

Dipole Baluns – BULLET Style

CIRCULAR BULLET STYLE 1:1 BALUN OPTIONS

500 Watts PEP



Bullet-1B-500/500LF

1500 Watts PEP



BULLET-1-1500EB

5000 Watts PEP



BULLET-1-5000EB

Purpose. These Bullet Baluns are rated at 500, 1500 and 5000 watts PEP into a matched load, and they are used as a 1:1 current balun/line isolator/feed line choke for 50 ohm coax fed antennas from 1.8-61 Mhz. The balun is designed to have a common mode rejection to current flowing on the outside braid while passing RF currents on the inside of the coax braid to the antenna. This 500/500LF watt balun features up to 35dB/42dB of common mode rejection and the 1500 and 5000 watt version are up to 60 dB (10 “S” units) over the 1-61 MHz frequency range.

For maximum common mode current protection (and receiver noise floor reduction due to common mode current pickup by the coaxial braid), use this balun to suppress TRANSMIT RFI on the coax braid at the antenna feed point and a CMNF-500HF, CMNF-1500 or CMNF-5000 coax noise filter at the radio shack equipment end of the coax to reduce RECEIVE common mode noise. In some difficult RFI cases, additional common mode chokes are needed between equipment such as linear amps and antenna tuners, and transceivers.

RECTANGULAR ENCLOSURE STYLE 1:1 BALUN OPTIONS

500 Watts PEP



MB-1-500SS

1500 Watts PEP



CB-1-1500EB

5000 Watts PEP



CB-1-5000EB

All of these baluns are designed to work with 50 ohm loads and the balun may be damaged or saturate if you use at high impedances and high power such as driving a 40 meter antenna with an 80 meter transmitter signal where the load impedance on the antenna is very high. Best use is with antennas having a load impedance in the 30-75 ohm range such as a resonant dipole or loop antenna, $\frac{1}{4}$ wave vertical, or corner-fed half square.

DIPOLE ANTENNA OPTIONS

Single Band dipoles – calculate total length (both sides) from formula:

$$\text{Length (feet)} = 468/\text{Freq (MHz)}$$

For example a dipole used for 3.5 MHz would have total length of $468/3.5$ or 133.7 Feet total or $133.7/2$ for each side = 66.85 feet. Now you should also add 12 inches for attachment to the balun and another 6 inches for insulator wire wrap. Each side should be cut for $66.85 + 1.5 = 68.35$ feet.

This formula to obtain the length of a half-wave dipole antenna will give a good ballpark value to start with.

Here is a table version by band from 160-2 meters for dipoles and loops in feet and meters.

Band	Frequency (Mhz)	1/4 λ (Feet)	1/2 λ Dipole (Feet)	1 λ Loop (Feet)	1/4 λ (Meters)	1/2 λ Dipole (Meters)	1 λ Loop (Meters)
160	1.800	130' 0"	260' 0"	558' 4"	39.6	79.3	170.2
	1.850	126' 6"	253' 0"	543' 3"	38.6	77.1	165.6
	1.900	123' 2"	246' 4"	528' 11"	37.5	75.1	161.2
	2.000	117' 0"	234' 0"	502' 6"	35.7	71.3	153.2
80	3.500	66' 10"	133' 9"	287' 2"	20.4	40.8	87.5
	3.750	62' 5"	124' 10"	268' 0"	19.0	38.0	81.7
	3.900	60' 0"	120' 0"	257' 8"	18.3	36.6	78.5
	4.000	58' 6"	117' 0"	251' 3"	17.8	35.7	76.6
60	5.330.5	43' 9"	87' 8"	188' 5"	13.4	26.8	57.5
	5.346.5	43' 7"	87' 5"	188' 0"	13.3	26.7	57.3
	5.366.5	43' 6"	87' 2"	187' 3"	13.3	26.6	57.1
	5.371.5	43' 5"	87' 1"	187' 1"	13.2	26.5	57.0
	5.403.5	43' 3"	86' 6"	186' 0"	13.2	26.4	56.7
40	7.000	33' 5"	66' 10"	143' 7"	10.2	20.4	43.8
	7.150	32' 9"	65' 5"	140' 7"	10.0	20.0	42.8
	7.300	32' 1"	64' 1"	137' 8"	9.8	19.5	42.0

