

Tarheel Antennas, Inc.

Instruction Manual for the Model 40A-HP Continuous Coverage HF Antenna

PROUDLY MADE IN THE



UNITED STATES OF AMERICA

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Thank you for purchasing the
Model 40A-HP Tarheel Antenna

Package List for Model 40A-HP

Model 40A-HP Antenna
6 ft. Stainless Steel Whip
Up/Down Switch
20 ft. Control Cable
Matching Coil
Ferrite Core
Fuse Holder & Fuse
1 tube of Dielectric Compound
Manual

Deluxe Package List for Model 40A-HP

All of the above -- plus the following
Small MT-1 Antenna Bracket
Quick Disconnect for the Whip
21 ft. of RG-8X Coax with connectors installed
1 pack of Coax Seal

Model 40A-HP Antenna Specifications

Lower Mast Length -- 16"
Frequency Coverage with 5' whip -- 7.0 to 37 MHz
Power Rating -- 1.5 Kw REP.
Typical SWR -- 1.5 to 1 or less
Total Height with 5' whip at 37 MHz -- 6'4"
Total Height with 5' whip at 7.0 MHz -- 7'0"
Weight 3.7 lbs.

Installation

Before installation of this antenna there are a few things you have to consider. To get peak performance you need to try to mount the antenna in a location where the decoupler (this is where the coil comes out of the antenna) is at least as high as the highest part of the vehicle. Next, and this is the most important is the vehicle ground plane must be close (12" or less) to the base of the antenna, this ground can be provided with ground strap at least 1" wide (small wire does not carry the RF ground well). The best way to provide this RE ground is to use mounts that are bolted directly to the vehicle ground that are unpainted or uncoated to provide the best RF and DC ground path for the antenna. All mounts made by Tarheel Antennas are glass beaded 304 stainless steel. In most cases with these mounts no other grounding is required. Some examples are in pictures 1- 5.



Picture 1 -- Small MT-1

After installation if the SWR will not go below 1.5 on the frequencies above 10 MHz it's because of the ground path mentioned above. Again, ground close to the base is most important with this and any other antenna.

This is a large antenna that will require heavy duty mounts to withstand the pressure produced from the windload. All of the Tarheel Antenna mounts are designed to take this load.

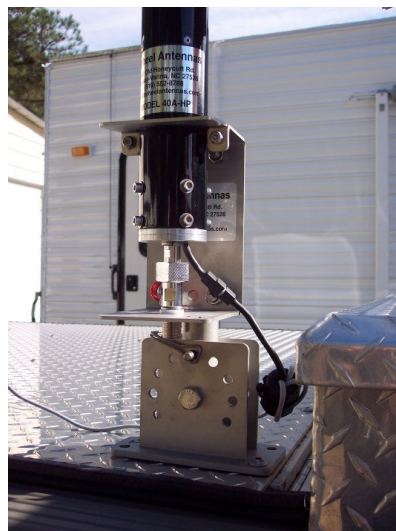
While we have a variety of mounts to lay the antenna down horizontally, it's designed to be mounted vertically. While using these mounts, just make sure the anti-rotation rib that's on the antenna will be at the bottom while in the horizontal position.



Picture 2 -- Beehive Mount



Picture 3 -- SS Door Jam Mount



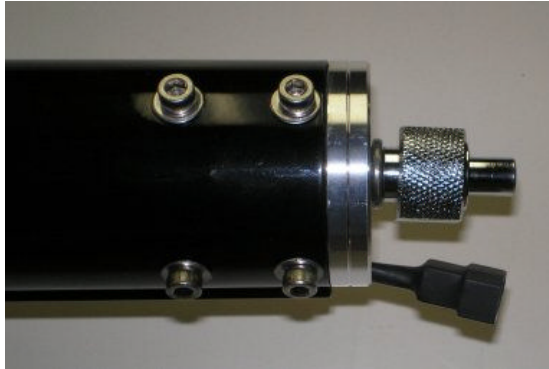
Picture 4 --- MT11S & Small MT-1



Picture 5 -- SS Flat Plate



The MT-1 antenna bracket is designed to make your antenna mounting convenient and incredibly strong. Made to clamp to standard 1" pipe (1.312 OD) or bolted to a flat surface. (Picture 6)



Picture 7

to install the upper half of the quick disconnect in the bottom of the antenna tight (Picture 7). Be sure to use the lockwasher

There are a few steps to make sure you install the MT-1 antenna bracket the way it was intended. First you need

The MT-1 antenna bracket has 6 cutouts for the anti-rotation rib that's on the antenna. Be sure the rib goes into one of these cutouts, there is no need to cut the insulator, it will compress enough to tighten the antenna down. (Picture 8)



Picture 8



Don't forget to tighten down the top half plate and the quick disconnect. (Pictures 9 & 10)



