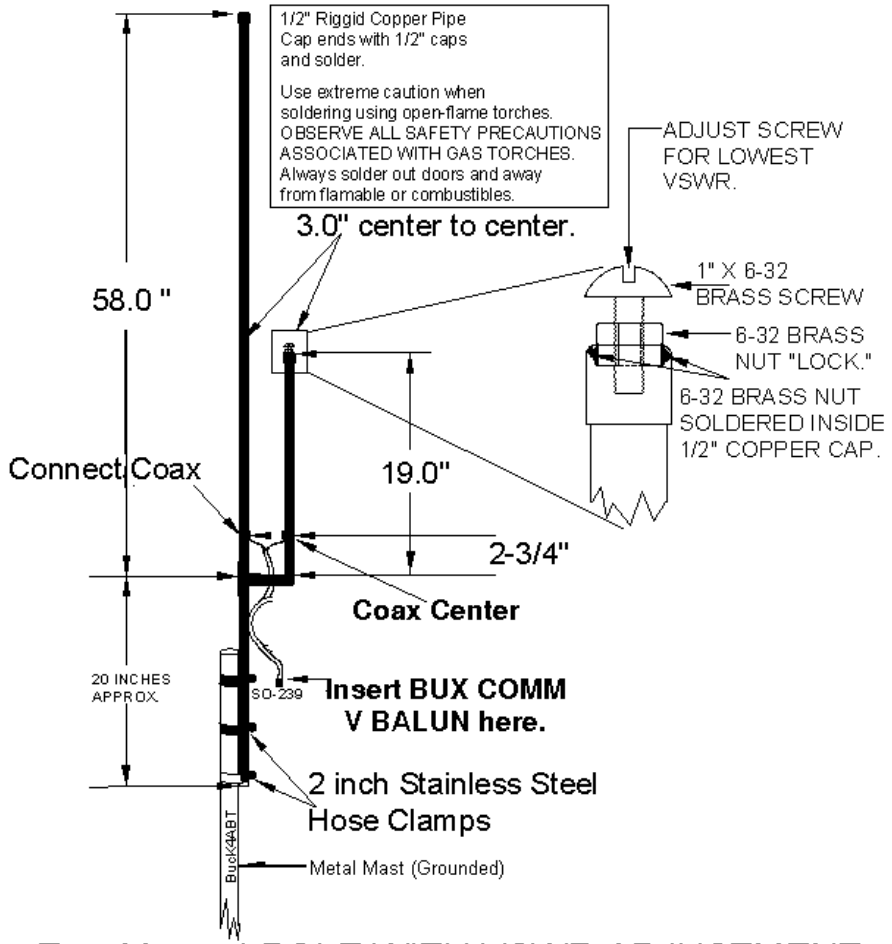
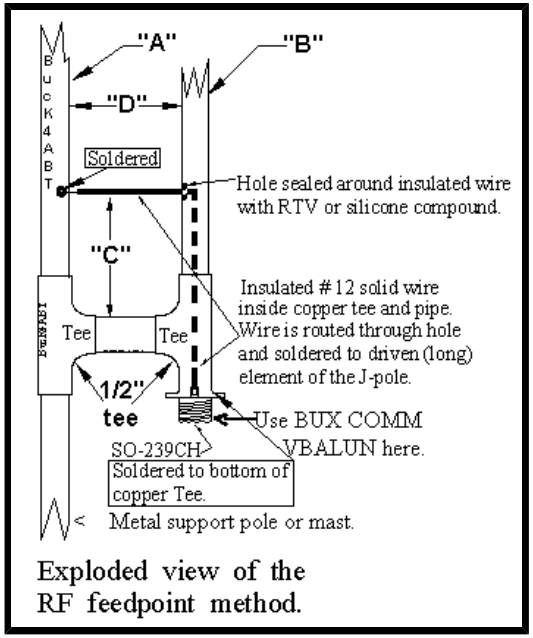
An adjustable VSWR, 2 meter J-Pole