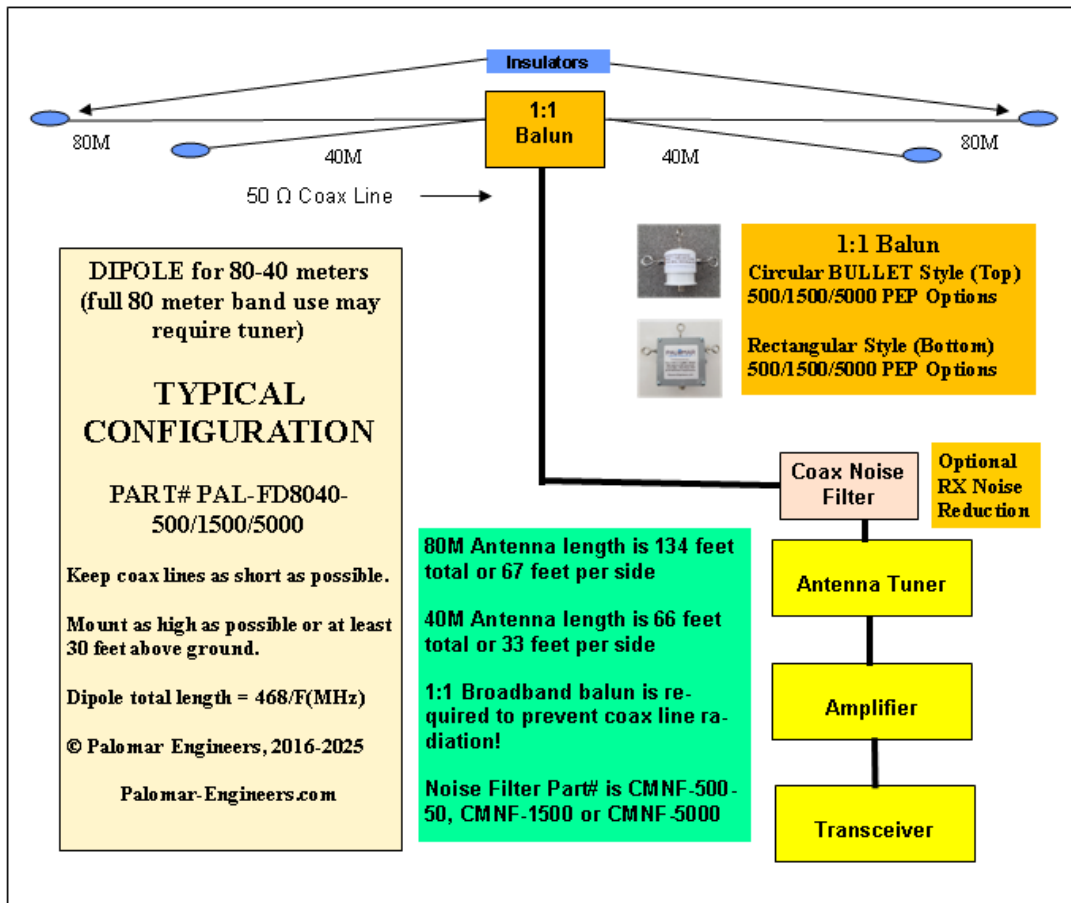
Ham Band	Frequency (Mhz)	1/4 λ (Feet)	1/2 λ Dipole (Feet)	1 λ Loop (Feet)		1/4 λ (Meters)	1/2 λ Dipole (Meters)	1 λ Loop (Meters)
30	10.100	23' 2"	46' 4"	99' 6"		7.1	14.1	30.3
	10.150	23' 1"	46' 1"	99' 0"		7.0	14.1	30.2
20	14.000	16' 9"	33' 5"	71' 9"		5.1	10.2	21.9
	14.150	16' 6"	33' 1"	71' 0"		5.0	10.1	21.6
	14.300	16' 4"	32' 9"	70' 3"		5.0	10.0	21.4
	14.350	16' 4"	32' 7"	70' 0"		5.0	9.9	21.3
17	18.068	12' 11"	25' 11"	55' 7"		3.9	7.9	17.0
	18.168	12' 11"	25' 9"	55' 4"		3.9	7.9	16.9
15	21.000	11' 2"	22' 3"	47' 10"		3.4	6.8	14.6
	21.200	11' 0"	22' 1"	47' 5"		3.4	6.7	14.4
	21.450	10' 11"	21' 10"	46' 10"		3.3	6.7	14.3
12	24.890	9' 5"	18' 10"	40' 5"		2.9	5.7	12.3
	24.990	9' 4"	18' 9"	40' 3"		2.9	5.7	12.3
10	28.000	8' 4"	16' 9"	35' 11"		2.5	5.1	10.9
	28.500	8' 3"	16' 5"	35' 3"		2.5	5.0	10.7
	29.700	7' 11"	15' 9"	33' 10"		2.4	4.8	10.3

