

SWR vs. SWR Curve

Solution

An antenna which is newly installed can be a challenge to tune without knowing some of the characteristics. Knowing only the swr does not really tell you a lot about the antenna. You can consult meters which can tell you all about the antenna, but it may be too much information. You don't want to know the phase, or reactance, or even pattern. You only want to get the antenna tuned with minimum effort.

The attached article gives you a general guide to basic tuning patterns. It details the swr curve as opposed to only one swr point on the curve. It doesn't tell you how to fix the antenna, but does give you information needed to fix or tune the antenna.

Importance of the Swr Curve

Note to a recent 13B2 owner:

This antenna is supposed to have an swr below 2:1 from 144 to 148 MHz. The manual says >4 MHz bandwidth. So, an swr curve will show the frequency where this actually occurs. See if yours is anywhere close to 4 MHz, even if it is outside the band. The center frequency location sets where these points fall.

If the center frequency is not 146 MHz, then the entire curve will shift with it. So, if it is actually 146.5, then the lower 2:1 point will be 144.5 MHz, and the upper point will be 148.5 MHz. This may be corrected by adjusting the slider bars on the driven element. Make notes before and after any changes so you can tell how much you changed.

This is why the swr curve is important. Your radio shutdown point may be like my Kenwood, where it starts reducing power at 1.5:1 swr. My Yaesu starts at 2:1. Yours may be different. So, if the 2:1 point happens at 144.5 MHz, and you check it at 144.0 MHz, you may only see 25 watts, or whatever the radio reduces the power to, to prevent burnout of the finals, because the swr is too high.

This is not a requirement for you to check, but for proper operation, you need to know the limits of your equipment.

Letter to an MFJ-1775 user:

Hi Don,
I can replace the matchbox if necessary. An easy check with an ohm meter can test it. You should have continuity from the center conductor to one side, and from the shield/ground to the other side, with no continuity between them. If the balun is replaced, and it is not the problem, you will be back where you are today.

You do not mention swr. Some bands are resonant below the amateur bands, for MARS operators. Example: 40m is around 6.8 MHz out of the box. If you did not change this, your swr at 7.000 would be about 4:1, and about 8:1 at 7.300. If you are using an internal tuner, it probably has an swr limit of 3:1, which will not tune higher.

Check the swr, and the swr curve:
<https://www.mfjenterprises.com/HelpDesk/knowledgebase.php?article=2>

You can bypass the balun for testing, and you should get the same swr curve that you had with it. Make a short jumper with open leads, which connect to where the balun was.

Assuming the balun is good, two solutions:
1. Retune the antenna where the resonant frequency is your frequency.
2. Use either a full range tuner(MFJ-939), or, a range extender(MFJ-914) which works with your radio to extend its' range to 30:1 swr.

I do not see you in our data base, so include a copy of your invoice with your reply.

Tom Stone, AA5MT
MFJ

Attachments:

 [swr curve.pdf](#)

Article details

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