Free Radiate Manual

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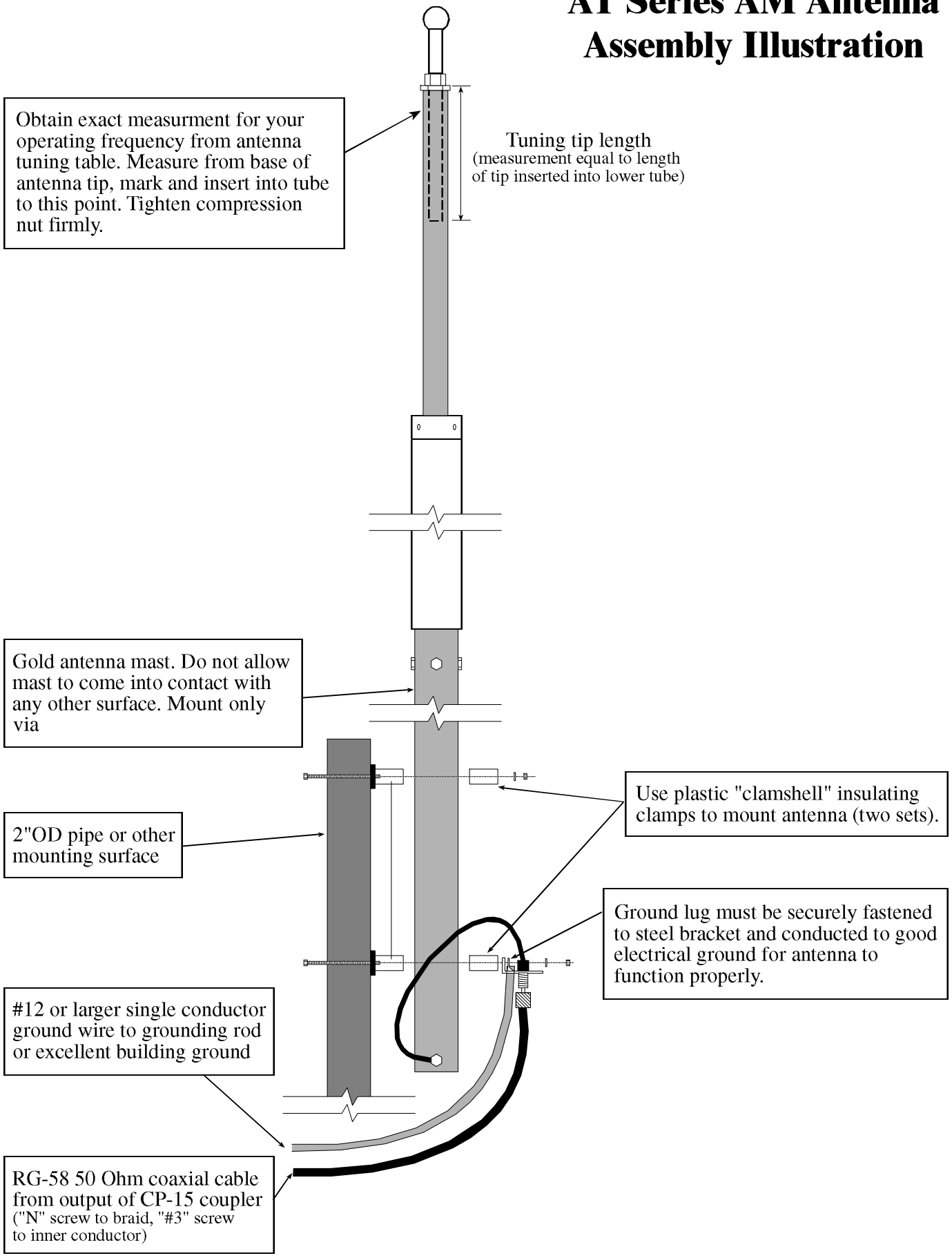
AT Series AM Antenna Assembly Illustration



INSTALLATION INSTRUCTIONS FOR RADIO SYSTEMS AT-xx AM ANTENNA SYSTEMS

NOTE: *These installation instructions must be followed carefully. Once installed, the antenna and transmitter must comply with FCC Part 15 rules, specifically Parts 15.221 and 15.209. Measurements which confirm compliance must be recorded, and a copy must be retained at the studio.*

Please contact a communications consultant or SBE-certified engineer if you are unsure of the FCC rules and/or the procedure for taking field strength readings.