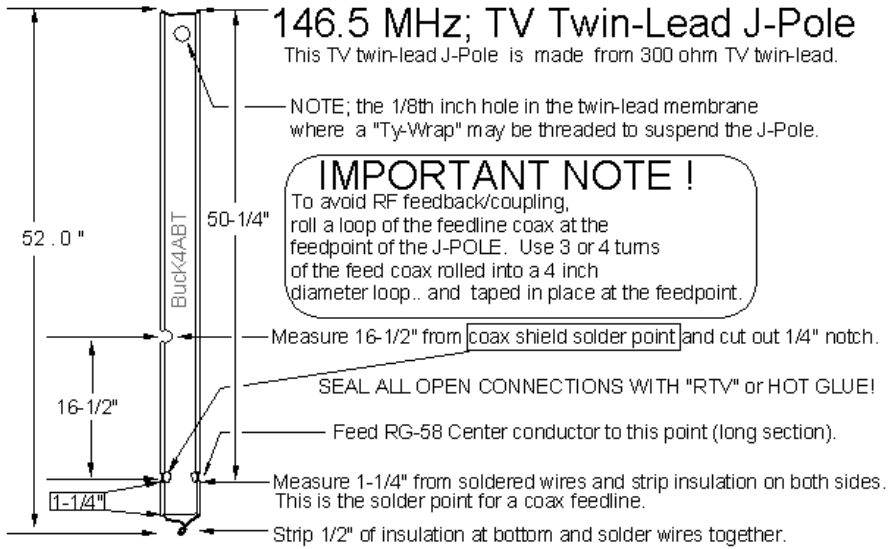


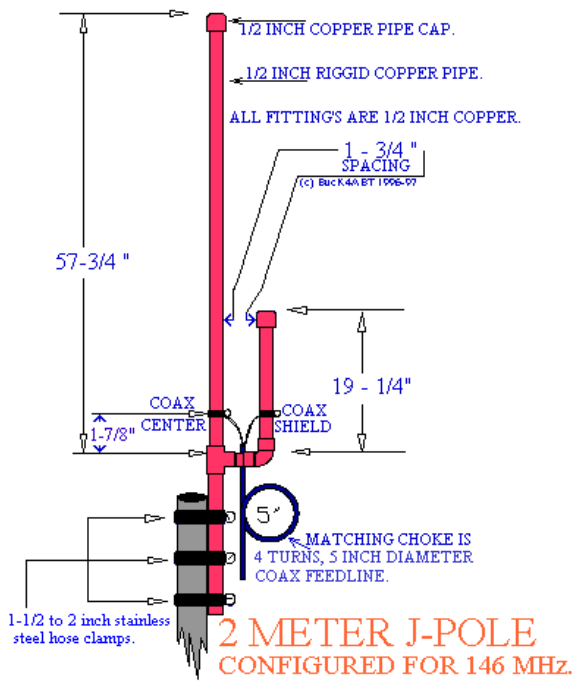
BUX VBALUN should be installed at the antenna feed point, or where the coax or feed-line attaches to the J-Pole antenna. BUX BALUNs are used to conne unbalanced transmission lines, such as coax cable. Their primary purpose is to prevent antenna (RF) currents from flowing down the outside of the cable. Anc BALUN41 is to match the impedance of an unbalanced coax to the balanced feed point of a balanced input antenna(s). BUX BALUNS may also be used as ' along the cable to prevent the destructive influence of induced RF currents (VSWR). BUX 1:1 BALUNs are current BALUNs. They consist of several large, nu cores.

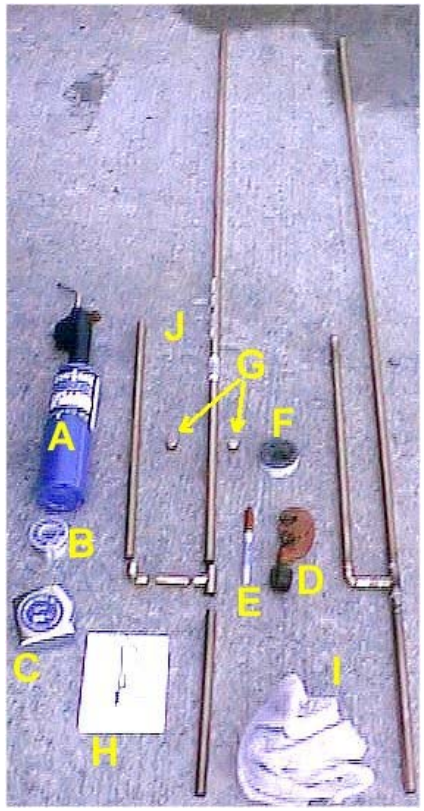


CLOSE UP of the alternative coax feed method.
Use BUX VBALUN to couple coaxial cable to J-Pole.