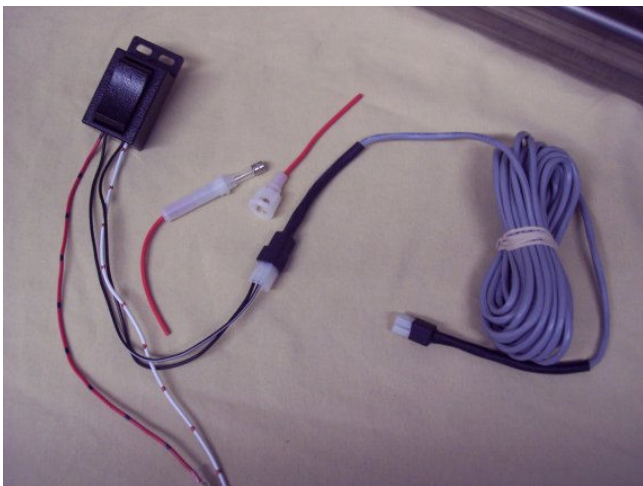
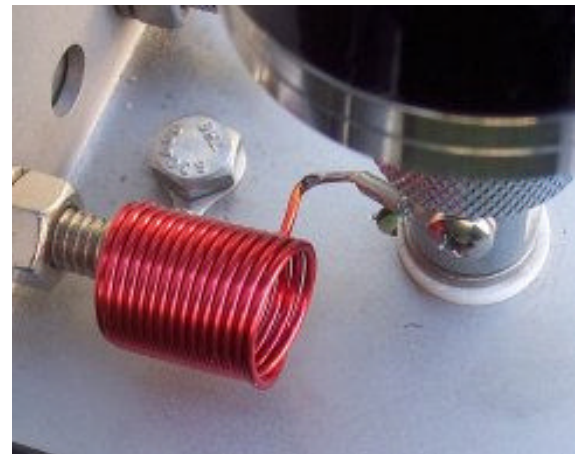
Picture 10

Picture 9



Included with the antenna is a special mix #31 ferrite core that needs to be mounted on the control cable as close to the antenna as possible. Loop the cable through the ferrite core a minimum of 3 times. (Picture 11) It is used to decouple the control cable from the antenna. If you fail to install this ferrite core the control cable acts like a single radial and the antenna will be untunable.

The next thing is the matching coil. This coil must go from the antenna base to the immediate ground. The Small MT-1 antenna bracket provides this connection. On a loaded mobile antenna below 10 MHz some form of impedance matching is required. Pictured is the matching coil on Small MT-1 bracket (Picture 12).



The up/down switch (Picture 13) that comes with the antenna package will plug directly into the control cable to the antenna, then there will be 2 wires left on the switch. One will be white with red dots and one red with black dots. This system is designed for a standard 12vdc system. Keep in mind polarity of these two wires are not important. This switch just reverses polarity for motor movement. With the switch mounted up (wire on bottom) you can wire the red wire

with black stripes to positive side of your 12vdc system, and the white wire with red stripes to the negative side. This will allow the antenna to go up while you press the up button (this is the way most wire up their systems). Up on switch means the antenna is going UP in height and DOWN in frequency. If you prefer that reversed all you have to do is reverse the connections. Be sure you add the fuse to the positive side.

Most installs: Red with black dots -- 12 volt positive
White with red dots 12 volt ground

Now You Need To Install The Top Whip

Whip Length versus Frequency Coverage

32 in. -- 9.0 MHz to 58.0 MHz
4 ft. --8.0 MHz to 49.0 MHz
5 ft. - 7.0 MHz to 37.0 MHz
6 ft. - 6.5 MHz to 32.0 MHz
8 ft. 5.5 MHz to 23.0 MHz
10 ft. - 5.0 MHz to 21.0 MHz
12 ft. -- 4.5 MHz to 19.0 MHz

CH-1- Capacitance Hat

Hat only -- 7.0 MHz to 45.0 MHz
Hat with 3 ft. whip 6.5 MHz to 27.0 MHz
Hat with 6 ft. whip -- 5.3 MHz to 25.0 MHz



Our standard whip is 6 ft. long; it can be cut to any length for the coverage you need. Keep in mind that the longer your whip is the better the performance will be on the lower bands, however you will lose your upper frequencies with the longer whip. As an example, if your main frequencies are 15 meters thru 60 meters then the capacitance hat plus the 6 ft. whip are a powerful combination.

Do not try to twist or turn the bug shield on the outside of the antenna, this is designed not to turn.

Initial Tune Up

For the initial tune up a SWR analyzer is nice to have if you have access to one. If not, make all your adjustments with low power. Now, lower your antenna until it reaches the end stop and go to 10 meters (or your highest frequency depending on whip length) and check your SWR, it should be low. Next, you can go to 15 meters and raise the antenna until you get a SWR dip there. Then 20, then so on.

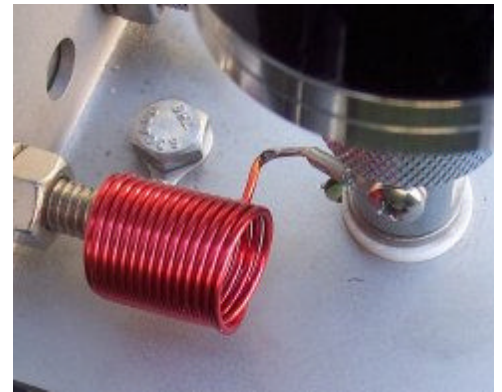
Keep in mind that 10-20 meters are close together. If the SWR doesn't go below 1.5 on these bands the ground is probably too far away, remember the ground needs to be less than 1 foot from the base of the antenna.