Ham Band	Frequency (Mhz)	1/4 λ (Feet)	1/2 λ Dipole (Feet)	1 λ Loop (Feet)		1/4 λ (Meters)	1/2 λ Dipole (Meters)	1 λ Loop (Meters)
6	50.000	4' 8"	9' 4"	21' 1"		1.4	2.9	6.1
	54.000	4' 4"	8' 8"	18' 7"		1.3	2.6	5.7
2	144.000	1' 8"	3' 3"	7' 0"		0.5	1.0	2.1
	148.000	1' 7"	3' 2"	6' 9"		0.5	1.0	2.1

However, the *actual* resulting frequency of resonance and feed-point impedance of a dipole will depend on:

- The *height* of the dipole above ground;
- The *conductivity* of the ground below;
- The *dielectric constant* of the ground below;
- The presence of buildings, trees, metal structures (tower) nearby.

FAN DIPOLE ANTENNA OPTIONS



Installation for Palomar Fan Dipole for 80 and 40 meters. Adjust dipole lengths depending up center frequency desired and height of antenna.

INSTALLATION

For best results support center at 30+ feet and ends over 15 feet. Angle of feed each side must be great than 45 degrees or 120 – 180 degrees total between each side preferred. Any length of 50 ohm feed line ok but longer feed lines over 50 feet may show reduced SWR on some bands due to losses in feed line and soil conductivity, nearby objects, etc. Due to local ground conditions, antenna height and feed line length, An antenna tuner may be required or some bands to bring SWR at end of feed line to acceptable levels. Use a good quality 52 ohm cable adequate for the power level of your station.



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**BEFORE YOUR START
CAUTION**

WARNING: INSTALLATION OF THIS PRODUCT NEAR POWER LINES IS DANGEROUS. FOR YOUR SAFETY FOLLOW THE INSTALLATION INSTRUCTIONS.

WARNING: AT NO TIME DURING ASSEMBLY, INSTALLATION, ADJUSTMENT OR OPERATION SHOULD ANY PART OF THIS PRODUCT BE ALLOWED TO COME INTO CONTACT WITH ELECTRIC POWER LINES, NOR SHOULD THIS PRODUCT BE INSTALLED IN SUCH A WAY THAT ANY PART OF IT MAY CONTACT POWER LINES DURING NORMAL OPERATION OR IN THE EVENT OF STRUCTURAL FAILURE. FAILURE TO EXERCISE EXTREME CARE IN THIS MATTER CAN RESULT IN DAMAGE TO PROPERTY, PERSONAL INJURY, OR DEATH.