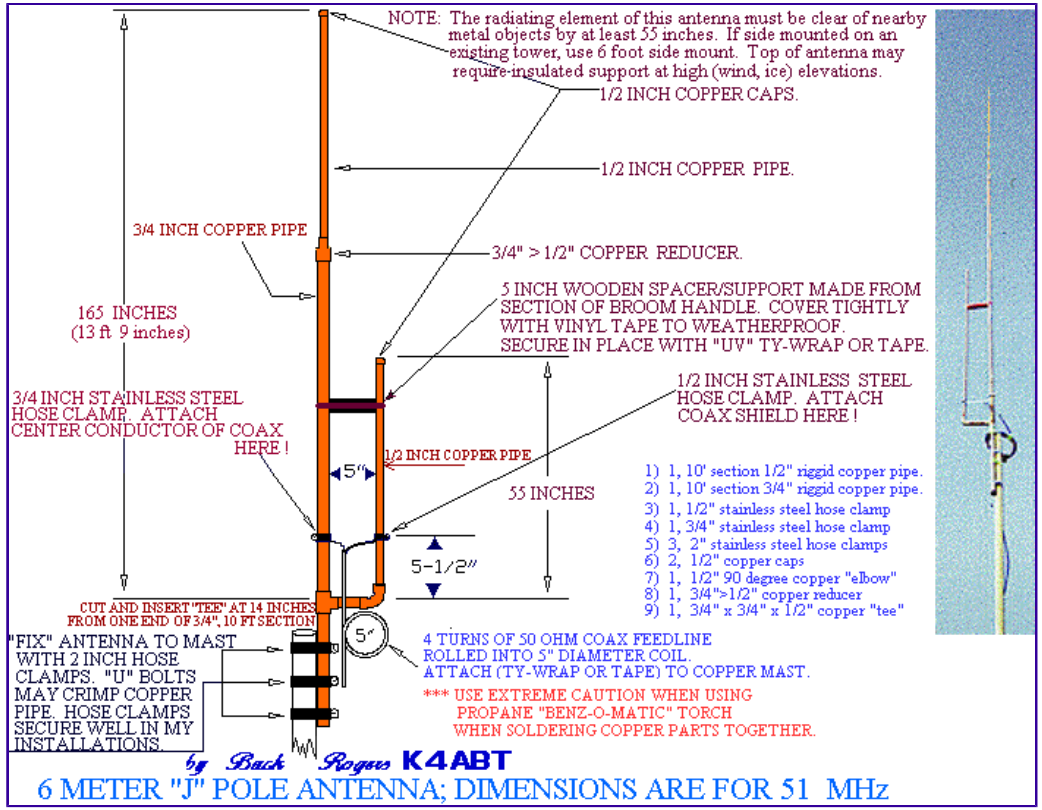
My Hardware J-Poles from 1969

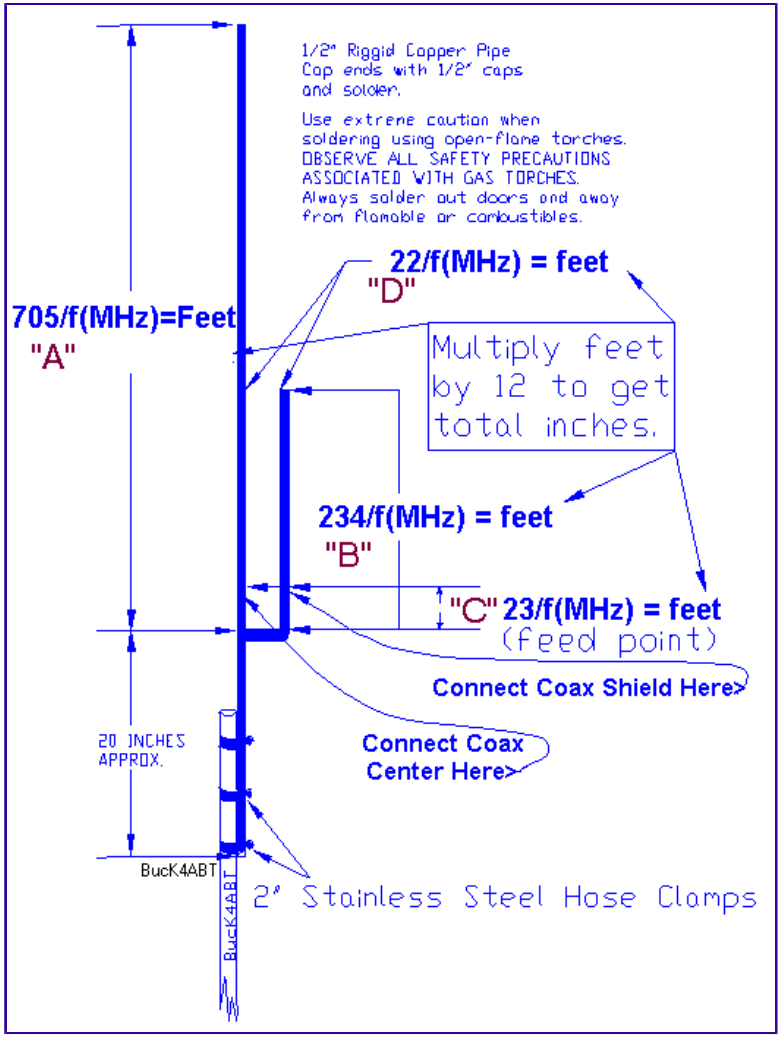






A=Benz-O-Matic propane torch; B=Lead-Free solder; C=Tape measure: D=Tubing cutter; E=Sharpie marking pen; F=Solder Paste; G= caps; H=Hardcopy of the above drawing; I=Wet Towel; J=PreCut, ready to assemble parts of the 2 meter J-Pole.


NOTE: The radiating element of this antenna must be clear of nearby metal objects by at least 55 inches. If side mounted on an existing tower, use 6 foot side mount. Top of antenna may require insulated support at high (wind, ice) elevations.
1/2 INCH COPPER CAPS.
1/2 INCH COPPER PIPE.
3/4 INCH COPPER PIPE
3/4" > 1/2" COPPER REDUCER.
5 INCH WOODEN SPACER/SUPPORT MADE FROM SECTION OF BROOM HANDLE. COVER TIGHTLY WITH VINYL TAPE TO WEATHERPROOF. SECURE IN PLACE WITH "UV" TY-WRAP OR TAPE.
165 INCHES (13 ft 9 inches)
3/4 INCH STAINLESS STEEL HOSE CLAMP. ATTACH CENTER CONDUCTOR OF COAX HERE !
1/2 INCH STAINLESS STEEL HOSE CLAMP. ATTACH COAX SHIELD HERE !
1/2 INCH COPPER PIPE
5"
55 INCHES
5-1/2"
1) 1, 10' section 1/2" riggid copper pipe.
2) 1, 10' section 3/4" riggid copper pipe.
3) 1, 1/2" stainless steel hose clamp
4) 1, 3/4" stainless steel hose clamp
5) 3, 2" stainless steel hose clamps
6) 2, 1/2" copper caps
7) 1, 1/2" 90 degree copper "elbow"
8) 1, 3/4">1/2" copper reducer
9) 1, 3/4" x 3/4" x 1/2" copper "tee"
CUT AND INSERT "TEE" AT 14 INCHES FROM ONE END OF 3/4", 10 FT SECTION
