(25 Check-Ins)
Solar Cycle 24: SFI = 132, SN = 94, A = 5, K = 2

04/16/14, K5LKJ (NCS), W5TKZ, W5HFF, K5CAM, K5LJ, WA5CYI, AA5OA, KL7AX (Katy), N5DTT (Bellaire), AF5T, KF5TFJ, W5RH, AA0ST (Dickenson).
(13 Check-Ins)
Solar Cycle 24: SFI = 173, SN = 149, A = 6, K = 0

04/23/14, K5LKJ (NCS), W5TOM, W5TKZ, AA5OA, W5HFF, N5DTT (Bellaire), WS5H, VK2AJB/5 (RCS) (Sidney, Australia), KE5OBY (R), K5LJ, AF5T, AA0ST (Dickenson). (12 Check-Ins)
Solar Cycle 24: SFI = 135, SN = 136, A = 5, K = 2

bile (P) = Portable (R) = Relay (RCS) = remote controlled station (T) = telephone check-in

Come join us each Wednesday evening. Regards. John K5LKJ

The Radio Hotel – The Standing Wave – Rick – W5RH

We use the term SWR, or Standing Wave Ratio, as an indicator of the quality of the impedance match in our antenna systems – in reality it is the difference of the impedance match between the antenna (the load) and the transmission line (TL). Ideally, a 50 ohm coax wants to feed a 50 ohm antenna, but that is not as typical as it would seem. There is always some variation -- from very slight to quite a difference.

But, just what is the standing wave? Here is the story: Power, as a sinusoidal wave of voltage (and current) from the transmitter, is input into the TL and the wave moves down the TL to the load. If the TL's characteristic impedance(Z) and the load input feed impedance (Z) are equal (matched), all power is transferred to the load from the TL, hence more signal is radiated from the antenna – a good thing. If the TL and load are mismatched (not equal), there will be some 'reflection' of a portion of the forward wave back toward the transmitter. The greater the mismatch differential the greater the reflected wave amplitude. This reflected wave heads back toward the transmitter……(Yes, Virginia, you can have 2 waves traveling in 2 different directions on a TL.) Keep in mind that the forward wave is continuously being generated by the transmitter and the reflected wave is being reflected back toward the transmitter continuously. Because it is a closed system, these two waves, one traveling one way and one traveling the other, start to set up a pattern.

You know how when you look at, from the side, two passing trains traveling at the same speed in different directions on a parallel set of tracks….you see a "pattern" form by the coordinated moving spaces between the cars. Similarly, the two voltage waves, passing each other on the TL, set up a "pattern" wave of their own, called the "standing wave". It is "standing" because it not moving. It is not moving because the waves are each traveling at the same speed and, also, there is no shifting due to any difference in frequency. Understand, though, that the standing wave is an apparent/virtual wave -- the literal "sum" of the addition of the Forward wave's values and the Reflected wave's values generated, as they pass each other at each point on the TL.

How is the standing wave generated? Check out -- http://www.bessernet.com/Ereflecto/tutorialFrameset.htm

Years ago, Hams used a Lecher wire to measure wavelength, but you could literally see the standing wave voltage variations along the line – (Google - Lecher wire). Use the url above and change the SWR value to i.e. 2, 3, 5, 10 [hit enter] and see how the reflected wave amplitude increases and the standing wave maximum voltage to minimum voltage differential becomes greater. The Standing Wave "Ratio" then is the maximum voltage on this standing wave compared to the minimum voltage on this standing wave.

Next time "The Standing Wave Ratio"
*The purpose of **The Radio Hotel** is to give you a practical kickstart into exploring the workings of antenna systems. Do a bit of research – Google the buzz words and find out what they mean. Read up on antenna theory to see how it all works together. You will be glad you did.*