

CHARLIE'S WHISTLE

By

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Where on earth did the summer go? Before we know it, the long hot summer will turn into cool days and nights and an occasional breeze with a frosty bite in it. Cold weather is certainly preparing itself for an appearance in just another few weeks. Charlie surely knows that. Do you have all those antenna projects finished? There's time left but not that much. Better plan to finish up soon before you'll regret delaying it.

Charlie had planned a few little things to do in his own autumn ritual up on Signal Hill. He can still climb his tower, albeit much more slowly than years ago, so he still does much of his own antenna work. Actually, he dreads the day when he won't be able to do it any longer, but now his knees tell him the time may be close. He starts the tower work by climbing to the top of the tower with two quarter inch box wrenches, a roll of silicone tape, a screwdriver and multi-blade knife in his pocket. Each is tied to his belt loop with a short string, a habit Charlie learned years ago. It saves unnecessary trips down to the ground and then back up because of dropped tools. When you're working alone, there's no one to yell down to. Why two wrenches? It's just an old habit he developed many years ago after dropping his only wrench from the top of the tower more than once. That why Charlie now ties everything to his pants with string, just in case. Just for insurance, he often wears industrial grade suspenders to guarantee that the tools don't pull much.

He standardized all his bolt heads to quarter inch years ago, so one wrench size will do everything. Charlie doesn't like adjustable wrenches because they slip off the bolts and eventually round out the corners on their heads. A closed box wrench is easier to use and never will damage the bolt.

He puts the wrench on every tower bolt and nut to be sure it hasn't wiggled loose in buffeting winds or expansion/contraction cycles in the past twelve months. The tape is always ready to repair an exposed or loose wire. A recheck of the rotator mounting and connections is on the list. As he progresses down the tower, he knows that by the time he's too tired to do any more, he'll be on the ground or at least close to it. This top-down system has worked for him for many years and now that he's a senior citizen, it's essential.

Charlie finished his fall checkup just about 5 PM, after more than three hours on the tower. As he slowly made his way from the tower to the back door with his knees and ankles aching, he heard someone drive up to the house. So, instead of going into the back door, he walked around to the front to see who had come visiting. Well, what a pleasure to see who it was!

His favorite student, Brian had just pulled up in his dad's truck. He called as he climbed out, "Hi Charlie. Do you have a few minutes? I just have something to get cleared up." What a silly question, Charlie thought. "Of course, I always have time for you, Brian. You're probably just in time for dinner, too. How's that sound?" Brian looked at his watch and stopped walking. "Oh, Golly! I'm sorry. I didn't realize it was this late. I didn't mean to intrude." Charlie had reached Brian and gripped his hand in a strong shake. "Don't be silly, son. It couldn't be a better time to drop in. Come on in. Mary will be delighted to see you. What brings you here? Aren't you back in school? You should be in Cambridge now, shouldn't you?" Brian explained that he was only home for a few days before starting his next term.

They went into the front door and were greeted by wonderful aromas from the kitchen. Any reservation Brian had about staying for dinner was instantly erased. Charlie called, "Mary, look who's going to join us for dinner. I hope we have enough soup in the pot." Mary looked out of the kitchen and saw Brian. With her usual twinkle, she said, "Well hello, dear. How nice that you stopped by. I was wondering how Charlie and I were going to be able to finish all this chicken stew and blueberry pie." She came over and gave both of her boys a big hug. "Why don't you both go do something on the radio. Dinner won't be ready for another 30 minutes or so. I'll bring you some tea and cookies to hold you off that long and I'll call your mom, Brian so she won't expect you for dinner."

Charlie said that would be fine and they headed for the well seasoned ham shack. The music of CW drifted out as they neared the small but fully stocked room, heaven to most hams around DX Hill or just

about anywhere else a DXer lives. As Charlie nudged Brian into the big old squeaky swivel chair in front of the main station transceivers and control panel, he said, "I'm not sure what band conditions are like. I've been working outside all day. They weren't so hot this morning. WWV had the A index at 15 and the K at 2. I suppose that's better than a month ago when the A was over 50, huh?" Brian didn't react immediately as he slowly tuned the receiver dial across a 30 kHz window of 20 CW, hearing a few weak signals.

After a few seconds, he asked, "How did you know, Charlie? Actually, that's what brought me here today. I guess I really don't understand how to use those propagation numbers from WWV. I thought I did but then when I listen to the bands, they don't behave the way the numbers say they should. It just seems like shooting dice for me. I'm just not experienced enough, I guess. But, would you go over how to understand this just one more time for me?" Charlie smiled and replied, "Why sure, I will. You know it's like so many other things in life. You don't need to be able to build a watch to use one. This isn't nearly as complicated as you think."

