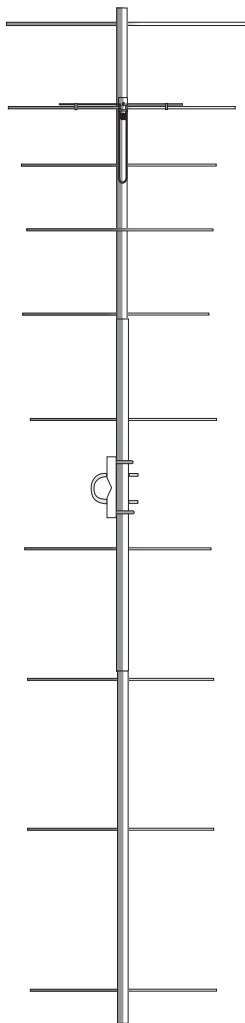




# DIRECTIVE SYSTEMS

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## DSFO222-10RS 10 ELEMENT 222 MHz "ROVER SPECIAL" YAGI ELECTRICAL SPECIFICATIONS



Frequency range: MHz .....	222-225
Gain: dBd.....	11.4
Impedance: Ohms.....	50
Connector type .....	Type N(F) UG-58/U
Front -to- back ratio: dB.....	20
SWR: Typical at resonance.....	≅ 1.2:1
Beamwidth: degrees	
E- Plane .....	39
H- Plane .....	42
Sidelobe level: decibels	
E- Plane .....	-24
H- Plane .....	-18
Power rating, Continuous: Watts .....	1500
Stacking Distance: in.(m)	
E- Plane .....	79.5" (2.019m)
H- Plane .....	74" (1.880m)

## MECHANICAL SPECIFICATIONS

Boom length: in. (m.) .....	96 (2.438)
Turning radius: in. (m.) .....	52 (1.727)
Weight Assembled: Lbs (kg.) .....	3.74 (1.61)
Max mast size: in. (cm.) .....	2.0 (3.81)
Wind surface area: Ft <sup>2</sup> (m <sup>2</sup> ) .....	0.69 (.063)
Wind Survival: Mph (km/hr) .....	100 (160)

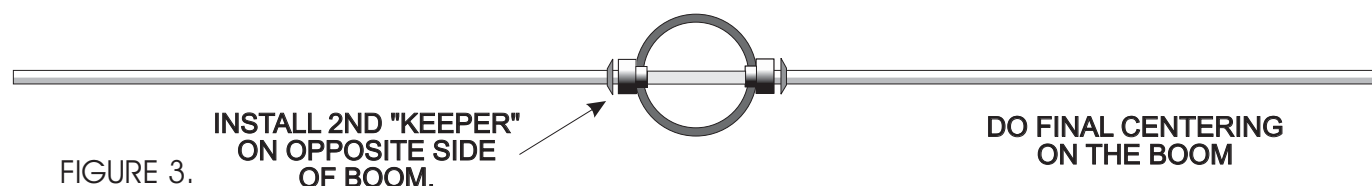
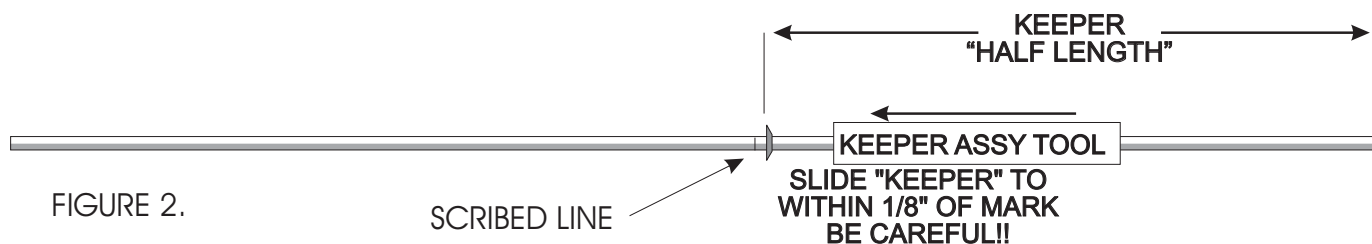
## PARTS LIST

