

5 Element 50Mhz OP-DES

High Performance low noise Yagi

Model: 5DES50-5

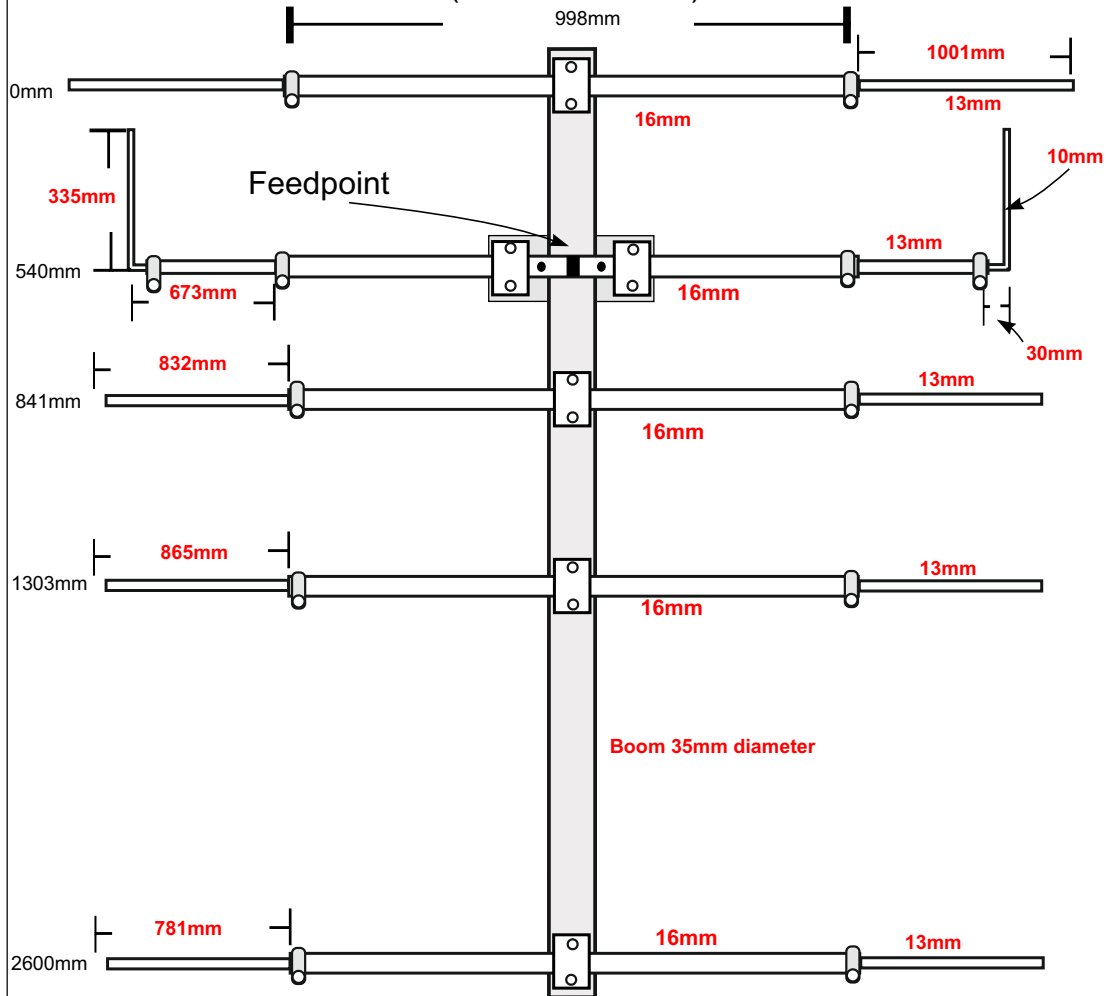


Weight: 7 Kg.
Max. Power: 7,0 kW+

InnovAntennas Limited

5el 50MHz OP-DES Yagi

(NOT TO SCALE)



Notes:

Adjust DE width for best SWR
Install 1:1 choke balun at feed point
Boom Length : 2.650m
Feed system: 1 feedline with 1:1 balun
Gain: 9.21dBi @ 50.200MHz
D1 is shorter than D2
Direct 50 ohm feed
Read Noted relating to mounting positions

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Testing the antenna

Please read the rest of the manual before testing and ensure a 1:1 balun or common mode choke is installed at the feed point. For effective 'on ground' testing your antenna should be at least one 1/4 wave or one boom length (whichever is the greatest length) above ground. It should also be pointed to a clear horizon with no building, trees or other objects in its view.