Charlie sat in the shack guest chair and explained, "Understanding this business about propagation is really simple unless you actually need to see the sun, measure the solar flux, observe 11 and 121 years trends, and ponder about a whole lot of imprecise impact analyses that often contradict themselves. In short Brian, you don't care about most of it. What you need to know is the probability that the HF bands are going to be open in some direction to somewhere. To do that, you'll need to get some idea of what conditions have been for the last few days or weeks. With that, you'll get some idea of whether the fish will bite today."

Brian just quietly looked at Charlie with that patented gaze of anticipation. Charlie explained, "OK, WWV sends out propagation bulletins every hour at 18 minutes past the hour." He looked at his shack clock and saw that it was 5:16. Let's go check their latest numbers." Charlie spun the dial to 15.0 MHz on his auxiliary receiver, an old classic Collins 51J-4. It sits off to the side of the main operating position but still within reach. He brought up the familiar tone 440-cycle tone with the one second ticking sound. The signal was strong. The announcement for 5:17 was made and they waited. At precisely 5:18, the tone ended and an announcement was made listing the solar flux index, A index and K index followed by a brief forecast of geomagnetic conditions. They came across quickly but Brian jotted the numbers down. The Solar Flux read 102, A was 15 and K was 8. The forecast was for active solar conditions.

Charlie wrinkled his nose and then smiled. Brian picked up on that and asked, "That's what I mean. You know right away that conditions aren't too good but to me, that WWV doesn't look too bad for this time in the cycle." Charlie nodded and said, "Yes, I can understand the problem. Let me point out some things to watch for that aren't so obvious. The biggest indicator is the direction, rate and amount of change from the readings of several hours earlier. In this case, the K is up from 4 and the A is up from 7 in this morning's report. Conditions are getting worse fairly quickly."

Brian seemed to understand something he may have overlooked. He asked, "So the rate of change is more important than the actual readings themselves? Charlie responded, "Well, that's often true but not always and not all of the story, either. Actually, you need to use historical data from the last few days and watch the volatility and direction of the change as well as the numerical values. Let's review what these indices actually are telling us."

Charlie pointed out that the National Institute of Standards and Technology (<http://www.boulder.nist.gov/timefreq/stations/wwv.html>) carries a good understandable explanation on its website. It says that the Solar Flux Index is read every day at 2000 UTC by the Canadian National Research Council in British Columbia by measuring the intensity of solar radio emissions at 2800 MHz. That shows the overall activity level of the sun and its radiation of energy that will affect our radio transmission when the energy reaches and combines with geomagnetic fields around the earth. This Solar Flux Index or SFI serves as the basis for other behavior observations such as the K Index and A Index. Charlie pointed out to Brian that understanding these indices is where most Amateurs have trouble.

The K Index, from 0 to 9 measures the horizontal component of the geomagnetic field around earth. A new K Index is determined every three hours. The A Index, from 0 to 400 expresses the range of disturbance of the geomagnetic field over the previous 24 hours. It is obtained by converting and averaging the past eight 3 hour K index values.

Charlie could see that even though Brian is a super bright young digital engineer, he was looking a little befuddled by all this physics. He continued, "Look, it's like golf. Lower numbers mean better conditions for HF propagation. When A is less than 10 and K is around 3, conditions are close to ideal. The lower the A and K figures, the less our signals will be absorbed by the earth's geomagnetic field. The K and A indexes are used also to compute the Maximum Usable Frequency or MUF and Lowest Usable Frequency or LUF for a given time and location on earth."

Slowly, Brian nodded and eventually said, "OK Charlie. I understand better now, I think. But all that doesn't always work, does it? Sometimes, the numbers seem to be good and the bands are not and other times, the MUF states that there's no hope of a path above 10 MHz and 20, 17 and 15 meters are wide open for an hour or two." Charlie laughed and agreed, "Yup, you're right. But, that's what keeps it all interesting for us. If it was as easy as dialing a phone, Amateur Radio and surely DX chasing wouldn't any fun at all, now would it?" Brian smiled and said, "It's the fun of the chase, not the result, right?" Charlie agreed just in time for Mary to call them to dinner. These guys are never late to one of Mary's dinners.

Trying to understand propagation and all the things that affect it is an approximate science, at best. We can recognize certain factors as being important but they cannot tell the story by themselves. The best rule for DXers is to listen, listen and then listen some more. Often, when all the signs point toward the fact that no propagation will be working for you to a given part of the earth, a path will open over an unexpected bearing. Sometimes 180 degrees form the direct path that's known as the long path and sometimes, by a crooked path following a weird route to the DX that's not predicted by anyone. It'll be good advice to keep that rotator in good operating condition during the next few years of Cycle 23's bottom. DX is often there but it will be weaker and not play by the propagation rules that you learned at the top of the cycle. One thing that is certain is that DXing is always a challenge and great fun. As our old DX cheerleader, Hugh Cassidy, author of the West Coast DX Bulletin would often say to all of us, DX IS! The lure of DX keep us coming back to explore and learn the mysteries of the ages. And so it will always continue.