

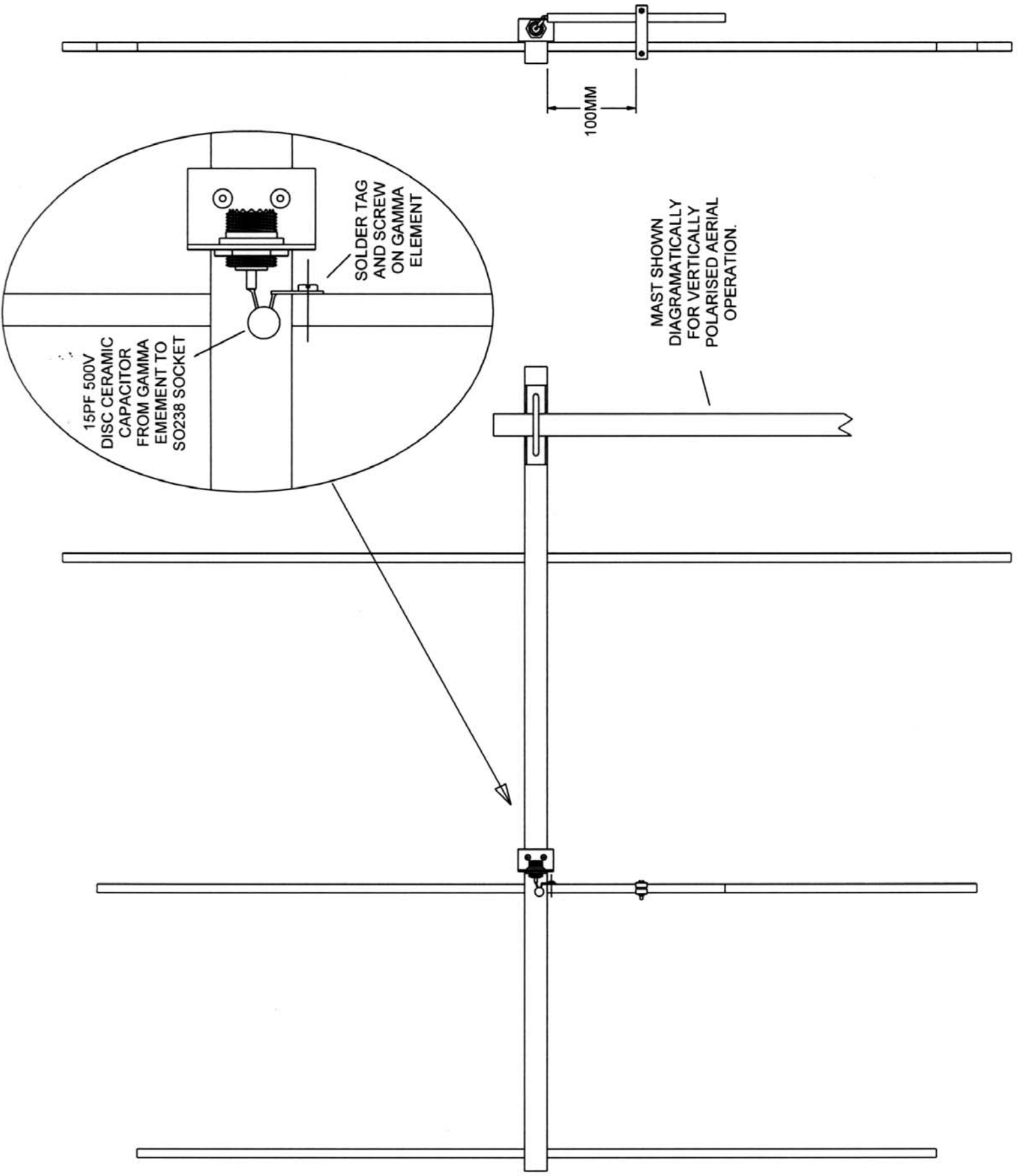
ASSEMBLY INSTRUCTIONS FOR THE VK5JST/AHARS THREE ELEMENT YAGI

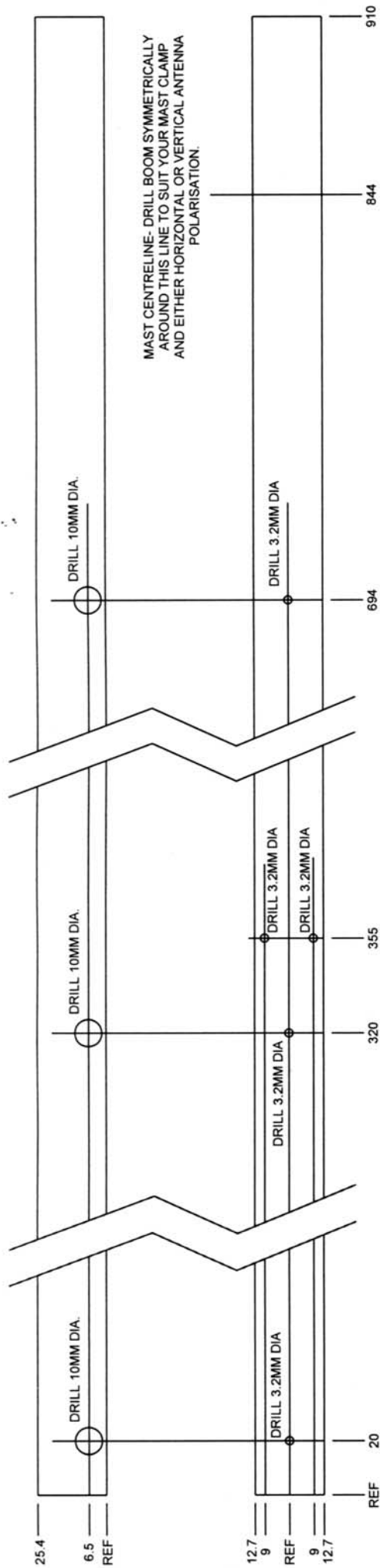
For this Yagi to perform correctly and deliver an SWR of less than 1.5 across the 2 meter band, it must be assembled accurately with all elements except the gamma match carefully centred. Note that the antenna can be used in either a vertically or horizontally polarised manner, and that with suitable phasing interconnections, several units can be fashioned into a highly effective phased array. Also note that when the antenna is mounted, the SWR will only remain unchanged if the mast is positioned at least 150mm behind the reflector. Placing the mast within the element structure will affect the SWR, particularly if the antenna is used in the vertically polarized mode.

