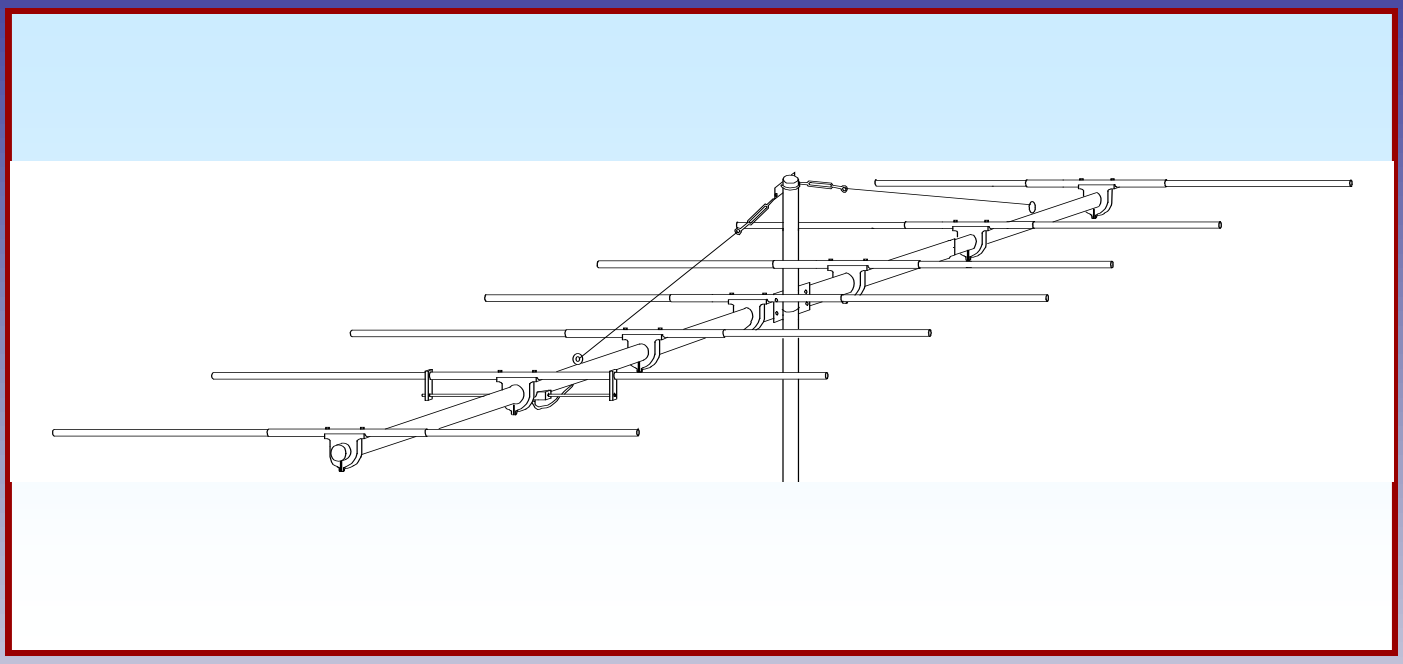
# M2 Antenna Systems, Inc.
# Model No: 41.5-7 YAGI ANTENNA



## SPECIFICATIONS:

| | |
|---|---|
| Model | 41.5-7 |
| Frequency Range | 41.0 To 41.5 MHz |
| *Gain | 10.0 To 10.7 dBi |
| Front to back | 20 dB over the rear 180° |
| Beamwidth | E=44° H=50° typical |
| Feed type | “T” Match, bal. 200 Ohms |
| Feed Impedance / Connect. | 50 Ohms / “N” Connector |
| Maximum VSWR | 1.5:1 |
| Balun Type | 4:1 Coaxial halfwave |
| Power Handling | 1 kW continuous |
| Boom Length / Dia | 31 ft. / 2.5” mid |
| Maximum Element Length /Dia | 147” / 0.875 mid |
| Turning Radius: | 17.5 ft. or less |
| Mounting | U-bolts for 2” O.D. mast |
| Weight | 34 Lbs. |
| Wind area / Survival | 5 Sq. Ft. / 125 MPH |
| Weight / Ship Wt. | 3 Lbs. / 4 Lbs. |