Boom		BAG # 1 (CONTINUED)	
1 1/8" OD x 0.058 x 38" rear boom	1	Brass T match bars	2
w. coax/ balun assy. attached		U- bolt, s.s. 5/16-18 x 2"	2
1 1/8" OD x 0.058 x 36" front boom	1	U-bolt, s.s. 1/4-20 x 1 3/8"	2
1 1/4" OD x 0.058" x 29" mid boom	1	Nut, hex, s.s. 1/4-20	4
		Lock washer, split, s.s. 1/4"	4
		Nut, hex s.s. 5/16-18	4
		Lock washer, split, s.s. 5/16"	4
		SS 1 3/8" worm clamp	2
		Insulators, element, Delrin <sup>®</sup>	20
		Keepers, s.s. 3/16"	23
		Element assembly tool	1
		Assembly instructions	1
<b>Element bundle</b>			
10 elements w. 2 T-match rods	1		
<b>Boom to Mast Bracket</b>			
1	1		
<b>HARDWARE BAG #1</b>			
8-32 x 1 3/4" machine screw	2		
8-32 s.s. hex nut	2		
#8 split s.s.lock washer	2		

Antenna components should be removed from the shipping carton, and the individual parts should be compared with the parts list on page one of this instruction sheet.

The boom consists of three aluminum tubing sections, all 36" long. The rear boom section already has the balun & driven element connector attached and is a 1 1/8" diameter tube. Assemble the three boom pieces and fasten with the 8-32 x 1 3/4" machine screw and hardware supplied. Align the marks on each boom section to insure proper orientation.

The element bundle contains all of the elements needed for assembly. Take time to inventory each one and check off each dimension with Table 1. Some elements vary by one or two millimeters, so extreme care in measuring is required here. Arrange elements in order of descending size and mark each element with a scribe, or sharp tool to properly locate the first keeper position. The scribe dimensions are listed in Table 1 as the "Keeper half length". The keepers are the stainless steel fasteners that slide over the 3/16" dia. Aluminum elements. Note that the reflector element is the longest followed by the brass driven element, and then director #1. Director #13 is the shortest element. Once you have marked each element, and using the hollow assembly tool, push the keeper onto the element until it meets the scribed line. See the figure 6 for proper keeper orientation prior to attaching the keepers. Be careful as the keeper cannot reverse direction if you overshoot the line. You must push the keeper all the way to the end and start over. A good trick is to install the element in a bench vise (if available) with the scribed line flush with the edge of the vise jaws. Push the keeper until it is against the edge of the jaws. This way, it is impossible to overshoot the scribed line. Be aware that the keepers are designed to go only a certain way. Now attach one keeper to every element as advised in Table 1, and shown below.



You are now ready to install the elements onto the boom. Start at the rear of the antenna, Install a pair of black Delrin insulators in the large 5/16" hole on each side of the boom. They may fit tightly and may have to be tapped into position with a small hammer. Now slide the correct element (Ref1) through the two insulators. Press a second keeper onto the opposite end of the element from the first keeper and push until the element is snugly captured on the insulators. Check that the element is centered on the boom. Equal lengths should extend on either side of the boom. Proceed with each succeeding element until all 10 elements are attached to the boom as shown above. Note that the driven element is brass rod, but is installed as the other elements.

The driven element T-Match assembly is constructed as shown in Figures 4 & 5.

Locate the two lengths of #12 copper wire TEE match pieces. Both are preformed. One is straight with a flattened end, while the other is bent and flattened on one end. Locate also the brass T-Match bars, and position them on the brass driven element as shown in figure 4.

