

# Adding springs to the Yaesu ATAS-120a.

Wiley Clarkson WA5OTR

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The following instructions and photos tell how to modify a Yaesu ATAS-120a Screwdriver Antenna to accept a small spring between the whip and the top of the main coil. They also describe how to modify a Hustler base spring for use with the ATAS-120a or any antenna that requires a UHF mount. Neither spring will effect the auto tuning of the antenna and it gives some flexibility as it makes it easier to change out the whip sections or to connect a long wire to the coil in place of the whip. So far, my experience with the ATAS-120 after the spring modifications has been all good. Before the springs mods, I had started to think that my ATAS-120a would be like numerous other commercially available Amateur antennas that just are not constructed to survive the harsh environment of my part of Texas. Yaesu seems to have cured the main complaint of water leakage in the older ATAS-120 with the installation of a weather boot on the top of the antenna coil. However, the modification I describe here, IMO, will increase the water resistance of the boot by making a compression of the boot where the spring attaches to the coil.

There are several problems with the ATAS-120a that are remedied by the following mods. Unfortunately, Yaesu either has not considered fixing them or has no desire to fix them. The first is the flexibility of the whip they include with the coil. It is thin and made of unusually soft stainless steel. This gives it a tendency to bend easily and stay bent, especially at 70MPH highway speed. The whip would bend backwards just above the coil or it would take a fairly symmetric bend from the force of the continuous wind. I found that the whip could easily be straightened without tools but it would soon bend again. The second problem I found was that the main coil was extremely rigid and was in constant danger of being broken by a tree limb when mounted high on the vehicle. The third problem that I found was the tendency for the available UHF mounts to come loose from the mount because of the rigidity of the antenna and the weight of the antenna. The two combined produced a lot of twist on the mount when driving down the road. The base rigidity and shock absorption was cured by modifying a Hustler stainless steel spring and installing it at the base of the antenna.

The top whip spring that I chose is a readily available small spring that was manufactured for many years by Antenna Specialists for their CB and commercial antennas. The Antenna Specialists K-126 Standard Replacement Spring is small, strong, and has a ¼" threaded stud on one end and a whip adapter to ¼" x 20 threaded hole on the other. I would have used an Antennex spring but their mounting stud is a step larger and would have required a larger hole than I was willing to drill and tap the first time I tried this mod. I did use an extra Antennex whip that I had and cut it to the same length as the Yaesu whip minus the length of the spring. An Antenna Specialist whip is also a high quality whip that will work well for this mod. The A/S spring has been copied by many other manufacturers for similar CB and commercial mobile antenna designs and should be readily available at many garage sales and hamfests.

If you decide to make the top whip spring modification, you do so at your own risk! If you are unsure of your abilities with tools, don't attempt the modification. Find someone who you trust and you know has the required talent with tools. This mod has worked very well for me, but I must add that I take no responsibility for how it will work for you. Remember, you are modifying a \$300.00 antenna and the warranty could be voided by the mod. In my case, the possible loss of warranty was more than outweighed by the better survivability of the antenna in my rural environment.

# Top Whip Spring

Shown below is the completed modification



1. Photos of the Antennex whip (top) and Yaesu whip cut to the same length. Note the bend in the Yaesu whip. That was from driving 25 miles to work and back.



2. To disassemble the coil. Remove the rain cap and the two set screws



3. Then slide the outer weather cover off the top of the coil



4. The Antenna Specialists spring assembly with hardware from my junk box. This spring is available from Antenna Specialists dealers as the K-126 replacement spring. I had several in my junk box.



5. Enlarging the hole. When drilling out the center of the whip holder, be sure to secure the upper coil section to prevent rotary flex by the drill. Use a #7 drill bit. This is the recommended size bit for the 1/4x20 thread. A tap/bit combination can be purchased at Home Depot for about \$6.00. Be careful when drilling not to go too deep. I went only to below the set screw openings.





6. After drilling the hole, carefully tap the hole with a 1/4 x 20 SAE thread. I would personally recommend cutting only three or four threads at a time the backing out several turns to help clear the hole before cutting more threads.



