

Repair and Restore Your Mosley Beam

Refurbish one of these popular Yagi antennas.

Dick Sander, K5QY

Mosley beam traps and tuning are stable and consistent, making them very repairable. I've owned several Mosley Classic 33 and PRO 57B Yagis, and I've even converted an obsolete PRO 77 into a Classic 36. Once you understand their construction, you can easily test and repair them.

Mosley has been great with support and installation instructions. All Mosley parts can be purchased, but most traps can be repaired for minimal cost, making them an inexpensive beam antenna for ARRL Field Day or for your home. Mosley uses two resonant LC traps inside a 2-inch diameter by 12-inch-long tube. The capacitance between the coils and the tubing forms the C in the resonant LC trap. Figure 1 shows a cutaway view of the 12-inch tube containing a 10 meter and a 15 meter trap.

Checking, Measuring, and Repairing Traps

Traps for each frequency consist of a different number of turns, as listed in the assembly manual. You can check traps without disassembling them. First, use an ohmmeter to check continuity (near zero resistance) between the 2-inch tube and its adjacent element. Then use an LC meter (I use the L/C Meter IIB, connected as shown in Figure 2) to accurately measure the trap inductance. Table 1 lists the various inductances versus number of turns for the traps.

Remove the black weather caps, then remove the flathead screws that retain the



Figure 1 — Cutaway view shows a two-coil trap. The coils and tube capacitance form a resonant circuit, and the 2-inch outer tube is part of an element (usually for 15 meters).



coil. On stuck traps, I apply WD-40® to each end, and spray some into the drain holes, then wiggle the trap vigorously to remove it. Check each side to see which one removes more easily. After removing one of the traps, use a 1¼-inch O.D. piece of PVC tubing to drive out the stuck spool (see Figure 3). Use contact cleaner to remove the oil and dirt.

After a broken trap (see Figure 4) is removed and cleaned, place the end with the screws (or pop rivets) into a bench vice. I used instant-bond glue to repair broken spools, then used PVC tubing to hammer the spool together. Visually inspect the repaired trap for shorts between windings.

You can rewind a bad coil on an otherwise good spool (see Figure 5). You can also change from one Mosley model to another



Figure 2 — Connect an LC meter as shown to measure the trap inductance.

Table 1
Inductances of the Traps

Number of turns	Left trap, μH	Right trap, μH
14	1.51	1.53
15	1.62	1.66
16½	1.76	1.74
23	2.51	2.50
25	2.78	2.76
26	2.90	2.94

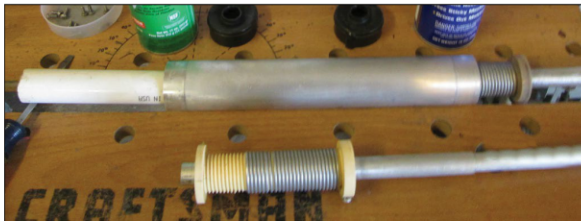


Figure 3 — Drive out a stuck trap by using PVC tubing (left) as a driver. Two black end caps can be seen above the trap.

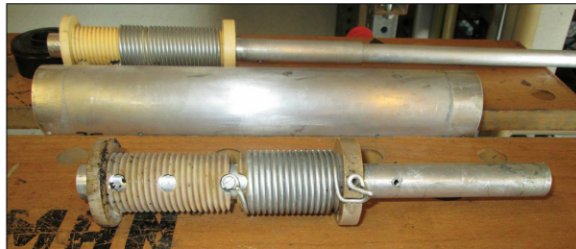


Figure 4 — A broken spool (foreground).



Figure 5 — A coil spool with new windings.

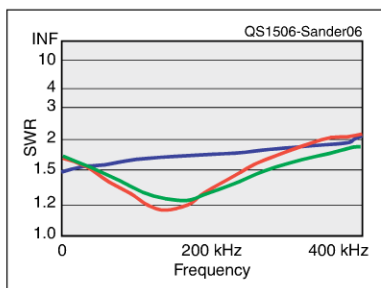


Figure 6 — VSWR measurement of the Yagi. Frequency is relative to the lower band edge of the 20 meter (red), 15 meter (green), and 10 meter (blue) bands.

sembly manual for proper dimensions, then reinstall the boom and elements. Double-check the traps and ensure that they are installed on the correct elements.

Results

The lead photo shows the Classic 36 that I converted from a discarded PRO 77 antenna. I hung it from a ladder to find the best balancing point. The Classic series incorporates a capacitive feed system that uses 87-inch-long #14 AWG wire in each leg of the driven element. I use the center conductor from RG-213 coax. The manual shows you how to tune your refurbished

antenna. After reassembly, I tested the performance with a nearby ham and front-to-back was typically 2 S-units. Figure 6 shows the VSWR for each band.

It's a lot of work to repair or convert a beam. It's my hope that details in this article give you the confidence to take on a major restoration project.

All photos by the author.

ARRL life member Dick Sander, K5QY, was first licensed in 1958. He holds an AAS degree in Industrial Electronics and a BA degree in Business. Dick retired from Rockwell/Alcatel Telecom after 25 years as a senior technical writer. He is listed on the DXCC #1 Honor Roll and earned 7B-DXCC and WAS while mobile. Dick is also an ARRL DXCC card checker. He models, designs, and builds antennas from 160 meter phased verticals to 440 MHz Yagis. You can reach him at 110 Starlite Drive, Murphy, TX 75094 and k5qy1@verizon.net or visit his website at www.k5qy.net.

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by rewinding traps to match the new model. When I converted an older PRO 77 to a Classic 36, I did it by rewinding two traps.

I had difficulty keeping the turns from touching when using #12 AWG solid copper wire, so I substituted #14 AWG wire, with good results. Older traps used a slot head screw to secure the coil, newer spools use a pop rivet. Drill out the pop rivet and replace it with a #6 metal screw. Wrap two turns of Teflon® tape to protect the coil from shorting between the turns and the screw.

I use all-new stainless steel hardware where old hardware is missing or damaged. Completely disassemble all of the tubing and use a fine sanding block to polish every element and component. Consult the as-

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Adventure Tuner Kit from SOTABEAMS

The Adventure Tuner kit from SOTABEAMS is designed to be an easy-to-build bi-directional L network giving a wide range of matching options from 3.5 to 30 MHz. Power rating is 20 W maximum, 10 W continuous. The kit includes a laser cut and engraved front panel. Full instructions and photographs are available for download. A built and tested version is also available. Price: kit, about \$51; assembled, about \$83 (without tax for US/Canada). For more information and ordering details, visit www.sotabeams.co.uk.