Radio Systems assumes no liability or responsibility for the installation or legality of this system. It is the responsibility of the purchaser to assure compliance.

SUPPLIED COMPONENTS:

1 Low Power AM Transmitter
1 Low Power Antenna tuning unit/coupling unit
1 Radio Systems AT-xx Antenna
1 Radio Systems Antenna Harness
1 Set 1.5" insulated mounts w/hardware
1 Radio Systems Antenna Mast
125' RG-58U Cable

REQUIRED TOOLS:

1 Set Open End/Box Wrenches
2 Pair Pliers
1 Pair Heavy-duty wire cutters
1 1/8" Allen (hex) wrench
1 3/8" Drill
1 1/4" Wood Drill Bit
1 1/4" Masonry Drill Bit
1 1/2" Masonry Drill Bit
1 Pair Wire Strippers
1 Pair Fork Terminal Crimper
2 Rolls Weatherproof Electrical Tape
1 Felt tip pen
1 6' Wooden Ladder
1 Tube silicone sealant or equivalent

INSTALLATION PROCEDURE:

Pre-assembly preparation:

1. Bring all tools and components to the installation location and carefully open any boxes. Neatly arrange all components 10 feet from the desired center of the installation. This will make the installation significantly easier.

2. Unpack the antenna and mast.

3. Install the roof mount according to the manufacturer's instructions.

Antenna Assembly:

4. Unpack the antenna. There will be a small bag of hardware in one of the tubes. Don't lose this hardware!

5. Assemble the base and coil together where the bolt holes are located using the three bolts supplied with the antenna.

6. Loosen the compression nut where the mid tip meets the tip (this will be the large nut just below the white ball at the very top of the antenna). The tuning tip will now be 'free'. Insert the tuning tip into the body of the antenna to the length specified in the guide *"AT Antenna Tuning Table."* Tighten compression nut with two wrenches.

7. Attach the antenna to the mast with the 1.5" insulated mounts. The mounts 'sandwich' the bottom of the antenna between the two halves. Use the supplied hardware to tighten the mounts to the mast. Approximately 3" of the antenna base tube should be *below* the lower plastic mount. Make sure to install the Antenna Harness to the lower 1.5" insulated mount. See the installation drawing for details. **Do not let the gold-colored antenna base (or any part of the antenna) come in contact with anything other than the antenna mounts!**

8. Install the mast in either the side or roof mount. Secure the mast to the mount carefully.

9. Cut the RG-58 cable approximately 20' longer than you expect to use. If you prefer, you may opt not to cut the cable; in this case, simply coil any excess. This will not affect the performance of the antenna.

10. Tightly screw the RG-58 cable with the PL-259 connector to the mating SO-239 (UHF) connector on the Antenna Harness at the antenna.

11. If using a ground rod, install a #10 copper wire between the Connector Plate and the rod. Use a hose clamp to secure the ground wire to the rod.

12. Tape or clamp the loose cable to the side or mast mount to prevent separation.

13. Run the opposite end of the cable to the transmitter/coupler site. If this requires drilling into a wall or hatchway, be certain to seal the hole with silicone sealant. DO NOT DRILL HOLES IN ROOFS!

14. Mount the transmitter and coupler. DO NOT PLUG THE TRANSMITTER IN.

15. Install fork terminals to the center conductor and braid of the cable. Be careful that the two conductors do not touch each other.

