

Product Review: MFJ-1664 Portable Screwdriver Antenna
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Introduction

I enjoy operating some HF mobile, and I also really enjoy operating HF portable. Enter MFJ with manual screwdriver antennas designed for BOTH mobile and portable uses.

New MFJ manual screwdriver antennas

MFJ's new manual screwdriver antennas utilize 1.7" diameter coils wound on PVC tubes (tinned copper wire wound at 12 turns per inch), and include both 4-1/2 foot and 10-foot collapsible whips. The 4-1/2 foot whips can be used in mobile applications, whereas the 10-foot whips can only be used in non-mobile environments as they are not designed to stand up to normal highway speeds. Of course, you can simply screw a 9-foot CB whip into these antennas for a higher efficiency mobile set-up if desired. All antennas utilize the standard 3/8x24 thread. The table below summarizes the antennas as advertised:

<u>Antenna</u>	<u>Coil Length</u>	<u>Coverage w/4.5' whip</u>	<u>Coverage w/10' whip</u>
MFJ-1661	12 inches	20-6 meters	40-2 meters
MFJ-1664	24 inches	60-6 meters*	80-6 meters
MFJ-1662	15 inches	40-2 meters	60-2 meters*
MFJ-1668	36 inches	80-6 meters	80-6 meters

* Advertised as 40 meters, but actually works down to 60 meters

These antennas are tuned with a 2"OD aluminum tube with finger-stock slides up over the coil and is held in place with a nylon-tipped thumbscrew. This method of shorting the coil turns gets around the de-"Q"ing of the coil that can occur when a clip lead is used to short the turns. Also, the coil is grounded through the coil wire – i.e. the outer aluminum sleeve does not make contact with the mast (remember – the thumbscrew is nylon tipped). This makes adjustment of the antenna very insensitive to contact with your fingers. According to MFJ "The coil shorts from the low impedance (50 Ohm side), not the high impedance (antenna side) that all other screwdriver type antennas do. This makes adjustments easy because the antenna is not sensitive to hand de-tuning."

MFJ also recognized the fact that base matching capacitors or inductors are often necessary with electrically short antennas, and so provided a thumbscrew on the shaft to make it easier to attach these external matching devices. More on this later.

MFJ-1664 Measured Data

The antenna I evaluated is the MFJ-1664 (see photo MFJ1664&whips.jpg). I chose this because I don't really care for 80 meters for portable operation (too much of a disadvantage with respect to antenna efficiency and transmit power). However, 60 meters is a different story, since everyone is limited to 50 watts ERP. I was sure that the MFJ-1661 didn't have enough coil inductance to resonate the antenna on 60 meters, and I was unsure whether the MFJ-1662 had enough coil for the job. Since the MFJ-1664 advertised coverage from 80-6 meters with the 10-foot whip, I knew that I'd get 60 meters with this antenna. As it turned out, I found that the MFJ-1664 also covers 60

meters with the 4.5-foot whip. And I've since found out the MFJ-1662 will cover 60 meters with the supplied 10-foot whip, but not the 4.5-foot whip.

In order to evaluate this antenna, I tried it in several different configurations:

1. Mobile mounted as designed (base loaded) with the 4.5-foot whip See photo "Mobile Mount".
2. Mobile mounted as designed (base loaded) with the 10-foot whip.
3. Ground-mounted using the antenna as designed (base loaded) with the 10-foot whip and with six 16-foot radials. See photo "Ground Mount".

Since short antennas need base matching in order to give you a good VSWR, I also determined the base matching capacitors necessary in the three different configurations.

Finally, the MFJ-1664 is very easy to resonate using an SWR Analyzer (MFJ-259B in my case). As I mentioned earlier, I could hold the thumb-screw and, after moving the shorting assembly up and down, see very little change when I released the thumb-screw. I also found that I could make marks on the aluminum tube with a permanent marking black felt-tip pen so I could easily return to the previous setting without any problem. The tables below show the results of my measurements.

Configuration: Base loaded, Mobile Mount, 4-1/2' whip					
Band	Base Match	Band	Base Match	Band	Base Match
80	-	30	620 pf	15	120 pf
60	1200 pf	20	330 pf	12	120 pf
40	820 pf	17	120 pf	10	120 pf

Configuration: Base loaded, Mobile Mount, 10' whip					
Band	Base Match	Band	Base Match	Band	Base Match
80	1500 pf	30	220 pf	15	none
60	820 pf	20	200 pf	12	none
40	620 pf	17	none	10	none

Configuration: Base loaded, Ground mounted, 10' whip					
Band	Base Match	Band	Base Match	Band	Base Match
80	820 pf	30	200 pf	15	none
60	510 pf	20	200 pf	12	none
40	330 pf	17	120 pf	10	none

Base Matching

Because short antennas need some sort of base matching to transform the low impedance to 50 ohms, MFJ provided a thumb-screw on the lower mast section of these antennas so that you can add either inductive or capacitive shunt matching. The necessary capacitors for base matching were defined in the above table. You can also put an MFJ-910 Mobile Matcher in-line at the antenna base (this is a capacitor switch box). Or, you may wish to use inductive matching, such as with a Lakeview Inducti-Match. The base mount seen in "Ground Mount" is described in another article on this web site.

Summary

The MFJ series of manual screwdriver antennas are both versatile and affordable, and can satisfy both your portable and mobile interests. They use the standard 3/8x24 thread, so any convenient standard mount can be used. As an example, the MFJ-1664 only weighs two pounds. Therefore it is probably a great candidate for mounting on a tri-magnet roof mounting assembly such as the MFJ-336T, or mounting on one of the sturdier trunk lip or hatchback mounting devices such as the MFJ-345T.



MFJ-1664 mounted on VW New Beetle



MFJ-1664 ground mounted



MFJ-1664 and supplied 10- and 4.5-foot whips