

# ***Tarheel Antennas, Inc.***

## **Instruction Manual for the Model 400A Continuous Coverage HF Antenna**

PROUDLY MADE IN THE



UNITED STATES OF AMERICA

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# Thank you for purchasing the Model 400A Tarheel Antenna

## Packing List for Model 400A

Model 400A Antenna  
6 ft. Stainless Steel Whip  
Up/Down Switch  
20 ft. Control Cable  
Ferrite Core  
Fuse Holder & Fuse  
1 tube of Dielectric Compound  
Manual

## Packing List for Model 400A Package

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

## Model 400A Antenna Specifications

Lower Mast Length – 4ft.  
Frequency Coverage with 6' whip – 1.7 to 25 MHz  
Power Rating – 250 watts P.E.P.  
Typical SWR – 1.5 to 1 or less  
Total Height with 6' whip at 25 MHz – 10'4"  
Total Height with 6' whip at 1.7 MHz – 12'4"  
Weight – 9.0 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 must be within 12 inches of the base of the antenna. This ground path should be provided with ground strap at least 1/2 inch wide.



Picture 1 – MT-1 & MT-30FB

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 wind load. All of Tarheel Antenna mounts are designed to take this load.

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



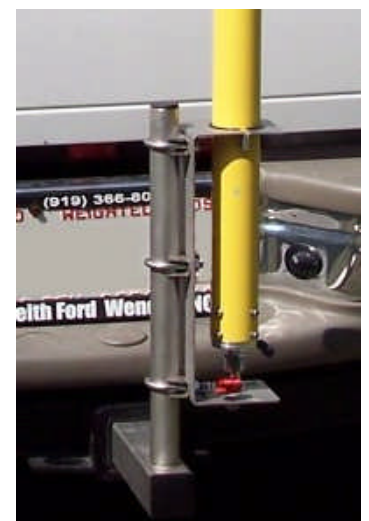
Picture 2 – MT-1 & MT-5



Picture 3 – MT-1 & MT-3FB



Picture 4 – MT-1 & Automatic Lift & Lay



Picture 5 – MT-1 & MT-3

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 6



Picture 7

There are a few steps to make sure you install the MT-1 antenna bracket the way it is intended. First you need to install the upper half of the quick disconnect in the bottom of the antenna tight (Picture 7). Be sure to use the lock washer.

The MT-1 antennas 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



Picture 9

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

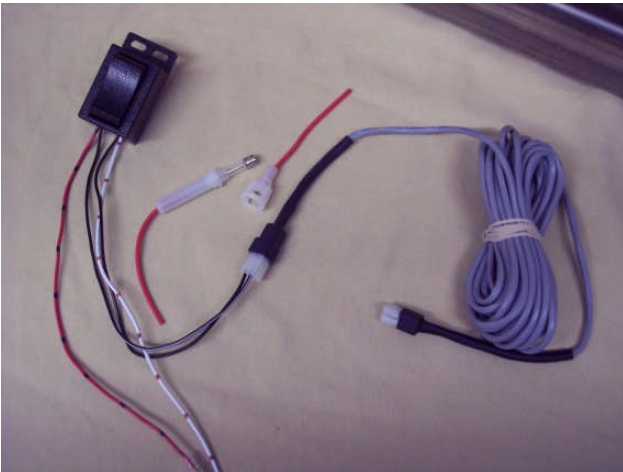


Picture 10



Picture 11

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



Picture 12

The up/down switch (Picture 12) 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. With the switch mounted up (wire to 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 to their systems). Up

on the switch means the antenna is going UP in the band and DOWN in the bottom (this is the way most wire up to their systems). Up on the switch means the antennas is going up in height and Down in frequency. If you prefer that is 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

4 ft. -- 1.8 MHz to 30.0 MHz

5 ft. -- 1.7 MHz to 28.0 MHz

6 ft.-- 1.6 MHz to 25.0 MHz

8 ft.-- 1.5 MHz to 20.0 MHz

12 ft.-- 1.2 MHz to 15.0 MHz

## CH-1 -- Capacitance Hat

Hat only -- 1.8 MHz to 30.0 MHz

Hat with 3 ft. whip – 1.6 MHz to 25.0 MHz

Hat with 6 ft. whip – 1.5 MHz to 21.0 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.

Always try to use the longest whip possible for best performance. After mounting of the antenna you need to route your antenna control cable and your coax cable in a location away from exhaust pipes and anywhere the cable can be damaged.

Next is the control box and control cable. We preassemble everything here so you'll have a plug and play system.

If properly installed this antenna will have a standing wave below 1.5 from 1.8 to 30 MHz. 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.

## 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 watts and watch the SWR meter till the dip.

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

## **Relative Tuning Positions**

The following photos will show you relative tuning positions of the Model 400 Tarheel Antennas.

**LEXAN COVER REMOVED FOR CLARITY**



Model 400 -- full down position with  
5 ft. whip -- 28.0 MHz



Model 400 -- 21.2 MHz with 5 ft. whip



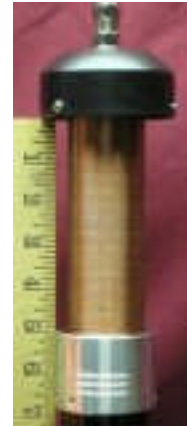
Model 400 -- 14.2 MHz with 5 ft. whip and 1/2" of coil showing



Model 400 -- 7.1 MHz with 5 ft. whip and 1 1/2" of coil showing



Model 400 -- 3.9 MHz with 5 ft. whip and 4" of coil showing



Model 400 -- 3.5 MHz with 5 ft. whip with 5" of coil showing



Model 400 -- 1.9 MHz with 5 ft. whip and 15" of coil showing



Model 400 -- 1.8 MHz with 5 ft. whip and 16 1/2" 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.

We use an automotive finish on this antenna so whenever you wash and wax your vehicle raise your antenna and wash and wax the shaft and the bug shield (Lexan tube), with wax on your antenna the bugs will have a harder time sticking to it.

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 to clean the coil:

1. Run the antenna up till all the coil is exposed.
2. Remove the are 3 screws in the top Delrin Cap.
3. Then slide the Lexan bug shield down to expose the coil, next feel the coil, is it sticky?
4. If so it's dirty, now wipe the coil with alcohol.
5. Then lightly scrub the coil with a Scotch-Brite pad (available at any hardware store).
6. Then one more wipe with alcohol and that's it.
7. Reassemble the Antenna.

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

IF for the 1st 30 days if for any reason you are not completely satisfied, return the antenna undamaged for a full refund less the shipping charges. The antenna has a ONE YEAR NO MATTER WHAT WARRANTY to the original owner. If for any reason **(other than damage due to unauthorized disassembly, negligence, improper use, or use of Non-recommended Controllers)** your Tarheel Antenna fails to perform due to quality or workmanship Tarheel Antennas, Inc. will at our discretion either repair or replace at no charge for parts or labor. Shipping charges are your (the customer's) responsibility to and from Tarheel Antennas' repair shop. We here at Tarheel Antennas hope you enjoy one of the best performing, best built, best looking motorized antennas available.

We here at Tarheel Antennas hope you enjoy one of the best performing, best built, best looking motorized antennas available.

Please pass along any suggestions you may have to make our antenna better. All suggestions are appreciated. Also when you have your antenna installed please send us pictures.

Thanks,  
Tarheel Antennas