***Subtract 2.14 from dBi for dBd**

## FEATURES:

The model 41.5-7 Yagi has been specifically designed for ONE MHz bandwidth segments between 40 and 50 MHz. We have several models that split the band like model 47-7 for instance which covers 46.5 to 47.5 MHz. Each antenna produces excellent gain and good match across it’s one MHz bandwidth. The computer aided design produces a clean pattern improving signal to noise ratio and wasting less transmit power. High grade, low corrosion aluminum (6063-T832) is used for both elements and boom and comes standard with no finish. For seaside or corrosive environments, optional alodined, anodized or powder painted finishes are available. Elements mount on CNC machined 6061-T6 aluminum ring clamps and stainless steel hardware is used throughout the assembly. All the elements are grounded to the boom for lightning and static protection. A broadband 'T' match and 4:1 balun couple energy efficiently to and from the antenna. The matching system handles 1 KW continuous transmit power. Higher power models using ‘HN’ and ‘DIN’ connectors are available and will handle up to 10 kW.

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**Rev.01**

# 41.5-7 YAGI ANTENNA ASSEMBLY MANUAL

**TYPICAL TOOLS REQUIRED: measuring tape, Phillips screwdriver, 5/16", 11/32, 7/16, and 1/2 spin-tite, end wrenches and / or sockets. Heavy duty models may require larger sizes.**

1. Begin by laying out the boom sections in order according to the DIMENSION SHEET. Note the dimensions next to each joint in the boom. These are reference dimensions used to position the ELEMENT RING CLAMPS…prior to assembling the boom.

2. Locate the rear boom section and install the three, 2 inch ring clamps on that section according to the dimension sheet. USE A FLAT BLADE SCREWDRIVER slipped in the slot of the ring clamp to spread it slightly allowing it to slide along the boom. Remove the screwdriver when the clamp is at the proper dimension.

3. Continue installing ring clamps on the individual boom sections, positioning them according to the dimension sheet.

4. Now assemble the boom using the hardware called out on the dimensions sheet. Use 1/4-20 bolts and locknuts and tighten securely.

5. Next mount the 'T' match section using The SINGLE 1/4-20 x 2-1/4" bolt but **don't tighten yet.** The two small connectors for the balun should face the middle of the boom. The ring clamp for the DRIVEN ELEMENT should now be slid right against the access cap on the 'T' match block. Rotate the ring clamp so the grooved side is on the opposite side of the boom from the 'T' block. Tighten the ring clamp just enough to hold it in place until the top part of the element is mounted.

6. Align the rest of the ring clamps with the driven element ring and 'T' match section.

7. Lay out the element pairs according to length, longest (REFLECTOR) to the shortest (FRONT DIRECTOR). Separate the center 7/8" x 30" sleeve sections. The four with the close spaced holes mount on the 2" ring clamps.

8. Starting with the longest element (REFLECTOR) insert one element half into a 'two inch ' sleeve, align the holes and drop a 1/4-20 x 1-3/4" bolt through to hold it in position. Insert the second element half and install the second bolt.

9. Now place this assembly over the rear (REFLECTOR) ring clamp on the boom, add two 1/4-20 locknuts and tighten until no rotation or movement of the inner 3/4" tube can be felt.

10. Now install the DRIVEN ELEMENT in the same manner. Then slide on the 'T' match shorting bars and position them on The 3/8" diameter 'T' sections on each side according to the DIMENSION SHEET. Install the 8-32 x 1-1/4 screw and lock nut through the shorting bar on each side. Align the shorting bars with each other and tighten in position. Add two 8-32 x 1/4" set screws to each side and tighten with the 5/64 Allen wrench provided. Once the whole assembly is straight, then tighten the 'T' match bolt and the ring clamp securely.

11. Continue this assembly procedure until all elements are mounted on the boom. Re check the element spacing according to the dimension sheet and re adjust the positions if necessary. Now carefully **align the elements with the** DRIVEN ELEMENT and tighten each clamp in place.

12. Install the EYEBOLTS **on the element side of the boom** in holes provided near each end of the boom using 5/16" nuts and lock washers and tighten securely. The eyes should be on the ELEMENT SIDE of the boom. Pick up the antenna and find the balance point. Mount the BOOM TO MAST PLATE at or near this point keeping the antenna just slightly FRONT HEAVY to offset the feed line weight (added later). IMPORTANT: If this antenna is **part of a phased array,** then all the mast mounting plates must be **mounted at the same distance from the driven element** to maintain proper phase.

13. Using the 5/16" black Dacron support line, take two loops through an eyebolt, add two half hitches or equivalent knot leaving about 6 to 8 inches of line after the knot. Pull hard on the knot to "SET" it. Repeat this procedure at the other eyebolt. DON'T CUT THE LINE YET!