"FIX" ANTENNA TO MAST WITH 2 INCH HOSE CLAMPS. "U" BOLTS MAY CRIMP COPPER PIPE. HOSE CLAMPS SECURE WELL IN MY INSTALLATIONS.
5"
4 TURNS OF 50 OHM COAX FEEDLINE ROLLED INTO 5" DIAMETER COIL. ATTACH (TY-WRAP OR TAPE) TO COPPER MAST.
*** USE EXTREME CAUTION WHEN USING PROPANE "BENZ-O-MATIC" TORCH WHEN SOLDERING COPPER PARTS TOGETHER.
by Buck Rogers K4ABT
6 METER "J" POLE ANTENNA; DIMENSIONS ARE FOR 51 MHz



One is for 144 to 148 mHz (model JPOL2) and the other is for 430-450 mHz (model JPOL4). Both models are shown in the following illustration:

2 meter version: **144 to 150 mHz**

(model JPOL2)

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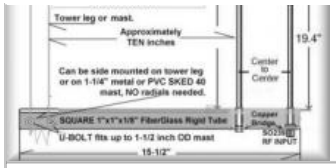

70cm version: **430-450 mHz**

(model JPOL4)

> CLICK HERE for on-line CATALOG

BUX VBALUN De-Coupling transformer

Primary use and application:
Feed point isolation and matching for J-Poles and VHF/UHF BEAMS.

This decoupling transformer prevents RF currents from traveling down the outer shield of the coax. The input connector is an SO239 (female) and the output connector is a PL259 (male).

BUX "VBALUN" De-Coupling transformer, has SO-239 (female) input connector. Output connector is 2 feet RG8X cable with Amphenol PL-259 (male). BUX VBALUN is an UNbalanced to UNbalance decoupling transformer designed to be used by the Apartment dweller or the RV ops when feeding J-Poles and similar VHF/UHF antennas.