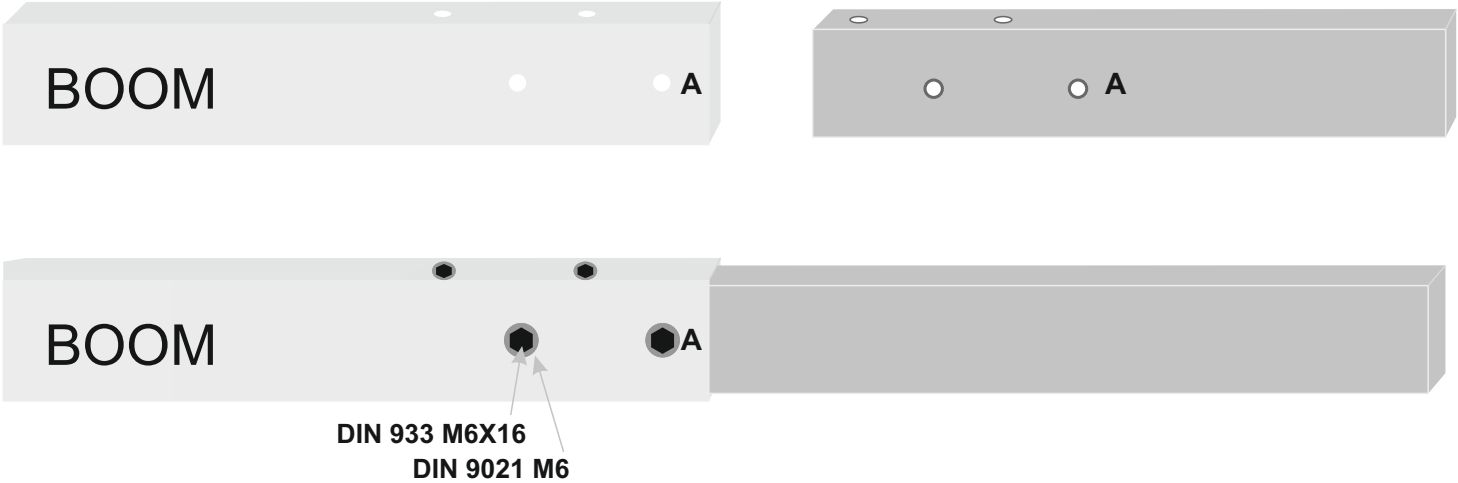
If a clear view is not possible, remove the top 50mm U-bolt from the boom to mast plate and allow the antenna to angle upwards in order the reflector is lower to ground than the director(s) and the antenna is pointing to clear sky. This will ensure that any final tuning you do at ground level is least likely to alter once the antenna is installed into its final position.