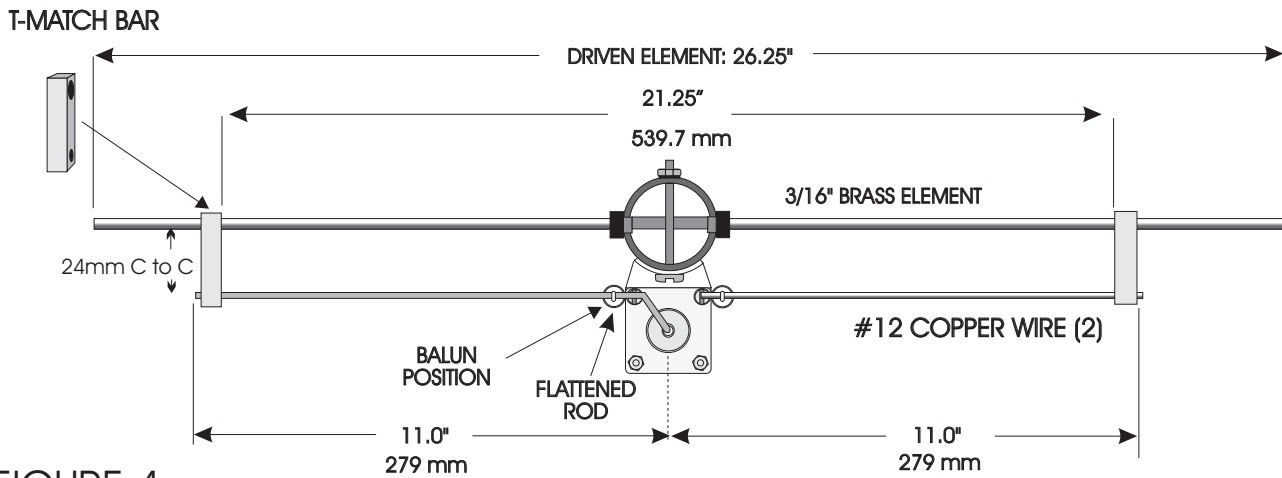
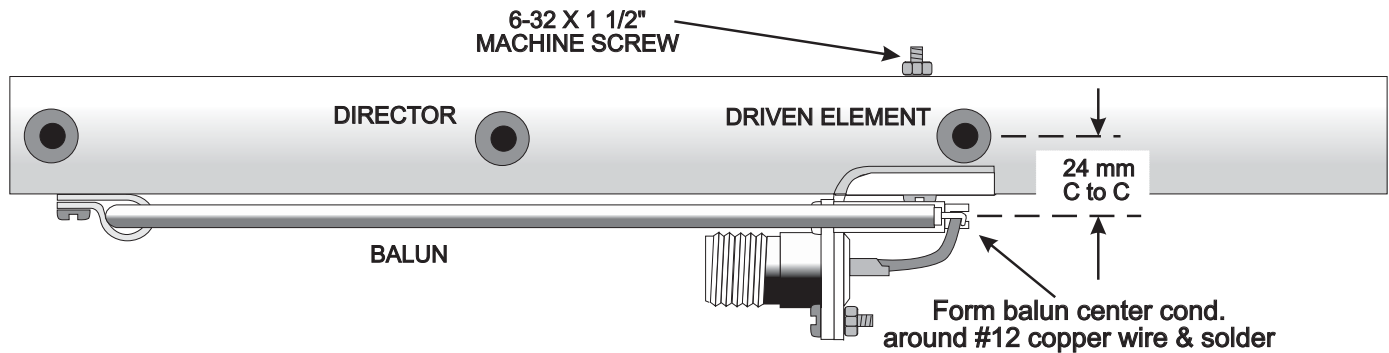


FIGURE 4.

Install the two copper "T"-match wire rods and "T" match bars on the driven element as shown in the diagram (Figure 4) above. Note that the formed end of the bent "T"- Match wire is inserted into the solder cup of the Type N connector and routed through the pre-assembled blue standoff insulator. Solder the "T" match wires to the connector center pin and the two blue standoffs. **If you are installing multiple antennas, please be sure that you build each antenna with the same T rod orientation. In the above drawing, the center pin goes to the right hand side of the antenna as viewed from the back of the connector. Make sure both antennas do the same! Proper phase relationship is very important here!** Align the "T"-match bars parallel with the edge of the connector bracket, and adjust their position as shown in Figure 4. You can slide the bars carefully into position. Be careful and do not apply excessive force to the blue standoff insulators. They are easily broken with rough handling. You may have to bend the connector bracket slightly to achieve the listed dimensions in Figures 4 & 5.