16. Install the **braid's** fork terminal to the coupler screw terminal marked "N"

17. Install the **center conductor's** fork terminal to the coupler screw terminal marked "3".

18. Connect a coaxial patch cord between the transmitter and coupler.

19. RECHECK ALL CONNECTIONS AT THE ANTENNA AND COUPLER! Be sure that there are no shorts or exposed wires.

20. Turn the transmitter on, and follow the match procedure as outlined on the lid of the coupler or ATU. You **must** obtain a good match. If you cannot obtain a good match, adjust the tip of the antenna by loosening the compression fitting at the top of the antenna and moving the tip 1/8" **UP**. Note the new reading on the coupler.

21. If the reading is lower, continue to adjust the tip upward until you achieve the lowest possible reading. If the reading is higher, adjust the tip 1/8" **DOWN**. Repeat the above procedure until you obtain a satisfactory reading.

22. If you cannot achieve an acceptable reading, **STOP!** Contact Radio Systems for further instructions.

23. Once the match is obtained, return the coupler/ATU to the OPERATE position.

24. Measure the signal strength at 30 meters for the edge of the property. Adjust the transmitter power output up or down so that you comply with FCC Part 15.209.

NOTE: The allowed field strength is 24000/F(kHz), in micro volts. Therefore, if your operating frequency is 650 kHz, the allowed signal strength would be 24000/650 micro volts, or 36.923 micro volts.

"AT" Series Antenna Tuning Table

NOTE: The lengths below are the amount of the antenna tip to be INSERTED into the tube. Measure this length from the bottom (flat end opposite the ball) and mark. Then, insert into the tube to this mark and tighten nut.

Model AT-53 530 kHz to 640 kHz

530	14-5/16"
540	24-7/16"
550	32-5/8"
560	30-5/8"
580	56-1/4"
590	63-7/16"
600	69-13/16"
610	76-1/4"
620	81-1/2"
630	78-1/2"
640	93-1/4"

Model AT-65 650 kHz to 730 kHz

650	22-3/8"
660	27-1/4"
670	32-13/16"
680	38"
690	42-13/16"
700	47-16/16"
710	55-3/4"
730	59-15/16"

Model AT-74 740 kHz to 900 kHz

740	1-5/8"
750	7″
760	12-3/8″
770	16-5/16″
780	21-1/2"
790	26-9/16"
800	27-5/8"
810	36-3/16″
820	40-1/4"
830	43"
840	47-1/8"
870	52"
880	57-5/8"
890	64-1/8"
900	67-3/8"

Model AT-91 910 kHz to 1020 kHz

910	34-5/8"
920	37-3/8"
950	48-1/4″
960	51-1/16″
970	53-7/8″
980	57″
990	59-5/8"
1010	64-1/4″
1020	67-1/8"

Model AT-103 1030 kHz to 1220 kHz

1030	2-9/16″
1040	6-13/16″
1050	11-1/2″
1060	14-15/16″
1070	23-1/2"
1080	26-1/16"
1110	30-5/8″
1160	43-9/16"
1170	45-9/16"
1180	45-3/16"
1200	51-5/8"
1210	53-1/2"
1220	55-1/2"

Model AT-123 1230 kHz to 1390 kHz

1230	15-9/16"
1250	19-9/16"
1270	24-9/16"
1280	27-7/16″
1290	28-1/16"
1300	30-1/16"
1310	32″
1320	33-5/16"
1350	38-15/16″
1380	43-5/16"
1390	44-9/16"

Model AT-140 1400 kHz to 1610 kHz

1400	1-3/16"
1410	2-5/8"
1420	3-11/16"
1430	4-3/4"
1440	5-3/4"
1450	6-11/16"
1460	7-5/8"
1470	8-11/16"
1480	9-9/16"
1490	10-1/2"
1500	11-7/8"
1510	12-3/16"
1520	13-1/8"
1530	14"
1540	14-15/16"
1550	15-11/16"
1560	16-7/16"
1570	17-5/16"
1580	18"
1590	18-3/4"
1600	19-9/16"
1610	20-3/8"

Model AT-162 1620 kHz to 1710 kHz

1620	7-13/16"
1630	8-11/16"
1640	9″
1650	9-9/16″
1660	10-15/16"
1670	11"
1680	11-3/4″
1690	12-1/2″
1700	13-1/4″
1710	13-11/16″

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