Help and assistance @ support@innovantennas.com

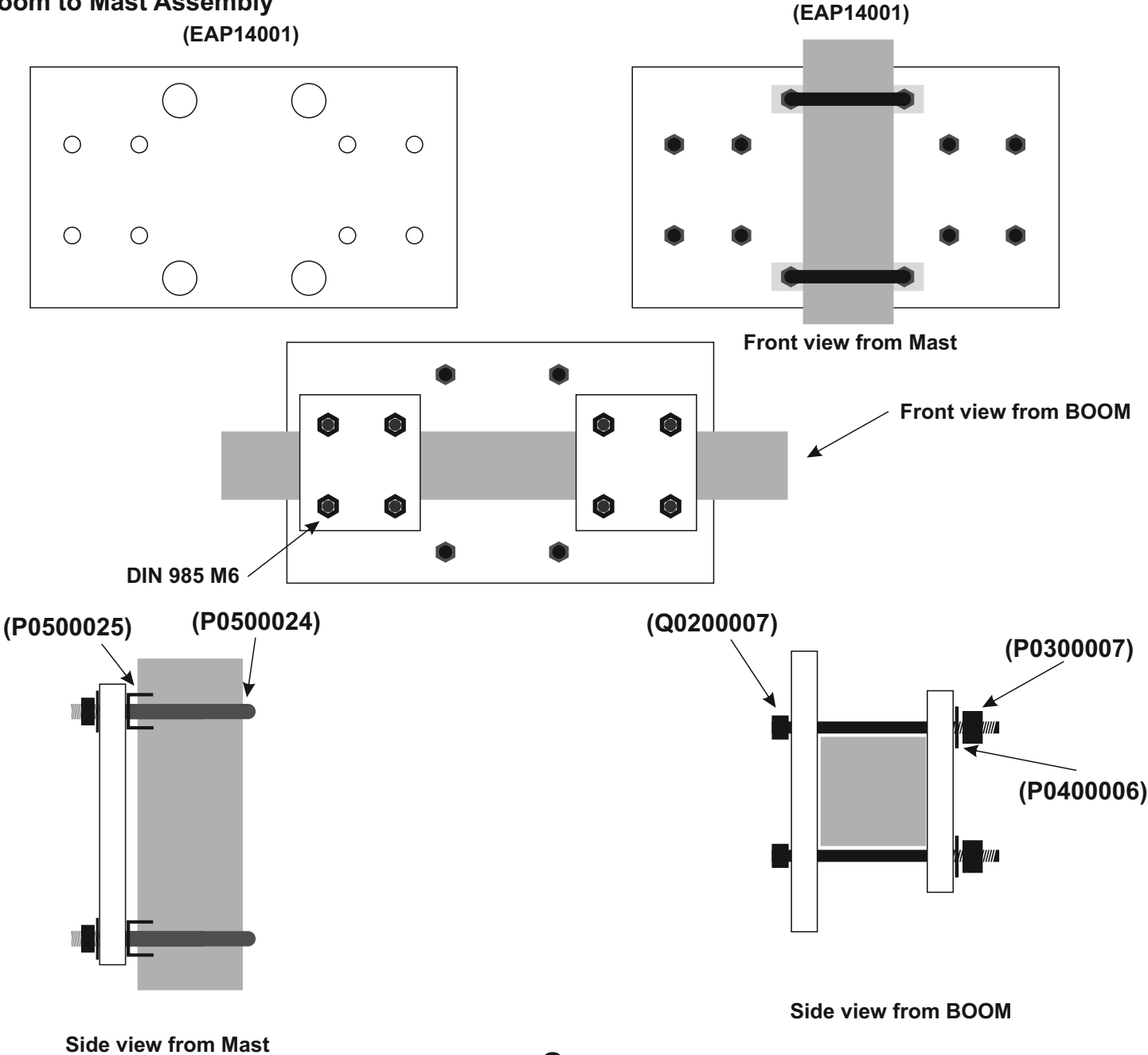
Boom Construction

The boom is tapered with 40mm square tube in the centre, dropping to 35mm then 30mm square tube at the ends. align the corresponding alpha-numeric letters (eg: AA, BB, CC etc), and join these sections together. Secure with fixing screws **DIN 933 M6X16** and washers **DIN 9021 M6**. It is recommended to install all bolts at each join before adding nuts and tightening them.

Grease or oil all Stainless Steel parts before assembly!



Boom to Mast Assembly
(EAP14001)

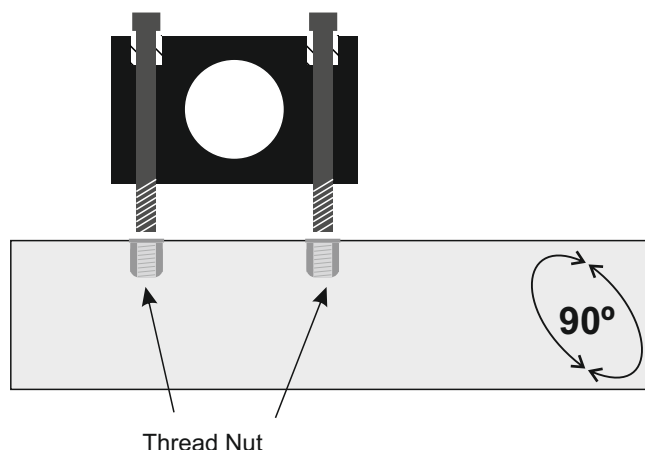
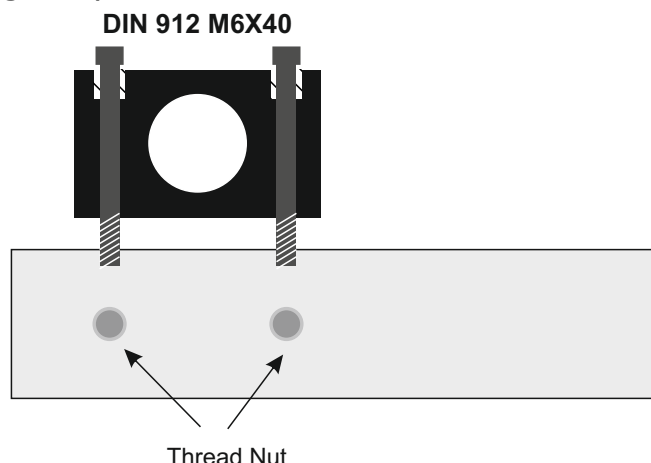