Carefully bend the balun center conductor leads around the T match wires at the blue standoffs, as shown in Figure 5, and solder them both. Adjust the T Match length to the dimensions shown in Figure 4. Once the bars and #12 copper wires are set properly, you can solder the T Match bars as well. This will complete the assembly of your DSFO222-10. The construction employed in this antenna will provide many years of consistent performance with no degradation of performance due to corrosion and weathering.



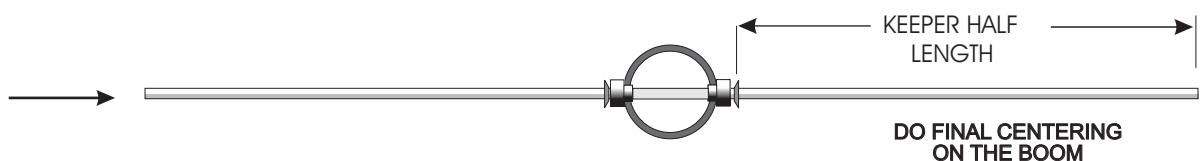
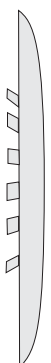
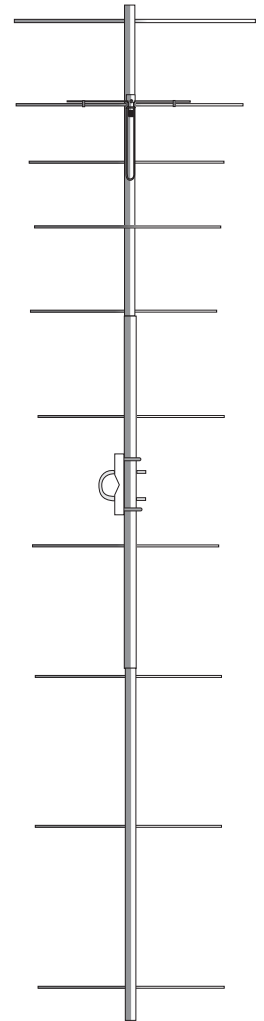
DRIVEN ELEMENT SIDE VIEW

FIGURE 5.

You are now ready to install your antenna. Install the 3x5" boom to mast plate at the balance point between directors 4 & 5. Use the 1 3/8" dia. U-bolts to fasten the boom to the plate. The large 2" u-bolts attach to your vertical mast. Once installed and the antenna mounted on your support mast and tightened, you can route your feedline along the mast and over to the driven element and connector. Dress the coax against the antenna boom and tighten the connector. Seal the connector body with several layers of good grade vinyl tape. Then apply a layer of butyl rubber antenna sealer or RTV over the tape. This will provide a good vapor barrier and ensure years of trouble free performance. It is also a good idea to spray the driven element and connector assembly with a clear spray such as Rustoleum Clearseal or Krylon clear spray. This will enhance the vapor barrier and prevent oxidation of the brass and copper components.

TABLE 1

ELEMENT DESCRIPTION	EL	LENGTH	KEEPER 1/2 LENGTH	
	In.	mm.	In.	mm
REFLECTOR	26.732	679	12.598	320
DRIVEN ELEMENT	26.250	666.7	12.360	314
DIRECTOR #1	24.646	626	11.555	293.5
DIRECTOR #2	24.055	611	11.300	287
DIRECTOR #3	23.504	597	10.984	279
DIRECTOR #4	23.268	591	10.827	275
DIRECTOR #5	23.031	585	10.709	272
DIRECTOR #6	22.835	580	10.630	270
DIRECTOR #7	22.677	576	10.551	268
DIRECTOR #8	22.520	572	10.512	267



Elements should be centered to within +/- 1/8th of an inch (3 mm max)

FIGURE 6.  
KEEPER DETAIL Note direction of travel!