IMPORTANT: Don't make any adjustment to the matching coil until you read and understand the next paragraph.

Now you need to go to the middle of 20 meters and check your SWR. Record that and then go to 40 meters and do the same. Your standing wave should be below 1.5 on both bands. If it is below 1.5 on both bands no adjusting is needed on the matching coil. However, if the SWR is above 1.5 on 20 meters and low on 40 meters this means there is too much inductance from the matching coil. This can easily be corrected by simply spreading the matching coil ([Example 7](#)) a very small amount until a low SWR is attained on 20 and 40 meters. If you have spread the coil approximately 1 1/2 inches wide and the SWR has not dropped on 20 meters then there is most likely a ground issue.

However, keep in mind if you had to go to this extreme to tune, your ground path is most likely too far away or you have other antennas too close to this antenna.

If properly installed this antenna will have a standing wave below 1.5 from 7.0 to 30 MHz (coverage depends on whip length). We know that every antenna installation is unique and it is impossible to describe all the scenarios in this manual. However, if you are having problems with this initial tuning please call.



Example 7

NOTE: Don't use the Dielectric Compound or Coax Seal until all testing has been done.

With everything working and your ready to button this system up, then you need to put a small dab of dielectric compound or petroleum jelly (Vaseline) in the molex connector at the antenna and also in the PL259 at the antenna. Wipe off any excess and then seal the molex plug and coax connector with Coax Seal or tape. We've seen this technique used for years on installs in the northern states where a lot of salt is used on the roads in the wintertime and when disassembled they look as clean and shiny as the day they were installed.

Operation

Remember that when the coil is all the way in it's resonant on the high bands and all the way out on the low bands. It will take a little time to get use to this style of antenna, some mark the antenna with tape to mark the approximate location of the bands, some just listen to the noise level increase on the radio's receive when it's close to resonant. When you fine tune you need to transmit a low carrier (AM, FM, CW) at 5 to 10 watts and watch the SWR meter until the dip. There are also several types of controllers on the market; most are good in their on unique way.

Relative Tuning Positions

The following photos will show you relative tuning positions of the Model 40A-HP Tarheel Antenna.



Model 40A-HP -- full down position with 5 ft. whip -- 37.0 MHz



Model 40A-HP -- 28.0 MHz with 5 ft. whip @ 1/2" of coil showing



Model 40A-HP -- 14.2 MHz with 5 ft. whip @ 1/2" of coil showing



Model 40A-HP -- 7.1 MHz with 5 ft. whip @ 5" of coil showing

Maintenance

Very little maintenance is required for your Tarheel Antenna. You should have years of trouble free service from this antenna. You've made a large investment for a mobile antenna. Here is a tip to help take care of your investment.

About once per year or so, depending on how much driving you do and where the antenna is mounted you will need to wash the coil to remove any road grime, no parts to replace. Also a dirty coil will show vertical black streaks. Here's how:

1. Run the antenna up till all the coil is exposed.
2. There are 3 screws in the top Delrin Cap, you'll remove them then slide the Lexan down to expose the coil, next feel the coil, is it sticky? If so it's dirty, now wipe the coil with alcohol, then scrub the coil with a Scotch-Brite pad (available at any hardware store), then one more wipe with alcohol and that's it.
3. Now slide the Lexan back in the cap, don't even try to align the screw holes, it's best to redrill (7/64" drill bit) the Lexan using the cap holes as guides and let the screws make new threads.
4. After you have the antenna reassembled, now is the time for a good cleaning on the outside. Use the alcohol to remove the grime off the tube and Lexan, next get a good coat or two of wax on it.

Warranty & Guarantee

The antenna comes with a one year guarantee for quality and workmanship. If for any reason (other than damage due to negligence, improper use or unauthorized disassembly) your Tarheel Antenna fails to perform due to quality or workmanship Tarheel Antennas will at our discretion either repair or replace at no charge for parts and/or labor. A return authorization number is required before warranty work can be performed. Your antenna needs to be sent in to the manufacturer for any warranty repairs. All shipping charges are your (the customer's) responsibility to and from Tarheel Antennas, Inc.

If for any reason the antenna does not meet the advertised specifications or any other reason you are dissatisfied with the antenna in the first 30 days of receipt of the antenna you may return it for a full refund minus any shipping charges incurred. You must inform Tarheel Antennas, Inc. of your intention to return the antenna prior to shipping. Once Tarheel Antennas, Inc. receives your antenna a refund will be processed within 30 days, only after it has been determined that the antenna has not been altered, mishandled, disassembled or damaged in any way.

Please understand, we will not under any circumstances send out warranty parts, no matter how good of an engineer you are. If your antenna is still under warranty and you insist on doing the repairs yourself, we will be more than happy to sell you the parts.

Please pass along any suggestions you may have to make our company and antennas better. All suggestions are appreciated.

Thanks,
Tarheel Antennas