Boom to Mast Assembly - continued

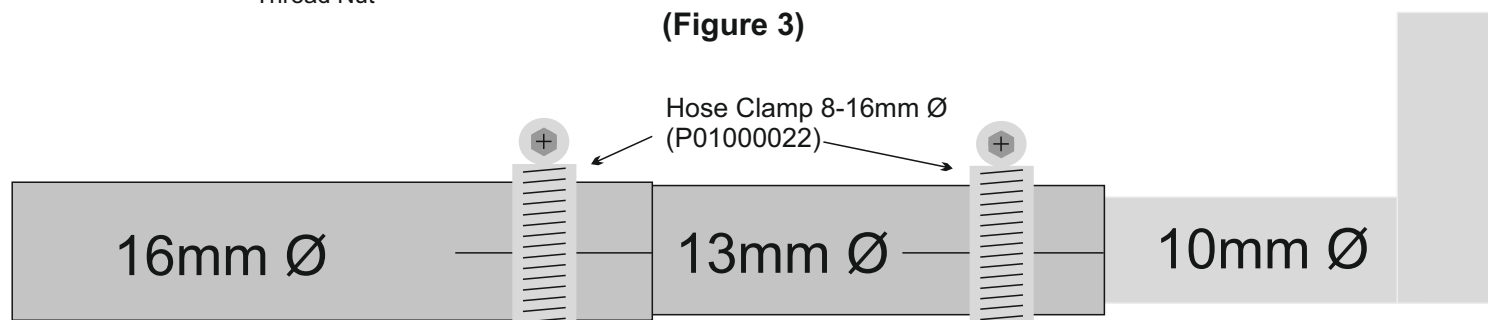
Locate the Boom to Mast plate (**EAP14001**) 250X100X6mm, this has 12 holes; 4 large for round U-bolts and 8 small holes for the 40mm square U-bolts that will secure the Boom to Mast plate to the boom (**EAP014011**). There are 4 x M8 U-bolts (**P0500024**), for securing a mast up to 2" or 50mm to the boom and these are secured with M8 nuts (**DIN 934 M8**) and washers (**DIN 9021 M8**). Suitable saddles for these M8 U-bolts are also supplied (**P0500025**) and should be fitted between the round U-bolts and the boom to mast plate.

Element fitting and mounting

(Figure 2)



(Figure 3)



Step 1: Install elements into their respective position on the boom (eg: Ref / DE1 / DE2 / D1 / D2 / D3 / D4...)

Step 2: With the help of a tape measure and a pen, calculate the center of each 'middle element' (16mm diameter tube) section and make a pen mark at this point. Make another mark 11mm either side of this centre point and then slide the middle elements into the insulator / white plastic block (**EAHYP013**). The block is 20mm wide so once you see your pen marks either side of the insulator, you know the element is then centered.

Step 3: Use two M6 x 40mm bolts (**DIN 912 M6X40**) to secure the insulators to the boom. DO NOT OVER-TIGHTEN, once the element is held firm, there is no need to further tighten, doing so could reduce the strength and life length of the insulator.

Step 4: Insert the respective 10mm diameter element tips into the ends of the middle elements, measure and tighten as per the drawing on page 2.

Step 5: The driven loop requires the addition of loop ends to be inserted and measured as per the drawing on page 2. feed point is on DE1 closest to the reflector. On all elements use the hose clamps 13mm Ø (**EAHYP013**) to secure each joined section of tube in place.

Step 6: Install 'eye' bolts (**P0200104**) for guy ropes onto the boom. These guy positions are located around 100mm from the first and last element on the boom.