14. Open each turnbuckle so just one thread appears inside the body. Install the turnbuckle plate on a short temporary mast or stick the turnbuckle U-bolt through the top set of holes in the boom to mast plate. Hook in the turnbuckles, center the line for an equal amount for each turnbuckle and cut the line. NOTE: The line may be sealed with a lighter or torch to prevent fraying. Take two turns through the turnbuckle eye, pull taught and lock in place with three half hitches or equivalent. Repeat for the other turnbuckle.

15. Using black electricians tape, tape each line end tightly back on the taught line. Cut off any ends in excess of 18 inches.

16. Now remove the 2 inch U-bolt and slide or lift the turnbuckle plate up. At about 2 to 3 feet up, the boom will come straight. Final turnbuckle plate positioning and turnbuckle adjustment will be done during installation.

17. Prior to installing the balun, thread the two (2) 3/8-32 gold seal nuts onto the small female connectors on the 'T' match block with the neoprene face out. Next install the balun on the 'T' match block. Tighten the connector nuts gently with 7/16" end wrench. Then run the nut seals up against the connector nuts creating a weather seal. Further gentle tightening of the seal nuts with a 1/2" end wrench may be done if desired. Use of additional weatherizing with COAX -SEAL (TM) or equivalent is OPTIONAL. Add the main feed line providing a 6 to 8 " drip loop before fastening the feed line to the boom with the large cable ties provided.

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# 41.5-7 YAGI ANTENNA ASSEMBLY MANUAL

# 41.5-7 YAGI ANTENNA PARTS & HARDWARE

| DESCRIPTION | QTY |
|---|---|
| BOOM SECTION #1, 2 x .065 x 60.0” | 1 |
| BOOM SECTION #2, 2-1/2 x .065 x 120” SOE | 1 |
| BOOM SECTION #3, 2-1/2 x .065 x 120” SBE | 1 |
| BOOM SECTION #4, 2” x .065 x 71” | 1 |
| BOOM TO MAST PLATE, 6 x .8 x 3/16 ALUMINUM | 1 |
| BOOM SUPPORT LINE, 5/16” x 32’ DACRON | 1 |
| ELEMENT HALVES, 3/4 x (SEE DIMENSION SHEET) | 14 |
| ELEMENT SLEEVES, 7/8 x 30 FOR 2” RING CLAMPS | 4 |
| ELEMENT SLEEVES, 7/8 x 30 FOR 2-1/2” RING CLAMPS | 3 |
| ‘T’ MATCH ASSEMBLY | 1 |
| BALUN, HALFWAVE RG-6U | 1 |
| ASSEMBLY INSTRUCTIONS | 1 |

**PARTS IN A SMALL BOX:**

***HARDWARE PACKAGE #1:***

| | |
|---|---|
| RING CLAMPS, 2” MACHINE ALUMINUM | 4 |
| RING CLAMPS, 2-1/2” MACHINE ALUMINUM | 3 |
| SHORTING BARS, 1/2 x 1 x 4-3/8” MACHINE ALUMINUM | 2 |
| TURNBUCKLE PLATE, 2 x 5 x 3/16” ALUMINUM | 1 |

***HARDWARE PACKAGE #2:***

| | |
|---|---|
| U-BOLT AND CRADLE 2” | 3 |
| U-BOLT AND CRADLE 2-1/2” | 2 |

***HARDWARE PACKAGE #3:***

| | |
|---|---|
| TURNBUCKLES, 5/16” STAINLESS | 2 |
| EYE BOLTS, 5/16 x 4” STAINLESS | 2 |

***HARDWARE PACKAGE #4:***

| | |
|---|---|
| NUTS, 5/16-18” STAINLESS | 12 |
| LOCKWASHER, 5/15 SPLIT RING STAINLESS | 12 |
| BOLT, 1/4-20 x 3” STAINLESS | 2 |
| BOLT, 1/4-20 x 2-3/4” STAINLESS | 4 |
| BOLT, 1/4-20 x 2-1/4” STAINLESS | 1 |
| BOLT, 1/4-20 x 1-3/4” STAINLESS | 14 |
| BOLT, 1/4-20 x 1” STAINLESS | 7 |
| NUT, LOCKING, 1/4-20 STAINLESS | 27 |
| SCREW, 8-32 x 1-1/4” PAN HEAD STAINLESS | 2 |
| SET SCREW, 8-32 x 1/4” INT HEX STAINLESS | 4 |
| NUT, LOCKING, 8-32 STAINLESS | 2 |
| ALLEN WRENCH, 5/64” | 1 |
| CABLE TIES, LARGE 11” | 5 |
| NUT SEALS | 2 |