$19.95 VBALUN

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Teflon ®™ E I DuPont corp.
Amphenol ®™ TYCO Corp.

The "VBALUN" is similar to our BUXUNUN, except constructed for VHF and UHF frequencies.

The object is to eliminate the need to go through all the calculations on another page of this website.

For all type of outdoor antenna connections, BALUNS, Coax connectors, coax bulkhead entry panels and more. Use **Coax-Seal**® to protect any outdoor connection or connector. ***Coax-Seal*** is made of a non-conductive, non-contaminating waterproof material that remains flexible at any temperature from -30° to 180°F. Coax connectors that are not waterproof or have exposed solder joints can weaken from oxidation ! Coax-Seal is superior to electrical tape or vinyl sealants for moisture protection. Each box of Coax-Seal contains (60 inches x 1/2 inch) five feet and will protect ten (10) connectors.

2.95 Order Code CS104

CLICK HERE to buy COAX SEAL

CAT#, CS104, For all type of outdoor antenna connections, BALUNS, Coax connectors, coax bulkhead entry panels and more.

TEMPERATURE CONTROLLED SOLDERING STATION 50W 350 - 900° F

Features :
manual temperature setting
electronic temperature control
power-on LED indication
with grounded output
Specifications :
heater power for soldering iron: 50W
temperature variable control: 375-900°F
voltage supply: 115VAC
weight: 2.65 lbs.
dimensions: 7 1/4" x 3 31/32" x 3 1/2"
input power: 50VA max.

$ 24.90 Order VTSS5

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The "Windom Antenna" was described by Loren G. Windom in QST magazine, September 1929. Pages 19 through 22.

Loren Windom, W8GZ, was first to reveal the antenna to the radio amateur community by describing the antenna in the September 1929 issue of QST. It was by Windom's name

that the antenna became known. The Windom antenna is an off-center fed dipole with an unbalanced coax feedline.

In 1937, the Windom was first described as a compromise multiband antenna. The antenna can be employed on 160, 80, 40, 20 and 10m with considerable, though acceptable levels of VSWR. What became perhaps the most popular multiband Windom design of all, was the German-made Fritzel FD4 antenna, described by the late Dr. Fritz Spillner1, DJ2KY, in 1971. It had the same dimensions as the multiband Windom antenna, but fitted with a 200Ω (4:1) balun at its feedpoint and fed with coax.

Today, many radio amateurs are using multiband Windom antennas with more than satisfactory results. It would not be without reason that Windom antennas are being employed during IARU HF World Championships! and most of all, by "high-stake-contests." ***Perhaps many young hams ignore the multiband Windom antenna because of its sheer simplicity and may be thinking it is too good to be true.*** *The complexity of feeding other dipoles and doublets, the losses in dipoles with traps and the esoteric marketing of some other antennas seem to appeal to them more.*

BUX *VBALUN* should be installed at the antenna feed point, or where the coax or feed-line attaches to the J-Pol connector

Important Notice; WHY USE A **4:1 BALUN**

Krusty Olde Kurt is now going to repeat himself. Why? Because the same question keeps coming up over and over. And he wants everyone to get it right.

"I'm feeding my dipole with 600-ohm line. At the station end I need a balun to convert to 50-ohm coax. I need a 12:1 balun, right?" ***Wrong!*** *A* ***4:1 balun*** *would be better.*

Why is that? If your dipole is up, let's say, 35 feet then on 80 meters it will probably have a resistance at resonance of about 40 ohms. The actual resistance depends on the height above ground in wavelengths.

If the dipole is 40 Ohms then what do you see at the transmitter end of your 600 ohm line? If the line is a half-wave long (120 ft on 80 Meters) you'll see 40 ohms. Remember, a half-wave line repeats what it sees at the other end. But if it is a quarter-wave long you'll see 8500 Ohms! At other line lengths you'll see impedances somewhere between these two extremes.

So you are not going to see 450 ohms at the end of your 450-ohm line. That only happens if you have a 500-ohm antenna hooked onto it. With such a variation in impedance at the transmitter end of the line there is no one balun transformer that will match it. Most of the time the impedance will be above the 50 Ohms of your coax so a high impedance balun would be desirable. Unfortunately high impedance baluns don't work well when not matched.

Experience has shown that ***4:1 baluns work best*** in this service. They are more rugged and will take bad mismatches especially if they are wound on an iron powder core. So stop searching for that 9:1 or 12:1 balun. **Use a 4:l BALUN and your system will work great.**

You can read Kurt N. Sterba "AERIALS" column in **World Radio Magazine.**

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