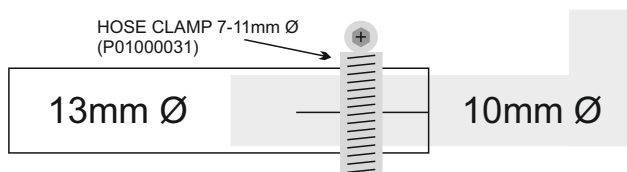
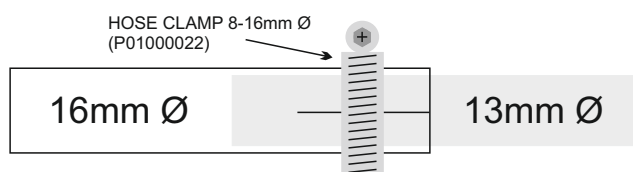
Step 7: Fit guy mounting plate (**EA010007**) between 1m and 1.5m above the boom of the antenna on a 2"/50mm mast. Attach guy rope (**R1700045**) to the eye hooks fitted to the boom one end, and the guy mounting plate the other end using the supplied wire clamps (**P1500011**).

Note: It is good practice to fully secure the antenna boom in its final position with the guy plate around 6" / 10cms below its ideal point. Adjust the guy ropes through the clamps (**P150001**) until they are firm and tightened. Loosen the guy plate and push upward until all sag is removed from the boom and tighten fully.

Step 8: Check SWR and adjust lop end sections (equal amount each side of the antenna) for the lowest SWR on your chosen frequency.

Note: if tuning before installation on a tower, the antenna must be at least one boom length above ground and clear of any surrounding objects, trees or buildings. If this is not possible, the antenna should be angled slightly skyward before attempting to tune.

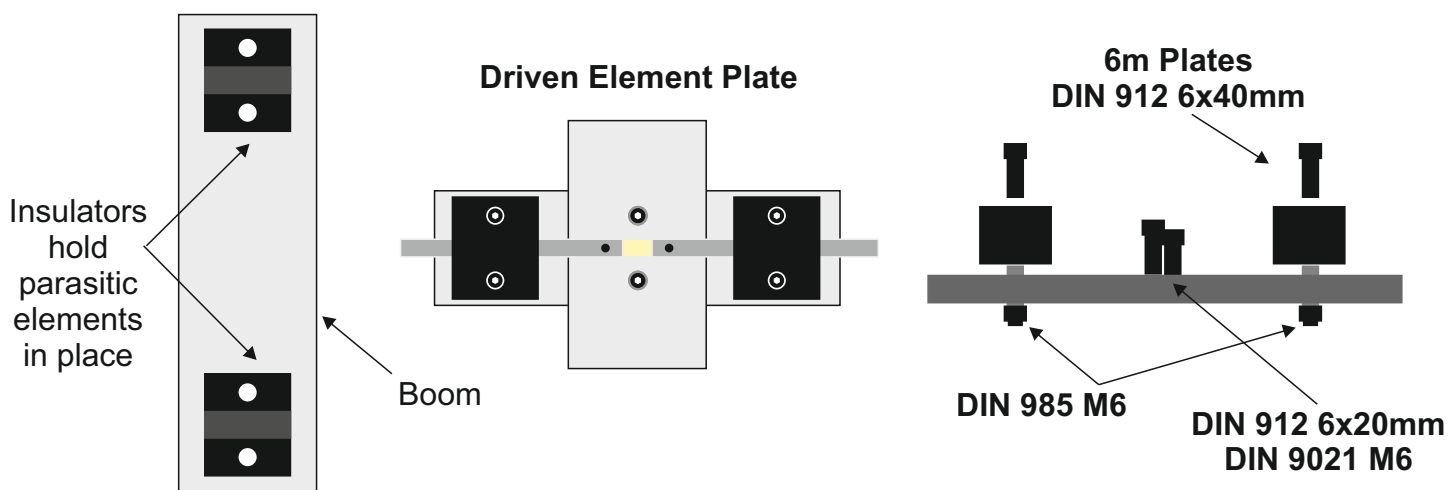
The driven element loop ends are fixed in place with a hose clamp 8-16mm (P0100022) at each corner of the 13 to 10mm diameter tubes. 7-11mm (P0100031) hose clamps hold the loop end in place and allow for adjustment (SWR).



