A REVIEW OF "REFLECTIONS", BY WALTER MAXWELL W2DU

My first assessment of this work is that many Amateurs regard SWR as public enemy one, to be eliminated at all costs. Apparently this is not completely true. The Author suggests that our impedance matching efforts have been concentrated on the wrong end of the line. Climbing precarious heights to adjust antennae, trim dipoles and the like are unjustified and needless.

Using open wire feed line, Amateurs of old were not concerned with high SWR.

With SWR, there is no power lost. It travels up and down the line. Losses are incurred by line loss. With low line loss, the SWR has insignificant effect as far as losses concerned.

1. Reflected power by itself is an unimportant factor in determining how efficiently power is being delivered to an antenna.
2. The effect of line attenuation is the key factor to let us know when and how much to be concerned about reflected power.
3. All power fed into the line, minus losses due to line attenuation is absorbed in the load regardless of the mismatch at the antenna terminals.
4. Reflection loss is canceled at the line input by reflection gain (from the transmatch or "tuner").
5. A low SWR reading by itself is no more a guarantee that power is being radiated efficiently than a high SWR reading guarantees it is being wasted.
6. SWR is not the culprit in transmitter loading problems- the real culprit is in the change in line impedance resulting in the SWR. This can be controlled or corrected with a matching device.

Low SWR does not guarantee success.

One example is removing radials from a vertical antenna system until the terminating resistance is 50 ohms. Commercial AM stations are required to have 120 radials, some have 240. There is a good match, but there is now 18 ohms of ground resistance. Close to half the power is now heating the

ground. Lowering the ends of a dipole closer to ground produces the same results.

When operating with a balun, the core may mask the poor match by saturating. The core will efficiently convert the RF into heat.

Be suspicious of a low SWR, especially if it remains low or relatively constant over a moderate frequency range. "If it looks too good to be true, it probably is not."

High SWR does not guarantee failure. With low loss in the line and a tuner, SWR presents no problems.

When SWR is not a big consideration:

1. Low line losses. At HF, 5:1 is not bad with RG-8. Hard Line can stand up to a bit more.
2. Short line length- short length, low loss.
3. Ladder line is practically lossless. It was made to take it.

When it merits more consideration:

1. With UHF frequencies. The line loss is considerably increased over that of HF frequencies. In UHF television it is very important, not for losses but reflections distort the picture. Same for data signals.
2. High line loss- very long runs of cheap coax would come under this category, more so at higher HF frequencies.

"Reflections" is available for download from the ARRL website, www. arrl.org. in Adobe Acrobat format- you will need the Acrobat reader to read or print it. A greatly abbreviated version by Steve Ford, WB8IMY, called "the SWR Obsession" is also available for download. "Reflections" can also be purchased from World Radio, and may have additional material.

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