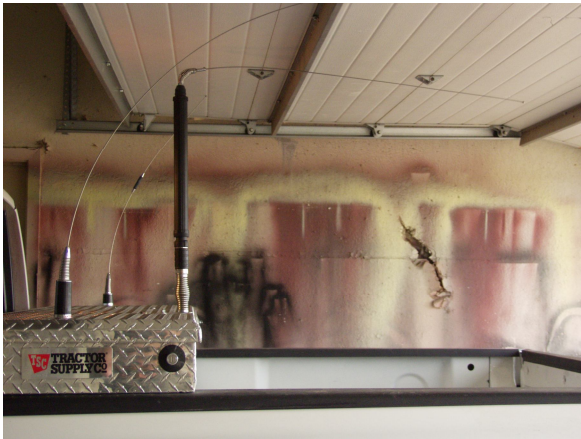
7. Install the stud 1/4 x 20 stud into the antenna coil before replacing the coil outer cover and weather boot.



8. Slide the cover over the coil top section over the coil, install the set screws, and cut the nipple off the rubber rain boot with a razor blade. The final step is to screw the spring on the thread and tighten.



9. The following photos showing why the whip spring and base spring are so badly needed on the ATAS-120A.



# The Base Spring Project



The base spring for the ATAS-120 (or any other UHF antenna for that matter) took some experimentation. The ATAS-120a uses the ground connection of the UHF connection for control voltages. The other problem was the weight of the antenna. After numerous attempts to find a spring that would keep my ATAS-120a vertical in the collapsed position while driving 70 MPH, I chose a stainless steel spring sold by Hustler in the \$15.00 to \$20.00 range. The actual modification of the spring is not difficult if you have the proper tools, some of which are difficult to find and are quite costly when purchased by special order from your local hardware store. I found the best supply source was a company on the web at <http://www.use-enco.com>. They had the best prices on drill bits and taps and dies. You will need two sizes of taps, the correct size drill bit for each, and preferably a drill press with a vice. The following steps are for constructing a base spring.

1. Using a 5/16" bit, drill out the mounting ends of the spring. This will give two holes that RG-58a/u can be pushed through. Be careful not to damage the threads in one end of the spring as the spring will mount using a 3/8"x 24 bolt or 3/8" deep hole NMO mount. It will also disconnect the inner spring braid from the spring ends.
2. Once both ends have been drilled out to a 5/16" hole, mount the spring tightly and use a drill bit size that is recommended for a 5/8"x24 tap. A 9/16" will work but it is a little small and makes



the tap work really hard to cut the threads and hole out to the 5/8" size.

3. Remove the inner braid wire that was inside the spring and empty out any shavings.
4. Tap the large hole to a 5/8x24.
5. Using hot melt glue, glue the center part of a standard PL-259 onto a PL-258 (double female barrel connector). Be sure to have RG-58A/U pig tailed out of the PL-259. The threads on the PL259 that the mounting ring screws over to attach the connector to a PL258 are 5/8x24. The outer part of the PL-259 is not needed.
6. Feed the coax pigtail through the large hole, then through the 5/16" hole on the other end, then carefully screw the combined PL-258/259 down into the threaded 5/8 x 24 hole until the lower set of threads on the PL-258 is just about even with the top of the spring.
7. If you feel that you need to lock the combined connectors into the hole, you can drill a 1/4" hole across the spring end and tap it for a set screw, or you can use a bulk head connector nut on the top of the spring connector to hold it in place. If you use a set screw, screw the connector assembly into the spring far enough that the set screw goes against the unthreaded part of the PL-258. I found that once the antenna is screwed onto the UHF connector on the spring, it will lock the connector in place without a set screw. I have tried it all three ways!
8. There are two ways to mount the spring. I tried both and prefer the second, but you almost need a drill press to accurately drill out the center of the bolt. It's difficult to do with just a hand drill. I tried! If you have had problems with your UHF antenna mount coming loose with the ATAS-120 mounted on it, these two methods of mounting should cure the problem. I haven't had a mount loosen up since I quit using the commercial uhf mountings.

- a. Remove the center insulator from an NMO 3/8" deep hole mount. Push the NMO mount through the 3/8" hole for the mount, push the coax from the top of the mount through the mount, and then carefully screw the spring onto the mount.



- b. Using a 1" 2/8x24 bolt, drill a 1/4" to 5/16" hole completely through the center of the bolt. Put a 3/8" lock washer and flat washer on the bolt, push it through the body hole, and proceed as above.