Measurements on the drawing on page 2 are exposed lengths for each tube. The element sections total length will be longer than this to allow for overlap. For antennas that have tapered elements, it is advisable to insert the centre section into the white insulator clamp and tighten both to the boom before inserting the tips, measuring and finalising each elements respective length.

The driven element section of the loop (closest to the reflector) has a small plate with two white insulators, one either side of the feedpoint. 2 M6 bolts DIN 912 6 x 20mm hold this plate in place. More details of the feed point arrangement are shown on page 6.

It is important **NOTE** to over-tighten the insulator blocks. They needs to be tight enough that neither they nor the element moves. They should not be tightened down further, this may reduce the life length of the clamp.



Grease or oil all stainless steel parts before assembly to ensure reliable fitment and long-term survivability of the antenna and its components. InnovAntennas ConductAseal and RubbAseal are recommended when installing and are available via the InnovAntennas website.

www.innovAntennas.com

Adjusting SWR

Once you have built your antenna and it is in position on your mast or test mast, you may find you need to make some small adjustments to the loop in order to get the best SWR. Move the loop ends in and out a few mm at a time until the best result is seen. At this point the loop hose clamps can be fully tightened.

Important notes on tuning

If the antenna is too close to ground when tuning, you may find the SWR alters once installed in its final position. In order to elevate this, you should ensure that in the test position the Yagi is at least one $\frac{1}{4}$ wavelength or one boom length (whichever is the greater distance) above ground. Additionally, the antenna should be pointed to a clear horizon with no trees or buildings close by. If this is not something you can achieve, then remove one of the U-bolts from the boom to mast plate in order the antenna can point slightly upward to clear sky. An angle of at least 20 degrees will give the same readings as would be seen if the antenna was installed several wavelengths above ground.

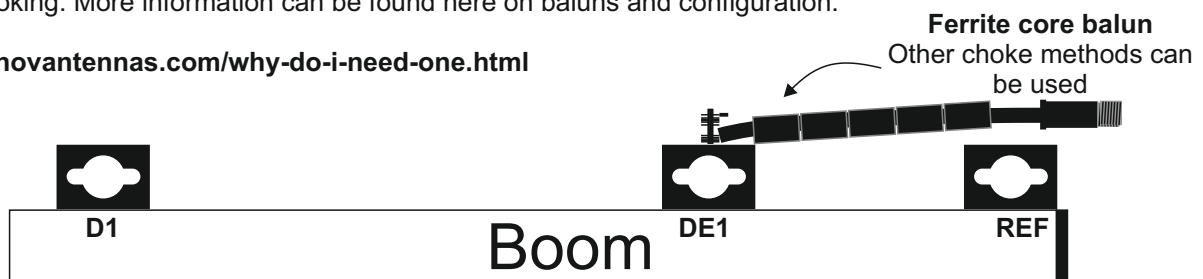


Balun - needed or not?

The LFA Yagi is a balanced antenna. Coax cable is an unbalanced feed line. If a balanced antenna is fed with unbalanced feeder, the coax can radiate as well as the antenna and this can have disastrous consequences on the performance of a Yagi that might not otherwise be seen on antennas such as verticals and dipoles. Therefore, it is important to install a BALANCED to UNBALANCED transformer (1:1 balun) or choke at the feedpoint.