The antenna specifications are 6.5dbd forward gain, a front to back ratio exceeding 25db, a 50 ohm feed impedance, and an SWR of less than 1.5 from 144 – 148 MHz. All aluminium used in the unit is grade 6060, which is very weather resistant.

ASSEMBLY

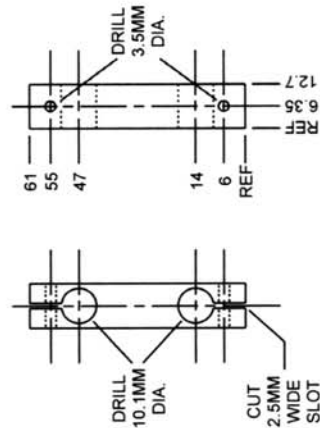
1. Position each element in the boom as shown in the accompanying drawing. Starting with the reflector (the longest element at the rear of the boom), carefully centralise this element with an accuracy of better than 1mm on either side of the boom. Drill through one side of the reflector tube with a 3.2mm dia or 1/8inch dia. drill using the hole in the boom as a guide. Pop rivet the reflector into final position.
2. Working towards the front of the boom, repeat 1. for the driven element and director.
3. Study the main drawings and photo to see which way the L-shaped mounting bracket should face on the boom. Pop rivet this bracket into position on the boom using one of the holes in the bracket and the hole provided in the boom. Now, squarely position the mounting bracket on the boom using the pop rivet as a hinge, and drill the second hole in the boom using the second hole in the mounting bracket as a guide. Pop rivet the mounting bracket into final position (this method gets rid of problems with tolerances in the mounting hole positions). Mount the SO238 connector.
4. Assemble the gamma match clamp. Two 25mm long 3mm dia screws together with spring washers and nuts are required. Place the gamma match element (200mm long) into one side of this clamp and slide the assembly along the driven element until the inside of the gamma match clamp is exactly 100mm from the side of the boom. Tighten the appropriate screw to lock the gamma match clamp on to the driven element. Now slide the gamma match element toward the boom through the gamma match clamp until the end of the element lies parallel with the side of the boom. Tighten the other screw in the gamma match clamp.
5. To finish the Yagi, solder three 4.7pf 500volt disc ceramic capacitors in parallel between the solder tag provided on the gamma match element and the central connection of the SO238 socket.
6. Test your Yagi to ensure that the SWR remains below 1.5 from 144 – 148 MHz
7. When mounting the Yagi on to its mast, note that the holes in the mounting clamp are very much larger than the diameter of the retaining U bolt. In order that the Yagi does not visibly sag downwards on the mast due to the tolerance in these mounting holes, drill and pop rivet the body of the mounting clamp to the boom so that it sits squarely. The electrical connections to the antenna should be carefully sealed with self amalgamating tape or similar so they are waterproof





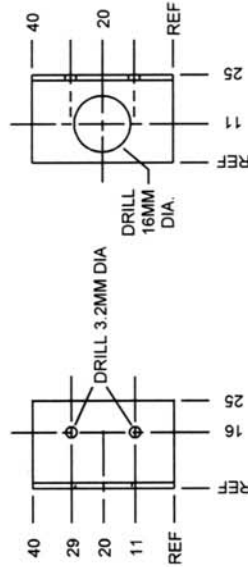
BOOM DETAILS

MATERIAL: 910MM LENGTH OF HOLLOW 25.4 MM SQUARE ALUMINIUM TUBE -1.22MM WALL THICKNESS- 6060 T5 ALLOY
SMART ALUMINIUM PART NO. HS252512- CUTTING TOLERANCE +/- 1MM



GAMMA MATCH CLAMP

MATERIAL- 12.7MM SQUARE ALUMINIUM TUBE
6060 T5 ALLOY, WALL THICKNESS 1.55MM
SMART ALUMINIUM PART NUMBER HS121215
CUTTING TOLERANCE +/- 1MM



SO239 SOCKET SUPPORT BRACKET

MATERIAL- 25MM ALUMINIUM ANGLE
6060 T5 ALLOY- WALL THICKNESS 1.6MM
SMART ALUMINIUM PART NO. A252516
CUTTING TOLERANCE +/- 1MM

ELEMENT MATERIAL- 10MM DIAMETER TUBE
1.2MM WALL THICKNESS- 6060 T5 ALLOY
SMART ALUMINIUM PART NO. TU1012E

ELEMENT LENGTHS
DIRECTOR- 900 +/- 1MM
DRIVEN ELEMENT- 992 +/- 1MM
REFLECTOR- 1070 +/- 1MM
GAMMA ELEMENT- 200 +/- 1MM

FEED IMPEDANCE- 50 OHM
SWR- BETTER THAN 1.5:1 FROM 144 TO 148MHZ
FORWARD GAIN- APPROX 6.5 dbd
FRONT TO BACK RATIO- BETTER THAN 25db
DRAWN 10/04/2008 VK5JST