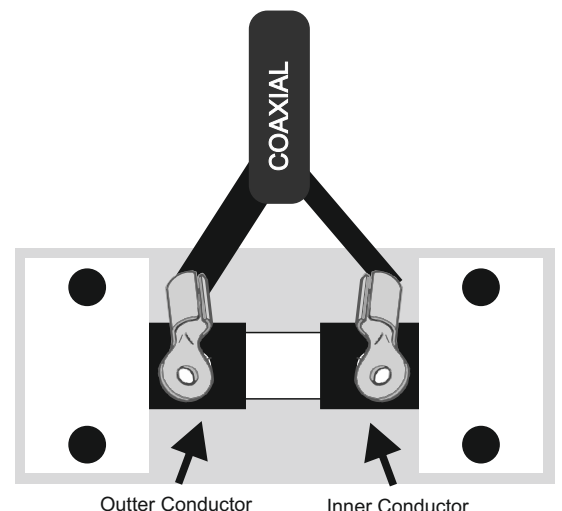
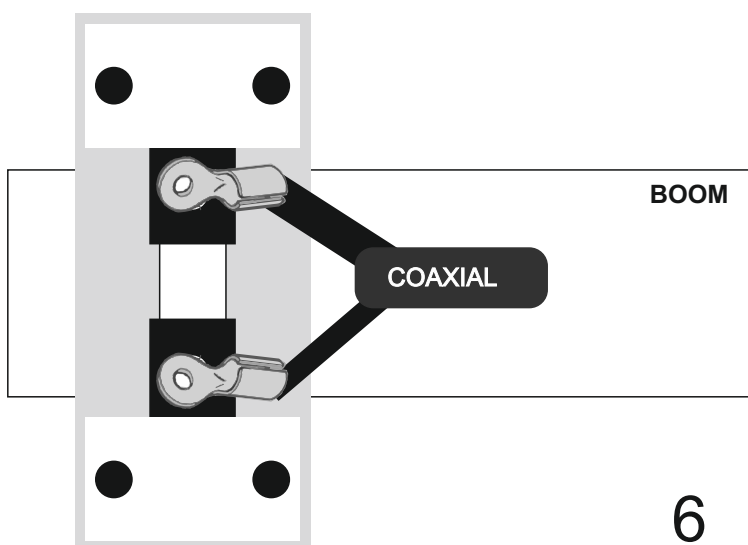
A 1:1 balun is one which connects 50Ohm coax cable to a 50Ohm antenna and prevents these common mode currents radiating back long the coax line. While it is possible to make a very simple choke from a coil of coax at the feed point of the antenna, any such arrangement should be confirmed at working with an antenna analyser. Often, good quality coax has a sleeve thickness too wide to provide enough capacitance between the turns of any coax coils to produce the desired choking. More information can be found here on baluns and configuration:

<http://www.innovantennas.com/why-do-i-need-one.html>

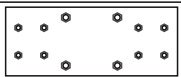


Any installed 1:1 balun or common mode choke must be as close to the feed point as possible. Ensure 'tails' (connection between coax cable and feedpoint) are as short as can be.

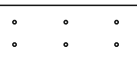
For any help and support, please Email us at support@innovantennas.com



BAG #1

PART # PIEZA N°	IMAGEN PART IMAGE	DESCRIPCION DESCRIPTION	MEDIDAS SIZES	CANTIDAD QUANTITY
EAP14001		Placa Mástil/Boom Mast and Boom plate	250 x 100 x 6mm	1
EAP14011			50 x 60 x 6mm	2
P0500001		2" U-Blot. Includes nuts and washers		2
P0500002		2" Tube Clamp		2
Q0200007		Allen DIN 912 Screw	60x6mm	8
P0400006		DIN 9021	M6	8
P0300007		DIN 985 NUT	M6	8

BAG #2

PART #	PART IMAGE	DESCRIPTION	SIZES	QUANTITY
INNOV100X6		DE1 Elements plates	Dipole center plate	1
Q0200089		Allen DIN 912 bolt	20x6mm	2
P0400006		DIN 9021	M6	2
EAHYP016		16mm Ø Insulator blocks	Element insulators/holders	7
Q0200003		Allen DIN 912 bolt	40x6mm	14
P0300007		DIN 985 NUT		4
P0100022		8-16mm Hose clamp	M6	14

PACKING LIST

BAG #3

PART #	PART IMAGE	DESCRIPTION	SIZES	QUANTITY
P0200024		Allen DIN 933 bolt	16x6mm	16
P0400006		DIN 9021	M6 washer	16
EA014539		Boom joint part	200x45mm	4

LARGER BOXED ITEMS

PART #	PART IMAGE	DESCRIPTION	SIZES	QUANTITY
6EL-OP4.7 A		Boom Section	1565mm x 40mm	1
6EL-OP4.7 B		Boom Section	1630mm x 40mm	1
6EL-OP4.7 C		Boom Section	1597mm x 40mm	1
		Loop end (Driven element)	325mm x 120mm x 10mm Ø	2
		Middle part of DE1	998mm x 16mm Ø	1
		Middle part of Elements	998mm x 16mm Ø	5
DE1		DE1 DRIVEN TIP	857mm x 13mm Ø	2
REF		REFLECTOR	1068mm x 13mm Ø	2
D1		DIRECTOR 1	967mm x 13mm Ø	2
D2		DIRECTOR 2	985mm x 13mm Ø	2
D3		DIRECTOR 3	953mm x 13mm Ø	2
D4		DIRECTOR 4	891mm x 13mm Ø	2